

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

NOVEMBER 2020

Prepared for:

MORLEY COMPANIES INC.  
20 Boulder Crescent, Suite 200  
Colorado Springs, Co 80903

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 6<sup>th</sup> 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

November 19<sup>th</sup>, 2020

**RODO Investments LLC**

**20 Boulder Crescent, Ste 200**

**Colorado Springs, CO 80903**

*Sent via email: [david@catamounteng.com](mailto:david@catamounteng.com)*

*Original to follow by US Mail*

Re: Water and Sewer Service to **Villas at Claremont Ranch**  
Commitment Letter No. **2020-13**

Dear David Mijares,

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 located at the northeast corner of Marksheffel Road and Meadowbrook Parkway. 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 occupancy:

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

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 Hashbrouck; Board President w/ encl: sent via email  
Kevin Brown; Jr. Engineer





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

December 2020

## Table of Contents

1	Introduction.....	2
2	Current Water Supplies.....	4
2.1:	CMD Wells 1-8 (In-Basin Use) .....	4
2.2:	CMD Wells 9-20 (In-District Use) .....	5
2.3:	Cherokee Water LLC .....	7
2.4:	Denver Basin Wells.....	7
2.5:	Nonpotable Irrigation Wells.....	9
2.6:	Water Supply Summary .....	10
3	Commitments.....	11
3.1:	In-Basin Commitments .....	11
3.2:	Out of Basin Commitments.....	11
3.3:	Schriever Air Force Base .....	13
3.4:	Other Commitments Including Golf Course Irrigation.....	14
3.5:	Commitment Summary .....	14
4	Water Balance.....	15
4.1:	Overview .....	15
4.2:	Per Capita Water Demand.....	16
4.3:	Future Water Supply Development.....	17
4.4:	Undeveloped and Other Future Supplies .....	18
4.5:	Future Demand.....	18
4.6:	Future Water Balance.....	18
5	Conclusion .....	19

## Table of Figures

<b>Figure 1-1:</b> Cherokee Metropolitan District map with important regions highlighted.....	3
<b>Figure 2-1:</b> CMD Upper Black Squirrel Creek Wells .....	6
<b>Figure 2-2:</b> Denver Basin wells .....	8
<b>Figure 4-1:</b> Single family water use since 2009 .....	16

## Table of Tables

<b>Table 2-1:</b> CMD Wells 1-8 .....	4
<b>Table 2-2:</b> CMD Wells 9-20 .....	5
<b>Table 2-3:</b> Cherokee LLC Water Rights .....	7
<b>Table 2-4:</b> Denver Basin water rights held by CMD .....	8
<b>Table 2-5:</b> Nonpotable Irrigation Wells .....	10
<b>Table 2-6:</b> Categorical summary of water rights and 2018 production .....	10
<b>Table 3-1:</b> In-Basin user commitments and demand in 2011 and 2018, in acre-feet per year ....	11
<b>Table 3-2:</b> Annual regular in-District use by category .....	11
<b>Table 3-3:</b> In-District commitments since the 2016 Report.....	12
<b>Table 3-4:</b> Schriever Air Force Base use in 2011 and 2018 .....	14
<b>Table 3-5:</b> Commitments Summary .....	14
<b>Table 4-1:</b> CMD In-District Water Balance.....	15
<b>Table 4-2:</b> Single Family and Multi Family.....	16
<b>Table 4-3:</b> Water supply development projects slated for construction or upgrade by 2021 .....	17
<b>Table 4-4:</b> Undeveloped CMD Water Rights .....	18

## **Table of Appendices**

Appendix A: CMD Well Production 2010-2019

Appendix B: CMD User Demand 2011-2019

Appendix C: 2016 Report

Appendix D: In-Basin Wells 15GW15

Appendix E: Wells 9-12 90GW05

Appendix F: Wells 13-17, 21 05CW06

Appendix G: Well 18 Documents

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).

