APPENDIX H

NOISE DATA

ON-SITE TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Name: Snowcreek Master Plan EIR

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: LSA, April 2006
Community Noise Descriptor: L_{dn}: _____ CNEL: X

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Analysis Condition Roadway Name Roadway Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Distance from Centerline of Roadway: CNEL at 100 Feet	Distance to Contour: 70 CNEL	65 CNEL	60 CNEL
Existing (Winter 2005) Conditions											
Minaret Road											
South of Meridian	2	0	7,772	40	0.5	0.5%	1.0%	58.5	17	37	80
Old Mammoth Road											
West of Minaret Road	2	0	4,950	40	0.5	0.5%	1.0%	56.6	13	27	59
Minaret to Meridian	2	0	14,870	40	0.5	0.5%	1.0%	61.3	26	57	123
Cumulative (Existing Plus Approved Projects) Conditions											
Minaret Road											
South of Meridian	2	0	13,600	40	0.5	0.5%	1.0%	61.0	25	54	116
Old Mammoth Road											
West of Minaret Road	2	0	8,090	40	0.5	0.5%	1.0%	58.7	18	38	82
Minaret to Meridian	2	0	21,140	40	0.5	0.5%	1.0%	62.9	33	72	155
Cumulative Plus Project Conditions											
Minaret Road											
South of Meridian	2	0	14,830	40	0.5	0.5%	1.0%	61.3	26	57	123
Old Mammoth Road											
West of Minaret Road	2	0	8,150	40	0.5	0.5%	1.0%	58.7	18	38	82
Minaret to Meridian	2	0	25,210	40	0.5	0.5%	1.0%	63.6	38	81	175

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway lanes.

OFF-SITE TRAFFIC NOISE LEVELS

Project Name: 2006 Revised Snowcreek Master Plan

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s): Existing and Future Traffic Noise Levels
Source of Traffic Volumes: LSA, April 2006
Community Noise Descriptor: L_{dn}: X CNEL:

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Traffic Noise Levels

Analysis Condition / Roadway Name / Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor[1]	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix[2] Medium Trucks	Vehicle Mix[2] Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) Ldn
Existing (Winter 2005) Conditions													
Minaret Road													
Meridian to Main Street	Residential	2	0	0	14,320	35	75	0.5	0	0.5%	1.0%	0.0	63.2
Old Mammoth Road													
North of Meridian	Residential	2	0	0	22,390	35	75	0.5	0	0.5%	2.0%	0.0	66.0
Cumulative (Existing Plus Approved projects) Conditions													
Minaret Road													
Meridian to Main Street	Residential	2	0	0	21,110	35	75	0.5	0	0.5%	1.0%	0.0	64.9
Old Mammoth Road													
North of Meridian	Residential	2	0	0	26,310	35	75	0.5	0	0.5%	2.0%	0.0	66.7
Cumulative Plus Project Conditions													
Minaret Road													
Meridian to Main Street	Residential	2	0	0	32,070	35	75	0.5	0	0.5%	1.0%	0.0	66.7
Old Mammoth Road													
North of Meridian	Residential	2	0	0	32,800	35	75	0.5	0	0.5%	2.0%	0.0	67.6

[1] Distance is from the centerline of the roadway segment to the receptor location.
[2] Percentage of medium and heavy trucks as part of the vehicle mix is taken from the Revised Noise Element of the Town of Mammoth Lakes General Plan, 1997.

- ENVIRONMENTAL NOISE ASSESSMENT -

MAMMOTH CREEK PARK FACILITIES PLAN
MAMMOTH LAKES, CALIFORNIA

PREPARED FOR

ROBERT BEIN, WILLIAM FROST & ASSOCIATES
14725 ALTON PARKWAY
IRVINE, CALIFORNIA 92618-2069

PREPARED BY

BROWN-BUNTIN ASSOCIATES, INC.
VISALIA, CALIFORNIA

JANUARY 6, 1999
(Revised February 17, 1999)

BBA

319 West School Ave., Visalia, CA 93291 • (209) 627-4923 • Fax: (209) 627-6284
7996 California Ave., Suite A • Fair Oaks, CA 95628 • (916) 961-5822 • Fax: (916) 961-6418

INTRODUCTION

The Town of Mammoth Lakes is proposing to construct various recreational facilities within the existing Mammoth Creek Park. Facilities proposed for construction include a dual-use, outdoor ice rink/in-line (concrete) skating rink, 10,000 square foot community center with outdoor assembly areas, volleyball and basketball courts, climbing wall, expanded parking lot, expanded restrooms and a picnic area. Buildings would be constructed to house a ticket/skate rental/concession operation and equipment and supply storage. The community center would be located within the western one-third of the site. The skating rink would be 85 feet by 185 feet and located approximately 100 feet from the north property line and approximately 190 feet from the west property line. Hours of operation for the skating rink would be from 8:00 a.m. to 10:00 p.m., including site preparation time. Sport lighting, low wattage lights across the skating rink and cutoff fixtures mounted to eight poles around the rink, would be provided in addition to lighting in the parking areas. Seating would be available on landscaped mounds and on small bleachers around the skating rink. The proposed park facilities are intended for use for team play, recreational skating and play and community events. The community center building may be constructed at a later date than other park facilities.

Noise sources associated with the proposed park facilities will include stationary refrigeration equipment to produce ice for the ice skating rink, mobile equipment used to remove snow from the ice skating rink and to groom the ice surface, groups of people either using or watching people use the various facilities, portable stereos that may be carried in by facility users and a public address (PA) system.

The purpose of this analysis is to quantify the noise impacts which may directly or indirectly result from the development and use of the proposed Mammoth Creek Park recreational facilities, and to identify mitigation measures which may be used to minimize the noise impacts of the project. It is intended that the findings and recommendations of this study be incorporated into the Draft Environmental Impact Report being prepared for the project.

Appendix A provides definitions of the acoustical terminology used in this report. Unless otherwise stated, all sound levels reported in this analysis are A-weighted sound pressure levels in decibels (dB). A-weighting de-emphasizes the very low and very high frequencies of sound in a manner similar to the human ear. Most community noise standards utilize A-weighted sound levels, as they correlate well with public reaction to noise.

DETERMINATION OF SIGNIFICANT NOISE IMPACTS

The significance of noise impacts may be determined by comparing the noise levels either directly or indirectly produced by the project to applicable federal, state or local noise level standards. The noise levels produced by the project may be considered a significant impact if the project results in noise levels which exceed applicable noise standards by 0.5 dB or more and the noise levels cannot be effectively mitigated. The standards for potential noise impact analysis that apply to this project are those contained within the Noise Element of the Town of Mammoth Lakes General Plan and Town of Mammoth Lakes Municipal Code (noise ordinance).

Noise Element:

The Town of Mammoth Lakes updated its noise element in 1997 (Resolution No. 97-34, adopted 6/18/97). The updated noise element contains Policy 4.2.4 that establishes noise level standards for *proposed* stationary noise sources as they may affect the exterior of existing noise-sensitive uses. For the daytime hours of between 7:00 a.m. and 10:00 p.m. (which is when most park facilities would operate) the noise element requires that noise levels from new stationary sources not exceed an hourly energy average (L_{eq}) of 50 dBA *or* an hourly maximum level (L_{max}) of 70 dBA. At night, between the hours of 10:00 p.m. and 7:00 a.m., the noise element standards are 5 dB *more* restrictive to account for increased sensitivity to noise intrusions and generally quieter background noise levels.

As defined by the noise element, "stationary noise source" includes any fixed or mobile source not preempted from local control by existing federal or state regulations. Examples of such sources include industrial or commercial facilities, and vehicle movements on private property. A "noise-sensitive land use" includes residential land uses, transient lodging, schools, libraries, churches, hospitals and nursing homes.

The stationary noise source standards of the noise element are to be applied at the receiving land use property line, or, in the case of upper floor receivers, at the location of outdoor activity areas such as decks or balconies.

