



# WATER FEASIBILITY REPORT – JAYNES PROPERTY SKETCH PLAN

## TOPICAL REPORT RSI-3232 A



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### PREPARED FOR

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**RESPEC**



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# 1.0 INTRODUCTION

The purpose of this study is to provide a preliminary feasibility of the water resources needs that might be necessary for the Jaynes Property Sketch Plan.

## 1.1 DEVELOPMENT DESCRIPTION

This property consists of 142.1 acres with a maximum number of residential units estimated to be 450 single family units. With a sketch plan, we are unable to define how many units will actually be platted and/or whether they fit high density water reduction criteria. Additional uses that require water would be 4.5 acres of neighborhood commercial, an 8.1 acre park, and 8.1 acres of additional buffer open space which may have some limited active landscaping.

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

**Appendix B** contains the proposed Jaynes Property Sketch Plan

# 2.0 BASIS OF WATER NEEDS

## 2.1 UNIT USER CHARACTERISTICS

It is expected that the residential lots on central water will be developed with varying densities of development with an estimated number of units of 450 residential units.

For the last five years, there has been a trend in land use that provides for much smaller lots and much denser development in certain areas. Lots smaller than 7,000 square feet are anticipated in certain areas. This is resulting in much lower water needs for these types of developments. The standard SFE adopted in Sterling Ranch has been 0.353 annual acre-feet. However, this is for the formerly typical household anticipating 1500 square feet or more of landscaping. In order to adjust for such increases in density, we are adopting a scaled down equivalency to meet the changes in lot sizes. For instance, lot areas less than 3500 sf have reduced water use that roughly is equivalent to apartments or townhomes where water use is indoor only.

In order to address this trend towards high-density development, we have established a SFE equivalency factor scale as follows for these smaller lot sizes;

Table 1. SFE Equivalency for High Density Lots

Lot Size	SFE Ratio	Effective Annual Demand
Lots < 2000 SF	0.65	0.23
Lots < 3500 SF	0.75	0.265
Lots < 7000 SF	0.90	0.318
Lots > 7000 SF	1.0	0.353



## 2.2 FEASIBILITY OF WATER SUPPLY

It is expected that the residential lots on central water will be developed with varying densities of development with an estimated number of 450 units. While it is expected that many of the 450 units will be high density lots, the exact lot sizes are unavailable and cannot be evaluated so this report is not an exact estimation of final water needs that will be better known once preliminary and/or final plats are proposed. Additional water needs include 4.0 acres of neighborhood commercial and a 3.2 acre park site. From a water standpoint, more of the higher density units are expected which would actually lower the water needs from the original sketch plan.

It is expected that full size single family residential lots in the Jaynes Sketch Plan will require an average of 0.353 annual acre-feet, which is the adopted user characteristic for FAWWA. This is consistent with historic needs for nearby developments.

Table 2. Maximum Water Demands for Jaynes Property Sketch Plan

# of Units	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)
0	Residential < 2000 SF	0.23	0	0	0	0
0	Residential < 3500 SF	0.265	0	0	0	0
0	Residential < 7000 SF	0.318	0	0	0	0
450	Residential > 7000 SF	0.353	158.85	141,812	347,438	362
7.29	Acres-Active Irrigation 65%	2.5	18.23	16,270	39,891	42
4.5	Acres-Commercial	1.0	4.5	4017	9843	10
<b>Total</b>			<b>181.58</b>	<b>162,099</b>	<b>397143</b>	<b>414</b>

The estimated annual demand of Jaynes Property Sketch Plan is roughly 181.58 AF.

This is a smaller sketch plan, so a buildout period of 10 years is reasonable. The total of all supplies currently available to Sterling/FAWWA is 1901.83 AF<sub>300 year</sub> which would allow for over 5388 SFE which is greater than the 450 residential units anticipated. FAWWA/Sterling are in a very feasible position to be able to easily provide for the water needs of the Jaynes Property Sketch Plan.

**It is reasonable and feasible that FAWWA /Sterling will easily have adequate water supply for the full buildout.**



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## 3.0 WATER RIGHTS AND SYSTEM FACILITIES

### 3.1 WATER RIGHTS OVERVIEW

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. Local groundwater rights are associated with the service area components, Sterling, and the Retreat. Each of these sites has existing decrees outlining the rights associated with the development lands.

Table 3 on the following page detail all of the water rights currently available for the FAWWA service area and also water rights that are contracted for by FAWWA/Sterling.

### 3.2 PHYSICAL WATER SYSTEM

The FAWWA/Sterling water system is currently being operated and supplying existing customers. Over the years, expansions of the source of supply will routinely require raw water line extensions, additional wells, and additional storage and treatment. The most major system expansion element (Bar-X Pipeline) already has an approved 1041 permit. The continued development of the FAWWA water system is outlined and will be needed from time to time as the Sterling area develops. Almost all of the Sterling growth will continue easterly and distribution extensions, will simply connect to the existing system at most every road and street extension.



