La Jolla View Reservoir Project
Environmental Impact Report

SCH No. 2018041020 - Project No. 331101

Appendix B

Acoustical Analysis Report

February 2020

HELIX Environmental Planning

La Jolla View Reservoir Project

Acoustical Analysis Report

December 2018

Prepared for:

City of San Diego
Public Works Department
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Prepared by:

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December 2018 | SDD-31.08

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ACRONYMS AND ABBREVIATIONS

ADT	average daily trips
ANSI	American National Standards Institute
CAD	Computer Aided Design
CadnaA	Computer Aided Noise Abatement
Caltrans	California Department of Transportation
CNEL	Community Noise Equivalent Level
cy	cubic yards
dB	decibel
dBA	A-weighted decibel
Hz	Hertz
kHz	kilohertz
L_{DN}	Day Night sound level
L_{EQ}	time-averaged noise level
LF	linear feet
LJCP	La Jolla Community Plan
MG	million gallon
NSLU	noise sensitive land use
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
SF	square foot/feet
SPL	sound pressure level
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service

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EXECUTIVE SUMMARY

This report presents an assessment of potential construction and operational noise impacts associated with the proposed La Jolla View Reservoir Project (Project) located in the La Jolla Community Plan (LJCP) area in the City of San Diego (City).

The proposed Project would replace the existing Exchange Place Reservoir and La Jolla View Reservoir with a new 3.1-million-gallon reservoir within the La Jolla Natural Park.

Project construction would involve demolition of the existing reservoirs, mass grading, pipeline construction and installation, reservoir construction, paving, and site improvements. Project construction noise would result in noise levels above City Noise Ordinance construction noise thresholds to off-site single-family residences located along Country Club Drive, Soledad Avenue, Pepita Way, La Jolla Knoll, Remley Place, and Brodiaea Way. Construction Phases 1, 6, and 8 would exceed the City's 75 time-averaged A-weighted decibel (dBA L_{EQ}; 12 hour) daytime noise level limit. A 16-foot tall noise barrier would reduce Phase 1 noise levels to below 75 dBA L_{EQ}, a 10-foot noise barrier would reduce Phase 6 noise levels to below 75 dBA L_{EQ}, and a 6-foot barrier would reduce Phase 8 noise levels to below 75 dBA L_{EQ}. Construction noise impacts from Phases 1, 6, and 8 would therefore be reduced to a less-than-significant level with mitigation incorporated.

Construction Phase 4 would occur during evening and nighttime hours and would therefore be subject to the City's 45 dBA L_{EQ} evening noise level limit and 40 dBA L_{EQ} nighttime noise level limit. Even with implementation of a 16-foot noise barrier, noise levels during this phase would still exceed the 45 dBA L_{EQ} evening noise level limit at residences within 1,350 feet of construction and the 40 dBA L_{EQ} nighttime noise level limit at residences within 760 feet of construction. Therefore, impacts would be significant and unavoidable.

With implementation of mitigation measures recommended in the Project's Transportation Impact Study, traffic generated during construction activities would increase noise levels by less than 3 dBA along Country Club Drive and Exchange Place and impacts from construction traffic would be less than significant.

Vibration impacts from construction would not exceed thresholds for sensitive receptors.

Operational noise from the Project's occasional vehicle trips for maintenance activities would not exceed City Noise Ordinance thresholds at off-site residences. Operation of the reservoir would include components that would generate negligible noise.

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1.0 INTRODUCTION

1.1 PROJECT LOCATION AND BACKGROUND

The Project is generally located within the 42-acre La Jolla Natural Park (a part of City Parks and Recreation Open Space), and is designated as "Parks, Open Space" under the La Jolla Community Plan. The site is bounded by Country Club Drive, across which is located a golf course, to the west; residences off Remley Place, Brodiaea Way, and Encelia Drive to the south; additional open space to the east; and residences off Valdes Drive to the north (see Figure 1, *Regional Location,* and Figure 2, *Aerial Vicinity*). The existing La Jolla View Reservoir is located in the La Jolla Natural Park, approximately 500 feet east of Country Club Drive and 150 feet north of the Remley Place residences. The Exchange Place Reservoir is located east of the intersection of Country Club Drive and Pepita Way, outside of the park limits. Improvements also would occur along Country Club Drive between Soledad Avenue and Romero Drive.

The existing La Jolla View Reservoir is a 0.72-million gallon (MG) potable water storage facility that was constructed in 1949. The existing 0.99-MG Exchange Place Reservoir was originally constructed in 1909 and was decommissioned in 2002. Use of the existing La Jolla View Reservoir is very limited due to higher-pressure zone and other water system changes. Water quality in the reservoir is also poor and requires supplemental chlorine treatment when in operation. In addition, the existing 16-inch diameter cast iron Muirlands Pipeline that supplies water to the existing La Jolla View Reservoir is beyond its useful life and is undersized for current water conveyance requirements.

1.2 PROJECT DESCRIPTION

The proposed Project would replace the existing Exchange Place Reservoir and La Jolla View Reservoir with a new 3.1-million-gallon reservoir within the La Jolla Natural Park (see Figure 3, *Site Plan*). The existing La Jolla View Reservoir and the Exchange Place Pump Station would be demolished. The Exchange Place Reservoir would be partially demolished by removing the roof and upper three feet of concrete lining, and then backfilling the reservoir with soil. The proposed new reservoir would be almost entirely buried, except for reservoir access hatches and supervisory control and data acquisition equipment. The new reservoir would include an approximately 200-foot-long, 18-inch overflow pipe with an at-grade outlet and energy dissipation structure. The outlet would be situated near the head of the north-central on-site drainage. In addition, 480 linear feet (LF) of an 8-inch utility water connection to the new reservoir would be provided from the existing water main in Brodiaea Way.

The Project also includes construction of approximately 2,790 linear feet of 30-inch pipeline. The pipeline would run from the new La Jolla View Reservoir in a general east-to-west direction through the La Jolla Natural Park to connect with the existing 16-inch Muirlands pipeline in County Club Drive. Approximately 1,050 linear feet of the 2,790 linear feet total would be replacing the 16-inch pipeline up to the existing Muirlands Pump Station. In addition, approximately 780 feet of an 8-inch pipeline will parallel the 30-inch pipeline along Country Club Drive to serve existing customers. An altitude valve vault will be located along the pipeline adjacent to Country Club Drive. The existing pipeline segment through the La Jolla Natural Park would be abandoned in place.

An existing paved access road from Encelia Drive would be reconstructed to allow access to the new reservoir site for maintenance vehicles. This road would terminate at the reservoir access hatches where two parking spaces and paved turnaround area will be provided. The remaining portion of the existing

access road to the existing La Jolla View Reservoir would be demolished, and the area would be revegetated.

Excavation to install the new reservoir would result in approximately 78,000 cubic yards (cy) of cut. Of this volume, approximately 22,000 cy would be permanently disposed of off-site, requiring approximately 4,500 truck trips. Based on mitigation required in the Project's Traffic Impact Analysis, truck trips would be limited to no more than 50 per day and approximately 7 per hour. The remainder (56,000 cy) would be temporarily stockpiled on site, including use of a proposed temporary access road that would run from the new reservoir site to the stockpile area within La Jolla Natural Park near Country Club Drive. During stockpiling, 5,000 cy would be used to backfill the Exchange Place Reservoir. Once the reservoir is installed, the remaining stockpiled soil would be backfilled into the new reservoir location and to cover the temporary access road. The backfilled areas would be revegetated.

Extended construction hours (up to approximately 18 hours per day) would be required for pouring the reservoir roof and floor/footing. In addition, concrete pouring of the walls may involve extended hours, up to 18 hours per day. It is conservatively estimated there would be 20 days of construction with extended hours.

2.0 ENVIRONMENTAL SETTING

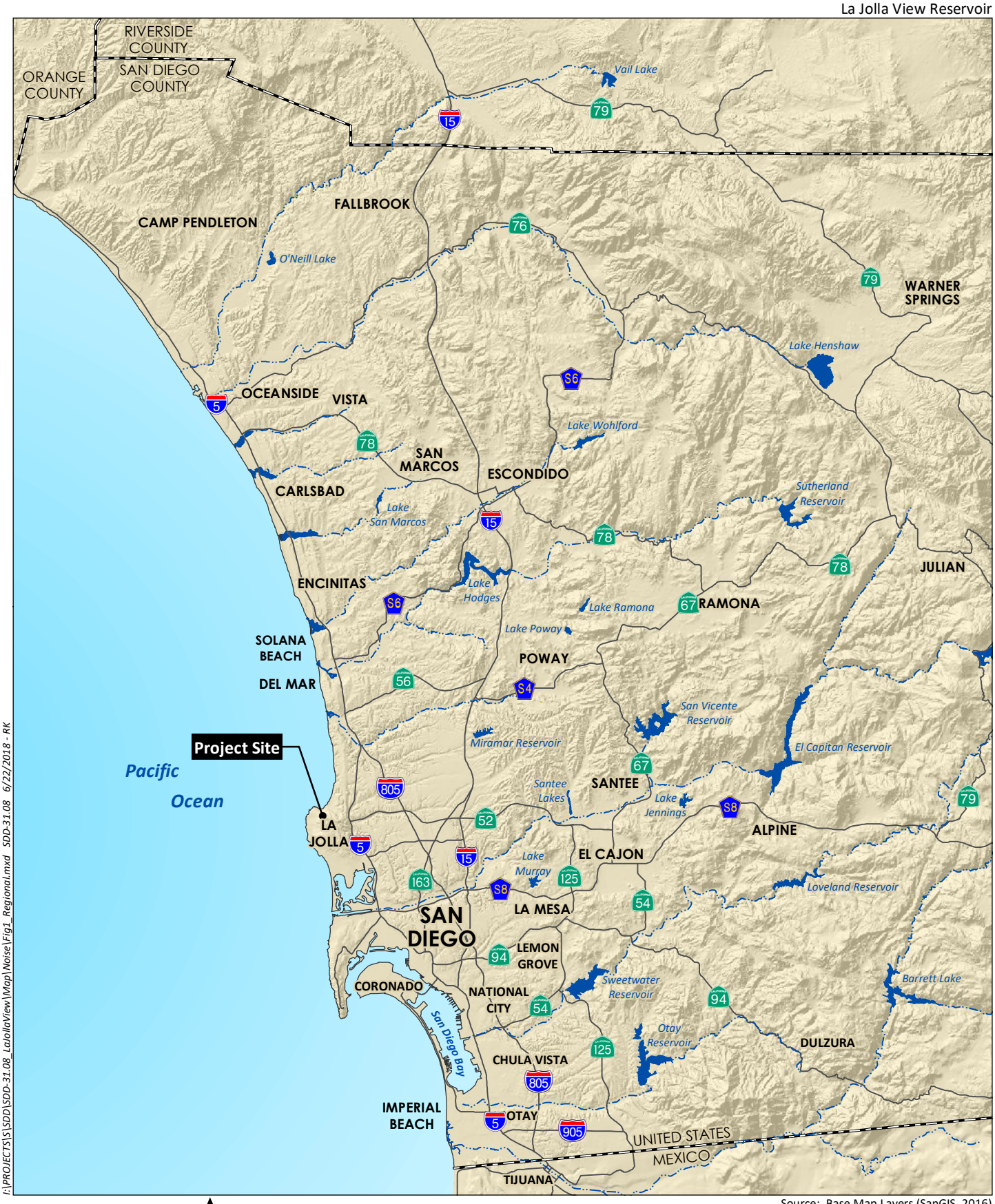
2.1 NOISE AND SOUND LEVEL DESCRIPTORS AND TERMINOLOGY

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A-weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dBA weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dBA weighting. This is similar to the Day Night sound level (L_{DN}), which is a 24-hour average with an added 10 dBA weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL are always based on dBA. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.



