5.4 NOISE

A portion of the following section is based on a noise analysis prepared by Wieland Associates, Inc. (July 2003). The noise analysis is provided in Volume II Appendix D of this EIR.

ENVIRONMENTAL SETTING

Moreno Valley is subject to typical urban noises such as noise generated by traffic, heavy machinery, and day-to-day outdoor activities. The City of Moreno Valley also has several transportation-related noise sources, including airport noise, railroad operations, major arterials and State Route 60. Noise sources that are not directly related to transportation include noise from commercial and industrial centers, construction, and property maintenance activities.

Noise Environment

Noise is most often defined as unwanted sound. Although sound can be easily measured, the perceptibility is subjective and the physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness." Sound pressure is measured and quantified using a logarithmic scale, which gives the level of sound in decibels (dB). The human hearing system is not equally sensitive to sound at all frequencies. Therefore, to approximate this human, frequency-dependent response, an A-weighting system is used to adjust measured sound levels and is expressed as dBA.

Noise consists of pitch, loudness, and duration; therefore, it is difficult to describe noise with a single unit of measure. Federal and state agencies have established noise and land use compatibility guidelines that use averaging approaches to noise measurement. Two measurement scales commonly used in California are the Community Noise Equivalent Level (CNEL) and the day-nigh level (L_{dn}). In order to account for increased human sensitivity at night, the CNEL level includes a five dB penalty on noise during the 7:00 P.M. to 10:00 P.M. time period and a 10 dB penalty on noise during the 10:00 P.M. to 7:00 A.M. time period. The L_{dn} level includes only the ten dB weighting for late-night noise. These values are nearly identical for almost all noise sources.

Title 24 (Part 2 Volume 1) of the California Code of Regulations includes noise insulation standards for new multi-family structures (hotels, motels, apartments, condominiums, and other attached dwellings) located within the 60 CNEL contour adjacent to roads, railroads, rapid transit lines, airports or industrial areas. An acoustical analysis is required showing that these multi-family units have been designed to limit interior noise levels with doors and windows closed to 45 CNEL in any habitable room. Title 21 of the California Code of Regulations (Subchapter 6, Article 2, Section 5014)

specifies that acoustical analyses shall be required for all new residential structures located near airports, where noise levels exceed 60 CNEL, showing that the proposed design will achieve noise levels in all habitable rooms of not more than 45 CNEL.

The environmental impact of noise is a function of the sensitivity of the land use where noise is heard. In general, land use sensitivity to noise is a function of human annoyance and community reaction rather than health and safety considerations. Human annoyance takes place at sound levels that are much lower than the sound levels that could produce hearing loss.

Residents typically become annoyed when the noise level in their environment interferes with sleeping, talking and listening to radio or television. People are particularly sensitive to nighttime noises that interfere with sleep. Interior noise levels of 45 Ldn or CNEL or less are considered necessary for restful sleep.

A summary of surveys of community reaction to noise was published in 1978. (T.J. Schultz, "Synthesis of Social Surveys on Noise Annoyance," Journal of the Acoustical Society of America, Vol. 63 No. 8, August 1978) Generally, very few people were highly annoyed with a residential noise environment of 50 Ldn, about 10 percent at 60 Ldn and approximately 16 percent at 65 Ldn. The level of annoyance increased to approximately 25 percent when the noise levels reached 70 Ldn, 35 percent at 75 Ldn and 70 percent at 85 Ldn.

It is important to note that the aforementioned surveys were completed before energy efficient building practices were commonplace. Energy efficient buildings tend to insulate interior living spaces from both heat and noise. Therefore, the level of annoyance at any given exterior noise level should be lower in newer housing developments than would be the case in older developments.

Noise can also interfere with nonresidential uses such as schools, libraries, churches, and hospitals. The activities associated with these uses, such as resting, concentrating, reading and listening, are best conducted in relatively quiet settings.

Agencies use different noise standards and guidelines based on the level of annoyance that is considered to be acceptable. All agency standards and guidelines attempt to strike a balance between community annoyance and economic feasibility.