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Table 3
Falcon Area Water and Wastewater Authority
Comprehensive Water Supply Inventory
Current Legal Supply

Update November 30, 2022

Table with columns: Land Formation/Acquirer, Reference Finding/Determination/Decree, Tributary Status, Volume, Annual Allocation 100 Year, Annual Allocation 300 Year, Reference Deed, Notes, Sand Thickness, Saturated Specific Yield. Includes sections for On-Site Sterling Water Legal Sources, On-Site Augmented Sterling Water Legal Sources, Off-Site Bar-X Ground Water Sources, Shamrock West Ground Water Sources, Off-Site McCune Ground Water Sources, and On-Site Retreat Water Legal Sources.

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 LPH 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 300-Year Water Supply (AF) 1901.83 Acre Feet (Legal Water Supply For Falcon Area Water and Wastewater Authority Central System)

FAWWA On-Site Supplies

FAWWA Off-Site Supplies

FAWWA Retreat Water Supplies

Retreat Wells private wells not included in calculation

JDS-Hydro a Division of Respec



### 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:

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. **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.

#### **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. 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**

Existing water quality reports for the initial wells drilled at Sterling Ranch are already meeting Drinking Water Standards. 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**

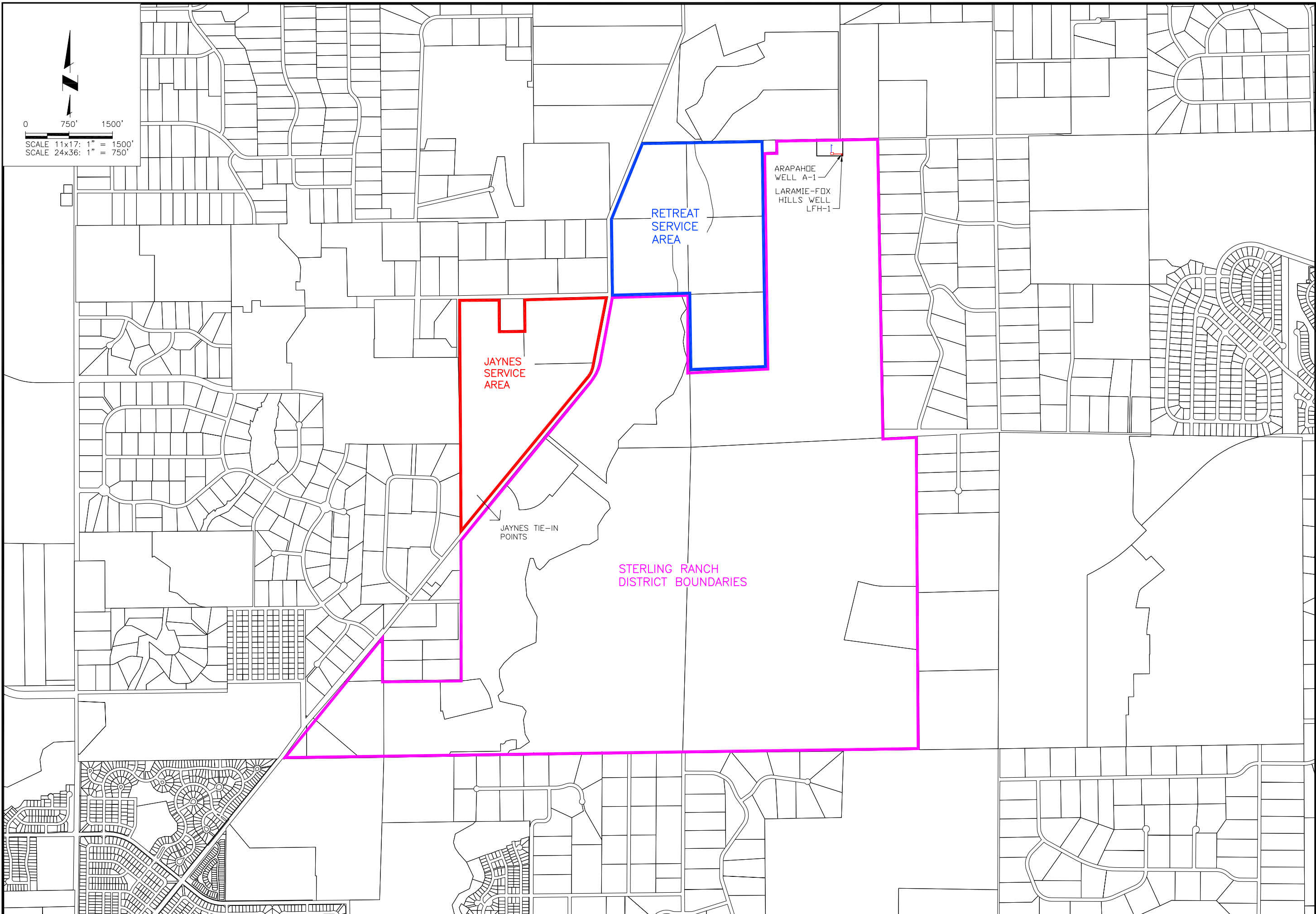
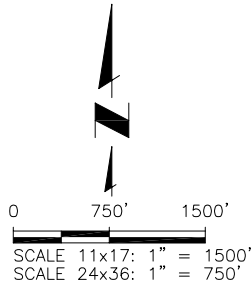
Ground elevations within the development service area range from approximately 6,970 feet to 7,320 feet. Adequate service pressures are generally considered 60 psi for residential service. The tank site is on the Sterling property at a base elevation of approximately 7,310 feet, which would be capable 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.



