Wildfire Hazard Evaluation Report

The Shop's Retail Center at Meridian Ranch
Parcel "H"

El Paso County, CO

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For the

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Parcel "H"

11810 Stapleton Drive

El Paso County, CO

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Warning and Disclaimer: The degree of protection from wildfire hazards intended to be provided by this plan is considered reasonable for planning purposes. It is based on accepted forestry and fire science methodology. This plan is intended to aid the Forest Lakes development in minimizing the dangers and impacts from wildfire hazards. Fire is a natural force and a historical part of forest and native grassland ecosystems. Therefore, unforeseen or unknown wildfire conditions, natural or man-made changes in conditions such as climate, vegetation, fire breaks, fuel materials, fire suppression or protection devices, and ignition sources may contribute to future damage to structures and land uses even though properly permitted and mitigated within designated wildfire hazard areas.

Cover Photo Courtesy of Kiowa County Press

December 3 , 2022

General Description

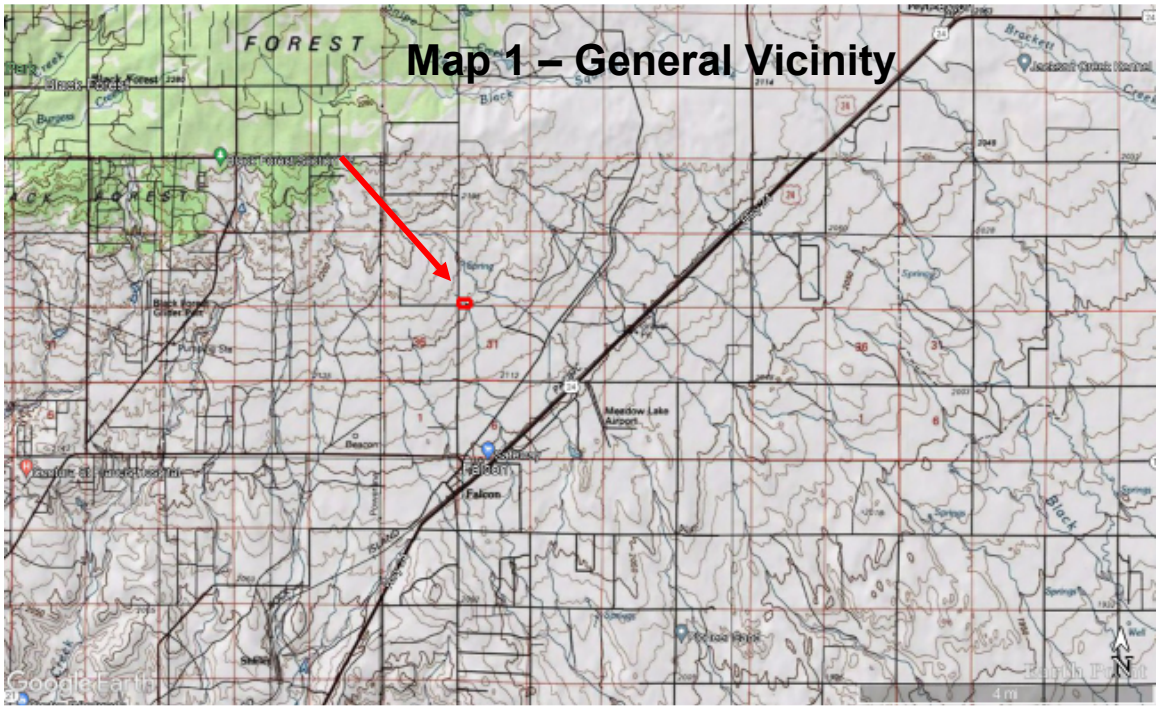
The Shop's Retail Center at Meridian Ranch subdivision lies in the northeast corner of the intersection of Meridian Road and Stapleton Drive (see Map 1). This report is intended to address the wildfire hazard affecting the development of a convenience store within Parcel "H". The El Paso County assessor's office parcel number is 423031905.

Elevation within the property is relatively level, draining from the northwest towards the south/southeast. This slope ranges from 2.3% up to 2.6%.

Access across the property is open consisting of disturbed grassland. The grassland consists of scattered bunch grass and annual weeds.