The U.S. Department of Housing and Urban Development (HUD) developed noise guidelines to ensure that housing projects supported by the agency are located in acceptable living environments. HUD defines and exterior noise level between 65 Ldn and 75 Ldn as "normally unacceptable" and above 75 Ldn as "Unacceptable."

The State of California General Plan Guidelines label exterior noise levels between 60 and 70 Ldn or CNEL as "conditionally acceptable" for residential uses (i.e. new construction is acceptable with the condition that noise reduction measures are identified

and included in the project design). Noise levels between 70 and 75 Ldn or CNEL are considered "normally unacceptable" for residential uses (i.e. new construction is discouraged and if new construction is proposed, noise reduction measures must be identified and incorporated into the project design). Noise levels above 75 Ldn or CNEL are considered "clearly unacceptable" for residential uses.

The California General Plan Guidelines also label exterior noise levels between 60 and 70 Ldn or CNEL as "conditionally acceptable" for schools, libraries, churches, and hospitals and noise levels between 70 and 80 Ldn or CNEL as "normally unacceptable." Noise levels above 80 Ldn or CNEL are considered "clearly unacceptable" for those uses. Office and commercial uses are considered "conditionally acceptable" between 60 and 75 Ldn or CNEL and "normally unacceptable" above 75 Ldn or CNEL.

The Moreno Valley General Plan discourages new residential development where noise due to aircraft overflights exceeds 65 CNEL. In addition, noise attenuation is required where necessary to achieve acceptable interior noise levels. The acceptable interior noise is 45 CNEL for residences and schools and 50 CNEL for libraries, hospitals, places of worship and office uses.

Transportation-Related Noise

Noise generated by transportation activity is the primary Moreno Valley noise source. Transportation noise is concentrated along the transportation corridors and aircraft flight patterns associated with the joint-use airport at March Air Reserve Base. Noise levels adjacent to roadways vary with the volume of traffic, the vehicular speed, the truck mix and the road cross-section. High traffic volumes and speed along State Route 60 and arterial roadways contribute to high noise levels. Noise levels due to air traffic from the joint-use airport at March Air Reserve Base depend on aircraft characteristics, the number, path, elevation and duration of flights as well as the time a day that flights take place. As depicted in **Figure 5.4-1,** a portion of the western Moreno Valley falls within the 60 CNEL future noise contour of the March joint-use airport).

Moreno Valley General Plan

Proposed Safety Element Objectives 6.3, 6.4 and 6.5 and associated policies and Program 6-3 substantially reduce noise exposure. For example, Policy 6.3.1 requires noise mitigation for sensitive uses where the projected noise level would exceed 65 CNEL. Policy 6.3.2 discourages residential uses where current or projected exterior noise due to aircraft over flights would exceed 65 CNEL. Policy 6.5.1 requires new commercial and industrial activities to mitigate noise impacts on adjacent uses. Policy 6.5.2 requires construction activities to limit noise impacts on surrounding uses. Program 6-3 calls for the City to reevaluate designated truck routes in terms of noise impact to determine if those routes and the hours that they are used should be adjusted to minimize exposure to truck noise.

Each land use alternative limits noise exposure for residential uses in areas heavily impacted by aircraft noise. In each case, areas exposed to noise levels of 65 CNEL or more are planned for commercial, office and industrial uses. Alternative 1 also prohibits residential uses in areas exposed to noise levels between 60 and 65 CNEL.

Existing Regulations

The noise generated by construction is addressed by existing city regulations. It is unlawful to create noise that annoys reasonable people of normal sensitivity. There are also restrictions on hours of activity. Grading may take place between 7 a.m. and 8 p.m. Construction may take place between 6 a.m. and 8 p.m. during the week and 7 a.m. and 8 p.m. on weekends and holidays.

Moreno Valley enforces the provisions of the State Noise Insulation Standards (Title 24). Title 24 specifies that combined indoor noise for multi-family living spaces shall not exceed 45 dB(A) CNEL. This standard must be implemented when the outdoor noise level exceeds 60 dB(A) CNEL. The future noise contour map can be used to determine the appropriate time to implement this standard. Title 24 also requires that the standard be applied to all new hotels and motels.

