WATER RESOURCES REPORT – COPPER CHASE AT STERLING RANCH

TOPICAL REPORT RSI-3232

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EXECUTIVE SUMMARY

This report is a resubmittal for Copper Chase at Sterling Ranch, also known as parcels 5 and 6 in the Sterling Ranch overall planning map. The land is to be provided central water and sewer services through the Sterling Ranch Metropolitan District (SRMD, Sterling). It should be noted that SRMD is one of the Districts which make up the newly-formed Falcon Area Water and Wastewater Authority (FAWWA), which will become the overall service entity for, not only the Sterling Ranch Metropolitan District, but also the Retreat and the future Ranch.

It is expected that an urban residential home in the Retreat at Copper Chase at Sterling Ranch will require an average of 0.353 annual acre-feet, which is the adopted user characteristic for FAWWA and SRMD. This is consistent with historic needs for nearby developments.

Copper Chase includes 138 single-family homes and a small corner park. **The resulting water demand is 142.92 single-family equivalents (SFEs), or 50.45 acre-feet. It should be noted that this development had a previous *Finding of Sufficiency* from the Division of Natural Resources, dated March 27, 2019, for a slightly different density.**

Appendix F is an accounting of active water commitments, which total 380.23 acre-feet including Copper Chase. With the recently completed case 02CW3059, which adds certain on-site non-tributary water and also augments on-site not non-tributary water, the current available water supply for FAWWA or SRMD is now 697.39 acre-feet $_{300\ year}$.

There is more than sufficient water supply to meet the needs of Copper Chase at Sterling Ranch on the 300-year basis.

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1.0 INTRODUCTION

The purpose of this study is to provide a preliminary outline of the water resources and wastewater needs that would be necessary for the Copper Chase at Sterling Ranch development.

1.1 NEW DEVELOPMENT DESCRIPTION

The Copper Chase at Sterling Ranch development consists of approximately 261 acres located east of Vollmer Road and north of Woodmen Road, and approximately 7 acres west of Vollmer Roadd allocated for Lots 11 and 12, which owned by Jacob Decoto, in Sections 27 & 28, Township 12 South, Range 65 West of the 6th P.M.

Appendix A contains the *Overall Service Area Map* for FAWWA, which includes SRMD.

Appendix B contains the *Tract Exhibit* for Copper Chase at Sterling Ranch.

2.0 PROJECTION OF WATER NEEDS

2.1 ANALYSIS OF WATER NEEDS

It is expected that the residential lots on central water will be developed with single-family housing with anticipated turf grass landscaping. The expected water demands are shown below:

138 SFE lots at 0.353 annual acre-feet (AF) yields 48.71 annual AF

1.39-Acre Corner Park at 50% active landscaping coverage yields 1.74 AF

Table 1. Projected Water Demands for Overall Copper Chase at Sterling Ranch

# of Units or SFE	Land Use	Water Use Per Unit (AF/Unit)	Annual Demand (AF)	Average Daily Flow (ADF) (GPD)	Maximum Daily Flow (MDF) (@2.45 x ADF) (GPD)	Peak-Hour Flow (@ 1.5 x MDF) (GPM)
138	Residential	0.353	48.71	43,485	106,539	111
	1.39-acre Park Effective Area 50%	2.50	1.74	1,553	3,804	4

The total annual demand of Copper Chase is 50.45 AF.

3.0 WATER RIGHTS AND SYSTEM FACILITIES

3.1 WATER RIGHTS

Water rights adjudications have been decreed by the State of Colorado, Water Division 2 District Court, Water Division 1 District Court, and the Colorado Groundwater Commission. The comprehensive rights for the FAWWA service include both decrees and determinations. Local groundwater rights are associated with the service area components, Sterling, and the Retreat. Each of these sites has existing decrees and/or determinations outlining the rights associated with the development lands.

The most recent water rights added to the Sterling Ranch Inventory is case 20 CW 3059, included in **Appendix C.** This case adjudicates certain groundwater on an adjacent 97-acre parcel known as the Schmidt property, and also provides for the augmentation of Denver and Arapahoe not non-tributary water on the Schmidt and Sterling Ranch properties. This addition will allow for an additional 283.16 $AF_{300\ year}$ to be made available through Sterling Ranch wells.