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**APPENDIX A – FAWWA SERVICE AREAS**

SERVICE AREAS AND WELL LFH-1 AND A-1 LOCATIONS

NO.	DESCRIPTION	BY	APP.	DATE
1				
2				
3				
4				
5				
6				
7				

**EXHIBIT**

Project No.: 161.04  
 Date: 07/20/22  
 Design: JPM  
 Drawn: SNW  
 Check: JPM



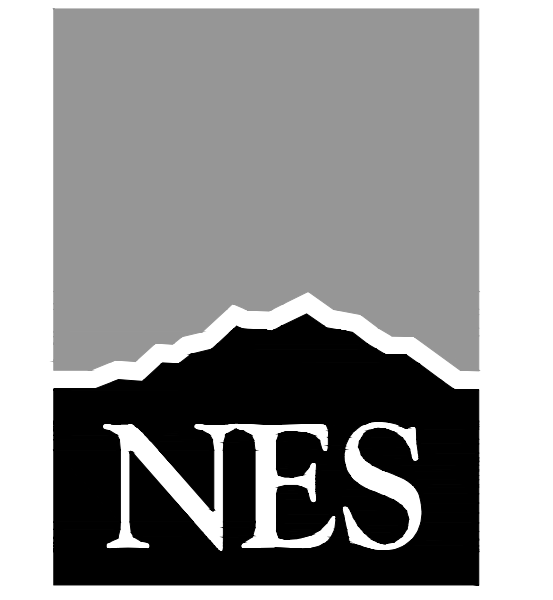
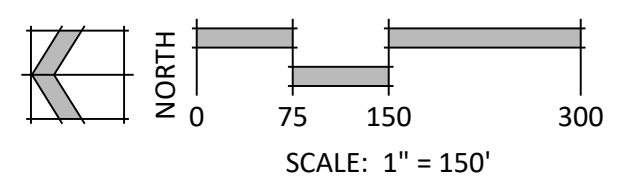
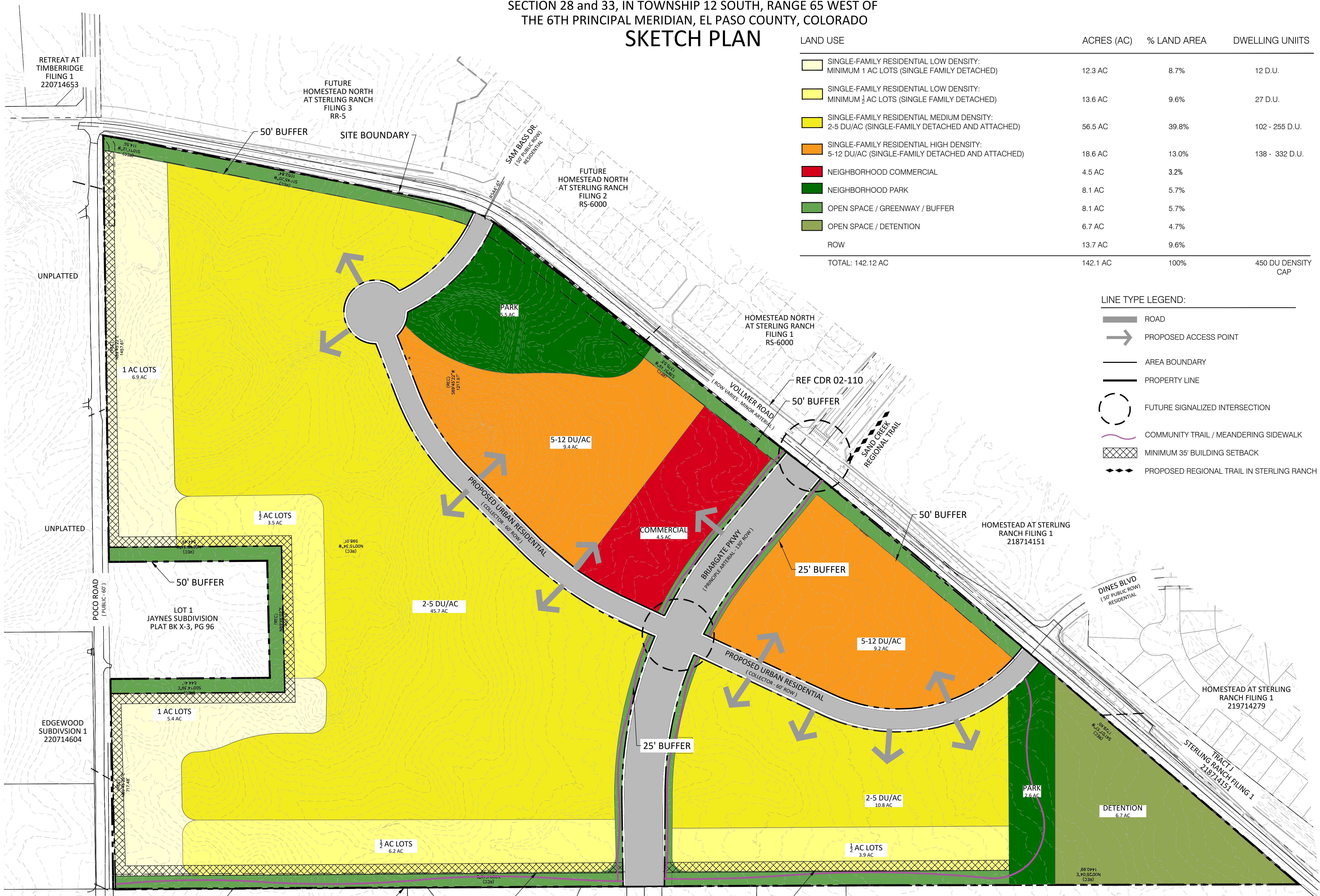
# JAYNES PROPERTY