It is not uncommon for grassland fires to occur on the eastern plains. A notable fire, near Ellicott, reached 400 acres on September 30, 2019. A smaller fire on April 8, 2020, was located near Curtis Road and Highway 94.

In late December of 2021, the Marshall Fire ignited in Boulder County, CO. This grass fire burned over 6,000 acres and destroyed upwards of 1,000 structures.



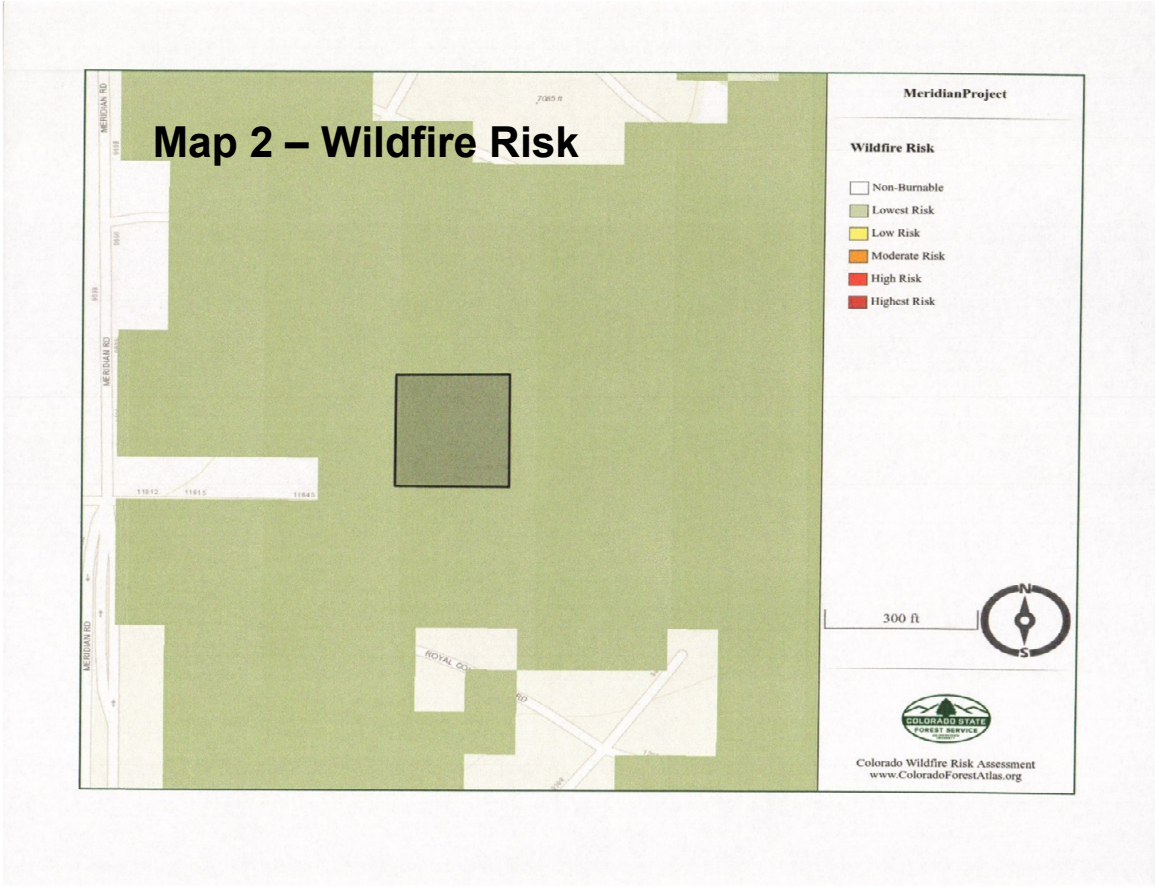
Map 1 – General Vicinity

Wildfire Hazard

The Colorado State Forest Service developed a wildfire risk assessment tool in 2012 referred to as the Colorado Wildfire Risk Assessment Web Portal (CO-WRAP). This assessment was updated to include events up to 2017 (see Appendix B).

Within the assessment report, the wildfire risk to the property is classified as having the lowest risk. Wildfire risk is a composite rating which identifies the probability of loss or harm from a wildfire.