Existing Noise Control Practices

Current practice is to require six-foot high masonry walls between single-family lots and major roadways. Such walls typically provide substantial noise attenuation (3-6 dba).

THRESHOLD FOR DETERMINING SIGNIFICANCE

For the purposes of this EIR, a significant impact would occur if implementation of General Plan Alternatives 1, 2, or 3 would:

- *Expose persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies*

- *Expose persons to or generation of excessive groundborne vibration or groundborne noise levels.*

- *Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.*

- *Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.*

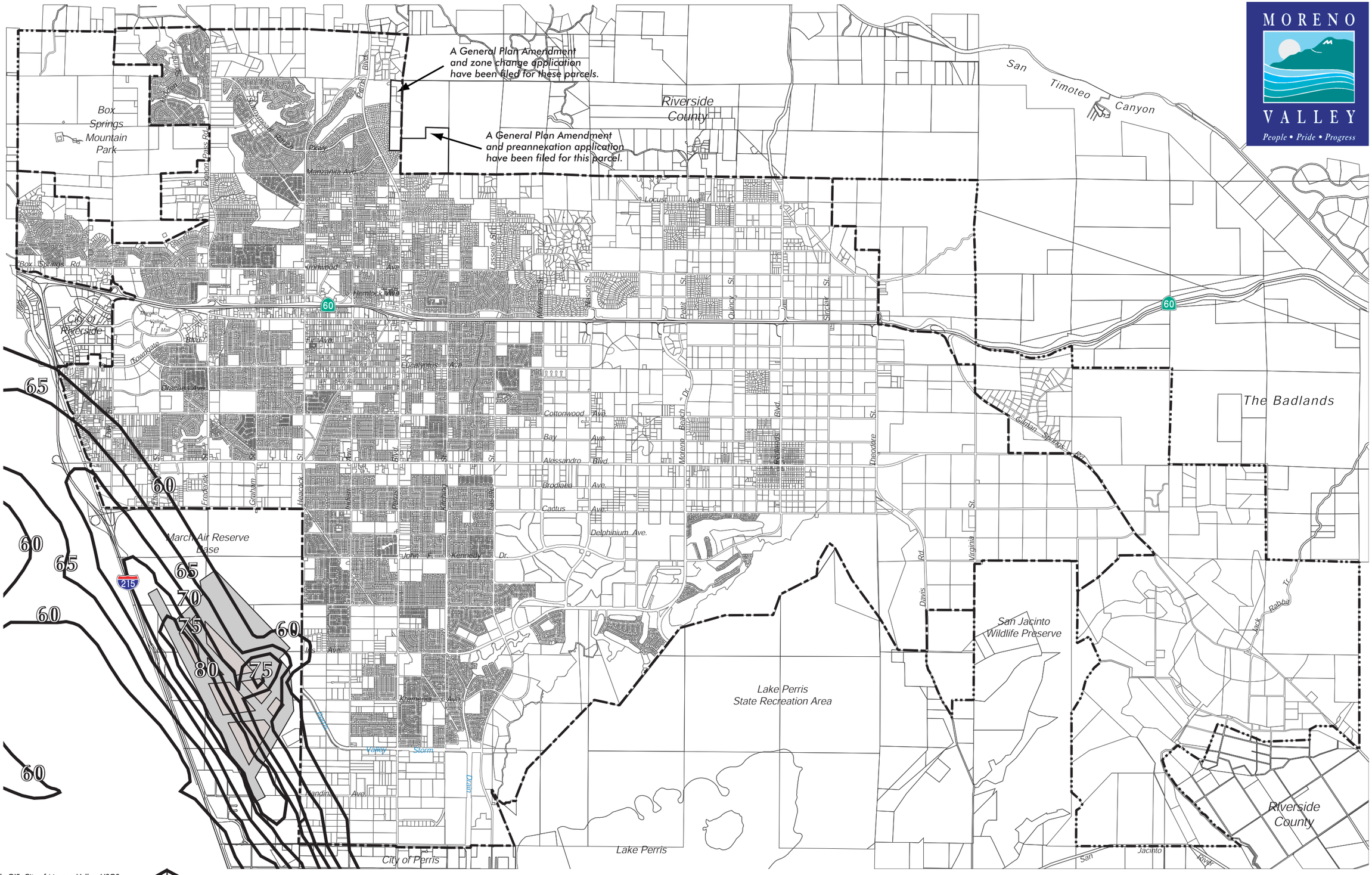

Figure 5.4-1 March Reserve Air Base Noise Impact Area

- *For a project located within an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.*

