Wildfire Hazard Evaluation Report

Cathedral Rock Commons Commercial
El Paso County, CO

Wildfire Hazard Evaluation Report

For the

Cathedral Rock Commons Commercial

El Paso County, CO

Prepared for: **Store Master Funding VII, LLC**
100 Big R Street
Pueblo, CO 81001
&
YOW Architects
115 South Weber Street
Colorado Springs, CO 80903

Prepared by: **Stephen J. Spaulding**
Consulting Forester
4680 Mariposa Lane
Cascade, CO 80809
(719) 641-0769

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

June 21, 2022

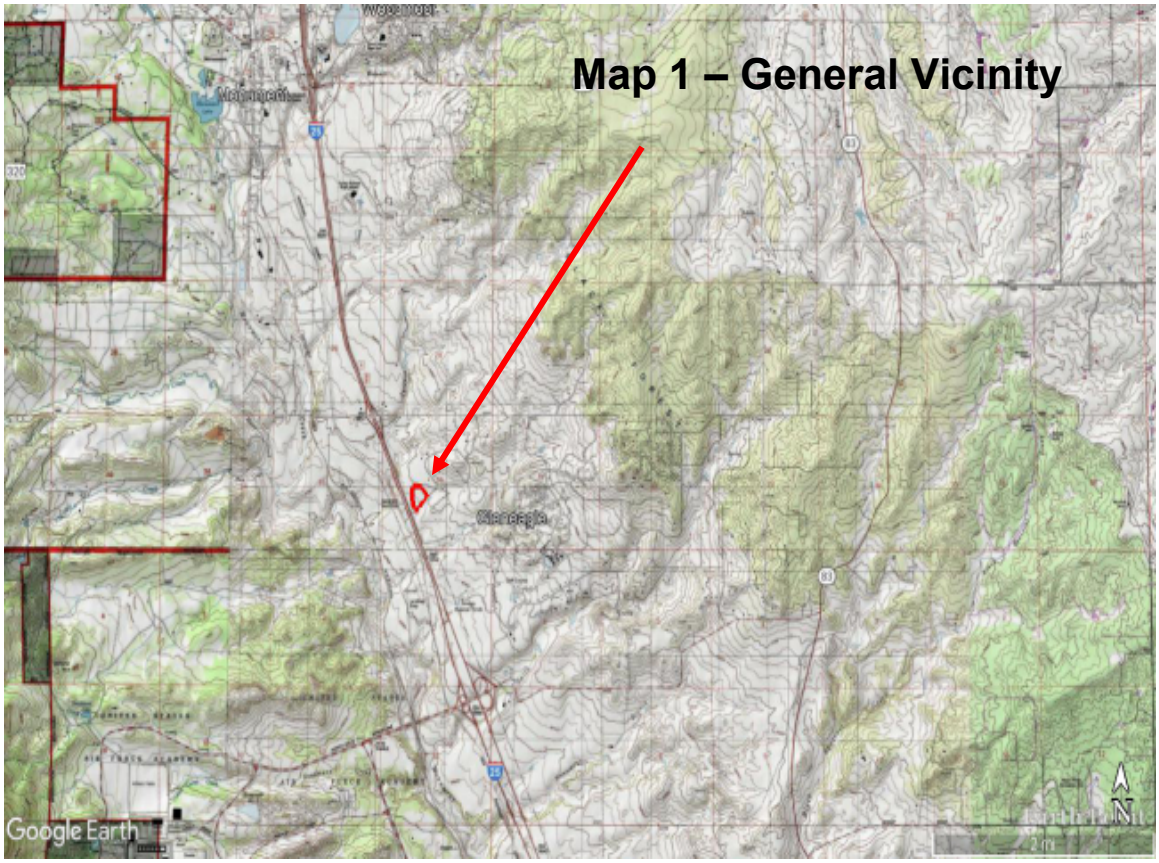
General Description

The Cathedral Rock Commons Commercial (CRCC) development consists of 10.23 acres and is located at 840 Spanish Bit Drive. The property lies north of the intersection of Struthers Road and Spanish Bit Drive (see Map 1) and is home to the local Big R store. The property is listed at the El Paso assessor's office under schedule number 7136002035.

Elevation within the property is relatively level, draining to the west and south in the direction of the existing detention pond. This slope ranges from less than 1% upwards to 2 ½% along Spanish Bit Drive.

Access across the property is excellent consisting of the Big R store paved road entrance and open grassland.

