

Assessment of the Water Usage of Yakima County Water Resources System for Year 2022

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Foreword

The purpose of this report is to summarize Yakima County's Water Resource System (YCWRS) annual water usage and to estimate future usage as required under federal and Washington State water law. The report provides essential data that allows the County and regulators to determine if the system is performing within its allocated water rights. Further, it illustrates trends in total water use by tracking groundwater withdrawals and estimating future use within the system by tracking and analyzing land use and permit data. This information will be used to understand future water demands within the system, and to ensure there are adequate water quantities for future domestic needs within Yakima County.

This document is anticipated to be updated each year.

Executive Summary

This report estimates use of groundwater in the YCWRS and compares it against the available water rights available within the YCWRS.

The water rights available must be capable of meeting demand within the system. Currently the YCWRS water rights available meet the current water usage, current approved 157 unbuilt structures, and estimated future need of 100 permitted structures, per year for another 9 years (through 2032), calculated as follows:

- The total available water rights within the YCWRS is 141 acre-feet (6,141,960 cubic-feet) per year;
- Total consumptive usage for 2022 was 19.43 acre-feet (846,654 cubic-feet);

- There were 157 unbuilt, permitted structures through 2022 that have an estimated reserve of 11.13 acre-feet (485,147 cubic-feet);
- Total consumptive usage and water rights reserved for unbuilt, permitted structures through 2022 equals a usage of 22% of the available water rights. Therefore, at current usage, the YCWRS water rights meet current and future need through 2032.

Introduction

As described above, this document provides compliance with federal and Washington State water law, which requires written documentation of water right management. This report documents the tracking of water right availability and usage within the Yakima County Water Resources System (YCWRS).

Water is an essential component for human residency in any area. With Yakima County located in a semi-arid location which receives approximately 7 to 9 inches of precipitation annual in the lowland, water is a scarce natural resource. Yakima County's largest economic driver—agriculture—and its communities rely on water.

The Yakima Basin is an over-appropriated system, with senior water right holders entitled to receive their water before junior users. There is a connection between groundwater and surface water in the Yakima Basin, as shown by a multi-year groundwater study conducted by the USGS which concluded in 2011. Under Yakima County's Growth Management Act responsibilities, the County is obligated to decide that water is legally and physically available before issuing building permits or approving subdivisions.

The YCWRS satisfies this obligation by providing cost-effective water rights for new domestic uses, when the new use does not currently have any water rights and is not near another public utility. YCWRS is a county-owned and operated water system that provides "mitigated" water supplies for the withdrawal of water from a groundwater permit-exempt well. The YCWRS holds senior water rights and allows the use of such rights by the public when wells are constructed and metered according to YCWRS procedures. The YCWRS water right is just one option to obtain proof of water availability before the county can issue a building permit. Other senior water rights are available through the state's Trust Water Rights Program.

The YCWRS was created in response to the history of water law and a series of rulings from Washington court cases. Washington State Supreme Court Decision Whatcom County, Hirst (Eric) v: W Wash. Growth Mgmt. Hr'gs Bd., No. 91475-3 requires the County to make a determination if water is legally and physically available when the County receives an application for a new use. Based on studies by the United States Geological Survey (USGS) and other court decisions in the Yakima Basin in Kittitas County, groundwater and surface water are connected and there are more water rights in the basin than there is water. Therefore, the County was required to implement a procedure for making that water availability determination. This was done with *Ordinance 13-2017*, adopted December 19, 2017.

The YCWRS is designed to be consistent with state water law and specifically the way water in the Yakima Basin is managed – water rights based on seniority, consumptive use, return flow, the interactions between surface and groundwater as depicted in the USGS model, the common understanding of water flow and rights as defined in the Yakima Basin Adjudication. The YCWRS also accommodates the Yakama Nation's Water Code into the permit process for those county-issued building and land use permits which occur within the boundary of the Reservation.

The YCWRS is built around groundwater use strategies based on hydrogeologic availability used in particularly-defined geographic “domains”, as explained in the “Assessment of the Availability of Groundwater for Residential Development in the Rural Parts of Yakima County Washington” by John Vaccaro. Specific measures are taken within the specific domain, to mitigate the effect of water use on the aquifer system, senior ground and surface water rights, flow-related habitat conditions and habitat use. To avoid impacts to tributaries there has been purchase of main stem rights, purchase of tributary rights where available, and requiring new domestic wells be drilled to specified well depth standards. The well depth standards were developed to avoid impacts to flows in the tributaries, with impact flow and senior rights mostly in the main stem reaches.

YCWRS is set up with thirty sectors, within thirteen domains. An explanation and evaluation of water right usage in each domain is reviewed in the next section. The report *Assessment of the Availability of Groundwater for Residential Development in the Rural Parts of Yakima County Washington* by J.J. Vaccaro lists further information of the groundwater domains including: each sector, the area of private lands, population, population exclusive of water service district, existing residences, existing residence not in municipalities, buildable lots not in municipalities, buildable lots not in municipalities but within irrigation district boundaries, the number of diversions, the quantity of diversions, the potential future demand on buildable lots outside municipalities and the potential future demand on buildable lots outside municipalities but within irrigation district boundaries.

Groundwater Domains

Background Information Analyzed to Establish Groundwater Domains

The basic background information for groundwater in the Yakima River basin was derived from a series of publications of the U.S. Geological Survey (USGS). These publications were completed as part of a multi-year study of the groundwater resources in the basin.

Mapping information was analyzed for defining the domains (including estimated sources of mitigation water) and in some cases, the partitioning of a domain into sectors. Factors examined included:

- Land Ownership and Land Use Authority
- Land Use/Zoning
- Major Water District Boundaries
- Census data
- Existing Residences and Residential-Land Undeveloped Parcels
- Location of Irrigation Districts and Canals/Laterals
- Points of Diversion for Surface Water--Allowable Quantity and Priority Date
- Fish Coverages
- Hydrogeology
- Groundwater levels
- Well Records
- Pumpage Records
- Groundwater Recharge
- Building Permit Trends

