Appendix D

Noise Technical Reports

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Draft Aircraft Noise Impact Technical Report for McClellan-Palomar Airport Master Plan Update

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Glossary of Terms and Acronyms

Abatement: The method of reducing the degree of intensity of noise and the use of such a method.

AEDT: The Federal Aviation Administration's (FAA), Office of Environment and Energy (AEE-100) has developed the Aviation Environmental Design Tool (AEDT) for evaluating aircraft noise impacts in the vicinity of airports. The AEDT replaces the Integrated Noise Model (INM) that had been the FAA's standard tool since 1978 for determining the predicted noise impact in the vicinity of airports. The FAA requires airports use the AEDT in assessing environmental impacts for soundproofing, evaluating physical improvements to the airfield, analyzing changes to existing or new procedures and in assessing land use compatibility.

Similar to INM, the AEDT Model utilizes flight track information, aircraft fleet mix, standard and user defined aircraft profiles and terrain as inputs. The AEDT model produces noise exposure contours that are used for land use compatibility maps. The AEDT program includes built in tools for comparing contours and utilities that facilitate easy export to commercial Geographic Information Systems (GIS). The model also calculates predicted noise at specific sites such as hospitals, schools or other sensitive locations.

Airport Master Plan: A long-range plan for development of an airport, including descriptions of the data and analyses on which the plan is based.

AIA: Airport Influence Area

ALUC: Airport Land Use Commission

ALUCP: Airport Land Use Compatibility Plan

ANOMS: Airport Noise and Operations Management System (ANOMS) is a sophisticated, acoustical system which monitors noise impacts by time of day, season and on an annual basis. ANOMS also monitors noise levels generated by a variety of outside aircraft activities and obtains accurate data of aircraft flight tracks and fleet mix.

ATADS: Air Traffic Activity System

Avigation Easement: An easement that transfers certain property rights from a property owner to an airport owner.

CEQA: California Environmental Quality Act

CFR: Code of Federal Regulations

CNEL: Community Noise Equivalent Level (CNEL) is the metric used to measure noise in California. CNEL is the 24-hour average sound level with a 5 dB penalty for noise events during the evening time period from 7 pm to 10 pm and a 10 dB penalty for the nighttime period from 10 pm to 7 am.

dB: The Decibel (dB) is the unit used to measure the magnitude or intensity of sound. Decibel means 1/10 of Bel (named after Alexander Graham Bell). The decibel uses a logarithmic scale to cover the very large range of sound pressures that can be heard by the human ear. Under the decibel unit of measure, a 10 dB increase will be perceived by most people to be a doubling in loudness, i.e., 80 dB seems twice as loud as 70 dB.

DNL: The Day-Night Average Sound Level (abbreviation DNL, denoted by the symbol Ldn) is the 24-hour average sound level for a given day, with the penalty of10 dB for noise events from 10 pm to 7 am.

EMAS: Engineered Material Arrest System

EPA: Environmental Protection Agency

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FICON: Federal Interagency Committee on Noise

General Aviation: Non-commercial airline aviation - primarily business aircraft and individuals traveling in private aircraft, includes those making connections to commercial flights.

Geographic Information Systems: is a computer software program to analyze spatial data. Can be especially useful in examining noise distribution over a geographic area.

GSE: Ground Support Equipment

H1: Helipad 1

IFR: Instrument Flight Rules (IFR) govern flight procedures during limited visibility or other operational constraints. Under IFR, pilots must file a flight plan and fly under the guidance of radar.

Intensity: The sound energy flow through a unit area in a unit time.

Noise Contour: A Noise Contour is a line on a map that represents equal levels of noise exposure.

Noise: (1) Unwanted sound. (2) Any sound not occurring in the natural environment, such as sounds emanating from aircraft, highways, industrial, commercial and residential sources. (3). An erratic, intermittent, or statistically random oscillation.

Noise Level: For airborne sound, unless specified to the contrary, it is the A-weighted sound level.

NLR: Noise Level Reduction (outdoor to indoor)

NSLU: Noise Sensitive Land Uses

PAL: Passenger Activity Levels

Reverberation: Sound that persists in an enclosed space, as a result of repeated reflection or scattering, after the source has stopped.

TFMSC: Traffic Flow Management System Counts

TGO: Touch and Go Operations

VFR: Visual Flight Rules (VFR) are air traffic rules allowing pilots to land by sight without relying solely on instruments. VFR conditions require good weather and visibility.

