5.7 - NOISE

5.7.1 - Introduction

Information in this section is based upon the following documents and correspondence received on the Notice of Preparation (NOP) (Appendix A, Notice of Preparation, Initial Study, Correspondence, and Meeting Notes):

- NMC Final EIR, City of Ontario, 1997.
- Acoustical Analysis, Rich Haven Specific Plan, RBF Consulting, August 18, 2006 attached as Appendix F to this Draft EIR.
- Memorandum. RBF Consulting, Rich Haven Acoustical Response to Comments, January 29, 2007 included in Appendix F to this Draft EIR.

The NMC Final EIR evaluated potential noise impacts, which included short-term construction-related impacts and impacts related to long-term operations. The NMC Final EIR stated that noise impacts related to construction activities were short-term in nature and, because the City did not have noise impact thresholds or regulations related to construction activities, less than significant impacts would result.

The NMC Final EIR also evaluated potential noise impacts related to the long-term operations of the buildout of the NMC. Sources of increased noise levels were related to the increased traffic that would result from development of the NMC, stationery noise sources resulting from the conversion to agricultural uses, and, depending on the location within the NMC, noise impacts related to airport operations.

This section of the Draft EIR evaluates the potentially significant impacts from noise that would result from implementation of the proposed project.

5.7.2 - Existing Conditions

Acoustic Fundamentals

Sound is a pressure wave transmitted through the air that is described in terms of loudness or amplitude (measured in decibels), frequency or pitch (measured in Hertz [Hz] or cycles per second), and duration (measured in seconds or minutes). The standard unit of measurement of the loudness of sound is the decibel (dB). Typical human hearing can detect changes in sound levels of approximately 3 dB under normal conditions. Changes of 1 to 3 dB are detectable under quiet, controlled conditions and changes of less than 1 dB are usually indiscernible. A change of 5 dB is

typically noticeable to most people in an exterior environment whereas a change of 10 dB is perceived as a doubling (or halving) of the noise.

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all and are "felt" more as a vibration. Similarly, while people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz. Since the human ear is not equally sensitive to sound at all frequencies, a special frequency dependent rating scale is used to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Noise

Noise is defined as unwanted sound, and is known to have several adverse effects on people, including hearing loss, speech and sleep interference, physiological responses, and annoyance. Based on these known adverse effects of noise, the federal government, the State of California and local governments have established criteria to protect public health and safety and to prevent disruption of certain human activities.

Noise may be generated from a point source, such as a piece of construction equipment, or from a line source, such as a roadway containing moving vehicles. Because noise spreads in an ever-widening pattern, the given amount of noise striking an object, such as an eardrum, is reduced with distance from the source. This phenomenon is known as "spreading loss." The typical spreading loss for point source noise is 6 dBA per doubling of the distance from the noise source.

A line source of noise, such as vehicles proceeding down a roadway, is also subject the spreading loss phenomenon. However, the rate of reduction includes the type of terrain over which the noise passes in addition to the distance. Hard sites, such as developed areas with paving, reduce noise at a rate of 3 dBA per doubling of the distance while soft sites, such as undeveloped areas, open space, and vegetated areas reduce noise at a rate of 4.5 dBA per doubling of the distance. These represent the extremes and most areas will actually contain a combination of hard and soft elements with spreading loss noise reduction placed somewhere in between. The only way to determine the absolute amount of attenuation that an area provides is through field measurement under operating conditions with subsequent noise level measurements conducted at varying distances from a constant noise source.

Most environmental noise sources produce varying amounts of noise over time, so the measured sound levels also vary. For example, noise produced during an aircraft over flight will vary from

relatively quiet background levels before the over flight to a maximum value when the aircraft passes overhead, then returning down to background levels as the aircraft leaves the observer's vicinity. Similarly, noise from traffic varies with the number and types of vehicles, speed, and proximity to the observer.

Public Reaction to Noise

Because people react not only to their perception of individual noise events, but also to how many events there are, and what time of day or night they occur. Public reaction to transportation noise can be expressed as the percentage of the population which is "highly annoyed" by exposure to increasing L_{dn} values. The number of persons "highly annoyed" represents the upper 25 to 30 percent of all persons who are annoyed to some degree by the noise. Widespread complaints may be expected when the transportation noise level exceeds 65 dB L_{dn} and widespread threats of legal action may be expected when the transportation noise level exceeds 70 dB L_{dn}.

Noise Measurement Standards

Community noise is generally not a steady state and varies with time. Under conditions of non-steady state noise, some type of statistical metric is used to quantify noise exposure over a long period of time. The following standards are used to define noise levels:

- **Day/Night Noise Level (L_{dn}) -** The L_{dn} is a 24-hour, time-weighted annual average noise level, measured in decibels, with an added penalty for people's increased sensitivity to noise at night from 10 PM to 7 AM. The Environmental Protection Agency (EPA) identifies 45 L_{dn} indoors and 55 L_{dn} outdoors as the desirable maximum level of noise.
- **Equivalent Noise Level (L_{eq}) -** The L_{eq} is a measurement of sound energy over a specified time (usually 1 hour). L_{eq} represents the amount of variable sound energy received by a receptor over a timed interval in a single numerical value. For example, a 1-hour L_{eq} noise level measurement represents the average amount of acoustical energy that occurred in one hour.
- **Community Noise Equivalent Level (CNEL) -** The CNEL noise metric is based on 24 hours of measurement. CNEL also differs from L_{eq} in that it applies a time-weighted factor designed to emphasize noise events that occur during the evening and nighttime hours (when quiet time and sleep disturbance is of particular concern). Noise occurring during the daytime period (7:00 AM to 7:00 PM) receives no penalty. Noise produced during the evening time period (7:00 PM to 10:00 PM) is penalized by 5 dBA, while nighttime noise (10:00 PM to 7:00 AM) is penalized by 10 dBA. The L_{dn} noise metric is similar to the CNEL metric except that the period from 7:00 PM to 10:00 PM receives no penalty. Both the CNEL and L_{dn} metrics yield

approximately the same 24-hour value (within 1 dBA) with the CNEL being the more restrictive (i.e., higher) of the two.