Noise Ordinance:

Chapter 8.16 of the Town of Mammoth Lakes Municipal Code pertains to the regulation of excessive noise from *existing* uses. Although the noise ordinance addresses existing noise sources, the ordinance may also be used to establish performance criteria for proposed new uses such as those proposed for the Mammoth Creek Park. The section of the noise ordinance applicable to most proposed facilities is Section 8.16.070 (exterior noise limits). That section establishes noise levels that may not be exceeded based upon the nature of the receiving land use, the time of day that the noise occurs and the statistical distribution over time of the noise levels generated by the source of concern.

The Town of Mammoth Lakes has determined that the closest residential land uses to the project site should be classified as "suburban" land uses for purposes of determining compliance with the noise ordinance. This determination was based upon Town's assessment of land uses in the project area and ambient noise measurement data contained within the noise element.

Table I of the noise ordinance establishes 55 dBA as the noise level that may not be exceeded for more than 30 minutes in any one-hour time period for multi-family residential uses in a suburban setting during the daytime hours of 7:00 a.m. to 10:00 p.m. Since planned activities on the project site would generally occur only during those hours, the more restrictive nighttime criteria do not apply to the project. Nighttime noise level standards are 5 dB more restrictive than the daytime standards of the noise ordinance.

Except as required elsewhere in the noise ordinance, Section 8.16.070 establishes the statistical distribution over time for noise levels occurring during any one-hour time period based on the concept that noise levels of increasing intensity should be permitted for progressively shorter periods of time. Table I summarizes the standards of the noise ordinance generally applicable to the proposed facilities based upon the above discussion and references to specific Town Municipal Code sections. As for the noise element, the noise ordinance standards are to be applied at the receiving land use property line.

TABLE I

**TOWN OF MAMMOTH LAKES NOISE ORDINANCE STANDARDS*
MAMMOTH CREEK PARK FACILITIES PLAN**

	Cumulative Number of Minutes/Hour (L_n)**				
Time of Day	**30 (L_{50})**	**15 (L_{25})**	**5 ($L_{8.3}$)**	**1 ($L_{1.7}$)**	**0 (L_{max})**
Day (7 a.m.-10:00 p.m.)	55 dBA	60 dBA	65 dBA	70 dBA	75 dBA
Night (10 p.m. - 7 a.m.)	50 dBA	55 dBA	60 dBA	65 dBA	70 dBA

* As applied when the receiving land use consists of multi-family residential uses in a suburban setting. In cases where the noise of concern consists of music or speech conveying informational content, an impulsive or repetitive noise such as hammering or the impacts of hockey pucks against dasher boards, or a distinctive screech or whine, the standards are to be reduced (made more restrictive) by 5 dB.

** L_n = noise level exceeded "n" percent of a specified time period (in this case, one hour). For example, a noise level of 55 dBA may not be exceeded for more than 30 minutes out of an hour (50% of the time) during the daytime hours.

Source: Chapter 8.16 Mammoth Lakes Municipal Code

Section 8.16.090 of the noise ordinance specifically addresses noise from construction activities. With the exception of emergency work or work conducted pursuant to a variance issued by the planning commission, construction activities are not allowed between the hours of 7:00 p.m. and 7:00 a.m. Monday through Saturday or at anytime on Sundays or holidays. For construction activities occurring during the permitted hours, and to the extent that it is *"technically and economically feasible,"* the noise ordinance establishes a maximum noise level standard of 80 dBA when measured within a multi-family residential area.

With specific regard to snow removal activities, Section 8.16.100 of the noise ordinance provides an exemption for the performance of emergency work such as may be required to prevent or alleviate personal or property damage caused by an emergency. Although not specifically cited as such in the noise ordinance, it is reasonable to assume that snow removal activities for purposes of public safety should be considered emergency work when they occur on public roadways, in parking lots or around places of business.

Thresholds of Significance for Noise Impact Analysis:

Comparison of the noise element and noise ordinance standards shows that the noise element is somewhat more restrictive than the noise ordinance with reference to the project. An exception to this is noise consisting of speech or music conveying informational content (such as PA system or crowd noise) or impulsive sounds, where the standards of the noise element and noise ordinance are the same.

The noise element allows for a *maximum* noise level of 70 dBA during the daytime hours in a suburban residential area whereas the noise ordinance allows for 75 dBA (70 dBA for music, speech or impulsive sounds). With regard to *average* noise levels, the noise element allows for an hourly energy average (L_{eq}) of 50 dBA during the daytime hours whereas the noise ordinance allows for a median (L_{50}) noise level of 55 dBA (50 dBA for music, speech or impulsive sounds).

The standards of the noise element and noise ordinance are both 5 dB more restrictive during the nighttime hours. For fluctuating noise sources, such as would be expected during use of the proposed park facilities, the L_{eq} would be expected to be somewhat higher (perhaps by 2-3 dB) than the median (L_{50}) noise level during the same period. Use of the hourly L_{eq} is therefore the most restrictive application of the Town's noise standards.

SETTING

Mammoth Creek Park is comprised of approximately 20 acres on both sites of Old Mammoth Road. Five acres is owned by the Town of Mammoth Lakes and 15 acres is administered by Inyo National Forest. The Town portion of the park is located on the west side of Old Mammoth Road, and it is within this area that the project is proposed. The Town portion of the park presently contains a children's play area, restrooms, bicycle paths and a 44-space parking lot.

Land uses surrounding Mammoth Creek Park include multi-family residential uses (apartments and/or condominiums) to the west and to the north, a golf course and open space across Old Mammoth Road to the south and the U.S. Forest Service portion of the park across Old Mammoth Road to the east. There are also some commercial uses on both sides of Old Mammoth Road to the north of the park.

Existing sources of noise in the project area include traffic on local roadways, wind in the trees, running water in nearby Mammoth Creek and various activities associated with existing park activities, human habitation and residential maintenance. During the winter months, there are additional noise sources associated with snow removal from roadways and parking lots and from avalanche control on nearby ski slopes.

Ambient Noise Level Measurements:

