

TECHNICAL MEMORANDUM

To: Karl Gailey, Hilltop Group
From: Mike Greene, Environmental Specialist/Acoustician
Subject: North County Environmental Resources Recycling Facility Access Road –
Supplementary Noise Technical Analysis
Date: May 21, 2019

Attachments: A – Ldn Consulting Noise Assessment Report
B – Operational Noise Calculations

This memorandum provides a supplementary noise technical analysis to augment the *Noise Assessment – North County Environmental Resources Recycling Center* report prepared by Ldn Consulting, Inc (Ldn 2013). The Ldn noise assessment report is provided as Attachment A to this noise memorandum.

1 PROJECT LOCATION AND DESCRIPTION

The project site is located in an unincorporated portion of San Diego County within the North County Metropolitan Subregional Planning Area (SPA). The project site is located at 25568 Mesa Rock Road immediately west of Interstate 15 (I-15), north of State Route 78 (SR-78), and south of the Hidden Meadows Community Planning Area (CPA), in the Twin Oaks Sponsor Group area. Regional access is provided by I-15 and local access to the site is provided by a private easement road via Mesa Rock Road (see Figure 1, Regional Location Map, and Figure 2, Vicinity Map).

The Project Applicant, Hilltop Group Inc., is proposing to develop a wood chipping and Construction, Demolition, and Inert (CDI) debris recycling facility. The proposed NCER Recycling Facility¹ would engage in three forms of recycling: (1) Chipping and Grinding of trees

¹ Permitting requirements classify the proposed facility as a Medium Volume construction and demolition /CDI Processing Facility under California Code of Regulations (CCR) Title 14, Division 7, Chapter 3.0, Article 5.9, Section 17383.5 and shall comply with the Registration Permit tier requirements set forth in CCR, Title 14, Division 7, Chapter 5.0, Article 3.0, commencing at Section 18100 et seq. Under this permitting tier, the facility has the option of collecting and processing materials identified in construction and demolition and CDI categories other than wood debris, and concrete and asphalt in the future; however, tonnage would still be

and logs (C&G tree waste); (2) the recycling of Construction and Demolition wood and construction debris (C&D wood); and (3) the recycling of concrete, asphalt, and inert material from construction and demolition projects (CDI debris). Only pre-sorted, non-contaminated wood and construction debris would be accepted for processing. The permits required to operate the NCER Recycling Facility prohibit composting and acceptance/storage of solid waste. The proposed project consists of a 12,000-square-foot steel building, 100,000-gallon water tank, a security trailer, storage and transport containers for feedstock materials and processed materials, truck scales, and security fencing. The recycling facility would be built on the 18.0 acre (after approved boundary adjustment) parcel in the southeast portion of the site. The facility would operate six days a week, Monday through Saturday, from 5:00 a.m. to 7:00 p.m. The on-site security trailer would not be utilized as a residence but would serve as a security work station, shelter, and break area.

2 METHODOLOGY

The operational noise levels at the adjusted lot line boundary were calculated using a standard equation for noise attenuation with distance known as the Inverse Square Law, in which for discrete noise sources (such as for individual pieces of construction equipment including the rock crusher), the sound level decreases at a rate of 6 decibels (dB) per doubling of distance. For example, if a given noise source is known to produce a sound level of 60 dB at a distance of 50 feet, the sound level at a distance of 100 feet would be 54 dB; at 200 feet the sound level would be 48 dB, and so on. At a distance of 400 feet, sound level would be 18 decibels lower than at 50 feet. The distance from the center of the project site to the nearest adjusted lot line (which occurs on the project's southerly side) would be 400 feet, based on Figure 2-A of the Noise Technical Report by Ldn Consulting (Ldn 2013).

3 SUPPLEMENTARY NOISE ANALYSIS

The various equipment types and their associated noise levels at a reference distance of 50 feet are shown in Table 1. Tables 2, 3, and 4 show the calculated operational noise levels originating from the project site at the nearby property lines to the south, east, and west respectively. The noise levels are also shown in Figure 1. Based upon information provided by the applicant, a maximum of two (2) pieces of equipment are anticipated to be operational at any one time (i.e., during any one hour). In order to assess the worst-case noise levels, the two pieces of equipment with the highest continual noise levels which would operate simultaneously (the wheeled loader and the C&D Crusher) were used. As shown in Table 2, the proposed project would comply

subject to the restrictions set forth in the County's Zoning Ordinance. Subsequent environmental review and permitting would be required to increase the amount of processed material.

with the County of San Diego’s Noise Ordinance criteria to the south, including the worst-case scenario of 57.5 dBA during nighttime hours while also conservatively accounting for intervening topography. As shown in Table 3, the proposed project would (technically) exceed the arithmetic average of 57.5 dBA for the worst-case nighttime scenario, by 0.5 dBA. The estimated noise level would be 58 dBA L_{eq} . However, the parcel zoned A70 (Limited Agriculture) immediately east of the project site, west of I-15 freeway, is Caltrans property located on a 2:1 slope. Due to the Caltrans ownership and steep slope, a residential or agricultural development is anticipated to not ever occur at that adjacent parcel. In addition, the existing residences located to the east of the project site, are located across the I-15 freeway, which is a continual source of relatively high noise levels, thus the very small exceedance² in noise due to the proposed project would not be audible and impacts would be less than significant.

Noise levels in the adjacent 3.9 acres of suitable California gnatcatcher habitat, west of the project site, would exceed the County’s threshold of 60 dB; however, a focused protocol-level survey for gnatcatcher was conducted and results were negative. In addition, due to the relatively small area of suitable habitat within the study area, as well as, human activity and freeway noise associated with I-15, it is unlikely that gnatcatcher would reside or breed in this area. Furthermore, the habitat is isolated and of fairly low quality. Therefore, no impacts would result.

Table 1
Equipment Noise Levels

On-Site Equipment	Source Noise Level at 50 feet (dBA L_{eq})
Wheel Loader	75
Dump Truck	72
Dump Truck Passing	82
Dump Truck Unloading	87
Tub Grinder	82
Trommel Screen	75
C & D Crusher	88

Source: Ldn Consulting 2013

Note: dBA = A-weighted decibels; L_{eq} = one-hour average noise level

² Incremental changes in noise level of 1 decibel or less are typically not audible in the context of community noise.

Table 2
Operational Noise Levels at Property Line - South (Residential)

Source ¹	Source Noise Level at 50 feet (dBA L _{eq})	Distance to Property Line (feet)	Noise Reduction Due to Distance (dBA)	Noise Reduction from Topography ² (dBA)	Calculated Noise Level at Property Line (dBA L _{eq})
Wheel Loader	75	800	-24.1	-22.5	28.4
C & D Crusher	88	800	-24.1	-22.5	41.4
Combined Calculated Noise Level (dBA L_{eq})					42
County Noise Standard based on Land Use (dBA L_{eq})					57.5
Complies with County Noise Ordinance?					Yes

1 - Based upon information provided by the applicant, no more than two (2) pieces of equipment would be operational at any one time during any one hour, because of the low amount of throughput permitted for the site. The worst-case scenario would be for one loader and for the loudest piece of processing equipment (i.e., the C&D Crusher) to be operational simultaneously.

2 - A large ridgeline exists to the south, between the project site and the nearest noise-sensitive land uses, which would entirely block the line-of-sight. Calculations for the noise reduction from intervening topography is provided in Attachment A.

Note: dBA = A-weighted decibels; L_{eq} = one-hour average noise level

Table 3
Operational Noise Levels at Property Line -East (Residential)

Source ¹	Source Noise Level at 50 feet (dBA L _{eq})	Distance to Property Line (feet)	Noise Reduction Due to Distance (dBA)	Noise Reduction from Topography (dBA)	Calculated Noise Level at Property Line (dBA L _{eq})
Wheel Loader	75	1,580	-30.0	0	45.0
C & D Crusher	88	1,580	-30.0	0	58.0
Combined Calculated Noise Level (dBA L_{eq})					58
County Noise Standard based on Land Use (dBA L_{eq})					57.5
Complies with County Noise Ordinance?					No

1 - Based upon information provided by the applicant, no more than two (2) pieces of equipment would be operational at any one time during any one hour, because of the low amount of throughput permitted for the site. The worst-case scenario would be for one loader and for the loudest piece of processing equipment (i.e., the C&D Crusher) to be operational simultaneously.

Table 4
Operational Noise Levels at Western Biological Habitat

Source ¹	Source Noise Level at 50 feet (dBA L _{eq})	Distance to Property Line (feet)	Noise Reduction Due to Distance (dBA)	Noise Reduction from Topography (dBA)	Calculated Noise Level at Property Line (dBA L _{eq})
Wheel Loader	75	750	-23.5	0	51.5

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C & D Crusher	88	750	-23.5	0	64.5
Combined Calculated Noise Level (dBA Leq)					64.7
County Noise Standard based on Land Use (dBA Leq)					60
Complies with County Noise Ordinance?					No

1 - Based upon information provided by the applicant, no more than two (2) pieces of equipment would be operational at any one time during any one hour, because of the low amount of throughput permitted for the site. The worst-case scenario would be for one loader and for the loudest piece of processing equipment (i.e., the C&D Crusher) to be operational simultaneously.

Note: dBA = A-weighted decibels; Leq = one-hour average noise level

While the operational limits of the project site, which generally aligns with the proposed access road, are approximately 50 feet from the east property line and approximately 65 feet from the southern property line, noise would primarily be sourced from the center of the project site where the processing area is located. Similarly, Table 5 shows the calculated operational noise levels originating from the project site at the project’s adjusted lot line. As shown in Table 5, operational noise would comply with the County’s noise standard for the permitted use of 70 dBA. Noise impacts resulting from operation of the proposed project would be less than significant.

