

USDA-FOREST SERVICE

FS-2500-8 (7/00)

7/14/2017

Date of Report:

**BURNED-AREA REPORT**  
(Reference FSH 2509.13)

**PART I - TYPE OF REQUEST**

## A. Type of Report

- ☒ 1. Funding request for estimated WFSU-SULT funds  
☐ 2. Accomplishment Report  
☐ 3. No Treatment Recommendation

## B. Type of Action

- ☒ 1. Initial Request (Best estimate of funds needed to complete eligible rehabilitation measures)  
☐ 2. Interim Report  
     ☐ Updating the initial funding request based on more accurate site data or design analysis  
     ☐ Status of accomplishments to date  
☐ 3. Final Report (Following completion of work)

**PART II - BURNED-AREA DESCRIPTION**

A. Fire Name: Holcomb Fire

B. Fire Number: CA-BDF-9443

C. State: California

D. County: San Bernardino

E. Region: 05

F. Forest: San Bernardino National Forest

G. District: 52

H. Date Fire Started: June 19, 2017

I. Date Fire Contained: June 28, 2017

J. Suppression Cost: as of 6/30/2017 cost of suppression are ~\$7,500,000

## K. Fire Suppression Damages Repaired with Suppression Funds

1. Fireline waterbarred (miles):  
 2. Fireline seeded (miles): 0  
 3. Other (identify): Miles of handline: 12 Miles of dozer: 2.5

## L. Watershed Number:

- Baldwin Lake (180702030101)
- Box S Springs (181001000402)
- Soggy Lake (181001000702)

## M. Total Acres Burned: 1,504

NFS Acres(1,490)      Other Federal (0)      State (0)      Private (14)

#### N. Vegetation Types:

Vegetation within the burn area was primarily composed of singleleaf pinyon pine (PJ) forest vegetation (87%) with smaller components of eastside pine (7%) and mixed vegetation (4%). This area has not burned in over 100 years. Pinyon pine forest is not known to tolerate fire well. Pinyon pine forest exhibits very slow recovery times, and invasive plants may inhibit the ability of the native plant species to recover.

O. Dominant Soils: Olete-Goulding (700 acres; 46% fire area); Olete-Kilburn-Goulding (438 acres; 29% fire area)

#### P. Geologic Types:

Cws - Wood Canyon Formation, siltite-quartzite unit (331 ac; 22% fire area)

Prsq - Stirling Quartzite, quartzite member (207 ac; 14% fire area)

Qyls - Young landslide deposits (126 ac; 8% fire area)

Cwc - Wood Canyon Formation, coarse-grained quartzite unit (118 ac; 8% fire area)

Cz - Zabriskie Quartzite (109 acre; 7% fire area)

Q. Miles of Stream Channels by Order or Class: 3.4 miles of Intermittent Stream

#### R. Transportation System

Trails: 0.39 miles      FS Roads: 13.1 miles      Non-FS Roads: 0.03 miles

### **PART III - WATERSHED CONDITION**

A. Burn Severity (acres):

424 (low)      954 (moderate)      28 (high)      98 (unburned)

B. Water-Repellent Soil (acres): 120 acres

C. Soil Erosion Hazard Rating (acres):

22 (low)      599 (moderate)      882 (high)

D. Erosion Potential: ~4.5 tons/acre

E. Sediment Potential: 1,259 cubic yards / square mile

### **PART IV - HYDROLOGIC DESIGN FACTORS**

**Table 1: Hydrologic Design Factors for Design Storm**

A. Estimated Vegetative Recovery Period	5 to 10 years	5 to 10 years	5 to 10 years
B. Design Chance of Success	95%	90%	60%
C. Equivalent Design Recurrence Interval	2-yr	5-yr	10-yr
D. Design Storm Duration	2 hrs	6 hrs.	6 hrs.
E. Design Storm Magnitude	0.768 in.	2.61 in.	3.19 in.
F. Design Flow (average)	88 cfs/sq.mi.	250 cfs/sq.mi.	386 cfs/sq.mi.
G. Estimated Reduction in Infiltration	34%	34%	34%

**Table 1: Hydrologic Design Factors for Design Storm****H. Adjusted Design Flow\***

NA*	NA*	NA*
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\*No treatments to control flow are recommended.

## **PART V - SUMMARY OF ANALYSIS**

### **A. Describe Watershed Emergency:**

#### **A. 1. Soil Burn Severity**

Overall, soil burn severity for the 1,503 acre Holcomb Fire is 27 acres High, 954 acres Moderate, and 522 acres Low and Unburned (Appendix A). Soil burn severity considers surface and below-ground factors that relate to soil hydrologic function, runoff and erosion potential, and vegetative recovery. Soil burn severity is described as the effect of a fire on ground surface characteristics; including char depth, organic matter loss, altered color and structure, and reduced infiltration. It is classified into one of 4 ratings (unburned, low, moderate, and high) using satellite imagery and on-the-ground monitoring to determine post-fire soil burn severity. Soil burn severity can affect vegetative recovery, hydrologic response, and erosion potential. Areas with moderate to high soil burn severity tend to have increased hydrophobic characteristics, a characteristic which reduces infiltration and increases runoff potential. Soil water repellency is caused by volatilization of organic compounds that have hydrophobic properties. When burned, these compounds concentrate in the soil, typically at the burn/unburned transition in the soil profile. It is possible for low SBS soils to exhibit hydrophobic characteristics as well. Material above the hydrophobic layer is likely to be transported in a runoff event.

Low soil burn severity: Surface organic layers are not completely consumed and are still recognizable. Structural aggregate stability is not changed from its unburned condition, and roots are generally unchanged because the heat pulse below the soil surface was not great enough to consume or char any underlying organics. The ground surface, including any exposed mineral soil, may appear brown or black (lightly charred), and the canopy and understory vegetation will likely appear “green.” Vegetative recovery is fairly rapid in low SBS locations because organic matter and fine roots are still somewhat intact.

Moderate soil burn severity: Up to 80 percent of the pre-fire ground cover (litter and ground fuels) may be consumed but generally not all of it. Fine roots (~0.1 inch or 0.25 cm diameter) may be scorched but are rarely completely consumed over much of the area. The color of the ash on the surface is generally blackened with possible gray patches. There may be potential for recruitment of effective ground cover from scorched needles or leaves remaining in the canopy that will soon fall to the ground. The prevailing color of the site is often “brown” due to canopy needle and other vegetation scorch. Soil structure is generally unchanged.

High soil burn severity: All or nearly all of the pre-fire ground cover and surface organic matter (litter, duff, and fine roots) is generally consumed, and charring may be visible on larger roots. The prevailing color of the site is often “black” due to extensive charring. Bare soil or ash is exposed and susceptible to erosion, and aggregate structure may be less stable. White or gray ash (up to several centimeters in depth) indicates that considerable ground cover or fuels were consumed. Sometimes very large tree roots (> 3 inches or 8 cm diameter) are entirely burned extending from a charred stump hole. Soil is often gray, orange, or reddish at the ground surface where large fuels were concentrated and consumed.

#### **A. 2. Erosion Response**

The post-fire erosion risk was assessed using the FS WEPP Post-Fire Erosion Prediction Model (WEPP-PEP), which is a web-based application that uses Water Erosion Prediction Project (WEPP) technology to estimate sediment yield and peak flows, in probabilistic terms, on burned and recovering forest, range, and chaparral lands. User inputs are processed by WEPP-PEP to combine rain event variability with spatial and temporal variabilities of soil burn severity and soil properties, which are then used as input parameters. WEPP-PEP produces a distribution of precipitation event sediment yield, runoff, and peak flow rates with a probability of occurrence for each.

**Table 2. Sediment yield for subwatersheds using WEPP-PEP.**

Sediment Yield <sup>1</sup> (tons/acre/year)					
	Pre-Fire <sup>2</sup>	Post-Fire <sup>3</sup>			
Subwatershed	T-Factor <sup>4</sup>	Q2	Q5	Q10	Erosion Hazard Rating <sup>5</sup>
Doble	2 to 5	1.580	3.12	3.82	Slight to Severe
Whiskey	1 to 2	0.001	0.26	1.30	Moderate to Very Severe
Jacoby <sup>6</sup>	1 to 2	1.458	3.56	7.29	Severe to Very Severe

Pour points are the outlet of a catchment of which all water in the basin drains through. Pour points based on Values at Risk were selected to determine watershed responses and determine post fire risks. The same pour points were used for hydrologic modeling and WEP-PEP. WEP-PEP dissects the delineated watershed into different slopes where each slope can be rated differently based on erosion potential. Three pour points were selected: Jacoby Canyon, Doble area, and Whiskey Springs.

All three drainage basins are dominated with soil types that have high (or severe) erosion hazard ratings (see Hydrology Report). The major soil type within the Doble drainage basin (Olete-Kilburn-Goulding families complex) occupies over 84 percent (214 acres) of the basin and is rated as severe primarily due to slope and erodibility of the surrounding hillslopes. Near the outlet of the Doble drainage basin is the Morical, very deep-Hodgson families association which occupies the remaining 16 percent (40 acres) of the basin. It has a low (or slight) erosion hazard rating likely due to the less steep slopes of the basin. Jacoby Creek results indicate tributaries have severe to very severe erosion hazard ratings with high volumes of sediment evacuated, transported, or deposited from the drainage basin, especially in larger storms capable of producing surface runoff. This supports the field observations that the terrain is subject to debris flows. According to WEP-PEP, soil loss volumes in the Doble area are the highest in the fire burn area. Some of the modeled slopes within the Doble pour point do exhibit only slight erosion potential but several slopes also exhibit severe erosion hazard ratings as well. In determining risk to downstream beneficial uses, ratings in the entire catchment must be considered. The volumes modeled in WEP-PEP would pose a risk to downstream beneficial uses from sedimentation.

### A. 3. Hydrologic/Watershed Response

In summary, field observations and modeling of the burned area support a general trend of increased flows, sedimentation, and erosion due to post-fire effects especially in subwatersheds with the most burned acreage (specifically moderate and high SBS), high erosion hazard ratings, and the steepest slopes. Areas most at risk from post-fire flooding, erosion, and sedimentation are within the burn area or within close proximity to the burn area, although some sites outside of the burn perimeter that are down slope or downstream of the burn area are still at risk from post-fire effects.

The burn area includes 3.4 miles of intermittent streams along with Jacoby spring, a developed perennial spring. Approximately 80 percent of the drainage area drains to the northeast into the Mojave Desert. The remaining drainage area drains to the south into Baldwin Lake.

The fire may have a wide range of effects on soil, water, and watershed resources.

With the loss of ground cover and reduction in soil infiltration, peak flood flows and erosion rates along with the

<sup>1</sup> Total quantity of sediment, expressed in units of mass (or volume) per unit time. Sediment yield is the volume of sediment transported from a drainage basin over a given time period.

