UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Pacific Southwest Regional Office
1323 Club Drive
Vallejo, CA 94592

Geologic and Flood Hazard Assessment of Cabin Sites within the Caldor Fire Eldorado National Forest and Lake Tahoe Basin Management Unit

March 28, 2023

By

Alan J. Gallegos
Digitally signed by Alan J. Gallegos
Date: 2023.03.29 15:06:04 -07'00'

Alan J. Gallegos
ACES Partnership Geologist

David Annis
Digitally signed by David Annis
Date: 2023.03.29 15:54:04 -07'00'

David Annis
PSW R5 Geology and Program Leader

Daniel Moore
ACES Partnership Hydraulic Engineer

INTRODUCTION

The Caldor Fire started on August 14, 2021, and burned 221,835 acres on the Eldorado National Forest (ENF) and Lake Tahoe Basin Management Unit (LTBMU). The fire destroyed over 1,000 structures, including over 175 structures on National Forest System Lands. Most of the structures were recreational residence cabins, under a long-term permit with the US Forest Service (USFS). Geologic hazards were evaluated on 151 cabin sites and are summarized in this report. Due to field season ending snowstorms, 24 cabin sites were not evaluated and are planned for evaluation under a Phase 2 Project once the snow melts in the Spring of 2023.

This report is a geological hazard assessment describing the evaluation of flooding, rockfall, debris flows and slope stability hazards on recreation residence cabin sites in the South Fork American River (SFAR) on the ENF and cabin sites along North Echo Road, Echo Summit, and Rainbow Tracts on the LTBMU (see Figure 1 - General Location Map). This assessment is based on a field-based evaluation of geologic hazards and modeling of the 100-yr flood event at sites where the cabin sites are located. Additionally, we reviewed other criteria that could be considered to mitigate and/or decide to allow the rebuilding of these cabins.

The purpose of this report is to document the geologic hazard assessment including providing recommendations to allow to rebuild or deny the rebuilding. In addition, a determination on the suitability of conventional septic systems and recommendations based on geologic hazards for further assessment to mitigate geologic hazards for rebuilding the cabins is provided. Geologic hazards, determinations, and potential mitigations are based on established practices prepared by a professional geologist, and flood modeling (e.g., 100-yr event) is based on established practices prepared by a certified hydraulic engineer, all practicing within the area of his or her competence.

Final determination of rebuild suitability and approval of all mitigation and designs of cabins are subject to approval of officials of the Eldorado National Forest and Lake Tahoe Basin Management Unit.

BACKGROUND

The 2021 Caldor Fire destroyed 175 cabins. The cabins are authorized under special use permits with a clause that states, “RISK OF LOSS. The holder assumes all risk of loss to the authorized improvements. Loss to the authorized improvements may result from but is not limited to theft, vandalism, fire, and any fire-fighting activities (including prescribed burns), avalanches, rising waters, winds, falling limbs or trees, and other forces of nature. If authorized improvements in the permit area are destroyed or substantially damaged, the authorized officer shall conduct an analysis to determine whether the improvements can be safely occupied in the future and whether rebuilding should be allowed. If rebuilding is not allowed, the permit shall terminate.”

This geologic hazard assessment reviewed federal and state regulations, Forest Service policy and land management planning direction in the determination of rebuilding and design of the cabins at their original location or within their lot. Several cabin sites were determined to be within or near the 100-year floodplain and in areas with high geologic hazards.
The forest decided prior to allowing any of the cabins to be rebuilt that a geologic hazard assessment should be completed to provide critical information to the decision to allow the rebuilding and design of cabins.

GEOLOGY

The lower SFAR is underlain with several plutons of Granodiorite including the Wrights Lake granodiorite (Cretaceous), the Pyramid Peak granite, Camper Flat granodiorite, Lovers Leap granodiorite, and Bryan Meadow granodiorite. These granodiorites are fine- to coarse-grained hornblende-biotite granodiorites with potassium feldspar and are displayed in the Geologic Maps (Figures 2 to 5) as Undifferentiated Granodiorites (Elder and Reichert, 2005). This section of the South Fork American River has extensive areas of Quaternary Landslide Deposits (Qls) that have been reactivated in some areas. Quaternary landslides are predominately confined to the west of Forni Creek and Strawberry tracts (Spittler and Wagner, 1998).

The upper reaches of the South Fork American River, down to Strawberry and Echo Summit are overlain with Glacial Deposits (Qg), which are an unconsolidated, bouldery till, characterized by large granitic boulders, and generally unweathered. Some of these glacial deposits have been preserved as sharp-crested moraines. Glacial outwash deposits are in the area. Older alluvium and alluvial fan deposits have been mapped in the area and the northwest side of 47 Milestone Tract is located on one of these alluvial fan deposits (see Geologic Map).

The nearest Quaternary faults in the area are located below Echo Summit, east of CA Highway 50. These faults are known as the West Tahoe-Dollar Point Fault Zone and the Tahoe-Sierra Frontal Fault Zone. Quaternary faults have geological evidence of coseismic surface deformation in large earthquakes during the past 2.58 million years (Myr) (see Figures 2-3, Geologic Maps).

GEOMORPHOLOGY

The Caldor Fire Cabin Geologic Hazard Assessment study area is along the SFAR on the ENF and along Echo Summit and the Upper Truckee River on the LTBMU. This area is in the Sierra Nevada Physiographic Province (CGS, 2002) and is typical of the eastern Sierras having steep slopes and the western side having gentle slopes. The South Fork American River has cut a deep canyon with highly unstable slopes mostly below Kyburz. The upper SFAR and the Truckee River have massive granitic rocks typical of the high Sierra, with glacially carved valleys and glacial moraines.

The SFAR has a highly incised, steep canyon inner gorge with active, and dormant landslides located mostly on the north side of the canyon. Landslides are mapped as far up the canyon as Forni Creek. Active landslides are known in this area to channelize and mobilize downslope as debris flows that deposit at breaks-in slopes (e.g. highway, roads, cabins, river). The steep canyon faces have active colluvial processes and the geologic map has several areas mapped as Colluvial Deposits. Flood plains were observed in the project area including a wide flood plain where Pyramid Creek Tract is located. Several lots are in the Pyramid Creek flood plain. Alluvial fans are located in the side channels of the SFAR, and several mapped Quaternary Alluvial Fans (Qaf) are mapped in the project area. The western side of 47 Milestone Tract is located on an active alluvial fan. This fan is highly dissected, littered with large boulders and has several wet areas located throughout the fan. These landforms are considered highly unstable, and channels could migrate across the landscape as debris flow material is deposited in the existing channels.

Rock falls are a dominant process in several areas where cabin sites are located. One of those areas is the steep rock outcrop slope on the north side of California Highway 50 adjacent to the Pyramid Tract. Another area is the steep glacially carved slope below Echo Summit and above CA Highway 50. This area is especially prone to rock fall because of the highly fractured east facing bedrock slope and the steep, east dipping (day light) fractures (features dipping out of the slope). The most recent rockfall along CA Highway 50, below Echo Summit occurred on March 4, 2022. This rockfall blocked the highway for one day.

REVIEW OF POLICY

Land Management Direction and Watershed Direction

Flood Plains and Wetlands (Executive Orders 11988, 11990, and FSM 2527)

These Executive Orders require Federal agencies to avoid, to the extent possible, short- and long-term effects resulting from the occupancy and modification of flood plains, and the modification or destruction of wetlands. Standards and guidelines are provided for soil, water, wetlands, and riparian areas to minimize effects to flood plains and wetlands. They incorporate the Best Management Practices of the Soil and Water Conservation Handbook. The standards and guidelines apply to all floodplains and wetlands where less restrictive management might otherwise occur (SNFP Amendment, 2004).

Proposed actions within the 100-year floodplain are subject to specific regulations (Executive order 11988, FSM 2527.06). When considering activities in a floodplain, the FS must follow an evaluation process as described in FSM 2527.06 to be compliant with EO 11988. The intent of floodplain management pursuant to FSM 2527 is to reduce losses from flood, prevent impacts to life and safety, and to protect natural resources. The evaluation process includes public

notification, evaluation of alternatives outside floodplains, evaluation of impacts and mitigating measures, and evaluation of flood hazards.

Best Management Practices (BMP) listed in R5 FSH 2509.22 Chapter 10 include:

> R5 FSH 2509.22 Chapter 10, BMP 7.3 – **Protection of Wetlands**, states the Forest Service will not permit the implementation of activities and new construction in wetlands when there is a practical alternative. During project planning, the Forest Supervisor will establish communications with other agencies legislatively responsible for protecting wetlands, Corps of Engineers, and EPA at the minimum, to ensure that local requirements are identified and incorporated into the project plan.
>
> R5 FSH 2509.22 Chapter 10, BMP 7.5 – **Control of Activities under Special Use Permit**, states the permittee will be required to conform to all applicable State and local regulations governing water quality and sanitation. Failure on the part of the permittee to meet the conditions of the special use permit may result in the permit being revoked.

Section 404 of the CWA requires any project that involves disturbance to a wetland or water of the U.S. to obtain a permit that authorizes the disturbance. If a wetland or jurisdictional water is determined to be present, then a permit must be obtained from the USACE to authorize a disturbance to the wetland.

Eldorado National Forest Land Management (LMP) Plan

> The forests LMP (1989) is generally silent on recreation residences, but it addresses riparian and wetlands management. Recreation Residences are addressed in Forest Plan Amendment #1, dated October 1990, prepared to update the special use permit terms.

Excerpts from the LMP (1989) include:

> Riparian - Riparian areas consist of riparian ecosystems, aquatic ecosystems, wetlands, and flood plains. These areas are among the most productive, sensitive, diverse, and geographically limited lands in the Forest. Many important resources such as fish, wildlife, and certain vegetation communities, are totally dependent on these riparian areas for their existence. The natural and beneficial values of riparian areas include ground water recharge, moderating of flood peaks, visual and recreational enjoyment, timber production, forage production, wildlife habitat, and cultural resources. Geographical boundaries of riparian areas are determined by soil and vegetation.
>
> Riparian areas have four characteristics in common: (1) they create well-defined habitat zones within much drier surrounding areas: (2) they make up a minor portion of the overall

Forest; (3) they are generally more productive in terms of biomass, plants, and animals: and (4) they are critical sources of diversity within the Forest ecosystem.

The Forest will take the opportunity to reduce or eliminate impacts to riparian vegetation. Standards and guidelines for the streamside management zone incorporate direction that protects riparian strips 100-feet on both sides of Class I, II and III streams, lakeshores, and wetlands. Watershed improvement projects are scheduled to further protect and enhance riparian strips. Treatment and mitigation will be blended into project EA's that affect riparian vegetation, followed by monitoring and evaluation of the results of project activities.

LMP Amendment #1 (1990) – Recreation Residences Special Use Permit Terms. Excerpts from Amendment #1 include:

- Issues identified during scoping that were deferred until the continuance study[1] is developed include:
    - Some recreation residence sites may now occupy areas that are not suitable for development, such as water influence zones, riparian zones, sensitive species habitat, meadows, and sensitive plant areas.
    - The safety of some areas along Highway 50 (due to ingress and egress) is impaired.

Sierra Nevada Forest Plan (SNFP) of 2001 (Amended in 2004). The 1989 Eldorado National Forest Land and Resource Management Plan was amended in 2001 and 2004 to adopt the SNFP and SNFP Amendment (SNFPA). Excerpts from the SNFPA include:

SNFPA establishes Riparian conservation area (RCA) widths (see below). RCA widths may be adjusted at the project level if a landscape analysis has been completed and a site-specific riparian conservation objectives (RCO) analysis demonstrates a need for different widths, pursuant to the SNFPA.

SNFP Riparian Conservation Area Widths:

- **Perennial Streams:** 300 feet on each side of the stream, measured from the bank full edge of the stream.
- **Seasonally Flowing Streams** (includes intermittent and ephemeral streams): 150 feet on each side of the stream, measured from the bank full edge of the stream.
- **Streams in Inner Gorge**[2] : top of inner gorge

[1] Began in 1985 and there is no indication that these continuance studies were completed.
[2] Inner gorge is defined by stream adjacent slopes greater than 70 percent gradient.

- **Special Aquatic Features**[3] or Perennial Streams with Riparian Conditions extending more than 150 feet from edge of streambank or Seasonally Flowing streams with riparian conditions extending more than 50 feet from edge of streambank: 300 feet from edge of feature or riparian vegetation, whichever width is greater.
- **Other hydrological or topographic depressions without a defined channel**: RCA width and protection measures determined through project level analysis.

Special Use Permits

Recreation Residence - Special Use Permit Excerpts:

- H. COMPLIANCE WITH LAWS, REGULATIONS. AND OTHER LEGAL REQUIREMENTS. In exercising the privileges granted by this permit, the holder shall comply with all present and future federal laws and regulations and all present and future state, county, and municipal laws, regulations, and other legal requirements that apply to the permit area.

- F. RISK OF LOSS. The holder assumes all risk of loss to the authorized improvements. Loss to the authorized improvements may result from but is not limited to theft, vandalism, fire, and any fire-fighting activities (including prescribed burns), avalanches, rising waters, winds, falling limbs or trees, and acts of gold. If authorized improvements in the permit area are destroyed or substantially damaged, the authorized officer shall conduct an analysis to determine whether the improvements can be safely occupied in the future and whether rebuilding should be allowed. If rebuilding is not allowed, the permit shall terminate.

- J. FLOOD DAMAGE [applies to select cabin sites]. The lands covered by this permit are in a floodplain or floodway. This permit is issued with the specific understanding that if the authorized improvements are substantially damaged and made Uninhabitable by a flood, the permit shall terminate, and the remaining improvements shall be removed within 90 days. If damage to the improvements is not substantial, they may be repaired and allowed to remain if they can be flood-proofed without affecting flows in the floodplain or floodway. No expansion of existing improvements or new improvements will be allowed in the floodplain or floodway. No claim shall be made against the United States for loss, damage, or termination of the permit due to a flood.

[3] Special Aquatic Features include lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs.

Setbacks

Planning requirements for El Dorado County were acquired by contacting the El Dorado County Planning Manager (personal communication, March 9, 2023) and El Dorado County Title 130, Article 3 (El Dorado County Planning, 2023). Planning requirements for the Lake Tahoe Basin were acquired from the Tahoe Regional Planning Agency (TRPA) Code of Ordinances (Tahoe Regional Planning Agency, 2022). El Dorado County and the TRPA have setback requirement for structures near the Stream Environment Zone (SEZ) (see Tables 1 & 2). Building Code conformance is additional to planning requirements and these building code requirements are not addressed in this report, except for setbacks to slopes.

There are additional county planning requirements not considered in our recommendations, because they are beyond the scope of our report. These requirements involve Oak Trees, Rare Plants, and a 200-foot setback to timber production zones.

Table 1 – El Dorado County Planning Department Structure Setbacks

Perennial Stream	Ephemeral Channels	Riparian/Wetlands	100-yr floodplain
100 feet to the South Fork of the American River[4]; 50 feet from edge of SEZ,	25 feet from edge of SEZ	25 feet	25 feet

Notes:

1. El Dorado County Code (Title 130, Article 3), structures "shall be set back a distance of 25 feet from any intermittent stream, wetland or sensitive riparian habitat, or a distance of 50 feet from any perennial lake, river or stream." 100 feet to the S. Fork of the American River.
2. The County Planning Manger stated that for neighboring private lots they have allowed a legal non-conforming variance for the 100-foot setback to the SFAR to the standard 50-foot requirement, because the 100-foot setback is not achievable within their legal lot boundaries. The cabins on National Forest System lands must be located within the lot boundary pursuant to the Special Use Permit, so the same conditions may apply. When space is available to meet the 100-foot setback to the SFAR, the 100-foot setback shall be controlling.

Table 2 – Tahoe Regional Planning Agency (TRPA) Structure Setbacks

Perennial Stream	Ephemeral Channels	Riparian/Wetlands	100-yr floodplain
50 feet from edge of SEZ	25 feet from edge of SEZ	25 feet	25 feet

[4] Title 130, Article 3, Table 130.30.030.H.1 – Specific Riparian Setbacks

Notes:

1. TRPA (Section 33.4.1) When the stability on or in the vicinity of a project area may be lessened by the proposed grading, a subsurface investigation and preparation of a subsurface soil and geographical report by a qualified professional.
2. The development or disturbance of steep slopes shall not impair the stability of slopes on the property or on surrounding land.

