# WILDFIRE MITIGATION PLAN

For Jim and Dianne Warren Residence 4336 Sunshine Canyon Drive, Boulder, CO Docket: LU - 05 - 006 Inspection date: 7/20/2006

Prepared for: Jim and Dianne Warren 915 Stage Coach Georgetown, TX 78628 Phone: 512-930-9411 Prepared by:

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#### PURPOSE OF A WILDFIRE MITIGATION PLAN

The purpose of a Wildfire Mitigation plan is to give guidelines to reduce wildfire hazards around a home or other structures through fuels reduction. It is a document to inform urban interface home owners of the dangers and responsibilities of living in the interface. This plan will help outline the initial and ongoing fuels reduction needed to create and maintain an effective wildfire defensible space. However, having a wildfire mitigation plan, implementation of a defensible space thinning, and following all the recommendations as outlined in this plan <u>does not guarantee that your home will survive a wildland fire; however, in combination they will give your home the best potential probability to survive a wildland fire.</u>

### SITE LOCATION AND PROPERTY DESCRIPTION

The property is located at Section 15, Township 1N, and Range 71W. Lot 3, Ponderoski Estates, Replat A, Boulder, CO. The fire protection district is Sunshine Fire Protection District (303-786-8255). There will be a new residence built on the site. The lot is 35.2 acres in size and has a modest ~20% percent slope with a northeast aspect. The residence is at 6,730 feet in elevation, and has total of 5,018 square feet. The proposed building site is mid-slope and it is a relatively dry site. There are no natural barriers that may help stop or slow the spread of a surface/crown fire on the site.

## CONSTRUCTION DESIGN AND MATERIALS

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The proposed house has a moderately complex design with a complex roofline and is oriented with a south aspect. The overall design of the structure greatly influences how it will withstand a wildfire. Complex building forms create heat traps, areas where the walls and roof members intersect one another where eddies form and hot air and embers from a fire can collect. It is important to keep these areas clear of combustibles such as needles and brush.

The roofing material will consist of Class A metal. Falling embers and fire brands from a wildfire can land on a roof and ignite the roof, either by directly heating the roofing material, or by igniting light fuels (pine needles) that have collected on the roof. Gutters will be covered with screens. It is recommended to place screening over them or make a yearly check to keep them clear of leaves and needles.

The exterior wall material is to be 1/4 stone, 1/2 IR siding, and 1/4 metal. The trim and fascia are to be 3/4" thick wood and the soffits will be cementitious.

The structure has many medium to large sized windows with the primary viewing direction being toward the north and dormers on the west side of the structure. The majority of the large windows will be located on the east side of the structure. Windows will be double glazed with low e-coated and tempered glass where required by building code. Frames will be made of metal-clad. Exterior doors are to be 1-3/4", fire-rated, and made of metal-clad wood with a tempered glass insert. All operable windows must be provided with screening that is constructed of either aluminum, galvanized steel, stainless steel, copper or of an approved material that, when exposed to flame for 15 seconds, will not burn through or melt, and remains intact. Windows are one of the weakest parts of a structure with regards to wildfire. They often crack and fail before the structure itself ignites, providing a direct path for embers and radiant heat to reach the interior. It is best to minimize the number of windows, especially on the downhill side of the home.

The deck will be constructed of synthetic wood materials and supported by heavy timber/steel support brackets. The deck will be open underneath and overhead and isolated from the surrounding landscape with a decorative rock over a fiberglass weed barrier. This material will be spread underneath the entire deck surface and to 2' past the drip-lines of the deck.



### UTLITIES

The propane tank is will be buried below ground approximately 50 feet to the southwest of the residence.

Utilities for the property will be buried from a main box which is located at the main gate southwest of the residence. The septic field is located ~130 feet to the northeast of the residence. A well will be located ~120 feet to the southwest of the residence.

### DRIVEWAY ACCESS FOR EMERGENCY VEHICLES

Access to the property from Boulder take Mapleton Ave west to Sunshine Canyon Drive.

The proposed driveway will create a little additional site disturbance and soil compaction and will require the removal of a few trees. The driveway is approximately 160 feet long with a hammerhead or "Y" turn-around that will be created 160 feet and another at 320 feet from the proposed house per Boulder County Requirements. Two additional pull-outs will also be created, one approximately half-way between the hammerheads at the upper half of the driveway and one located between the second hammerhead and the house at the lower half of the driveway. The driveway will be 12 feet wide with a vertical clearance of 13'6" and a grade that is less than 12% with a short steeper section at 14%.

### **EVACUATION ROUTES**

In the event of a wildland fire the best escape routes from the area, depending on the location of the fire, would be to go east on Sunshine Canyon Drive to Boulder or west on Sunshine Canyon Drive to Gold Hill or the Peak to Peak Highway.

#### **EMERGENCY WATER SUPPLY FOR FIRE FIGHTING**

The water source will be from two 3,600 gallon fire cisterns ~320 feet to the southwest of the residence. Since the residence is greater than 3,600 square feet, an NFPA 13-D residential sprinkler system will also be installed. The cisterns will be filled and fully usable prior to the beginning of the framing stage of construction. All water sources should be clearly marked and clear of brush. The cistern will be located a minimum of 50 feet from the front of the house and no further than 150 feet from the rear of the structure. The cistern will have a dry hydrant connection with a 6 inch NH threaded connection and cap. Contact the Sunshine Fire Protection District (303-786-8255) for more information and specific details.

