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June 24, 2014

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**SUBJECT: Construction noise evaluation for the proposed Chollas Creek
Bike Trail Project in the City of San Diego CA**

Ldn Consulting, Inc. (Ldn), has prepared this noise letter as part of the CEQA process for the project to determine if the project would result in noise impacts during construction and operation. The proposed alignment for the multi-use path would begin at Dorothy Petway Neighborhood Park and continue southwest along the creek to Rigel Street, then follow Rigel Street to Main Street. The path would head north on the west side of Main Street until it meets Chollas Creek on the northwest side of the Interstate 15 freeway ramp. The path would then follow Chollas Creek south to 32nd Street, at which point the path would follow the 32nd Street right-of-way to its terminus at E Harbor Drive, proximate to the Pacific Fleet Station MTS trolley stop.

Applicable Standards

Construction Noise

Division 4 of Article 9.5 of the City of San Diego Municipal Code addresses the limits of disturbing or offensive construction noise. The Municipal Code states that with the exception of an emergency, it should be unlawful to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

The City of San Diego has established a 60 dBA Leq or ambient threshold, whichever is higher, for construction activities within a sensitive habitat area during the breeding/nesting season.

Operational Noise

The generation of noise from certain types of land uses could cause potential land use incompatibility. A project which would generate noise levels at the property line which exceed Section 59.5.0401 of the City's Municipal Code is considered potentially significant, as identified in Table 1.

Table 1: Sound Level Limits in Decibels (dBA)

Land Use	Time of Day	One-Hour Average Sound Level (decibels)
1. Single Family Residential	7 a.m. to 7 p.m.	50
	7 p.m. to 10 p.m.	45
	10 p.m. to 7 a.m.	40
2. Multi-Family Residential (Up to a maximum density of 1/2000)	7 a.m. to 7 p.m.	55
	7 p.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
3. All other Residential	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
4. Commercial	7 a.m. to 7 p.m.	65
	7 p.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	60
5. Industrial or Agricultural	any time	75

Source: City of San Diego Noise Ordinance Section 59.5.0401

Existing Ambient Noise Levels

Noise measurements were taken using a Larson-Davis Model LxT Type 1 precision sound level meter, programmed, in "slow" mode, to record noise levels in "A" weighted form in one-minute increments. The sound level meter and microphone were mounted on a tripod, five feet above the ground and equipped with a

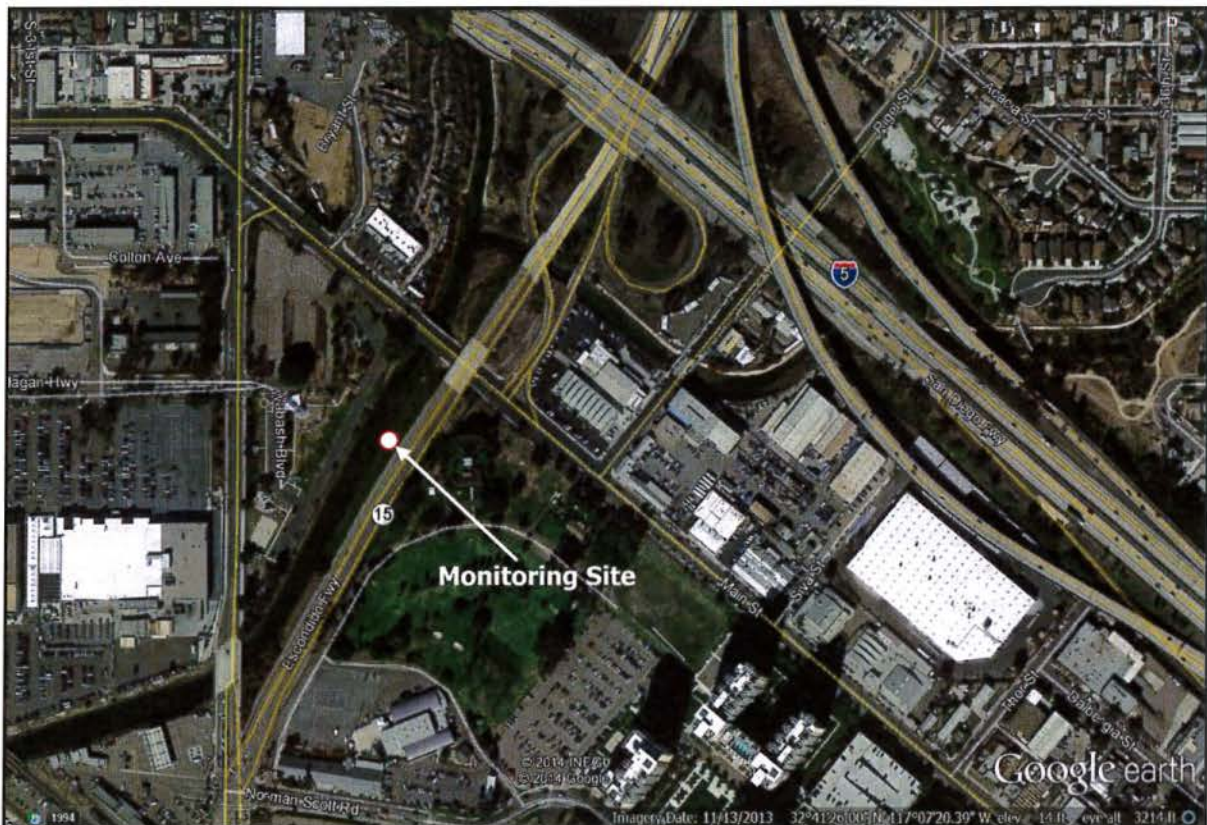
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windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