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Source: Base Map Layers (SanGIS, 2016)

Regional Location

Figure 1

Source: Aerial (SanGIS 2014)

Aerial Vicinity

Figure 2

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Source: IEC 2017

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Site Plan

Figure 3

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 micro Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.

2.2 NOISE AND VIBRATION SENSITIVE LAND USES

Noise-sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, schools, transient lodging (hotels), hospitals, educational facilities, and libraries. Industrial and commercial land uses are generally not considered sensitive to noise. NSLUs in the Project area include single-family residences (see Figure 2).

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (California Department of Transportation [Caltrans] 2013) are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. In addition, excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses or schools. Land uses in the Project area that are subject to annoyance from vibration include the single-family residences.

2.3 REGULATORY FRAMEWORK

Applicable noise standards for the proposed Project are codified in the following City regulations:

2.3.1 City of San Diego Municipal Code, Chapter 5, Article 9.5, Division 4, §59.5.0404 Construction Noise

(a) It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; whether proposed night work is in the general public interest; and he shall prescribe such

conditions, working times, types of construction equipment to be used, and permissible noise levels as he deems to be required in the public interest.

(b) Except as provided in subsection (c) hereof, it shall be unlawful for any person, including the City of San Diego, 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 dBA during the 12-hour period from 7:00 a.m. to 7:00 p.m.

(c) The provisions of subsection (b) of this section shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.

2.3.2 City of San Diego Municipal Code, Chapter 5, Article 9.5, Division 4, §59.5.0401, Sound Level Limits

(a) It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the following table (Table 1, *Applicable Noise Limits*), at any location in the City on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.

Table 1
APPLICABLE NOISE LIMITS

Land Use Zone	Time of Day	One-hour Average Sound Level (dBA)
Single Family Residential	7:00 a.m. to 7:00 p.m.	50
	7:00 p.m. to 10:00 p.m.	45
	10:00 p.m. to 7:00 a.m.	40
Multi-Family Residential (up to a maximum density of 1/2000)	7:00 a.m. to 7:00 p.m.	55
	7:00 p.m. to 10:00 p.m.	50
	10:00 p.m. to 7:00 a.m.	45
All other Residential	7:00 a.m. to 7:00 p.m.	60
	7:00 p.m. to 10:00 p.m.	55
	10:00 p.m. to 7:00 a.m.	50
Commercial	7:00 a.m. to 7:00 p.m.	65
	7:00 p.m. to 10:00 p.m.	60
	10:00 p.m. to 7:00 a.m.	60
Industrial or Agricultural	Anytime	75

Source: City of San Diego Municipal Code, Chapter 5, Article 9.5, Division 4, §59.5.0401, Sound Level Limits

(b) The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Permissible construction noise level limits shall be governed by Section 59.5.0404 of this article.

2.3.3 Federally Listed Biological Species

Some studies, such as that completed by the Bioacoustics Research Team (1997), have concluded that 60 dBA is a criterion to use as a starting point for passerine impacts until more specific research is done. Associated guidelines produced by the U.S. Fish and Wildlife Service (USFWS) require that project noise be limited to a level not to exceed 60 dBA L_{EQ} or, if the existing ambient noise level is above 60 dBA L_{EQ}, increase the ambient noise level by 3 dBA at the edge of occupied habitat during the avian species breeding season.

2.4 EXISTING CONDITIONS

2.4.1 Surrounding Land Uses

Surrounding uses include single-family residential neighborhoods to the south, east, north and west; open space (La Jolla Natural Park) to the north; and park/recreation space (La Jolla County Club) to the southwest (see Figure 2).

2.4.2 Existing Noise Conditions

2.4.2.1 General Site Survey

Five short-term measurements, two of which were 15 minutes in length and three of which were 10 minutes in length, were conducted during a site visit on January 25, 2018 (see Figure 4, *Measurement Locations*). The short-term measurements focused on the ambient noise levels of the Project vicinity. Measurements were conducted adjacent to the existing La Jolla View Reservoir and Exchange Place Reservoir, along the stretch of Country Club Drive adjacent to the La Jolla Country Club golf course, at the intersection of Romero Court and Remley Place, and within La Jolla Natural Park. The measured noise levels and related weather conditions for the short-term measurements are shown in Table 2, *Short-term Noise Measurement Results*. See Appendix A, *On-site Noise Measurement Sheets*, for survey notes from the short-term measurements.

Table 2
Short-Term Noise Measurement Results

Measurement	Location	Conditions	Time	dBA L_{EQ}	Notes
1	Northeast side of Country Club Drive and Pepita Way Intersection (approximately 12 feet from roadway centerline); adjacent to existing Exchange Place Reservoir	58°F, 32mph wind, 61 percent humidity, sunny	11:06 - 11:21 a.m.	62.0	Occasional car and maintenance truck traffic along Country Club Drive; distant weed-whacker and lawn mower
2	Adjacent to golf course along southern side of Country Club Drive, approximately 175 feet west of intersection with Fairway Road (approximately 22 feet from roadway centerline)	61°F, 5 mph wind, 66 percent humidity, sunny	11:37 - 11:47 a.m.	61.5	Infrequent car passing; distant golf course lawn mower; birds chirping; distant saw work
3	Southwestern corner of Romero Court and Remley Place intersection	61°F, 11 mph wind, 71 percent humidity, partly cloudy	1:05 - 1:16 p.m.	45.0	Birds chirping; leaves rustling in wind; distant talking; occasional slow car on Romero Court; airplane overhead
4	North of the curve in the access road within Lo Jolla Natural Park	61°F, 6 mph wind, 67 percent humidity, mostly sunny	12:06 - 12:16 p.m.	48.3	Distant traffic, siren, and wave noise from urban area and ocean below; multiple airplanes overhead
5	Adjacent to western side of existing La Jolla View Reservoir	61°F, 9 mph wind, 69 percent humidity, mostly sunny	12:28 - 12:43 p.m.	52.1	Distant helicopter; birds chirping and leaves rustling; intermittent distant landscape equipment use

3.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

3.1 METHODOLOGY AND EQUIPMENT

The following equipment was used to measure existing noise levels at the Project site:

- Larson Davis System LxT Integrating Sound Level Meters
- Larson Davis Model CAL150 Calibrator
- Windscreen and tripod for the sound level meter
- iPhone camera

Source: Aerial (SanGIS 2014)

Measurement Locations

Figure 4

The sound level meter for the five short-term measurements was field-calibrated immediately prior to the noise measurements to ensure accuracy. All measurements were made with a meter that conforms to the American National Standards Institute (ANSI) specifications for sound level meters (ANSI SI.4 1983 R2001). All instruments were maintained with National Bureau of Standards traceable calibration per the manufacturers' standards.

Modeling of the exterior noise environment for this report was accomplished using three computer noise models: Computer Aided Noise Abatement (CadnaA) Version 2018, Traffic Noise Model (TNM) version 2.5, and the Roadway Construction Noise Model (RCNM). CadnaA is a model-based computer program developed by DataKustik for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project-related information, such as noise source data, barriers, structures, and topography to create a detailed CadnaA model, and uses the most up-to-date calculation standards to predict outdoor noise impacts.

Traffic noise was predicted using TNM. TNM was released in February 2004 by the U.S. Department of Transportation (USDOT) and calculates the daytime average hourly L_{EQ} from three-dimensional model inputs and traffic data (California Department of Transportation [Caltrans] 2004). Input variables included existing and projected traffic volumes, estimated haul truck composition percentages, and vehicle speeds.

RCNM (U.S. Department of Transportation [USDOT] 2008) is a model developed by the USDOT which utilizes estimates of sound levels from standard construction equipment at varying distances.

RCNM was initially used to determine noise levels generated by the use of project construction equipment at varying distances to residential properties. RCNM, however, only allows for a rudimentary analysis of the effect of noise barriers on noise levels, and therefore CadnaA, which allows for the more precise input of barriers, was used for mitigation analysis. The piece(s) of construction equipment analyzed in RCNM was input into CadnaA and analyzed with and without a noise barrier. The difference in noise level from implementation of the barrier was then applied to the original value determined in RCNM to assess the effect of the barrier on noise levels.

3.2 ASSUMPTIONS

3.2.1 Construction

The Project is anticipated to be constructed over nine major phases from March 2021 to May 2023 (see Table 3, *Anticipated Construction Schedule for Major Construction Activitie*s). The beginning and ending construction activities include mobilization and setup, lead and asbestos abatement, and demobilization, which do not use heavy construction equipment that generates substantial noise; therefore, they are not included within the major phases and not analyzed further for noise impacts. Use of heavy construction equipment begins with the demolition phases in March 2021. Construction activities would occur within La Jolla Natural Park, along Country Club Drive, and near the intersection of Country Club Drive and Pepita Way at the site of the existing Exchange Place Reservoir. Construction equipment for each phase is shown in Table 4, *Major Construction Phases and Equipment*.