Vibration

Vibration is a trembling, quivering, or oscillating motion of the earth. Like noise, vibration is transmitted in waves, but in this case through the earth or solid objects. Unlike noise, vibration is typically of a frequency that is "felt" rather than heard.

Vibration can be either natural as in the form of earthquakes, volcanic eruptions, sea waves, landslides, etc., or man-made as from explosions, the action of heavy machinery, or heavy vehicles such as trucks or trains. Both natural and man-made vibration may be continuous such as from operating machinery, or transient as from an explosion.

As with noise, vibration can be described by both its amplitude and frequency. Amplitude is generally characterized in three ways: particle displacement, particle velocity, and particle acceleration. Particle displacement is a measure of the distance that a vibrated particle travels from its original position and for the purposes of soil displacement is typically measured in inches or millimeters. Particle velocity is the rate of speed at which soil particles move in inches per second or millimeters per second. Particle acceleration is the rate of change in velocity with respect to time and is measured in inches per second per second or millimeters per second per second. Typically, particle velocity and/or acceleration (measured in gravities) are used to describe vibration. Table 5.7-1 presents the human reaction and effect on buildings to various levels of vibration.

Table 5.7-1: Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (inches/second)	Human Reaction	Effect on Buildings
0.006 - 0.019	Threshold of perception, possibility of intrusion.	Vibrations unlikely to cause damage of any type.
0.08	Vibrations readily perceptible.	Recommended upper level of vibration to which ruins and ancient monuments should be subjected.
0.10	Level at which continuous vibration begins to annoy people.	Virtually no risk of "architectural" damage to normal buildings.
0.20	Vibrations annoying to people in buildings.	Threshold at which there is a risk to "architectural" damage to normal dwelling - houses with plastered walls and ceilings

Table 5.7-1 (Cont.): Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (inches/second)	Human Reaction	Effect on Buildings
0.4 - 0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking by bridges.	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage.
Source: Rich Haven Acoustical Analysis, RBF Consulting, August 18, 2006.		

Vibrations also vary in frequency and this affects perception. Typical construction vibrations fall in the 10 to 30 Hz range and usually occur around 15 Hz. Traffic vibrations exhibit a similar range of frequencies. For example, due to their suspension systems, city buses often generate frequencies around 3 Hz at high vehicle speeds. It is more uncommon, but possible, to measure traffic frequencies above 30 Hz.

The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborn vibrations is complicated and difficult to predict because of the endless variations in the soil and other sub-surface conditions through which waves travel. There are three main types of vibration: propagation, surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. Compression waves, or P-waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. Shear waves, or S-waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse or "side-to-side and perpendicular to the direction of propagation."

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Regulatory Setting

To limit population exposure to physically and/or psychologically damaging, as well as intrusive noise levels, the federal government, the State of California, and local government have established standards and ordinances to control noise.

Federal Government

The federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's Health and Safety Plan. As any site construction will be required to operate under an approved Health and Safety Plan, occupational noise is not applicable and therefore not addressed in this document.

The U.S. Department of Housing and Urban Development (HUD) has set a goal of 45 dBA L_{dn} as a desirable maximum interior standard for residential units developed under HUD funding. (This level is also generally accepted within the State of California.) While HUD does not specify acceptable exterior noise levels, standard construction of residential dwellings constructed under Title 24 standards typically provide in excess of 20 dBA of attenuation with the windows closed. Based on this premise, the exterior L_{dn} should not exceed 65 dBA.

The EPA has published "Noise Effects Handbook: A Desk Reference to Health and Welfare Effects of Noise, dated July 1981 which contains thresholds for offsite mobile impacts of 5.0, 3.0, and 1.5 dBA.

State of California

The State Office of Noise Control has set acceptable noise limits for sensitive uses. Sensitive-type land uses, such as dwelling units and schools, are "normally acceptable" in exterior noise environments up to 65 dBA CNEL and "conditionally acceptable" in areas up to 70 dBA CNEL. A "conditionally acceptable" designation implies that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use type is made and needed noise insulation features are incorporated in the design. By comparison, a "normally acceptable" designation indicates that standard construction can occur with no special noise reduction requirements.

Applicable interior standards for new multi-family dwellings are governed by Title 24 of the California Administrative Code. These standards require that acoustical studies be performed prior to construction in areas that exceed 60 dBA L_{dn}. Such studies are required to establish measures that will limit interior noise to no more than 45 dBA L_{dn}.

The California Department of Transportation has published "Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol, dated October 1998.

City of Ontario

The two applicable City standards that are related to noise are discussed below.