In addition to groundwater adjudicated under the various service areas, Sterling has contracted for numerous off-site groundwater acquisitions, which include three major sites. These contractual arrangements allow for Sterling Ranch to "take down" or purchase inventories over time to match needs as growth occurs.

Table 2 on the following page details all of the water rights currently available for the FAWWA service area.

draft see below sheets

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Update March, 2022

Table 2
Falcon Area Water and Wastewater Authority
Comprehensive Water Supply Inventory
Current Legal Supply

Land Formation/Aquifer	Reference Finding/ Determination/ Decree	Tributary Status	Volume	Annual Allocation 100 Year	Annual Allocation 300 Year	Approved Well Locations	Notes	Saturated Sand Thickness	Saturated Specific Yield
			Acre-Feet	A-F/Year	A-F/Year				
Currently Available On-Site Sterling Water Legal Sources									
Laramie Fox Hills	86-CW-19 08CW113	NT NT	53,900 40	539.00 0.40	179.67 0.13	KLF-1 - KLF-4	Under 1410 acres Under 41.44 acres, reduced to 1.44 acres	255	15%
Arapahoe	86-CW-18	NT	57500	575.00	191.67	KA-1 - KA-4	Under 1410 acres	240	17%
					371.47				
Available On-Site Augmented Sterling Water Legal Sources (Note 2)									
Laramie Fox Hills	20CW 3059	NT	2780	27.80	9.27		97.54 acres SR Quarry (Note 5)	190	
Arapahoe	20CW 3059	NNT	4320	43.20	14.40	**Augmented via Same Case**	97.54 acres SR Quarry (Note 5)	260.5	
Denver	20CW 3059	NNT	4895	48.95	16.32	**Augmented via Same Case**	97.54 acres SR Quarry (Note 5)	295.2	
Denver	08CW113 Aug 20CW 3059	NNT	72893	728.93	242.98	**Augmented via Pending Case**	Sterling Ranch 1410 acres		
Arapahoe	08CW113 Aug 20CW 3059	NNT	60	0.60	0.20	**Augmented via Pending Case**	Sterling Ranch 41.44 reduced to 1.44 acres		
					283.16				
Currently Available On-Site Retreat Water Legal Sources (Note 1)									
Laramie Fox Hills	17CW3002	NT	6,440				Under 225.97 acres	190	15%
LFH (Retained Water by predesecer in title)		NT	-612						
LFH (Relinquishment)	18CW3002	NT	-2,796				PPD Augmenting 29 wells		
			3,032	30.32	10.11				
Arapahoe	17CW3002	NT	9,796	97.96	32.65		Under 225.97 acres	255	17%
Legal Supply: Phase 3, Phase 4 (excluding Lots 39-41) and Phase 6			12,828	128.28	42.76				
Augmentation (Dawson NNT)	18CW3002	Aug	2,796	27.96	9.32				
Legal Supply: Phase 2 (excluding Lots 11-12), Lots 39-41 of Phase 4, and Phase 5					9.32	29 Single Family Wells (Phase 2 (excluding Lots 11-12), Lots 39-40 & 41 of Phase 4, & 5)	Replace a min of 4% of pumping		
Augmentation (Dawson NNT)	18CW3002	Aug	1567.5	15.68	5.23		Replace actual depletions		
Legal Supply Phase 1					5.23	11			
Currently Available Off-Site Ground Water Legal Sources									
Augmentation (Dawson NNT)	18CW3002	Aug	240.0	2.40	0.80	Phase 2 - Lots 11 & 12)	pumping		
20			240.0	2.4	0.8				

Note 1. The water listed in the shaded area will be used to serve single family wells and is not included in the Total Available for the Central System

Note 2. In February, 2022: removed the existing Bar-X holdings from the supply sheet as the LFH water is dedicated to post-pumping depletions for Augmentation Case 20 CW 3059 and added the water yield from Case 20 CW 3059