Executive Summary

This report presents an assessment of current and forecasted long-term noise conditions and potential aircraft noise impacts at McClellan-Palomar Airport (Airport) associated with implementation of the Airport Master Plan (Proposed Project).

The Proposed Project is located within the municipal limits of the City of Carlsbad on airport property. The Airport is owned and operated by the County of San Diego (County). In determining how the Proposed Project and associated aviation operational noise may affect the noise environment, the Federal Aviation Administration's (FAA) standards [Federal Aviation Regulation Part 150, Section 150.21)] are used for analyzing impacts. The thresholds are defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. For ground-level noise sources (e.g. traffic, industrial sources, amphitheaters), the *County of San Diego Guidelines for Determining Significance for Noise* (2007) are used.

Under FAA Order 1050.1F, the determination of significance must be obtained through the use of modeled noise contours along with local land use information. Per FAA standards, a significant noise impact would occur if the analysis shows that the Proposed Project will cause noise sensitive areas to experience an increase in noise of 1.5 decibels (dB) or more at or above Community Noise Equivalent Level (CNEL) 65 noise exposure level when compared to the no-action (with-project) condition. For example, if the Proposed Project results in an increase in noise levels over a noise sensitive land use, as defined by FAA (i.e. residential home), to increase from 65.5 dB to 67 dB it is considered a significant impact, as is an increase from 63.5 dB to 65 dB.

The Proposed Project improvements are split into three phases: near term (0-7 years), intermediate term (8-12 years), and long term (13-20 years). The improvements are primarily focused on enhancing safety areas for current and future aircraft, which would include the demolition of existing airport infrastructure and the construction of new aircraft movement facilities to meet FAA design standards. The Proposed Project also includes a phased extension of Runway 06-24 from 4,897 ft. to an ultimate length of 5,697 ft. and shifting the runway 123 ft. to the north. The aircraft operations associated with the proposed extension and shift would potentially affect the noise environment surrounding the Airport.

The FAA's Aviation Environmental Design Tool (version 2d) was used to model a depiction of the noise generated from aircraft operations at McClellan-Palomar Airport. As the County has the discretionary authority to allow for additional commercial service operations at the Airport, the noise analysis included not only an evaluation of impacts generated from the Proposed Project improvements, but an evaluation of the change in noise generated from the increase in commercial aircraft operations forecasted in the Airport Master Plan.

Modeling results determined that the Proposed Project would not result in significant noise level increases greater than the thresholds identified under FAA Order 1050.1F over areas identified as noise sensitive land uses. Therefore, the Proposed Project would not result in a significant project-level impact or contribute to a cumulative noise impact.

Section 1—Introduction

1.1 Project Description

1.1.1 Purpose of the Report

The County of San Diego (County) Department of Public Works is preparing an Airport Master Plan Update for the McClellan-Palomar Airport. The objective of the Airport Master Plan is to develop an outline of airside and landside facility improvements for the next 20-year planning period in order to maximize safety and operational efficiency at the Airport, while accounting for the necessary improvements to accommodate long-term growth in relation to aviation demand forecasts and market trends approved by the Federal Aviation Administration (FAA). Throughout the planning process, facility improvements were analyzed based on a multitude of defined criteria including land use opportunities and constraints, phasing, financial feasibility, stakeholder and public input, and environmental constraints. The purpose of this document is to determine whether noise impacts generated by aircraft operations would occur as a result of the Proposed Project and to assess whether mitigation of noise impacts is required.

1.1.2 Project Location and Description

The County owns approximately 487 acres in and around the Airport, including land used for aviation and non-aviation purposes. The County properties are located within the municipal limits of the City of Carlsbad. Approximately 231-acres of the County owned property make up the Airport Master Plan update study area. This includes the active airfield, tenant lease-holds, aircraft and auto parking, passenger terminal building, and administrative facilities located north of Palomar Airport Road at Yarrow Drive.

According to the *City of Carlsbad General Plan* (2015), the Airport is located in an area of planned industrial and open space land uses (see **Figure** 1 for regional location and **Figure 2** for land use). The closest noise sensitive land uses (NSLU) are residential developments located southeast of the Airport, on the south and east sides of Palomar Airport Road and El Camino Real, respectively (see **Figure 3**). This residential area, known as Bressi Ranch, is made up mostly of high-density single family homes with the closest house located more than a half-mile from the approach end of Runway 24. The Holy Cross Episcopal Church is also located adjacent to Bressi Ranch along Gateway Road. The closest school (Pacific Ridge School) is located over 1.3 miles east of the Airport.