**Table 5
Operational Noise Levels at Adjusted Lot Line Boundary**

Source ¹	Source Noise Level at 50 feet (dBA Leq)	Distance to Property Line ² (feet)	Noise Reduction Due to Distance (dBA)	Noise Reduction from Topography (dBA)	Calculated Noise Level at Property Line (dBA Leq)
Wheel Loader	75	400	-18.1	0	56.9
C & D Crusher	88	400	-18.1	0	69.9
Combined Calculated Noise Level (dBA Leq)					70
County Noise Standard for Permitted Land Use (dBA Leq)					70
Complies with County Noise Ordinance?					Yes

1 - Based upon information provided by the applicant, no more than two (2) pieces of equipment would be operational at any one time during any one hour, because of the low amount of throughput permitted for the site. The worst-case scenario would be for one loader and for the loudest piece of processing equipment (i.e., the C&D Crusher) to be operational simultaneously.

2 - The nearest distance of 400 feet was used, which was the distance from the center of the project site to the adjusted lot line on the south side; the distance to the adjusted lot line on the west is 450 feet. Distances based on Figure 2-A of the Noise Technical Report (Ldn Consulting 2013).

The distance from the center of the project site to the nearest adjusted lot line was used, and no intervening terrain was assumed for the lot line calculations. Potential sources of large amounts of noise generated from this access road would be typically limited to dump trucks during

normal operation. The proposed project would be limited to two export truck trips. Due to such a low volume of heavy truck trips per day, along with the intervening topography and distance to nearest noise sensitive land uses, noise generated from heavy trucks along the access road would also be at or below the County’s Noise Ordinance criteria at the nearest property lines. Therefore, the proposed project would have less than significant impacts related to operational noise on surrounding properties.

4 VIBRATION ANALYSIS

Project implementation could expose the uses listed in Tables 6 and 7 to groundborne vibration and noise levels equal to or greater than the levels shown.

Table 6
Guidelines For Determining the Significance of Groundborne Vibration and Noise Impacts

Land Use Category	Groundborne Vibration Impact Levels (inches/second RMS)		Groundborne Noise Impact Levels (dB re 20 micropascals)	
	Frequent Events ^a	Occasional or Infrequent Events ^b	Frequent Events ^a	Occasional or Infrequent Events ^b
Category 1: Buildings where low ambient vibration is essential for interior operations (research and manufacturing facilities with special vibration constraints) ^f	0.0018 ^c	0.0018 ^c	Not applicable ^{d,e}	Not applicable ^{d,e}
Category 2: Residences and buildings where people normally sleep (hotels, hospitals, residences, and other sleeping facilities) ^f	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use (schools, churches, libraries, other institutions, and quiet offices) ^f	0.0056	0.014	40 dBA	48 dBA

Source: FTA 2006.

RMS = root mean square; re = relative

Notes:

- ^a “Frequent events” is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
- ^b “Infrequent events” is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.
- ^c This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
- ^d Vibration-sensitive equipment is not sensitive to groundborne noise.
- ^e There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 17 gives criteria for acceptable levels of groundborne vibration and noise for these various types of special uses.
- ^f For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the PPV exceeds 1 inch per second. Nontransportation vibration sources such as impact pile drivers or hydraulic breakers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in the County.

Table 7
Guidelines for Determining the Significance of Groundborne Vibration
and Noise Impacts for Special Buildings

Type of Building or Room	Groundborne Vibration Impact Levels (inches/second RMS)		Groundborne Noise Impact Levels (dB re 20 micropascals)	
	Frequent Events ^a	Occasional or Infrequent Event ^b	Frequent Events ^a	Occasional or Infrequent Events ^b
Concert halls, TV studios, and recording studios	0.0018	0.0018	25 dBA	25 dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theaters	0.0040	0.010	35 dBA	43 dBA

Source: FTA 2006.

RMS = root mean square; re = relative

Notes:

^a "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

^b "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

As stated in note F of Table 6, Caltrans criteria shall be used for piles drivers and transient sources such as those associated with project construction. Therefore, for the purposes of this vibration analysis, impacts from pile driving would occur if vibration levels exceed 0.1 inch per second PPV. It should be noted that no pile driving would take place as part of this project, however. Thus, impacts from general construction would occur if vibration levels exceed 0.0040 inch per second RMS (County of San Diego 2009).

Operations

Operational components of the proposed project would include the equipment listed in Table 1, including a wheeled loader, dump truck, tub grinder, trammel screen and a crusher. Vibration levels from this equipment would be comparable to typical heavy construction equipment, which varies from approximately 0.003 inches per second PPV for a small bulldozer to approximately 0.089 inches per second PPV for a large bulldozer or a hoe ram (FTA 2006) as shown in Table 8. At the upper end of the vibration range for conventional construction equipment is a vibratory roller, which is estimated to produce approximately 0.210 inches per second PPV (FTA 2006). The nearest vibration-sensitive land uses consist of residences located approximately 800 feet to the south. According to the FTA's methodology for determining vibration propagation, the vibration level corresponding to even a high-vibration piece of equipment such as a vibratory roller would be approximately 0.001 inches per second at a distance of 800 feet. Thus, no significant groundborne noise or vibration impacts would occur with the operation of the proposed project and impacts would be **less than significant**.

Table 8
Typical Construction Equipment Vibration Levels

Equipment	PPV at 25 feet (inch per second)	Approximate Vibration Level (VdB) at 25 Feet*
Pile drive (impact) – typical	0.644	104
Pile drive (sonic) – typical	0.170	93
Vibratory roller	0.210	94
Jackhammer	0.035	79
Large bulldozer	0.089	87
Loaded trucks	0.076	86
Small bulldozer	0.003	58

Sources: FTA 2006

PPV = peak particle velocity

Note:

* Where noise level is the velocity level in decibels (VdB) referenced to 1 microinch/second and based on the RMS velocity amplitude.

Construction

Conventional Construction Activities

On-site construction equipment that would cause the most groundborne vibration (other than blasting activities, which is addressed below) would be associated with site grading and excavation. During grading and excavation, the largest vibration levels are anticipated to be generated by large bulldozers, loaders, excavators, and loaded trucks used for earthmoving. The nearest vibration-sensitive land uses consist of residences located approximately 800 feet to the south. According to the FTA’s methodology for determining vibration propagation, the vibration level corresponding to a large bulldozer or similar heavy equipment would be approximately 0.0005 inches per second at a distance of 800 feet. Thus, no significant groundborne noise or vibration impacts would occur with the construction of the proposed project and impacts would be **less than significant**.

Blasting

Due to the geologic character of the project proposed project site, blasting and/or on-site rock breaking may be necessary during site preparation activities for the proposed project. Thus, construction-related blasting activities may result in significant groundborne vibrations or groundborne noise impacts. The noise analysis conducted for the project (Ldn Consulting 2013) addressed potential noise impacts from blasting activities. As discussed in the Ldn noise report, because of the location of the project site, blasting would not take place within 400 feet of noise or vibration-sensitive land uses.

When explosive charges detonate in rock, almost all of the available energy from the explosion is used in breaking and displacing the rock mass. However, a small portion of the energy is released in the form of vibration waves that radiate away from the charge location. The strength, or amplitude, of the waves reduces as the distance from the charge increases. The rate of amplitude decay depends on local geological conditions but can be estimated with a reasonable degree of consistency, which allows regulatory agencies to control blasting operations by means of relationships between distance and explosive quantity.

Because the exact blasting locations, necessary geotechnical data or blasting and materials handling plans are not known at this time, it is not possible to conduct a groundborne vibration analysis assessing the proposed blasting and materials handling associated with the Proposed Project. With the implementation of the Project Design Feature PDF N-1, as detailed in Section 5 (Project Design Features), this impact would be **less than significant**.

5 PROJECT DESIGN FEATURES

PDF-N-1 Prior to approval of the grading permit for any portion of the proposed project, the project applicant, or its designee, shall direct that the designated contractor shall prepare a blasting and monitoring plan with an estimate of noise and vibration levels of each blast at NSLU within 1,000 feet of each blast. Where potential exceedance of the County of San Diego Noise Ordinance is identified, the blast drilling and monitoring plan shall identify mitigation measures shown to effectively reduce noise and vibration levels (e.g., altering orientation of blast progression, increased delay between charge detonations, presplitting) to be implemented to comply with the noise level limits of the County's Noise Ordinance, Sections 36.409 and 36.410, the vibration-level limits of 1 inch per second peak particle velocity. Such measures shall be implemented by the Proposed Project applicant, or its designee, prior to the issuance of the grading permit. Additionally, all Proposed Project phases involving blasting shall conform to the following requirements:

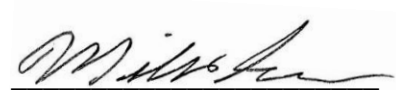
- All blasts shall be performed by a blast contractor and blasting personnel licensed to operate in the County.
- Each blast shall be monitored and recorded with an air-blast overpressure monitor and groundborne vibration accelerometer that is located outside the closest residence to the blast and is approved by the County Blasting shall not exceed 0.1 inch per second peak particle velocity at the nearest occupied residence, in accordance with County of San Diego's Noise Guidelines, Section 4.3.

Implementation: Applicant(s), or its designee, and primary contractor(s) of all Proposed Project phases involving blasting.

Timing: Prior to and during Proposed Project-related blasting activities.

