The majority of annual rainfall in the air basin occurs between the months of November and April. Summer rainfall is minimal and generally limited to scattered thundershowers in coastal regions and slightly heavier showers in the eastern portion of the basin and along the coastal side of the mountains. Annual average rainfall at the Torrance station varies from over three inches during the month of January to less than one inch between May and October. Moreover, monthly and yearly rainfall totals are extremely variable. At the Torrance monitoring station, the annual average rainfall (determined from the past 60 years) is 13 inches compared with the actual rainfall of six inches during all of 1990.

Even though the South Coast Air Basin has a semi-arid climate, the air near the surface is generally moist because of the presence of a shallow marine layer. With very low average wind speeds, there is a limited capacity to disperse air contaminants horizontally. Downtown Los Angeles wind speed averages 5.7 miles per hour with little seasonal variation; wind speeds average slightly higher in the summertime than during the winter. Inland areas have slightly lower wind speeds than Downtown Los Angeles, while coastal wind speeds average about two miles per hour higher. The dominant daily wind pattern is an onshore daytime breeze and an offshore night-time breeze. The typical wind flow pattern fluctuates only with occasional winter storms or strong northeasterly Santa Ana winds from the mountains and deserts north of the SoCAB. Figure 43 shows the predominant wind flow pattern for the region.

During spring and early summer, pollution produced during any one day is typically blown out of the air basin through the mountain passes or lifted by warm, vertical currents adjacent to mountain slopes. Air contaminants can be transported sixty miles or more from the air basin by ocean air during the afternoons. From early fall to winter, the transport is less pronounced because of slower wind speeds and the appearance of drainage winds earlier in the day. During stagnant wind conditions, offshore drainage winds may begin by the late afternoon. Pollutants remaining in the air basin are trapped and begin to accumulate during the night and the following morning. A low morning wind speed in pollutant source areas is an important indicator of air stagnation and the build-up potential for primary air contaminants.

With persistent low inversions and cool coastal air, morning fog and low stratus clouds are common. However, 73% of possible sunshine is recorded in Downtown Los Angeles. This is an extremely important climatological factor considering the role of sunshine in the photochemical smog production process. Cloudy days are less likely in the eastern portions of the air basin and about twenty-five percent greater along the coast.

PREDOMINANT WIND FLOW PATTERN

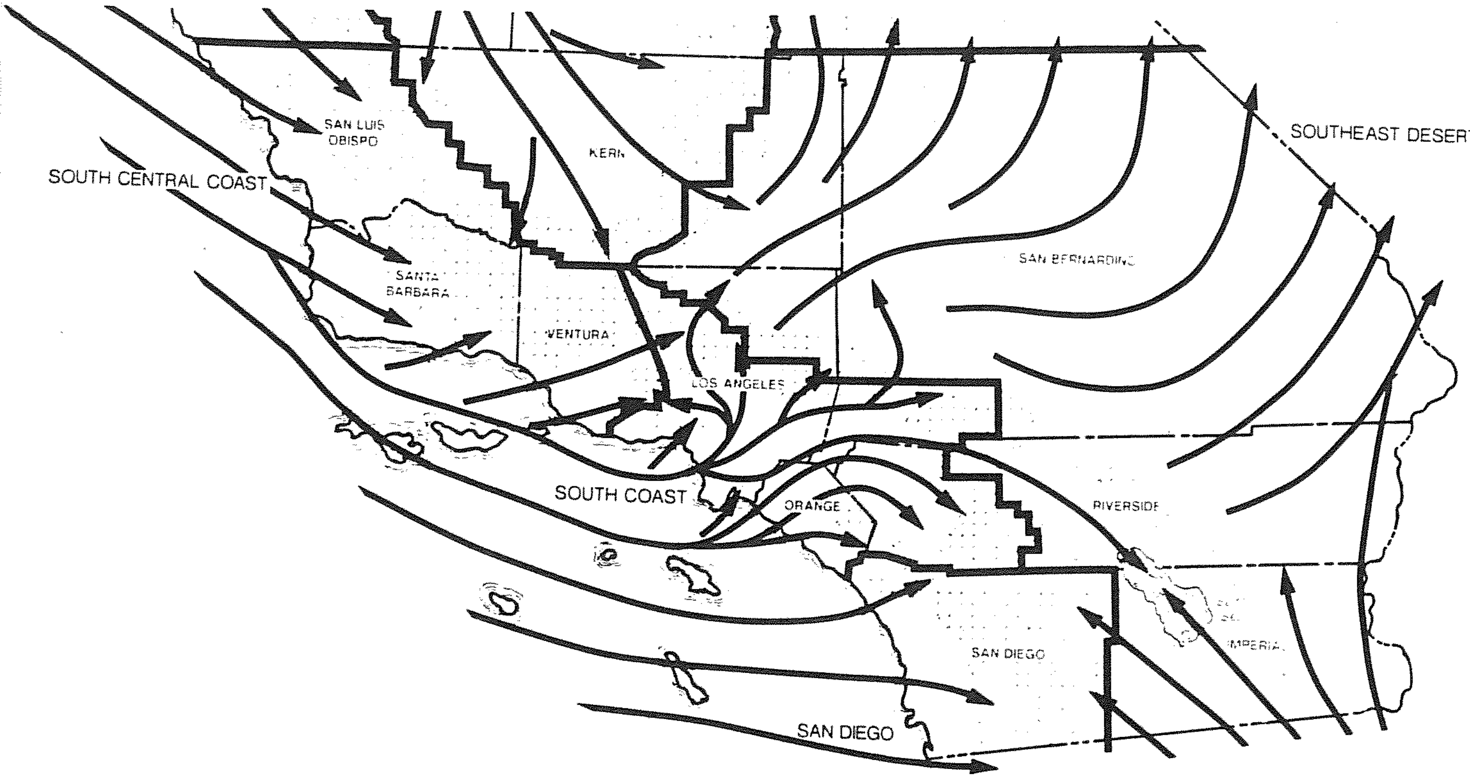

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TABLE 13
AMBIENT AIR QUALITY STANDARDS

Air Pollutant	CALIFORNIA Concentration	FEDERAL Primary (>)	FEDERAL Secondary (>)
Ozone	0.09 ppm, 1-hr. avg. >	0.12 ppm, 1-hr. avg.	0.12 ppm, 1-hr. avg.
Carbon Monoxide	9.0 ppm, 8-hr. avg. >[a] 20 ppm, 1-hr. avg. >	9 ppm, 8-hr. avg.[b] 35 ppm, 1-hr. avg. >	9 ppm, 8-hr. avg 35 ppm, 1-hr. avg. >
Nitrogen Dioxide	0.25 ppm, 1-hr. avg. >[c]	0.053 ppm, annual avg.[d]	0.053 ppm, annual avg. [d]
Sulfur Dioxide	0.05 ppm, 24-hr. avg.>=with ozone>=0.10 ppm, 1-hr. avg. or TSP >= 100 ug/m^3, 24-hr. avg. 0.25 ppm, 1-hr. avg.>[e]	0.03 ppm, annual avg. 0.14 ppm, 24-hr. avg.	0.50 ppm, 3-hr. avg.
Suspended Particulate Matter (PM 10)	30 ug/m^3, annual geometric mean > 50 ug/m^3, 24-hr. avg. >[f]	50 ug/m^3, annual[g] arithmetic mean 150 ug/m^3, 24-hr. avg.	50 ug/m^3, annual [g] arithmetic mean 150 ug/m^3, 24-hr. avg.
Sulfates	25 ug/m^3, 24-hr. avg. >=		
Lead	1.5 ug/m^3, 30-day avg. >=	1.5 ug/m^3, calendar quarter	1.5 ug/m^3, calendar quarter
Hydrogen Sulfide	0.03 ppm., 1-hr. avg. >=		
Vinyl Chloride	0.010 ppm, 24-hr. avg. >=		
Visibility Reducing Particles	In sufficient amount to reduce the visual range to less than 10 miles at relative humidity less than 70%, 8-hr. avg. (9am-5pm)[h]		

[a] Effective December 15, 1982. The standards were previously 10 ppm, 12-hour average and 40 ppm, 1-hour average.
[b] Effective September 13, 1985, standard changed from > 10 mg/m^3 (>= 9.3 ppm) to > 9 ppm (>= 9.5 ppm).
[c] Effective March 9, 1987, standard changed from >= .25 ppm to > .25 ppm.
[d] Effective July 1, 1985, standard changed from > 100 ug/m^3 (> .0532 ppm) to > .053 ppm (> .0534 ppm).
[e] Effective October 5, 1984. The standard was previously .5 ppm, 1-hour average.
[f] Effective August 19, 1983. The standards were previously 60 ug/m^3 TSP, annual geometric mean, and 100 ug/m^3 TSP, 24-hour average.
[g] Effective July 1, 1987. The standards were previously: Primary- Annual geometric mean TSP > 75 ug/m^3, and a 24-hour average TSP > 260 ug/m^3. Secondary- Annual geometric mean TSP > 60 ug/m^3, and a 24-hour average TSP > 150 ug/m^3.
[h] Effective October 18, 1989. The standard was previously "In sufficient amount to reduce the prevailing visibility to less than 10 miles at relative humidity less than 70%, 1 observation", and was based on human observation rather than instrumental measurement.

SOURCE: South Coast Air Quality Management District, April 1991.

The vertical dispersion of air pollutants in the South Coast Air Basin is limited by temperature inversions in the atmosphere close to the earth's surface. Temperature normally decreases with altitude and a reversal of this atmospheric state, where temperature increases with altitude, is called an inversion. The height from the earth to the inversion base is known as the mixing height.

Inversions are generally lower in the nighttime when the ground is cool than during the daylight hours when the sun warms the ground and in turn, the surface air layer. As this heating process continues, the temperature of the surface air layer approaches the temperature of the inversion base causing heating along its lower edge. If enough warming takes place, the inversion layer becomes weak and opens up to allow the surface air layers to mix upward. This can be seen in the middle to late afternoon on a hot summer day when the smog appears to clear up suddenly. Winter inversions typically break earlier in the day, preventing excessive contaminant build-up.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high winds speeds, ambient air pollutant concentrations are lowest. During periods of low inversions and low wind speeds, air pollutants generated in urbanized areas are transported predominantly onshore through the Santa Ana Canyon, into Riverside County and San Bernardino County. In the winter, the greatest pollution problems are carbon monoxide and oxides of nitrogen because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen to form photochemical smog.

Air Quality Setting

Both the State of California and the Federal Government have established health based standards for six air pollutants. As shown in Table 13, these pollutants include carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, lead and fine particulate matter (PM_{10}). In addition, the state has set standards for ethylene, hydrogen sulfide, sulfate, visibility and vinyl chloride. These standards are designed to protect the health and welfare of the populous with a reasonable margin of safety.

In addition to primary and secondary air pollution standards, the State of California has established a set of episode criteria for carbon monoxide, NO_2, SO_2 and particulate matter (see Appendix D). These criteria refer to episode levels representing periods of short-term exposure to air pollutants which actually threaten public health. Health effects are progressively more severe as pollutant levels increase from Stage One to Stage Three.

Local Air Quality

The project site is located within Source Receptor Area (SRA) 4, one of the thirty areas under the jurisdiction of SCAQMD. The communities within an SRA are expected to have similar climatology and subsequently, similar ambient air pollutant concentrations. The SCAQMD maintains ambient air quality monitoring stations in SRAs throughout the basin as shown in Figure 44. The Long Beach monitoring station in SRA 4 is the nearest station to the study area.

The Long Beach station monitors all seven of the criteria pollutants: sulfur dioxide, ozone, suspended particulates, sulfate, nitrogen dioxide, carbon monoxide and lead.[31] Other air pollutants for which standards exist are considered local problems and are handled through the District's permitting process for stationary sources.

Air quality trends between 1989 and 1991 at the Long Beach air quality monitoring station are discussed below. From the ambient air quality data (see Table 14), it can be seen that sulfur dioxide, lead, and sulfate have not equalled or exceeded the relevant state and federal standards. Carbon monoxide, ozone, nitrogen dioxide, and suspended particulates have exceeded the standards.

Of all of the pollutants monitored, suspended particulates equalled or exceeded the state standard most often. Concentrations of particulate matter, with an aerodynamic diameter less than 10 microns (PM_{10}), monitored at the Long Beach station in the last three years show a 24-hour maximum of 119 ug/m^3 during 1989 and 1990. The state 24-hour standard of 50 ug/m^3 was exceeded on 31 percent of the days monitored. The federal 150 ug/m^3 24-hour standard was not exceeded during the three year period.

[31] Source: South Coast Air Quality Management District, Air Quality Tables and California Air Resources Board, Air Quality Data Annual Summaries.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AIR MONITORING STATIONS

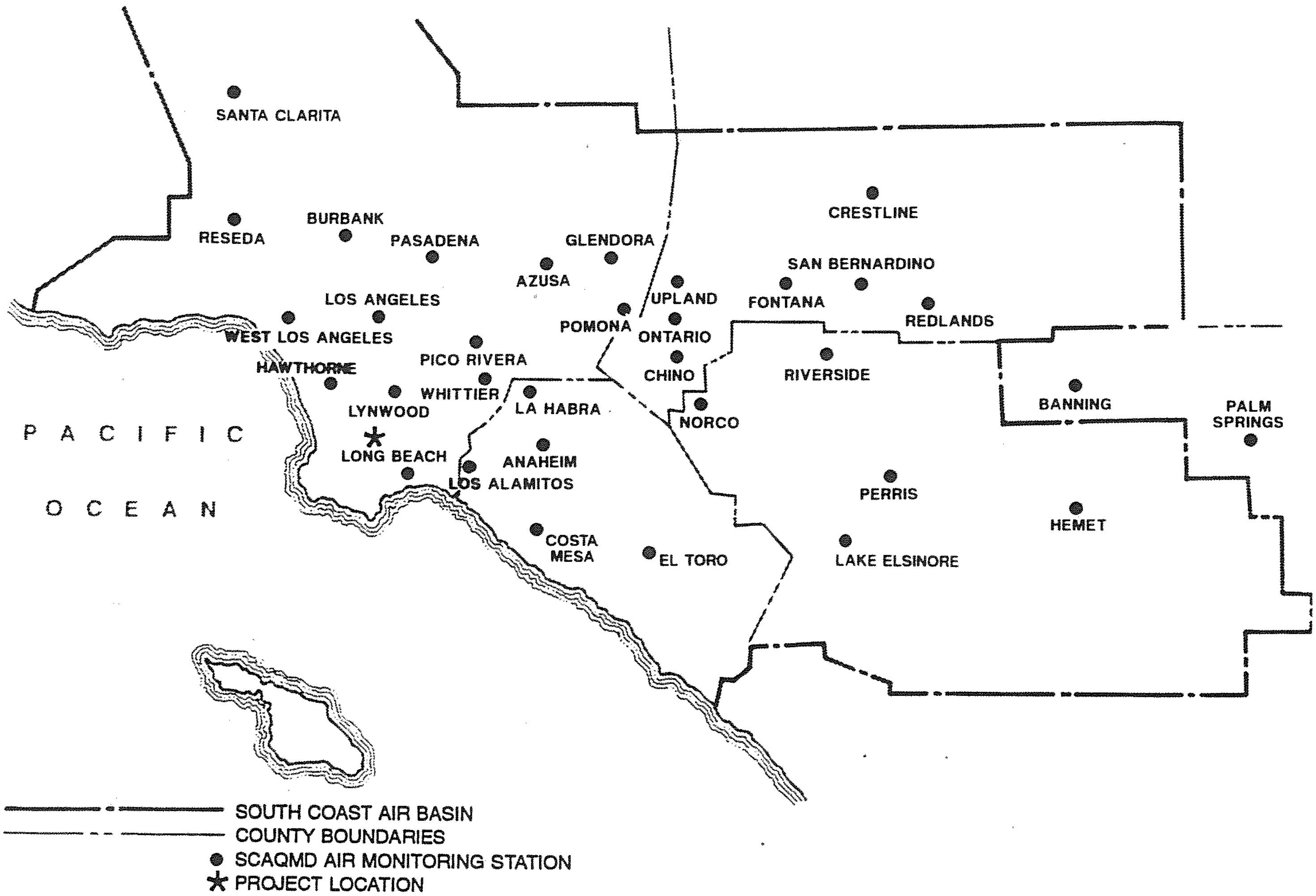

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TABLE 14
AMBIENT AIR QUALITY
LONG BEACH AIR MONITORING STATION

	CARBON MONOXIDE				*OZONE*		*NITROGEN DIOXIDE*	
	Maximum 1-Hour Conc. (ppm)	Number of Days Exceeded	Maximum 8-Hour Conc. (ppm)	Number of Days Exceeded	Maximum 1-Hour Conc. (ppm)	Number of Days Exceeded	Maximum 1-Hour Conc. (ppm)	Number of Days Exceeded
State Standards	> 20 ppm/1-Hour		≥ 9.1 ppm/8-Hour		> .09 ppm/1-Hour		> .25 ppm/1-Hour	
1991	14.0	0	9.3	1	.11	4	.28	2
1990	11.0	0	9.1	1	.12	5	.27	1
1989	13.0	0	10.1	2	.16	10	.27	1
MAXIMUM	14.0		10.1		.16		.28	
% EXCEEDED		0%		<1%		2%		<1%
Federal Standards	> 35 ppm/1-Hour		≥ 9.5 ppm/8-Hour		> .12 ppm/1-Hour		No Federal Standard	
1991	14.0	0	9.3	0	.11	0	NA	NA
1990	11.0	0	9.1	0	.12	0	NA	NA
1989	13.0	0	10.1	2	.16	3	NA	NA
MAXIMUM	13.0		10.1		.16		NA	
% EXCEEDED		0%		<1%		<1%		NA