The Proposed Project improvements are split into three phases: near term (0-7 years), intermediate term (8-12 years), and long term (13-20 years). The phased improvements are shown on **Figure 4**.

The following describes the Proposed Project's near term phase:

1. Relocation of the Glideslope Building and Antenna
2. Relocation of the Segmented Circles and Windsock Equipment
3. Relocation of the Aircraft Rescue and Fire Fighting Facility
4. Construction of Engineered Material Arrest System (EMAS) on Runway 06 End
5. Relocation of the Vehicle Service Road
6. Relocation of the Lighting Vault
7. 200 ft Extension of Existing Runway and Parallel Taxiway

The following describes the Proposed Project's intermediate term phase:

8. Removal of Fuel Farm on North Apron
9. Removal of North Apron and Taxiway N
10. Area Reserved for Future General Aviation Parking
11. Passenger/Admin/Parking Facility Improvements

The following describes the Proposed Project's long term phase:

12. Relocation and Extension of Runway 06-24 (includes relocation of navigational aids)
13. Remove/Reconstruct Connector Taxiways
14. Removal/Reconstruction of Taxiway A (includes lighting)
15. Construction of EMAS System on Runway 06
16. Relocation of EMAS System on Runway 24

Construction Activities

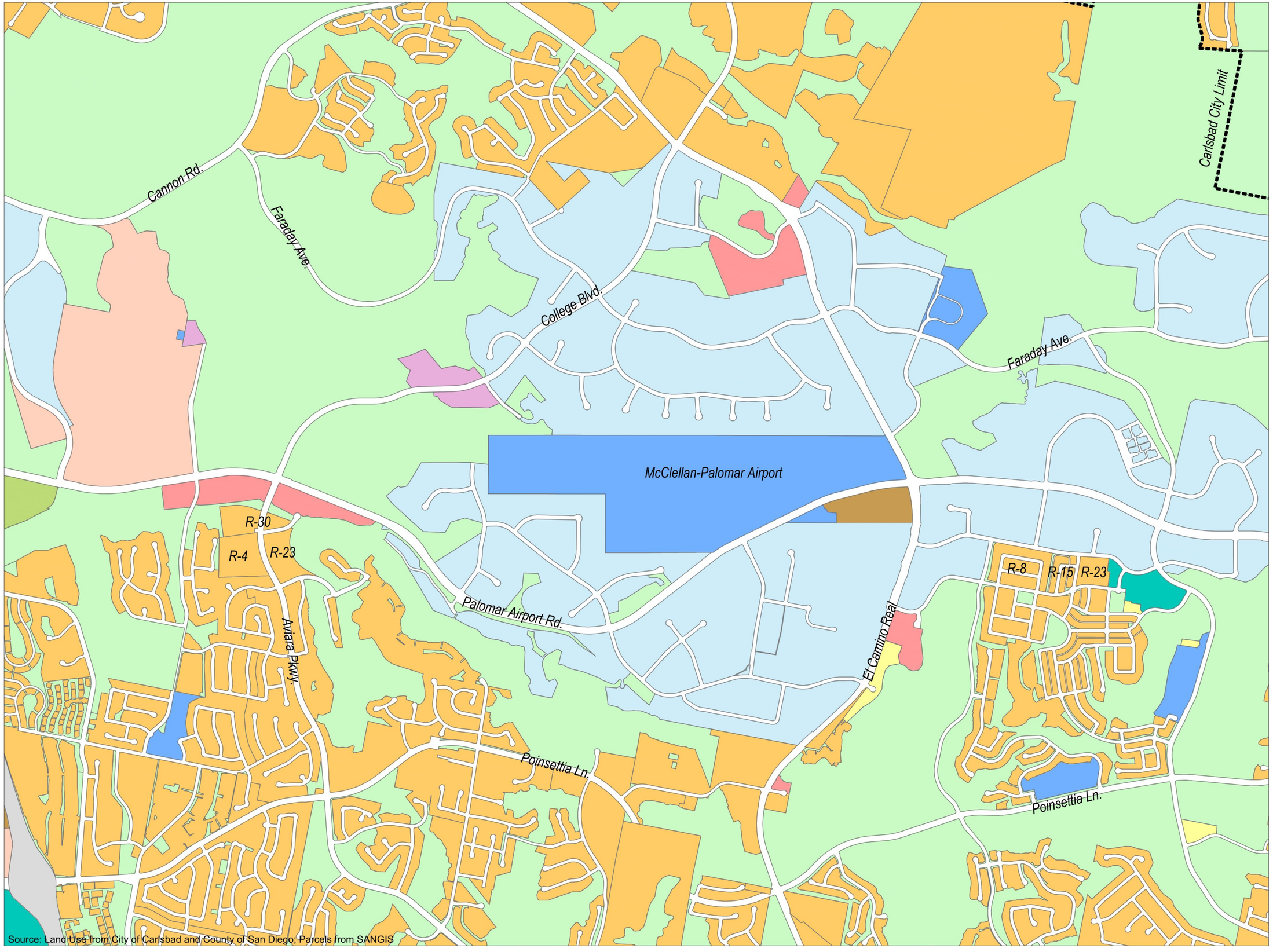
As shown on **Figure 4**, the Airport's north apron is located immediately north of Runway 06-24. The north apron (to be demolished) would be used as the primary construction staging area during development of the Proposed Project. The north apron area can be accessed through a security gate located on the northeast corner of the airport property, along El Camino Real. Once on the airport property, a service road can be utilized to gain access to the apron by authorized personnel. Although the north apron is proposed to be demolished under the intermediate term phase, the area would still be used for construction staging and material stockpiling. If necessary, eastern portions of the south apron, currently utilized for aircraft parking, could be utilized as a secondary staging area for construction equipment and materials. An assessment of potential construction noise impacts associated with the Proposed Project has been prepared as a separate technical report.