Enforcement: County

Sincerely,



Mike Greene, INCE Bd. Cert.
Environmental Specialist/Acoustician

cc: Carey Fernandes, AICP, Principal
Alex Martini, Environmental Planner

5 REFERENCES

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ATTACHMENT A

Ldn Consulting, Inc. Noise Assessment Report

NOISE ASSESSMENT

**NORTH COUNTY ENVIRONMENTAL RESOURCES
RECYCLING CENTER, Case No.3500 08-015,
Log No. 3910 08-0812**

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May 21, 2013

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GLOSSARY OF TERMS

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 μ Pa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by $20 \log (L/L_{ref})$.

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. L_{eq} is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (Ldn): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB “Penalty” for night time noise. Typically Ldn’s are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts associated with the development of the proposed North County Environmental Resources Recycling Center located on a seven parcels totaling approximately 35 gross acres. The Project is located near the City of Escondido in the unincorporated northern portion of San Diego County, CA.

Based on the noise levels, topography and the distances to the property lines the Project's related cumulative noise levels from the proposed recycling facility are anticipated to comply with the property line standards at all adjacent and surrounding land uses. No impacts are anticipated and no mitigation is required. Additionally, the parcel created, due to the proposed boundary adjustment, located between the habitat area to the east and the residences to the south cannot be developed according to the Project's Plat Map. The operational activities are located at least 350 feet from the habitat area to the west and a minimum of 465 feet from the residences to the south. At these distances, the noise levels would be at or below 60 dBA at the habitat and 57.5 dBA at the residences. Therefore, no restrictions on the placement or location of the operational equipment are required.

If all the equipment was working in the same area, at a distance as close as 115 feet, the point source noise attenuation from the construction activities and the nearest property line is -7.2 dBA. This would result in an anticipated worst case eight-hour average combined noise level of less than 75 dBA at the property line. Additionally, the existing topography, over a fifty-foot hill is located between the equipment and the southern and eastern property lines. Additionally, the nearest residential uses located to the east are over 1,500 feet away and located more than 40 feet below the site blocking the line of sight to operations. Given this and the spatial separation of the equipment over the site, the noise levels from the grading are anticipated to comply with the County of San Diego's 75 dBA standard per Section 36.409 of the Noise Ordinance at all Project property lines.

Based on the unshielded 75 dBA Leq contours from the rock crusher, which extends 225 feet, the rock crushing operation would not exceed the County standard and no noise impacts will occur from any rock crushing activities.

Blasting will occur on an as-needed basis across the site. Based on the site layout and separation from the nearest occupied property line, no blasting is anticipated within 400 feet of any occupied noise sensitive land uses. Therefore, no noise or vibration impacts are anticipated. The blasting contractor should conduct a pre-blast survey to determine if any sensitive uses need to be monitored during blasting operations.

In the unlikely event that all grading, drilling and blasting equipment is staged 400 feet of any occupied noise sensitive land use. The cumulative unshielded noise levels would still be below the

75 dBA threshold and no impacts are anticipated.

In order to comply with the County's maximum impulsive noise level threshold of 82 dBA the rock drills would need to be located 200 feet from the nearest occupied residential property line. Since no blasting is anticipated within 400 feet of any occupied noise sensitive land use no impulsive noise impacts are anticipated. Blasting operations must comply with the County's Consolidated Fire Code (2011) Section 3301.2 of the establishing permitting and notification procedures.

If clearing, grubbing, and grading activities are proposed during the period of February 1 to August 31 of any year, and the Biological Monitor has determined that there are sensitive bird nests that may be affected by the construction activity noise levels, the following recommendations would apply: A County approved acoustical consultant shall perform noise measurements to assess the ambient noise levels in the absence of construction activities. The intent of these measurements is to establish baseline noise levels in the occupied habitat without construction. If the construction noise levels at nest sites during the breeding season are anticipated to exceed the 60 dBA Leq or ambient condition, whichever is higher, noise attenuation measures including, but not limited to, noise barriers and noise reducing features on construction equipment shall be implemented as necessary to maintain construction noise at acceptable levels at nest sites.

Periodic monitoring during the breeding season of noise levels at nest sites shall be performed to verify that construction noise levels are maintained at acceptable levels. The Project's Biological Monitor shall notify the County Department of Public Works Construction Inspector if noise measurements exceed the standard at any nest. These recommendations should be placed on the face of the grading or improvement plans.

1.0 INTRODUCTION

This noise study was completed to determine the noise impacts associated with the development of the proposed North County Environmental Resources Recycling Center Project. The Project is located at 33°10' 10" N and 117° 06' 42" W, near the City of Escondido in northern San Diego County. The proposed Project site is located at 25568 Mesa Rock Road, in the North County Metro Community Planning Area (Twin Oaks Sponsor Group Area), within the unincorporated northern area San Diego County. The Project proposes a light recycling processing facility to handle green waste and construction and demolition waste on a 35.5-acre site. The general location of the Project is shown on the Vicinity Map, Figure 1-A.

1.1 Project Description

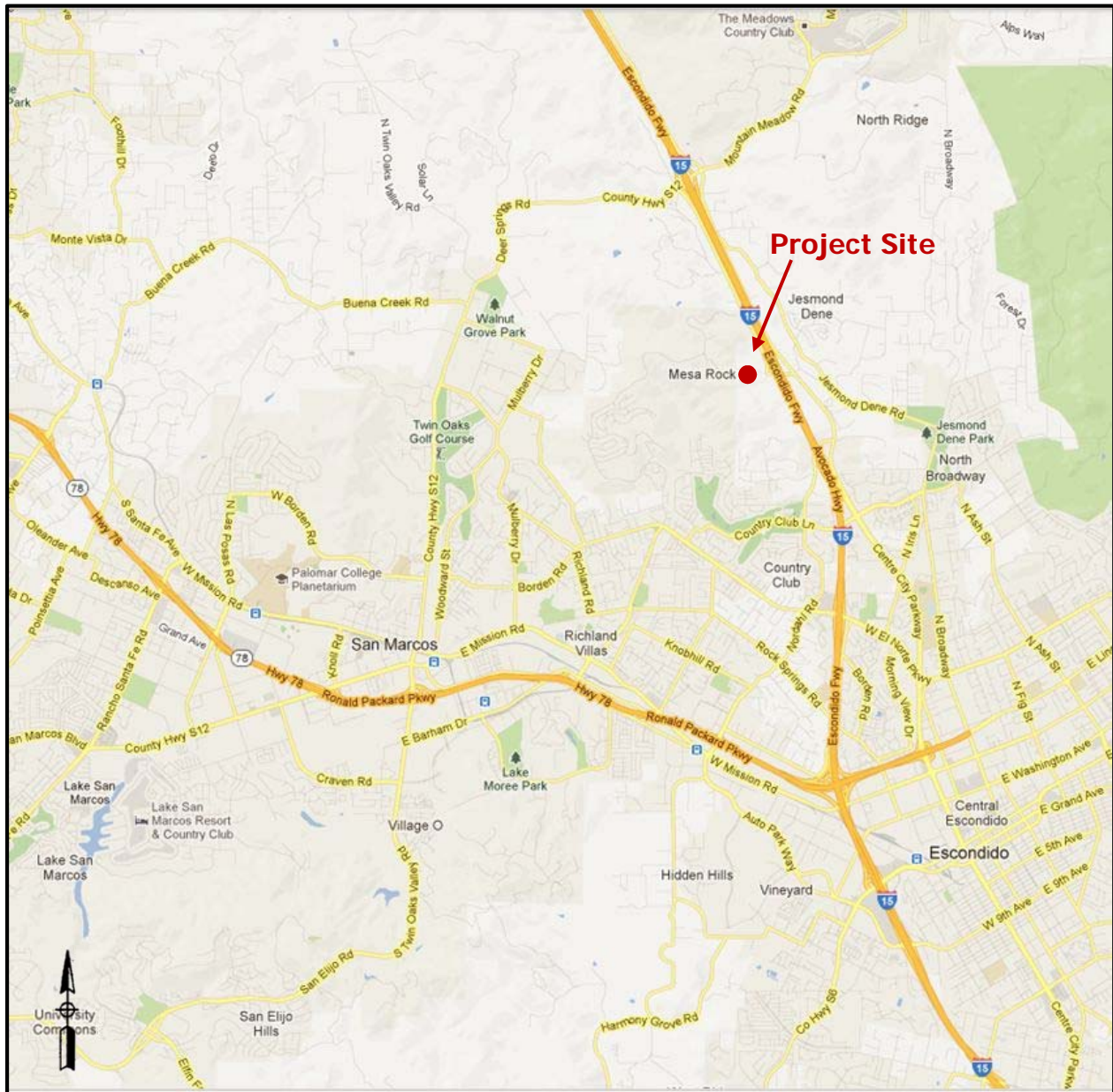
The project is a site plan that proposes a light recycling processing facility to handle green waste and construction and demolition waste on a 35.5-acre site. The facility will be open six days a week Monday through Saturday with the hours of operation from 5 a.m. to 7 p.m. and will employ a maximum of 18 people. The Project will maintain an existing security trailer, a 12,000 square foot steel building used for recycling, offices, shop, wash facility, truck scales, and a 100,000 water tank.

The site is subject to the General Plan Regional Category Semi-Rural, Land Use Designation I-3, High Impact Industrial, and is zoned M54. The site contains six permitted wells. The applicant is capping all wells at ground level and in the future may activate wells to water the landscaping. During grading the existing trailer, patio cover, septic system and a concrete pad will be removed. Access will be provided by a private easement road connecting to Mesa Rock Road across APNs 187-100-33, 23, 38, 31 and 35 to Parcel 37.

