

CITY OF
MILTON-FREEWATER

WATER MANAGEMENT AND
CONSERVATION PLAN UPDATE



PUBLIC WORKS DEPARTMENT
FEBRUARY 2021



**CITY OF MILTON-FREEWATER, OREGON
WATER MANAGEMENT AND CONSERVATION PLAN
UPDATE
2020**

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FEBRUARY 2021

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LIST OF ABBREVIATIONS/ACRONYMS

ADD – Average Day Demand
AMI – Advanced Metering Infrastructure
CFS – Cubic Feet per Second
City – City of Milton-Freewater, Oregon
CRBG – Columbia River Basalt Group
DOE – U.S. Department of Energy
DWP – Oregon Department of Human Services Drinking Water Program
ESU – Evolutionary Significant Unit
GPCD – Gallons per Capita Day or Gallons per Person per Day
GPM – Gallons per Minute
HP – Horsepower
MDD – Maximum Day Demand
MG – Million Gallons
MGD – Million Gallons per Day
MMD – Maximum Month Demand
MSL – Mean Sea Level
OAR – Oregon Administrative Rules
ODEQ – Oregon Department of Environmental Quality
OHA – Oregon Health Authority
OWRD – Oregon Water Resources Department
PRC - Portland State University College of Urban and Public Affairs Population Research Center
PRV – Pressure Reducing Valve
PSI – Pounds per Square Inch
TMDL – Total Maximum Daily Load
UGB – Urban Growth Boundary
WMCP – Water Management and Conservation Plan

EXECUTIVE SUMMARY

The City of Milton-Freewater (City) is a community located in the Walla Walla Valley in northeast Oregon. Milton-Freewater is located on the alluvial fan of the Walla Walla River which flows adjacent to the eastern boundary of Milton-Freewater from south to north. The Little Walla Walla River, a distributary branch of the Walla Walla River, meanders through the middle section of the City.

The City of Milton-Freewater (City) is a community located in the Walla Walla Valley in northeastern Oregon. The City serves a population of approximately 7,338 in its water service area.

The City of Milton-Freewater, Oregon, is submitting this Water Management and Conservation Plan (WMCP) Update to meet the requirements of Oregon Administrative Rule (OAR) 690-086-0125. This WMCP includes a summary of the existing system, a description of water sources/rights, water conservation measures, the City's curtailment plan and a supply evaluation as outlined in *Water Management and Conservation Plans – A Guidebook for Oregon Municipal Water Suppliers*¹.

The City of Milton-Freewater's WMCP Update summarized herein is intended to meet the requirements of the Oregon Water Resources Department (OWRD) for a Conservation Plan. The WMCP Update outlines the City's water system needs for the next 20 years and beyond. The WMCP Update also outlines practices and water system management methods to help track water use and demands as well as identify potential conservation measures for further evaluation and potential implementation.

NOTICE TO AFFECTED LOCAL GOVERNMENTS

The cities closest to the City of Milton-Freewater include College Place, Washington (8 miles to the north), Umapine, Oregon (4.5 miles northwest) and Weston, Oregon (8 miles to the south). Any actions taken by the City of Milton-Freewater concerning its water system will not impact any of the neighboring communities. However, the City did send the WMCP update to the local governments noted below.

This WMCP was submitted to the following local governments for review:

- ◆ City of Weston, OR
- ◆ City of Athena, OR
- ◆ Umatilla County

No comments were received from local governments.

¹ Oregon Water Resources Department, 2015. *Water Management and Conservation Plan – A Guidebook for Oregon Municipal Water Suppliers*. March, 2015 (2nd Edition). https://www.oregon.gov/OWRD/WRDPublications1/wmcp_guidebook.pdf

PROPOSED WMCP UPDATE SCHEDULE

- 2025 – WMCP Progress Report
 - ◆ Update status of Curtailment Plan
 - ◆ Update status of Conservation Measures

2030 – WMCP Full Update

CONSERVATION BENCHMARKS

The City of Milton- Freewater already practices or completes all required conservation measures listed in OAR 690-086-0150. The City intends to improve upon some of the required measures as well as consider additional conservation measures with the intent of improving overall water conservation. A summary of the benchmarks for the City's conservation activities is provided in Exhibit ES.1

Benchmark	Status / Action	Implementation Date	Anticipated Completion Date	Frequency
Measurement & Reporting	Compliant	N/A	N/A	Annual
Annual Water Audit	Compliant	N/A	N/A	Annual
Meter Testing & Maintenance Program				
Service & Calibrate Meters	10-Year Plan	Ongoing	Ongoing	10 Years
Meter Replacement Program	5-Year Plan	~2025	~2030	~20 Years
Leak Detection & Repair (Smart Meters)	Continuous	2010	Ongoing	Ongoing
Rate Structure Based On Use	Compliant	N/A	N/A	Ongoing
Public Education Program				
Utility Pamphlets	Annual Plan	Ongoing	Ongoing	Annual
Newsletters	Annual	Ongoing	Ongoing	Annual
City Website	Continuous	N/A	Ongoing	Ongoing
High Consumption	Continuous	2012	Ongoing	Ongoing

Exhibit ES.1 - A summary of the City of Milton-Freewater's Conservation Benchmarks.

The City has a curtailment plan, as summarized in Section 4 of this WMCP Update. The curtailment plan is consistent with the requirements outlined in OAR 690-086-0160, including four stages of alert with specific implementation actions to help conserve water during each stage of alert. The City also has an Emergency Response Plan as required by the Oregon Department of Human Services Drinking Water Program (DWP) to provide further guidance during water system related emergencies.

SECTION 1 – OVERVIEW & MUNICIPAL WATER SUPPLIER PLAN

This section satisfies the requirements of OAR 690-086-0125.

1.1 INTRODUCTION

The City of Milton-Freewater (City) is a community located in the Walla Walla Valley in northeast Oregon. The City is located in north Umatilla County about 10 miles south of the City of Walla Walla, WA. The location and vicinity of the community are shown in Exhibit 1.1. Milton-Freewater is located at the base of the Blue Mountains on the alluvial fan of the Walla Walla River which flows adjacent to the eastern boundary of Milton-Freewater from south to north. The Little Walla Walla River, a distributary branch of the Walla Walla River, meanders through the middle section of the City. The area's economy is driven by agriculture including world-class vineyards, apples, cherries, alfalfa and wheat.

The City withdraws water from 7 basalt wells located in the City or the Urban Growth Boundary (UGB). The basalt wells range in depth from 502 feet to 1,051 feet. Water is either delivered to one of three water reservoirs or pumped directly into the distribution system. The City also has municipal surface water rights to the Walla Walla and South Fork Walla Walla Rivers with a priority dates of 1890 and newer, in addition to other surface water rights. The City has not used its surface water rights for municipal use for approximately 60 years. In the past, the City operated a sand filter treatment facility to treat Walla Walla River water prior to supplying water users. The treatment facility was abandoned due to end of life-cycle and rising operating costs².

In 2019, the City provided water to approximately 7,278 people within City Limits. The City also provides water to approximately 50 people that are located outside of City Limits. The City provides water to approximately 2,336 active water accounts, with residential accounts making up the largest portion of users. As of November 2019, there are 2,076 residential, 203 commercial, 39 government/public, 7 motel/assistant living and 11 industrial active accounts.

1.2 PLAN REQUIREMENT

The Final Order dated June 30, 2011, approving the City's current WMCP specified that an updated WMCP to be submitted no later than June 17, 2020.

This WMCP meets all the requirements of the Oregon Administrative Rules (OAR 690-086) regarding WMCPs.

1.3 PLAN ORGANIZATION

This WMCP Update is organized based on the *Water Management and Conservation Plan Guidebook*³ to meet the requirements of OAR 690-086. The WMCP Update is separated into the following sections:

Executive Summary – provides a brief overview of the city's overall WMCP.

² See Section 2.7 for a complete list of the City's water rights.

³ OWRD, 2015.

Section 1: Overview/Introduction (OAR 690-086-0125) – provides a brief overview of the City’s WMCP, update requirements, WMCP organization.

Section 2: Water Supplier Description (OAR 690-086-0140) – provides a summary of the service area, customer base, population data, water use characteristics, and water sources. Maps for the current service area, major water system features and pressure zones are presented. The City’s water rights are tabulated and described, including an assessment of environmental resource issues and the adequacy and reliability of supply sources. The results of water audits are also discussed.

Section 3: Water Management and Conservation (OAR 690-086-0150) – provides a summary of the City’s water use measurement and reporting, including water conservation elements to be considered for the water system. This section also includes a proposed implementation schedule for conservation items yet to be implemented.

Section 4: Municipal Water Curtailment (OAR 690-086-0160) – discusses events that have resulted in past curtailment situations and contains the adopted curtailment plan.

Section 5: Municipal Water Supply (OAR 690-086-0170) – provides key data for water system planning including population projections, area development considerations, water system demand forecasting, options for obtaining additional supply sources, maintaining existing supply sources and a comparison of maximum use to permitted amounts.

Appendices – provides supporting information for the WMCP, such as well logs, City water rights and other documents.

1.4 AFFECTED LOCAL GOVERNMENTS

OAR 690-086-0125(5)

The cities closest to the City of Milton-Freewater include College Place, Washington (8 miles to the north), Umapine, Oregon (4.5 miles northwest) and Weston, Oregon (8 miles to the south). Any actions taken by the City of Milton-Freewater concerning its water system will not impact any of the neighboring communities. However, the City did send the WMCP update to the local governments noted below.

This WMCP was submitted to the following local governments for review:

- ◆ City of Weston, OR
- ◆ City of Athena, OR
- ◆ Umatilla County

No comments were received from the local governments.

The letters requesting comments and documentation of any comments received are in **Appendix A**.

1.5 PLAN UPDATE SCHEDULE

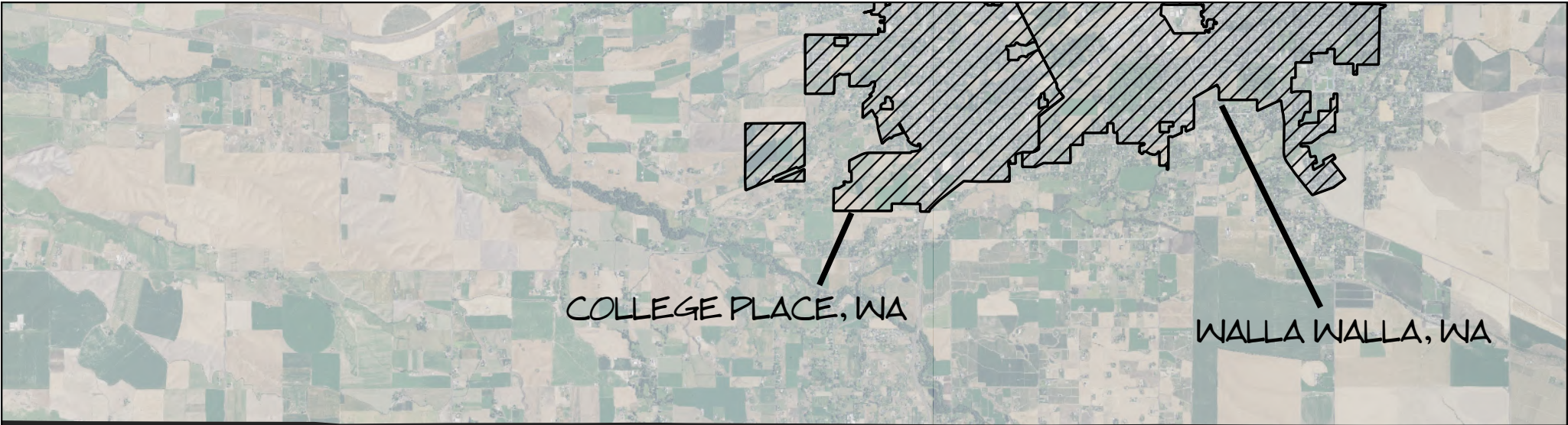
OAR 690-086-0125(6)

The City of Milton-Freewater anticipates submitting an update of this WMCP within 10 years of the final order approving this WMCP. As required by OAR 690-086, a progress report will be submitted within 5 years of the final order approving this WMCP.

1.6 TIME EXTENSION

OAR 690-086-0125(7)

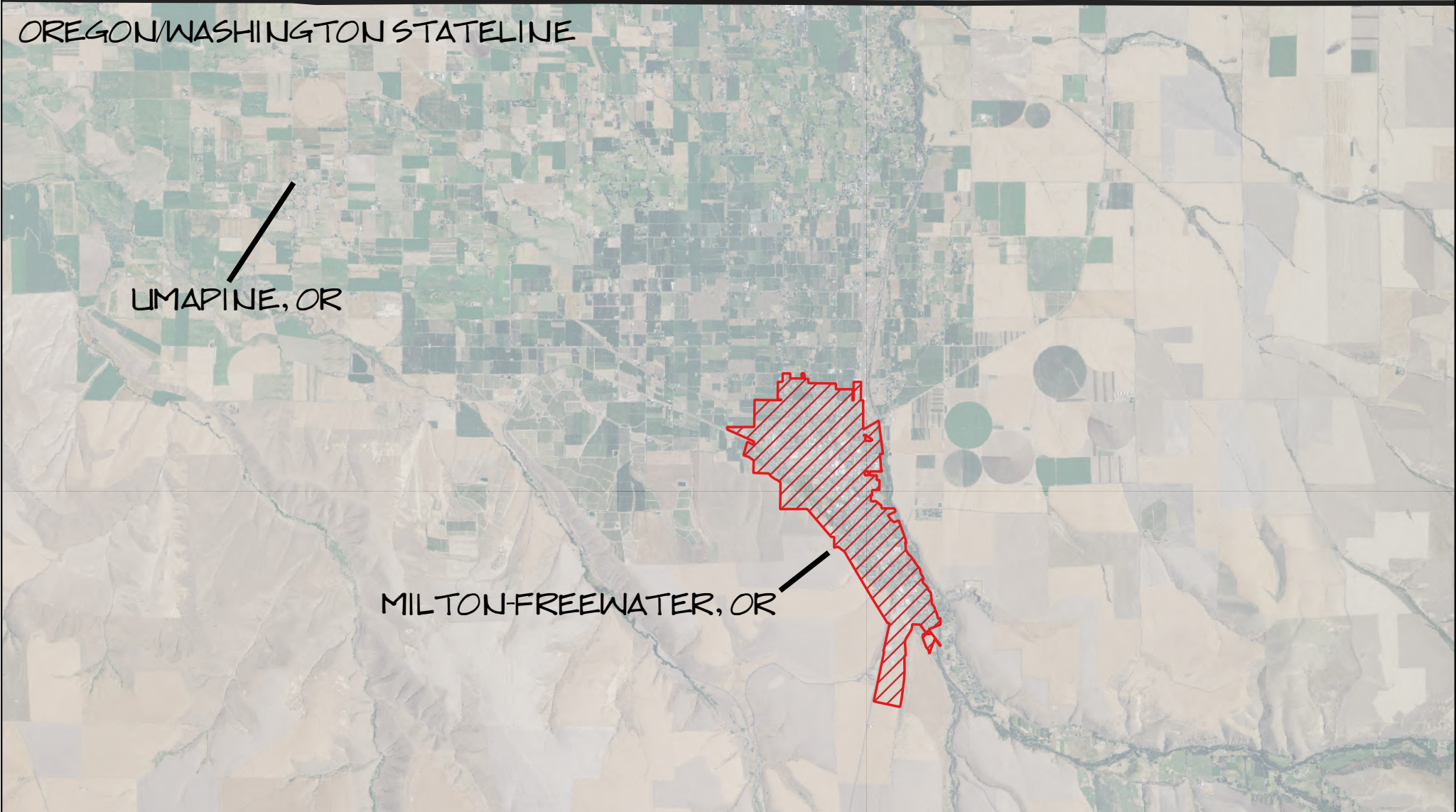
The City is not requesting additional time to implement metering or a previous benchmark.



COLLEGE PLACE, WA

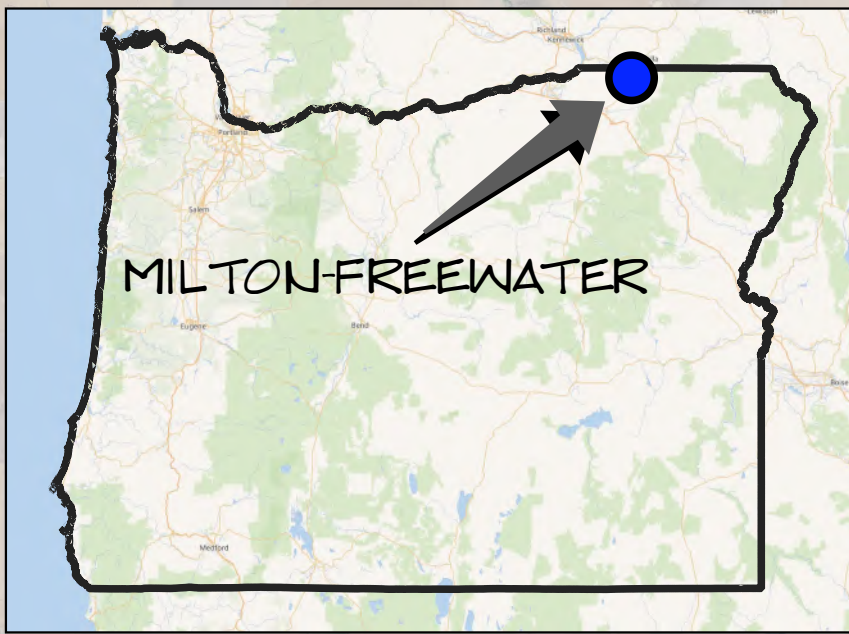
WALLA WALLA, WA

OREGON/WASHINGTON STATELINE

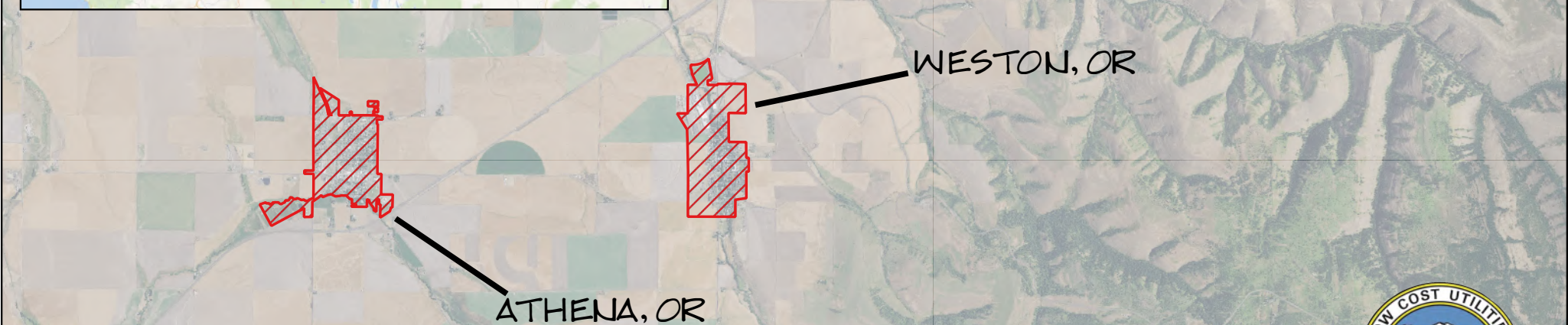


UMAPINE, OR

MILTON-FREEWATER, OR






MILTON-FREEWATER



WESTON, OR

ATHENA, OR

LEGEND

- BOUNDARIES/FEATURES**
-  OREGON CITY LIMITS
 -  WASHINGTON CITY LIMITS
 -  OREGON STATE BOUNDARY

0 1 2 3 4 MILES



CITY OF MILTON-FREEWATER, OR
 WATER MANAGEMENT AND CONSERVATION PLAN
 LOCATION MAP
 EXHIBIT I.1

SECTION 2 – WATER SUPPLIER DESCRIPTION

This section satisfies the requirements of OAR 690-086-0140.

2.1 WATER SOURCES

OAR 690-086-0140(1)

As of November 2019, the City's water supply is provided from 7 active basalt wells drilled into the Columbia River Basalt Group (CRBG). Wells range in depth from 502 feet to 1,051 feet. Generally, the City's wells provide good quality water and past air entrainment problems have been resolved. The City also has multiple unused wells that could be brought into service if required. The City has multiple municipal surface water rights to the Walla Walla River, but these have not been used for almost 60 years. In the past, the City used a sand filter treatment facility to provide treatment of Walla Walla River water prior to supplying the water to City users. The treatment plant was abandoned due to end of life-cycle and rising operating costs.

Well 1: Originally drilled in 1937, Well 1 was extended 15 feet in 1971 to a final depth of 651 feet. The well was rehabilitated and cleaned to 584 feet in 1994, prior to lowering the turbine pump. The well is connected to the Middle Reservoir to dissipate an air entrainment issues. A new drive unit was installed in 2020. This well cannot pump directly into the distribution system.

Well 2: Originally drilled in 1945, Well 2 was rehabilitated in 1988. The well was shut down in 1993 due to air entrainment. This issue was resolved with a discharge line routed to the Middle Reservoir in 2001 to facilitate removal of entrained air. Well 2 was rehabilitated in 2016. This well cannot pump directly into the distribution system.

Well 3: Well 3, originally drilled in 1946, was reconditioned in 1969 and rehabilitated in 1991. Troubleshooting occurred in 1993 to determine aeration problems. An attempt to seal the aquifer and set the pump column to a great depth was undertaken. However, the sealing effort failed to stop the aeration problem and a new transmission line was constructed in 1999 to allow the well to discharge to the North Reservoir. This well cannot pump directly into the distribution system.

Well 5: Well 5, originally drilled in 1936, was deepened 10 feet in 1980. The well was rehabilitated in 2000 and 2013. It is believed that the principal aquifer is located in the bottom 30 feet of the hole (below 470 feet). This well developed air entrainment problems in September 2000 and a discharge line to the North Reservoir was constructed in 2001. This well cannot pump directly into the distribution system.

Well 6: Originally drilled in 1950, Well 6 was rehabilitated in 1992 and 2017. The hole is crooked and placing the original column was difficult. Well 6 also developed air problems and a separate discharge into the North Reservoir was constructed in 1999. This well cannot pump directly into the distribution system.

Well 8: Well 8, originally drilled in 1965, was initially 888 feet deep. It was deepened to 1,051 feet in 1970, becoming the City's deepest well. The well was rehabilitated when it was deepened in 1970. This well is the most recently drilled well in the City and currently it is the least efficient well to operate. Well 8 pumps directly into the Middle pressure zone's distribution system.

Well 9: Well 9, originally drilled in 1951, was acquired by the City in 1993 after previously being owned and operated by the Umatilla Canning Company. The last rehabilitation of the well was completed in 1997 and new drive units were installed in 2016. Well 9 pumps directly into the Middle pressure zone's distribution system. Well 9 has a biofouling issue and a strong sulfur smell and is only used when necessary. Two booster pumps are located in the Well 9 pump house which transfers water from the Middle Reservoir distribution system into the South Reservoir.

Water Reservoirs: The City currently has three water storage reservoirs, one for each pressure zone (Exhibit 2.2, Exhibit 2.13 and Exhibit 2.15). The North Reservoir is a 2-million-gallon steel storage reservoir that was constructed in 1960. The base elevation for the North Reservoir is 1,145 feet above mean sea level (MSL). The reservoir is approximately forty (40) feet tall with a full water surface elevation of 1,183 feet above MSL. The Middle Reservoir is a 1-million-gallon steel reservoir that was constructed in 1956. The base elevation for the Middle Reservoir is 1,210 feet above MSL. The reservoir is approximately thirty (30) feet tall with a full water surface elevation of 1,238 feet above MSL. The South Reservoir is a 2-million-gallon steel storage reservoir constructed in 1999. The base elevation of the South Reservoir is approximately 1,444 feet above MSL. The reservoir is approximately 24 feet tall with a full water surface elevation of 1,466 feet above MSL.

Surface Water: The City's surface water diversion and treatment system on the Walla Walla River was last used in 1959. When it was used, the water was treated via a slow sand filter plant with a 1,200 gallon per minute (gpm) capacity. The plant was shut down due to comparatively high water production costs and water quality limitations. The plant continues to be inoperative at this time. The City also has other surface water rights for multi-purposes including municipal use. The City also holds multiple irrigation water rights. See section 2.7 for a full list of City water rights.