McClellan-Palomar Airport Master Plan

Project Location

Figure 1



Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use

- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential
  - R-4 (0-4 du/ac)
  - R-8 (4-8 du/ac)
  - R-23 (15-23 du/ac)
  - R-30 (23-30 du/ac)

1000' 0' 1000' 2000'

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McClellan-Palomar Airport Master Plan

Land Use

Figure 2



McClellan-Palomar Airport Master Plan

Noise Sensitive Receptors

Figure 3

McClellan-Palomar Airport Master Plan

Proposed Project

Figure 4

CONCEPTUAL DEVELOPMENT PHASES/FEATURES:

NEAR-TERM (0-7 YEARS)

1. Relocation of the Glideslope Building and Antenna
2. Relocation of the Segmented Circle and Windsock Equipment
3. Relocation of ARFF Facility
4. Construction of EMAS System for RWY 24
5. Relocation of the Vehicle Service Road
6. Relocation of Lighting Vault
7. 200' Extension of Existing RWY 06-24 and TWY A

INTERMEDIATE-TERM (8-12 YEARS)

8. Removal of Fuel Farm on North Apron
9. Removal of the North Apron and TWY N
10. Area Reserved for Future GA Parking
11. Passenger/Admin/Parking Facility Improvements

PHASE 3: LONG-TERM (13-20 YEARS)

12. Relocation 123' North/Extension of RWY 06-24 (Includes REILs, PAPIs, Localizer Antennae and MALSRs)
13. Removal/Reconstruction of Existing Connector Taxiways
14. Removal/Reconstruction of Existing TWY A (Includes Lighting)
15. Construction of EMAS System for RWY 06
16. Relocation of EMAS System for RWY 24



Source: McClellan-Palomar Airport Master Plan: Kimley Horn

1.2 Environmental Setting and Existing Conditions

1.2.1 Settings and Location

McClellan-Palomar Airport was built on top of a mesa with steep vertical drops on almost all sides and is underlain by an active landfill beneath portions of the ground surface. The area surrounding the Airport is a mixture of undeveloped canyons and hillsides with commercial and residential developments that make up the City of Carlsbad, with the Cities of Vista and San Marcos located further to the east. The airport property reaches an elevation of 330.5 feet mean-sea-level.

On-Airport Land Uses

The County property on which the Airport resides is zoned Industrial (M) pursuant to the Carlsbad Municipal Code Title 21 "Zoning Ordinance" (Section 21.34[1]) and consists of government (airport) facility land use.

Surrounding Land Uses

Directly north of the airport property is land identified by the City of Carlsbad for Planned Industrial land uses. Office buildings line the northern boundary of the airport property, across from the north apron. El Camino Real, located approximately 1,400 feet from the arrival end of Runway 24, creates the eastern boundary of the active Airport operating area. Portions of the County-owned property located on the eastern side of El Camino Real are identified as Open Space. To the south, the airport property is bordered by Palomar Airport Road. The area south of the Airport is predominantly identified as Planned Industrial with some small pockets of land identified as Open Space or General Commercial. The western boundary of the Airport is identified as Planned Industrial and Open Space which is utilized as a golf course (The Crossings at Carlsbad).