<sup>2</sup> <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>

<sup>3</sup> <https://forest.moscowfs.wsu.edu/fswepp/>

<sup>4</sup> An estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period.

<sup>5</sup> A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical. (<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>)

<sup>6</sup> Average sediment yield for 9 smaller subwatersheds within the larger Jacoby subwatershed due to WEPP-PEP limitations on watershed size.

potential for debris flows and mass wasting are higher and potentially more damaging to the critical values. Changes in the timing, duration, frequency, and magnitude of increased peak flood flows can negatively affect stream channel and riparian characteristics through stream channel scour, streambank erosion, and loss of floodplain, substrate material, sediment aggradation and deposition, and loss of aquatic and riparian vegetation. Infrastructure such as the County landfill), buried pipelines such as the those in the Cushenbury area, bridges/large stream crossings such as along HWY 18, and roads can be directly or indirectly affected.

Water quality is affected by the rapid and large influx of sediment, debris, organic matter, and ash as well as the loss of aquatic and riparian (streamside) vegetation. Increases in water turbidity, temperature, suspended sediment, as well as a decrease in dissolved oxygen can be expected.

Using the same drainage basins modeled with WEPP-PEP for quantifying post-fire sediment yield, StreamStats was used to conduct modeling of the post-fire hydrologic response relating to flood flows (discharge) with a 2, 5, and 10-year reoccurrence interval. (See hydrology report for details on method.) See Table 3 for modeled flood flows and the percent increase at the outlet of each drainage basin.

Doble Pour point: This pour point was selected for both trends of post-fire response as well as to determine risks to downstream VARs. Soil burn severity is an important factor in determining post-fire runoff. Doble area burned primarily with moderate SBS compared to other watersheds (ex. Whiskey) that burned in more mosaic patterns of low, moderate, and very low SBS. As mentioned, higher SBS tends to result in an increased hydrologic response. In moderate to high SBS, there is less organic matter, usually higher hydrophobic characteristics, and less vegetation and soil cover.

Jacoby Canyon burned with a range of low, moderate and high SBS; however, the larger catchment includes a large portion of unburned acreage. The headwaters were mostly outside the burn area. Hydrologic response in the unburned area will be unchanged. In considering the peak flow discharge through a pour point, the percent of the burn area within the catchment needs to be considered. In Jacoby Canyon, the burn occurred lower in the watershed, leaving little room for unburned area to attenuate post-fire flows from down stream beneficial uses, such as Jacoby Spring and Jacoby Road. There is over a mile of unburned stream channel until the HWY 18 crossing. This unburned channel has large boulders and mature hardwoods stabilizing the unburned channel; however, some areas of the channel adjacent to the HWY are confined. There is potential for the burn area to deliver not only increased sediment and runoff, but increased woody debris that can bulk flows. Bulking of flows can alter flow paths within the channel and floodplain areas.

Whiskey pour point modeled the north end of the fire which has steep slopes, mosaic burn, and most of the catchment falling within the burn perimeter. The burn pattern within this pour point has the headwaters burning at higher SBS (moderate to high) and lower areas burning mostly at low to unburned. This pattern could help attenuate flows, however, all channels in the northern section of the fire are steep, transport systems with little to no depositional areas to trap sediment. There is at least one mile of unburned stream channel from the burn perimeter to HWY 18 crossing.

**Table 3. Pre-fire and post-fire peak flood flows based upon a 2, 5, and 10-year recurrence interval.**

	Discharge (Q, ft <sup>3</sup> /s)						
	Pre-Fire <sup>7</sup>			Post-Fire <sup>8</sup>			
Subwatershed	Q2	Q5	Q10	Q2	Q5	Q10	Percent Difference, Q2
Doble	19.5	54.6	84.9	32.1	90.0	140.0	65
Whiskey	9.2	53.6	135	12.3	71.8	180.9	34
Jacoby	18	105	263	22.6	131.8	330.0	25

<sup>7</sup> <https://water.usgs.gov/osw/streamstats/>

<sup>8</sup> <https://forest.moscowsl.wsu.edu/BAERTOOLS/ROADTRT/Peakflow/USGS/supplement.html#Modifier>

Flood flows and erosion rates higher than normal are expected for several years with the greatest increases occurring the first year following the fire primarily due to the erosive soils and steep slopes throughout the Holcomb Fire perimeter. It may take several years before the normal flow regime returns based upon watershed condition.

#### A. 4 Geologic Response

##### a. Debris Flow

Risk of debris flows has been significantly increased as a result of the fire. Debris flows can mobilize with destructive force 100-1,000,000 cubic yards of rock, sediment, organic material from hillslopes and steep stream channels and have very rapid velocities measured in miles per hour. Although debris flows were not modeled for the fire burned area, on-the-ground observations across the burn indicated that the area could be subject to mass wasting. Jacoby Canyon has several steep tributaries with sediment laden channels that burned with moderate soil burn severity. This material is likely to mobilize in a storm event without the vegetation left to stabilize it. The slope map in the Hydrology Report displays steep slopes within Jacoby Canyon, with many steep slopes just above the road. A monsoonal thunderstorm is common in the fire burn area (high intensity, short duration storm) during summer months. A storm such as this has potential to cause a debris flow.

##### b. Rock Fall

Rock fall potential exists within some areas of the burn, specifically the north end of the fire and in Jacoby Canyon (see hydrology report slope map). These areas have steep slopes with outcrops of rock that may have become unstable with the fire. These sites will continue to be unstable for the next 3-5 years due to a loss of ground cover and will increase temporarily during runoff events.

#### B. Values At Risk

See Appendix B for detailed list of VARs that were evaluated. Only VARs with intermediate and higher risk ratings are included in the list below.

##### a. Life and Safety

###### a.1. Public Safety: Jacoby Canyon Area

The post-fire hydraulic response, burn severity, topography, and geology of Jacoby canyon pose a threat to use of the road. Runoff and erosion of slopes are expected to increase significantly during post-fire storm events potentially resulting in flooding of the canyon and road, and erosion and burial of the road. Additionally, there are a substantial amount of standing fire-killed trees that pose a risk to forest users in the canyon. Based on the potential for debris flows, flooding, rock falls, hazard trees, etc. in Jacoby Canyon, the BAER team identified serious risk to the public and employees.

Probability of Damage or Loss: **Very Likely**

Magnitude of Consequences: **Major**

Risk Level: **Very High**

**Treatment Recommended: Yes**

###### a.2. Public Safety: Doble Mine Area

The BAER team determined that the historic mine tailings that are located in the basin of the Doble area (below the historic Baldwin Mine) may be a risk to life and safety. Historic mining operations utilized hazardous chemicals in the mining process and there is some risk that residual chemicals may still exist at the site. Mining in the area began in the 1860's and continued until around the 1950's, creating an accumulation of tailings in the basin of the catchment. Over time, vegetation re-established on the site and in the catchment, stabilizing the tailings and minimizing off-site mobilization and exposure to people. Based on the pre-fire vegetation type and size, this area has not experienced a sizable fire since before the mining operation.

The recent fire exposed the tailings, removed vegetation that was stabilizing the site, and destabilized the slopes above the site. It is very likely (as supported by the hydrologic and erosion modeling) that the increased

post-fire runoff will result in mobilization of tailings. Exposed contaminants may be kicked up into the air by vehicles or foot traffic, and inhaled or result in direct skin contact. Strong winds can blow contaminants off-site and/or expose nearby people.

Transport of contaminants off-site may also pose a hazard to downstream beneficial uses such as water quality for natural resources and recreation.

Other concerns in the basin include flooding at the PCT stream crossing and a number of hazard trees. The BAER team is in the process of testing the site for level and extent of contaminants. This information will assist the forest in determining whether future stabilization treatments are warranted.

Probability of Damage or Loss: **Likely**

Magnitude of Consequences: **Major**

Risk Level: **Very High**

**Treatment Recommended: Yes**

#### a.3. Hazardous Materials: Greg Paul Mining Claim

This active mining operation was burned over during the Holcomb incident. Included in the site are heavy machinery, various fuel type containers, explosives, mining equipment, a metal storage unit and a mobile home. A mobile home was completely destroyed by the flames - only fragments of various metals and appliances remain. Various equipment and a larger metal storage unit were burned by the flames. Along the walls of the storage unit are chips of paint coming off of the wall, which can be an indicator of lead-based paint. The remains of a dump truck also show remnants of potential lead-based paint (the paint was also peeling off). The exterior of a generator and excavator were burned, leaving the interior exposed. This poses as a potential threat since fluids such as oil are excreted and deposited into the land. Furthermore, the charred plastic and rubber surrounding the different cables can start a fire as well. Several plastic water tank containers were scorched during the fire. A container with unidentified fluids inside was stored within the perimeter. The label on the container could not be deciphered, leaving a cloud of doubt to whether the contents are biohazard or not.

The site could pose a threat to water quality and safety. The California Integrated Waste Management Board (CIWMB) has stated that ash and debris from residential structures consumed by wildfires may contain concentrated amounts of heavy metals, such as arsenic, barium, beryllium, copper, chromium, cadmium, lead and zinc. Further, according to the CIWMB, the occurrence of these metals in burned residential debris has been demonstrated in the "Assessment of Burned Debris Report for the Cedar and Paradise Fires, San Diego County, CA" dated December 2003. It is also known that asbestos remains are found in burned debris and poses a threat when disturbed and airborne. Common household products found in burned structures are usually present such as pesticides, fertilizers, paints and thinner, automobile products and other petroleum based products. Hazmat cannot be released into a surrounding body of water since there is not one on the premises but there is a small chance that solvable hazmat left behind from the refuse that was burned can be released into the soil and surrounding areas.

Probability of Damage or Loss: **Likely**

Magnitude of Consequences: **Moderate**

Risk Level: **High**

**Treatment Recommended: Yes**

#### a.4. Doble Camp:

Just upslope of developed camping site Doble Camp, there are dispersed camp sites within the fire burn perimeter. There are hazard trees and potential rock fall. Additionally, the above hillslope is expected to experience increased erosion and runoff into the campsites (with the burn perimeter). Threats to campers include hazard trees, rock fall, increased overland flow and sedimentation into the campsite. The developed area of Doble Camp is not at risk from post-fire effects (with the exception of the potentially contaminated mine tailings. See other discussion.)

Probability of Damage or Loss: **Likely**



Magnitude of Consequences: **Major**  
 Risk Level: **Very High**  
**Treatment Recommended: Yes**

## **b. Property**

### **b.1. Roads**

#### **b.1.a. Roads (3N16):**

Forest Road 3N16 was assessed to determine the probability and magnitude of road damage or loss as a result of the changed watershed condition. 3N16 is a level 3 road. The road has two drainage spots within the fire burned area where the road bed is at risk from post-fire runoff and erosion. The upslope area for both locations has moderate soil burn severity. Estimated increases in post-fire runoff and erosion are predicted to overwhelm the existing drainage control structures, leading to road bed failure. The length of 3N16 is at risk from hazard trees. 3N16 is also a historic road bed.