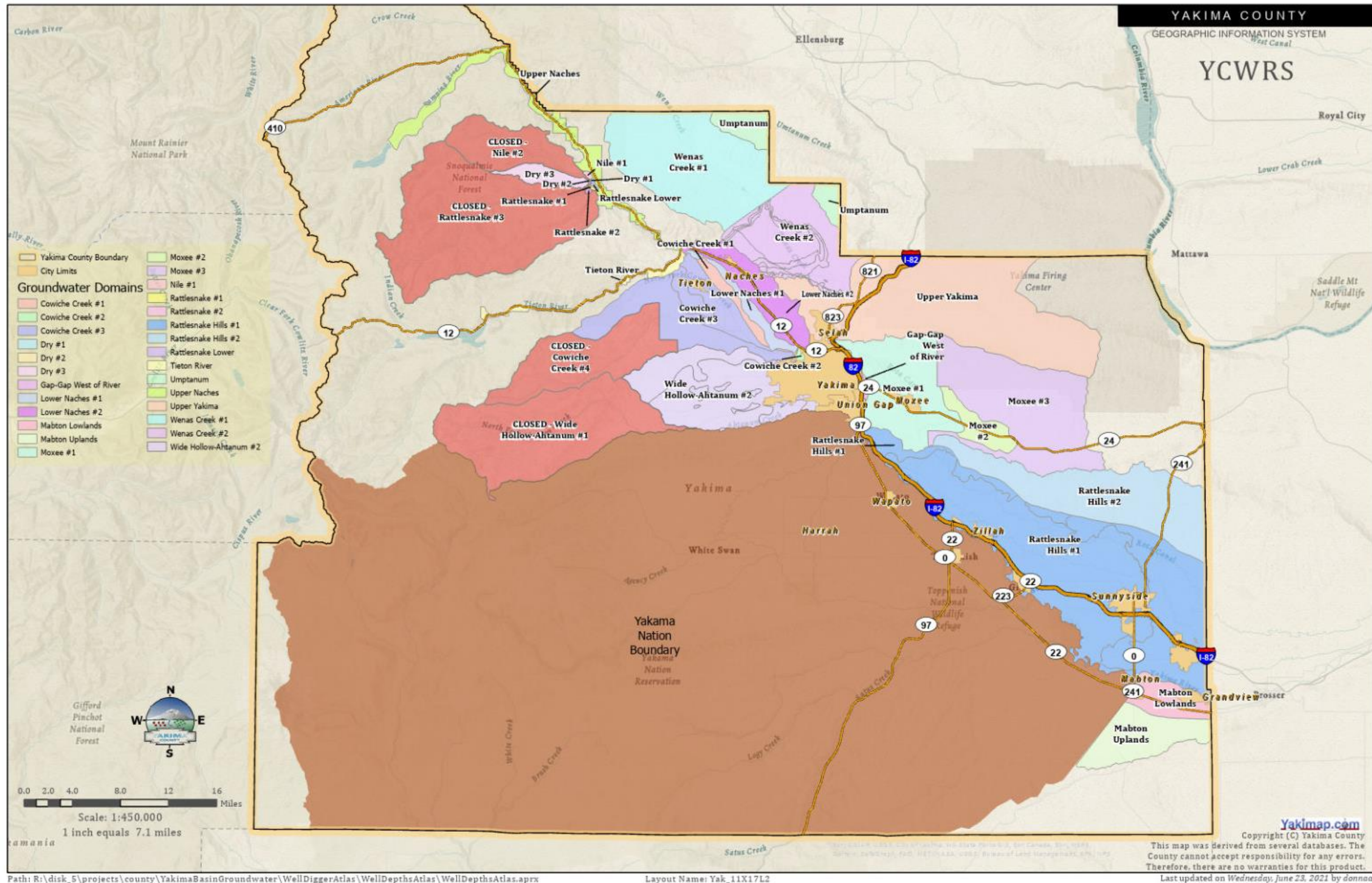
Types of geologic materials from which wells withdraw water were also an important consideration. GIS layers for the hydrogeologic information developed during the USGS Yakima River basin study were also used.

Purpose to Establish Groundwater Domains

The main purpose of establishing groundwater domain was to make a general assessment of the potential effects of future groundwater pumpage on streamflow. Pumpage from future wells was assessed by estimating, to the extent possible, where the effects of pumpage would propagate to, such as main stem streams (Bumping, Tieton, Naches and Yakima Rivers) or tributary creeks. Defining the domain allowed for mitigation strategies to be developed, as appropriate for the specific hydrogeologic conditions of each basin.

Figure 1 below shows the domains that were identified during the analysis.

Figure 1: YCWRS Domains



Groundwater Domains Locations

Upper Naches

The Upper Naches Domain includes lands upstream of the mouth of the Tieton River and includes the Bumping River. This domain covers 11.42 square miles of private lands. The domain also includes lands within the drainage area of the Naches River above the mouth of the Tieton.

In 2022, Upper Naches had 3 active meters, which made up 1% of the total active meters for YCWRS. The total water usage for Upper Naches was 5,511 cubic-feet, which was 0.65% of the total water usage for YCWRS in 2022. Also, there were 1 unbuilt, permitted structures pending.

Nile Creek

The Nile Creek Domain encompasses 1.1 square miles of private lands. The domain includes three sectors: Sector 1 – low-lying lands, Sector 2 – upper Nile Creek drainage, Sector 3 – general land-surface altitude in area that abuts the Naches River.

In 2022, Nile Creek had 0 active meters. Also, there were 0 unbuilt, permitted structures pending.

Dry Creek

The Dry Creek Domain includes a lands total of 0.17 square miles. The domain was divided into three sectors based on location of private lands, land-surface altitude, and proximity to the Naches River.

In 2022, Dry Creek had 0 active meters. Also, there were 0 unbuilt, permitted structures pending.

Rattlesnake Creek

The Rattlesnake Creek Domain includes the 0.78 square miles. The domain was divided into four sectors. Sector 1 includes the flat, low-lying part of the basin. Sector 2 is in the steeper uplands bordering sector 1. Sector 3 is the rectangular area of private lands in the uplands. Sector 4, the Lower Rattlesnake sector, includes area in the flat-lying area that abuts the Naches River.

In 2022, Rattlesnake Creek had 0 active meters. Also, there were 0 unbuilt, permitted structures pending.

Tieton River

The Tieton River Domain includes 1.97 square miles of private land.

In 2022, Tieton River had 0 active meters. Also, there were 1 unbuilt, permitted structures pending.

Lower Naches River

The Lower Naches River Domain includes 32 square miles. The domain has two sectors. Sector 1 is on the right bank, south of the alluvial valley, where the surficial geology generally is defined by the extent of the outcropping andesite geologic unit. Sector 2 encompasses the remaining part of the domain.