Some land uses are considered more sensitive to ambient noise levels than others because of the amount of noise exposure (both exposure duration and insulation from noise) and the types of activities typically involved. Residences, schools, rest homes, churches and hospitals are more sensitive to noise than commercial and industrial land uses[2]. The closest residential land uses to the Airport are located a half-mile to the southeast, across from the intersection of Palomar Airport Road and El Camino Real (see **Figure 3**). Additional residential land uses can be found south of the airport property and Palomar Airport Road.

[1] Carlsbad Municipal Code, http://www.qcode.us/codes/carlsbad/

[2] *FAA Environmental Desk Reference for Airport Actions,* October 2007.

1.2.2 Existing Conditions (2016) Noise Contours

This section analyzes the existing noise conditions at the Airport. The noise contours displayed on **Figure 5** represent the noise pattern as it existed in 2016. The data on which the existing conditions were based was derived from detailed flight information gathered on aircraft operations that took place from 1/1/2016 through 12/31/2016. This included an evaluation of data provided by the County's Airport Noise and Operations Management System (ANOMS) and FAA's Traffic Flow Management System Counts (TFMSC) and Air Traffic Activity System (ATADS) (see Appendix A). This differs from the baseline aircraft operations total that was reported in the Airport Master Plan as those represent the FAA Terminal Area Forecast and not the actual operations count.

The results of the existing conditions noise modeling are presented on **Figure 5** and **Table 1**. **Figure 5** shows the 70 Community Noise Equivalent Level (CNEL), 65 CNEL and 60 CNEL contours over existing land use mapping. Noise exposures at locations along the contours are equal to the contour value.

Table 1 – Existing Conditions (2016) CNEL Noise Exposure Area (acres)

Noise Exposure (CNEL)	Area (acres)
60-65	436.8
65-70	168.9
>70	123.5
Total ≥60	**729.2**

Source: C&S Engineers, Inc. 2017

The operational flow of the Airport, with aircraft primarily arriving from the east and departing to the west, is depicted in the shape of the Existing Conditions (2016) noise contours shown on **Figure 5**. The 60 CNEL noise contour extends off the airport property greatest to the west, in the direction of where the large majority of aircraft departures take place. The 60 CNEL noise contour extends over land uses identified as Open Space, Planned Industrial and General Commercial and does not extend over any areas that would be considered noise sensitive.

1.2.3 Existing Conditions (2016) Aircraft Operations and Fleet Mix

The following presents the aircraft operations data used for input into the Aviation Environmental Design Tool (AEDT) version 2d software system. AEDT was used to determine the existing conditions aircraft noise levels. Aircraft operations and fleet mix (i.e. the types of aircraft operated at the Airport) are important components of this analysis as cumulative noise levels in the environs of the Airport are a function of the loudness of the aircraft type and number of aircraft operations.

ATADS represents the official FAA record of operations for a specific airport. The number of operations reported by the FAA's ATADS is presented below in **Table 2**. This value was used to determine the total number of aircraft operations at the Airport in the calendar year 2016.

Table 2 – Existing Conditions (2016) Operations by Aircraft Category

Aircraft Category	Aircraft Operations	% of Total
Jet	16,255	10.6%
Turboprop	8,591	5.6%
Piston-Propeller	108,133	70.7%
Helicopter	20,037	13.1%
Total	**153,016**	**100%**

Source: FAA ATADS 2016 and C&S Engineers, Inc. 2017

Cannon Rd.
Faraday Ave.
College Blvd.
Faraday Ave.
Carlsbad City Limit
County of San Diego
Land Use
60 CNEL
65 CNEL
70 CNEL
McClellan-Palomar Airport
Palomar Airport Rd.
Aviara Pkwy.
El Camino Real
Poinsettia Ln.
Poinsettia Ln.

Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use

- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

Existing Noise Contours

- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour

1000' 0' 1000' 2000'

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McClellan-Palomar
Airport Master Plan
Existing Conditions (2016)
Noise Contours
Figure 5

In order to calculate noise contours for the existing conditions, the average number of daily operations (arrivals and departures) by specific aircraft types was prepared for input into AEDT. ANOMS records indicated that there were approximately 91,263 aircraft operations under the existing conditions (2016), 67,753 fewer than the 153,016 operations reported by FAA ATADS. This is because the ANOMS system applies different methods for capturing flight operations. Generally, it includes nearly all Instrument Flight Rule (IFR) operations, but a significant number of Visual Flight Rule (VFR) operations are calculated differently due to local (touch-and-go) operations that stay within the airport flight pattern. ATADS data showed there were 46,768 IFR operations, 49,642 VFR operations and 56,606 local (touch and go) operations in 2016.

