

Grant Creek Village  
Missoula, Montana

Risk Analysis and Fire Protection & Emergency Plan



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## EXECUTIVE SUMMARY

This Risk Analysis and Fire Protection & Emergency Plan (RAFPEP) provides an analysis, in general terms, of the fire protection issues associated with the features of the site for Grant Creek Village. It also outlines the Fire Protection & Emergency Plan to be followed by the developer.

The Risk Analysis portion analyzes the proposed site for the Grant Creek Village including topography, weather, and fuels. Structural and wildland fire services are reviewed for their capability to provide services to the proposed project. Once the components of the Risk Analysis are evaluated, an overall Analysis of the risk of the proposed project is provided.

The Fire Protection & Emergency Plan outlines a series of fire protection requirements to mitigate the adverse impacts to the public safety identified in the Risk Analysis section of the report.

Fire protection and emergency medical service is provided by the Missoula Fire Department (MFD). Law enforcement services are provided by the Missoula Police Department (MPD).

This document has been reviewed by the MFD, MPD, Missoula County Emergency Management and Missoula County Sheriff's Department for its accuracy.

## 1.0-INTRODUCTION

# Grant Creek Village Risk Analysis and Fire Protection Plan

This Risk Analysis and Fire Protection and Emergency Plan (RAFPEP) has been prepared for the Grant Creek Village zone change. The purpose of this RAFPEP is to assess the potential impacts resulting from wildland fire hazards and identify the measures necessary to adequately mitigate those impacts. As part of the analysis, the plan has considered the property location, topography, combustible vegetation (fuel types), and climatic conditions. The RAFPEP addresses water supply, access (including secondary/emergency access where applicable), structural ignitability and ignition resistant building features, fire protection systems and equipment, and impacts to existing emergency services.

The RAFPEP has been submitted to and approved by Missoula County Emergency Management, MFD and MPD and is based upon requirements of the MFD and City of Missoula regarding the Community Wildland Fire Protection Plans, including pertinent local Fire Ordinances, the Wildland-Urban Interface (WUI) Development Standard Guidelines.

# Risk Analysis

## 2.0 Project Location, Description and Environmental Setting

### Project Location

Grant Creek Village lies just north of Expo Parkway in an old gravel quarry. The entire project is within the City of Missoula. It is located in what is designated a wildland/urban interface area.

### Project Description

KJA Development, LLC proposes to rezone the parcels located at 2900 Expo Parkway and 2920 Expo Parkway in Missoula, Montana to RM1-45 (multi-family) with an accompanying development agreement. The development proposed will include a mixture of four-story multi-family residential buildings, condominiums, and townhomes. The purpose of the rezone is to allow the development to better meet the criteria of the Missoula 2035 Growth Policy, and to allow additional development flexibility to meet the City's market needs, which have changed rapidly and substantially since the beginning of 2020. The development will include a total of 622 one-, two-, and three-bedroom apartment residences, and 78 townhomes and condominiums, totaling 700 residences.

### Environmental Setting

#### Topography

Topography or the "lay of the land" affects the behavior of wildland fires.

#### Slope

Of all the topographic features reviewed on the site, the slope is among the most important. Fires will generally spread faster uphill than downhill, and they will preheat fuels, including homes, further up the slope and ignite easier than other fuels.

Slopes on the site, of the proposed Grant Creek Village, where development will occur range from 0% (flat) to 25%. The condominium portion of the development is along the perimeter of the developed portion of the site and at a slightly higher elevation than the multi-family buildings.

## Aspect

South, southwest and west slopes are called high energy slopes, which is based on the amounts of sunlight they receive during spring, summer and fall seasons. The vegetation on the undeveloped slope is a grass fuel type. These vegetation types quickly mature and become cured early in the summer season and become an available fuel for spreading a fire.

The aspect of the undeveloped portion of Grant Creek Village is generally composed of east, southeast facing slope.

## Climate

Dry and warm weather during the summer fire season increases the likelihood of a significant wildland fire. Drought conditions, along with hot and dry summers, will reduce the moisture in the live vegetation and large fuels. These conditions increase the ease of ignition and make wildland fires burn and spread more rapidly.

The Grant Creek Village area experiences typical Missoula fire weather conditions. The general lack of burnable fuels on the area of the property to be developed generally will negate wildfire concerns.