An excerpt from the Water Quality Management Plan for the Lake Tahoe Region was found in Volume 1, Water Quality Management Plan[5]. The excerpt states the following: It is important to set new development back from the edge of SEZs, both to preserve the integrity of the SEZ itself, and to preserve the important wildlife and scenic values of the edge zone created by the SEZ and the adjoining vegetation types. Buildings, other structures, and land coverage shall be set back from SEZs in accordance with Table 2 above.

Septic

Tracts within Lake Tahoe Basin

Requirements that apply to tracts within the Lake Tahoe Basin (Echo Road North, Echo Summit North, and Rainbow) include a requirement that domestic septic systems shall be holding tanks only - no conventional septic systems are allowed.

No onsite wastewater systems are allowed within the Lake Tahoe Basin pursuant to the Porter-Cologne Act (§ 13950-13952). Under the Porter-Cologne Act, the Regional Board allows exceptions to the mandate for export for a small number of summer homes where wastewater must be disposed to holding tanks, or incinerator toilets; holding tank wastes or ashes must be exported from the Lake Tahoe Basin. These requirements are well known by the local recreation residences and followed. Holding tank pumper trucks (also known as liquid waste haulers) are available to pump out holding tanks.

Excerpts from the El Dorado County Local Agency Management Plan (LAMP) (Eldorado County, 2018) include the following:

> "The California State Water Code (Porter-Cologne Water Act) Chapter 12 (Cal. Health & Safety Code, §§ 13950-13952.5) prohibits the disposal of municipal wastewater to groundwater and requires export of sewage from the Tahoe Basin, therefore Onsite Waste Treatment System (OWTS) will not be permitted. Any previously unknown OWTS, once discovered, will be identified and Community Development Agency, Environmental

[5] SEZ Setbacks (regulatory) 140 CFR 130.6 (c) (4) (ii), (iii) (El and (GI; 130.6 (c) (7) 1

Management Division (CDAEMD) will consult with appropriate Regional Water Quality Control Board (RWQCB) staff to evaluate options for sewage disposal (Appendix A. County of El Dorado – Regional Water Quality Control Board Jurisdiction [map] and Appendix B. Tahoe Prohibitions) (OWTS Policy 9.1.2)."

"The Porter-Cologne Act (§ 13950-13952) includes specific language regarding domestic wastewater disposal in the Lake Tahoe Basin. It requires the export of all domestic wastewater from the California portion of the Lake Tahoe Basin; an Executive Order of the Governor of Nevada requires export on the Nevada side. The TRPA also prohibits the discharge of domestic, municipal, or industrial wastewater within its jurisdiction, with the types of exceptions noted below. Under the Porter-Cologne Act, the Regional Board allows exceptions to the mandate for export for a small number of summer homes in remote areas of the Lake Tahoe Basin where sewage would be environmentally damaging. Toilet wastes must be disposed to holding tanks, or incinerator toilets; holding tank wastes or ashes must be exported from the Lake Tahoe Basin. Disposal of graywater (sink and shower wastes only) to leach fields may be allowed. Food wastes must be exported or incinerated. Garbage grinders, washing machines, dishwashers, and phosphate-based detergents are not allowed. Proper long-term maintenance of exempted facilities (both holding tanks and greywater systems) is very important. Regional Board staff should continue surveillance of these exempted facilities, and their exemptions should be revoked if the Regional Board cannot continue to find that they will not individually or collectively, directly, or indirectly, adversely affect the quality of the waters of Lake Tahoe. The Forest Service periodically reviews its permits for summer home tracts. Regional Board staff should continue to review and comment on proposals for permit extensions, to ensure that wastewater issues are adequately addressed."

All Other Tracts

To help the Forest Service review future septic designs, a summary of the key County and Water Board requirements to assist in this effort is provided below. Key components are broken out as follows: 1) Limiting Layer, 2) Percolation Rates, 3) Leach Field Setbacks, 4) Septic Tank Setbacks, and 5) Triggers that require Additional Studies.

1) Depth to Limiting Layer (Soil and Groundwater Depth)

El Dorado County LAMP, Section 5(A) (Table 3) Pursuant to the State OWTS Policy, the minimum depth to the anticipated highest level of groundwater below the bottom of the leaching trench, and the native soil depth immediately below the leaching trench, shall not be less than the following (see Table 3).

Table 3 – Minimum Soil Depth Required below the bottom of the leaching trench.

Percolation Rate	Native Soil Depth
Percolation Rate 1 to 5 MPI	Twenty (20) feet
Percolation Rate >5 to 30 MPI	Eight (8) feet
Percolation Rate>30 to 120 MPI	Five (5) feet

2) Percolation rates

Percolation rates must fall between 1 and 120 MPI. Corresponding soil thickness (separation) requirements to restrictive layers (e.g. bedrock, groundwater) is listed in Table 3. Septic systems shall only be allowed when soils fall between these values, and the corresponding soil thickness is available.

3) Leach field Setback[6] Requirements

- 150-feet to public water wells
- 100-feet to domestic wells
- 100-feet to perennial streams*, intermittent and seasonal streams, lake, pond, marsh, or wetlands
- 50-feet to ephemeral streams* or drainage courses
- 50-feet to season wet areas
- 100-feet to irrigation ditch or canal

4) Septic Tank / Holding Tank Setback Requirements

- 150-feet to public water wells
- 100-feet to domestic wells
- 50-feet to perennial streams*, intermittent and seasonal streams, lake, pond, marsh, or wetlands
- 25-feet to ephemeral streams* or drainage courses
- 50-feet to season wet areas
- 50-feet to irrigation ditch or canal

**As measured from the ten (10) year high water mark.*

[6] (OWTS Policy 9.2.3) (County Ordinance 110.32.240) (OWTS Manual Section 2B) – Leach Field and Septic Tank Setbacks.

5) Triggers that require additional studies

- Slopes >30% require a slope stability report.
- When the highest anticipated depth to groundwater cannot be determined with the use of soil observation pits or soil borings, the county may require groundwater monitoring wells to be installed to determine the highest anticipated depth to groundwater.

Septic Exclusion Zone

No septic systems shall be allowed within the Septic Exclusion Zone (see Maps). Septic setbacks are based on the 10-yr high water mark (see accompanying 10-yr flood model discussion and Map). The Septic Exclusion Zone setbacks are based on leach line setbacks[7]. Streams included in the mapping include: SFAR (portion), Upper Truckee River (portion), five unnamed perennial streams near Phillips Tract, unnamed streams near 47 Milestone Tract, Aspen Creek, Bryant Creek, Sayles Creek, Tamarack Creek, Pyramid Creek, Rocky Creek, Strawberry Creek, and Forni Creek. The study area contains additional perennial and ephemeral streams, drainage courses, and seasonal wet areas that are unmapped, yet additive to the exclusion zone.

METHODOLOGY

Geologic Maps

The geologic hazard assessment was conducted by evaluating available geologic maps, publications and field reviewing the areas where the cabin sites are located. Geologic maps available for this project area include the geology and landslide map by Wagner and Spittler, 1998. This map extends as far east as Strawberry and shows a landslide feature above the 36 Milestone Tract and Forni Creek. Four cabin sites are in 36 Milestone Tract. The notation on the Wagner and Spittle map for this area states "Slope with possible landslide geomorphology and where geologic exposures indicate landslide displacement". In addition, a landslide map derived from Interferometric Synthetic Aperture Radar (InSAR) data was reviewed to determine if any of the cabin sites were located on unstable ground (Ya Kang, and Others, 2021). InSAR is a method to detect active landslides during the observation period (2016 to 2019). The InSAR method is particularly sensitive to small deformations and is highly effective in detecting slow-moving landslides. Moreover, InSAR data has the capability to partially penetrate the vegetation canopy and has the potential to reveal landslides covered by dense forests. The Eldorado InSAR landslide map extended to the east as far as Forni Creek and landslide polygons in Tract 36 and Forni Creek coincided with polygons mapped as Quaternary Landslide Deposits on the available geologic map. The InSAR data and landslide polygon in Tract 36 indicated there is surface

[7] 100-setback to perennial streams and 50-foot setback to ephemeral streams.

deformation in this area and the landslide could be active. The four cabin sites in 36 Milestone Tract will be assessed during the Phase II Geological Hazard Assessment.

Remote Sensing

Additional mapping of the project area was accomplished using 2010, 2018 and 2019 LiDAR DEM and Bare Earth Hillshade digital data for the LTBMU and ENF. The 2010 LiDAR dataset is considered Quality Level (QL) 1. However, the dataset does not meet 3DEP standards, which is the current standard by USGS, because the dataset is missing the USGS Base Specification Products. The 2018 LiDAR dataset covers the LTBMU and is considered QL9 and does not meet 3DEP Standards. The 2019 LiDAR dataset covers the ENF, is QL1 and meets 3DEP standards. The 2018 LiDAR was only used for the DEM data, which was used to derive the flood modeling for the Rainbow Tract on the LTBMU. The 2019 Lidar data DEM was used to derive the flood modeling on the ENF. The 2010 and 2019 LiDAR Bare Earth Hillshade dataset was used to identify geomorphic landforms denoted in the geologic map.

Additional mapping of the Caldor Geologic Hazard Area project area was accomplished using imagery primarily composed of NAIP imagery from 2018, 2019, and 2020. This color imagery has a resolution of 60 cm.

The primary GIS data set that was used to identify the destroyed cabin sites was provided by the ENF GIS Coordinator, Debra Tatman. This data set is called the Caldor Damage Inspection (DINS) database. The data set was provided by Eldorado County and was used to identify sites where hazard materials were cleaned up after the Caldor Fire. The data set includes points where the county had a record of buildings in the Caldor Fire area. The field review of the cabin structures on NFS lands determined that many of the cabin structure sites were not accurate. This report provides a GIS layer with more accurate (3 m) locations where the cabin site structures were located using geographic position system (GPS) with an external antenna during our field work. This data set is called the "20230320_Actual Cabin Locations". Both data sets are displayed in accompanying maps.

Field review of the destroyed cabins was performed during the weeks of September 25-30, 2022, and October 23-28, 2022. Field review was completed for 151 of the 175 sites that were identified in the destroyed cabin GIS data set. Points for the cabin locations and supporting data (LiDAR, geologic maps, and flood data) were used and ground truthed in an application called Avenza Map, which aided the field identification and analysis of the cabin sites. Field review needs to be completed for 24 cabin sites (see Table 10). These cabin sites will be reviewed in Phase 2 of the project.

Flood Analysis

Flood hazards were assessed using the US Army Corps of Engineers HecRAS, 2D flow Model. The 2D option is especially useful for braided streams, to determine subdivision of flow more precisely in various adjacent channels. In addition, 2D provides high resolution output for depth, water surface elevation, and flow velocity. The 2D option for the 'West Slope" area and "Lake Tahoe Basin Area" is based on terrains produced from Original Product Resolution (OPR) Digital Elevation Models (DEM) derived from Quality Level (QL) 1 LiDAR (USGS, 2019) and QL 9 LiDAR (USFS, 2018), respectively. QL 9 LiDAR was adequate for this analysis at Rainbow Tract. Flood maps were created to show the Pre-Fire 100-Yr Flood Area, the Post-Fire 100-Yr Flood Area, and the 10-Yr Flood Area to derive the Septic Exclusion Area. See Flood Maps Figures 6-8. This work was required because the study area was mapped by Federal Emergency Management Agency (FEMA) as "Zone D", an area of undetermined flood hazard. This work establishes the flood hazard for this area. However, FEMA mapped the 100-yr flood area of the Upper Truckee River along the Rainbow tract. This work modeled and confirmed the FEMA flood mapping at Rainbow tract.

The 2D RAS model requires flow input as hydrographs rather than only peak values. These were obtained by first determining statistical peak flows associated with the 10- and 100-year return intervals and then estimating hydrograph shapes for each peak. The flood peaks for the various study areas located along the SFAR were obtained using the USGS StreamStats regression-based hydrology model. The statistical reliability of these peak flow estimates increases with increase of either drainage area or return interval. In other words, the StreamStats peak 100-year value for an 80 square-mile drainage area will be more reliable than the 2-year peak of a 2 square-mile drainage area. For the very small and steep side channels assessed in this study, the flow input into the 2D RAS model was determined not using StreamStats, but rather by modeling the entire side channel drainage area in RAS with precipitation input. Precipitation values for this purpose were determined from the NOAA Atlas 14 Precipitation Frequency Data Server (PFDS), which assesses return interval precipitation values at precise geographic locations. The peak flows for the Rainbow Tract area were determined from the nearby USGS Stream Gauge Station (USGS Stream Gauge 10336600) on the Upper Truckee River directly across from the cabin location. The statistical reliability of these peak flow estimates increases with duration and recency. This stream gauge collected data continuously for 26 years between October 1960 and September 1986. In other words, the Stream Gauge derived peak 100-year value is based on data collected from 1960 to 1986, which does not capture current changes in weather patterns (i.e. Climate Change) and therefore represents a minimum value.

Peak 100-year flows for post fire unstable conditions were determined by multiplying the peak 100-year value by the flow[8]-bulking[9] factor quantified by the Caldor Burned Area Emergency Response (BAER) Team (Weddle and Other, 2021). The BAER Team quantified the post-fire clear water discharge and a soil bulking factor using the relative percent of the watershed burned at a low, moderate, and high soil burn severity, based on the Forest Service Methodology for bulking documented in Gusman (2011). The statistical reliability of the BAER Teams bulking factor estimates decreases with time. In other words, the more time (wet seasons) since the fire, the more the watershed will stabilize and return to a quasi-prefire condition.

Estimates of hydrograph shape to associate with each flow peak value were obtained using the NRCS Unit Hydrograph Transformer (Moore, 2016), which creates a hydrograph shape given drainage area, time of concentration, and peak rate factor. In the 2D RAS model, assessment of flood hazard is less dependent on the exact shape of the hydrograph and more impacted by the flood peak value.

Flood model results are significantly correlated to selection flow boundary resistance or roughness, as represented by the Mannings *n* value. These values were selected by combining field observations with research methods generally accepted in hydraulics practice. For relatively steep mountain streams one of the most used equations, by Jarrett (1984), estimates *n* value as a function of flow profile slope and the hydraulic radius of a particular flow level in each stream cross-section. Field observations for the SFAR conformed well with equation estimates.

The energy and momentum equations used in hydraulic modeling of stream flows have an applicability issue that should be addressed. As profile slope increases above about ten percent the equations lose accuracy in flood depth prediction. This is since the force of a volume of water due to pressure is perpendicular to its boundary, which varies from the direction of the force of gravity. This issue did not affect any of the main channel SFAR hydraulic models, as their flow profile slopes remained below ten percent. Pyramid Creek flow profiles also remained below ten percent. In this study the issue is only applicable to the steeper side channels. However, the loss of accuracy in flood depth determination is considered small and with no greater impact than the uncertainty of the regression-based precipitation values.

Hydraulic models are limited to the SFAR River and Upper Truckee River, with the exception for drainage areas modeled in RAS with precipitation inputs. All other streams are excluded from this study, but are still subject to all laws, regulations, and building codes (e.g. setbacks).

[8] Increase in clear-water runoff caused by loss of vegetation, litter, and duff, and formation of a hydrophobic soil layer that repels water and increases runoff.
[9] Increasing the clear-water discharge to account for a high concentration of sediment in the flow is known as bulking.

GEOLOGIC HAZARD ASESSMENT

Geologic hazards were assessed for each cabin footprint and for the roads accessing the area (see Cabin Site Assessment section below). Flood, rockfall, slope stability, and debris flow hazards to each cabin footprint is assigned a hazard rating that ranges from low to high (see Geologic Hazards Explanations section below for definitions).

Recommendation to address identified geologic hazards range from approve, deny, move, setback, and review the cabin site (see Rebuild Recommendations Explanations section below for definitions).

GEOLOGIC HAZARD CLASSES

Flood hazards were assessed using high, moderate, and low hazard classes (see Table 4).

High flood hazards were given to cabin sites where (1) the entire lot and cabin footprint are within the 100-year flood area (prefire conditions), (2) Cabin site located within alluvial/debris flow fans.

Moderate flood hazards were given to cabin sites where (1) the cabin footprint is within the 100-year flood area or alluvial/debris flow fans, and (2) space is available for cabin sites to be set back within the lot and located outside the 100-year floodplain and alluvial/debris flow fans.