- 1) Hazard trees:  
 Probability of Damage or Loss: **Possible**  
 Magnitude of Consequences: **Major**  
 Risk Level: **High**
- 2) Erosion and loss of road bed  
 Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **High**
- 3) Cultural VAR: Erosion and loss of road  
 Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **High**

**Treatment Recommended: Yes**

#### **b.1.b. Roads (3N61, Jacoby Road):**

Jacoby Canyon Road is steep, has several water crossings, and has high potential for stream channel diversion given the post-fire environment. The post-fire environment is expected to cause significant increases in runoff and erosion in Jacoby Canyon putting water quality and riparian habitat at risk, especially if water concentrates down the road surface. Preventing stream channel diversion will help prevent unnecessary erosion and sediment delivery.

Probability of Damage or Loss: **Very Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **Very High**  
**Treatment Recommended: Yes**

#### **b.1.c. Highway 18:**

Based on the potential for increased runoff, erosion, debris flows, and woody debris that may result from the post-fire environment, State Highway 18 may be at risk if storm patrols are not conducted regularly after precipitation events. Runoff from the fire may be transporting significantly larger amounts of sediment, woody debris, and runoff than regularly experienced in the channel and at the crossing.

Probability of Damage or Loss: **Possible**  
 Magnitude of Consequences: **Major**  
 Risk Level: **High**  
**Treatment Recommendation: Yes**

## b.2 Trails

### b.2.a. Pacific Crest Trail (PCT):

Serious potential conditions exist for the section of the Pacific Crest Trail (PCT) within or below burned areas where falling hazard trees, post-fire erosion, flooding and/or debris flows are likely to occur during heavy rain events. These conditions are based on anticipated post-wildfire impacts on trails and trail users. Main threats to the PCT include:

- 1) Excessive erosion of the trail caused by interception and diversion of runoff from steep, burned hill-slopes, saddles, and ridgelines; and scouring and deposition where trail intersects with drainages,  
 Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **High**
- 2) Illegal OHV use on the PCT;  
 Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **High**
- 3) Rock fall and hazard trees.  
 Probability of Damage or Loss: **Possible**  
 Magnitude of Consequences: **Major**  
 Risk Level: **High**

**Treatment Recommended: Yes**

## b.3. Facilities:

### b.3.a Buried Facilities in Cushenbury Area (Southwest Gas, Verizon, Big Bear Area Regional Wastewater Agency):

This site in the Cushenbury area and has had previous erosion issues that exposed the buried lines. Recent efforts (Fall 2016) were taken to stabilize the site; however, given the previous erosion issues, increases in post-fire runoff and erosion have potential to unearth the buried lines again. Exposure of the lines could result in vandalism by the public, which could have significant consequences if the pipelines burst or are shot.

Probability of Damage or Loss: **Possible**  
 Magnitude of Consequences: **Major**  
 Risk Level: **High**

**Treatment Recommendation: Yes**

### b.3.b. San Bernardino County Landfill and Transfer Station:

Because the fire is expected to result in increases in runoff and erosion from the fire burn area, the station may be at risk of nuisance sediment and minor flooding. There is a culvert in a closed basin drainage system where some runoff from the fire is directed. The extent of the flooding and sediment delivery is considered minor but will be above normal baseline delivery.

Probability of Damage or Loss: **Very Likely**  
 Magnitude of Consequences: **Minor**  
 Risk Level: **Low**

**Treatment Recommendation: Yes**

### b.3.c. SCE powerlines:

Because the fire is expected to result in increases in runoff and erosion from the fire burn area, there is potential for the lines to be a risk from hazard trees and erosion. One of the lines is also a cultural resource.

Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **High**  
**Treatment Recommendation: Yes**

### **c. Natural and Cultural Resources**

#### **c.1. Threatened and Endangered Plants and Heritage Resources in Jacoby Canyon area:**

##### **c.1.a. Jacoby Spring: wildlife**

There is only one developed spring (Jacoby Spring) within the fire perimeter. Function of water sources is critical to provide water for a number of wildlife species in this dry area, especially nearby federally listed Endangered Southwestern Willow Flycatcher which had pre-fire breeding habitat in Jacoby Canyon. The water source infrastructures represent a substantial government investment over many years. The greatest impacts to the Jacoby Spring will be higher water flows and higher levels of sediment delivery to stream channels resulting in greater scouring and deposition. There is also a much higher likelihood of debris flows that could result in rocks, boulders, soil, and vegetation flowing into and damaging the spring. The fire damaged a fence that surrounds the Jacoby Spring. This fence is held up by a burned tree, which has a high likelihood of falling. Should the fence fall over, there is increased risk to wildlife of entanglement. During high water flows the fence could damage the spring box.

Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Major**  
 Risk Level: **Very High**  
**Treatment Recommendation: No**

##### **c.1.b. Jacoby Spring area: cultural resources (2 sites)**

The archaeological sites near Jacoby Spring are at risk from higher water flows, sediment delivery, and debris flows.

Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **High**  
**Treatment Recommendation: No (due to lack of feasibility of treatment needed to protect site)**

##### **c.1.c Federally Listed Endangered Southwestern Willow Flycatcher Breeding Habitat:**

The Southwestern Willow Flycatcher Breeding habitat within Jacoby Canyon is at risk of habitat damage due to increased OHV access/disturbance, increased non-native invasive plants, and debris flows caused by the post-fire environment. The fire has burned through the existing riparian habitat, opening up the stream channel and creating the opportunity for OHV incursion. OHV incursion may also introduce non-native plant species that replace native plant species, delaying recovery.

Probability of Damage or Loss: **Very Likely**  
 Magnitude of Consequences: **Major**  
 Risk Level: **Very High**  
**Treatment Recommendation: Yes**

##### **c.1.d. Calcium Carbonate, Federally Threatened and Endangered (TE) plant species:**

Federally endangered plants and critical habitat is within the burn area and experienced low to moderate severity along the Jacoby Canyon road. What is of concern in this area is potential OHV incursion into this critical habitat area off of Jacoby Canyon Road due to lack of vegetative barriers. Consequences from OHV incursion through the habitat would cause serious ground disturbance. New occurrences of invasive weeds moving into the site post-fire also pose a threat.

Probability of Damage or Loss: **Possible**  
 Magnitude of Consequences: **Major**  
 Risk Level: **High**  
**Treatment Recommendation: Yes**

c.2. Heritage Resources Threatened and Endangered (TE) Plants in Doble area:

c.2.a. Cultural sites: (Golden Hill/Baldwin Mine)

This site is a complex historical and pre-historical site with deposits spread throughout. Because of the fire, there is increased visibility which will likely lead to increased off-trail OHV use, site visits, vandalism, and looting. Features and artifacts on the surface can be damaged or destroyed by unauthorized OHV use and can lead to significant damage. Unauthorized OHV incursions and impacts can enable looters to access public land that would otherwise be inaccessible. These disturbances, primarily the damage to features, loci and subsurface deposits, can destroy the site's data potential and integrity which will adversely affect the site. Due to the expansive nature of the site and loss of vegetation, the site is now susceptible to OHV disturbance if not blocked from access. Other threats include post-fire flooding, sedimentation, and erosion, as supported by the watershed modeling.

Probability of Damage or Loss: **Likely**  
 Magnitude of Consequences: **Moderate**  
 Risk Level: **High**  
**Treatment Recommendations: Yes**

c.2.b. Botanical sites: Montane Meadow and Pebble Plain TE/Sensitive Plant Taxa in the Doble Area

Critical plant habitat and known occurrences for both listed pebble plain and montane meadow plant taxa occur within and downstream of the burned area. The threat of invasion from post-fire erosion and sedimentation, noxious weeds, OHV incursion, and trampling are very high and could result in a significant loss of the total population.

For pebble plains, critical habitat exists in this area for the federally threatened plant taxa *Castilleja cinerea*, *Eriogonum kennedyi* var. *austromontanum* and *Eremogone ursina*. Of greater concern is the montane meadow critical plant habitat within and directly downstream of the fire. Four federally endangered plant taxa occur in the montane meadow, *Poa atropurpurea*, *Sidalcea pedata*, *Taraxacum californicum* and *Thelypodium stenopetalum*. All of the federally listed species within this area are extremely rare. This location is expected to receive the highest erosion and sediment deposition due to post fire effects of anywhere affected by the Holcomb Fire (watershed modeling).

Hydrologic modeling for this area predicts 8.9 to 450 acre/tons/year of sediment deposition into the critical habitat of these four species, where all four endangered plant species have known occurrences and critical habitat. While all the endangered taxa in this area are highly endangered, the population of *Thelypodium stenopetalum* is of the greatest concern. *T. stenopetalum* has exhibited dramatic population decline and is essentially only known from two extant populations, both of which occur within 8 km of each other. Number of extant populations may vary depending on who is delineating them, but no matter they are divided up, the species is critically endangered. The large amount of sediment deposition (which includes potentially contaminated mine tailings) may have a dramatic negative effect on remaining populations (S. Eliason, pers. comm 6/29/2017). *Taraxacum californicum* (also endemic to the north east portion of San Bernardino National Forest) is in an equally potentially precarious state. The other two federally endangered plants in the area, *Poa atropurpurea* and *Sidalcea pedata*, while still highly endangered, have higher populations and a slightly broader distribution. However, loss of an entire population, and the genetic diversity contained within it, for these species will certainly be detrimental to their continued existence.

OHV incursion and off-trail foot traffic pose significant threats to these plant populations as the area has been opened up by the fire. Historic unauthorized routes have now become very visible from the main road and the fire burn area is accessible in several locations (terrain, lack of vegetation as a barrier). Disturbance and trampling of the plants will inhibit recovery and add stress to an already stressed ecosystem.

Hazardous material results for mine tailings above the area of critical habitat for these species will not be available to be included within this report, and exact amounts of sediment deposition within the area are also not clear. It is probable that a large sediment deposition event will occur which could bury the montane meadow in this area with sediment that includes potentially toxic heavy metals and other toxic chemicals. If this occurs then the potential exists for effects from this fire to push populations of at least *T. stenopetalum* very close to the brink of extinction. It is unclear how this montane meadow system, and the plants within it, will respond to the predicted sediment pulse.

