

WATER RESOURCES REPORT FOR THE VILLAS AT CLAREMONT RANCH

NOVEMBER 2020

Prepared for:

Phi Real Estate Services, LLC
200 W. City Center Dr. Ste 200
Pueblo, CO 81003

Prepared By:



**WATER RESOURCES REPORT
FOR
THE VILLAS AT CLAREMONT RANCH**

A. Summary of the Proposed Subdivision:

The Villas at Claremont Ranch Lincoln Commons is a 10.17-acre subdivision within a portion of the southwest quarter of section 4 and northwest quarter of section 9, Township 14 south, Range 65 west of the 6th P.M. in El Paso County, Colorado. The site is located at the northeast corner of the intersection of Marksheffel Road and Meadowbrook Parkway. Proposed development includes 83 single family residential townhome units.

This site lies within the Cherokee Metropolitan District service area. Cherokee metropolitan District is identified by the El Paso County Water Master Plan as projected growth area region 5 (Cherokee Metropolitan District) as identified in the El Paso Water and wastewater service are to be provided by Cherokee Metropolitan District.

Additionally, the District is implementing a water conservation plan to address future development within the District and pursuing conservation measures with current customers. A copy of the water conservation plan has been included in the appendix.

The Cherokee Metropolitan District has an adequate water supply to meet the demands of the Villas at Claremont Ranch Development on a 300-year basis.

The parcel is a replat of Tract ‘A’ and Tract ‘G’ previously studied in the ‘Master Water Resources Report and Wastewater Report’ for Claremont Ranch Filing 7 &8’, prepared by Matrix Design Group.

B. Determination of Sufficient Quantity of Water:

1. CALCULATION OF WATER DEMAND:

Proposed development includes 83 single family residential townhome units.

Anticipated residential water demand is approximately 223 GPD/household (0.25 AC-FT/YR). This results in the following quantities:

(223 GPD/household) X (83 households)	=	18,509 GPD
	=	20.75 AC-FT/YR
Irrigation use	=	4.00/AC-FT/YR
TOTAL USE	=	24.75 AC-FT/YR

The open space area of this site encompasses 5.67 acres or 58% of the total site area. Anticipated irrigation of common areas will be 4.0 AC-FT/YR.

Anticipated irrigation use of common landscape areas was provided by Project Planner/Landscape Consultant. This opinion of probable residential water demand is made on the basis of experience

and qualifications and represents Catamount Engineering's best judgment as an experienced and qualified professional firm, familiar with the construction industry. Catamount Engineering cannot and will not guarantee that actual water demand will not vary from this opinion of probable water demand.

2. *Calculation of Water Available:*

- a. The Villas at Claremont Ranch is to be served by the Cherokee Metropolitan District water system. Catamount Engineering has obtained a letter of commitment from the District. *(Included in Appendix)*
- b. A map of the existing and proposed water system is provided with the Preliminary Plan submittal.
- c. There are no groundwater sources on this site.
- d. The site was previously included in the "Master Water Resources Report and Wastewater Report" for Claremont Ranch Filing 7 & 8"

C. Determination of Sufficient Dependability of Water Supply:

1. Water rights - water supply is to be provided by the Cherokee Metropolitan District.
2. Financial plan and capital improvement plan from water provider - water supply is to be provided by Cherokee Metropolitan District.
3. Water supply is to be provided by Cherokee Metropolitan District. The subdivision is within the Cherokee metropolitan District service boundary. The proposed water system will connect to the existing water system in Meadow Brook Parkway (see utility map).
4. There are no wells proposed on this site.
5. Catamount Engineering has obtained a letter of commitment from Cherokee Metropolitan District.
6. Short term water supplies for use during construction operations (construction meters) shall be provided by Cherokee Metropolitan District.

The Cherokee Metropolitan District (CMD) is located in unincorporated El Paso County east of the city of Colorado Springs. CMD provides water and sewer service to over 8,000 residential and commercial accounts. CMD's water supply is entirely sourced from groundwater including the alluvial aquifer in the Upper Black Squirrel Creek Designated Groundwater Basin (UBS Basin), the Denver Basin Aquifers, and the Sand Creek alluvium.

CMD's water supply portfolio is comprised of water rights and contractual interests totaling 5,096 acre-feet per year of water. The sources of CMD's water supply sources fall into five categories:

1. CMD Wells 1-8 (Use within UBS Basin)
2. CMD Wells 9-21 (Exporable to CMD)
3. Cherokee Water LLC
4. Black Forest Wells (Denver Basin Ground Water)
5. Sand Creek Wells (Golf Course Irrigation)

CMD's peak year total demand, to date, was 3040 AFY in 2011. CMD's 2018 Production rate (baseline year provided) was 3024 AFY. Total water rights delineated within the December 2020 Cherokee Metropolitan District Water Resources Report Prepared for the Colorado Division of Water Resources is 4427 AFY.

D. DETERMINATION OF SUFFICIENT QUALITY AND POTABILITY OF WATER:

1. A copy of the Current Cherokee Metropolitan District Water Quality Report has been included in the appendix.
2. The Villas at Claremont Ranch is to be served by the Cherokee Metropolitan District water system. Catamount Engineering has obtained a letter of commitment from the District. *(Included in Appendix)*

E. WATER MASTER PLAN GOALS AND POLICIES:

Goal 1.1 – Ensure an adequate water supply in terms of quantity, dependability and quality for existing and future development.

The development has been incorporated in previous water planning by Cherokee Metropolitan District and service commitment has been provided by the District.

Goal 3.1 – Promote cooperation among water providers to achieve increased efficiencies on infrastructure.

Goal 3.4 – Promote cooperation between water providers to achieve increased efficiencies on storage.

Goal 3.7 – Encourage the interconnection of infrastructure owned by water providers and projects that will have access to more than one water source, both to foster conjunctive use and to better accommodate water supply emergencies.

In order to meet the goals of the County Water Master Plan Section 3 to promote cooperation among water providers to achieve increased efficiencies in infrastructure, treatment, reuse, storage, and interconnection Cherokee Metropolitan District has been included in the Pikes Peak Regional Water Authority to cooperate on future regional water infrastructure development.

Goal 4.5 – Plan for water resources in a thoughtful way that recognizes the non-renewable nature of water resources in the area, accommodates existing and historical uses, and allows for sustainable, planned growth.

The District is implementing a water conservation plan to address future development within the District and implement conservation measures with current customers. A copy of the Water Conservation Plan has been included in the appendix.

Goal 5.1 – Identify the potential water supply gap at projected full development build-out (2060).

Goal 5.2 – Identify regional opportunities and barriers to satisfying water supply needs at full development build-out (2060).

CMD is currently developing several additional water sources to meet future demand. Six groundwater rights are slated for development or upgrade by the end of 2021 (Table 4-2). In

addition to providing water for new users, these additional wells will provide greater flexibility in meeting peak demands.