#### FOREST COMPONENT AND HEALTH

The site has a dominant overstory consisting of ponderosa pine (*Pinus ponderosa*) with a ponderosa pine, douglas fir (*Pseudotsuga menziesii*), rocky mountain juniper (*Juniperous scopulorum*) component. The understory component consists of a dense cover of native grasses (western wheat-grass (*Agropyron smithii*)/ big blue stem (*Andropogon gerardii*), shrubs (mountain mahogany (*Cercocarpus montanus*)/ common juniper (*Juniperous communis*) and forbs (Kinnikinnick (*Arctostaphylos uva-ursi*)). The area is predominantly fuel model 9 with ground fuels consisting of grasses, shrubs and forbs. Fuel model 9 is represented by closed canopy stands of ponderosa pine and mixed conifer. Understory may consist of small trees and shrubs, grasses and moderate concentrations of down, dead woody litter. High amounts of needle litter may be present. This model can exist from the foothills to subalpine. There were no signs of any insect and disease problems on the property at the time of the inspection.

#### FUELS REDUCTION

All trees to be removed are marked with blue spray paint. All trees that are to remain within zones 1 and 2 will be unmarked and limbed to 6 feet of 1/3<sup>rd</sup> the height of the tree whichever is less. If the property is less than 1 acre it may not have zones marked due to boundary interference. Harvested wood that remains on site will be stacked at least 30 feet from the house and at the same elevation when possible. Slash from the harvest will be chipped or burned. Note that if you decide to burn piles, you must obtain a valid Open Burning Permit from the Boulder County Environmental Health Department (303-441-1180) and notify your local fire protection district (Sunshine Fire Protection District (303-786-8255).

#### DEFENSIBLE SPACE MANAGEMENT

There are three defensible space zones to be created around the structure(s) on the site. Please note that it is possible that one or more of these zones will cross over the subject property onto adjacent properties. Property boundaries must be respected; mitigation work is not required beyond immediate boundaries. However, landowners are encouraged to contact and work with neighbors if property lines limit the ability to mitigate within the prescribed area. **Defensible space** is a benefit, not only to the individual but also to the community as a whole.

**Zone 1** - Starts at the foundation and extends out 15 feet in all directions from the outside edge of the structure(s). Zone 1 is broken down into three segments:

**Zone 1A** - Consists of the structure(s) themselves and the area immediately adjacent to and surrounding the structure(s) on all sides. A three-foot wide, non-flammable strip will be created using decorative stone over a fiberglass weed barrier material. This strip will also extend back under, and out to, two feet past the drip line of any decks.

**Zone 1B** - Extends out from Zone 1A. In this zone, all highly flammable vegetation is to be removed. Any large dead woody material on the ground will also be removed. Firewise plants will be used for landscaping and revegetation. Grasses will be irrigated when possible and mowed to a maximum height of 6 to 8 inches twice per growing season to a distance of 30 feet from the structure.

Zone 1C - This zone extends out from Zone 1B to 15 feet from the house. All understory trees (ladder fuels) will be removed as marked. These are small seedling and sapling size trees that can be ladders for fire to get in the crowns of the larger trees. A few of the larger, healthy trees can be retained for screening. All remaining trees in this zone will be pruned to a height of 10 feet. They must be well spaced so that the crowns are not touching (10 foot minimum crown spacing). No trees will overhang the house or decks, unless approved by Boulder County or CSFS as "part of the structure" with additional fuels reduction around those trees to insure the defensible space integrity. Trees should be at least 15 feet away from the house on all sides, and a minimum of 10 feet from chimneys.

Zone 2 - This zone extends out from Zone 1C, and acts as a transition zone between the heavily thinned areas near the house to the existing forest setting. It extends down slope between 100-170 feet depending upon slope steepness. Zone 2 also extends on either side of the structure a minimum of 100 feet and behind the house between 70-100 feet assuming no boundary restrictions. Tree spacing begins as in Zone 1C and gradually decreases as you approach the outer edge of the zone. Thinning and crown spacing becomes greater in areas of steep slopes. Ladder fuels and poor quality, suppressed and/or diseased trees, 6 to 8 inches in diameter, make up the majority of the removals. The remaining mature trees will be pruned to a height of 10 feet at the intersection of Zones 1 and 2 with limbing reduced in height to 6 feet as you approach Zone 3. If there are any questions pertaining to slope and the changes in thinning spacing and distance regulations please refer to www.colostate.edu/Depts/CSFS/ and find the Quick Facts 6.302 Creating Wildfire Defensible Space.

**Zone 3** - This zone extends out from Zone 2 to the edge of the property. It may extend out to areas that are not part of the immediate mitigation efforts. In this zone, a few thicker clumps of trees are acceptable, as well as some unpruned trees near the outer edge. Thinning in this zone adds some protection, but is aimed more at forest health. Trees that are of poor quality or form, or have insect or disease infestations, should be removed. Slash in this zone can be lopped and scattered and/or piled for wildlife use.

- Thin suppressed trees and trees with disease and insect infestations and retain the larger, healthier trees.
- Snags should be retained for wildlife.
- Some slash in this zone can be lopped and scattered and/or piled for wildlife enhancement and shelter.
- Large amounts of slash should be disposed of by chipping, hauling to an approved site, or burning.
- For burning permits, check with your local fire protection district.