In 2022, Lower Naches River had 6 active meters in Sector 1 and 16 active meters in Sector 2, which made up 8.5% of the total active meters for the YCWRS. The total water usage for Lower Naches River was 73,180 cubic-feet, which was 8.6% of the total water usage for YCWRS in 2022. Also, there were 18 unbuilt, permitted structures pending.

Upper Yakima River

The Upper Yakima River Domain includes 32.6 square miles.

In 2022, Upper Yakima River had 29 active meters, which made up 11% of the total active meters for the YCWRS. The total water usage for Upper Yakima River was 118,613 cubic-feet, which was 14% of the total water usage for YCWRS in 2022. Also, there were 20 unbuilt, permitted structures pending.

Wenas Creek

The Wenas Creek Domain includes 48 square miles. The domain was divided into 2 sectors. Sector 1 is the drainage area for Wenas Dam and encompasses about 13.8 square miles. Sector 2 is the remaining drainage area of the relevant lands in the Wenas Creek drainage area.

In 2022, Wenas Creek had 1 active meter in Sector 1, 33 active meters in Sector 2, and 1 active meter in Sector 3 which made up 13.5% of the total active meters for the YCWRS. The total water usage for Wenas Creek was 110,526 cubic-feet, which was 13% of the total water usage for YCWRS in 2022. Also, there were 12 unbuilt, permitted structures pending.

Cowiche Creek

The Cowiche Creek Domain includes 64.8 square miles within the Cowiche Creek drainage area. The domain was divided into four sectors. Sector 1 (6.55 square miles) is in the northeast part of the basin. Sector 2 is a 0.35 square mile area where basalt groundwater levels indicate flow is moving outside of the basin and does not discharge to the creek. Sector 3 (32.9 square miles) is oriented to the northern and northeast part of the basin. Sector 4 is in the part of the watershed where pumpage effects (even with deeper wells) could be propagated to the South Fork of Cowiche Creek.

In 2022, Cowiche Creek had 3 active meters in Section 1 and 17 active meters in Sector 3, which made up 7.7% of the total active meters for the YCWRS. The total water usage for Cowiche Creek was

54,140 cubic-feet, which was 6.4% of the total water usage for YCWRS in 2022. Also, there were 10 unbuilt, permitted structures pending.

Wide Hollow/Ahtanum

The Wide Hollow/Ahtanum Domain includes 91.5 square miles within the Wide Hollow Creek drainage area and the Ahtanum Creek drainage area outside of the lands of the Confederated Bands and Tribes of the Yakama Nation. The domain was divided into two sectors. Sector 1 is the Ahtanum Creek drainage area (20.8 square miles) above what is termed ‘the Narrows.’ At the terminus of the Narrows, the creek debouches onto the floodplain composed of the mapped alluvial unit (Jones and others, 2006).

In 2022, Wide Hollow/Ahtanum had 43 active meters in Sector 2, which made up 16.4% of the total active meters for the YCWRS. The total water usage for Wide Hollow/Ahtanum was 158,277 cubic-feet, which was 18.7% of the total water usage for YCWRS in 2022. Also, there were 33 unbuilt, permitted structures pending.

Moxee

The Moxee Domain includes 104 square miles. The domain is divided into three sectors. Sector 1 (49 square miles) includes the small sliver of lands west of the Yakima River and the part of the Moxee valley that encompasses the Selah-Moxee Irrigation District and much of the Roza Irrigation District. Sector 2 (11.5 square miles) abuts sector 1 to the east, and contains the remaining part of the Roza Irrigation District that is in the valley, which was not included in sector 1. Sector 3 (43.5 square miles) is the remaining part of the relevant land in the Moxee Domain.

In 2022, Moxee had 18 active meters in Sector 1 and 2 active meter in Sector 2 and 1 active meter in Sector 3, which made up 8% of the total active meters for the YCWRS. The total water usage

for Moxee was 87,288 cubic-feet, which was 10% of the total water usage for YCWRS in 2022. Also, there were 21 unbuilt, permitted structures pending.

Rattlesnake Hills

The Rattlesnake Hills Domain includes 246 square miles. The domain was divided into two sectors; one sector is north of the Roza Irrigation District on the upper slopes of Rattlesnake Hills and the second sector encompasses the irrigation districts and most of the developed or developable relevant lands.

In 2022, Rattlesnake Hills had 78 active meters in Sector 1 and 0 active meter in Sector 2, which made up 30% of the total active meters for the YCWRS. The total water usage for Rattlesnake Hills was 218,014 cubic-feet, which was 26% of the total water usage for YCWRS in 2022. Also, there was 37 unbuilt, permitted structures pending.

Mabton

The Mabton Domain is 40.9 square miles, which includes the area north of Horse Heaven Hills (defined by the ridge line), east of the Yakama Nation boundary, south of the Yakima River, and west of the Yakima-Benton County line.

In 2022, Mabton had 9 active meters, which made up 3.5% of the total active meters for the YCWRS. The total water usage for Mabton was 23,096 cubic-feet, which was 2.7% of the total water usage for YCWRS in 2022. Also, there were 1 unbuilt, permitted structures pending.

Meters in Each Domain

Figure 2 below shows the number of active meters in each domain that was active during the 2022 year. Figure 3 shows the total number of active meters for the YCWRS at the end of each year.