	SULFUR DIOXIDE		*SUSPENDED PARTICULATES*[1]		*LEAD*		*SULFATE*	
	Maximum 1-Hour Conc. (ppm)	Number of Days Exceeded	Maximum 24-Hour Conc. (ug/m^3)	Number of Samples Exceeded	Maximum Quarter/ Month Conc. (ug/m^3)	Quarters/ Months Exceeded	Maximum 24-Hour Conc. (ug/m^3)	Number of Samples Exceeded
State Standards	≥ .05 ppm/24-Hour		> 50 ug/m^3/24-Hour		≥ 1.5 ug/m^3/Monthly Avg.		≥ 25 ug/m^3/24-Hour	
1991	.016	0	92*	11*	.08	0	19.9	0
1990	.013	0	119	14	.09	0	22.6	0
1989	.022	0	119	26	.11	0	20.0	0
MAXIMUM	.022		119		.11		22.6	
% EXCEEDED		0%		31%		0%		<1%
Federal Standards	> .14 ppm/24-Hour		> 150 ug/m^3/24-Hour		> 1.5 ug/m^3/Quarterly Avg.		No Federal Standard	
1991	.016	0	92*	0*	.07	0	NA	NA
1990	.013	0	119	0	.07	0	NA	NA
1989	.022	0	119	0	.08	0	NA	NA
MAXIMUM	.022		119		.08		NA	
% EXCEEDED		0%		0%		0%		NA

NA Not Applicable/Not Available
1 Refers to respirable particulate matter, PM_{10}.
* Less than 12 full months of data. May not be representative.
ppm = Parts per million
ug/m3 = micrograms per cubic meter

ANNUAL AVERAGE PM10 CONCENTRATION

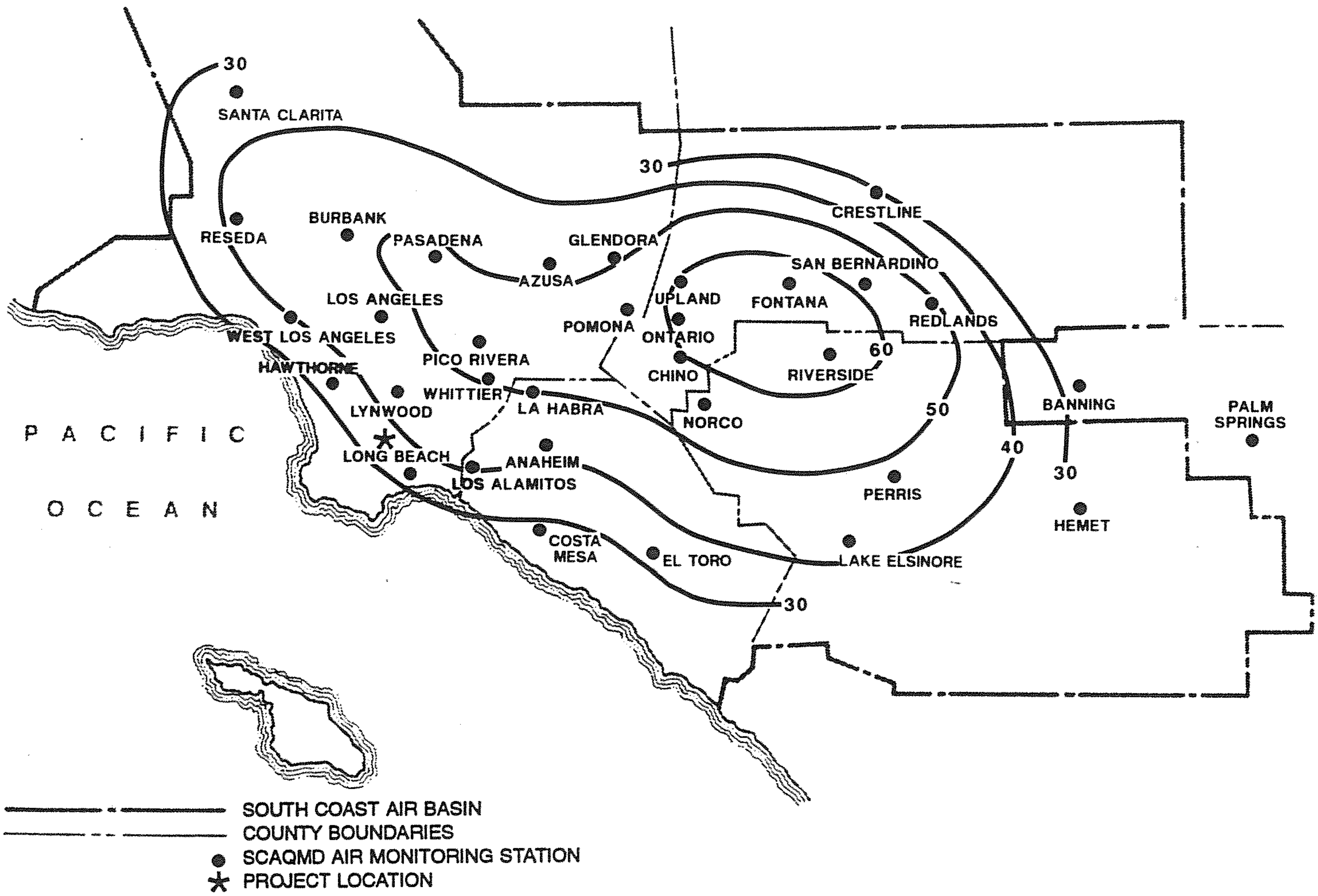

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Figure 45 depicts the annual arithmetic mean PM_{10} concentrations throughout the air basin for the year 1990. It can be seen from Figure 45 that the project site falls between the 30 ug/m^3 and 40 ug/m^3 contour. At less than 50 ug/m^3, the project area is below the federal annual arthritic mean standard for particulate (PM_{10}) concentrations. Ozone exceeded the state 1-hour standard two percent of the time during the last three years and the federal 1-hour standard less than one percent of the time. No first stage (one-hour average>20 pphm), second stage (one-hour average>35 pphm), or third stage (one-hour average>50 pphm) ozone episodes were called at the Long Beach station during the last three years.

Figure 46 depicts the annual number of days exceeding the state 1-hour ozone standard during 1990. As shown therein, the annual number of days exceeding the 9 pphm standard in the project area is less than 25 days. From Figure 46, it can be seen that the project area and other coastal regions exceeded the federal standard less than inland areas of the SoCAB.

The state nitrogen dioxide standard was exceeded less than one percent of the days during the last three years. The maximum concentration of nitrogen dioxide (.28 ppm) was measured during 1991.

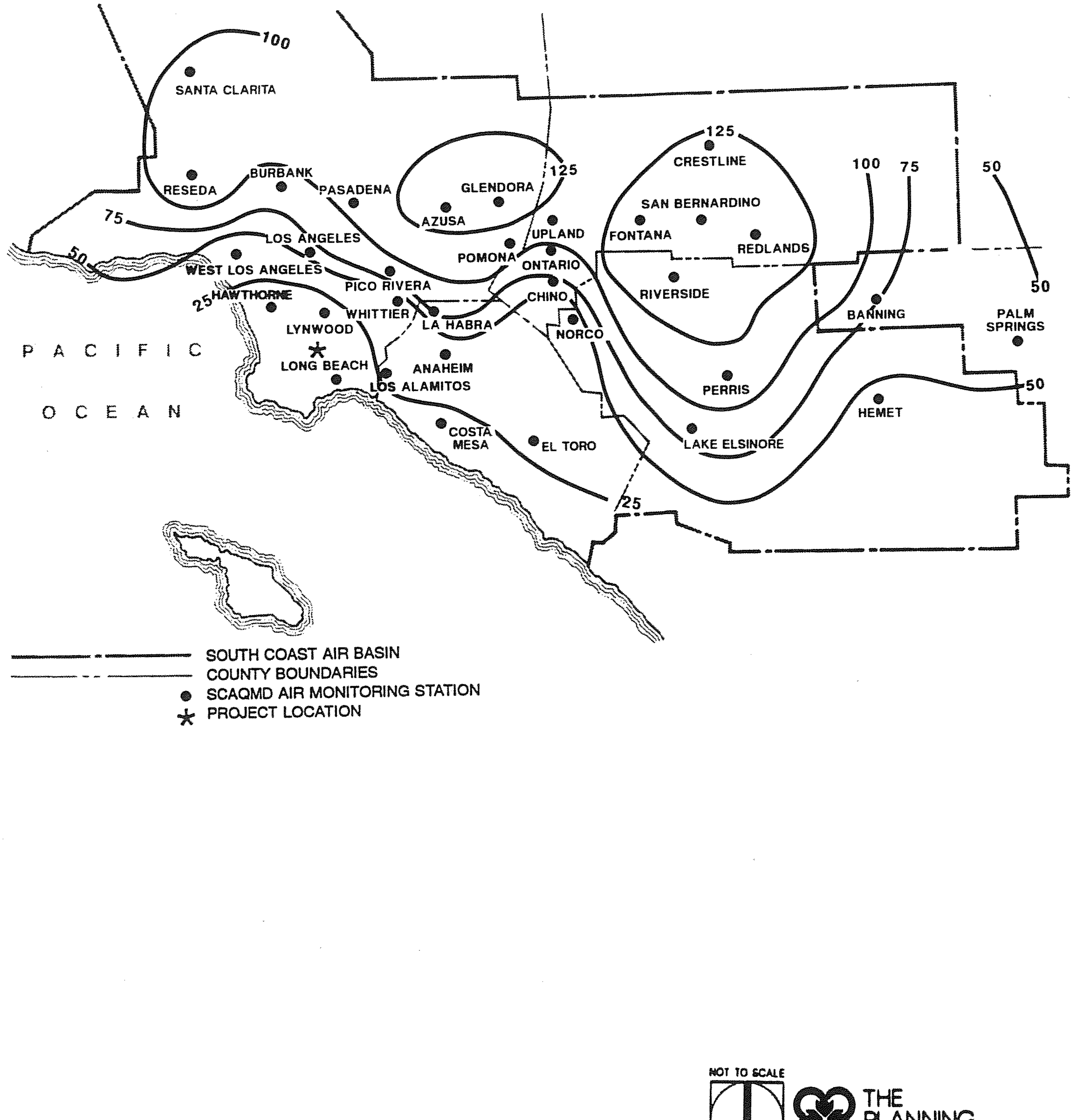
The state and federal 1-hour carbon monoxide standards were not exceeded during 1989, 1990 or 1991. The maximum one-hour carbon monoxide concentration measured 13.0 ppm during 1989, 11.0 ppm in 1990, and 14.0 in 1991. State and federal 8-hour carbon monoxide standards were exceeded on two or fewer occasions during each of these years. Sulfur dioxide, lead, and sulfate did not exceed the relevant standards in the last three years. The maximum sulfur dioxide level measured was 0.022 ppm. Maximum lead levels were 0.11 ug/m^3 for monthly averages, and 0.08 ug/m^3 for quarterly averages. The maximum daily sulfate concentration of 22.6 ug/m^3 was recorded in 1990.

Local Sources of Air Contaminants

Two general sources of air pollutants contribute to decreased air quality in Carson and the Basin as a whole--mobile sources and stationary sources. Mobile sources include automobiles, trucks, motorcycles, airplanes, helicopters, trains, and ships. Motor vehicles are the largest generator of air pollutants in Carson, although upwind sources inside and outside of the City contribute considerable pollutants from train, ship and refinery activities.

In particular, motor vehicles on the Harbor Freeway (I-110) and the Interstate 405 Freeway (I-405) are considered major sources of air contaminants. The average

OZONE - 1990
NUMBER OF DAYS EXCEEDING STATE STANDARD



daily vehicle trips (ADT) along I-110 is 182,000, while ADT along I-405 is 217,000.[32] At an average speed of 35 miles-per-hour, these vehicles currently generate 6.31 grams of carbon monoxide, 0.23 grams of reactive organic gases, 0.83 grams of nitrogen oxides and 0.12 grams of particulate matter for every mile traveled.[33]

4.3.2 Environmental Impacts

Air pollutant emissions associated with the project would occur over the short-term for site preparation and construction activities to support the proposed land uses. In addition, emissions would result from the long-term operation of the completed project. Note that the project replaces vacant land that was previously the site of an air polluting refinery. Short-term and long-term air quality impacts associated with the project are detailed in the following sections.

Short-Term Impacts

Construction operations are responsible for emissions of CO, NOx, SOx, ROG, and PM10. These emissions are largely generated from construction operations and equipment. The amount of emissions generated is related to the level and type of construction activity. Construction-related emissions are short-term in nature and can generally be mitigated to a level of insignificance. However, it is important to estimate the total air quality impacts of a project by considering both construction-related and operational sources.

The SCAQMD identifies the major sources of construction-related emissions that should be considered. These sources are stationary equipment, construction related vehicle trips, mobile construction equipment, fugitive dust, asbestos, and emissions from architectural coatings and building materials.

Stationary Equipment

Stationary equipment sources are classified as point and area sources. Point sources refer to a site that has one or more emission sources at a facility with an identified location (e.g. power plants, refinery boilers). Area sources comprise many small emission sources for which locations are specifically identified, but for which emissions over a given area may be calculated (e.g. water heaters,

32 1990 Traffic Volumes on California State Highways, Caltrans.

33 Draft CEQA Air Quality Handbook, 1992, Appendix 9.

painting and coatings and fuel use and consumption). To accurately calculate emissions from stationary equipment the types and numbers of equipment, brake emission factors, rate and quantity of fuel consumption, and phases and hours of operation all must be considered.

Stationary equipment is known to generate CO, ROG, NOx and PM10 emissions. The amount of emissions generated from stationary sources is typically not as significant as the emissions generated from mobile equipment and vehicles. However, the emissions do incrementally contribute to the total amount of construction related emissions generated on a given day.

Mobile Construction Equipment Emissions

The exhaust fumes from mobile construction equipment are a direct source of NOx, ROG and PM10. Most constructive operations involve the combustion of emissions from utility engines, on-site construction vehicles and construction vehicles hauling equipment and materials to and from the site. The amount of exhaust emissions generated is based upon the type and amounts of construction equipment and construction activity.

The proposed Specific Plan is planned for completion in 1995. At this planning stage, phased construction level emissions cannot be estimated in a precise manner. The Specific Plan level does not include construction schedules, road re-routings or grading plans. Therefore, "worst case" estimates are utilized herein. When the ongoing remediation is complete, the site will be graded. However, there will still be limited final grading to prepare for construction.

The mix of construction equipment estimated for the Golden Eagle Specific Plan project area is based upon the past requirements of similar projects. The equipment requirements for the project and their associated emissions are detailed in Table 15.

TABLE 15
CONSTRUCTION EQUIPMENT EMISSIONS

Equipment Type	Number Equipment Used	Hours of Operation	Pollutants (Lbs./Day)[1]				
			CO	ROG	NOx	SOx	PM10
Motor Grader	1	8	1.2	0.3	0.4	0.7	0.5
Off-Hwy Truck	3	8	5.4	4.6	100.8	10.8	6.2
Roller	1	8	2.4	0.5	7.0	0.5	0.4
Misc.	1	4	2.7	0.6	6.8	0.6	0.6
Total Emissions			**11.7**	**6.0**	**115.0**	**2.6**	**7.7**

[1] 1992 CEQA Air Quality Handbook, SCAQMD, Table 9-8-A.

Mobile construction equipment emissions would not result in emissions that could threaten local attainment of clean air standards. Emissions should generally be minimal and disperse without significant impact on nearby receptors. However, during later phases of project development, sensitive receptors in occupied portions of the project could be subject to construction-related emissions. Pollutant emissions generated during peak construction activity, especially NOx, may be temporarily significant. Mobile construction equipment emissions can be reduced by using construction equipment that has catalytic converters, using methanol or low-sulfur pile drivers, and by preventing trucks from idling longer than two minutes. The SCAQMD has estimated that emissions from construction equipment can be reduced by 60% by using low emission on-site mobile equipment.

In addition to the categories of construction emissions discussed above, emissions could result from congestion or detours associated with activity on-site. Any street sweepers required to clean dust from site access routes would generate emissions, as well as potential interference with local traffic. Lane closures or detours of ambient traffic may cause traffic delays or additional vehicle miles of travel. This would be more substantial during peak hour conditions when interference between vehicles accessing the site and commuters could reduce average vehicle speeds and potentially increase idling emissions. Emissions from construction related traffic congestion can be reduced by configuring construction parking to minimize traffic interference, providing temporary traffic control during all phases of construction activities, scheduling construction activities during off-peak hours, consolidating truck deliveries and rerouting construction trucks off congested streets.

Construction Related Vehicle Trips

Construction related vehicle trips contribute to the total amount of emissions generated during construction activities. Construction-related vehicle trips include: 1) commute trips to and from the site; 2) non-work trips associated with lunch or other errands; and 3) trucks hauling soil or construction equipment. To quantify these emissions, the number employee trips, average speed, and average vehicle miles traveled must all be considered.

The number of employees working on-site would vary with each construction phase of the project. The number of construction jobs to be added by the proposed development of the Specific Plan is not available at this time. It is estimated that a maximum of fifty employees on-site would be expected at any one time, representing the finishing phase of project construction. Additional access for 3 individuals related to building inspection and project management is anticipated. Assuming that each employee or visitor drives alone, a total of 103 vehicle trips would be related to commute trips. Additional daily trips associated with lunch time, deliveries and miscellaneous activities should not exceed 30. A total of 133 vehicle trips at an average trip length of 10 miles would generate approximately 9.7 pounds of carbon monoxide, 1.2 pound of NOx, 0.8 pound of ROG and 0.3 pound of particulates on a worst-case day. These emissions can be reduced from 25 percent to 90 percent by incorporating the mitigation measures identified in the mitigation section.