### MAINTENANCE AND RECOMMENDATIONS

As detailed in fact sheet 6.302, <u>Creating Wildfire Defensible Zones</u>, an important factor that determines a structure's ability to survive wildfire is defensible space. Defensible space is a maintained area around a structure where fuels (flammable materials) are modified to slow the possible spread of wildfire to the structure, as well as from the structure to the surrounding areas. Defensible space provides a place where structure protection and fire suppression operations may occur. Wildfire hazard mitigation work breaks up fuel continuity, potentially decreasing a wildfire's intensity, and for more effectiveness should be completed beyond a home's defensible space, zone 1 and 2, area into zone 3.

In addition to the above recommendations, several other measures can be taken to make your home more fire safe and add an additional measure of safety for your family. While not required through site plan review, the following measures should be undertaken to maintain the home and defensible space in the future.

- Maintain your defensible space yearly; contact your local forester for a 5-year maintenance inspection
- Establish an escape route and safety zone with the aid of your local fire protection district
- · Keep firewood at least 30 feet away from buildings; clear weeds and grass from around pile
- Do not stack fresh cut wood against live trees this could invite unwanted insects
- When possible, maintain an irrigated green space; mow grasses 6" to 8" high
- · Connect, and have available, a minimum of 50 feet of garden hose with an adjustable nozzle
- Have an emergency evacuation plan in place (included in wildfire mitigation plan)
- Be aware of fire danger; check the Boulder Fire Weather website at www.crh.noaa.gov/bou/awebphp/fireindx.php.html
- Keep driveways and property address marked with reflective easy to see signs
- Maintain screens on foundations, soffit vents, roof vents, and attic openings
- Get rid of unnecessary accumulations of debris and trash from yards
- Keep tools such as shovels, rakes, ladders, and axes available and ready for use
- Clean debris from the roof and gutters at least two times annually
- Check screens and maintain spark arresters on chimneys annually
- Avoid storing combustibles under decks such as wood piles, scrap lumber, and fuels

## DEFINITIONS

Aspect - Exposure. The direction a slope faces.

Canopy - The cover of branches and foliage formed collectively by crowns of adjacent trees.

Crown - Branches and foliage of a tree.

Dominant fuel type - Matter that would carry a fire, found on the ground.

Fuel Model – A number system that identifies the types of fuels found on the property that will directly influence fire behavior

Fire danger - An assessment of both fixed and variable factors of the fire environment, which determine the ease of ignition, rate of spread, difficulty of control, and the fire impact.

<u>Fire hazard</u> - The potential fire behavior for a fuel type, regardless of the fuel type's weather-influenced fuel moisture content or its resistance to fireguard construction. Assessment is based on physical fuel characteristics, such as fuel arrangement, fuel load, condition of herbaceous vegetation, and presence of elevated fuels.

<u>Fire management</u> - The activities concerned with the protection of people, property and forest areas from wildfire and the use of prescribed burning for the attainment of forest management and other land use objectives, all conducted in a manner that considers environmental, social and economic criteria.

**<u>Fire risk</u>** - The probability or chance of fire starting determined by the presence and activities of causative agents. <u>**Fire season**</u> - The period(s) of the year during which firs are likely to start, spread and do damage to values-at-risk sufficient to warrant organized fire suppression; a period of the year set out and commonly referred to in fire prevention legislation. In B.C. the fire season is considered to extend from April 1 to October 31.

Fuel continuity - The proximity of fuels to each other. Helps determine if a fire can sustain itself.

Forest ecology - The relationships between forest organisms and their environment.

Forest health - A forest condition that is naturally resilient to damage; characterized by biodiversity, it contains sustained habitat for timber, fish, wildlife, and humans, and meets present and future resource management objectives.

Ladder fuels - Fuels that provide vertical continuity between the surface fuels and crown fuels in a forest stand, thus contributing to the ease of torching and crowning.

Limb (verb) -To remove the branches from a tree.

**New forestry** - A philosophy or approach to forest management that has as its basic premise the protection and maintenance of ecological systems. In new forestry the ecological processes of natural forests are used as a model to guide the design of the managed forest.

Noxious weeds - Any weed so designated by the Weed Control Regulations and identified on a regional district noxious weed control list.

Overstory - The tree species that forms the uppermost forest layer (dominant and co-dominant).

Understory - Plants that grow underneath the overstory species.

Snag - Standing dead tree, often used by wildlife such as woodpeckers, owls, and other various mammals.

Wildfire Mitigation Plan - A plan to reduce wildfire hazards around a home or property.





# Annual fire safety checklist

- Thin trees and brush properly within defensible space.
- Remove trash and debris from defensible space.
- Remove needles and pine cones from window wells.
- Remove needles from porches, decks and entrance ways.
- Remove trees growing through a porch or other portions of a structure.
- Clear leaves and debris from the roof and gutters of structures.
- Remove branches that overhang a chimney or roof.
- Stack firewood uphill from a home or on a contour away from the home.
- Use noncombustible roof materials.
- Place shutters, fire curtains or heavy drapes on windows.
- Place screens on foundation and eave vents.
- Enclose sides of stilt foundations and decks.
- Remove any combustibles from under decks, porches or entrance ways.
- Use a chimney screen or spark arrester in fireplaces.
- Clear vegetation from around fire hydrants, cisterns, propane tanks, etc.
- Place placards on garages if storing flammable materials inside.
- Make sure that an outdoor water supply is available with a hose, nozzle and pump.
- Post address signs that are clearly visible from the street or road.
- Make sure that driveways are wide enough for fire trucks and equipment.
- Check with appropriate highway agencies to make sure load limits are posted on bridges and for the appropriate protocol for posting load limits for bridges on private property.
- Install and test smoke detectors.
- Practice a family fire drill and evacuation plan.