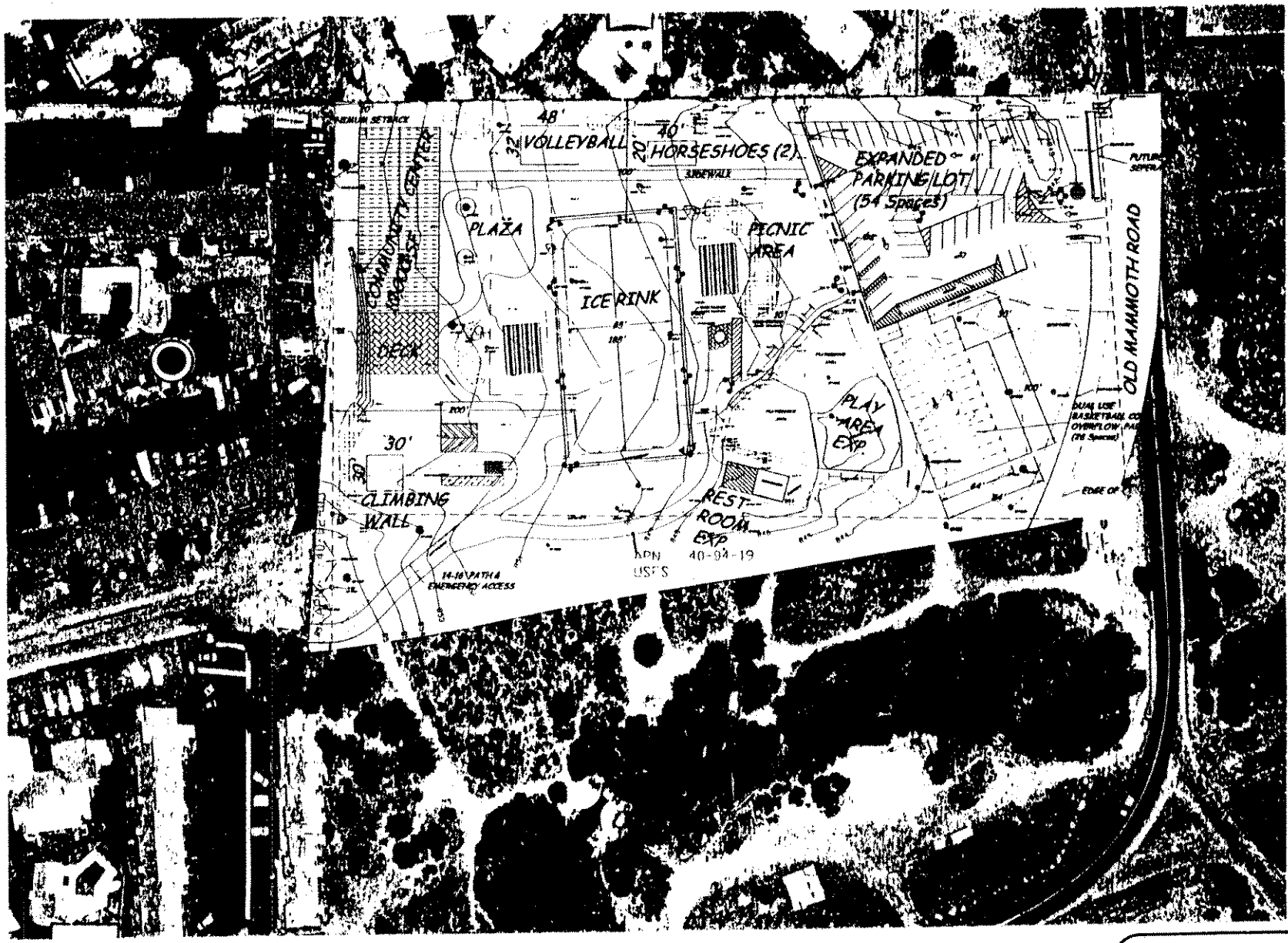
In order to quantify existing ambient noise levels in the project area, 24-hour noise measurements were conducted by Brown-Buntin Associates, Inc. (BBA) starting at 3:00 p.m. on July 28, 1998 at the location shown on Figure 1. The noise measurement site is representative of typical existing noise exposure in the residential areas adjoining Mammoth Creek Park to the west and north. The measurement site is also typical of many other residential locations within the Town of Mammoth Lakes that are somewhat removed from a major roadway.

Noise monitoring equipment used for the ambient noise survey consisted of a Larson Davis Laboratories Model LDL 820 sound level analyzer equipped with a Bruel & Kjaer (B&K) Type 4176 ½" microphone. The instrumentation was calibrated prior to use with a B&K Type 4230 acoustical calibrator to ensure the accuracy of the measurements, and complies with applicable requirements of the American National Standards Institute (ANSI) for Type I (precision) sound level meters. The microphone was placed on a tripod at approximately 8 feet above the ground with a clear "view" of the Mammoth Creek Park area.

Figure 2 provides a summary of measured ambient noise level data collected during the 24-hour noise survey. L_{50} and L_{eq} values shown by Figure 2 represent typical average (median and energy average, respectively) hourly noise levels recorded during the survey period. L_{max} values represent the highest noise levels recorded during each hour of the survey, and L_{90} values represent typical background (or residual) noise levels. Residual noise levels were observed to be caused by wind in the trees or distant traffic during the day and evening hours and by running water during the night and early morning hours. The measured Day/Night Average Level (L_{dn}) during the 24-hour survey period was 48 dB.

The 1997 Noise Element also contains ambient noise level data obtained during a community noise survey. The community noise survey included long-term (24-hour) and short-term noise measurements at six sites within the Mammoth Lakes area. Four of those sites were typical of

FIGURE 1

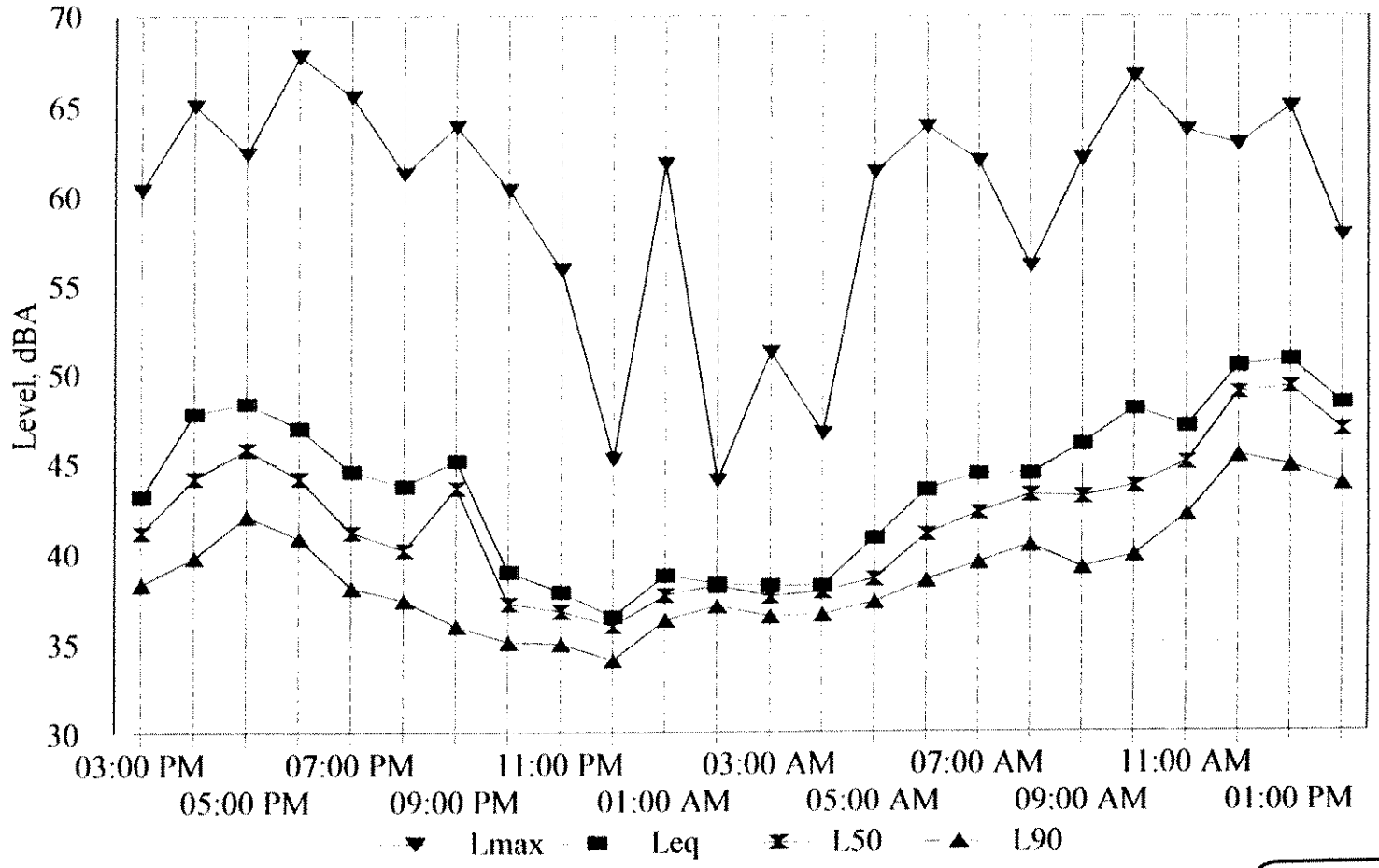


● Ambient noise monitoring site

BBA

FIGURE 2

24-HOUR AMBIENT NOISE SURVEY
LA VISTA BLANC APARTMENTS
JULY 28-29, 1998



BBA

residential areas within the Town limits. Measurements were conducted during the winter (April 1995) and summer (July 1995) months.