While ANOMS reported a lower number of operations than the amount reported in ATADS, it was used to determine the representative aircraft fleet mix at the Airport because ATADS does not provide specific aircraft type information necessary for input into AEDT. Therefore, the total operations reported by ATADS was proportionally distributed among the aircraft types as determined by the ANOMS aircraft type percentages.

It was assumed that all jet and turboprop aircraft would operate under IFR flight plan conditions, as commonly practiced, and therefore would have been accurately recorded under ANOMS. As a result, the count of piston propeller aircraft and helicopters recorded by ANOMS for 2016 was reported lower than what actually took place. Since, the majority of these operations occur under VFR with no filed flight plans, the ANOMS system likely did not collect specific aircraft type data but did record the flight track and record of operation. In order to address this issue and determine the correct amount of piston-propeller and helicopter operations, the fleet mix distribution was confirmed with airport staff. These percentages were then applied to the 2016 baseline operations from ATADS.

The piston-propeller aircraft operations were further separated into itinerant and touch-and-go (TGO) categories. According to FAA guidance[3], local flights include, "Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport." Itinerant operations are, "all aircraft operations other than local. Essentially, these data represent takeoffs and landings of aircraft going from one airport to another." For the purpose of this analysis, all operations that leave the traffic pattern are considered itinerant operations. The goal is to isolate the number and type of aircraft that remain in the traffic pattern completing TGOs as they contribute more significantly to noise at an airport than an aircraft simply departing or arriving from another airport. The specific aircraft types used for TGOs were derived from historical operations data at the Airport, a review of current flight school operations, and from FAA TFMSC data. The total number

[3] Federal Aviation Administration, *Terminal Area Forecast Summary*, Fiscal Years 2015-2040.

of local operations as reported by ATADS was assumed to be made up of piston-propeller TGO operations. A review of the training aircraft at the Airport revealed that there were no flight schools currently using turboprop aircraft; therefore, the amount of TGOs flown by them would be negligible.

The fleet mix used in the analysis as well as the percentage of operations on each runway end are presented below in **Table 3.** Aircraft types that were reported in the ANOMS data but had very few annual operations[4] were aggregated with comparable aircraft types (similar weights, engine types and sizes) that are included in AEDT and have a substantial number of annual operations at the Airport. Aircraft aggregation is a standard practice in aircraft noise modeling and provides results within FAA acceptable tolerances.

Table 3 – Existing Conditions (2016) Aircraft Fleet Mix by Runway Usage

Aircraft Make/Model	Arrivals		Departures	
Jets	**Runway 6**	**Runway 24**	**Runway 6**	**Runway 24**
Bombardier Challenger 600	1%	99%	2%	98%
Cessna Citation Bravo	1%	99%	4%	96%
Cessna Citation II	1%	99%	5%	95%
Cessna Citation Sovereign	0%	100%	3%	97%
Cessna Citation Ultra	1%	99%	2%	98%
Cessna Citation X	0%	100%	1%	99%
Dassault Falcon 2000	1%	99%	0%	100%
Dornier 328 Jet	0%	100%	1%	99%
Eclipse 500	2%	98%	3%	97%
EMBRAER 145	0%	100%	0%	100%
Gulfstream GII	0%	100%	2%	98%
Gulfstream GIV	0%	100%	2%	98%
Gulfstream GV/650	0%	100%	6%	94%
Learjet 36	0.3%	99.7%	2.3%	97.7%

[4] Aircraft types that had less than 100 annual aircraft operations at the Airport for the 2016 baseline year were not considered for inclusion in the aircraft fleet mix.

Table 3 (cont.) – Existing Conditions (2016) Aircraft Fleet Mix by Runway Usage

Aircraft Make/Model	Arrivals		Departures	
Turboprop	**Runway 6**	**Runway 24**	**Runway 6**	**Runway 24**
Cessna 208 Caravan	2%	98%	2%	98%
Cessna Conquest II	1%	99%	3%	97%
Dash 6	0%	100%	0%	100%
Embraer 120	3%	97%	8%	92%
Piaggio P.180 Avanti	0%	100%	0%	100%
Piper Meridian	1%	99%	3%	97%
Piston-Propeller				
Beechcraft Baron	4%	96%	1%	99%
Beechcraft Bonanza	1%	99%	1%	99%
Cessna 172	0%	100%	1%	99%
Cessna 182	0%	100%	1%	99%
Cessna 206	0%	100%	1%	99%
Cirrus SR22	1%	99%	1%	99%
GASEPV	1%	99%	1%	99%
Piper Warrior	1%	99%	1%	99%
Helicopter	**Helipad 1**	**Runway 24**	**Helipad 1**	**Runway 24**
Eurocopter 135	0%	100%	0%	100%
Robinson R22	90%	10%	90%	10%
Robinson R44	75%	25%	75%	25%
Sikorsky SH-60 Seahawk	0%	100%	0%	100%