Fugitive Dust (PM_{10})

When fugitive dust enters the atmosphere, the larger particles of dust quickly fall to the ground. The smaller particles, however, may remain suspended for long periods and are referred to as total suspended particulates (TSP). Within TSP are those dust particles that are less than ten microns in diameter and which are referred to as PM_{10}. Because PM_{10} is respirable and can seriously damage the lungs, fugitive dust is a matter of concern.

A variety of construction related sources generate PM_{10} emissions. These sources include auto and truck trips on paved and unpaved roads and parking areas, dirt storage piles, dirt pushing and grading activities, truck dumping activities, and demolition operations. To accurately calculate PM_{10} emissions, project specific information is needed. Such information would include the amount of vehicle miles traveled by autos, trucks and construction equipment on paved and unpaved surfaces, area covered by storage piles that are susceptible to wind erosion, tons of truck filling material used per day and acres of graded surfaces.

At this time all of the required information to calculate PM_{10} emissions is not available. Therefore, it is not possible to accurately estimate project specific emissions. However, fugitive dust can generally be estimated by assuming a worst-case day for construction activities. A worst case estimate for fugitive dust generation is that the entire 76-acre site, minus the 10-acre asphalt cap, is available for grading. Based upon EPA's AP-42 standard of 1.2 tons of fugitive dust per acre per month of activity, the fugitive dust emissions for the site are anticipated to be 2.6 tons of particulate matter per day; with regular watering these emissions can be reduced by 50 percent to 1.3 tons per day. It is estimated that only 45 percent of the particulate matter (0.59 tons) would be the PM_{10} particles of concern from a public health perspective. These emission levels can be reduced even further with dust palliatives. The site will most likely be graded in sections as they become available after remediation.[34] In this case, PM_{10} emissions would be spread out over a longer period, further reducing the amount

34 Per telephone conversation with Hsien Chen, Earth Technology Corporation on August 31, 1992.

of particulate matter emitted per day. It has been estimated that this extended construction period would result in less than 150 pounds of PM_{10} per day, which is the SCAQMD threshold for this pollutant.

Architectural Coatings and Building Materials

Architectural coatings applied to a building either during or just after construction are a source of project emissions that need to be considered. Examples of architectural coatings include painting the exterior walls, or coatings applied to windows and window casings at the construction sites. Many of the architectural coatings and building materials currently used generate ROG emissions. To calculate ROG emissions the type and amounts of materials must be identified. At this phase of the project this information is not available. Therefore, it is not possible to estimate project specific emissions. The SCAQMD also requires that a project be evaluated for potential asbestos emissions. Asbestos emissions are usually not associated with new construction activity and are not expected with this project. They are more common with demolition or renovation operations.

Long-Term Impacts

Long-term air emission impacts are those associated with the change in permanent usage of the project site. Two types of air pollutant sources must be considered with respect to the proposed project, stationary sources and mobile sources. Stationary sources include emissions on-site from activities at the proposed land uses and natural gas combustion, as well as emissions at the power plant associated with the electrical requirements of the project. Motor vehicle trips are generated by employees commuting to the office buildings, patients, visitors and community residents accessing the project site, deliveries, and maintenance activities. Emission inventory assumptions are provided in the Appendix D. Stationary source emissions are generally less than two percent of the project total, with the remainder associated with mobile emissions.

The total emissions associated with the project are expected to be 3,581 pounds of carbon monoxide, 66 pounds of reactive organic gases, 332 pounds of NOx, and 61 pounds of particulates on a daily basis. Air pollutant emissions of this magnitude, with the exception of particulates, exceed the criteria for significance suggested by the South Coast Air Quality Management District, as shown in Table 16.

TABLE 16
PROJECT-RELATED
EMISSION INVENTORY
(Year 1995-Lbs./Day)

Pollutant	Mobile	Stationary	Total	Significance Thresholds[1]	Threshold Exceeded
CO	3,510	71	3,581	550	Yes
ROG	65	1	66	55	Yes
NOx	339	7	332	55	Yes
Particulates[2]	60	1	61	150	No

1 CEQA Air Quality Handbook, 1992, SCAQMD.
2 Note that particulates include PM10 plus larger particulate matter.

Microscale Projections

An assessment of the project-related impact on localized ambient air quality requires that future ambient air quality levels be projected. Carbon monoxide concentrations can be estimated adjacent to nearby intersections carrying substantial volumes of project-related traffic using the California Department of Transportation Line Source Dispersion Model (CALINE4). Carbon monoxide levels in the project vicinity during peak hour traffic were assessed with the CALINE4 computer model. Figure 47 identifies the intersections most affected by project-related traffic which were analyzed with the model. A complete discussion of the CALINE4 model and modeling assumptions are provided in the Appendix D.

Existing ambient carbon monoxide concentrations are 10.0 ppm over a 1-hour averaging period and 8.9 ppm over the 8-hour averaging period as measured at the Long Beach monitoring station and documented by the California Air Resources Board in the Air Quality Data, 1990 Annual Summary. Since the background levels are close to the 9.0 state and federal standards in SRA 4, the 8-hour carbon monoxide levels from mobile sources even without the project are expected to be exceeded in the project area.

Two scenarios were analyzed. The first scenario reflects ambient and cumulative traffic volumes in the buildout year 1995. The second scenario reflects year 1995 + project traffic volumes. As shown in Table 17, carbon monoxide concentrations adjacent to the intersections most affected by the project would be below the current 20 ppm state standard and the 35 ppm federal standard (one-hour average) with or without the development proposed on-site. Conversely, the state and federal eight-hour carbon monoxide standards (9.0 ppm) would be exceeded at these intersections with or without the project being considered.

POLLUTANT ANALYSIS-AIR LOCATIONS

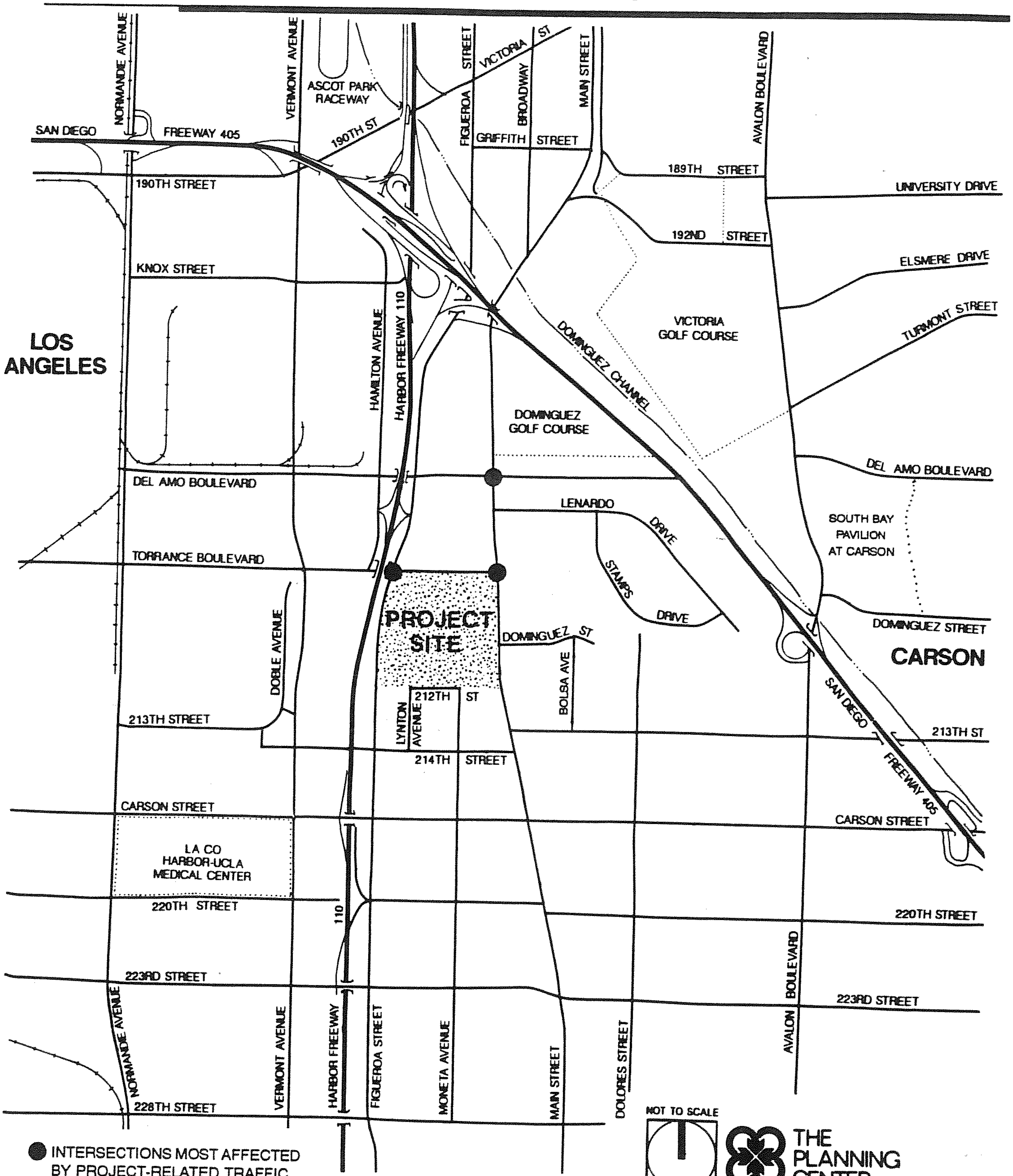


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TABLE 17 INTERSECTION CARBON MONOXIDE CONCENTRATIONS (Year 1995)						
	1-Hour Average (ppm)			8-Hour Average (ppm)		
Receptor Distances[1] (Feet)	**100**	**150**	**200**	**100**	**150**	**200**
AMBIENT SCENARIO						
Figueroa Street @ - Torrance Boulevard	3.8	3.1	2.6	3.4	2.8	2.3
Main Street @ - Torrance Boulevard	2.4	1.9	1.6	2.1	1.7	1.4
- Del Amo Boulevard	3.7	2.8	2.4	3.3	2.5	2.1
Maximum Concentration with Background	**13.8**	**13.1**	**12.6**	**12.3**	**11.7**	**11.2**
AMBIENT + PROJECT SCENARIO						
Figueroa Street @ - Torrance Boulevard	4.8	3.8	3.2	4.3	3.4	2.8
Main Street @ - Torrance Boulevard	3.5	2.7	2.2	3.1	2.4	2.0
- Del Amo Boulevard	4.1	3.1	2.6	3.6	2.8	2.3
Maximum Concentration with Background	**14.8**	**13.8**	**13.2**	**13.2**	**12.3**	**11.7**
Background Concentration[2]	10.0	10.0	10.0	8.9	8.9	8.9
State Standard	20.0	20.0	20.0	9.0	9.0	9.0
Federal Standard	35.0	35.0	35.0	9.0	9.0	9.0

1. Receptor distances are measured from the intersection centerline.
2. Represents second highest annual concentrations at Long Beach monitoring station as documented by the California Air Resources Board in the Air Quality Data, 1990 Annual Summary.

Over a one-hour and an eight-hour averaging period, "worst-case" project-related traffic at the intersections analyzed would contribute 1.1 ppm or less to the carbon monoxide concentration at all receptor distances from the roadway centerline. The maximum intersection carbon monoxide contribution expected in the project would be 4.8 ppm over the one-hour averaging period and 4.3 ppm over the eight-hour averaging period at 100 feet from the intersection of Figueroa Street and Torrance Boulevard. With the addition of intersection carbon monoxide generation to background levels, the concentrations could reach 14.8 ppm over the 1-hour averaging period and 13.2 ppm over the 8-hour averaging period. The 8-hour levels would exceed the state and federal standards by 64 percent and constitute a significant impact of the project.

The carbon monoxide levels projected in the project area reflect cumulative conditions with the project in the year 1995. The microscale analysis indicates that project-related increases in carbon monoxide levels are significant; although under cumulative conditions, the standards would be exceeded with or without the project.

Air Quality Management Plan Consistency

According to the AQMP Conformity Criteria (Component I. General Development), there are three tests for conformity to the AQMP for general development projects.[35] They are as follows: (1) the project is improving the city's jobs/housing balance, (2) the project must demonstrate that vehicle trips and vehicle miles have been reduced to the greatest extent feasible, and (3) the project's Environmental Impact Report demonstrates that the project will not have a long-term negative impact on regional air quality, that all AQMP control measures are used to the greatest extent possible and that the project impact is analyzed on a local and regional level.

Although the Housing Element of the General Plan indicates that the jobs/housing balance within Carson itself is balanced, the proposed project straddles two urban subregions of the South Coast Air Basin that are considered jobs-rich. Implementation of the Specific Plan would add an estimated 4,730 permanent employment opportunities. However, since the subregion shows strong evidence of economic depression, the project may actually improve short-term conditions in the Central Los Angeles and Santa Monica Bay subregions.

To comply with the second criteria, the project would need to incorporate transportation and parking control measures to reduce vehicle trips and vehicle miles of travel associated with the project. Land use measures can also be incorporated at this point in the project development to ensure that amenities are provided on-site for the planned hotel and employment facilities. To reduce emissions associated with vehicle trips, several tactics supported by the SCAQMD are provided in the mitigation section.

The project is analyzed on a local and regional basis as shown in Tables 15, 16 and 17. The increase in emissions associated with the project is considered significant from a regional and a local perspective. Therefore, the project appears

35 Air Quality Management Plan; Appendix IV-G.

to be inconsistent with the AQMP conformity test and should be considered inconsistent with the AQMP.

4.3.3 Mitigation Measures

While many of the measures cannot be quantified, expected efficiencies from specific measures are identified by the percentage effectiveness at reducing emissions from the source category following the measure, e.g. (55%).

Short-Term Mitigation Strategies

To minimize fugitive dust during grading and construction activities, the following methods shall be applied to the project:

1. Graded surfaces shall be watered at least twice daily to form a wind-resistant temporary crust. The program should include control of wind-blown dust on site access roadways and in the existing paved areas of the site. (45-90%)

2. The site and the construction equipment shall be sprayed with water in the morning and the evening.

3. Ground cover shall be planted as soon as practical in the construction process. (20-65%)

4. Any earth being transported shall be covered and the wheels and lower portions of transport trucks will be sprayed with water before they leave the construction area. This includes trucks moving excavated earth from one portion of the site to the other if fugitive dust is visible from the transporting activity.

The following mitigations serve to minimize mobile source emissions during the construction:

5. Construction equipment shall be selected considering emission factors and energy efficiency. All equipment shall be properly tuned and maintained.

6. Electric or diesel-powered equipment shall be utilized in lieu of gasoline-powered engines.

7. Construction activities shall minimize obstruction of through traffic lanes adjacent to the site and, if necessary, a flagperson shall be retained to maintain safety adjacent to existing roadways.

Long-term Mitigation Strategies

Although the project cannot be mitigated to a level of insignificance, the following mitigation measures will help in reducing the level of impact of the project.

8. Energy Use

- Use light colored roof materials to reflect heat.
- Use building materials that do not require use of paints and solvents such as pre-primed and a wood moulding and trim products and pre-primed wallboard. (80-100%).
- Require recycling bins in addition to trash bins and contract for recycling services.
- Increase walls and attic insulation beyond Title 24 requirements. (5-9%)
- Extensive use of shade trees to reduce building heat. (55%)
- Use energy efficient and automated controls for air conditioners. (30%)
- Use energy efficient parking lot lights such as metal halide, clean lucalox, high pressure sodium or low pressure sodium. (55%)
- Use lighting controls and energy efficient lighting. (60-75%)
- Low-polluting and high-efficiency appliances shall be installed wherever possible.

9. Motor Vehicle Trips/Emissions

- Utilize a mix of services on-site to provide further amenities for employees and customers that would reduce off-site vehicle trips. Consideration shall be given to postal services, bank automated teller machines, medical office facilities, restaurants, and day care. (25-50%)
- Synchronize any traffic signals installed in conjunction with the project with other signals in the project vicinity.

- Design parking lot layouts to limit access so that a parking control could be easily added if parking pricing becomes a city-wide or regionwide strategy.
- Provide for future electric vehicle spaces by identifying preferential locations that have access to an electrical supply. Conduit access to electrical supply should be available so that reconstruction is not necessary to convert spaces.
- The project shall implement applicable transportation demand management and trip reduction measures as required by the City's CMP/TDM Ordinance, including provision of a transportation demand management association to facilitate ridesharing among the Center's employees.

4.3.4 Level of Significance After Mitigation

Despite the imposition of substantial mitigation, the project's impact on air quality remains significant.

4.4 NOISE

4.4.1 Environmental Setting

Characteristics of Sound

Noise is usually defined as "unwanted sound". It consists of any sound that may produce physiological or psychological damage and/or interfere with a person's communication, work, rest, recreation, and sleep. While hearing impairment and other physical damage does occur from high noise levels, the damage in terms of quality of life from stress and annoyance is much more widespread.

Sound intensity or acoustic energy is measured in decibels (dBA) that are weighted to correct for the relative frequency response of the human ear. Ambient community sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Sound levels corresponding to typical sources found in and around population centers are provided in Figure 48.