## Vegetation and Fuels

Fuel is required for any fire to burn. In a wildland fire, fuels consist of vegetation, both living (e.g., trees, shrubs, and grasses) and dead (e.g., pine needles, fallen branches and dead trees). For vegetation to be able to feed a fire it must become available and is then considered fuel. In a wildland/urban interface fire, fuel consists of not only the vegetation, but includes the homes and businesses, as well.

The grass group is represented by:

Fuel Model 1 (FM 1) - dominated by short grass where very little shrubs or timber is present. Fire spread is governed by the fine, porous, and continuous fuels that have cured or are nearly cured.

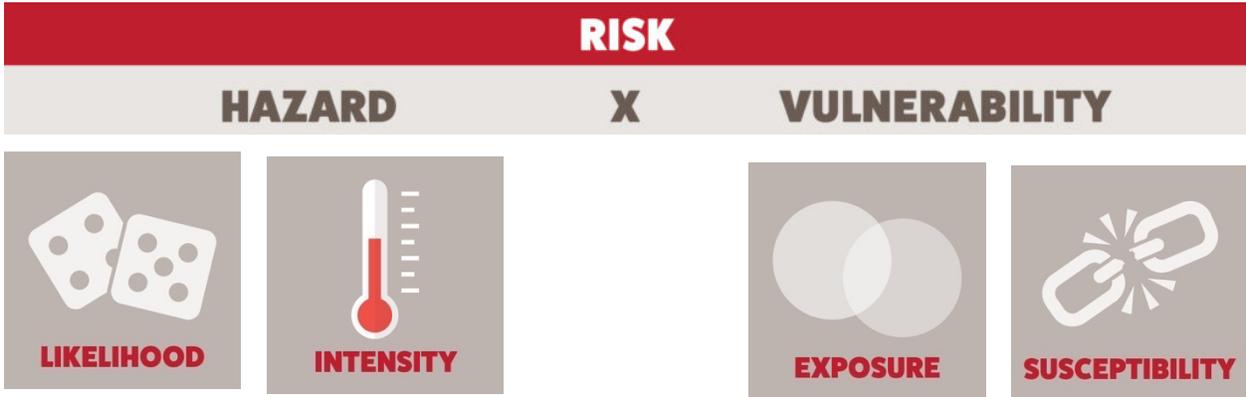


The fuels on the property are in the area of the condominium development and the area that will not to be developed as part of the Grant Creek Village project.

Wildfire Risk

*Wildfire Risk to Communities* is a free, easy-to-use website with interactive maps, charts, and data to help communities in the United States understand, explore, and reduce wildfire risk. Maps and data are available at the community, county, and state levels. *Wildfire Risk to Communities* is a project of the USDA Forest Service, under the direction of Congress in the 2018 Consolidated Appropriations Act (H.R. 1625, Section 210). The following data is taken from the [www.wildfirerisk.org](http://www.wildfirerisk.org).

A community’s wildfire risk is the combination of likelihood and intensity (together called “hazard”) and exposure and susceptibility (together called “vulnerability”).

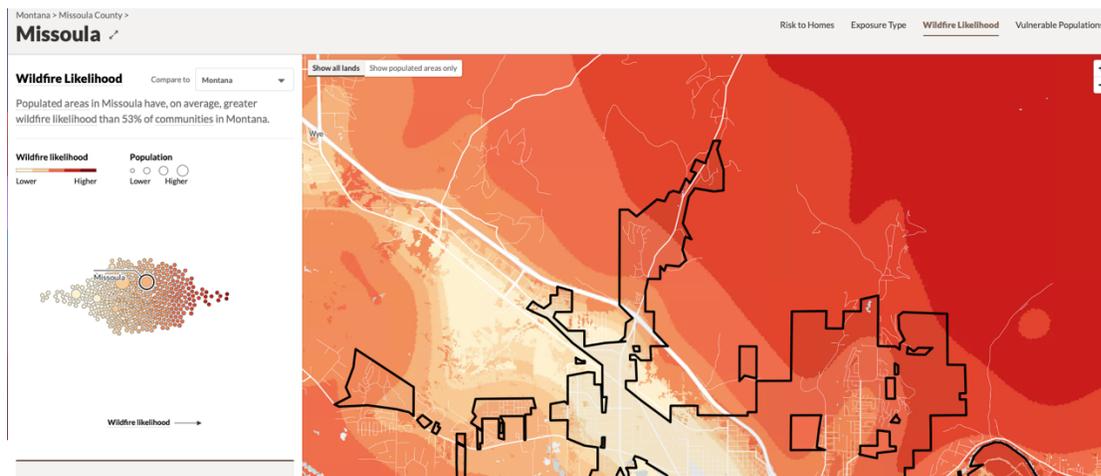


**Wildfire Likelihood**

Wildfire likelihood is the annual probability of wildfire burning in a specific location. At the community level, wildfire likelihood is averaged where housing units occur.