The non-burnable area, in white, reflects development in place prior to 2017. The light gray represents the area of low sparse grass fuel (see Map 2). There are areas within the gray that have been developed and would be considered as non-burnable regarding fuel for a wildfire (see Map 3, pg.9).



The Burn Probability is the annual probability of any location becoming subject to a wildfire event. The assessment gives the development area a very low to low ranking in this regard. This is not unexpected due to the sparse grass fuel model that is present.

One distinction that can be drawn from the assessment is the selection of the fuel model used in determining the wildfire hazard. The assessment uses GR1 which is described as a short, sparse dry climate grass. The grass is either naturally short or is short due to grazing or some other disturbance.

A field inspection was performed on Sunday, December 4, 2022, to determine if any change should be made to the wildfire hazard conclusions in the CO-WRAP assessment. The results of the assessment are appropriate for the property.

Based upon the field inspection, the lowest ranking could be revised to non-burnable. There appears to be repeated disturbance to the vegetation and soils surface from vehicles driving on the property (see Photo 1).

Photo 1. A view from the southeast corner of the subject property looking to the west. Stapleton Drive can be seen in the mid-ground left of the photo. Note the patches of bare mineral soil and vehicle track.

Wildfire Behavior

This rating considers the role of the three major components that affect wildfire behavior: fuels, topography and weather. These three components will be examined in relation to Parcel “H’ development plan.

Fuels

The area was field checked, and the results of the CO-WRAP assessment were confirmed based upon the observed fuel models on the property. The USDA – Forest Service Intermountain Forest and Range Experiment Station in Ogden, Utah, developed these fuel model descriptions. They are used as aids in estimating fire behavior (see Appendix A).

The criteria for choosing a fuel model reflects that a wildfire will burn in that fuel type which best supports that fire. There may be more than one fuel model represented on any given area of land. In addition, current and expected weather conditions will influence the condition of these fuels.

The grassland is best described under Fuel Model 1 (see Appendix A). “The fine, very porous and continuous herbaceous fuels that have cured or are nearly cured govern fire spread. Fires are surface fires that move rapidly through the cured grass. Very little shrub or timber is present, generally less than one-third of the area.”

Fuel Model 1 can be further refined to GR1, Short, Sparse Dry Climate Grass. This fuel model was developed by Scott & Brogan in 2005. The primary carrier of a fire is sparse grass.

If the dead grass/weeds moisture is very low, a wildfire will only spread at approximately 22 feet per minute. This can occur under a low wind speed of 5 m.p.h. and the rate of spread should remain constant with even greater wind speeds. Flame length in this instance may range from 2-3 feet in length giving direct attack a high probability of success.

Topography

The topography of the site is one of the main factors that will influence a fire spread. The aspect or compass direction that any slope faces influences the fuel type that exists and the amount of preheating these fuels receive by the sun. Aspect can also influence the effects of diurnal winds, as they move upslope during the daylight hours and down slope during the evening and early morning hours.

In this instance, the topography of the property and the surrounding area is not a significant factor affecting a wildfire and any subsequent spread.

Weather

Weather is the most variable of all the factors. The accumulative effects of weather over time can influence vegetation curing and fuel moisture content.

Grasses, for example, are described as being one-hour time lag fuels. Time lag is a measure of the rate at which a given dead fuel gains or loses moisture. Hence grasses tend to be influenced by the weather conditions on an hourly basis.

Winds can influence the direction and rate of spread of a wildfire. Of greater concern is the short spotting of the fire by embers transported by winds ahead of the main fire. In the case of the 117 Fire, high winds carried embers across a railway bed and several county roads. The wind, over thirty miles per hour, pushed the fire from Highway I-25 east past Hanover, over ten miles in just one day. While the property and surrounding area have a low level of fuel, there is large dry grass land just to the west and southwest which could transport embers ahead of a flame front.

Another example of this condition is the wildfire that burned at the entrance of the Colorado Springs Airport and the Amazon distribution center to the south. This occurred in May of 2022 and was named the Alturas fire. This fire was ignited by a catalytic converter and burned over 180 acres.

In summary, while the weather may contribute greatly to a wildfire event, particularly in its spread, it is immune to outside influences.

