Water Management and Conservation Plan

Draft Report

Prepared for:

Crooked River Ranch Water Company - CRRWC

Date:

May 2025

Prepared by:

Oregon Association of Water Utilities

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Crooked River Ranch Water Company

WATER MANAGEMENT CONSERVATION PLAN

Executive Summary:

A Water Management Conservation Plan (WMCP), is required by the Oregon Water Resources Department (OWRD), found in the Oregon Administrative Rules (OAR) Chapter 690, Division 86 directly tied to criteria relating to water rights and permitting. Quantities of water consumed for municipal purposes are increasing as populations grow, and developing strategies to manage the water rights of an entity will become more essential in the future. Key components in the WMCP are, a) water conservation measures stretching those existing water rights with substantive evidence proving the need to maintain and or grow the total required water, b) considering future water needs as it relates to both existing and potential alternative sources of water for Crooked River Ranch Water Company (CRRWC).

The WMCP is formed with five primary points, building on the current resources and parlaying said information to the calculated estimates of water demand in the future. The population served, types of service (residential vs commercial) and the gallons per capita daily are measurements that substantiate necessary resources for the future, initially using five-year data set of water pumped.

The regulations that pertain to the "conservation" element of the WMCP delves into the current measures the water system is performing or not, i.e., water audit, metering, rates, leakage as well as education of the public. Public water (municipal) systems (PWS) are encouraged to upgrade infrastructure that reduces the total amount of water used. If this step is deemed successful, the management team must also look at the financial impact of selling less water.

The curtailment section of the WMCP should coincide with the emergency response plan already implemented per rule OAR 333-061-0064. In this section of the WMCP, the decision makers create stages of alert and establish trigger points to assist when the water system applies curtailment actions, either voluntarily or mandated. These actions should be initiated on the water system's ability to supply water during all levels of demand or continue to supply minimal water during a partial disruption of services.

The water supply element of the WMCP looks at the forecasted demand as it relates to projected needs of water and the available sources of water. This piece of the WMCP is part of the overall coordination of demands for water from other prevailing claims on a water source.

Long-term permitting and extensions of time are becoming increasingly more difficult to obtain. Maintaining the ability to prove beneficial use towards certification will require public water systems additional time and resources. These actions are very different today than in the past as data collection should become a higher priority for operations. Operationally, the accuracy in

the data supports the necessary decisions to negotiate the water permitting and certification process.

Additional future costs for system upgrades and repairs will be required to meet the minimal unaccounted-for water (water loss). Water loss above ten percent will require development and implementation of a regularly scheduled and systematic program to detect and repair leaks in the transmission and distribution system. These requirements will require staff time and or contractual workforce, both requiring additional monetary resources, a point decision makers must address.

The table below is a snapshot depicting the current "average" water usage calculated for both a typical daily usage, known as gallons per capita daily (GPCD) and usage as it relates to "peak" demand, a number ascertained as it relates to a system operations and performance. A comparative set of figures details the current quantity of water allowed by the water system's permitted rights against the current actual usage for CRRWC**,** as well as the projected needs in maximum volume of water. The percentages shown indicate the relativity of water used against the total available water. Assuming conditions remain consistent with water production and water sold, it is speculated that CRRWC will be using **sixty (60) percent** of the allotted water rights during the timeframe of this WMCP.

Comparative Usage – Remaining Balance:

Table ES-1 Comparative Usage and Remaining Balance

Permits	Maximum Allowed Rate	Development Limitations CFS	Maximum GPM	Ave Daily Usage CFS	Peak Day Usage CFS	Bal of Permit Daily Gals	Balance of Permit CFS	Remaining Balance %
G-18478	5.0000	3.75	1683	0.83	2.26	962,945	1.49	39.7%
Total	**5.0000**	**3.75**	**1683**	**0.83**	**2.26**	962,945	1.49	**39.7%**

Key figures in blue show the development limitation, If applicable, and its unused portion available for future

Balance of permits show unused water (CFS) available for the future growth of the PWS

Balance % shows precentage of water available from the existing right(s) for the future growth of the PWS

	2.25	60%	

The table is a method to assess two aspects relating to water rights, a) comparative view to resolve if the total permitted quantity of water meets the future needs of the public water system, b) to understand the balance of remaining (unused) quantity of total permitted water rights complements the projected need. The maximum allowed rate is the amount of water

originally allocated, the development limitation is an adjusted amount of water a PWS can divert that cannot be exceeded and is less than the maximum allowed rate.

Development limitation is a criterion placed on water under an extended permit as a condition to limit any diversion beyond the stated limits. The undeveloped portions of any single permit may be categorized under “Greenlight” water. Greenlight water refers to the undeveloped portion of the water that has yet to be diverted for beneficial use. Water being recorded and accounted for during the writing of the WMCP becomes the developed portion. The development limitations, “undeveloped portion” freezes any amount of water until an application requesting additional water is placed in the WMCP. The Public Water System must obtain approval and authority granted by OWRD to use any water identified as green light water. The development limitation amount is not figured based on the findings in this WMCP but has been established based on annual water reports remitted to OWRD. Currently, it is not a requirement of the CRRWC to submit annual water use reports to the State.

These specific points are emphasized due to the nature of retaining permitted water rights, the total amount of water currently allowed, and any potential or real State policy or rule amendments that can occur.

As the uncertainty of the future cannot guarantee the findings discovered in this WMCP, the Public Water System is encouraged to seek professional advice from consultants, engineering firms and or water rights legal counsel for guidance relating to water permitting, certification.

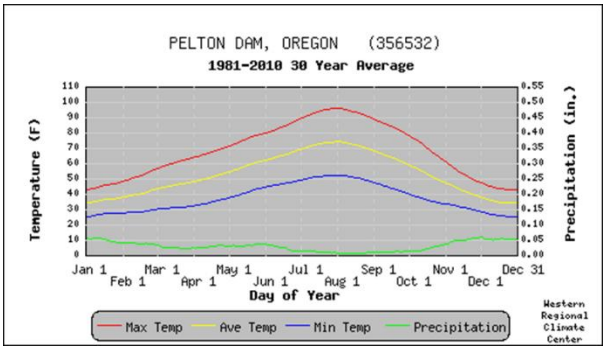
Introduction:

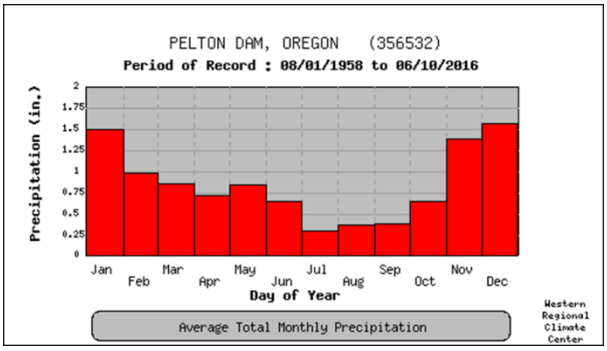
Situated in the southern part of Jefferson County, originally developed in 1972 as recreational sites; covering approximately 10,000 acres was rezoned in 1980 with the 1992 final version making the area a residential subdivision.[1] The CRRWC serves approximately 4,000 residences through 1,691 connections with most parcels being almost four acres in size.

The median household income for the Jefferson County area is $59,748.00 [2] while the current population, per Portland State University-Population Research Center (2023 Annual Population Report), is 25,478 people.[3] The high desert terrain provides eastern views of the Cascade Mountain Range, specifically Mount Jefferson, the second highest peak in the State of Oregon.

The Crooked River Ranch Water Company (CRRWC) began serving water in 1973 to approximately 450 homes, and fifty years later those services provide water to ≈ 1,691 connections.

Weather related information is taken from the averages substantiated by the Western Regional Climate Center over a period of 1981 through 2010. Annual rainfall is 10.2 inches, with 50 percent occurring over a four-month period between December through March. Like many areas of Oregon, the hottest month occurs in July while the coldest month is usually December or January. The average minimum temperature is 37^0 F as the average mean maximum temperature is 68^0 F.[4]





	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	45.4	51.9	59.8	66.6	75.4	83.7	93.4	92.4	83.7	69.9	53.3	44.7	68.3
Average Min. Temperature (F)	26.3	28.6	31.1	34.8	40.8	47.1	51.4	50.8	44.2	36.4	31.6	26.7	37.5
Average Total Precipitation (in.)	1.55	0.95	0.84	0.73	0.83	0.67	0.31	0.35	0.37	0.66	1.4	1.54	10.2

1 - https://www.crookedriverranch.com/association/page/history
2 - https://datausa.io/profile/geo/jefferson-county-or/
3 - https://www.pdx.edu/population-research/population-estimate-reports
4 - https://wrcc.dri.edu/summary/Climsmor.html

Scope:

The scope of this WMCP is to consider the functions of the water system from various points as it is run by the CRRWC. The primary concern is the management of existing water sources and the sustainability of the sources as they relate to the growth in and around the area. Equally important is continuing to supply water to both existing and future customers. Implementing conservation ideals and methods will be another tool to manage beneficial water use. Management of the water under continual satisfactory conditions will be an effort for both water system personnel and the community.

Purpose:

The purpose of this WMCP is to gain a better understanding of the balance of water from the source, through the water system and how it is consumed by the customers, coordinate with OAR requirements and guidelines towards water management and conservation. CRRWC currently meets the criteria proven under OAR 690-086-0150(5), serving a population of ≈4,000 through 1,691 connections.[1]

This WMCP is the second report sent to Water Resources Department and is written as a guideline for the CRRWC and continued efforts towards water conservation. The next update for a WMCP is due in 2034, will be preceded by a progress report due in 2029.

Every five years, the CRRWC will update the Water Resources Department with a progress report on how the benchmarks are being implemented as well as any changes in the efforts of water management and conservation.

Following the administrative rules, the CRRWC proposes to send a progress report as key benchmarks are obtained, and water use reported. Progress reports will be written and sent to the Water Resources Department as addendums to this water management and conservation plan.

Key benchmarks presented will be dependent on both the monetary and available work force to complete the tasks. At a minimum the CRRWC will:

- Supply educational information on water conservation to the customers via a website.
- Perform annual water audit, reviewing past production, consumption records.
- Verify accuracy of production meters.
- Initial leak detection.

This document has been compiled by the Oregon Association of Water Utilities with authorization from the CRRWC. This WMCP follows the Oregon Administrative Rules (OAR) Chapter 690, Division 86.

1 - https://yourwater.oregon.gov/inventory.php?pwsno=00862

SECTION ONE
MUNICIPAL WATER SUPPLIER

1.1 Affected Local Governments: OAR 690-086-0125 (5)

A list of the affected local governments to whom the draft plan was made available pursuant to OAR 690-086-0120 (6) and a copy of any comments on the plan provided by the local governments.

In October 2024, CRRWC submitted a copy of this water management conservation plan for review to all affected governments listed below, requesting for comments on the awareness of water management and conservation planning. The following persons are:

- Jefferson County Planning Manager - Phil Stenbeck – 541.475.4462
    - pstenbeck@jeffco.net
- Public Works Supervisor - Kim Symons – 541.546.6494
    - ksymons@cityofculver.com
- District 11 Watermaster - Jeremy Giffin – 541.306.6885
    - jeremy.giffin@water.oregon.gov

Comments were received from a single entity, Jefferson County Planning, stating “no concerns from the county. A copy of the notification letter and comments are included in Appendix A

1.2 Updated Plan Submittal: OAR 690-086-0125 (6)

A proposed date for submittal of an updated plan within no more than 10 years is based on the proposed schedule for implementation of conservation measures, any relevant schedules for other community planning activities, and the rate of growth or other changes expected by the water supplier; or an explanation of why submittal of an updated plan is unnecessary and should not be required by the Department.

OAR 690-086-0125 (6) says an updated plan to be sent within no more than 10 years unless significant changes are expected by the water supplier. This is based on the proposed schedule for implementing conservation measures, rate of growth or other expected changes by the water supplier. A “Progress Report” will be sent on or before the 5-year period (2029) to review benchmarks and water use progress and to give an updated WMCP at the end of the 10-year period.

Conservation and water use practices are constantly evolving. Listed conservation efforts at the end of section two will be reviewed annually by assigned administrative staff, enabling CRRWC to decide the progress of the management conservation plan.

All efforts towards management and conservation will be noted and kept for the progress report which will be given every five years by CRRWC. The next progress report will be due by the end of 2027.

1.3 Additional Time: OAR 690-086-0125 (7)

If the municipal water supplier is requesting additional time to implement metering as required under OAR 690-086-0150 (4)(b) or a benchmark established in a previously approved plan, documentation showing additional time is necessary to avoid unreasonable and excessive costs.

CRRWC is not requesting an extension of time to implement metering, or a benchmark set up in a previously approved water management conservation. CRRWC is a fully metered water system, with new meters installed in 2019.

1.4 Municipal Water Supplier Description: OAR 690-086-0140 (1)

A description of the supplier's source(s) of water; including diversion, storage, and regulation facilities; exchange agreements; intergovernmental cooperation agreements; and water supply or delivery contracts.

CRRWC supplies water to the community through two wells (wells 4 and 5) capable of producing approximately 2000 gallons per minute (GPM) from a deep basalt aquifer under Permit G-18478 while a third well (well 2) is used only in case of an emergency. This well #2 is exercised each year to test flow capacity, approximately 10-15 minutes. Well 3 is physically disconnected from the water system. There is no treatment necessary to meet drinking water standards. Water is pumped to both the two reservoirs (0.68 million gallons) as well as the distribution system serving primarily single family residential (SFR) customers with a few commercial services.

CRRWC does not have any agreements with other governmental agencies or delivery contracts due to the location of the subdivision to adjacent water suppliers. The two nearest public water systems are Terrebonne Domestic Water District (≈ 10 miles) south, and the City of Culver, (≈7.0 miles) north as a crow flies. At this time, logistically and financially, it is improbable that a regional water district could be formed due to the terrain.

1.4.1 Points of Diversion

Table 1-1: POD Locations / Production Rates

Table 1-1: POD Locations / Production Rates								
Permit	Town-ship	Range	Section	Qtr Qtr	Notes		Rate (CFS)	Rate (GPM)
G-18478	13-S	12-E	24	NW-NW	Well 2	a	6.68	3000
G-18478	13-S	12-E	16	NW-SE	Well 3	b	5.57	2500
G-18478	13-S	12-E	16	NE-SE	Well 4	c	2.79	1250
G-18478	13-S	12-E	16	NE-SE	Well 5	d	2.74	1230
Total Allowed							5.00	2,244
Maximum of 5.0 CFS from each well or in case of rotation. Development limitation is 3.75 CFS								
a - Well 2 flushed annually to test capacity flows - use only in an emergency								
b- Well 3 is physically disconnected from the water system								
c - rotation with Well 5								
d - rotation with Well 4								

1.4.2 Water Storage - Reservoirs

Table 1-2: Water Storage Reservoirs

Table: 1-2: Water Storage Reservoirs		
Reservoir	Storage Capacity (MG)	Elevation
1	0.08	350
2	0.60	350
Total Capacity	0.680	
Reservoir is offline		

1.5 Current Service Area: OAR 690-086-0140 (2)

A delineation of the current service areas and an estimate of the population served, and a description of the methodology used to make the estimate.