Inactive/Abandoned Wells: The City owns an inactive well named the Key Well. This well was originally drilled for use by a cannery. Since the cannery has closed, the City obtained ownership of the well. Although currently inactive, the well could be utilized in an emergency scenario. The Key well is indicated on the water system maps as an inactive well. The City abandoned Well 4 in 1960 after a compromised well casing and faulty sewer caused a typhoid epidemic. Well 4 is not indicated on any of the water system maps, however the City still maintains the water right.

2.2 SERVICE AREA DESCRIPTION AND POPULATION

OAR 690-086-0140(2)

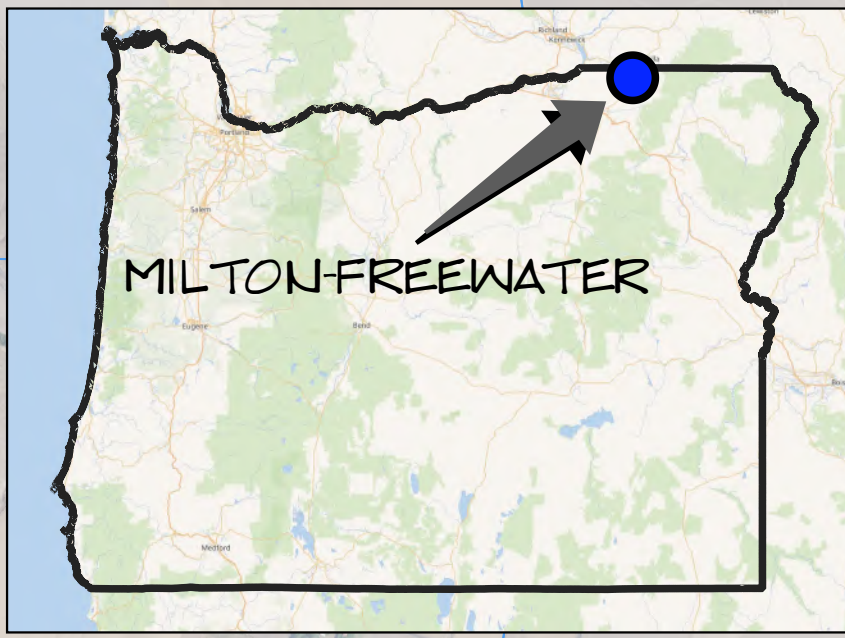
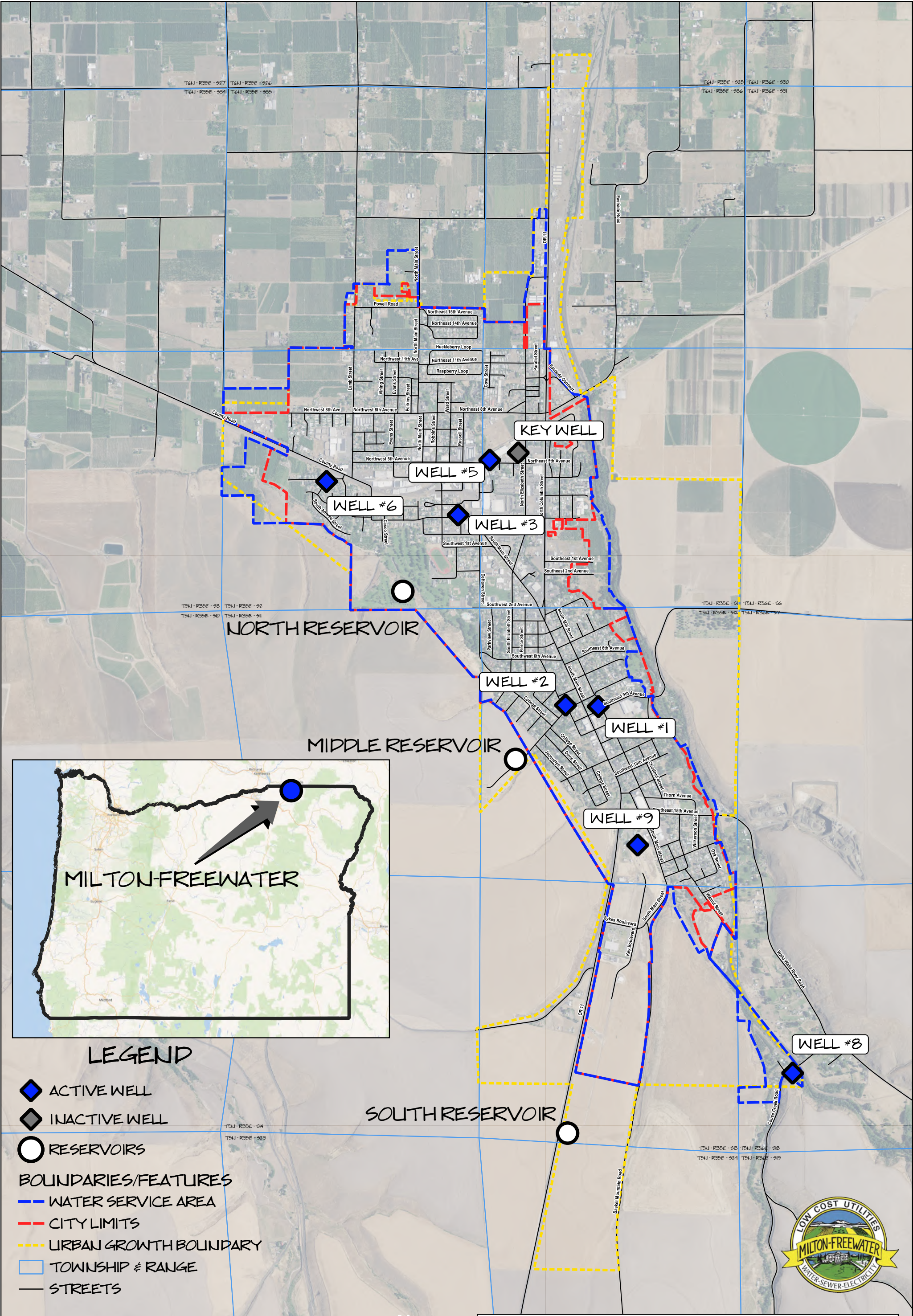
The City's current water service area includes City Limits, portions of the City's UGB and areas outside of its UGB, primarily in the Couse Creek area near Marie Dorian Park and Well 8. Exhibit 2.1 shows the overview map of the existing service area and major infrastructure components. Exhibit 2.2 shows the three pressure zones for the City and the area that could be serviced by each zone with pressure ranges of 35-100 pounds per square inch (PSI). The population within City Limits was 7,278 in 2019⁴, as estimated from the Portland State University College of Urban and Public Affairs Population Research Center (PRC). The total population served by the City's water system is approximately 7,338.

⁴ <https://www.pdx.edu/prc/home>

2.3 INTERCONNECTIONS AND INTERGOVERNMENTAL AGREEMENTS

OAR 690-086-0140 (1) and (7)

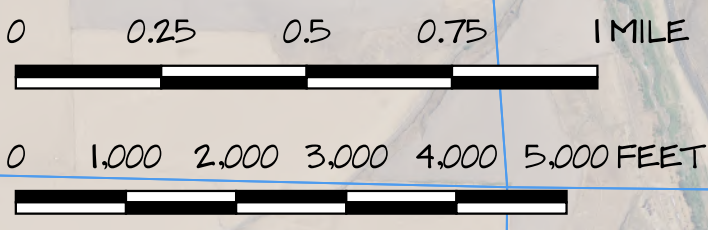
The City of Milton-Freewater does not have interconnections or intergovernmental agreements with neighboring water systems. There are no private water systems adjacent to the City. The nearest communities are Umapine, OR (4.5 miles NW), Weston, OR (8 miles S) and College Place, WA (8 miles N) (see Exhibit 1.1).



LEGEND

- ◆ ACTIVE WELL
- ◆ INACTIVE WELL
- RESERVOIRS

- BOUNDARIES/FEATURES**
- WATER SERVICE AREA
 - CITY LIMITS
 - - - URBAN GROWTH BOUNDARY
 - TOWNSHIP & RANGE
 - STREETS



**CITY OF MILTON-FREEWATER, OR
WATER MANAGEMENT AND CONSERVATION PLAN
LOCATION AND OVERVIEW MAP
EXHIBIT 2.1**

LEGEND

EXISTING PRESSURE ZONES

- MIDDLE PRESSURE ZONE
- NORTH PRESSURE ZONE
- SOUTH PRESSURE ZONE

ELEVATION PRESSURE ZONES

- MIDDLE PRESSURE ZONE
- NORTH PRESSURE ZONE
- SOUTH PRESSURE ZONE
- 80 PSI LINE (SEE NOTE 2)

RESERVOIRS

- NORTH RESERVOIR
- MIDDLE RESERVOIR
- SOUTH RESERVOIR

WELLS

- ACTIVE WELL
- INACTIVE WELL

BOUNDARIES/FEATURES

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TOWNSHIP & RANGE
- STREETS

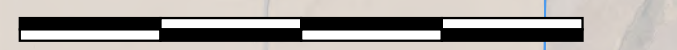
NOTES

1. ELEVATION PRESSURE ZONE LIMITS WERE DETERMINED ASSUMING FULL RESERVOIRS AND THE RESULTING PRESSURE RANGES FROM 35-100 PSI.

2. THE UNIFORM PLUMBING CODE STATES THAT SERVICE PRESSURES SHOULD BE NO MORE THAN 80 PSI.

3. THE BOUNDARY BETWEEN THE NORTH AND MIDDLE EXISTING & ELEVATION PRESSURE ZONES IS SHOWN AT ITS TRUE LOCATION BASED ON CITY OPERATIONS, NOT ELEVATION LEVELS.

0 0.25 0.5 0.75 1 MILE



0 1,000 2,000 3,000 4,000 5,000 FEET



CITY OF MILTON-FREEWATER, OR
WATER MANAGEMENT AND CONSERVATION PLAN
PRESSURE ZONES MAP
EXHIBIT 2.2



2.4 RECORDS OF WATER USE & HISTORICAL WATER DEMANDS

OAR 690-086-0140 (4) and (9)

TERMINOLOGY

Annual/System Demand: Quantity of water produced by all water sources for municipal uses. This includes metered consumption, unmetered authorized uses (hydrant flushing, street operations, firefighting, etc.), water lost due to pipe leakage and system overflows (start-up discharging, reservoir overflow, etc.).

Average Day Demand (ADD): Equals the total annual system demand divided by 365 (or 366) days.

Maximum Day Demand (MDD): Equals the highest system demand that occurs on any single day during a calendar year (i.e. the day of the year when the most water is used).

Maximum Month Demand (MMD): Equals the highest total monthly demand of the calendar year.

Peaking Factor: The ratio of Maximum Daily Demand to the Average Day Demand (MDD:ADD).

Peak Months: Refers to the months of May through September when water use is typically higher.

Non-Peak Months: Refers to the months of October through April when water use is typically lower.

ANNUAL DEMANDS

Exhibit 2.3 summarizes historical demands and peaking factors for the City's water municipal system for 2015-2019.

Year	Annual Demand (MG)	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Maximum Month Demand (MGD)	Maximum Month Demand (MG)	Peaking Factor (MDD:ADD)
2015	648.6	1.78	3.70 (8/5/2015)	3.38	104.8	2.1
2016	630.2	1.72	3.80 (8/19/2016)	2.87	89.1	2.2
2017	648.3	1.78	4.69 (8/3/2017)	4.06	125.8	2.6
2018	618.5	1.69	3.44 (8/14/2018)	3.90	120.8	2.0
2019	600.8	1.65	3.21 (8/1/2019)	3.18	98.5	2.0
AVERAGE	629.3	1.72	3.77	3.48	107.8	2.2
HIGHEST	648.6	1.78	4.69	4.06	125.8	2.6

Exhibit 2.3 - Water Service Area Historical Water Demand Data for 2015-2019, including Annual Demand, Average Day Demand, Maximum Day Demand, Maximum Month Demand and Peaking Factor (Average Day Demand:Maximum Day Demand).

Exhibit 2.4 shows historic annual water demand, in Million Gallons (MG), for the City's Water Service Area from 2002-2019. Over the last 15 years the City has reduced its annual water demand from 900 MG in the early 2000s to around 600-650 MG over the last nine years. Annual water demand has stabilized in the 600-650 MG range for the last decade.

Exhibit 2.5 shows average day demand and maximum day demand, in MG, over the last five years. Similar to the annual water demand, average day and maximum day demands have been fairly stable over the last five years. With the exception of maximum day demand in 2017, values have decreased slightly over the last five years.

Exhibit 2.6 shows monthly demand, in MG, over the last five years with peak demand noted in red columns. Peak month demands range from ~60 MG to ~120 MG and non-peak month demands range from about 25 MG to 45 MG. Non peak month demand has been stable over the last five years while peak month demands have changed based on annual temperature and precipitation variations.

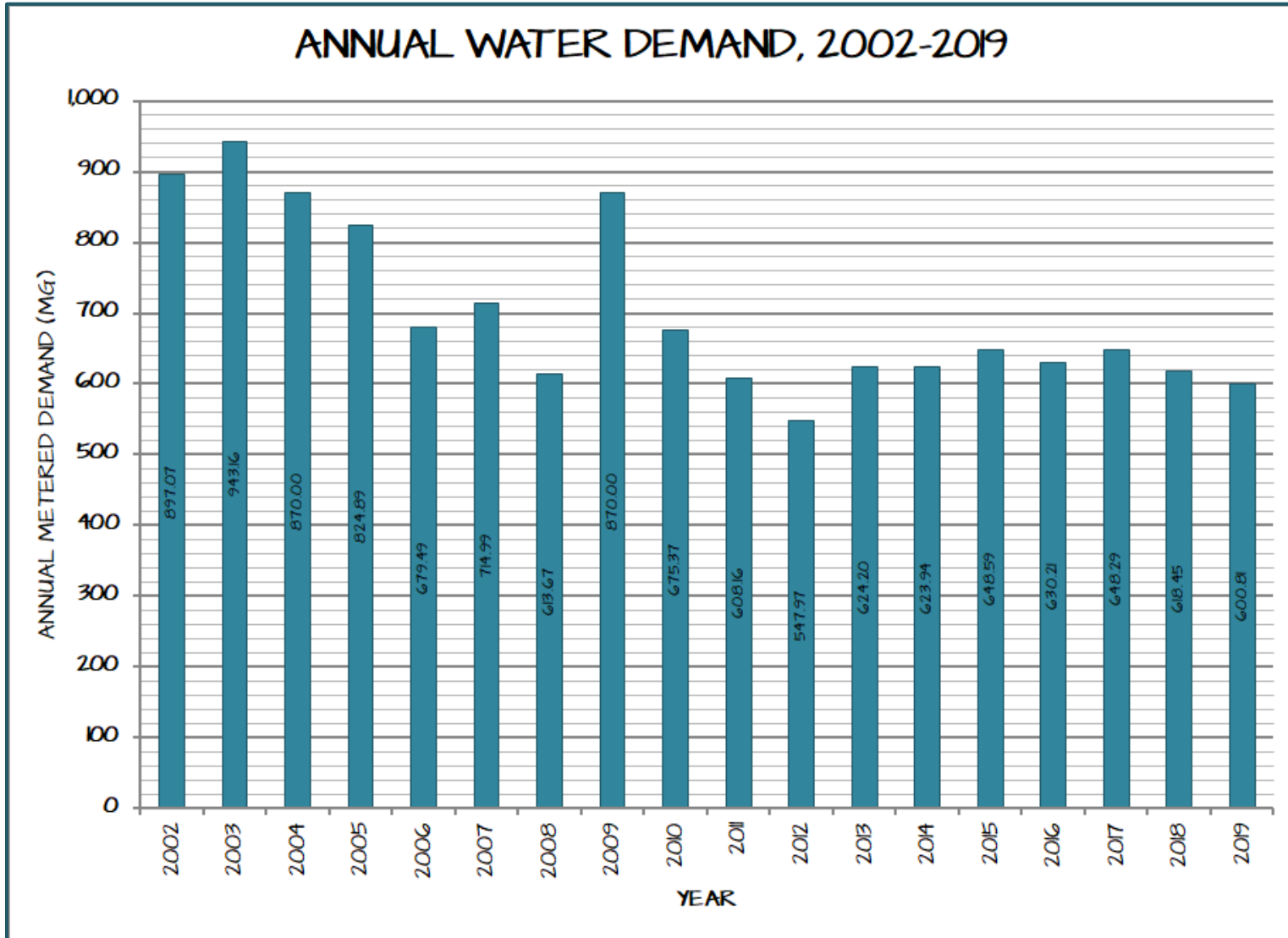


Exhibit 2.4 – City of Milton-Freewater Water Service Area Annual Demand in Million Gallons (MG), 2002-2019.

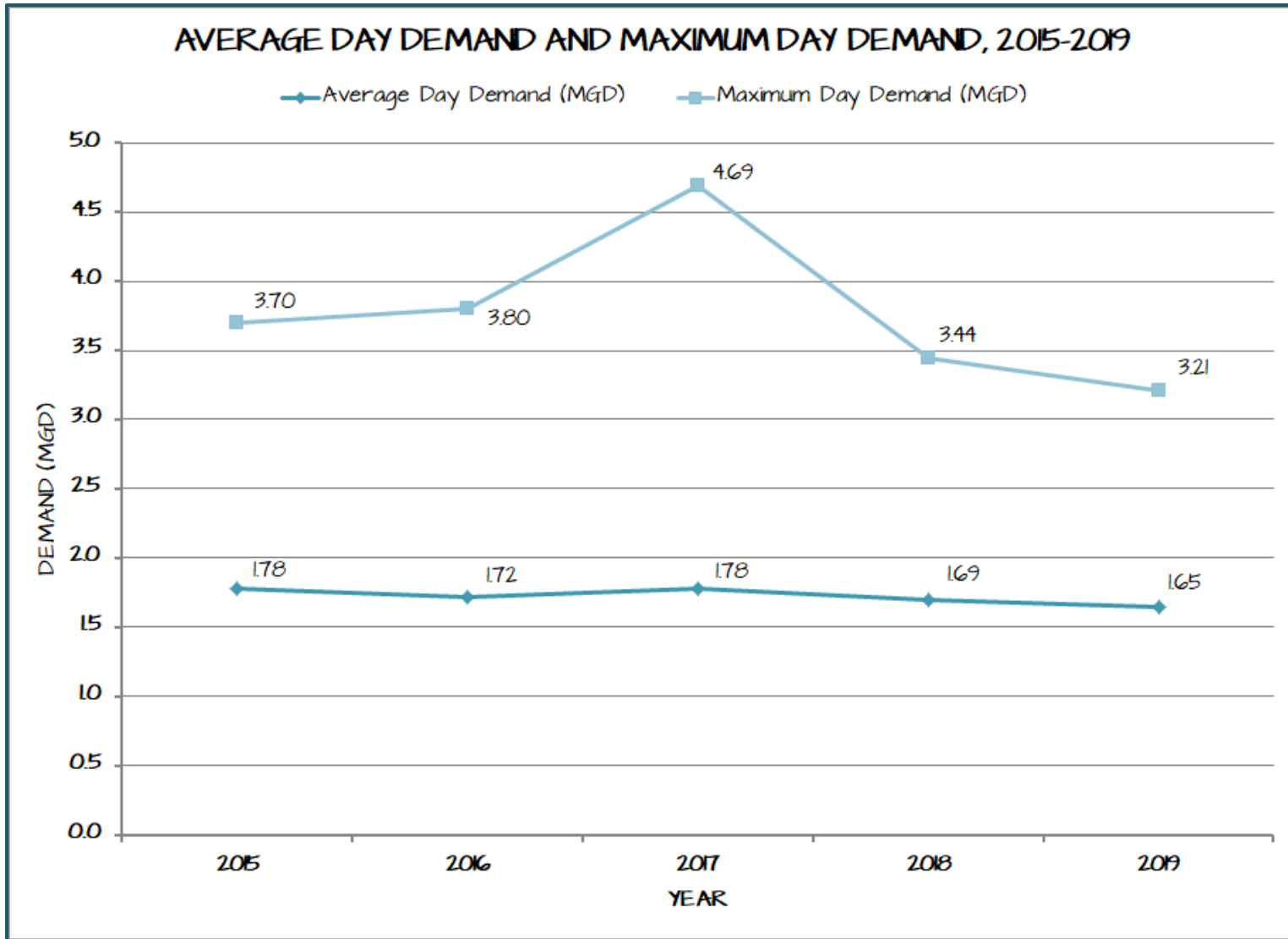


Exhibit 2.5 – Average day demand, in MGD, and maximum day demand, in MGD, for Milton-Freewater from 2015 to 2019.

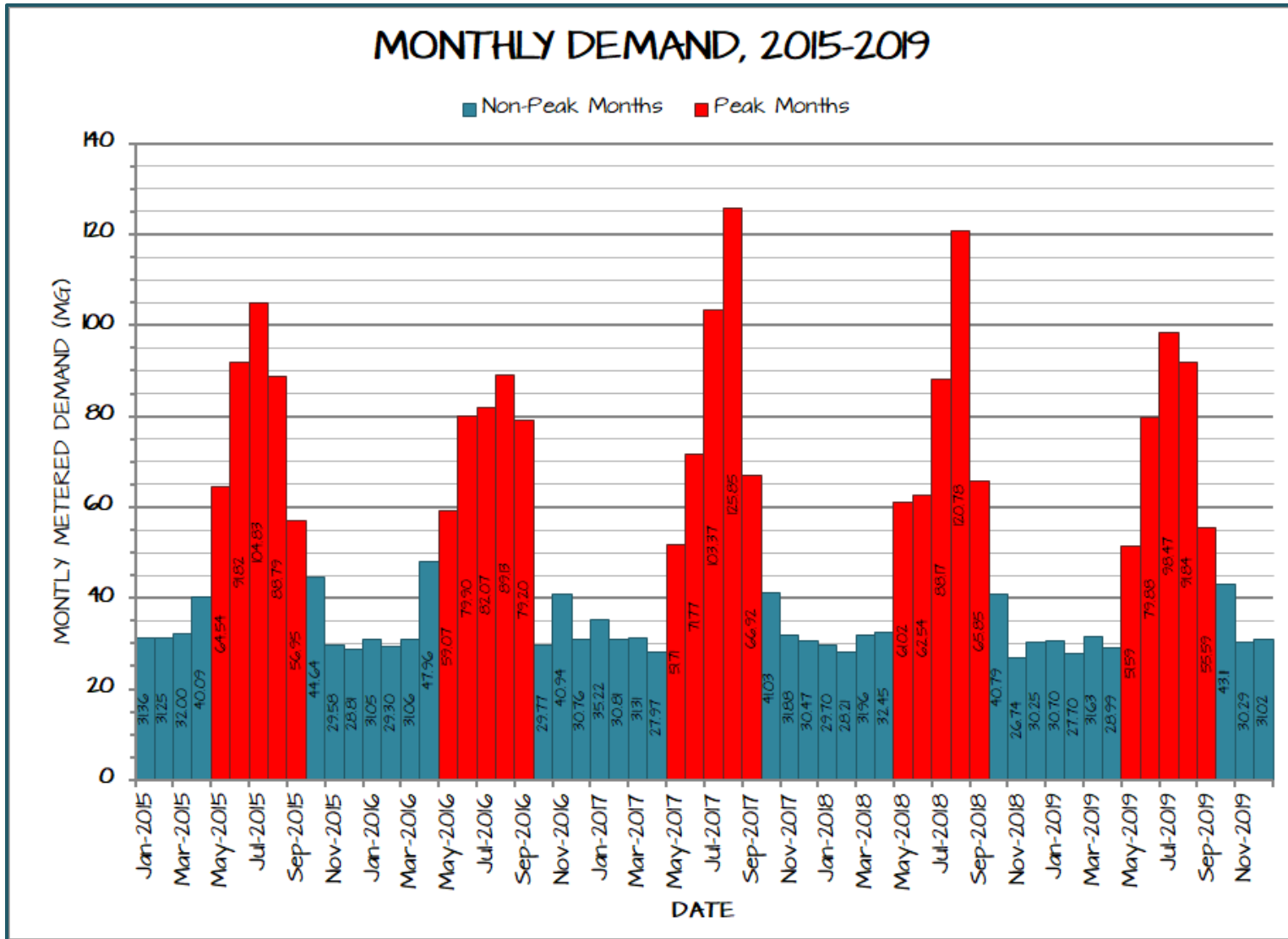


Exhibit 2.6 - Monthly demand, in MG, for the City of Milton-Freewater, 2015 to 2019. Non-peak months are October to April and peak months are May to September.