Table 3
ANTICIPATED CONSTRUCTION SCHEDULE FOR MAJOR CONSTRUCTION ACTIVITIES

Phase	Construction Activity	Construction Period		
		Start	End	Number of Working Days
1	Demolition of La Jolla View Reservoir Demolition of Exchange Place Reservoir Pipeline Construction (30-inch only) STA 17+67 to STA 21+50 (west portion of park)	3/1/21	4/2/21	25
2	Mass Grading; Backfill of Exchange Place Reservoir	3/12/21	8/20/21	116
3	Pipeline Construction - Inlet/Outlet in Park STA 16+94 to STA 17+67 & STA 21+50 to reservoir (across Country Club Drive and east portion of Park); Pipeline Construction - Reservoir Drain/Overflow and Discharge Structures (in park)	8/23/21	9/17/21	20
4	Reservoir Construction (including yard piping)	9/20/21	5/27/22	180
5	Reservoir Backfill	5/30/22	9/2/22	70
6	Pipeline Construction – 8-inch Supply Line & Electrical Service	9/5/22	9/23/22	15
7	Reservoir Final Grading and Site Improvements	9/26/22	12/16/22	60
8	Pipeline Construction - 8" Distribution - Country Club Drive; Relocate Security Pole / Test Electrical Systems; Install Temporary Irrigation & Vegetation inside Park; Pipeline Construction – 30-inch Distribution - Country Club Drive STA 1+00 to STA 16+94	12/19/22	4/20/23	89
9	Curb Ramp Improvements & Paving/Temp Irrigation/Planting at Exchange Place Reservoir; Demobilization	4/21/23	5/11/23	15

Source: City of San Diego Public Works Department and Infrastructure Engineering Corporation 2018

3.2.1.1 Phase 1

Demolition of La Jolla View Reservoir

The existing steel tank, with a footprint of 3,850 square feet (SF) and associated concrete wall would be completely demolished. A cutting torch would be used to break up the steel plating of the tank and a concrete saw would be used to break up the concrete slab. A backhoe would further break up the slab and load the materials into a dump truck, which would transport the materials off site.

Demolition of Exchange Place Reservoir

The upper three feet of the existing concrete reservoir, which has a footprint of 11,700 SF, would be demolished, along with the associated metal and wood roof, concrete pump house, stairs, and valve vault. A concrete saw or breaker would be used to break up the concrete and a backhoe would break up the metal and wood and load the materials into a dump truck, which would transport the materials off site.

Pipeline Construction

Approximately 380 LF of 30-inch pipeline would be installed in the western portion of La Jolla Natural Park. A backhoe would be used to dig a trench 4.5 feet wide and 8 feet deep for installation of the pipeline. In addition, the backhoe would replace and recompact the soil once the pipeline is installed below ground. Approximately 40 feet of pipeline would be installed per day.

3.2.1.2 Phase 2

The mass grading phase would involve excavation at the site of the proposed below-ground reservoir, the construction of a temporary access road for hauling activities, and backfill at the existing Exchange Place Reservoir site. An excavator would be used to excavate the site of the proposed reservoir. The excavator would work simultaneously with a loader and a dump truck to load the cut material and haul it either off site or to the temporary stockpile area.

Construction of the temporary access road would involve a dozer moving earth to clear the path for the road. The dozer would work simultaneously with a loader and dump truck to create the path, load the material, and haul it either off site or to the temporary stockpile area. Once the path for the road has been made, a dozer, grader, scraper, and roller would create a flat and usable road surface.

To backfill the Exchange Place Reservoir site, a dump truck would haul the material in, a loader would distribute the material across the site, and a dozer and grader would level out the site.

The mass grading phase would result in approximately 78,000 cy of cut. Of this volume, approximately 22,000 cy would be permanently disposed off site, and the remainder would be temporarily stockpiled on site using the temporary access road.

3.2.1.3 Phase 3

Phase 3 would involve the installation of 810 LF of 30-inch pipeline across Country Club Drive and in the eastern portion of La Jolla Natural Park from the new reservoir site to the location of the 30-inch pipeline that would be installed in Phase 1. A concrete saw would be used to break up the pavement within Country Club Drive. A backhoe would dig a 4.5-foot wide trench in Country Club Drive and in the eastern portion of La Jolla Natural Park. Following installation of the below-ground pipelines, a dozer would backfill the soil and a roller would re-flatten areas within the park and in Country Club Drive.

3.2.1.4 Phase 4

The proposed reservoir, with a footprint of 12,470 SF, would be constructed in the eastern portion of La Jolla Natural Park. The reservoir floors, walls, and columns would be constructed during regular daytime hours. Construction work would occur for up to approximately 18 hours per day for concrete

pouring of the concrete slab roof and floor/footing, and would therefore require evening and nighttime work. In addition, concrete pouring of the walls may involve extended hours, up to approximately 18 hours per day. It is conservatively estimated there would be 20 days with extended hours. Construction equipment used for concrete pouring would include a concrete truck, concrete pump, concrete vibrator, generator set, trowel, man-lift, forklift, and crane. Following the concrete work, a generator and wrapping machine would be used to reinforce the reservoir concrete during the daytime.

3.2.1.5 Phase 5

Upon completion of construction of the new reservoir, the site would be backfilled, and the reservoir buried. A dozer and backhoe would distribute the backfill material on site, and a grader, scraper, and roller would compact and flatten the soil.

3.2.1.6 Phase 6

Approximately 480 LF of 8-inch supply pipeline would be installed within the existing access road extending from Encelia Drive to the new reservoir. A backhoe would be used to dig the 2-foot wide and 4-foot deep trench and backfill the trench once the pipeline is installed.

3.2.1.7 Phase 7

Phase 7 would involve final grading and site improvement activities at the new reservoir site and surrounding areas. A backhoe, loader, and two dozers would distribute backfill material to and around the site and perform other required earth-moving activities. A roller and a paver would then compact and flatten the site.

3.2.1.8 Phase 8

Approximately 780 LF of 8-inch distribution pipeline and approximately 700 LF of 30-inch distribution pipeline would be installed within Country Club Drive at 80 and 25 feet per day, respectively. A concrete/industrial saw would be used to break up the pavement within the road. A backhoe would then create a 2-foot wide and 4-foot deep trench for the 8-inch pipeline and a 4.5-foot wide and 9-foot deep trench for the 30-inch pipeline. Once the pipeline is installed below ground, a backhoe would backfill the trench. Phase 8 would also involve relocating a security pole and testing electrical systems and installing temporary irrigation and vegetation in La Jolla Natural Park. These activities would not require the use of heavy equipment.

3.2.1.9 Phase 9

Following pipeline installation in Country Club Drive, curb ramp improvements and repaving would be required. This would involve the use of a rollers and paver. Temporary irrigation and planting proposed for the Exchange Place Reservoir would not require the use of heavy equipment.

Table 4
MAJOR CONSTRUCTION PHASES AND EQUIPMENT

Phase	Construction Activity	Equipment	Number
1	Demolition of La Jolla View Reservoir	Backhoe	1
		Concrete Saw	1
	Demolition of Exchange Place Reservoir	Backhoe	1
		Concrete Saw	1
		Breaker	1
	Pipeline Construction (30-inch only) STA 17+67 to STA 21+50 (west portion of park)	Backhoe	1
2	Mass Grading; Backfill of Exchange Place Reservoir	Loader	2
		Dozer	1
		Excavator	1
		Grader	1
		Scraper	1
		Roller	1
		Soil drill	1
3	Pipeline Construction - Inlet/Outlet in Park STA 16+94 to STA 17+67 & STA 21+50 to reservoir (across Country Club Drive and east portion of Park); Pipeline Construction - Reservoir Drain/Overflow and Discharge Structures (in park)	Backhoe	1
		Roller	1
		Dozer	1
		Concrete Saw	1
4	Reservoir Construction	Wrapping machine	1
		Generator Set	1
		Cement truck	1
		Cement pump	1
		Concrete vibrator	1
		Trowel	1
		Man-lift	1
		Forklift	1
		Crane	1
5	Reservoir Backfill	Dozer	1
		Backhoe	1
		Grader	1
		Scraper	1
		Roller	1
6	Pipeline Construction – 8-inch Supply Line & Electrical Service	Backhoe	1
7	Reservoir Final Grading and Site Improvements	Backhoe	1
		Loader	1
		Dozer	2
		Roller	1
		Paver	1
8	Pipeline Construction - 8" Distribution - Country Club Drive; Relocate Security Pole / Test Electrical Systems; Install Temporary Irrigation & Vegetation inside Park; Pipeline Construction – 30-inch Distribution - Country Club Drive STA 1+00 to STA 16+94	Backhoe	1
		Concrete saw	1

Table 4 (cont.)
CONSTRUCTION PHASES AND EQUIPMENT

Phase	Construction Activity	Equipment	Number
9	Curb Ramp Improvements & Paving/Temp Irrigation/Planting at Exchange Place Reservoir; Demobilization	Paver	1
		Roller	1

Source: City of San Diego Public Works Department and Infrastructure Engineering Corporation 2018

3.2.1.10 Equipment Noise Levels

Table 5, *Construction Equipment Noise Data*, presents the calculated Sound Power Levels (S_{WL}) for anticipated construction equipment for the project. This table includes data from the site measurements, the Federal Highway Administration (FHWA) table of construction equipment noise levels (FHWA 2007), and the United Kingdom's Department for Environment, Food and Rural Affairs (Defra) construction noise database (Defra 2005). S_{WL} measures the total acoustic power radiated from a given sound source; it does not incorporate a distance component.

