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Mr. Terry Plum
P.O. Box 8208
Mammoth Lakes, California 93546

Re. Plum Property
Avalanche Hazard Analysis and Comments

Dear Mr. Plum

At your request I offer the following analysis and comments on your proposal to subdivide and adjust property lines on Lot # 56 in the Bluffs and the adjacent property off of Tamarack Street. You propose to subdivide these properties into three separate parcels. The first parcel will be accessed off of LaVerne Street in the Bluffs subdivision. The second and third parcels will be accessed off an extension of Tamarack Street. Specifically you have asked me to address the following issues and concerns relative to their impact on any potential or perceived avalanche risk.

The feasibility of building a residence on Lot#56 in the Bluffs and within the Town of Mammoth's Snow Deposition Design Zone (SDD), parcel #1

The feasibility of subdividing and building residences on the lower section of #Lot 56 and the property to the north, parcel #2 and #3

To review and evaluate John Moynier's letter dated June 22, 2004 in which he provides a review of your proposal to subdivide Lot#56

Each of these general issues are related and also include a number of details and considerations which I will try to address below. As you are aware the Bluff's area and adjoining properties have been the subject of considerable study and analysis including some of which I conducted. As part of this analysis, for your project, I have reviewed many of these documents. I have also reviewed the following documents which are specific to your proposal and plans. Arthur Mears May 1997 Avalanche Hazard Change Resulting From The Bluffs; Arthur Mears November 4, 2003, Avalanche Mitigation Analysis, Tamarack Road Lots; John Moynier June 22, 2004, Independent Review of Avalanche Studies Prepared for the Plum Tentative Parcel Map; Tentative Parcel Map No. 36-203; A revised access map; no date.

BUILDING IN THE SNOW DEPOSITION DESIGN ZONE (SDD)

Parcel #1 in your proposed subdivision and property line adjustment is located off of Le Verne Street in the Bluff Subdivision. Access will be from the Le Verne Street and will necessitate the construction of the residence within the Town of Mammoth's SDD. The intent of the SDD was to limit development on the Bluffs that might increase snow deposition into the avalanche starting zones to the north and east of the Bluffs. During the development of the Bluffs subdivision there was concern that structures and or activities within the Bluffs would increase the avalanche risk to the properties below.

Although there may be some argument that certain types of activities within the Bluffs could increase avalanche frequency from the avalanche paths to the north and east, such activity will not increase the size of avalanches from these paths. It has been my position that properly placed

structures within the SDD will in fact decrease both the frequency and size of avalanches which originate from the paths below the Bluffs. This would result from the tendency of wind transported snow to be deposited in the vicinity of and especially downwind of objects. If structures are placed an appropriate distance from starting zones, snow that may have been blown into and deposited in the starting zone will be deposited near the structures. I have worked on a number of projects in the Bluffs where the town has accepted this premise and allowed construction of structures within the SDD. Proper orientation and placement of structures in this area is critical so as not to cause greater than natural snow deposition in the starting zones. Generally the Town has approved structures which meet the following criteria.

Structures should be located a minimum of 30ft to the windward of the point at which the slope steepens to 30 degrees.

Structures should be located at a minimum of 1.5 times their height above grade to the windward of the point at which the slope steepens to 30 degrees. Should the structures be multilevel each level should conform to this 1.5 times factor.

Roof, walkways, and driveways should be located or positioned such that shedding snow or plowed snow does not directed be towards the starting zones.

Based upon the Town's past approvals, a structure which meets these criteria should be approved.

BUILDING IN THE AVALANCHE RUNOUTS OFF TAMARACK

Parcels #2 and #3 will be located at the eastern edge of Lot #56 and will be accessed from an extension of Tamarack Street. The Snowcreek golf course is immediately to the east of these parcels. I understand that you recently purchased the Miller property which is to the north and is continuous with lower portion of Lot #56. Previously you had proposed to access these parcels from an extension of Tamarack that would run into the upper portion of the parcels. Recently you have proposed to relocate the extension of Tamarack. With this change, the access to these parcels will be from the lower eastern edge of the parcels.