The CRRWC's water system serves an unincorporated area in Jefferson County which encloses approximately 12K acres of land on the eastern slopes of the Cascade Mountain Range. In the southern section of Jefferson County. The community boasts a rural setting with major amenities found twenty minutes south in the larger cities of Redmond and Bend . CRRWC's

population served is approximately 4,000 through 1,691 connections,[1] equaling 2.4 persons per household.

The area served by CRRWC is limited to the canyons created by both the Deschutes and Crooked Rivers. Outlined from the Water Master Plan (WMP) the engineering report projects a total buildout (fully developed) to have a maximum of 2,060 service connections. Using 2.4 people per household, the water company could serve a population of ≈ 5,000 people, if the land zone criteria remain in place. Changes in land zoning may potentially see an increase in population, but numerous steps of authority must approve such a decision. The area over the past three years (2020-2023) has seen significant increases in overall annual population. Approximately 11-12 new homes have been constructed annually. Maps in appendix B show various information for CRRWC.

1.6 Adequacy / Reliability of Existing Source: OAR 690-086-0140 (3)

An assessment of the adequacy and reliability of the existing water supply considering potential limitations on continued or expanded use under existing water rights resulting from existing and potential future restrictions on the community's water supply.

The adequacy and reliability of the existing water supply can be proven from two focus points, a) the ability to sustain flows from the two primary wells based on the recharge of raw water into the aquifer, b) manage the existing water during distribution. A sound approach for the company is detailed data measurements of water drawn from the source, and the ability to manage supplies without loss. The service area is bounded by both the Deschutes and Crooked River with well depths being below the rivers. One well log noted a significant water bearing zone that likely drilling materials were carried away by moving water. The water supplied to CRRWC is considered a deep water aquifer in the Crooked River Basin.

Water production figures from Tables 1-4, 1-5 on the following pages give evidence for the consistency of water production at an average of 16.9 MG (0.87 CFS) monthly. A review of periodic production times (1998-02, 2009-13 and 2015-19) indicates the production wells have consistently pumped a monthly average of 16 MG, an increase of 3.5 MG per month over the past twenty-five plus years. CRRWC is aware of the completion date for Permit G-18748 and is discussing it with a consultant on an extension of time. The past six plus years management of CRRWC has been focused on system upgrades relating to storage, distribution and data from new meters. This WMCP timeline is demonstrating 141 gallons per capita daily (GPCD) which equates to ≈350 gallons per day per household.

With a firm supply of water, CRRWC has a production capacity of 1,900 GPM (4.23 CFS), and Table 1-5 indicating a five-year average usage rate at 380 GPM (0.848 CFS) (16.4 MG/month). The maximum measured peak demand for CRRWC is 850 GPM or (2.12 CFS).

1 - https://yourwater.oregon.gov/inventory.php?pwsno=00862

Regarding production adequacy and reliability, CRRWC is properly matched for both production and demand. Well #1 is Well #4 which is ≈ 400-500 feet from the newer Well #5. Routine static water level reviews, and pumping levels show a maximum drawdown of twelve inches, and recover is instantaneous. CRRWC is focused in managing both the sources as it relates to production potential, usage of water diverted and understanding the percentage of unaccounted water.

The raw water supporting the CRRWC is part of the Deschutes Groundwater Mitigation Program, balancing new groundwater development while protecting scenic waterway flows. The U.S. Geological Services discovered that groundwater and surface water are hydraulically connected within the Deschutes Groundwater Study area. This connectivity stymies new groundwater permits without mitigation. The CRRWC, during the timeframe of this WMCP, will not be applying for new groundwater permits, or managing the existing permits with the best management practices.

1.8.0 Water Rights: OAR 690-086-0140 (5)

A tabular list of water rights held by the municipal water supplier that includes the following information.
(a) Application, permit, transfer, and certificate numbers (as applicable)
(b) Priority date(s)
(c) Source(s) of water
(d) Type(s) of beneficial uses specified in the right
(e) Maximum instantaneous and annual quantity of water allowed under each right
(f) Maximum instantaneous and annual quantity of water diverted under each right to date
(g) Average monthly and daily diversions under each right for the previous year, and if available for the previous five years
(h) Currently authorized date for completion of development under each right; and
(i) Identification of any stream flow-dependent species listed by a state or federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in a critical ground water area.

Table 1-3: CRRWC Water Permits, Certificates Inventory:

Table 1:3 Water Permits, Certificates Inventory													
									Actual Diversion				
Application No. (5)(a)	**Permit No. (5)(a)**	**Certificate No. (5)(a)**	**Priority Date (5)(b)**	**Transfer No.(5)(a)**	**Source (5)(c)**	**Use (5)(d)**	**Maximum Allowed Rate (cfs) (5)(e)**	**Allowed Rate under Development Limitations (cfs) (5)(e) [1]**	**Maximum Instantaneous Rate Diverted to Date (cfs) (5)(f)**	**Maximum Annual Quantity Diverted to Date (MG) (5)(f)**	**Average Monthly Diversion (MG) (5)(g)**	**Average Daily Diversion (Gallons) (5)(g)**	**Authorized Completion Date (5)(h)**
G-12579	G-18478	0	6/18/1991	T-13940	Well 4	QM	5.00	3.75	0.90	85.97	7.164	0.239	10/1/2028
G-12579	G-18478	0	6/18/1991	T-13940	Well 5	QM			1.39	106.59	8.883	0.296	10/1/2028
					Total		5.00	3.75	2.29	192.56	16.047	0.535	NA
T-13940 - Place of use approved - 9-15-2020													
1 -The use is limited to not more than 3.75 CFS, being 2.5 CFS from each well, or its equivalent in case of rotation, measured at each well. Development limitation maximum is 3.75 CFS.													
Average daily diversions derived from data collected for years 2019 through 2023													
CRRWC will submit a Permit Extension of Time to stay in compliance and retain compliance with the Permit G-18478													
Appendix C: Copies of permits, transfers and extensions													

Table 1-4: Water Production, Sales, Unaccounted:

Table 1-4: Water Production, Sales, Unaccounted										
PERMIT	**PRODUCTION YEARS**					**Total Diverted Water (MG)**	**Raw Water Pumped**	**Operations Usage**	**Ave. GPM**	**Ave. CFS**
	2023	**2022**	**2021**	**2020**	**2019**					
	Million Gallons (MG) [A]								**5-yr Average**	
G-18478	215.89	210.53	210.58	206.03	172.91	1015.94	1,015,940,000		386.58	0.86
	0.00	0.00	0.00	0.00	0.00	0.00	-		0.00	0.00
	0.00	0.00	0.00	0.00	0.00			**Annual Average**		
0	0.00	0.00	0.00	0.00	0.00					
0	0.00	0.00	0.00	0.00	0.00					
0	0.00	0.00	0.00	0.00	0.00					
0	0.00	0.00	0.00	0.00	0.00					
0	0.00	0.00	0.00	0.00	0.00	0.00	-		0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	-		0.00	0.00
Production	215.89	210.53	210.58	206.03	172.91	1015.94	1,015,940,000	203.188	386.58	0.861
Oper Usage	1.72	1.72	1.41	1.26	1.38	7.49	7,490,800	1.498	3.56	0.008
Monthly Average (MG)	17.99	17.54	17.55	17.17	14.41	**16.93**		**Operations [B]**		
	Annual Water Sales (MG)					**Total Water Sales (MG)**	**Total Water Pumped**	**Operations Usage**	**Accounted Water**	
2023	197,171,296					197.17	215.89	1.72	92.12%	
2022	205,622,032					205.62	210.53	1.72	98.49%	
2021	218,920,240					218.92	210.58	1.41	90.30%	
2020	214,938,304					214.94	206.03	1.26	90.40%	
2019	183,084,384					183.08	172.91	1.38	91.90%	

Table 1-4-1: Water Production, Sales Unaccounted Summary Averages								
2023-2019	**2023**	**2022**	**2021**	**2020**	**2019**	**Five Year Loss Ave ***	**Unaccounted**	**-7.96%**
Max MG	215.89	210.53	210.58	206.03	172.91	Notes:		
Max CFS	0.92	0.89	0.89	0.87	0.73	A - Figures taken from Water Use Report timeframe coinciding with WMCP		
(5e) Allowed [C]	5.00	5.00	5.00	5.00	5.00	B - Line flush, PSI - flow testing, general operations,		
Allowed DL [D]	3.75	3.75	3.75	3.75	3.75	C - figures calculated in CFS without development limitations		
(5f) Max Inst [C]	2.29	2.29	2.29	2.29	2.29	D - figures calculated in CFS with development limitations		
(5f) Max Ann [E]	215.89	210.53	210.58	206.03	172.91	E - figures calculated in MG		
(5g) Ave Mo. [E]	17.99	17.54	17.55	17.17	14.41	* - Water loss (7.4-8.0%) is more accurate, instrumentation was recalibrated		
(5g) Ave Daily [E]	0.600	0.585	0.585	0.572	0.480	* - 2021-2019 years was reconfigured better defining actual water loss		

1.7 Quantification of Present and Historical Use: OAR 690-086-0140 (4)

A quantification of the water delivered by the water supplier identifies current and available historic, average annual water use, peak seasonal use, and average and peak day use.

Table 1-5 outlines the quantification of water delivered both from an average monthly and annual quantity and the peak months for the past five-years. Highlighted are the months which the peak demand was created.

Table 1-5: CRRWC Water Usage

Table 1-5: CRRWC Water Usage								
	Total Gallons						**Gallons**	
Month	**2023**	**2022**	**2021**	**2020**	**2019**	**Mo. Averages**	**GPD**	**CFS**
January	9,440,144	6,168,512	6,085,408	6,638,128	6,170,864	6,900,611	222,600	0.34
February	8,075,200	7,050,512	6,754,160	6,105,008	5,678,512	6,732,678	217,183	0.34
March	6,643,616	6,736,128	6,000,736	6,665,568	6,467,216	6,502,653	209,763	0.32
April	7,228,480	9,335,872	12,701,584	11,745,888	7,856,464	9,773,658	315,279	0.49
May	14,446,768	14,882,672	20,007,680	18,412,240	18,028,080	17,155,488	553,403	0.86
June	26,280,464	19,407,136	36,309,392	26,953,136	26,499,200	27,089,866	873,867	1.35
July	35,208,656	33,506,592	**39,148,256**	36,348,592	31,864,896	35,215,398	1,135,981	1.76
August	**35,399,952**	**40,527,312**	37,592,016	**41,058,864**	**33,915,056**	37,698,640	1,216,085	**1.88**
September	28,730,464	31,946,432	26,882,576	29,421,952	24,103,296	28,216,944	910,224	1.41
October	12,189,632	20,365,968	13,261,360	17,841,488	9,876,832	14,707,056	474,421	0.73
November	7,277,872	8,369,984	6,703,200	7,283,360	6,486,032	7,224,090	233,035	0.36
December	6,250,048	7,324,912	7,473,872	6,464,080	6,137,936	6,730,170	217,102	0.34
Annual Averages - Million Gallons								
Annual Totals	197,171,296	205,622,032	218,920,240	214,938,304	183,084,384	16,995,604	566,520	0.88
Annual Daily Ave	540,195	563,348	599,781	587,263	501,601	558,438	558,438	0.86
Mo. Maximum	35,399,952	40,527,312	39,148,256	41,058,864	33,915,056	41,058,864	1,368,629	**2.12**
Peak Seasonal	August	July	July	July	August			
Peak Day Use	1,179,998	1,350,910	1,304,942	1,368,629	1,130,502	1,368,629		2.12
User Averages								
Population	4000	3950	3900	3850	3800			
Ave GPCD	135	143	**154**	153	132	143	154	
Peak GPCD	295	342	335	**355**	298	325	355	

1.8.1 Environmental Resource Issues of Concern OAR 690-086-0140 (5)(i)

Identification of any stream-flow dependent species listed by the State or Federal Agency as sensitive, threatened, or endangered that are present in their source(s). Any listing of the source as being water quality limited and the water quality parameters, any designation of the source as being in a critical ground water area.

The CRRWC obtains its water from two wells that can produce 1,900 GPM. These wells are considered deep basalt, and the bottom of the wells sit at a lower elevation than both the Deschutes and Crooked Rivers. See appendix B. The wells are located west of the center of the service area, with ≈ 1.1-1.3 miles of distance to the edges of each river. The ecoregion for CRRWC is a narrow band centrally located in the State of Oregon, labeled "East Cascades", and touches both northern and southern state borders.

Identification of any stream-flow species is found in Table 1-6, Environmental Concerns Endangered Species with the State and Federal listing and area designation. Deschutes Ground Water Study area surrounds the CRRWC as two major rivers (Deschutes and Crooked) flow on the western and eastern sides of the CRRWC boundaries merging approximately 16 miles north of the service area. A map of the Deschutes GW Study Area [1] depicts the influence of groundwater on both the Deschutes and Crooked Rivers, increasing the flows up to 150 CFS. See Appendix D. 1- https://apps.wrd.state.or.us/apps/gis/gis_map_library/

Table 1-6: Environmental Concerns, Endangered Species

Table 1-6: Environmental Concerns, Endangered Species					
Species	**Ecoregion**	**ODFW Listing**	**Federal Listing**	**Area Designation**	**ESA Critical Habitat**
Lower Deschutes River					
HUC 17070306					
Bull Trout	Deschutes	S	Threatened	SMU	No
Chinook Salmon - Fall	Deschutes	S	Threatened	ESU	Yes - 2021
Chinook Salmon - Spring	Deschutes	s	Threatened	ESU / SMU	Yes - 2021
Lamprey	Deschutes	S	Threatened	Range Wide	Yes - 2021
Pacific Lamprey	Deschutes	S		Range Wide	Yes - 2021
Steelhead Trout *	Deschutes	SC	Threatened	ESU / SMU	Yes - 2021
Oregon Senisitve Species List - 2021 -https://www.dfw.state.or.us/wildlife/diversity/species/docs/Sensitive_Species_List.pdf					
E - endangered, S - sensitive, SC -sensitive-critical, SMU - significant management unit, ESU - evolutionary significant unit, DPS - Distinct Population Segment					
* - Summer Steelhead,					

The CRRWC source of water is groundwater, which has no listed endangered species in the source. The source of water is found in the Upper Deschutes restricted area labeled as a

Deschutes Groundwater Study Area or mitigation program area. The quality limited parameters found in the 2022 Integrated Report is listed in appendix D. The parameters are associated with surface waters relating to lakes found throughout the area.

1.9 Water use characteristics: OAR 690-086-0140 (6)

A description of customers served including other water suppliers and the estimated numbers; general water uses characteristics of residences, commercial and industrial facilities, and any other uses; and a comparison of the quantities of water used in each sector with the quantities reported in the water supplier's previously submitted water management and conservation plan and progress reports.

The CRRWC serves an approximate population of 4,000 through 1,691 connections in a land area typically appointed for a small rural city. The majority of the area is zoned rural residential with a small eastern section zoned commercial. See maps in appendix B.

Commercial services normally associated with a water system service are convenience stores, hotels, restaurants, golf courses and other small businesses services substantiated by the needs of everyday living. The CCRWC also serves four recreational vehicle parks while a fifth park is being planned during the outline of this WMCP.

Neither commercial nor industrial services make up a large portion of the service connections as a total of 42 commercial, industrial accounts make up a small percentage of all service connections.