Wildfire Mitigation

It should be noted here that the occurrence of a wildland fire on this property and any subsequent spread of a wildfire to adjacent land could never be eliminated. In the Spaatz Fire, near Monument, suppression forces were able to arrive on scene in approximately four minutes after the fire was reported. Even with this rapid response, the wildfire reached a size of 67 acres before it was controlled.

The potential for loss can be reduced and the odds can be improved that initial response forces can be successful in keeping a wildfire to the smallest size possible and structure loss to a minimum. But even with the best efforts of suppression forces, there will always exist a level of risk of loss to a wildfire.

As the property is either considered as being probably non-burnable or having the lowest risk, the next consideration is whether a fire could threaten the convenience store itself.

As the area around the store is scheduled to be paved for parking, it is assumed that the current fuel model will change to non-burnable. That would leave only landscaping features and debris as fuel for a wildfire.

Regarding landscaping, ornamental junipers should not be used. Beyond their high flammability at any time, they can trap and collect wind-blown trash which will only add to the risk if ignited. If deciduous shrubs and/or ornamental grasses are used in landscaping, areas of planting should be cleaned of trash on a regular basis.

Wind blown debris and litter should be considered as flammable fine fuels. These fuels should not be allowed to accumulate around the building, particularly at any entrance or exit. This may allow for embers to enter the structure itself. In addition, items such as cardboard boxes or propane bottles should not be stored near these locations as well.

There have been several instances where a wildfire has entered commercial outlets through these innocuous means.

Water Supply

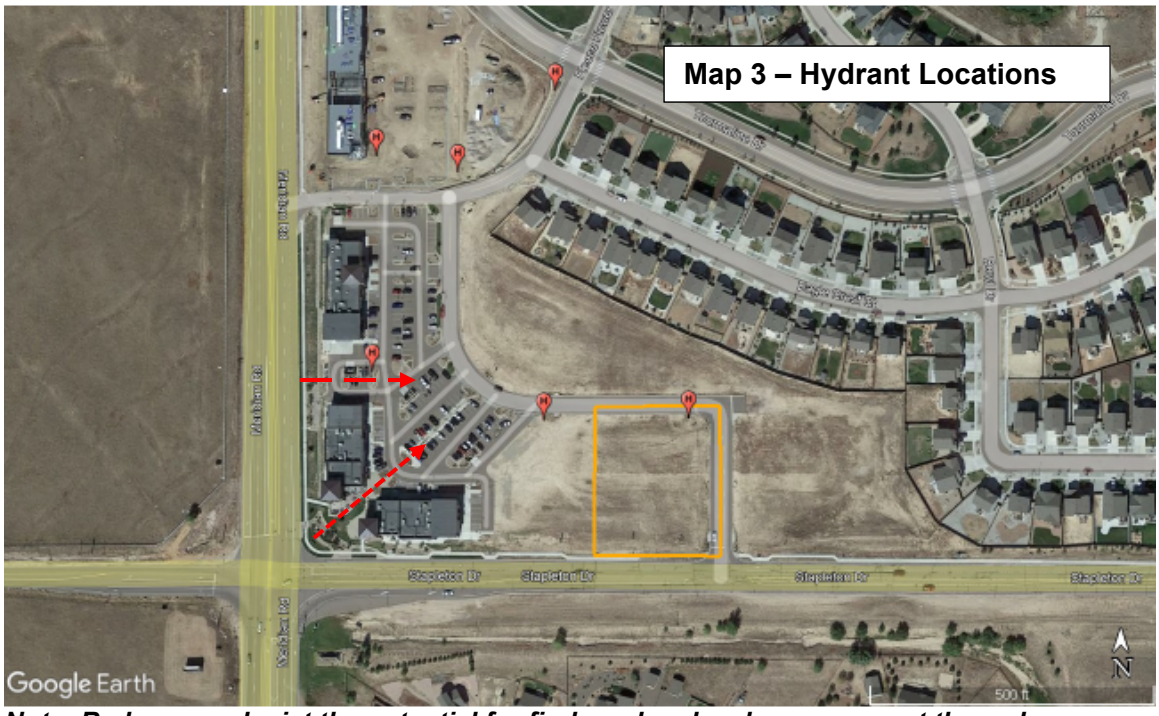
The property lies within unincorporated land of El Paso County. For emergency response, it is serviced by the Falcon Fire Protection District.