Figure 2: 2022 Active Meters in Each Domain

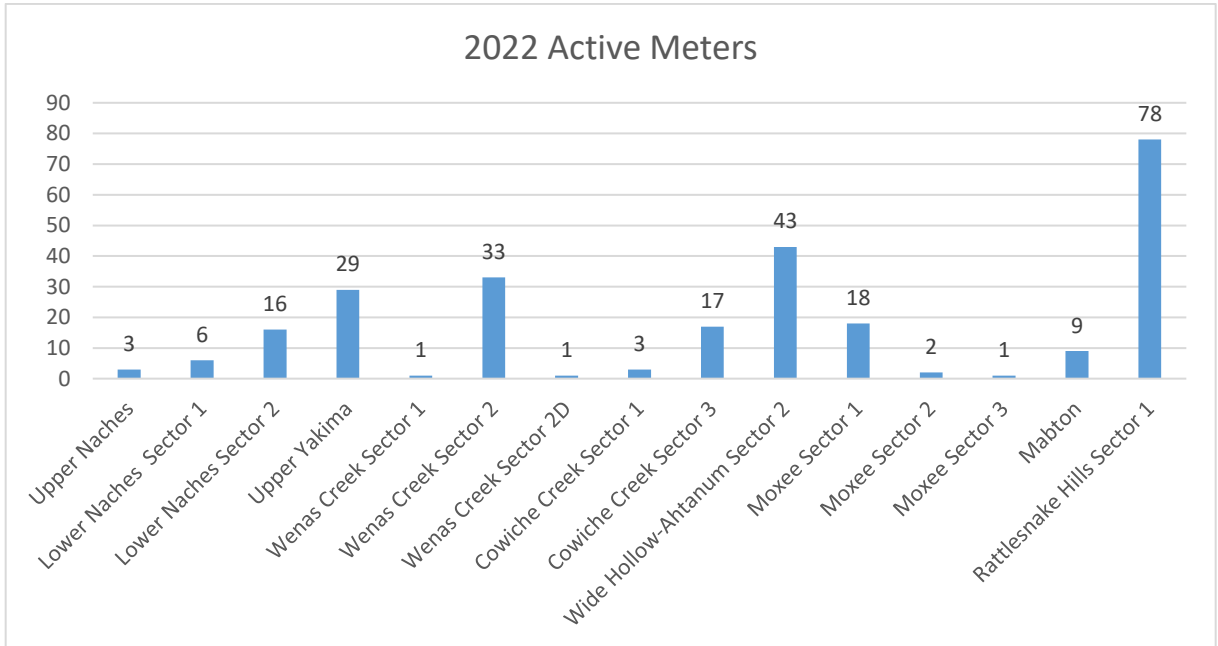
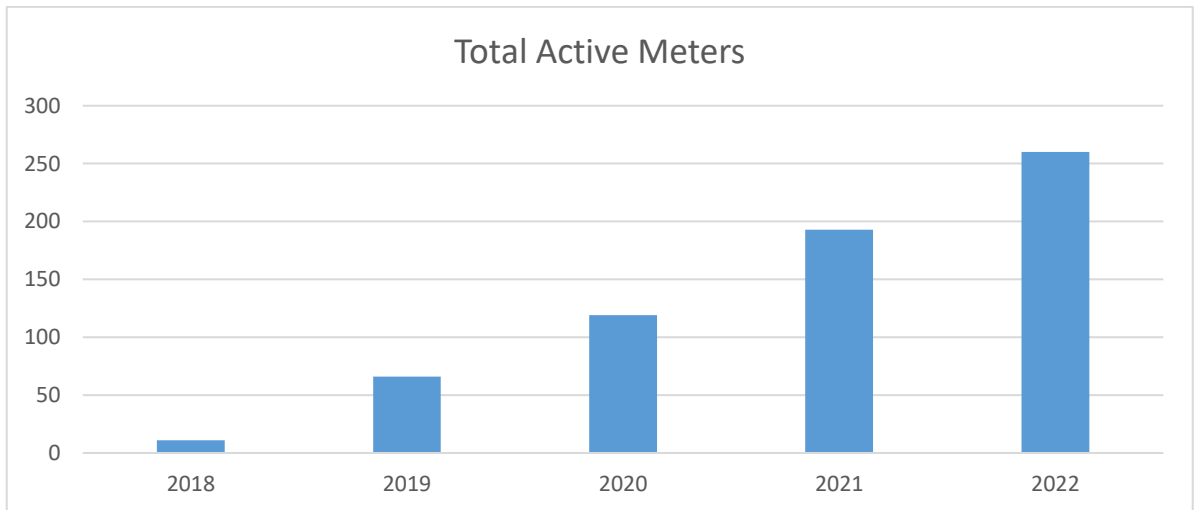


Figure 3: Number of Active Meters by Year



YCWRS Water Usage

Because the basin is closed and the surface water resources of the area are completely apportioned, future domestic development will depend largely upon the availability and proper utilization of ground water. The availability of ground water could be a limiting factor in future population growth within Yakima County.

To properly evaluate and manage the water resources and rights associated with the YCWRS, meters have been placed on each of the domestic wells. These meters reading data is the main factor in understanding the ground water use within the YCWRS.

Usage data was compiled from field readings of the meters. Water meter readings were first gathered in June of 2018. Figure 4, Figure 5, and Figure 6 shows the monthly total usage for 2019, 2020, and 2021. Figure 7 collects each of these years monthly usage data into a single graph for comparison. Figure 8 provides the yearly consumptive usage metered from 2018-2020.