Many noise rating schemes exist for various time periods, but an appropriate rating of ambient noise affecting human communities would also account for the annoying effects of sound. The predominant rating scales for human communities are the Noise Equivalent Level (Leq) and the Community Noise Equivalent Level (CNEL). The Leq is the total sound energy of time-varying noise over a sample period. The CNEL is the time-varying noise over a twenty-four hour period with a weighting factor applied to noises occurring during evening hours from 7:00 p.m. to 10:00 p.m. (relaxation hours) and at night from 10:00 p.m. to 7:00 a.m. (sleeping hours) of 5 and 10, respectively. The CNEL scale accounts for the magnitude of a noise, its duration, number of occurrences and time of day it occurs. The noise environment for this project is analyzed in the CNEL time-averaged measure of noise levels.

Relevant Planning

Noise goals and policies relevant to this project are provided in the City of Carson Noise Element (September 1977 and updated December, 1981). The noise goals are to: 1) establish a sufficient noise base to effectively consider noise in the planning process; 2) develop strategies for abatement of excessive noise exposures; 3) protect regions for which noise environments are considered acceptable and "noise sensitive" locations; 4) establish the community noise environment for local compliance with the State Standards; 5) encourage intergovernmental coordination to abate noise; 6) enforce current state and local noise regulations to reduce the impact of noise from all sources; 7) reduce the

SOUND LEVELS AND HUMAN RESPONSE

NOISE SOURCE	RESPONSE	dB(A) NOISE LEVEL
		150
Carrier Jet Operation		
	HARMFULLY LOUD	140
	PAIN THRESHOLD	130
Jet Takeoff (200 ft.) Discotheque Unmuffled Motorcycle		120
Auto Horn (3 ft.) Rock 'n Roll Band Riveting Machine	MAXIMUM VOCAL EFFORT	
		110
Loud Power Mower	PHYSICAL DISCOMFORT	
Jet Takeoff (2000 ft.) Garbage Truck	VERY ANNOYING	100
Heavy Truck (50 ft.) Pneumatic Drill (50 ft.)	HEARING DAMAGE (STEADY 8-HOUR EXPOSURE)	
		90
Alarm Clock Freight Train (50 ft.) Vacuum Cleaner (10 ft.)	ANNOYING	80
Freeway Traffic (50 ft.)	TELEPHONE USE DIFFICULT	70
Dishwashers Air Conditioning Unit (20 ft.)	INTRUSIVE	60
Light Auto Traffic (100 ft.)	QUIET	50
Living Room Bedroom		40
Library Soft Whisper (15 ft.)	VERY QUIET	30
Broadcasting Studio		
		20
	JUST AUDIBLE	10
	THRESHOLD OF HEARING	0

SOURCE: WILLIAM BRONSON, "EAR POLLUTION," CALIFORNIA HEALTH (OCTOBER, 1971), P. 29

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impact of construction and industrial noises; and 8) promote public awareness of the effects of noise.

The Carson Noise Control Program includes implementation techniques for noise reductions. This is accomplished through systematic noise surveys, establishing noise standards for land use planning, coordination with all governmental agencies and enforcement of noise reductions through ordinances, motor vehicle noise emission regulations, the County Department of Animal Care and Control and the planning process. Several land use compatibility matrices for community noise are contained in the September, 1977 Noise Element. Since that time, the State of California Office of Noise Control has established guidelines for Noise Elements. These guidelines are utilized as standards for determining land use compatibility associated with the Golden Eagle Center. Standards are identified as "normally acceptable," "conditionally acceptable," "normally unacceptable," and "clearly unacceptable" noise levels for categories of land use. As shown in Figure 49, multi-family residential and transient lodging are "normally acceptable" to 65 CNEL and all other residential uses are "normally acceptable" to 60 CNEL. Residences, motels/hotels, auditoriums, schools, libraries, churches, hospitals and nursing homes are "conditionally acceptable" up to 70 CNEL. Office buildings, business commercial and playgrounds are "normally acceptable" up to 70 CNEL. The land uses proposed with the Specific Plan need to be compatible with these noise standards.

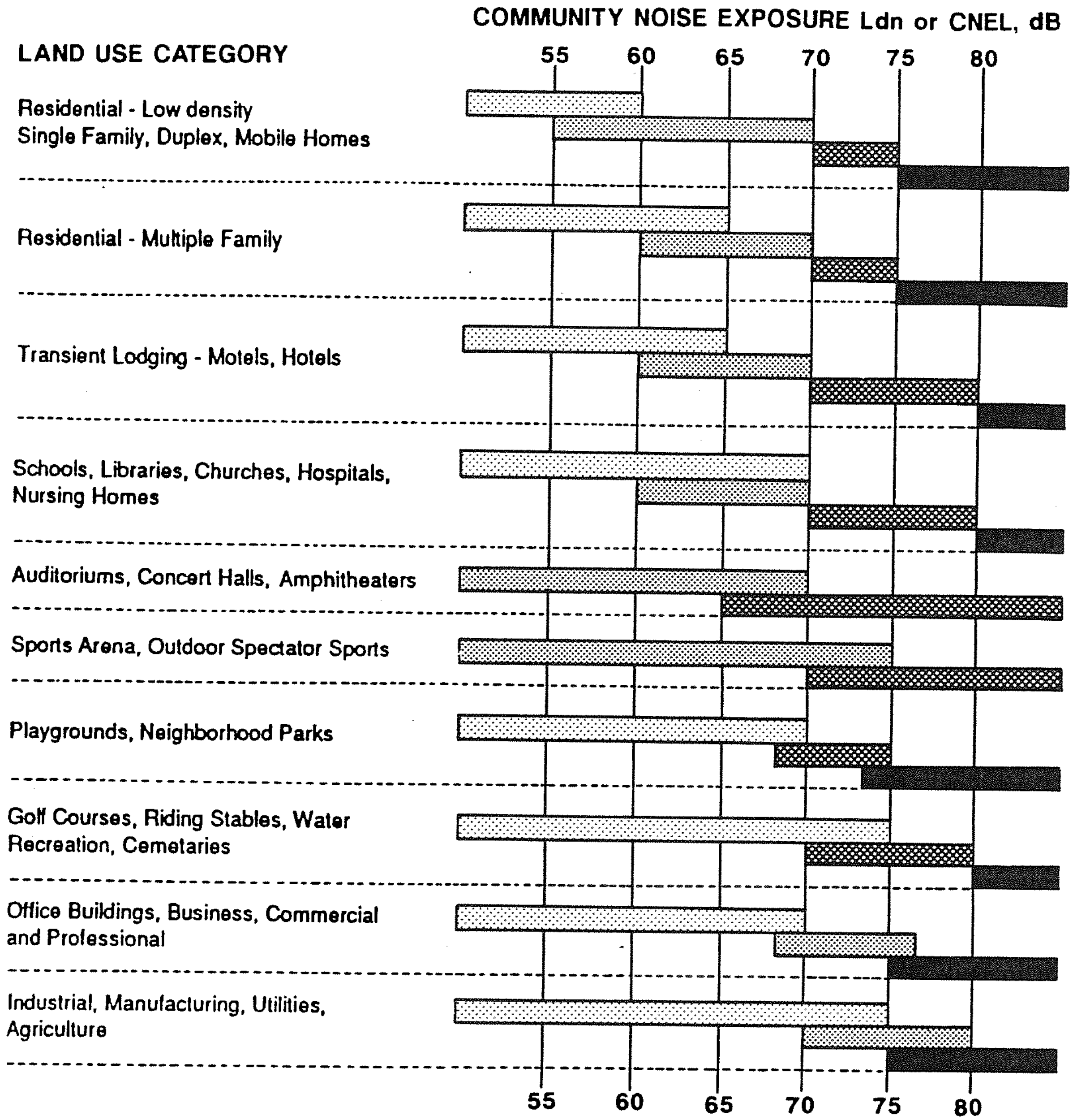
The City of Carson has a noise ordinance that provides noise guidelines and standards for significant sound generators encompassing motor vehicles, amplifying devices, animals, radios, unnecessary noises, shouting and construction activities. The Carson Municipal Code's Chapter 1, Section 4101-Unnecessary Noises limits building construction from 7:00 AM to 6:00 PM weekdays, except in the interest of public health and safety. This standard is provided to limit noise during sensitive time periods. The City engineer may grant a permit to extend activities outside these hours or on Sundays.

Existing Noise Environment

In the City of Carson, there are five major sources of noise. These existing sources are provided below:

1. Aircraft operations from the Long Beach and Compton Airports
2. Traffic on Interstates 110 and 405
3. Traffic on the roadways within the City
4. Rail operations on the Southern Pacific rail line, and
5. Commercial/industrial activities.

LAND USE COMPATIBILITY FOR COMMUNITY NOISE EXPOSURE



LEGEND

Normally Acceptable
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable
New construction or development should be undertaken only after a detailed analysis of the noise reduction requiremints is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice. Outdoor environment will seem noisy.

Normally Unacceptable
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.

Clearly Unacceptable
New construction or development should generally not be undertaken. Construction costs to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

SOURCE: CALIFORNIA OFFICE OF NOISE CONTROL

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The primary noise source affecting the project area is traffic on area roadways, including major routes through the City and Caltrans routes. Interstate 110, known as the Harbor Freeway, is just west of the project boundary. Traffic noise from Interstate 405 does not emanate into the project vicinity. Similarly, Long Beach Municipal Airport, Compton Airport and the Southern Pacific Transportation Company rail lines are too distant from the site to create a measurable impact.

The highway traffic noise prediction model developed by the Federal Highway Administration (RD-77-108) was used to evaluate existing noise conditions in the project area. This model utilizes various parameters including the traffic volume, vehicle mix and speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening and nighttime hours. The resultant noise levels are then weighted and summed over 24 hourly periods to determine the daily CNEL value. Noise contours are derived through a series of computerized iterations to provide the 60, 65, and 70 CNEL locations. These contour locations can be used as a planning tool to locate noise sensitive receptors away from major noise generators. Existing noise barriers and other shielding features are not represented in these contours.

Table 18, Existing Exterior Noise Exposure, provides the current noise levels adjacent to roadways in the project area. Assuming a standard sound attenuation of 4.5 dBA with each doubling of distance, the location of various noise contours used for land use compatibility purposes have also been determined. As shown in Table 18, noise levels at 100 feet from the centerline of roadways in the project area currently range from a low of 58.9 CNEL along Hamilton Avenue to a high of 66.4 CNEL along Torrance Boulevard. The noise level at 150 feet from the centerline of the I-110 Freeway ranges from 75.5 to 76.5 CNEL and the I-405 from 76.4 to 77.0 CNEL in the project vicinity of the I-110 and I-405 freeways. The 70 dBA contour presently falls within the right-of-way along 14 of the 21 roadway links analyzed. The 65 dBA contour does not fall within the right-of-way along any of the links analyzed.

As shown in Figure 49, residences, motels/hotels, auditoriums, schools, libraries, churches, hospitals and nursing homes are acceptable only in a noise environment of 70 dB CNEL or less, and, thus, are not compatible with the ambient noise levels within approximately 39 to 123 feet from the centerline of surface roadways. The existing 65 CNEL contour, considered appropriate for sensitive uses, ranges from 39 to 123 feet from the centerline of surface roadways and from 348 to 436 feet from the freeway centerline.

TABLE 18
EXISTING EXTERIOR NOISE EXPOSURE

Roadway	ADT[1] (Veh./Day)	CNEL[2] @ 100 Feet	Distance to Contours (Ft.)[3] 70 dBA	65 dBA	60 dBA
HAMILTON AVENUE					
North of Torrance Boulevard	17,200	61.9	R/W	62	133
South of Del Amo Boulevard	8,600	58.9	R/W	39	84
HARBOR FREEWAY (I-110)					
North of Carson Street	152,000	75.5	348	749	1,614
North of San Diego Freeway (405)	191,000	76.5	405	872	1,879
FIGUEROA STREET					
North of Carson Street	10,200	61.0	R/W	54	117
South of Torrance Boulevard	10,200	61.0	R/W	54	117
North of Torrance Boulevard	18,400	63.6	R/W	80	173
South of Del Amo Boulevard	15,100	62.7	R/W	70	152
North of Del Amo Boulevard	15,300	62.8	R/W	71	153
MAIN STREET					
North of Carson Street	18,500	63.0	R/W	73	158
South of Torrance Boulevard	18,500	64.3	R/W	89	172
North of Torrance Boulevard	12,700	62.6	R/W	69	150
South of Del Amo Boulevard	12,700	62.6	R/W	69	150
North of Del Amo Boulevard	15,600	63.5	R/W	80	172
CARSON STREET					
East of Figueroa Street	28,100	64.8	45	97	209
East of Main Street	27,700	64.8	45	96	207
TORRANCE BOULEVARD					
East of Harbor Freeway (I-110)	30,000	66.4	57	123	266
East of Figueroa Street	11,200	62.1	R/W	64	138
West of Main Street	11,200	62.1	R/W	64	138
SAN DIEGO FREEWAY (405)					
West of Harbor Freeway (I-110)	270,000	77.0	436	940	2,025
East of Harbor Freeway (I-110)	240,000	76.4	403	869	1,872

1. ADT = Average Daily Traffic volume.
2. CNEL = Community Noise Equivalent Level. Measured at 100 feet from roadway centerlines except for Harbor Freeway and San Diego Freeway which are measured at 150 feet.
3. Measured from roadway centerline. R/W means contour is located within the roadway right-of-way.

Ambient Noise Monitoring

As prerequisite to an effective noise control program, a community must be cognizant of the location and extent of local noise problems: major noise source locations, noise sensitive receptor locations and levels of exposure. These data can then be utilized to focus noise control and abatement efforts where they are most needed. By recognizing these limitations, more effective land use strategies can be developed.

Noise measurements were taken during a typical weekday at four locations in the project area as shown in Figure 50. Criteria for site selection included proximity to transportation facilities and sensitive receptor locations. The primary purpose of noise monitoring was to determine an existing profile for the study area that could be used for estimating the level of current and future noise impact.

Measurements represent motor vehicle noise emanating from the I-110 freeway and other streets on the local roadway network. Sensitive receptor locations monitored include existing single-family residential units. Other monitoring locations were on the project site to identify existing background noise levels. All monitoring occurred during peak traffic conditions to represent maximum noise levels.

Table 19, Ambient Noise Levels, provides noise measurement data and site descriptions for the four monitoring locations. As shown therein, the noise level exceeded the 65 dBA criteria established for residential land uses, in one location (Site 4). However, this site is representative of numerous residential locations adjacent to Main Street, southeasterly of the site. The other residential location where noise measurements were taken was in the housing tract adjacent to the southern site boundary. The range provided indicates several measurements of background noise levels in this residential neighborhood in the absence of activity on the project site. The noise level ranged up to 58.9 dBA, which is well below the "normally acceptable" standard for these uses. Noise measurements at Sites 1 and 2 represent on-site locations in proximity to the freeway and adjacent arterials. The measurements at these sites indicate that noise levels are approaching the 75 dBA maximum standard for industrial/commercial land uses, but are currently within the "conditionally acceptable" level.

TABLE 19
AMBIENT NOISE LEVELS

Location	Measured Leq	Day	Time	Land Use[1]	Description
1	72.3	2/24/91	4:45 p.m.	OS	On-site adjacent to intersection of Figueroa and Torrance.
2	72.8	2/24/91	4:30 p.m.	OS	On-site mid-block adjacent to Torrance Blvd.
3	49.9 - 58.9	2/2491	5:05 p.m.	SFD	Numerous measurements at residences interior to the tract and in proximity to the site.
4	67.3	2/24/91	4:15 p.m.	SFD	Residence located mid-block along Main Street; representative of many residences.