The Sweetwater #5 Well is a conditional water right that CMD must make absolute by filing an application on or before February 26, 2021. CMD began pumping this well in February of 2020. This well is legally authorized to withdraw a maximum of 290 acre-feet per year pursuant to the final decree in Case No. 05CW6/05CW20.

The Albrecht Well is a recent water rights acquisition made by CMD since the 2016 Report. The well is permitted to withdraw a maximum of 153 acre-feet per year pursuant to Final Permit Nos. 27571 and 27572 (Appendix J). CMD is currently working to connect this well to its supply infrastructure.

The AR-1 right consolidation is a new well permit application for the highly productive Arapahoe Aquifer on the Sundance property made on April 9th, 2020 and approved on June 19th, 2020 as Permit 84421-F. It combined the allocation from the Sundance property with the allocation for the adjacent Shamrock property into one point of diversion.

DA-1 and DA-4 are Dawson Aquifer wells currently drilled on the Sundance property that are currently drilled and awaiting pump installation. These wells will produce water from the Dawson Aquifer pursuant to the plan for augmentation decreed in Case No. 14CW3061.

In addition to these known production improvements CMD also has a pending replacement plan which could enhance the efficiency of CMD's portfolio through recovery and/or reuse of recharge water.

Goal 6.0 – Require adequate water availability for proposed development.

The Cherokee Metropolitan District has an adequate water supply to meet the demands of the Villas at Claremont Ranch Development on a 300-year basis. A commitment letter from the District has been included in the appendix of this report.

APPENDIX



CHEROKEE METROPOLITAN DISTRICT

6250 Palmer Park Blvd., Colorado Springs, CO 80915-2842

Telephone: (719) 597-5080 Fax: (719) 597-5145

February 25th, 2022

Phi Real Estate Services, LLC

200 W City Center Dr. #200

Pueblo, CO 81003

Sent via email: jshagin@nescolorado.com

Re: Water and Sewer Service to **Villas at Claremont Ranch**
Commitment Letter No. **2022-04 (Revised from 2022-03)**

Dear Phi Real Estate Services,

As requested, this document will serve as a formal Letter of Commitment from the Cherokee Metropolitan District to provide municipal water and sewer services for the Villas at Claremont Ranch development located at the northeast corner of Meadowbrook Parkway and Marksheffel Road. The proposed location for this development is located within the District's established boundaries and therefore is eligible for service connections from the District.

Cherokee Metropolitan District staff, along with the developer, have determined that the following will be the total water demand required by this development:

Type of Use	Demand (AF/yr)
Domestic	20.75
Irrigation	4.01
Total	24.8

Based on a conservatively low 0% consumptive use of domestic water, the development is expected to produce 22,000 gallons of wastewater per day, representing 0.9% of CMD's wastewater capacity. This usage is in line with anticipated wastewater demand for this area of the District.

This water commitment is hereby made exclusively for this specific development project at this site within the District. To confirm this commitment you must provide the District with a copy of the final plat approval from El Paso County Development Services within 12 months of the date of this letter. Otherwise, the District may use this allocation for other developments requesting a water commitment. If the subject project is re-platted, you must submit a new commitment request prior to submitting the re-plat to El Paso County, which may result in a recalculation of the water demand for the project.

If I may be of further assistance please contact me at your convenience.

Sincerely,



Amy Lathen
General Manager

Cc: Peter Johnson; Water Counsel w/ encl: sent via email
Steve Hasbrouck; Board President w/ encl: sent via email
Jeff Munger; Water Resource Engineer: sent via email
Kevin Brown; Jr. Engineer: sent via email



CHEROKEE METROPOLITAN DISTRICT

6250 Palmer Park Blvd., Colorado Springs, CO 80915-2842

Telephone: (719) 597-5080 Fax: (719) 597-5145

Water Provider's Supplement to the Water Resources Report for Tract G Claremont Ranch Filing No. 7

Commitment Number 2022-03

February 18th, 2021

This document was prepared to satisfy the requirements of El Paso County for a Water Provider's Report in support of **the development of Tract G of Claremont Ranch Filing 7** at the **northeast corner of Marksheffel Road & Meadowbrook Parkway.**

Introduction

Cherokee Metropolitan District (CMD) is a Title 32 special District which provides water and wastewater to an approximately 5000-acre enclave of unincorporated El Paso county surrounded by the City of Colorado Springs. Currently CMD serves approximately 8000 residential taps and 600 commercial taps in addition to bulk users in eastern El Paso County including Schriever Air Force Base.

CMD water is sourced entirely from groundwater in two regions. The majority is recovered from the alluvial Upper Black Squirrel (UBS) Aquifer in eastern El Paso County through 20 wells. The remainder is sourced from two wells in deep bedrock aquifers in the northern part of the county on the “Sundance Ranch” property. Water from eight of the 20 wells in the eastern part of the county can only be used to serve a fixed set of customers. Water for the main service area of CMD comes only from the remaining 12 wells in UBS along with the two wells in Black Forest.

Calculation of Anticipated Water Demand

Estimated water demand for the proposed development was calculated in two parts: domestic use and irrigation use. Cherokee’s 10 year maximum average per-tap use for single homes similar to the proposed development is 0.25 AFY. The proposed development will include 83 units which yields an expected water supply requirement of 20.75 AFY. Using the County estimate of 2.43 feet of water for traditionally irrigated areas and the developer’s estimate of 1.65 acres of fully irrigated terrain with none of the project area designated for reduced watering yields an outdoor watering demand estimate of 4.01 AFY. The total expected water demand for this development is 24.8 AFY.

Water Supplies

Cherokee has eight wells that are restricted to serving a maximum of 653 AFY to specified in-basin customers. Excess allocation for these wells is unavailable for new developments, even if they are inside the Basin, so this water is tracked separately from CMD’s general supply portfolio. CMD’s other alluvial wells are available for export outside the UBS basin. The total annual volume available to CMD from these exportable supplies is 3,953.5 AFY (Table 1). The physical yield of these wells is significantly higher than their annual appropriation, allowing flexibility in satisfying summer peak demand.

Table 1: Water rights and tributary status of Exportable Wells

Well Number	Water Right (AFY)	2020 Use (AFY)	Permit Number	Aquifer	Aquifer Status
Well 9	176	175	14145-FP-R	UBS Alluvium	Tributary
Well 10	176	143	14146-FP-R	UBS Alluvium	Tributary
Well 11	244	174	6821-FP-R	UBS Alluvium	Tributary
Well 12	244	166	11198-FP	UBS Alluvium	Tributary
Well 13	1268	830	49988-F	UBS Alluvium	Tributary
Well 14	0	0	52429-F	UBS Alluvium	Tributary
Well 15*	281	117	54070-F	UBS Alluvium	Tributary
Well 16*	219	115	54069-F	UBS Alluvium	Tributary
Well 17*	175	123	63094-F	UBS Alluvium	Tributary
Well 18	225	161	16253-RFP-R	UBS Alluvium	Tributary
Well 19	95	65	20567-RFP-R	UBS Alluvium	Tributary
Well 20	400	94	4332-RFP	UBS Alluvium	Tributary
Well 21	258.5	224	81782-F	UBS Alluvium	Tributary
DN-4**	110	88	78315-F	Denver Aquifer	Non-Tributary
AR-1***	347.7	306	75881-F	Arapahoe Aquifer	Non-Tributary
Total	4153.2	2464			

*Wells 15-17 can produce a total of 609 AFY instead of their nominal total of 675 AFY. This limitation is reflected in the 3984.7 AFY total available production.