The project will be served by an onsite septic system and water from Vallecitos Water District. Earthwork will consist of cut of 96,000 cubic yards and fill of 182,000 for a net import of 72,000 cubic yards which accounts for expected swell quantities too. The proposed site development plan is shown on Figure 1-B on Page 3 of this report.

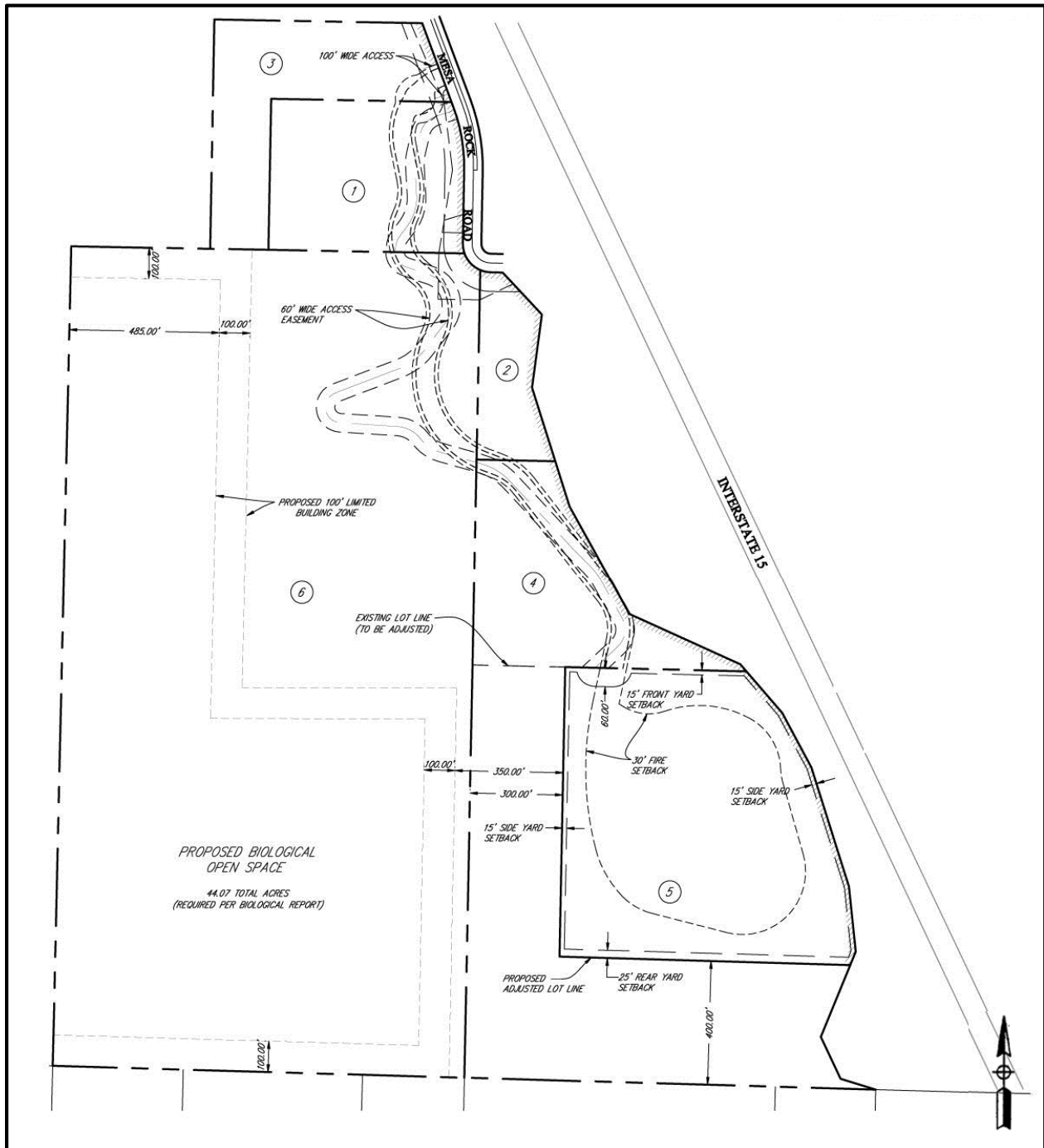
Construction of the proposed project would be expected to begin early 2014 and would begin with minor demolition of well heads and a covered 634 SF patio as well as site preparation to begin grading. Grading operations are expected to occur over a six month period which would include all necessary earthwork for realignment of the site driveway. Once grading is complete, the project would pave the driveway and parking areas onsite allowing for the construction of the 12,000 square foot steel building.

Figure 1–A: Project Vicinity Map



Source: Google Maps, 2013

Figure 1-B: Proposed Project Site Plan



Source: Excel Engineering, 2013

Project vehicular trips would be generated from construction workers to and from the project site along with any haulage trips necessary for importing the 72,000 CY of fill. During operations of the proposed project, the project would generate 36 trips from employees, 30 trips from delivery trucks, 6 trips from processed material export trucks and 6 trips from the live security resident. In totality, the project operations would generate roughly 78 trips. The traffic impact analysis has corrected the delivery trucks to a Passenger Car Equivalent (PCE) or multiplied the 36 truck trips by two or assuming a generation of 72 trips. With this assumption, the project would generate 114 passenger car equivalents.

1.2 Environmental Settings & Existing Conditions

a) Settings & Locations

The affected County Assessor Parcel Numbers (APNs) are 187-100-33, 23, 38, 31 and 35 to Parcel 37, totaling approximately 35 acres; however, only a portion of the subject parcels would be developed as part of the Project. The zoning for the Project parcel is M54 (industrial) and all surrounding land uses are A-70 and RR (rural residential).

b) Existing Noise Conditions

The Project is located west of Interstate 15 along a private easement road and is currently undeveloped. Existing noise occurs mainly from vehicular traffic traveling on Interstate 15.

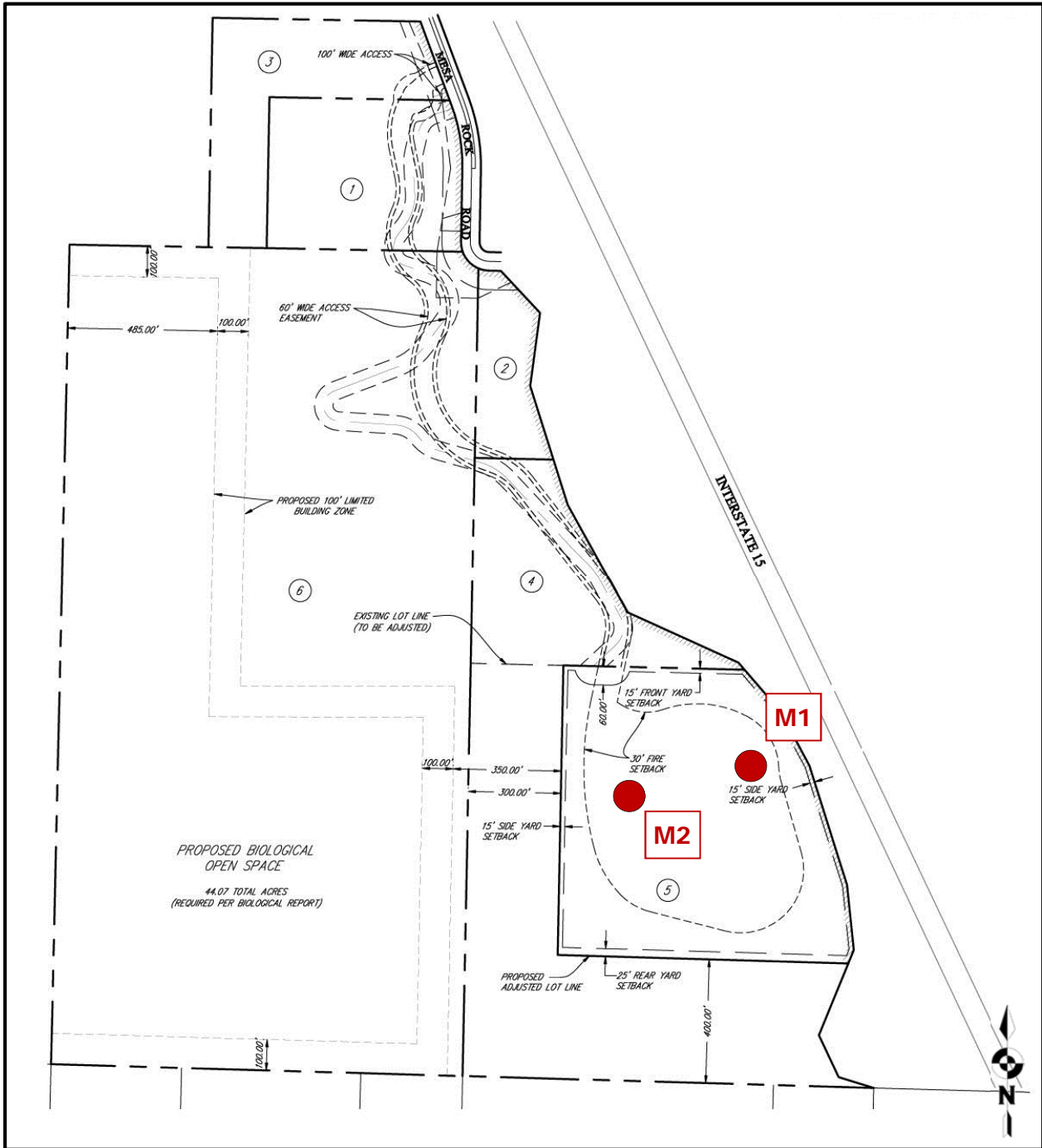
1.3 Methodology and Equipment

a) Noise Measuring Methodology and Procedures

To determine the existing noise environment, measurements were taken at two locations on the project site, to determine the existing noise levels in the Project area. The noise measurements were recorded on March 13, 2013 by Ldn Consulting between approximately 9:00 a.m. and 10:00 a.m. 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. The sound level meter and microphone were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

Monitoring location 1 (M1) was located in the eastern portion of the site along Interstate 15 approximately 400 feet from the centerline. Monitoring location 2 (M2) was located near the western area of the proposed facility location approximately 800 feet from the centerline. The noise monitoring locations are provided graphically in Figure 1-C on the following page.