City of Ontario General Plan Noise Element Policies. The City Noise Element of the 1992 General Plan, which is directly referenced in the NMC General Plan, has identified 65 dB CNEL as the maximum acceptable noise level for noise sensitive uses such as residential and public institutions. The maximum acceptable noise level for recreational areas, livestock areas, and wildlife preserves is 70 dBA CNEL.

City of Ontario - Article 33: Section 9-1.3305, Noise. The following ordinance applies to property line noise level limits between two or more land uses and has been established to prevent the creation of noise on any particular property that may be perceived as noxious at another property.

Maximum permissible exterior sound levels by receiving land uses are:

- Noise standards for the various categories of land uses set forth in Table 5.7-2 shall, unless otherwise specified, apply to each property or portion of property in the community. Where two or more dissimilar land uses occur on a single property, the more restrictive noise standard shall apply.
- In the event of a dispute over the identification of a receiving land use, interpretation is to be made by the Zoning Administrator.
- No person shall operate or cause to be operated any source of sound or noise at any location within the city, or allow the creation of any noise on property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level to exceed the levels indicated on 5.7-2.

Table 5.7-2: Maximum Exterior Noise Levels (Property Line Standards)

Receiving Land Use Category	Noise Level (dBA)	
	10 PM-7 AM	7 AM-10 PM
Residential (except multiple-family)	45	65
Multiple-Family Residential and Mobile Home Parks	50	65
Commercial (All C Zones, including AP)	60	65
Light Industrial (M1, M2)	70	70
Heavy Industrial (M3)	70	70
Source: City of Ontario Municipal Code Sec. 9-1.3305.		

City of Ontario - Article 33: Section 9-1.3350, Hours of Operation. With the exception of office and security activities, any industrial production, processing, cleaning, testing, repairing, shipping or outdoor activities within 300 feet of a residential district shall be limited to the hours of 7 AM to 10 PM. The city Planner may approve additional hours when it can be found that such additional hours will not generate additional disturbance, or that mitigation measures will ensure compatibility with nearby residential areas.

The City of Ontario does not provide noise significance thresholds for offsite mobile impacts within the General Plan or the Municipal Code.

Field Survey

Noise measurements were taken at the project site, on Monday August 14, 2006 between 11:00 AM and 12:30 PM. Noise measurements were taken using a Larson-Davis Laboratories Model 820 Type 1 sound level meter which was calibrated to ensure accuracy of the measurements.

Table 5.7-3: Noise Measurements

Site	Location	L_{eq} (dBA)	Time	Comments
1	Lorenzo near Oaks Loop	53.5	11:20 AM	Sunny, mild temperatures
2	Riverside Drive and Mill Creek	57.3	11:50 AM	Sunny, mild temperatures
3	Milliken Avenue, East of SCE Substation	62.4	12:25 PM	Sunny, mild temperatures
Source: Noise Monitoring Survey, RBF Consulting, August 14, 2006.				

Noise Modeling

Mobile Sources

Vehicular noise along major roadways in the vicinity of the proposed project was modeled to estimate existing noise levels from mobile traffic. The existing and future roadway noise levels were projected using the Federal Highway Administration (FHWA) Traffic Noise Prediction Model (RD-77-108), together with several roadway and site parameters. The FHWA model is based upon reference energy mean emission levels (REMEL) for automobiles, medium trucks (2 axles), and heavy trucks (3 or more axles), with consideration given to vehicle volume and speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. To predict CNEL values, it is necessary to determine the hourly distribution of traffic for a typical day and adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Traffic volumes used in the FHWA model were obtained from the Rich-Haven Specific Plan Traffic Impact Analysis prepared by Meyer, Mohaddes and Associates (July 2006) for the year 2015. Other

traffic inputs into the model were obtained from field observations. These traffic inputs determine the projected impact of vehicular traffic noise and include the roadway cross-section (e.g., number of lanes), roadway width, average daily traffic (ADT), vehicle travel speed, percentages of automobile and truck traffic, roadway grade, angle of view, and site conditions (hard or soft).

Vehicular noise along major roadways was modeled to estimate existing noise levels from mobile traffic. The result of the traffic noise modeling is presented in Table 5.7-4 (Existing Traffic Noise). Based on the analysis, noise levels range from 56.1 dBA CNEL to 67.0 dBA CNEL. The highest noise levels were modeled on Riverside Drive, between Archibald Avenue to Turner Avenue.

Table 5.7-4: Existing Traffic Noise

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Noise Contour (distance from centerline)		
			60 CNEL	65 CNEL	70 CNEL
Riverside Drive:					
West of Archibald	12,300	66.4	496	157	50
Archibald to Turner	13,940	67.0	563	178	56
Turner to Haven	13,530	63.9	205	95	44
Haven to Mill Creek	9,430	62.3	161	75	35
Mill Creek to Milliken	8,280	61.7	148	69	32
East of Milliken	8,440	64.8	341	108	34
Chino Avenue:					
West of Archibald	4,620	57.2	70	32	15
Archibald to Turner	3,170	58.4	74	23	7
Edison Avenue:					
West of Archibald	7,330	61.6	136	63	29
Archibald to Schaefer	5,730	60.5	115	54	25
Archibald Avenue:					
Edison to Schaefer	11,770	62.0	157	73	34
Schaefer to Chino	12,290	65.2	382	121	38
Chino to Riverside	15,660	66.2	487	154	49
North of Riverside	16,760	66.5	521	165	52

Table 5.7-4 (Cont.): Existing Traffic Noise

Roadway Segment	ADT	dBA @ 100 Feet from Roadway Centerline	Noise Contour (distance from centerline)		
			60 CNEL	65 CNEL	70 CNEL
Turner Avenue:					
Schaefer to Chino	2,120	57.7	66	21	7
Chino to Riverside	5,020	61.4	156	49	16
North of Riverside	3,030	59.2	94	30	9
Haven Avenue:					
Chino to Riverside	2,700	56.1	59	27	13
Riverside to Creekside	11,140	66.0	450	142	45
Milliken Avenue:					
Chino to Riverside	12,040	64.2	282	89	28
North of Riverside	14,240	63.0	178	83	38
Source: Rich Haven Specific Plan, 2006.					