**CMD holds additional water rights in the Denver Aquifer associated with the Sundance Ranch property but this particular well has a maximum annual recorded yield of 110 AFY.

***As of December 2019 AR-1 has 2040 AF of banked water which allows actual pumping to exceed allocation on a limited basis.

CMD is developing owned water supplies to increase available water and improve flexibility in provision of summer peak flows. The District has a set of owned but undeveloped water rights which can contribute 458 AFY of capacity to the CMD system (Table 2) as they are completed for a total of 4,443.0 AFY. Since 2011, actual demand from CMD customers has fallen 30-35% below commitments, partially due to some currently committed developments being incomplete but largely due to water saving measures undertaken by CMD customers.

Table 2: New water supplies available for connection to system

Well Number	Water Right (AFY)	Permit Number	Aquifer	Aquifer Status
Well 22	153.5	27571-FP	UBS Alluvium	Tributary
DA-1	40.3	83604-F	Dawson	Not Non-Tributary
DA-4	64.5	83603-F	Dawson	Not Non-Tributary
Total	258.3			

CMD has 4,411.5 AFY of exportable water supply available in its portfolio from alluvial and deep bedrock aquifers. Further development in the Denver Basin is not planned at this time and instead CMD is focusing on acquiring new renewable supplies proximate to existing infrastructure.

Water Commitments

CMD’s water commitments stand at 4238.9 AFY before the addition of the proposed development (Table 3). The Tipton and Kane commitments are related to an arrangement from the mid-2000’s where developers reserved commitments on two new wells. The water from these wells is considered fully committed to these developers even if they have not yet begun the projects associated with the reserved commitments. Due to a complex legal history, the “Kane” water right was not tied to a specific physical water well but instead operates as a commitment served from CMD’s general supply portfolio. The “Tipton” water right corresponds to CMD’s Well 18.

Table 3: CMD Commitments before addition of new development

Commitments	AFY
In-District (2015)	2693
Committed Since 2015	626.0
Schriever Air Force Base	537
Kane	200
Tipton	225
Construction	25
Parks	25
Total	4331.0

Water Balance

With 4,411.5 AFY of exportable supply and 4331.0 AFY of commitments, CMD has a water balance of 80.5 AFY before the subject development. After commitment of 24.8 AFY to this development, the District will have 55.7 AFY remaining for additional commitments.

Table 4: Water balance with new development

Water Balance Before New Commitment	80.5 AFY
New Commitment: Tract G Claremont Ranch Filing 7	24.8 AFY
Water Balance Remaining	55.7 AFY

Other Relevant Information

Recent Water Acquisitions/Losses

CMD has not acquired any new water rights since 2015 but has been developing owned water rights. CMD has not engaged in any water trades nor lost any water rights in the last year. The District is not currently under contract to purchase new water rights although CMD is investigating purchases of renewable water rights proximate to its existing infrastructure on an ongoing basis.

New Augmentation Plans

CMD is currently pursuing a replacement plan in partnership with Meridian Service Metropolitan District (MSMD) in order to maximize the efficiency of its water supplies.

Major Water System Capital Improvements

CMD has been actualizing owned water by drilling wells and beginning production on several well sites. In February of 2020 CMD brought its well 21 (81782-F) online after a year of planning and construction. The District recently completed drilling of the Albrecht Well (Well 22) which after connection to the system will contribute 153.5 AFY annually.

CMD is currently preparing to install pumps in two existing wells in the Dawson Aquifer (83603-F & 83604-F). Beyond these projects, additional well construction in the Denver Basin is not anticipated at this time, although CMD has a substantial amount of undeveloped water rights in the Denver Basin Aquifers.

Smaller-scale improvements to the distribution system to improve reliability and resiliency have been ongoing and include deeper computer integration, upgrades to treatment systems, rehabilitation of tanks, and emergency generator refurbishment.



Cherokee Metropolitan District Water Resources Report
Prepared for the Colorado Division of Water Resources

December 2020

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Appendix H: Well 19 Documents

Appendix I: Well 20 Final Decree

Appendix J: Albrecht Well Final Decree

Appendix K: Sundance Augmentation Plan

Summary

This report serves to update to the Colorado Division of Water Resources (DWR) on the water supplies and commitments of Cherokee Metropolitan District (CMD). It is an update and refinement of the Technical Memorandum prepared by Forsgren Associates (2016 Report, Appendix C) which was submitted to DWR on May 18, 2016, and which DWR approved on June 10, 2016. In this report, the supply plan detailed in the 2016 Report has been revised and updated with a greater focus on development of renewable Upper Black Squirrel Creek groundwater rather than nonrenewable Denver Basin groundwater. New water acquisitions have allowed CMD to increase the water supply surplus presented in the previous report, and CMD's water supply planning provides a sustainable path to complete buildout of CMD.

1 Introduction

CMD is located in unincorporated El Paso County immediately east of the City of Colorado Springs. CMD provides water and sewer service to over 8,000 residential and commercial accounts, representing approximately 20,000 residents and 500 businesses. CMD's water supply is entirely sourced from groundwater including the alluvial aquifer in the Upper Black Squirrel Creek Designated Groundwater Basin (UBS Basin), the Denver Basin aquifers, and the Sand Creek alluvium (Figure 1-1).

CMD's water supply portfolio is comprised of water rights and contractual interests totaling 5096 acre-feet per year (AFY) of water. The sources of CMD's water supply sources fall into five categories:

1. CMD Wells 1-8 (Use within UBS Basin)
2. CMD Wells 9-21 (Exportable to CMD)
3. Cherokee Water LLC
4. Black Forest Wells (Denver Basin Ground Water)
5. Sand Creek Wells (Golf Course Irrigation)

CMD's peak year total demand, to date, was 3040 AFY in 2011. These commitments and obligations fall into five categories:

1. In-Basin Use (CMD Wells 1-8)
2. In-District Use (Exportable Supplies, Black Forest Wells, and Cherokee Water LLC)
3. Bulk Customers (Schriever Air Force Base)
4. Non-Potable Irrigation (Sand Creek Wells)
5. Other (Parks Irrigation, Construction, etc.)