Total Current Available 300-Year Water Supply (AF)	**697.39**	**Acre-Feet :Legal Water Supply For Falcon Area Water and Wastewater Authority Central System**

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3.2 ADEQUACY OF WATER RIGHTS CURRENT SUPPLY

The current water rights inventory by area is as follows:

- Sterling original on-site non-tributary (NT) water rights – 371.47 $AF_{300\ year}$
- 02 CW 3059 – 283.16 $AF_{300\ year}$
- Retreat at Timber Ridge on-site rights – 42.76 $AF_{300\ year}$

Sterling-owned and currently available on-site NT and adjudicated not non-tributary (NNT) water totals are 697.39 $AF_{300\ year}$, which would be adequate supply to meet the needs of 1,975 SFE.

As of March 2022, the total water commitment within SRMD requires 380.23 $AF_{300\ year}$. See Appendix F – Sterling Ranch Water Supply vs Current Water Commitments.

This leaves a net excess of currently available but uncommitted water for the remainder of Sterling Ranch of 317.16 $AF_{300\ year}$.

3.3 MASTER PLANNING AND LONG-TERM AND FUTURE SOURCES OF SUPPLY

The FAWWA water system has only been in operation for three years, so little-to-no usable historic information would be reliable for unique, long-term planning. However, substantial nearby data from the Falcon area is available for use. As of the end of 2021, the system had approximately only 300 active users. Therefore, initial projections have been based on area-wide water user characteristics and a linear buildout rate. This rate is considered to be an average annual rate that might be reasonably maintainable over a 10-year period. The average growth rate is projected as 180 units added per year.

- **2040 Scenario:** Based on the above factors, the FAWWA system might conservatively anticipate serving 3,710 SFEs in the year 2040. This number is a service area projection and includes the Retreat and The Ranch, as well as the main Sterling Ranch residents. This would require 1,310 annual AF of water.
- **2060 Scenario:** Based on the same factors, the Sterling system might be expected to serve 7,310 SFEs within its expanded service area, which includes the Retreat and The Ranch. This would be substantially greater than the actual Sterling Ranch. The annual acre-foot requirement might be 2,580 annual AF, but supply would include water from The Ranch.

In order to meet future demands, contractual arrangements have been made to obtain additional legal and physical supply to meet growing demands, outlined herein:

- The McCune Water SR Water LLC has contracted with the McCune Ranch to purchase NT water rights in El Paso County. These water rights include Laramie-Fox Hills, Arapahoe, and Denver formation water, totaling 118,900 AF. Some additional NNT water is included, but is not included in this calculation at this time.
- The Bar-X water has also been contracted for in a similar manner; some water has already been purchased, but remaining Laramie-Fox Hills, Arapahoe, and Denver formation water totals 204,433 AF. Some additional NNT water is included, but not included in this calculation at this time.

In addition to adding off-site sources, potential, additional supplies include renewable resources and/or regional projects bringing new water to the area

Long-Term Planning: Future water supply has already been contracted for and plans for implementation are underway. The first project recently completed provides augmentation for certain on-site NNT water, so that that water may be used in existing and expanded well fields on-site.

1. **Bar-X Northern Delivery Project:** To extend supplies beyond 1,975 SFEs, the McCune and Bar-X contracts for water acquisition will require a major pipeline to be extended northerly to Hodgen Road. This pipeline system will allow for the physical, as well as legal, availability and acquisition of both McCune and Bar-X water to Sterling. Preliminary routing, environmental assessments, and 1041 applications are presently underway for this facility. As discussed previously, development beyond 1,975 SFEs will require the addition of this pipeline.
2. **McCune and Bar-X Acquisitions:** The off-site acquisitions discussed previously will be exercised as needed to continually add to the Sterling supply.

McCune	Acre-feet NT
1689-BD LFH	26,300
1690-BD Arapahoe	39,800
1691-BD Denver	52,800

There is a 1,500 AF set aside, reducing the Denver formation portion of the McCune supply and leaving a net total of 117,400 acre-feet of NT water, which yields a **391.33 AF_{300}** supply, adding the capacity for an additional 1,109 SFE capacity.