Low flood hazards were given to cabin sites that are located outside the 100-year floodplain but are adjacent to perennial and ephemeral creeks, or riparian areas.

Table 4 - Flood Hazard Classes for Cabin Sites

High	Moderate	Low
1) Cabin site and lot located within 100-yr flood area. 2) Cabin site located within alluvial/debris flow fans.	1) Cabin sites located within 100-yr floodplain that can be relocated within lot outside of flood area. 2) Cabin sites located on the outer edges of alluvial/debris flow fans that can be relocated within lot outside of flood area.	1) Cabin sites located near channel banks or riparian areas but are located outside the 100-year flood area.

Rockfall hazards were assessed with high, moderate, and low hazard classes (see Table 5).

High rockfall hazards were given to cabin sites where 1) Cabin sites located below rock outcrops that have visible (daylighting) fractures with large boulders/blocks that are loose or highly fractured. 2) Cabin sites located within the transport or deposition zone of known and active rockfalls. Rockfall accumulation near the cabin site is numerous. 3) Large rocks >4' diameter are visibly in-place near cabin site and rockfall accumulation is present.

Moderate rockfall hazards were given to cabin sites where 1) Cabin sites are located below steep slopes with highly fractured bedrock, capable of producing rockfalls. 2) Rockfall accumulation near the cabin is minor. 3) Rocks 1'> 4' diameter and are visibly in-place near cabin site and rockfall accumulation is present.

Low rockfall hazards were given to cabin sites where 1) Cabin sites are located near rockfall runout zones. 2) Cabin sites have a natural and stable barrier protecting the site from rockfall. 3) Small rock or boulders < 12" may be located near the cabin site.

Table 5 - Rockfall Hazard Classes for Cabin Sites

High	Moderate	Low
1) Cabin sites located below rock outcrops that have visible (daylighting) fractures with large boulders/blocks that are loose or highly fractured. 2) Cabin sites located within the transport or deposition zone of known and active rockfalls. Rockfall accumulation near the cabin site is numerous. 3) Large rocks >4' diameter are visibly in-place near cabin site and rockfall accumulation is present.	1) Cabin sites located below steep slopes with highly fractured bedrock, capable of producing rockfalls. 2) Rockfall accumulation near the cabin is minor. 3) Rocks 1'> 4' diameter are visibly in-place near cabin site and rockfall accumulation is present.	1) Cabin sites located near rockfall runout zones. 2) Cabin sites have a natural and stable barrier protecting the site from rockfall 3) Small rock or boulders < 12" may be located near the cabin site.

Slope stability was assessed with high, moderate, and low hazard classes (see Table 6).

High slope stability hazards were given to cabin sites where 1) Cabin sites and lots located near cliffs, on steep slopes comprised of highly fractured bedrock and or open fractures. 2) Cabin sites located near landslides or in mapped landslide. 3) Cabin site foundation is located on highly weathered and weak material.

Moderate slope stability hazards were given to cabin sites where 1) Cabin sites located below cuts > 4' high. 2) Failing retaining walls or compromised retaining walls. 3) Cabin sites are located within 25' of steep, potentially unstable slopes > 60%.
Low slope stability hazards were given to cabin sites where 1) Undercutting of fill from channel erosion. 2) Cutbanks < 4' high. 3) Cabin foundation located on potentially unstable ground including slopes > 30% or within 50' of steep slopes >60%.

Table 6 – Slope Stability Hazard Classes for Cabin Sites

High	Moderate	Low
1) Cabin sites and lots located near cliffs, on steep slopes comprised of highly fractured bedrock and or open fractures. 2) Cabin sites located near landslides or in mapped landslide. 3) Cabin site foundation is located on highly weathered, weak material.	1) Cabin sites located below cuts > 4' high. 2) Failing retaining walls or compromised retaining walls. 3) Cabin sites located within 25' of steep, potentially unstable slopes > 60%.	1) Undercutting of fill from channel erosion. 2) Cutbanks < 4' high. 3) Cabin foundation located on potentially unstable ground including slopes > 30% or within 50' of steep slopes >60%.

Debris flow hazards were assessed with high, moderate, and low debris flow hazard classes (see Table 7)

- **High** debris flow hazards were given to cabin sites where 1) cabin sites on located in the active portions of alluvial/debris flow fan or within 50' of channels with debris flow potential.
- **Moderate** debris flow hazards were given to cabin sites where 1) Cabin sites are located on the periphery of debris flow/alluvial fans or within 50'-100' of channels with debris flow potential.
- **Low** debris flow hazards were given to cabin sites where 1) Cabin sites are located near flood areas, near channels or on flood plains with debris flow potential.

Table 7 – Debris Flow Hazard Classes for Cabin Sites

High	Moderate	Low
1) Cabin sites on located in the active portions of alluvial/debris flow fan or within 50' of channels with debris flow potential.	1) Cabin sites are located on the periphery of debris flow/alluvial fans or within 50'-100' of channels with debris flow potential.	1) Cabin sites are located near flood areas, near channels or on flood plains with debris flow potential.

GEOLOGIC REBUILD RECOMMENDATIONS EXPLANATION

Recommendations for cabin rebuilding based on geologic hazards were provided as approve, deny, move, setback, and review (see Table 8). A qualified to the cabin level review summary includes Dry Cabin Only.

- **Approve** recommendation is assigned to cabins where the cabin can be rebuilt within the existing cabin footprint without any further geologic review.
- **Deny** recommendation is assigned to cabins where the cabin footprint and corresponding lot is unsafe to rebuild based on Policy. Provide in-lieu lots as alternative building site.
- **Setback** recommendation is assigned to cabins where the cabin can be rebuilt provided the cabin footprint is setback to meet policy (See Table 9 for setback standards). Space is available within the lot for cabin sites to be setback.
- **Move** recommendation is assigned to cabins where the cabin can be rebuilt provided the cabin footprint is moved a specified distance (Specified in Cabin Level Summary Table) to mitigate site specific geologic hazards. This distance is beyond the general Setback distance in Table 6. Space is available for cabin sites to be moved appropriately.
- **Review (additional studies)** recommendation is assigned to cabins where the rebuilding of the cabin is predicated on additional studies (Specified in Cabin Level Summary Table). These additional studies shall be performed by a qualified professional hired by the permit holder. The findings of the studies shall be reviewed by the FS and appropriate agencies (e.g. county). Once completed, the FS will make a final rebuild determination.
- **Qualifier – Dry Cabin Only** recommendation qualified is assigned to cabins where the cabin can be rebuilt but must be a dry cabin. Meaning that the cabin cannot have an onsite wastewater treatment system (also known as a septic system) because required setbacks cannot be achieved (see Septic Exclusion Zone in Attachments). The cabin can utilize an incinerator or composting toilet. Dry Cabins may utilize graywater systems for the disposal of sink and shower wastes only. Food wastes must be exported or incinerated. Garbage grinders, washing machines, dishwashers, and phosphate-based detergents are not allowed. A community sewer is a recommended option.

Notes: The exclusion of the Dry Cabin qualifier does not imply that sites are suitable for conventional septic systems. All proposed septic systems must be prepared by a Qualified Professional and require design review and approval by the landowner (FS). See septic exclusion map.

Table 8 – Geologic Rebuild Recommendations

Approve	Deny	Setback	Move	Review (Additional studies)
Rebuilt within the existing cabin footprint without any further geologic review	Cabin cannot be rebuilt within the existing footprint or lot pursuant to Policy.	Setback cabin within the lot boundary to meet Policy.	Move the cabin within the lot to maintain a safe distance to geologic hazards (e.g. landslides, rockfall)	Additional studies are required to determine rebuild suitability.
	Unable to setback or move within lot to mitigate hazard pursuant to Policy.	Maintain 50-foot setback to perennial streams. Maintain 25-foot setback to ephemeral streams, wetlands, riparian.	The move distance typically exceeds the standard setback distance. If equal, should be identified as Setback.	Additional studies must be performed by qualified professionals (e.g. geotechnical engineer, engineering geologist) hired by the client.

Table 9 – Recommended Structure Setbacks for Rebuilding

Perennial Stream	Ephemeral Stream	Riparian & Wetlands	Descending Slopes[10]	Rock/Boulder Slopes at Echo Summit[11]
50 feet	25 feet	25 feet	Slopes less than 1:1 (100%) = setback minimum of $\frac{\text{Slope Height}}{3}$ and maximum of 40 feet, measured from the break-in slope Slopes steeper than 1:1 (100%) = the setback listed above shall be measured from an imaginary plane 45° to the horizontal, projected upward from the toe of the slope	require a subsurface investigation and preparation of a subsurface soil and geographical report by a qualified professional

*Any setback or buffer required shall be measured from the ordinary high-water mark of a river, perennial, or intermittent stream, and the ordinary high-water mark or spillway elevation of a lake or reservoir.
*The development or disturbance of steep slopes shall not impair the stability of slopes on the property or on surrounding land.
*The development or disturbance will conform to the requirements of the County Grading Ordinance, including best management practices for erosion and sedimentation control.

CABIN SITE ASSESSMENT

Each cabin site was reviewed and given geologic hazard ratings including flood, debris flow, rockfall, and landslide hazards. Recommendations are based on policy, and professional and industry standards. For a brief overview of each tract, see the Tract-Level Summary below. For a detailed Cabin Level Assessment see Tables 11 (LTBMU) and 12 (Eldorado NF). We provide detailed notes on what was found at the cabin site, as well as geologic hazard ratings and recommendations.

[10] Setbacks from the 2019 California Building Code (CBC), Title 24, Part 2. Alternative setbacks to slopes are permitted, provided a geotechnical investigation as set forth in Section 1803.5.10 in the CBC (requires a soil engineers analysis and written approval), and sets forth a reduced and safe setback. Setbacks for slopes less than 1:1 shall be measured from the top of slope (top of slope must be less than 10% to qualify).
[11] TRTP (Section 33.4.1)

Other site characteristics observed at the cabin sites are described. These characteristics include the presence of wet areas or wetlands, the presence of riparian vegetation, and the presence of channels and the flow regime in channels (perennial or ephemeral) at or near the cabin sites. Potential conflicts with land management plan objectives are also described and were taken into consideration in the recommendation to build or not build the cabin. This was the case of the Twin Bridges cabin located within 100' of a recreation parking lot and trail head in the Pyramid Creek Special Interest Area. Not only did this cabin have geologic hazard issues (potential flooding and rock fall), it also is in a high use recreation area.

Other site characteristics not considered include cabin setbacks to the CA-Highway (Hwy) 50 right-of-way (ROW), and appropriate line-of-sight visibility distance from cabin site access roads to ingress/egress onto CA Hwy 50. These characteristics are beyond the scope of our report, but we recommend they should be considered as a fundamental safety component for the rebuild determination.

An assessment was conducted to determine cabin site locations with respect to their lot boundaries. Out of 171 cabin sites evaluated, 126 cabin structures were located within their lot boundary (74%) (see Table 11 & 12). Tables 11 & 12, column 2 indicate in or out of lot boundary.

TRACT-LEVEL SUMMARY

We summarize each tract as follows:

Rainbow Tract

One (1) cabin building site was evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Rainbow Tract. The cabin site was determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. The cabin site was Lot 11.

Echo Road North Tract

Six (6) cabin building sites were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Echo Road North Tract. One (1) cabin site was determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. This cabin site is Lot 48. Two (2) cabin sites were determined to be located near the cliff-edge in fractured bedrock in a source area for frequent rockfalls. These site conditions require a feasibility study by a geotechnical engineer to determine the stability of the site and identify a safe setback distance. These cabin sites include: 4 and 14. Three (3) cabin sites have the aforenoted rockfall hazard with compounding issues. Sites 13, 26, and 41 have three

CalTrans avalanche cannons, an open canal owned by El Dorado Irrigation District (EID), walk-in access only, and the area is a wetlands. It is recommended not to approve the rebuilding of these cabin sites.

Septic systems are not allowed in this area pursuant to Policy. A holding tank is allowed. Additionally, many of the sites at Echo Summit are located upslope from CA Hwy 50 and within a notorious rockfall source area. All construction activities must be aware of this inherent hazard, and we recommend the stakeholders (e.g., Forest Service, County, CalTrans, Cabin Owners) develop BMPs to ensure safe and appropriate construction activities.

Echo Summit North Tract

Thirty (30) cabin building sites were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Echo Summit North Tract. Lot 20 and Lot 48 have two buildings located within the lots. Thirteen (13) cabin sites were determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. These cabin sites include: 4, 9, 10, 11, 12, 13, 14, 16, 18, 20-1, 24, 26, and 47. Seventeen (17) cabin sites were determined to have a concern for slope stability (e.g. rockfall hazard, proximity to cliff-face). Echo Summit is comprised of fractured bedrock susceptible to frequent rockfalls. These site conditions require either a setback, a feasibility study by a geotechnical engineer to determine the stability of the site, or other site-specific mitigation described in Table 11. These cabin sites include: 5, 6, 7, 8, 15, 17, 19, 20-2, 21, 22, 23, 25, 27, 28, 43, 48a, 48b. It is recommended to approve the rebuilding of all cabin sites in this tract, with appropriate mitigations.

Septic systems are not allowed in this area pursuant to Policy. A holding tank is allowed. Additionally, many of the sites at Echo Summit are located upslope from CA Hwy 50 and within a notorious rockfall source area. All construction activities must be aware of this inherent hazard, and we recommend the stakeholders (e.g., Forest Service, County, CalTrans, Cabin Owners) develop BMPs to ensure safe and appropriate construction activities.

Phillips Tract

Six (6) cabin building sites were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Phillips Tract. All six (6) cabin sites were determined to have a concern for rockfall. The tract is situated at the base of a steep slope susceptible to rockfall. Prior to the fire there was a dense stand of trees about 100 feet above the cabin sites that protected the cabins from rolling rocks. Once the burned, dead, and standing trees fall this risk will exacerbate. An additional assessment by a licensed geologist hired by the cabin owners is necessary to evaluate the rockfall hazard to the cabins and design mitigations, when determined to be necessary. These cabin sites include: 3, 4, 5, 6, 7, and 8.

47 Milestone Tract

Twenty (20) cabin building sites were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the 47 Milestone Tract. Lots 112 and 116 had two buildings located within the lots. Nine (9) cabin sites were determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. These cabin sites include: 2, 12, 102, 103, 105, 106, 108, 110, and 107*. Cabin site 107* may be mislabeled in the original GIS dataset we used for our analysis. The original GIS dataset had Cabin 107* labeled as 106. Three (3) cabin sites were determined to be located within the 100-yr flood modeling conducted for the assessment. These cabin sites can be shifted a short distance within the lot and maintain an appropriate setback to the 100-yr flood area. The mitigated site locations require a flood elevation certificate. These cabin sites include: 1, 4, and 11. Eight (8) cabin sites are located within an active alluvial fan and determined to have a high flood potential based on the 100-yr flood modeling. It is recommended not to approve the rebuilding of these cabin sites. These cabin sites include: 111, 112a, 112b, 113, 114, 115, 116a, and 116b.

Aspen Tract

Twenty (20) building sites in 16 lots were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Aspen Tract. Five (5) cabin sites were determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. These cabin sites include: 7-1, 7-2, 8, 9, and 10. Seven (7) cabin sites were determined to be either located within riparian areas, encroaching on the perennial channel, or having fill slopes encroaching on the perennial channel banks that are being undercut. We recommend these cabin sites are setback 50-feet from perennial channels and 25-feet to riparian/wetlands to mitigate and approve the rebuilding of these cabin sites. These cabin sites include: L4*, L6-1, 12, 15, 16, 17, and 18. There was no GPS point for Lot 4* cabin site in the GIS dataset provided. Four (4) cabin sites were determined to have a concern for slope stability. These site conditions require a geotechnical investigation for slope stability for the building site. These cabin sites include Lot 13, 22, 23, 9701*. Signs at the sites identified Lot 22 as Lot 21, and Lot 23 as Lot 22. Cabin 9701* does not have a GIS point in the GIS dataset. Address sign 9701 observed near cabin site. Three (3) cabin sites are located within a flood or riparian area with no space to safely setback within the lot. It is recommended not to approve the rebuilding of these cabin sites. These cabin sites include: 5 and 11. There is no GIS point for cabin site L48. Lot 6-2 and Lot 6-3 fall within this condition and recommendation, but Lot 6-2 and 6-3 are outbuildings and not a cabin, therefore they are excluded from the count.