Throughout this report, the years of 2011 and 2018 are used as baseline years for production and consumption, respectively. CMD's highest per capita demand on record occurred in 2011 due to dry conditions and a different rate structure so it is a useful benchmark for peak demand. However, CMD's 2011 demand was partially satisfied by an interim water supply agreement between CMD and Colorado Springs Utilities, so 2011 is not the highest period of production for CMD's current water rights portfolio. 2018 is the highest annual production from CMD groundwater rights on record, so this year is a more useful benchmark for comparisons and analyses related to well production.

Figure 1-1: Water System Overview

- District Service Areas
- Production Wells
- Water Transmission Lines
- Treated Effluent Line
- Sewer Conveyance

Sundance Wells
(Denver Basin)

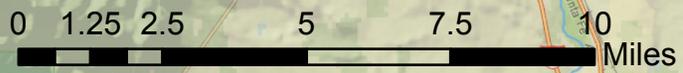
AR-1
DN-4
DA-1
DA-4

Upper Black Squirrel
Designated Basin
Wells

Main District Service
Area

Groundwater
Recharge
Basins

Water
Reclamation
Facility



2 Current Water Supplies

2.1: CMD Wells 1-8 (In-Basin Use)

CMD Wells 1-8 produce groundwater from the UBS Basin alluvial aquifer. Pursuant to a 1999 stipulation with the State and the Upper Black Squirrel Ground Water Management District in Case No. 98CW80, CMD Wells 1-8 can only be used within the legal boundaries of the UBS Designated Basin. In Case No. 15GW15, these wells' annual production was limited to the total annual demand of a fixed list of in-basin customers to a maximum of 653 AFY. As a result, in-basin supplies and demands are tracked separately from all other sources and commitments (Table 1-1). The combined 2018 water demand of in-Basin customers was 456 AFY, 70% of their total commitment.

Table 2-1: CMD Wells 1-8

Well Number	2018 Production (AFY)
Well 1	1.1
Well 2	4.5
Well 3	0.0
Well 4	40.7
Well 5	88.3
Well 6	57.4
Well 7	47.1
Well 8	216.9
Total	455.9

2.2: CMD Wells 9-20 (In-District Use)

CMD Wells 9-20 provide 88% of In-District, Out-of-Basin water supplies. These wells are spread across 20 miles of the UBS Basin (Figure 2-1, Table 2-2). Water levels and physical production rates from these wells have remained stable or improved over the last 10 years.

Table 2-2: CMD Wells 9-20

Well Number	2018 Production (AFY)	Water Right (AFY)	Remainder (AFY) (Production – Water Right)	Percent Used (Production / Water Right) x 100
Well 9	174.5	176	1.5	99%
Well 10	167.1	176	8.9	95%
Well 11	229.4	244	14.6	94%
Well 12	214.6	244	29.4	88%
Well 13	809.3	1268	458.7	64%
Well 14*	0.0	0	0.0	0%
Well 15**	81.1	281	199.9	29%
Well 16**	87.6	219	131.4	40%
Well 17**	102.6	175	72.4	59%
Well 18	144.4	225	80.6	64%
Well 19	60.5	95	34.5	64%
Well 20	186.1	400	213.9	47%
Total	2257.1	3437	1245.9	64% (of total)

*Well 14 has been permanently decommissioned and the water right has been abandoned

**Wells 15-17 can produce a collective total of 609 acre-feet per year. This limit is reflected in the total of all water rights (3,437 AFY).