2.5 DESCRIPTION OF CUSTOMERS SERVED

OAR 690-086-0140 (6)

The City has several water service categories: single family residential, multi-family residential, commercial, industrial, public/government, irrigation, large irrigation and motels/assistant living. As shown in Exhibit 2.7, the largest customer category is single family residential, with commercial and multi-family as second and third highest categories. Public/Government categories are billed the same as industrial use and therefore are combined into the same category for the consumption reports (Exhibit 2.9 and 2.10). The vast majority of water services in the City's water system are 5/8" or 3/4" meters (Exhibit 2.8). Exhibit 2.10 shows the percentage of annual usage by category. The residential category makes up almost 75% of the City's annual usage, with commercial and industrial the majority of the remaining usage.

Service Category	Number of Accounts	Percent
Residential - Single Family	1939	83.0%
Residential - Multi-family	137	5.9%
Commercial	203	8.7%
Industrial	1	0.5%
Public/Government	39	1.7%
Motels/Assistant Living	7	0.3%
Total	2336	100.0%

Exhibit 2.7 - Number of City of Milton-Freewater water service connections by category, 2019.

Meter Size	Number of Services	Percent
5/8"	2023	71.36%
3/4"	83	2.93%
1"	178	6.28%
1.5"	50	1.76%
2"	40	1.41%
3"	9	0.32%
4"	10	0.35%
6"	6	0.21%
10"	1	0.04%
Inactive/ Disconnected	435	15.34%
Total	2835	100.0%

Exhibit 2.8 - Number of City of Milton-Freewater water service connections by meter size, 2019.

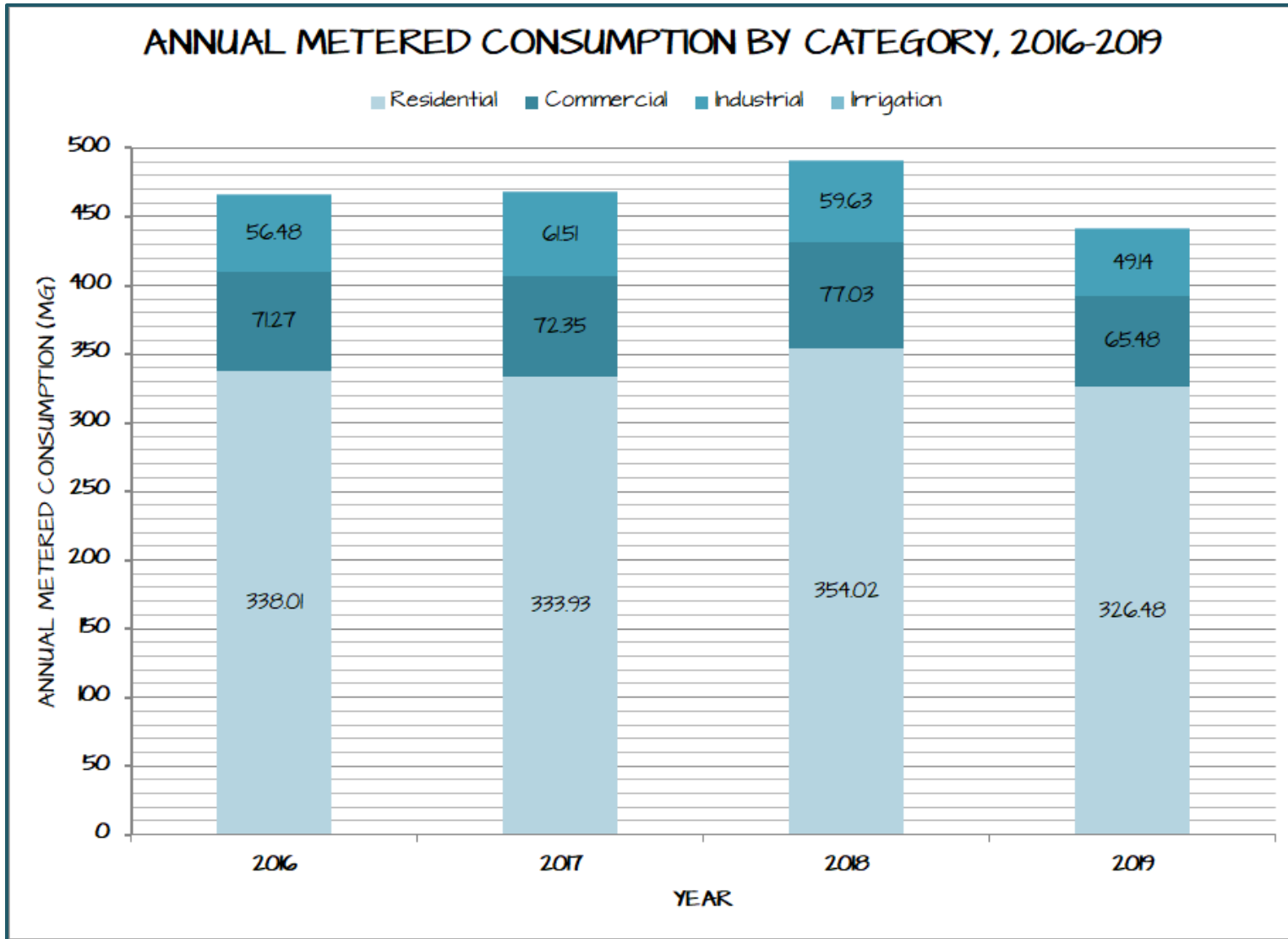


Exhibit 2.9 – City of Milton-Freewater Annual Metered Consumption, in Million Gallons, by Category, 2016-2019. Government and other public uses are classified within the industrial category.

PERCENT ANNUAL METERED CONSUMPTION BY CATEGORY, 2019

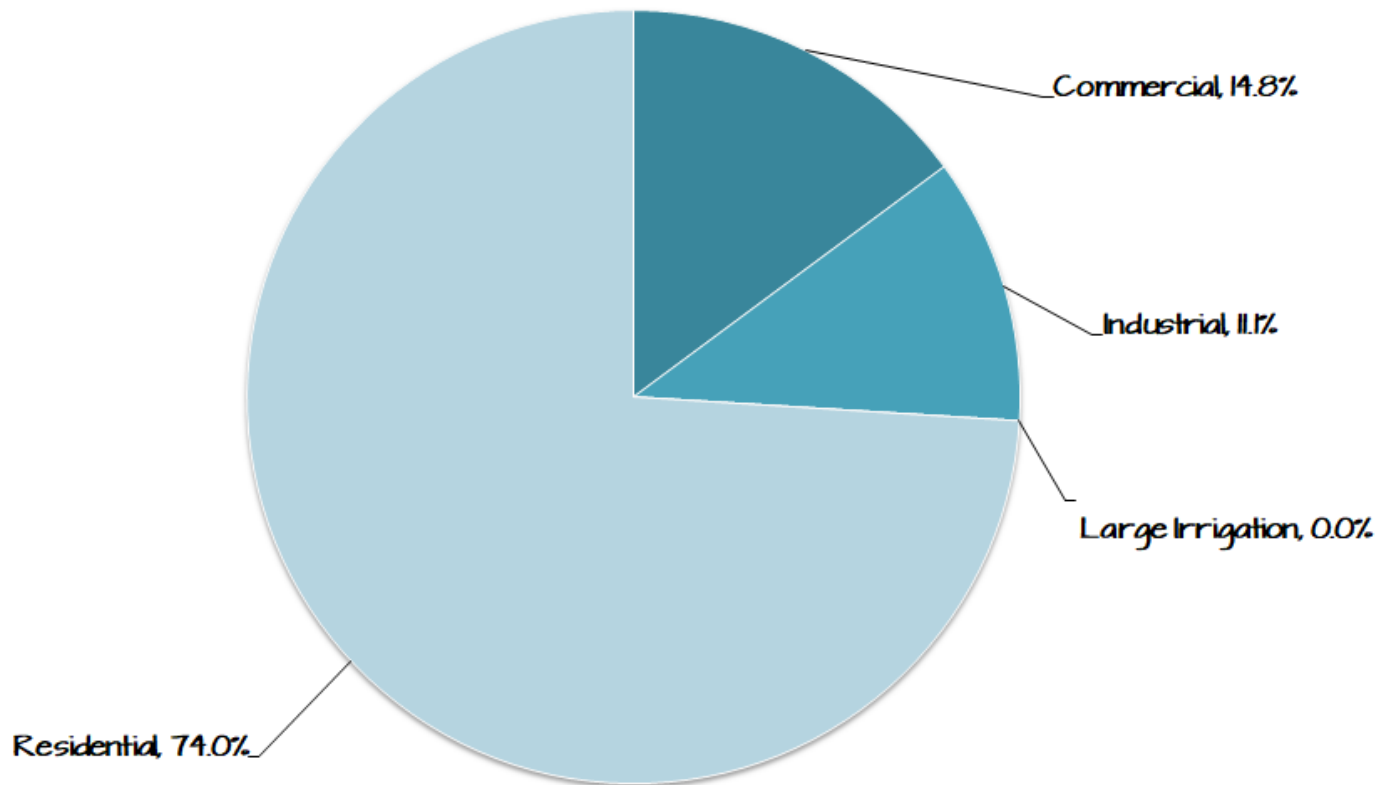


Exhibit 2.10 – City of Milton-Freewater annual metered consumption by category, 2019, in percentage of total produced water.

WATER SECTOR USE COMPARISON

The values for water use by sector from the previous WMCP and this WMCP were compared. In 2010, the distribution included approximately 68% residential use, 8% commercial and 30% public/industrial. In 2020 the distribution has changed to 74% residential, 14.8 % commercial and 11.1% public/industrial. These changes may be due to growth in some businesses and declines in others. In addition, the population has increased slightly over the last 10 years which may account for some of the increase in residential use. The previous WMCP did not include annual quantities by sector/category to compare.

2.6 WATER LOSSES

OAR 690-086-0140 (9)

The City conducts an annual water audit that calculates system water loss as the difference between annual water produced (i.e. water pumped from wells) and total annual metered (i.e. billed water usage) and unmetered consumption (i.e. hydrant flushing, firefighting, sewer jetting, etc). The City estimates unmetered water consumption for a number of activities. In addition, there may be undocumented unmetered uses by Milton-Freewater Rural Fire for firefighting and county/state agencies. The remaining, unaccounted water is the system's water loss. System loss can be due to leaking water mains, compromised pipe joints, service connections, valves or other system deterioration. Exhibit 2.11 shows annual water loss from 2002 to 2019. Annual water loss ranges from 7.6% to 22.6% over the last 18 years. Over the last five years, the average water loss has been 17.5%.

The City has located a number of leaks in the system including a main leaks at the following locations:

- ◆ SE 14th Ave near S Main St
- ◆ Depot St near NW 2nd St
- ◆ SW 3rd Ave near S Columbia
- ◆ SW 3rd Ave near Pierce St
- ◆ NE 6th Alley near N Main St
- ◆ S Main St near SW 7th Ave - FIXED
- ◆ S Main St near Linden St – FIXED
- ◆ S Main St near Broadway – FIXED
- ◆ S Main St near SW 1st - FIXED

A number of service leaks have also been identified at the following locations:

- ◆ SE 9th Ave near S Main St
- ◆ College St near SW 8th Ave - FIXED
- ◆ Andrea St near Tara St - FIXED
- ◆ W Broadway Ave near Merrill St - FIXED
- ◆ N. Main St near NW 2nd Ave - FIXED

See Section 3.4 for details on the City's leak detection and repair program.

	Gallons Produced	Gallons Sold	Unmetered Use	Gallons Lost	Calculated Water Loss
2002	897,069,000	710,628,000	23,550,000	162,891,000	18.2%
2003	943,157,000	749,140,000	23,550,000	170,467,000	18.1%
2004	869,999,000	649,930,000	23,550,000	196,519,000	22.6%
2005	824,892,000	634,590,000	23,550,000	166,752,000	20.2%
2006	679,488,000	565,564,000	23,550,000	66,824,000	9.8%
2007	714,993,000	550,106,000	23,550,000	141,337,000	19.8%
2008	613,669,000	504,461,000	57,464,000	51,744,000	8.4%
2009	869,999,000	649,930,000	35,972,000	184,097,000	21.2%
2010	675,368,000	494,588,000	73,233,000	107,547,000	15.9%
2011	608,156,000	449,951,000	74,959,100	83,245,900	13.7%
2012	547,974,000	462,222,000	23,550,000	62,202,000	11.4%
2013	624,198,000	553,539,934	23,350,836	47,307,230	7.6%
2014	623,939,000	512,778,991	33,226,500	77,933,509	12.5%
2015	648,588,000	517,374,633	50,246,000	80,967,367	12.5%
2016	630,208,000	465,761,305	44,207,800	120,238,895	19.1%
2017	648,287,000	467,814,480	42,000,000	138,472,520	21.4%
2018	618,448,000	490,680,253	38,375,000	89,392,747	14.5%
2019	600,812,000	441,112,106	37,905,000	121,794,894	20.3%

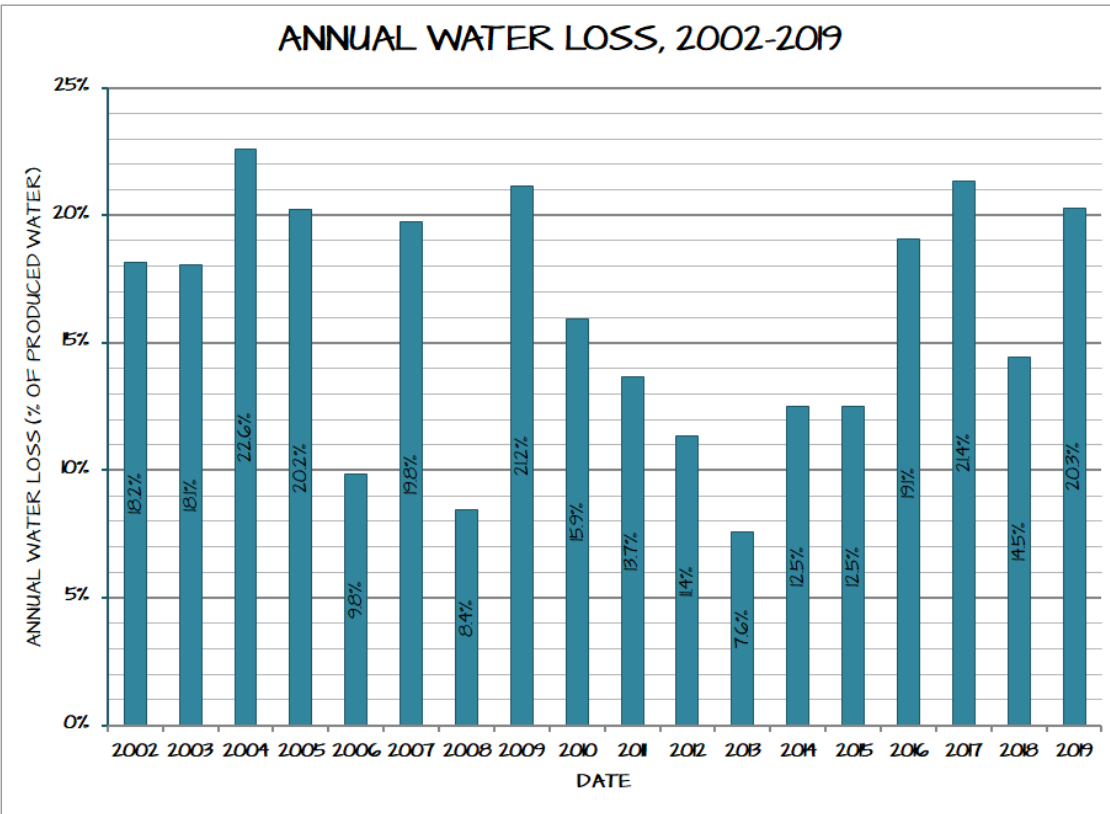


Exhibit 2.11 - Annual water loss for the City of Milton-Freewater's water system from 2002-2019. Annual loss values are a percentage of total annual water produced from City wells. Unmetered uses include sewer jetting, hydrant flushing, system flushing, fire activities, bulk water sales, water main maintenance, street sweeping and known leaks.

2.7 WATER RIGHTS

OAR 690-086-0140 (5)

Water Source	Application	Permit	Certificate	Permitted Rate (cfs/gpm)	Priority Date	Authorized Completion Date
Well 1	U-109	U-102	12070	15 / 673	1/18/1937	N/A
	G-5389	G-4924	-	2.0 / 898	1/4/1971	10/1/1999
Well 2	U-159	U-150	15548	3.0 / 1346	2/28/1944	N/A
Well 3	U-191	U-172	16998	3.5 / 1571	1/10/1946	N/A
Well 4	U-808	U-717	23532	1.0 / 448.8	4/13/1955	N/A
Well 5	U-809	U-718	23533	2.7 / 1212	4/13/1955	N/A
Well 6	U-511	U-462	23519	3.5 / 1571	7/16/1952	N/A
Well 8	G-2502	G-2312	41011	3.9 / 1,750	12/13/1962	N/A
	G-14665	G-13488	-	0.128 / 57	1/15/1998	10/1/2002
Well 9	G-13494	G-12582	-	3.3 / 1,481	8/16/1993	10/1/1999
Key Well	U-165	U-158	15551	2.22 / 996	12/2/1944	N/A
Dry Creek Well (Farm Well)	G-1116	G-954	28482	1.22 / 547	7/29/1958	N/A
Seven Hills Road Well (Farm Well)	G-55	G-154	28272	118 / 529	2/1/1955	N/A
Sub Station Well	G-4667	G-4391	41022	0.06 / 26.9	11/1/1968	N/A
WWTP (Storage)	R-69553	R-11219	93042	20.157 AF 10.81 AF	2/1/1988	10/1/1993
WWTP (Irrigation)	S-69266	S-50962	93030	15.4 / 6914	9/2/1987	10/1/1993
Walla Walla River	-	D-12920	12920	7.24 / 3,245	1890	N/A
Walla Walla River	S-11067	S-2391	3285	82 / 36,818	11/14/1914	N/A
Walla Walla River	-	-	12919	0.0375 / 16.8	1872	N/A
Walla Walla River	S-55136	S-41598	82171	3.6 / 1,616	1/21/1977	N/A
Walla Walla River	-	-	90855 (T-11851)	0.0381 / 17	12/31/1885	N/A
Walla Walla River	-	-	89164	0.16 / 71	1885/1887	N/A
Walla Walla River	-	-	89166	0.64 / 287	1875/1893	N/A
Walla Walla River	-	-	89168	0.59 / 264	1875, 1880, 1885, 1891, 1893, 1894 &	N/A
Walla Walla River	-	-	92701	0.021 / 9.4	1883	N/A
Little Walla Walla River	-	-	92414	0.105 / 47	1908	N/A
Crockett Branch Walla Walla River	S-9341	S-6154	93224	0.04 / 17.9	1/15/1924	N/A
South Fork of the Walla Walla River	S-11067	S-7830	15559	86.3 / 38,748	9/2/1926	N/A

Exhibit 2.12 - City of Milton-Freewater water rights.

WELL 1

Source:	Well 1
Application:	U-109 & G-5389
Permit:	U-102 & G-4924
Certificate:	12070
Priority Date:	01/18/1937 & 01/04/1971
Type of Beneficial Use:	Municipal, Domestic, Industrial, Commercial (12070) & Municipal (G-4924)
Maximum Use Permitted:	1.5 cfs/1,084.7 AF/year (673 gpm) & 2.0 cfs/1,445.4 AF/year (900 gpm)
Maximum Use to Date:	0.45 cfs (202 gpm) & 2.0 cfs (898 gpm) – 687.3 AF
Average Monthly Use (last year)	9,249,000 gallons / 28.38 AF
Average Daily Use (last year)	303,245 gallons / 0.93 AF
Authorization Date for Completion	12070 – N/A G-4924 – 10/01/1999
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

WELL 2

Source:	Well 2
Application:	U-159
Permit:	U-150
Certificate:	15548
Priority Date:	02/28/1944
Type of Beneficial Use:	Municipal
Maximum Use Permitted:	3.0 cfs/2,169.6 AF/year (1,346 gpm)
Maximum Use to Date:	2.0 cfs (900 gpm) – 615.2 AF
Average Monthly Use (last year)	11,130,500 gallons / 34.16 AF
Average Daily Use (last year)	364,934 gallons / 1.12 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

WELL 3

Source:	Well 3
Application:	U-191
Permit:	U-172
Certificate:	16998
Priority Date:	01/10/1946
Type of Beneficial Use:	Municipal
Maximum Use Permitted:	3.5 cfs/2,531.2 AF/year (1,571 gpm)
Maximum Use to Date:	2.80 cfs (1,256 gpm) – 571.5 AF
Average Monthly Use (last year)	14,117,420 gallons / 43.32 AF
Average Daily Use (last year)	462,866 gallons / 1.42 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

WELL 4

Source:	Well 4 (Abandoned in 1960)
Application:	U-808
Permit:	U-717
Certificate:	23532
Priority Date:	04/13/1955
Type of Beneficial Use:	Municipal
Maximum Use Permitted:	1.0 cfs / 723.2 AF/year (448.8 gpm)
Maximum Use to Date:	N/A (Abandoned)
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

WELL 5

Source:	Well 5
Application:	U-809
Permit:	U-718
Certificate:	23533
Priority Date:	04/13/1955
Type of Beneficial Use:	Municipal
Maximum Use Permitted:	2.7 cfs/1,952.6 AF/year (1,212 gpm)
Maximum Use to Date:	2.5 cfs (1,100 gpm) – 1,138.5 AF
Average Monthly Use (last year)	16,199,500 gallons / 49.71 AF
Average Daily Use (last year)	531,131 gallons / 1.63 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

WELL 6

Source:	Well 6
Application:	U-511
Permit:	U-462
Certificate:	23519
Priority Date:	07/16/1952
Type of Beneficial Use:	Municipal
Maximum Use Permitted:	3.5 cfs/2,531.2 AF/year (1,571 gpm)
Maximum Use to Date:	2.78 cfs (1,250 gpm) – 1,209.6 AF
Average Monthly Use (last year)	3,954,500 gallons / 12.13 AF
Average Daily Use (last year)	129,656 gallons / 0.40 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

WELL 8

Source:	Well 8
Application:	G-2502 & G-14665
Permit:	G-2312 & G-13488
Certificate:	41011
Priority Date:	12/13/1962 & 01/15/1998
Type of Beneficial Use:	Municipal (41011) & Frost Protection/Irrigation (G-13488)
Maximum Use Permitted:	3.9 cfs/2,820.5 AF/year (1,750 gpm) & 0.128 cfs/30.6 AF/year (57.5 gpm)
Maximum Use to Date:	3.9 cfs (1,750 gpm) & 0.111 cfs (50 gpm) – 792.2 AF & 4.38 AF
Average Monthly Use (last year)	793,917 gallons / 2.44 AF
Average Daily Use (last year)	26,030 gallons / 0.08 AF
Authorization Date for Completion	G-13488 – 10/01/2002 – CBU submitted
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

WELL 9

Source:	Well 9
Application:	G-13494
Permit:	G-12582
Certificate:	
Priority Date:	02/27/1996
Type of Beneficial Use:	Municipal
Maximum Use Permitted:	3.34 cfs/2,415.5 AF/year (1,499 gpm)
Maximum Use to Date:	2.4 cfs (1,080 gpm) – 644.7 AF
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	10/01/1998 (construction) & 10/01/1999 (beneficial use) – CBU submitted
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

KEY WELL

Source:	Key Well
Application:	U-165
Permit:	U-158
Certificate:	15551
Priority Date:	12/02/1944
Type of Beneficial Use:	Canning Operations
Maximum Use Permitted:	2.22 cfs/1,605.5 AF/year (996 gpm)
Maximum Use to Date:	N/A (Never been used by City)
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

DRY CREEK WELL (FARM WELL)

Source:	Dry Creek Well
Application:	G-1116
Permit:	G-954
Certificate:	28482
Priority Date:	07/29/1958
Type of Beneficial Use:	Irrigation & Supplemental Irrigation
Maximum Use Permitted:	1.22 cfs/ 164.7 AF/year (547 gpm)
Maximum Use to Date:	1.22 cfs - 147.31 AF
Average Monthly Use (last year)	1,325,000 gallons / 4.07 AF
Average Daily Use (last year)	43,443 gallons / 0.13 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

SEVEN HILLS ROAD WELL (FARM WELL)