1 OS - Open Space/On-site
Noise measurements were taken in 1991.

4.4.2 Environmental Impacts

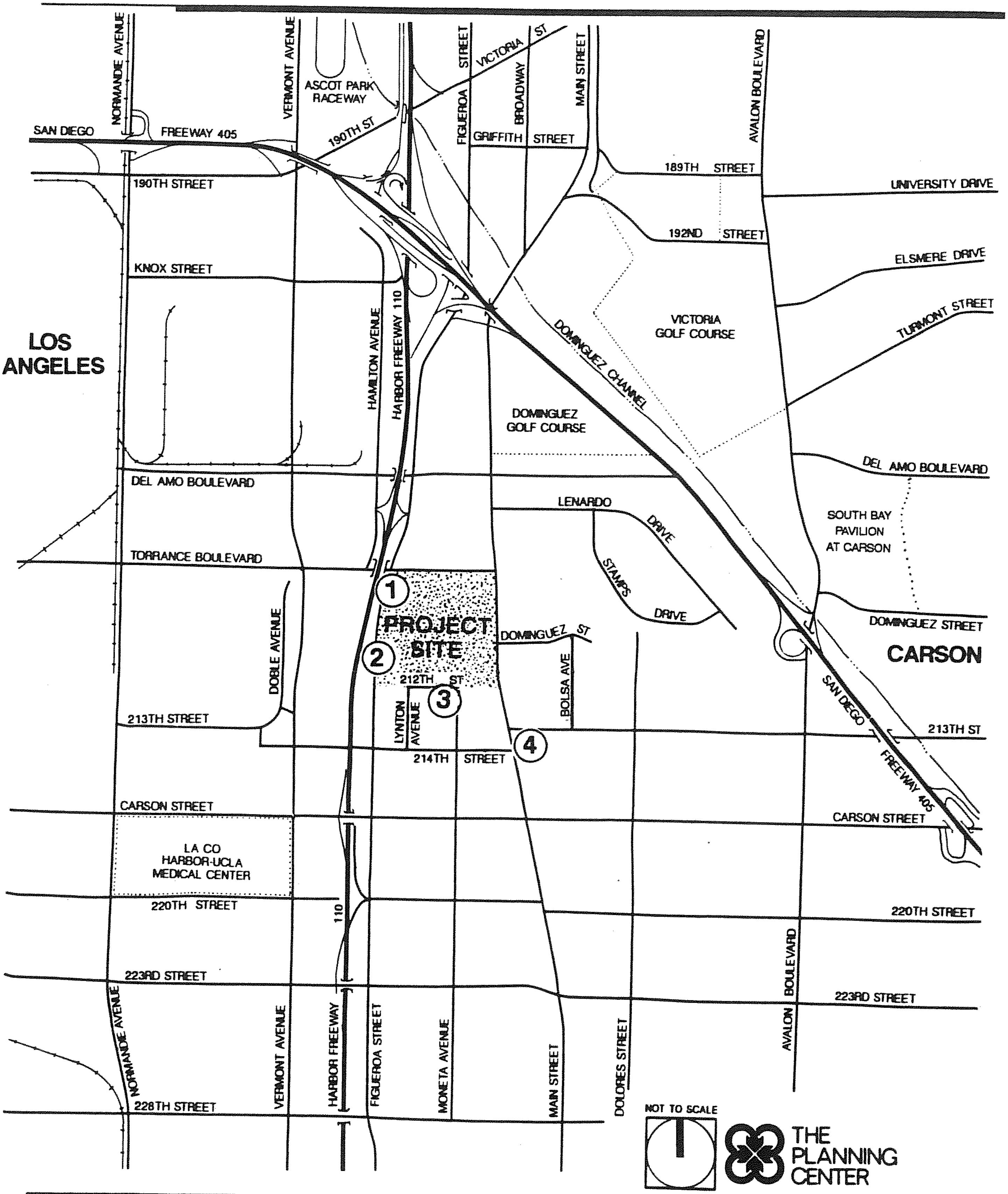
Short-Term Impacts

Short-term acoustic impacts are those associated with construction activities necessary to implement the proposed land uses on-site. The noise levels would be higher than the ambient noise levels in the project area but would subside once construction is completed.

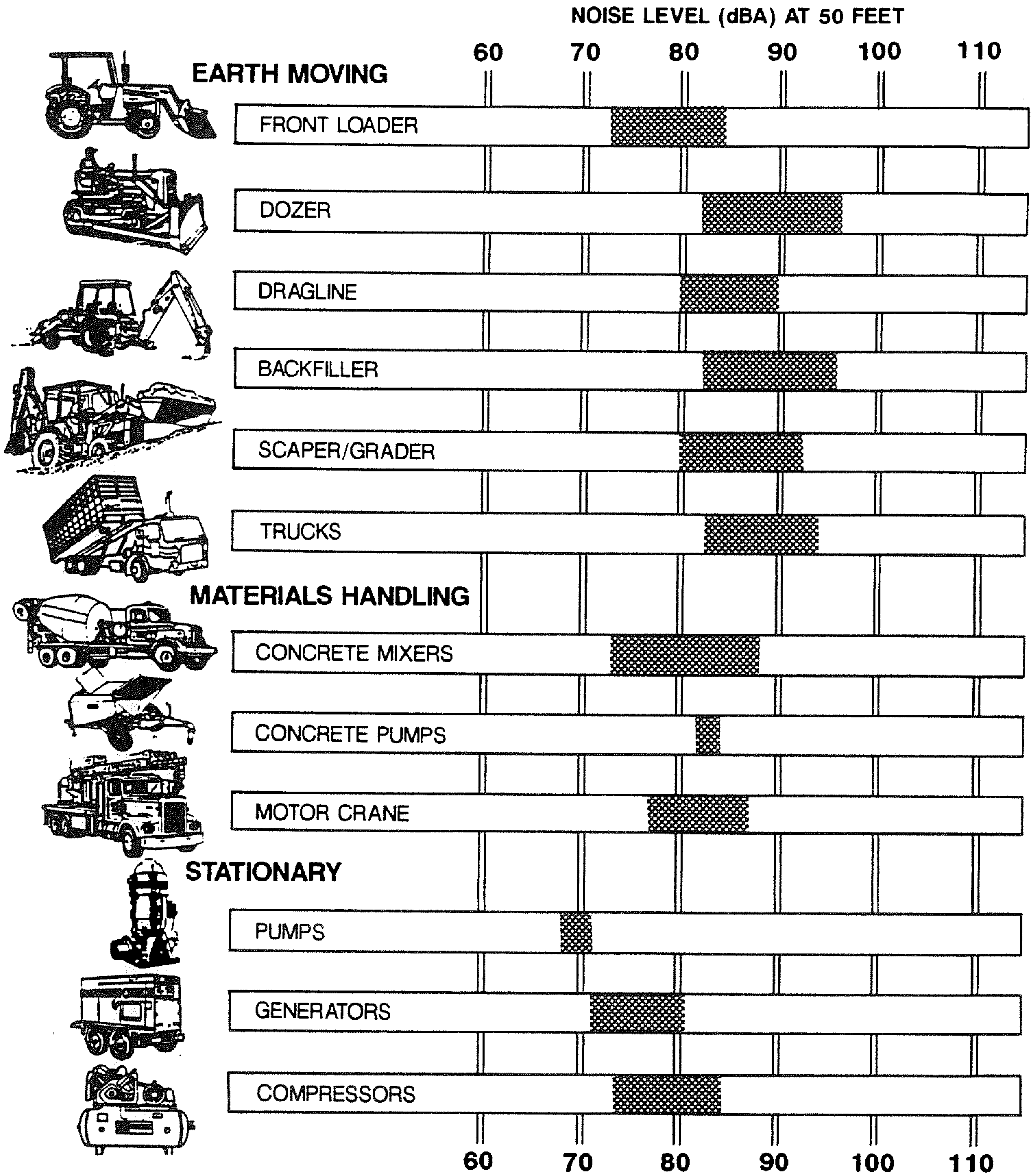
Two types of noise impacts should be considered during the construction phase. First, the transport of workers and equipment to the construction site would incrementally increase noise levels along site access roadways. The increase should not exceed 1.0 dBA when averaged over a 24-hour period, and should therefore be inaudible to adjacent noise receptors. The other impact is related to noise generated by the construction operations on-site.

Construction activities are carried out in discrete steps, each of which has its own mix of equipment, and consequently its own noise characteristics. These construction phases would change the character of the noise levels surrounding the construction site as work progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow noise ranges to be categorized by work phase. Figure 51 illustrates typical construction equipment noise ranges at a distance of 50 feet.

NOISE MEASUREMENT LOCATIONS



CONSTRUCTION EQUIPMENT NOISE LEVELS



SOURCE: EPA, 1971; "NOISE FROM CONSTRUCTION EQUIPMENT AND OPERATIONS, BUILDING EQUIPMENT, AND HOME APPLIANCES". NTID300.1

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Noise ranges were found to be similar during all phases of construction, although the erection phase tends to be less noisy. Noise levels varied from 79 dBA to 89 dBA at 50 feet during the erection phase of construction. The grading and site preparation phase tended to create the highest noise levels.

This is precisely because the noisiest construction equipment is found in the earth moving equipment category. This category includes excavating machinery (backfillers, bulldozers, draglines, front loaders, etc.) and highway building equipment (compactors, scrapers, graders, etc.) Typical operating cycles may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Noise levels at 50 feet from earth moving equipment range from 73 to 96 dBA during peak equipment operations. However, since much of the earth moving operations are taking place with the ongoing hazardous waste clean-up of the site, very limited construction noise is expected with the project.

Throughout the project area, sensitive land uses exist and could be impacted by construction noise emanating from the project site or from construction vehicles on site access routes. The residential community just south of and adjacent to the site would be the nearest receptor of concern. During later phases of project construction, office and commercial workers in earlier phases of development on-site may be subject to the sight and sound of construction operations to implement the proposed land uses. Residential areas exist south of the site, so construction vehicles accessing the site should avoid routes adjacent to these sensitive land uses. The noise emanating from these operations may be less than is occurring today with the clean-up project and, therefore, is not expected to be a significant impact on adjacent receptors.

Long-Term Impacts

Future Off-Site Conditions

Noise levels on area roadways were quantified for cumulative future (Post-2000) conditions without and with the project. Cumulative future conditions include traffic generated by other proposed developments in the project area as provided by Linscott, Law, & Greenspan, Engineers. Tables providing noise levels with and without the project are provided in the Appendix E. Noise levels under cumulative plus project conditions are provided in Table 20. Noise barriers and other shielding features are not represented in these contours.

TABLE 20
CUMULATIVE + PROJECT NOISE LEVELS

Roadway	ADT[1] (Veh./Day)	CNEL[2] @ 100 Feet	Distance to Contours (Ft.)[3] 70 dBA	65 dBA	60 dBA
HAMILTON AVENUE					
North of Torrance Boulevard	21,300	62.8	33	71	154
South of Del Amo Boulevard	28,800	64.1	40	87	188
HARBOR FREEWAY (I-110)					
North of Carson Street	179,700	77.0	293	631	1,359
North of San Diego Freeway	225,100	78.0	340	733	1,579
FIGUEROA STREET					
North of Carson Street	22,200	64.4	42	91	196
South of Torrance Boulevard	21,100	64.2	41	88	190
North of Torrance Boulevard	35,000	66.4	57	123	266
South of Del Amo Boulevard	40,700	67.0	63	136	294
North of Del Amo Boulevard	46,300	67.6	69	149	320
MAIN STREET					
North of Carson Street	51,600	66.6	60	129	277
South of Torrance Boulevard	52,700	68.1	75	162	349
North of Torrance Boulevard	54,200	68.3	77	165	356
South of Del Amo Boulevard	54,200	68.3	77	165	356
North of Del Amo Boulevard	45,400	67.5	68	147	316
CARSON STREET					
East of Figueroa Street	39,300	65.5	50	107	231
East of Main Street	44,900	66.0	54	117	252
TORRANCE BOULEVARD					
East of Harbor Freeway	41,500	67.1	64	138	298
East of Figueroa Street	27,900	65.4	49	106	228
West of Main Street	22,900	64.5	43	93	200
SAN DIEGO FREEWAY (405)					
West of Harbor Freeway (I-110)	314,100	79.4	425	915	1,972
East of Harbor Freeway (I-110)	273,900	78.8	388	835	1,800

1. ADT = Average Daily Traffic volume.
2. CNEL = Community Noise Equivalent Level. Measured at 100 feet from roadway centerline except for Harbor Freeway and San Diego Freeway which are measured at 150 feet.
3. Measured from roadway centerline. R/W means contour is located within the roadway right-of-way.

TABLE 21
CUMULATIVE FUTURE PROJECT-RELATED NOISE CHANGE

Roadway	CNEL @ 100 Ft. Cumulative Future No Project	CNEL @ 100 Ft. Cumulative Future + Project	CNEL @ 100 Ft. Change
HAMILTON AVENUE			
North of Torrance Boulevard	62.1	62.8	+0.7
South of Del Amo Boulevard	63.8	64.1	+0.3
HARBOR FREEWAY (I-110)			
North of Carson Street	77.0[1]	77.0[1]	0.0
North of San Diego Freeway	77.9[1]	78.0[1]	+0.1
FIGUEROA STREET			
North of Carson Street	62.6	64.4	+1.8
South of Torrance Boulevard	62.5	64.2	+1.7
North of Torrance Boulevard	65.0	66.4	+1.4
South of Del Amo Boulevard	66.5	67.0	+0.5
North of Del Amo Boulevard	67.4	67.6	+0.2
MAIN STREET			
North of Carson Street	66.5	66.6	+0.1
South of Torrance Boulevard	67.7	68.1	+0.4
North of Torrance Boulevard	67.5	68.3	+0.8
South of Del Amo Boulevard	67.5	68.3	+0.8
North of Del Amo Boulevard	67.3	67.5	+0.2
CARSON STREET			
East of Figueroa Street	64.9	65.5	+0.6
East of Main Street	65.8	66.0	+0.2
TORRANCE BOULEVARD			
East of Harbor Freeway	66.4	67.1	+0.7
East of Figueroa Street	63.4	65.4	+2.0
West of Main Street	63.1	64.5	+1.4
SAN DIEGO FREEWAY (405)			
West of Harbor Freeway (I-110)	79.4[1]	79.4[1]	0.0
East of Harbor Freeway (I-110)	78.8[1]	78.8[1]	0.0

[1] CNEL is provided at 150 feet, since 100 feet may be within the right-of-way.

Cumulative future noise levels with the project are provided in Table 20. As shown therein, noise levels with the project at 100 feet from the centerline of roadways in the project area would range from a low of 62.8 CNEL along Hamilton Avenue to a high of 68.3 CNEL along Main Street. The noise level with the project at 150 feet from the centerline of the I-110 and I-405 Freeways would range from 77.0 to 79.4 CNEL.

Noise impacts can be broken down into three categories. The first is "audible" impacts which refers to increases in noise level that are perceptible to humans. Audible increases in noise level generally refer to a change of 3.0 dBA since this level was found to be barely perceptible in exterior environments. The second category, "potentially audible", references a change in noise level between 1.0 dBA and 3.0 dBA. This range of noise levels was found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1.0 dBA that are "inaudible" to the human ear. Only "audible" changes in noise level are considered significant. A comparison between the two cumulative future scenarios indicates an increase in cumulative future noise along 18 of the 21 links analyzed and no change on the remaining three links with the addition of project traffic. Noise level changes are identified in Table 21, Cumulative Future Project-related Noise Change, that range from "no change" to an increase of 2.0 dBA with the project. Expected increases in noise adjacent to Hamilton Avenue, Figueroa Street, Main Street, Carson Street, and Torrance Boulevard are considered "inaudible" or "potentially audible". No "audible" increases in noise level are anticipated. However, residential uses adjacent to Figueroa and Main Street would be subject to slight increases in noise level. Since this increase would not be perceptible to humans, the project does not result in a significant noise impact.

Future On-Site Conditions

On-site noise impacts result from cumulative traffic volumes on roadways adjacent to the project area. The worst-case cumulative traffic volumes in post-2000 were evaluated to determine the level of impact and mitigation required to reduce on-site noise to acceptable levels.

In the City of Carson, transient lodging is "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Office buildings, business facilities, commercial facilities are "normally acceptable" up to 70 CNEL and "conditionally acceptable" to 77 CNEL. The proposed land uses on-site need to be compatible with these noise levels to meet the criteria for insignificance.

Noise levels from Table 20 indicate a future noise environment below 70 CNEL for land uses adjacent to Figueroa Street, Main Street and Torrance Boulevard. These noise levels would be compatible with the land uses proposed on-site.

However, uses adjacent to Figueroa Street would receive combined noise from the Harbor Freeway.

Existing monitoring indicated a measurement of 72.8 dBA at a mid-block location and 72.3 dBA near the intersection of Figueroa Street and Torrance Boulevard, both in proximity of the freeway. Future noise levels would increase less than 2.0 dBA above existing monitoring as a result of cumulative plus project traffic. Therefore, noise levels on-site in proximity to the Harbor Freeway would be 75 CNEL or less. This level is considered "normally unacceptable" for transient lodging and "conditionally acceptable" for retail commercial uses. Mitigation is provided in the following section to reduce these impacts to a level of less than significant.

The hotel uses would require architectural treatments to ensure an interior noise level of 45 dBA to meet the State of California standards and appropriate design to ensure a 65 dBA exterior level in usable areas. Normal construction would provide an exterior-to-interior reduction of 20 to 25 dBA. To be compatible with the noise environment, the hotel uses would require a further reduction of 5 to 10 dBA. This can be provided through architectural treatments to windows and wall assemblies. While development plans for the hotel have not been established, any exterior activity areas being considered would require an analysis to determine compatibility with the exterior environment. The areas to be analyzed would include garden areas, outdoor eating establishments and swimming pool areas. Architectural plans would need to be analyzed by a qualified acoustical consultant to verify that the needed interior-to-exterior noise reduction and any exterior noise mitigation are incorporated into the design.

Noise generated on-site would increase the sound level in the adjacent residential neighborhood. The noise from parcels 8, 9, 10 and 11, as identified in Figure 13, would be limited to traffic operations and occasional machinery usage through open doors and windows. This noise can easily be minimized through enforcement of the Carson Noise Ordinance.

Residences adjacent to Parcel 1 (see Figure 13) would be subject to the sound of motor vehicles in the parking lot and customers accessing the retail areas. Since existing levels are relatively low, this noise is not expected to exceed the standards.[36] Noise from horn sounding, car brake squeals, door closing and occasional accidents may be heard in these areas, and would constitute a nuisance to nearby receptors. This is not considered a significant impact of the project.

[36] Monitored levels ranged between 49.9 and 58.9 dBA.

4.4.3 Mitigation Measures

The following specific mitigation measures are recommended for incorporation in the project to minimize noise impacts and insure compliance with applicable noise standards. The projected noise level is considered compatible with the land uses proposed on-site if mitigation measures are implemented as proposed.

Short-Term Mitigation

1. Construction activities shall take place only between 7:00 A.M. and 6:00 P.M. Monday through Saturday as specified in the City of Carson Noise Ordinance. Hours of operation shall be incorporated in all construction contracts.

2. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. The construction contracts shall require that all equipment and noise mufflers are in proper working order.

3. Stationary equipment shall be placed such that emitted noise is directed away from occupied buildings in the project area. The construction contracts shall require the proper placement of all stationary construction equipment.