- *For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.*

ENVIRONMENTAL IMPACT

Construction Activities

Implementation of the Moreno Valley General Plan would result in additional development, which would generate noise during construction. Construction activity would have the potential to impact noise sensitive land uses located adjacent to construction sites.

Table 5.4-1 illustrates typical noise levels from operating construction equipment at a distance of 50 feet. As shown, construction equipment generates high levels of intermittent noise ranging from 70 dB(A) to 105 dB(A). Although construction activities will result in a noise impact at such locations, this impact will be short-term and will cease upon completion of construction. The temporary nature of the impact in conjunction with existing city regulations on hours of operation will lessen the potential of a significant impact due to construction noise. However, noise sensitive land use located adjacent to construction sites may be significantly impacted by future construction in the planning area as a result of groundborne noise levels and vibration, noise levels that exceed existing standards, and excessive temporary or periodic increases in the ambient noise level. Mitigation Measures N5 and N10 will reduce these impacts to a level less than significant.

TABLE 5.4-1
CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment Item	Range of Noise Level at 50 Feet	Nominal Noise Level, Leq, at 50 Feet
Earthmoving		
Backhoes, 200 HP	71 to 93 dB(A)	85 dB(A)
Berm Machine, 100 HP	74 to 84 dB(A)	80 dB(A)
Dozers	72 to 96 dB(A)	86 dB(A)
Front Loaders, 300 HP	71 to 96 dB(A)	82 dB(A)
Graders	73 to 95 dB(A)	85 dB(A)
Paver	80 to 92 dB(A)	89 dB(A)
Roller, 180 HP	78 to 84 dB(A)	79 dB(A)
Scrapers	73 to 95 dB(A)	88 dB(A)
Tractors, 200 HP	72 to 96 dB(A)	84 dB(A)
Trencher, 80 HP	76 to 86 dB(A)	82 dB(A)
Truck/Trailer, 200 HP	70 to 92 dB(A)	82 dB(A)
Truck:125 HP, 150 HP	76 to 85 dB(A)	80, 82 dB(A)
Materials Handling		
Concrete Mixer	70 to 90 dB(A)	85 dB(A)
Concrete Pump	74 to 84 dB(A)	82 dB(A)
Crane, Moveable: 50 HP, 200 HP, 400 HP	75 to 95 dB(A)	76, 80, 83 dB(A)
Derrick	86 to 89 dB(A)	88 dB(A)
Forklift, 40 HP	68 to 82 dB(A)	80 dB(A)
Side Boom, 200 HP	80 to 90 dB(A)	85 dB(A)
Water Truck, 500 HP	79 to 88 dB(A)	84 dB(A)
Stationary Equipment		
Boiler, 1600 HP	79 to 85 dB(A)	82 dB(A)
Compressors: 100 HP, 200 HP	68 to 87 dB(A)	78, 81 dB(A)
Generators: 20 HP, 400 HP, 1300 HP	69 to 81 dB(A)	74, 81, 84 dB(A)
Pumps: 25 HP, 200 HP, 350 HP	60 to 80 dB(A)	73, 76, 80 dB(A)
Impact Equipment		
Compactor, 20 HP	84 to 90 dB(A)	86 dB(A)
Jack Hammers	75 to 104 dB(A)	88 dB(A)
Pile Drivers (Peak Level)	90 to 104 dB(A)	101 dB(A)
Pneumatic Tools	82 to 88 dB(A)	86 dB(A)
Rock Drills	90 to 105 dB(A)	98 dB(A)
Steam Boiler (Pile Driver)	83 to 92 dB(A)	88 dB(A)
Other Equipment		
Saws	67 to 92 dB(A)	78 dB(A)
Vibrators	69 to 80 dB(A)	76 dB(A)
Welding Machines: 50 HP, 80 HP	76 to 85 dB(A)	80, 82 dB(A)

Source: Wieland Associates, 1999.