Table 1-7: Water Use Characteristics

Table 1-7: Water Use Characteristics			
Classification	Million Gallon Consumption		
	Ave. Annual Gallons		203,947,251
	Peak Monthly Gallons		41,058,864
	Gallons per Capita Daily -GPCD		154
	Peak - GPCD		355
	Gallons per day MG	**# Connections**	**% of total gallons**
Ave Gallons per Day	0.5584		
Peak Gallons per Day	1.3686		
Residential	0.503	1636	90
Commercial / Industrial	0.050	55	9
Operations [1]	0.006	NA	<1
1 - Operations review, upgrades reduces normal operationalwater usage to < 1 percent of total production			

The comparison of quantities of water between current and past conservation documents provides different data as it relates to total water consumed over various timeframes, average

daily demand, peak demand and GPCD. Table 1-8 shows GPCD based on total annual water usage, estimated populations for each year, and the GPCD. The GPCD has remained relatively the same while adding population.

Table 1-8: Gallons Per Capita Daily

Table 1-8 Gallons per Capita Daily

	2018	2017	2016	2015	2014
MG	197.28	175.56	194.76	173.41	185.25
Pop	3780	3732	3667	3571	3496
GPCD	143	129	146	133	145
	2023	**2022**	**2021**	**2020**	**2019**
MG	197.17	205.62	218.92	214.94	183.08
Pop	4000	3950	3900	3850	3800
GPCD	135	143	154	153	132

GPCD - is calculated using total gallons sold divided by an approximate population for the year

1.10 Interconnections with other systems: OAR 690-086-0140 (7)

Identification and description of interconnections with other municipal supply systems.

Currently, the CRRWC has no inter-ties with other water supply systems. The closest single community water systems will be the Terrebonne Domestic Water District to the south (4 miles) while all other directions are land locked by canyon terrain.

1.11 System Schematic: OAR 690-086-0140 (8)

A schematic of the system that shows the sources of water, storage facilities, treatment facilities, major transmission and distribution lines, pump stations, interconnections with other municipal supply systems, and the existing and planned future service area; and

CRRWC's water system schematic was derived from their water master plan completed in 2012 by WH Pacific Engineering and will be required to update in 2032. The multi-page appendix shows land use zones, distribution map that depicts service lines and reservoirs. Also shown are the well drill depths. See appendix B.

1.12 Quantification of System Leakage: OAR 690-086-0140 (9)

A quantification and description of system leakage that includes any available information regarding the locations of significant losses.

The CRRWC tracks water from two wells, reservoir meters recording the total gallons pumped throughout the calendar year. CRRWC also reads meters on a monthly basis, tracks operational usage of water due to line flushing and repairs on leaks.

CRRWC has had no significant large leaks throughout the system during the past ten years, but major upgrades to water production, reservoirs and distribution system were performed in 2017 -2019. Significant water was provided during the construction phase of the system upgrades. The CRRWS has performed an annual water audit by reading and comparing meter totals. Since 2018 new meters will indicate above average usage, recording the time of excess usage to the time the excess flows are corrected.

CRRWC, through normal operations of line flushing, fire hydrant testing and small leak repair, estimates an approximate 1.5 MG of water are accounted for annually.

Tracking water will be the first line of defense to initiate or continue leak detection if unaccounted for increases above ten percent. CRRWC reviews data monthly to mitigate any occurrences, i.e., leaks.

Referencing table 1-4 on page 9, supplies information about non-revenue, water loss percentages for each year 2019 through 2023.

SECTION TWO
WATER CONSERVATION ELEMENT

Water conservation activities contribute an important facet towards the sustainability of water for the future. Not all conservation efforts are going to be effective. It is those that have been implemented, prove, effective will be continued as benchmarks for CRRWC.

CRRWC, having 8.0 percent un-accounted water has diligently increased its review on water consumption and production from a managerial perspective. CRRWC will emphasize various water conservation efforts which will include water system audits, leak detection, public education, providing an assortment of water saving devices for older fixture replacement.

2.1 Progress Report: OAR 690-086-0150 (1)

A progress report on the conservation measures scheduled for implementation in a water management and conservation plan previously approved by the Department, if any.

This water management conservation plan for CRRWC is a follow up document sent to OWRD in 2014. It is the intent of both the Board and staff to continue to enhance the ideals of conservation through system operational reviews, customer knowledge, and implementation of conservation measures. The conservation measures from the 2007 WMCP were fully implemented except for routine calibration of the production meter, which was upgraded in 2020. Water rates are adjusted, when necessary, but reviewed annually. This water management conservation plan and the data discovered during the five-year timeline proves CRRWC efforts made are substantiated with a less than ten percent unaccounted for water.

2.2 Water Use Measurements and Reporting: OAR 690-086-0150 (2)

A description of the water supplier's water uses measurement and reporting program and a statement that the program complies with the measurement standards in OAR Chapter 690, Division 85, that a time extension or waiver has been granted, or that the standards are not applicable.

The measurement and reporting information found in this document is taken from the annual production report compiled by the management staff at CRRWC. Flow meters are placed at wells, the outlet on the reservoirs, and service connections on all customers, which is in compliance with OAR Chapter 690-085

Extensions of time for permit G-12579 have been given to CRRWC for the authorized completion date of 10-01-2028, which this five-year timeline through 2045 concludes that 0.85 CFS has been necessary to meet current demands and 2.29 CFS will be required for the future.

2.3 Measurement Already Implemented: OAR 690-086-0150 (3)

A description of other conservation measures, if any, currently implemented by the water supplier, including any measures required under water supply contracts.

The CRRWC has two primary approaches to conservation measures, a) management review of annual and monthly figures and b) and a series of conservation tips found on the website. The CRRWC does not supply water under contract to any entity. Water is only supplied to the community through distribution and to fill water trucks primarily for support of construction projects.

2.4 Annual Water Audit: OAR 690-086-0150 (4)

A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers.

2.5 Unmetered / Unauthorized Usage (4) (a)

An annual Water Audit that includes a systematic and documented methodology for estimating any un-metered authorized and unauthorized uses, and an analysis of the water supplier's own water use to identify alternatives to increase efficiency.

CRRWC reviews water production and consumption figures to compare and define total actual losses, with this single step being the primary effort in an annual water audit.

System-wide, the system is inspected through routine travels by the water department's crew looking for leaks, illegal connections, misuse of fire hydrants or vandalism. These efforts lead to understanding the real water losses. See Table 2-1: Water Loss Control Activity Matrix page 22

2.6 Full Metering of System: OAR 690-086-0150 (4) (b)

If the system is not fully metered, a program to install meters on all un-metered water service connections. The program shall start immediately after the plan is approved and shall identify the number of meters to be installed each year with full metering completed within five years of approval of the water management and conservation plan.

The CRRWC is a fully metered water system which includes meters on both the raw water sources (wells), reservoir and consumer connections. Currently, the water system is considered fully metered. Production meters are read daily, and consumers' meters read monthly.

2.7 Meter Testing and Maintenance: OAR 690-086-0150 (4) (c)

A meter testing and maintenance program.

CRRWC has not created a scheduled meter testing program, except for the source meters (2016 installation) on the production side, which solely looks at electrical impulses. The design of the system does not allow a production meter to be isolated for testing. Primary effort in managing source meters accuracy is through tracking of pumping totals on a monthly and annual basis.

Figures are compared to past records (same timeline) for fluctuations or discrepancies in readings.

The CRRWC has replaced water service meters in 2021. Replacing the battery every ten years is the single recommended maintenance step for meter services. The CRRWC will continue to track billing records for discrepancies and will implement a test, repair, or replace meters when an irregularity is found.

2.8 Rate Structure: OAR 690-086-0150 (4) (d)

A rate structure under which customers' bills are based, at least in part, on the quantity of water metered at the service connections.

CRRWC has in place a consumption rate structure for water usage, which was implemented in 2021. Water rates and authorized charges are set by the resolution of the Board and reviewed annually.

MONTHLY SERVICE CHARGE:

5/8” or 3/4" Connections	$42.16
1.0 inch	$63.24
1.5 inch	$105.40
2.0 inch	$168.63

Zero allowance of water is offered in the monthly service charge, with an additional commodity charge of $1.51 per 100 cubic feet (748 gallons).
Appendix E

2.9 Leak Detection Program: OAR 690-086-0150 (4) (e)

If the annual water audit indicates that system leakage exceeds 10 percent.

2.9.1 Factors of Loss and Remedies OAR 690-086-0150 (4) (e) (A)

Within two years or approval of the water management conservation plan, the water supplier shall provide a description and analysis identifying potential factors for the loss and selected action for remedy.

CRRWC currently has a five-year annual average unaccounted-for water at approximately 8.0 percent. The primary potential factor for water loss would be leaking pipes. The field crews will better track and estimate the gallons lost when repairing a water line. Total gallons will be calculated using a two-year timeline reference as operational water. If the unaccounted-for water is proven to increase above the ten percent threshold, the area where leaks were repaired will be the central section to begin a formal leak detection program.

The following areas of concern have been addressed:

- Meter Accuracy – service meters were replaced in 2019-2021
- Created customer portal to alert customers of above average usage.

- Software update – to be implemented in 2025-2026
- Promotion of water conservation measures through the website

2.9.2 Systematic Leak Evaluation OAR 690-086-0150 (4) (e) (B)

If actions identified under subsection (A) do not result in the reduction of water losses to 10 percent or less, within five years or approval of the water management conservation plan, the water supplier shall, **(i)** develop and implement a regularly scheduled and systematic program to detect repair leaks in the transmission and distribution system using methods and technology appropriate to the size and capability of the municipal water supplier or a line replacement program detailing the size and length of pipe to be replaced each year; or **(ii) –** develop and implement a water loss control program consistent with American Water Works Association standards.

CRRWC has consistently looked at methods to sustain or improve on lowering water loss. Over the past ten years, efforts toward better management of the resources have proven successful with an 8.0 percent unaccounted-for water loss. The CRRWC is not required to develop or implement a systematic program for leak detection. The water loss control program matrix on page 21 shows the highlighted cells that CRRWC has and will continue to put efforts towards reducing unaccounted for water.

2.10 Public Education Program: OAR 690-086-0150 (4) (f)

A public education program to encourage efficient water use and the use of low water use landscaping that includes regular communication of the supplier's water conservation activities and schedule to customers.

Currently, the CRRWC supplies information on drinking water solely from the company's website. Topics relating to water: water quality, consumer confidence reports, and general information from links to other water organizations.

CRRWC will continue the efforts of water conservation by supplying more information to the consumers through displaying brochures (flyers) in areas throughout the community encouraging the use of water saving devices and gardening techniques.

General information from water conservation bulletins provided in the links below will be placed on the company's website.

www.oregon.gov/owrd/WRDPublications1/Saving_Water_Municipal_Systems.pdf
www.oregon.gov/owrd/WRDPublications1/Saving_Water_Inside.pdf
www.oregon.gov/owrd/WRDPublications1/Saving_Water_Outside.pdf
www.americanwater.com/49ways.htm
www.wateruseitwisely.com
www.awwa.org/waterwiser.com

2.11 Expansion / Diversion: OAR 690-086-0150 (5)

If the municipal water supplier serves a population greater than 1,000 and proposes to expand or initiate diversion of water under an extended permit for which resource issues have been identified under OAR 690-086-0140(5)(i), or if the municipal water supplier serves a population greater than 7,500,a description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following measures, or documentation showing that implementation of the measures is neither feasible nor appropriate for ensuring the efficient use of water and the prevention of waste.

Currently CRRWC serves ≈ 4,000 people but does not propose to expand or start diversion of water under an extended permit for the primary reason; a) CRRWC water supplies are speculated to be adequate utilizing the existing permit, b) CRRWC does not serve a population greater than 7,500, c) CRRWC is using groundwater from an area considered a "groundwater mitigation" region labeled Upper Deschutes Basin. The CRRWC meets criteria established by rule as it relates to conservation yet is not required to implement the following benchmarks. The CRRWC will establish additional efforts as an ambassador in the area to promote conservation over the next five years.

2.12 Technical and Financial Assistance: OAR 690-086-0150 (5)(a)

Technical and financial assistance programs commensurate the size of the municipal water supplier to encourage and aid residential, commercial, and industrial customers in implementation of conservation measures.

CRRWC currently does not supply technical or financial aid in developing water conservation ideas, such as rebates for water efficient fixtures, water audits for households, and public information. As told in sub-section 2.9.1, CRRWC will consider more methods to share information with its consumers. The CRRWC management deems a conversation with the commercial customers feasible through outreach and establishing periodic meetings regarding:

- Conservation ideas at their facilities.
- Water saving equipment for commercial entities.
- Ground maintenance and drought tolerant plants recommended for open spaces.
- Look at water schedules for efficiency

Conversations with commercial entities are currently considered the best approach as there is no outlay for funds, yet a message on the idea of reducing water usage is the most practical.

2.13 Retrofitting/Replacement: OAR 690-086-0150 (5)(b)

Supplier financed retrofitting or replacement of existing inefficient water using fixtures, including distribution of residential conservation kits and rebates for customer investments in water conservation.

Retrofitting is the adaptation or replacing of an older water fixture with one that is more water efficient and ultimately offers considerable water saving potential in the home and business.

The CRRWC will initially make available a small amount of faucet aerators (25) and low flow shower heads(25) (efficient fixtures) to its citizens as customers pay their bills at the Company's office. The CRRWC consider rain gauges, but nixed the idea due to lack of rainfall.

2.14 Rate Structures: OAR 690-086-0150 (5)(c)

Adoption of rate structures, billing schedules, and other associated programs that support and encourage water conservation.

In subsection 2.8, it explains the rate structure in effect in January 2021. This structure is aligned to better support water conservation. Currently the rate structure is a base with zero allowance of water for the monthly service and water being charged per 100 cubic feet at $1.51 per.

2.15 Recycle / Reuse: OAR 690-086-0150 (5)(d)

Water reuse, recycling, and non-potable water opportunities; and

For the CRRWC water reuse, recycling and non-potable water usage is not applicable for wastewater, there is no sanitary sewer system service in the area. Modification of a standard septic system for gray water, though feasible, is not likely to be on a large scale. Only from an individual's basis can collecting rainwater for agricultural use provide some reduction in garden use water.

2.16 Other Conservation Measures: OAR 690-086-0150 (5)(e)

Any other conservation measures identified by the water supplier that would improve water use efficiency.

The CRRWC has two primary approaches to conservation measures, a) management review of annual and monthly figures and b) and a series of conservation tips found on the website. The CRRWC does not supply water under contract to any entity. Water is only supplied to the community through distribution and to fill water trucks primarily for support of construction projects.

CRRWC has not found any other conservation measures that would improve water use efficiency. CRRWC does not have to supply additional measures as it does not propose to expand or initiate diversion of water under an extended permit.

The efforts and benchmarks completed over the next five years will be as follows:

- Track water use characteristics (gallons per capita daily) for significant increases as billing is completed monthly.

- Public information (education) highlighted, continue using the CRRWC's website.
- Commercial entity discussions regarding water reduction.
- Meter Accuracy – service meters were replaced in 2019-2021.
- Software update – to be implemented in 2025-2026.

In the table on the following page, are activities coordinated with the above bulleted items based on a timeline from a short-term though long-term approach in conservation. Actions taken by the CRRWC are highlighted with footnotes explaining the step taken towards completion.