Figure 1-C: Noise Measurement Locations



The results of the noise level measurements are presented in Table 1-1. The noise measurements were monitored for a time period of at least 20 minutes. The ambient Leq noise levels measured in the area of the project during the morning hour were found to be roughly 58 dBA nearest to Interstate 15 and 47 dBA to the west. Topography of the site and the elevation change between the roadway the site helped reduce the overall noise levels. The existing noise levels in the project area consisted primarily of traffic along Interstate 15.

Table 1-1: Existing Noise Levels

Location	Time	One Hour Noise Levels (dBA)					
		Leq	Lmin	Lmax	L10	L50	L90
M1	9:00–9:25 a.m.	58.0	52.4	65.6	60.0	57.7	55.3
M2	9:35–10:00 a.m.	46.6	41.8	59.1	48.0	45.6	43.8

Source: Ldn Consulting, Inc. March 13, 2013

b) Noise Calculations and Factors

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs and when the noise occurs.

Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as Leq represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

The Community Noise Equivalent Level (CNEL) is the 24 hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder.

Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiate in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. Hard site conditions consist of concrete, asphalt and hard pack dirt while soft site conditions exist in areas having slight grade changes, landscaped areas and vegetation. On the other hand, fixed/point sources radiate outward uniformly as it travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance.

The most effective noise reduction methods consist of controlling the noise at the source, blocking the noise transmission with barriers or relocating the receiver. Any or all of these methods could be required to reduce noise levels to an acceptable level.

2.0 OPERATIONAL ACTIVITIES

2.1 Guidelines for the Determination of Significance

Section 36.404 of the County of San Diego noise ordinance provides performance standards and noise control guidelines for determining and mitigating non-transportation, or stationary, noise source impacts to adjacent properties. The purpose of the noise ordinance is to protect, create and maintain an environment free from noise that may jeopardize the health or welfare, or degrade the quality of life.

The County Noise Ordinance states that it shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property exceeds the applicable limits provided in Table 2-1.

Table 2-1: Sound Level Limits in Decibels (dBA)

ZONE		APPLICABLE LIMIT ONE-HOUR AVERAGE SOUND LEVEL (DECIBELS)
R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U Use Regulations with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
R-RO, R-C, R-M, C-30, S-86, R-V, R-U and V5. Use Regulations with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
S-94, V4, and all other commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
V1, V2	7 a.m. to 7 p.m.	60
V1, V2	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
M-50, M-52, M-54	Anytime	70
S-82, M-58, and all other industrial zones.	Anytime	75

Source: County of San Diego Noise Ordinance Section 36.404

As stated above in Section 1, the Project is zoned industrial (M54) and the surrounding properties are zoned Rural residential (A-70 & RR). The project site, zoned M54, is subject to a one-hour average sound level limit of 70 dBA anytime. Abutting land uses to the west, east, and south are zoned A70 and RR that allows a one-hour average sound level of 50 decibels (dBA) from 7 a.m. to 10 p.m. and 45 decibels (dBA) from 10 p.m. to 7 a.m. The final one-hour average sound level limit for two zoning districts is the arithmetic mean of the respective zones. In this case, the most conservative property lines along the western, eastern and southern boundaries would be subject to 60 dBA daytime and 57.5 dBA nighttime under Section 36.404 of the Noise Ordinance.

2.2 Potential Operational Noise Impacts

This section analyzes the property line noise impacts from onsite noise sources. Noise sources include on site materials transportation and extractive activities. According to the information provided by the Project applicant, equipment used during the aggregate recovery operations and recycling materials and the associated noise levels utilized in this analysis are shown in Table 2-2. The anticipated noise levels during operations are characterized below for each piece of equipment. These noise levels are derived from the Federal Highway Administration construction noise model (FHWA) 2006; Bradley landfill and recycling center Draft Environmental Impact Report, City of Los Angeles, December 2005; Environmental Noise Analysis, Liberty Quarry, January 2009. The noise levels listed represent the A-weighted maximum sound level (Lmax) and the last column is the hourly average based on duty-cycles of the proposed equipment.

Table 2-2: List of Equipment and Reference Noise Levels

Operational Phase	Construction Equipment	Source Level @ 50-Feet (dBA Lmax)	Source Level @ 50-Feet (dBA Leq)
Recycling, Sorting and Processing Operations	Wheel Loader	79	75
	Dump Truck	76	72
	Dump Truck Passing by	86	82
	Dump Truck Unloading	91	87
	Tub Grinder	86	82
	Trommel Screen	79	75
	C & D Crusher	92	88
	Combined Noise Level	94	90

The noise from heavy equipment is created from a variety of sources on the equipment, including but not limited to the engine exhaust, engine block, and radiator. The equipment is typically not working at full power and only has a portion of the noise source directly facing in a single direction for limited periods of time. The Federal Highway Administration utilizes an operational time of 40% of maximum as a basis for analyzing hourly average noise impact levels for these type of heavy equipment. This would equate to a 4 dBA reduction in the noise levels of each piece of equipment as can be seen in the last column of Table 2-2.

Sound from a localized source (a point-source) radiates uniformly outward as it travels away from the source. The sound level attenuates or drops-off at a rate of 6 dBA for each doubling of distance. A drop-off rate of 6 dBA per doubling of distance was used for the proposed equipment to the property lines using a point-source noise modeling program. The equipment noise levels were modeled to each adjacent property line and to the nearest existing residences. The site orientation, equipment locations along with the existing or proposed property uses can be seen in Figure 2 below.

Based on calculations from the existing topography, over a fifty-foot hill is located between the equipment and the southern and eastern property lines, showed that a 20 decibel reduction could occur. To be conservative, only a 15 decibel reduction was taken for the topography (ridge line) on the southern and eastern sides of the facility. The nearest residential uses located to the east are over 1,500 feet away and located more than 50 feet below the site blocking the line of sight to operations. Additional topography along both Interstate 15 and Old Highway 395 also shield the site from the residences to the east. This combination of the topography will reduce the noise levels at least 5 decibels. Additionally, the parcel created, due to the proposed boundary adjustment, denoted as 4 in Figure 2-A located between the habitat area to the east and the residences to the south cannot be developed according to the Project's Plat Map.

Operational noise levels were propagated out to the nearest property lines located to the south, east and west. The cumulative noise level results of the proposed facility are provided in Tables 2-3 thru 2-5 below for each land use. As can be seen in Tables 2-3 thru 2-5, the proposed recycling facility operations are anticipated to comply with the County of San Diego's worst-case nighttime noise ordinance criteria at all surrounding land uses. Therefore, no impacts are anticipated and no mitigation is required.

The operational limits, identified as a dotted line on Figure 2-A, are located 350 feet from the habitat area to the west and 465 feet from the residences to the south. At these distances, the noise levels would be at or below 60 dBA at the habitat and 57.5 dBA at the residences. Therefore, no restrictions on the placement or location of the operational equipment are required.