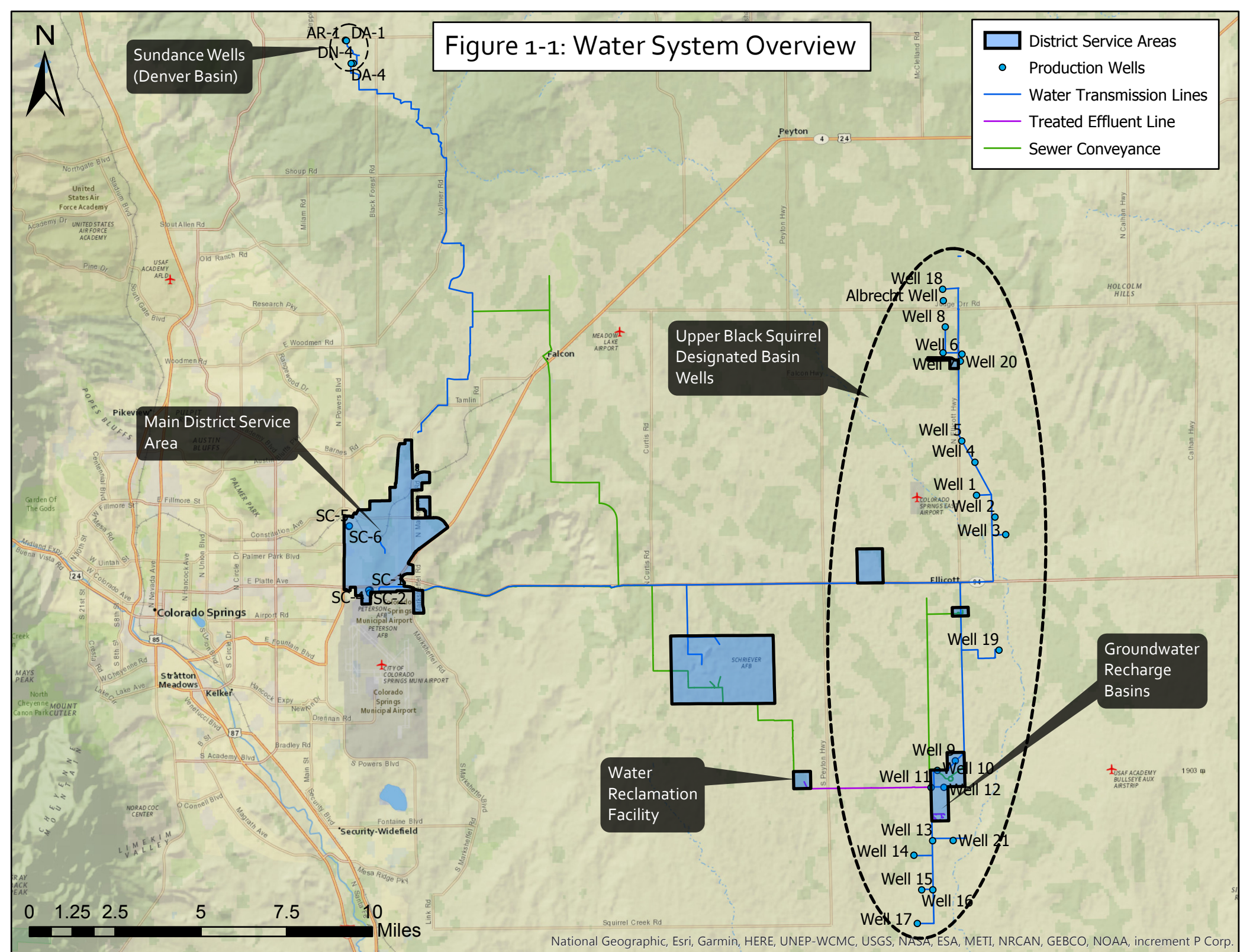
CMD's water supply portfolio is comprised of water rights and contractual interests totaling 5096 acre-feet per year (AFY) of water. The sources of CMD's water supply sources fall into five categories:

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.