At the four residential locations, average daytime noise levels (as defined by the hourly L_{eq}) ranged from about 35 to 65 dBA during the winter measurement period and from about 35 to 60 dBA during the summer measurement period. L_{dn} values either measured or estimated during the community noise survey for the 1997 Noise Element ranged from 47 to 76 dBA for the winter measurement period and from 44 to 56 dBA for the summer measurement period. Measured noise levels during the winter sample period were higher than those measured during the summer sample period due to high winds during the winter sample period.

The 1997 Noise Element also contains information on noise levels from snow removal and avalanche control operations. These are normal and existing noise sources within the Town of Mammoth Lakes. As reported in that document, snow removal activities on roadways and in parking lots generate noise levels of 68 - 87 dBA at 100 feet from the equipment, and can occur at any time during the 24-hour day. Snow removal activities for purposes of public safety are considered emergency work and are therefore exempt from the noise level limits of the Town Municipal Code.

Avalanche control activities are conducted under the supervision of the U.S.F.S., and occur intermittently during the winter months. As reported in the noise element for the location of the Fire Station on Old Mammoth Road (near the project site), maximum A-weighted sound levels from charge detonations ranged from 54 to 78 dBA.

In summary, ambient noise levels may be expected to vary considerably in the area surrounding Mammoth Creek Park due to weather conditions, proximity to major roadways and whether or not snow removal equipment is in use. This is evidenced by variations in ambient noise levels documented by the 1997 Noise Element and by the measurements conducted for this particular analysis. These informational sources indicate that daytime hourly noise levels in the range of 40 to 55 dBA L_{eq} are typical of most residential areas within the Town of Mammoth Lakes except during periods of high winds or other severe weather conditions, or while snow removal activities are in progress.

Existing Traffic Noise Levels:

Existing traffic noise levels along Old Mammoth Road were estimated based upon traffic data and noise level projections contained within the 1997 Noise Element. According to that document, annual average traffic volumes on the section of Old Mammoth Road that passes by Mammoth Creek Park were 6,900 in 1994 and are projected to increase to 9,700 by 2009. The resulting distances from the center of the roadway to the 60 dB L_{dn} contour are 68 feet for 1994 and 85 feet for 2009. This means that existing and future traffic noise exposure at 100 feet from the center of Old Mammoth Road is less than 60 dB L_{dn}.

PROJECT IMPACTS AND MITIGATION MEASURES

The major noise sources associated with the proposed Mammoth Creek Park Facility Plan include the following:

- Refrigeration equipment for producing and maintaining ice for the ice skating rink.
- Mobile equipment used to remove snow from the ice skating rink and to groom the ice surface.
- Voices of facility users and/or spectators.
- Amplified speech or music.
- Project-related increase in traffic noise on Old Mammoth Road and within the expanded parking lot.
- Construction noise

Stationary and Mobile Noise Sources:

Impacts

Refrigeration equipment (chiller) specifications have been published by the Town and mobile snow removal and ice grooming equipment is either already in the possession of the Town or will be purchased if the facility is constructed.

In order to estimate noise exposure from proposed stationary and mobile equipment, BBA reviewed noise measurement data from the manufacturers of equipment and conducted noise measurements

at the Squaw Valley Olympic Ice Pavilion. Specifically, manufacturer's data were analyzed for the chiller and for the Trackless Utility Vehicle that would be used in snow removal operations. Noise measurements were conducted in Squaw Valley to document noise levels from a portable snow blower, a Zamboni and an edger used for grooming the surface of the ice rink. Noise measurements were also conducted at the Squaw Valley Olympic Ice Pavilion, and at various other existing outdoor recreational complexes, to document noise levels from crowd noise and from typical use of a PA system.

The specified chiller is a Trane Model RTAA-300 or its equivalent. Manufacturer's data for a McQuay ALS280A (equivalent to the Trane RTAA-300) were analyzed to determine overall A-weighted sound levels under the conditions the chiller would be operated. Factors influencing the amount of noise produced by the chiller include the amount of "load" on the unit, ambient air temperature, orientation of the unit and whether or not the equipment operates at 50 Hz or 60 Hz. Although the chiller would normally operate only during the daytime hours between 7:00 a.m. and 10:00 p.m., there may be occasions when the chiller operates during the nighttime hours.

Noise level data for a Trackless MT Series V (110 HP) utility vehicle with a snow blower were obtained from Snoquip, a Trackless dealer in Sacramento, assuming full throttle at 2500 RPM. According to Snoquip, the measurements were conducted in an unpaved parking lot area.

Measurements of noise from a Zamboni, an ice surface edger and a portable snow blower were conducted at the Squaw Valley Olympic Ice Pavilion while the equipment was in normal use for ice grooming and/or snow removal purposes. Noise measurements were conducted on the opposite side of the plexiglas dasher boards that surround the Squaw Valley ice rink at the distances from the noise sources described below. Similar dasher boards would be installed at the proposed Mammoth Creek Park facility.

The Zamboni measured, a gasoline-powered model, is assumed to be comparable to the unit the Town proposes to obtain for Mammoth Creek Park. The only known difference is that the Town plans to use a propane-powered Zamboni, which may be quieter than its gasoline-powered counterpart. Zamboni noise level measurements were conducted at approximately 25 feet from the edge of the ice rink (75 feet from the center of the rink). It required about 12 minutes of Zamboni operation to surface the 100 feet by 200 feet oval ice rink at Squaw Valley.

The portable ice rink edger and snow blower were measured at 10 feet from the source during normal operations. Both of these pieces of equipment are powered by Honda gasoline engines. It took about 2 minutes for the edger to surface the outer perimeter of the rink prior to use of the Zamboni for the rest of the rink.

The data summarized in Table II provide estimates of noise exposure at the closest residential property lines based on the above-described noise level data. For the chiller, data are presented for "full" and "50% full" load conditions, assuming a 60 Hz unit, an ambient air temperature of 74°F or less, and the unit oriented so that the control panel faces east. For mobile equipment, it was assumed that the equipment could be operated at various orientations relative to receiving land uses and that the equipment could be operated at any location within the ice skating rink area. Noise levels reported in Table II also assume that the depressed ice skating rink and surrounding berm (a total of six feet from the surface of the ice to the top of the berm) and proposed plexiglas dasher boards would reduce noise exposure at the closest *ground level* residential receivers by about 5 dB. This adjustment applies to mobile equipment only. The noise level projections presented in Table II assume that the chiller is not shielded by any berms or other noise barriers or enclosures.

From Table II it is apparent that the chiller is estimated to generate noise levels of 50-54 dBA at the closest residential property lines, depending upon the cooling "load" on the equipment. The chiller normally would not run constantly, especially during periods of cold weather, but could be expected to run for an hour or more at a time. Based upon the 50 dBA daytime and 45 dBA nighttime hourly L_{eq} noise level thresholds identified for the noise analysis, *chiller noise levels will require mitigation.*

Table II indicates that the various mobile equipment used for ice grooming or snow removal could generate noise levels ranging from 45 to 69 dBA depending upon where within the skating rink area the equipment is being operated.