Stationary Noise Sources

The primary sources of stationary noise in the project vicinity are generated from urban- and agricultural-related activities (i.e., mechanical equipment, landscape maintenance, conversations [normal to loud]). Noise is also generated by residential activities (i.e., air conditioners, pool/spa equipment, landscape maintenance, and conversations). The noise associated with these sources may represent a single event noise occurrence, short-term or long-term/continuous noise.

5.7.3 - Thresholds of Significance

According to Initial Study, the proposed project could have a significant noise-related impact if the proposed project would cause:

- Exposure of 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.
- Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Significance of Changes in Ambient Noise Levels

A project is considered to have a significant noise impact where it causes an adopted noise standard to be exceeded for the project site or for adjacent sensitive receptors. In addition to concerns regarding the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing ambient noise environment. If the ambient noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, an impact may occur. Lacking adopted City of Ontario standards for evaluating such impacts, a general standard for community noise environments is that a change of over 5 dBA, regardless of the ambient noise level without project, is readily noticeable and is therefore considered a significant impact; refer to Table 5.7-5. In areas where the ambient noise level without project is 60-65 dBA, some individuals may notice an increase in the ambient noise level of greater than 3 dBA. Changes in community noise levels by 1.5 dBA or more in areas where the ambient noise level is greater than 65 dBA is considered a significant impact because the increase would contribute to an existing noise deficiency. These standards are found in the Environmental Protection Agency publication "Noise Effects Handbook: A Desk Reference to Health and Welfare Effects of Noise," dated July 1981 and the California Department of Transportation publication "Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol," dated October 1998.

Table 5.7-5: Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (L_{dn} or CNEL)	Significant Impact is Assumed to Occur if the Project Increases Ambient Noise Levels by:
< 60 dBA	+ 5.0 dBA or more
60 - 65 dBA	+3.0 dBA or more
> 65 dBA	+1.5 dBA or more

dBA = A-weighted decibel CNEL = community noise equivalent level
L_{dn} = day/night average noise level
Source: U.S. Environmental Protection Agency Office of Noise Abatement and Control, Noise Effects Handbook - A Desk Reference to Health and Welfare Effects of Noise, October 1979 (revised July 1981).

5.7.4 - Project Impacts

Following is a discussion of the project impacts that correspond to the thresholds of significance previously identified in Section 5.7.3, Thresholds of Significance.

The proposed project would convert the existing agricultural uses on the project site to urban uses that would result in increased levels of noise associated with an urban environment and increased traffic generation.

Impacts Related to the Generation of Noise Levels in Excess of Standards

Short-Term Construction Noise

Construction activities have the potential to cause short-term noise impacts at sensitive receptors. In this case, the nearest sensitive receptor would be the Colony High School located north at the northwest corner of the project and surrounding residential homes. The surrounding area is primarily agricultural land for dairy farming. Construction of the proposed project is anticipated to occur in two phases. Development of individual planning areas and associated park facilities would occur as appropriate levels of master infrastructure, public facilities, and any required dedications are provided. The phasing sequence is subject to change over time to respond to various factors. Development phasing would be implemented by the City through the approval of tentative tract maps and development permits.

Noise produced by construction equipment varies substantially depending upon the type of equipment being used and its operation and maintenance. Construction noise is generally of relatively short duration, lasting from a few days to a period of months. Noise impacts associated with construction activities would typically occur in several distinct phases, each with its own noise characteristics. The first phase, site preparation, is generally the noisiest and has the shortest duration. Activities that occur during this phase include earthmoving and compacting of soils. The figures indicated in Table 5.7-6, represent typical sound levels of common construction equipment. The estimates illustrated below are worst-case assumptions for three pieces of equipment operating simultaneously. In order to reduce impacts associated with the operation of construction equipment, mitigation measure N-1 would be implemented. Mitigation measure NOI-1 provides specifications such as locating equipment as far from sensitive receptors as possible and using mufflers. Compliance with mitigation measure NOI would reduce impacts to less than significant levels.

In accordance with the City of Ontario requirements, mitigation measures necessary to minimize or eliminate adverse construction noise impacts would be incorporated into the project plans and specifications; refer to Section 5.7-6, mitigation measures. In addition, as specified in mitigation measure N-2, construction activities would be required to adhere to the City of Ontario Municipal Code, Article 33: Section 9-1.3350, which provides limits on construction hours between 7:00 AM and 10:00 AM. It is anticipated that no significant sources of construction vibration would be related to this project. However, any vibration impacts would be limited to annoyance effects. With the implementation of mitigation measures N-1 and N-2, construction noise impacts would be less than significant.