Probability of Damage or Loss: **Very Likely**  
 Magnitude of Consequences: **Major**  
 Risk Level: **Very High**  
**Treatment Recommendation: Yes**

c.2.c. Pebble plain listed plant taxa occurrences and critical habitat in the vicinity of 3NO2:

A small portion of the known occurrences and critical habitat for the federally threatened plant taxa *Castilleja cinerea*, *Eriogonum kennedyi* var. *austromontanum* and *Eremogone ursina* burned at low to moderate severity in this area. We expect that plants in the burned area will recover naturally. However, at this location increased visibility of an historic OHV unauthorized route now exists. This unauthorized route allows access to the fire perimeter, which OHV drivers may want to access now that the area is opened up. This portion of the forest has a long history of OHV incursions, making these a very likely occurrence with major damage to critical habitat of federally listed species. The main threats are OHV incursion trying to access the fire burned area and invasion of noxious weeds.

Probability of Damage or Loss: **Very Likely**  
 Magnitude of Consequences: **Major**  
 Risk Level: **Very High**  
**Treatment Recommendation: Yes**

c.2.d. Dammer's Blue Butterfly:

The Pebble Plain habitat that supports the endangered host plant for Dammer's Blue Butterfly is at risk of habitat damage due to increased OHV access/disturbance and spread of non-native invasive plants. The fire has created an opportunity for OHV incursion into Pebble Plain areas. OHV incursion may also introduce non-native plant species that replace native plant species, delaying recovery.

Probability of Damage or Loss: **Very Likely**  
 Magnitude of Consequences: **Major**  
 Risk Level: **Very High**  
**Treatment Recommendation: Yes (overlaps with treatments for other VARs)**

c.3.e. Federally listed plants and vegetative recovery (soil productivity):

An emergency exists with respect to vegetative recovery and federally listed plants as a result of the threat of post-fire weed introduction and spread and unauthorized off-road vehicle (OHV) use. Localities within the burn area have a history of concentrated unauthorized OHV use. The unknowing introduction and dispersal of invasive weeds into areas disturbed by fire suppression and rehabilitation has the potential to establish large and persistent weed populations. In addition, it is highly likely that extant weed infestations along fuelbreaks will increase in the burn area due to their accelerated growth and reproduction and a release from competition with natives. These weed populations could affect the structure and habitat function of native plant communities within the burn area. It is expected that most native vegetation would recover if weed invasions are minimized. There are multiple TES plant species within the area that are very likely to be impacted by invasive weeds.

Approximately 3 miles of dozer line and 15 miles of handline were constructed outside and within the burn perimeter. In addition to causing an increase in weed invasion, the disturbances caused by dozer lines are expected to create accelerated erosion and soil compaction that may also inhibit the recovery of native plant

populations. If weed infestations are not controlled it is expected that multiple Threatened, Endangered, and Sensitive plant species will be significantly impacted (see botany VARs).

Probability of Damage or Loss: **Very Likely**

Magnitude of Consequences: **Major**

Risk Level: **Very High**

**Treatment Recommendation: Yes**

**B. Emergency Treatment Objectives:**

- Provide for public safety
- Limit damage to property
- Limit loss of soil productivity and provide for natural vegetative recovery
- Early detection of noxious/invasive weeds
- Road and trail treatments to protect investment in infrastructure and limit post-fire watershed response
- Conserve threatened and endangered species habitat
- Prevent permanent loss of T&E plant species from post-fire effects to habitat in Doble area.

**C. Probability of Completing Treatment Prior to First Major Damage-Producing Storm:**

Land 90%      Channel N/A%      Roads 90%      Other 95%

**D. Probability of Treatment Success**

	Years after Treatment		
	1	3	5
Land	80%	95%	100%
Channel	-	-	-
Roads	80%	95%	95%
Protection of Life and Safety	85%	100%	100%

**E. Cost of No-Action (Including Loss):** (See economic analysis, Appendix D.) Several treatments are intended to protect life and safety protection and prevent substantial loss of TES plant species from post-fire effects. A no-action alternative could result in the loss of life or pose a serious risk to public safety.

**F. Cost of Selected Alternative (Including Loss):** \$141,688 (See economic analysis for details)

**G. Skills Represented on Burned-Area Survey Team:**

<input checked="" type="checkbox"/> Hydrology	<input checked="" type="checkbox"/> Soils	<input type="checkbox"/> Geology	<input type="checkbox"/> Range	<input checked="" type="checkbox"/> Hazmat
<input type="checkbox"/> Forestry	<input checked="" type="checkbox"/> Wildlife	<input type="checkbox"/> Fire Mgmt.	<input checked="" type="checkbox"/> Engineering	<input checked="" type="checkbox"/> CERCLA
<input type="checkbox"/> Contracting	<input type="checkbox"/> Ecology	<input checked="" type="checkbox"/> Botany	<input checked="" type="checkbox"/> Archaeology	<input checked="" type="checkbox"/> Recreation
<input type="checkbox"/> Fisheries	<input type="checkbox"/> Research	<input type="checkbox"/> Landscape Arch	<input checked="" type="checkbox"/> GIS	

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- Robin Eliason, Julie Donnell (Wildlife)
- Bill Wells (Soils, Hydrology, Engineering)
- Stephen Hodges (Botany)
- Jay Marshall (Archaeology)

- Jeannette Granger (Recreation/trails)
- Tracy Tennant (GIS)
- Pete Hubbard (Road Technician)
- Javier Diaz (Environmental Engineer/Hazmat)
- Belinda Walker (Environmental Engineer)

## **H. Treatment Narrative:**

### **Overall Summary**

The proposed treatments on National Forest System lands can help to reduce the impacts of the fire from storm events, but treatments cannot fully mitigate the effects of the fire on the watershed. Detailed information of the treatments is summarized below. Hill slope treatments (such as hydromulching, aerial seeding, and straw or woodstrands application) were not proposed because they are infeasible and/or would not reduce the probability of damage to assets. The treatments listed below are those that are considered to be the most effective on National Forest System lands for the identified threats. A map of treatments is located in Appendix C.

Controlling access to NFS lands within the burned area via road closures, conducting storm patrols, and implementing road and trail stabilization, will lessen the risks to critical values on NFS lands. Specifically, FS roads 3N16 and 3N61 are most at risk for flooding and erosion. In the case of 3N61 lateral migration and diversion of the stream channel to the road as well as loss of the remaining riparian vegetation and changes to stream channel geomorphology are expected. Controlling road runoff from FS 3N16, which is above the PCT and County Landfill will help mitigate any excessive downstream effects to the ephemeral PCT channel crossing, 3N16 headcutting, and sediment deposition onto the County Landfill.

Buried infrastructure (such as buried transmission lines) could be at risk of exposure from increased flows that scour out swales, channels, and drainages (where infrastructure crosses these features and have a history of pre-fire erosion). It is recommended that a closer analysis is completed on buried infrastructure as the BAER assessment is only a rapid assessment.

### **Wildlife and Botany Resources – Summary of Treatments**

The BAER assessment team has proposed an OHV Resource Protection treatment that includes installation of barriers, gates, fencing, and vegetation barriers to try to limit the amount of illegal cross-country vehicle use that is expected due to the lack of vegetation. The OHV Resource Protection treatment will help reduce the risk of damage to critically endangered plants from vehicles driving off road. It will also help speed the rate of habitat recovery by reducing habitat degradation, effects to other native vegetation, and the spreading and establishment of non-native plants. See OHV protection for implementation description and costs.

The BAER assessment team has determined that an emergency condition does exist for the critical natural value of the federally endangered southwestern willow flycatcher due to the risk of debris flows and illegal cross-country vehicle use, which may slow down the rate of habitat recovery and increase the risk of spreading and establishing non-native plants. OHV use can prevent native plants from re-establishing and introduce non-native plant species. The proposed road closure of Jacoby Canyon road includes installation of barriers or gates to limit the amount of illegal cross-country vehicle use that is expected due to the lack of vegetation. The road closure will also help speed the rate of habitat recovery by reducing the risk of spreading and establishing non-native plants. See Jacoby Road Closure for details and costs of implementation.

In addition, the BAER assessment team has proposed a fire-wide Early Detection and Rapid Response (EDRR) treatment which will reduce the risk of habitat degradation from non-native invasive plants. The treatment will help prevent further loss and degradation of TES habitat as a result of weed infestations. See Land Treatments for a description of EDRR implementation and costs.

The BAER team also recommends seed banking of TES species downstream of the Doble area. This area supports several TES plant species, one of which is at particularly high risk from post-fire effects, OHV

incursion, and foot-traffic (Botany report). The post-fire watershed response modeling conducted for the assessment supports these findings.

### **Heritage Resources – Summary of Treatments**

Treatments are needed for sites that are vulnerable to increased OHV activity and separate treatments are required for those properties that are vulnerable to the effects of increased erosion, flooding and hazard trees. The Proposed Doble Area Closure (and OHV Prevention) treatment will protect heritage sites by keeping unauthorized OHV use out of the fire area. There is no treatment recommended for Jacoby Spring to protect it from flooding and erosion as those treatments are not feasible.

### **Protection/Safety Treatments – Summary of Treatments**

The BAER team determined that post-fire watershed responses pose a serious and significant threat to public safety and infrastructure during storm events over the next few years. To address that threat as well as post-fire threats to natural resources and cultural resources associated with the public use of the SBNF within the recently burned area, the BAER Team recommends some temporary closures within and near the burned area. Two area closures are proposed for Life and Safety (as primary reason) and two area closures are proposed for protection of resources (as primary reason). Life and Safety Closures will be discussed in this section.

### **Detailed Description of Treatments:**

#### **Life and Safety:**

##### **1. Doble Area Closure**

As mentioned, the BAER team determined that the historic mine tailings that are located in the basin of the Doble area (below the historic Baldwin Mine) may be a risk to life and safety. Historic mining operations utilized hazardous chemicals in the mining process and there is some risk that residual chemicals may still exist at the site. The recent fire exposed the tailings, removed vegetation that was stabilizing the site, and destabilized the slopes above the site. Increased post-fire runoff may result in mobilization of tailings that could negatively affect beneficial uses and public safety. Exposed contaminants may be kicked up into the air by vehicles or foot traffic, and inhaled or result in direct skin contact. Strong winds can blow contaminants off-site and/or expose nearby people.

Transport of contaminants off-site may also pose a hazard to downstream beneficial uses such as water quality for municipal use and recreation. Coordination with the State Baldwin Lake Ecological Reserve is recommended. Coordinating with the State will also be necessary to enforce the recommended area closure.

As the site has not been tested for hazardous materials in the past, the team ordered tests to evaluate the sediment for contaminants and hazards to the public and downstream beneficial uses. As of writing this report, the sampling has not been completed. Because the Forest does not know the extent or the concentration of the contamination, the BAER team recommends a temporary closure until the tests are completed.

To implement the closure, the following actions would be required:

- Official Forest Closure Order
- Detour of the PCT.
- Temporary closure of Doble Camp
- Signs
- Patrols to enforce closure.