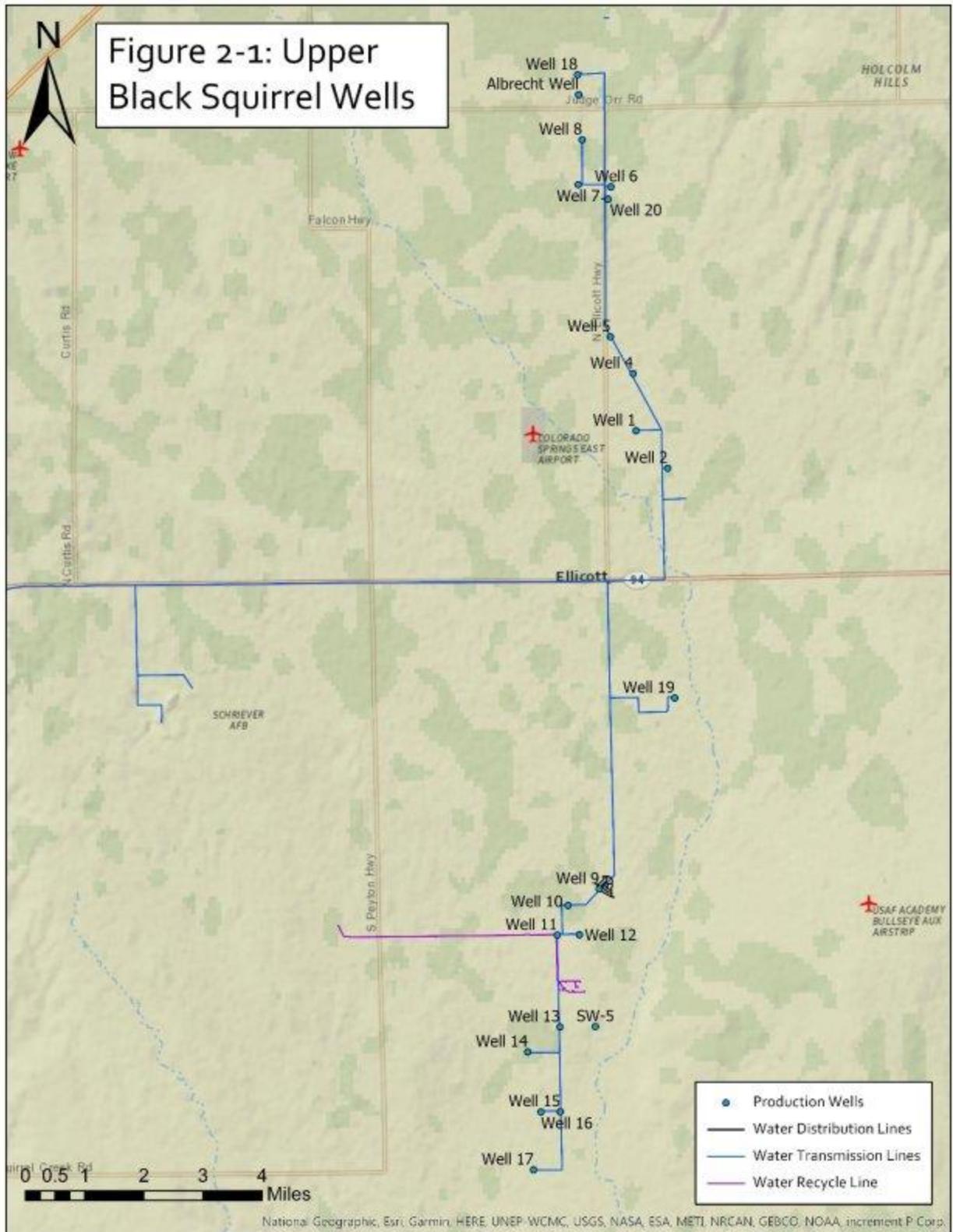


Figure 2-1: CMD Upper Black Squirrel Creek Wells

2.3: Cherokee Water LLC

In 2006, Cherokee Water LLC was formed by CMD and several developers to enable CMD to develop new infrastructure and serve demand from certain proposed developments. Cherokee Water LLC holds title to two water rights that are dedicated to serve specified commitments. The Tipton Right is a permitted right to withdraw up to 225 acre-feet per year from the District's Well 18 in the UBS Basin alluvial aquifer for export and use in CMD. The Kane Right is a contractual water right to the first 200 AFY produced from the collective Sweetwater absolute and conditional rights. DWR's opinion is that the Kane Right does not allow an increase in the production from the Sweetwater points of diversion (Case Nos. 05CW06/05CW20 and 88CW49) or drilling a new point of diversion. Therefore, the actual production for this water right is listed as zero because the commitments associated with this right are supplied from CMD's other Sweetwater rights.

The water rights held by the LLC are reserved for developments on specified areas of land within CMD. Like the in-Basin use of CMD Wells 1-8, this water is tracked separately from CMD's other supplies. Though several of the specified developments have not achieved full buildout as of 2020, CMD considers the full amount of water held by the LLC to be fully committed, and it is not available to other customers or new developments. Water for developments on land specified in the LLC agreements comes from this already-committed volume, and therefore commitments to these developments do not reduce water availability in the general portfolio. However, if a specified development exceeds the amount of water purchased under the original agreements, then the additional water may be supplied from CMD's general portfolio.

Table 2-3: Cherokee LLC Water Rights

Category	Water Rights (AFY)	Commitments (AFY)	Remainder (AFY)
LLC Kane Right	0	200	-200
LLC Tipton Right	225	225	0

2.4: Denver Basin Wells

CMD owns Denver Basin groundwater rights under four parcels of land near the Douglas-El Paso County line (Figure 2-3, Table 2-3). To date, CMD has completed one Denver Aquifer well (DN-4) and one Arapahoe Aquifer well (AR-1) to withdraw these ground water rights. CMD operates a water treatment plant and pump system at the Sundance Ranch at the center of these properties. CMD's water rights for this well field include both nontributary and not-nontributary ground water located outside of a designated basin. An augmentation plan for replacement of depletions associated with withdrawals of not-nontributary water was approved in Case No. 14CW3061 on October 2, 2017. Due to the non-renewable nature of Denver Basin groundwater, CMD plans to use this water source as a bridge supply while developing and acquiring new renewable sources. Once the renewable sources have been developed, CMD plans to use this water as a drought protection supply.

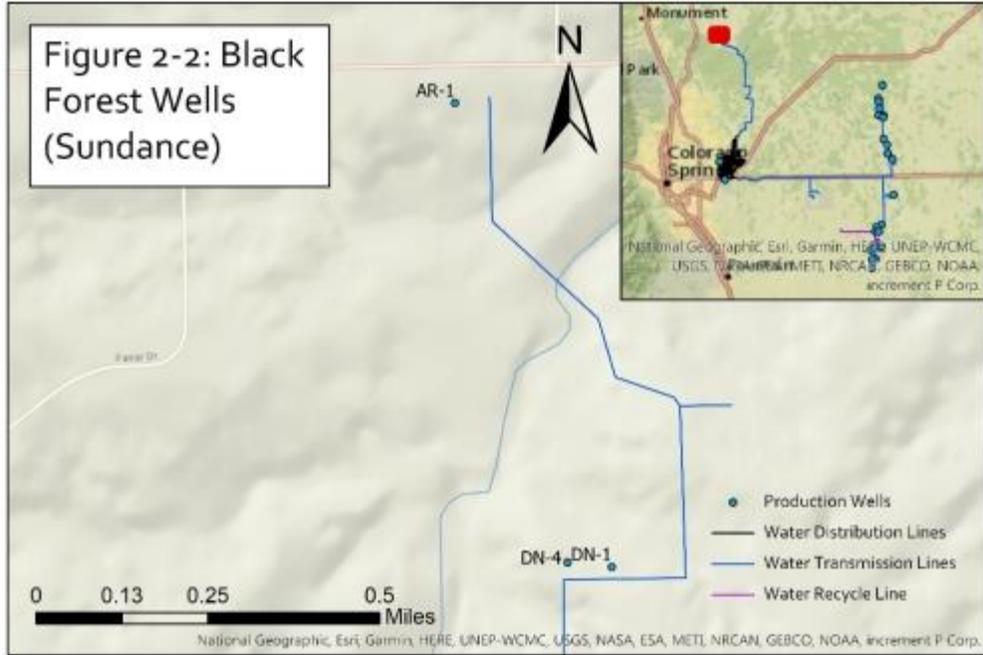


Figure 2-2: Denver Basin wells

Table 2-4: Denver Basin water rights held by CMD. Water rights listed without well numbers do not yet have a well permit.

CMD Well Name/Location	CMD Abbr.	Permit #	Case/Decree Number	Status	Augmentation Status	Water Right (AFY)	2018 Production
Sundance							
Arapahoe	AR-1	84421-F	99CW126	Active	NT	427.7	227.4
Denver 1	DN-1	75882-F		Not Drilled	NT	328.5	0
Denver 2	DN-4	78315-F		Active	NT		83.3
Denver 3					NT		0
Dawson 1	DA-1	83604-F		Drilled, Inactive	NNT	361.3	0
Dawson 2	DA-4	83603-F		Drilled, Inactive	NNT		0
Laramie-Fox Hills						NT	
Shamrock East							
Arapahoe			94CW023		NT	0*	0
Denver 1					NT	600	0
Denver 2					NT		0
Denver 3					NT		0
Denver 4					NT		0

Denver 5				NT		0
Dawson				NNT	591	0
Laramie-Fox Hills				NT	210	0
Shiloh						
Arapahoe			96CW125	NT	220.3	0
Denver 1				NT	350.9	0
Denver 2				NT		0
Denver 3				NT		0
Denver 4				NT		0
Dawson				NNT	423.6	0
Laramie-Fox Hills				NT	136.8	0
County Line						
Arapahoe			96CW110, 96CW169	NT	143	0
Denver 1				NT	209	0
Denver 2				NT		0
Dawson				NNT	261	0
Laramie-Fox Hills				NT	90	0
Total:					4353.1	310.7

*Shamrock Ranch Arapahoe Aquifer rights were combined with the Sundance Arapahoe rights as well permit 84421-F as of June 19th, 2020

The Sundance rights include banked water that began accumulating on the final decree date of Case No. 99CW126 in July of 2000. CMD currently has just over 2,000 AF of banked water in the Arapahoe aquifer, which allows for production above yearly allocations. DWR recently approved a consolidation of this well permit that allows CMD to withdraw the Arapahoe aquifer water rights associated with underlying the adjacent Shamrock East parcel in addition to the Arapahoe aquifer water underlying the Sundance property. This allows for increased production from the Sundance Arapahoe pump well without drawing down banked water reserves.