Wildfire likelihood is based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather, topography, and ignitions are varied based on patterns derived from observations in recent decades. Wildfire likelihood is not predictive and does not reflect any currently forecasted weather or fire danger conditions.

Wildfire likelihood is simply a probability that any specific location may experience wildfire in any given year. It does not say anything about the intensity of fire if it occurs. Wildfire likelihood can be difficult to modify, but wildfire prevention, response, and fuel treatments are steps communities can take to reduce likelihood.



## Wildfire Intensity

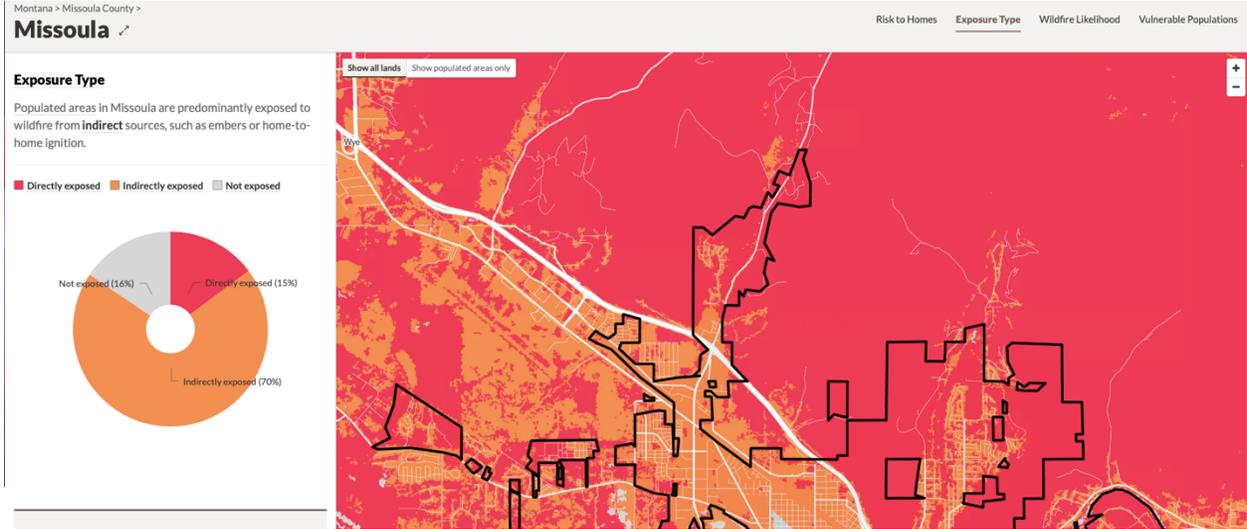
Wildfire intensity is a measure of the energy expected from a wildfire. Intensity is largely a condition of the physical landscape (topography) and vegetative fuel available to burn. For example, a crown fire on a forested hillside can produce a greater wildfire intensity than grasses on flat ground.

Wildfire intensity can be reduced by modifying the home ignition zone, land use planning, wildfire response, and fuel treatments.

## Exposure

Exposure is the spatial coincidence of wildfire likelihood and intensity with communities. Any community that is located where wildfire likelihood is greater than zero (in other words, where there is a chance wildfire could occur) is exposed to wildfire. For example, a home in a flammable forest is exposed to wildfire.

Communities can be directly exposed to wildfire from adjacent wildland vegetation, or indirectly exposed to wildfire from embers and home-to-home ignition. Communities can reduce their exposure to wildfire with actions such as modifying the home ignition zone, home hardening, land use planning tools, and wildfire preparedness.

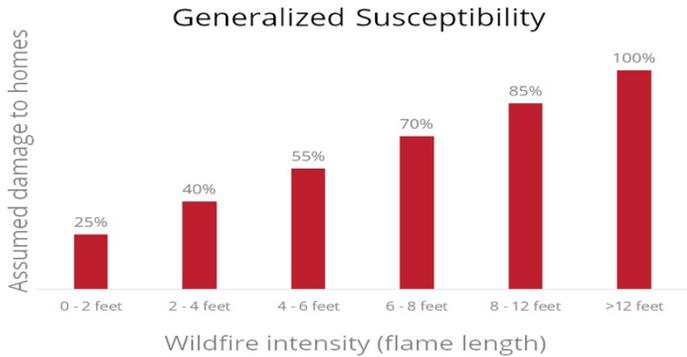


**Susceptibility**

Susceptibility is the propensity of a home or community to be damaged if a wildfire occurs.