4. Construction vehicle routing shall avoid routes adjacent to residential uses where feasible.

Long-Term Mitigation

5. Site design in retail commercial areas in Parcel 1 in proximity to the Harbor Freeway shall consider attenuation of roadway noise. Buildings can be setback to increase the distance to the roadway, locating parking areas and landscaping in intervening spaces. Further analysis is required to determine specific mitigation when exact uses and building footprints are available.

6. Truck access, parking area design and air conditioning refrigeration units should be carefully designed and evaluated at more detailed levels of planning to minimize the potential for acoustic incompatibilities between land uses.

7. Truck loading areas will be oriented and designed in a manner that minimizes noise intrusion into the residential areas south of the site.

Should noise from loading activities become a nuisance, truck access could be restricted to the hours between 7:00 a.m. and 7:00 p.m.

8. For proposed transient lodging uses, a site specific analysis will be required to address appropriate mitigation and site design after building plans have been developed. Other noise mitigation methods exist which shall be considered in project-level development design to attenuate roadway noise. These methods include:

- The location of bedrooms and quiet living areas in transient lodgings should face away from the Harbor Freeway while areas (such as kitchens, garages, bathrooms and recreation rooms) that are more noise tolerant should face the source.

- Where a recreational area associated with the hotel facilities is designed for quiet activities, it should not be located near the Harbor Freeway.

- Courtyards, plazas and open space areas designed for pedestrian uses should be shielded from intrusive noise levels by intervening structures wherever possible.

9. An eight-foot wall between the project site and the residential neighborhood to the south would be sufficient to mitigate any noise impacts. The wall must be built of solid material and be placed contiguous with the ground surface with no intervening air space. To minimize potential aesthetic impacts, the walls should blend with the surrounding environment. Extensive landscaping with a variety of plants, trees and vines is encouraged to reduce visual impacts.

4.4.4 Level of Significance After Mitigation

The noise impacts of the project are less than significant after mitigation.

4.5 GEOLOGY

4.5.1 Environmental Setting

Soils

The proposed site for the Golden Eagle Center consists of about 76 acres of vacant land, including a closed and capped landfill. Leighton and Associates has mapped[37] surficial alluvial sediments in this area of Carson as **Pfm**, or Pleistocene-aged moderately to well-consolidated and locally cemented, sands and minor gravels, and finer deposits of silt and clay. These soils are older alluvium, flood plain, and Late Pleistocene marine and nonmarine terrace deposits. Substantial subsurface exploration, including well drilling and cone penetration testing (CPT), has been conducted on-site in conjunction with the remedial work for clean up of contaminated soils on this site (see Section 2.2.1 Site History and 2.2.2 Ongoing Cleanup). These investigations indicate that the alluvial soils on-site consist primarily of clay-rich soils including: clay, silty clay, sandy clay, silt, clayey silt, sandy silt, silty sand. Groundwater was first encountered at approximately 51 feet below the ground surface. Current on-site bioremediation operations involve excavating contaminated soil, piling the excavated soil in treatment units, treating and testing the soil, and finally backfilling excavated areas with the treated soil. This will result in considerable horizontal and vertical mixing of the on-site soils.

Liquefiable soils have been identified as occurring at or near the site.[38] Although the scale of this map makes exact boundaries somewhat difficult to identify, it appears that soils north of Torrance Boulevard are susceptible (the project site is just south of Torrance Boulevard). Liquefaction refers to a phenomenon in which water-saturated granular soils are temporarily transformed from a solid to a liquid state because of a sudden shock or strain, typically occurring during earthquakes. Depending on the other factors such as soil density, ground slope and stratification, the temporary loss of strength may result only in surface sand and soils or cracks and may also lead to foundation failures, landslides and excessive subsidence. To have potential for liquefaction, three simultaneous conditions are necessary: generally cohesionless soils, high groundwater, and ground shaking.

37 Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 1, p. 3-34 and Plate 2 "Engineering and Geologic Materials."

38 Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 2, Plate 4.

Where high groundwater and ground shaking hazards are identified, soils most susceptible to liquefaction include those which include fine to coarse sand and silt mixtures. Clayey sand and silt (clay < 15 percent), sandy gravels (gravel < 50 percent) and clayey sand and gravels (< 15 percent clay and liquid limit < 35 percent) are the least susceptible.[39] The groundwater levels (51+ feet below surface level) are not especially high. Liquefaction potential at this site in an undisturbed condition would probably range from low to moderate, despite considerable potential for ground shaking during earthquakes. However, it is appropriate that a registered soils or geotechnical engineer examine the boring logs and CPT records to make this determination.

Other potential soils engineering problems in the project vicinity include earthquake-induced ground settlement hazards and potential for expansive soils. The Technical Report prepared for the Los Angeles County Seismic Safety Element indicates that damaging settlements can occur in areas outside those identified as susceptible to liquefaction, although settlement generally is not as damaging as liquefaction. All alluvial areas in Los Angeles County are susceptible to earthquake-induced ground settlement,[40] including the Golden Eagle Center site. Expansive soils are those which show significant increases/decreases in volume (shrink-swell or expansive soils) as moisture content changes. Expansive soils include some types of clays and some shales and mudstones; some on-site soils may be expansive. The remediation for soil contamination will provide extensive engineering properties information about on-site soils. Again, it is appropriate that a registered soils or geotechnical engineer examine the site after soils remediation to make a determination regarding design requirements and/or to identify appropriate measures to alleviate any remaining weak soils characteristics.

Seismicity

Discussion of seismicity utilizes several key concepts: magnitude, the maximum credible event (MCE), and intensity. Magnitude is the most commonly used measure of the size of an earthquake and is an objective, instrumentally determined measure of the amount of energy released by an earthquake. Several numeric scales (including the Richter scale) have been devised by seismologists to study and compare earthquake events. Magnitude is not used to measure damage caused by an earthquake. The MCE is a calculated estimate of the "worst case" magnitude earthquake if the fault were ruptured along its entire length,

39 Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 1, p. 3-29.

40 Ibid., p. 3-42.

based on the best current knowledge of a particular fault. Seismologists and geotechnical engineers generally use the characteristics estimated for a MCE to identify methods to reduce structural damage from earthquakes. Unlike magnitude, intensity is an estimate of potential or observed damage from a particular earthquake event. Intensity scales are measures of the perceived strength of an earthquake as it affects local residents and construction, based on interviews and observations. The Modified Mercalli scale (see Table 22) is the most commonly used intensity scale, and is more useful for planning purposes than magnitude, since it is readily understood by the average person.

Information on regional seismicity and hazards was obtained from the Safety and Seismic Safety Elements of the Carson General Plan, the Safety Element of the Los Angeles County General Plan, the California Division of Mines and Geology (DMG) Planning Scenario for a Major Earthquake on the Newport-Inglewood Fault Zone, and the Urban Geology Master Plan for California.

The City of Carson is located within the West Coast Basin, a portion of the Los Angeles Coastal Plain in the Peninsular Ranges Geomorphic Province. The West Coast Basin is a poorly drained plain, flanked by eroded highland areas to the east and south, and underlain by water-bearing deposits of Pleistocene age.[41]

This part of southern California is characterized by elongated northwest-southeast trending ridges, valleys and structural features and is a seismically active area. There are approximately 50 onshore active and potentially active faults or principal fault segments located wholly or partially in Los Angeles County. Twenty-one of these are considered major active faults. There are also an unknown number of buried thrust faults and several offshore faults, some of which could cause damaging earthquakes.[42] Many of these regional faults have the potential to generate significant groundshaking impacts at the project site. Detailed information is provided below about those faults within 10 miles of the Golden Eagle site, in addition to the San Andreas fault which is also capable of impacting the site.

The City of Carson is located on the western boundary of the Newport-Inglewood fault zone. Two segments of this active fault zone (the Cherry Hill fault zone and the Avalon-Compton fault zone, which are both part of the Newport-Inglewood fault) traverse the City. The Seismic Safety Element of the Carson General Plan

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[41] SCE Engineers, May 1990. Final Modified Remedial Investigation for Golden Eagle Refinery Site Carson, California.

[42] Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 1, p. 5.

TABLE 22
THE MODIFIED MERCALLI INTENSITY SCALE[1]

(As modified by Charles F. Richter in 1956 and rearranged)

If most of these effects are observed	*then the intensity is:*
Earthquake shaking not felt. But people may observe marginal effects of large distance earthquakes without identifying these effects as earthquake caused. Among them: trees, structures, liquids, and bodies of water sway slowly, or doors swing slowly.	I II
Effect on people: Shaking felt by those at rest, especially if they are indoors, and by those on upper floors. *Effect on people:* Felt by most people indoors. Some can estimate duration of shaking. But many may not recognize shaking of building as caused by an earthquake: the shaking is like that caused by the passing of light trucks.	III
Other effects: Hanging objects swing. *Structural effects:* Windows or doors rattle. Wooden walls and frames creak.	IV
Effect on people: Felt by everyone indoors. Many estimate duration of shaking. But they still may not recognize it as caused by an earthquake. The shaking is like that caused by the passing of heavy trucks, through sometimes, instead, people may feel the sensation of a jolt, as if a heavy ball had struck the walls. *Other effects:* Hanging objects swing. Standing autos rock. Crockery clashes, dishes rattle or glasses clink. *Structural effects:* Doors close, open or swing. Windows rattle.	V
Effect on people: Felt by everyone indoors and by most people outdoors. Many now estimate not only the duration of shaking but also its direction and have no doubt as to its cause. Sleepers wakened. *Other effects:* Hanging objects swing. Shutters or pictures move. Pendulum clocks stop, start or change rate. Standing autos rock. Crockery clashes, dishes rattle or glasses clink. Liquids disturbed, some spilled. Small unstable objects displaced or upset. *Structured effects:* Weak plaster and Masonry D* crack. Windows break. Doors close, open or swing.	VI
Effect on people: Felt by everyone. Many are frightened and run outdoors. People walk unsteadily. *Other effects:* Small church or school bells ring. Pictures thrown off walls, knickknacks and books fall off shelves. Dishes or glasses broken. Furniture moved or overturned. Trees, bushes shaken visibly, or heard to rustle. *Structural effects:* Masonry D* damaged; some cracks in Masonry C*. Weak chimneys break at roof line. Plaster, loose bricks, stones, tiles, cornices, unbraced parapets and architectural ornaments fall. Concrete irrigation ditches damaged.	VII
Effect on people: Difficult to stand. Shaking noticed by auto drivers. *Other effects:* Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Furniture broken. Hanging objects quiver. *Structural effects:* Masonry D* heavily damaged; Masonry C* damaged, partially collapses in some cases; some damage to Masonry B*; none to Masonry A*. Stucco and some masonry walls fall. Chimneys, factory stacks, monuments, towers, elevated tanks twist or fall. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off.	VIII
Effect on people: General fright. People thrown to ground. *Other effects:* Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes. Steering of autos affected. Branches broken from trees. *Structural effects:* Masonry D* destroyed; Masonry C* heavily damaged, sometimes with complete collapse; Masonry B* is seriously damaged. General damage to foundations. Frame structures, if not bolted, shifted off foundations. Frames cracked. Reservoirs seriously damaged. Underground pipes broken.	IX
Effect on people: General Panic. *Other effects:* Conspicuous cracks in ground. In areas of soft ground, sand is ejected through holes and piles up into a small crater, and, in muddy areas, water fountains are formed. *Structural effects:* Most masonry and frame structures destroyed along with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes and embankments. Railroads bent slightly.	X
Effect on people: General Panic. *Other effects:* Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. *Structural effects:* General destruction of buildings. Underground pipelines completely out of service. Railroads bent greatly.	XI
Effect on people: General Panic *Other effects:* Same as Intensity X. *Structural effects:* Damage nearly total, the ultimate catastrophe. *Other effects:* Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.	XII

* Masonry A: Good workmanship and mortar, reinforced, designed to resist lateral forces.
Masonry B: Good workmanship and mortar, reinforced.
Masonry C: Good workmanship and mortar, unreinforced.
Masonry D: Poor workmanship and mortar and weak materials like adobe.

1 From Urban Geology: Master Plan for California, Bulletin 198, California Division of Mines and Geology, Sacramento, California 1973.

identifies the Newport-Inglewood fault as the most hazardous for Carson. Regional active faults located outside the City boundaries, but within about 100 kilometers (about 62 miles), also have potential to impact the city. The nearest of these include: the Palos Verdes fault, the Cabrillo fault, and the Redondo Canyon fault (off-shore). Although the San Andreas fault is located about 50 miles from the city, it has the potential to generate an magnitude 8+ earthquake (MCE) which would impact the Los Angeles Basin[43], although a lesser magnitude earthquake on a nearer fault, such as the Newport-Inglewood, would be more damaging.

The Golden Eagle site is located approximately 3 miles from the nearest segment of the Newport-Inglewood fault zone (the Avalon-Compton fault zone), about 4 miles from the Cherry Hill fault zone (also part of the Newport-Inglewood fault), 4 miles from the Palos Verdes Hills fault, 6 miles from the Cabrillo fault, and about 7.5 miles from the off-shore Redondo Canyon fault.[44] The site is within about 50 miles of the nearest active segment of the San Andreas fault. Although there is an Alquist-Priolo Special Studies Zone (APSSZ) identified for portions of both the Avalon-Compton and Cherry Hill faults and surface fault rupture hazard in Carson is high within the boundaries of these zones, the site is not located within any APSSZ. Figure 52 shows the approximate location of the Alquist-Priolo fault zones with respect to the site.

Newport-Inglewood fault zone: The Newport-Inglewood fault zone is expressed at the surface by a northwest-trending zone of faulted anticlines. According to Yeats (1973):

> "All these anticlines are sites of oil fields; from northwest to southeast, these are the Cheviot Hills, Inglewood, Potrero, Howard Townsite, Rosecrans, Dominguez, Long Beach, Seal Beach, Sunset Beach, Huntington Beach, and West Newport oil fields... On the northwest, the zone terminates abruptly against the Malibu Coast fault system in the vicinity of the Cheviot Hills oil field, but the extension of the zone to the southeast beyond the West Newport field is a matter of controversy."[45]

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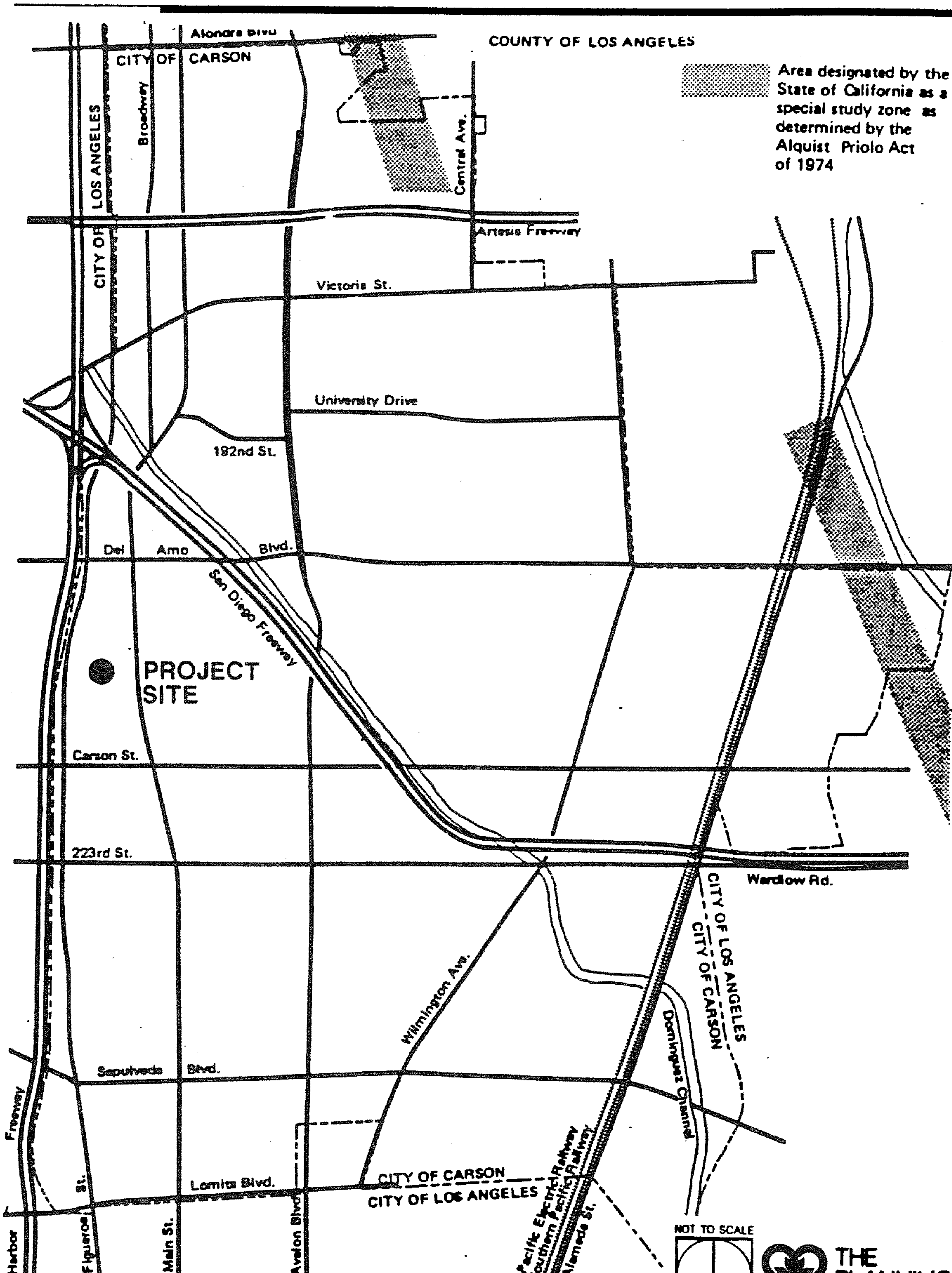
43 Measurements made using the Fault Map of California with Locations of Volcanos, Thermal Springs and Thermal Wells, California Division of Mines and Geology, 1988 printing.