Figure 4: 2020 YCWRS Monthly Total Usage

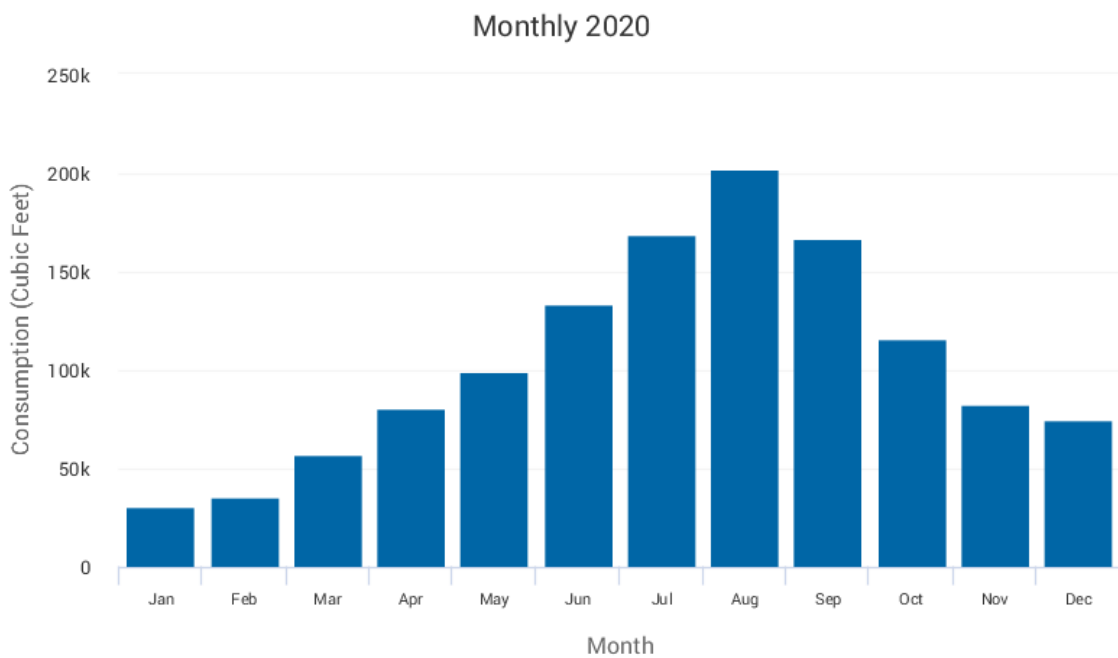


Figure 5: 2021 YCWRS Monthly Total Usage

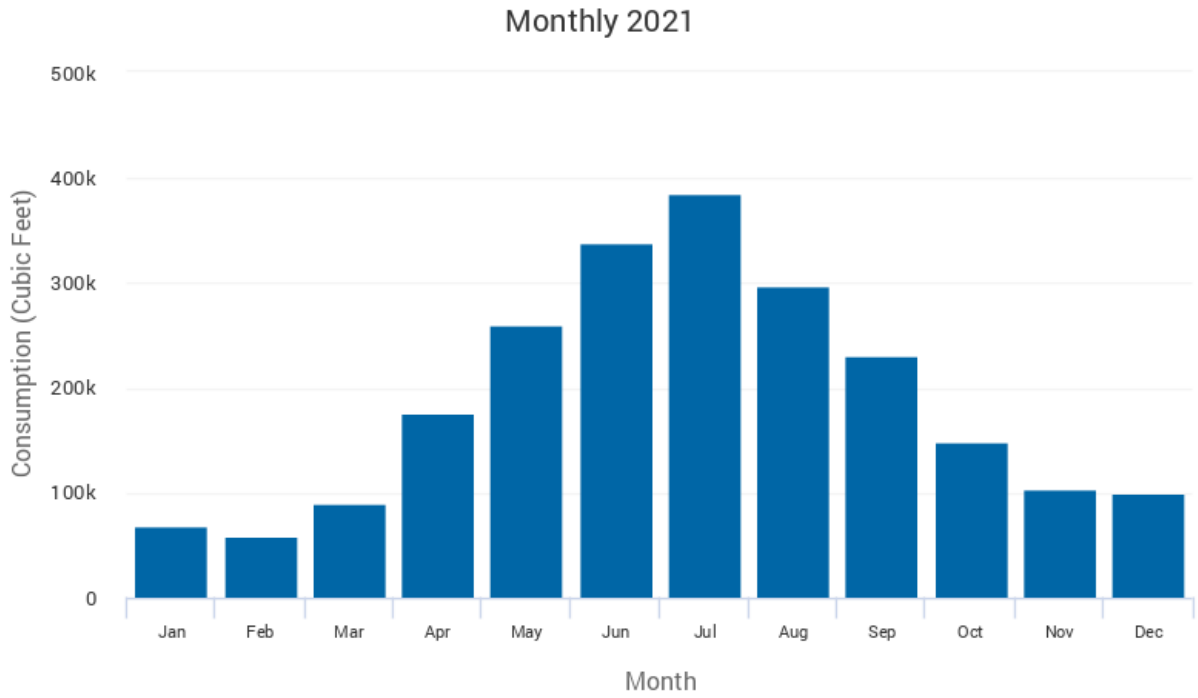


Figure 6: 2022 YCWRS Monthly Total Usage