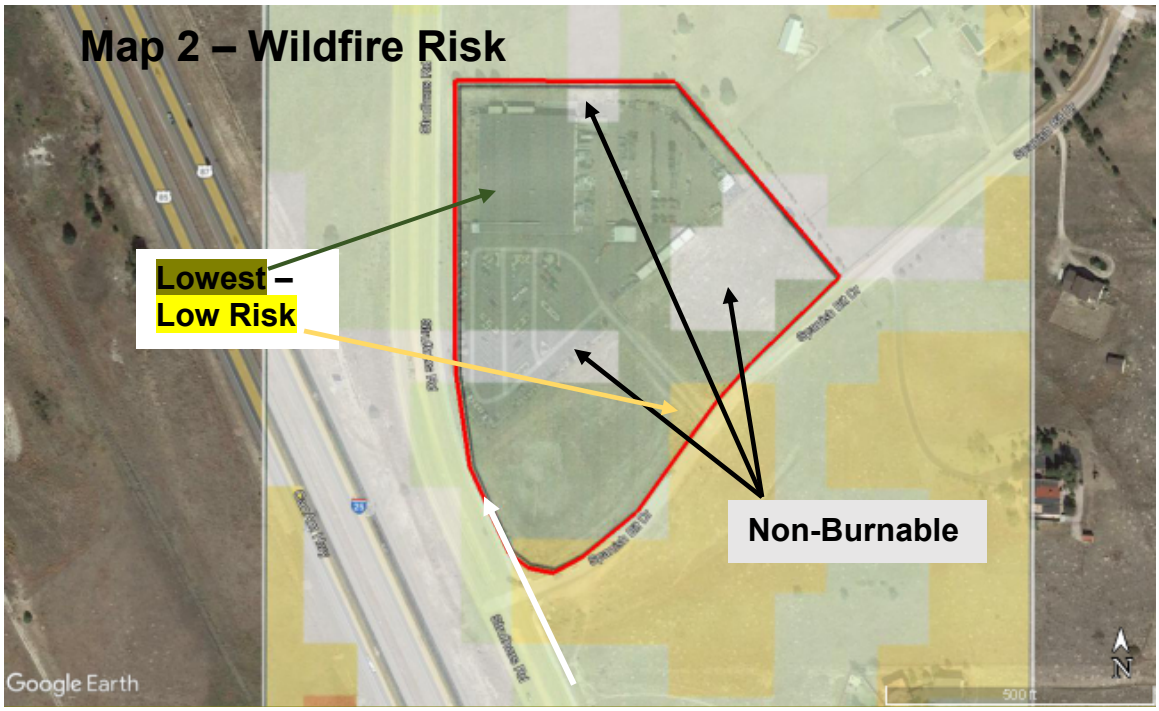
It is not uncommon for grassland fires to occur in this area. There have been numerous fires along Interstate 25 and out on the eastern plains. The Alturas fire, near the Colorado Springs airport, reached an estimated 182 acres on May 12, 2022. A smaller fire on May 14, 2022, burned an additional five acres and jumped over the Milton E Proby parkway.



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 just recently updated to include events up to and including 2017 (see Appendix B).

Within the assessment report, the wildfire risk to the property is classified as non-burnable (20%), lowest risk (73%) and low risk (7%). Wildfire risk is a composite rating which identifies the probability of loss or harm from a wildfire (see Map 2).



The assessment is not recognizing areas that might be classified as non-burnable, such as the asphalt parking area for the Big R store.

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

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 and GR2 which are described as short, sparse dry climate grass or low load, dry climate grass. Here the fuels are continuous in nature.

A field inspection was performed on Sunday, June 19, 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 to low ranking could be revised to lowest. The location that is not developed has been heavily disturbed from prior construction activity and unauthorized traffic over the site (see Photo 1).

PHOTO 1. A view from the northeast property boundary looking to the southwest. The red pickup truck is travelling west on Spanish Bit Drive. The fuel model in the foreground would be considered low load dry climate grass.

The area in and around the dentention pond is represented by fuel model GS1, which is sparse, low growing grass. Weeds may be considered as the dominant vegetation (see Photo 2).

PHOTO 2. A view of the detention pond area. Sandy subsurface soils have been exposed resulting in hot, dry growing conditions for any vegetation.

Photo 3 (next page) shows a decorated concrete wall that surrounds the subject property on the east and north sides. The eastern portion of the property has somewhat better growing conditions due to relative lack of disturbance when compared to the western portion.