Figure 2-A: Recycling Facility and Surrounding Land Use Orientation

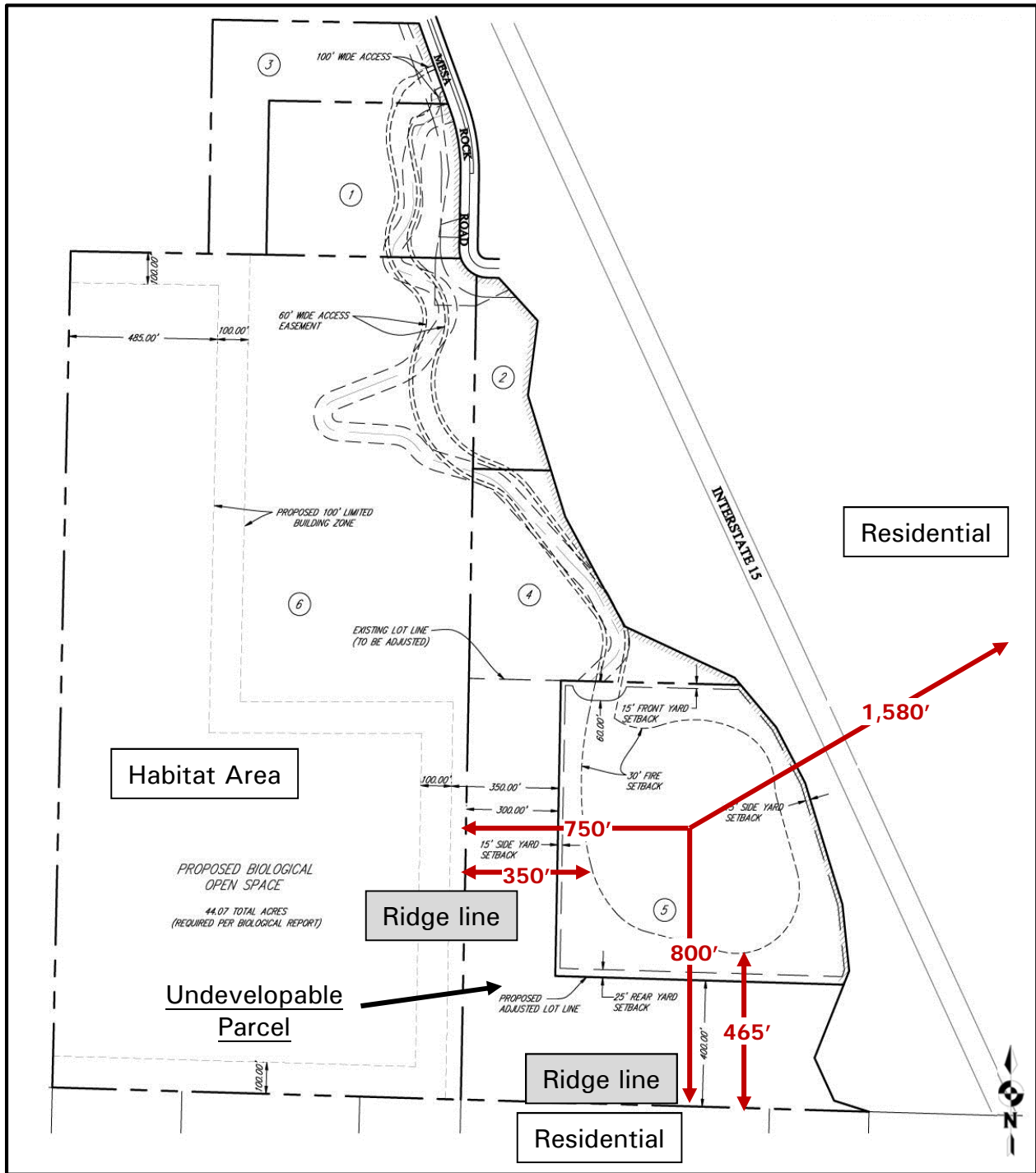


Table 2-3: Property Line Noise Levels – West (Habitat)

Source	Distance from Source to Measurement (Feet)	Source Level (dBA)	Distance to Property Line (Feet)	Noise Reduction due to distance (dBA)	Noise Reduction from Buildings (dBA)	Resultant Noise Level @ Property Line (dBA Leq)
Wheel Loader	50	75	750	-23.5	-15	36.5
Dump Truck	50	72	750	-23.5	-15	33.5
Dump Truck Passing by	50	82	750	-23.5	-15	43.5
Dump Truck Unloading	50	87	750	-23.5	-15	48.5
Tub Grinder	50	82	750	-23.5	-15	43.5
Trommel Screen	50	75	750	-23.5	-15	36.5
C & D Crusher	50	88	750	-23.5	-15	49.5
Cumulative Noise Level (dBA Leq)						53.3
Noise Standard based on Land Use (dBA Leq)						60
Complies with County Noise Ordinance						Yes

Table 2-4: Property Line Noise Levels – South (Residential)

Source	Distance from Source to Measurement (Feet)	Source Level (dBA)	Distance to Property Line (Feet)	Noise Reduction due to distance (dBA)	Noise Reduction from Buildings (dBA)	Resultant Noise Level @ Property Line (dBA Leq)
Wheel Loader	50	75	800	-24.1	-15	35.9
Dump Truck	50	72	800	-24.1	-15	32.9
Dump Truck Passing by	50	82	800	-24.1	-15	42.9
Dump Truck Unloading	50	87	800	-24.1	-15	47.9
Tub Grinder	50	82	800	-24.1	-15	42.9
Trommel Screen	50	75	800	-24.1	-15	35.9
C & D Crusher	50	88	800	-24.1	-15	48.9
Cumulative Noise Level (dBA Leq)						52.8
Noise Standard based on Land Use (dBA Leq)						57.5
Complies with County Noise Ordinance						Yes

Table 2-5: Property Line Noise Levels – East (Residential)

Source	Distance from Source to Measurement (Feet)	Source Level (dBA)	Distance to Property Line (Feet)	Noise Reduction due to distance (dBA)	Noise Reduction from Topography (dBA)	Resultant Noise Level @ Property Line (dBA Leq)
Wheel Loader	50	75	1,580	-30.0	-5	40.0
Dump Truck	50	72	1,580	-30.0	-5	37.0
Dump Truck Passing by	50	82	1,580	-30.0	-5	47.0
Dump Truck Unloading	50	87	1,580	-30.0	-5	52.0
Tub Grinder	50	82	1,580	-30.0	-5	47.0
Trommel Screen	50	75	1,580	-30.0	-5	40.0
C & D Crusher	50	88	1,580	-30.0	-5	53.0
Cumulative Noise Level (dBA Leq)						56.8
Noise Standard based on Land Use (dBA Leq)						57.5
Complies with County Noise Ordinance						Yes

2.3 Conclusions

Based on the noise levels, topography and the distances to the property lines the Project’s related cumulative noise levels from the proposed recycling facility are anticipated to comply with the property line standards at all adjacent and surrounding land uses. No impacts are anticipated and no mitigation is required. Additionally, the parcel created, due to the proposed boundary adjustment, located between the habitat area to the east and the residences to the south cannot be developed according to the Project’s Plat Map. The operational activities are located at least 350 feet from the habitat area to the west and a minimum of 465 feet from the residences to the south. At these distances, the noise levels would be at or below 60 dBA at the habitat and 57.5 dBA at the residences. Therefore, no restrictions on the placement or location of the operational equipment are required.

3.0 CONSTRUCTION ACTIVITIES

3.1 Guidelines for the Determination of Significance

Construction Noise: Noise generated by construction activities related to the project will exceed the standards listed in San Diego County Code Sections as follows.

SEC. 36.408: HOURS OF OPERATION OF CONSTRUCTION EQUIPMENT

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

- a. Between 7 p.m. and 7 a.m.
- b. On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.

SEC. 36.409: SOUND LEVEL LIMITATIONS ON CONSTRUCTION EQUIPMENT

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

SEC. 36.410: SOUND LEVEL LIMITATIONS ON IMPULSIVE NOISE

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

- (a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410A (provided below), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410A are as described in the County Zoning Ordinance.

TABLE 36.410A: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA)

OCCUPIED PROPERTY USE	DECIBELS (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

(b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410B, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410B are as described in the County Zoning Ordinance.

TABLE 36.410B: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA) FOR PUBLIC ROAD PROJECTS

OCCUPIED PROPERTY USE	dB(A)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

(c) The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

3.2 Potential Property Line Noise Impacts

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. Grading activities typically represent one of the highest potential sources for noise impacts. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

The U.S. Environmental Protection Agency (U.S. EPA) and the Federal Highway Administration (FHWA) have compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment can range from 60 dBA to in excess of 100 dBA when measured at 50 feet. 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.

According to the project applicant, a total of two loader/tractors, two water trucks, a dozer, two scrapers and a grader will be required during grading activities to complete the proposed grading operations. Project construction activities also include blasting and rock crushing that will require one hoe ram, two rock drills and a small crushing facility to be utilized.

Grading Operations

The grading equipment will be spread out over the site. The list of equipment and the associated noise levels utilized in this analysis are shown in Table 3-1. The worst case anticipated construction noise levels during construction are characterized below.

Table 3-1: Grading Operation Noise Levels

Construction Equipment	Quantity	Source Level @ 50 Feet (dBA) ¹	Duty Cycle (Hours/Day)	Cumulative Noise Level @ 50 Feet (dBA)
Scrapers	2	75	8	78
Tractors/Loaders/Backhoes	2	72	8	75
Graders	1	74	8	74
Rubber Tired Dozers	1	73	8	73
Water Trucks	2	70	8	73
Cumulative Levels @ 50 Feet (dBA)				82
Distance To Property Line				115
Noise Reduction Due To Distance				-7.2
NEAREST PROPERTY LINE NOISE LEVEL				74.8
¹ Source: EPA 1971, FHWA and Empirical Data				