44 Measurements made using Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 2, Plate 1.

45 Yeats, R.S., "Newport-Inglewood fault zone, Los Angeles Basin, California," American Association of Petroleum Geologists Bull., 57, pp. 117-135, 1973.

SEISMIC STUDY ZONES



SOURCE: SAFETY, SEISMIC SAFETY AND NOISE ELEMENTS, CITY OF CARSON GENERAL PLAN, REVISED DECEMBER, 1981.

The Newport-Inglewood fault is believed to be responsible for the catastrophic 1933 Long Beach earthquake with a Richter scale magnitude of 6.3. According to Richter: "Loss of life is commonly stated as 120, and property damage at 50 million dollars" from this event.[46] It is estimated that the MCE for this fault is a 7.5 magnitude earthquake. Such an earthquake would be sixteen-fold more powerful than the 1933 quake and would cause widespread devastation.

Both the *Avalon-Compton fault zone,* located about three miles northeast of the site and the *Cherry Hill fault zone,* located about four miles east of the site are active segments of the Newport-Inglewood, and impacts to the site from these fault zones are as described for the Newport-Inglewood fault zone as a whole. Both of these faults are northwest trending, vertical faults with reverse-right-oblique sense of movement. The Avalon-Compton fault last moved in 1941 and 1944; while there have been numerous small earthquakes east of the trace of the Cherry Hill fault.[47] The epicenter for the November 14, 1941 Torrance-Gardena earthquake (M_L 5.4) was located southwest of the surface trace for the Cherry Hill fault.[48]

The City of Carson is included in Planning Area 5 for the Newport-Inglewood Fault Zone (NIFZ) Planning Scenario. The Planning Scenario addresses the impact of a major earthquake on communities in the vicinity of the NIFZ, and provides a "worst case" for emergency planning. It is not intended to substitute for site-specific engineering evaluations.[49] The NIFZ Planning Scenario does, however, provide some useful information for seismic emergency planning as it relates to Carson.

According to the NIFZ Planning Scenario, the vicinity of the Golden Eagle site could experience intensities ranging around VIII from a 7.5 event on the Newport-

46 Richter, C.F., 1958. Elementary Seismology, p. 768, W.H. Freeman and Company, San Francisco.

47 Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 1.

48 Note that magnitude M_L refers to a scale originally developed for measuring southern California earthquakes, which are generally less than 15 km deep. Ziony, J.I. and Yerkes, R.F., 1985. Evaluating Earthquake and Surface-Faulting Potential, *in* Evaluating Earthquake Hazards in the Los Angeles Region: An Earth Science Perspective, U.S. Geological Survey Professional Paper 1360, pp. 43-91, U.S. Government Printing Office, Washington, DC.

49 Toppozada, *et al.,* 1988. Planning Scenario for a Major Earthquake on the Newport-Inglewood Fault Zone, Special Publication 99, California Department of Conservation, Division of Mines and Geology.

Inglewood fault.[50] Intensity depends on: magnitude, distance from the epicenter, acceleration, period duration and amplitude of seismic waves, type of ground, water table, type and quality of construction, and the natural fundamental period of structures and their foundations.

Palos Verdes Hills fault: The Palos Verdes Hills fault, located an estimated 4 miles to the southwest of the Golden Eagle Center site, is an active fault with an onshore extent of about 15 kilometers that extends across the Palos Verdes peninsular. This fault has also been mapped northwestward into Santa Monica Bay while segments of the fault extend into San Pedro Bay. There have been numerous small earthquakes on this fault, and it is considered an active fault. It is estimated that the MCE on this fault would be magnitude 7.0 on the Richter scale.[51]

Cabrillo fault: This fault is located roughly 6 miles southwest of the Golden Eagle site. The Cabrillo fault is comprised of several echelon (braided) strands which has had scattered small earthquakes near the fault trace.[52] Leighton and Associates categorize this as an active fault because Holocene displacement on the offshore portion of the fault suggests more study of this fault is warranted.[53]

Redondo Canyon fault: The Redondo Canyon fault is an off-shore fault located approximately 7.5 miles west of the project site. There have been scattered small earthquakes near the trace of this fault.[54]

San Andreas: The San Andreas fault system is the dominant active fault in southern California, and is the boundary between two moving tectonic plates; the Pacific Plate to the southwest and the North American Plate to the northeast. The San Andreas fault is generally northwest-southwest trending, dipping south approximately 80 degrees to near vertical.

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50 Ibid.

51 Ziony, J.I. and Yerkes, R.F., 1985. Evaluating Earthquake and Surface-Faulting Potential, *in* Evaluating Earthquake Hazards in the Los Angeles Region: An Earth Science Perspective, U.S. Geological Survey Professional Paper 1360, pp. 43-91, U.S. Government Printing Office, Washington, DC.

52 Ibid.

53 Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 1, p. A-18.

54 Ibid.

Two great historical earthquakes, with extensive surface faulting, have occurred along this fault in recent times; the 1906 San Francisco earthquake and the 1857 Fort Tejon earthquake. The Fort Tejon quake was the last major earthquake reported on the San Andreas fault in the southern California region, although smaller events have occurred since then. The California Division of Mines and Geology has published the *Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault*[55] which states that the San Andreas is capable of generating severe groundshaking in the Carson area with intensities approximately equivalent to intensity VII to VIII, in the event of the "scenario earthquake." The "scenario earthquake" assumes a repeat of the Fort Tejon earthquake, an estimated **M** 8.3 earthquake on the southern San Andreas fault.

Due to the proximity of these regional active and potentially active faults in and around Los Angeles County, and local active faults in Carson, the risk of structural damage and loss of life due to ground shaking is considerable. The largest losses of life and property in California due to geological hazards have been caused by violent ground shaking during earthquakes.[56] Although this hazard is not unique to the City of Carson, nor to Los Angeles County, ground shaking hazard should not be underestimated even in portions of the city where surface rupture risk is low. The Los Angeles County Seismic Safety Element notes that Carson and the entire South Bay area are regarded as one of the most severe shock areas in the Los Angeles basin, due to the fact that the area has an unstable sub-base of sandy soil.[57]

Due to statewide potential for severe geologic hazards and concerns regarding personal injury and property damage from future earthquakes, the Seismic Safety Mapping Act was passed in 1990. This new law calls for delineation of special Seismic Hazards Study Zones (SHSZ) or areas of high potential for enhanced ground shaking, liquefaction, earthquake-induced landslides, and other ground failures, which collectively account for most earthquake losses. The law requires the state geologist to compile maps identifying seismic hazards and submit them to the State Mining and Geology Board (SMGB) and to all affected cities, counties, and state agencies for review and comment. Revisions of the final maps will then be provided to each state agency, city or county having jurisdiction over lands containing an area of seismic hazard. This mapping program has just gotten underway, and it is expected to take between 1-1.5 years before compilation of the

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55 California Department of Conservation, Division of Mines & Geology, 1982. Earthquake Planning Scenario for a Magnitude 8.3 Earthquake on the San Andreas Fault in Southern California, Special Publication 60.

56 California Division of Mines and Geology, 1973. Urban Geology: Master Plan for California, Bull. 198, p. 19.

57 City of Carson, 1981. Seismic Safety Element of the Carson General Plan.

first maps, therefore it is not certain whether all or only portions of Carson will fall into a SHSZ. However, with the existing Avalon-Compton and Cherry Hill fault zones and portions of the city at risk for ground failure and liquefaction, it is possible that this new planning requirement would take effect before project buildout and impose special design standards affecting the project site. This is mentioned to indicate the direction of future planning for earthshaking protection.

Currently, new construction of buildings in Carson is required to utilize earthquake resistant design of buildings, in accordance with the Uniform Building Code (UBC), using the seismic safety requirements derived from the appropriate section of the UBC. Adherence to the UBC standards is the best mitigation method currently available to reduce hazards from ground shaking, although it does not totally eliminate the problem of building collapse or structural damage caused by large earthquakes.

4.5.2 Environmental Impacts

The Golden Eagle Center is likely to be subjected to severe ground shaking from earthquakes originating from active faults where the epicenter was located within about 100 kilometers (62 miles) from the City within the design lifetime of the proposed structures. This is not unusual for Southern California, and any development located in an active seismic region needs to take potential ground shaking into consideration.

The Specific Plan would add structures and people to the site that may be impacted by on-site weak soils and regional geologic/seismic hazards as the Golden Eagle Center is developed. The Specific Plan allows tilt-up concrete construction in the R&D/Light Industrial uses. The Specific Plan also permits development of both high occupancy and high-rise (over 8 stories) buildings. The high-rise hotel would attract visitors from outside the area, while other non-residential development in the Specific Plan area would add a large employee population to the site. The retail component of the Specific Plan would also attract a large population of customers.

Soil properties affect foundations for buildings, facilities for storing water, drainage systems, systems for the disposal of sewage, and the construction and maintenance of roads and pipelines. Soil properties relating to engineering uses include texture, depth from surface, depth to seasonal high water table, permeability, liquefaction potential, and shrink-swell potential. Potentially present on-site problem soils include: soils susceptible to liquefaction, significant increases/decreases in volume (shrink-swell or expansive soils) as moisture content changes, or structural weakness. Problem soils would require some form of stabilization, design, or an engineering solution to reduce potential for property damage. The subsurface investigations prepared for the on-site soils remediation contain information useful in assessing the site's suitability for construction of the proposed buildings and their foundations. However, engineering suitability characteristics are not described or evaluated in these studies, since these were prepared specifically to address on-site hazardous materials concerns.

A licensed geologist or geotechnical engineer should be retained to review the existing boring logs and CPT's and to make a determination regarding on-site seismic parameters to which buildings should be constructed to withstand. With the remediation, replacement, and compaction of on-site soils a considerable mixing would occur, and this may either improve the overall condition of the site or create problem areas in some portion of the site. Additional site-specific geotechnical assessment may be required to determine engineering suitability of on-site soils after remediation and replacement and site preparation is completed. A determination regarding current site-specific liquefaction potential and assessment of soils to identify portions of the site with potential expansive soils should be required. If either liquefaction, expansive soils, or other weak soils are detected, appropriate mitigation measures should be identified by the geologist and geotechnical engineer providing these technical reports.

High-rise buildings (over 8 stories) are more likely to be damaged by long period groundshaking during an earthquake on a distant fault than from earthquakes generated on near-field local faults.[58] There is also a greater risk for internal non-structural damage from falling lamps, ventilators, office equipment, and interior non-load bearing walls.[59] In particular, internal damage during an earthquake may lead to increased fire hazards. Evacuation from high rise buildings is also more difficult than from shorter structures. Visitors to the Golden Eagle Center's hotel, especially those visitors who live in regions with little risk for seismic hazards may be especially at risk, since they may have little knowledge of what is the appropriate response to such an event.

The high-rise structures planned are also high occupancy uses. Structures that typically have high levels of occupancy, such as buildings used for public assembly, or that otherwise attract large congregations of people (i.e., 500 or more people) such as shopping centers, high-rise office buildings, schools, auditoriums, churches, or movie theaters are usually identified as facilities at high risk, since the concentration of people using these types of facilities at any given time puts

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58 Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 1, p. 4-15.

59 State of California, Seismic Safety Commission, 1987-03. Guidebook to Identify and Mitigate Seismic Hazards in Buildings.

more lives at risk and implies a greater need for protection than low occupancy structures. A disaster event may occur at a time when there is a high concentration of individuals on-site (for example, Saturday afternoons in a shopping center) and mass panic may occur.

Low-story buildings are more likely to be damaged by near-field earthquakes produced by a local fault, such as the Newport-Inglewood, than by earthquakes on distant faults, such as the San Andreas. The R&D/Industrial land uses for the Specific Plan allows use of tilt-up concrete construction. Recent trends (post-1971) in tilt-up concrete construction have been to increase the height, reduce the shear wall area, and increase the complexity of the building configurations using minimal post-1971 UBC provisions; and there is evidence from the 1987 Whittier Narrows earthquake that some complex tilt-up concrete construction buildings are still vulnerable to collapse during seismic events.[60]

The addition of new jobs would increase the "population at risk" (within City limits) for a disaster event; an increase which the City of Carson's Emergency Plan does not provide for. The Specific Plan would add an employee population of 6,464 employees. The project would also add visitors at the hotel uses on-site. In addition, the project would also add shoppers at the planned retail commercial facilities. The City's Emergency Plan, therefore, should be updated periodically to insure that an adequate response can be activated in the event of an emergency. Disaster planning provides a non-structural adjustment to a hazardous environment which includes recommendations for individual and group behavior that have potential to reduce deaths and injuries, reduce property loss, provide disaster assistance such as medical care and emergency shelter, and provide for effective evacuation for those types of disasters which requires it.

4.5.3 Mitigation Measures

1. Future development projects shall include a geotechnical report identifying seismic parameters (such as peak ground acceleration) to which buildings must be built to enable structures to withstand the maximum credible earthquake. This determination shall be made by a licensed, registered geologist or engineering geologist. Such studies shall be provided prior to building plan approval, as directed by the City's Building Official, and shall include design requirements to address all site-specific soils, geologic, and seismic hazards.

[60] Leighton & Associates, January 1990. Technical Appendix to the Safety Element of the Los Angeles County General Plan, Hazard Reduction in Los Angeles County, Vol. 1, p.4-20; Hamburger, *et al.*, 1988. The Whittier Narrows, California Earthquake of October 1, 1987, Performance of Tilt-Up Buildings: EERI - Earthquake Spectra, Vol., 4, No. 2, pp. 219-254.

2. For each development application, the development plan shall include provisions relating to general public safety (for employees and visitors), including adequate access and a disaster plan.

3. The City shall update its Emergency Plan to include development of the 76-acre site for the land uses proposed; if the City determines it is necessary, each developer shall provide a pro-rated share of the cost of updating and implementing the Emergency Plan.

4.5.4 Level of Significance After Mitigation

Mitigated to a less than significant level.

4.6 AESTHETICS

The term "aesthetics" within the context of this EIR refers primarily to the visibility of a structure from its surroundings and the visual compatibility of structures with each other. Issues of concern in considering the aesthetic qualities of a given project include potential obstruction of scenic vistas or views open to the public, creation of aesthetically offensive sites open to the public view, and shading or shadowing due to new construction. Design review of the aesthetic quality of the structures proposed includes consideration of form, surface articulation, choice of materials, finishes, and colors.

4.6.1 Environmental Setting

The site is currently vacant, with the exception of about 10 acres in the northeast portion of the site which was once used for a Class III landfill. The landfill is now closed, and is covered by an asphalt cap.

The area surrounding the Golden Eagle Center site is heavily urbanized. Existing uses adjacent to the project site include older residential, retail/service, commercial, and industrial land uses. These buildings are one- and two-stories in height, with variation in the size of setbacks, and sparse landscaping. For a detailed description of the surrounding land uses, refer to Section 4.1, Land Use. The current vistas across the site are not aesthetically pleasing and the site itself is currently an aesthetically offensive vista partially screened from public view.

The Carson General Plan Land Use, Open Space, and Scenic Highway Elements contain goals, guidelines, standards, and programs designed to protect and improve Carson's urban environment. These policies are further discussed in Section 4.1, Land Use and Relevant Planning.

4.6.2 Environmental Impacts

The goal for the Golden Eagle Center Specific Plan is to establish a distinctive image, attract prestige businesses, implement landmark office building, and beneficially influence surrounding properties. To achieve this requires:

- A strong initial phase of landscaping and street improvements.
- Clear visibility of the Center from the surrounding streets.
- Attractive and well-coordinated design themes.

Descriptions of the Specific Plan and methods utilized to incorporate the above goals are discussed below.

The Specific Plan would combine defined landscape palates, perimeter and interior streetscape standards, landscaped buffers, signage and lighting standards and site development standards to create a coherent, attractive and harmonious development.

The Development Plan for the Golden Eagle Center Specific Plan provides for Retail Commercial, Visitor Commercial, Office, Research and Development, and Light Industrial land uses. Retail Commercial/Visitor Commercial would cover 40 acres, located on the western half of the site. These buildings would be one to two stories tall, with storefronts oriented to Torrance Boulevard and Main Street. The landfill area located in this portion of the project site cannot support structures, and will be used for parking.

A hotel and accompanying restaurants could be located in the northwest corner of the site. The hotel would be a maximum of 10-stories high, with high freeway visibility.

A business park is planned for the southeast portion of the site. Office and light industrial buildings ranging from 1 to 6 stories would compose the business park. Office and light industrial buildings adjacent to the residential neighborhood to the south would not impact the residences. This would be accomplished by inclusion of a landscaped buffer strip along the site boundary and by increasing the building setback by one foot for each foot of height over 30 feet.

Implementation of the Specific Plan would prevent adverse impacts due to building design and would eliminate the existing offensive conditions.

The primary potential impact is shading of the nearby existing residences. A shade/shadow analysis indicates that the only land use sensitive to shadow impacts are the residences located directly south of the project site. However, the two-story height maximum for retail commercial structures that could be built along the southern edge of the Golden Eagle site, combined with the southern edge buffer zone and height/setback requirements for office buildings, would avoid creating shadows that could impact residents living in the adjacent homes.