Table 5.7-6: Estimated Construction Noise in the Project Area

Distance Attenuation	
Distance to Receptor (Feet)	**Sound Level at Receptor (dBA)**
50	92
100	86
200	80
400	73
600	69
800	67
1,000	64

Notes:
The following assumptions were used
- Basic sound level drop-off rate: 6.0 dB per doubling distance
- Molecular absorption coefficient: 0.7 dB per 1,000 feet
- Analogous excess attenuation: 1.0 dB per 1,000 feet
- Reference sound level: 92 dBA
- Distance for reference sound level: 50 feet
- Assumes simultaneous operation of 1 scraper, 1 heavy truck and 1 bulldozer

Source: Rich Haven Specific Plan, 2006.

Impacts Related to Hauling of Soils

Export and/or import of soil shall be required for the project. The recommended haul routes for the proposed project would include using Haven Avenue towards Edison Avenue, and Edison Avenue to Interstate 15 via Cantu Galleano interchange. Another route would include Hamner Avenue towards State Route 60. The areas surrounding these routes would include primarily vacant land and industrial areas. Noise impacts associated with importing and exporting soil are anticipated to be less than significant.

Impacts Related to Excessive Groundborne Vibration

It is not anticipated that short-term construction operations or long-term operations for the proposed project would result in excessive groundborne vibration or ground borne noise levels. Vibration producing construction equipment such as pile drivers is not typically used for the type of residential homes and commercial buildings that would be developed as part of the Rich-Haven Specific Plan. Although the proposed project would include the use of heavy-duty construction equipment, vibration impacts that would be generated would not damage structures within the project vicinity. In addition, long-term operation at residential units typically would not produce excessive ground vibration. Impacts are considered to be less than significant.

Impacts Related to a Substantial Permanent Increase in Ambient Levels in the Project Vicinity Above Existing Levels Without the Project

Long-Term Mobile Noise

Offsite Noise

In Table 5.7-7 (Year 2015 Traffic Noise Levels), the dBA at 100 feet from the roadway centerline depicts the noise level that would be heard 100 feet perpendicular to the roadway centerline. According to Table 5.7-7, under the "2015 Without Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 48.7 dBA to 70.4 dBA. The highest noise levels would occur along Edison Avenue, west of Archibald Avenue. The area will change from a relatively quiet agricultural area, to a noisier urban environment.

Under the "2015 With Project" scenario, noise levels at a distance of 100 feet from the centerline would range from approximately 53.7 to 70.7 dBA. The highest noise levels would occur along Haven Avenue, between and Riverside Avenue and Creekside Avenue. As shown in Table 5.7-7, the "2015 With Project" scenario would result in a maximum increase of 12.2 dBA along Mill Creek Road, between Edison Avenue and Chino. However, the overall resultant traffic noise levels along this segment of Mill Creek Road would be below the City's standards of 65 dBA CNEL (i.e., 60.6 dBA). While there will be noise increases as the area changes from agriculture to urban uses, the noise increases will not expose persons to levels above applicable standards. Therefore, ambient noise levels would not significantly increase as a result of the proposed project. Mobile noise sources would be considered less than significant.

Onsite Noise

As indicated in Table 5.7-7, future noise levels at the roadways bordering the proposed project along Riverside Drive, Edison Avenue, Archibald Avenue, Haven Avenue, and Milliken Avenue would have noise levels above 65 dBA. (Comparison of future noise to existing noise levels is provided in the memorandum of January 29, 2007 included in Appendix F.) Therefore, onsite residential land uses located along these roadways would require additional noise attenuation to ensure that noise levels comply with the City's exterior and interior noise standards of 65 dBA CNEL and 45 dBA CNEL. As the development phasing would be implemented through the approval of tentative tract maps and development permits, the proposed project would be required to implement mitigation measure N-5, which requires that an acoustical analysis be required for residential units upon submittal final site design plans. Mitigation N-5 includes providing attenuation measures such as soundwalls or increasing the distance between habitable spaces and roadways. Compliance with mitigation measure N-5 would reduce impacts from roadways noise to onsite residential homes to less than significant.

Table 5.7-7: Year 2015 Traffic Noise Levels

Roadway Segment	Future Without Project		Future Plus Project		Difference in dBA @ 100 Feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	ADT	dBA @ 100 Feet from Roadway Centerline	
Riverside Drive:					
West of Archibald	16,694	67.8	18,258	68.1	0.3
Archibald to Turner	14,635	67.2	15,852	67.5	0.3
Turner to Haven	17,380	65.0	18,802	65.3	0.3
Haven to Mill Creek	23,752	66.3	26,243	66.8	0.5
Mill Creek to Milliken	30,040	67.3	26,215	66.7	-0.6
East of Milliken	28,323	70.0	29,514	70.1	0.1
Chino Avenue:					
West of Archibald	3,693	56.3	3,960	56.6	0.3
Archibald to Turner	4,976	60.4	4,333	59.8	-0.6
Turner to Haven	2,378	54.3	3,357	55.8	1.5
Mill Creek to Milliken	7,62	49.4	2,031	53.7	4.3
Schaefer Avenue:					
West of Archibald	4,667	57.3	4,788	57.4	0.1
Archibald to Turner	6,519	58.7	7,165	59.1	0.4
Turner to Edison	6,911	59.0	7,577	59.4	0.4
Edison Avenue:					
West of Archibald	55,495	70.4	58,253	70.6	0.2
Archibald to Schaefer	40,780	69.0	44,809	69.5	0.5
Schaefer to Haven	43,543	69.3	48,373	69.8	0.5
Haven to Mill Creek	49,389	69.9	55,592	70.4	0.5
Archibald Avenue:					
Edison to Schaefer	31,520	66.3	31,538	66.3	0.0
Schaefer to Chino	38,129	70.1	38,686	70.2	0.1
Chino to Riverside	37,669	70.1	38,187	70.1	0.0
North of Riverside	40,337	70.4	40,468	70.4	0.0
Turner Avenue:					
Schaefer to Chino	1,214	55.2	1,239	55.3	0.1
Chino to Riverside	1,756	56.8	1,756	56.8	0.0
North of Riverside	3,397	59.7	3,570	59.9	0.2