Bryant Tract

Eight (8) of the 17 cabin building sites were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Bryant Tract. The remainder will be evaluated in a complimentary, yet separate Phase II Report. Seven (7) cabin sites were determined to have no concerns for geologic hazards and are recommended to be rebuilt without

further geologic review. These cabin sites include: 7, 19, 20, 21, 23, 24, and 26. One (1) cabin site was determined to have a concern for slope stability. This site requires a geotechnical engineer to evaluate slope stability of the cut bank and the rock wall and the uncontrolled runoff from the slope above the cabin site. This cabin sites includes Lot 25.

Fir Tract

Twenty-four (24) cabin building sites were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Fir Tract. Eighteen (18) cabin sites were determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. These cabin sites include: 2, 3, 4, 6, 9, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, and 26. Six (6) cabin sites encroach on a flood or riparian area and have space to safely setback within the lot. It is recommended to setback all these sites to maintain a 50-foot separation to perennial streams and approve the rebuilding of these cabin sites. These cabin sites include: 5, 7, 8, 10, 11, and 12. There was no GPS point for Lot 4 cabin site in the GIS dataset provided.

Sayles Canyon Tract

Twenty-one (21) cabin building sites were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Sayles Canyon Tract. Eleven (11) cabin sites were determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. These cabin sites include: 1, 20, 28, 30, 31, 32, 33, 34, 35, 36, and 39. Three (3) cabin sites were determined to be located on steep slopes with a concern for slope stability. These sites require a geotechnical engineer to evaluate the slope stability of the cut bank and prepare an appropriate design to mitigate the site conditions. Additionally, the slopes are such they must be evaluated by an engineering geologist (slope stability report) to ensure they are stable for a septic system. These cabin sites include: 13, 17, and 18. Seven (7) cabin sites were determined to be located near an abrupt change in slope. We recommend allowing these cabin(s) to be rebuilt if they maintain an appropriate setback to the change in slope (setback minimum of $\frac{\text{Slope Height}}{3}$ and maximum of 40 feet) (California Building Code). These cabin sites include: 21, 22, 23, 24, 25, 26, 27.

Twin Bridges Tract

Four structures were located within three lots and were evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Twin Bridges Tract. This tract is located within a Forest Service Special Interest Area. Three (3) cabin sites are located within an active rockfall area, wetland, under powerlines, or other special uses. Additionally, the access road is in poor condition and the Twin Bridges Tract is located within the Pyramid Creek Special Interest Area. It is recommended not to approve the rebuilding of these cabin sites. These cabin sites include: 3, 9, and 14.

Pyramid Tract

Seventeen (17) cabin building site was evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Pyramid Tract. This tract is located within a Forest Service Special Interest Area. Five (5) cabin sites were determined to have no concerns for geologic hazards and are recommended to be rebuilt without further geologic review. These cabin sites include: 4, 5, 6, 7, 18114 US-50. Six (6) cabin sites encroach on a flood area and have space to safely setback within the lot. Additionally these cabin sites have a moderate rockfall hazard. It is recommended to setback all these sites to maintain a 50-foot separation to perennial streams and require an additional geologic review to evaluate the rockfall potential and prepare an appropriate design to mitigate the site conditions. These cabin sites include: 24, 30, 31, 32, 33a, 34. Three (3) cabin sites were determined to be either located within riparian areas, boggy areas, or flood areas. We recommend these cabin sites are setback 50-feet from perennial channels and 25-feet from riparian/wetlands areas to mitigate and approve the rebuilding of these cabin sites. These cabin sites include Lot 14, 17, and 37. Two (2) cabin sites were determined to have a concern for rockfall. The tract is situated at the base of an 80+ percent slope and on the other side of CA-Hwy 50. The steep slope above Hwy 50 is susceptible to rockfall. Prior to the fire there was a dense stand of trees above the cabin sites that protected the cabins and highway from rolling rocks. Once the burned, dead, and standing trees fall this risk will exacerbate. An additional assessment by a licensed geologist hired by the cabin owners is necessary to evaluate the rockfall hazard to the cabins and design mitigations, when determined to be necessary. These cabin sites include Lot 1* and 18116 US-50. Lot L1* - there was no evidence that a cabin existed at this site. GIS Point L18150 could be cabin site L1. One (1) cabin site is located within an area determined to have a high flood potential based on the 100-yr flood modeling. It is recommended not to approve the rebuilding of this cabin site. This cabin site is Lot 39.

Forni Tract

One (1) cabin building site was evaluated for geologic hazards including flood, rockfall, slope stability and debris flow hazards in the Forni Tract. The cabin site is located within a flood area. It is recommended not to approve the rebuilding of this cabin site. This cabin site is Lot 3.

RECOMMENDATIONS

This project assessed 151 cabin sites for rebuilding destroyed cabins and geologic hazards that could be a threat to life and property on the cabin site. Out of the 151 cabin sites, sixty-eight (68) cabin sites have no geologic hazards. It is recommended to approve the building of cabin structures at these sites without any further geologic assessment. Fifteen cabin (15) sites were identified as having high geologic hazards and avoidance cannot be achieved. Therefore, it is recommended to deny approval of the building of cabin structures at these cabin sites. Sixty-eight cabin (68) sites were identified as having moderate to high geologic hazards and hazards

can be mitigated. Therefore, it is recommended to move the cabin sites to a different place within the lot or set back the cabin structures a short distance from where they were previously located or have additional studies to develop a design to mitigate the geologic hazard. In addition, it is recommended to have a flood certificate for some of these cabin sites. See Table 10 for a summary of cabin tracts. See Tables 11 and 12 for site specific descriptions and recommendations on cabin sites.

In the cases where cabin sites are recommended for denial, we identified several lots as practical alternatives (in-lieu lots), in the event the owners of the select lots decide not to rebuild. These lots are in the Sayles Canyon Tract - lots 20 through 36 and the Fir Tract - lots 14 through 26. If additional in lieu lots are needed geologic hazards will need to be evaluated to ensure the building site is safe.

Twenty-six (26) cabin sites are recommended for further assessment by private consultants (geotechnical engineers or geologists) hired by the permittee. Several of these permittees may decide to rebuild and will need to hire private consultants who will produce reports with conclusions on their assessment of geologic hazards and recommendations to mitigate and/or provide design measures for the cabin structures or cabin sites. These reports should be reviewed by an in-house Forest Service engineer or geologist to verify qualifications of the authors of these reports and adequacy of the report findings, conclusions, and recommendations.

In the cases where cabin sites are recommended for rebuilding or further assessment, we reviewed the sites preliminary suitability for onsite wastewater treatment systems (septic systems). All cabin sites located within the LTBMU (Thirty-seven (37)) require a septic holding tank only, pursuant to The Porter-Cologne Act (§ 13950-13952). An additional eighteen (18) cabin sites are recommended as dry cabins because of the sites inability to meet required setbacks to perennial streams and community wells. We modeled the 10-yr flood area to form the basis for setbacks to perennial streams (see Flood Maps for Septic Exclusion Zone). The suitability of many of the other sites are questionable due to shallow soils and groundwater conditions. We provided a summary of policy (see Review of Policy - Septic section above) and setback maps to help the agency review future septic systems designs prepared by qualified professionals. Failure to meet water quality and sanitation requirements is a requirement of their special use permit, and state and local regulation.

In the cases where permittees decide not to rebuild their cabins, proper rehabilitation of all existing septic tanks will need to be conducted. Abandoned barrels, sewage tanks and sewage pipe will need to be removed from National Forest lands and properly disposed and any excavation conducted to pull out the tanks needs to be properly graded using standard best management practices.

Several cabin sites are not located within their lot boundaries and are recommended to move or set back (see Tables 11 and 12, column 2). If the cabin site is moved or set back outside the existing footprint, the cabin must be moved within the lot boundary, pursuant to the description of the Special Use Permit.

Other site characteristics not considered include cabin setbacks to the CA-Highway (Hwy) 50 right-of-way (ROW), and appropriate line-of-sight visibility distance from cabin site access roads to ingress/egress onto CA Highway 50. These characteristics are beyond the scope of our report, but we recommend they should be considered as a fundamental safety component for the rebuild determination.

Table 10 – Tract Summary

Tract	# of Cabin Sites	Recommendations		
		Approve	Deny	Mitigate (move, setback, additional studies)
Rainbow Tract	1	1		
Echo Road North Tract	6	1	3	2
Echo Summit North Tract	30	13		17
Phillips Tract	6			6
47 Milestone Tract	18	9	6	3
Aspen Tract	16	3	1	12
46 Milestone**	**9**			
Bryant Tract*	8/**9***	7		1
Fir Tract	24	18		6
Sayles Canyon Tract	21	11		10
Twin Bridges Tract	3		3	
Pyramid Tract	17	5	1	11
42 Milestone**	**1**			
Sciots **	**1**			
Forni Tract	1		1	
36 Milestone **	**4**			
Total	**151/175**	**68**	**15**	**68**

*Bryant - 9 cabin sites remain to be evaluated

** All cabins remain to be evaluated – 15 cabin sites within tract.

Total numbers exclude double structures for one cabin site and outbuildings.

151 cabin sites have been evaluated; 24 lots (cabin sites) need to be completed.

CONCLUSIONS

Geologic hazards were evaluated for 151 out of the 175 cabin sites that are located on ENF and LTBMU and are under a special permit. Recommendations are provided for either approval to build without additional geologic review; denial to rebuild; and move, set back, or have additional studies to determine and mitigate the level of risk that a geologic hazard may pose on a building site. A phase 2 project will be conducted when the field areas are available to review, and the remaining 26 cabin sites will be evaluated.

LIST OF ATTACHMENTS

Maps (https://usfs.box.com/s/030f0d9xf79hxb2u26jb8tfyr7m1jfcp)

Map 1: General Location Map
Maps 2-5: Geologic Maps
Maps 6-8: Flood Maps

GIS Data (https://usfs.box.com/s/u4zpcbc2xbozpav3gxd57q5449xkxykn)

20230320_Actual Cabin Locations
DINSEPAPhase1_BLM_Z11_GeoHaz_03012023.shp – Cabin Site Recommendations

20230329_FloodData Geodatabase
- All_Tracts_100Yr_Pre_Fire
- Pyramid_100Yr_Alternative
- All_Tracts_100Yr_PostFire
- FinalSepticExclusionZone_V1.0

REFERENCES

Elder, Don and Reichert, Mark, 2005, Region-wide GIS bedrock compilation mapping – an ArcSDE geodatabase: digital dataset - agency internal publication, USDA Forest Service, Pacific Southwest Region, Vallejo, California.

El Dorado County Planning Manager, personal communication, March 9, 2023. Placerville, CA.

El Dorado County Local Agency Management Plan for Onsite Wastewater Treatment Systems (LAMP), Effective as of May 13, 2018. Placerville, CA.

El Dorado County Site Planning and Project Design Standards, 2023, Eldorado County Code Title 130 – Article 3, Adopted 12/15/2015. Placerville, CA. accessed on March 9, 2023 at URL*:* *TITLE 130 Master Complete Adopted 08-14-18 AMD 12-2-20 AMD 9-10-21.pdf (edcgov.us)*

LiDAR-West Slope Area

U.S. Geological Survey, 20210722, USGS Original Project Resolution CA_UpperSouthAmerican_Eldorado_2019: U.S. Geological Survey.

LiDAR-Lake Tahoe Basin

2018 USFS Lake Tahoe Basin Management Unit Lidar, Quality Level 9.

2010 USFS Lake Tahoe Basin Management Unit Lidar, Quality Level 1.

Jarrett, R.D. 1984, Hydraulics of High-Gradient Streams, Journal of Hydraulic Engineering, Vol. 110, No. 11, November, 1984.

Gusman, J., 2011, Sediment Debris Bulking Factors and Post-Fire Hydrology for Ventura County, Draft Report, West Consultants, Inc.

Moore, Daniel, 2016. Unit Hydrograph Transformer, Version 3. Natural Resource Conservation Service. Portland, OR.

Spittler, Thomas E. and Wagner, L David, 1998. Geology and Slope Stability Along Highway 50. California Geology May/June 1998 and DMG OPEN-FILE REPORT 97-22, California Geological Survey, Sacramento, CA.

Tahoe Regional Planning Agency, 2022, TRPA Code of Ordinances, Tahoe Regional Planning Agency, Lake Tahoe, Adopted by Governing Board December 12, 2012, Amended July 25, 2022.

USDA Forest Service, 2004. Sierra Nevada Forest Plan Amendment, Final Supplemental Impact Statement, Record of Decision. Forest Service, Pacific Southwest Region, Vallejo, CA.

Ya Kang, and Others, 2021. InSAR monitoring of creeping landslides in mountainous regions: A case study in Eldorado National Forest, California. Remote Sensing of Environment

Volume 258, 1 June 2021, 112400.

Weddle, Tracy and Others, 2021. Hydrology Specialist Report Caldor Fire BAER Assessment. Eldorado National Forest, Placerville, CA.

CABIN-LEVEL SUMMARY

Geologic hazards, determinations, and recommendations have been provided for each of the cabin sites and are described in Tables 11 and 12 below. Final determination of rebuild suitability and all mitigations are subject to approval of the ENF and LTBMU National Forest. Final determination of rebuild suitability and all mitigations are subject to approval of the subject National Forest, which is beyond the scope of this report.

Legend: White = No Hazards; Yellow = Substantial Mitigations are Required by cabin owner (e.g. flood certificate, slope stability study, setbacks), triggering a subsequent geologic review by the FS; Purple = Do Not Rebuild.

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Lake Tahoe Basin Management Unit