Based upon measurements conducted by BBA at Squaw Valley, and conversations with ice rink maintenance personnel there, the Zamboni and edger would not be operated simultaneously and the total time required to surface the ice rink would be 15 minutes or less during any one-hour period. For that reason, the 50 dBA hourly L_{eq} threshold of significance would not be exceeded, and *noise mitigation is not required for the daytime use of the Zamboni or the edger.*

TABLE II

SUMMARY OF ESTIMATED NOISE LEVELS FROM STATIONARY AND MOBILE EQUIPMENT* MAMMOTH CREEK PARK

	Maximum Sound Level, dBA**		Hourly L_{eq} Values, dBA***	
Equipment	**Apts. to West**	**Apts. to North**	**Apts. to West**	**Apts. to North**
Chiller (McQuay ALS280A-60HZ)				
Full load	54	54	54	54
50% load	50	50	50	50
Trackless MT Series V (110 HP)				
Full throttle	50-63 (53-62)	51-69 (54-63)	62	63
Zamboni (gasoline-powered)				
Normal Operation	45-48 (46)	45-53 (48)	40	42
Edger (Honda-powered)				
Normal Operation	50-53 (51)	50-58 (53)	36	38
Snow Blower (Honda-powered)				
Normal Operation	49-52 (50)	49-57 (52)	50	52

Note: Shaded boxes indicate noise levels that are estimated to potentially exceed the daytime limits of the Town's noise level standards.

* Noise level estimates for mobile equipment include an adjustment of -5 dB to account for the depressed ice rink, surrounding berm and plexiglas dasher boards, as proposed by the Town of Mammoth Lakes.

** Maximum levels are shown as a range of values for mobile equipment since equipment could operate anywhere in the ice rink area and at any orientation relative to nearby receivers. The values shown in the parenthesis represent the noise level when mobile equipment is operating near the center of the skating rink.

*** Hourly L_{eq} values are based upon the estimated time of operation of individual pieces of equipment within any one hour period using the center of the ice rink as the effective center of mobile equipment activities and the actual location of the chiller for the projection of chiller noise levels.

Source: Brown-Buntin Associates, Inc. and equipment manufacturers

Hourly noise levels generated by the Trackless utility vehicle and portable snow blower are difficult to predict because the equipment could operate anywhere within the park. Assuming that the center of activity would be the center of the skating rink, hourly noise levels would be expected to exceed

the 50 dBA hourly L_{eq} threshold of significance during extended (more than an hour) periods of snow removal activities. *Noise levels from the Trackless utility vehicle and portable snow blower will require mitigation.*

Mitigation

Construction of an enclosure or other form of noise barrier around the west and north sides of the chiller would reduce chiller noise to an insignificant level, provided that the enclosure/barrier reduces chiller noise by at least 5 dB and the chiller does not operate at night between the hours of 10:00 p.m. and 7:00 a.m. Nighttime chiller operations will require an enclosure or barrier that reduces chiller noise by at least 10 dB when measured at the closest residential property lines, including consideration of upper floor outdoor activity areas such as decks or balconies. An alternative to the above-described mitigation for the chiller would be a property line noise barrier. That alternative is discussed below.

Mitigation of noise from the Trackless utility vehicle and portable snow blower could be accomplished by either utilizing quieter equipment than was measured for this analysis or by constructing a noise barrier around the perimeter of the park in areas where residential receivers are located. It is unknown whether quieter equipment is commercially available.

The required height of a property line noise barrier to mitigate noise from snow removal activities is significantly affected by the fact that there are second floor outdoor activity areas both to the north and west of the park. Calculations of noise barrier insertion loss indicate that a property line noise barrier 25 feet in height would be required to mitigate noise at the closest second floor outdoor activity areas north of the skating rink when the Trackless snow removal equipment is operating in the skating rink area. For the closest second floor outdoor activity areas to the west of the skating rink, a property line noise barrier 19 feet high would be required for mitigation of noise from the Trackless snow removal equipment in the skating rink. Snow removal activities in the parking lot and on walkways leading from the parking lot to the proposed community center are considered emergency work and therefore exempt from the Town's noise standards.

Participant and Spectator Noise:

Impacts

The proposed recreation facilities at Mammoth Creek Park will include a volleyball court, horseshoe pit area, picnic area, climbing wall, basketball court, community center, and the above-described skating rink. All of these facilities will generate noise from persons either participating in or watching the activities associated with the facilities. Of the proposed facilities, only the skating rink will have designated seating (bleachers) for spectators.

Since few spectators were observed during the above-referenced Squaw Valley noise level measurements, it was necessary to refer to analyses prepared by BBA for a community center in Ripon, California and for a recreational park in Shafter, California. Noise levels from both of these facilities were monitored during Little League baseball games where a combination of participant and spectator noise was measured. Based upon those noise measurements, typical noise levels at a reference distance of 200 feet from home plate ranged from 48 to 72 dBA. Some of the baseball players were much closer than 200 feet from the microphone during those measurements. However, maximum noise levels were produced by spectators in the bleachers just behind home plate. Two hundred feet is the approximate distance from the center of the skating rink to the closest residential receivers.

The hourly L_{eq} was not specifically measured during the above-described studies, but the L_{eq} *during periods of active play* was 58-59 dBA. The *hourly* L_{eq} would be lower than this due to the fact that crowd noise is not constant for an extended period of time. Assuming that crowd noise could equal the levels described above for approximately 15 minutes out of the hour, the hourly L_{eq} would be in the range of 54-55 dBA.

Both a maximum noise level of 72 dBA and an estimated hourly L_{eq} of 55 dBA exceed the thresholds of significance identified for the noise analysis for sources containing informational content. Those thresholds are a maximum noise level of 70 dBA and an hourly L_{eq} of 50 dBA during the daytime hours. However, the levels described above would only be expected to occur occasionally when the bleachers around the skating rink are being used for special events or possibly during volleyball games near the northern boundary of the park. Participant and spectator noise at other locations around the park would not be expected to produce noise levels in excess of the thresholds of significance identified for this analysis due to smaller crowds and greater setback distances from noise sensitive receptors.

Mitigation

Mitigation of participant and spectator noise around the skating rink may be achieved by constructing the property line noise barriers described above for mitigation of noise from the Trackless snow removal equipment. Such barriers would also mitigate participant and spectator noise produced in the area where the volleyball court would be located, and in the deck area at the south end of the proposed community center. Construction of a noise barrier along the north and west sides of the ice rink area (including the bleachers) is an alternative that would be effective for noise produced by participants and spectators within the ice rink area, but not for noise sources associated with snow removal or persons using the deck area south of the proposed community center.

Public Address System Noise:

Impacts

Noise level measurements of a typical PA system in use at an outdoor ice skating rink were conducted by BBA at the Squaw Valley Olympic Ice Pavilion. Noise levels measured at approximately 130 feet from the center of the rink (and the overhead loudspeaker) during normal skating with background music and announcements ranged from 50 to 68 dBA. Projecting those noise levels for a distance of 200 feet from the center of the skating rink, the resulting levels would range from 47 to 64 dBA with an hourly L_{eq} of 59 dBA. An hourly L_{eq} of 59 dBA exceeds the 50 dBA hourly L_{eq} threshold of significance identified for the noise analysis.

Mitigation

Mitigation of PA system noise could be accomplished by using directional speakers that face away from the closest residential receivers and by setting a limit on the sound levels that may be produced by the system. It is not expected that noise from a properly designed PA system would exceed the 70 dBA maximum noise level threshold of significance identified for the noise analysis. *Noise impacts from the PA system are therefore considered insignificant.*

Traffic Noise:

Impacts

Traffic on Old Mammoth Road could be expected to increase as a result of the project. It is estimated that such increases will not exceed 15% of the existing traffic. Assuming a project-related increase in traffic of 15% would increase L_{dn} values along old Mammoth Road by less than 1 dB. *Noise impacts from project-related traffic increases are insignificant.*

Mitigation

None required.

Construction Noise:

Impacts

During the construction of the proposed park facilities, noise from construction activities would potentially impact noise-sensitive land uses in the immediate area. Activities involved in construction would generate noise levels at a reference distance of 50 feet as indicated by Table III. *Construction activities would be temporary and for that reason are not considered significant.*

TABLE III

TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS

Type of Equipment	Maximum Level, dB (50 Ft.)*
Scrapers	88
Bulldozers	87
Heavy Trucks	88
Backhoe	85
Pneumatic Tools	85

*Fifty feet is a reference distance that may be used to estimate noise levels at various distances from the source.