### **Evacuation tips**

- If a wildfire is threatening your area, listen to the radio for updated reports and evacuation information.
- Confine pets to one room and make plans to take care of them in the event of evacuation.
- Arrange for temporary housing with a friend or relative whose home is outside the threatened area. Leave a note in a prominent place in your home that says where and how you can be contacted.
- If your home is threatened by wildfire, you will be contacted and advised by law enforcement officers to evacuate. If you are not contacted or you decide to stay and help defend your home, evacuate pets and family members who are not needed to protect your home.
- Remove important documents, mementos, etc. from the possible fire area.
- Choose an evacuation route away from the fire if possible. Watch for changes in the speed and direction of the fire and smoke.

- Take a disaster supply kit containing:

- Drinking water.
- A change of clothing and footwear for each family member.
- Blanket or sleeping bag for each person.
- First-aid kit and prescription medications.
- Emergency tools including a battery-powered radio, flashlight and extra batteries.
- Extra set of car keys and credit cards, cash or traveler's checks.
- Extra pairs of eyeglasses or other special items for infants, elderly or disabled family members.

### **Defending your home**

Whether you choose to stay to defend your home or to evacuate, complete as many of the following preparations as possible.

- DO NOT JEOPARDIZE YOUR LIFE. NO MATERIAL ITEM IS WORTH A LIFE.
- Wear fire-resistant clothing and protective gear.
- Remove combustible materials from around structures.
- Close or cover outside vents and shutters.
- Position garden hoses to reach the entire house, but do not turn the water on until it is needed. Hoses should have an adjustable nozzle.
- Place large, full water containers around the house. Soak burlap sacks, small rugs or large rags in the containers.
- Place a ladder against the roof of the house on the opposite side of the approaching wildfire. Place a garden hose near the ladder, prepared as described previously.
- Place portable pumps near available water supplies, such as pools, hot tubs, creeks, etc.
- Close all windows and doors. Do not lock them.
- Close all inside doors.
- Turn on a light in each room and all outside lights. Leave them on even during daylight hours.
- Fill tubs, sinks and similar containers with water.
- Shut off gas supplies to structures at outside meters. Shut of propane supplies at the outside meter of the tank.
- Remove curtains made of lace, nylon or other light materials. Close blinds, heavy drapes and fire resistant window covers.
- Move overstuffed furniture into the center of the house, away from windows and sliding doors.
- Cars should be parked in the garage, facing out. Close the windows of the vehicle but do not lock the doors. Leave the keys in the ignition.
- Close the garage door but leave it unlocked. Disconnect automatic garage door openers.

For additional copies of these checklists, visit <u>www.colostate.edu</u> and search for wildfire, view the Colorado State Cooperative Extension fact sheet on <u>Forest Home</u> <u>Fire Safety</u>, or contact the local Cooperative Extension office usually listed under the county government section of your local phone book.

(Information provided by Colorado State University Cooperative Extension and the Colorado State Forest Service.)

### Safety Zone Guidelines

A Safety Zone is an area that in the event of a wildland fire you could survive the passing fire without the aid of a fire shelter. A natural safety zone could be an area already burned clean by the fire (in the black), rock areas where flashy fuels are absent, or large bodies of water. A manmade safety zones could be pre-constructed sites such as clear cuts. It should be close enough to your home to consider escape time to reach the safety zone. They should not be located upslope or downwind of the fire or in heavy fuels.

- 1. Avoid locations that are downwind from the fire.
- 2. Avoid locations that are in chimneys, saddles, or narrow canyons.
- 3. Avoid locations that require a steep uphill escape route.
- 4. Take advantage of heat barriers such as lee side of ridges, large rocks, or solid structures.
- 5. Burn out safety zones prior to flame front approach.
- 6. For <u>radiant heat only</u>, the distance separation between you and the flames must be at least four times the maximum flame height. This distance must be maintained on all sides, if the fire has ability to burn completely around the safety zone. Convective heat from wind and/or terrain influences will increase this distance requirement.

	Flame Heights	Distance separation	Area in Acres
	10 feet	40 feet	1/10 acre
	20 feet	80 feet	1/2 acre
	50 feet	200 feet	3 acres
	75 feet	300 feet	7 acres
	100 feet	400 feet	12 acres
-	200 feet	800 feet	50 acres

#### **Calculations Assuming No Slope and No Wind**

**Note**: Distance separation is the radius from the center of the safety zone to the nearest fuels. When fuels are present that will allow the fire to burn on all sides of the safety zone this distance must be doubled in order to maintain effective separation in front, to the sides, and behind the person.

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Area in Acres is calculated to allow for distance separation on all sides for a <u>three</u> <u>person family and a vehicle</u>. One acre is approximately the size of a football field or exactly 208 feet x 208 feet.