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Rainbow	11 (in)	None	None	None	None	The Base Flood Elevation (BFE) on the FEMA Map is 6347' which is higher than the DEM derived elevation of 6278'. There is a discrepancy in the elevations between the FEMA map and the DEM dataset used to determine elevation of the cabin site.	Based on our flood model the elevation of the 100-yr flood line is 6267.5'. Cabin site is 10.5' higher in elevation and 75' away from the 100-yr flood area.	Cabin can be rebuilt without further geologic review.	No septic system allowed. Municipal sewer connection required if available. Or Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Road North	4 (in)	None	None	Moderate	None	The site is located near the break-in-slope of a 60% slope and is located on shallow soils and fractured bedrock. A massive bedrock slab is located on the slope below the cabin site.	This cabin site hazmat was not cleaned up on the day it was reviewed (9/29/2022).	Recommend rebuilding with additional geotechnical investigation by a qualified professional to determine slope stability of cabin site. This cabin site may have to be setback farther from the break-in-slope of the steep slope (recommend 50’ setback). Needs new wastewater holding tank.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Road North	13 (in)	None	None	Moderate	None	Site is located within 20' of the break-in-slope of a very steep slope that drops off at 80%. The site is in a wetland area on a	CalTrans has 3 avalanche cannons located near the cabin site and one of the cannons is within 40' of the	It is recommended not to rebuild this cabin at this site because too close to riparian cannot achieve setback to	This site is questionable as a cabin site considering the three avalanche cannons, open	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						point between two channel headwaters and is located on shallow soil overlaying highly fractured (12' spacing) bedrock. Slope stability at the has a low rating.	cabin. The cabin is accessed by a narrow trail that is below an open canal owned by EID that flows water most of the year.	riparian areas and conflicting uses. However, if the cabin is rebuilt at this site, we recommend an additional geotechnical investigation by a qualified professional to determine the stability of the site and setback away from the cliff face at least 50'.	canal, narrow access trail and wetland area.	
Echo Road North	14 (out)	None	High	High	None	This cabin site is located 10' from the break in slope of the cliff face. The site is located on fractured bedrock w/ several fractures daylighting the cliff face including wedge failure fracture sets. Open fractures were observed where the cabin was located.	The cliff face is actively failing and there is a rockfall deposit directly below this rock outcrop. There is high potential the site where the old cabin was located could collapse and fail. The cabin site is located outside of the nearby lot boundary.	To rebuild this cabin the site must meet setback requirements and be setback into Lot 14. Alternative setbacks to slopes are permitted, provided a geotechnical investigation as set forth in Section 1803.5.10 in the CBC, and so long as the reduced setbacks are safe.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Road North	26 (out)	Low	Low	Moderate	None	Cabin site is located above a channel and 25' away from ditch. Water is leaking from open canal into a channel and is flowing within 4' of cabin site. Cabin is located on a 32% slope and 50' above a	A rock outcrop with evidence of rock fall is located on the other side of a 6' water pipe. There is a low rockfall hazard from this rock outcrop. Cabin site is probably protected from rock	It is recommended not to rebuild this cabin at this site because too close to riparian and cannot achieve setback to riparian areas. Additionally, there is an EID open canal, and moderate slope stability hazards. However, if the cabin is rebuilt at	This site is questionable as a cabin site considering the three avalanche cannons, open canal, narrow access trail and wetland area and slope stability concerns.	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						break-in-slope of a steep 80% slope.	fall by this pipeline. There is no room to move the cabin site in this area. There are avalanche cannons, narrow access trail, and moderate slope stability hazards at this site.	this site, we recommend an additional geotechnical investigation by a qualified professional to determine the stability of the site and setback away from the cliff face at least 50’.		
Echo Road North	41 (in)	None	None	Low	None	Site is located 45' from the break-in-slope of a very steep slope that drops off at 80%. The site is located above a channel headwater and is located on shallow soil overlaying highly fractured (12' spacing) bedrock.	There are 3 avalanche cannons located near the cabin site. The cabin is accessed by a narrow trail that is 30' below an open canal that flows water most of the year. A wetland area is located above the open canal.	It is recommended not to rebuild this cabin at this site because of wetlands area and unable to achieve setbacks, and conflicts with other uses (e.g. avalanche cannons, canal). However, if the cabin is rebuilt at this site, we recommend an additional geotechnical investigation by a qualified professional to determine the stability of the site and setback away from the cliff face at least 50’.	This site is questionable as a cabin site considering the three avalanche cannons, open canal, narrow access trail and wetland area.	
Echo Road North	48 (out)	None	None	None	None	Cabin site is located on 45% slope with highly erosive soils. Next door cabin owner (Tina Beard) stated that after the fire during August rain storm the slope above her cabin was	All the cabins in this tract have closed septic tanks and are pumped out by a local septic service according to Ms. Beard.	Cabin can be rebuilt without further geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						severely eroded and deposited sediment against her cabin.				
Echo Summit North	4 (in)	None	None	None	None	Site is located on gentle bedrock slope. The site is stable and has a solid foundation. No concerns for geologic hazards.		Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	5 (in)	None	Low	Moderate	None	This cabin site has a 100' x 75' x 10' deep hole with a large 8' diameter boulder in the middle. The upper end of the hole has 10' high an unstable cut. There is a rock outcrop above the cabin site that is highly fractured.	There is a low rockfall hazard associated with the fractured bedrock above the cabin site and moderate slope stability hazard associated with the 10' high cut.	This cabin site should be reviewed by a geotechnical engineer to evaluate the rock fall hazard and unstable cut with recommendations for a retaining wall and mitigation for the rockfall hazard.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	6 (in)	None	Low	None	None	This site is located on a 5% slope with 2 bedrock levels. The rock surface is flat with buildable space. There is a highly fractured rock outcrop on the southeast end of lot that is a low rockfall hazard to the cabin site. This rock	Old Insufficient leach field (no cover). Replace with closed septic tank and are pump out.	The cabin structure should be set back 50’ from the rock outcrop on southeast end of lot. A cabin can be rebuilt at this site without further geologic review if there is a setback distance of 50' from the rock outcrop.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						outcrop has a low rockfall hazard.				
Echo Summit North	7 (in)	None	Moderate	None	None	This site is located on 15% slopes below a highly fractured outcrop. There are rocks that range from 6' to 15' diameter that are separated on both sides and weathering along fractures. There is a moderate rockfall hazard associated with this rock outcrop.	There is a fiberglass septic tank burned and buried at the site that needs to be removed.	This cabin site should be reviewed by a geotechnical engineer to evaluate the rock outcrop and rock fall hazard.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	8 (in)	None	None	High	None	Cabin site is located within 20' of cliff edge with a rock wall and presumably a patio area. Open and daylighting fractures were observed in bedrock near the rock wall.	The cabin site is 105' away from CA-HWY 50 and possible within the highway ROW. Construction of a cabin, close to the cliff edge could be a hazard to highway 50 if a rock is dislodged.	To rebuild this cabin the site must meet setback requirements and be setback into Lot 8. Alternative setbacks to slopes are permitted, provided a geotechnical investigation as set forth in Section 1803.5.10 in the CBC, and so long as the reduced setbacks are safe. And evaluate hazards to CA Highway 50 below the cabin site.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	9 (in)	None	None	None	None	Cabin site is located on a flat slope above a 35% slope and a cliff face above CA Highway 50. Large 6'	There are no geologic hazards at this cabin site.	Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						to 12' large boulders have been placed on either side of the building site. The cabin site is set back a safe distance away from the cliff face.			Act (§ 13950-13952).	
Echo Summit North	10 (in)	None	None	None	None	Cabin site is located on gentle slopes near rounded, weathered core stone rocks 30 ft. from steeper slope below. There is no concern for any geologic hazards at this site.	There are no geologic hazards at this cabin site. Septic tank at this site is not reusable and needs to be removed.	Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	11 (out)	None	None	None	None	Cabin site is located on gentle slopes near rounded, weathered core stone rocks 60 ft from steeper slope below. There is no concern for any geologic hazards at this site.		Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	12 (in)	None	None	None	None	Cabin site is located on 10-15% slopes near rock outcrops that do not have rock fall hazards threatening cabin sites.	Septic systems will have to be rebuilt as septic pumping tanks.	Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Echo Summit North	13 (in)	None	None	None	None	Cabin site is located on 10-15% slopes near rock outcrops that do not have rock fall hazards threatening cabin sites.	Septic systems will have to be rebuilt as septic pumping tanks.	Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	14 (in)	None	None	None	None	Cabin site is located on 10-15% slopes near rock outcrops that do not have rock fall hazards threatening cabin sites.	Septic systems will have to be rebuilt as septic pumping tanks.	Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	15 (in)	None	Low	None	None	Site is located on 35% slope. Loose, unstable rocks placed on side of access road above cabin site. There were no geologic hazards observed at this site.	There is a septic tank in place that needs to be removed and replaced with a tank that can be pumped.	Rebuild cabin without any additional geologic review. The rocks above the cabin site should be moved to a more stable location.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	16 (in)	None	None	None	None	Cabin site is located on a 27% slope with exposed bedrock and core stones. There are no concerns for geologic hazards.		Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	17 (in)	None	High	High	None	This cabin is located on a rock pile about 20’ from cliff face. Rock pile has loose unstable rocks and could be a rockfall hazard to Highway 50. There was a	There are some loose rocks daylighting the slope where an upper pad of building site is located. The lower pad is a small area	To rebuild this cabin the site must meet setback requirements and be setback into Lot 17. Alternative setbacks to slopes are permitted, provided a geotechnical investigation as set	The rock pile is an unsuitable building site for a cabin. This site is not suitable for a conventional septic system. No septic system	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						septic system draining into a 50-gal barrel and onto slope below cabin. This site has a high rockfall and slope stability hazard.	in the middle of a rock pile. The building site is 88' from the highway and could be within the Highway 50 ROW.	forth in Section 1803.5.10 in the CBC, and so long as the reduced setbacks are safe.	allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	18 (in)	None	None	None	None	This cabin site is located outside of Lot 18. This site has no geologic hazards and is a stable site for a cabin. The cabin could be moved into Lot 18 without any geologic hazard concerns.		Rebuild cabin without any additional geologic review. Consider moving into lot.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	19 (in)	None	Moderate	High	None	Cabin site is located on 25% slope, well above break in slope of steep slope above Highway 50. The building site is located on highly weathered rock and saprolite material. There is a moderate rockfall hazard and high slope stability hazard.	An open 3" fracture was observed on the graded building site and indicates movement and unstable conditions. The site has a rock-mortar retaining wall that looks cracked in some places.	This building site needs to be reviewed by a geotechnical engineer to determine stability of the site and to make recommendations to stabilize the site. The rock wall also needs to be assessed for stability. Maintain a 50’ setback to the cliff.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	20-2 (out)	None	Low	None	None	Site is located on a 45% slope, 125' above a cliff. Highway 50 is below this cliff.	There is a stack of loose flat, angular rocks above the graded cut of the building site. The low rockfall hazard is associated with	The loose rocks should be moved and redistributed within the lot. Cabin could be rebuilt at this site without further geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
							the stacked, loose rocks.			
Echo Summit North	20-1 (in)	None	None	None	None	This site is on stable ground without any geologic hazards.	This site looks like an outbuilding to Cabin L20 and was not cleaned up. Appears to have wood stove.	Out building could be rebuilt without further geologic review. Site needs to be cleaned up.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	21 (in)	None	None	Low	None	Located on 22% slope, 25' above break in slope of cliff face above Highway 50. There is a low rockfall hazard at this site due to the failing retaining walls.	There is an unreinforced mortar rock retaining wall holding back a fill that is cracking and unstable.	Existing mortar rock wall will need to be reviewed by a geotechnical engineer if used to support new cabin structure or parking area.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	22 (in)	None	Low	Low	None	The cabin site is located on a 30% slope just above a break in slope of a 40-60% slope below the cabin site. There is a concern for slope stability because of the proximity to the steep slope.	An old septic tank was observed on the site that indicated septic was being discharged at shallow levels.	A cabin could be rebuilt on the site. A geotechnical engineer review will be required because of the steep potential unstable slope.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	23 (in)	None	Low	Low	None	Cabin site is located on a 25%, bilevel graded slope, which is on a decomposed granite soil foundation. The	There is a 2-4' diameter rock sitting on the slope above the cabin site which is a low rockfall hazard to a	A cabin could be rebuilt on the site. A geotechnical engineer review will be required because of the bilevel graded site. The boulder	No septic system allowed. Septic holding tank only. Per The Porter-Cologne	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						cabin site is located 20-40' from a steep break in slope above Highway 50.	future cabin if the slope below is disturbed. A concrete septic tank is located on the cabin site.	above the cabin structure site should be removed further away from the cabin site.	Act (§ 13950-13952).	
Echo Summit North	24 (in)	None	Low	None	None	Cabin site is located on a 28% slope, 75-100' away from a cliff face above highway 50. Core stone boulders are located around the cabin site.	One large round rock, 6' in diameter is located above the cabin, but it appears to be anchored in bedrock. This was determined to be a low rockfall hazard.	A cabin could be rebuilt on the previous site without further geologic/Geotech review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	25 (in)	None	None	Low	None	The cabin site is located on flat, gentle slopes. The deck extended onto fractured bedrock and weathered core stones. The cabin structure site is located on a solid foundation. However, the deck has a potential unstable foundation. The deck was located on the edge of the cliff face.	The septic system was either a pump tank or waste ejector tank that was poorly located. There is a concern that any construction above Highway 50 needs to take precautions not to dislodge any rocks that could be a hazard to the highway below.	A cabin could be rebuilt on the previous site without further geologic/Geotech review. However, if a deck is proposed to be rebuilt on the core stones and fractured blocks a geotechnical assessment should be required.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	26 (in)	None	Low	None	None	Cabin site is located on flat, gentle slopes near the edge of a break in slope of a 30% slope. Highway 50 is directly below this cabin site.	There is a concern that any construction above Highway 50 needs to take precautions not to dislodge any rocks that could be	The cabin could be rebuilt on the previous cabin site without further geologic review. Caution during construction due to location of CA State Highway 50 below.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
							a hazard to the highway below.			
Echo Summit North	27 (in)	None	None	None	None	The cabin site is located on moderately (4'-6' spaced) fractured bedrock outcrop with 6'-8' core stones exposed on the surface. There is a windrow of stacked boulders, 3'-4' diameter near the access road to the cabin site.	There was evidence of a septic tank below the cabin on a steep slope where septic was allowed to flow.	A cabin could be rebuilt on the site. A geotechnical investigation will be required because of the complicated foundation. The windrow of boulders should be coordinated with Forest Service to redistribute this rock in the lot.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	28 (in)	None	None	None	None	This site is located on a flat lying, moderately fractured bedrock. There is no soil on the site. Six-to-eight-foot diameter and smaller boulders are located on the site and the cabin structure was overlying these boulders. Concrete piers were observed on the site.	Photo shows radial fractures in one of the outcrops at the site.	A cabin could be rebuilt on the site where the old cabin was located. However, a geotechnical investigation will be required because of the complicated foundation.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Echo Summit North	43 (in)	None	Low	Moderate	None	Located at end of wide driveway on 25% slopes. There are two rock walls at this site. The upper wall is a stacked rock wall that is failing in some places. The lower wall is mortar reinforced that is failing and subject to additional failure.	There is a rock outcrop off to the side of the building site that has 6' diameter rocks on a slope that could roll with a trajectory toward the cabin site. This rock outcrop is a low rockfall hazard to the cabin site and should be evaluated.	Recommend having geotechnical engineer review rockfall hazard and rock walls to provide engineering design to reinforce or rebuild rock walls.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	47 (in)	None	None	None	None	This cabin site is located on flat stable ground with large boulders located around the building site. There are no concerns for geologic hazards.		Rebuild cabin without any additional geologic review.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	
Echo Summit North	48a (in)	None	High	Low	None	This cabin site had two buildings and they were located 10' from the edge of a cliff face. The site is located on a highly fractured rock outcrop that has active rockfall occurring below where the cabin was located. The fractures are gentle dipping and daylighting the cliff face.	There is a concern that the ground near the edge of the cliff is unstable and would not support any feature of a cabin and rock fall could be a hazard to Johnson Pass Road.	To rebuild this cabin the site must meet setback requirements and be setback into Lot 48. Alternative setbacks to slopes are permitted, provided a geotechnical investigation as set forth in Section 1803.5.10 in the CBC, and so long as the reduced setbacks are safe.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 11 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – LTBMU										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Echo Summit North	48b (in)	None	High	Low	None	This cabin site had two buildings and they were located 10' from the edge of a cliff face. The site is located on a highly fractured rock outcrop that has active rockfall occurring below where the cabin was located. The fractures are gentle dipping and daylighting the cliff face.	There is a concern that the ground near the edge of the cliff is unstable and would not support any feature of a cabin and rock fall could be a hazard to Johnson Pass Road.	To rebuild this cabin the site must meet setback requirements and be setback into Lot 48. Alternative setbacks to slopes are permitted, provided a geotechnical investigation as set forth in Section 1803.5.10 in the CBC, and so long as the reduced setbacks are safe.	No septic system allowed. Septic holding tank only. Per The Porter-Cologne Act (§ 13950-13952).	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado National Forest