Additional treatments proposed for protection of other resources (costs included in different section) that would support the effectiveness of the area closure include:

- OHV preventative barrier along 3N16 (boulders, and smooth-wire and post/cable fencing)
- Other OHV prevention on unauthorized routes (boulders)
- Gate at road 3N16 crossing with PCT



<b>Protection/Safety Treatment #1: Doble Area Closure Treatment - Signs and Enforcement</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
Warning and Closure Signs (flooding, burned area, hazardous material, etc.) – initial signing and replacement signs	Each	\$200	10	\$2,000
Patrol of area (See <i>Monitoring</i> )				
<b>Total Cost</b>				<b>\$2,000</b>

As of June 30<sup>th</sup>, 2017 the SBNF implemented a Forest Order to close portions of the fire; the order will be in effect for one year. This Order included the Doble Area and Jacoby Road.



**Figure 1: Photo of depositional area below historic mining facility. Vegetation that was stabilizing the site has been removed by the fire. Area is susceptible to erosion.**

One developed recreation site (Doble Trail Camp) is included in the Forest Closure. The Forest Closure includes use of Forest Road 3N61 (Jacoby Canyon Road) and a small portion of the Pacific Crest Trail. There is a feasible and safe detour that would take hikers off the trail for 2 miles and put them on Forest Road 3N16 and 3N69. They would be off the trail for 2.4 miles.

To ensure effectiveness of the Forest Orders:

- Area Closure via Forest Order of the Doble area until hazardous waste testing can be completed;
- Road Closure via Forest Order of Jacoby Rd.
- Barrier Treatment for the Area Closure/Doble Area
- Barrier Treatment for the Jacoby Road
- Enforcement of the closures

Once the SBNF has received the hazardous waste test results, the closure area would be re-evaluated to determine the next course of action. Should the above Doble Area Closure be lifted (upon testing results), the BAER team recommends evaluating the area for a separate hard closure of Doble area within and just downstream of the fire boundary for resource protection. The hard closure is recommended because in addition to risks from OHV, other off-trail travel can trample and damage vegetation. See OHV prevention treatment.



**Figure 2. Overview of the Doble closure area. Site is easily accessed by OHV now that vegetation has been removed. Photo depicts depositional area of mine tailings as well as downstream beneficial uses. Montane meadow and Baldwin Lake Ecological Reserve are visible downstream.**

## 2. Jacoby Road Closure

The BAER team determined that post-fire watershed responses pose a very serious and significant threat to public safety during storm events over the next few years, especially within the Jacoby Canyon area. As mentioned, Jacoby Canyon Road (3N61) is located at the bottom of a steep, narrow canyon that is susceptible to post-fire hazards such as rockfall, debris flows, mass wasting, and flooding. The road has multiple hazard trees resulting from the fire that pose a threat to road users should it remain open.

The closure would also address the natural and cultural resource post-fire concerns (OHV incursion) in the canyon that increased access for OHV may cause. As mentioned in the VARs discussion, there are TE plants and TE habitat that could be negatively affected by OHV incursion. To address the life and safety threat as well as post-fire threats to natural resources associated with the public use of the SBNF within the recently burned area, the BAER Team recommends temporary closure of Jacoby Road. The closure would be re-evaluated in one year.

To implement the closure, the following actions would be required:

- Official Forest Closure Order (implemented June 30, 2017)
- Installation of two gates (to block use and allow emergency access in the case of a fire).



- Signs
- Patrols to enforce closure.

<b>Protection/Safety Treatment #2: Jacoby Road Closure Treatment – Gates, Signs, Enforcement, Water Quality Protection</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
Angeles Gates on Forest Service roads – gates and installation: <ul style="list-style-type: none"> <li>• 3N61 – 2 gates</li> </ul>	Gate and installation	\$9,000	2	\$18,000
Warning Signs (flooding, rock fall, burned area, etc.) – initial signing and replacement signs	Each	\$200	4	\$800
Patrols to enforce closure (see <i>Monitoring</i> )				
GS-9 Archaeologist Clearance/Monitoring	Day	\$300	2	\$600
GS-11 Botanist Monitoring	Day	\$400	1	\$400
Travel (mileage) 2 vehicles	Miles	\$1.00	100	\$100
<b>Total Cost</b>				<b>\$19,900</b>



**Figure 3: Photo depicts location of Jacoby Road. Road in at the bottom of a narrow canyon with steep slopes. Hazard trees, rock fall, debris flows and flooding would be hazards to road users over the next year or so until recovery.**

### 3. Hazard Tree Treatment on Road and Trails:

The fire resulted in several fire-killed trees that are still standing. Many of these trees pose a hazard tree threat to employees traveling through the area and implementing BAER treatments as well as forest users on roads and trails.

Removal of approximately 18-25 hazard trees along the PCT is included in the cost estimate for trail stormproofing, as crews would fell trees at the same time/before they stabilize the trail. Felling of the trees is critical to provide for crew safety. Treatment costs are identified below in Roads and Trails treatment section.

#### 4. Mining Operation Hazmat Stabilization and Cleanup

Storage material from the Lucky Baldwin mine (active mining on SBNF with a plan of operations) burned in the fire. In order to prevent tampering until cleaning and disposal action can be conducted, a silt fence should be installed around the downslope perimeter of the burned mobile home, metal storage shed, and dump truck until cleanup and disposal action can be conducted. Monitoring and maintenance of the fencing should be conducted after large storm events and corrective measures taken. The hazmat containers should be removed and properly disposed of off-site. The owner of the mining site shall coordinate hazmat cleanup and inform the San Bernardino National Forest on the day that the cleanup is to take place. The Forest should coordinate installation of the fencing with the miner.

<b>Life and Safety Protection #3: Hazmat Stabilization</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b>No. of Units</b>	<b>Cost</b>
Install silt fencing around mobile home	Each	\$1,000	1	\$1,000
Supplies	Each	\$500	1	\$500
Monitoring and maintenance	Each	\$500	1	\$500
Total Cost:				\$2,000

#### 5. Interagency Coordination

The following non-FS sites and infrastructure were determined to be at risk and interagency coordination is recommended. The BAER team's finding should be sent to those entities so that they can plan measures to protect/prepare infrastructure from post-fire watershed response events. It is recommended those agencies conduct a detailed assessment of the identified sites as the BAER assessment is intended to be a rapid identification of sites at risk, not a detailed analysis.

<b>Value at Risk</b>	<b>Potential Threats/hazard type</b>
Baldwin Lake Ecological Reserve and recreational area	Potential influx of hazardous sediment from mine tailings. Exposure of public to contaminants.
Southwest Gas Line-- buried line in Cushenbury area	Erosion, exposure of lines and potential vandalism/damage of exposed pipelines
SCE – Doble Circuit (overhead powerline)	Hazard tree potential.
SCE – Ute Circuit (overhead powerline)	Hazard tree potential. Erosion potential.
SCE – Cushenbury Circuit (overhead powerline)	Erosion, undermining of pole.
BBARWA Sewer Outfall Line (buried pipe)	Erosion, exposure of lines and potential vandalism/damage of exposed pipes
Verizon fiber-optic – buried conduit	Erosion, exposure of lines and potential vandalism/damage
State Route 18	Erosion, flooding, increased delivery of woody debris from fire area.
County Road – Holcomb Valley	Sedimentation, flooding.
County Landfill	Sedimentation, flooding.

<b>Life and Safety Protection #4: Interagency Coordination</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
GS-9 Hydrologist	Day	\$300	3	\$900

GS-11 Special Uses Administrator	Day	\$375	5	\$1,875
GS-13 District Ranger	Day	\$550	2	\$1,100
<b>Total Cost</b>				<b>\$3,875</b>

## **Road and Trail Treatments**

### **1. Pacific Crest Trail Treatments**

Prior to the first damaging rain events and within the first year following the fire, storm proofing is recommended to minimize erosion of the trail tread. Storm proofing treatments, implemented with hand-tools, would include out-sloping, de-berming, water-bars, armored crossings at ephemeral drainages, and other suitable treatments outlined in the BAER Treatments Catalog to protect the trails from accelerated post fire flows and soil erosion.

<b>Roads and Trails #1a: Initial Storm Inspection and Response</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
1 GS-09 Botanists clearance/monitor	Days	\$250	2	\$500
1 GS-09 Archaeologist clearance/monitor	Days	\$250	2	\$500
Travel (mileage) 2 vehicles	Miles	\$1.00	100	\$100
<b>Total Cost</b>				<b>\$1,100</b>

<b>Roads and Trails #1b: Implementation Crew Labor Cost and Project Oversight (Trail Specialist)</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
1 GS-9 Trails Specialist	Days	\$250	2	\$500
Trail rehab./Hazard Tree Removal (18 to fell/limb) (UCC 6 member crew)	Days	\$1,500	2	\$3,000
Vehicle (\$1.00/mile) 1 vehicle	Mile	\$1	50	\$50
<b>Total Cost</b>				<b>\$3,550</b>

### *Warning Signs for the Pacific Crest Trail:*

Long term closure of the PCT is not anticipated due to strong public interest in the trail as a recreational opportunity for local residents as well as thru-hikers, and BAER Risk Conditions that do not support closure. Hazard Conditions /Warning Signs will be installed as soon as practical. Ongoing trail and watershed conditions should be evaluated, especially after mountain Monsoon events and after the first post fire winter. If hazardous conditions are stable Warning Signs can be removed at that time. If a temporary PCT and Doble Trail Camp Closure is deemed necessary because of the test results of the mine tailings, a convenient reroute is available that should not cause undue hardship on visitors.

<b>Roads and Trails #1c: PCT Warning Signs</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
GS-9 Trails Specialist	Days	\$250	1	\$250
Warning Signs along PCT (includes hiking and installation)	Each	\$200	2	\$400
<b>Total Cost</b>				<b>\$650</b>

### **2. Road Treatments on 3N16 and 3N61**

The section of 3N16 selected for road treatment is within an area of moderate burn severity and is expected to experience increased runoff from adjacent burned slopes. Only two locations on the road were selected for enhancing existing drainage control structures. Both sites have existing dips that need to be enhanced to handle the expected increase in runoff and erosion. One of the dips needs additional outlet armoring. The entire length of 3N16 needs to be treated for hazard trees as mentioned in the Hazard Tree section. Treatment would address post-fire threats to life and safety, infrastructure, recreation use, and cultural value of the road.

Another resource protection measure for water quality is to construct several water bars on Jacoby Road (3N61) to prevent diversion of the stream channel down the road surface. There is an increased risk of



diversion due to the increased sediment delivery and runoff from the fire. This work is intended to protect water quality and reduce the risk of the road diverting the stream out of the natural stream bed. Should the stream channel divert down the road surface, the sensitive habitat in Jacoby Canyon that is already damaged by the fire could be stressed even more.