**Example**: Given a fire with 10 foot flame heights (no wind or slope). You would need a minimum of 40 feet between you and the flames. So your total safety zone should be 80 feet x 80 feet. If you are settled into the middle of the safety zone you will have a minimum distance of 40 feet to each edge of the zone.

Property of Jim and Dianne Warren 4336 Sunshine Canyon Drive, Boulder, CO LU-05-006

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## WARREN RESIDENCE September 28, 2006

#### Wildfire Mitigation Plan - Preliminary:

Warren Residence 4336 Sunshine Canyon Drive Lot 3, Ponderoski Estates, Replat A Boulder County, CO

#### **Prepared for:**

Jim and Dianne Warren 915 Stage Coach Georgetown, TX 78628

#### **Prepared by:**

Arcadea Architecture 741A Pearl Street Boulder, CO 80302 Phone: (303) 449-6605 Fax: (303) 449-2148 Principal: David Biek Project Manager: Stacey Root E-mail: stacey@arcadea.com

Arcadea organized a pre-submittal site meeting with the Sunshine Canyon Fire District Fire Chief Steve Stratton and Boulder County Wildfire Mitigation Official Eric Philips for additional recommendations. Please refer also to the attached document summarizing the notes from that meeting.

This wildfire mitigation plan and report has been reviewed by Wildfire Mitigation consultant Nicole Palestro of the Colorado State Forestry (Contact 303.823.5774). Additionally, the defensive space was marked on July 20<sup>th</sup>, 2006 by Ms. Palestro.

## SITE LOCATION AND PROPERTY DESCRIPTION

Legal description: Lot 3, Ponderoski Estates, Replat A.

The property is located in the Northwest ¼ of Section 15, Township 1 North, Range 71 West of the 6<sup>th</sup> P.M., Boulder, Colorado. The lot is 35.20 acres in size. It is at approximately 6730 feet in elevation above sea level. There are currently no existing structures on the site. The proposed building site has a slope of approximately 20% with an east aspect, and there are two primary existing natural drainages. The proposed structure will be located on an existing cleared flat spot. It is a relatively xeric site. A minor dirt road provides a natural barrier to surface fire spread. Because of the topography, the building site is a medium wildfire hazard.

The site is best represented by Fuel Model 4. Except at the existing clearing (house location) and existing driveway, the property is covered with dense stands of ponderosa pine and Douglas fir. The under-story consists of a cover of native grasses (90%) and rock (10%). All of the forest litter will be removed prior to construction to within 25 feet of the house. There is no appreciable amount of downed timber and there are no signs of infection in the standing trees.

Because the Owners wish to minimize the visual impact of the project and to maintain the natural privacy afforded by the site, there are 5 trees noted on the site plans which will be considered to be "structure" in order to protect them as part of the overall design of the house.

### CONSTRUCTION DESIGN AND MATERIALS

The proposed structure will be constructed to meet Ignition-Resistant (IR) requirements. The main house structure is to be oriented to the east and run north-south along its major axis; the garage, which runs east-west, is attached by a small link. Both parts have a relatively simple design with a simple roofline. The roofing material will be Class A metal. Metal gutters with screens will be used to collect runoff water from the roof. The finished exterior wall surface material will be 1/4 stone, 1/2 IR siding, and 1/4 metal. Trim and fascia will be wood; soffits will be cementitious. There are medium-sized windows on the north, south and west sides and dormers on the west side. There are large-sized windows and sliding doors on the east side. Windows will be metal-clad units with double pane (low-e coated) glass. Tempered glass will be used where required by building code. Exterior doors are to be made of metal-clad wood with a tempered glass insert. The rear deck / stair will be made with synthetic wood decking on top of heavy timber / steel support brackets. The deck will be open and isolated from the surrounding landscape by elevating it above grade and above the lower level basement.

## UTILITIES

Utilities will be buried in a trench along the existing access driveway. The well will be located 120 feet SW of the house and 75 feet S of the propane tank. The septic field is located 130 feet NE of the house and approximately 75 feet below it. The propane tank will be approximately 50 feet from the house and about 225 feet from the fire cistern, and be above the house elevation by about 15 feet. The tank will be buried below ground. No tree branches will overhang the tank and vegetation within 10 feet of the tank will be kept cleared.

### **DEFENSIBLE SPACE ZONES**

There are three defensible space zones to be created around the structures.

**Zone1** – Starts at the foundation and extends out 15 feet in all directions from the outside edge of the structures.

Zone 1 is broken down into three segments:

**Zone 1A** – Consists of the structures themselves and the area immediately adjacent to and surrounding the structures on all sides. A three-foot wide, non-flammable strip will be created using existing rock and boulders. No flammable materials (such as firewood) will be stored in this area.

**Zone 1B** – Extends out from Zone 1A. In this zone, all highly flammable vegetation is to be removed. Any large, dead, woody material on the ground will also be removed. Firewise plants will be used for landscaping. Grasses planted for revegetation will be kept mowed to a maximum height of 6 to 8 inches twice per growing season to a

distance of 15 feet from the structure. (Grass will be irrigated when possible).