Here the grasses are taller but are not going to contribute to a substantive increase in a wildfire spread. There are individual shrubs present such as rabbit brush, but these will not contribute rapid fire spread.

PHOTO 3. This is a view along the east boundary with the Chaparral Estates subdivision. Note the faced concrete block wall which extends along the east and north boundary of the property.

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 CRC's 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 GR2, Low Load, Dry Climate Grass in the east portion of the property. This fuel model was developed by Scott & Brogan in 2005. The primary carrier of a fire is grass. Any brush, if present, will not significantly affect fire behavior.

The area west of the Big R store entrance road can be best expressed by GR1, short, sparse dry climate fuels.

Caution needs to be expressed here if the dead grass moisture is very low. With a moderate wind speed of 10 – 13 miles per hour, the rate of spread of a wildfire can exceed 160 feet per minute. Flame lengths may exceed 10 feet in length for short durations making direct attack extremely difficult.

This location could be very similar to the Alturas Fire and others which have ignited along Interstate 25 (see Photo 4).

PHOTO 4. Note the patchy pattern of the burnt grass.

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 influence 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 surrounding is not a significant factor affecting the wildfire hazard.

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 in 2019, 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 which could transport embers ahead of a flame front (see Photo 5).

PHOTO 5. The area located by the arrow lies to the west of the subject property. Embers from this location could be blown across Highway 25 based upon recent high wind events.

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 non-burnable or having a lowest to low risk, the next consideration is whether a fire could threaten the Big R store and any subsequent structure built on the site.

A visual inspection of the grounds around the structure showed accumulation of flammable debris around the foundation or lodged around flammable materials. This debris consisted primarily of straw that has blown around the Big R storage yard. While this may seem a minor concern, this type of debris may have contributed to subsequent damage to commercial properties during the Marshall fire in Boulder County.

These areas should cleaned of any debris that may accumulate, particularly around the propane tank fueling station.

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 Load, Dry Climate Grass (GR2) 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.

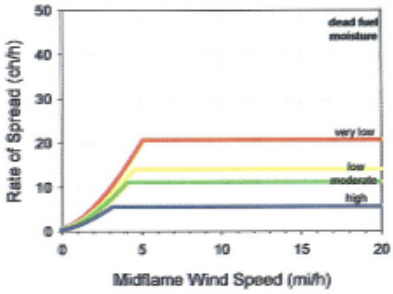
Photo 3: Open pine—grasslands on the Lewis and Clark National Forest

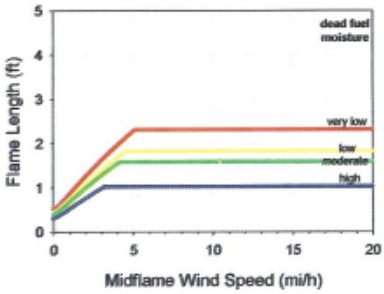
GR1 (101)

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



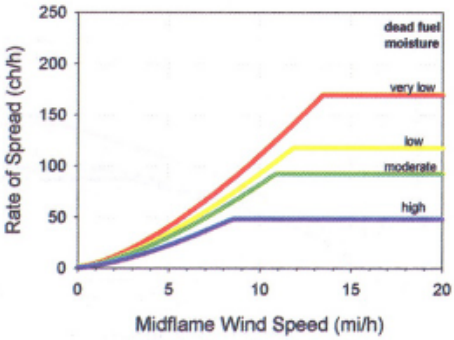


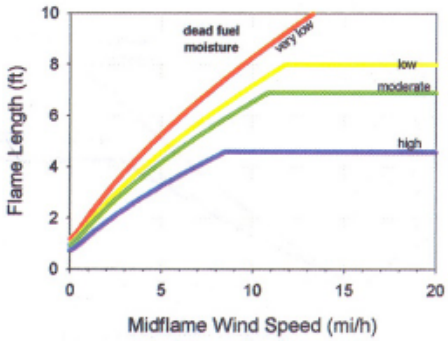
GR2 (102)

Low Load, Dry Climate Grass (Dynamic)

Description: The primary carrier of fire in GR2 is grass, though small amounts of fine dead fuel may be present. Load is greater than GR1, and fuelbed may be more continuous. Shrubs, if present, do not affect fire behavior.

Fine fuel load (t/ac)	1.10
Characteristic SAV (ft-1)	1820
Packing ratio (dimensionless)	0.00158
Extinction moisture content (percent)	15





Appendix B

CO-WRAP Assessment

(Provided on CD)