Source:	Seven Hills Road Well
Application:	G-55
Permit:	G-154
Certificate:	28272
Priority Date:	02/01/1955
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	1.18 cfs/ 432.6 AF/year (529 gpm)
Maximum Use to Date:	1.18 cfs - 147.31 AF
Average Monthly Use (last year)	1,325,000 gallons / 4.07 AF
Average Daily Use (last year)	43,443 gallons / 0.13 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No – however located in a Serious Water Management Problem Area as of 2017

SUB STATION WELL

Source:	Sub Station Well
Application:	G-4667
Permit:	G-4391
Certificate:	41022
Priority Date:	11/01/1968
Type of Beneficial Use:	Industrial use including sanitary facilities and landscaping
Maximum Use Permitted:	0.06 cfs/ 43.4 AF/year (26.9 gpm)
Maximum Use to Date:	N/A
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No

WASTEWATER TREATMENT PLANT (STORAGE)

Source:	Wastewater Treatment Plant – Storage
Application:	R-69553
Permit:	R-11219
Certificate:	93042
Priority Date:	02/01/1998
Type of Beneficial Use:	Storage
Maximum Use Permitted:	69.2 AF
Maximum Use to Date (Monthly/Annual):	119 AF / 644.5 AF
Average Monthly Use (last year)	57,301,420 gallons / 175.85 AF
Average Daily Use (last year)	1,878,735 gallons / 5.77 AF
Authorization Date for Completion	10/01/1993
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No

WASTEWATER TREATMENT PLANT (IRRIGATION)

Source:	Wastewater Treatment Plant and 3 lagoons
Application:	S-69266
Permit:	S-50962
Certificate:	93030
Priority Date:	09/02/1987
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	6.61 cfs/ 1,185.9 AF/year (2,966 gpm)
Maximum Use to Date (Monthly/Annual):	4.9 cfs (2,200 gpm)
Average Monthly Use (last year)	17,392,500 gallons / 53.38 AF
Average Daily Use (last year)	570,246 gallons / 1.75 AF
Authorization Date for Completion	10/01/1993
Listed Streamflow-Dependent Species:	N/A
Water Quality Limited Parameters:	N/A
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	-
Permit:	D-12920
Certificate:	12920
Priority Date:	12/31/1890
Type of Beneficial Use:	Domestic and Municipal
Maximum Use Permitted:	7.24 cfs 5,235.9 AF/year (3,249 gpm)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	S-11067
Permit:	S-2391
Certificate:	3285
Priority Date:	11/14/1914
Type of Beneficial Use:	Municipal Uses, Development of Power & Domestic
Maximum Use Permitted:	82.0 cfs/ 59,302 AF/year (36,801 gpm)
Maximum Use to Date:	N/A
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	-
Permit:	-
Certificate:	12919
Priority Date:	1872
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	0.0375 cfs/ 27.1 AF/year (16.8 gpm)
Maximum Use to Date:	0.0375 cfs (16.8 gpm) - Unknown
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	S-55136
Permit:	S-41598
Certificate:	82171
Priority Date:	01/21/1977
Type of Beneficial Use:	Supplemental Irrigation
Maximum Use Permitted:	3.6 cfs/ 2,603.5 AF/year (1,615 gpm)
Maximum Use to Date (Monthly/Annual):	463 gpm / 63.59 AF
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	-
Permit:	-
Certificate:	90855
Priority Date:	12/31/1885
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	0.157 cfs (113.5 AF/year) (70.4 gpm)
Maximum Use to Date:	0.157 cfs - Unknown
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	-
Permit:	-
Certificate:	89164
Priority Date:	1885 & 1887
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	0.16 cfs (115.7 AF/year) (71.8 gpm)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	-
Permit:	-
Certificate:	89166
Priority Date:	1875 & 1893
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	0.64 cfs (462.8 AF/year) (287 gpm)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	-
Permit:	-
Certificate:	89168
Priority Date:	1875, 1880, 1885, 1891, 1893, 1894 & 1896
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	0.59 cfs (426.7 AF/year) (264 gpm)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	N/A
Average Daily Use (last year)	N/A
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

WALLA WALLA RIVER

Source:	Walla Walla River
Application:	-
Permit:	-
Certificate:	92701
Priority Date:	12/31/1883
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	0.021 cfs (15.2 AF/year) (9.4 gpm)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Arsenic, Biological Criteria, Cadmium, Chloride, Chlorophyll a, Chromium, Copper, Dissolved Oxygen, <i>E. coli</i> , Fecal Coliform, Flow Modification, Habitat Modification, Heptachlor, Lead, Nickel, pH, Phosphate Phosphorus, Sedimentation, Selenium, Silver, Temperature, Zinc. The Walla Walla River has an approved temperature TMDL.
Located in a Critical Groundwater Area:	No

LITTLE WALLA WALLA RIVER

Source:	Little Walla Walla River
Application:	-
Permit:	-
Certificate:	92414
Priority Date:	12/31/1908
Type of Beneficial Use:	Irrigation
Maximum Use Permitted:	0.105 cfs (75.9 AF/year) (47 gpm)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	N/A
Average Daily Use (last year)	N/A
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Chlorpyrifos, Dissolved Oxygen, Fecal coliform, Guthion, Parathion and Pesticides
Located in a Critical Groundwater Area:	No

CROCKET BRANCH WALLA WALLA RIVER

Source:	Crocket Branch Walla Walla River
Application:	S-9341
Permit:	S-6154
Certificate:	93224
Priority Date:	01/15/1924
Type of Beneficial Use:	Supplemental Irrigation
Maximum Use Permitted:	0.04 cfs (28.9 AF/year) (18 gpm)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	N/A
Average Daily Use (last year)	N/A
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Chlorpyrifos, Dissolved oxygen, and Guthion.
Located in a Critical Groundwater Area:	No

SOUTH FORK OF THE WALLA WALLA RIVER

Source:	South Fork Walla Walla River
Application:	S-11067
Permit:	S-7830
Certificate:	15559
Priority Date:	09/02/1926
Type of Beneficial Use:	Municipal Uses & Power Development
Maximum Use Permitted:	5.8 cfs (4,194.5 AF/year) (Municipal) & 80.5 cfs (58,217.2 AF/year) (Power Development)
Maximum Use to Date (Monthly/Annual):	N/A
Average Monthly Use (last year)	0 gallons / 0 AF
Average Daily Use (last year)	0 gallons / 0 AF
Authorization Date for Completion	N/A
Listed Streamflow-Dependent Species:	Summer steelhead (Middle Columbia River): Columbia River bull trout
Water Quality Limited Parameters:	Alkalinity, Ammonia, Biological criteria, Chloride, Chlorophyll a, Dissolved oxygen, <i>E. coli</i> , Flow Modification, Habitat Modification, pH, Phosphate Phosphorus, and Temperature.
Located in a Critical Groundwater Area:	No

2.8 EVALUATION OF WATER RIGHTS AND SUPPLY

OAR 690-086-0140 (3)

The City holds a combination of surface water and groundwater water rights that add up to over 119 cfs (~53,600 gpm). These water rights are split between groundwater (24.4 cfs/10,950 gpm) and surface water (95.04 cfs/42,653 gpm). Currently, the City relies solely on the groundwater rights to meet its municipal needs. The groundwater rights are spread amongst 7 basalt wells. The current infrastructure at these seven wells allows for pumping rates of approximately 17.1 cfs or 7,700 gpm (11.0 MGD).

WELL OPERATION

Many communities in Eastern Oregon rely upon wells as their primary water source, and wells have proven to be dependable and reliable in meeting the water supply needs of these communities. The City of Milton-Freewater has developed a system of wells that effectively serves the City's current and estimated future water needs.

With current infrastructure, the City is able to produce approximately 7,700 gpm. Under current infrastructure, City wells would need to pump a little over 8 hours per day to meet peak daily demand. In 2030, with no changes to the infrastructure, City wells would need to increase to almost 10.5 hours per day to meet peak daily demand. In 2040, with no changes to the infrastructure, City wells would need to increase to just less than 11 hours per day to meet peak daily demand.

City wells are divided amongst two of the three pressure zones; Middle and North (see Exhibit 2.2 and 2.13). Under normal operations, these two pressure zones do not exchange water. The Middle zone has four wells (Wells 1, 2, 8 & 9) while the North zone has three wells (Wells 3, 5 & 6). The Middle zone has a production capacity of approximately 4,300 gpm and the North zone has a production capacity of approximately 3,400 gpm. The third pressure zone, South, pulls water from the Middle Pressure Zone's distribution network to fill the south reservoir (see Section 2.9).

RELIABILITY

The reliability of the water supply is one of the most important functions of any water system. A number of factors, such as mechanical failures, power outages, primary water transmission line failures, etc., can affect the reliability of a water supply. It is nearly impossible to ensure 100 percent reliability of any system. However, having proper system components can help ensure long-term reliability.

The City does not operate a water treatment plant as the current basalt aquifer sources do not require treatment. Having fewer components in the water system allows for better reliability. Currently, the City has standby power via a diesel generator at Well 2. This provides some reliability for the Middle Pressure Zone in the event of a power outage.

A CLA valve, located at DeHaven and Broadway, and a few normally closed valves can be opened to allow the Middle Pressure Zone to supply water to the North Pressure Zone, or vice versa, providing a level of backup reliability for both zones. In addition, the South Pressure Zone can supply water into the Middle Pressure Zone via three CLA valves (1", 3" and 6") providing an additional level of reliability for the Middle Pressure Zone.

The higher elevation South Pressure Zone does not have standby power or backup water supply sources available, but it does have a large capacity reservoir with fewer users. See Exhibit 2.13 for a conceptual map of the water system.

SERIOUS WATER MANAGEMENT PROBLEM AREA (SWMPA)

The OWRD updated the subbasin program rules classification for groundwater uses and implemented a Serious Water Management Problem Area (SWMPA) designation for the basalt aquifers in the subbasin. The new classification limits future groundwater allocation to exempt uses only in the alluvial and basalt aquifers (OAR 690-507-0030(3)). The SWMPA designation requires water-use measurement and reporting for the basalt aquifers. The classification and designation were initiated due to declining water levels in the basalt aquifer system. Although groundwater declines indicate overuse of the resource, there are no indications of short-term (10-20 years) concern for water supply. If water levels continue to decline, OWRD may implement a Critical Groundwater Area which would mandate decreases in annual pumpage based on priority date with junior users affected first. The City currently has many of the most senior water rights in the basalt aquifer and may not be affected by future regulation. In addition, the City has alternate surface water sources that could be utilized if needed in the future. Under the current SWMPA designation, there are no regulatory changes other than the requirement for measurement and reporting.

SURFACE WATER ASSESSMENT

The City has a number of surface water rights on various surface water bodies in the basin including the Walla Walla River, South Fork Walla Walla River and Little Walla Walla River. These water rights include multiple beneficial uses including domestic, municipal, irrigation and power development (hydro power). The Walla Walla River flows out of the Blue Mountains through the City of Milton-Freewater into the Walla Walla Valley. This river has consistent base flows in the summer around 100 cubic feet per second (cfs) and higher flows in the late fall through spring seasons ranging from 200 cfs up to over 4,000 cfs (see Exhibit 2.14). The City has two main municipal surface water rights: Certificate 12920 with a priority date of 1890 for 7.24 cfs and Certificate 15559 with a priority date of 1926 for 5.8 cfs. As shown in Exhibit 2.14, the Walla Walla River has enough water to meet these demands. The 1890 water right is senior to most irrigation water rights in the area; however the 1926 water right is junior to most of the valley irrigation downstream of the point of diversion. The reliability of the Walla Walla River is very high as base flows are maintained by mountain springs that provide a significant amount of the dry-season flow. The senior water right for 7.24 cfs (3,243 GPM or 4.67 MGD) would be adequate to meet the 2030 projected Maximum Day Demand and would almost meet the Maximum Day Demand for 2040. In conjunction with the City's 7 basalt wells, these water rights should be adequate for future water demands if needed.

LEGEND

PRODUCTION & DISTRIBUTION

- WELL PRODUCTION
- BOOSTER PUMP
- WELL DISTRIBUTION
- RESERVOIR DISTRIBUTION
- INTERCONNECTION

WATER

- ACTIVE WELL
- INACTIVE WELL
- SURFACE WATER POD

PRESSURE ZONES

- MIDDLE PRESSURE ZONE
- NORTH PRESSURE ZONE
- SOUTH PRESSURE ZONE

BOUNDARIES/FEATURES

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- WATER SERVICE AREA
- TOWNSHIP & RANGE
- STREETS

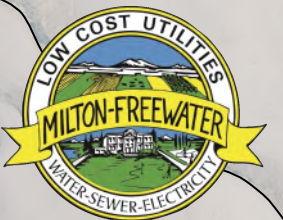
NOTES:

1. NORTH SYSTEM (ELEV 950-1100 ABOVE MSL)
MIDDLE SYSTEM (ELEV 1015-1165 ABOVE MSL)
SOUTH SYSTEM (ELEV 1235-1390 ABOVE MSL)
2. CHLORINATION EQUIPMENT IS LOCATED AT ALL WELLS.
3. THE WALLA WALLA RIVER INTAKE IS CURRENTLY NOT IN USE.
4. KEY WELL IS INACTIVE AND NOT CONNECTED TO THE WATER SYSTEM.
5. THE NORTH AND MIDDLE PRESSURE ZONES CAN BE INTERCONNECTED VIA 2 VALVES.
6. THE SOUTH PRESSURE ZONE CAN DISTRIBUTE WATER TO THE MIDDLE PRESSURE ZONE VIA 3 VALVES.

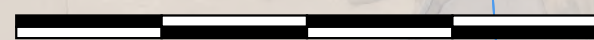
NORTH RESERVOIR
2 MILLION GALLONS
ELEV = 1140

MIDDLE RESERVOIR
1 MILLION GALLONS
ELEV = 1215

SOUTH RESERVOIR
2 MILLION GALLONS
ELEV = 1445



0 0.25 0.5 0.75 1 MILE



0 1,000 2,000 3,000 4,000 5,000 FEET



CITY OF MILTON-FREEWATER, OR
WATER MANAGEMENT AND CONSERVATION PLAN
CONCEPTUAL WATER SYSTEM LAYOUT
EXHIBIT 2.13

WALLA WALLA RIVER FLOW AND MILTON-FREEWATER SURFACE WATER RIGHTS 2014-2019

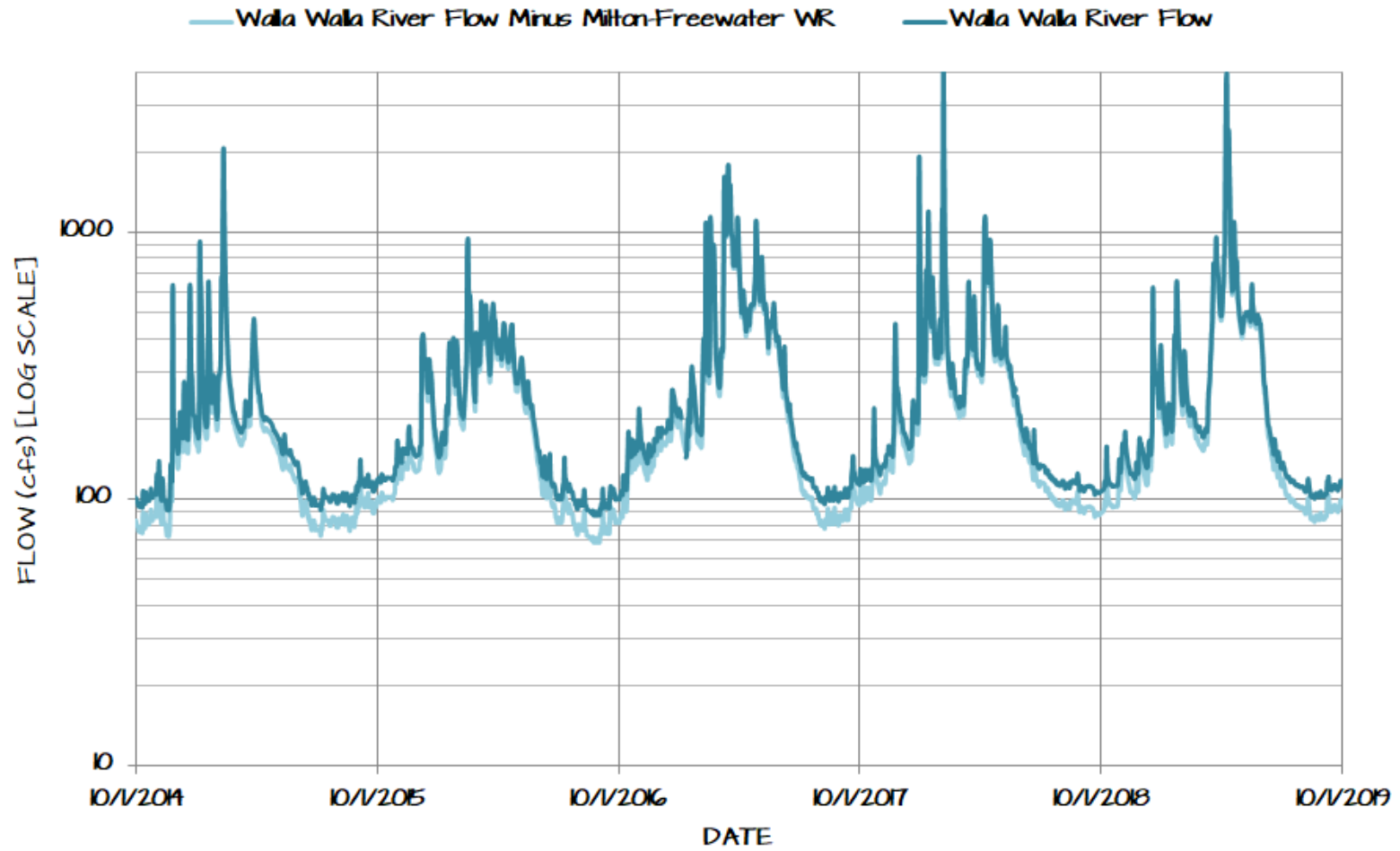


Exhibit 2.14 – Walla Walla River flow just downstream of the City of Milton-Freewater surface water rights point of diversion. Comparison of existing flows and flows if all municipal and irrigation water rights were exercised.

AQUATIC RESOURCE CONCERNS

OAR 690-086-140(5)

The City's surface water rights allow for diversion from the Walla Walla and South Fork Walla Walla Rivers. The Walla Walla River and the South Fork Walla Walla River are listed as a water quality limited stream according to the Oregon Department of Environmental Quality (ODEQ). The Walla Walla River is designated as water quality limited for: Dissolved oxygen, flow modification, habitat modification, and temperature. The South Fork Walla Walla River is designated as water quality limited for: Dissolved oxygen, flow modification, habitat modification, and temperature. The Walla Walla River has an approved Total Maximum Daily Load (TMDL) for water temperature. The list of water quality limiting parameters can be found on the ODEQ's website: <https://www.deq.state.or.us/wq/assessment/rpt2010/search.asp>

Exhibit 2.15 shows the fish species listed under the federal and state Endangered Species Acts for the Walla Walla River and the South Fork Walla Walla River within the reaches of the City's point of diversions.

Exhibit 2.15 – Listed aquatic species in the Walla Walla and South Fork Walla Walla Rivers within the reach of the City of Milton-Freewater's point of diversions.

Species	Common Name	ESU	Federal Listing	State Listing
<i>Oncorhynchus mykiss</i>	Steelhead	Middle Columbia River	Threatened	-
<i>Salvelinus confluentus</i>	Bull Trout	Columbia River	Threatened	-
<i>Entosphenus tridentatus</i>	Pacific Lamprey	-	-	Species of Concern

2.9 SYSTEM DESCRIPTION

OAR 690-086-0140 (8)

This section summarizes the City's water supply wells, storage reservoirs, booster pump system and distribution system. In general, the City is served by a gravity-pressure system from the three water reservoirs. A conceptual map of the City's water system is shown on Exhibit 2.13. The layout of the distribution system is shown on Exhibit 2.16. Water system components are discussed in further detail hereafter.

WATER SOURCES

Prior to 1959, the City obtained its drinking water from a combination of wells and surface water from the Walla Walla River. Currently the City obtains its water supply from seven basalt groundwater wells (Wells 1, 2, 3, 5, 6, 8 and 9). The City also has an inactive well, the Key Well, located near Well 5 that is not active or currently connected to the water system. See sections 2.1 and 2.7 for additional info on water sources.

WATER STORAGE RESERVOIRS

The City currently has three water storage reservoirs, one for each pressure zone (Exhibit 2.2, Exhibit 2.11 and Exhibit 2.16). The North Reservoir is a 2-million-gallon steel storage reservoir that was constructed in 1960. The base elevation for the North Reservoir is 1,145 feet above

mean sea level (MSL). The reservoir is approximately forty (40) feet tall with a full water surface elevation of 1,183 feet above MSL.

The Middle Reservoir is a 1-million-gallon steel reservoir that was constructed in 1956. The base elevation for the Middle Reservoir is 1,210 feet above MSL. The reservoir is approximately thirty (30) feet tall with a full water surface elevation of 1,238 feet above MSL.

The South Reservoir is a 2-million-gallon steel storage reservoir constructed in 1999. The base elevation of the South Reservoir is approximately 1,444 feet above MSL. The reservoir is approximately 24 feet tall with a full water surface elevation of 1,466 feet above MSL.

Reservoir Name	Pressure Zone	Material	Capacity (MG)	Construction Date (Year)	Full Water Elevation (feet)
North Reservoir	North	Steel	2	1960	1,183
Middle Reservoir	Middle	Steel	1	1956	1,238
South Reservoir	South	Steel	2	1999	1,466

Exhibit 2.16 - Summary of Milton-Freewater water storage reservoirs.

BOOSTER PUMP STATION

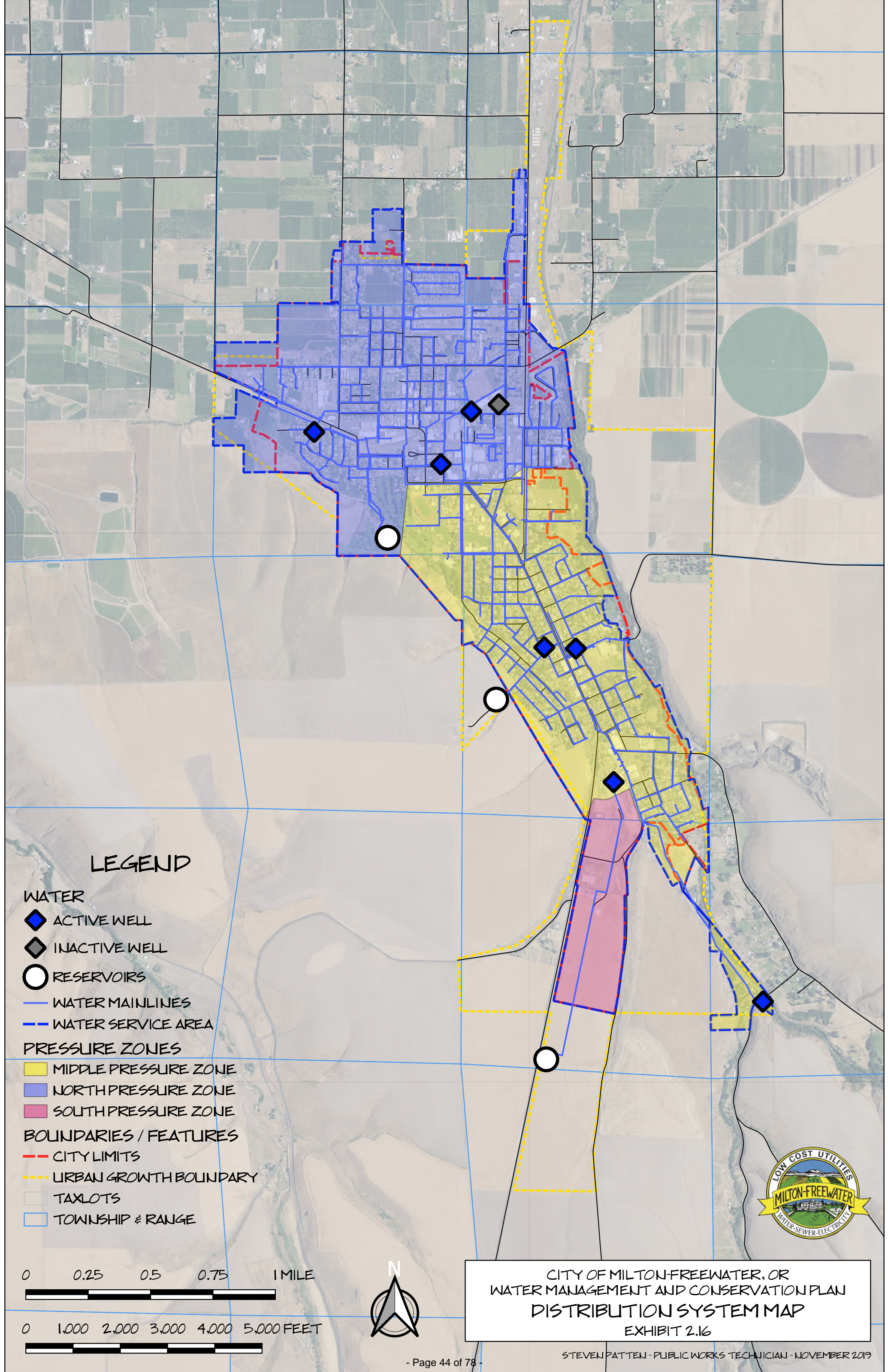
The City currently operates one booster station that contains two booster pumps located in the Well 9 well house (Exhibit 2.13). This station has one 50 horsepower (HP) booster pump and one 100 HP booster pump. These booster pumps are used to transfer water from the middle distribution system to the south distribution system, filling the South Reservoir.

