APPENDIX B – AIR QUALITY

Association of Monterey Bay Area Governments (AMBAG). Consistency Letter. December 29, 2005

Ambient Air Quality and Noise Consulting. Carbon Monoxide Modeling.

PMC. Urbemis 2007 Modeling. - Estimated Construction Emissions.

AMBAG
ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS

December 29, 2005

Pamela Lapham
Assistant Planner
Pacific Municipal Consultants
585 Cannery Row, Suite 304
Monterey, CA 93940

Dear Ms. Lapham:

This letter is in response to your September 22, 2005 request for a determination of consistency of the Harper Canyon Subdivision with the *Air Quality Management Plan for the Monterey Bay Region* (AQMP).

Consistency of housing projects with the AQMP is analyzed by comparing the total potential population growth facilitated by the project with the forecasted growth for Monterey County. The *2004 Population, Housing Unit, and Employment Forecasts* adopted by the AMBAG Board of Directors on April 14, 2004 are the forecasts used for this consistency determination.

AMBAG staff surveyed each jurisdiction in Monterey County to determine the number of housing units that jurisdictions have approved but have not yet received a building permit. The total number of units is 8,395. Building permit data was also collected. A total of 1,067 housing units have received building permits between January and October 2005. The California Department of Finance estimates there are 138,314 dwelling units in Monterey County as of 1/01/05. Combined, there are 147,776 existing, approved, and or permitted housing units in Monterey County.

The Harper Canyon Subdivision consists of a total of 17 residential units. Occupancy of the housing units is estimated to take place by 2010. The *2004 Population, Housing Unit, and Employment Forecast* forecasts there will be 151,844 housing units in Monterey County by the year 2010.

The combination of the existing and approved housing units in Monterey County (147,776) plus the 17 housing units in the Harper Canyon Subdivision is less then the regional forecasts for Monterey County (151,844.) Therefore the Harper Canyon Subdivision is **consistent** with the 2004 regional forecasts and the Air Quality Management Plan.

Please feel free to contact me if you have any questions about this determination.

Sincerely,

Todd Muck

Todd Muck, AICP
Senior Transportation Planner

cc: Jean Getchell, MBUAPCD

Carbon Monoxide Modeling

PREDICTED CO CONCENTRATIONS
INTERSECTION: HWY 68 & CORRAL DE TIERRA RD

BACKGROUND 1-HR:	2.8	(Highest Measured, Salinas Monitoring Station 2003-2005)
BACKGROUND 8-HR:	1.4	(Highest Measured, Salinas Monitoring Station 2003-2005)
MOBILE-SOURCE CONC 1-HR:	1.4	(~3m roadway edge, SE/SW Quadrants)
MOBILE-SOURCE CONC 8-HR:	1.3	(~7m roadway edge, SE/SW Quadrants)

		CAAQS	EXCEEDS
TOTAL (BACKGROUND+MOBILE) 1-HR:	4.2	20	NO
TOTAL (BACKGROUND+MOBILE) 8-HR:	2.7	9	NO

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1
JOB: 168&CorralDeT
RUN: Hour 1
POLLUTANT: Carbon Monoxide
I. SITE VARIABLES
U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= .0 DEGREES VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 10. DEGREES TEMP= 4.0 DEGREE (C)
II. LINK VARIABLES

LINK DESCRIPTION	* LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. 168EBAPEX	* ***** ***** ***** *****				AG	1487	7.5	.0	22.8
B. 168EBAPIN	* ***** ***** ***** *****				AG	1487	12.0	.0	22.8
C. 168EBDPIN	* ***** ***** ***** *****				AG	1530	9.9	.0	22.8
D. 168EBDPEX	* ***** ***** ***** *****				AG	1530	7.5	.0	22.8
E. 168WBAPEX	* ***** ***** ***** *****				AG	1298	7.5	.0	22.8
F. 168WBAPIN	* ***** ***** ***** *****				AG	1298	12.0	.0	22.8
G. 168WBDPIN	* ***** ***** ***** *****				AG	1220	9.9	.0	22.8
H. 168WBDPEX	* ***** ***** ***** *****				AG	1220	7.5	.0	22.8
I. CORNBEXT	* ***** ***** ***** *****				AG	244	7.5	.0	22.8
J. CORNBIN	* ***** ***** ***** *****				AG	244	8.5	.0	22.8
K. CORSBIN	* ***** ***** ***** *****				AG	279	8.5	.0	22.8
L. CORSBEXT	* ***** ***** ***** *****				AG	279	7.5	.0	22.8