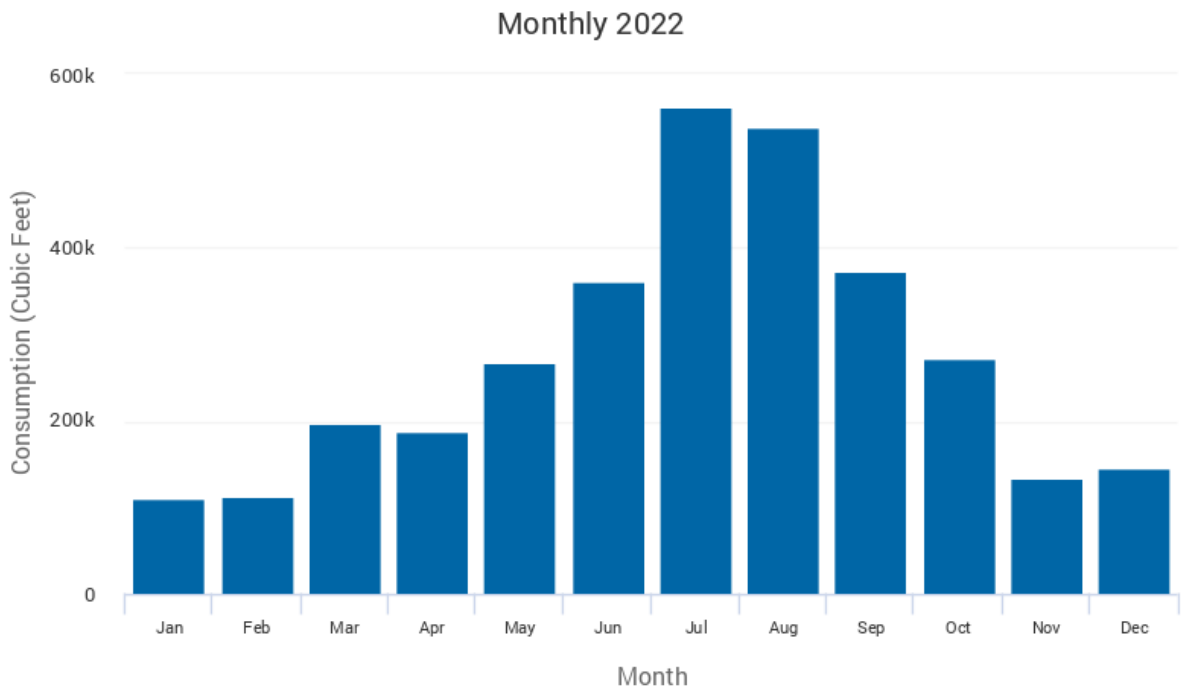


Figure 7: 2018-2022 YCWRS Monthly Total Usage

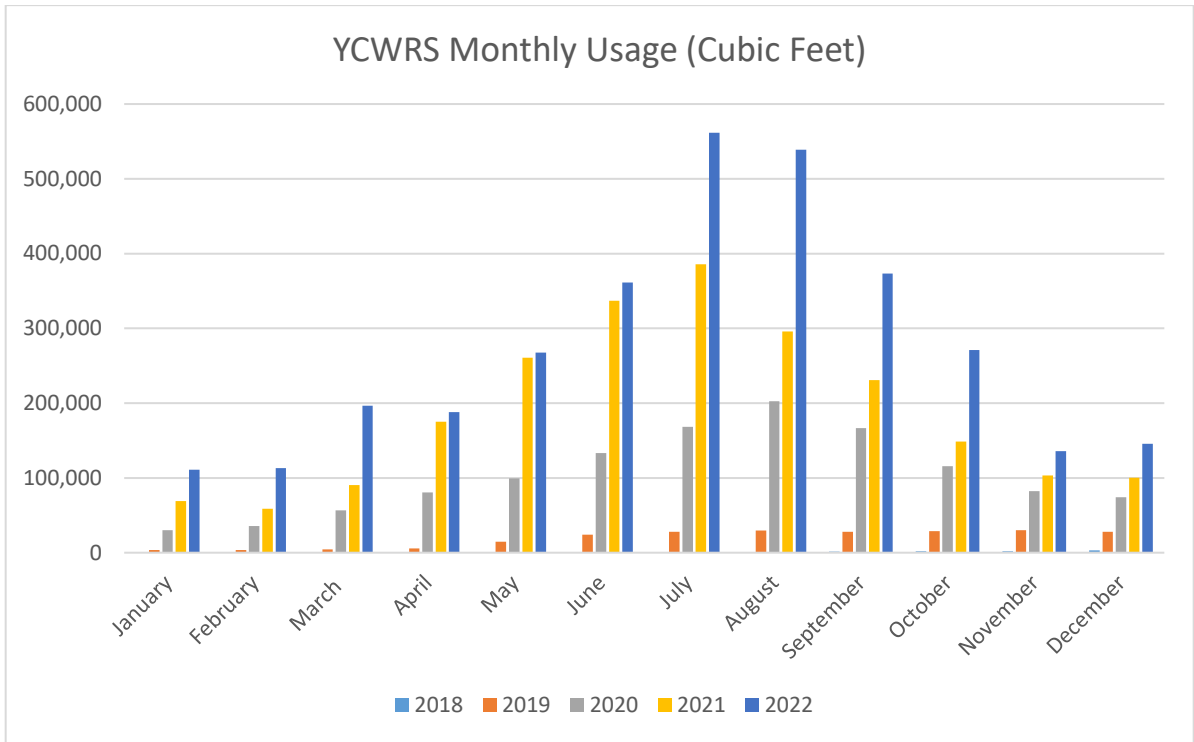
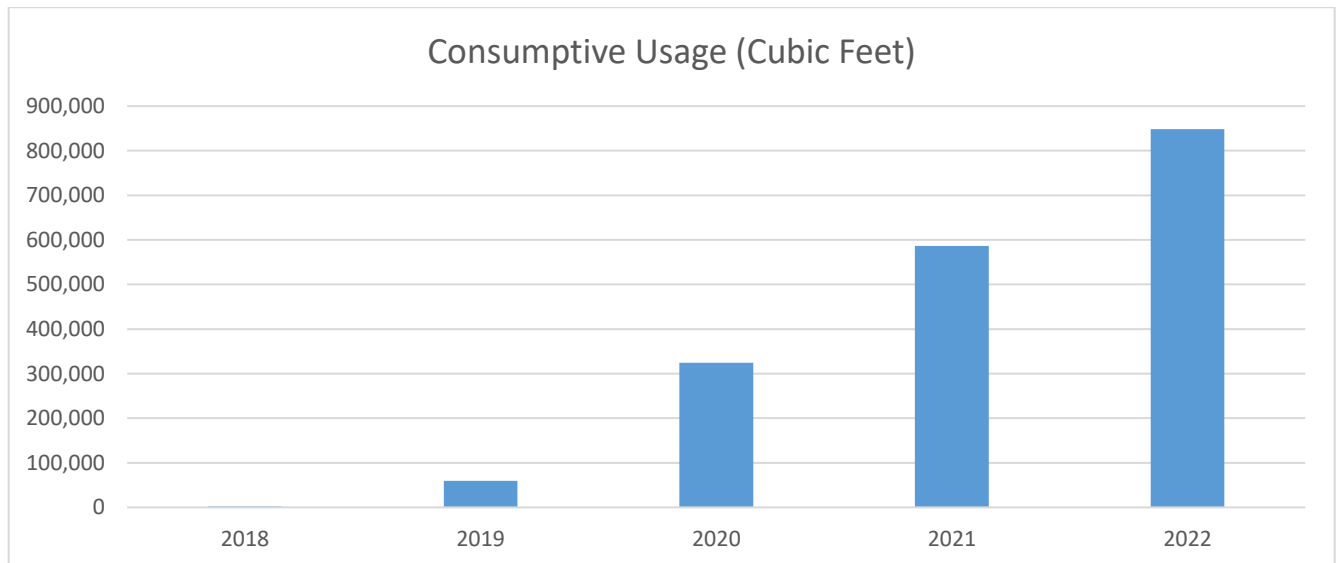
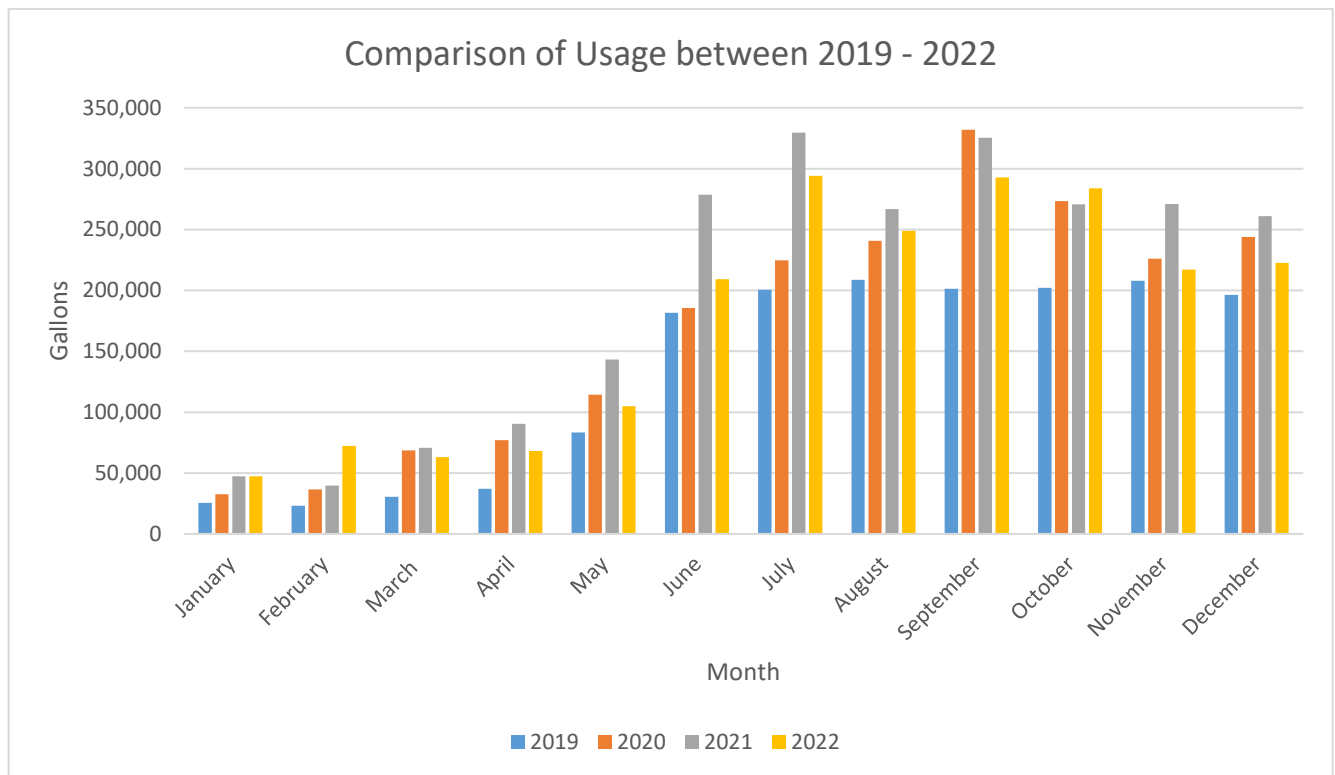