## 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
<b>Total</b>	<b>455.9</b>



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

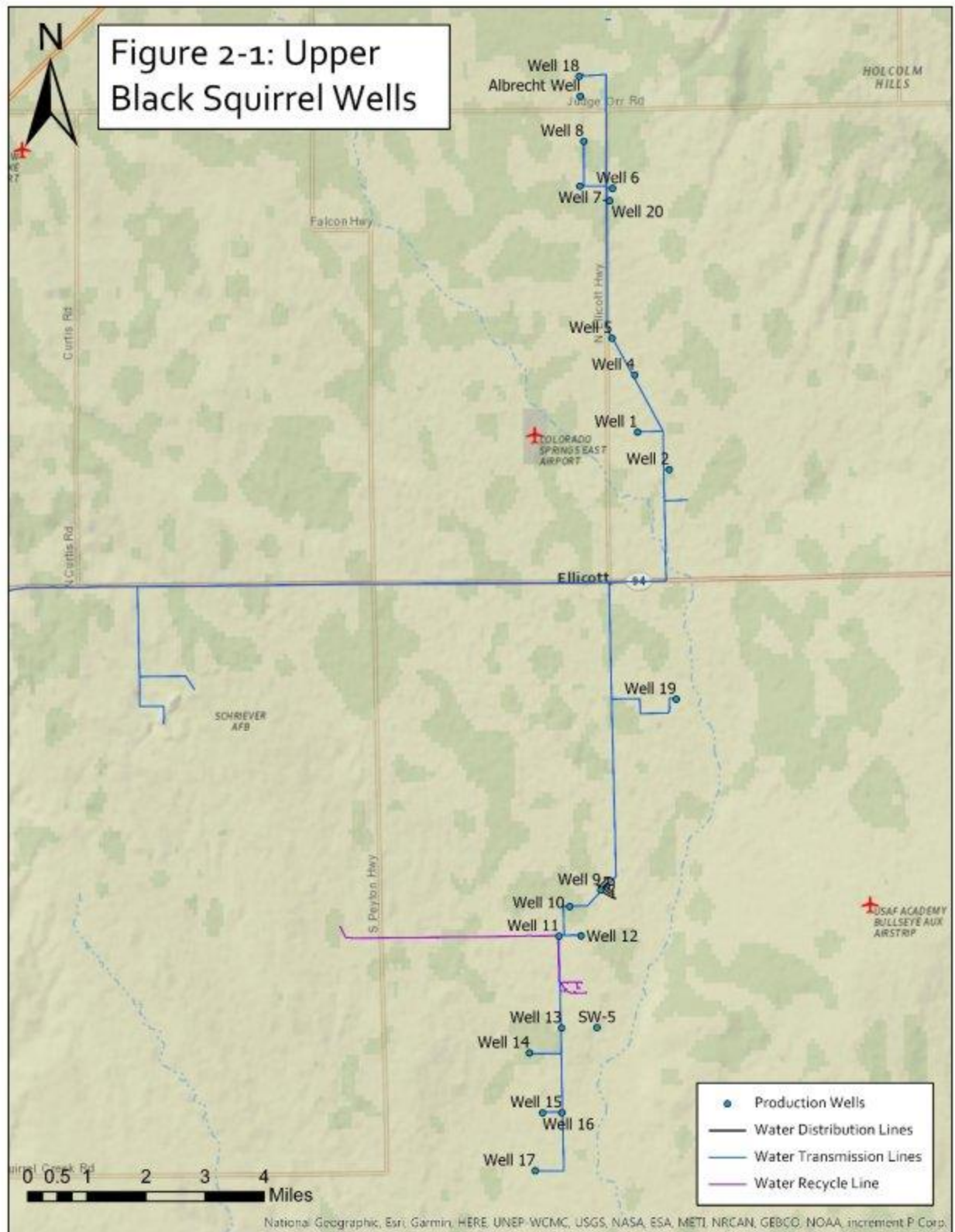
CMD Wells 9-20 provide 88% of In-District, Out-of-Basin water supplies. These wells are spread across 20 miles of the UBS Basin (Figure 2-1, Table 2-2). Water levels and physical production rates from these wells have remained stable or improved over the last 10 years.