SECTION 28 and 33, IN TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE 6TH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO

## SKETCH PLAN

LAND USE	ACRES (AC)	% LAND AREA	DWELLING UNITS
SINGLE-FAMILY RESIDENTIAL LOW DENSITY: MINIMUM 1 AC LOTS (SINGLE FAMILY DETACHED)	12.3 AC	8.7%	12 D.U.
SINGLE-FAMILY RESIDENTIAL LOW DENSITY: MINIMUM 1/2 AC LOTS (SINGLE FAMILY DETACHED)	13.6 AC	9.6%	27 D.U.
SINGLE-FAMILY RESIDENTIAL MEDIUM DENSITY: 2-5 DU/AC (SINGLE-FAMILY DETACHED AND ATTACHED)	56.5 AC	39.8%	102 - 255 D.U.
SINGLE-FAMILY RESIDENTIAL HIGH DENSITY: 5-12 DU/AC (SINGLE-FAMILY DETACHED AND ATTACHED)	18.6 AC	13.0%	138 - 332 D.U.
NEIGHBORHOOD COMMERCIAL	4.5 AC	3.2%	
NEIGHBORHOOD PARK	8.1 AC	5.7%	
OPEN SPACE / GREENWAY / BUFFER	8.1 AC	5.7%	
OPEN SPACE / DETENTION	6.7 AC	4.7%	
ROW	13.7 AC	9.6%	
<b>TOTAL: 142.12 AC</b>	<b>142.1 AC</b>	<b>100%</b>	<b>450 DU DENSITY CAP</b>

- LINE TYPE LEGEND:**
- ROAD
  - PROPOSED ACCESS POINT
  - AREA BOUNDARY
  - PROPERTY LINE
  - FUTURE SIGNALIZED INTERSECTION
  - COMMUNITY TRAIL / MEANDERING SIDEWALK
  - MINIMUM 35' BUILDING SETBACK
  - PROPOSED REGIONAL TRAIL IN STERLING RANCH



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PLANNER / LANDSCAPE ARCHITECT  
IN ASSOCIATION WITH

**JAYNES PROPERTY**

VOLLMER ROAD

TAX ID: 522800024 & 522800025

DATE: 11.09.2022  
PROJECT MGR: A. BARLOW  
PREPARED BY: A. LANGHANS

STAMP

**ENTITLEMENT**

DATE: 11/29/30 BY: AL/JS DESCRIPTION: COUNTY COMMENTS

**SKETCH PLAN**

SHEET NUMBER: 2 OF 4  
PLAN FILE # SKP225

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