To determine the existing noise level environment and to assess potential noise impacts within the potential habitat along Chollas Creek, noise measurements were taken at the mid-point of the proposed trail approximately 45-feet from the centerline of Interstate 15. The preliminary measurements taken June 3, 2014. The location of the noise monitoring equipment is shown in Figure 1. The average ambient hourly noise level measured was found to be between 63.2 dBA Leq. Since the ambient noise levels are above 60 dBA the threshold is therefore the ambient conditions of 63.2 dBA Leq at the adjacent habitat area. The dominant ambient noise source was the combination of vehicular traffic along Interstate 15 to the immediate south and background noise from Interstate 5 and Main Street.

Figure 1: Ambient Monitoring Location



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Construction Noise Levels

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders and scrapers can reach relatively high levels. The most effective method of controlling construction noise is through local control and temporary barriers. The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment at a distance of 50 feet can range from 60 dBA for a small tractor up to 100 dBA for rock breakers. However, these noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 75 dBA measured at 50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor, and reduced to 63 dBA at 200 feet from the source.

Using a point-source noise prediction model, calculations of the expected construction noise impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative source to receiver horizontal and vertical separations, the amount of time the equipment is operating in a given day, also referred to as the duty-cycle and any transmission loss from topography or barriers. To determine the worst-case noise levels for the grading operations no topographic attenuation, duty-cycle or barrier reductions were utilized.

Construction noise impacts for the proposed project were completed based upon construction equipment anticipated for the project pursuant to the equipment needs on similar projects. The anticipated equipment during the earthwork operations include an excavator, a loader, road grader and a water truck and possibly a few haul trucks for material export. Due to physical constraints and normal construction operations most of the equipment will be spread out over the alignment of the project except when loading haul trucks for export. This operation will require a loader and single haul truck at a time. An excavator or the water truck will occasionally be needed in the same vicinity. Therefore the worst-case noise condition would occur when the loader, a haul truck and an excavator are working in close proximity to each other.

Based on the EPA noise emissions and empirical data the reference noise levels for the three pieces of equipment, the cumulative noise levels are provided in Table 2 below. Based upon the calculations of the noise levels and empirical data collected of similar construction activities, the average noise levels would not exceed the 75-dBA Leq 12-hour standard at the property lines. As a result, no impacts are anticipated at the

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property lines and no mitigation measures are required to reduce noise levels at adjacent or nearby land uses.