Source: Cunniff 1977

Mitigation

Construction activities would have to comply with the provisions of the Town Municipal Code which limit hours of construction to 7:00 a.m. to 7:00 p.m. Monday through Saturday and prohibit construction on Sundays or holidays. In addition to limits on days and hours of construction activities, the Town's noise ordinance requires that construction noise not exceed a maximum of 80 dBA at the property line when the receiving land use consists of multi-family residential uses. According to the noise ordinance, the 80 dBA maximum noise level standard may be exceeded only if it is not technically or economically feasible to further reduce construction noise levels. Effective mufflers should be fitted to gas- and diesel-powered equipment.

Cumulative Project Impacts:

The foregoing section of this analysis has primarily focused on the noise levels that could be produced by individual components of the project. If the project is constructed, it may be assumed that some activities would likely occur simultaneously, thus increasing overall ambient noise levels in the project area.

The combination of activities that would most likely produce the highest cumulative noise levels would be snow removal operations, chiller operation and ice grooming. As previously described, noise levels produced by snow removal equipment could exceed applicable thresholds of significance, and will require mitigation. It is noted that such levels presently occur in the vicinity of the closest residential receivers during periods of snow removal from public and private roadways and parking lots. Such activities are exempt from the noise level limitations of the Town Municipal Code. Chiller noise can be effectively mitigated by a noise enclosure or barrier, and is therefore not considered significant.

The other combination of activities that could produce cumulative noise levels exceeding the thresholds of significance applied to this analysis would be the use of the skating rink for events attracting a crowd of spectators. Under this condition, noise could be produced simultaneously by the crowd (and participants), by the PA system and by the chiller. As previously described, chiller, PA system, and crowd noise may be effectively mitigated through proper design and/or the use of enclosures or noise barriers.

Although the community center may be constructed at a later date than the other park facilities described by this analysis, it could provide substantial acoustical shielding of skating rink activities for residential uses located near the northwest corner of the park. However, if the community center building is used as a substitute for the property line noise barriers described above, the deck at the south end of the community center will require a noise barrier along its west side. The best way to provide the required mitigation would be to connect the community center building with the property line noise barrier required for mitigation of noise from snow removal and crowd noise in the skating rink area.

CONCLUSIONS

The findings of the noise analysis are based upon a worst-case interpretation of the Town's noise level limits, in that impacts and the potential need for mitigation are determined at the *boundary* between the project area and surrounding residential uses. The development of effective mitigation measures is significantly affected by the fact that there are second floor outdoor activity areas located near the property line, overlooking the project area. In many cases, such areas are only occasionally used during the winter months when the proposed ice skating rink would most often be used for events that could generate significant noise levels.

Although it is appropriate to prepare an assessment of potential noise impacts at the closest receivers, it is also appropriate to note that noise beyond the first row of receivers will be significantly reduced by increased distance from the source and acoustical shielding from intervening buildings.

Noise produced by snow removal equipment within the skating rink area is not exempt from the limits of the Town Municipal Code because such snow removal work is not required to prevent or alleviate damage due to an emergency. However, noise from snow removal activities is a normal part of the acoustic environment in the Town of Mammoth Lakes during the snow season.

APPENDIX A

ACOUSTICAL TERMINOLOGY

AMBIENT NOISE LEVEL: The composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

CNEL: Community Noise Equivalent Level. The average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night before 7:00 a.m. and after 10:00 p.m.

DECIBEL, dB: A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

DNL/L_{dn}: Day/Night Average Sound Level. The average equivalent sound level during a 24-hour day, obtained after addition of ten decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.

L_{eq}: Equivalent Sound Level. The sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over 1, 8 and 24-hour sample periods.

NOTE: The CNEL and DNL represent daily levels of noise exposure averaged on an annual basis, while L_{eq} represents the average noise exposure for a shorter time period, typically one hour.

L_{max}: The maximum noise level recorded during a noise event.

L_n: The sound level exceeded "n" percent of the time during a sample interval (L_{90}, L_{50}, L_{10}, etc.). L_{10} equals the level exceeded 10 percent of the time.

BBA

ACOUSTICAL TERMINOLOGY

NOISE EXPOSURE CONTOURS: Lines drawn about a noise source indicating constant levels of noise exposure. CNEL and DNL contours are frequently utilized to describe community exposure to noise.

NOISE LEVEL REDUCTION (NLR): The noise reduction between indoor and outdoor environments or between two rooms is the numerical difference, in decibels, of the average sound pressure levels in those areas or rooms. A measurement of "noise level reduction" combines the effect of the transmission loss performance of the structure plus the effect of acoustic absorption present in the receiving room.

SEL or SENEL: Sound Exposure Level or Single Event Noise Exposure Level. The level of noise accumulated during a single noise event, such as an aircraft overflight, with reference to a duration of one second. More specifically, it is the time-integrated A-weighted squared sound pressure for a stated time interval or event, based on a reference pressure of 20 micropascals and a reference duration of one second.

SOUND LEVEL: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the response of the human ear and gives good correlation with subjective reactions to noise.

DRAFT

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MAMMOTH CREEK PARK FACILITIES PROJECT ENVIRONMENTAL IMPACT REPORT

FEBRUARY 1999

Prepared for:

Town of Mammoth Lakes

Prepared by:

Robert Bein, William Frost & Associates

Administrative Draft EIR Completed: January 12, 1999
Preliminary Draft EIR Completed: February 18, 1999
Draft EIR Completed: February 26, 1999
Final EIR Completed: _____

DRAFT

ENVIRONMENTAL IMPACT REPORT

for the

MAMMOTH CREEK PARK FACILITIES PROJECT

(Use Permit Application 98-3)
SCH # 98121081

Lead Agency:

TOWN OF MAMMOTH LAKES
437 Old Mammoth Road
Mammoth Lakes, California 93546
Contact: Ms. Karen Johnston
760/934-8989

Consultant:

ROBERT BEIN, WILLIAM FROST & ASSOCIATES
14725 Alton Parkway
Irvine, California 92618
Contact: Mr. Glenn Lajoie, AICP
949/472-3505

February 1999

JN 34978

LONG-TERM NOISE IMPACTS

Long-term noise impacts can be generated by both mobile and stationary sources. The major noise sources associated with the proposed Mammoth Creek Park Facility Plan include the following:

- Refrigeration equipment for producing and maintaining ice for the ice skating rink.
- Mobile equipment used to remove snow from the ice skating rink and to groom the ice surface.
- Voices of facility users and/or spectators.
- Amplified speech or music.
- Project-related increase in traffic noise on Old Mammoth Road and within the expanded parking lot.
- Construction noise.
- Hockey pucks against dasher boards.

On-Site Equipment Noise

5.4-3 *On-site equipment operations would generate additional noise on-site and to the surrounding area.* ***Significance: Potentially significant impact for the refrigeration unit which can be mitigated to a less than significant level. Less than significant impact for ice grooming and no mitigation required. Potentially significant impact for snow removal equipment which can be mitigated to a less than significant level.***

5.4-3 Discussion. Refrigeration equipment (chiller) specifications have been published by the Town and mobile snow removal and ice grooming equipment is either already in the possession of the Town or would be purchased if the facility is constructed.

In order to estimate noise exposure from proposed stationary and mobile equipment, BBA reviewed noise measurement data from the manufacturers of equipment and conducted noise measurements at the Squaw Valley Olympic Ice Pavilion. Specifically, manufacturer's data were analyzed for the chiller and for the Trackless Utility Vehicle that would be used in snow removal operations. Noise measurements were conducted in Squaw Valley to document noise levels from a portable snow blower, a Zamboni and an edger used for grooming the surface of the ice rink. Noise measurements were also conducted at the Squaw Valley Olympic Ice Pavilion, and at various other existing outdoor recreational complexes, to document noise levels from crowd noise and from typical use of a PA System (see discussion which follows).