Figure 8: Consumptive Usage 2018-2022



Domestic water use in a home is dynamic. Water usage may go up or down based upon weather, for example. To better understand the usage trend within the YCWRS a comparison was made between a set of identical meters for 2019 and 2020. To make sure that each was consistent the comparison was only made between those meters that had full months of water usage to compare between. For example, if a meter was installed partway through October of 2019 only the water usage values from November and December of 2019 was compared to the November and December 2020 and 2021 values. Figure 9 shows this comparison between 2019 and 2020 and 2021 usage at identical meters.

Figure 9: Comparison of Usage between 2019 – 2022



Description of Water Rights and Overall Usage

Domestic water use includes both indoor use and outdoor use at a residence. The most common indoor water use includes usage such as: drinking, food preparation, washing dishes and clothes,

bathing, and flushing toilets. Outdoor usage commonly includes items such as: watering lawns and gardens, maintaining pools, or watering other landscape features. Some of the water domains within YCWRS are also within irrigation districts. Homes within an irrigation district have access to irrigation water and will likely only use irrigation water for outdoor usage.

Groundwater domestic usage estimates initially relied on the Washington Department of Health estimate that average residential use is 350 gallons per day (0.39 acre-foot per year). This was later confirmed through looking at average use calculations for existing customers in the Terrace Heights region between 1998 and 2012. Other primary information used in the initial analysis included: Land Ownership and Land Use Authority, Land Use/Zoning, Major Water District Boundaries, Census Data, Existing Residences and Residential-Land Undeveloped Parcels, Location of Irrigation Districts and Canals/Laterals, Points of Diversion for Surface Water-Allowable Quantity and Priority Date, Fish Coverages, Hydrogeology, Groundwater Levels, Well Records, Pumpage Records, Groundwater Recharge, and Building Permit Trends.

The report *Assessment of the Availability of Groundwater for Residential Development in the Rural Parts of Yakima County Washington* by J.J. Vaccaro estimates that the demand of 350 gallons per day likely could be reduced by about 57% for new residences in irrigation districts. For estimating future usage of permitted structure inside an irrigation district a value of 210 gallons per day, which is 60% of 350 gallons. This includes the 57% estimated reduction and further reduced to 40% as an added safety factor. This is in line for what was seen in the Terrace Heights water system. Between 2014 and 2017, the annual average daily use for customers that have access to irrigation water was 212 gallons per day.

All applicants for a building permit or other development permit requiring potable water must provide evidence of an adequate water supply that is “Water Budget Neutral” to the county prior to the issuance of the permit.

“Water Budget Neutral” is withdrawal of water whose impact to area streams and senior water rights is mitigated by water from existing senior water rights being left in-stream. The consumptive use (amount of water not returned to rivers and streams) does not exceed the amount of water of these existing water rights.

Consumptive use of the water right for residential connections is estimated to be 26% of total use.

YCWRS has a total of 6.14 million cubic feet (141 Acre-Feet) per year of water rights. This includes 4.83 million cubic feet (111 Acre-Feet) per year of water right from the Boise-Cascade purchase and 1.3 million cubic feet (30 Acre-Feet) of water rights related to the purchase made at the Nile Landslide area. Water rights were also a portion of a land purchase near Highway 12 & Ackley Road (parcels 18130941008, 18130941009, 18131032002, 18131032004), but are still pending adjudication before the amount of water rights can be officially determined.

Table 1: Water Rights in YCWRS System

Water Rights (Consumptive Use Available) per Year		
	Acre-Feet	Cubic Feet
Boise-Cascade	111	4,835,160
Nile Landslide	30	1,306,800
Highway 12 & Ackley (Pending)	Pending	Pending
TOTAL	141	6,141,960