<b>Roads and Trails #2: 3N16 Treatment – Road Work and Water Quality Protection</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
Installation of drainage features to protect water quality (3N16)	Each	\$3,000	2	\$6,000
Installation of waterbars to protect water quality (3N61)	Each	\$1,000	10	\$10,000
GS-9 Archaeologist Clearance/Monitoring	Day	\$300	1	\$300
GS-11 Botanist Monitoring	Day	\$400	1	\$400
Travel (mileage) 2 vehicles	Miles	\$1.00	100	\$100
<b>Total Cost</b>				<b>\$16,800</b>

### 3. OHV Prevention - Threatened and Endangered Plants and Heritage Resource Protection

#### *OHV Prevention in the Doble Area: Multiple Resource Protection*

Increased unauthorized off-road vehicle access to the Holcomb Fire burned area is expected to occur due to removal of vegetation, easy terrain, and “inviting” curiosities (e.g., historic mining operations, etc.) that are now visible from a main Forest Service road. Unauthorized vehicle use is a major threat to the burned watersheds and resources within the burned area.



**Figure 4: Photo depicts main road adjacent to fire burn area. Area is now susceptible to OHV incursion as vegetative barriers have been removed and site has increased visibility.**

Erosion, spread of invasive species, damage to cultural sites, destruction of rare plant and native plant communities, disturbance to wildlife, degradation of wildlife habitat, and risks to public safety are very likely to result from unauthorized access in this area. The BAER Assessment team has identified that Forest Service

system road 3N16 offers easy access to burned area. Historically it has been difficult to control off-road uses in this area. Since the fire removed or affected most of the natural barriers that existed, controlling off-road uses may be even more difficult without additional barriers.

The recommended treatment includes installation of barriers along 3N16 where easy topography and lack of vegetation provide access into the burned area (including site with heritage resources and T/E plants) in order to facilitate natural vegetative recovery without additional degradation.

Prevention of OHV incursion will be enforced through installation of gates, fencing, and signage. Funding for materials to construct the barriers and signage is requested. This will also require heritage clearance for the ground disturbance, and coordination by the botanists with implementation crews to ensure avoidance of effects to Threatened/Endangered plants.

Should the Doble Area Closure for risks from the mine tailings be lifted (based on testing results), the BAER team recommends evaluating the area for a separate hard closure of Doble area within and just downstream of the fire boundary for natural and cultural resource protection. The cultural resource of concern is expansive and complex, located in areas that are susceptible to vandalism and disturbance now that the sites have increased in visibility. Pebble Plain habitat in the area supports the host plant for Dammer's Blue Butterfly as well.

In addition to risks from OHV, other off-trail travel can trample and damage vegetation. As discussed in the Botany Report, *T. stenopetalum* could be significantly impacted as a large portion of the entire population is already at risk from post-fire erosion and sedimentation. It is a recommendation that the entire meadow and surrounding area closed until the system has regenerated and stabilized from the predicted sediment deposition, and endangered plant populations have stabilized.

<b>Roads and Trails #3: OHV Prevention – Fences and Boulders</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
GS-7 Botanist Coordination & Monitoring	Days	\$190	2	\$380
GS-11 Botanist Coordination & Monitoring	Days	\$475	2	\$950
GS-9 Archaeologist Coordination & Monitoring	Days	\$289	4	\$1,156
GS-12 Archaeologist Coordination, Clearance, & Monitoring	Days	\$415	2	\$830
2-Strand Smooth Wire Fence – Materials (1.75 miles of fencing)	Mile	\$3,500	1.75	\$6,125
2-Strand Smooth Wire Fence – Installation by UCC crew (includes supervisor, vehicle, and mileage)	Day	\$2,000	10	\$20,000
Post-and-Cable – Materials and Installation (900' along 3N16)	Mile	\$20,000	0.17	\$3,410
Boulder barriers (FS provides rock; contractor transports and places)	Lump	\$2,000	3	\$6,000
Gate at PCT road crossing	Each	\$7,000	1	\$7,000
Closure Signs/Warning Signs (hazardous waste, flooding, debris flows) – initial signing and replacement signs (along 3N16, along Holcomb Valley Road and along property boundary at south end of closure.	Each	\$200	10	\$2,000
Printer and Laminating Supplies for smaller paper signs around the boundary	Each	\$500	1	\$500
Misc. Costs (mileage, vehicle, tools)	Each	\$500	1	\$500
Enforcement/Monitoring – see Monitoring Treatment				
<b>Total Cost</b>				<b>\$48,851</b>

Through past experience, the SBNF has determined that signage, gates, fencing, and other hard closures installed to discourage soil disturbance and assist in allowing natural vegetative recovery are not effective without enforcement patrol. Therefore, additional funding is requested to monitor effectiveness of these closures/protective measures (see Effectiveness Monitoring Treatment).

The post-fire impacts of OHV incursions to Values at Risk for the Holcomb Fire area include:

- Loss of habitat quality for rare endemic plant habitat meadows and pebble plains (including seven federally-listed plant species and designated Critical Habitat) due to increased access due to burning of vegetative barriers/screening/cover. Incursions by vehicles, mountain bikes, and even foot traffic, can channel water, changing the morphology and soil conditions for these very rare habitats that are dependent on very specific soil conditions. Additionally, post-fire erosion may further increase OHV, mountain bike, and foot traffic in the vulnerable habitat.
- Loss of individual plants for seven federally-endangered plant species.
- Risks of vandalism and destruction of a number of important cultural resource sites due to burning of vegetative screening.
- Increased risk for establishment of non-native plants in the burned area and chronic (long-term) soil disturbance and sedimentation.
- Loss of Forest Service investments (fences, PCT trail bed, PCT Doble Trail Camp, developed spring, Forest Road erosion structures).
- Exposure to toxic chemicals from abandoned historic mining operations. This includes cyanide, arsenic, lead, and mercury from historic gold mining processing. A lack of vegetative cover has resulted in airborne dust in this naturally-windy site. If chemicals are present, erosion may expose them and activate them (via water and via air). Activated toxins, if present and mobilized, could affect public health. They could also possibly kill endangered plants (including two species with extremely limited population numbers and distribution resulting in viability concerns for these two critically-endangered species).

The Doble portion of the fire area has long had a management challenge of controlling unauthorized OHV use. The Mountaintop District has invested many thousands of dollars over the years in controlling illegal use, restoring habitat, and protecting vulnerable resources in that area. This includes a partnership with the California Department of Fish and Game since the Baldwin Lake Ecological Reserve is located south of the National Forest land boundary.

Previous wildfires and ecological restoration activities on the SBNF have provided the Forest numerous opportunities to determine treatment methods with the highest rate of success. One of the long-term challenges has been maintaining a fence on the Holcomb Valley road due to the high rate of speed of vehicles accessing the County landfill/transfer station. There are frequent breaches to the fences from drivers losing control of their vehicles (including large trucks) or unauthorized cutting of the fence for access. The treatment would use a combination of boulders, smooth-wire fence, and post and cable fencing to achieve the highest likelihood of success. Frequent monitoring and patrolling will be required to ensure effectiveness.

*OHV Prevention and Critical Habitat Protection: Pebble plain listed plant taxa occurrences and critical habitat in the vicinity of 3N02*

The main threats to Pebble plain listed plant taxa occurrences and critical habitat in the vicinity of 3N02 are OHV incursion accessing the fire burned area and invasion of noxious weeds. The unauthorized route allows access to the fire perimeter, which OHV drivers may want to access now that the area is opened up. This portion of the forest has a long history of OHV incursions, making these a very likely occurrence with major damage to critical habitat of federally listed species. Three strand fencing has historically not been effective at preventing OHV incursions here, and now that the historic unauthorized route has increased visibility, these are more likely to occur. The location of the proposed fence (0.06mi) was chosen to tie in with existing fencing along 3N02 because this is the only defensible location in which to place an enforced barricade (post and cable fencing). Noxious weeds are also likely to invade this area (see the Noxious Weed report for early



detection and rapid response weed treatments). Enforcement and patrol of closure is necessary to ensure effectiveness of the treatment.

<b>Roads and Trails #4: OHV Prevention - Barrier on 3N02 – Post and Cable Fencing</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
Post and Cable (materials and Labor)	Mile	\$20,000	0.06	\$1,200
GS-11 Botanist	Days	475	1	\$475
GS-9 Archeologist	Days	\$289	2	\$578
GS-7 Botanist technician	Days	\$190	2	\$380
Misc. (mileage, fuel)			1	\$200
<b>Total Cost</b>				<b>\$2,833</b>

## **Land Treatments**

### **1. Doble Camp Dispersed Camping Closure**

Due to rock fall and hazard tree potential in the burned area north of the developed Doble Camp area, the area within the fire perimeter and near the fire perimeter should be closed to dispersed camping. Dispersed camping in the fire area may also inhibit vegetative recovery. Dropping hazard trees, signage, and patrol of the campground (included in the cost of PCT treatments) should be sufficient to protect life, safety, and resources from potential threats. Downed trees should be felled in a way as to block access to the burned area.

<b>Land Treatment #1: Doble Camp dispersed camping closure</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
1 GS-9 Trails Specialist	Days	\$250	1	\$250.
Hazard Tree Removal (UCC 6 member crew)	Days	\$1,500	1	\$1,500.
Vehicle (\$1.00/mile) 1 vehicle	Mile	\$1	50	\$50.
<b>Total Cost</b>				<b>\$1,800</b>

### **2. Seed Banking: For TES plant that may be at risk for significant population loss.**

It is recommended that seed banking of the population of *Thelypodium stenopetalum* be conducted downstream of the Doble area. This population is significantly at risk as it is critically endangered and a sizeable portion of the population is located downstream of the fire. Based on hydrologic and erosion modeling, this area is expected to see substantial increases in sedimentation, runoff, and erosion.

<b>Land Treatment #2: Conservation Seed Banking – <i>Thelypodium stenopetalum</i></b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
Maternal Line Seed Accession	Accession	\$3,000	1	\$3,000
GS-11 Botanist	Days	\$475	2	\$950
GS-7 Botanist technician	Days	\$190	3	\$570
Misc. (mileage, fuel, collecting equipment)			1	\$200
<b>Total Cost</b>				<b>\$4,720</b>

### **3. Native Plant Recovery: Early Detection, Rapid Response**

Weed detection surveys and rapid response eradication treatments are to determine whether ground disturbing activities related to the Holcomb Incident and the fire itself have resulted in new or the expansion of existing noxious weed infestations. It is expected that new and expanding weed infestations will proliferate in and along fire lines and access roads, eventually leading to vegetation type conversion.