Table 5
CONSTRUCTION EQUIPMENT NOISE DATA[1]

Source	One-octave Center Band Frequency (Hertz)									Overall A-weighted Value (dBA)
	31.5	63	125	250	500	1,000	2,000	4,000	8,000	
Excavator	121.0	126.0	119.0	118.0	118.0	114.0	112.0	109.0	104.0	120.0
Loader	124.7	121.7	117.7	111.7	112.7	109.7	106.7	106.7	95.7	115.4
Backhoe	104.0	106.7	97.7	101.7	101.7	97.7	96.7	90.7	84.7	103.6
Dozer	-	125.5	114.5	116.5	113.5	112.5	118.5	102.5	96.5	121.2
Grader	-	88.0	87.0	83.0	79.0	84.0	78.0	74.0	65.0	86.0
Scraper	105.1	115.4	125.6	117.1	120.7	116.1	107.4	107.3	103.4	121.1
Roller	-	80.0	75.0	77.0	72.0	67.0	62.0	54.0	46.0	73.0
Soil Drill	-	67.0	80.0	74.0	72.0	72.0	72.0	68.0	61.0	77.0
Paver	-	87.0	84.0	81.0	80.0	79.0	76.0	74.0	65.0	84.0
Generator Set[2]	-	80.0	74.0	57.0	54.0	53.0	48.0	45.0	37.0	61.0
Breaker	119.5	113.5	118.5	116.5	118.5	122.5	119.5	118.5	116.5	126.7
Dump Truck	31.0	116.0	118.0	108.0	106.0	107.0	104.0	100.0	93.0	111.5
Concrete Saw	-	106.7	123.7	115.7	114.7	114.7	116.7	120.7	119.7	125.3
Crane	-	114.7	113.7	107.7	108.7	107.7	107.7	98.7	89.7	112.9
Cement Truck	-	117.7	108.7	113.7	106.7	105.7	112.7	102.7	94.7	115.6
Cement Pump	-	113.0	113.0	103.0	102.0	100.0	99.0	93.0	85.0	105.9

Source: FHWA 2007, Defra 2005, and on-site measurements.

[1] All source data for equipment noise presented as Sound Power levels (S_{WL}).

[2] The wrapping machine, concrete vibrator, trowel, man-lift, and forklift used in Phase 4 utilize engines comparable to a generator; therefore, sound levels for a generator were used for these pieces of equipment.

3.2.2 Operation

The operational noise sources associated with the proposed Project include occasional vehicle trips for structure and equipment inspection, as well as for long-term (five years) revegetation maintenance and monitoring. The new reservoir would not include components that would emit noise, as water would enter and exit the reservoir at the inlet/outlet pipe located near the bottom of the tank. No water

splashing associated with filling the reservoir would occur. Vents would be located in the roof of the tank to allow for sufficient air flow within the tank and would not emit noise. An altitude valve vault would be constructed on the north side of Country Club Drive, where the 30-inch waterline crosses under the road. The valve vault would generate minor noise emissions, which would be negligible.

4.0 IMPACTS

4.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE AND CONDITIONS OF APPROVAL

The following thresholds are based on the City Significance Determination Thresholds (City 2016) and Noise Ordinance, as applicable to the Project.

A significant noise impact would occur if the Project would:

1. Result in temporary construction noise that exceeds 75 dBA L_{EQ} (12 hour) at the property line of a residentially-zoned property from 7:00 a.m. to 7:00 p.m. If construction work is to occur outside of the hours of 7:00 a.m. to 7:00 p.m., the City's property line noise limits (as identified in Table 1) would be the significance threshold. Therefore, for construction during the evening and nighttime hours, a significant noise impact would occur if the project's construction noise exceeds 45 dBA L_{EQ} (12 hour) from 7:00 p.m. to 10:00 p.m. or 40 dBA L_{EQ} (12 hour) from 10:00 p.m. to 7:00 a.m. at the property line of a single-family residential zone.

2. Subject vibration-sensitive land uses to construction-related ground-borne vibration from continuous/frequent intermittent construction sources (such as impact pile drivers, vibratory pile drivers, and vibratory compaction equipment) that exceeds the "severe" vibration annoyance potential criterion for human receptors of 0.4 inch per second peak particle velocity (PPV), or exceeds the potential criteria for damage to older residential structures of 0.5 inch per second PPV, as specified by Caltrans (2013).

3. Result in or create a significant permanent increase in the existing noise levels. For the purposes of this analysis, a significant increase would be greater than a perceptible change (3 dBA) over existing conditions or the generation of noise levels at a common property line that exceed the limits shown in Table 1.

4.2 ISSUE 1: TEMPORARY INCREASE IN AMBIENT NOISE LEVELS

4.2.1 Construction Noise Impacts to Residences

To analyze noise impacts from Project construction activities, the combination of construction equipment that would be working simultaneously and would produce the loudest noise levels was determined for each construction phase. Noise levels at the residences nearest each construction phase were determined by the construction equipment noise emissions and distance to each residence, and are described in detail below per phase. A summary of the noise levels per phase and if they exceed the City Noise Ordinance construction threshold is provided in Table 6, *Construction Noise Impacts to Residences*. Construction noise outputs are included in Appendix B, *Construction Noise Calculations.*

4.2.1.1 Phase 1

Demolition of La Jolla View Reservoir

The most substantial noise generation from demolishing the existing La Jolla View Reservoir would occur during the break-up of the concrete slab that borders the tank to the east. As stated in Section 3.2.1.1, a concrete saw and backhoe would be used to break up the concrete slab but would not operate simultaneously. The concrete saw would be loudest of the two pieces of equipment and would operate as close as 100 feet to the nearest single-family residence, located to the south along Remley Place.

For modeling, it was assumed that the concrete saw would be in operation for 20 percent of a typical construction hour. It was conservatively assumed that this piece of equipment would be in operation at a constant location nearest the residence. At a distance of 100 feet, a concrete saw would generate a noise level of 74.8 dBA L_{EQ} (12 hour). Therefore, use of a concrete saw during the demolition of the existing La Jolla View Reservoir would not exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour) at the nearest residence, and impacts would be less than significant.

Demolition of Exchange Place Reservoir

The most substantial noise generation from demolishing the existing Exchange Place Reservoir would occur during the break-up of the concrete walls of the reservoir and demolition of the concrete pump house, valve vault, and stairs. A concrete saw or breaker along with a backhoe would be used to break up the concrete, but would not operate simultaneously (e.g., the concrete saw or breaker would operate without the backhoe). The concrete saw or breaker would be the louder of the two pieces of equipment and would operate as close as 20 feet from the nearest single-family residence, located immediately to the east.

For modeling, it was assumed that the concrete saw would be in operation for 20 percent of a typical construction hour and a breaker in operation for 10 percent. It was conservatively assumed that the piece of equipment would be in operation at a constant location nearest the residence. At a distance of 20 feet, a concrete saw would generate a noise level of 88.8 dBA L_{EQ} (12 hour) and a breaker would generate a noise level of 86.2 dBA L_{EQ} (12 hour). Therefore, use of a concrete saw or breaker during the demolition of the existing Exchange Place Reservoir would exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour) at the nearest residence, and impacts would be potentially significant.

Pipeline Construction

The most substantial noise generation from installing the 30-inch pipeline in the western portion of La Jolla Natural Park would occur during trenching. As stated under Section 3.2.1.1, a backhoe would be used to create the trench. This process would occur as close as 200 feet to the nearest single-family residence, located to the south along Remley Place.

For modeling, it was assumed the backhoe would be in operation for 40 percent of a typical construction hour. It was conservatively assumed that this piece of equipment would be in operation at the same location nearest the residence for the entire work day. At a distance of 200 feet, this piece of equipment would generate a noise level of 59.8 dBA L_{EQ} (12 hour). Therefore, use of a backhoe for trenching during this phase would not exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be less than significant.

4.2.1.2 Phase 2

The most substantial noise generation from mass grading would occur during the simultaneous use of a dozer and scraper. This process would occur as close as 150 feet to the nearest single-family residence, located to the south at the intersection of Brodiaea Way and Encelia Drive.

For modeling, it was assumed that the dozer and scraper would be in operation for 40 percent of a typical construction hour. It was conservatively assumed that these pieces of equipment would be in operation simultaneously at the same location. At a distance of 150 feet, these pieces of equipment would generate a noise level of 71.4 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during the mass grading phase would not exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be less than significant.

4.2.1.3 Phase 3

The most substantial noise generation from installing the 30-inch pipeline across Country Club Drive and in the eastern portion of La Jolla Natural Park would occur during road cutting within Country Club Drive. As stated under Section 3.2.1.3, a concrete saw would be used to cut the asphalt road prior to trenching. This process would occur as close as 130 feet from the nearest single-family residence, located to the south on Fairway Road.

For modeling, it was assumed the concrete saw would be in operation for 20 percent of a typical construction hour. Although pipeline installation during this phase would progress at approximately 80 feet per day, it was conservatively assumed that the concrete saw would be in operation at constant location nearest the residence. At a distance of 130 feet, a concrete saw would generate a noise level of 72.5 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during Phase 3 would not exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be less than significant.

4.2.1.4 Phase 4

The most substantial noise generation from constructing the proposed reservoir would occur during the use of a cement truck, concrete pump, concrete vibrator, generator, trowel, man-lift, forklift, and crane in the concrete pouring process. The concrete vibrator, trowel, man-lift, and forklift utilize engines comparable to a generator. Following the concrete work, a wrapping machine and generator would be used to reinforce the reservoir concrete. A wrapping machine utilizes an engine comparable to a generator as well. Both the concrete pouring and wrapping processes would occur as close as 300 feet from the nearest single-family residence, located to the south at the intersection of Brodiaea Way and Encelia Drive.

For modeling of the concrete pouring process, it was assumed that the cement truck would be in operation for 40 percent of a typical construction hour, the concrete pump 100 percent, the crane 16 percent, and the generator (used for modeling the noise levels from the generator, concrete vibrator, trowel, man-lift, and forklift) 50 percent. These pieces of equipment would be in operation simultaneously at the same location. At a distance of 300 feet, these pieces of equipment would generate a noise level of 70.3 dBA L_{EQ} (12 hour). The concrete pouring of the roof slab would occur up to approximately 18 hours per day and would occur during daytime (7:00 a.m. to 7:00 p.m.), evening (7:00 p.m. to 10:00 p.m.), and nighttime (10:00 p.m. to approximately 11:00 p.m.) hours. Therefore, the

use of construction equipment during the roof slab concrete pouring process of construction of the proposed reservoir would not exceed the daytime City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour) but would exceed the evening threshold of 45 dBA L_{EQ} (12 hour) and nighttime threshold of 40 dBA L_{EQ} (12-hour), and impacts would be potentially significant.

For modeling of the wrapping process, it was assumed that two generators (used for modeling for the generator and wrapping machine) would be in operation for 50 percent of a typical construction hour. These two pieces of equipment would be in operation simultaneously at the same location. At a distance of 300 feet, these pieces of equipment would generate a noise level of 63.3 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during the wrapping process would not exceed the daytime City Noise Ordinance construction threshold of 75 dBA L_{EQ} 12-hour, and impacts would be less than significant.