*Wildfire Risk to Communities* assumes a generalized susceptibility for all homes. The greater the wildfire intensity (flame length), the greater the percent damage to homes.

*Wildfire Risk to Communities* does not account for homes that may have been mitigated and does not measure other important resources that may be damaged by a wildfire (such as infrastructure, watersheds, or forest health).



In reality, a structure’s ability to survive a wildfire is driven primarily by local conditions (known as the “Home Ignition Zone”), including the construction materials and the vegetation in the immediate area. The construction requirements incorporated in the

Development Agreement and approved by the MFD to the greatest extent possible mitigate the potential for ignitions within the Grant Creek Village project.

Based on *Wildfire Risk to Communities* and the Missoula County’s Community Wildfire Protection Plan, the wildland fire risk to Grant Creek Village is low to moderate. Within the developed area the risk is negligible.

Fire Protection

Structural Fire Protection

The Grant Creek Village is within the boundaries of the City of Missoula and MFD provides fire and emergency services.

MFD is organized as a municipal fire department under Montana statutes. The MFD is a career fire department with 95 career members staffing 5 fire stations. Fire Station #4 is first due to the Grant Creek Village project.

Insurance Rating

The insurance premiums that residential and commercial customers pay are based on a rating system established by the Insurance Services Office (ISO). In its evaluation of a community, ISO considers the water system and the fire protection provided by the fire department. The relative weight the components are:



- Water Supply - 50%
- Fire Department - 40%
- Fire Dispatch - 10%<sup>1</sup>

The rating system produces ten different Public Protection Classifications, with Class 1 receiving the most insurance rate recognition and Class 10 receiving no recognition.<sup>2</sup>

<sup>1</sup> [www.iso.com](http://www.iso.com)  
<sup>2</sup> *Fire Protection Handbook*, NFPA 2008

MFD currently has an Insurance Service Office (ISO) Rating of Class 3.

## Response Time

Response time, as defined in the Commission on Fire Accreditation International, Inc. (CFAI) in their *Fire & Emergency Service Self-Assessment*<sup>3</sup>, is composed of three primary elements:

**Alarm Processing or Dispatch Time** - is the period of time that is required for the communications center to identify the fact that an emergency is in progress, collect the information pertinent to making the appropriate dispatch and access the methodology used by the agency to deploy its resources. The benchmark for this element of response time is a 50 second time frame.

**Turnout Time** - is defined as the period of time that it takes for response personnel to discontinue the activities that they are engaged in, properly attire themselves and board the vehicle in readiness for response. For **staffed** fire stations, the benchmark is 60 seconds.

**Travel Time** - is defined as the period of time between the wheels beginning their uninterrupted response and the actual time that the emergency response vehicle arrives at the address or location to which it has been dispatched.

Two standard methodologies exist for quantifying response time:

1. The Insurance Services Office - Commercial Risk Services uses the formula  $T = 0.65 + 1.7D$ , where T equals time and D equals distance.<sup>4</sup>
2. The CFAI Self-Assessment Manual uses a standard of 35 mph or 53.1 feet per second.<sup>5</sup>

## Fire Station #4

The estimated mileage to the entrance of the project is 4.7 miles and equates to a response time of:

- |         |   |              |
|---------|---|--------------|
| 1. ISO  | = | 6.69 minutes |
| 2. CFAI | = | 5.93 minutes |

Generally, the longer the response time to an incident, the more severe the impacts

<sup>3</sup> Commission on Fire Service Accreditation International, Inc.

<sup>4</sup> [www.iso.com](http://www.iso.com)

<sup>5</sup> Commission on Fire Service Accreditation International, Inc.

from medical emergencies and structural and wildland/urban interface fires.

#### Mutual Aid

Mutual aid resources from Missoula County fire organizations are available to assist MFD with significant incidents.

## SUMMARY

A detailed analysis of the site, reviewing the topographic features, weather, fuels, evaluating fire protection, and the risk assessment of the proposed Grant Creek Village has allowed the developer to design fire protection features and a fire protection plan which will mitigate, to the greatest extent possible, any adverse impacts these factors have on the public safety. The necessary fire protection elements and emergency services strategies are outlined in the fire protection and emergency plan for the Grant Creek Village.