2.5: Nonpotable Irrigation Wells

Two golf courses are located within CMD boundaries and are served by two separate, non-potable systems drawing tributary water from six wells, Sand Creek Wells 1-8, in the Sand Creek Alluvium (Table 2-4). The use of these wells is designated to irrigation of the two golf courses only and any out of priority depletions are replaced pursuant to the augmentation plan approved in Case No. 09CW115. The production from these wells has been stable over the last decade and is not expected to change.

Table 2-5: Nonpotable Irrigation Wells

	Permit #	Decree	Allocation	WY 2019 Use
SC-1	31777-F	09CW115	125	15.0
SC-2	30957-F	09CW115	125	1.6
SC-3	30956-F	09CW115	125	17.4
SC-4	30955-F	09CW115	125	0.0
SC-5	67221-F	09CW115	322	115.3
SC-6	76859-F	09CW115	322	61.6
Total			1144	210.9

2.6: Water Supply Summary

CMD holds an array of groundwater resources in El Paso County that provide consistent production of high quality water that remains stable during regional drought. The district’s widely spread wells allow for uninterrupted service in the event of electrical or mechanical failures at single or multiple wells.

Table 2-6: Categorical summary of water rights and 2018 production

Category	Water Rights (AFY)	2018 Production (AFY)
CMD Wells 1-8*	653	456
CMD Wells 9-17, 19, 20	3212	2113
Developed Denver Basin**	337	311
LLC Kane Right	0	0
LLC Tipton Right (Well 18)	225	144
Total	4427	3024

*Pursuant to the order in Case No. 15GW15, water from Wells 1-8 in excess of demand is not available to new developments, even if they are in-Basin.

**Total of the highest annual production of each Denver Basin well (Section 2.4). More water rights are available in these aquifers but current production is physically limited to the amount shown here.

3 Commitments

Because CMD Wells 1-8 are restricted to in-Basin use only, CMD generally tracks its customer demand as in-Basin and in-District (out-of-Basin). Schriever Air Force Base is tracked separately as well because it is geographically outside the main district service area but must be served with out-of-Basin, in-District water.

3.1: In-Basin Commitments

CMD Wells 1-8 are limited to a maximum annual production of 653 AFY for a fixed list of in-Basin customers. The maximum deliverable and actual use of in-Basin customers are detailed in Table 3-1.

Table 3-1: In-Basin user commitments and demand in 2011 and 2018, in acre-feet per year

	Allocation	2011 Demand	2018 Demand	% Change
Woodmen Hills	350	358.8	348.3	-3%
Viewpoint/Antelope Acres	50	20.8	19.8	-5%
EPC Telephone	1	0.20	0.02	-90%
Ellicott Springs	60	16.2	16.3	1%
Ellicott School	10	5.4	4.9	-9%
Diamond Moon	2	1.8	2.3	29%
Harding Nursery	180	117.0	107.2	-8%
Total	653	520	499	-4%

3.2: Out of Basin Commitments

Out of Basin demand accounts for 85% of water deliveries and has accounted for all growth since 2006. Out of Basin water is used entirely within CMD's boundaries, the only exception being Schriever Air Force Base (Section 3.3). Out of District demands are billed and tracked by tap size. All tap categories have seen significant reduction in both bulk demand and per tap demand since the high flow year of 2011 (Table 3-2).

Table 3-2: Annual regular in-District use by category*. Commercial, multi-family and irrigation meters range in size from ¾" to 6" but are summarized by a single category in this table

Use Type	Demand (AF)			Demand/Tap (AF)		
	2011	2018	Change	2011	2018	Change
Single-Family	1355.7	1294.2	-5%	0.24	0.21	-14%
Multi-Family	246.4	199.2	-19%	0.27	0.20	-26%
Commercial	420.4	375.4	-11%	1.03	0.78	-25%
Irrigation	144	126	-13%	1.16	0.95	-18%
Total	2166.5	1994.8	-8%			

The 2016 Report calculated a total annual commitment of 2,693 AFY by analyzing the average demand of taps during 2011 (year of highest demand). Since the 2016 Report, an additional 328.2 acre-feet per year has been committed from the exportable water supply portfolio including wells 9-20 and Denver Basin wells while excluding wells 14 and 18 (Table 3-3). Water commitments have also been made from the Kane and Tipton water rights to developments specified in the LLC agreements but these allocations are accounted for in the Kane and Tipton commitments.

Table 3-3: In-District commitments since the 2016 Report, commitments are organized in chronological order of initial application, some have had expiration dates extended

Completed Developments Committed After 2016 Report (volumes in acre-feet per year)					
Commitment Name	Type	General	Kane	Tipton	
King Soopers Commercial Phase 1	Commercial	4.46			
Constitution Apartments	Residential	19	2		
Freedom Springs Apartments	Residential	14.5			
Covert Ops Paintball	Commercial	0.15			
King Soopers Commercial Phase 2	Commercial	4.46			
Space Village Commercial	Commercial	3.44			
Claremont Ranch Filing 9C	Residential	5.94			
Total		51.95	2	0	
Outstanding & Under Construction Commitments Made After 2016 Report					
Commitment Name	Type	General	Kane	Tipton	Status
Meadowbrook Crossing	Residential	36.27			Under Construction
Appaloosa Highway 24 Subdivision	Commercial	1.25			Under Construction
Hannah Ridge Filings 5, 6, 7	Residential		60.5	76	Under Construction
Midtown at Hannah Ridge	Residential	33.84			Under Construction
Claremont Business Park Tract C	Commercial		12.2		Pending; Expires 8-Aug-21
Richmond Homes at Feathergrass	Residential	33.6			Under Construction
DWIRE Storage Yard	Commercial	3.51			Pending; Expires 11-Nov-21
Gardens at North Carefree	Residential	22			Under

					Construction
Mountain States Pipe & Supply	Commercial	0.31			Pending; Expires 13-Jan-21
Claremont Business Park Filing 1C Lots 1 & 2	Commercial	0.64			Under Construction
Solace Apartments Phase 1	Residential	61.8			Pending; Expires 12-Feb-21
Midtown at Hannah Ridge Filing C	Residential	9.24			Pending; Expires 27-May-21
6201 Platte Avenue	Commercial	1.83			Pending; Expires 11-Jun-21
Windermere Subdivision	Residential	68.8			Pending; Expires 11-Jun-21
Meadowbrook Park	Residential	18.7			Pending; Expires 21-Sep-21
Villas at Claremont Ranch	Residential	24.8			Pending; Expires 19-Nov-21
Crossroads Mixed Use	Mixed	84.0			Pending; Expires 8-Dec-21
Total Unbuilt Commitments Since 2015 Report		400.6	72.7	76	
Total Commitments Since 2015 Report		452.5	74.7	76	

The water volumes committed to each development are calculated at the time of plat based on building square footage, intended use, and landscaping square footage. For multi-family developments El Paso County presumptive use values per unit are used. For single-family neighborhoods the single family presumptive use value of 0.31 AFY/SFE (acre-feet per year per Single Family Equivalent) is used as explained in the previous report. Single family use has dropped below this value but this builds a safety factor into residential developments to account for high use years.