**Zone 1C** – This zone extends out from Zone 1B to 15 feet from the house. All understory trees (ladder fuels) will be removed as marked. A few of the larger, healthy trees will be retained for screening (shown on the plans). All remaining trees in this zone will be pruned to a height of 10 feet. They are well spaced so that the crowns are not touching (10 foot minimum crown spacing). All trees are at least 15 feet away from the house on the downhill side and a minimum of 20 feet away from chimneys. No trees will overhang the house or deck.

**Zone 2** - This zone extends out from Zone 1C, and acts as a transition zone between the heavily thinned area near the house to the existing forest setting. It extends down slope for 75 feet, to either side for 75 feet and above the house for 75 feet. Tree spacing begins as in Zone 1C and gradually decreases as one approaches the outer edge of the zone. All ladder fuels and poor quality, suppressed and/or diseased trees, 6-8 inches in diameter, make up the majority of the removals. The remaining mature trees will be pruned to a height of 8 feet at the intersection of Zones 1 and 2, with limbing reduced in height

to 6 feet as one approaches Zone 3.

**Zone 3** – This zone extends out from Zone 2 to the edge of the property. It will extend out to areas that are not part of the immediate mitigation efforts. In this zone, there are thicker clumps of trees, as well as some unpruned trees near the outer edge.

Trees that are of poor quality or form, or have insect or disease infestations, will be removed. Slash in this zone may be lopped and scattered and/or piled for wildlife use.

All trees to be removed will be marked with blue tree marking paint or flagging. All trees within zones 1 and 2 that are to remain for screening will be unmarked. Wood generated by the cutting operation will be bucked up into firewood to be stacked on site (at least 30 feet from the house) or hauled off site. Slash will be chipped and spread or hauled off site or piled and burned. (Note: a valid Open Burning Permit from the Boulder County Environmental Health Department will be obtained before piles are burned. The local Fire Protection District will be checked).

## DRIVEWAY ACCESS FOR EMERGENCY VEHICLES

The property is accessed directly via Sunshine Canyon Drive. There is an existing, cleared driveway which will be regraded according to the Civil Engineer's recommendations in coordination with Bruce Honeyman of the Sunshine Canyon Fire Protection District. This regrading will create some additional site disturbance and soil compaction; it will not require the removal of any trees. The driveway will be designed and built to meet Boulder County Private Access standards. It will be a minimum of 12 feet wide with a vertical clearance of 13'6". It will be graded at 0-12%, with a short steeper section at 14%. A hammerhead or "Y" turn-around will be created 320 feet from the proposed house per Boulder County Requirements as approved under #LU-05-006. A second hammerhead or "Y" turn-around will be created 160 feet from the proposed house on Lot 3; this location was coordinated on-site with Bruce Honeyman, Fire Chief of the Sunshine Canyon Fire Protection District. Two additional pull-outs will also be created, one approximately half-way between the hammerheads at the upper half of the driveway and one located between the second hammerhead and the house (see plan drawing) at the lower half of the driveway.

#### **EMERGENCY WATER SUPPLY FOR FIREFIGHTING**

As approved per #LU-05-006, a minimum of two ganged fire protection cisterns will be installed (buried), to be shared with the adjacent residence on Lot 4 (same Owner); final sizes of the cisterns to be coordinated by Mr. Honeyman and Owner's consultant certified fire protection engineer, Steven Scandaliato of Scandaliato Design Group. The cisterns will be located 320 feet SW from the house. The cisterns will have a schedule 40 PVC dry hydrant connection with a 6" NH threaded connection and cap. The cisterns will be filled and fully usable prior to the beginning of the framing stage of construction. Since the residence is greater than 3,600 square feet, an NFPA 13-D residential sprinkler system will also be installed.

#### MAINTENANCE

In addition to the above recommendations, several other measures will be taken to make the home more fire safe. While not required through Site Plan Review, the following measures may be undertaken by the Owners to maintain the home and defensible space in the future.

- The defensible space will be maintained yearly; The Colorado State Forest Service and/or your local Fire Protection District may be contacted for a 5-year maintenance inspection.
- Firewood will be kept at least 30 feet away from buildings; weeds and grass will be cleared from around firewood piles.
- When possible, an irrigated greenspace will be maintained; grasses mowed 6" to 8" high.
- A minimum of 50 feet of garden hose with an adjustable nozzle will be connected and available.
- Be aware of fire danger; fire danger signs are posted at the entrance of most major canyons.
- There will be no soffit vents on the project.
- Unnecessary accumulations of debris and trash from yards will be removed.
- Tools such as shovels, rakes and axes, will be kept available and ready for use.
- Debris from the roof and gutters will be cleaned at least two times a year.
- Screens and spark arresters on chimneys will be checked and maintained.
- Address markers will be clearly visible from the main access road.
- Combustible materials (such as firewood) will not be stored under decks.
- Gutters and downspouts will be metal.





SCALE: 1\*+10'-0" COPYRIGHT 2004 ALL REPTS RESERV

BOULDER CO 80302 TEL 303 449 6605



#### WARREN RESIDENCE November 3, 2005

#### Wildfire Mitigation Plan - Preliminary:

Warren Residence 0000 Sunshine Canyon Drive Lot 3, Ponderoski Estates, Replat A Boulder County, CO

#### **Prepared for:**

Jim and Dianne Warren 915 Stage Coach Georgetown, TX 78628

#### **Prepared by:**

Arcadea Architecture 741A Pearl Street Boulder, CO 80302 Phone: (303) 449-6605 Fax: (303) 449-2148 Principal: David Biek Project Manager: Stacey Root E-mail: stacey@arcadea.com

Arcadea organized a pre-submittal site meeting with the Sunshine Canyon Fire District Fire Chief Steve Stratton and Boulder County Wildfire Mitigation Official Eric Philips for additional recommendations. Please refer also to the attached document summarizing the notes from that meeting.