Vehicular Traffic

The following analyzes vehicular noise impacts of Alternatives 1, 2, and 3.

Alternative 1

Implementation of the General Plan Alternative 1 will allow new development within the planning area. Such development will generate additional traffic that will increase noise levels along the roadways. Table F-1, contained in Appendix D in Volume II of this EIR, summarizes the buildout noise levels from roadways within the planning area. As Table F-1 depicts, future noise levels along major streets in the planning area are projected to range from approximately CNEL 60.5 dB(A) to CNEL 86.0 dB(A). State Route 60 and Interstate 215 will continue to be the primary noise sources with noise levels reaching CNEL 86.0 dB(A) and CNEL 85.5 dB(A), respectively, at a distance of 50 feet from the near lane centerline.

Figure 5.4-2 depicts the buildout noise contours for Alternative 1. As identified in **Figure 5.4-2** and Table F-1, certain portions of the City will be subject to noise levels exceeding the City's noise standards. Sections of Alessandro Boulevard, Cactus Avenue, Day Street, Eucalyptus Avenue, Gilman Springs Road, Interstate 215, Iris Avenue, Moreno Beach Drive, Perris Boulevard, and State Route 60 have noise contours 75 dB(A) or higher at 50 feet from the centerline of the outside lane. This is considered a significant impact because the project will result in a permanent increase in ambient noise levels above levels existing without the project, and these levels may exceed established standards along some roadway corridors. Implementation of Mitigation Measures N1, N2, N6, N7 and N9 will reduce these impact associated with vehicular noise to a level less than significant

Alternative 2

Implementation of the General Plan Alternative 2 will allow new development within the planning area. Such development will generate additional traffic that will increase noise levels along the roadways. Table F-2, contained in Appendix D in Volume II of this EIR, summarizes the buildout noise levels from roadways within the planning area. As Table F-2 depicts, future noise levels along major streets in the planning area are projected to range from approximately CNEL 56.5 dB(A) to CNEL 86.0 dB(A). Interstate 215 and State Route 60 will continue to be the primary noise sources with noise levels reaching CNEL 86.0 dB(A) and CNEL 85.5 dB(A), respectively, at a distance of 50 feet from the centerline of the near lane. Under this alternative, the fewest number of residential units would be allowed along the SR 60 corridor.

Figure 5.4-3 depicts the buildout noise contours for Alternative 2. As identified in **Figure 5.4-3** and Table F-2, certain portions of the City will be subject to noise levels exceeding the City's noise standards. Sections of Alessandro Boulevard, Cactus Avenue, Eucalyptus Avenue, Gilman Springs Road, Interstate 215, Iris Avenue, Perris Boulevard, and State Route 60 have noise contours 75 dB(A) or higher at 50 feet from the centerline

of the near lane. This is considered a significant impact because the project will result in a permanent increase in ambient noise levels above levels existing without the project, and these levels may exceed established standards. Implementation of Mitigation Measures N1, N2, N6, N7 and N9 will reduce the impact associated with vehicular noise to a level less than significant.

Alternative 3

Implementation of General Plan Alternative 3 will allow new development within the planning area. Such development will generate additional traffic that will increase noise levels along the roadways. Table F-3, contained in Appendix D in Volume II of this EIR, summarizes the buildout noise levels from roadways within the planning area. As Table F-3 depicts, future noise levels along major streets in the planning area are projected to range from approximately CNEL 60.0 dB(A) to CNEL 86.0 dB(A). State Route 60 and Interstate 215 will continue to be the primary noise sources with noise levels reaching CNEL 86.0 dB(A) and CNEL 85.5 dB(A) at a distance of 50 feet from the near lane centerline.