III. RECEPTOR LOCATIONS

RECEPTOR	* COORDINATES (M) X	Y	Z
1. Recpt 1	* 613850	******	1.8
2. Recpt 2	* 613846	******	1.8
3. Recpt 3	* 613873	******	1.8
4. Recpt 4	* 613877	******	1.8

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2
JOB: 168&CorralDeT
RUN: Hour 1
POLLUTANT: Carbon Monoxide
IV. MODEL RESULTS (PRED. CONC. INCLUDES AMB.)

RECEPTOR	* PRED CONC (PPM)	* CONC/LINK (PPM) A	B	C	D	E	F	G	H	I	J
1. Recpt 1	* 1.3	* .0	.0	.6	.0	.0	.0	.6	.0	.0	.0

Carbon Monoxide Modeling

2. Recpt 2	1.4	.0	.8	.1	.0	.0	.0	.5	.0	.0	.0
3. Recpt 3	1.3	.0	.0	.7	.0	.0	.0	.6	.0	.0	.0
4. Recpt 4	1.3	.0	.0	.8	.0	.0	.0	.5	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) K	L
1. Recpt 1	.0	.0
2. Recpt 2	.0	.0
3. Recpt 3	.0	.0
4. Recpt 4	.0	.0

Carbon Monoxide Modeling

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Hwy 68 Roadway Segment
RUN: Hour 1
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	.0 PPM		
SIGTH=	10. DEGREES	TEMP=	15.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF* (G/MI)	H (M)	W (M)
A. Link A	*****	*****	*****	*****	AG	1838	6.2	.0	13.3
B. Link B	*****	*****	*****	*****	AG	1838	6.2	.0	13.3
C. Link C	*****	*****	*****	*****	AG	1838	6.2	.0	13.3
D. Link D	*****	*****	*****	*****	AG	1838	6.2	.0	13.3
E. Link E	*****	*****	*****	*****	AG	1838	6.2	.0	13.3
F. Link F	*****	*****	*****	*****	AG	1838	6.2	.0	13.3

*DERIVED FROM EMFAC2002,YR2006,WINTER CONDITIONS,50 DEG.CENT,
BASED ON HIGHEST E.F. FOR SPEED RANGE 35-60 MPH.

III. RECEPTOR LOCATIONS (AT APPROXIMATELY 50 METERS FROM ROADWAY)

RECEPTOR	COORDINATES (M) X	Y	Z
1. Recpt 1	606304	******	1.8
2. Recpt 2	605375	******	1.8
3. Recpt 3	605301	******	1.8
4. Recpt 4	605092	******	1.8
5. Recpt 5	604997	******	1.8
6. Recpt 6	606230	******	1.8

IV. MODEL RESULTS (PRED. CONC.)

RECEPTOR	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F
1. Recpt 1	.3	.0	.0	.0	.0	.0	.3
2. Recpt 2	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	.2	.0	.0	.2	.0	.0	.0
4. Recpt 4	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	.3	.0	.3	.0	.0	.0	.0
6. Recpt 6	.0	.0	.0	.0	.0	.0	.0

Carbon Monoxide Modeling

MAXIMUM PRED 1-HR ROADWAY CO CONCENTRATION AT RECEPTOR (PPM): 0.3
MAXIMUM AMBIENT 1-HOUR CO CONCENTRATION: 2.8
TOTAL WORST-CASE 1-HR CO CONCENTRATION (PPM): 3.1
CALIFORNIA AMBIENT AIR QUALITY STANDARD (PPM): 20