The specified chiller is a Trane Model RTAA-300 or its equivalent. Manufacturer's data for a McQuay ALS280A (equivalent to the Trane RTAA-300) were analyzed to determine overall A-weighted sound levels under the conditions the chiller would be operated. Factors influencing the amount of noise produced by the chiller include the amount of "load" on the unit, ambient air temperature, orientation of the unit and whether or not the equipment operates at 50 Hz or 60 Hz. Although the chiller would normally operate only during the daytime hours between 7:00 a.m. and 10:00 p.m., there may be occasions when the chiller operates during the nighttime hours. Table 5.4-4 summarizes estimated chiller noise levels.

Noise level data for a Trackless MT Series V (110 HP) utility vehicle with a snow blower were obtained from Snoquip, a Trackless dealer in Sacramento. Estimated noise levels are summarized in Table 5.4-4, assuming full throttle at 2500 RPM. According to Snoquip, the measurements used for the estimates reported in Table 5.4-4 were conducted in an unpaved parking lot area.

Measurements of noise from a Zamboni, an ice surface edger and a portable snow blower were conducted at the Squaw Valley Olympic Ice Pavilion while the equipment was in normal use for ice grooming and/or snow removal purposes. Noise measurements were conducted on the opposite side of the plexiglass dasher boards that surround the Squaw Valley ice rink at the distances from the noise sources described below. Similar dasher boards would be installed at the proposed Mammoth Creek Park facility.

The Zamboni measured, a gasoline-powered model, is assumed to be comparable to the unit the Town proposes to obtain for Mammoth Creek Park. The only known difference is that the Town plans to use a propane-powered Zamboni, which may be quieter than its gasoline-powered counterpart. Zamboni noise level measurements were conducted at approximately 25 feet from the edge of the ice rink (75 feet from the center of the rink). It required about 12 minutes of Zamboni operation to surface the 100 feet by 200 feet oval ice rink at Squaw Valley. The Zamboni noise estimates at the closest residential receivers presented in Table 5.4-4 are based upon those measurements.

The portable ice rink edger and snow blower were measured at 10 feet from the source during normal operations. Both of these pieces of equipment are powered by Honda gasoline engines. It took about 2 minutes for the edger to surface the outer perimeter of the rink prior to use of the Zamboni for the rest of the rink. Noise level estimates for the portable ice rink edger and snow blower, based upon the Squaw Valley measurements, are presented in Table 5.4-4.

Table 5.4-4
SUMMARY OF ESTIMATED NOISE LEVELS FROM STATIONARY AND MOBILE EQUIPMENT*

Equipment	Maximum Sound Level, dBA**		Hourly Leq Values, dBA***	
	Units to West	Units to North	Units to West	Units to North
Chiller (McQuay ALS280A-60HZ)				
Full load	54	54	54	54
50% load	50	50	50	50
Trackless MT Series V (110 HP)				
Full throttle	50-63 (53-62)	51-69 (54-63)	62	63
Zamboni (gasoline-powered)				
Normal Operation	45-48 (46)	45-53 (48)	40	42
Edger (Honda-powered)				
Normal Operation	50-53 (51)	50-58 (53)	36	38
Snow Blower (Honda-powered)				
Normal Operation	49-52 (50)	49-57 (52)	50	52

NOTE: Shaded boxes indicate noise levels that are estimated to potentially exceed the daytime limits of the Town's noise level standard.

* Noise level estimates for mobile equipment include an adjustment of -5 dB to account for the depressed ice rink, surrounding berm and plexiglass dasher boards, as proposed by the Town of Mammoth Lakes.

** Maximum levels are shown as a range of values for mobile equipment since equipment could operate anywhere in the ice rink area and at any orientation relative to nearby receivers. The values shown in the parenthesis represent the noise level when mobile equipment is operating near the center of the skating rink.

*** Hourly Leq values are based upon the estimated time of operation of individual pieces of equipment within any one hour period using the center of the ice rink as the effective center of mobile equipment activities and the actual location of the chiller for the projection of chiller noise levels.

Source: Brown-Buntin Associates, Inc. and equipment manufacturers.

The data summarized in Table 5.4-4 provide estimates of noise exposure at the closest residential property lines based on the above-described noise level data. For the chiller, data is presented for "full"

and "50% full" load conditions, assuming a 60 Hz unit, an ambient air temperature of 74°F or less, and the unit oriented so that the control panel faces east. For mobile equipment, it was assumed that the equipment could be operated at various orientations relative to receiving land uses and that the equipment could be operated at any location within the ice skating rink area. Noise levels reported in Table 5.4-4 also assume that the depressed ice skating rink and surrounding berm (a total of six feet from the surface of the ice to the top of the berm) and plexiglass dasher boards would reduce noise exposure at the closest *ground level* residential receivers by about 5 dB. This adjustment applies to mobile equipment only. The noise level projections presented in Table 5.4-4 assume that the chiller is not shielded by any berms or other noise barriers or enclosures.

From Table 5.4-4 it is apparent that the chiller is estimated to generate noise levels of 50-54 dBA at the closest residential receivers, depending upon the cooling "load" on the equipment. The chiller normally would not run constantly, especially during periods of cold weather, but could be expected to run for an hour or more at a time. Based upon the 50 dBA daytime and 45 dBA nighttime hourly Leq noise level threshold identified for the noise analysis, chiller noise levels would require mitigation.

Construction of an enclosure or other form of noise barrier around the west and north sides of the chiller would reduce chiller noise to an insignificant level, provided that the enclosure/barrier reduces chiller noise by at least 5 dB and the chiller does not operate at night between the hours of 10:00 p.m. and 7:00 a.m. Nighttime chiller operations would require an enclosure or barrier that reduces chiller noise by at least 10 dB when measured at the closest residential receivers, including consideration of upper floor outdoor activity areas such as decks or balconies. An alternative to the above described mitigation for the chiller would be a property line noise barrier, as described below.

Table 5.4-4 indicates that the various mobile equipment used for ice grooming or snow removal could generate noise levels ranging from 45 to 69 dBA depending upon where within the skating rink area the equipment is being operated.

Based upon measurements conducted by BBA at Squaw Valley, and conversations with ice rink maintenance personnel there, the Zamboni and edger would not be operated simultaneously and the total time required to surface the ice rink would be 15 minutes or less during any one-hour period. For that reason, the 50 dBA hourly Leq threshold of significance would not be exceeded by the Zamboni or the edger, and

noise mitigation *is not* required for the daytime use of the Zamboni or the edger.

Hourly noise levels generated by the Trackless utility vehicle and portable snow blower are difficult to predict because the equipment could operate anywhere within the park. Assuming that the center of activity would be the center of the skating rink, hourly noise levels would be expected to exceed the 50 dBA hourly Leq threshold of significance during extended (more than an hour) periods of snow removal activities. Noise levels from the trackless utility vehicle and portable snow blower would require mitigation.

Mitigation of noise from the Trackless utility vehicle and portable snow blower could be accomplished by either utilizing quieter equipment than was measured for this analysis or by constructing a noise barrier around the perimeter of the park in areas where residential receivers are located. It is unknown whether quieter equipment is commercially available.

The required height of a property line noise barrier to mitigate noise from snow removal activities is significantly affected by the fact that there are second floor outdoor activity areas both to the north and west of the park. Calculations of noise barrier insertion loss indicate that a property line noise barrier 25 feet in height would be required to mitigate noise at the closest second floor outdoor activity areas north of the skating rink when the trackless snow removal equipment is operating in the skating rink area. For the closest second floor outdoor activity areas to the west of the skating rink, a property line noise barrier 19 feet in height would be required for mitigation of noise from the trackless snow removal equipment in the skating rink. Thus, noise from snow removal activities within the skating rink is a significant impact requiring mitigation. Snow removal activities in the parking lot and on walkways leading from the parking lot to the proposed community center are considered emergency work and therefore exempt from the Town's noise standards.