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Phillips	3 (in)	None	Low	None	None	Several logs have been cut and dropped parallel above the cabin site. These logs could be a hazard to any construction operation of the cabin site. The cut to CA Hwy50 is located below the cabin site and a wastewater discharge could cause cutbank failure.	There is 35-40% slope, a rock outcrop, and a dead stand of trees about 100' above the cabin site. There is a low rock fall now, but there could be a moderate rockfall after the dead trees fall or the logs are removed.	Recommend having additional assessment by a geologist to evaluate rockfall hazard and provide mitigation for rockfall hazard.	May be suitable for conventional septic system.	
Phillips (in)	4 (in)	Low	Low	None	None	Several logs have been cut and dropped parallel above the cabin site. These logs could be a hazard to any construction operation of the cabin site. The edge of the cabin site is 40' east of a perennial channel.	There is 35-40% slope, a rock outcrop, and a dead stand of trees about 100' above the cabin site. There is a low rock fall hazard now, but there could be a moderate rockfall hazard after the dead trees fall or the logs are removed.	Recommend having additional assessment by a geologist to evaluate rockfall hazard and provide mitigation for rockfall hazard.	This site may be suitable for a conventional septic system. Maintain 100’ distance with septic from 10-year floodplain (See Flood Maps for Septic Exclusion Zone).	
Phillips (in)	5 (in)	Moderate	Low	None	Low	This cabin site is located 25' to the west of a perennial channel and 60' to the east of an ephemeral channel.	This cabin site is located between an ephemeral channel and a perennial channel. Setback requirements for	**Dry cabin only.** Recommend having additional assessment by a geologist to evaluate rockfall hazard	Not suitable for septic (See Flood Maps for Septic Exclusion Zone).	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						There is also a power line above the cabin site. There is a steep slope located above the cabin site with a low rock fall potential. There is a stand of dead trees between the cabin site and this steep slope.	an onsite wastewater system to the channel will require a dry cabin.	and provide mitigation for rockfall hazard.		
Phillips (in)	6 (in)	None	Moderate	None	None	This cabin site is located 100' below a rock outcrop and 100' to the west of an ephemeral channel. There is also a power line above the cabin site. There is a steep slope located above the cabin site with a moderate rock fall potential.	This site has soils 4-6 ft deep with large boulders. This site may have adequate soils for conventional septic system. There is a road cut along CA Hwy50 is located below the cabin site and wastewater discharge could saturate soils above the road cut and cause failure.	Recommend having additional assessment by a geologist to evaluate rockfall hazard and provide mitigation for rockfall hazard.	This site may be suitable for a conventional septic system. Maintain 100’ distance with septic from 10 Yr. floodplain (See Flood Maps for Septic Exclusion Zone).	
Phillips (in)	7 (in)	None	Moderate	None	None	Site has 30% slope and is located below a rock outcrop with 4-10' diameter boulders. Rock outcrop is moderately fractured. Some rocks appear to have fallen and rolled	This site has soils 4-6 ft deep with large boulders. This site may have adequate soils for conventional septic system. The cut to CA Hwy50 is located below the cabin site and	Recommend having additional assessment by a geologist to evaluate rockfall hazard and provide mitigation for rockfall hazard.	May be suitable for conventional septic system.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						down the slope and deposited near the cabin site. There is also a power line above the canin site.	wastewater discharge could saturate soils above the road cut and cause failure.			
Phillips (in)	8 (in & out)	None	Moderate	None	None	There were two structures at this site. One of the building sites is outside the lot. Site has 30% slope and is located below rock outcrop with 4-10' diameter boulders. The rock outcrop is moderately fractured. Some rocks appear to have fallen and rolled down the slope and deposited near the cabin site.	This site has soils 4-6 ft deep with large boulders. This site may have adequate soils for conventional septic system. The cut to CA Hwy 50 is located below the cabin site and wastewater discharge could saturate soils above the road cut and cause failure.	Recommend having additional assessment by a geologist to evaluate rockfall hazard and provide mitigation for rockfall hazard.	May be suitable for conventional septic system.	
47 Milestone	1 (in)	Moderate	None	None	Low	This cabin site is within the 100-yr flood area and has a moderate flood hazard.	There is a 24" culvert crossing Highway 50 draining a wet area. The culvert is undersized and poorly placed. Peak flows can disperse water across the highway flooding Lot 1.	Shift cabin to west. A geologist and civil engineer will need to review for flooding. Require flood elevation certificate.	The NW portion of the lot may be suitable for conventional septic system. There needs to be 100' separation from the perennial channel for septic (See Flood Maps for Septic	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
									Exclusion Zone).	
47 Milestone	2 (in)	None	None	None	None	Located on gentle 5% slopes and 95' away from CA Highway 50. There are no geologic hazards at this cabin site.	This cabin site is located on the far eastern side of the Lot 2. Lot 1 needs to be moved to the western side of Lot 1 and would very close to Cabin Site 2. There is plenty of room for Cabin Site 2 to move further west in Lot 2.	Cabin can be rebuilt without additional geologic assessment. However, to accommodate the Cabin Site shift in Lot 1, it is recommended to move Cabin Site 2 west.	This site may be suitable for a conventional septic system. Maintain 100' distance with septic from 10 Yr. floodplain (See Flood Maps for Septic Exclusion Zone).	
47 Milestone	4 (in)	None	None	None	None	This cabin site is located between CA Highway 50 and the South Fork American River. This cabin site has shallow groundwater and a small wet area near the highway that extends to the cabin site.	There is a berm & ditch draining a highway culvert, 110' away from the cabin site to the north. This drainage feature could be contributing to shallow groundwater at the cabin site.	**Dry Cabin only**. This site could have a cabin rebuilt. Shallow groundwater is a concern. Conventional septic is prohibitive due to the shallow groundwater. Recommend this site be evaluated by a CE to mitigate the groundwater to the building foundation.	Not suitable for a septic system because of shallow groundwater.	
47 Milestone	12 (out)	Low	None	None	None	Located 70' from highway and completely outside of lot. Some potential for flooding.		Cabin could be rebuilt without further geologic review if within existing footprint.	Site is suitable for cabin.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
47 Milestone	101 (in)	High	Low	None	High	Located in alluvial fan, wetland, and bottom of perennial channel w/ saturated conditions 100' wide.		This cabin could be rebuilt if moved to the west outside the modeled flood area and riparian area. This site will need geologic/Geotech review if rebuilt.	This existing footprint of the cabin is not suitable for a cabin site because of wet conditions. This site may be suitable for a conventional septic system. Maintain 100' distance with septic from 10 Yr. floodplain (See Flood Maps for Septic Exclusion Zone).	
47 Milestone	102 (in)	None	Low	None	None	This structure does not look like it was a cabin. Maybe a structure for storage.	Located 30' below powerline and stand of dead trees above powerline.	Could be rebuilt w/out further geologic review.	This site may be suitable for a conventional septic system.	
47 Milestone	103 (in)	None	Low	None	None	Located on 25% slopes, 75' below powerline and stand of dead trees. No concerns for geologic hazards.		Cabin could be rebuilt without further geologic review.	This site may be suitable for a conventional septic system.	
47 Milestone	105 (in)	None	Low	None	None	Located 100' from highway and below powerline and stand of dead trees. Edge of cabin pad is 55' from CA Hwy 50.	Steep (75%) slope above stand of dead trees. This steep slope has high rockfall potential with rocks depositing behind trees and	Cabin could be rebuilt without further geologic review.	This site may be suitable for a conventional septic system.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
							protecting cabin sites.			
47 Milestone	106 (in)	None	Low	None	None	Located on 25% slopes, rocky.	Steep (75%) slope above stand of dead trees. This steep slope has high rockfall potential with rocks depositing behind trees and protecting cabin sites.	Cabin could be rebuilt without further geologic review.	This site may be suitable for a conventional septic system.	
47 Milestone	107* (in)	None	Low	None	None	This cabin site may be mislabeled. Could be 107. Located on 25% slopes, rocky. This lot was labeled 106 in GIS layer. Changed to Lot 107*.	Steep (75%) slope above stand of dead trees. This steep slope has high rockfall potential with rocks depositing behind trees and protecting cabin site.	Cabin could be rebuilt without further geologic review.	This site may be suitable for a conventional septic system.	
47 Milestone	108 (in)	None	Low	None	None	Located on 18% slopes, 80' from highway in rocky glacial deposits. Large rocks near cabin could be rockfall in origin. Edge of cabin pad is 60' from CA Hwy 50.	Steep (75%) slope above stand of dead trees. This steep slope has high rockfall potential with rocks depositing behind trees and protecting cabin sites.	Cabin could be rebuilt without further geologic review.	Questionable suitability for cabin site because of proximity to highway. This site may be suitable for a conventional septic system.	
47 Milestone	109									