3.3: Schriever Air Force Base

CMD provides water to Schriever Air Force Base in eastern El Paso county immediately south of State Highway 94. The base is home to approximately 1,000 personnel around the clock and about 7,000 more during the workday. SAFB consumes about 10% of CMD's total water deliveries and has a commitment of 537 acre feet per year as specified in its original contract (Table 3-4). The population of the base has grown in recent years and is expected to continue growing. Despite this growth, the base itself has consistently reduced overall water consumption since 2011 and the housing has improved water efficiency.

Table 3-4: Schriever Air Force Base use in 2011 and 2018

	2011	2018	% Change
Schriever Air Force Base	246.1	204.0	-17%
Schriever AFB Housing	78.4	86.0	10%
Total	324.5	289.9	-11%

3.4: Other Commitments Including Golf Course Irrigation

CMD maintains several parks within its boundaries which are supplied with potable water from the general system and have collectively reduced water demand from 30 acre-feet in 2011 to 21 acre-feet in 2019. CMD also provides water for construction which can vary substantially year to year but averages to approximately 15 acre-feet per year and has rarely exceeded 25 acre-feet per year. To be conservative, CMD’s demand planning uses a projected annual demand of 25 acre-feet per year for construction.

The two golf courses in the District boundaries consume a large amount of irrigation water but this is provided from a separate, non-potable system (see Section 2.5) and no growth in demand is anticipated. The golf course clubhouses are supplied with potable water from the main potable system and are considered regular commercial customers.

3.5: Commitment Summary

Commitments served from CMD’s exportable water portfolio are summarized in Table 3-5. The Kane and Tipton water commitments are reserved to members of Cherokee Water LLC and are thus considered fully committed despite the fact that construction has not started on several included projects.

Table 3-5: Commitments Summary

Commitments	AFY
In-District (2015)	2693
Committed Since 2015	452.5
Schriever Air Force Base	537
Kane*	200
Tipton*	225
Construction	25
Parks	25
Total	4157.5

*The Kane and Tipton water rights are considered fully committed even though some of the subject developments are not completely developed.

4 Water Balance

4.1: Overview

CMD's water rights exceed its annual commitments, and actual deliveries are significantly lower than these commitments (Figure 4-1). Irrigation scheduling, communication about water scarcity, and a tiered rate system have reduced water use per customer in CMD to among the lowest in the region. Through dry and wet years since 2011, water use per customer has dropped across all customer types, indicating customer-led conservation measures. CMD's acquisition and development of new water rights has placed it in a strong position to better serve current customers and to provide for new customers as the District approaches buildout.

Table 4-1: CMD In-District Water Balance including Schriever Air Force Base. 2018 production indicates actual use in each of these categories in 2018.

Commitments	Legal	2018 Use	Difference
In-District (2015)	2693	1995	-26%
Committed Since 2015	452.5	123	-73%
Schriever Air Force Base	537	252	-53%
Kane*	200	200	0%
Tipton*	225	225	0%
Construction	25	17.1	-32%
Parks	25	21.2	-15%
Total	4157.5	2833	-30%
Supply			
CMD Wells 9-17, 19, 20	3212	2568	-25%
Developed Denver Basin**	258	311	15%
LLC Kane Right	0	0	0%
LLC Tipton Right	225	144	-36%
New Exportable Production 2020	748	0	
Exportable Total	4443	2879	-35%
Balance	285.5	AFY	

*The Kane and Tipton water rights are considered fully committed even though some of the subject developments are not completely developed.

**Denver Basin proven production includes production from banked water in the Arapahoe Aquifer (see Section 2.4).

4.2: Per Capita Water Demand

In the 2016 Report, CMD established an average water demand for planning of 0.31 acre-feet per single-family equivalent (AF/SFE) for single family homes. CMD’s current actual per capita demand is less than this presumed use flow, but this conservative assumed demand remains useful to account for possible increases in outdoor watering in unusually dry summers or possible increases in average persons per household (Table 4-1). This lower flow figure has remained relatively constant through drought and is mainly a result of a more aggressive tiered rate structure implemented 2011-2012 (Figure 4-1). CMD has used 0.31 AFY/SFE to calculate commitment demand for all single family commitments since 2016, and CMD will continue to use this figure for future commitments unless specific features of the development may reduce water usage. CMD may seek to adjust this default figure in future reports for all single family developments in order to better match actual demand.

Table 4-2: Single Family and Multi Family (¾” tap) water use in calendar years 2011 and 2018

	Demand (AF)			Demand/Tap (AF)		
	2011	2018	% Change	2011	2018	% Change
Single Family	1355.7	1294.2	-5%	0.24	0.21	-14%
Multi Family	144.8	134.0	-7%	0.17	0.15	-16%