Remaining Unpurchased Bar-X Supply	Acre-feet NT
93-CW018 Arapahoe	73,800
93-CW018 Denver	130,633
Minus (set-asides)	-19,098

There is additional Dawson NNT water included in the purchase arrangement, but no current augmentation plan is under consideration, so it is not counted here. Thus, there is a net total of 204,433 acre-feet of NT unpurchased Bar-X water, which yields a **617.78 AF_{300}** supply, adding the capacity for an additional 1,750 SFE capacity.

3. **Regionalization Opportunities:** FAWWA's main supply source is centralized at a point that both Cherokee Metropolitan District and Woodmen Hills Metropolitan District have adjacent major storage and delivery facilities. There are currently no arrangements in place to make connections, but in the future, SRMD may seek to have interconnections and possibly share supply.

   The second element is a much broader regionalization: conducting cooperative actions with Colorado Springs Utilities (CSU), which SRMD has been open to. CSU is potentially also open to shared physical facility utilization, which would enable Sterling to expand its scope in seeking water rights. While it is not expected that Sterling will provide actual water, the access to facilities opens greater doors for SRMD.
4. **Indirect, Reuse, Lawn Irrigation Return Flows (LIRF) Credits, Aquifer Storage/Recharge, and Direct Reuse:** Regarding return flows, initial development is being planned around sourcing available physical supplies. These supplies are all fully-consumable and ultimately result in potential return-flow capabilities. Since SRMD wastewater is discharged to the Meridian

system, which in turn has the potential to convert some reusable flows to available physical supplies, those options will be available and considered by Sterling. With regard to LIRF credits, Sterling has already initiated a case that will make augmentation use of its potential LIRF credits.

3.4 SYSTEM INTERCONNECTS

FAWWA currently has no system interconnections. However, as discussed previously, FAWWA's main supply source is centralized at a point that both Cherokee Metropolitan District and Woodmen Hills Metropolitan District have adjacent major storage and delivery facilities. It is possible that future agreements could be made.

3.5 SOURCE OF PHYSICAL SUPPLY

Municipal water demand would be met using primarily Arapahoe and Laramie-Fox Hills formation wells in the SRMD area. The first well site will be drilled with an Arapahoe Well (A-1) and Laramie-Fox Hills Well (LFH-1); well site #1 includes both an Arapahoe and a Laramie-Fox Hills well. Additional permits will be obtained as needed to ultimately continue to add to the system as needed. Existing well permits are included in **Appendix D**.

Off-site water to the north of the SRMD service area is generally in the Denver and Arapahoe formations.

3.6 WATER QUALITY AND TREATMENT

Appendix E contains the water quality reports for the initial wells drilled at Sterling Ranch. The quality is generally consistent with Denver Basin water typically encountered in the Falcon area. The quality of water in these aquifers in this area has typically been suitable for potable use with the addition of iron and manganese treatment.

3.7 WATER STORAGE, DISTRIBUTION, AND TRANSMISSION LINES

An initial 1.0-million-gallon tank has already been constructed at the SRMD site.

For the purpose of fire protection, we recommend eight-inch lines throughout the residential subdivision. The lines should be looped wherever the street layout allows. A transmission line of 24-inches in diameter has been extended south-southwesterly along one of the major roadways from the storage tank into Phase One of the development.

3.8 PUMPING FOR SERVICE PRESSURES

Ground elevations within the development service area range from approximately 6,970 feet to 7,320 feet. Adequate service pressures are generally considered 60 psi for residential service. The tank site is on the Sterling property at a base elevation of approximately 7,310 feet, which would be capable of supplying acceptable service pressures to ground elevations of approximately 7,190 feet. Initial development is anticipated to be at elevations below 7,190 feet, so the tank site will be able to provide adequate pressure.

As development construction progresses, FAWWA plans to construct the northern transmission line to bring in the off-site water contracted for. Because the storage tanks are located at a high elevation, there is substantial pressure for residential service and fire flow for the initial development of FAWWA and all of the Ranch.

Appendices are all missing; please verify report meets Section 8.4.8 of Code.

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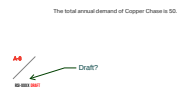

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