DISTRIBUTION SYSTEM

The City's distribution system includes approximately 40.6 miles of mainline pipes (see Exhibit 2.17). About twenty percent of these mainlines were installed in the 1940s or earlier. Water mainlines range in size from 2 inches to 20 inches in diameter with materials including asbestos concrete (AC), cast iron (CI), ductile iron (DI), galvanized iron (GI), polyvinyl chloride (PVC), reinforced concrete pressure pipe (RCPP) and steel pipe (SP). The few areas in the City still served by 2-inch lines were developed in the 1940s. Over the last few decades, replacement and new installations have used C900 PVC pipe.



Prior to the 1950 merger of Milton and Freewater, both Cities operated their own water systems. Shortly after consolidation, the decision was made to operate the systems at separate pressure levels. This decision was made on the belief that the Freewater system would not withstand the higher operating pressures provided by Milton. The pressure difference results from an approximate 65-foot base elevation difference between the North (Freewater) and Middle (Milton) reservoirs.

The City currently operates three pressure zones in the distribution system. The pressure zone layout is shown in Exhibit 2.2. The North zone serves areas north of Broadway Ave. The Middle zone serves areas south of Broadway Ave to the south end of town in the valley bottom, including up to Marie Dorian Park near Couse Creek Road. The South zone serves the southern portion of town located on the hill.






LEGEND





WATER

-  ACTIVE WELL
-  INACTIVE WELL
-  RESERVOIRS
-  WATER MAINLINES
-  WATER SERVICE AREA

PRESSURE ZONES

-  MIDDLE PRESSURE ZONE
-  NORTH PRESSURE ZONE
-  SOUTH PRESSURE ZONE

BOUNDARIES / FEATURES

-  CITY LIMITS
-  URBAN GROWTH BOUNDARY
-  TAXLOTS
-  TOWNSHIP & RANGE

0 0.25 0.5 0.75 1 MILE

0 1,000 2,000 3,000 4,000 5,000 FEET



CITY OF MILTON-FREEWATER, OR
 WATER MANAGEMENT AND CONSERVATION PLAN
 DISTRIBUTION SYSTEM MAP
 EXHIBIT 2.16

SECTION 3 – WATER MANAGEMENT AND CONSERVATION

This section satisfies the requirements of OAR 690-086-0150(1)-(6).

This section of the City of Milton-Freewater’s Water Management and Conservation Plan (WMCP) Update outlines conservation measures the City is already implementing and conservation measures to be considered. The City’s water use reporting and water rate structure are also summarized. The City’s planned conservation measures and five-year benchmark goals are also presented.

3.1 CURRENT AND ON-GOING CONSERVATION MEASURES

OAR 690-086-0150(1) and (3)

The City already completes the mandatory conservation practices outlined in the WMCP guidebook. The City’s water system is fully metered and the City has excellent methods in place for keeping track of water system components and water use. The City does not spend significant money repairing meters. The City does not regularly test residential water meters, however, if a water meter demonstrates erroneous readings, the meter is tested and/or replaced as required. The City also completes annual water audits (see Section 2.6).

Exhibit 3.1 – City of Milton-Freewater Conservation Benchmarks and Conservation Element Actions.

Benchmark	Status / Action	Implementation Date	Anticipated Completion Date	Frequency
Measurement & Reporting	Compliant	N/A	N/A	Annual
Annual Water Audit	Compliant	N/A	N/A	Annual
Meter Testing & Maintenance Program				
Service & Calibrate Meters	10-Year Plan	Ongoing	Ongoing	10 Years
Meter Replacement Program	5-Year Plan	~2025	~2030	~20 Years
Leak Detection & Repair (Smart Meters)	Continuous	2010	Ongoing	Ongoing
Rate Structure Based On Use	Compliant	N/A	N/A	Ongoing
Public Education Program				
Utility Pamphlets	Annual Plan	Ongoing	Ongoing	Annual
City Website	Continuous	N/A	Ongoing	Ongoing
High Consumption Monitoring	Continuous	2012	Ongoing	Ongoing

Additional conservation measures taken by the City include:

- ◆ Elimination of dead end systems
- ◆ Monthly billing
- ◆ High consumption monitoring

3.2 WATER USE AND REPORTING PROGRAM

OAR 690-086-0150(2)

The City's water measurement and reporting program complies with the measurement standards in OAR 690-085. The City's water use records can be found on the OWRD webpage: https://apps.wrd.state.or.us/apps/wr/wateruse_query/

All of the active City wells (Wells 1, 2, 3, 5, 6, 8 & 9) have a propeller meter and Act-Pak installed.

3.3 RATE STRUCTURE AND METERING

OAR 690-086-0150(4d)

The City has a monthly base charge based on meter size with 5,000 gallons of use included in the base charge. After 5,000 gallons, a consumption charge is based on the quantity of water used at the service connection (see Exhibit 3.2 & 3.3).

Type	Metered Units*	Rate
Residential & Commercial:		
Base Monthly Charge	0-5,000 gallons/month	\$21.78 Base Monthly Rate
Additional Usage Rate	5,001-100,000 gallons/month	\$1.58 / 1,000 gallons used
Additional Usage Rate	100,001 + gallons/month	\$1.74 / 1,000 gallons used
Government & Industrial:		
Base Monthly Charge	0-5,000 gallons/month	\$21.78 Base Monthly Rate
Additional Usage Rate	5,001-100,000 gallons/month	\$1.58 / 1,000 gallons used
Additional Usage Rate	100,001 + gallons/month	\$1.12 / 1,000 gallons used
Outside City Limits Customers:		
Outside City Customers	Rate will be 2 times the base charge, plus usage rates as applicable.	

Exhibit 3.2 – Water rate structure for the City of Milton-Freewater as of December 2019.

Meter Size	Base Monthly Charge*
3/4"	\$21.78
1"	\$21.78
1 1/2"	\$50.22
2"	\$219.37
3"	\$291.94
4"	\$575.47
6"	\$789.81
8"	\$1,031.11
10"	\$1,252.28

*No minimum meter charge shall apply when the usage exceeds base monthly charge

Exhibit 3.3 – City of Milton-Freewater base monthly charges for meter sizes.

3.4 REQUIRED CONSERVATION PROGRAMS

OAR 690-086-150(4)

OAR 690-086-150(4) requires all water suppliers to establish 5-year benchmarks for implementing the following water management and conservation measures:

- ◆ Annual Water Audit (Section 2.6)
- ◆ System-wide Metering
- ◆ Meter Testing and Maintenance
- ◆ Unit-based Billing (see Section 3.3)
- ◆ Leak Detection and Repair
- ◆ Public Education

ANNUAL WATER AUDIT

Defined as an analysis of the water system that includes a thorough accounting of all water into and out of the system to identify system leakage and metered or estimated use for authorized and unauthorized water uses. The water audit also includes analysis of the water supplier's own water use.

The City conducts annual water audits by calculating the difference between total water produced (i.e. well meters) and total metered consumption (i.e. customer flow meters) plus estimated known unmetered consumption (i.e. street sweeping, hydrant flushing, etc.). This calculated water consists of unknown unmetered uses, system overflows, inaccurate meter measurements and system leakage. The results of annual water audits for the water years 2002-2019 are summarized in Section 2.6 of this WMCP Update. The audit results show that the City of Milton-Freewater regularly has “unaccounted for water” in the range of 15 percent or more. The City currently has a leak detection program in place that has led to the replacement of leaking water main lines. Please see the Leak Detection section below for additional details.

When suspected leaks are discovered by routine monitoring of flow records or field crews, the City determines the location of the leak and completes repairs as soon as practically possible. The City also notes the location and estimated rate of the leak for the annual audit.

Five-Year Benchmarks: The City will continue to conduct annual water audits and summarize the results. In the next five years, the City will work to refine and improve its estimation of non-metered uses including hydrant flushing, firefighting, street flushing and others.

SYSTEM-WIDE METERING

The City is completely metered. In 2012, the City finished converting to an AMI water meter system. The new AMI (Advanced Metering Infrastructure) meters are equipped with the ability to flag accounts that show continuously running meters. These “leak detections” are investigated by City water crews to determine if the leak is located in the City's system or in private lines. City water crews fix leaks found on the City's side of the flow meter. Landowners are notified of leaks on their side of the flow meter.

Five-Year Benchmarks: The City will continue to require installation of meters at all new connections.

METER TESTING AND MAINTENANCE

The City of Milton-Freewater does not have a formal written meter testing and maintenance program. However, the City public works staff currently documents water use trends for meters via daily meter checks for wells. Additionally, all well meters are connected to the City's SCADA system for trend analysis. Meters are replaced when they fail or when they began to show anomalous readings.

The City was selected by the Department of Energy (DOE) as part of a Pacific Northwest team to demonstrate a regional smart grid project. As part of this project, all of the City's water meters were replaced with an AMI system that interfaces with the City's electric meters. Installation of the new meters was completed in 2012. The new meters have a 20-year warranty and testing of the meters will take place ten years after installation.

Five-Year Benchmarks: The City will continue to monitor its meters for irregular readings and repair/replace meters as necessary. The City will develop a written meter testing and maintenance program within five years.

WATER RATE STRUCTURE

The City has a monthly base rate based upon meter size and a consumption charge based on the quantity of water metered at the service connection (after 5,000 gallons). The monthly base rates and consumption rates are detailed in Section 3.3 and Exhibits 3.2 & 3.3.

The City rate structure is built around an increasing block rate structure for Residential and Commercial accounts. The net result for these rate structures is that customers pay a higher unit cost for water as use goes up. The City rate structure is built around a decreasing block rate structure for Government and Industrial accounts.

Five-Year Benchmarks: The City will complete a rate study in the next five years to determine costs for each customer category. This will ensure each customer category is paying it fair share of system demand. The City will continue to bill customers based on the volume of water consumed with pricing structures set to encourage conservation, especially during peak months.

LEAK DETECTION AND REPAIR

The City's leak detection and repair program includes detecting leaks in the City water system (on the City's side of meters) through above-ground inspections by City staff. In addition, reports by citizens are investigated. Repairs are made to any leaks found in the City's water system. If leaks are found in private water systems, the landowners are made aware of the leak by City staff. The City is also alerted to high usage with the AMI meter system. City staff is dispatched to investigate high usage accounts to look for leaks. Identified leaks are evaluated for their potential water loss and fixed on a prioritized basis.

The City is in the process of replacing portions of their water mainlines, prioritizing areas with old steel water main lines (typically pre-1950), which has helped reduce water loss. See Exhibit 3.4 for water mainline and other water system improvement projects.

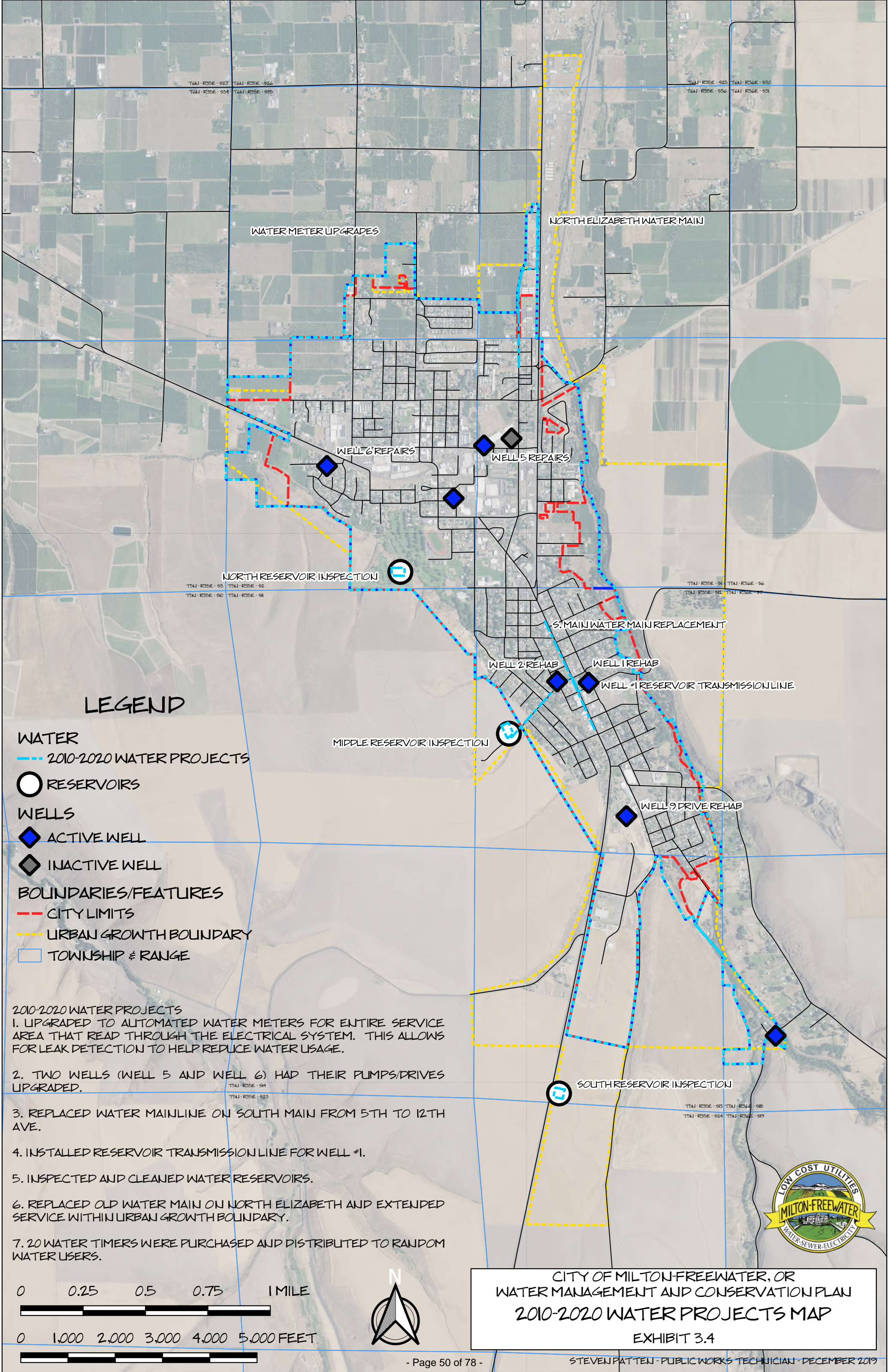
Two-Year Benchmarks: The City will conduct a leak detection study within two years to identify potential factors for the loss and select actions to reduce system leakage below 10% within a five year period.

Five-Year Benchmarks: The City will continue to conduct above-ground visual inspections for leaks and respond to reported leaks. The City will also continue to use the AMI meter system to identify continuous usage on the customer side of the meter and notify landowners to investigate for leaks. The City will conduct a leak detection study within two years to identify potential factors for the loss and select actions to reduce system leakage below 10%. If the system leakage does not reduce to below 10% within 5 years, the City will develop and implement a water loss control program consistent with AWWA standards.

PUBLIC EDUCATION

The City of Milton-Freewater currently has a public education program. Efforts have been made to educate water customers using pamphlets outlining simple methods customers can utilize to help conserve water. These pamphlets are displayed fulltime at the Public Works Department, City Hall, and the Milton-Freewater Public Library. The City intends to continue posting conservation information for the public on their website and Facebook account. The City will include information (improving water conservation, detecting leaks and improving irrigation efficiency) in upcoming newsletters that are mailed to utility customers every quarter. The City currently has information on its Public Works Water webpage under the Water Conservation section including info for water conservation for residential and commercial users as well as low water use landscaping.

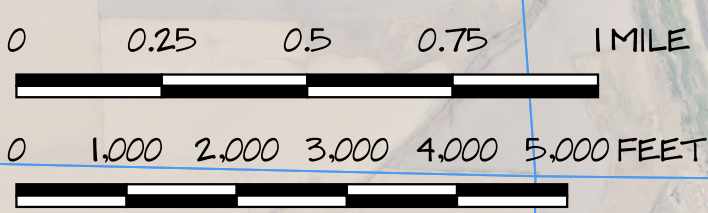
Five-Year Benchmarks: In the next five years, the City will develop additional outreach materials including information about the status of source water for the City, the City's treatment and distribution system, regional groundwater declines and conservation opportunities.



LEGEND

- WATER**
- 2010-2020 WATER PROJECTS
- RESERVOIRS
- WELLS**
- ◆ ACTIVE WELL
- ◆ INACTIVE WELL
- BOUNDARIES/FEATURES**
- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TOWNSHIP & RANGE

- 2010-2020 WATER PROJECTS**
1. UPGRADED TO AUTOMATED WATER METERS FOR ENTIRE SERVICE AREA THAT READ THROUGH THE ELECTRICAL SYSTEM. THIS ALLOWS FOR LEAK DETECTION TO HELP REDUCE WATER USAGE.
 2. TWO WELLS (WELL 5 AND WELL 6) HAD THEIR PUMPS/DRIVES UPGRADED.
 3. REPLACED WATER MAINLINE ON SOUTH MAIN FROM 5TH TO 12TH AVE.
 4. INSTALLED RESERVOIR TRANSMISSION LINE FOR WELL #1.
 5. INSPECTED AND CLEANED WATER RESERVOIRS.
 6. REPLACED OLD WATER MAIN ON NORTH ELIZABETH AND EXTENDED SERVICE WITHIN URBAN GROWTH BOUNDARY.
 7. 20 WATER TIMERS WERE PURCHASED AND DISTRIBUTED TO RANDOM WATER USERS.



CITY OF MILTON-FREEWATER, OR
 WATER MANAGEMENT AND CONSERVATION PLAN
 2010-2020 WATER PROJECTS MAP
 EXHIBIT 3.4



3.5 EXPANDED USE UNDER EXTENDED PERMITS

OAR 690-086-0150(5)

Under OAR 690-086-0150(5), any municipal water supplier that proposes to expand or initiate the diversion of water under an extended permit for which resource issues have been identified shall include a description of activities and five-year implementation schedule for a system wide leak repair or line replacement program to reduce system leakage to no more than 15 percent

The City does not have plans to increase use from any resource with identified issues in section 2.7, therefore this section does not apply.

3.6 ADDITIONAL CONSERVATION MEASURES

OAR 690-086-0150(6)

Under, OAR 690-086-0150(6), a municipal water supplier that serve a population greater than 1,000 and proposes to expand or initiate the diversion of water under an extended permit for which resource issues have been identified, or if the population served is greater than 7,500, is to provide a description of the specific activities, along with a five-year schedule to implement several additional conservation measures.

The City supplies water to a population greater than 1,000 but less than 7,500 (the population was 7,278 in 2019), and does not propose to expand diversion of water under extended permits. Consequently, the requirements under OAR 690-086-0150(6) do not apply.

3.7 SUMMARY OF BENCHMARKS

The City of Milton-Freewater intends to improve current conservation practices and also consider implementation of additional practices. A summary of benchmarks for the City's conservation activities is provided in Exhibit 3.5 below.

Benchmark	Frequency	Comments
Annual Water Audit	Annual	Improve audit estimates for non-metered sources
System-wide metering	On-going	All new connections will be metered and replacement of malfunctioning meters as necessary.
Metering and Maintenance	Annual	The City will develop a written meter testing and maintenance program within five years.
Leak Detection and Repair	On-going	The City will conduct a leak detection study within in five years.
Rate Structure Based on Use	On-going	The City will conduct a rate study within five years.
Outreach	On-going	City will continue to develop outreach materials for the water system.

Exhibit 3.5 – Summary of conservation benchmarks for the City of Milton-Freewater.

SECTION 4 – MUNICIPAL WATER CURTAILMENT ELEMENT

This section satisfies the requirements of OAR 690-086-0160.

4.1 INTRODUCTION

The City of Milton-Freewater currently obtains all of its water supply from its seven basalt (Columbia River Basalt Group) wells (see Appendix C for well log lithography and stratigraphy). This section outlines past events that have resulted in curtailment and includes stages of alert and the associated triggers and curtailment actions for each stage. The water curtailment plans are intended to minimize the impacts of water supply shortages.

4.2 HISTORY OF SYSTEM CURTAILMENT EVENTS

OAR 690-086-0160(1)

The City of Milton-Freewater has not experienced major water supply deficiencies in the last ten (10) years that has triggered any curtailment events. The only shortage of water supply has been short-term supply caused by infrequent mechanical problems related to the wells or other infrastructure. The City's supply wells are deep basalt wells that have performed adequately in the past and continue to do so. The City has a schedule for upgrading the pumping and control equipment at each well. Although some of the City's wells show static water level declines, these declines have had little to no impact on pumping rates. In 2017, a Serious Water Management Problem Area (SWMPA) was declared for the basalt aquifers in the Walla Walla Subbasin. However, this SWMPA declaration only requires measurement and reporting of water use which the City is already complying with. The SWMPA has not and will not create curtailment events in the future. Static and pumping water level trends will continue to be closely monitored by the City to evaluate if a supply deficiency will occur in the future.

Due to the time-scale of basalt recharge and supply, the City's water supply is able to maintain delivery during long-term droughts that may impact surface water sources. During previous droughts in the last few decades, the City's water supply has been able to maintain delivery without any curtailment during the droughts. The USGS is starting a 5-year groundwater study for the Walla Walla Basin which may help inform the vulnerability of the basalt aquifers to drought/wet conditions. The most likely impact to basalt levels during a drought would be additional groundwater use by irrigators that do not have sufficient surface water supplies. However, the City has senior water rights in the basalt aquifer which could be called upon to limit junior uses if impacts are apparent. The City's wells are spread through multiple compartments in the basalt aquifers which do not appear to be hydraulically connected (see Exhibit 4.2). This would allow for spatial distribution of water use to account for any impacts due to drought conditions. An earthquake natural disaster could create shortages issues for the City. However, the City's wells are potentially spread through multiple compartments of the local Columbia River Basalt Group (CRBG), as described by recent investigations by the OWRD (see Exhibit 4.2)⁵.

4.3 CURTAILMENT EVENT TRIGGERS AND STAGES

OAR 690-086-0160(2) and (3)

The City has prepared a curtailment plan with four progressive stages: alert, warning, critical and emergency. The City's curtailment plan is provided in Appendix B. Reduced levels of

⁵ <https://www.oregon.gov/OWRD/programs/GWWL/GW/WallaWallaSubbasin/Pages/default.aspx>

supply, increased demands, or capacity limitations of the water system can cause water shortages. A sustained problem in any of these three areas, or a combination of problems, would necessitate conservation or curtailment of water use. Therefore, it is important to identify events that trigger activation of the alert stage and subsequent curtailment actions. The stages, trigger criteria, curtailment actions and approaches for enforcement are presented in Exhibit 4.1.