2.17 Benchmark Summary:

Crooked River Ranch Water Company efforts towards conservation:

- Management review of annual and monthly figures.
- Provide conservation tips found on the website.
- Water audit with monthly comparison between production and consumption figures.
- Meter accuracy comparison with past consumption figures.
    - Ten percent overage, staff will reach out to customers.
- Begin routine leak detection when unaccounted for exceeds ten percent.
    - Multiple repairs in a specific area will trigger leak detection.
- Continue to enhance public education through the CRRWC website.
    - Placing water information flyers throughout the community.
- Technical assistance with commercial entities regarding water saving equipment.
- Provide water saving devices (aerators, low-flow showerheads).
- Maintain a rate structure that encourages water conservation.

Cells highlighted in the Matrix table will be a guide for continuing both short- and long-term activities over the next ten-year cycle of water management and conservation.

Table 2-1: Water Loss Control Activity Matrix

Table 2-1: Water Loss Control Activity Matrix					
Water Audit		Apparent Loss Control		Real Loss Control	
Time	Activity	Time	Activity	Time	Activity
Highlighted Task will be implemented over five-years					
S		**S**	Distribution of brochures on water saving tips	**S, L**	Display worn out water system components
	Top Down	**S**	Verify production meters for accuracy	**S**	Review past records[1,2]
					Target Range < 15%
					Target Range < = 10%
M	Bottom Up	**S**	Flow chart customer billing	**S**	Customer Policy Leaks [3]
Some tasks are required if water system exceeds 15 percent water loss					
Ongoing		**PRIORITY**	Technical Assistance [4]		
		S, L	Water Rate Study		
		S	Meter Testing NEW 2021	**S**	Leak Detection [5]
			Larger Meters		Initial Leak Detection
			Sample Residential Meters		Ongoing Leak Detection
		S	Audit Billing	**S**	PSI Review - Excess
		M	Install Upgrade Production Meters - 2016	**S**	District Meter Area [6]
		M	Policy for Unauthorized Use	**M**	Create annual leak detection program
		M	Auto Meter Read Program Investigation	**M**	Leak Noise Detectors
		L	Install AMR/AMI System	**L**	Maintenance Information System
		L	New Billing System	**L**	Section Distribution System [7]
		L	Large Customer Meter Replacement - 2019	**L**	CIP for infrastructure [8]
		L	Line Pressure Testing	**L**	Line Replacement Program
S - short-term, M - medium-term, L - long-term					
1 - Maintenance records on line repairs, set target range compatible with existing, future resources					
2 - Volumes of leaks documented					
3 - Review billing software, policies for customer leaks, incentives to use less water					
4 - Water efficient fixtures, large water user audits, rebates for water efficient appliances,					
5 - Leak detection and hydrant repair, testing performed the past few years, contracted					
6 - Isolate area for one hour leak analysis					
7 - Develop District Management Areas - if feasible					
8 - Capital Improvement Plan for short term small projects -funded by rates					

SECTION THREE
WATER CURTAILMENT ELEMENTS

Water curtailment is designed to minimize the impacts of a short-term emergency water shortage by reducing the demand and possibly looking for an alternative water supply. Generally, conservation measures and a secondary supply, or a combination of the two are the most important tools water suppliers can use to at once to reduce the shock on the primary source. Curtailment plans usually develop through voluntary and mandatory restrictions of usage, depending upon the severity of the shortage.

3.1 Assessing Water Supply: OAR 690-86-0160 (1)

A description of the type, frequency, and magnitude of supply deficiencies within the past 10 years and current capacity limitation. The description shall include an assessment of the ability of the water supplier to maintain delivery during long-term drought or other source shortages caused by a natural disaster, source contamination, legal restrictions on water use, or other circumstances.

The CRRWC is poised to supply water over the long-term as the single shortcoming of the water system was storage which increased seven-fold in 2016. Relating to supply deficiencies, the two wells can produce ≈2,000 GPM, but do not operate 1,440 minutes per day. Alternating between the two wells, the average run time for each well is ≈ 5.0 – 7.0 hours, average versus maximum demand. With good production and storage, the system can deliver water within the parameters of the permit under most circumstances. With 3.75 CFS allowable water and routine usage at 2.29 CFS, the CRRWC is in a fortunate position as it relates to permitted water. Since CRRWC uses deep basalt aquifers to obtain its water, long-term droughts do not impact groundwater in the same as surface water sources.
During a drought declaration by the Governor, CRRWC notifies its customers of the impending conditions and asked its constituents for voluntary reduction in water usage. If water consumption equals 80-85 percent of production, then the water system will move towards a higher level (mandatory) water reduction.

3.2 Stages of Alerts: OAR 690-86-0160 (2)

A list of three or more stages of alert for potential shortage or water service difficulties. The stages shall range from a potential or mild alert, increasing through a serious situation to a critical emergency.

CRRWC has adopted a five-level approach for curtailment of water use, with the primary goal of keeping adequate supplies to meet essential uses such as drinking, cooking, sanitation, and fire flow. A secondary goal is to support normal flows for all customers 24 hours per day, during all conditions.

The five levels of alert will be named as mild, moderate, serious, critical and emergency. Events causing this plan to be activated would include, but are not limited to the following:

- Mechanical or electrical malfunctions of pumping equipment
- Interruption of the local power company supply for a duration of time (2 days) unless emergency back-up power restores water production
- Abnormal weather conditions, extreme heat weather, consumption of more water, or a decline is production capabilities for the WTP.
- Declaration of a drought for their area by the Governor by Oregon Revised Statute 536.720
- Natural disasters that damage critical infrastructure preventing the water system to work under normal conditions
- A deliberate act of contamination of water at various points in the water system

3.3 Alert Triggers: OAR 690-86-0160 (3)

A description of pre-determined levels of severity of shortage or water service difficulties that will trigger the curtailment actions under each stage of alert to provide the greatest assurance of maintaining potable supplies for human consumption; and

With an ability to quickly know production capabilities, (or lack of) CRRWC approaches water curtailment primarily from the production perspective, as this method can swiftly discern limitations in supply. The approach is multi-facet:

- Production cannot sustain against consumption
    - Usage or water loss is considered – investigated
- Storage levels diminishing more rapidly
    - Customer usage increases, or major leak is detected

Table 3-1, next page details those triggers that put in motion the curtailment actions under each stage of alert.

Table 3-1: Levels of Alert Triggers

Table 3-1: Levels of Alert Triggers
Mild Alert Level
♦ Water usage reaches 80% of capacity (water production) for three consecutive days
♦ Construction projects that impede full capacity flow of system for more than 3 days
♦ A production shut down or any action that may reduce flow capacity below 80%
♦ Aquifer drawdown shows a slower recovery than normal
Moderate Alert Level
♦ Water use reaches 85% of capacity (water production) for three consecutive days
♦ Pumping capacity is reduced to 80% of normal production
♦ Normal flow in the water system is reduced to 80% of full flow
♦ Primary supply well capacity is reduced to less than 75% capacity
Serious Alert Level
♦ Water use reaches 90% of capacity (water production) for three consecutive days
♦ Pumping capacity is reduced to 70% of normal production
♦ Normal flow in the water system is reduced to 70% of full flow
♦ The area is declared a severe drought by the Governor
Critical Alert Level
♦ Water use reaches 90% of capacity (water production) for five consecutive days
♦ Pumping capacity is reduced to 60% of normal production
♦ Normal flow is reduced to 50% in water system
♦ A natural disaster that incapacitates the water system, or contaminates the water source
♦ Intentional act causing long-term disabling of the water system or sustained deficit of water
Emergency Alert Level
♦ Water usage and production ability are similar or inverted
♦ A natural disaster that incapacitates the water system, or contaminates the water source

3.4 Curtailment Actions: OAR 690-86-0160 (4)

A list of specific standby water uses curtailment actions for each stage of alert ranging from notice to the public of a potential alert, increasing through limiting nonessential water use, to rationing and/or loss of service at the critical alert stage.

Coordinated efforts to implement any curtailment or restrictions in water usage will be carried out by the CRRWC Manager with assistance from the Board.

Table 3-2: Curtailment Actions

Table 3-2: Curtailment Actions
Low Level Action (1)
The General Manager, following the procedures proven in the CRRWC policies, will issue a general request for a voluntary reduction in water use by all water users. The request is made at a time when there is a strong sign that the CRRWC's water supply or production capabilities will be reduced below the capacity or maximum flow is reduced so not to supply adequate service to all water customers.
The request will include a summary of the current water situation, the reason for the requested reduction, and a warning that mandatory cutbacks will be necessary if the voluntary measures do not sufficiently reduce water usage by 5-10 percent. The time for the voluntary reduction will be set up, showing the date and time the reduction will be concluded.
Mild Level Action (2)
A second step would be to implement mandatory reduction in water use by all consumers. This step will ensure normal capacity flows during reduced production or delivery schedules and eliminate peak demands that may create other concerns for the water system. This step is the next natural level of curtailment moving towards a moderate level of action.
The goal of this step is to support 95% flow rates using a 10% reduction.
Moderate Level Action (3)
CRRWC will put in place the following:
♦ No flushing of system lines unless essential for water quality improvement.
♦ Implement schedules for irrigation of lawns and landscape.
♦ Commercial use to be reduced by 10% and residential use by 20%.
♦ Washing of vehicles will be prohibited.
♦ Bulk water sales/usage will be stopped until further notice
The goal is to support 85% flow rates using a 20% overall reduction in usage.
Critical Level Action (4)
CRRWC will put in place the following:
♦ Possibly establish a "drought" rate surcharge.
♦ All outdoor use of water is prohibited.
♦ All customers will be set at a daily allotment in number of gallons per day.
♦ Water service will be disconnected if allotment if disregarded.
♦ Commercial users will be reduced to 70% of the previous year's allotment.
The goal is to support a 75% flow rate using a 30% overall reduction in usage.
Emergency Level Action (5)
It is not "if" an emergency is going to occur, but when an emergency will take place. There are several circumstances that can result in an emergency response condition, all resulting in the water system being incapable of supplying water to the consumers.
♦ Distribution points are set up to provide a minimum of 70 gallons per day person per day

Each step will be carried out according to the company's policy, using various methods of communication. See curtailment actions in table 3-2.

Table 3-3: Action Levels of Curtailment

Table 3-3: Action Levels of Curtailment:			
Water Curtailment and Reduction Goals			
Shortage Condition	Level	Reduction Usage Goal	Type of Rationing
5%	1	10%	Voluntary
10%	2	10%	Mandatory
15%	3	20%	Mandatory
25%	4	30%	Mandatory
Water System Failure	5	75 - 85%	Mandatory

SECTION FOUR

WATER SUPPLY ELEMENT

Municipal Water Supply Element 690-086-0170 the water supply element shall include at least the following:

4.1 Delineation - Current and Future service areas: OAR 690-086-0170 (1)

A delineation of the current and future service areas consistent with state land use law that includes available data on population projections and anticipated development consistent with relevant acknowledged comprehensive land use plans and urban service agreements or other relevant growth projections.

The current area of service for the CRRWC has been confirmed under the Jefferson County's Comprehensive Land Use Plan. The Portland State University-Population Research Center (PSU-PRC), Coordinated Population Forecast shows projections for Jefferson County, its UGBs and areas outside the UGBs.

The 2024 statistics forecast by PSU-PRC found the county's annual average growth rate (AAGR) through 2050 would be 0.7 percent over the twenty-plus-year period. For the CRRWC, considered by Jefferson County's forecast for outside the UGB, the annual average growth rate is 0.1 percent through 2050 [1]

The CRRWC is not expected to reach saturation development through the timeline of the WMCP. Buildable lots equate to 2,060, which creates an additional 369 service connections or 18-20 percent increase. The area served by CRRWC has seen an increase in activity for housing starts with ≈ 55 new homes in the past five-year period, and since 2018, CRRWC has averaged thirteen (13) new connections annually.

Relevant to the consumption of total water users, the maximum speculated population could be 5,000 persons per Water Master Plan. With the current water service of 4,000 people, it is unlikely an additional 1,000 people will be added to the water system over the next 20 years.

1- https://docs.google.com/spreadsheets/d/1bSikR44_Bnx4EtzAtFvviVNDsb8LT2jbiKb3IKBgwn4/edit?gid=1213866013#gid=1213866013

Table 4-1: Population Forecast

Table 4-1: Population Forecast						
YEAR	**2024**	**2030**	**2035**	**2040**	**2045**	**2050**
Jefferson County [1]	25,589	26,481	27,377	28,338	29,432	30,636
Population + -	892	896	961	1094	1204	Average [3]
% change *	3.49%	3.38%	3.51%	3.86%	0.00%	0.7%
Outside UGB [1]	13,203	13,163	13,141	13,207	13,412	13,648
Population + -	-40	-22	66	205	236	Average [3]
% change	-0.1%	0.0%	0.1%	0.3%	0.3%	0.03%
Population						
Crooked River [2]	4,000	4,032	4,052	4,073	4,093	4,114
	32	20	20	20	21	Average [3]
	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%
Notes:						
1 - figures forecasted by Portland State University - Population Research Center.						
2 - Figure 2024 provided by CRRWC						
3 - Average percentage is factored to a single year,						

4.2 Permit Usage Schedule: OAR 690-086-0170 (2)

An estimated schedule that identifies when the water supplier expects to fully exercise each of the water rights and water use permits currently held by the supplier.

It is difficult to predict the population forecast due to various factors that may distort the final outcomes. Using data compiled by PSU-PRC prediction for population estimates were factored to year 2050, based on annual growth of one percent annually, which will be applied for future predictions.

The second figure implemented in the forecast equation will be the peak demand of 355 GPCD that is taken from the user averages in Table 1-5 calculated as peak demand over the five-years, occurring in August of 2020. Peak demand was determined to be 2.4 times the average monthly demand.

Current Permit Usage is shown in Table 4-2 indicates that the two production wells over a five-year timeline have had a maximum instantaneous production at 61 percent of the allowed rate under development limitations.

Table 4-2: Current Permit Usage

Table 4-2: Current Permit Usage							
Permit No. (5)(a)	**Certificate No. (5)(a)**	**Priority Date (5)(b)**	**Source (5)(c)**	**Maximum Allowed Rate (cfs) (5)(e)**	**Allowed Rate under Development Limitations (cfs) (5)(e)**	**Maximum Instantaneous Rate Diverted to Date (cfs) (5)(f)**	**% total Allowance**
G-18478	0	6/18/1991	Well 4	5.00	3.7500	0.8980	23.9%
G-18478	0	6/18/1991	Well 5			1.3874	37.0%
Totals				5.00	3.7500	**2.29**	60.9%
Shaded cells are indicating development limitations associated with permit, certificate							
Total allowable water under permit G-18478 is 5.0 CFS.							

In preparing a schedule that proves to fully exercise CRRWC single water right at 3.75 CFS with development limitations, the CRRWC is compelled to apply usage by forecasting and justifying the need for more water, if proven necessary.

Using the calculations provided by the water system from the data covering January 2019 through December 2023, water demand estimates are based on population forecasts and gallons per capita per day, peak demand. To fully exercise the single permit, under development limitations, using 0.1 percent growth and GPCD, Permit G-18478 at 3.75 CFS would only be fully exercised beyond the year 2150, if all added water were presumed applied. This does not consider the added available water beyond the developmental limitation. It is undeterminable when CRRWC expects to fully exercise Permit G-18478.