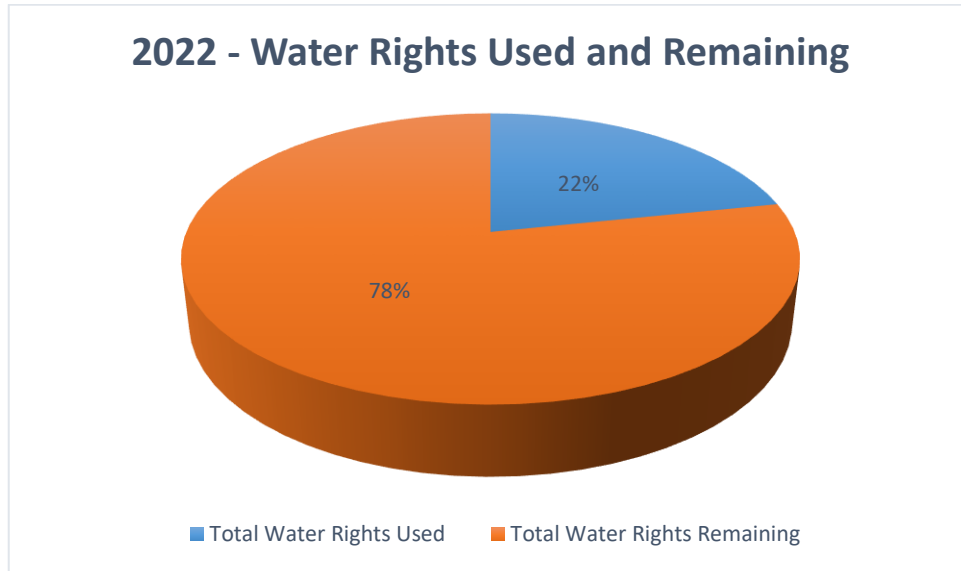
In order to understand the YCWRS usage compared to water rights available, the collected metered usage was converted to a consumptive usage figure by multiplying by 0.26 to get the estimated 26% of metered usage considered consumptive. Also, each year there are a number of structures that have obtained permits for future building, but have not completed any structures. For these approved future connections an estimated demand of 350 gallons per day is held in reserve if the connected parcel is located outside of an irrigation district. For approved future connections within an irrigation district an estimated demand of 210 gallons per day is held in reserve. Currently there is no distinguishing between the type of structure or typical usage, so it is generally assumed that these figures are conservative as some of the future connections will be low consumptive use, such as for a single restroom in a connected ADU.

Table 2 provides a table comparing the metered consumptive use and estimate use for future connections against the available water rights.

Table 2: Water Rights vs. Consumptive Use & Reserved

	2018	2019	2020	2021	2022
Consumptive Use Metered	2,381	59,831	324,299	586,207	848,645
Estimated Consumptive Use of Approve Future Connections	61,841	160,264	249,106	444,210	485,147
Water Rights Available (Cubic Feet)	4,835,160	4,835,160	6,141,960	6,141,960	6,141,960
Estimated % of Water Rights Used	1%	5%	9%	17%	22%

Figure 10: 2021 Water Rights Used and Available



Capacity for Future Connections

The goal of the YCWRS is to provide a continuous supply of water rights for new development within Yakima County. The current and future water needs for the YCWRS will help guide a range of possible water resources management actions. Capacity for future connections is especially important in assessment of future water rights needs. Being able to identify and quantify current and future water needs is an important factor to guide when to purchase additional water rights.

Water needs and supply demands during deficiencies, such as during a drought, may change over time. Tracking these numbers throughout the life of the YCWRS can help to understand how some needs for water may decline, while others may increase.

YCWRS is a younger system, having started in 2018. With only a few years worth of data there is little confidence on whether these years will be representative for the system in the long term. However, the trendline of 2018 to 2022 data indicates the current water rights could supply the system up to 9 years (until 2032).

Appendix A

Below is a collection of additional data collected for each domain within YCWRS.

Table 3: Total Active Meters

Domain	Total Active Meters				
	2018	2019	2020	2021	2022
Upper Naches					
Upper Naches	0	0	0	2	3
Lower Naches					
Sector 1	1	1	2	5	6
Sector 2	3	9	12	13	16
Upper Yakima River					
Upper Yakima	3	11	15	22	29
Wenas Creek					
Sector 1					1
Sector 2	1	7	10	24	33
Sector 2D					1
Cowiche Creek					
Sector 1				3	3
Sector 3	1	4	8	8	17
Wide Hollow-Ahtanum					
Sector 2	2	9	16	29	43
Moxee					
Sector 1	0	3	8	15	18
Sector 2				1	2
Sector 3	0	1	1	1	1
Mabton					
Mabton	0	3	6	8	9
Rattlesnake Hills					
Sector 1	0	18	41	62	78

Table 4: Yearly Metered Water Usage

Domain	Yearly Water Usage (Cubic Feet)				
	2018	2019	2020	2021	2022
Upper Naches					
Upper Naches				8,687	21,197
Lower Naches					
Sector 1	221	9,311	9,312	13,691	44,989
Sector 2	4,784	27,050	82,589	164,451	236,473
Upper Yakima River					
Upper Yakima	1,056	43,428	90,212	224,255	456,202
Wenas Creek					
Sector 1					17,427
Sector 2	897	33,162	107,185	349,370	405,312
Sector 2D					2,361
Cowiche Creek					
Sector 1				22,640	39,250
Sector 3	641	7,545	28,713	122,389	168,981
Wide Hollow-Ahtanum					
Sector 2	1,559	17,086	105,256	279,222	608,759
Moxee					
Sector 1	0	7,175	90,690	153,184	295,633
Sector 2				5,653	7,656
Sector 3	0	318	47,968	49,299	32,436
Mabton					
Mabton	0	23,478	77,388	103,348	88,831
Rattlesnake Hills					
Sector 1	0	61,564	607,992	764,107	838,514

Table 5: Yearly Consumptive Usage Estimated from Meters

Domain	Yearly Consumptive Usage (Cubic Feet)				
	2018	2019	2020	2021	2022
Upper Naches					
Upper Naches				2,259	5,511
Lower Naches					
Sector 1	57	2,421	2,421	3,560	11,697
Sector 2	1,244	7,033	21,473	42,757	61,483
Upper Yakima River					
Upper Yakima	274	11,291	23,455	58,306	118,613
Wenas Creek					
Sector 1					4,531
Sector 2	233	8,622	27,868	90,836	105,381
Sector 2D					614
Cowiche Creek					
Sector 1				5,886	10,205
Sector 3	167	1,962	7,465	31,821	43,935
Wide Hollow-Ahtanum					
Sector 2	405	4,442	27,367	72,598	158,277
Moxee					
Sector 1	0	1,866	23,579	39,828	76,865
Sector 2					1,991
Sector 3	0	83	12,472	12,818	8,433
Mabton					
Mabton	0	6,104	20,121	26,871	23,096
Rattlesnake Hills					
Sector 1	0	16,007	158,078	198,668	218,014
Sector 2					