ALERT LEVEL	ALERT LEVEL TRIGGERS		NOTIFICATION	CURTAILMENT ACTION	ENFORCEMENT ACTION
	SUPPLY	CAPACITY			
<i>NORMAL OPERATION</i>	6,500-7,500 GPM	SYSTEM FULLY FUNCTIONAL	N/A	N/A	N/A
<i>ALERT</i>	4,000 GPM	-75%	PUBLIC RADIO, NEWSPAPER AND SOCIAL MEDIA	VOLUNTARY IRRIGATION AND COMMERCIAL USE CONSERVATION CURTAIL HYDRANT FLUSHING	VOLUNTARY
<i>WARNING</i>	3,000 GPM	-50%	PUBLIC RADIO, NEWSPAPER AND SOCIAL MEDIA. DIRECT CONTACT WITH LARGE WATER USERS	IRRIGATION USE LIMITED TO EVENING/EARLY MORNING HOURS FOR ALL USERS. NO HYDRANT FLUSHING	CITY STAFF MONITORING AND REMINDING CUSTOMERS
<i>CRITICAL</i>	2,000 GPM	-25%	PUBLIC RADIO, NEWSPAPER AND SOCIAL MEDIA. DIRECT CONTACT WITH LARGE WATER USERS	NO IRRIGATION, CAR WASHING OR WASHING SIDEWALKS/DRIVEWAYS. NO HYDRANT FLUSHING. VOLUNTARY REDUCTION OF INDUSTRIAL/COMMERCIAL USE	PERIODIC PATROLS TO ENSURE WATER CURTAILMENT. ISSUANCE OF FINES.
<i>EMERGENCY</i>	COMPLETE LOSS OF ALL WELLS (PUMP FAILURE OR CONTAMINATION)	ALL RESIDENCES EXPERIENCE SUSTAINED, COMPLETE LOSS OF WATER PRESSURE.	PUBLIC RADIO, NEWSPAPER AND SOCIAL MEDIA. DELIVERY OF PAMPHLETS. DIRECT CONTACT WITH COMMERCIAL AND INDUSTRIAL USERS.	NON-ESSENTIAL WATER USE PROHIBITED. OUTSIDE WATER USE PROHIBITED. WATER USE LIMITED TO HEALTH, SANITATION AND SAFETY.	CITY STAFF AND COUNTY SHERIFF MONITORING. ISSUANCE OF FINES.

NOTE: THE AUTHORITY TO ENACT THESE NOTIFICATION, CURTAILMENT AND ENFORCEMENT ACTIONS IS RAISED BY THE MILTON-FREEWATER CITY COUNCIL.

Exhibit 4.1 – City of Milton-Freewater Water Curtailment Plan.

LOSS OF WATER SUPPLY SCENARIOS

Possible scenarios that could result in the City of Milton-Freewater losing its water supply are limited. Scenarios include a severe and prolonged drought, regional earthquakes or massive contamination of the basalt aquifers. It is the City’s opinion that adverse effects from a long-term drought are not a major concern because variations in annual precipitation have shown little to no long-term effect on the deep basalt aquifers. Recent studies have shown the aquifers supplying water to City wells have relatively old water with limited new water contributions which would limit the impacts from a prolonged drought. A long, severe drought could cause increased use of the deep basalt aquifer when surface water users turn to basalt water rights to meet water demands.

In the event of aquifer contamination, it is anticipated that the City would not lose the use of every well because the City’s wells are separated by considerable distance. Additionally, recent data from OWRD suggests that the City’s wells are not all in direct hydraulic connection. The City’s wells are separated into three groups (see Exhibit 4.2). If necessary, the City could also use their surface water rights, with the appropriate water treatment, in the event multiple wells became contaminated. Severe flooding events should not have adverse effects on the City’s wells since they are sealed at the ground surface and are located in protected structures above the floodplain.

A prolonged power failure (more than one day) would have an adverse effect on the City's water supplies. Currently, only Well 2 has emergency power capabilities, giving the City the ability to provide approximately 800 gpm during a prolonged power outage. Well 2 is located in the Middle Pressure Zone, therefore it could be used to supply the Middle and North Pressure Zones. However, 800 gpm cannot meet the City's average water demand.

In addition, the City has 5 million gallons of storage between the three water reservoirs which can provide water for short-term water demands.

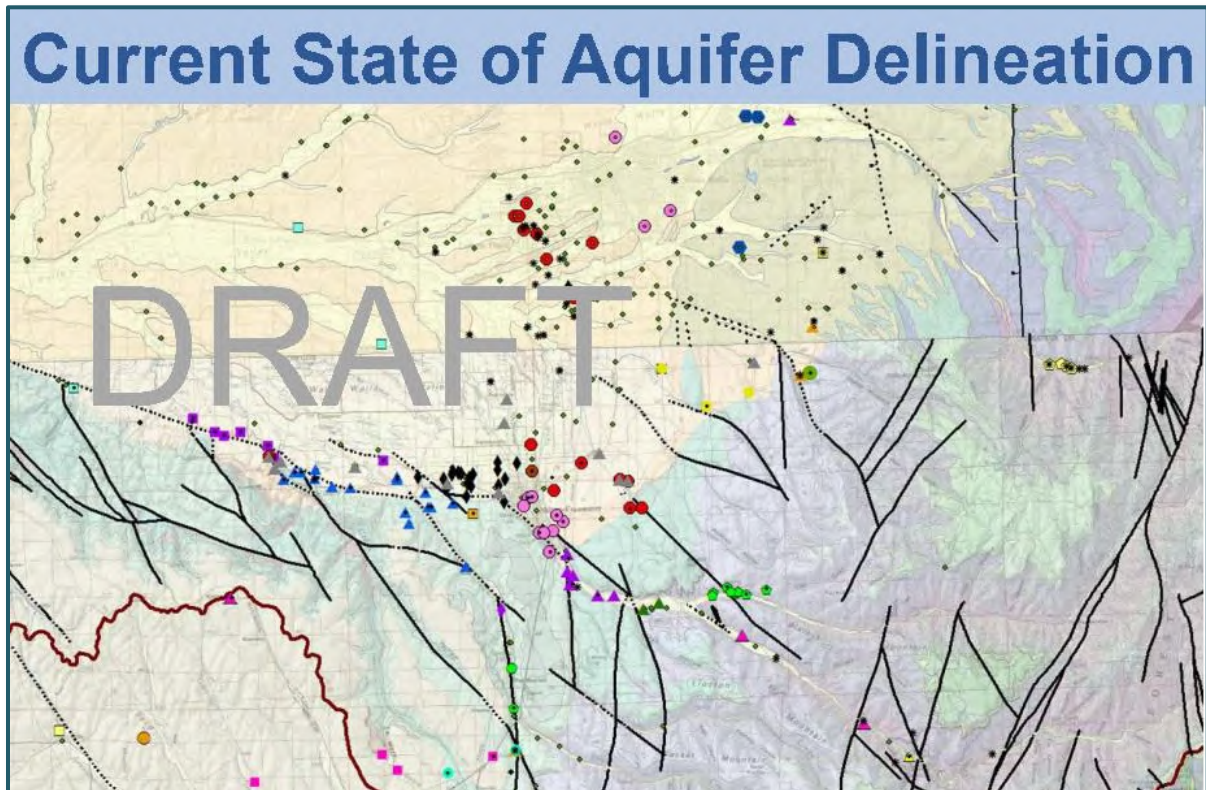


Exhibit 4.2 – Geology map showing a portion of the Walla Walla Basin around Milton-Freewater. Black and dashed lines indicate mapped and potential faults. Symbol shape/color show wells that have similar water level elevations potentially indicating hydraulic connections⁶. City wells are spread between the black diamonds, pink circles and purple triangles.

CAPACITY LIMITATIONS

The City currently has considerable water supply available to meet current and future needs and well production capacity limitations are not a problem. The City also has ownership of an additional well that is currently not connected to the water system. This old cannery well could be retrofitted and water rights transferred in an emergency. The City also has a number of surface water rights that could be utilized, with appropriate treatment, to meet demands if well production capacities were limited.

⁶ Woody, Jen, Greg Silbernagel and Justin Iverson. "Basalt Groundwater of the Walla Walla Subbasin." Powerpoint Presentation, Oregon Water Resources Department, Milton-Freewater, OR, December 18, 2018.

4.4 AUTHORITY AND ENFORCEMENT

The City of Milton-Freewater City Council adopted the water curtailment plan as part of the last WMCP update on December 13, 2010. The full water curtailment plan is attached as Appendix B. As per the approved WMCP Resolution 2195.

4.5 CURTAILMENT PLAN IMPLEMENTATION

OAR 690-086-0160(4)

STAGE 1: ALERT STATUS

Curtailment Activity: The City will initiate a voluntary conservation program and inform customers of the potential for a water shortage and request individual water users to make a concerted effort to voluntarily reduce their consumption. The City would also curtail hydrant flushing during a Stage 1 water alert status. This voluntary conservation program would be initiated by the City by making public radio, social media and newspaper announcements.

Activation: The Stage 1, Alert Status, would be activated when the City Manager, in conjunction with the Public Works Department, determines that the potential exists that demand will exceed the supply and storage capabilities of the water system.

STAGE 2: WARNING STATUS

Curtailment Activity: The City will initiate a program to reduce nonessential water use by limiting yard and garden watering to between the hours of 8 P.M. and 8 A.M. This curtailment activity will also be imposed upon all school and park watering. No hydrant flushing will be performed. The Stage 2, Warning Status, will be initiated by the City by using radio, social media and newspaper announcements and direct contact with large water irrigators, such as schools and farmers.

Activation: The Stage 2, Warning Status, would be activated when the City Manager, in conjunction with the Public Works Department, determines there is the potential that consumption will exceed the supply and storage capabilities of the system or when there is a major malfunction of the pumping equipment that will interrupt supply.

STAGE 3: CRITICAL STATUS

Curtailment Activity: The City will initiate a program to limit nonessential water use, which includes no lawn watering, no car washing, no washing down of sidewalks/driveways, no hydrant flushing, no park or school irrigation and voluntary reduction of industrial/commercial usage.

Activation: The Stage 3, Critical Status, curtailment plan would be activated when the City Manager, in conjunction with the Public Works Department, determines there is a definite threat that demands in consumption will exceed the supply and storage capabilities of the water system. Stage 3 will be activated by the use of newspaper, social media and radio announcements, as well as direct personal contact with major users. Under the Stage 3 condition, the City would have periodic patrols to ensure that nonessential water usage is curtailed.

STAGE 4: EMERGENCY STATUS

Curtailment Activity: The City would initiate a program to prohibit nonessential water use and limit essential water usage. Under Stage 4, all outside water use would be prohibited and water usage would be limited to providing human and animal consumption and proper sanitation and health needs.

Activation: The City would activate Stage 4, Emergency Status, when the City Manager, in conjunction with the Public Works Department, determines that there is an immediate health and safety hazard as it relates to the demand exceeding the supply and storage capabilities of the water system. Stage 4 will be activated by the use of newspaper, social media and radio announcements, delivery of pamphlets and direct personal contact with commercial/industrial users.

SECTION 5 – MUNICIPAL WATER SUPPLY

This section satisfies the requirements of OAR 690-086-0170.

This section describes the City's current and future water delivery areas and population projections, demand projections for 10 and 20 years and the schedule for when the City expects to fully exercise its water rights. Also required is a comparison of the City's projected water needs and the available sources of supply, an analysis of alternative sources of water and a description of required mitigation actions, if required.

5.1 DELINEATION OF SERVICE AREAS

OAR 690-086-0170(1)

As described in Section 2, the City's current water service area includes City Limits and a few outlying areas (see Exhibit 2.1). Future water service area includes areas included within the Urban Growth Boundary (UGB) and potential commercial users that develop just outside the City's existing water service area.

The present UGB of Milton-Freewater encompasses a considerable area that is not likely to be fully developed within the planning period of this plan. This includes areas adjacent to OR11 both north and south of town and the upper hills on the east side of the City. If development occurs in these areas, significant water system improvements may be needed similar to improvements completed in 1999 for the south pressure zone. The area within the current City limits of Milton-Freewater is approximately 1,305 acres and the area in the UGB is approximately 2,260 acres.

5.2 POPULATION PROJECTIONS

OAR 690-086-0170(1)

The City's service area population is projected to be 7,636 in 2030 and 8,032 in 2040. As shown in Exhibit 5.1, the City's projected service area population consists of the population within City Limits and the population outside City Limits⁷. The population projections are based on the Population Research Center at Portland State University and were published June 30, 2019.

Year	Current Population	Projected Population	Percentage Increase
2019	7,278		
2030		7,633	5%
2040		8,032	10%

Exhibit 5.1 - Population forecasts for the City of Milton-Freewater.

⁷ <https://www.pdx.edu/prc/home>

5.3 DEMAND FORECAST

OAR 690-086-0170(3)

The City’s current average and peak daily demands, as summarized in Section 2, are:

- ◆ Average Daily Demand = 236 gallons per person per day (gpcd)⁸
- ◆ Maximum Daily Demand = 614 gallons per person per day (gpcd)⁹

Using current demands, future water demands for the City can be estimated based on future population projections. Residential use represents a majority of water demands in Milton-Freewater. Residential growth is anticipated to account for the majority of future demands, assuming a high water use industry does not locate in Milton-Freewater. The highest peaking factor of 2.6, from 2017, will be used for future water demand forecasts. In 2030 projected peak demand will be 4.69 MG and in 2040 projected water demand will be 4.93 MG. Pumping rates to meet peak demand are estimated at 3,255 GPM for 2030 and 3,425 GPM for 2040 (see Exhibit 5.2).

Year	Population	Annual Demand (MG)	Average Day Demand (MGD)	Maximum Day Demand (MGD)	Maximum Day Demand (GPM)
2015-2019 AVERAGE	7,278	629.28	172	3.77	2,618
2030	7,633	657.51	180	4.69	3,255
2040	8,032	691.88	190	4.93	3,425

Exhibit 5.2 – Future water demand forecast for the City of Milton-Freewater.

With current infrastructure, the City is able to produce approximately 7,700 gpm. Under current infrastructure, City wells would need to pump a little over 8 hours per day to meet peak daily demand. In 2030, with no changes to the infrastructure, City wells would need to increase to almost 10.5 hours per day to meet peak daily demand. In 2040, with no changes to the infrastructure, City wells would need to increase to just less than 11 hours per day to meet peak daily demand.

5.4 SCHEDULE TO EXERCISE PERMITS AND COMPARISON OF PROJECTED NEED TO AVAILABLE SOURCES

OAR 690-086-0170(2) & (4)

As previously described, the City relies on seven basalt wells for its water system. The combined production of these seven wells is approximately 7,700 GPM (17.1 cfs, 11.0 MGD) which exceeds the maximum day demands for both 2030 and 2040. With its current infrastructure and water rights, the City can meet the estimated maximum day demands for both 2030 and 2040.

The City currently has two permitted municipal water rights at Well 1 and Well 9 that still need to be fully exercised and certificated.

⁸ 1,720,000 Average Day Demand (2015-2019) / 7,278 (Population) = 236 gallons per person per day.

⁹ 236 gallons/day/person X 2.6 (highest peaking factor) = 614 gallons per person per day.

Well 1 had a certificate of beneficial use submitted in 2014. City staff are working with OWRD staff to determine actions needed for completing the permit requirements. The City plans to have this process completed within the next five years. Current infrastructure at Well 1 is able to fully exercise the water right under permit G-4924.

Well 9 had a certificate of beneficial use submitted in 2014. City staff are working with OWRD staff to determine actions needed for completing the permit requirements. The City plans to have this process completed within the next five years. However, Well 9 currently has chemical or bio-fouling issues that the City is working to resolve which may cause some delays in this process. In addition, the current infrastructure at Well 9 cannot pump the full 1,499 gpm allowed under permit G-12582. Additional modifications may be required to fully exercise the permit.

In addition, the City has Permit G-13488 which still needs to be certificated. A certificate of beneficial use was submitted in 2014. City staff are working with OWRD staff to determine actions needed for completing the permit requirements. The City plans to have this process completed within the next five years. Current infrastructure at Well 8 is able to fully exercise the water right under permit G-13488.

5.5 ALTERNATIVE SOURCES

OAR 690-086-0170(5)

OAR 690-086-0170(5) requires an analysis of alternative sources of water if any expansion or initial diversion of water allocated under existing permits is necessary to meet future water demand as described above.

IMPLEMENTATION OF CONSERVATION MEASURES

OAR 690-086-0170(5)(a)

The City is already implementing a number of conservation measures as described in Section 3. Existing and additional planned conservation measures can help slow growth of future demands, but are dubious to eliminate additional water demands. The City will continue to improve its non-revenue water volumes, water auditing and leak detection. Additionally, the City's annual water production has trended downwards over the last 15 years (Exhibit 2.4).

INTERCONNECTIONS

OAR 690-086-0170(5)(b)

Currently there are no interconnections between the City and other water systems. The closest water system is Umapine, OR, located 4.5 miles NW, which operates a small community water system that would not be able to provide significant water volumes for City use. Additionally, a pipeline would need to be installed to connect the systems.

ADDITIONAL CONSERVATION MEASURES

OAR 690-086-0170(5)(c)

The City does not currently have plans to expand use under existing permits, so provisions of this section are not applicable. Current infrastructure at Well 9 limits the pumping rate below the amount allowed under permit G-12582. However, 20-year and 30 year projections have been based on either physical infrastructure pumping limits or water right pumping limits, whichever is less. For Well 9, the physical infrastructure is the limiting factor. Currently, the well can pump

approximately 1,080 gpm which is less than the permitted amount. The current pumping value of 1,080 gpm was used to evaluate whether the City can meet the 20-year and 30-year projected water use demands rather than the 1,499 gpm allowed under permit G-12582.

5.6 QUANTIFICATION OF PROJECTED MAXIMUM RATE AND MONTHLY VOLUME

OAR 690-086-0170(6)

OAR 690-086-0170(6) requires a quantification of the maximum rate of withdrawal and maximum monthly use if any expansion or initial diversion of water allocated under an existing permit is necessary to meet demands in the 20-year planning horizon.

The City does not currently have plans to expand use under existing permits, so provisions of this section are not applicable. Similar to the previous section, the City does not have plans to expand diversion of water from Well 9 to meet the 20-year or 30-year projected water demands.

5.7 MITIGATION ACTIONS UNDER STATE AND FEDERAL LAW

OAR 690-086-0170(7)

Under OAR 690-086-0170(7), for expanded or initial diversion of water under an existing permit, the water supplier is to describe mitigation actions it is taking to comply with legal requirements of the Endangered Species Act, Clean Water Act, and other applicable state or federal environmental regulations.

The City does not currently have plans to expand or initiated diversion of water under existing permits. Similar to the previous sections, the City does not have plans to expand diversion of water from Well 9 to meet the 20-year or 30-year projected water demands.

The City does not have any mitigation requirements under existing permits. If the City chose to start using surface water rights from an ESA listed body (namely the Walla Walla River or South Fork Walla Walla River), the diversion would need to meet existing ODFW and NFWS requirements for fish screening. Other surface water rights are in compliance with fish screening requirements with the fish screens located at the Little Walla Walla Diversion.

5.8 NEW WATER RIGHTS

OAR 690-086-0170(8)

Under OAR 690-086-0170(8), if a municipal water supplier finds it necessary to acquire new water rights within the next 20 years in order to meet its projected demand, an analysis of alternative sources of the additional water is required. The analysis must consider availability, reliability, feasibility and likely environmental impacts and a schedule for development of the new sources of water.

The City currently does not intend to acquire new water rights to meet demands within the next 20 years, so the provisions of this section are not applicable.

APPENDICES

Appendix A – Local Government Review Letters

Appendix B – City of Milton-Freewater Water Curtailment

Appendix C – Well Logs

APPENDIX A – LOCAL GOVERNMENT REVIEW LETTERS



Since 1889

**CITY OF
MILTON-FREEWATER**

•Public Works Department•
•P.O. Box 6, 501 Lamb Street, Milton-Freewater, OR 97862 •
•Phone (541) 938-8270, 8272, 8274 • FAX (541) 938-8289•

April 23, 2020

Nancy Parker
City Recorder
City of Athena
PO Box 686
302 East Current Street
Athena, OR 97813

Subject: Water Management and Conservation Plan Update for City of Milton-Freewater

Dear Ms Parker,

The City of Milton-Freewater has been working to update its Water Management and Conservation Plan. The draft updated plan is included in email sent to you.

The City has updated this plan to fulfill the requirements of OAR 690-86. We are required to submit this updated plan to OWRD in June, 2020. As part of the plan update we need to send this to local governments for their review and request comments relating to consistency with the local government's comprehensive land use plan.

Please provide any comments to me within 30 days from the date of this letter. If the plan appears consistent with the city's Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may mail any comments to the address in the letterhead or to my email: steven.Datten@milton-freewater-or.gov.

If you have any questions, please feel to contact me via email or 541-938-8274.

Sincerely,

A handwritten signature in blue ink, appearing to read "S. Patten".

Steven Patten
Public Works Technician

Patten, Steven

From: Nancy Parker <nancy@cityofathena.com>
Sent: Tuesday, May 5, 2020 8:17 AM
To: Patten, Steven
Cc: Michelle Fox; Kenneth Faircloth
Subject: RE: City of Milton-Freewater - Updated Water Management and Conservation Plan

STOP and VERIFY - This message came from **outside** of the City of Milton-Freewater.

Good Morning Steven,

The City of Athena has reviewed the City of Milton-Freewater updated Water Management and Conservation Plan and does not have any comments.

Best Regards,
Nancy

Nancy Parker, MMC, City Recorder
PO Box 686
Athena OR 97813
541-566-3862





Since LXV)

**CITY OF
MILTON-FREEWATER**

•Public Works Department•
•P.O. Box 6, 501 Lamb Street, Milton-Freewater, OR 97862 •
•Phone (541) 938-8270, 8272, 8274 • FAX (541) 938-8289•

April 23, 2020

Sheila Jasperson
City Recorder
City of Weston
PO Box 579
114 Main Street
Weston, OR 97886

Subject: Water Management and Conservation Plan Update for City of Milton-Freewater

Dear Ms Jasperson,

The City of Milton-Freewater has been working to update its Water Management and Conservation Plan. The draft updated plan is included in email sent to you.

The City has updated this plan to fulfill the requirements of OAR 690-86. We are required to submit this updated plan to OWRD in June, 2020. As part of the plan update we need to send this to local governments for their review and request comments relating to consistency with the local government's comprehensive land use plan.

Please provide any comments to me within 30 days from the date of this letter. If the plan appears consistent with the city's Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may mail any comments to the address in the letterhead or to my email: steven.patten@milton-freewater-or.gov.

If you have any questions, please feel to contact me via email or 541-938-8274.

Sincerely,

Steven Patten
Public Works Technician



Since 1887

CITY OF
MILTON-FREEWATER

•Public Works Department•
•P.O. Box 6, 501 Lamb Street, Milton-Freewater, OR 97862 •
•Phone (541) 938-8270, 8272, 8274 • FAX (541) 938-8289•

April 23, 2020

Robert Waldher
Director, Department of Land Use Planning
Umatilla County
216 SE 4th Street
Pendleton, OR 97801

Subject: Water Management and Conservation Plan Update for City of Milton-Freewater

Dear Mr. Waldher,

The City of Milton-Freewater has been working to update its Water Management and Conservation Plan. The draft updated plan is included in email sent to you.

The City has updated this plan to fulfill the requirements of OAR 690-86. We are required to submit this updated plan to OWRD in June, 2020. As part of the plan update we need to send this to local governments for their review and request comments relating to consistency with the local government's comprehensive land use plan.

Please provide any comments to me within 30 days from the date of this letter. If the plan appears consistent with the county's Comprehensive Land Use Plan, a letter response to that effect would be appreciated. You may mail any comments to the address in the letterhead or to my email: steven.patten@milton-freewater-or.gov.

If you have any questions, please feel to contact me via email or 541-938-8274.

Sincerely,

Steven Patten
Public Works Technician

APPENDIX B – CITY OF MILTON-FREEWATER WATER CURTAILMENT PLAN

STAGE 1: ALERT STATUS

Curtailment Activity: The City will initiate a voluntary conservation program and inform customers of the potential for a water shortage and request individual water users to make a concerted effort to voluntarily reduce their consumption. The City would also curtail hydrant flushing during a Stage 1 water alert status. This voluntary conservation program would be initiated by the City by making public radio, social media and newspaper announcements.

Activation: The Stage 1, Alert Status, would be activated when the City Manager, in conjunction with the Public Works Department, determines that the potential exists that demand will exceed the supply and storage capabilities of the water system.

STAGE 2: WARNING STATUS

Curtailment Activity: The City will initiate a program to reduce nonessential water use by limiting yard and garden watering to between the hours of 8 P.M. and 8 A.M. This curtailment activity will also be imposed upon all school and park watering. No hydrant flushing will be performed. The Stage 2, Warning Status, will be initiated by the City by using radio, social media and newspaper announcements and direct contact with large water irrigators, such as schools and farmers.

Activation: The Stage 2, Warning Status, would be activated when the City Manager, in conjunction with the Public Works Department, determines there is the potential that consumption will exceed the supply and storage capabilities of the system or when there is a major malfunction of the pumping equipment that will interrupt supply.