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
47 Milestone	110 (in)	None	Low	None	None	Located on 22% slopes, 200' from highway in rocky glacial deposits. Large rocks near cabin could be rockfall in origin. This cabin site is in Lot 109.	Steep (75%) slope above stand of dead trees. This steep slope has high rockfall potential with rocks depositing behind trees and protecting cabin sites.	Cabin could be rebuilt without further geologic review.	Cabin site may be suitable for a conventional septic system. Maintain 100' distance with septic from 10 Yr. floodplain (See Flood Maps for Septic Exclusion Zone).	
47 Milestone	111 (in)	High	Moderate	None	High	Located between two channels in an alluvial fan. Extremely rocky skeletal soils.	Access with burnt bridge?	Do not rebuild because of alluvial fan flood hazard.	Not suitable for a cabin site because in alluvial fan flood area.	
47 Milestone	112a (in)	High	Moderate	None	High	Located on alluvial fan 60' from perennial channel and high flood hazard area.	High Rockfall Haz above stand of trees. When trees drop this site will have Moderate Rockfall Hazard.	Do not rebuild because of alluvial fan flood hazard.	Not suitable for a cabin site because in alluvial fan flood area.	
47 Milestone	112b (in)	High	Moderate	None	High	Located on alluvial fan 100' from perennial channel and high flood area.	High rockfall hazard above stand of trees. When trees drop this site will have Moderate Rockfall Hazard.	Do not rebuild because of alluvial fan flood hazard.	Not suitable for a cabin site because in alluvial fan flood area.	
47 Milestone	113 (in)	Moderate	Moderate	None	Moderate	High Rockfall Haz above stand of trees. When trees drop this cabin site will have Moderate Rockfall Hazard.	Located on alluvial fan. Some flood potential.	Do not rebuild because of alluvial fan flood hazard.	Not suitable for a cabin site because in alluvial fan flood area.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
47 Milestone	114 (in)	Moderate	Moderate	None	Moderate	High Rockfall Haz above stand of trees. When trees drop this cabin site will have Moderate Rockfall Hazard.	Located on alluvial fan. Some flood potential.	Do not rebuild because of alluvial fan flood hazard.	Not suitable for a cabin site because in alluvial fan flood area.	
47 Milestone	115 (in)	High	Moderate	None	High	Located within 20' of perennial channel and in area with shallow groundwater. High Rockfall Haz above stand of trees. When trees drop this site will have Moderate Rockfall Hazard.	Located on alluvial fan with high flood potential.	Do not rebuild because of alluvial fan flood hazard and too close to channel.	Not suitable for a cabin site because in alluvial fan flood area.	
47 Milestone	116a (in)	Moderate	None	None	Moderate	Two building sites located in wetland area between two perennial channels. Site is flooded from groundwater. See 116b.	Located between two perennial channels (60' & 100').	Do not rebuild because of alluvial fan flood hazard. Additionally, cabin site is flooded and within wetland.	Not suitable for a cabin site because in alluvial fan flood area.	
47 Milestone	116b (in)	High	None	None	Moderate	The building sites was once a riparian area. Location GIS points are mislocated. See 116a.	Located between two perennial channels (60' & 100').	Do not rebuild because of alluvial fan flood hazard. Additionally, cabin site is flooded and within wetland.	Not suitable for a cabin site because in alluvial fan flood area.	
Aspen Creek	L4* (in)	None	None	None	None	No GIS point for this structure site, labeled L4*. There was a site clean-up sign that indicated Lot 3. Structure footprint is in riparian area. Cabin		Cabin could be rebuilt. Recommend 25' setback to riparian area, 50’ setback to SFAR, and 25’ to unnamed channel.	Conventional septic system may be suitable in a portion of the lot. Maintain 100' distance with septic from 10	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						site is not located in 100-yr flood area and there are no other geologic hazards.			Yr. Floodplain and 50’ from unnamed ephemeral (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	5 (in)	None	None	None	None	There was no evidence of a cabin at this site. Site is well above 100 yr. flood area. Dense riparian vegetation was growing at this site. Why is there a GIS point in this database?		There is no cabin at this site. This lot is not suitable for a cabin because of the riparian vegetation.		
Aspen Creek	L6-1 (out)	Low	None	None	Low	This structure is mislocated in GIS. The correct location is closer to creek and outside of lot boundary.	The location of the cabin site is immediately outside of the 100-yr flood area and has a low flood potential and debris flow potential.	**Dry Cabin only.** Cabin could be rebuilt. Recommend 50' setback from perennial channel. Would require moving structure an additional 35' from channel bank.	Not suitable for septic system due to setbacks (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	L6-2 (in)	Low	None	None	Low	Outbuilding structure located in riparian area.	The location of the building site has a low flood and debris flow potential.	It is recommended not to approve the building of any structure at this site because it’s in a riparian area. There was no cabin (outbuilding only).	Not suitable for conventional septic system.	
Aspen Creek	L6-3 (out)	Moderate	None	None	Moderate	No structure at this location. There is a high flood and	This GPS point is located on	There was no structure at this site; therefore, do	Not suitable for conventional septic system.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						moderate debris flow hazard at this site.	boundary of 100-yr flood area.	not allow a structure at this site.		
Aspen Creek	7-1 (in)	None	None	None	None	Cabin site has 2 building sites located in lot. Chimney patio is located outside lot in riparian zone.		**Dry Cabin only.** Cabin could be rebuilt without further geologic review.	Not suitable for septic system due to setbacks (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	7-2 (in)	None	None	None	None	Cabin site located in lot. Chimney patio is located outside lot in riparian zone.		**Dry Cabin only.** Cabin could be rebuilt without further geologic review.	Not suitable for septic system due to setbacks (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	8 (in)	None	None	None	None	Existing septic system is w/in 100’ of creek.		Cabin can be rebuilt without further geologic review. Maintain 50' setback from perennial channel	Conventional septic system may be suitable in the east corner of the lot. Maintain appropriate setbacks to perennial and ephemeral streams (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	9 (in)	Low	None	None	None	This cabin site has flood potential.	Existing septic system is w/in 100' of creek.	Cabin can be rebuilt without further geologic review. Maintain 50' setback from perennial channel	Conventional septic system may be suitable in the east side of the lot.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
									Maintain 100' distance with septic from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	10 (in)	None	None	None	None	Located on gentle slopes outside 100-yr flood area. Located 50' from channel bank and 39' from the 100-yr flood area.	No geologic hazards	Cabin can be rebuilt without further geologic review. Maintain 50' setback from perennial channel	Conventional septic system may be suitable in the east side of the lot. Maintain 100' distance with septic from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	11 (out)	None	None	Low	None	Cabin site is located w/in 15' of channel bank and not in lot. Fill material has encroached on riparian zone of channel and channel flood plain. This encroaching in flood area could destabilize the fill of the building pad.	Road is 65' from the 100-yr flood area. There is not room to setback the cabin site further away from channel without encroaching on the road.	Do not approve rebuilding at this cabin site because of inability to meet setback to perennial channel. Lot 11 on other side of Aspen Road may not be feasible to build a cabin due to steep boulder slopes. Therefore, another lot will have to be found for this cabin. Offer in-lieu lot.	The existing cabin site and Lot 11 is not suitable for a cabin.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Aspen Creek	12 (out)	None	None	Moderate	None	Cabin is located w/in 20' of channel and outside of lot. Channel banks are failing.	The channel bank is failing and causing the instability of the fill slope of the building pad.	Move cabin site to maintain 50’ setback to the perennial channel. Move cabin site onto the lot. Additional geologic review will not be needed if the cabin site is setback 50'.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	13 (out))	None	None	Moderate	None	Located on 38% slopes, outside of lot. 5' cut on graded site consists of unconsolidated glacial till. Unstable.		**Dry Cabin only.** Needs geotechnical investigation for slope stability both building site and access road.	Not suitable for septic system due to setbacks (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	15 (out)	None	None	Low	None	Cabin site is located w/in 15' of channel bank and not in lot. Fill material has encroached on riparian zone of channel and channel flood plain. This encroaching in flood area could destabilize the fill of the building pad.	Road is 60' from the 100-yr flood area. There is not room to setback the cabin site further away from channel without encroaching on the road. The lower slope in Lot 15 is feasible to build a cabin and there are no geologic hazards in this area.	Move cabin site into the lower slopes of Lot 15 to maintain at least a 50' setback from perennial channel. Cabin can be rebuilt without further geologic review if moved into Lot 15.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Aspen Creek	16 (out)	None	None	Low	None	Cabin site is located w/in 15' of channel bank and not in lot. Fill material has encroached on riparian zone of channel and channel flood plain. This encroaching in flood area could destabilize the fill of the building pad.	Road is 55' from the 100-yr flood area. There is not room to setback the cabin site further away from channel without encroaching on the road. The lower slope in Lot 16 is feasible to build a cabin and there are no geologic hazards in this area.	Move cabin site to maintain 50’ setback to the perennial channel. Move cabin site into the lower slopes of Lot 16. Cabin can be rebuilt without further geologic review if moved into Lot 16.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	17 (out)	None	None	Low	None	Cabin site is located w/in 5' of channel bank and not in lot. Fill material has encroached on riparian zone of channel and channel flood plain. This encroaching in flood area could destabilize the fill of the building pad.	Road is 48' from the 100-yr flood area. There is not room to setback the cabin site further away from channel without encroaching on the road. The lower slope in Lot 17 is feasible to build a cabin and there are no geologic hazards in this area.	Move cabin site to maintain 50’ setback to the perennial channel. Move cabin site into the lower slopes of Lot 17. Cabin can be rebuilt without further geologic review if moved into Lot 17.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	18 (out)	None	None	Low	None	Cabin site is located w/in 18' of channel bank and not in lot. Fill material has encroached on riparian zone of channel and channel	Road is 50' from the 100-yr flood area. There is not room to setback the cabin site further away from channel without	Move cabin site to maintain 50’ setback to the perennial channel. Move cabin site into the lower slopes of Lot 18. Cabin can be rebuilt without further geologic	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						flood plain. This encroaching in flood area could destabilize the fill of the building pad.	encroaching on the road. The lower slope in Lot 18 is feasible to build a cabin and there are no geologic hazards in this area.	review if moved into Lot 18.	(See Flood Maps for Septic Exclusion Zone).	
Aspen Creek	22 (in)	None	Low	Moderate	None	Cabin site is located on a flat area below a 45% slope building site. There is a cut and unstable retaining wall made from railroad ties that were destroyed in the fire. There are round boulders on the steep slope with low rockfall hazard.	On ground sign identified as Lot 21. Unstable cut and damaged retaining wall.	Needs geotechnical investigation and design for a retaining wall to stabilize the upslope cut.	May be suitable for conventional septic system.	
Aspen Creek	23 (out)	None	None	Moderate	None	Site has 32% slopes. There is a lack of a graded site for a cabin structure. No access for construction. This site could have been a walk-in cabin with a raised foundation.	On ground sign identified as Lot 22.	Site grading will require geotechnical investigation for slope stability both building site and access road. And septic slope stability report.	Conventional septic system is not feasible at this site without a slope stability report determining the slope is stable.	
Aspen Creek	9701*	Low	Low	Low	Low	This cabin site located on steep 45% slopes with a 4' high cut supported by a loose rock retaining wall. The site has core stone boulders and low	This cabin site does not have a GIS point in the GIS dataset. Address sign 9701 observed near cabin site. Determined this	Setback cabin site 25' away from channel. A geology/Geotech review should be required to evaluate slope stability related to the steep slope and the failing wall. Alteration	Conventional septic system may be suitable in the east side of the lot. Maintain 50’ setback from ephemeral	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						rockfall, slope stability, and debris flow hazards. An ephemeral channel is located adjacent to cabin site footprint.	site associated with Lot 10 according to county records.	of the ephemeral channel is prohibited.	channel (See Flood Maps for Septic Exclusion Zone).	
Bryant Creek	7 (in)	None	None	None	None	This cabin site is located on 20% slopes. There is no rock outcrop above cabin site to be concerned about. There are no slope stability concerns or other geologic hazards at this site.	This site has moderately deep soils 60" deep. This site could have adequate soils for a conventional septic system.	Cabin can be rebuilt without further geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Bryant Creek	19 (out)	None	None	None	None	This cabin site is located outside of the lot boundary on 15% slopes. There are some boulders on the slope deposited from glacial moraine. There are no concerns for geologic hazards at this site.	This site has moderately deep soils 60" deep with large boulders. This site could have adequate soils for a conventional septic system.	Cabin can be rebuilt without further geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Bryant Creek	20 (in)	None	None	None	None	This cabin site is located on 15% slopes. There are some boulders on the slope deposited from glacial moraine. There are no concerns for	This site has moderately deep soils 60" deep with large boulders. This site could have adequate soils for a	Cabin can be rebuilt without further geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						geologic hazards at this site.	conventional septic system.		Maps for Septic Exclusion Zone).	
Bryant Creek	21 (in)	None	None	None	None	This cabin site is located on 15% slopes. There are some boulders on the slope deposited from glacial moraine. There are no concerns for geologic hazards at this site.	This site has moderately deep soils 60" deep with large boulders, 4' to 8' in diameter. This site could have adequate soils for a conventional septic system. However, the large boulders could be a problem.	Cabin can be rebuilt without further geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Bryant Creek	23 (in)	None	None	None	None	This cabin site is in the very northwest corner of the lot on 25% slopes. This 25% slope extends upslope for 200' above the cabin then steepens into a 55-60% slope. The steeper slope is underlain with bedrock. There is no evidence of erosion on and around the cabin site.	The cut of the graded cabin site is about 4' high and appears to be stable. There is at least soil down to 48". There are very few boulders on the slope.	Cabin can be rebuilt without further geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Bryant Creek	24 (in)	None	None	None	None	This cabin site is located on 25% slopes. This 25% slope extends upslope for 200'	The cut of the graded cabin site is less than 4' high and appears to be stable. There is at	Cabin can be rebuilt without further geologic review.	May be suitable for conventional septic system. Maintain 100'	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						above the cabin then steepens into a 55-60% slope. The steeper slope is underlain with bedrock. There is no evidence of erosion on and around the cabin site.	least soil down to 48". There are very few boulders on the slope.		setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Bryant Creek	25 (in)	None	None	Moderate	None	This site is located on 25% slopes, which continues for about 200' above cabin site. A steeper 60% bedrock slope is above the 25% slope. Runoff/erosion has developed into shallow 6" deep rills on the slope above the cabin. There is concern for uncontrol	The graded site for the cabin has a 6' to 8' high cutback that is partially supported with a loose, stacked rock wall. The wall has failed in a few places. There is a concern for slope stability of this cut and the failing rock wall.	This cabin site needs to be reviewed by a geotechnical engineer to evaluate slope stability of the cut bank and the rock wall and the uncontrolled runoff from the slope above the cabin site.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Bryant Creek	26 (in)	None	None	None	None	This site is located on 25% slopes, which continues for about 200' above cabin site. A steeper 60% bedrock slope is above the 25% slope. There is no evidence of uncontrolled runoff occurring at this cabin site.	There are no concerns for geologic hazards at this site.	Cabin can be rebuilt without further geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Fir	2 (in)	None	None	None	None	Cabin site is 135' from the active channel on 10% slopes. The site has large boulders 3-5' in diameter. These boulders could make for a complicated foundation and septic system. There are no geologic concerns.	The cabin site is adequately set back far enough from the channel for a conventional septic system. However, the soils and boulders preclude a conventional septic system.	Recommend building cabin without additional geologic review. Consider a community septic system for this area or a dry cabin.	Conventional septic system is not suitable because of the boulder soils. Advanced Treatment (NSF40) may be suitable. Any wastewater dispersal must maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	3 (in)	None	None	None	None	This cabin site is approximately 100' away from the perennial channel and there are no geologic concerns.	Soils are less than 60" deep. This cabin site is too close to the channel for a conventional septic system to be located between the cabin site and the channel.	Rebuild cabin on previous site without additional geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	4 (in)	None	None	None	None	This cabin site is adequately set back over 100' away from the perennial channel and there are no geologic concerns.	Soils are less than 60" deep.	Rebuild cabin on previous site without additional geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
									(See Flood Maps for Septic Exclusion Zone).	
Fir	5 (in)	Moderate	None	None	None	Cabin site is located 55' away from channel bank on 10% slope and within the riparian area. The cabin site is located within the 100-yr flood area. There are no other geologic concerns other than a moderate flood hazard.	Soils are less than 60" deep. This site is too close to the channel for a conventional septic system.	Recommend shifting cabin site at least 50' away from riparian area and outside of the modeled flood area. Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	6 (in)	None	None	None	None	This cabin site is adequately set back over 100' away from the perennial channel and there are no geologic concerns.	There is an old rock mortar wall between the channel and the rehabilitated building site. This rock wall could be from an old cabin structure that was never removed. Soils are less than 60" deep.	Rebuild cabin on previous site without additional geologic review.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	7 (out)	Moderate	None	None	None	Cabin site is located 20' away from channel bank on 10% slope and within the riparian area. The 100-yr	Soils are less than 60" deep. This site is too close to the channel for a conventional septic system.	Recommend shifting cabin site at least 50' away from riparian area and outside of the modeled flood area. Rebuild cabin without	May be suitable for conventional septic system. Maintain 100' setback from 10	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						flood area is located on the edge of the cabin site. There are no other geologic concerns other than a low flood hazard.		any additional geologic review. Consider a community septic system for this area.	Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	8 (in)	None	None	None	None	Cabin site is located on gentle < 10% slopes and 25' away from 100-yr flood zone and less than 100' away from the perennial channel. Soils are less than 60" deep. The septic system is located at edge of the riparian area.	There are no concerns for geologic hazards. The existing septic system is too close to the perennial channel and riparian vegetation and will need to be moved at least 100' away from the channel.	Recommend shifting cabin site at least 50' away from riparian area and channel. Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	9 (in)	None	None	None	None	Cabin site is located on gentle slopes < 10% and 60' away from 100-yr flood zone. Soils are less than 60" deep. The septic system is in the riparian area.	There are no concerns for geologic hazards. The existing septic system is too close to the perennial channel and within the riparian vegetation and will need to be moved at least 100' away from the channel.	Recommend maintaining cabin site at least 50' away from riparian area. Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	May be suitable for conventional septic system. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	10 (in)	Low	None	None	None	Cabin site is located 20' away from channel bank on 10% slope and within the riparian area. The 100-yr flood area is located	Soils are less than 60" deep. This site is too close to the channel for a conventional septic system.	Recommend shifting cabin site at least 50' away from riparian area. within 100' of channel. Rebuild cabin without any additional geologic review.	Site is probably not suitable for conventional septic system. Although there is a narrow area at the front of	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						on the edge of the cabin site. There are no other geologic concerns other than a low flood hazard.		Consider a community septic system for this area.	the lot that maintains setbacks to the creek – soils dependent. Any wastewater dispersal must maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Fir	11 (in)	Low	None	None	None	Cabin site is located 25' away from channel bank on 10% slope and at the edge of the riparian area. The 100-yr flood area is located on the edge of the cabin site. There are no other geologic concerns other than a low flood hazard.	Soils are less than 60" deep. This site is too close to the channel for a conventional septic system.	**Dry Cabin only.** Recommend shifting cabin site at least 50' away from riparian area. Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for onsite wastewater treatment systems due to setbacks.	
Fir	12 (in)	Low	None	None	None	Cabin site is 75' from the active channel on 12% slopes and within 50' of riparian area. The 100-yr flood area is located on the edge of the cabin site. There are no other geologic concerns other than a low	This site is too close to the channel for a conventional septic system. However, the NW corner of the lot meets the 100' setback requirement from the channel.	**Dry Cabin only.** Setback cabin further away from riparian are to meet setback requirement. Rebuild cabin without any additional geologic review. Consider a community septic system for this area. Maintain 50' setback of	Site is not suitable for onsite wastewater treatment systems due to setbacks. Leach field would be too close to community well (150'	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						flood hazard. Soils are less than 48' deep.		cabin footprint from riparian area.	required) and too shallow of soils.	
Fir	14 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	There is a community well located 90' away from the cabin site and too close to the cabin with a conventional septic system. (150 setback). Soils are less than 48' deep.	**Dry Cabin only.** Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for onsite wastewater treatment systems due to setbacks. Leach field would be too close to community well (150' required) and too shallow of soils.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	15 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	There is a community well located 140' away from the cabin site and too close to the cabin with a conventional septic system (150 setback). Soil is less than 48' deep.	**Dry Cabin only.** Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for onsite wastewater treatment systems due to setbacks. Leach field would be too close to community well (150' required) and too shallow of soils.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Fir	16 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 48' deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	17 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 48' deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	18 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	19 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
									Treatment (NSF40) may be suitable.	
Fir	20 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	21 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	22 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Fir	23 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	24 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	25 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no other geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced Treatment (NSF40) may be suitable.	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.
Fir	26 (in)	None	None	None	None	Cabin site is located on 10% slopes and is over 100' from 100-yr flood area. There are no geologic hazards.	Soil is less than 60" deep.	Rebuild cabin without any additional geologic review. Consider a community septic system for this area.	Site is not suitable for conventional septic system because of too shallow of soils. Advanced	If some of the cabins are not rebuilt in lots 14 through 26, they could be available as in lieu lots.