Table 5.7-7 (Cont.): Year 2015 Traffic Noise Levels

Roadway Segment	Future Without Project		Future Plus Project		Difference in dBA @ 100 Feet from Roadway
	ADT	dBA @ 100 Feet from Roadway Centerline	ADT	dBA @ 100 Feet from Roadway Centerline	
Haven Avenue:					
South of Edison	24,929	65.8	26,646	66.1	0.3
Edison to Chino	25,655	65.9	28,503	66.4	0.5
Chino to Riverside	26,570	66.0	33,433	67.0	1.0
Riverside to Creekside	27,196	69.9	33,225	70.7	0.8
Mill Creek:					
South of Edison	3,188	55.6	3,952	56.5	0.9
Edison to Chino2	652	48.7	5,601	60.9	12.2
Chino to Riverside	2,598	57.6	5,170	60.6	3.0
Milliken Avenue:					
South of Edison	22,893	64.2	24,816	64.5	0.3
Edison to Chino	17,677	65.9	20,624	66.6	0.7
Chino to Riverside	16,973	65.7	20,031	66.4	0.7
North of Riverside	45,548	69.8	50,081	70.2	0.4

Notes:
Noise levels along this Mill Creek, between Edison and Chino would increase by 12.2 dBA. However, this is not considered a significant impact because noise levels along this roadway would be 60.9 dBA. Noise levels would be below the City's 65 dBA CNEL.
Source: Traffic Impact Analysis, Meyer, Mohaddes and Associates, July 2006.

Long-Term Operational (Stationary Sources)

As previously discussed, the proposed project includes Residential District Planning Areas (Planning Areas [PAs] 1 through 19) and Commercial/Mixed Use Planning Areas (PA 20-21); refer to Exhibit 3-8 for planning area locations. PAs 1 through 19 would include primarily residential and neighborhood parks, with the exception of PA 13, which is a proposed middle school and PA 7, which is the Southern California Edison (SCE) easement. Currently SCE power transmission lines traverse the site. PAs 20 and 21 would include primarily commercial land uses with the potential for some residential homes.

Mechanical Equipment

Mechanical equipment, such as generators, trash compactors, heating, ventilation and air conditioning (HVAC) units would be included as part of the proposed improvements. Mechanical equipment would be utilized in commercial as well as institutional areas. Typically, equipment noise is 55 dBA

at 50 feet from the source. Noise generated from mechanical equipment could impact residential uses and other sensitive receptors within the project vicinity by exceeding the City's 65 dBA noise standard. However, the proposed project would be subject to the provisions of Ontario Municipal Code, which requires that noise levels emitted from such equipment not exceed 65 dBA at any property line within a residential zone, residential use, or other noise-sensitive use. Noise levels from mechanical equipment would be further minimized with implementation of mitigation requiring the orientation of equipment away from any sensitive receptors, proper selection of equipment, and installation of equipment with proper acoustical shielding; refer to mitigation measure NOI-5. With implementation of Mitigation Measure NOI-5 and compliance with Ontario Municipal Code provisions, potential impacts from mechanical equipment are considered less than significant.

Slowly Moving Trucks (Deliveries)

It is anticipated that truck deliveries would occur at the proposed commercial uses, as described above, and may potentially occur at the proposed institutional uses. The maximum noise levels of slow moving heavy and small trucks range between 73 and 70 dBA, respectively, at 50 feet. Noise generated by delivery trucks on the project site could exceed the City's 65 dBA noise standard and a significant impact could occur unless mitigated. Delivery truck noise impacts would be minimized through compliance with the provisions of Ontario Municipal Code, Article 33: Section 9-1.3350 as specified in mitigation measure NOI-6, which includes limitations on hours of operation, would reduce noise impacts from trucks to less than significant levels.

It should be noted that delivery truck traffic is not of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. The CNEL is most useful where the noise is more or less continuous, such as traffic noise.

Loading Docks

Noise sources at loading docks located with the Mixed Use District may include maneuvering and idling trucks, truck refrigeration units, fork lifts, banging and clanging of equipment (i.e., hand carts and roll-up doors), noise from public address systems, and voices of truck drivers and employees. The maximum noise level associated with loading docks is typically 73 dBA at 75 feet. The project proposes commercial uses, as described above that may contain loading docks. Noise generated by loading docks could exceed the City's 65 dBA noise standard for residential and/or other sensitive noise receptors.

Loading dock noise impacts are considered less than significant following compliance with the provisions of Ontario Municipal Code as specified in mitigation measure NOI-6, which would reduce noise impacts from loading docks to less than significant levels.