STAGE 3: CRITICAL STATUS

Curtailment Activity: The City will initiate a program to limit nonessential water use, which includes no lawn watering, no car washing, no washing down of sidewalks/driveways, no hydrant flushing, no park or school irrigation and voluntary reduction of industrial/commercial usage.

Activation: The Stage 3, Critical Status, curtailment plan would be activated when the City Manager, in conjunction with the Public Works Department, determines there is a definite threat that demands in consumption will exceed the supply and storage capabilities of the water system. Stage 3 will be activated by the use of newspaper, social media and radio announcements, as well as direct personal contact with major users. Under the Stage 3 condition, the City would have periodic patrols to ensure that nonessential water usage is curtailed.

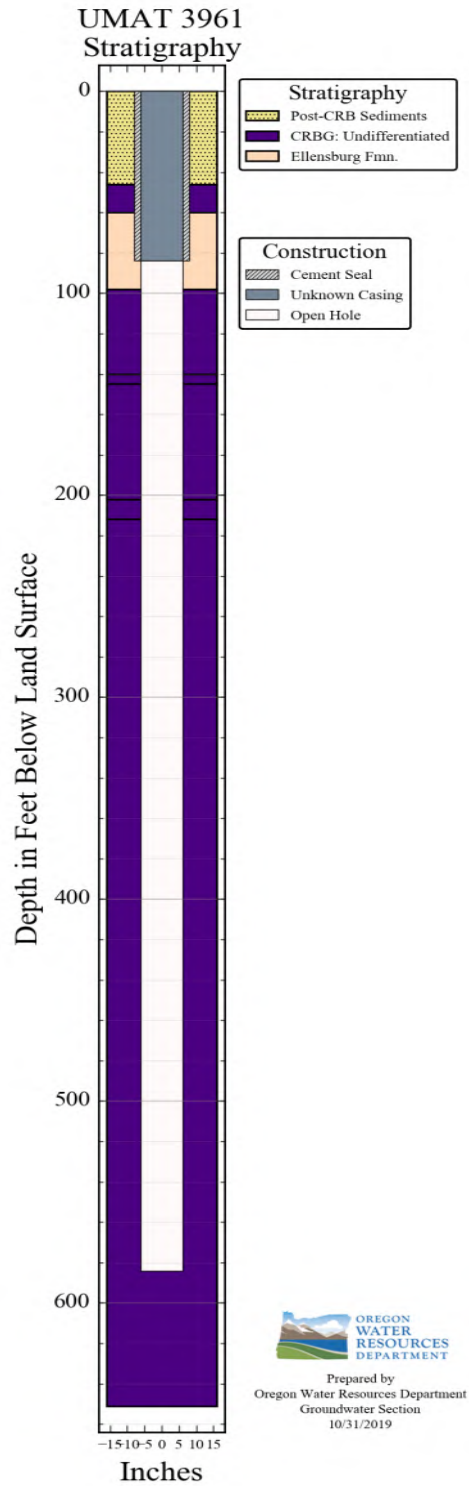
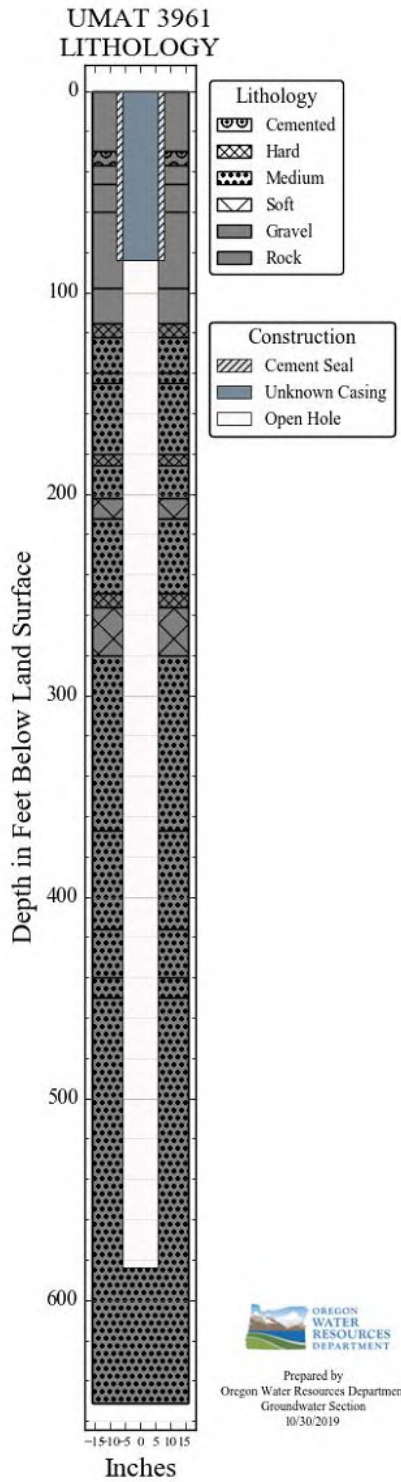
STAGE 4: EMERGENCY STATUS

Curtailment Activity: The City would initiate a program to prohibit nonessential water use and limit essential water usage. Under Stage 4, all outside water use would be prohibited and water usage would be limited to providing human and animal consumption and proper sanitation and health needs.

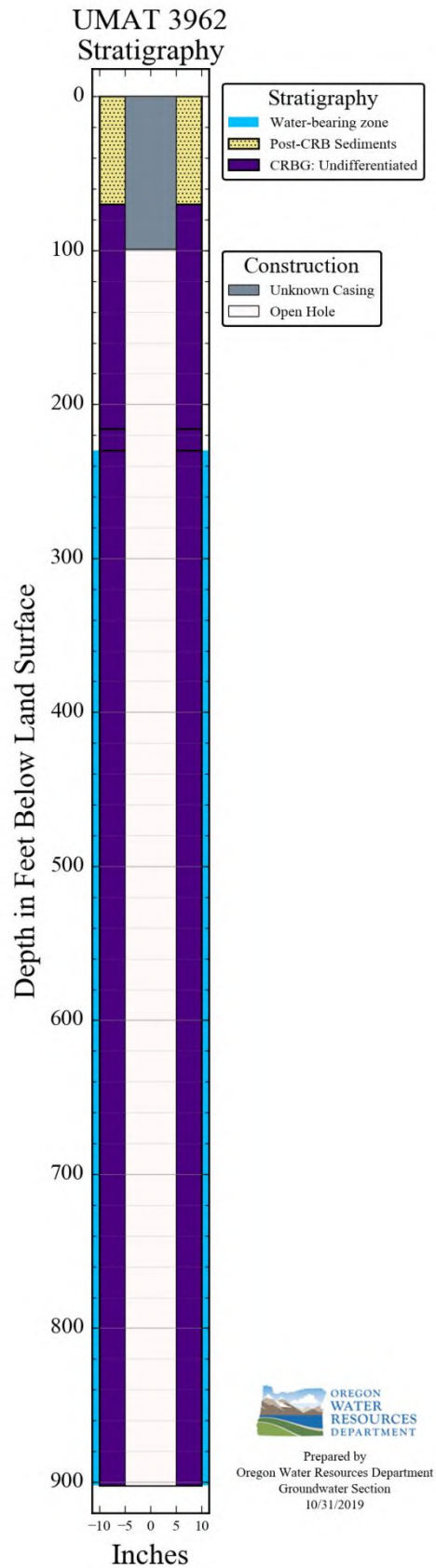
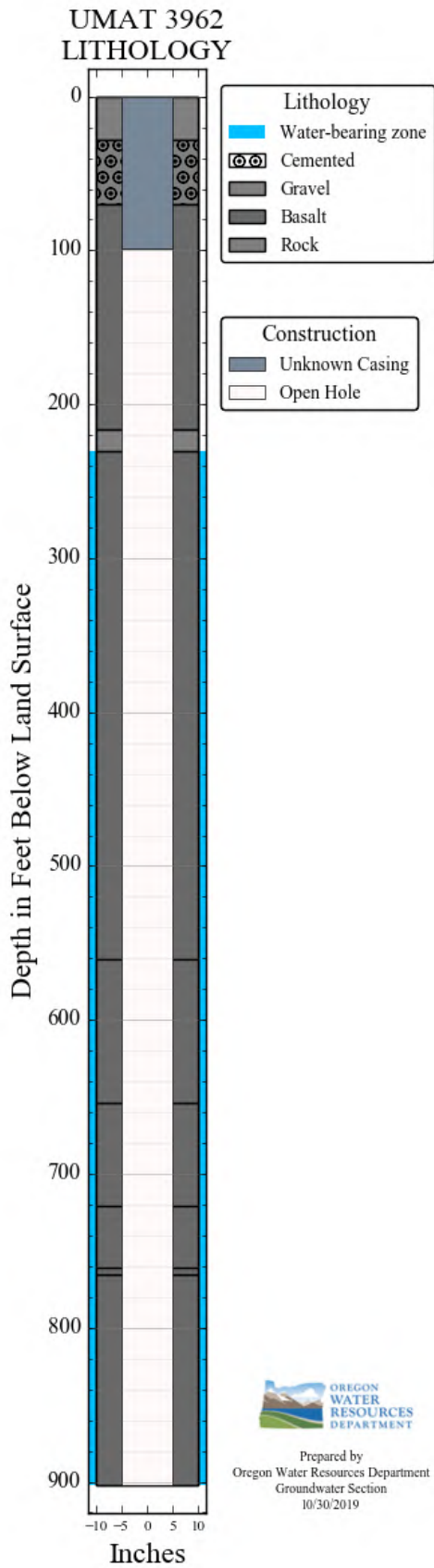
Activation: The City would activate Stage 4, Emergency Status, when the City Manager, in conjunction with the Public Works Department, determines that there is an immediate health and safety hazard as it relates to the demand exceeding the supply and storage capabilities of the water system. Stage 4 will be activated by the use of newspaper, social media and radio announcements, delivery of pamphlets and direct personal contact with commercial/industrial users.

APPENDIX C – WELL LOG LITHOLOGY & STRATIGRAPHY

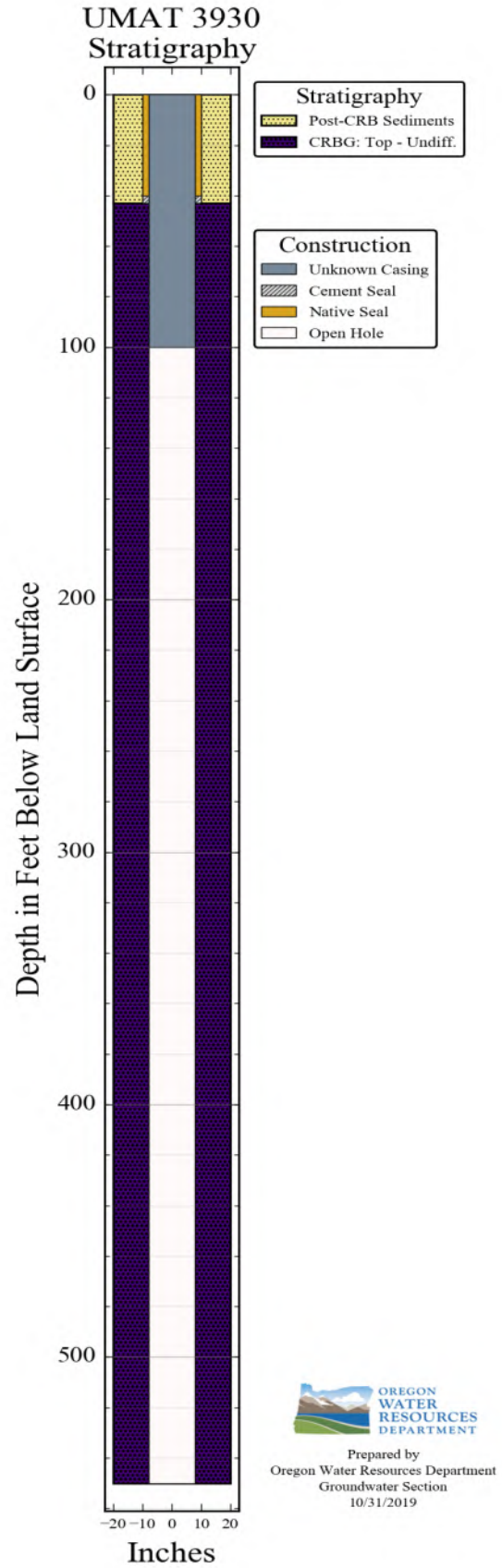
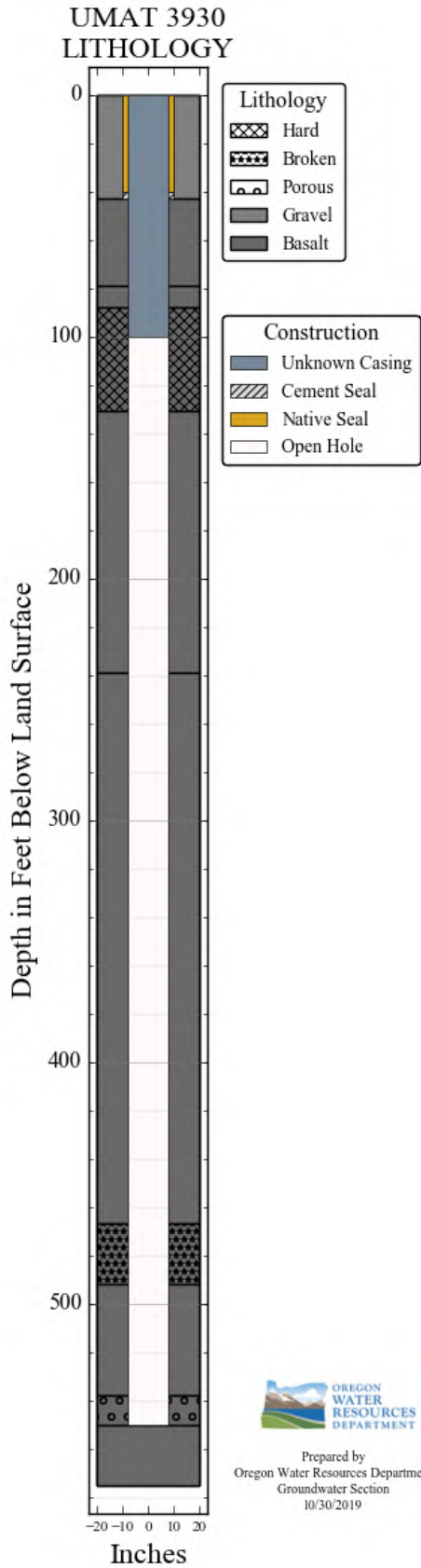
WELL 1



WELL 2

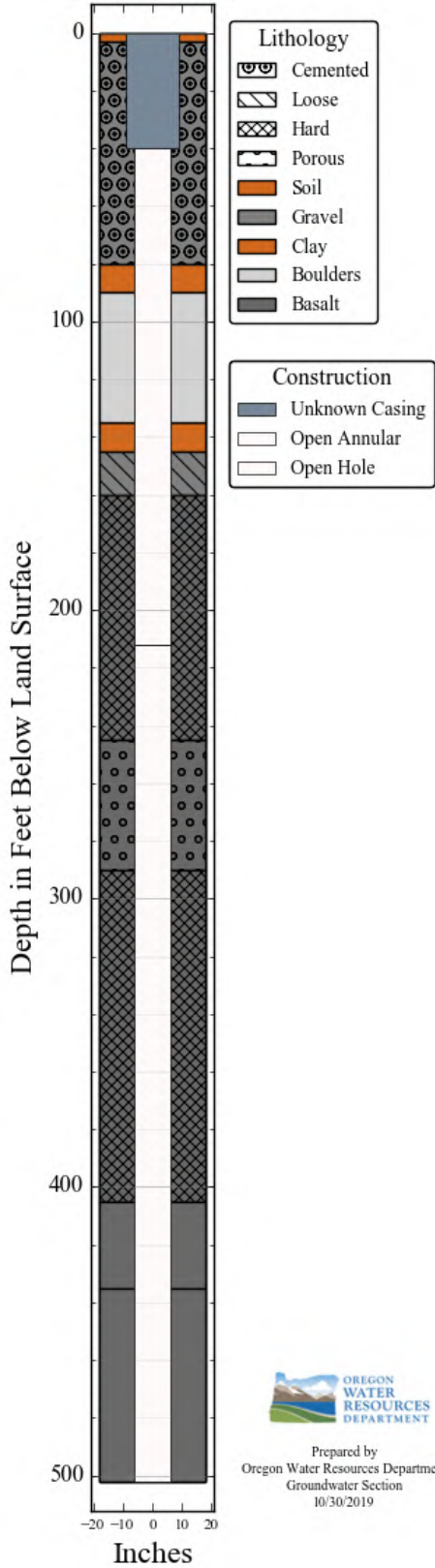


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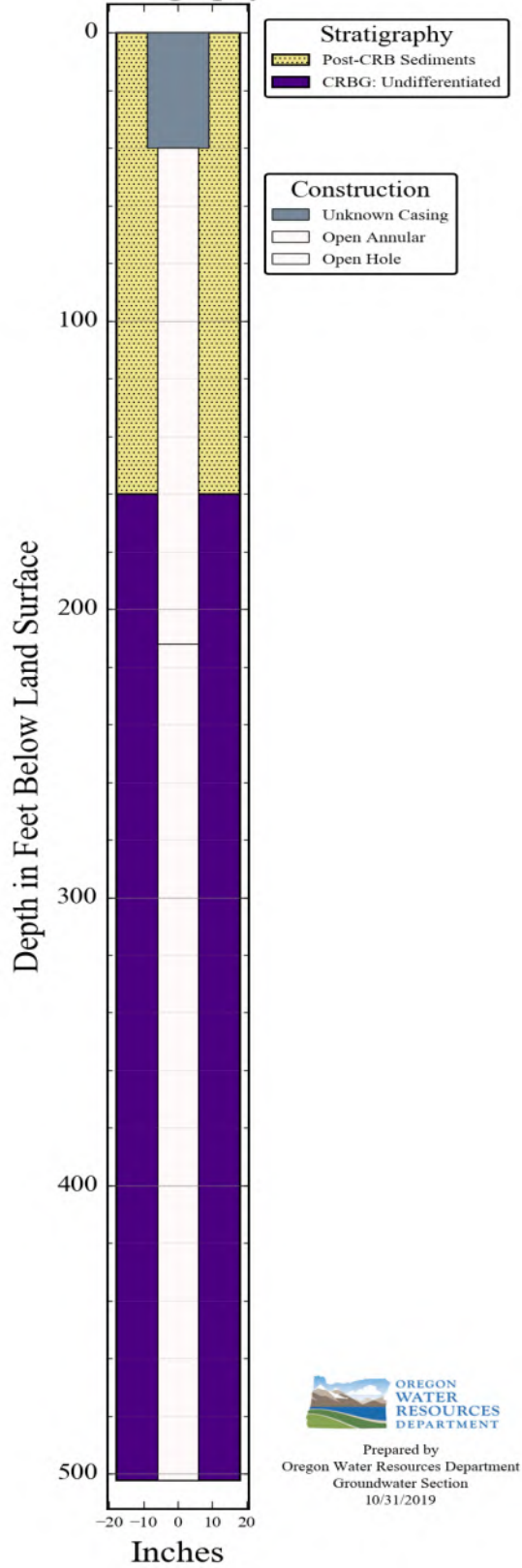


WELL 5

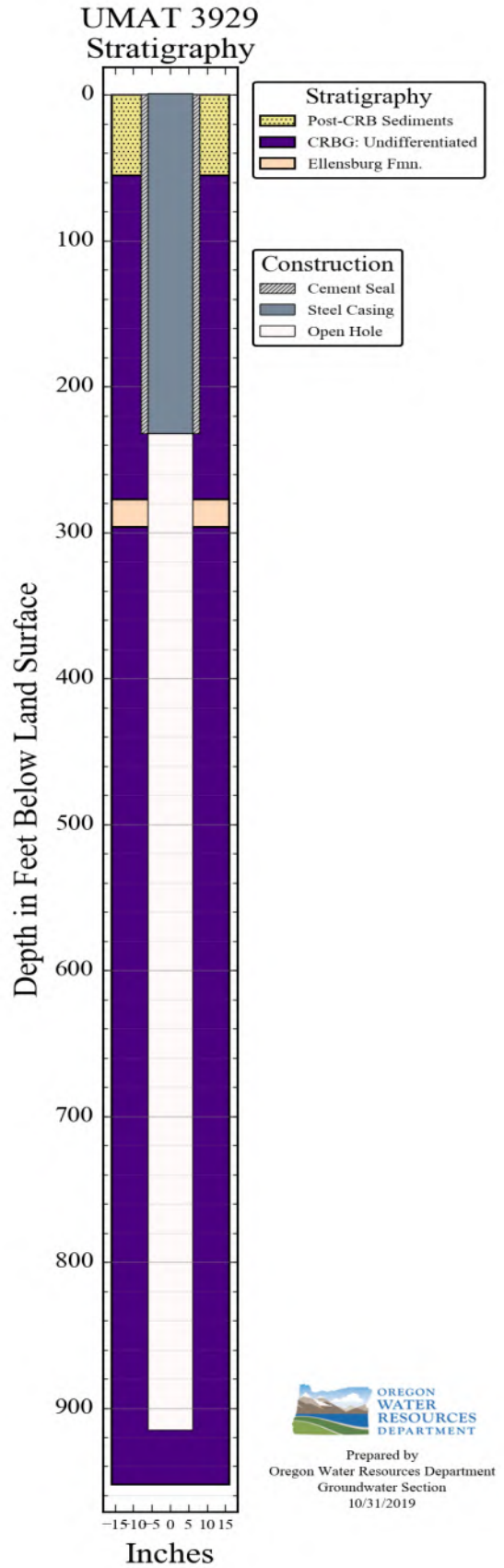
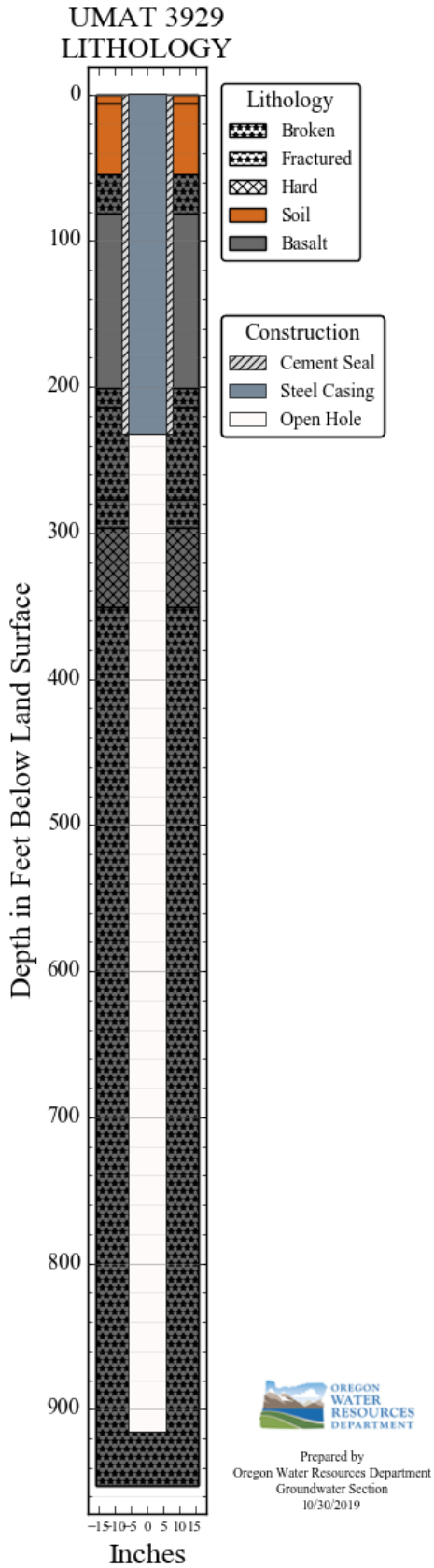
**UMAT 3909
LITHOLOGY**