4.3 Demand Forecast: OAR 690-086-0170 (3)

Based on the information provided in section (1) of this rule, an estimate of the water supplier's water demand projections for 10 and 20 years, and at the option of the municipal water supplier, longer periods.

The forecasted rate at which CRRWC will grow is founded on how the various classifications of users expand following the current alignment with the land comprehensive use plan. Historically with most rural communities, the residential services account for approximately 90 percent of the total water served. Total water needed in the future:

- Population Forecast – (2045) 4,093-4,114
- Peak Demand – gallons per capita daily 355
- Total gallons per day - 1.46 MG
- Total CFS - 2.26

Table 4-3: Water Demand Projections

Table 4-3: Water Demand Projections						
Crooked River	Projected Year					
	2024	2025	2030	2035	2040	2045
Populations	4,000	4,032	4,052	4,073	4,093	4,114
Ave GPCD	**154**		Peak GPCD	**355**		
Million Gallons per Month						
Ave. Month Demand	16,995,604	18,602,971	18,696,172	18,789,840	18,883,977	18,978,586
CFS	0.88	0.96	0.96	0.97	**0.97**	**0.98**
Max Month Peak Demand	41,058,864	43,001,025	43,216,461	43,432,976	43,650,575	43,869,265
CFS	2.12	2.22	2.23	2.24	**2.25**	**2.26**

4.4 Comparison - Future Needs and Sources: OAR 690-086-0170 (4)

A comparison of the projected water needs and the sources of water currently available to the municipal water supplier and to any other suppliers to be served considering the reliability of existing sources.

The projected water requirements for CRRWC will be 2.26 CFS (1,014 GPM) which is ≈ 50 percent of the two well capacities. Data from subsections 1.6 and tables 1-4 and 1-5 stipulates key factors proving the reliability of the water source. Alternative water sources for CRRWC is seemingly improbable due to the geography of the area, approximate location and availability of alternative sources.

Through the year 2045, consistent with the figures discovered throughout this WMCP, the CRRWC will require ≈ 60 percent of the existing water rights or 2.26 CFS from the 3.75 CFS. This figure could change if the criteria exercised in this WMCP changes, i.e., land use zoning from SFR to multi-family dwellings, or other changes to the demographics.

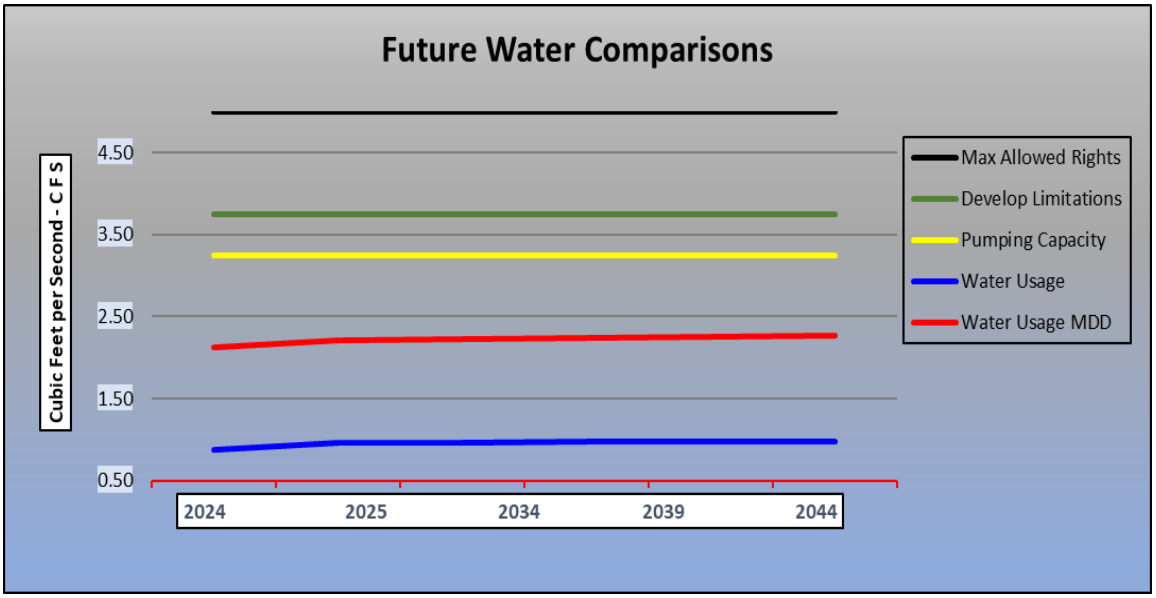
Comparison of both average and peak demands currently and during the projected 20-years indicate a remaining balance of permitted water at 40 percent.

Table 4-4: Applied Permit Forecasts

Table 4-4: Applied Permit Forecasts										
Permit	**Certificate**	**Allowed Rate Development Limitations CFS**	**Daily Usage CFS [1]**	**Peak Daily Usage CFS [1]**	**2024**	**2030**	**2035**	**2040**	**2045**	**Total % each permits**
Population					4,000	4,032	4,052	4,073	4,093	
GPCD Peak Demand					**355**					
Projected Water Usage (CFS)*					2.20	2.22	2.23	2.24	2.26	
G-18478	0	3.75	0.83	2.12	2.20	2.22	2.23	2.24	2.26	
Totals		**3.75**	**0.83**	**2.12**	**2.20**	**2.22**	**2.23**	**2.24**	**2.26**	**0.60**
Grey shaded cells are indicating development limitations as noted under "Allowed Rate"										
1 - Ave and peak daily usage taken from figures used in this WMCP, using gallons per capita daily (GPCD), coverted to CFS										
* - Total CFS is determined by peak demand GPCD, projected using anticipated populations for the timeline of this WMCP										

Chart 4-1, provides the visual comparison of the projected required water for CRRWC which is 2.26 CFS, (1,014 GPM) based on peak demand for the year 2045. CRRWC's projected use compared to 3.75 CFS from the available sources of water, and their reliability are deemed adequate. The chart indicates the relationship between permitted water, water with development limitations, the operational pumping capacity as well as average and peak demands.

Chart 4-1: Future Water Requirements:



4.5 Expansion - Initial Diversions: OAR 690-086-0170 (5)(a)

If any expansion or initial diversion of water allocated under existing permits is necessary to meet the need shown in section (3) of this rule, an analysis of alternative sources of water that considers availability, reliability, feasibility, and likely environmental impacts. The analysis shall consider the extent to which the projected water needs can be satisfied through: (a) implementation of conservation measures identified under OAR 690-086-0150. counted

Expansion or initial diversion of water under Permit G-18478 will not be required to meet the 2.26 CFS (1,014 GPM) out of the 3.75 CFS (1,683 GPM). The CRRWC anticipates a 60 percent usage rate from Permit G-18478, knowing there is an additional 1.25 CFS (561 GPM) available under the green light water process.

It is the goal of the CRRWC to pump less water from the source and keep lower consumptions of water through conservation methods prior to applying for more water rights. Given the total amount of water rights, the CRRWC currently, is looking to expand or start the diversion of additional water. The CRRWC will consider future monitoring of all production water, static water levels at the wells and delivery methods to stay in compliance with current water permit requirements.

4.6 Interconnections: OAR 690-086-0170 (5) (b)

Interconnection with other municipal supply systems and cooperative regional water management; and

The CRRWC has no emergency inter-ties with any other entity as the distance to create an inter-tie is not possible. The CRRWC is open to discussing the topic of regional water management for the benefit of all who choose to take part. Participation will be contingent on the time and resources needed to aid in a cooperative regional water management group.

4.7 Cost Saving Measures: OAR 690-086-0170 (5) (c)

Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.

At this time, CRRWC has not developed any other conservation measures that will affect the cost of supplying water. The primary focus in conservation efforts is to reduce the demand on their existing supplies thus retaining current water sources, maintaining less than ten (10) percent unaccounted-for water. Information on xero-scape landscaping with be added to CRRWC's website as another means to reduce per capita water usage.

4.8 Quantification of Maximum Rate: OAR 690-086-0170 (6)

If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, a quantification of the maximum rate and monthly volume of water to be diverted under each of the permits.

Expansion or initial diversion of water allocated under existing permit is not necessary for existing or future needs. Table 4-5 below shows usage rates as they relate to the permit.

Table 4-5 shows the development limitations at 3.75 CFS and with current average daily usage (0.88 CFS) and peak demand (2.26 CFS). The CRRWC will continue to put forth an effort to manage the water usage in a responsible manner. The figures prove production, usage and unaccounted for water are a work in progress. Enhanced routine methods will be implemented for two purposes, a) to reduce the overall percentage of unaccounted-for water, b) to recognize areas of apparent losses. The two methods will more accurately define the balance of water during the update of this WMCP. According to this document, CRRWC does not intend to expand the diversion of its groundwater to meet the 20-year demand projections.

Table 4-5 Permit Usage Rates

Table 4-5: Permit Usage Rates

Permit #	Maximum Allowed Rate (cfs) [1]	Maximum Rate Allowed (CFS) [2]	Maximum Rate Allowed (GPM)	Monthly Maximum Quantity Allowed (MG)
G-18478	5.00	3.75	1683	72.71
Total	5.00	3.75	1683	72.71

1- No development limitations, 2- With development limitations,

4.9 Mitigation Actions: OAR 690-086-0170 (7)

For any expansion or initial diversion of water under existing permits, a description of mitigation actions the water supplier is taking to comply with legal requirements including but not limited to the Endangered Species Act, Clean Water Act, Safe Drinking Water Act; and

CRRWC will not be expanding or begin initial diversion under their existing permits as stated previously in this WMCP. CRRWC has followed both Federal and State rules under the Safe Drinking Water Act. Rules are in place and followed as it relates stream flow management and minimum fish persistence target flows. The wells are in an area that is not considered a “critical groundwater” area, nor does CRRWC’s production water impact stream flows. Regarding the Clean Water Act, actions are not required by CRRWC for the discharge of wastewater effluent as the service area does not have a sanitary sewer collection system. CRRWC is not required to follow the rules implemented by the State of Oregon Department of Environmental Quality (DEQ).

4.10 Acquisition of New Water Rights OAR 690—086-0170(8)

If acquisition of new water rights will be necessary within the next 20-years to meet the needs shown in (3), an analysis of alternative sources of the additional water that considers availability, feasibility, and likely environmental impacts and he schedule for development of the new sources of water. The analysis shall consider the extent to which the new for new water rights can be eliminated through.

It is not necessary for CRRWC to attain new water rights within the next 20-years, as CRRWC is currently forecasted to use 2.26 CFS of 3.75 CFS (without development limitations) or ≈ 60 percent through the year 2045, or when it is assumed, saturation is completed with a total population of ≈ 5,000 full-time residents.

4.11 Implementation of Conservation Measures: OAR 690-086-0170 (8) (a)

Implementation of conservation measures identified under OAR 690-086-0150.

The CRRWC is charged with the conservation and management of the State's water. Through a series of steps outlined in section 2.10 CRRWC currently meets all the requirements in the following manner. Annual Water audit, full metered system (replacement of new meters in 2021). Meters have the capability to connect to a webpage portal set up for each individual customer, allowing the customer to be notified about abnormal water usage. Leak detection and repair has been implemented and will be reevaluated if CRRWC moves up above 10 percent unaccounted-for water. CRRWC set a rate structure that encourages conservation and a public education program. Pending on results of upcoming years water loss reports (2030), such evidence will guide the CRRWC to add steps if necessary.

4.12 Cooperative Regional Water Management OAR 690-086-0170 (8) (b)

Interconnection with other municipal supply systems and cooperative regional water management; and

The CRRWC, for several reasons, is strategically found between two larger municipalities, but relating to regional water management and interconnections, it is physically unlikely to develop an inter-tie with any entity soon. CRRWC's Board will be open to discussions with regional entities to keep abreast of the growth of and demand of water usage in the area.

4.13 Other Conservation Measures OAR 690-086-0170 (8) (c)

Any other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources.

The CRRWC has no other conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources. Sources are proven adequate in terms of both quantity and quality both currently and during the timeline of this WMCP.

4.14 Conservation Schedule – Cost: OAR 690-086-0130(7)(a)

If during the next 20 years the maximum rate of water diverted under an extended permit will be greater than the maximum rate authorized for diversion under the extension or previously approved water management conservatio1,000.: a) the plan includes a schedule for development of any conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources, unless the supplier has provided sufficient justification for the factors used in selecting other sources for development or the supplier serves a population of less than 1,000;

CRRWC, over the next 20-years will not likely need to divert an amount of water greater than the maximum rate of diversion under permit G-18478 for the final order approving the WMCP, allowing a total of 3.75 CFS (1,683 GPM). Additionally, the efficiency which CRRWC supplies water to its customers will prove more economical as the continued existing measures upgrades to the meters, distribution system and public education will begin a new era of water control and management.

4.15 Justification of Source(s) OAR 690-086-0130(7)(b)

Increase use from the source is the most feasible and appropriate water supply alternative available to the supplier; and

The CRRWC's sources are the most feasible and appropriate supply. The CRRWC has not considered an alternative supply source due to the logistics in obtaining water from outside the service area. CRRWC's personnel are aware of production capacities, static water levels in the aquifer, and uses this information for the best management of its existing water source.

4.16 Mitigation Requirements: OAR 690-086-0130(7)(c)

If mitigation is legally required to address limitations or restrictions on the development of permits for which resource issues are identified under OAR 690-086-0140(5)(i), the plan contains documentation that the supplier is complying with the mitigation requirements. The Department may consult with federal and state agencies in making this determination.

Resource issues identified with the water source are primarily focused on the wells, which are considered located in a deep aquifer. The Deschutes and Crooked Rivers were reviewed for designations and the North Unit, as defined by the Upper Deschutes Basin Study area has no restrictions as CRRWC production wells cause no significant environmental impacts anticipated.[1] Appendix D provides additional information.

1 – Class II Environmental Assessment -CRRWC Improvement Project 2013

Greenlight Water Worksheet

*(**NOTE**: Water suppliers are encouraged to include this worksheet as part of their WMCP. Use additional sheets as necessary.)*

1. Does the water supplier hold any extended water use permits?

X Yes **No**

If **NO**, stop. A Greenlight Water request does not apply.

If **YES**, list the extended permit number(s) and indicate the maximum instantaneous rate of water allowed by the permit:

Permit Number	**Instantaneous Rate of Water Allowed by Permit (*in cfs or gpm*)**
G-18478	5.0 CFS – 2,244 GPM

2. Do the extended permit(s) have a Development Limitations condition imposed by a final order approving the Permit Extension **or** a previously submitted WMCP that freeze the quantity of water that can be diverted under the extended permit?

X Yes **□ No**

If **NO**, stop. A Greenlight Water request does not apply.

If **YES**, list the extended permit number(s) and indicate the maximum instantaneous rate of water allowed under the Development Limitations condition established by the Permit Extension or previously approved WMCP:

Permit Number	**Development Limitations** **Instantaneous Rate of Water Allowed by Final Order approving a Permit Extension or previous WMCP (*in cfs or gpm*)**
G-18478	3.75 CFS – 1,683 GPM

3. Does the water supplier anticipate needing to divert water under an extended permit(s) at an instantaneous rate that **is greater than** the amount specified in the Development Limitations condition (established by the Permit Extension **or** previously approved WMCP) to meet its projected 20-year water demands?

□ Yes X No

If **NO**, stop. A Greenlight Water request does not apply.