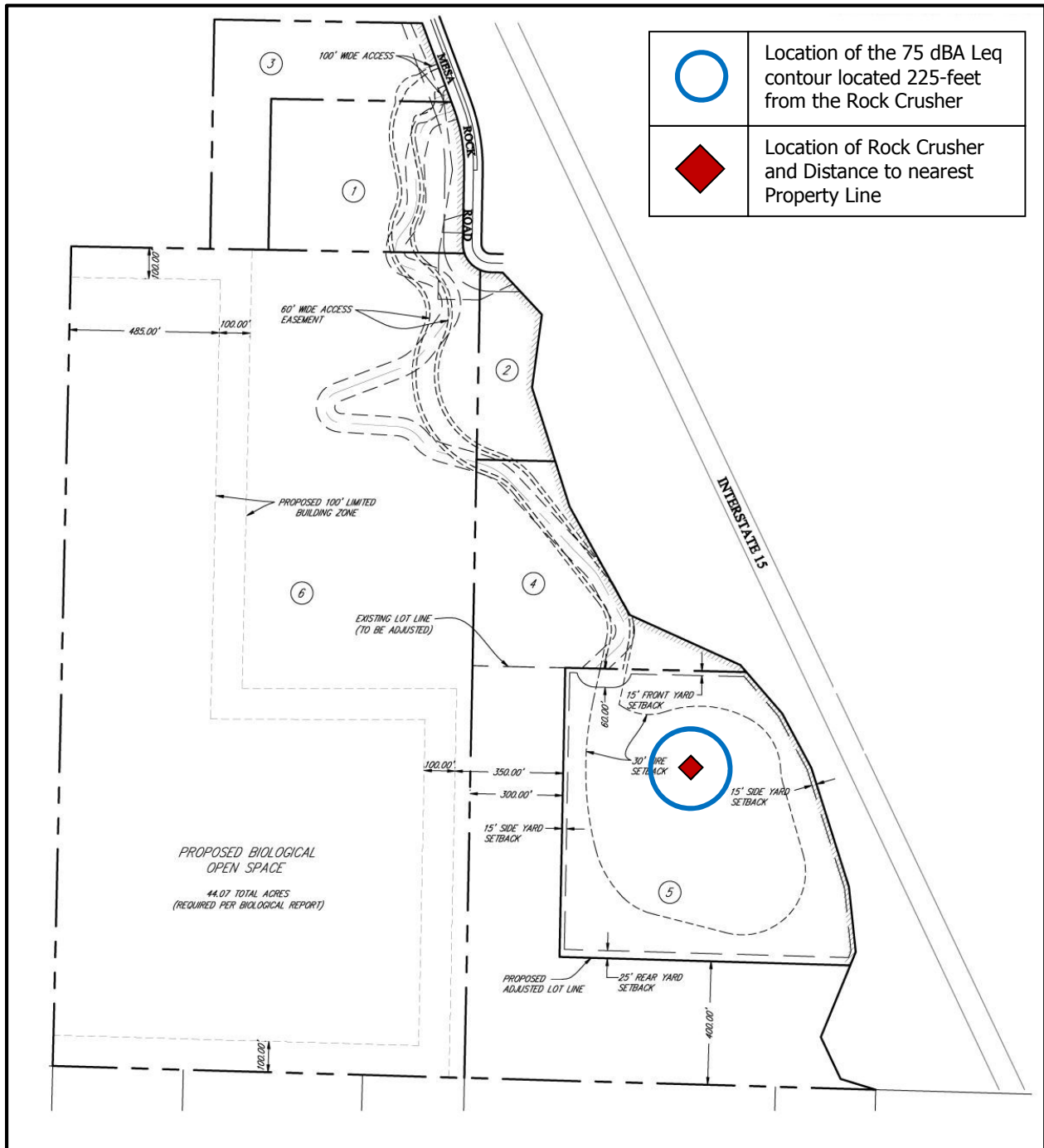
As can be seen in Table 3-1, if all the equipment was operating in the same location, which is not physically possible, at a distance as close as 115 feet from the nearest property line the point source noise attenuation from these construction activities is -7.2 dBA. This would result in an anticipated worst case eight-hour average combined noise level of less than 75 dBA at the property line. As described above the existing topography, over a fifty-foot hill is located between the equipment and the southern and eastern property lines. Additionally, the nearest residential uses located to the east are over 1,500 feet away and located more than 40 feet below the site blocking the line of sight to operations. Given this and the spatial separation of the equipment, the noise levels will comply with the County of San Diego's 75 dBA standard at all Project property lines.

Rock Crushing

Excess rock and grading debris will be crushed on site with the rock crushing operation at one fixed location for a short duration of the grading activities. The location of the rock crusher is provided in Figure 3-A. The project is proposing the use of a Pegson Model 4242 rock crusher or similar unit. The typical noise emission levels from a rock crusher of this size range between 85 and 88 dBA at 50 feet based upon previous analysis conducted by Ldn Consulting. The worst-case noise level of 88 dBA at 50 feet will be used in this analysis. In an unshielded condition, the required distance needed to attenuate the rock crushing activities by 13.0 decibels (88 minus the 75 dBA CNEL standard) is 225 feet. The 225 foot affected area is also shown on Figure 3-A for the rock crusher site, denoted as the 75 dBA Leq contour. Based on the 75 dBA Leq contours the proposed rock crusher will not exceed the County standard. Additionally, based on calculations from the existing topography, over a fifty-foot hill is located between the equipment and the southern and eastern property lines, showed that a 20 decibel reduction could occur.

The rock material is collected and crushed during the initial or "heavy" grading stage when the most significant amount of dirt and rock is moved. It is anticipated that the rock crusher will only be on site and operational once the stock piled material has been collected. The rock crushing operations are anticipated to last for approximately 2-4 weeks depending on weather conditions and final material quantities. When an adequate amount of crushed material has been generated, the rock crushing activities will cease and the equipment disassembled and moved offsite. It should be noted that the rock crushing activities are temporary and permitted with an approved grading plan. The rock crushing activities are permitted for on-site uses only. No off-site impacts will occur from any rock crushing activities.

Figure 3-A: Rock Crusher Activities



Blasting Operations

Areas of the project site that require deeper cuts and where the native material is not easily ripable (graded) may require blasting and the use of rock drills and a hoe ram to prepare the finish

grading. The two rock drills and single hoe ram would be moved around the site on an as needed basis dependent upon the site characteristics. The use of two rock drills and a hoe ram would occur independently of all other proposed equipment. The drilling and blasting operation would occur then the grading equipment would relocate or remove the debris. To determine the worst-case noise levels from the drilling operations both drills and the hoe ram equipment was placed in a centroid location on the site, which is not physically possible. The cumulative noise level for all pieces of equipment would be 89.8 dBA at 50 feet. Utilizing a 6 dBA reduction per doubling of distance, at distances of 275 feet from any property line, the noise levels will comply with the County of San Diego’s 75 dBA standard as shown in Table 3-2.

Table 3-2: Construction Noise Levels with Blasting

Construction Equipment	Quantity	Source Level @ 50 Feet (dBA)	Duty Cycle (Hours/Day)	Cumulative Noise Level @ 50 Feet (dBA)
Rock Drill	2	85	8	88.0
Hoe Ram	1	85	8	85.0
Cumulative Levels @ 50 Feet (dBA)				89.8
Distance To Property Line				275
Noise Reduction Due To Distance				-14.8
NEAREST PROPERTY LINE NOISE LEVEL				75.0

Blasting will occur on an as-needed basis across the site. Based on the site layout and separation from the nearest occupied property line, no blasting is anticipated within 400 feet of any occupied noise sensitive land uses as can be seen in Figure 3-A above. Therefore, no noise or vibration impacts are anticipated. The blasting contractor should conduct a pre-blast survey to determine if any sensitive uses need to be monitored during blasting operations.

In the unlikely event that all grading, drilling and blasting equipment is staged 400 feet of any occupied noise sensitive land use. The cumulative unshielded noise levels would still be below the 75 dBA threshold and no impacts are anticipated.

Additionally, the County Noise Ordinance Section 36.410, states that except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown of 82 dBA (at residential uses), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period. The maximum sound level and uses are shown above in Table 36.410A as described in the County Zoning Ordinance.

The rock drills that will be utilized can produce impulsive noise. Based upon normal procedures the two rock drills are anticipated to be separated but working in the same area on the site. Rock drills can produce maximum noise levels (Lmax) of 87-91 dBA at a distance of 50 feet based on the orientation of the equipment (Source: Rancho Cielo Rock Drill Measurements, Ldn Consulting 2011). Typically, a rock drill is not continuously operating at full power; this is referred to as the usage factor. The usage factor is the percentage of time that a piece of construction equipment is operating at full power. Since the maximum noise level from a rock drill exceeds the County's maximum noise level threshold of 82 dBA the rock drills would need to be located 200 feet from the nearest occupied residential property line or only operate 25% of the hourly or daily duration (15 minutes of any hour and 2 hours of a 8 hour work day) when located within that distance.

As stated above, based on the site layout and separation from the nearest occupied property line, no blasting is anticipated within 400 feet of any occupied noise sensitive land use. Therefore, no impulsive noise impacts are anticipated. Blasting operations must comply with the County's Consolidated Fire Code (2011) Section 3301.2 of the establishing permitting and notification procedures.

Biological Impacts

In 1991, the U.S. Fish and Wildlife Service (USFWS) recommended that hourly noise levels not exceed 60 dBA Leq or ambient conditions, whichever is greater, to protect the California Gnatcatcher and other bird species. The County of San Diego has adopted this standard for all sensitive species.

If clearing, grubbing, and grading activities are proposed during the period of February 1 to August 31 of any year, and the Biological Monitor has determined that there are sensitive bird nests that may be affected by the construction activity noise levels, the following recommendations would apply: A County approved acoustical consultant shall perform noise measurements to assess the ambient noise levels in the absence of construction activities. The intent of these measurements is to establish baseline noise levels in the occupied habitat without construction. If the construction noise levels at nest sites during the breeding season are anticipated to exceed the 60 dBA Leq or ambient condition, whichever is higher, noise attenuation measures including, but not limited to, noise barriers and noise reducing features on construction equipment shall be implemented as necessary to maintain construction noise at acceptable levels at nest sites.

Periodic monitoring during the breeding season of noise levels at nest sites shall be performed to verify that construction noise levels are maintained at acceptable levels. The Project's Biological Monitor shall notify the County Department of Public Works Construction Inspector if noise

measurements exceed the standard at any nest. These recommendations should be placed on the face of the grading or improvement plans.

3.3 Construction Conclusions

If all the equipment was working in the same area, at a distance as close as 115 feet, the point source noise attenuation from the construction activities and the nearest property line is -7.2 dBA. This would result in an anticipated worst case eight-hour average combined noise level of less than 75 dBA at the property line. Additionally, the existing topography, over a fifty-foot hill is located between the equipment and the southern and eastern property lines. Additionally, the nearest residential uses located to the east are over 1,500 feet away and located more than 40 feet below the site blocking the line of sight to operations. Given this and the spatial separation of the equipment over the site, the noise levels from the grading are anticipated to comply with the County of San Diego's 75 dBA standard per Section 36.409 of the Noise Ordinance at all Project property lines.

Based on the unshielded 75 dBA Leq contours from the rock crusher, which extends 225 feet, the rock crushing operation would not exceed the County standard and no noise impacts will occur from any rock crushing activities.