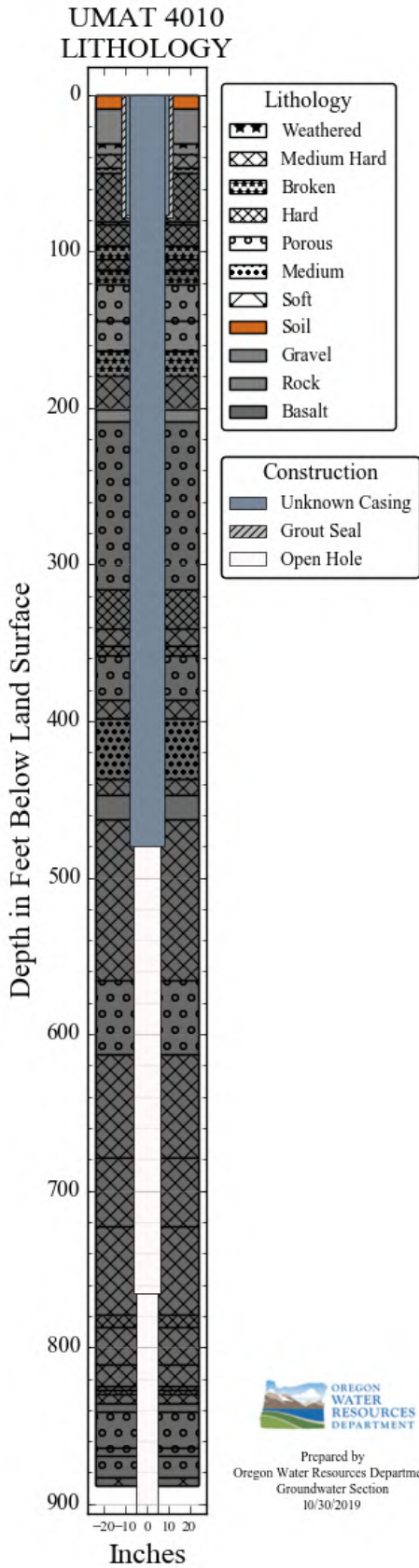
**UMAT 3909
Stratigraphy**



WELL 6

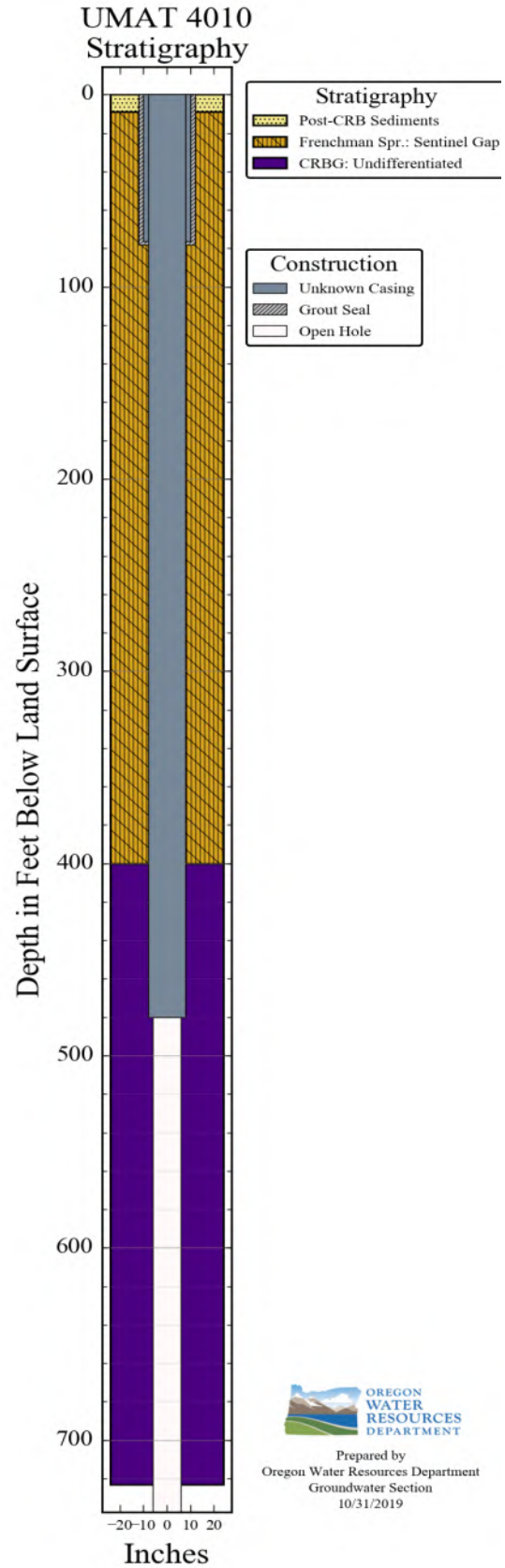


WELL 8





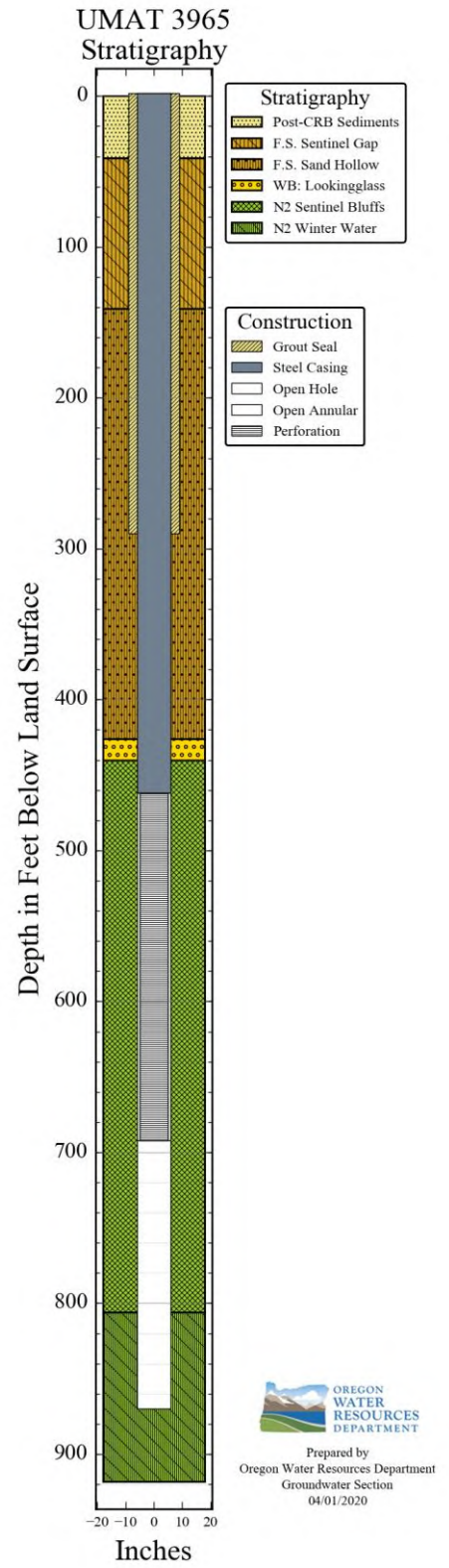
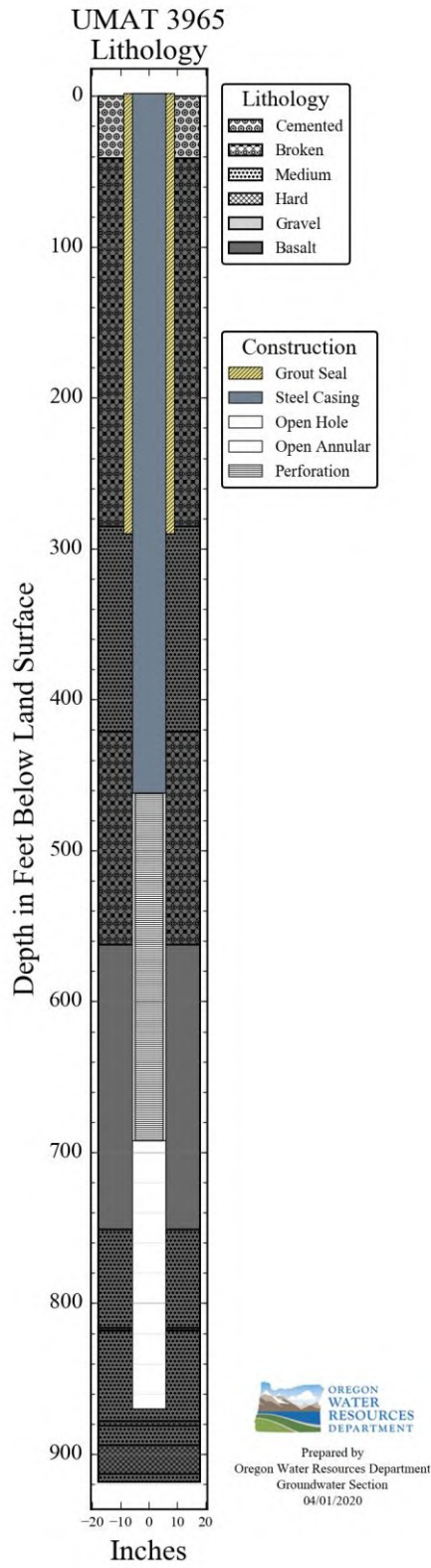
 Prepared by
 Oregon Water Resources Department
 Groundwater Section
 10/30/2019



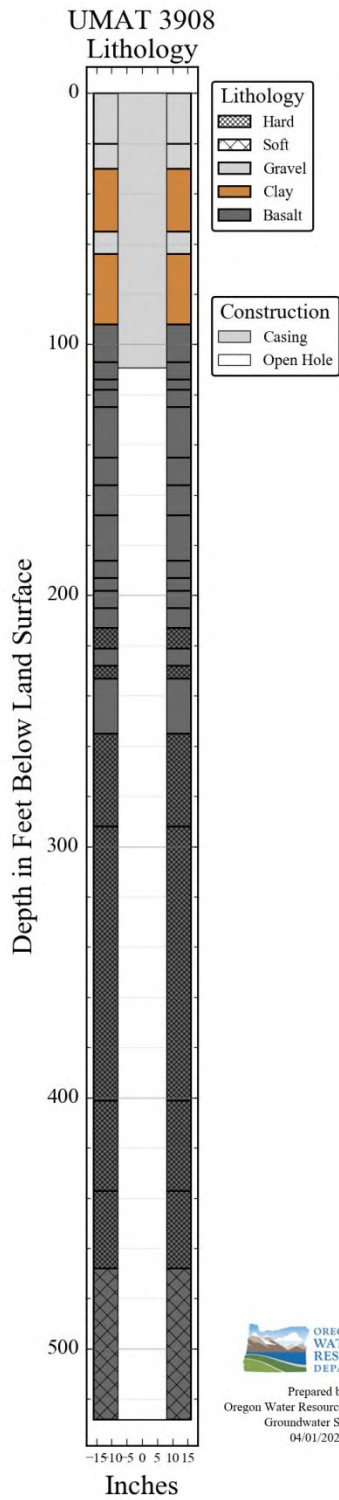



 Prepared by
 Oregon Water Resources Department
 Groundwater Section
 10/31/2019

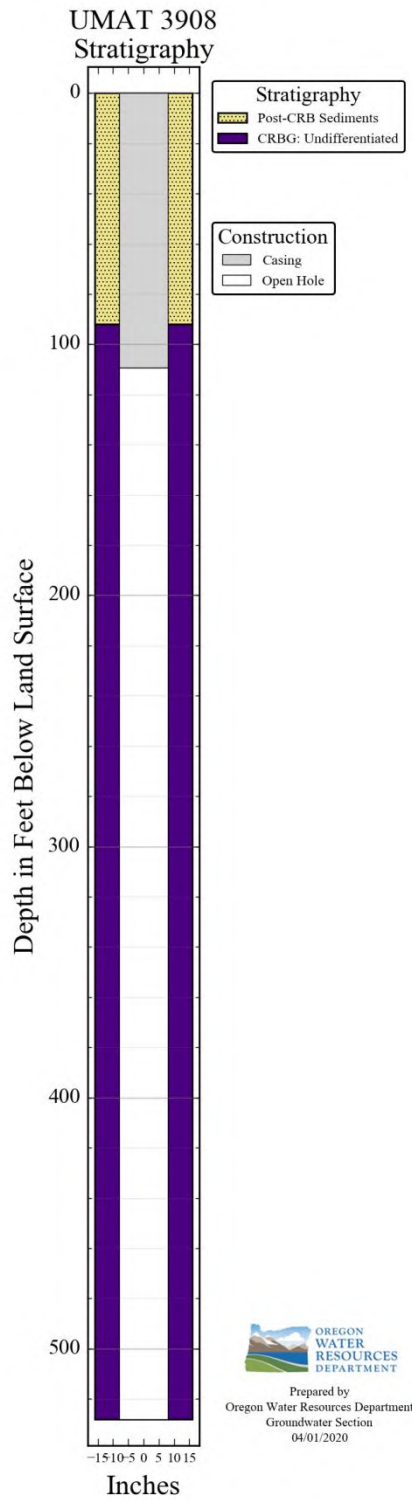
WELL 9



KEY WELL

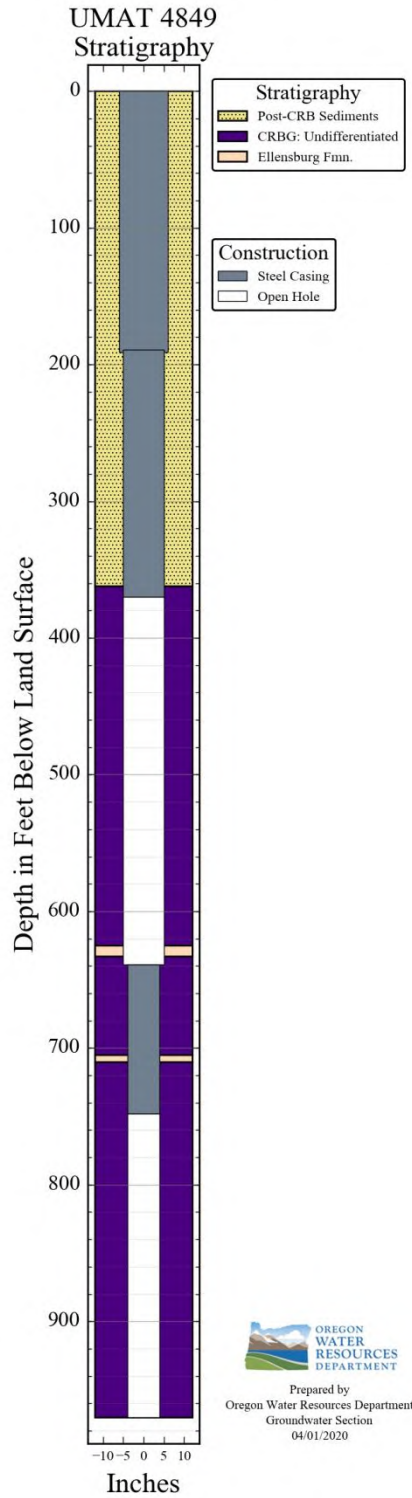
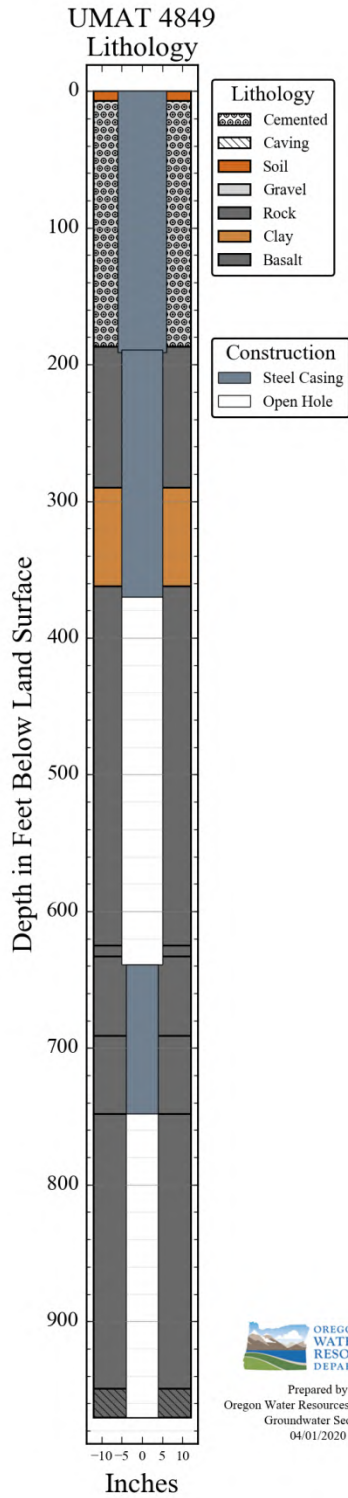



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Oregon Water Resources Department
Groundwater Section
04/01/2020

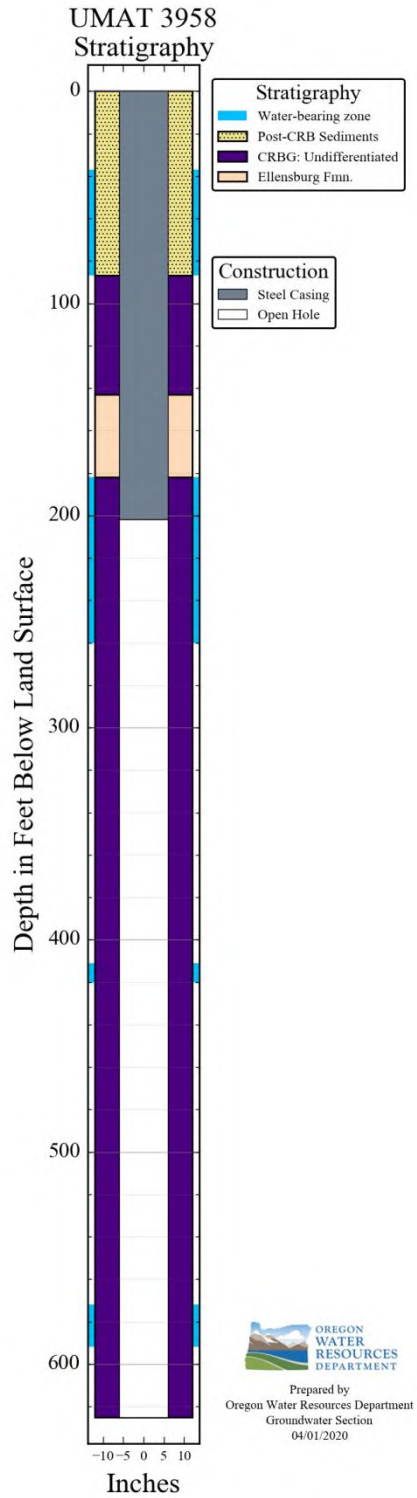
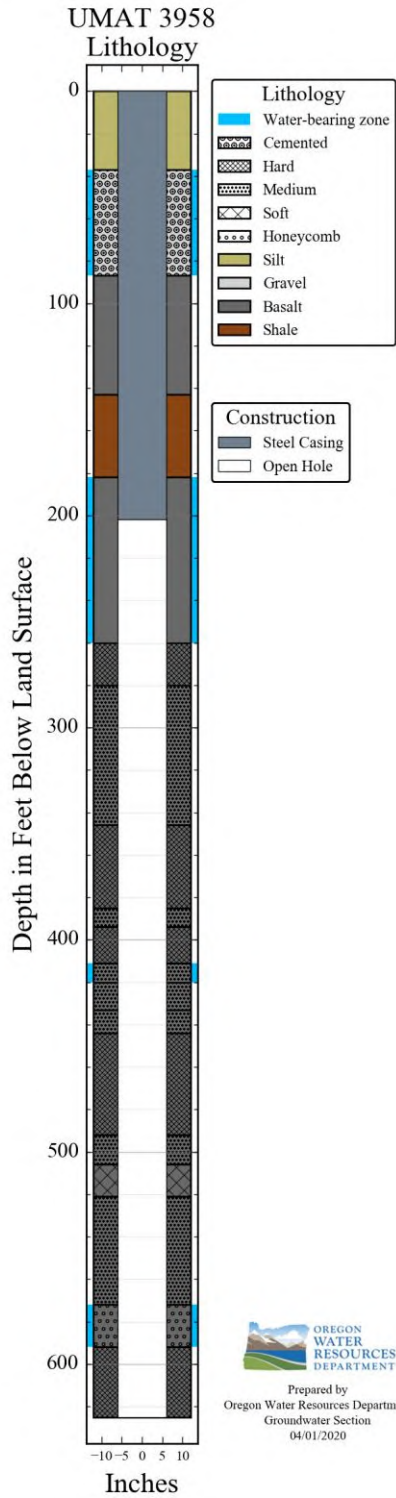



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 Prepared by
Oregon Water Resources Department
Groundwater Section
04/01/2020

DRY CREEK WELL (FARM WELL)



SEVEN HILL ROAD WELL (FARM WELL)



SUB STATION WELL

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
STATE ENGINEER, SALEM, OREGON 97310
within 30 days from the date of well completion.

RECEIVED
STATE OF OREGON
STATE ENGINEER
SEP 22 1967
(Please type or print)
(Do not write above this line)

UMAT
5065

35 accd
State Well No. 6N/35-1
State Permit No. G-4667

(1) OWNER:

Name City of MILTON-Freewater
Address Box 108 - M.F. Ore.

(2) TYPE OF WORK (check):

New Well Deepening Reconditioning Abandon
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary Driven
Cable Jetted
Dug Bored

(4) PROPOSED USE (check):

Domestic Industrial Municipal
Irrigation Test Well Other

CASING INSTALLED: Threaded Welded
6" Diam. from 1-1/2 ft. to 108 ft. Gage 280
" Diam. from _____ ft. to _____ ft. Gage _____
" Diam. from _____ ft. to _____ ft. Gage _____

PERFORATIONS:

Perforated? Yes No.
Type of perforator used Colling Torch
Size of perforations 1/4 in. by 4 to 8 in. length
68 perforations from 55 ft. to 65 ft.
201 perforations from 83 ft. to 108 ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.
perforations from _____ ft. to _____ ft.

(7) SCREENS:

Well screen installed? Yes No
Manufacturer's Name _____ Model No. _____
Type _____ Slot size _____ Set from _____ ft. to _____ ft.
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WATER LEVEL: Completed well.

Static level 37 ft. below land surface Date 9/18
Artesian pressure _____ lbs. per square inch Date _____

(9) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? Yes No If yes, by whom? Bill Widner
d: _____ gal./min. with _____ ft. drawdown after _____ hrs.
30 " 48 " 63 " 4 "
Bailer 50 gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m. Date some - in the
Temperature of water 58 Was a chemical analysis made? Yes No

(10) CONSTRUCTION:

Well seal—Material used Cement
Depth of seal 38 ft.
Diameter of well bore to bottom of seal 9 in.
Were any loose strata cemented off? Yes No Depth _____
Was a drive shoe used? Yes No
Did any strata contain unusable water? Yes No
Type of water? _____ depth of strata _____
Method of sealing strata off _____
Was well gravel packed? Yes No Size of gravel: 3/4 in.
Gravel placed from 38 ft. to 80 ft.

(11) LOCATION OF WELL:

County Umatilla Driller's well number _____
1/4 Section 36 T. 6N. R. 35E. W.M.

Bearing and distance from section or subdivision corner
on Cobb R. near old Millway

(12) WELL LOG:

Diameter of well below casing 6"
Depth drilled 153 ft. Depth of completed well 153 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level as drilling proceeds. Note drilling rates.

MATERIAL	From	To	SWL
Brown soil + gravel	0	3	35-65
Brown silty sand + gravel	3	5	
Cobbles + gravel	5	11	
Brown hard pan	11	14	
Gray cemented gravel	14	50	Water
Water bearing sr.	50	53	
Brown hard pan	53	67	
Brown packed clay + sr.	67	79	Water
Brown clay softer	79	109	Water
Brown clay packed hard	109	115	
CLAY Braten packed hard	115	122	Water
Clay Brown coarse sand hard	122	130	
3" of water bearing gravel	122		
364' in - - -	130		
Clay Brown pack. fine sr.	130	146	Water
3" layer of gravel	146		
Clay Brown packed hard	146	153	
Larger layer of gravel	153		Water

Work started 9/6 1967 Completed 9/19 1967
Date well drilling machine moved off of well 19 1967

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Rudd W. Davis Date 9/19, 1967
(Drilling Machine Operator)

Drilling Machine Operator's License No. 147

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
NAME Rudd W. Davis
(Person, firm or corporation) (Type or print)
Address 159 So Columbus M.F. Ore.
[Signed] Rudd W. Davis
(Water Well Contractor)
Contractor's License No. 159 Date 9/19, 1967

(USE ADDITIONAL SHEETS IF NECESSARY)