MAXIMUM PRED 8-HR ROADWAY CO CONCENTRATION AT RECEPTOR (PPM): 0.2
MAXIMUM AMBIENT 8-HOUR CO CONCENTRATION: 1.2
TOTAL WORST-CASE 8-HR CO CONCENTRATION (PPM): 1.4
CALIFORNIA AMBIENT AIR QUALITY STANDARD (PPM): 9.0

Urbemis 2007 Version 9.2.4

Summary Report for Summer Emissions (Pounds/Day)

File Name:

Project Name: Harper Ranch Construction Emissiosn

Project Location: Monterey County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

CONSTRUCTION EMISSION ESTIMATES

	CO2
007 TOTALS (lbs/day unmitigated)	17,457.25
008 TOTALS (lbs/day unmitigated)	20,013.43

AREA SOURCE EMISSION ESTIMATES

	CO2
TOTALS (lbs/day, unmitigated)	273.15

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	CO2
TOTALS (lbs/day, unmitigated)	1,677.78

9/19/2008 1:32:18 PM

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	CO2
TOTALS (lbs/day, unmitigated)	1,950.93

12/19/2007 2:40:05 PM

Urbemis 2007 Version 9.2.2

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\lmonreal\Application Data\Urbemis\Version9a\Projects\Harper Canyon.urb9

Project Name: Harper Canyon

Project Location: Monterey Bay Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.02	0.21	0.09	0.00	0.00	0.00	271.93
Hearth - No Summer Emissions							
Landscape	0.14	0.01	0.79	0.00	0.00	0.00	1.21
Consumer Products	0.83						
Architectural Coatings	0.14						
TOTALS (lbs/day, unmitigated)	1.13	0.22	0.88	0.00	0.00	0.00	273.14

12/19/2007 2:40:05 PM

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.02	0.21	0.09	0.00	0.00	0.00	271.93
Hearth - No Summer Emissions							
Landscape	0.14	0.01	0.79	0.00	0.00	0.00	1.21
Consumer Products	0.83						
Architectural Coatings	0.14						
TOTALS (lbs/day, mitigated)	1.13	0.22	0.88	0.00	0.00	0.00	273.14

Area Source Changes to Defaults

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	2.34	3.60	27.06	0.02	3.04	0.61	1,689.13
TOTALS (lbs/day, unmitigated)	2.34	3.60	27.06	0.02	3.04	0.61	1,689.13

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2009 Temperature (F): 70 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	164.00	11.55	dwelling units	17.00	196.35	1,740.11
					196.35	1,740.11

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	49.0	2.0	97.6	0.4
Light Truck < 3750 lbs	10.9	3.7	90.8	5.5
Light Truck 3751-5750 lbs	21.7	0.9	98.6	0.5
Med Truck 5751-8500 lbs	9.5	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	1.6	0.0	75.0	25.0
Lite-Heavy Truck 10,001-14,000 lbs	0.6	0.0	50.0	50.0
Med-Heavy Truck 14,001-33,000 lbs	1.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.9	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	3.5	77.1	22.9	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.0	10.0	80.0	10.0

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Rural Trip Length (miles)	11.8	8.3	7.1	11.8	4.4	4.4
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			

% of Trips - Commercial (by land use)

