# Homewood Mountain Resort Development Water, Gas, and Electric Energy Use Projection

For: Homewood Mountain Resort 5145 West Lake Boulevard Homewood, California 96143



By:

Beaudin Ganze Consulting Engineers, Inc. 11430 Deerfield Dr, Suite B5 Truckee, CA 96161 October 30, 2007 Homewood Mountain Resort Development Water, Gas, and Electric Energy Use Projection October 30, 2007 Page 4

- c) Mid Mountain Facility: 150 DFU, 80 GPM
- d) Development Total: 6,900 DFU, 1,650 GPM
- 2. In addition to the sewage flow demand created by the building development, parking drainage and pool backwash may also create additional sanitary sewer flow. These additional flows are assumed to be negligible compared to the rest of the project.

### B. Sanitary Sewage Discharge

- 1. The daily sanitary sewer flow will be near the daily building cold water usage as detailed above.
  - a) North Base: 44,700 GPD
  - b) South Base: 22,000 GPD
  - e) Mid Mountain Facility: 3,750 GPD
  - d) Development Total: 70,400 GPD

#### IV. Gas

## A. Demand Estimation:

- 1. Likely sources of gas consumption will be appliances, space heating, water heating, Pool heating, Ventilation air, and snowmelt. To predict the project gas demand we considered each one of these items separately for each of the resort areas.

  Appendix D summarizes each of the expected demands. Gas demand analysis assumed the following:
  - a) Gas appliance quantities are as shown in Appendix A. Appliance consumption rates are as recommended by the 2001 CPC.
  - b) Space peak heating gas consumption rate is 18 Btuh/sq.ft.
  - c) Water peak heating gas consumption rate is 12 Btuh/sq.ft.
  - d) Pool Heating gas consumption is based on uncovered, winter-time use.
  - e) Snowmelt areas were assumed to be 6,000 sq.ft. prorated by square footage to various parts of the development. Energy input rate to snowmelt systems is assumed to be 200 Btuh/sq.ft.
  - f) Appliance and Altitude Combustion efficiencies of 80%.
  - g) 10% safety factor
- 2. Our results for gas demand are as follows:
  - a) North Base -83,400 MBH
  - b) South Base 83,000 MBH

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- c) Mid Mountain Facility 3,300 MBH
- d) Development Total 154,000 MBH

## B. Usage Estimation

- 1. In order to estimate annual consumption of gas a month by month analysis was completed for each gas use in each part of the development (Appendix E). In this analysis the following was used:
  - a) Annual heating degree data from the state of California for the town of Tahoe City, CA to determine monthly gas consumption for space heating.
  - b) Hours of appliance operation per month as shown in Appendix E.
  - c) 50% of the daily water usage was assumed to be hot water.
  - d) The mid-mountain building will not be operated during the summer months.
- 2. The Annual gas consumption is summarized here:
  - a) North Base: 632,000 therms.
  - b) South Base: 402,000 therms.
  - c) Mid Mountain Facility: 30,500 therms.
  - d) Development Total: 1,064,000 therms.

#### V. Electricity

#### A. Demand Estimation

- 1. Industry standard data for watts/sq.ft. were applied to each area on the project to calculate the expected electrical demand. Appendix F shows the load in each respective area of the project. Our study has estimated the following electrical demand for each building area on the project:
  - a) North Base 9.02 Megawatts(MW)
  - b) South Base -6.8 MW
  - c) Mid-mountain 250 kW
  - d) Development total 16 MW
- 2. Existing electrical demand data for the past two years was obtained from the utility company. The maximum site demand over the past couple of years was 1.6 MW. Most of this demand was due to ski lift operation. This 1.6 MW will still occur in addition to the building demands mentioned above.

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## B. Electrical Usage

- 1. Industry standard data for annual kWh/sq.ft. were applied to each area on the project to calculate the expected electrical demand. Appendix G shows the load in each respective area of the project. Our study has estimated the following electrical usage for each building area on the project:
  - a) North Base -14,417,000 kWh
  - b) South Base -6,528,000 kWh
  - c) Mid-mountain 741,000 kWh
  - d) Development total 43,374,000 kWh
- 2. Existing electrical usage data for the past two years was obtained from the utility company. The average annual resort energy usage was 1,220,000kWh. Again, we attribute most of this usage to ski lift operation. This usage will occur in addition to the building usages mentioned above.