Participant and Spectator Noise Impacts

5.4-4 *The increase in use and activity at Mammoth Creek would result in higher noise levels for residents adjacent to the north and west of the Park due to Park user activities and associated spectator participation.* ***Significance: Potentially Significant Impact. Recommended mitigation measure would reduce impacts to less than significant levels.***

5.4-4 Discussion. The proposed recreation facilities at Mammoth Creek Park includes a volleyball court, horseshoe pit area, picnic area,

climbing wall, basketball court, community center, and the above-described skating rink. All of these facilities would generate noise from persons either participating in or watching the activities associated with the facilities. Of the proposed facilities, only the skating rink would have designated seating (bleachers) for spectators.

Since few spectators were observed during the referenced Squaw Valley noise level measurements, it was necessary to refer to analyses prepared by BBA for a Community Center in Ripon, California and for a recreational park in Shafter, California. Noise levels from both of these facilities were monitored during Little League baseball games where a combination of participant and spectator noise was measured. Based upon those noise measurements, typical noise levels at a reference distance of 200 feet from home plate ranged from 48 to 72 dBA. Some of the baseball players were much closer than 200 feet from the microphone during those measurements. However, maximum noise levels were produced by spectators in bleachers just behind home plate. Two hundred feet is the approximate distance from the center of the skating rink to the closest residential receivers.

The hourly Leq was not specifically measured during the above-described studies, but the Leq *during periods of active play* was 58-59 dBA. The *hourly* Leq would be lower due to the fact that crowd noise is not constant for an extended period of time. Assuming that crowd noise could equal the levels described above for approximately 15 minutes out of the hour Leq would be in the range of 54-55 dBA. Both a maximum noise level of 72 dBA and an estimated hourly Leq of 55 dBA exceed the thresholds of significance identified for the noise analysis for sources containing informational content. Those thresholds are a maximum noise level of 70 dBA and an hourly Leq of 50 dBA during the daytime hours. However, such levels would only be expected to occur occasionally when the bleachers around the skating rink are being used for special events or possibly during volleyball games near the northern boundary of the Park. Participant and spectator noise at other locations around the park would not be expected to produce noise levels in excess of the thresholds of significance identified for this analysis due to smaller crowds and greater setback distances from noise sensitive receptors.

Mitigation of participant and spectator noise around the skating rink may be achieved by constructing the property line noise barriers described in the on-site equipment noise analysis of this Section. Such barriers would also mitigate participant and spectator noise produced in the area where the volleyball court would be located and in the deck area at the south end of the proposed Community Center. Construction of a noise barrier only along the north and west sides of the ice rink area (including the bleachers) is an alternative that would

be effective for noise produced by participants and spectators within the ice rink area, but not for noise sources associated with snow removal or activity on the deck area on the southerly side of the proposed Community Center. It is noted that Mitigation Measure No. 5.4-3c which requires a noise barrier along the perimeter of the park where residential uses are located would also mitigate spectator and participant noise levels to less than significant levels.

Public Address System Noise Impacts

5.4-5 *A public address system may create amplified noise on-site which would impact adjacent sensitive receptors.* ***Significance: Potentially Significant Impact. Mitigation which involves directional speakers would reduce impacts to less than significant levels.***

5.4-5 Discussion. Noise level measurements of a typical PA system in use at an outdoor ice skating rink were conducted by BBA at the Squaw Valley Olympic Ice Pavilion. Noise levels measured at approximately 130 feet from the center of the rink (and the overhead loudspeaker) during normal skating with background music and announcements ranged from 50 to 68 dBA. Projecting those noise levels for a distance of 200 feet from the center of the skating rink, the resulting levels would range from 47 to 64 dBA with an hourly Leq of 59 dBA. An hourly Leq of 59 dBA exceeds the 50 dBA hourly Leq threshold of significance identified for this analysis.

Mitigation of PA system noise could be accomplished by using directional speakers that face away from the closest residential receivers and by setting a limit on the sound levels that may be produced by the system. It is not expected that noise from a properly designed PA system would exceed the 70 dBA maximum noise level threshold of significance identified for the noise analysis.

Simultaneous Park Activities

5.4-6 *Combined activity/operations at the Park would increase ambient noise levels on-site and to the surrounding area.* ***Significance: Potentially Significant Impact. Noise barrier features cited in Mitigation Measure No. 5.4-3c would reduce impacts to less than significant levels.***

5.4-6 Discussion. The foregoing section of this analysis has primarily focused on the noise levels that could be produced by individual components of the project. If the project is constructed, it may be assumed that some activities would likely occur simultaneously, thus increasing overall ambient noise levels in the project area.

The combination of activities that would most likely produce the highest noise levels would be snow removal operations, chiller operation and ice grooming. As previously described, noise levels produced by snow removal equipment could exceed applicable thresholds of significance, and would require mitigation. It is noted that such levels presently occur in the vicinity of the closest residential receivers during periods of snow removal from public and private roadways and parking lots. Such activities are exempt from the noise level limitations of the Town Municipal Code. Chiller noise can be effectively mitigated by a noise enclosure or barrier, and is therefore not considered significant.

The other combination of activities that could produce noise levels exceeding the thresholds of significance applied to this analysis would be the use of the skating rink for events attracting a crowd of spectators. Under this condition, noise could be produced simultaneously by the crowd (and participants), by the PA system and by the chiller. As previously described, chiller, PA system and crowd noise may be effectively mitigated through proper design and/or the use of enclosures or noise barriers.

Although the community center may be constructed at a later date than the other park facilities described by this analysis, it could provide substantial acoustical shielding of skating rink activities for residential uses located near the northwest corner of the park. However, if the Community Center building is used as a substitute for the property line noise barriers previously described, the deck at the south end of the community center may require a noise barrier on the west side. The best way to provide the required mitigation would be to connect the Community Center building with the property line noise barrier required for mitigation of noise from snow removal and crowd noise in the skating rink area.

CUMULATIVE NOISE IMPACTS

5.6-7 *The proposed project, combined with cumulative projects, would increase the ambient noise levels in the site vicinity.* ***Significance: Potentially Significant Impact. Impact analysis and mitigation determination evaluated on a project-by-project basis.***

5.6-7 Discussion. Implementation of the proposed project, combined with development of cumulative projects, would increase ambient noise levels in the site vicinity. This increase would be due to both vehicular traffic noise along local roadways and stationary noise sources associated with development. The evaluation of noise impacts is typically determined on a project-by-project basis in order to focus

mitigation on a particular noise source. It is also noted that the Town General Plan EIR did include an evaluation of noise impacts resulting from General Plan buildout.

MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements included in the analysis section.

5.4-1 No mitigation measures are required.

5.4-2 No mitigation measures are required.

5.4-3a An enclosure or other form of noise barrier shall be constructed around the west and north sides of the chiller unit.

5.4-3b The chiller unit shall not be operated between the hours of 10:00 p.m. and 7:00 a.m.

5.4-3c A noise barrier consisting of 25 feet in height along the northern perimeter property line and 19 feet in height along the west property line shall be constructed in areas where residential receivers are located.

5.4-4 Refer to Mitigation Measure No. 5.4-3c.

5.4-5 Directional speakers shall be installed in a direction which is away from adjacent residents.

5.4-6 Refer to Mitigation Measure No. 5.4-3c.

5.4-7 No mitigation measures are required.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Implementation of the recommended mitigation measures would reduce potential land use impacts to a less than significant level.

Should Mitigation Measure No. 5.4-3c be deleted, the proposed project would result in significant noise impacts associated with snow removal equipment, spectator and participant activity at the skating rink and activity at the volleyball court, thereby creating a significant and unavoidable impact. If the Town of Mammoth Lakes approves the project with the deletion of Mitigation Measure No. 5.4-3c, the Town shall be required to cite their findings in accordance with Section

15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.