Figure 5.4-4 depicts the buildout noise contours for Alternative 3. As identified in **Figure 5.4-4** and Table F-3, certain portions of the City will be subject to noise levels exceeding the City's noise standards. Sections of Alessandro Boulevard, Cactus Avenue, Eucalyptus Avenue, Gilman Springs Road, Interstate 215, Iris Avenue, Moreno Beach Drive, Perris Boulevard, and State Route 60 have noise contours 75 dB(A) or higher at 50 feet from the near lane centerline. This is considered a significant impact because the project will result in a permanent increase in ambient noise levels above levels existing without the project, and these levels may exceed established standards. Implementation of Mitigation Measures N1, N2, N6, N7 and N9 will reduce the impact associated with vehicular noise to a level less than significant.

Aircraft Operations

As depicted in **Figure 5.4-1**, a very small portion of the southwestern Moreno Valley falls within the 75 CNEL noise contour impact area. It is within the Clear Zone of the Moreno Valley Industrial Area Specific Plan. Additionally, small portions of the southwestern and western City fall within the 70 CNEL, 65 CNEL, and 60 CNEL noise contour impact areas. For all three alternatives, uses within those contours are acceptable or conditionally acceptable. To ensure that "conditionally acceptable" land uses are properly designed to avoid significant noise impacts associated with aircraft operations, Mitigation Measures N3 and N8 are proposed. Implementation of these measures will reduce the impact associated with aircraft operations to a level less than significant.

Stationary Noise

Implementation of any of the three General Plan Alternatives may result in excessive noise generated by non-residential projects such as industrial and commercial uses, restaurants, and bars. These types of uses are allowed throughout the planning area. This