Please consider this plan to be preliminary. Prior to construction, this wildfire mitigation plan will be revised and augmented as recommended by Wildfire Mitigation consultant Cory Secher of the Colorado State Forestry.

#### SITE LOCATION AND PROPERTY DESCRIPTION

## Legal description: Lot 3, Ponderoski Estates, Replat A.

SPR# + Square Footage

The property is located in the Northwest ¼ of Section 15, Township 1 North, Range 71 West of the 6<sup>th</sup> P.M., Boulder, Colorado. The lot is 35.20 acres in size. It is at approximately 6730 feet in elevation above sea level. There are currently no existing structures on the site. The proposed building site has a slope of approximately 20% with an east aspect, and there are two primary existing natural drainages. The proposed structure will be located on an existing cleared flat spot. It is a relatively xeric site. A minor dirt road provides a natural barrier to surface fire spread. Because of the topography, the building site is a medium wildfire hazard.

The site is best represented by Fuel Model 4. Except at the existing clearing (house location) and existing driveway, the property is covered with dense stands of ponderosa pine and Douglas fir. The under-story consists of a cover of native grasses (90%) and rock (10%). All of the forest litter will be removed prior to construction to within 25 feet of the house. There is no appreciable amount of downed timber and there are no signs of infection in the standing trees.

Because the Owners wish to minimize the visual impact of the project and to maintain the natural privacy afforded by the site, there are 6 trees noted on the site plans which will be considered to be "structure" in order to protect them as part of the overall design of the house.

## CONSTRUCTION DESIGN AND MATERIALS

The proposed structure will be constructed to meet Ignition-Resistant (IR) requirements. The main house structure is to be oriented to the east and run north-south along its major axis; the garage, which runs east-west, is attached by a small link. Both parts have a relatively simple design with a simple roofline. The roofing material will be Class A metal. Metal gutters with screens will be used to collect runoff water from the roof. The finished exterior wall surface material will be 1/4 stone, 1/2 IR siding, and 1/4 metal. Trim and fascia will be wood; soffits will be cementitious. There are medium-sized windows on the north, south and west sides and dormers on the west side. There are large-sized windows and sliding doors on the east side. Windows will be metal-clad units with double pane (low-e coated) glass. Tempered glass will be used where required by building code. Exterior doors are to be made of metal-clad wood with a tempered glass insert. The rear deck / stair will be made with synthetic wood decking on top of heavy timber / steel support brackets. The deck will be open and isolated from the surrounding landscape by elevating it above grade and above the lower level basement.

### UTILITIES

Utilities will be buried in a trench along the existing access driveway. The well will be located 120 feet SW of the house and 75 feet S of the propane tank. The septic field is located 130 feet NE of the house and approximately 75 feet below it. The propane tank will be approximately 50 feet from the house and about 225 feet from the fire cistern, and be above the house elevation by about 15 feet. The tank will be buried below ground. No tree branches will overhang the tank and vegetation within 10 feet of the tank will be kept cleared.

#### **DEFENSIBLE SPACE ZONES**

There are three defensible space zones to be created around the structures.

Zone1 – Starts at the foundation and extends out 15 feet in all directions from the outside edge of the structures.

Zone 1 is broken down into three segments:

**Zone 1A** – Consists of the structures themselves and the area immediately adjacent to and surrounding the structures on all sides. A three-foot wide, non-flammable strip will be created using existing rock and boulders. No flammable materials (such as firewood) will be stored in this area.

**Zone 1B** – Extends out from Zone 1A. In this zone, all highly flammable vegetation is to be removed. Any large, dead, woody material on the ground will also be removed. Firewise plants will be used for landscaping. Grasses planted for revegetation will be kept mowed to a maximum height of 6 to 8 inches twice per growing season to a

distance of 15 feet from the structure. (Grass will be irrigated when possible).

**Zone 1C** – This zone extends out from Zone 1B to 15 feet from the house. All understory trees (ladder fuels) will be removed as marked. A few of the larger, healthy trees will be retained for screening (shown on the plans). All remaining trees in this zone will be pruned to a height of 10 feet. They are well spaced so that the crowns are not touching (10 foot minimum crown spacing). All trees are at least 15 feet away from the house on the downhill side and a minimum of 20 feet away from chimneys. No trees will overhang the house or deck.

**Zone 2** - This zone extends out from Zone 1C, and acts as a transition zone between the heavily thinned area near the house to the existing forest setting. It extends down slope for 75 feet, to either side for 75 feet and above the house for 75 feet. Tree spacing begins as in Zone 1C and gradually decreases as one approaches the outer edge of the zone. All ladder fuels and poor quality, suppressed and/or diseased trees, 6-8 inches in diameter, make up the majority of the removals. The remaining mature trees will be pruned to a height of 8 feet at the intersection of Zones 1 and 2, with limbing reduced in height

to 6 feet as one approaches Zone 3.