## C. On-site generation study

- 1. BGCE, Inc. completed an alternative energy study for micro-hydro turbine power systems on the mountain streams. We estimated the Madden and Ellis Creek systems could generate 589,000 kWh during three months of operation. This amount of power is estimated to be 1.4% of the developed resort's annual energy usage. This may seem trivial, but the annual power requirements of the eleven, 5,000 sq.ft. single family homes is estimated to be 856,000kWh. Therefore, just by operating three months a year, the Madden and Ellis systems could provide 68% of the annual electrical energy consumption for the eleven new homes.
- 2. Other potential uses of energy include, but are not limited to, the following:
  - a) Homewood's renovation plan, by 2017, will have chairlifts requiring approximately 1,850 kW when running at full capacity. It is estimated that Homewood Mountain Resort demands 11,100 kWh per day to run all the chairlifts at full capacity. That being said, the proposed micro-hydro turbine generation systems could generate enough energy in a year to power all chairlifts at Homewood Mountain Resort for 53 days.

Daily Water Use I	Based on 1997	UPC Recommend	ded Values		
	Quantity	Approx area (sq.ft)	GPD/Unit	Quantity	Total GPD
North Base					
Hotel Building					
Standard King Guest Room	34	572	30		1020
Double Queen Guestroom	12	609	30		360
Executive Suite Guestroom	2	1144	30		60
Presidential Suite Guestroom	2	1716	30		60
One Bedroom Suites (Sold)	40	1144	30		1200
One Bedroom Lockoff (Sold)	40	572	30		1200
F&B (Bar and Restaurant)	1	4980	10/meal	200*	2000
Function Space	1	4487	25/person	100**	2500
Lobby Areas	1	2001	.1/sq.ft.		200.1
Retail Areas	1	2581	.1/sq.ft.		258
Fitness/Spa Area	1	12001	50/person	50**	2500
Food and Bev BOH	1	3930	25/person	20**	500
Function Support	1	755	25/person	20**	750
Employee Facilities	1	2765	10/person	50	500
Housekeeping/Laundry	1	4135	50/washing	150***	7500
Boh circulation	1	4376	25/person	10**	250
Condos	1	7370	20/06/30/1	10	200
One Bedroom Units	10	1100	30		300
Two Bedroom Units	36	1650	60		2160
Three Bedroom Units	20	2200	90		1800
Four Bedroom Units	6	2750	120		720
North Common Areas	1	32597	.1/ft^2		3259.7
North Base Skier Services	1	41596	0.1/sq.ft		4160
North Base Retail	1	25000	•		2500
North Base Retail	1	25000	0.1/sq.ft.		<b>35758</b>
North Base Total:					35/50
South Base					
South Base Residential					
One Bedroom Units	16	1100	30		480
Two Bedroom Units	48	1650	60		2880
Three Bedroom Units	38	2200	90		3420
Four Bedroom Units	18	2750	120		2160
Single Family Homes	11	5000	90		990
Managers housing	1	1500	42		42
Assisstant Manager housing	1	1200	42		42
Employee Apartments	20	850	42		840
South Base common area	1	57331	.1/ft^2		5733
South Base skier Services (incl 2000 kitchen)	1	4420	10/meal	100**	1000
South Base Total:	1	7720	Torrical	100	17587
Journ Buse Fotal.					17007
Mid mountain Facility					
Maintenance Area	1	7830			0
Lodge Areas (incl 1800 kitchen)	1	7000	10/meal	300**	3000
Circulation	1	2886	0	-	0
Mechanical	1	200	0		0
Mid Mountain Total:	-		-		3000
25% Future/Safety					14086
Mountain Total:					70431

<sup>\*</sup>Estimated number of meals per day

<sup>\*\*</sup>Estimated Occupancy
\*\*\*Usage based on estimated laundyr cycles daily