There are multiple fire hydrants found next to or near the property (see Map 3). Hydrants currently exist at the northeast east corner and near the northwest corner along the access road for the Shop's Retail Center at Meridian Ranch.

All hydrant locations should provide safe and accessible sources of water in the event of extended initial fire attack and suppression.

It is assumed that Falcon FPD Station 1 would be the primary initial attack on a wildfire. Station 1 is located at 12072 Royal County Down Road, just over one-quarter of a mile away. Station 3, which would respond as backup, is located at 7020 Old Meridian Road, just over three miles to the south of the property.

The district has the availability of 2 – Type 1 engines, 2- Type 6 brush trucks, 2 water tenders in proximity at any given time from these two stations. These resources contain an onboard capacity of 6,100 gallons.



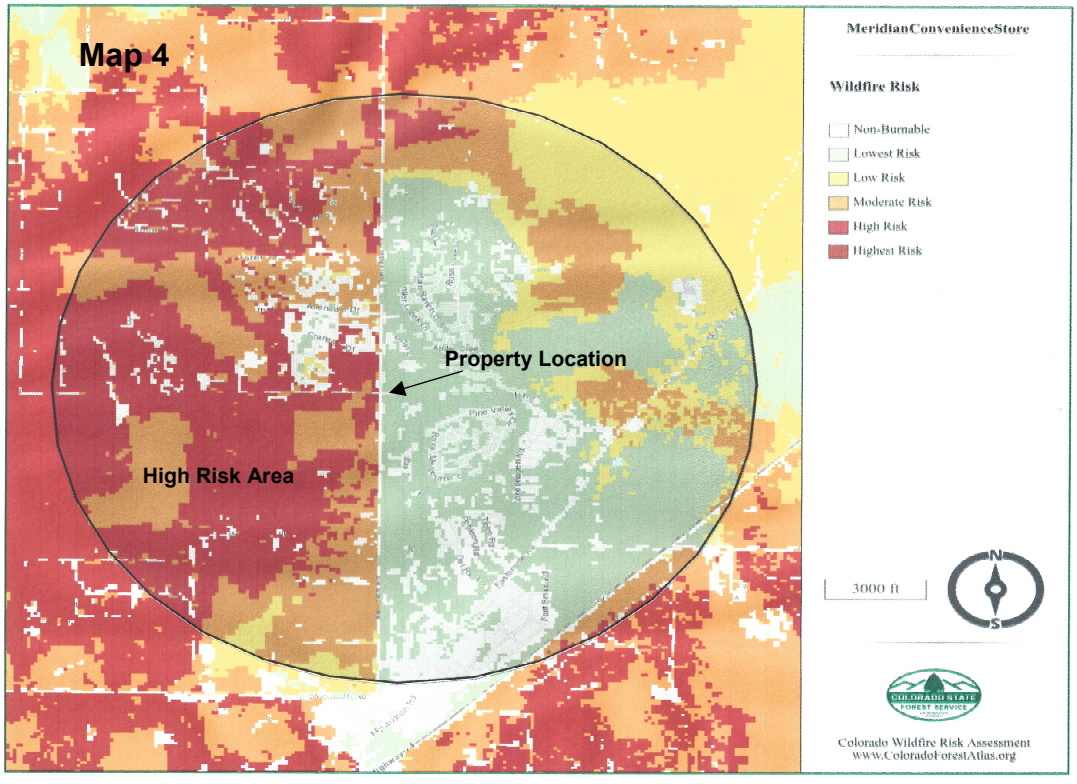
Note: Red arrows depict the potential for firebrand and ember movement through space between retail buildings and impacting the subject property. Red balloons indicate fire hydrant locations.

Special Concern - Firebrands

It is becoming more apparent that structure loss is not occurring during the passage of a burning wildfire front but from ignition of the structure by firebrands and secondary ignitions. Firebrands are burning materials or embers that are lifted into the air by convective wind currents. Firebrands can be cast hundreds of feet in advance of the fire front.