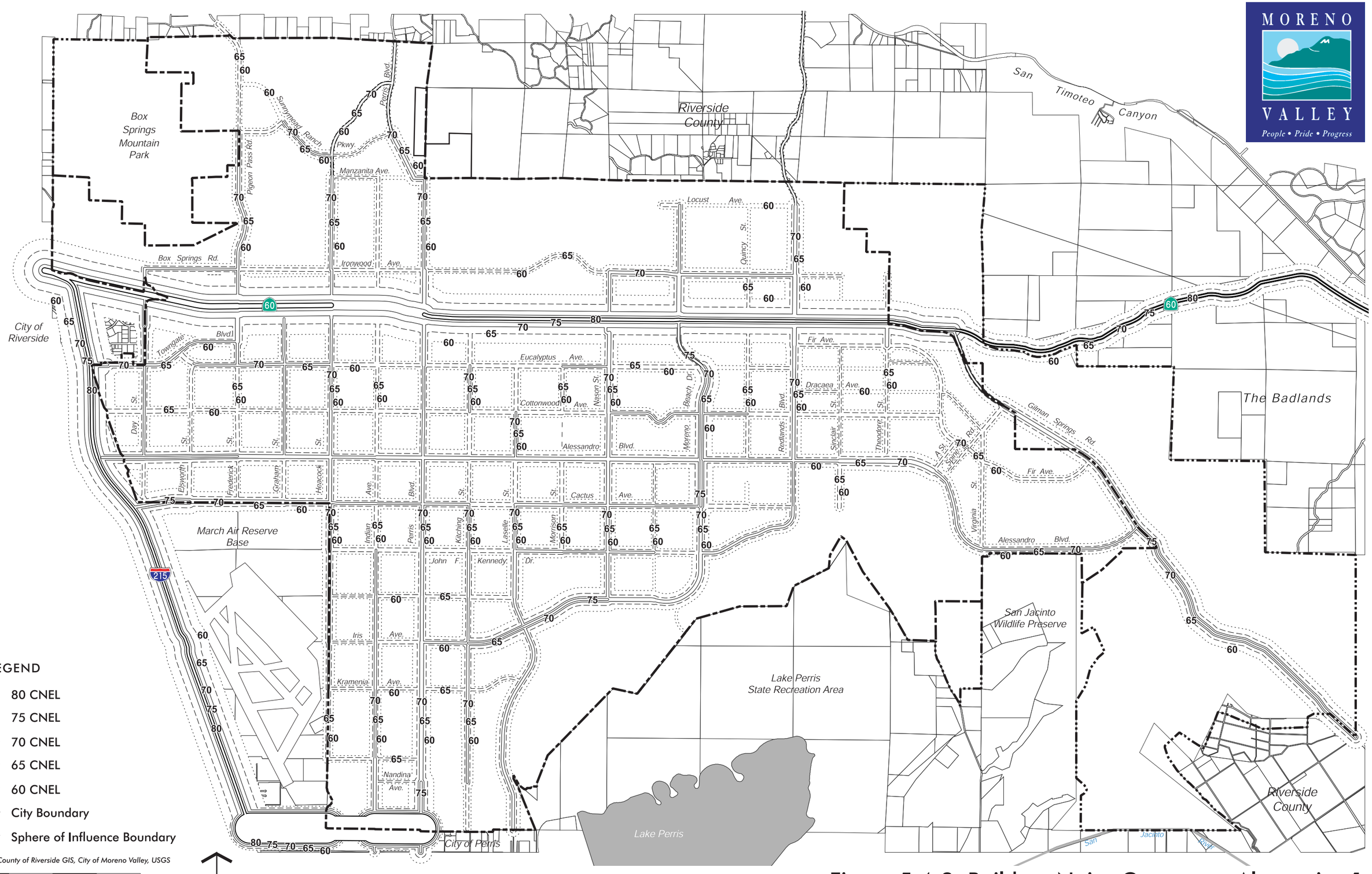

Figure 5.4-2 Buildout Noise Contours – Alternative 1

MORENO VALLEY
People • Pride • Progress

Box Springs Mountain Park

Riverside County

San Timoteo Canyon

City of Riverside

March Air Reserve Base

The Badlands

San Jacinto Wildlife Preserve

Lake Perris State Recreation Area

Lake Perris

City of Perris

Riverside County

Box Springs Rd.
Sunnymead Ranch Pkwy.
Perris Blvd.
Pigeon Pass Rd.
Manzanita Ave.
Ironwood Ave.
Locust Ave.
Quincy St.
Towngate Blvd.
Eucalyptus Ave.
Cottonwood Ave.
Nason St.
Beach Dr.
Fir Ave.
Dracaea Ave.
Gilman Springs Rd.
Day St.
Elsworth St.
Frederick St.
Graham St.
Heacock St.
Alessandro Blvd.
Moreno Beach Dr.
Redlands Blvd.
Sinclair St.
Theodore St.
A St.
Spine Rd.
Virginia St.
Cactus Ave.
John F. Kennedy Dr.
Indian St.
Perris Blvd.
Kitching St.
Laselle St.
Morrison St.
Iris Ave.
Kramenia Ave.
Nandina Ave.

60 CNEL
65 CNEL
70 CNEL
75 CNEL
80 CNEL

LEGEND

80 CNEL
75 CNEL
70 CNEL
65 CNEL
60 CNEL
City Boundary
Sphere of Influence Boundary

Sources: County of Riverside GIS, City of Moreno Valley, USGS

0 2,500 5,000 10,000 ft.

North

Figure 5.4-3 Buildout Noise Contours – Alternative 2

MORENO VALLEY
People • Pride • Progress

Box Springs Mountain Park
Riverside County
San Timoteo Canyon
City of Riverside
March Air Reserve Base
The Badlands
San Jacinto Wildlife Preserve
Lake Perris State Recreation Area
Lake Perris
City of Perris
Riverside County

Box Springs Rd.
Pigeon Pass Rd.
Sunnymead Ranch Pkwy.
Perris Blvd.
Manzanita Ave.
Iroquois Ave.
Locust Ave.
Quincy St.
Fir Ave.
Eucalyptus Ave.
Cottonwood Ave.
Dracaea Ave.
Gilman Springs Rd.
Alessandro Blvd.
Cactus Ave.
Iris Ave.
Krameria Ave.
Nandina Ave.
John F. Kennedy Dr.
Towngate Blvd.
Day St.
Elsworth St.
Frederick St.
Graham St.
Heacock St.
Indian Ave.
Perris Blvd.
Kitching St.
Laselle St.
Morrison St.
Nason St.
Beach Dr.
Moreno Blvd.
Redlands Blvd.
Sinclair St.
Theodore St.
A St.
Spine Rd.
Virginia St.
San Jacinto Blvd.