These parcels are located at the bottom of the avalanche paths which start below the Bluffs. There has been more than one documented avalanche occurrence just to the west and north of these parcels. In his 1997 Avalanche report to the Town, Mears provided a map which identified the Design Magnitude Avalanches (100 year return interval) from the Bluffs area. As identified on that map the eastern third of Parcels #2 and #3 are beyond the runout of avalanches from paths below the Bluffs. I understand that in November 2003 Mears conducted a site specific avalanche analysis for you and your neighbor that included both Parcels #2 and #3. In his analysis he provide detailed information on both the Design Magnitude Avalanches that may reach the property. According to this Mears analysis, Design Magnitude avalanches will terminate approximately 70 feet west of the eastern edge of the Snowcreek Golf Course. This is 70 feet from the eastern edge of Parcels #2 and #3. In his report Mears also provided avalanche impact loads and other information for designing and constructing structures within the runout of the avalanches paths on parcels #2 and #3. I understand you had requested this information.

I understand that your current proposal for this area includes the realignment of Tamarack to the eastern edge of the parcels. Additionally you are proposing to build two residences, one on each parcel, just to the west of the Tamarack extension. These residences will be designed and constructed to withstand the avalanche impact loads that were provided by Mears. Winter access to these residences will be from the east.

Your proposal to realign the road, design and construct the residences to withstand the expected avalanche impact loads, and create the winter access to the east should eliminate most of the avalanche risk to the inhabitants and users of the property. The road relocation will eliminate the avalanche risk for users of the road through most of the property since most of the new alignment is outside of the Design Magnitude Avalanche. Inhabitants and persons accessing the residences will either be outside of the avalanche area or inside of the structures designed to withstand the expected maximum avalanche impact.

RESPONSE TO JOHN MOYNIER REVIEW

In his June 22, 2004 review of your Tentative Parcel Map, Mr. Moynier addressed a number of avalanche occurrence and safety issues related to your property. Specifically he offered details of avalanche events he claims to have observed on your and adjacent properties and a discussion of the safety of recreation and water district employee users of the property.

In his review Mr. Moynier reports observations of avalanche occurrences that reached the MCWD well site and that "traveled through the property onto the flat land of the lower slope below". From this description, it is not clear if these observations conflict with Mr. Mears calculated avalanche runout delineations which is 70 feet west of the Plum Snowcreek Golf Course property line. The MCWD well site is located to the south of your property. Avalanches reaching this site would not necessarily have traveled through your property to reach this site. Mr. Moynier's description of avalanches traveling onto the flat land of the lower slope appears to be in agreement with the Mear's calculated runout zone. The area identified by Mears as 70 feet west of the golf course is on flat land.

There are two factors which suggest the observations of Mr. Moynier should be viewed with some skepticism. I understand, based upon your conversations with MCWD staff and in particularly Mark Busby, Maintenance Superintendent, that MCWD staff has never observed avalanches reaching the well site. Additionally I understand from your conversation with Mr. Busby that MCWD staff has not need to access this well site in the winter. Secondly, it does not appear that Mr. Moynier nor for that matter anyone else ever contested or challenged the Mear's 1997 avalanche map, commissioned by the Town of Mammoth which clearly identifies the well site and the eastern edge of your property outside of the avalanche runout zones.

Mr. Moynier offers considerable personal opinions on the MCWD staff's and general public's exposure to avalanches in accessing the well site and the public lands to the south of your property while crossing your private property. It is important to note that this hazard already exists and that your proposed subdivision will not increase the risk to these current users. The new proposed alignment of Tamarack to the east edge of your property will actually provide a route through your property that is beyond the Design Magnitude Avalanche. This well allow MCWD a safer winter route across your property. As for the public access, this is your private property, if necessary you could prohibit trespass across it. I understand you hope to avoid this option.

I hope this report provides the information you require. If you have any questions or need any additional information, please contact me.

Respectfully submitted

Larry Heywood