Estimated GHG Emissions CH4 N20
GHG Inventory

Year	Vehicle Class	Net VMT (per day)	N2O factor (g/mile)	CH4 factor (g/mile)	N2O (lb/day)	CH4 (lb/day)	N2O (tons/year)	CH4 (tons/year)
2010	Light Duty Auto (Gasoline)	46,519	0.0079	0.0147	**0.81**	**1.51**	0.148	0.275
	Light Duty Auto (Diesel)	93	0.001	0.0005	**0.00**	**0.00**	0.000	0.000
	Light Duty Truck (Gasoline < 3	12,140	0.0101	0.0157	**0.27**	**0.42**	0.049	0.077
	Light Duty Truck (Diesel< 3,75(	1,084	0.0015	0.001	**0.00**	**0.00**	0.001	0.000
	Light Duty Truck (Gasoline 3,7	22,434	0.0101	0.0157	**0.50**	**0.78**	0.091	0.142
	Light Duty Truck (Diesel 3,751-	113	0.0015	0.001	**0.00**	**0.00**	0.000	0.000
	Medium Duty Trucks (Gasolin(	12,791	0.0177	0.0326	**0.50**	**0.92**	0.091	0.168
	Medium Duty Trucks (Diesel)	-	0.0048	0.0051	**0.00**	**0.00**	0.000	0.000
	Light-Heavy Duty Trucks (Gas(	1,951	0.0177	0.0326	**0.08**	**0.14**	0.014	0.026
	Light-Heavy Duty Trucks Diese	759	0.0048	0.0051	**0.01**	**0.01**	0.001	0.002
	Light-Heavy Duty Trucks (Gas(	433	0.0177	0.0326	**0.02**	**0.03**	0.003	0.006
	Light-Heavy Duty Trucks Disel:	542	0.0048	0.0051	**0.01**	**0.01**	0.001	0.001
	Medium-Heavy Duty Trucks ((	217	0.0177	0.0326	**0.01**	**0.02**	0.002	0.003
	Medium-Heavy Duty Trucks D	1,301	0.0048	0.0051	**0.01**	**0.01**	0.003	0.003
	Heavy-Heavy Duty Trucks (Gc	-	0.0177	0.0326	**0.00**	**0.00**	0.000	0.000
	Heavy-Heavy Duty Trucks Die:	1,843	0.0048	0.0051	**0.02**	**0.02**	0.004	0.004
	Other Bus (Diesel)	108	0.0177	0.0326	**0.00**	**0.01**	0.001	0.001
	Urban Bus	-	0.0177	0.0326	**0.00**	**0.00**	0.000	0.000
	Motorcycle (Gasoline)	4,770	0.0177	0.0326	**0.19**	**0.34**	0.034	0.063
	School Bus (Diesel)	108	0.0048	0.0051	**0.00**	**0.00**	0.000	0.000
	Motor Home (Gasoline)	1,084	0.0177	0.0326	**0.04**	**0.08**	0.008	0.014
	Motor Home (Diesel)	109	0.0048	0.0051	**0.00**	**0.00**	0.000	0.000
	TOTAL	**108,400**			**2.46**	**4.29**	0.450	0.783

Estimated GHG Emissions
Vehicle Fleet Data

Vehicle Class	Percent of Vehic	Percent of Duty C	Weighted Percer	Net Vehicle Trips	Net VMT (per da
Light Duty Auto (Gasoline)	43.0%	99.8%	42.9%	84	747
Light Duty Auto (Diesel)	43.0%	0.2%	0.1%	0	1
Light Duty Truck (Gasoline < 3,750 GVW)	12.2%	91.8%	11.2%	22	195
Light Duty Truck (Diesel< 3,750 GVW)	12.2%	8.2%	1.0%	2	17
Light Duty Truck (Gasoline 3,751=5,750 GVV	20.8%	99.5%	20.7%	41	360
Light Duty Truck (Diesel 3,751-5,750 GVW)	20.8%	0.5%	0.1%	0	2
Medium Duty Trucks (Gasoline)	11.8%	100.0%	11.8%	23	205
Medium Duty Trucks (Diesel)	11.8%	0.0%	0.0%	-	-
Light-Heavy Duty Trucks (Gasoline: 8,500-10	2.5%	72.0%	1.8%	4	31
Light-Heavy Duty Trucks Diesel: 8,500-10,00(	2.5%	28.0%	0.7%	1	12
Light-Heavy Duty Trucks (Gasoline: 10,001-1	0.9%	44.4%	0.4%	1	7
Light-Heavy Duty Trucks Disel: 10,001-14,00(	0.9%	55.6%	0.5%	1	9
Medium-Heavy Duty Trucks (Gasoline: 14,0(	1.4%	14.3%	0.2%	0	3
Medium-Heavy Duty Trucks Diesel: 14,001-3	1.4%	85.7%	1.2%	2	21
Heavy-Heavy Duty Trucks (Gasoline: 33,001	1.7%	0.0%	0.0%	-	-
Heavy-Heavy Duty Trucks Diesel: 33,001-60,(	1.7%	100.0%	1.7%	3	30
Other Bus (Diesel)	0.1%	100.0%	0.1%	0	2
Urban Bus	0.0%	0.0%	0.0%	-	-
Motorcycle (Gasoline)	4.4%	100.0%	4.4%	9	77
School Bus (Diesel)	0.1%	100.0%	0.1%	0	2
Motor Home (Gasoline)	1.1%	90.9%	1.0%	2	17
Motor Home (Diesel)	1.1%	9.1%	0.1%	0	2
TOTAL	**100.0%**		**100.0%**	**196**	**1,740**