Source: ANOMS and C&S Engineers, Inc. 2017

Table 4 shows the sum total of operations per aircraft as well as the time of day that the operations occurred. Time of day is defined as Day (7:00 a.m. to 6:59 p.m.), Evening (7:00 p.m. to 9:59 p.m.), and Night (10:00 p.m. to 6:59 a.m.). Aircraft operations are distributed by time of day in order to represent the added intrusiveness of sounds occurring during evening and nighttime hours, CNEL 'penalizes' or weighs events occurring during the evening and nighttime periods by 5 dB in the evening and 10 dB at night, respectively.

Table 4 – Existing Conditions (2016) Operations by Time of Day

Aircraft Make/Model	Arrivals			Departures		
	Day	Evening	Night	Day	Evening	Night
Jets						
Bombardier Challenger 600	83%	13%	4%	88%	9%	3%
Cessna Citation Bravo	85%	9%	5%	90%	7%	4%
Cessna Citation II	81%	13%	6%	88%	8%	4%
Cessna Citation Sovereign	82%	11%	7%	89%	7%	4%
Cessna Citation Ultra	92%	7%	1%	92%	7%	1%
Cessna Citation X	89%	7%	4%	91%	7%	2%
Dassault Falcon 2000	90%	7%	3%	89%	8%	3%
Dornier 328 Jet	89%	7%	4%	91%	7%	2%
Eclipse 500	79%	14%	7%	87%	9%	4%
EMBRAER 145	82%	15%	3%	89%	8%	3%
Gulfstream GII	82%	13%	5%	89%	8%	3%
Gulfstream GIV	82%	13%	5%	88%	8%	4%
Gulfstream GV/650	76%	15%	9%	83%	11%	6%
Learjet 36	84%	12%	4%	89%	8%	3%
Turboprop						
Cessna 208 Caravan	90%	8%	2%	91%	7%	2%
Cessna Conquest II	84%	12%	4%	89%	9%	2%
Dash 6	81%	15%	4%	87%	10%	3%
Embraer 120	73%	13%	14%	78%	14%	8%
Piaggio P.180 Avanti	81%	15%	4%	87%	10%	3%
Piper Meridian	84%	12%	4%	89%	9%	2%

Table 4 (cont.) – Existing Conditions (2016) Operations by Time of Day

Aircraft Make/Model	Arrivals			Departures		
	Day	Evening	Night	Day	Evening	Night
Piston-Propeller						
Beechcraft Baron	90%	8%	2%	92%	7%	1%
Beechcraft Bonanza	92%	7%	1%	93%	6%	1%
Cessna 172	88%	10%	2%	90%	9%	1%
Cessna 182	94%	5%	1%	93%	6%	1%
Cessna 206	92%	6%	2%	94%	5%	1%
Cirrus SR22	92%	6%	2%	92%	6%	2%
GASEVP	92%	7%	1%	93%	6%	1%
Piper Warrior	87%	10%	3%	89%	9%	2%
Helicopter						
Eurocopter 135	70%	12%	18%	71%	14%	15%
Robinson R22	94%	6%	0%	92%	8%	0%
Robinson R44	94%	6%	0%	92%	8%	0%
Sikorsky SH-60 Seahawk	83%	6%	11%	78%	11%	11%

Source: ANOMS and C&S Engineers, Inc. 2017

1.3 Methodology & Equipment

1.3.1 Noise Measuring Methodology & Procedures

As indicted in Section 1.2, the noise exposure patterns for the Airport are presented in terms of the average annual CNEL for existing (2016) and future (2036) conditions. The annual CNEL measure is the average annual total of noise energy that occurs at a given location during the day, evening, and night periods. As noted, with CNEL, evening (between 7:00 pm and 9:59 pm) noise events are weighed (or penalized) by 5 dB and nighttime (between 10:00 pm and 6:59 am) noise events are weighed by 10 dB to reflect the greater perceived impact of noise during those periods. CNEL[5] is an FAA accepted noise metric that is used in California to demonstrate compliance with the California Environmental Quality Act (CEQA). With the exception of the evening period, the noise metric is identical to the day-night average sound level (DNL)[6] used in other noise studies conducted by or under the review of the FAA.