As was seen from the Marshall Fire in Boulder County, embers and firebrands from low hazard fuels, such as grasses, can cause large losses and extensive damage. To the west of the subject property, there is a long expanse of tall grass, approximately one-quarter mile in length (see Map 4).

To the southwest, there is a continuous fuel bed of grass that is miles long. If the threat of high winds and low humidity is present, this becomes eerily like a potential repeat of the Marshall Fire.



While this does not impact the subject property in a direct manner, there may be a threat from the adjacent retail buildings. Within the Shops at Meridian, there are spaces between buildings that may act as a venturi, forcing wind to speed up through these spaces. This may result in firebrands or embers being carried further than might be reasonably expected (see Map 3 – red arrows).

Appendix A

Fuel Model Descriptions

Fuel Model 1 Summary Pages

Source: Anderson, Hal E. Aids to Determining Fuel Models for Estimating Fire Behavior, National Wildfire Coordinating Group, General Technical Report INT-122, April 1982.

"This report presents photographic examples, tabulations, and a similarity chart to assist fire behavior officers, fuel management specialists, and other field personnel in selecting a fuel model appropriate for a specific field situation. Proper selection of a fuel model is a critical step in mathematical modeling of fire behavior and fire danger rating."

Low, Sparse Dry Climate Grass (GR1) Summary Page

Source: Scott, Joe H. & Burgan, Robert E. 2005. Standard fire behavior fuel models: a comprehensive set for use with Rothermel's (1972) surface fire spread model. Gen. Tech. Rep. RMRS-GTR-153, Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 72 p.

"This report describes a new set of standard fire behavior fuel models for use with Rothermel's surface fire spread model and the relationship of the new set to the original 13 fire behavior fuel models."

FUEL MODEL DESCRIPTIONS

Grass Group

Fire Behavior Fuel Model 1

Fire spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. Very little shrub or timber is present, generally less than one-third of the area.

Grasslands and savanna are represented along with stubble, grass-tundra, and grass-shrub combinations that met the above area constraint. Annual and perennial grasses are included in this fuel model. Refer to photographs 1, 2, and 3 for illustrations.

This fuel model correlates to 1978 NFDRS fuel models A, L, and S.

Fuel model values for estimating fire behavior

Total fuel load, < 3-inch dead and live, tons/acre	0.74
Dead fuel load, ¼-inch, tons/acre	.74
Live fuel load, foliage, tons/acre	0
Fuel bed depth, feet	1.0

Photo 1. Western annual grasses such as cheatgrass, medusahead ryegrass, and fescues.

Photo 2. Live oak savanna of the Southwest on the Coronado National Forest.

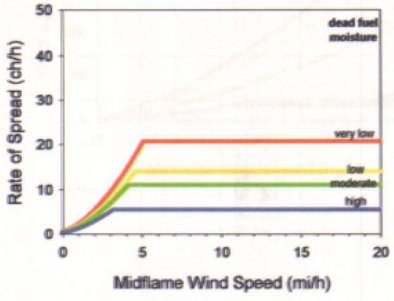
Photo 3: Open pine—grasslands on the Lewis and Clark National Forest

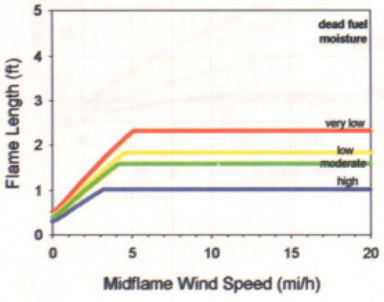
GR1 (101)

Short, Sparse Dry Climate Grass (Dynamic)

Description: The primary carrier of fire in GR1 is sparse grass, though small amounts of fine dead fuel may be present. The grass in GR1 is generally short, either naturally or by grazing, and may be sparse or discontinuous. The moisture of extinction of GR1 is indicative of a dry climate fuelbed, but GR1 may also be applied in high-extinction moisture fuelbeds because in both cases predicted spread rate and flame length are low compared to other GR models.

Fine fuel load (t/ac)	0.40
Characteristic SAV (ft-1)	2054
Packing ratio (dimensionless)	0.00143
Extinction moisture content (percent)	15





Appendix B

CO-WRAP Assessment

(Provided on CD)