Esitmated GHG Emissions
GHG Factors

Default CH4 and N2O Emission Factors for Highway Vehicles by Model Year*

Gasoline Passenger Cars

Model Year	N2O (g/mi)	CH4 (g/mi)
1984-1993	0.0647	0.0704
1994	0.0560	0.0531
1995	0.0473	0.0358
1996	0.0426	0.0272
1997	0.0422	0.0268
1998	0.0393	0.0249
1999	0.0337	0.0216
2000	0.0273	0.0178
2001	0.0158	0.0110
2002	0.0153	0.0107
2003	0.0135	0.0114
2004	0.0083	0.0145
2005	0.0079	0.0147

Gasoline Light Trucks (Vans, Pickup Trucks, SUVs)

Model Year	N2O (g/mi)	CH4 (g/mi)
1987-1993	0.1035	0.0813
1994	0.0982	0.0646
1995	0.0908	0.0517
1996	0.0871	0.0452
1997	0.0871	0.0452
1998	0.0728	0.0391
1999	0.0564	0.0321
2000	0.0621	0.0346
2001	0.0164	0.0151
2002	0.0228	0.0178
2003	0.0114	0.0155
2004	0.0132	0.0152
2005	0.0101	0.0157

Esitmated GHG Emissions
GHG Factors

Gasoline Heavy-Duty Vehicles

Model Year	N2O (g/mi)	CH4 (g/mi)
1985-1986	0.0515	0.4090
1987	0.0849	0.3675
1988-1989	0.0933	0.3492
1990-1995	0.1142	0.3246
1996	0.1680	0.1278
1997	0.1726	0.0924
1998	0.1693	0.0641
1999	0.1435	0.0578
2000	0.1092	0.0493
2001	0.1235	0.0528
2002	0.1307	0.0546
2003	0.1240	0.0533
2004	0.0285	0.0341
2005	0.0177	0.0326

Diesel Passenger Cars

Model Year	N2O (g/mi)	CH4 (g/mi)
1960-1982	0.0012	0.0006
1983-2004	0.0010	0.0005

Diesel Light Trucks

Model Year	N2O (g/mi)	CH4 (g/mi)
1960-1982	0.0017	0.0011
1983-1995	0.0014	0.0009
1996-2004	0.0015	0.0010

Diesel Heavy-Duty Vehicles

Model Year	N2O (g/mi)	CH4 (g/mi)
All	0.0048	0.0051

Esitmated GHG Emissions
GHG Factors

Source: Gasoline vehicle factors from EPA Climate Leaders, Mobile Combustion Guidance, (2007) based on U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (2007). Diesel vehicle factors based on U.S. EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005 (2007), Annex 3.2, Table A-98.

* Currently, CCAR's General Reporting Protocol Version 3.0 (April 2008) uses different CH4 and N2O emission factors. CCAR will be replacing the current CH4 and N2O emission factors with these emission factors in the next version of its GRP. CCAR members are encouraged to use these emission factors for consistency with The Climate Registry and this Protocol.