Parking Areas

The commercial and institutional uses proposed by the project would include designated parking areas. Traffic associated with parking lots is not of sufficient volume to exceed community noise standards that are based on a time averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by a car door slamming, an engine starting-up, and car passing by may be an annoyance to adjacent sensitive receptors. Estimates of the maximum noise levels associated with some parking lot activities are presented in Table 5.7-8 (Maximum Noise Levels Generated by Parking Lots). Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 48 feet for normal speech to 50 dBA at 50 feet for very loud speech (Harris 1979).

Table 5.7-8: Maximum Noise Levels Generated by Parking Lots

Noise Source	Maximum Noise Levels @ 50' from Source
Car door slamming	63 dBA
Car starting	60 dBA
Car accelerating	55 dBA
People shouting, laughing	65 dBA
Car idling	61 dBA
Source: Wieland Associates, 2002.	

Noise attenuation from existing walls and intervening vegetation and topography would further lessen potential impacts. However, parking lot noise levels at the property line of nearby sensitive receptors could exceed the City's 65 dBA noise standard if located closer than 50 feet to the noise source. This impact is considered potentially significant unless mitigated. Mitigation measure N-4 has been recommended requiring that subsequent noise analyses be prepared for future uses, as determined necessary by the City of Ontario, to demonstrate that sound attenuation has been incorporated into proposed parking areas (i.e., walls, landscaping and brushed driving surfaces), to limit noise below the criterion 65 dBA level.

Following mitigation, noise generated by parking lots is not expected to exceed the 65 dBA noise standard and a less than significant impact would occur in this regard.

Neighborhood Park

The project proposes three parks located in PA 5, PA 12, and PA 18. As specified within the Rich Haven Specific Plan the parks would include both active and passive uses. Neighborhood parks in PA 5 and PA 12 would include picnic areas, basketball courts, tot lots, football, soccer, or softball

facilities. The neighborhood park in PA 18 could potentially include a tot lot, a play lawn (croquet field), rose gardens, and picnic areas.

Activities at the park could expose surrounding receptors to noise impacts from events at these facilities, primarily from crowd noise. As indicated in Table 5.7-8, people shouting/laughing generate maximum noise levels of 65 dBA at 50 feet from the source. Since the residences would be located at a minimum of 50 feet from the proposed park facilities, noise generated from people utilizing the park would not exceed the City's 65 dBA noise standard. Furthermore, potential park activities would be limited to operation during daytime hours. Impacts in this regard are considered less than significant.

Landscape Maintenance

Development of the proposed uses would introduce new landscaping requiring periodic maintenance. The proposed neighborhood park would require the greatest amount of landscape services. Noise generated by gas lawnmowers is estimated to be approximately 70 dBA at a distance of 5.0 feet from the source. For each doubling of distance from a point noise source (i.e. lawnmower), the sound level will decrease by 6 dBA. Additionally, walls attenuate noise at an average of 9 dBA. Based on the distance between the proposed neighborhood park and the closest residence, momentary noise levels of up to 52 dBA may occur at the nearest resident property line. Although, maintenance activities would operate during daytime hours for brief periods of time and would increase ambient noise levels in the project vicinity, the gas lawnmower noise levels at the nearest residential property line would not exceed the City's 65 dBA noise standard.

Potential impacts from landscaping activities would be minimized with adherence to the Ontario Municipal Code, which prohibits loud and unnecessary noise. Additionally, a subsequent noise analysis shall be prepared during preparation of the Final Development Plans, demonstrating that site placement of stationary noise sources identified above would not exceed City Code criteria for adjacent residences and sensitive receptors. Therefore, with implementation of the recommended mitigation measures, landscape maintenance noise generated from the proposed uses would be reduced to a less than significant level.

5.7.5 - Cumulative Impacts

Implementation of the proposed project, combined with development of cumulative projects, would increase ambient noise levels in the project area as a result of vehicular traffic noise along local roadways. Other projects would likely require mitigation measures similar to the proposed project, or design features that require additional setbacks from roadways, or some combination of both.

As previously noted, the project would not result in cumulatively significant mobile noise impacts along the roadway segments analyzed. As indicated in Table 5.7-7, noise levels would not increase at significant levels based on the established Significance Criteria. Onsite residential homes located within the project; however, would require additional acoustical analysis upon final design. Surrounding roadways would have noise levels above 65 dBA and proper noise attenuation shall be implemented to ensure the City's exterior and interior standards of 65 dBA CNEL and 45 dBA CNEL are met.

The evaluation of noise impacts is typically determined on a project-by-project basis in order to focus mitigation on a particular noise source. As such, future development proposals within the City would require separate discretionary approval and CEQA assessment, which would address potential noise impacts and identify attenuation measures where appropriate. As previously stated above, the proposed project, as well as cumulative development projects, would be individually required to reduce noise impacts to below City noise standards and demonstrate adherence to the Ontario Municipal Code requirements. Also, it is likely that development in the NMC would require participation in a fee program that makes fair share contributions to noise mitigation.

Nevertheless, cumulative impacts related to noise would be experienced in the region due to this project and other related projects resulting from traffic noise and other human activities. As the NMC makes the transition from agriculture to urban uses and population increases, noise associated with traffic, schools, recreation, shopping and other activities will increase throughout the City and region including areas of Riverside County. Cumulative impacts relating to noise are significant.