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
									Treatment (NSF40) may be suitable.	
Sayles Canyon	1 (in)	None	None	None	None	This cabin site is located on 15% slopes approximately 60' away from the 100-year flood zone and over 100' away from the South Fork American River. There are no concerns for geologic hazards and conventional septic system.	Cabin Site 1 is in NW corner of lot.	Rebuild cabin without any additional geologic review.	This site is suitable for a conventional septic system assuming there is adequate depth. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Sayles Canyon	13 (out)	None	None	Moderate	None	Lot is located on 40% slopes and grading of site could result in a high cut that could be a concern for slope stability. Site will probably need a retaining wall. Materials consist of unconsolidated soil/rock and glacial till.		Cabin could be rebuilt with evaluation of slope stability of cut bank and appropriate design by Engineering Geologist. And septic slope stability report.	Conventional septic system is not feasible at this site without a slope stability report determining the slope is stable. And soils report. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Sayles Canyon	17 (out)	None	None	Moderate	None	Lot is located on 40% slopes with a 10' high cut in the graded building site. Materials consist of unconsolidated soil/rock and glacial till.	Septic system could potentially be reconstructed where previously located.	Cabin could be rebuilt with evaluation of slope stability of cut bank and appropriate design by Engineering Geologist. And septic slope stability report.	Conventional septic system is not feasible at this site without a slope stability report determining the slope is stable. And soils report. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	
Sayles Canyon	18 (out)	None	None	Moderate	None	Lot is located on 40% slopes and graded site has two retaining walls. The upper wall is unstable and needs to be rebuilt. The lower wall needs to be evaluated for stability.		Cabin could be rebuilt with evaluation of slope stability of cut bank and appropriate design by Engineering Geologist. And septic slope stability report.	Conventional septic system is not feasible at this site without a slope stability report determining the slope is stable. And soils report. Maintain 100' setback from 10 Yr. Floodplain (See Flood Maps for Septic Exclusion Zone).	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Sayles Canyon	20 (in)	None	None	Low	None	This cabin site is located on 8% slopes and there is concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot is ideal for a community septic system.	Rebuild cabin without any additional geologic review. Maintain 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	21 (in)	None	None	Low	None	This cabin site is located on 8% slope and there IA concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for community septic system.	Recommend allowing to rebuild cabin and set back at least 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	22 (in)	None	None	Low	None	This cabin site is located on 8% slope and within 25' of the break in slope of a steep 60% unstable slope. There is concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for community septic system.	Recommend allowing to rebuild cabin and set back at least 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	23 (in)	None	None	Low	None	This cabin site is located on 8% slope and within 25' of the break in slope of a steep 60% unstable slope. There IA concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for community septic system.	Recommend allowing to rebuild cabin and set back at least 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Sayles Canyon	24 (in)	None	None	Low	None	This cabin site is located on 8% slope and within 25' of the break in slope of a steep 60% unstable slope. There is concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for community septic system.	Recommend allowing to rebuild cabin and set back at least 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	25 (in)	None	None	Low	None	This cabin site is located on 8% slope and within 10' of the break in slope of a steep 60% unstable slope. There IA concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for community septic system.	Recommend allowing to rebuild cabin and set back at least 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	26 (in)	None	None	Low	None	This cabin site is located on 8% slope and within 25' of the break in slope of a steep 60% unstable slope. There is concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for community septic system.	Recommend allowing to rebuild cabin and set back at least 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	27 (in)	none	None	Low	None	This cabin site is located on 8% slope and within 25' of the break in slope of a steep 60% unstable slope. There is concern for slope	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for	Recommend allowing to rebuild cabin and set back at least 25' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						stability on the steep slope west of the of this cabin site.	community septic system.			
Sayles Canyon	28 (in)	none	None	Moderate	None	This cabin site is located on 8% slope and within 10' of the break in slope of a steep 60% unstable slope. A small landslide was observed on this slope. and there is concern for slope stability on the steep slope west of the of this cabin site.	This area appears to have adequate soil and depth for a conventional septic system. This lot ideal for community septic system.	Recommend allowing to rebuild cabin and set back 50' from the break in slope of steep 60% slope.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	30 (in)	None	None	None	None	Located on flat (<5%), gentle slopes with moderately deep soils	There are no geologic concerns and no concerns for septic systems. This lot ideal for community septic system.	Rebuild cabins without further geologic review	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	31 (in)	None	None	None	None	Located on flat (<5%), gentle slopes with moderately deep soils	There are no geologic concerns and no concerns for septic systems. This lot ideal for community septic system.	Rebuild cabins without further geologic review	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	32 (in)	None	None	None	None	Located on flat (<5%), gentle slopes with moderately deep soils	There are no geologic concerns and no concerns for septic systems. This lot ideal for community septic system.	Rebuild cabins without further geologic review	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Sayles Canyon	33 (in)	None	None	None	None	Located on flat (<5%), gentle slopes with moderately deep soils	There are no geologic concerns and no concerns for septic systems. This lot ideal for community septic system.	Rebuild cabins without further geologic review	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	34 (in)	None	None	None	None	Located on flat (<5%), gentle slopes with moderately deep soils	There are no geologic concerns and no concerns for septic systems. This lot ideal for community septic system.	Rebuild cabins without further geologic review	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	35 (in)	None	None	None	None	Located on flat (<5%), gentle slopes with moderately deep soils	There are no geologic concerns and no concerns for septic systems. This lot ideal for community septic system.	Rebuild cabins without further geologic review	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	36 (in)	None	None	None	None	Located on flat (<5%), gentle slopes with moderately deep soils	There are no geologic concerns and no concerns for septic systems. This lot ideal for community septic system.	Rebuild cabins without further geologic review.	May be suitable for conventional septic systems. Consider community septic system.	If some of the cabins are not rebuilt in lots 20 through 36, they could be available as in lieu lots.
Sayles Canyon	39 (in)	None	None	None	None	There are no concerns for geologic hazards and conventional septic system.		Rebuild cabin without any additional geologic review.	This site is suitable for a conventional septic system assuming there is adequate depth. Maintain 100' setback from 10 Yr.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
									Floodplain (See Flood Maps for Septic Exclusion Zone).	
Twin Bridges	3a (in)	None	High	High	None	This site may have had two structures. Located on 60% slopes, directly below CA HWY 50. Several unstable rocks located on slope above cabin site.	Active rockfall deposit and unstable cut above cabin site. Shallow groundwater observed 3' below existing grade.	It is recommended not to rebuild this cabin site because it is in a high rockfall hazard area. There was also shallow groundwater observed at the site. However, if the cabin is rebuilt at this site, we recommend a geotechnical engineering review and mitigation.	Not suitable because located in special interest, and cabin area has steep slopes and rockfall hazard and proximity to Highway 50 and shallow groundwater.	Could be rebuilt with major geotechnical engineering design to mitigate rockfall hazards. No septic allowed due to shallow groundwater.
Twin Bridges	3b (in)	None	High	Hugh	None	This site may have had two structures. Located on 60% slopes, directly below Highway 50. Several unstable rocks located on slope above cabin site.	Active rockfall deposit and unstable cut above cabin site. Shallow groundwater observed 3' below existing grade.	It is recommended not to rebuild this cabin site because it is in a high rockfall hazard area. There was also shallow groundwater observed at the site. However, if the cabin is rebuilt at this site, we recommend a geotechnical engineering review and mitigation.	Not suitable because located in special interest, and cabin area has steep slopes and rockfall hazard and proximity to Highway 50 and shallow groundwater. Not suitable for septic.	Could be rebuilt with major geotechnical engineering design to mitigate rockfall hazards.
Twin Bridges	9 (in)	Low	None	None	None	Cabin site is located within 30' of powerline and within 50' of wetland. Area has shallow soils and	Debris flow deposits observed in South Fork American River. However, cabin	Do not rebuild because located in wetland area. Additionally, the site is too close to powerline and rocky conditions.	Not suitable as a cabin site because located in special interest area, cabin is too	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						rock outcrop was observed.	site is outside of this area.		close to riparian area and powerline and in rock. Not suitable for septic.	
Twin Bridges	14 (in)	None	Moderate	None	None	This site has a highly fractured rock out crop above the road with a moderate rockfall hazard. Located 15' from 100 yr. flood area & under/within 30' of powerline and located within 100' of trailhead (Slippery Ford Trail) & special interest area.	Shallow, rocky soils.	It is recommended not to rebuild this cabin site because of conflicts with other land management uses (e.g. within special interest area, proximal to power lines, and forest roads, and trail heads). However, if the cabin is rebuilt at this site, we recommend a geotechnical assessment for rockfall hazards. Additionally, the site must be setback 50-feet from the SFAR, and it must be a Dry Cabin.	Not suitable for a cabin because located in special interest area, cabin is too close to powerline & has flood potential. Not suitable for septic.	Rock fall and flood hazard is capable of mitigating.
Pyramid Creek	1 (?)	None	Moderate	None	None	There was no evidence that a cabin existed at this site. GIS Point L18150 could be cabin site L1. A developed spring box is located about 35' from the GIS Point for L1.	Steep 80% slope on the other side of Highway 50 with moderate rockfall hazard.	There are no recommendations for L1. Evaluated cabin site needs further geologic assessment to assess rock fall hazard on slope north of Highway 50.	Site is located within a special interest area. This site may be suitable for a conventional septic system assuming soil depth and depth to groundwater is adequate.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Pyramid Creek	4 (in)	None	None	None	None	This site is located on flat < 5% slopes and near (55' & 65') two rock outcrops that are far enough away from cabin site not to be a concern.	This cabin site is located 20' from power pole and underground concrete box (electrical).	Rebuild cabin without any additional geologic review.	Site is located within a special interest area. This site may be suitable for a conventional septic system assuming soil depth and depth to groundwater is adequate.	
Pyramid Creek	5 (in)	None	None	None	None	This site is located on flat < 5% slopes and near (100') two rock outcrops that are far enough away from cabin site not to be a concern.		Rebuild cabin without any additional geologic review.	Site is located within a special interest area. This site may be suitable for a conventional septic system assuming soil depth and depth to groundwater is adequate.	
Pyramid Creek	6 (out)	None	None	None	None	This cabin site is located on rocky soils and fractured bedrock and a septic tank was observed in the rocky soils.		Rebuild cabin without any additional geologic review. This cabin site is not suitable for a conventional septic system.	Site is located within a special interest area. Conventional septic system is not suitable because of surface rock and shallow soils. Advanced Treatment (NSF40) may be suitable.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Pyramid Creek	7 (out)	None	None	None	None	Cabin site is in an area with rocky soils and bedrock. The cabin site has no concerns for geologic hazards.	The site is above a wet depression with willows and other riparian vegetation. This area below the cabin site has a high-water table. This cabin site may have had a septic system draining into the wet area.	Maintain 25' set back from riparian area. Rebuild cabin without any additional geologic review. This cabin site is not suitable for a conventional septic system.	Site is located within a special interest area. Conventional septic system is not suitable because of shallow rocky soils and proximity to riparian area. Advanced Treatment (NSF40) may be suitable.	
Pyramid Creek	14 (in)	None	None	None	None	Cabin site is in an area with a high-water table. Standing water was observed on the cabin site. Bracken ferns are growing throughout area. This high-water table would be a problem for a conventional septic system.	Cabin site is located within 25' of a drainage ditch to the north.	**Dry Cabin only.** Cabin could be rebuilt but the cabin site should be moved outside of wet riparian area and on dryer ground in the lot. This tract is ideal for a community septic system.	Site is located within a special interest area. Not suitable for conventional septic system. Consider community septic system.	
Pyramid Creek	17 (in)	High	None	None	High	Cabin site is located 75' from Pyramid Creek and is in the 100-year flood area. This cabin site is located between two standing cabins on slightly higher ground. No other	This cabin site is located on rocky glacial alluvial soils and bedrock.	Cabin site requires a flood certificate prior to approval. Alternatively, cabin could be moved 50' further away from Pyramid Creek and rebuilt on higher ground. Conventional septic system may not be feasible at this site.	Site is located within a special interest area. Feasibility for conventional septic system is unlikely. Although, dependent on soil depth and	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						geologic hazards observed.		This tract is ideal for a community septic system.	depth to groundwater is adequate. Maintain 100' distance with septic from 10-Yr Floodplain (See Flood Maps for Septic Exclusion Zone).	
Pyramid Creek	24 (out)	None	Low	None	None	Cabin site located on flood plain and is within 30' of spring fed ephemeral stream. Site is located outside of 100-yr flood area.	The site has rocky, shallow soils and a rock outcrop is with low Rockfall hazard is located to the southeast. Septic tank is located near stream.	**Dry Cabin only.** Could be rebuilt. Recommend setback distance of at least 50' from perennial channels. Will require additional geologic review to mitigate rockfall hazard. This tract is ideal for a community septic system.	Site is located within a special interest area. Not suitable for conventional septic system due to setbacks.	Capable as cabin site with flood design features (50-ft setback to perennial streams) and rockfall design features (e.g. energy dissipating rockfall fence & raised foundation).
Pyramid Creek	30 (out)	None	Moderate	None	None	Cabin site located on flood plain and is within 29' of 100-year flood area. Cabin site has a moderate rockfall hazard from fractured rock outcrop to south of cabin site.	Access road to cabin has a high rock fall hazard. Rocky, shallow soils. Septic tank is located near ephemeral channel and too close to Pyramid Creek.	**Dry Cabin only.** Cabin could be rebuilt. Maintain setback distance of at least 50' from channel. Will require additional geologic review to mitigate rockfall hazard. This tract is ideal for a community septic system.	Site is located within a special interest area. Not suitable for septic system due to setbacks.	Capable as cabin site with flood design features (50-ft setback to perennial streams) and rockfall design features (e.g. energy dissipating rockfall fence & raised foundation).

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF									
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Pyramid Creek	31 (out)	None	Moderate	None	None	Cabin site is located on flood plain and 25’ from 100-year flood area. Cabin site has a moderate rockfall hazard from fractured rock outcrop to south of cabin site.	Rocky, shallow soils. Cabin is located below highly fractured rock outcrop with two large boulders perched that could roll down the slope. Septic tank located on the site 10’ from channel. Access road to cabin has a high rock fall hazard.	**Dry Cabin only.** Cabin could be rebuilt. Maintain setback distance at least 50’ from channel. Will require additional geologic review to mitigate rockfall hazard. This tract is ideal for a community septic system.	Site is located within a special interest area. Not suitable for septic system due to setbacks.	Capable as cabin site with flood design features (50-ft setback to perennial streams) and rockfall design features (e.g. energy dissipating rockfall fence & raised foundation).
Pyramid Creek	32 (out)	None	High	None	None	Cabin site is located on flood plain and below and within a high Rockfall hazard area. Located 22’ from 100-yr flood zone and 30’ of powerline.	Rocky, shallow soils. Cabin is located below highly fractured rock outcrop. Access road to cabin has a high rock fall hazard.	**Dry Cabin only.** Cabin could be rebuilt. Recommend narrowing cabin footprint and maintain setback distance at least 50’ from perennial channel. Very little room to move. Will require additional geologic review and design by a geologist to mitigate rockfall hazard. This tract is ideal for a community septic system.	Site is located within a special interest area. Not suitable for septic system due to setbacks (See Flood Maps for Septic Exclusion Zone).	Capable as cabin site with flood design features (50-ft setback to perennial streams) and rockfall design features (e.g. energy dissipating rockfall fence & raised foundation).
Pyramid Creek	33a (out)	Moderate	High	None	Moderate	Cabin site is located on flood plain and below high Rockfall hazard and immediately adjacent to 100-yr flood area. Cabin	Rocky, shallow soils. Cabin is located below highly fractured rock outcrop. Access road to	**Dry Cabin only.** Could be rebuilt. Recommend narrowing cabin footprint and setback 50' away from river. Will require additional geologic review and	Site is located within a special interest area. Not suitable for septic system due to setbacks (See Flood	Capable as cabin site with flood design features (50-ft setback to perennial streams) and rockfall design

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						site is too close to channel.	cabin has a high rock fall hazard.	design to mitigate rockfall hazard. Remove outhouse toilet. This tract is ideal for a community septic system.	Maps for Septic Exclusion Zone).	features (e.g. energy dissipating rockfall fence & raised foundation).
Pyramid Creek	33b (out)	None	High	None	None	This is an outhouse structure to Cabin Site 33 and was not damaged in the fire.	Rocky, shallow soils. Fractured rock outcrop above outhouse with high rockfall hazard. Access road to cabin has a high rock fall hazard.	Remove “outhouse” because too close to river. If outhouse is allowed to be used, warn cabin owners of high rock fall hazard.	Site is located within a special interest area. Not suitable due to rockfall hazard and too close to river (See Flood Maps for Septic Exclusion Zone).	
Pyramid Creek	34 (out)	Low	High	None	Low	Cabin site located on flood plain and below fractured bedrock w/ 2-3’ diameter loose rocks deposited around cabin site. Rocks are deposited behind cabin. Some rocks could have fallen against cabin.	Rocky, shallow soils. Fractured rock outcrop above outhouse. High rockfall hazard. Access road to cabin has a high rock fall hazard.	**Dry Cabin only.** Cabin could be rebuilt. Recommend setback distance of at least 50’ from perennial channel. Will require additional geologic review and design to mitigate rockfall potential to cabin. This tract is ideal for a community septic system.	Site is located within a special interest area. Not suitable for septic system due to setbacks (See Flood Maps for Septic Exclusion Zone).	Capable as cabin site with flood design features (50-ft setback to perennial streams) and rockfall design features (e.g. energy dissipating rockfall fence & raised foundation).

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Pyramid Creek	37 (out)	None	None	None	None	Cabin site and septic tank are in a wet riparian area swale and in an area with a shallow groundwater table. Ground water observed 18-24" below ground surface. Cabin site located outside of lot.	This cabin site is in a wet, boggy meadow area. A conventional septic system was in use at this site.	**Dry Cabin only.** Cabin could be rebuilt but the site should be moved outside of swale and on dryer ground within lot. The septic tank should be removed and filled in. This tract is ideal for a community septic system.	Site is located within a special interest area. Not suitable for septic system due to setbacks (See Flood Maps for Septic Exclusion Zone).	This cabin site is capable to be converted to a meadow.
Pyramid Creek	39 (out)	High	None	None	High	This cabin site is located on the flood plain and on an island (37' wide) within the 100-year flood area. Part of the old cabin structure is located within the 100-year flood area. The access road would completely be flooded in a 100-year flood event.	The access road crosses the flood plain and high flow channel. This high flow channel crossing has two 24" culverts and less than 10" of cover. A flood event could take out this culvert and fill.	This cabin site should not be allowed to rebuild because of the high flood hazard and inability to meet setbacks. The existing septic tank should be pulled and filled in. The culverts to the access road should also be removed.	Site is located within a special interest area. This area is not suitable for a cabin site.	
Pyramid Creek	18114 US-50 (in/out)	None	Low	None	None	Cabin site is located on flat 5% slopes and adjacent to rock outcrop w/ fractures dipping into the slope. Major fractures are 5' apart. Some spalling of rock outcrop. Low rock fall hazard.	This cabin may have had two structures.	Cabin could be rebuilt without further geologic review.	Site is located within a special interest area. This site may be suitable for a conventional septic system assuming soil depth and depth to groundwater is adequate.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
Pyramid Creek	18116 US-50 (out)	None	Moderate	None	None	Cabin site is near rock outcrop with 3 to 4' diameter boulders. Could be glacial deposit and not result of rock fall from rock outcrop. Rock outcrop has widely spaced fractures w/ one fracture day lighting slope. Steep > 75% bedrock slope on north side of Highway 50 that has a moderate rockfall hazard. Rocks could roll down slope and be a hazard to this cabin site.	Cabin site is near Highway 50 and may be in ROW. Small building site 20'x25 located west. Both building sites are not in a lot.	This cabin needs further geologic assessment to assess rock fall hazard on slope north of Highway 50.	Site is located within a special interest area. This site may be suitable for a conventional septic system assuming soil depth and depth to groundwater is adequate.	
Pyramid Creek (Near)	Utility Misc Structure	None	None	None	None	Unlabeled site on GIS layer. Water tanks for nearby cabin. There are no geologic hazard concerns.		Rebuild water tanks without further geologic review	Site is located within a special interest area.	
Forni Creek	3 (in)	High	None	None	High	Cabin site is within the 100-year flood area and 135' to the west of Forni Creek. Debris flow deposits were observed in Forni Creek. There was evidence of runoff and erosion on the access road to the cabin site.	There is a 4'Hx6'W concrete box culvert on Forni Creek and CA-HWY 50. The culvert is undersized and results in flood waters inundating the highway surface and	This cabin site should not be allowed to rebuild because it is in a flood area.	This cabin site and lot is not suitable for a cabin.	

Table 12 – Caldor Fire Geologic Hazard Assessment for Recreational Cabin Sites – Eldorado NF										
Tract	Lot (in/out)	Hazard				Comments_1	Comments_2	Recommendations	Suitability	Capability
		Flood	Rockfall	Slope Stability	Debris Flow					
						Observed a constructed ditch near the cabin.	flowing towards the cabin site.			