4.2.1.5 Phase 5

The most substantial noise generation from backfilling at the newly constructed reservoir would occur during the operation of a dozer. This process would occur as close as 300 feet from the nearest single-family residence, located to the south at the intersection of Brodiaea Way and Encelia Drive.

For modeling, it was assumed that the dozer would be in operation for 40 percent of a typical construction hour. It was conservatively assumed that the dozer would be in operation at a constant location nearest the residence. At a distance of 300 feet, the dozer would generate a noise level of 60.4 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during backfill at the new reservoir would not exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be less than significant.

4.2.1.6 Phase 6

The most substantial noise generation from installing the 8-inch pipeline within the Encelia Drive access road would occur during trenching. As stated under Section 3.2.1.6, a backhoe would be used to create the trench. This process would occur as close as 10 feet from the nearest single-family residence, located to the southwest at the intersection of Brodiaea Way and Encelia Drive.

For modeling, it was assumed that the backhoe would be in operation for 40 percent of a typical construction hour. Although installation of the pipeline would progress at approximately 40 feet per day, it was conservatively assumed that the backhoe would be in operation at a constant location nearest the residence. At a distance of 10 feet, a backhoe would generate a noise level of 85.8 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during pipeline installation in this phase would exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be potentially significant.

4.2.1.7 Phase 7

The most substantial noise generation from final grading and site improvements at the site of the new reservoir would occur during operation of two dozers. This process would occur as close as 100 feet from the nearest single-family residence, located to the south/southwest at the intersection of Brodiaea Way and Encelia Drive.

For modeling, it was assumed that two dozers would be in operation for 40 percent of a typical construction hour. It was conservatively assumed that these pieces of equipment would be in operation simultaneously at a constant location nearest the residence. At a distance of 100 feet, two dozers would generate a noise level of 72.9 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during the final grading and site improvement phase would not exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be less than significant.

4.2.1.8 Phase 8

The most substantial noise generation from installing pipeline within Country Club Drive would occur during the operation of a concrete saw to cut the asphalt prior to trenching. As stated under Section 3.2.1.8, a concrete saw would be used to break up the asphalt. This process would occur as close as 10 feet from the nearest single-family residence, located to the north along Country Club Drive.

For modeling, it was assumed that a concrete saw would be in operation for 20 percent of a typical construction hour. The concrete saw would have a cutting rate of approximately 4 feet per minute (Concrete Association 2018); therefore, the concrete saw was modeled to be adjacent to a single residence for 30 minutes. At a distance of 15 feet, a concrete saw would generate a noise level of 79.3 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during pipeline installation in this phase would exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be potentially significant.

4.2.1.9 Phase 9

The most substantial noise generation from curb ramp improvements and paving within Country Club Drive would occur during the operation of a vibratory compactor/roller. This process would occur as close as 10 feet from the nearest single-family residence, located to the north along Country Club Drive.

For modeling, it was assumed that the vibratory compactor/roller would be in operation for 20 percent of a typical construction hour. A compactor/roller would progress at four to five miles per hour during operation; therefore, it was conservatively assumed that a paver would be adjacent to a given residence for approximately 15 minutes in a day. At a distance of 15 feet, a compactor/roller would generate a noise level of 69.9 dBA L_{EQ} (12 hour). Therefore, use of construction equipment during the curb improvements and paving phase would not exceed the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour), and impacts would be less than significant.

Table 6
CONSTRUCTION NOISE IMPACTS TO RESIDENCES

Phase	Construction Activity	Distance to 75 dBA L_{EQ} (feet)	Distance to Nearest Residence (feet)	Noise Level at Residence (dBA L_{EQ})	Exceed 75 dBA L_{EQ}?
1	Demolition of La Jolla View Reservoir	98	100	74.8	No
	Demolition of Exchange Place Reservoir	98, 73[1]	20	88.8, 86.2[1]	**Yes**
	Pipeline Construction (30-inch only) STA 17+67 to STA 21+50 (west portion of park)	35	200	59.8	No
2	Mass Grading; Backfill of Exchange Place Reservoir	99	150	71.4	No
3	Pipeline Construction - Inlet/Outlet in Park STA 16+94 to STA 17+67 & STA 21+50 to reservoir (across Country Club Drive and east portion of Park); Pipeline Construction - Reservoir Drain/Overflow and Discharge Structures (in park)	98	130	72.5	No
4	Reservoir Construction	161[2]	300	70.3	No[3]
5	Reservoir Backfill	56	300	60.4	No
6	Pipeline Construction – 8-inch Supply Line & Electrical Service	35	10	85.8	**Yes**
7	Reservoir Final Grading and Site Improvements	79	100	72.9	No
8	Pipeline Construction - 8" Distribution - Country Club Drive; Relocate Security Pole / Test Electrical Systems; Install Temporary Irrigation & Vegetation inside Park; Pipeline Construction – 30-inch Distribution - Country Club Drive STA 1+00 to STA 16+94	25	15	79.3	**Yes**
9	Curb Ramp Improvements & Paving/Temp Irrigation/Planting at Exchange Place Reservoir; Demobilization	8	15	69.9	No

Source: RCNM

[1] Of the two numbers listed, the first corresponds to the use of a concrete saw and the second corresponds to the use of a breaker.

[2] Distance to 45 dBA L_{EQ}: 5,095 feet; distance to 40 dBA L_{EQ}: 9,062 feet.

[3] Construction of the proposed reservoir would not exceed the 75 dBA L_{EQ} daytime threshold but would exceed the 45 dBA L_{EQ} evening threshold when construction activities occur between 7:00 p.m. and 10:00 p.m. and the 40 dBA L_{EQ} nighttime threshold when construction activities occur between 10:00 p.m. and 7:00 a.m.

4.2.2 Construction Noise Impacts to Sensitive Biological Habitat

As discussed in Section 2.3.4, associated guidelines produced by the USFWS require that project noise be limited to a level not to exceed 60 dBA L_{EQ} or, if the existing ambient noise level is above 60 dBA L_{EQ}, increase the ambient noise level by 3 dBA at the edge of occupied habitat during the avian species breeding season. Table 7, *Construction Noise Impacts to Sensitive Biological Habitat,* indicates the distance to the 60 dBA L_{EQ} noise level during each Project construction phase. For an analysis of impacts and required mitigation associated with biological resources, see the Biological Technical Report prepared for the Project (Rocks Biological Consulting 2016).

Table 7
CONSTRUCTION NOISE IMPACTS TO SENSITIVE BIOLOGICAL HABITAT

Phase	Construction Activity	Distance to 60 dBA L_{EQ} (feet)
1	Demolition of La Jolla View Reservoir	551
	Demolition of Exchange Place Reservoir	551, 408[1]
	Pipeline Construction (30-inch only) STA 17+67 to STA 21+50 (west portion of park)	196
2	Mass Grading; Backfill of Exchange Place Reservoir	556
3	Pipeline Construction - Inlet/Outlet in Park STA 16+94 to STA 17+67 & STA 21+50 to reservoir (across Country Club Drive and east portion of Park); Pipeline Construction - Reservoir Drain/Overflow and Discharge Structures (in park)	551
4	Reservoir Construction	906
5	Reservoir Backfill	314
6	Pipeline Construction – 8-inch Supply Line & Electrical Service	196
7	Reservoir Final Grading and Site Improvements	444
8	Pipeline Construction - 8" Distribution - Country Club Drive; Relocate Security Pole / Test Electrical Systems; Install Temporary Irrigation & Vegetation inside Park; Pipeline Construction – 30-inch Distribution - Country Club Drive STA 1+00 to STA 16+94	138

Table 7 (cont.)
CONSTRUCTION NOISE IMPACTS TO SENSITIVE BIOLOGICAL HABITAT

Phase	Construction Activity	Distance to 60 dBA L_{EQ} (feet)
9	Curb Ramp Improvements & Paving/Temp Irrigation/Planting at Exchange Place Reservoir; Demobilization	47

Source: RCNM

[1] Of the two numbers listed, the first corresponds to the use of a concrete saw and the second corresponds to the use of a breaker.

4.2.3 Construction Traffic

Project construction traffic would likely be highest during the mass grading phase due to the high level of haul truck trips used to dispose of the excess cut material. The total number of vehicle trips, including haul trucks, worker vehicles, water trucks, and equipment, associated with this phase would be approximately 354 average daily trips (ADT; Chen Ryan 2018). These trips would be comprised of 320 ADT for haul trucks, 10 ADT for construction equipment, and 24 ADT for worker vehicles. Implementation of mitigation measures recommended in the Project's Transportation Impact Study (Chen Ryan 2018), however, would limit the number of haul truck trips to a maximum of 50 per day and approximately 5 per hour (over a 10-hour period).

The vehicles would use Country Club Drive, Exchange Place, Torrey Pines Road, and La Jolla Parkway and would be as close 10 feet from residences. Table 8, *Construction Traffic Trips Per Hour,* indicates the hourly number of trips for autos, medium trucks, and heavy trucks for existing conditions and existing plus project conditions for Country Club Drive and Exchange Place. Country Club Drive and Exchange Place were analyzed because they have the lowest existing ADT and therefore provide a conservative analysis for construction traffic noise increases. Other roadways analyzed in the traffic analysis, such as Torrey Pines Road and La Jolla Parkway, have very high existing ADT values of at least 39,000 ADT, and project-added traffic would add minor noise to these roadways.

Table 8
CONSTRUCTION TRAFFIC TRIPS PER HOUR

Roadway	Autos	Medium Trucks	Heavy Trucks
Country Club Drive (Exchange Place to Fairway Drive)			
Existing	211	4	2
With Construction Traffic	214	4	7
Exchange Place (Torrey Pines Road to Country Club Drive)			
Existing	384	8	4
With Construction Traffic	387	8	9

Source: Existing traffic volumes from Chen Ryan 2018

Note: With construction traffic volumes assume three construction worker trips per hour and five haul truck trips (heavy trucks) per hour.

A general rule of thumb is that a doubling in noise, a 3 dBA increase, would be considered a significant increase. The existing and the increased mitigated traffic volumes from construction were input into TNM for the two roadway segments. As shown in Table 9, *Construction Traffic Noise Levels,* construction traffic noise levels would increase by less than 3 dBA. Therefore, impacts from construction traffic noise would be less than significant.