Surveys and rapid response eradication treatments will begin in 2018 during the flowering periods of weed species. Because of differences in flowering times for all potential species, two visits will be required during the growing season. If timing is such that all the target species are detectable/treatable in one visit, the actual costs would be lower than displayed below. Completion of surveys in riparian areas, dozer lines, roads, staging areas, safety zones, known invasive plant populations, and sensitive plant populations would be the first priority. The second survey priorities would be along hand lines and drop points. Surveys of the general habitats in the burned area would be the lowest priority.

<b>Land Treatment #3: Early Detection and Rapid Response (Invasive removal) Costs</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
1 GS-11 botanist	Days	\$451	5	\$2,225
2 GS-7 weed technicians	Days	\$356	20	\$7,120
1 GS-7 Planning and Data entry	Days	\$178	5	\$890
1 GS-9 Archeologist	Days	\$319	1	\$319
Supplies	Each	\$2,000	1	\$2,000
Vehicle gas mileage	Miles	\$0.55	7500	\$4,125
Vehicle FOR	Month	3	350	\$1,050
<b>Total Cost</b>				<b>\$17,729</b>

#### **I. Monitoring Narrative:**

##### **Treatment Effectiveness Monitoring**

Effectiveness Monitoring: TMonitoring the effectiveness of the other BAER treatments (as described above) will be used to determine if additional treatments are needed.

**Monitor closure effectiveness** This treatment includes a patrol person dedicated to the closure area, working weekends, holidays, and school vacation periods when use is highest, to enforce the closure maintain the structures, and augment closure structures as needed. The patrol would also help enhance presence during storms. This is an effective way to complete effectiveness monitoring of the closure and related treatments.

<b>Monitoring #1: Enforcement Patrolling the closure and maintaining structures for 6 months</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
Patrol (OHV Technician) GS-7	Day	\$200	26	\$ 5,200
mileage	each	\$1,000	1	\$1,000
<b>Total Cost</b>				<b>\$6,200</b>

Monitoring the effectiveness of the above-described BAER treatments will be used to determine if additional treatments are needed to protect the TE habitat and species. This includes re-evaluation and monitoring of the closure orders, spring treatment, and PCT storm proofing treatments. Monitoring would include site visits, photo documentation and recording observations. Monitors would also support review and adaptive management of the recommended treatments.

<b>Monitoring #2: Monitoring Treatment Effectiveness</b>				
<b>Item</b>	<b>Unit</b>	<b>Unit Cost</b>	<b># of Units</b>	<b>Cost</b>
Hydrologist/Soil Scientist	Day	\$410	6	\$2,460
GS-6 biological technician	Day	\$175	15	\$2,625
GS-9 biologist	Day	\$330	4	\$1,320
GS-11 biologist	Day	\$475	2	\$900
Misc. Costs (mileage, etc.)	Each	\$500	1	\$500
<b>Total Cost</b>				<b>\$7,805</b>

## Part VI – Emergency Rehabilitation Treatments and Source of Funds by Land Ownership

			NFS Lands				Other Lands				All
		Unit	# of	WFSU	Other		# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	SULT \$	\$		units	\$	Units	\$	\$
A. Land Treatments											
1. Doble Camp Closure	Day	\$900	2	\$1,800	\$0			\$0		\$0	\$1,800
2. Seed Collection	Day	\$787	6	\$4,720	\$0			\$0		\$0	\$4,720
3. ED/RR	Day	\$709	25	\$17,729	\$0			\$0		\$0	\$17,729
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Land Treatments				\$24,249	\$0			\$0		\$0	\$24,249
B. Channel Treatments											
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Channel Treat.				\$0	\$0			\$0		\$0	\$0
C. Road and Trails											
1. PCT	Days	\$1,325	4	\$5,300	\$0			\$0		\$0	\$5,300
2. 3N16/3N61	Sites	\$1,400	12	\$16,800	\$0			\$0		\$0	\$16,800
3. OHV Prvntn/Closure	Miles	\$24,426	2	\$48,851	\$0			\$0		\$0	\$48,851
4. OHV Prvntn 3N02	Miles	\$47,216	0.06	\$2,833	\$0			\$0		\$0	\$2,833
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Road & Trails				\$73,784	\$0			\$0		\$0	\$73,784
D. Life and Safety											
1. Doble Area Closure	Area	\$2,000	1	\$2,000	\$0			\$0		\$0	\$2,000
2. Jacoby Closure	Area	\$19,900	1	\$19,900	\$0			\$0		\$0	\$19,900
3. Hazmat	Sites	\$2,000	1	\$2,000	\$0			\$0		\$0	\$2,000
4. Interagency Coord	Day	\$388	10	\$3,875	\$0			\$0		\$0	\$3,875
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Safety				\$27,775	\$0			\$0		\$0	\$27,775
E. BAER Evaluation											
Team	Team	\$35,463	1	\$35,463	\$0			\$0		\$0	\$35,463
Supplies	Total	\$6,638	1	\$6,638	\$0			\$0		\$0	\$6,638
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Evaluation				\$42,101	\$0			\$0		\$0	\$42,101
F. Monitoring											
1. Enforcement	Day	\$248	25	\$6,200	\$0			\$0		\$0	\$6,200
2. Monitoring	Day	\$279	28	\$7,805	\$0			\$0		\$0	\$7,805
Insert new items above this line!				\$0	\$0			\$0		\$0	\$0
Subtotal Monitoring				\$7,805	\$0			\$0		\$0	\$7,805
G. Totals				\$175,714	\$0			\$0		\$0	\$175,714

**PART VII - APPROVALS**

1. /s/ Jody Noiron  
Forest Supervisor (signature)

7/7/2017  
Date

Authorization is given to expend up to \$ 122,978, after these amendments to the proposed treatments:

- Request of \$4720 for Seed Collection – not approved
- Request for \$7805 for Monitoring – partially approved, at \$1890

2. \_\_\_\_\_  
Regional Forester (signature)

\_\_\_\_\_  
Date

Appendix A: BARC MAP depicting Holcomb Fire Soil Burn Severity.



## Appendix C: Detailed Values At Risk List

Risk Type	Category	Value at Risk	Potential Threats/hazard type	Land Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
Life, Safety, Property								
Life/Safety	Hazmat	Mine Tailings	exposure of buried contaminates, transport of contaminates off-site	FS	Possible	Major	High	Temporary closure of Doble area until CERCLA testing is completed. Closure extends from road to property boundary. Includes Doble Camp and PCT segment. Forest will need to work with active mining claim (not associated with historic tailings) to communicate risks. Interagency coordination with Baldwin Lake Ecological Reserve to enforce closure area boundary. Patrols to enforce closure. Barriers proposed for Heritage and Botany protection from OHV incursion will also reinforce area closure for safety.
Life/Safety	Road	3N61 (Jacoby Canyon Road)	debris flow, erosion, flooding, rock fall, hazard trees. Diversion potential.	FS	Very Likely	Major	Very High	Temporary road closure. Signage. Barrier (gates to allow fire response if necessary). Patrols to enforce closure.
Resources	Road	3N61 (Jacoby Canyon Road)	Diversion potential.	FS	Very Likely	Moderate	Very High	See road closure in Life/Safety. Add water bars to prevent resource damage caused by (potential) stream diversion.
Property/Resources	Road	3N16	erosion, loss of road bed	FS	Likely	Moderate	High	Road work. Includes two locations: 1) enhance water bar and 2) enhance water bar and add riprap to outlet.
Life/Safety	Road	3N16	Hazard trees	FS	Likely	Major	Very High	Remove hazard trees.
Property/Resources	Road	3N02 (Burnt Flat Road)	erosion, loss of road bed	FS	unlikely	minor	Very low	No treatment.
Life/Safety	Developed Rec	Doble Trail Camp	Dispersed camping in burned area with hazard trees and rock fall potential.	FS	Likely	Major	Very High	Cut hazard trees. Use downed trees to block access to fire burned area. Signage to close burned area to camping.
Life/Safety	Developed Rec	Doble Trail Camp	Potential exposure to mine tailings.	FS	Possible	Major	High	Temporary closure until CERCLA testing is completed.
Life/Safety/Property	Developed Rec	Doble Trail Camp--water system	Impacts to water quality or exposed by erosion	FS	unlikely	Minor	Very Low	No treatment.



Risk Type	Category	Value at Risk	Potential Threats/hazard type	Land Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
Property/ Life/Safety	Trail	PCT	Hazard trees. Rock fall.	FS	Possible	Major	High	Signage warning users of rock fall and post-fire hazards. Hazard tree removal of 25 trees.
Property/ Resources	Trail	PCT	OHV incursion	FS	Likely	Moderate	High	Horse gate at entrance (off Holcomb). Also see OHV prevention for Gold Mountain/Baldwin Mine and T&E species: Doble area.
Property/ Resources	Trail	PCT	Trail erosion.	FS	Likely	Moderate	High	Trail stormproofing.
Life/Safety	Trail	PCT	Potential exposure to mine tailings.	FS	Very Likely	Major	Very High	Temporary closure and reroute of trail until testing is completed.
Life/Safety	Mine	Mine adit-- Memphis Mine	Open access to public. Safety hazard. Located outside fire boundary.	FS				Outside fire boundary. No BAER treatment.
Life/Safety	Mine	Mine Shafts (Doble area shafts/caves)	No mine shafts found.	FS				No treatments.
Life/Safety/ Resources	Mine/Hazmat	Greg Paul burned mine/remaining equipment	Hazmat, erosion of burned material. Exposure to toxins, transport off-site.	FS	Likely	Moderate	High	Work with miner to secure burned materials that may be transported off-site during runoff events. Silt fencing to prevent movement off-site.
Property	Mine	Robert McGrew-- Golden Hawk Claims	No facilities at site.	FS				No treatment
Non-FS Life/Safety/ Property								
Life/Safety/ Resources	Wildlife	Baldwin Lake Ecological Reserve and recreational area	Potential influx of hazardous sediment from mine tailings. Exposure of public to contaminants.	State	Possible	Major	High	Interagency coordination.
Property	Facilities	Southwest Gas Line (buried line in Cushenbury area)	Erosion, exposure of lines and potential vandalism/damage	Non-FS	Possible	Major	High	Interagency coordination.