## 3.0 – FIRE PROTECTION AND EMERGENCY PLAN

A fire protection and emergency plan provides a series of mitigation measures which when designed into the Grant Creek Village, substantially reduce the adverse impacts of the site and will significantly reduce the risk of disastrous losses from structure fire, an encroaching wildland fire or a wildland/urban interface fire. Included are potential strategies which might be utilized to manage a significant emergency in the Grant Creek area. Elements of the fire protection and emergency plan for the Grant Creek Village include the following components.

### VEGETATION MANAGEMENT

There is currently minimal vegetation on the area to be developed, the entire site will be landscaped.

#### Defensible Space

The current design of the project provides adequate defensible space for the project.

### FIRE SPRINKLERS

The entire development is to be built utilizing automatic fire sprinklers. The developer can market a fire safe community because of the sprinkler requirement, thus virtually

ensuring that no one will experience a significant fire.

## STRUCTURAL DESIGN AND CONSTRUCTION

A building's design and construction are one of the most important factors in providing a fire safe environment for a home in a wildland/urban interface area.

### Roof Coverings

The second most effective tool in saving homes in a wildland/urban interface fire is a fire-resistant roof covering.

All roofing materials meet Class A flame spread ratings. Class A roofing materials provide the maximum protection from embers landing on the roof structure of a home or business.

### Exterior Walls

Most home fires in urban areas have internal sources of ignition. By contrast, home fire ignitions during a wildland/urban interface fire are almost entirely external. The fire-resistance of exterior walls becomes very important and in wildland/urban interface areas the construction of exterior walls meet fire-resistant requirements of the IFC.

### Windows

Windows can easily be a weak point in the fire protection of a home in a wildland/urban interface fire. They allow radiated heat to enter at such intensity that interior materials (e.g., furniture, draperies) are ignited, and they admit convective heat, fire brands, or flames when they are open or broken.

Exterior windows, window walls and sky lights should be of extra-strength glass (e.g., tempered or multilayered glazed).

### Vents

Attic ventilation openings, foundation or under floor vents, or other ventilation openings in vertical exterior walls and vents through roofs should not exceed 144 square inches each. The vents should be covered with noncombustible mesh with openings not to exceed 1/8 inch.

## WATER SUPPLY

The developer is providing an approved water supply capable of supplying the required fire flows for fire protection for the proposed Grant Creek Village.

## ACCESS

One of the most important aspects of development from the fire protection perspective is access. Adequate ingress and egress routes are provided to allow safe and rapid passage for both fire apparatus and private vehicles in opposite directions simultaneously.

## EMERGENCY MANAGEMENT STRATEGIES

Missoula County Emergency Management and the Missoula County Sheriff's Office have a evacuation plan that is general in nature. Each evacuation is very different based on the time of day, time of year, incident type, incident location, etc. Fire Logistics, Inc. met with representatives of Missoula County Emergency Management, Missoula County Sheriff's Office, and Missoula Police Department to understand potential approaches to an evacuation in Grant Creek.

Given a significant wildland fire incident in the Upper Grant Creek area that requires a major evacuation effort, the following strategies might be utilized by the Missoula County Sheriff's Office (MCSO), Missoula County Emergency Management and Missoula Police Department:

- If time permits, a notification via Smart 9-1-1 system.
- MCSO would implement a phase evacuation of affected properties, working from the most impacted to the least impacted.
- MCSO can request mutual aid from the MPD, Montana Highway Patrol, Montana Fish Wildlife and Parks Wardens, Livestock Inspectors, University Police, other law enforcement entities and other Sheriff's Offices in the state.
- Given the need to conduct a robust evacuation of most of the properties in upper Grant Creek, the following might occur:
  - Both lanes of Grant Creek Road might be used for exiting vehicles.
  - Prospect Drive, Stonebridge Road and Expo Parkway would be blocked by law enforcement to prohibit additional traffic entering the exit path.
  - All traffic leaving Grant Creek would be routed to the West bound entrance to Interstate 90.
  - The West bound exit to Grant Creek and North Reserve from Interstate 90 would be blocked.
  - The East bound exit to Grant Creek and Reserve Street from Interstate 90

- would be blocked.
- North Reserve traffic would be routed to the East bound entrance to Interstate 90.

Based on implementing the above strategies, an incident requiring an evacuation in Grant Creek could be conducted without impacting the population of Grant Creek Village, or having that population impact an evacuation flow out of Grant Creek.