LEGEND

- 80 CNEL
- 75 CNEL
- 70 CNEL
- 65 CNEL
- 60 CNEL
- City Boundary
- Sphere of Influence Boundary

Sources: County of Riverside GIS, City of Moreno Valley, USGS

0 2,500 5,000 10,000 ft.

North

Figure 5.4-4 Buildout Noise Contours – Alternative 3

is considered a potentially significant impact because stationary noise sources may subject some residents and noise sensitive land uses to substantial increases in ambient noise levels and groundborne vibration that exceed established standards. Noise generated by new development is controlled through the normal design review process and General Plan Policy 6.5.1. When reviewing proposed non-residential projects, noise impacts to surrounding development will be considered. Acoustical analyses will be required for projects that could generate noise potentially affecting residential and other sensitive uses. Where impacts are identified, mitigation measures will be required. Implementation of Mitigation Measures N4, N7, and N9 will reduce this impact to a level less than significant.

MITIGATION MEASURES

N1. The following noise control measures shall be applied to new single-family dwellings exposed to noise along major roadways:

a. Install sound barriers (masonry walls or walls with earth berms) between residences and noise sources.

b. Install double-paned or similar sound rated windows.

c. Provide sound insulating exterior walls and roofing systems.

d. Locate and/or design attic vents to minimize sound propagation into each home.

e. Provide forced-air ventilation systems.

f. Place dwellings as far as practical from the noise source.

N2. Acoustical analyses shall be conducted for new residential development along State Route 60. Noise control measures shall be required to reduce the amount of noise to acceptable levels (limit interior noise levels with doors and windows closed to 45 CNEL).

N3. Discourage residential uses where current or projected exterior noise due to aircraft over flights will exceed 65 CNEL (**Policy 6.3.2**).

N4. New commercial and industrial activities (including the placement of mechanical equipment) shall be evaluated and designed to mitigate noise impacts on adjacent uses (**Policy 6.5.1**).

N5. Construction activities shall be operated in a manner that limits noise impacts on surrounding uses (**Policy 6.5.2**).

N6. The City shall reevaluate designated truck routes in terms of noise impact on existing land uses to determine if those established routes and the hours of their use should be adjusted to minimize exposure to truck noise (**Program 6-3**).

N7. The following uses shall require mitigation to reduce noise exposure where current or future exterior noise levels exceed 20 CNEL above the desired interior noise level (**Policy 6.3.1**):

a. New single-family and multiple-family residential buildings shall be insulated to achieve an interior noise level of 45 CNEL or less. Such buildings shall include sound-insulating windows, walls, roofs and ventilation systems. Sound barriers shall also be installed (e.g. masonry walls or walls with berms) between single-family residences and major roadways.

b. New libraries, hospitals and extended medical care facilities, places of worship and office uses shall be insulated to achieve interior noise levels of 50 CNEL or less.

c. New schools shall be insulated to achieve interior noise levels of 45 CNEL or less.

N8. Where the future noise environment is likely to exceed 70 CNEL due to overflights from the joint-use airport at March, new buildings containing uses that are not addressed under Policy 6.3.1 shall require insulation to achieve interior noise levels recommended in the March Air Reserve Base Air Installation Compatible Use Zone Report (**Policy 6.3.3**).

N9. The City shall enforce the California Administrative Code, Title 24 noise insulation standards for new multi-family housing developments, motels and hotels (**Policy 6.3.5**).

N10. Building construction shall be prohibited between 8 p.m. and 6.am. during the week and 8 p.m. and 7 a.m. weekends and holidays (**Policy 6.3.6**).

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Less than significant.

NOTES AND REFERENCES

None.