Risk Type	Category	Value at Risk	Potential Threats/hazard type	Land Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
Property	Facilities	SCE – Doble Circuit (overhead powerline)	Hazard tree potential.	FS	Likely	Moderate	High	Interagency coordination.
Property	Facilities	SCE – Ute Circuit (overhead powerline)	Hazard tree potential. Erosion potential.	FS	Unlikely	Moderate	Low	Interagency coordination.
Property	Facilities	SCE – Cushenbury Circuit (overhead powerline)	Erosion, undermining of pole.	FS	Unlikely	Major	Intermediate	Interagency coordination.
Property	Facilities	SCE – Goldhill Substation	No threat.	Non-FS				No treatment.
Property	Facilities	BBARWA Sewer Outfall Line (buried pipe)	Erosion, exposure of lines and potential vandalism/damage	Non-FS	Possible	Major	High	Interagency coordination.
Property	Facilities	Verizon fiberoptic – buried conduit (buried with gas line)	Erosion, exposure of lines and potential vandalism/damage	Non-FS	Possible	Moderate	Intermediate	Interagency coordination.
Property	Road	State Route 18	Erosion, flooding, increased delivery of woody debris from fire area.	State	Possible	Major	High	Interagency coordination.
Property	Road	County Road – Holcomb Valley Road (Dump Road)	Sedimentation, flooding.	County	Likely	Minor	Low	Interagency coordination.
Property	Facilities	County Landfill	Sedimentation, flooding.	County	Very Likely	Minor	Low	Interagency coordination.
Property	Private Homes	Cactus Flat/Hwy 18 private parcel	Sedimentation, flooding.	Private	Unlikely	Minor	Very Low	No treatment.
Property	Mine	Mitsubishi Facilities	No threat.	Private				No treatment.
Property	Private Property	Inholding on NE slope of	Erosion, sedimentation, flooding.	Private	Possible	Minor	Low	No treatment.

Risk Type	Category	Value at Risk	Potential Threats/hazard type	Land Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
		Gold Mountain						
<b>Natural and Cultural Resources</b>								
Resources	Developed Rec	Doble Trail Camp:	Dispersed camping in burned area, impacts to regeneration.	FS	Likely	Moderate	High	Signage to close burned area to camping. Use downed hazard trees to block access to burned area. Signage.
Resources	Spring	Jacoby Canyon spring	Erosion. Flooding. Scouring of the spring. Hazard trees. Fire damaged fence may fail. Increased risk to wildlife.	FS	Likely	Moderate	High	Hazard tree removal. Remove fence damaged by fire.
Heritage	Historic Property	P1314-28/H	Erosion. Flooding. Scouring of the site.	FS	Likely	Moderate	High	No treatment.
Heritage	Historic Property	FS-05-12-52-01469	Erosion. Flooding. Scouring of the site.	FS	Likely	Moderate	High	No treatment.
Heritage	Historic Structure	SCE – Doble Circuit (overhead powerline)	Hazard tree potential. Erosion potential.	FS	Likely	Moderate	High	Interagency coordination.
Heritage	Historic Road	3N16 FS 0512521482	erosion, loss of road bed	FS	Likely	Moderate	High	Road work. See roads treatment.
Heritage	Mine/Historic	Gold Mountain/Baldwin Mine	Erosion, OHV incursion, vandalism	FS	Likely	Moderate	High	Install barrier along road edge (3N16). Barrier includes combination of smooth wire fencing, boulders and post/cable fence. Patrols to enforce closure. Also addresses Botany issues in Doble area for T&E species. Enforces closure for safety related to Mine Tailings.
Heritage	Arch	Sites off 3N02	No threats.	FS				No treatment.
Resources	Botany	TES plants – 3N02	OHV incursion, erosion.	FS	Very Likely	Major	Very High	Permanent barrier (post and cable). 0.06mi. Enforcement and patrol of closure.
Resources	Botany	TES plants – Doble Area	OHV incursion, erosion from travel and foot traffic.	FS	Very Likely	Major	Very High	Permanent barrier 0.16mi (post and cable). Add horse gate at entrance to PCT. Disguise the unauthorized route with boulders, and woody debris from on-site. Doble area

Risk Type	Category	Value at Risk	Potential Threats/hazard type	Land Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
								closure to all use (including hiking) off-trail. Signage. Enforcement of closure. Also see treatment for OHV prevention for Gold Mountain/Baldwin Mine.
Resources	Botany	TES plants – Doble Area	Erosion and sedimentation leading to permanent loss of species/habitat. Exposure to pulse of water and sediment with toxic chemicals (from leaching of mine tailings).	FS	Very Likely	Major	Very High	Seed collection. See other treatments aimed at reducing impacts from OHV disturbance in Doble area.
Resources	Botany	calcium carbonate (Jacoby Creek)	Erosion, OHV incursion	FS	Possible	Major	High	Temporary road closure. See 3N61, Jacoby Road treatment.
Resources	Botany	calcium carbonate (Cushenbury)	Erosion.	FS	unlikely	Minor	Very Low	No treatment.
Resources	Botany	Native plant recovery, especially of T&E species	Invasive weeds	FS	Very Likely	Major	Very High	Early detection surveys and rapid response.
Resources	Botany	Native plant community recovery	Fire burn severity and climate change may inhibit long term recovery of non-fire resistant vegetative communities.	FS	Possible	Moderate	Intermediate	No BAER treatment for long term recovery. See invasive weed treatment.
Resources	Botany	Dammer's Blue Butterfly	OHV incursion into Pebble Plain habitat, invasive weeds	FS	Likely	Major	Very High	Install barriers to prevent OHV incursion. EDRR weed treatment.
Resources	Wildlife	Bald Eagle Night Roost	Loss of habitat from OHV incursion	FS	unlikely	Minor	Very Low	No treatment.
Resources	Wildlife	Southwestern Willow Flycatcher Habitat (Jacoby Canyon)	Loss of habitat from OHV incursion, erosion, flooding.	FS	Very Likely	Major	Very High	Temporary road closure until habitat has been re-established. See 3N61, Jacoby Road treatment.
Resources	Wildlife	Whiskey Springs	Erosion, sedimentation, flooding	FS	Possible	Moderate	intermediate	No treatment.

Risk Type	Category	Value at Risk	Potential Threats/hazard type	Land Ownership	Probability of Damage	Magnitude of Consequences	Risk	Forest Service Treatment Method
Life/Safety/Resources	Wildlife	Baldwin Lake Ecological Reserve and recreational area	Influx of hazardous sediment from mine tailings. Exposure of public to toxins.	FS	Possible	Major	High	Interagency coordination.

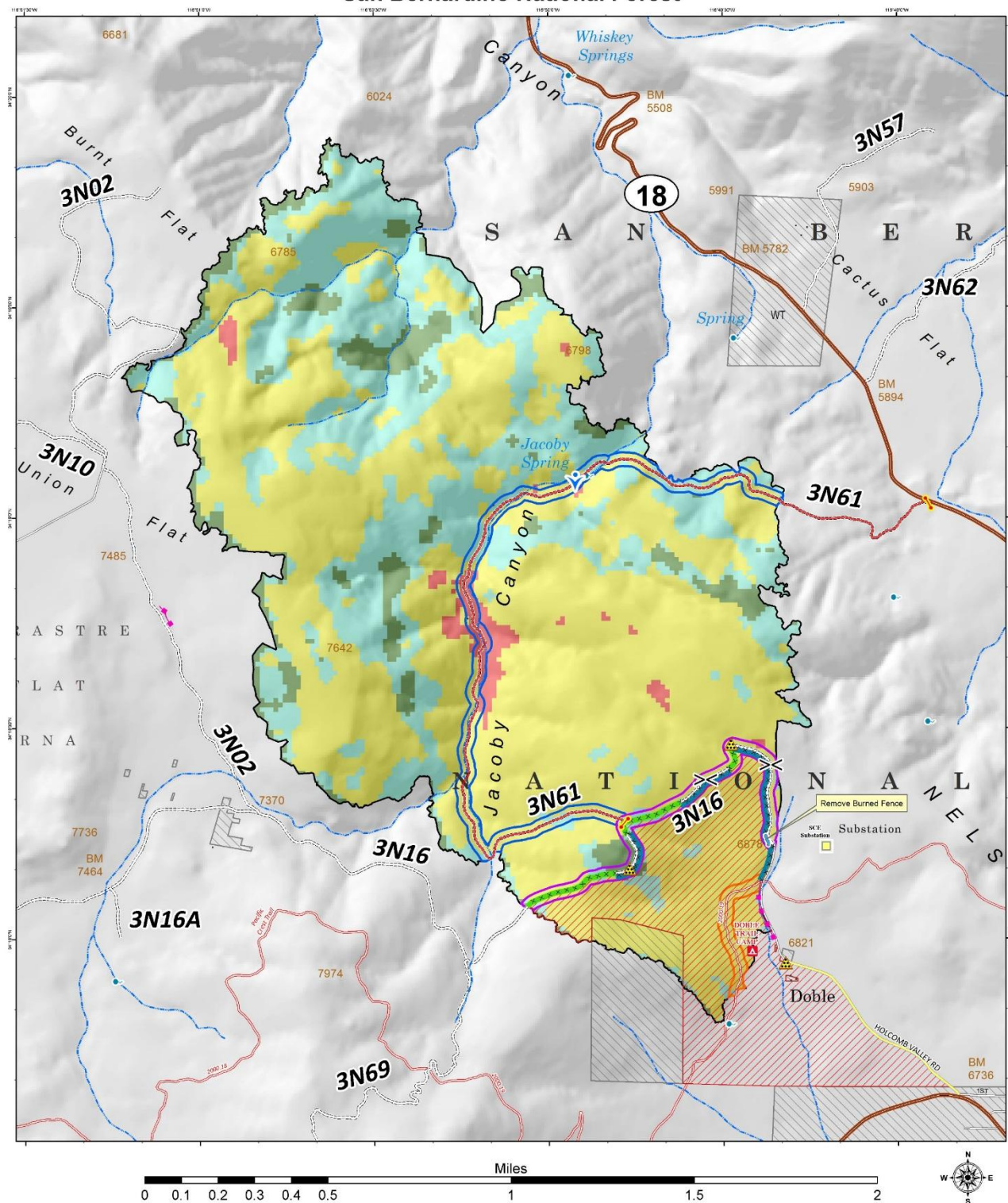
Appendix

C:

Treatment

Map

**BAER Treatment Map  
Holcomb Fire June 2017  
San Bernardino National Forest**



**BAER Treatments**

- Angeles Gate with Boulder Tie-Ins
- ▲ Boulder Barrier
- >> Rolling Dip Repair
- ⚡ Spring Protection
- Road Closure
- ▨ Closure Area

- Install Smooth-Wire Fence - One side of Road
- Install Smooth-Wire Fence - Two Sides of Road
- Install Post and Cable Fence - One Side of Road
- Remove Burned Fence
- 3N61 Dip and Drain Repair
- 3N16 Hazard Tree Removal
- PCT Hazard Tree Removal & Storm-Proofing

**Soil Burn Severity**

- High
- Moderate
- Low
- Unburned
- Fire Perimeter
- Non-Forest Land
- State Highway
- Major Road
- Local Road
- Forest Road
- Pacific Crest Trail
- Intermittent Stream
- SpringSeep

Appendix D. Economic Analysis (Attached in Separate Document.)