**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%
<b>Total</b>	<b>2257.1</b>	<b>3437</b>	<b>1245.9</b>	<b>64% (of total)</b>

\*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.

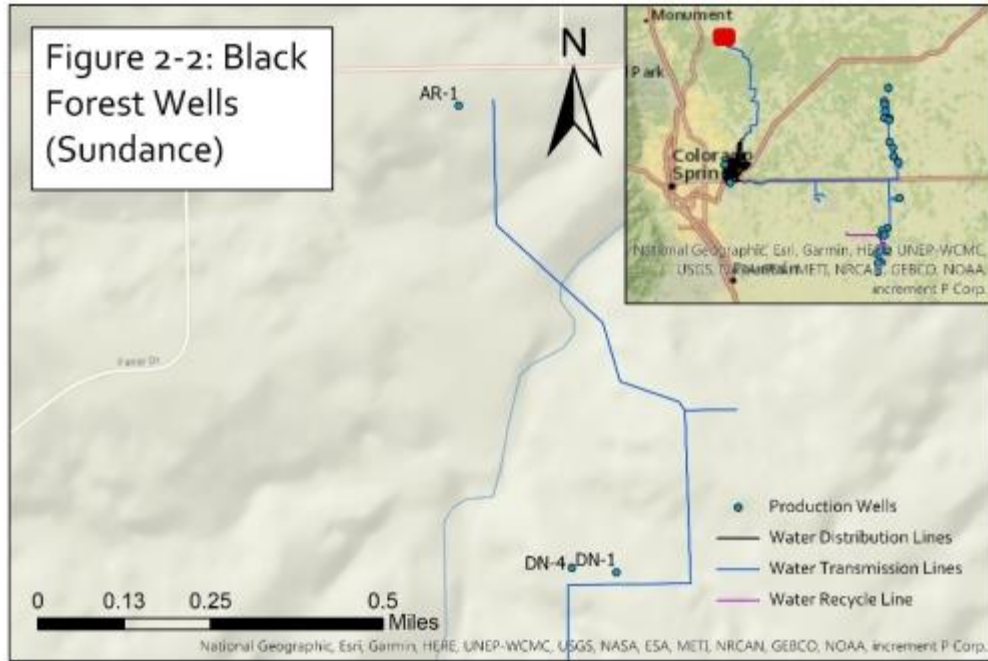
The water rights held by the LLC are reserved for developments on specified areas of land within CMD. Like the in-Basin use of CMD Wells 1-8, this water is tracked separately from CMD's other supplies. Though several of the specified developments have not achieved full buildout as of 2020, CMD considers 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		0
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
<b>Shiloh</b>						
Arapahoe				NT	220.3	0
Denver 1				NT	350.9	0
Denver 2				NT		0
Denver 3			96CW125	NT		0
Denver 4				NT		0
Dawson				NNT	423.6	0
Laramie-Fox Hills				NT	136.8	0
<b>County Line</b>						
Arapahoe				NT	143	0
Denver 1				NT	209	0
Denver 2			96CW110, 96CW169	NT		0
Dawson				NNT	261	0
Laramie-Fox Hills				NT	90	0
<b>Total:</b>					<b>4353.1</b>	<b>310.7</b>

\*Shamrock Ranch Arapahoe Aquifer rights were combined with the Sundance Arapahoe rights as well permit 84421-F as of June 19<sup>th</sup>, 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
<b>Total</b>			<b>1144</b>	<b>210.9</b>

## 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
<b>Total</b>	<b>4427</b>	<b>3024</b>

\*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%
<b>Total</b>	<b>653</b>	<b>520</b>	<b>499</b>	<b>-4%</b>

#### 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%
<b>Total</b>	<b>2166.5</b>	<b>1994.8</b>	<b>-8%</b>			

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			
<b>Total</b>		<b>51.95</b>	<b>2</b>	<b>0</b>	
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
<b>Total Unbuilt Commitments Since 2015 Report</b>		<b>400.6</b>	<b>72.7</b>	<b>76</b>	
<b>Total Commitments Since 2015 Report</b>		<b>452.5</b>	<b>74.7</b>	<b>76</b>	