Table 2: Roadway Grading Noise Levels

Construction Equipment	Quantity	Source Level @ 50-Feet (dBA Leq)	Duty Cycle (Hours/Day)	Cumulative Noise Level @ 50-Feet (dBA Leq)
Excavator	1	74	8	74.0
Loader	1	72	8	72.0
Haul Truck	1	75	8	75.0
Cumulative Noise Levels @ 40 Feet				78.6
Noise Reduction Needed to Achieve Ambient Conditions (63.2 dBA Leq)				15.4
Distance To Achieve Unshielded Ambient Noise Level (Feet)				290

Also shown at the bottom of Table 2, utilizing the drop-off rate of 6 decibels for each doubling of distance the required distance separation required for the construction activities to be below a level of 63.2 dBA Leq without shielding is 290-feet. Therefore shielding, or mitigation measures, is required to reduce the construction noise levels below the ambient conditions in the habitat area if construction occurs during the nesting/breeding season and the consulting biologist has determined that birds are nesting/breeding within the area of noise impacts.

The construction noise levels are anticipated to be above the ambient conditions at the potential habitat along Chollas Creek. Therefore, mitigation maybe required if construction activities are occurring during the nesting/breeding season if construction occurs during the nesting/breeding season and the consulting biologist has determined that birds are nesting/breeding within the area of noise impacts.

Habitat Mitigation Measures

Construction noise could result in potential significant impacts to nesting/breeding birds within adjacent habitat areas. If construction occurs during the nesting/breeding season and the consulting biologist has determined that birds are nesting/breeding within the area of noise impacts, then mitigation measures would be required to reduce noise impacts to below a level of significance.

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The Fresnel Diffraction Method was utilized for determining the relative noise reduction associated with the incorporation of a temporary plywood mitigation wall. The model output is provided as an Attachment to this letter. The reduction is dependent upon the source elevation (i.e., exhaust and engine height) and the vertical separation from the sensitive habitat. The mitigation wall would need to be located at the top of slope along the limits of work between the sensitive habitat area and the construction activities.

The wall should extend past the habitat area 290-feet as identified in Table 1 above. A noise reduction of 15.5 dBA is needed to lower construction emissions below the ambient conditions. It was determined that a mitigation wall 12-foot-high would reduce mid octave-band (250 Hertz and 500 Hertz) sound levels associated with typical construction activities between 15.8 dB and 18.8 dB. The effective mitigated sound level within the sensitive habitat area is therefore anticipated to be at or below the City of San Diego's ambient threshold of 63.2 dBA Leq.

Compliance of Construction Noise Levels

The 12-foot high temporary barrier must be constructed prior to the beginning of the breeding/nesting season and noise monitoring will need to be conducted once construction starts and continue until the nesting/breeding season ends. This must be done to determine whether or not construction activities will be in compliance with the ambient findings and the City's threshold at the adjacent Habitat with the incorporation of the 12-foot high barrier. If noise exceedances are found, additional measures may include the treatment of the 12-foot high wall with sound absorbing materials or the retrofitting of the construction equipment mufflers.

Random bi-weekly monitoring, per the City's protocol, should also be conducted during the nesting/breeding season until the season has ended or until the City and project biologist has deemed the noise levels are not affecting the adjacent habitat area or upon completion of the construction activities. Weekly findings should be provided to the City and project team along with any potential impacts or project changes.

Operational Noise Levels

Noise measurements of children playing and people walking along a trail were taken in Temecula at a similar use on August 14th, 2010. The measurements consisted of kids playing while walking or riding bikes with their parents and people jogging and talking. The measurements were taken at a distance of 30-feet from the edge of the trail. It was found that the noise levels ranged from 45 dBA when people were talking to 65 dBA when kids were playing. The noise levels were intermittent over the monitoring

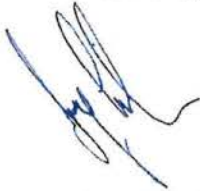
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period and the overall noise level was found to be below 50 dBA. Therefore, no operational noise impacts are anticipated from the trail usage.

If you should have any questions regarding these findings, please contact me at (760) 473-1253 at your convenience.

Sincerely,
Ldn Consulting, Inc.



Jeremy Loudon, Principal

Attachment: Fresnel Barrier Reduction Calculations