Table 9
CONSTRUCTION TRAFFIC NOISE LEVELS[1]

	Existing	Existing Plus Mitigated Project Construction	Increase	Significant Impact?[2]
Country Club Drive	61.0	62.8	1.8	No
Exchange Place	63.7	64.8	1.1	No

[1] Noise levels measured at 10 feet.

[2] A 3 dBA or greater increase would be considered a significant impact.

See Appendix C, *Construction Traffic Noise Analysis,* for calculation details.

4.2.4 Mitigation Measures

The following mitigation measures would be required to reduce construction noise impacts to below a level of significance:

Noi-1 **Noise Barrier for Construction Phase 1 - Demolition of Exchange Place Reservoir.** Prior to issuance of demolition, grading, or building permits, the City's Environmental Designee and Mitigation Monitoring Coordinator (MMC) shall ensure the following notes are included on the project plans. For demolition of the existing Exchange Place Reservoir, if a breaker is used within 73 feet or if a concrete saw is used within 98 feet of a residence, a temporary 16-foot-high noise control barrier shall be erected between the breaker or concrete saw and the residence to reduce noise levels below the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour). The barrier shall be a minimum of five feet above the first floor foundation of the adjacent residential structure. If applicable, a construction safety barrier may be enhanced to act as a noise control barrier by meeting the specifications listed below.

The temporary noise control barrier shall be tall enough to break the line of sight between the breaker and concrete saw and the sensitive receptor. The sound attenuation barrier must be solid. It can be constructed of wood, plywood, or flexible vinyl curtains that meet a rating of Sound Transmission Class (STC) 19, as long as there are no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood or plywood is used, it can be tongue and groove and must be at least 5/8-inch total thickness or have a density of at least 3.5 pounds per square foot.

Alternative methods (including, but not limited to the use of alternative sound barriers, noise attenuation devices/modifications to construction equipment, limiting hours of operation, or a combination of these measures) may be employed to reduce noise levels below the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour); however, if alternate measures are employed, they shall be evaluated by a qualified acoustician prior to the initiation of construction activities to ensure that they will reduce noise levels to within City standards.

Noi-2 **Noise Barrier for Construction Phase 4.** Prior to issuance of demolition, grading, or building permits, the City's Environmental Designee and MMC shall ensure the following notes are included on the project plans. For construction of the proposed reservoir, if concrete pouring occurs during evening and nighttime hours, a temporary 16-foot-high noise control barrier shall be erected and shall surround the construction site and operating equipment to reduce noise levels.

The sound attenuation barrier must be solid. It can be constructed of wood, plywood, or flexible vinyl curtains that meet a rating of STC 19, as long as there are no cracks or gaps, through or below the wall. Any seams or cracks must be filled or caulked. If wood or plywood is used, it can be tongue and groove and must be at least 5/8-inch total thickness or have a density of at least 3.5 pounds per square foot.

Noi-3 Noise Barrier for Construction Phase 6. Prior to issuance of demolition, grading, or building permits, the City's Environmental Designee and MMC shall ensure the following notes are included on the project plans. For trenching within the Encelia Drive access road, if a backhoe is used within 35 feet of a residence, a temporary 10-foot-high noise control barrier shall be erected between the backhoe and residence to reduce noise levels below the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour).

The temporary noise control barrier shall be tall enough to break the line of sight between the pieces of equipment and the residence. The sound barrier specifications and alternative compliance procedures shall be the same as those described in Mitigation Measure Noi-1.

Noi-4 Noise Barrier for Construction Phase 8. Prior to issuance of demolition, grading, or building permits, the City's Environmental Designee and MMC shall ensure the following notes are included on the project plans. For trenching within Country Club Drive, if a concrete saw is used within 25 feet of a residence, a temporary 6-foot-high noise control barrier shall be erected between the concrete saw and the residence to reduce noise levels below the City Noise Ordinance construction threshold of 75 dBA L_{EQ} (12 hour).

The temporary noise control barrier shall be tall enough to break the line of sight between the pieces of equipment and the residence. The sound barrier specifications and alternative compliance procedures shall be the same as those described in Mitigation Measure Noi-1.

4.2.5 Significance of Impacts After Mitigation

Impacts from Phases 1, 6, 8 would be reduced to a less-than-significant level following the implementation of mitigation measures Noi-1, Noi-3, and Noi-4, as the barriers would reduce noise levels below the 75 dBA L_{EQ} threshold (see Table 10, *Construction Noise Impacts with Barriers*). For Phase 4, implementation of the 16-foot noise barrier proposed in mitigation measure Noi-2 would reduce the noise level from 70.3 dBA L_{EQ} to 53.8 dBA L_{EQ}, which would still be above the 45 dBA L_{EQ} evening noise level threshold and the 40 dBA L_{EQ} nighttime noise level threshold. With the barrier, the 45 dBA L_{EQ} noise contour would extend approximately 1,350 feet and the 40 dBA L_{EQ} noise contour would extend approximately 760 feet. Due to the construction requirements for the concrete pouring process, potential mitigation such as reducing the hours of construction worked or the number of equipment being used would not be feasible. Therefore, a noise barrier would be the only feasible mitigation measure in this scenario. The noise barrier cannot reduce noise levels below the specified thresholds due to the physical limits on noise reduction from a barrier. Although the noise barrier would provide substantial noise attenuation from breaking the line of sight between the equipment and the noise receptors, as shown in the approximately 16 dBA reduction modeled, some noise would still travel through the barrier or above the barrier and reach the receptor. Using a thicker or taller noise barrier would provide negligible to marginal improvement, as a feasible construction noise barrier has a maximum theoretical noise reduction capability of approximately 20 dBA. Therefore, although noise levels would be reduced with implementation of mitigation measure Noi-2, noise levels would still

exceed the City evening and nighttime noise level thresholds, and impacts would be significant and unavoidable.

Table 10
CONSTRUCTION NOISE IMPACTS WITH BARRIERS

Phase	Construction Activity	Distance to Nearest Residence (feet)	Barrier Height to Achieve 75 dBA L_{EQ} (feet)
1	Demolition of Exchange Place Reservoir	20	16
6	Pipeline Construction – 8-inch Supply Line & Electrical Service	10	10
8	Pipeline Construction - 8" Distribution - Country Club Drive; Relocate Security Pole / Test Electrical Systems; Install Temporary Irrigation & Vegetation inside Park; Pipeline Construction – 30-inch Distribution - Country Club Drive STA 1+00 to STA 16+94	15	6

Source: CadnaA

4.3 ISSUE 2: EXCESSIVE GROUND-BORNE VIBRATION

4.3.1 Impact Analysis

4.3.1.1 Construction Vibration

Construction activities known to generate excessive ground-borne vibration, such as pile driving, would not be conducted by the Project. A possible source of vibration during general Project construction activities would be a vibratory compactor/roller, which may be used within 15 feet of the nearest residence along Country Club Drive. A vibratory compactor/roller would create approximately 0.210 inch per second PPV at a distance of 25 feet (Caltrans 2013). A 0.210 inch per second PPV vibration level would equal 0.368 inch per second PPV at a distance of 15 feet.[1] This would be lower than what is considered the "severe" human annoyance threshold of 0.4 inch per second PPV, and the structural damage impact threshold to older residential structures of 0.5 inch per second PPV. Therefore, although a vibratory roller may be perceptible to nearby human receptors, temporary impacts associated with the roller (and other potential equipment) would be less than significant.

4.3.1.2 Operational Vibration

The proposed Project does not include operational components that would generate substantial vibration. Therefore, operational vibration impacts are less than significant.

4.3.2 Mitigation Measures

Because impacts would be less than significant, no mitigation is required.

[1] Equipment PPV = Reference PPV * $(25/D)^n$ (in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receiver in feet, and n = 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2013.

4.3.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

4.4 ISSUE 3: PERMANENT INCREASE IN AMBIENT NOISE LEVELS

4.4.1 Operational Noise

The operational noise sources associated with the proposed Project include occasional vehicle trips for structure and equipment inspection, as well as for long-term (five-year) revegetation maintenance and monitoring. It is anticipated that maintenance trips would include two vehicle trips per week, which would not result in a substantial increase in ambient noise levels.

The new reservoir would not include components that would emit noise, as water would enter and exit the reservoir at the inlet/outlet pipe located near the bottom of the tank. No water splashing associated with filling the reservoir would occur. Vents would be located in the roof of the tank to allow for sufficient air flow within the tank and would not emit noise. The altitude valve vault would be constructed on the north side of Country Club Drive, where the 30-inch waterline crosses under the road. The valve vault would generate minor noise emissions, which would be negligible and inaudible at the nearest residence, located over 150 feet to the southwest. Therefore, the Project would not result in a substantial increase in ambient noise levels, and impacts would be less than significant.

4.4.2 Mitigation Measures

Because impacts related to Issue 3 would be less than significant, no mitigation is required.

4.4.3 Significance of Impacts After Mitigation

Impacts would be less than significant without mitigation.

5.0 LIST OF PREPARERS

Hunter Stapp	Acoustic Analyst
Bill Vosti	Acoustic Analyst
Charles Terry	Senior Acoustic Specialist
Andrea Bitterling	Project Manager

6.0 REFERENCES

Bioacoustics Research Team. 1997. Environmental Effects of Transportation Noise, A Case Study: Noise Criteria for Protection of Endangered Passerine Birds. University of California, Davis, Transportation Noise Control Center Technical Report 97-001.

California Department of Transportation (Caltrans). 2013. Transportation and Construction Vibration Guidance Manual, Environmental Engineering, Hazardous Waste, Air, Noise, Paleontology Office. September.

Chen Ryan 2018. La Jolla View Reservoir Project Transportation Impact Study. May 25.

City of San Diego. 2016. California Environmental Quality Act Significance Determination Thresholds. July.

2008. Amended in 2015. City of San Diego General Plan Noise Element. March 10.

City of San Diego Public Works Department and Infrastructure Engineering Corporation. 2018. Personal communication between Anders Egense of Infrastructure Engineering Corporation, Ed Fordan of City of San Diego Public Works Department, and Andrea Bitterling of HELIX. January 12 and April 5.

Concrete Association. 2010. Construction. Available from: http://www.concreteconstruction.net/how-to/construction/hey-cut-that-out_o?o=1. October 4.

Defra. 2005. Update of Noise Database for Prediction of Noise on Construction and Open Sites.