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%
<b>Total</b>	<b>324.5</b>	<b>289.9</b>	<b>-11%</b>

### 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
<b>Total</b>	<b>4157.5</b>

\*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%
<b>Total</b>	<b>4157.5</b>	<b>2833</b>	<b>-30%</b>
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	
<b>Exportable Total</b>	<b>4443</b>	<b>2879</b>	<b>-35%</b>
<b>Balance</b>	<b>285.5</b>	<b>AFY</b>	

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

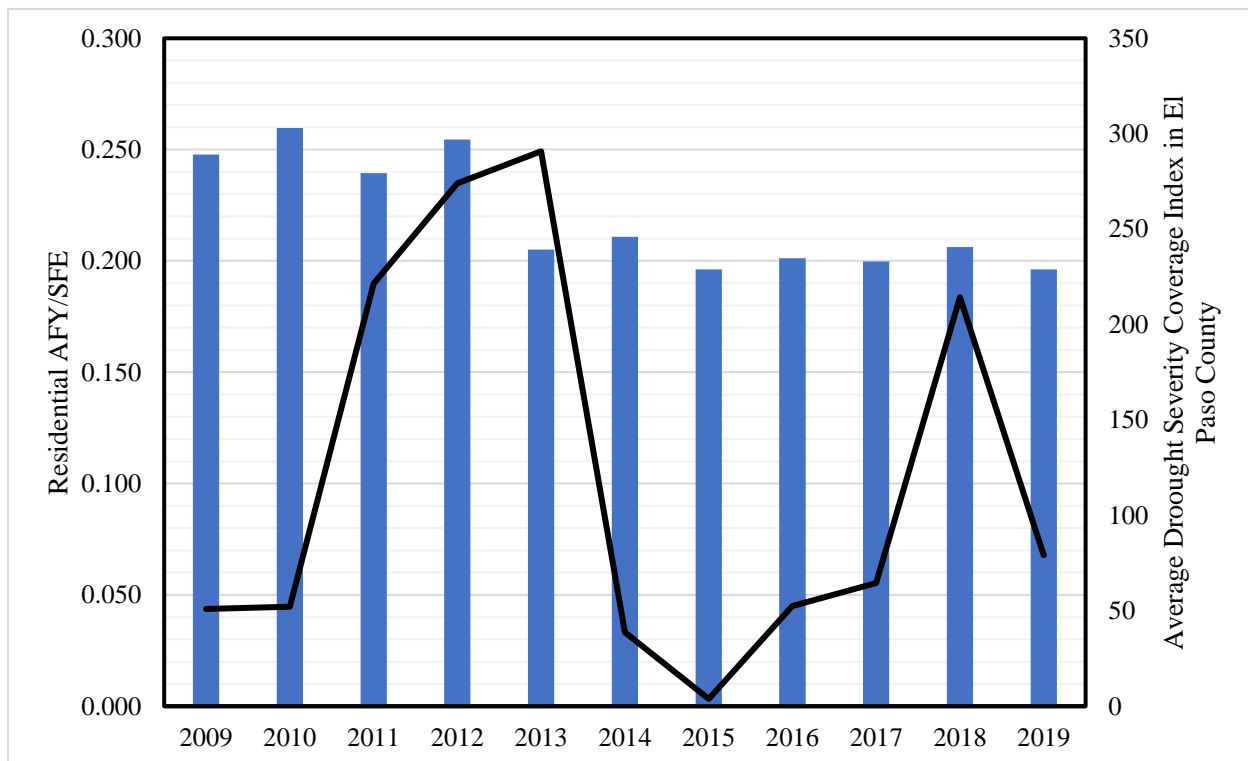
\*\*Denver Basin proven production includes production from banked water in the Arapahoe Aquifer (see Section 2.4).

## 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 ( $\frac{3}{4}$ " 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
<b>Total</b>	<b>1452.9</b>	<b>748.3</b>	

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 19<sup>th</sup>, 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.