**Zone 3** – This zone extends out from Zone 2 to the edge of the property. It will extend out to areas that are not part of the immediate mitigation efforts. In this zone, there are thicker clumps of trees, as well as some unpruned trees near the outer edge.

Trees that are of poor quality or form, or have insect or disease infestations, will be removed. Slash in this zone may be lopped and scattered and/or piled for wildlife use.

All trees to be removed will be marked with blue tree marking paint or flagging. All trees within zones 1 and 2 that are to remain for screening will be unmarked. Wood generated by the cutting operation will be bucked up into firewood to be stacked on site (at least 30 feet from the house) or hauled off site. Slash will be chipped and spread or hauled off site or piled and burned. (Note: a valid Open Burning Permit from the Boulder County Environmental Health Department will be obtained before piles are burned. The local Fire Protection District will be checked).

### DRIVEWAY ACCESS FOR EMERGENCY VEHICLES

The property is accessed directly via Sunshine Canyon Drive. There is an existing, cleared driveway which will be slightly regarded according to the Civil Engineer's recommendations. This re-grading will create some additional site disturbance and soil compaction; it will not require the removal of any trees. The driveway will be designed and built to meet Boulder County Private Access standards. It will be a minimum of 12 feet wide with a vertical clearance of 13'6". It will be graded at 0-12%, with a short steeper section at 14%. A hammerhead or "Y" turn-around will be created 320 feet from the proposed house per Boulder County Requirements as approved under #LU-05-006. A second hammerhead or "Y" turn-around will be created 160 feet from the proposed house; this location was coordinated on-site with Bruce Honeyman, Fire chief of the Sunshine Canyon Fire Protection District. Two pull-outs will be created as well, one approximately half-way between the hammerheads and one located between the second hammerhead and the house (see plan drawing).

### **EMERGENCY WATER SUPPLY FOR FIREFIGHTING**

As approved per #LU-05-006, a minimum of two ganged 3,600-gallon fire protection cisterns (or as required by a certified fire protection engineer) will be installed, to be shared with the adjacent residence on Lot 4 (same Owner). The cisterns will be located 320 feet SW from the house. The cisterns will have a schedule 40 PVC dry hydrant connection with a 6" NH threaded connection and cap. The cisterns will be filled and fully usable prior to the beginning of the framing stage of construction. Since the residence is greater than 3,600 square feet, an NFPA 13-D residential sprinkler system will also be installed.

## MAINTENANCE

In addition to the above recommendations, several other measures will be taken to make the home more fire safe. While not required through Site Plan Review, the following measures may be undertaken by the Owners to maintain the home and defensible space in the future.

- The defensible space will be maintained yearly; The Colorado State Forest Service and/or your local Fire Protection District may be contacted for a 5-year maintenance inspection.
- Firewood will be kept at least 30 feet away from buildings; weeds and grass will be cleared from around firewood piles.
- When possible, an irrigated greenspace will be maintained; grasses mowed 6" to 8" high.
- A minimum of 50 feet of garden hose with an adjustable nozzle will be connected and available.
- Be aware of fire danger; fire danger signs are posted at the entrance of most major canyons.
- There will be no soffit vents on the project.
- Unnecessary accumulations of debris and trash from yards will be removed.
- Tools such as shovels, rakes and axes, will be kept available and ready for use.
- Debris from the roof and gutters will be cleaned at least two times a year.
- Screens and spark arresters on chimneys will be checked and maintained.
- Address markers will be clearly visible from the main access road.
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- Gutters and downspouts will be metal.



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Warren Residence Architectural Narrative November 3, 2005

Prepared for: Jim & Dianne Warren 915 Stage Coach Georgetown, TX 78628

Prepared by: Arcadea Architecture 741A Pearl Street Boulder, CO 80302 Phone: (303) 449-6605 Fax: (303) 449-2148 Stacey Root, Project Manager E-mail: stacey@arcadea.com

This project is for a retiring couple from Texas that hopes to reside on a lot adjacent to their daughter & son-in-law. The goal is a house that has very little visual and environmental impact. The house will sit mainly on an existing cleared flat spot (accessed by an existing cleared driveway) and the site is heavily treed. Because the Owners value the fact that the site is relatively private, shaded, and sheltered by these trees, the house is designed to minimize destruction and to be screened from view by "stepping around" a handful of existing trees. For the purpose of the Wildfire Mitigation Plan, we propose to include a few of these trees as part of the structure in order to preserve them, and to remove only those that are absolutely required for wildfire mitigation efforts. This will also help to screen the house from afar, though the project location is not visible from either the Bald Mountain Scenic Area or from the Anne U. White trail in Fourmile Canyon Open Space.

We have chosen materials that will blend with the natural surroundings, including natural reddish-brown wood siding, dark reddish-brown metal siding, natural stone and a dark reddish-brown metal roof. For ease of accessibility for our clients, most of the house is on one level. Two guest bedrooms and a mechanical room are located on the basement level. There is an attached 2-car garage, joined to the house perpendicularly with a small mudroom.

If the proposal is accepted by the Boulder County Land Use Department, the Owners plan to employ the same general contractor that their daughter and son-in-law will use for construction of their own home on an adjacent lot. This will afford some economy in building, but more importantly, it will allow for the smoothest construction coordination and the least possible disruption to the neighborhood.