Federal Highway Administration. 2007. Highway Construction Noise Handbook. August 24. Available at: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/

Rocks Biological Consulting. 2016. La Jolla View Reservoir Project Draft Restoration and Revegetation Plan. May 24. Revised December 16.

U.S. Department of Transportation (USDOT). 2008. Roadway Construction Noise Model.

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Appendix A

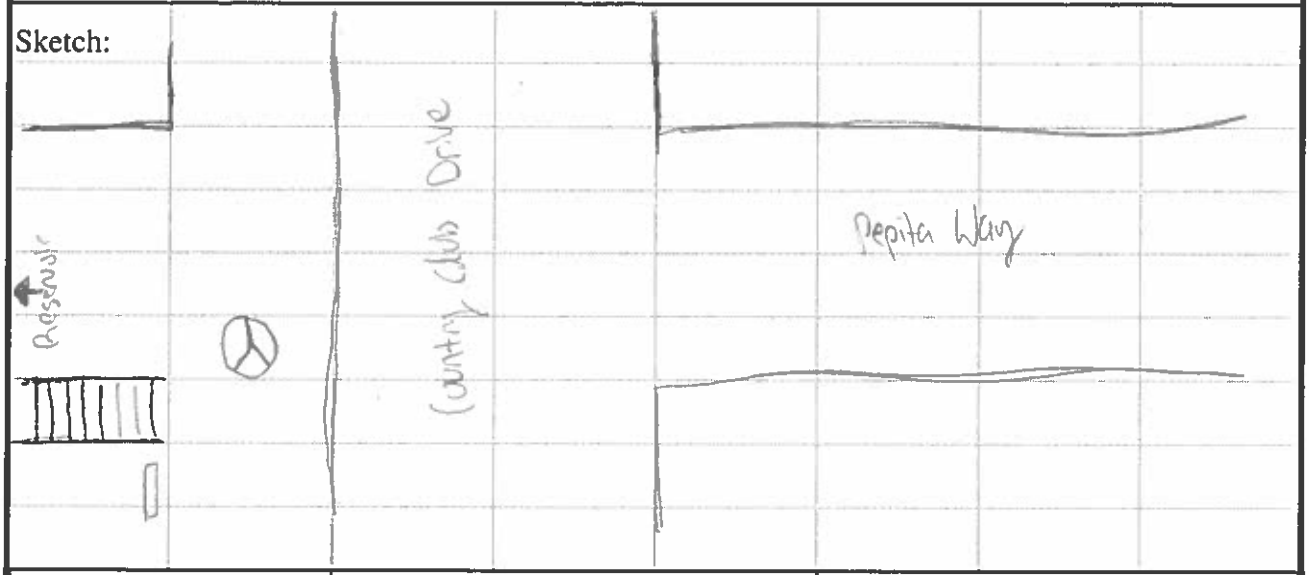
On-site Noise Measurement Sheets

Site Survey

Job # SDD-31.08	Project Name: La Jolla Vista Reservoir		
Date: 1/25/18	Site #: 1	Engineer: Hunter Stapp	
Address: Intersection of Country Club Dr. and Pepita Way (@EPR)			
008 Meter: LD LXT	Serial #: 000 1013	Calibrator: LD	Serial #: 4371

Notes: Occasional passing car; distant weed-wacker / lawn-mower
↳ maintenance trucks

Sketch:



Temp: 58°F	Wind Spd: 2 mph	mph	Humidity: 61%	%	
Start of Measurement: 11:06	End of Measurement: 11:21		62.0	dBA L_{EQ}	

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

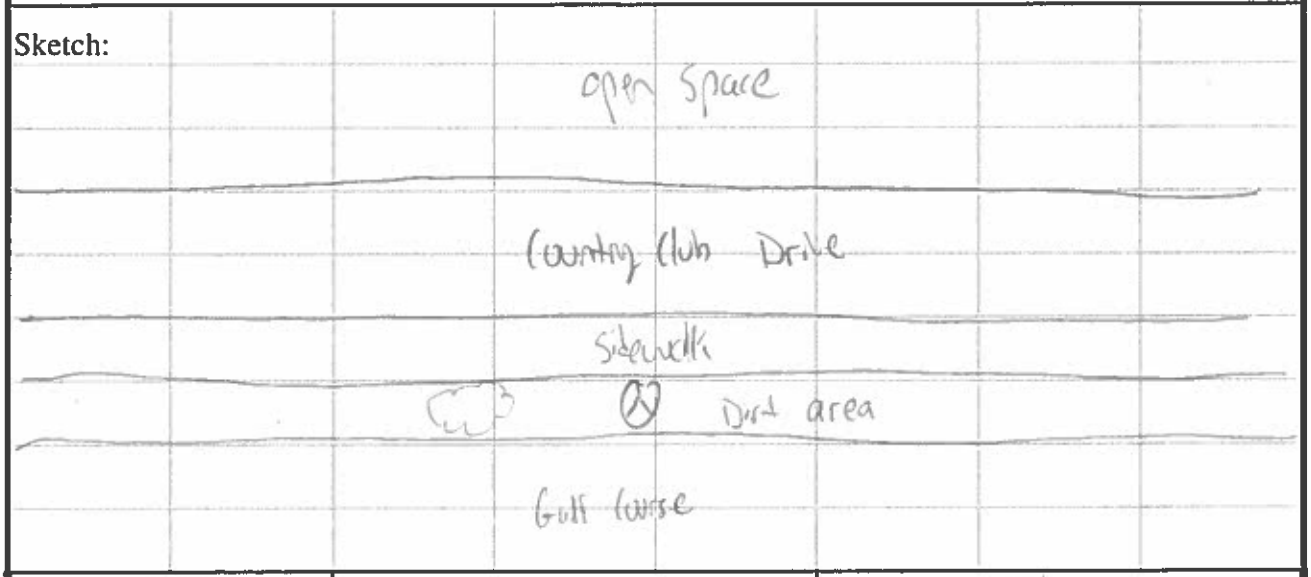
No Calibration Analysis Will Be Provided

Site Survey

Job # SDD-31.08	Project Name: La Jolla View Reservoir		
Date: 1/25/18	Site #: 2	Engineer: Hunter Stapp II	
Address: Alvarado Country Club Drive Adjacent to Golf Course			
.00# Meter: LD LXT	Serial #: 0001013	Calibrator: LD	Serial #: 4371

Notes: Very frequent car passing; distant golf course lawn mower; birds chirping; distant construction work

Sketch:



Temp: 61 °F	Wind Spd: 5 mph	Humidity: 66 %
Start of Measurement: 11:37 am	End of Measurement: 11:47 am	61.5 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

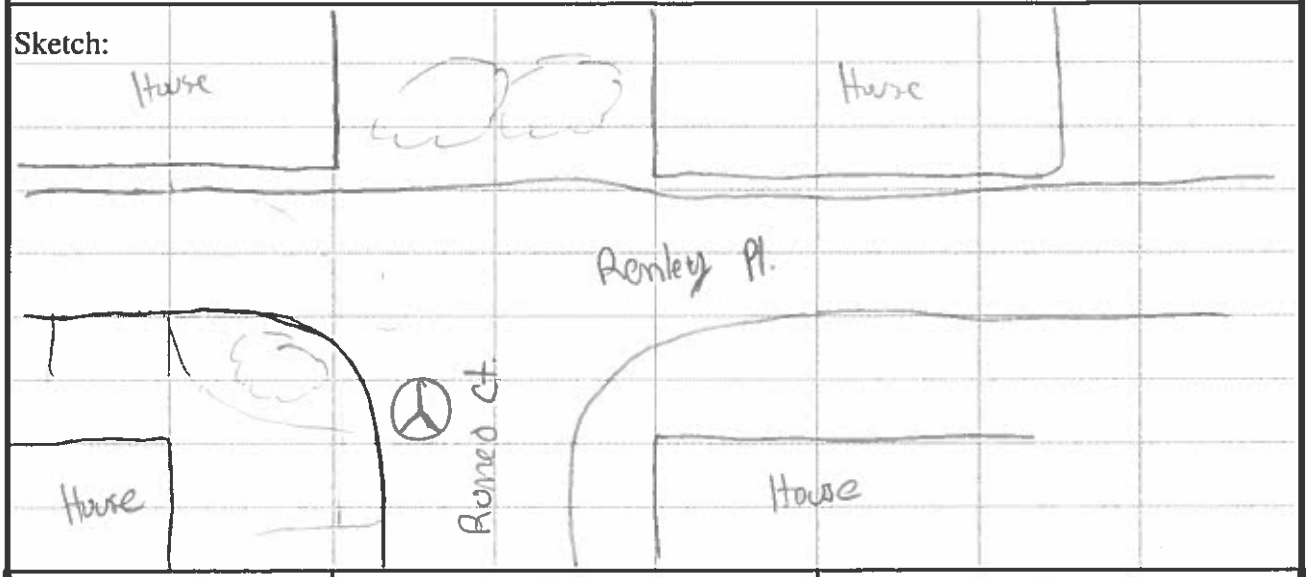
No Calibration Analysis Will Be Provided

Site Survey

Job # SDD-31.08	Project Name: La Jolla View Reserver		
Date: 1/24/19	Site #: 3	Engineer: Hunter Stapp	
Address: Intersection of Romeo Ct. and Remley Pl.			
01 Meter: LD LXT	Serial #: 0001013	Calibrator: LD	Serial #: 4571

Notes: Birds chirping; distant talking; leaves rustling; occasional car on Romeo; airplane; dogs barking; pausing for sand use

Sketch:



Temp: 61	Wind Spd: 11 mph	Humidity: 71 %
Start of Measurement: 1:05 pm	End of Measurement: 1:16 pm	45.0 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