4.6.3 Mitigation Measures

Because no significant impacts are anticipated, no mitigation measures are necessary.

4.6.4 Level of Significance After Mitigation

Not significant.

4.7 POPULATION, EMPLOYMENT, & HOUSING

4.7.1 Environmental Setting

Local Conditions

Population

Table 23 summarizes Carson's population growth trends during the last two decades. In 1970 the City of Carson had a population of 72,358 residents. By 1980 Carson gained 8,863 new residents for an estimated population of 81,221. During the decade between 1970 and 1980, therefore, the city experienced a 12.2 percent increase in its population, for an annual growth rate of 1.2 percent. Population growth in the city slowed considerably during the next ten years. In 1990 the Census counted 83,995 Carson residents, an increase of only 2,774 residents over the 1980 counts. This resulted in a 3.4 percent increase, or 0.3 percent annual growth rate, between 1980-1990.

The population in Carson has stabilized largely because the city is nearing its build-out capacity for residential land. There were only 26.37 acres of residentially zoned vacant land remaining in Carson in May of 1989.[61] There is also about 94 acres of residentially zoned land which is "underutilized," where large residential parcels are occupied by dwellings which utilize 50 percent or less of the site. The State Department of Finance estimated Carson's January 1992 population to be 84,456 residents, or 461 more residents than were counted in the 1990 Census.

TABLE 23
POPULATION GROWTH TRENDS IN CARSON
1970-1992

Year	Population[1]	Interval, in Years	Population Increase/ Decrease	% Difference	Average Annual Increase/ Decrease	% Difference, per year
1970	72,358					
1980	81,221	10	8,863	12.2	886	1.2
1990	83,995	10	2,774	3.4	277	0.3
1992	84,456[2]	2	461	0.5	231	0.3

1 Population counts for 1970, 1980, and 1990 from the U.S. Census Record.
2 State of California, Department of Finance, Demographic Research Unit, May 1992. Population and Housing Estimates of California Cities and Counties, Report E-5.

61 City of Carson, June 1989. Housing Element of the General Plan, p. III-4.

The 1990 Census collection methods include provisions to take a more accurate count of minorities, particularly Hispanics, who are thought to have been undercounted in earlier Census Records. Carson is a very balanced community ethnically. The Southern California Association of Government (SCAG) computes the 1990 ethnic breakdown for the city as: 28 percent Hispanic, 26 percent black, 24 percent Asian/Pacific Islander, and 22 percent white.[62]

Housing[63]

In 1980, the City of Carson had 23,250 dwelling units. According to the Housing Element, in 1980 approximately 77.2 percent of all housing units were single-family residential uses. The remaining 22.8 percent of housing was broken down as 9.7 percent multi-family with five or more units, 9.2 percent mobile homes, and 3.9 percent multi-family uses with less than five units.

By 1990 there were 24,441 dwelling units in Carson, with 633 of these units vacant, establishing a vacancy rate of 2.6 percent. The total increase in dwelling units between 1980 and 1990 was 1,191 units.

One of the three major regional plans that SCAG produces is the Regional Housing Needs Assessment (RHNA), which identifies each jurisdiction's contribution towards meeting this need. In 1988 there were an estimated 23,831 households in Carson. A household consists of all persons, related family members and all unrelated persons, who occupy a housing unit. The number of households may vary somewhat from the dwelling unit counts because even a single room is regarded as a housing unit when occupied or intended for occupancy as separate living quarters.[64] Of these, 5,886 (or 24.7 percent of all Carson households) were identified as low-income households, meaning that the incomes of these households is 80 percent or less of the median area household income. The Los Angeles County median area household income is currently $42,000. A total of 2,713 or 46 percent of all the low-income households in Carson are overpaying for their shelter needs. This number is equivalent to the identified Existing Housing Need by income and tenure. These overpaying households are broken down as 1,648 very low and 1,065 low-income households overpaying for housing. About half of the low-income overpaying households are

62 SCAG 1990. Regional Census Data Center Population and Percent Ethnic, 1990 Census Redistricting File.

63 City of Carson, June 1989. Housing Element of the General Plan, except as noted. All 1990 data is from the U.S. Census Record, as indicated by the City of Carson.

64 Bureau of U.S. Labor Statistics, August 1989. Handbook of Labor Statistics, Bull. 2340, p. 3.

renters.[65] In 1990 there were only 23,808 households, or a loss of 23 households. As of 1990 there were 3.51 persons per household living in Carson.

Based on the regional conditions, and the current (1988) conditions within jurisdictions, the RHNA identified 1989-1994 Future Need for Carson as 2,483 units affordable to low-income households. Future Need is the number of units that would have to be added to each jurisdiction to accommodate the projected growth in household by July 1, 1994, while compensating for anticipated demolitions and changes to achieve the "ideal" vacancy rate.[66] This figure was revised in December 1988, to a Future Need of 1,982. The revised figures for Future Need include 567 units (28.6 percent) which are recommended to be affordable to lower-income households, while the remaining 1,415 units (71.4 percent) are recommended to be affordable to households with moderate or better incomes.[67]

The Housing Element indicates there is potential to add an additional 1,400 dwelling units to the City. The number of units to be added as planned in 1989 included: building permits for 132 residential units, 354 residential units in the Redevelopment areas approved and in the plan checking stage and 914 units based on estimates of vacant and underutilized land from the Vacant Land Survey. The 1990 Census counts indicate an increase in housing of 839 units (or 60 percent of the 1,400 planned new units).

Since the City is unable to fully meet the RHNA recommendations, it has adopted a number of alternative policies in the Housing Element. In addition to adding 1,400 new units, the City of Carson has included in its 5-Year Housing Program a plan to conserve about 2,900 housing units in mobile home parks, Section 8 rental assisted units, or other subsidized units and to rehabilitate 500 substandard dwelling during the period between 1989-1994.

The City also has planned to conduct a land use survey to determine whether there are additional sites suitable for residential development that could support development of an additional 1,000 housing units. The Golden Eagle site, though vacant, is probably not suitable for development of residential uses due to past hazardous materials releases. Development of residential uses at this site would require a Hazardous Waste Release Site determination by the Cal-EPA Department

65 SCAG, December 1988. Revised Regional Housing Needs Assessment.

66 Ibid.

67 Southern California Association of Governments, December 1988. Revised Regional Housing Needs Assessment, Table 7, p. IV-3&4.

of Toxic Substance Control, Technical Services Branch, Land Use and Air Assessment Unit (Health and Safety Code Sections 25220 et seq.), as described in Sections 2.2.1 Site History and 2.2.2 Ongoing Cleanup, because of its status as a California Superfund Site.

Employment

Employment opportunities refers to the number of jobs available in the City, and are estimates based on land uses. Employment opportunities may be filled by City residents, or by non-residents who commute to Carson to take advantage of these opportunities. In 1989 it was estimated that there were 51,300 employment opportunities in the City.

In the Growth Management Plan adopted in 1989, SCAG projected that by 2,010 that 71,440 jobs would be available, for an assumed increase of 20,140 jobs added during that 21-year period. However, these projections may be overly optimistic, since the projections were developed in 1984, prior to the current slowdown in the economy.[68] New SCAG projections are not expected until the end of this year (1992).

In 1989 Carson was considered to have a strong economic base, due to its industrial and commercial land uses. Past growth has occurred in three major areas: (1) increased industrial development throughout the City due to the proximity of major freeways and the Port of Los Angeles; (2) development of the Carson Mall Regional shopping center (now the South Bay Pavilion at Carson) and (3) continued growth and expansion of major automobile dealerships.[69]

The 1983-1988 period began at the bottom of the most severe recession in Los Angeles County in nearly 50 years. The year 1983 was followed by a recovery characterized by uninterrupted growth. In contrast, shortly after the 1988-1993 period began, there appeared the first stages of a marked slowdown.[70] This period of economic instability has not yet improved.

[68] Ibid.

[69] City of Carson, June 1989. Housing Element of the General Plan, p. II-18 through II-20.

[70] State of California, Employment Development Department, Labor Market Information Division, 1991. Projections of Employment 1988-1993 by Industry and Occupation: Los Angeles-Long Beach Metropolitan Statistical Area (Los Angeles County), p. 9.

SCAG recently reviewed the State Employment Development Department's (EDD) once-a-year "benchmark revisions" of employment data which SCAG had used in making its projections for the SCAG region. The SCAG region lost an estimated 264,300 jobs between 1990 and 1991. The original 1991 employment estimates for the SCAG region published by EDD were revised downward by 303,400, which is the largest benchmark revision in recent history. A high share of both job losses and downward revisions in the SCAG region occurred in Los Angeles and Orange Counties: over 96 percent of the 1990-91 regionwide job declines were registered in those two counties. SCAG concluded that the revised job statistics for the SCAG region call for a reassessment of the current recession and acknowledgment (at least from a regional market perspective) that this recession is a very deep, long and severe one.[71]

Carson's economy, not unlike the rest of the county, has weakened recently although not as drastically as many of its neighboring communities. In February 1992 there was an estimated civilian labor force of 48,700 in Carson. The civilian labor force employed persons by place of residence, workers involved in labor disputes, and unemployed persons > 16 years of age actively seeking employment. Of these an estimated 4,600 Carson residents (9.5 percent) were unemployed, while the remaining 44,100 were employed on either a full- or part-time basis. Employed workers do not include members of the armed forces, but do include self-employed, unpaid family workers, and workers in labor disputes. Unemployed figures do not include the "discouraged" unemployed who have given up looking for work.

In September 1992 the unemployment rate for Carson was 10.0 percent. Several areas bounding or near Carson also are experiencing high unemployment rates. In September 1992, nearby Long Beach had an estimated 10.1 percent unemployment rate while the City of Los Angeles had an unemployment rate of 11.6 percent. The cities of Lynwood, Maywood, and Paramount were also recently reported as economically depressed areas. Only the nearby City of Torrance (6.1 percent in September 1992) has current unemployment rates estimated as considerably better than the county average (10.4 percent in September 1992). These city estimates are based on the 1980 Census ratio of civilian labor force, employment, and unemployment for each city compared with the county, while the County labor force date is based on the Current Population Survey (CPS).[72]

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71 Dr. Frank Wen, Associate Economist, SCAG Employment Trends Monthly, "Overview: SCAG Region" May 1992.

72 Telephone conversation April 10, 1992 with Jay D. Harowitz, Labor Force Analyst for Los Angeles County, State of California Employment Development Department, Labor Market Information Division.

Los Angeles County, as a whole, had a February 1992 unemployment rate of 9.9 percent (the highest unemployment rate since July 1984, when it peaked at 9.5 percent). There was somewhat of an improvement by March 1992, when 9.0 percent, or 403,000 Los Angeles County workers were seeking employment. In contrast, the county had an unemployment rate of 6.9 percent in March of 1991.[73] By September 1992, however, the County's unemployment rate had risen to 10.4 percent. October 1992 estimates for the county have improved somewhat, for an estimated 9.5 percent unemployment rate. A breakdown of unemployment rates by city for October is not yet available.

The unemployment rate for Carson, its surrounding cities, and Los Angeles County is considerably higher than the State's civilian unemployment rate (seasonally adjusted) which was 9.4 percent in September 1992 compared with 7.7 percent in September 1991. The State also currently has a higher rate of unemployment than the nation, which was 7.5 percent in September 1992 and 6.8 percent in September 1991.[74]

Jobs/Housing Balance

The Housing Element of the General Plan indicated that in 1989 Carson had an estimated 0.578 jobs for every person residing in the City and concludes that the jobs/housing balance within Carson itself was balanced.[75] It is unclear from currently available employment data whether that trend has continued in light of the present economy, since current estimates apply the ratio of city to county employment and unemployment trends observed in the 1980 Census. The data on employment from the 1990 Census are not yet available.

Regional Growth[76]

Population

Carson lies within the Southern California region, which consists of: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. Regional

73 State of California Employment Development Department, Labor Market Information Division, April 3, 1992. News Release by Jay D. Horowitz, Labor Market Analyst for Los Angeles County.

74 State of California, Employment Development Department, Labor Market Information Division, September 1992. California Labor Market Bulletin, Table 1: Employment and Unemployment in California.

75 City of Carson, June 1989. Housing Element of the General Plan, p. II-18 through II-20.

76 Information on the region and subregion obtained from the Southern California Association of Governments, February 1989, Growth Management Plan.

studies show that between 1950 and 1970, the population doubled in size, and grew at a rate of five percent each year.[77] The 1980 Census Record shows that 11.6 million people resided in this region. By January 1988 the population had increased to 13 million residents. SCAG projects that by 2010, the regional population will have increased to 18.3 million.

SCAG divides the region into sub-regions to evaluate growth management issues. The city of Carson is located in the Central Los Angeles subregion, which had a 1984 baseline population of 2,102,000. By 1988, the population for the subregion was projected to increase to 2,288,100 and by the year 2010 the population is estimated to be 2,354,500 persons. The increase in population by 252,500 persons over the 26 year period between 1984-2010 represents a 12.0 percent increase.

Housing

Between 1970 and 1980, there was a net addition of 870,000 housing units added to the six-county SCAG region. There is significant variability in the amount of new housing construction on an annual basis due to economic fluctuations. The regional 1984 baseline estimate was 4,650,400 housing units. By 1988, there were an estimated 5,080,200 dwelling units in the region. The Growth Management Plan (GMP) forecasts indicate that by 2010 there will be a total of 7.34 million housing units. This represents a level of growth which is (44 percent) higher than the projected increase in population (34 percent) between 1988 and 2010.[78]

The Central Los Angeles subregion is classified as an "urban" subregion. The subregion had a baseline estimate of 777,100 dwelling units. By 1988, the number of housing units had increased to about 826,200 units. It is projected that there will be 898,100 housing units in the subregion by the year 2010. This represents an increase of about 121,000 units, or a 15.6 percent increase over the 1984 baseline figures.

Employment

Total employment opportunities in the SCAG region were 4,270,000 in 1972 and rose to 5,923,100 by 1984. Between the late 1970s and late 1980s there was a dramatic increase in employment opportunities in the region, and the GMP projections were based on the expectation that this rate of growth in employment opportunities would continue. The GMP estimates that there will be nearly nine million employment opportunities in the six-county region by the year 2010.

77 Ibid., p. II-2.

78 Ibid., p. II-5; text plus Figure II-4.

at this time, and all construction jobs would be temporary. The addition of construction jobs provided by the development of the Golden Eagle Specific Plan is expected to be beneficial, rather than adverse, since it would improve unemployment rates in this industry.

Permanent Employment

Implementation of the Specific Plan would add an estimated 4,731 permanent employment opportunities (see Table 24). There would be only about 57 percent of the jobs in office, retail and development, or light industrial categories. The remaining 2,033 jobs would be generated from the retail/visitor commercial land uses. Of these, an estimated 1,792-1,832 jobs (38 percent of the permanent jobs) would be from the retail uses while an additional 200 to 240 positions (4-5 percent of the permanent jobs) would be in the hotel/restaurant service trade.

TABLE 24
EMPLOYMENT IMPACTS
GOLDEN EAGLE CENTER SPECIFIC PLAN

Land Use	Proposed Increase (square feet or # rooms)	Generation Factor per this Land Use Category[1]	Number of Employees
Retail/Visitor Commercial	609,840 sq.ft.	1 empl./300 sf	2,033
Office/Retail Commercial	286,624 sq.ft.	1 empl./250 sq.ft.	1,146
Office/R&D Light Industrial	388,119 sq.ft.	1 empl./250 sq.ft.	1,552
		TOTALS:	**4,731**

[1] Economic Nexus Analysis Linked Development Fee for a Housing Trust Fund, Keyser Marston Associates, Inc., February 1990.

Most of the newly created employment opportunities would be filled either by City residents or residents of surrounding communities. The impacts on employment are expected to be beneficial. The addition of jobs with the Specific Plan would occur gradually as individual development projects are added.

Regional Population/Housing/Employment Impacts

This portion of the EIR assesses conformity of the proposed changes in the Carson General Plan with the SCAG Regional Growth Management Plan.

Population

The proposed development is not expected to increase the population in the Central Los Angeles subregion, since no residential development is included. Although there are increased job opportunities and this is a jobs-rich subregion, Los Angeles County, not unlike much of rest of the state and nation is currently experiencing high unemployment rates. Although Carson's unemployment rate is only slightly less than the County's there are a number of communities in and around the Carson area where the unemployment rates are considerably higher.

Housing

Although the development planned for the Specific Plan does not include any residential uses, the proposed increases in employment are not expected to create a significant additional demand upon housing in the region. Despite the fact that the Central Los Angeles subregion is categorized as jobs-rich in the GMP, this part of the region has communities with very high unemployment rates (up to 19.5 percent). Therefore, the assumption is that unemployed or underemployed persons living in Carson and the surrounding communities would absorb most or all of the employment opportunities.

Employment

According to Table 24, about 4,731 permanent jobs would be created with the Specific Plan to the subregion. SCAG projects there would be 199,200 new employment opportunities added to the Central Los Angeles subregion by the year 2010. The added employment opportunities from the Golden Eagle Specific Plan represents 2.4 percent of the growth in employment opportunities projected for the subregion. The increase would not be significant, although locally beneficial, particularly with the recent slowdown in economic growth for the region.

Regional Jobs/Housing Impacts

The change in land uses in Carson from the proposed project would alter the way in which the use of the site fits into the observations, trends and policy forecasts for jobs/housing balance in the Central Los Angles subregion. The proposed project would add no residential uses and no population, while increasing the subregional employment opportunities through the addition of a maximum of 4,731 permanent new jobs with implementation of the Specific Plan.