If **YES**, Items **A** and **B** below must be addressed in the water supplier's WMCP being prepared for submittal:

A. Identify the maximum instantaneous rate and the maximum monthly volume of water that will be needed under the extended permit(s) for the next 20 years to meet the water supplier's projected demands:

Permit Number	**Greenlight Water Request**	
	Maximum Instantaneous Rate of Water (*in cfs or gpm*) Anticipated to be Diverted to meet 20-year Demands	**Maximum Monthly Volume of Water *(in million gallons*) Anticipated to be Diverted to meet 20-year Demands**
Total		

Greenlight Water Worksheet *(…continued)*

B. In the spaces provided below, describe how the water supplier has satisfied each of the following criteria:

• **OAR 690-086-0130(7)(a)** The plan includes a schedule for development of any conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources, **unless**: ▪ the supplier has provided sufficient justification for the factors used in selecting other sources for development; **or** ▪ the supplier serves a population of less than 1,000.
NA
• **OAR 690-086-0130(7)(b)** Increased use from the source is the most feasible and appropriate water supply alternative available to the supplier.
NA
• **OAR 690-086-0130(7)(c)** If mitigation is legally required to address limitations or restrictions on the development of permits for which resource issues are identified under OAR 690-086-0140(5)(i), the plan contains documentation that the supplier is complying with the mitigation requirements. The Department may consult with federal and state agencies in making this determination.
NA

Appendices A: Notice of WMCP

To:

- Jefferson County Planning Manager - Phil Stenbeck – 541.475.4462
    - pstenbeck@jeffco.net
- Public Works Supervisor - Kim Symons – 541.546.6494
    - ksymons@cityofculver.com
- District 11 Watermaster - Jeremy Giffin – 541.306.6885
    - jeremy.giffin@water.oregon.gov

From: The CRRWC – Frank Day

RE: Water Management Conservation Plan (WMCP)

To Whom It May Concern:

Following rule 690-086-0125(5), notification of local governments of the completion of our WMCP draft, please find an e-copy attached in this e-mail for your review. Under the rule, a water supplier will make its WMCP draft available for review by the affected local government(s). Any comments on the plan can be sent by a replied e-mail and will be placed in the copy that will be sent to the office of Oregon Water Resources Department.

Please provide a reply within thirty (30) days or sooner of receiving this e-mail so we may move forward with this project. We appreciate the time spent under review. Please send any questions or comments to Frank Day, General Manager at frank@crrwater.com.

Sincerely,

Frank Day

CRRWC – General Manager

From Jefferson County CDD – Phil Stenbeck

Hi Frank,

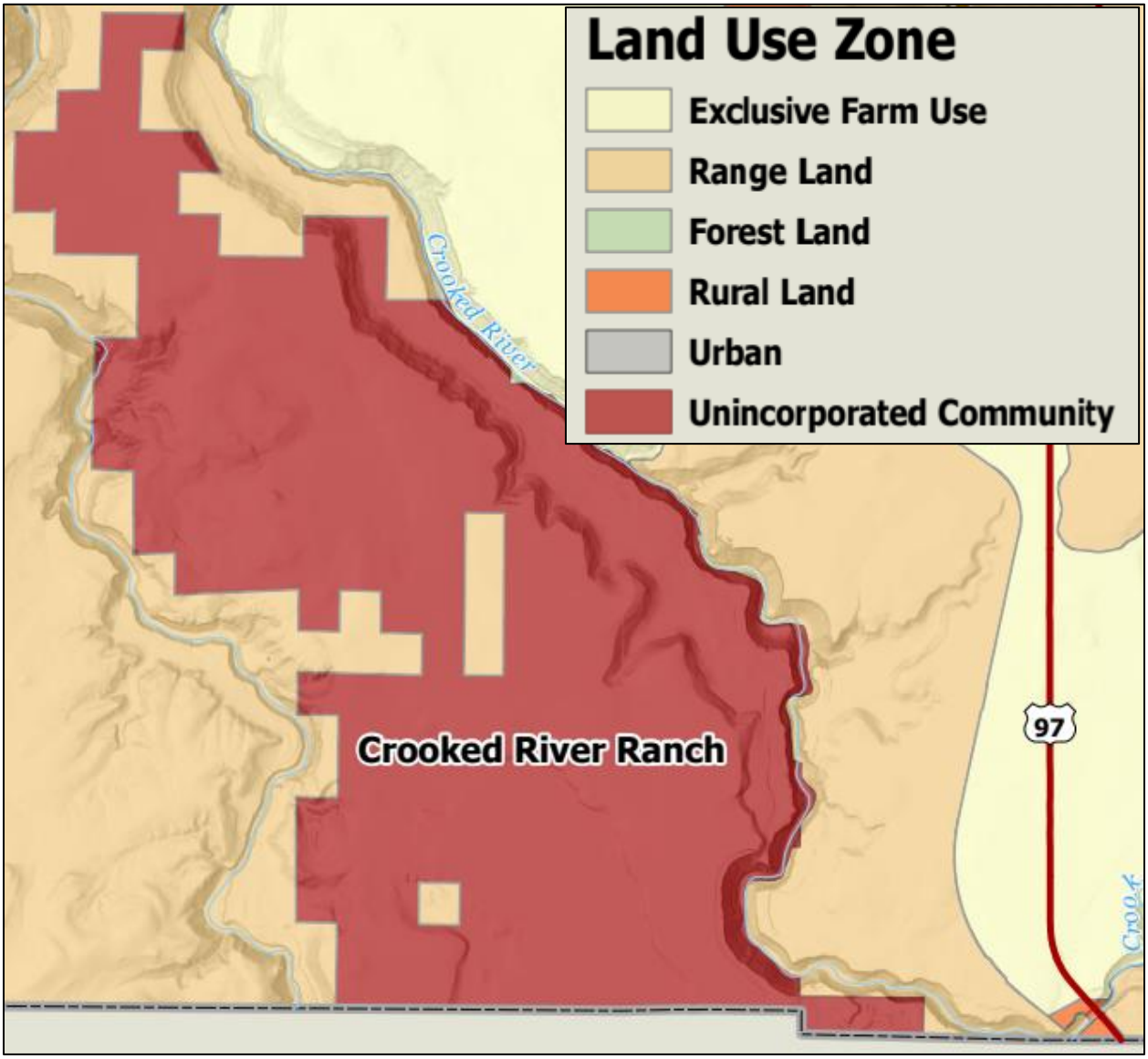
No concern at Jefferson County CDD.

Cordially,

Phil

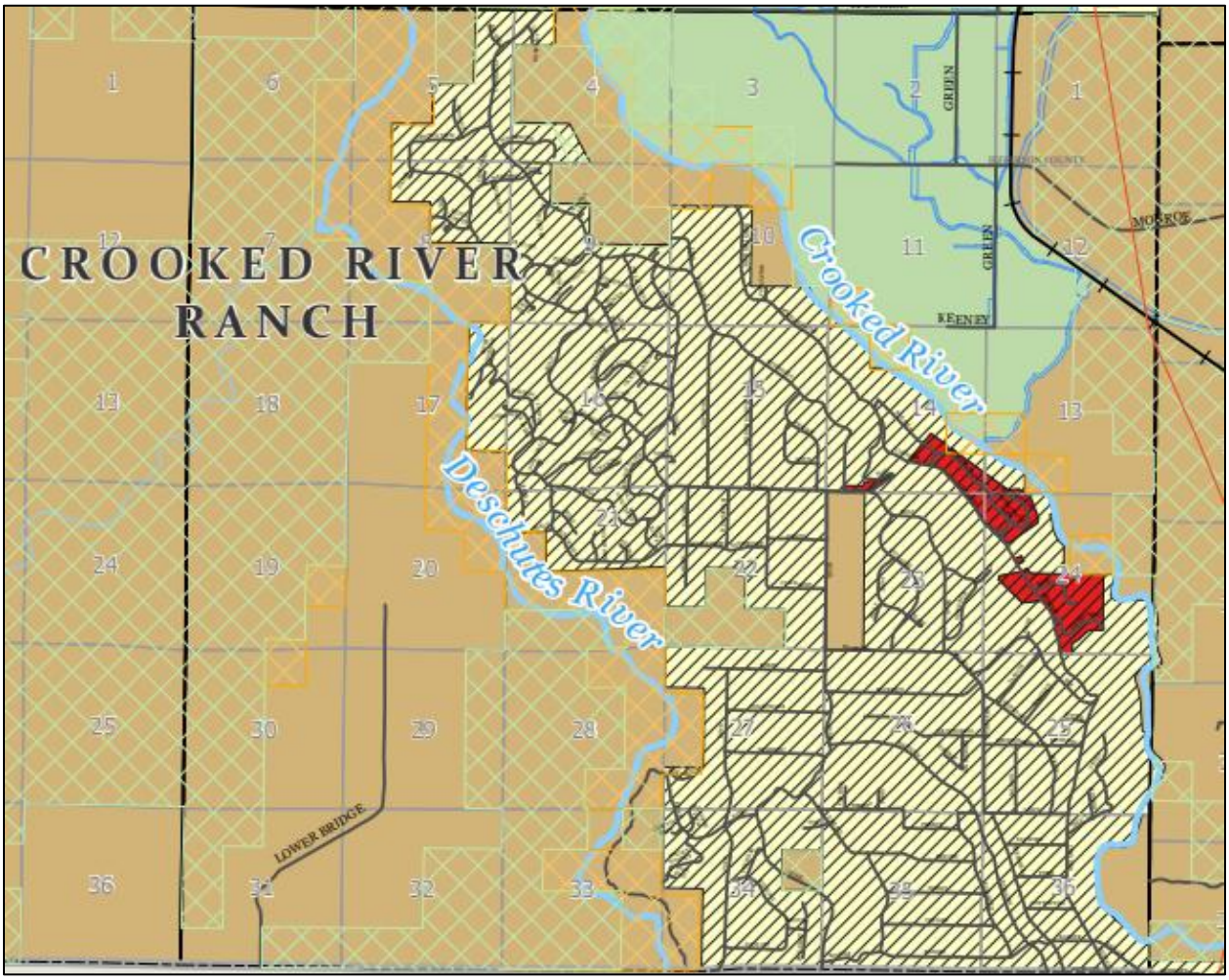
Appendix B Aerial Urban Growth Boundary

Appendix B: Land Use Zone – Distribution Map



Map provided by Jefferson County GIS Department at:

http://maps.co.jefferson.or.us/MAPS/Comp_Plan_Map.pdf

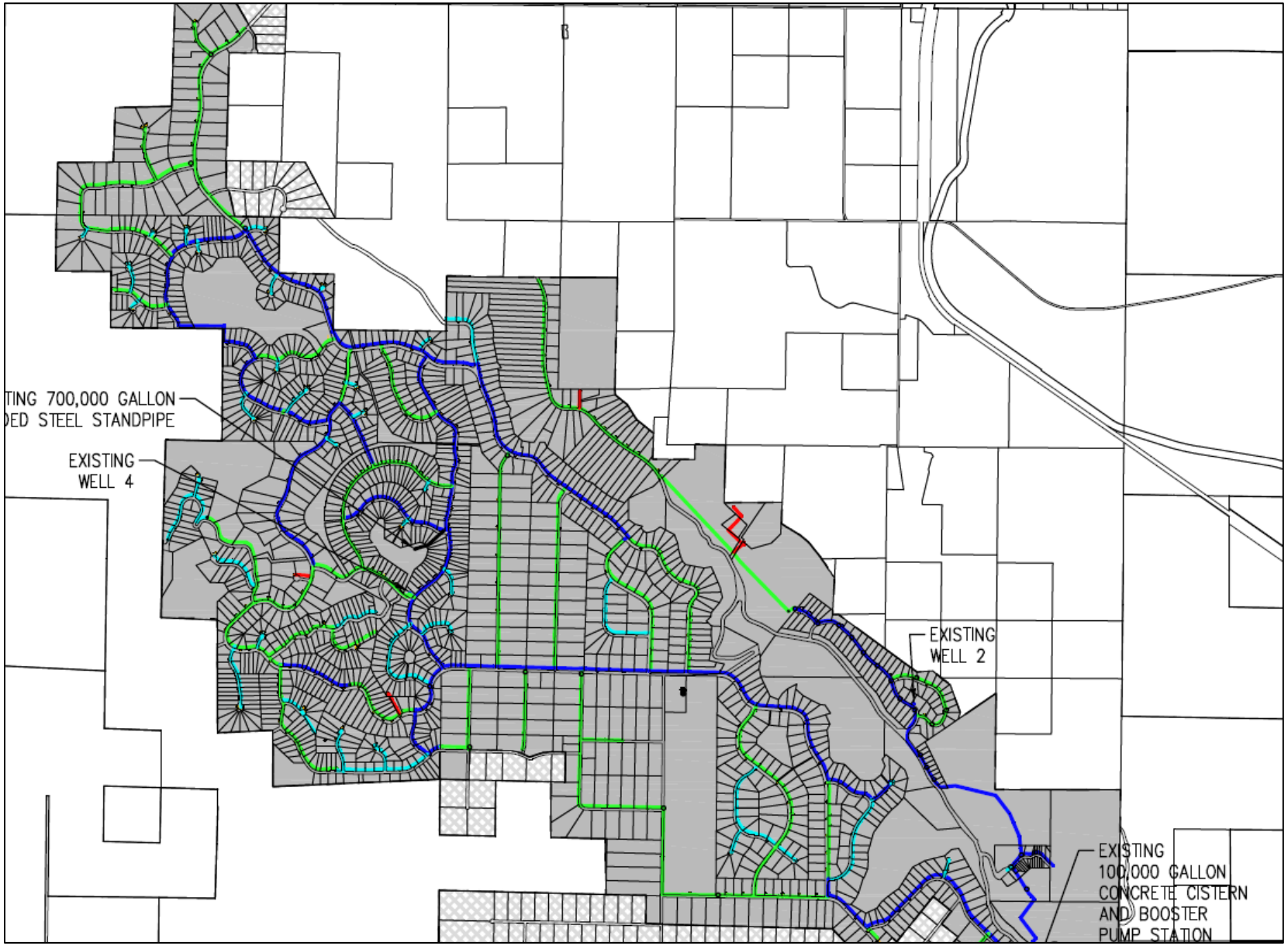


CRRC - Crooked River Ranch Commercial Zone

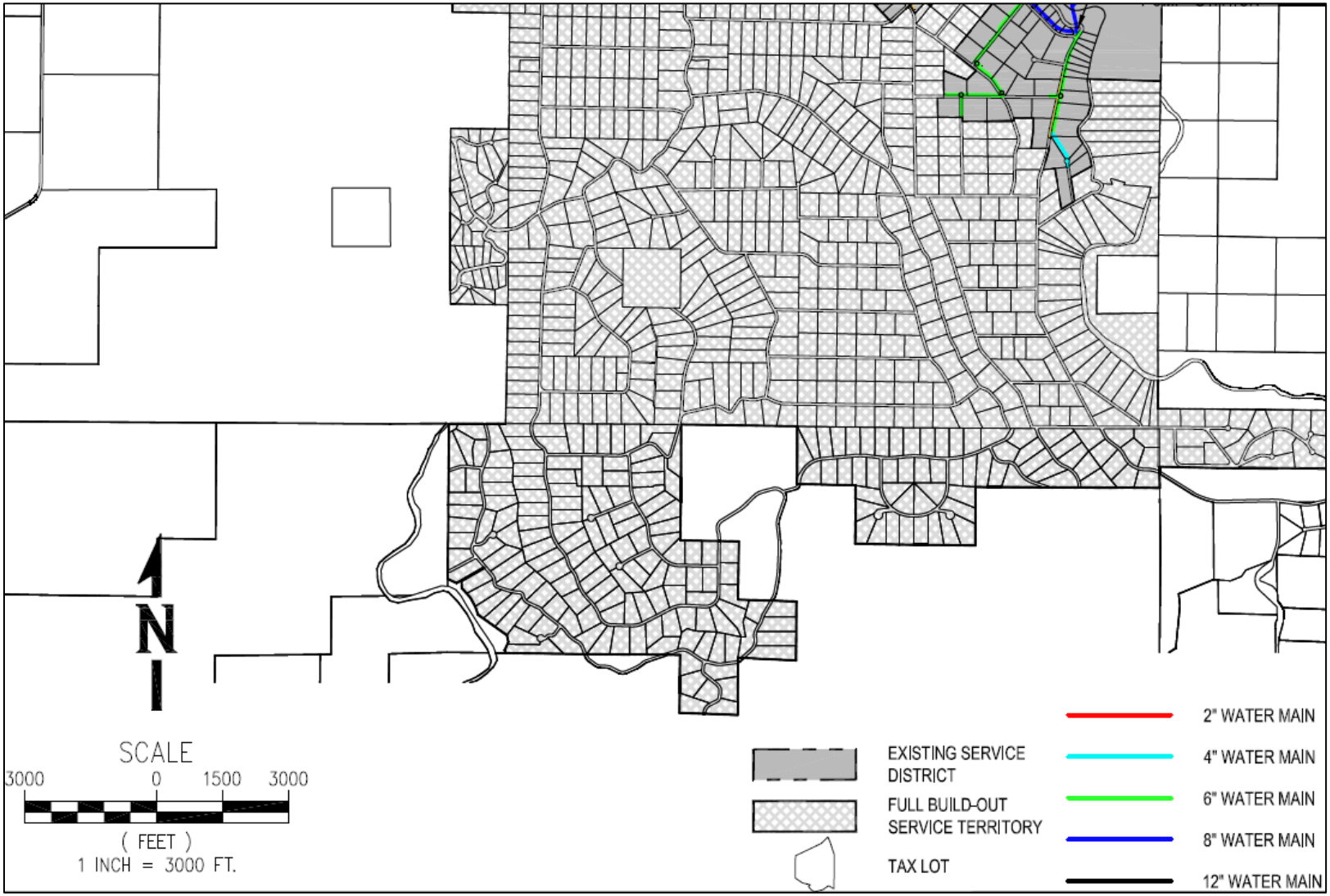
CRRR - Crooked River Ranch Residential Zone

Map provided by Jefferson County GIS Department at:

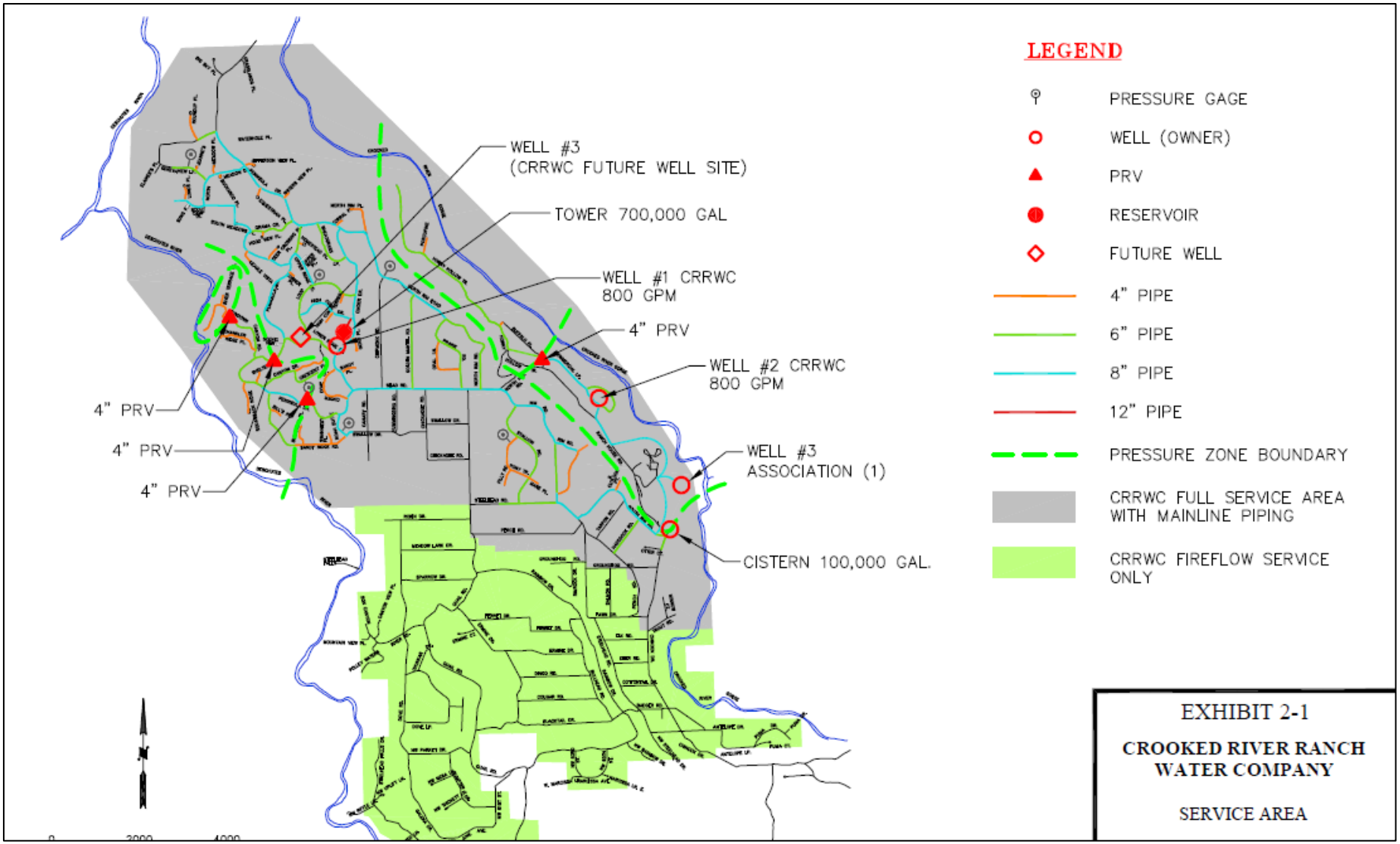
http://maps.co.jefferson.or.us/MAPS/JeffCo_Zoning.pdf


TING 700,000 GALLON
)ED STEEL STANDPIPE
EXISTING
WELL 4
EXISTING
WELL 2
EXISTING
100,000 GALLON
CONCRETE CISTERN
AND BOOSTER
PUMP STATION

Water Main Distribution Map – Northern Section Developed



Water Main Distribution Map – Southern Section Undeveloped (Build-out)


WELL #3
(CRRWC FUTURE WELL SITE)
TOWER 700,000 GAL
WELL #1 CRRWC
800 GPM
4" PRV
WELL #2 CRRWC
800 GPM
4" PRV
4" PRV
4" PRV
WELL #3
ASSOCIATION (1)
CISTERN 100,000 GAL.
LEGEND
PRESSURE GAGE
WELL (OWNER)
PRV
RESERVOIR
FUTURE WELL
4" PIPE
6" PIPE
8" PIPE
12" PIPE
PRESSURE ZONE BOUNDARY
CRRWC FULL SERVICE AREA WITH MAINLINE PIPING
CRRWC FIREFLOW SERVICE ONLY
EXHIBIT 2-1
CROOKED RIVER RANCH WATER COMPANY
SERVICE AREA

Well Depth Diagram

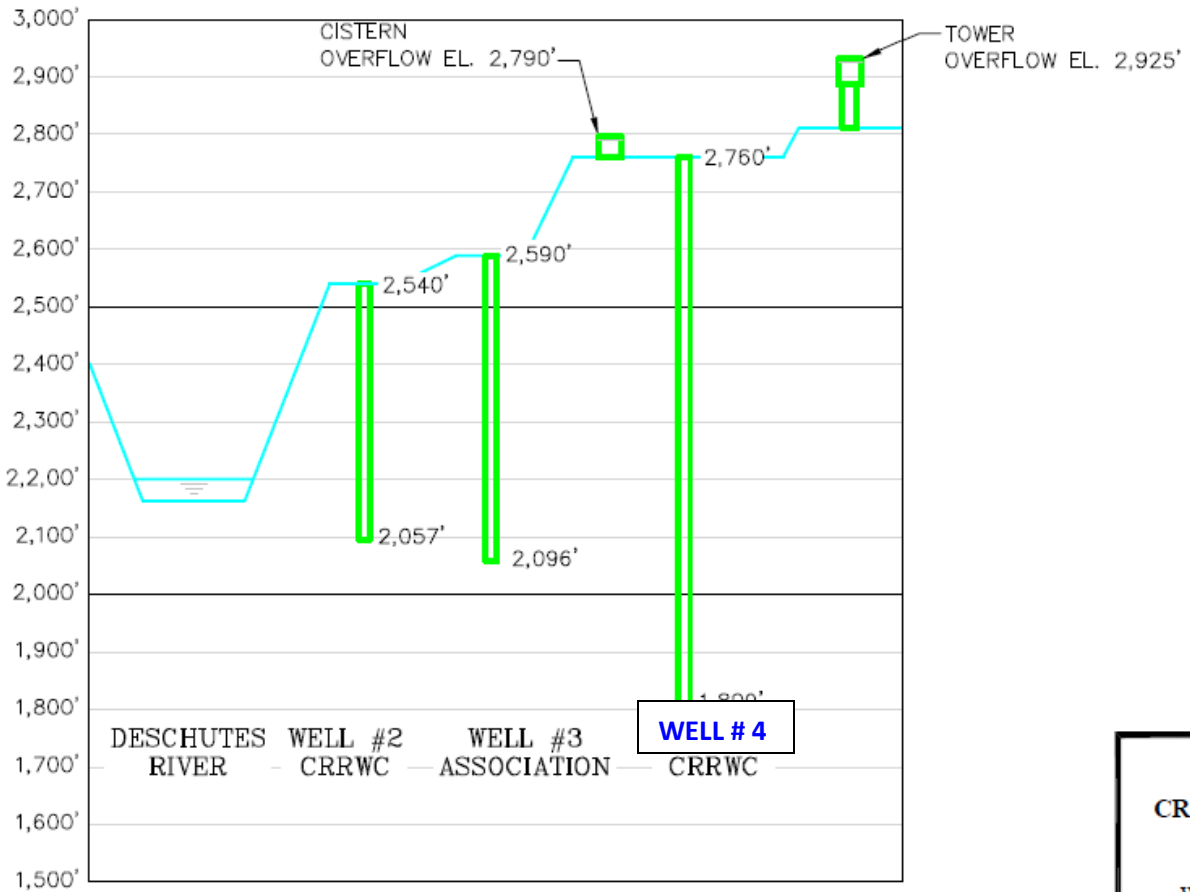
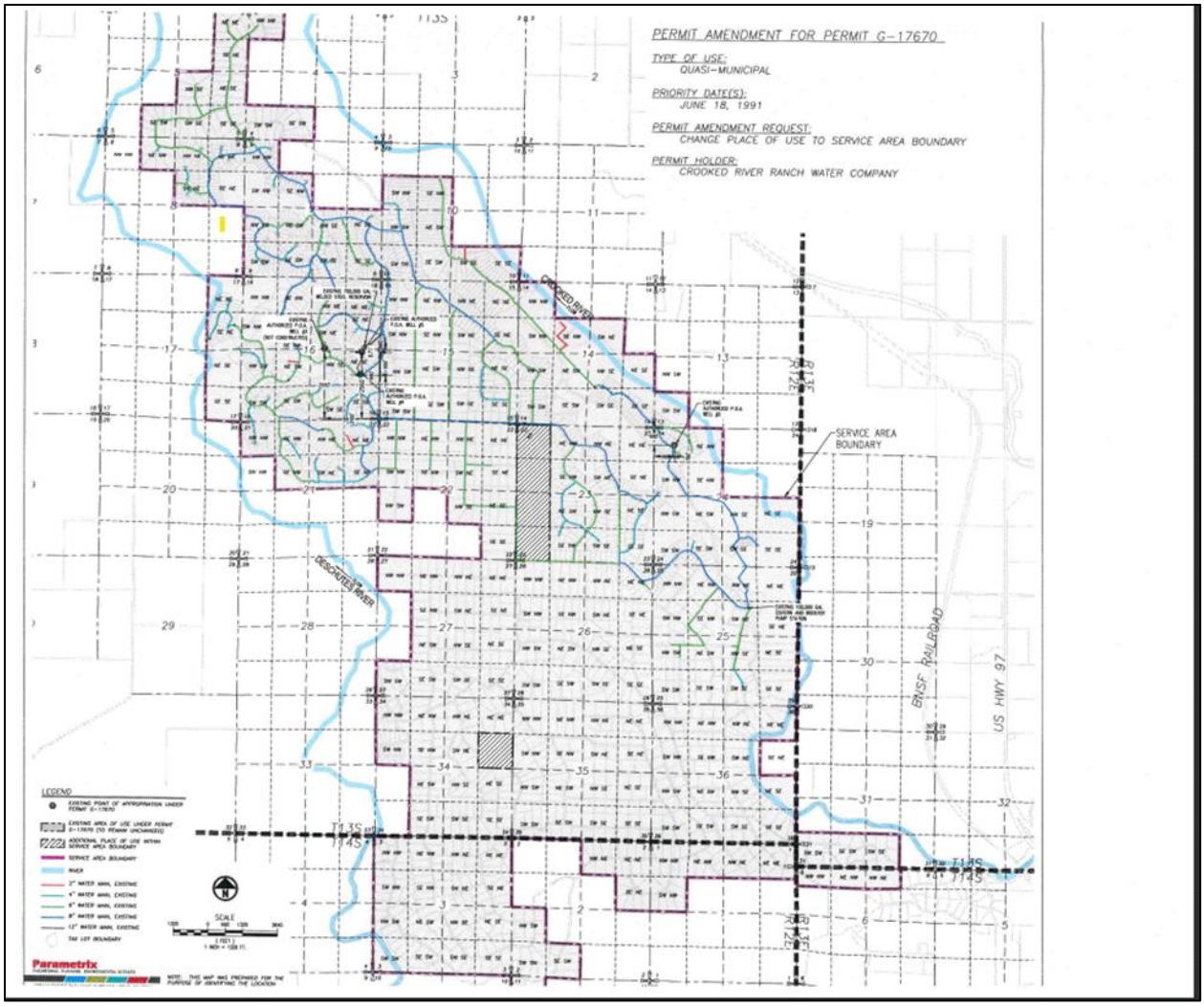