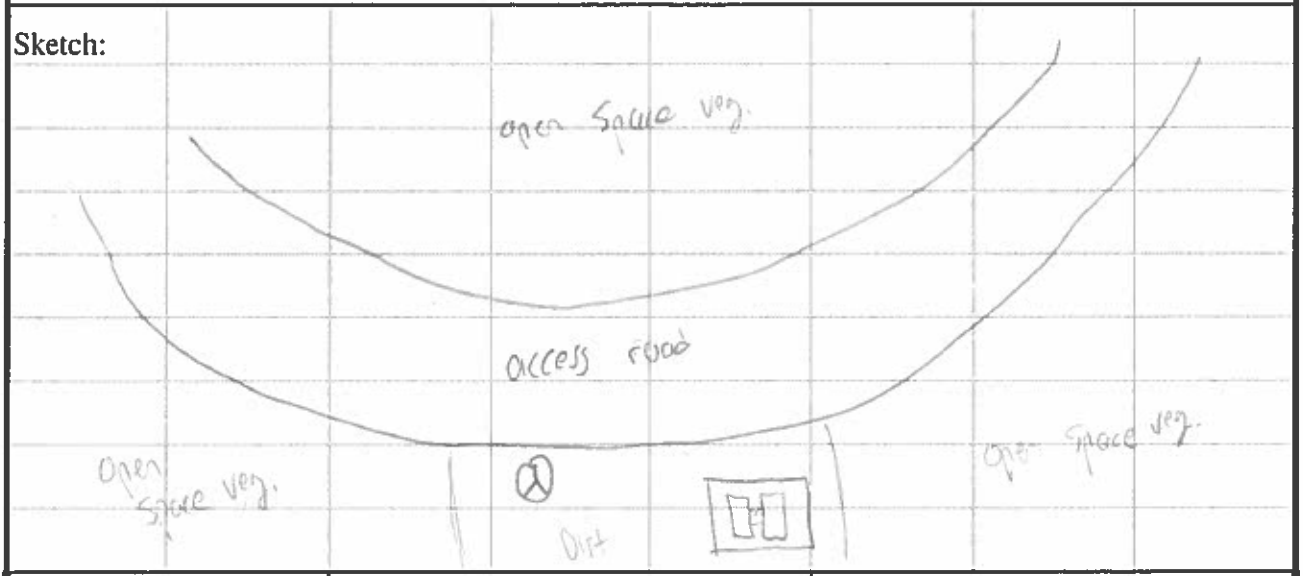
No Calibration Analysis Will Be Provided

Site Survey

Job # SDD-31.08	Project Name: La Jolla View Reservoir		
Date: 1/25/18	Site #: 4	Engineer: Hunter Stapp	
Address: Curve of access road			
0.010 Meter: LD LXT	Serial #: 0001013	Calibrator: LD	Serial #: 4371

Notes: Distant traffic noise; leaves; hum as "white noise"; airplanes; siren; general urban noise from below (to the west)

Sketch:



Temp: 61	Wind Spd: 6 mph mph	Humidity: 67 %	
Start of Measurement: 12:06 pm	End of Measurement: 12:11 pm	48.3	dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

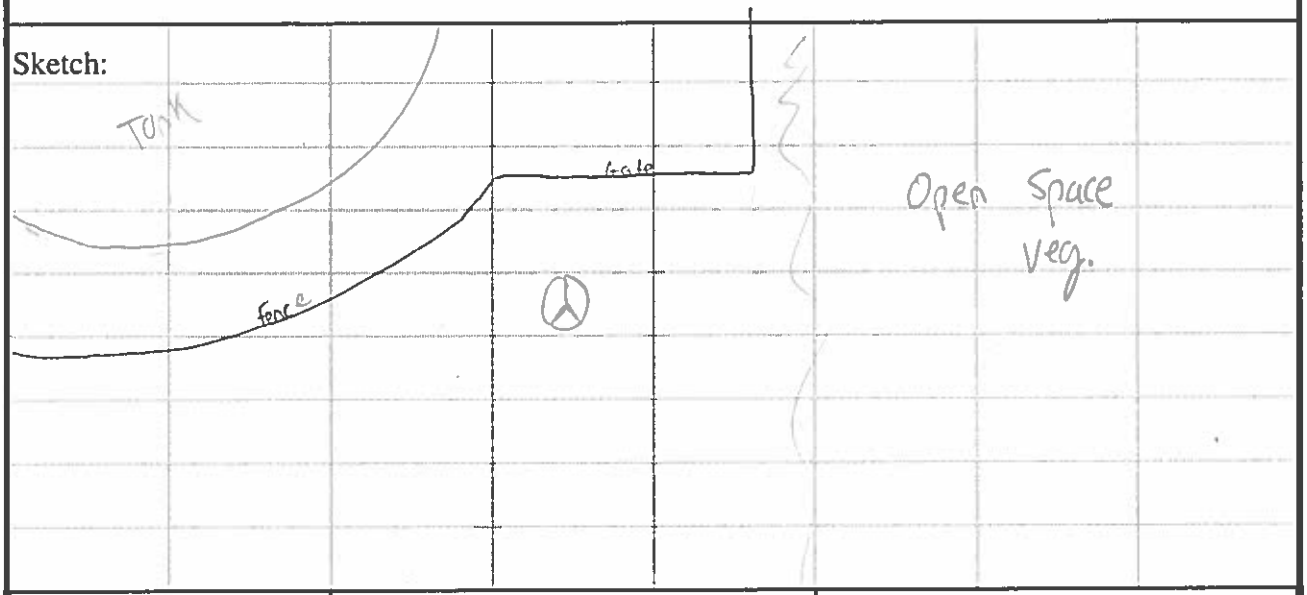
No Calibration Analysis Will Be Provided

Site Survey

Job # SDD-31.08	Project Name: La Jolla View Reservoir		
Date: 1/25/18	Site #: 5	Engineer: Hunter Stapp	
Address: @ La Jolla View Tank			
0.01 Meter: LD LXT	Serial #: 0001013	Calibrator: LD	Serial #: 4371

Notes: Helicopter ; birds chirping ; leaves rustling ; general urban noise ; intermittent landscape equipment use

Sketch:



Temp: 61°F	Wind Spd: 9 mph	Humidity: 69 %
Start of Measurement: 12:28 pm	End of Measurement: 12:43 pm	52.1 dBA L_{EQ}

Cars (tally per 5 cars)	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

No Calibration Analysis Will Be Provided

Appendix B

Construction Noise Calculations

Phase 1 - Demolition of La Jolla View Reservoir

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	89.6	N/A	N/A	N/A	80.8	N/A	74.8	75	98.0
Concrete Saw	89.6	20.00%	8	12	80.8	100.0	74.8	60	551.4

Phase 1 - Demolition of Exchange Place Reservoir

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	89.6	N/A	N/A	N/A	80.8	N/A	88.8	75	98.0
Concrete Saw	89.6	20.00%	8	12	80.8	20.0	88.8	60	551.4

Phase 1 - Demolition of Exchange Place Reservoir

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	90.0	N/A	N/A	N/A	78.2	N/A	86.2	75	72.6
Hydra Break Ram	90.0	10.00%	8	12	78.2	20.0	86.2	60	408.2

Phase 1 - Pipeline Construction

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	77.6	N/A	N/A	N/A	71.9	N/A	59.8	75	34.8
Backhoe	77.6	40.00%	8	12	71.9	200.0	59.8	60	195.9

Phase 2

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	85.0	N/A	N/A	N/A	80.9	N/A	71.4	75	98.9
Bulldozer	81.7	40.00%	8	12	76.0	150.0	66.4	60	314.0
Scraper	85.0	40.00%	8	12	79.3	150.0	69.7	75	81.6

Phase 3

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	89.6	N/A	N/A	N/A	80.8	N/A	72.5	75	98.0
Concrete Saw	89.6	20.00%	8	12	80.8	130.0	72.5	60	551.4

Phase 4 - Wrapping

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	80.6	N/A	N/A	N/A	78.8	N/A	63.3	75	77.8
Portable Generator	80.6	50.00%	8	12	75.8	300.0	60.3	75	55.0
Portable Generator	80.6	50.00%	8	12	75.8	300.0	60.3	75	55.0

Phase 4 - Concrete Work

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	80.6	N/A	N/A	N/A	85.2	N/A	70.3	75	161.1
Cement Truck	78.8	40.00%	8	8	74.8	300.0	59.3	75	49.0
Pump	77.0	100.00%	8	8	77.0	300.0	61.4	75	62.9
Portable Generator	80.6	50.00%	8	8	77.6	300.0	62.0	75	67.4
Portable Generator	80.6	50.00%	8	8	77.6	300.0	62.0	75	67.4
Portable Generator	80.6	50.00%	8	8	77.6	300.0	62.0	75	67.4
Portable Generator	80.6	50.00%	8	8	77.6	300.0	62.0	75	67.4
Portable Generator	80.6	50.00%	8	8	77.6	300.0	62.0	75	67.4
Crane	80.6	16.00%	8	8	72.6	300.0	57.1	75	38.1

Phase 5

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	81.7	N/A	N/A	N/A	76.0	N/A	60.4	75	55.8
Bulldozer	81.7	40.00%	8	12	76.0	300.0	60.4	60	314.0

Phase 6

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	77.6	N/A	N/A	N/A	71.9	N/A	85.8	75	34.8
Backhoe	77.6	40.00%	8	12	71.9	10.0	85.8	60	195.9

Phase 7

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	81.7	N/A	N/A	N/A	79.0	N/A	72.9	75	79.0
Bulldozer	81.7	40.00%	8	12	76.0	100.0	69.9	75	55.8
Bulldozer	81.7	40.00%	8	12	76.0	100.0	69.9	75	55.8

Phase 8

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	89.6	N/A	N/A	N/A	68.8	N/A	79.3	75	24.5
Concrete Saw	89.6	20.00%	0.5	12	68.8	15.0	79.3	60	137.8

Phase 9

Equipment	dBA L_{MAX}	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)	Distance	L_{EQ} dBA (Daily)	Distance To (dBA):	Distance
Noise Sum	83.2	N/A	N/A	N/A	59.4	N/A	69.9	75	8.3
Compactor Vibratory	83.2	20.00%	0.25	12	59.4	15.0	69.9	60	46.7

Appendix C

Construction Traffic Noise Analysis

Construction Traffic Noise Analysis

Country Club Drive	25 mph	**Exchange Place**	25 mph
Existing			
Total ADT	2175	3961	
Total TPH	217	396	
Autos TPH	211	384	
MTs TPH	4	8	
HTs TPH	2	4	
W/ Traffic Mitigation (limiting haul truck trips to 50 per day and 5 per hour)			
Total ADT	2182	3968	
Total TPH	225	404	
Autos TPH	214	387	
MTs TPH	4	8	
HTs TPH	7	9	
Noise Levels w/o project construction traffic			
At 10 feet	61 dBA	63.7	dBA
Noise Levels w/ project traffic and mitigation			
At 10 feet	62.8 dBA	64.8	dBA
Diff from w/o project	**1.8**	**1.1**	

TPH = Trips per hour
ADT = Average daily trips