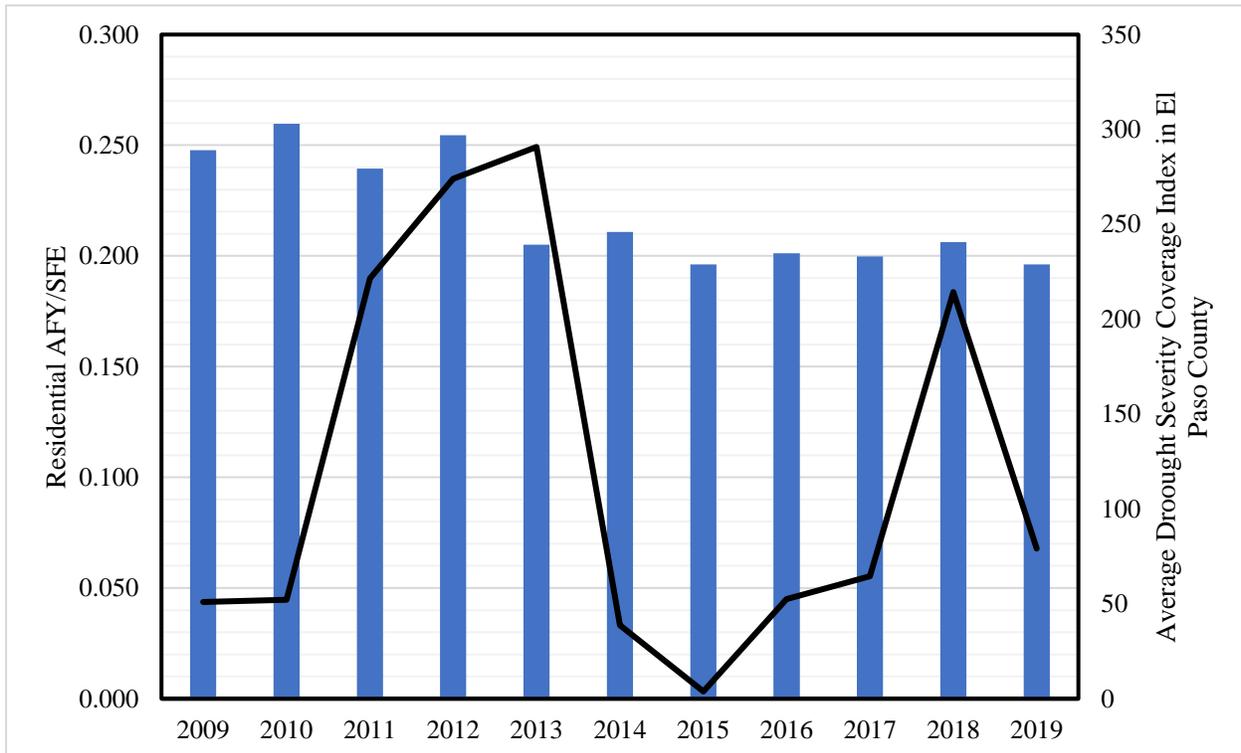


Figure 4-1: Single family water use since 2009 in blue compared to Drought Severity Coverage Index for El Paso County in black. In this index 0 is no drought in the county and 500 is stage 4 drought covering the entire county

Residential developments comprise the bulk of CMD’s water deliveries and new commitments but commercial users have also seen a drop in actual water demand since 2011. New commercial commitments are estimated using development size and industry-specific American Water Works Association (AWWA) water demand averages.

4.3: Future Water Supply Development

CMD is currently developing several additional water sources to meet future demand. Six groundwater rights are slated for development or upgrade by the end of 2021 (Table 4-2). In addition to providing water for new users, these additional wells will provide greater flexibility in meeting peak demands.

Table 4-3: Water supply development projects slated for construction or upgrade by 2021

	Decreed (AFY)	Planned (AFY)	Timeframe
Sweetwater #5 Well	290.0	290.0	2020
Albrecht Well	153.5	153.5	2021
AR-1 Right Consolidation	280.0	200.0	2020
DA-1	180.7	40.3	2021
DA-4	180.7	64.5	2021
Total	1452.9	748.3	

The Sweetwater #5 Well is a conditional water right that CMD must make absolute by filing an application on or before February 26, 2021. CMD began pumping this well in February of 2020. This well is legally authorized to withdraw a maximum of 290 acre-feet per year pursuant to the final decree in Case No. 05CW6/05CW20.

The Albrecht Well is a recent water rights acquisition made by CMD since the 2016 Report. The well is permitted to withdraw a maximum of 153 acre-feet per year pursuant to Final Permit Nos. 27571 and 27572 (Appendix J). CMD is currently working to connect this well to its supply infrastructure.

The AR-1 right consolidation is a new well permit application for the highly productive Arapahoe Aquifer on the Sundance property made on April 9th, 2020 and approved on June 19th, 2020 as Permit 84421-F. It combined the allocation from the Sundance property with the allocation for the adjacent Shamrock property into one point of diversion.

DA-1 and DA-4 are Dawson Aquifer wells currently drilled on the Sundance property that are currently drilled and awaiting pump installation. These wells will produce water from the Dawson Aquifer pursuant to the plan for augmentation decreed in Case No. 14CW3061.

In addition to these known production improvements CMD also has a pending replacement plan which could enhance the efficiency of CMD’s portfolio through recovery and/or reuse of recharge water.

4.4: Undeveloped and Other Future Supplies

CMD holds undeveloped groundwater rights that may be developed in the future (Table 4-3). CMD is also actively pursuing additional purchases of renewable water rights in the Upper Black Squirrel Aquifer, with a general goal of acquiring an additional 200-500 AFY within the next decade.

Table 4-4: Undeveloped CMD Water Rights

	Amount (AFY)	Plans
Sundance Ranch Denver Basin	477	Production increases in existing wells are planned
Other Owned Denver Basin	4042	Currently not planned for development, except as future replacements for current Denver Basin wells
Additional Renewable Supplies	200-500	Acquire additional rights as available
Replacement Plan	Unknown	Replacement plan will allow for reuse of a portion of recharged water

4.5: Future Demand

CMD has 432 acres of developable land with no outstanding commitments, constituting 10% of total district area. To estimate the future water demand for this area, CMD first examined undeveloped land area in the district and compared its zoning composition to CMD's overall zoning composition. Although the undeveloped area contains a higher proportion of industrial and commercial zoning than CMD as a whole, and while these land use types generally require more water than residential use, in CMD the demand-per-acre for commercial and industrial uses is on average lower than that of residential. Therefore, to be as conservative as possible, CMD extrapolated the demand associated with single-family detached homes to the entire undeveloped area. CMD concluded that its production must increase by approximately 240 acre-feet per year to serve this undeveloped area.

Though the anticipated demand of undeveloped area falls slightly under the projected surplus, CMD is continuing to explore new water supplies in order to provide a factor of safety for zoning changes of undeveloped land as well as densification of developed land. An increase of water use intensity on properties within the District is unlikely in the near term but as housing and land costs continue to increase in El Paso County redevelopment of existing single family detached subdivisions into higher density developments is possible in the future.

4.6: Future Water Balance

The full-buildout demand (an additional 240 AFY) described above is less than the surplus projected by the end of 2021, meaning CMD is well-situated to serve the needs of its entire district. Nonetheless, CMD is pursuing purchases of additional water supplies as they become available in order to further increase this surplus, provide greater redundancy, and support higher

density development. CMD is not currently pursuing new acquisitions of Denver Basin groundwater, but it may continue to develop current holdings in those aquifers.

5 Conclusion

With its ongoing efforts to develop existing water supplies, CMD will be well-situated to serve its growing demand as it approaches total buildout of its boundaries with a water surplus of 285.5 acre-feet per year. CMD will continue to acquire new renewable water supplies as they become available, and it is moving forward with a replacement plan that will allow it to increase the overall efficiency of its system. In addition to providing for buildout demands, these water supplies will further increase CMD's operational surplus, provide greater redundancy, and provide for higher density development within the district. With connections to Colorado Springs Utilities, Woodmen Hills Metropolitan District, and Meridian Service Metropolitan District, CMD's infrastructure could facilitate regional water sharing agreements as El Paso County population growth continues.