EXHIBIT 2-4

CROOKED RIVER RANCH WATER COMPANY

WELL DEPTH DIAGRAM

Information taken from Economic and Engineering Services - 2003


PERMIT AMENDMENT FOR PERMIT G-17670
TYPE OF USE:
QUASI-MUNICIPAL
PRIORITY DATE(S):
JUNE 18, 1991
PERMIT AMENDMENT REQUEST:
CHANGE PLACE OF USE TO SERVICE AREA BOUNDARY
PERMIT HOLDER:
CROOKED RIVER RANCH WATER COMPANY
SERVICE AREA BOUNDARY
CROOKED RIVER
DESCHUTES RIVER
BNSF RAILROAD
US HWY 97
T14S
T15S
R12E
R13E
LEGEND
SCALE
Parametrix

Appendix C – Water Permits, Extensions, and Certificates

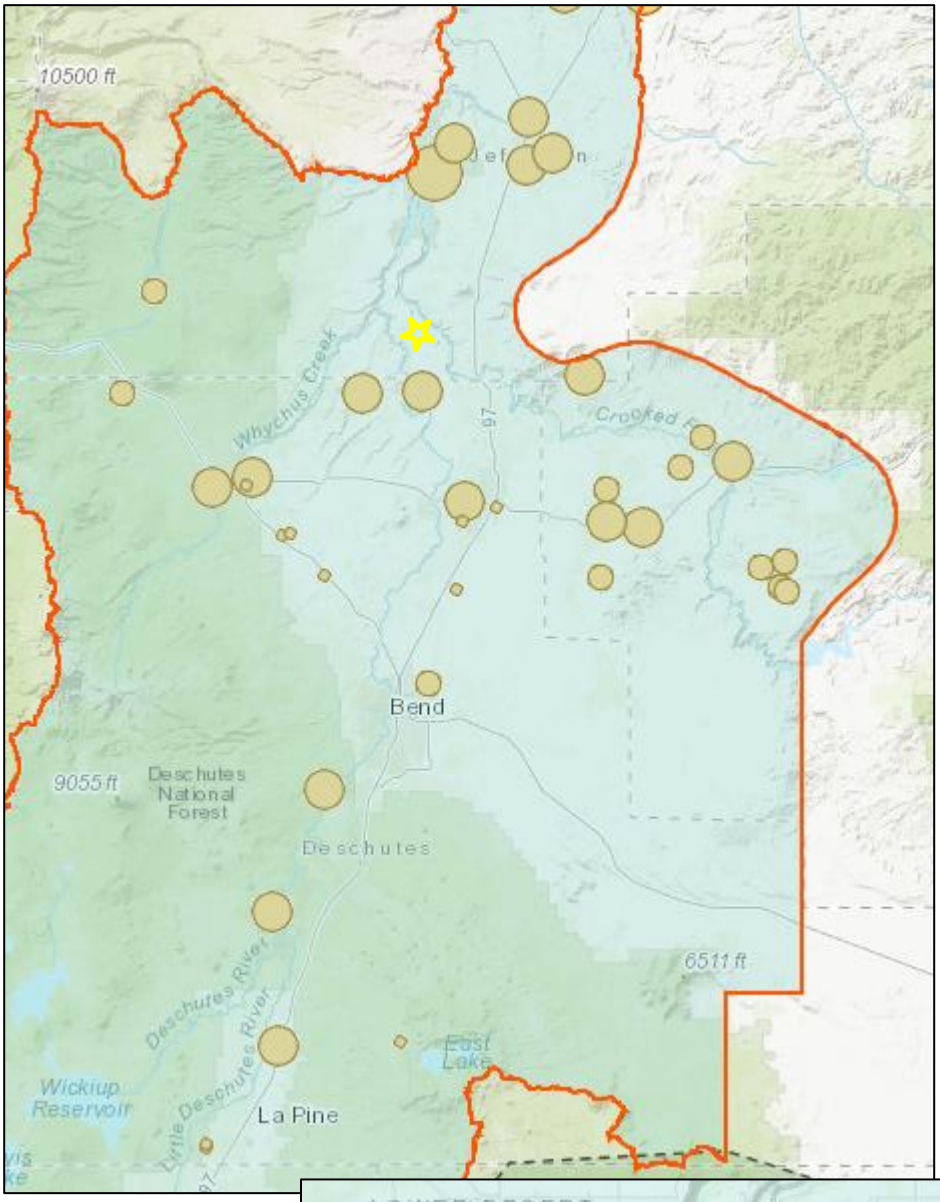

Permit G-18478.pdf


Permit G-18478.pdf


Permit G-18478.pdf

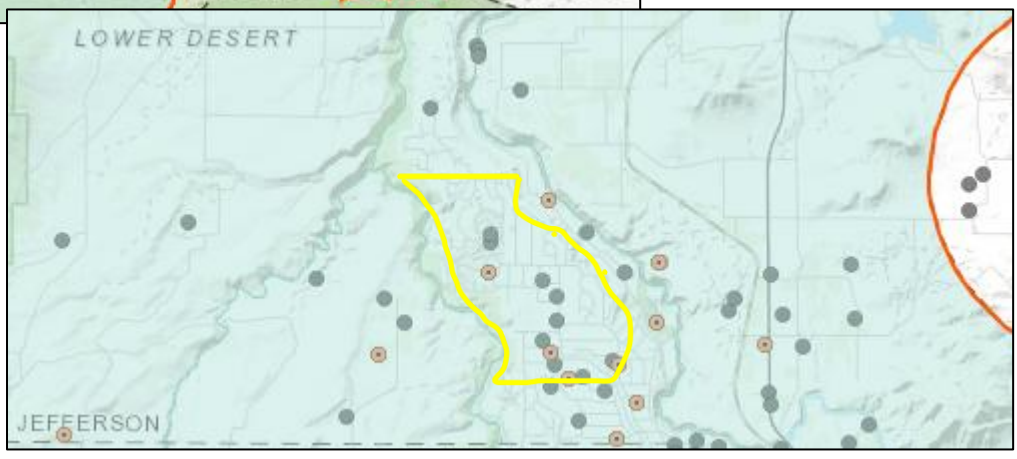

Permit G_17670 supers G-17417.pdf

Appendix D – Endangered Species Information – Water Quality Assessments

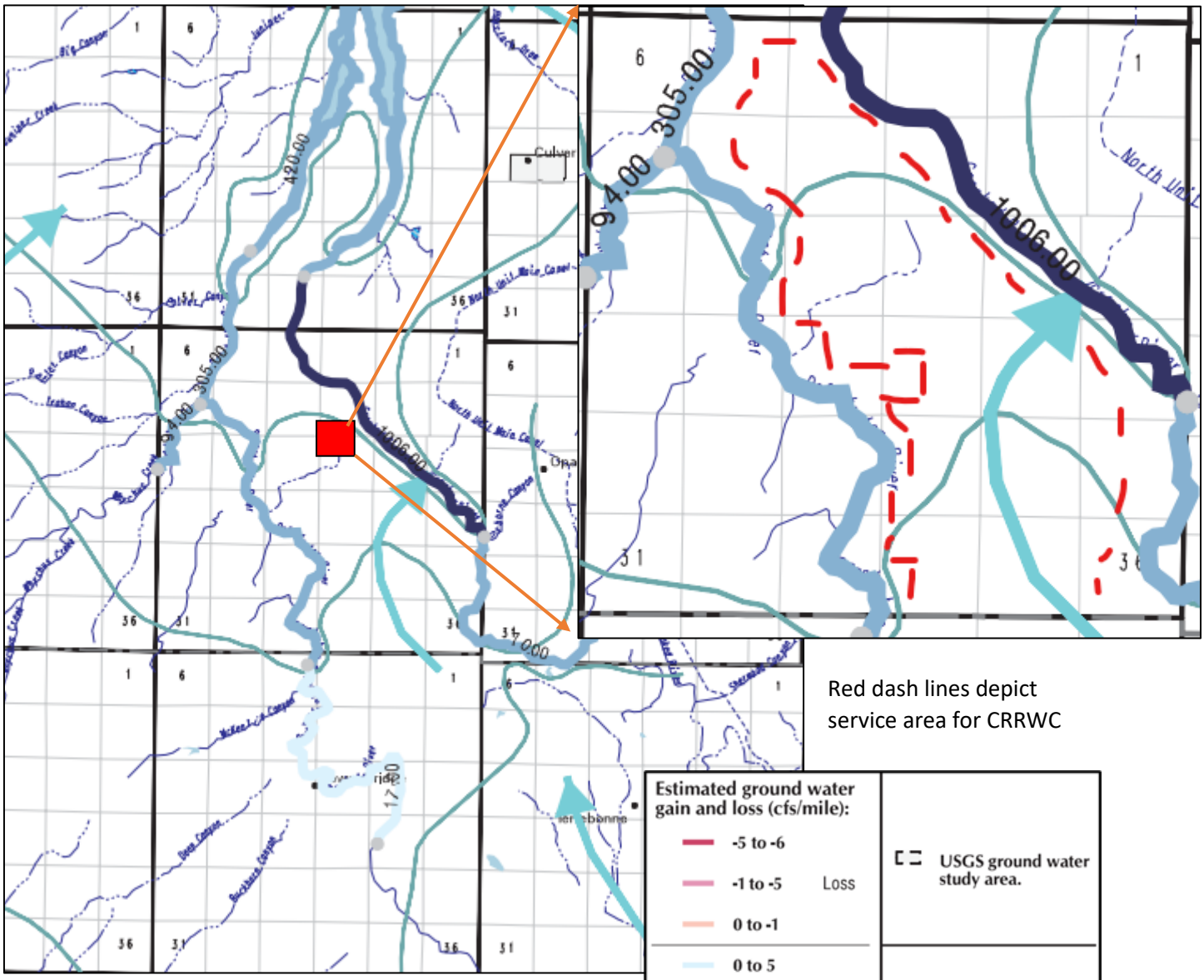


Upper Deschutes Basin – no restrictions

Yellow Star location of CRRWC



Deschutes GW Study Area GW-Surface Water Interaction Flow Direction



AU Name	AU Description	AU parameter category	assessed 2022	AU delist	Year listed	TMDL Priority	HUC_12	HU_12_NAME	Pollutant	Assessment	TMDL_Project
Crane Prairie Reservoir	Lake/Reservoir Unit	5	Yes	No	2022	Medium	170703010108	Charlton Creek	Dissolved Oxygen	Dissolved Oxygen	Upper Deschutes and Little Deschutes Subbasins
Crane Prairie Reservoir	Lake/Reservoir Unit	5	Yes	No	2022	Medium	170703010108	Charlton Creek	pH	pH	Upper Deschutes and Little Deschutes Subbasins
Crane Prairie Reservoir	Lake/Reservoir Unit	5	Yes	No	2022	Medium	170703010108	Charlton Creek	Temperature	Temperature - Numeric	Upper Deschutes and Little Deschutes Subbasins
Crane Prairie Reservoir	Lake/Reservoir Unit	5	No	No	2010	Medium	170703010108	Charlton Creek	Harmful Algal Blooms		Upper Deschutes and Little Deschutes Subbasins
Wickiup Reservoir	Lake/Reservoir Unit	5	No	No	2018	Medium	170703010207	Wickiup Reservoir-Deschutes River	Temperature	Temperature - Numeric	Upper Deschutes and Little Deschutes Subbasins
Wickiup Reservoir	Lake/Reservoir Unit	5	No	No	2010	Medium	170703010207	Wickiup Reservoir-Deschutes River	Harmful Algal Blooms		Upper Deschutes and Little Deschutes Subbasins
Odell Lake	Lake/Reservoir Unit	5	Yes	No	2004	Medium	170703010201	Upper Odell Creek	Chlorophyll-a	Chlorophyll-a	Upper Deschutes and Little Deschutes Subbasins
Odell Lake	Lake/Reservoir Unit	5	Yes	No	2010	Medium	170703010201	Upper Odell Creek	Dissolved Oxygen	Dissolved Oxygen	Upper Deschutes and Little Deschutes Subbasins
Odell Lake	Lake/Reservoir Unit	5	No	No	2010	Medium	170703010201	Upper Odell Creek	Dissolved Oxygen	Dissolved Oxygen	Upper Deschutes and Little Deschutes Subbasins
Odell Lake	Lake/Reservoir Unit	5	Yes	No	2004	Medium	170703010201	Upper Odell Creek	pH	pH	Upper Deschutes and Little Deschutes Subbasins
Odell Lake	Lake/Reservoir Unit	5	No	No	2018	Low	170703010201	Upper Odell Creek	Methylmercury	Toxic Substances - Human Health	
Odell Lake	Lake/Reservoir Unit	5	No	No	2010	Medium	170703010201	Upper Odell Creek	Harmful Algal Blooms		Upper Deschutes and Little Deschutes Subbasins
Davis Lake	Lake/Reservoir Unit	5	Yes	No	2022	Medium	170703010204	Lower Odell Creek	Dissolved Oxygen	Dissolved Oxygen	Upper Deschutes and Little Deschutes Subbasins
Davis Lake	Lake/Reservoir Unit	5	Yes	No	2022	Medium	170703010204	Lower Odell Creek	pH	pH	Upper Deschutes and Little Deschutes Subbasins
Lake Billy Chinook	Lake/Reservoir Unit	5	No	No	1998	Medium	170703011007	Spring Creek-Metolius River	Chlorophyll-a	Chlorophyll-a	Upper Deschutes and Little Deschutes Subbasins
Lake Billy Chinook	Lake/Reservoir Unit	5	No	No	2018	Medium	170703011007	Spring Creek-Metolius River	Harmful Algal Blooms		Upper Deschutes and Little Deschutes Subbasins
Lake Billy Chinook	Lake/Reservoir Unit	5	Yes	No	1998	Medium	170703011104	Haystack Draw-Deschutes River	Chlorophyll-a	Chlorophyll-a	Upper Deschutes and Little Deschutes Subbasins
Lake Billy Chinook	Lake/Reservoir Unit	5	Yes	No	1998	Medium	170703011104	Haystack Draw-Deschutes River	pH	pH	Upper Deschutes and Little Deschutes Subbasins
Crescent Lake	Lake/Reservoir Unit	5	Yes	No	2022	Medium	170703020204	Crescent Lake	Dissolved Oxygen	Dissolved Oxygen	Upper Deschutes and Little Deschutes Subbasins
Paulina Lake	Lake/Reservoir Unit	5	No	No	2018	Low	170703020702	Upper Paulina Creek	Methylmercury	Toxic Substances - Human Health	
Paulina Lake	Lake/Reservoir Unit	5	No	No	2010	Medium	170703020702	Upper Paulina Creek	Harmful Algal Blooms		Upper Deschutes and Little Deschutes Subbasins

Appendix E: Water Rates

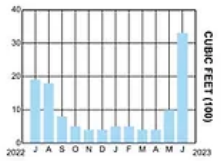
Base Rate by your meter size

Service Meter Size	Monthly Base Rate
5/8 inch or 3/4 inch	$42.16
1 inch	$63.24
1 1/2 inch	$105.40
2 inch	$168.63

Usage Allowance

This isn't any usage allowance associated with the monthly base rate.

Commodity Rate $1.51 per 100 CF



Other Important Information

Miscellanous Service Fees
Follow Me

Reduce size of meter request charges
Coming Soon

Special Provisions

1. These rates are based on continuous service. Discontinuation of service may not be employed to avoid monthly charges for service.
2. Water used during the construction of buildings, etc., shall be metered. Charges shall be made at the rates specified in this schedule. When Setting a meter is impracticable, the amount of water used shall be estimated, and the charges shall be made at specified rates for the amounts so estimated.