5.7.6 - Mitigation Measures

The Noise Section of the NMC Final EIR identified nine mitigation measures (N-1 through N-9) intended to reduce noise impacts. Mitigation measures N-1 through N-4 required the preparation of an Acoustical Analysis Report prior to the issuance of a grading permit that would: 1) describe the cumulative effect of road noise on surrounding land uses and recommend mitigation measures, as necessary, to attenuate that noise; 2) describe in detail the interior and exterior noise levels on the project site and the specific design and mitigation features to ensure compliance with the City's noise criteria; 3) require the location and type of noise barriers to be located on the project site; and 4) identify those residential lots that may require mechanical ventilation to achieve compliance with the City's interior noise standards. Mitigation measure N-5 required owners and occupants of residential units to be formally noticed prior to purchase or occupancy that certain interior spaces and outdoor spaces could be subject to noise levels in excess of City residential noise standards. Mitigation measures N-6 through N-9 were related to mitigating noise impacts from short-term, construction-related activities, which included limiting and/or staging construction hours, noise-limiting equipment

on construction vehicles, and determining locations for stockpiling construction supplies and staging locations for construction equipment.

Implementation of the NMC Final EIR mitigation measures and the following mitigation measures would reduce potentially significant impacts to a less than significant level.

Short-Term Construction

N-1 Prior to Grading Permit issuance, the Applicant shall demonstrate that the project complies with the following:

- All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the Noise Control Officer.
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers, to the satisfaction of the City Planner.
- During construction and to the satisfaction of the City Planner, stockpiling and vehicle staging areas shall be located as far as practical from noise sensitive receptors during construction activities.

N-2 Prior to the issuance of a building permit, require an Acoustical Analysis Report to be submitted to the City of Ontario Planning Department that includes the following noise reduction information that adheres to the City of Ontario Noise Ordinance: a description of the interior and exterior noise levels for residential uses on the project site and specific design features and mitigation measures to document compliance with the established City of Ontario noise criteria; identification of the hours of construction in compliance with Section 9-1.3350 of the Ontario Municipal Code; a description of the location of the construction equipment and the distance between the equipment and the affected sensitive receptors; identification of temporary noise attenuation fences; a description of the preferential location of construction equipment; and a description of the use of current noise suppression technology and equipment.

Long-Term Operational

N-3 Prior to the construction of residential development along Riverside Drive, Haven Avenue, Mill Creek Avenue, Edison Avenue, and Milliken Avenue, an acoustical noise analysis should be prepared prior to the submittal of final tentative tract maps to ensure that exterior and interior noise levels are met. According to the California Building Code, typical residential construction has a Sound Transmission Class of 20 dBA, which would attenuate 65 dBA noise to 45 dBA. The acoustical analysis shall demonstrate that

the buildings have been designed to limit interior noise levels to 45 dBA CNEL and exterior noise (backyards and habitable balconies and patios) to less than 65 dBA CNEL. In areas where typical construction does not attenuate interior noise to 45dBA or less, additional measures shall be incorporated into the design and construction of the residences to limit interior noise to 45 dBA. Such additional measures may include, but not be limited to:

- Install an eight-foot backyard perimeter wall at the edge of the pad for project site homes that back up onto Riverside Drive, Haven Avenue, Mill Creek Avenue, Edison Avenue, and Milliken Avenue.
- Install double-paned windows and extra wall insulation in second story bedrooms of project site dwelling units that are adjacent to Riverside Drive, Haven Avenue, Mill Creek Avenue, Edison Avenue, and Milliken Avenue.
- Use non-noise sensitive structures such as garages to shield noise-sensitive areas.
- Orient buildings to shield outdoor spaces from a noise source.
- Incorporate architectural design strategies, which reduce the exposure of noise-sensitive spaces to stationary noise sources (i.e., placing bedrooms or balconies on the side of the house facing away from noise sources). These design strategies shall be implemented based on recommendations of acoustical analysis for individual developments as required by the City to comply with City noise standards.
- Modify elements of building construction (i.e., walls, roof, ceiling, windows, and other penetrations) as necessary to provide sound attenuation. This may include sealing windows, installing thicker or double-glazed windows, locating doors on the opposite side of a building from the noise source, or installing solid-core doors equipped with appropriate acoustical gaskets.

N-4 To mitigate noise from commercial parking areas into residential areas and other sensitive receptors, prior to the construction of commercial development an acoustical analysis shall be required to ensure that walls, landscaping or other attenuating measures are sufficient to reduce noise from parking areas to levels below 65 dBA.

5.7.7 - Level of Significance After Mitigation

All of the mitigation measures require implementation prior to permit issuance. This eliminates the potential for construction-related activities to commence without the benefit of the recommended mitigation measures.

Mitigation measures N-1 and N-2 would require the preparation of an Acoustical Analysis Report that would provide documentation that the project would comply with established City noise standards for short-term, construction-related activities on the entire project site and with interior and exterior noise levels for the residential component of the project.

Mitigation measure N-3 would reduce the noise impacts from the increase in traffic resulting from the proposed project to proposed dwelling units located adjacent to Riverside Drive, Haven Avenue, Mill Creek Avenue, Edison Avenue, and Milliken Avenue. The construction techniques outlined in mitigation measure N-3 have been shown to reduce interior and exterior noise levels by 5 dB or more, thus reducing the 70 dB noise levels to 65 dB or less.

With the implementation of the recommended mitigation measures, noise impacts in the project area with implementation of the proposed project would be less than significant. However, cumulative noise impacts in the region would remain significant.