Blasting will occur on an as-needed basis across the site. Based on the site layout and separation from the nearest occupied property line, no blasting is anticipated within 400 feet of any occupied noise sensitive land uses. Therefore, no noise or vibration impacts are anticipated. The blasting contractor should conduct a pre-blast survey to determine if any sensitive uses need to be monitored during blasting operations.

In the unlikely event that all grading, drilling and blasting equipment is staged 400 feet of any occupied noise sensitive land use. The cumulative unshielded noise levels would still be below the 75 dBA threshold and no impacts are anticipated.

In order to comply with the County's maximum impulsive noise level threshold of 82 dBA the rock drills would need to be located 200 feet from the nearest occupied residential property line. Since no blasting is anticipated within 400 feet of any occupied noise sensitive land use no impulsive noise impacts are anticipated. Blasting operations must comply with the County's Consolidated Fire Code (2011) Section 3301.2 of the establishing permitting and notification procedures.

If clearing, grubbing, and grading activities are proposed during the period of February 1 to August 31 of any year, and the Biological Monitor has determined that there are sensitive bird nests that may be affected by the construction activity noise levels, the following recommendations would apply: A County approved acoustical consultant shall perform noise measurements to assess the

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4.0 SUMMARY OF PROJECT IMPACTS, MITIGATION & CONCLUSIONS

- Operational Noise Analysis

Based on the noise levels, topography and the distances to the property lines the Project's related cumulative noise levels from the proposed recycling facility are anticipated to comply with the property line standards at all adjacent and surrounding land uses. No impacts are anticipated and no mitigation is required. Additionally, the parcel created, due to the proposed boundary adjustment, located between the habitat area to the east and the residences to the south cannot be developed according to the Project's Plat Map. The operational activities are located at least 350 feet from the habitat area to the west and a minimum of 465 feet from the residences to the south. At these distances, the noise levels would be at or below 60 dBA at the habitat and 57.5 dBA at the residences. Therefore, no restrictions on the placement or location of the operational equipment are required.

- Construction Noise Analysis

If all the equipment was working in the same area, at a distance as close as 115 feet, the point source noise attenuation from the construction activities and the nearest property line is -7.2 dBA. This would result in an anticipated worst case eight-hour average combined noise level of less than 75 dBA at the property line. Additionally, the existing topography, over a fifty-foot hill is located between the equipment and the southern and eastern property lines. Additionally, the nearest residential uses located to the east are over 1,500 feet away and located more than 40 feet below the site blocking the line of sight to operations. Given this and the spatial separation of the equipment over the site, the noise levels from the grading are anticipated to comply with the County of San Diego's 75 dBA standard per Section 36.409 of the Noise Ordinance at all Project property lines.

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In the unlikely event that all grading, drilling and blasting equipment is staged 400 feet of any occupied noise sensitive land use. The cumulative unshielded noise levels would still be below the

75 dBA threshold and no impacts are anticipated.

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If clearing, grubbing, and grading activities are proposed during the period of February 1 to August 31 of any year, and the Biological Monitor has determined that there are sensitive bird nests that may be affected by the construction activity noise levels, the following recommendations would apply: A County approved acoustical consultant shall perform noise measurements to assess the ambient noise levels in the absence of construction activities. The intent of these measurements is to establish baseline noise levels in the occupied habitat without construction. If the construction noise levels at nest sites during the breeding season are anticipated to exceed the 60 dBA Leq or ambient condition, whichever is higher, noise attenuation measures including, but not limited to, noise barriers and noise reducing features on construction equipment shall be implemented as necessary to maintain construction noise at acceptable levels at nest sites.

Periodic monitoring during the breeding season of noise levels at nest sites shall be performed to verify that construction noise levels are maintained at acceptable levels. The Project's Biological Monitor shall notify the County Department of Public Works Construction Inspector if noise measurements exceed the standard at any nest. These recommendations should be placed on the face of the grading or improvement plans.

5.0 CERTIFICATIONS

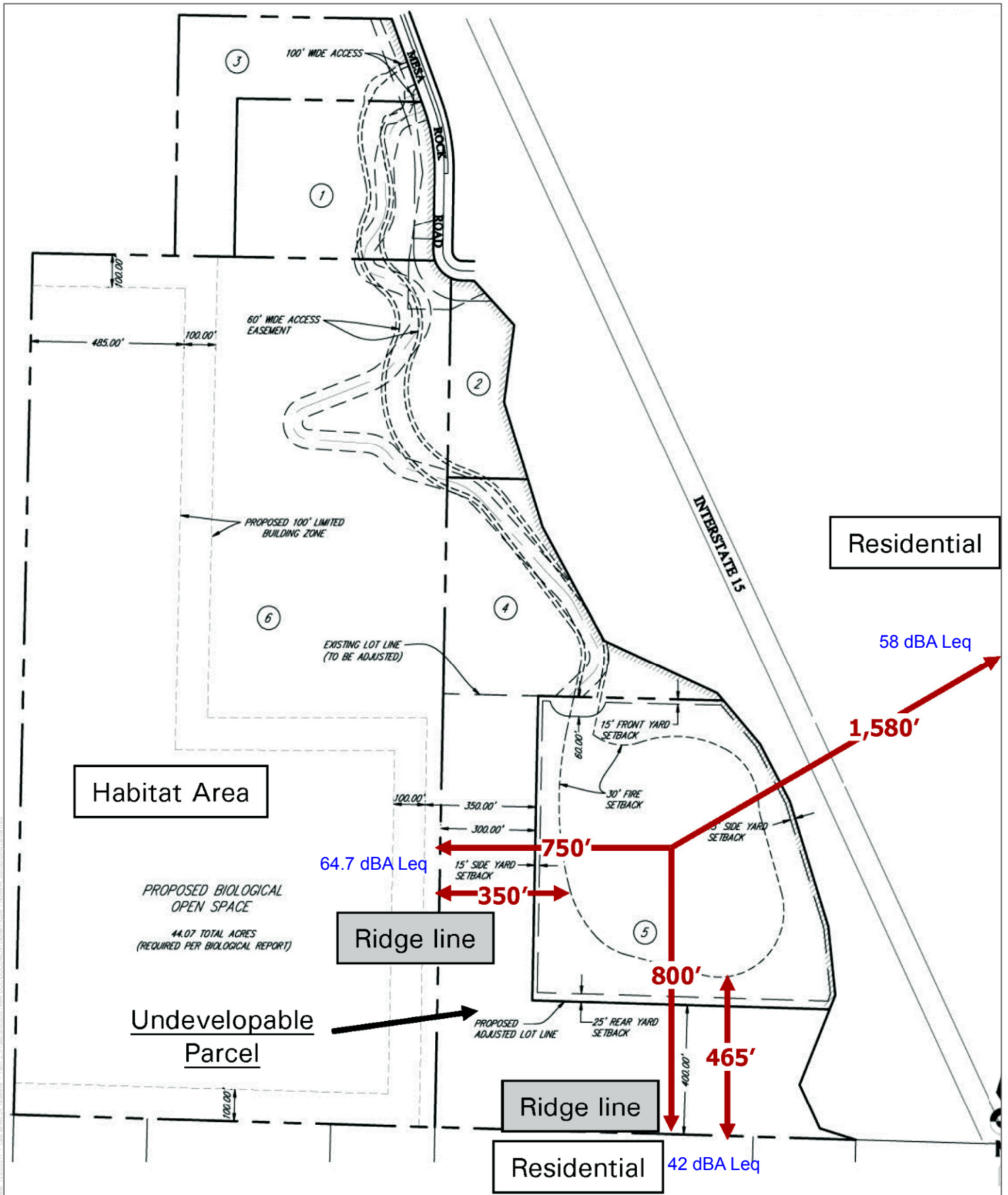
The contents of this report represent an accurate depiction of the existing and future acoustical environment and impacts within the proposed North County Environmental Resources Recycling Center project development. The report was prepared by Jeremy Loudon; a County approved CEQA Consultant for Acoustics.

DRAFT

Jeremy Loudon, Principal
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760-473-1253

Date May 21, 2013

ATTACHMENT B
Operational Noise Calculations



SOURCE: Ldn Consulting Inc. 2013

FIGURE 1

Recycling Facility Noise at Surrounding Land Uses

Hilltop NCER Project

ATTACHMENT A - SHIELDING ATTENUATION CALCULATIONS: RAY-TRACE PROGRAM (FOR A POINT-SOURCE)

Uses the Equation: $(A_{ed})_{point} = 20 \cdot \log[(2 \cdot \pi \cdot N)^{1/2} / \tanh(2 \cdot \pi \cdot N)^{1/2}] + 5 \text{dB}$
 (Ref. Pg.174, Noise and Vibration Control, L.L. Beranek Editor, 1971 Ed.)

Project: NCER Hilltop Recycling
 Date: 13-Dec-17
 By: MG

Please Enter: Using English (E) units

E

Ray Trace Number/Description	Source-Receiver Distance (ft. or m)	Source Base Elev. (ft. or m)	Source Height above Ground	Receiver Base Elev. (ft. or m)	Receiver Height above Ground	Horizontal Barrier Dist. (in ref. to	Barrier Base Elev. (ft. or m)	Barrier Height (ft. or m)	Dominant Freq.(Hz)	Source-Revr Straight-Line Dist.	Source-Top-of-Barrier Dist.	Receiver-Top-of-Barrier Dist.	Lambda	N _{max}	AE _(barriers) (dB)
Ptoject Site / Rcvr to South	800.0	1000.0	5.0	1100.0	5.0	750.0	1130.0	0.0	500.0	806.2	760.3	55.9	2.3	8.9	22.5