1.3.2 Noise Modeling Software

On September 27, 2017, the FAA released AEDT, Version 2d. This program was used to model aircraft operations at the Airport in order to generate noise contours over the Airport and surrounding community. AEDT was developed under the auspices of the FAA for use in all Federal Aviation Regulations (FAR) Part 150 noise studies and other environmental studies dealing with aircraft noise. The distribution of the noise pattern calculated by AEDT is a function of the number of aircraft operations during the evaluation period, the types of aircraft flown, the time of day of the operation, aircraft flight tracks, how frequently each runway is used for operations, and aircraft arrival and departure procedures.

1.3.3 Noise Formulas and Calculations

In order to develop an accurate depiction of the noise generated from aircraft operations, AEDT requires the input of the physical and operational characteristics of a specific airport. Physical characteristics include runway coordinates, airport altitude, and weather data. Operational characteristics include various types of aircraft data. This includes not only the aircraft types and flight tracks, but also departure procedures, arrival procedures and stage lengths (flight distance) that are specific to aircraft operations at a given airport.

[5] While DNL is the primary metric FAA uses to determine noise impacts. FAA accepts the CNEL when a state requires that metric to assess noise effects.

[6] For aviation noise analyses, the FAA has determined that the cumulative noise energy exposure of individuals to noise resulting from aviation activities must be established in terms of Yearly Day Night Average Sound Level (DNL), the FAA's primary noise metric.

In developing the modeling inputs, historical aircraft operational data was collected from a number of sources that includes the ANOMS system, FAA TFMSC, and FAA ATADS. In addition, the 2006 FAR Part 150 Noise Study Update and previous noise analysis completed for National Environmental Policy Act and CEQA documentation specific to the Airport were reviewed to determine their applicability for use in the AEDT modeling. Based on a comparison of the historical data and assumptions made under recent noise studies many of the modeling inputs such as runway use percentages, flight tracks, and day/evening/night splits were determined to still be accurate with existing conditions (2016) when compared to 2016 ANOMS data. The most notable changes made for the updated analysis were modifications to the aircraft fleet mix and a lower number of total annual aircraft operations that occurred under the 2016 baseline condition when compared to previous years. The following sections present the data that was used with AEDT to generate the existing and future conditions noise contours.

Aircraft Operations

Aircraft operations for existing conditions (2016) were obtained from the FAA ATADS and are presented in **Table 4**. For future conditions (2036), aircraft operations were obtained from the aviation demand forecasts prepared as part of the Airport Master Plan. The Airport Master Plan developed a number of separate forecast scenarios, based on the anticipated demand of commercial operations at the Airport. Two scenarios, reflective of forecasted passenger activity levels (PAL), were selected for further evaluation. The first scenario (PAL 1) includes 195,050 annual aircraft operations. The second scenario (PAL 2), which includes 208,004 annual aircraft operations was also evaluated under this noise analysis as it reflects the highest number of aircraft operations forecasted in the Airport Master Plan for future conditions (2036). Due to the discretionary nature of allowing commercial service at the Airport, a third scenario was evaluated in the noise analysis which included the forecasted growth of aircraft operations at the Airport without commercial service operations reflected in PAL 1 and PAL 2. This scenario (Forecasted Growth) included 180,450 annual aircraft operations in 2036.

Aircraft Fleet Mix

Aircraft operations and fleet mix (i.e. the types of aircraft operated at the Airport) are important components of a noise analysis as cumulative noise levels in the environs of the airport are a function of the loudness of an aircraft and number of aircraft operations. As noted under Section 1.2, under Exiting Conditions (2016) both ANOMS and FAA TFMSC operational records were reviewed for the 2016 calendar year to determine the existing aircraft fleet mix that was included in the AEDT modeling.

Under Future Conditions (2036) several assumptions were made in order to select the future fleet mix. Since each aircraft's useful life differs depending on several factors such as type of aircraft, frequency of use, and level of maintenance, it is difficult to say which aircraft out of

the current fleet mix would still be operating at the Airport under the future conditions. For the purposes of this study it was assumed that any aircraft that ended production prior to 2005 would be replaced with a newer comparable model by 2036.

Some exceptions were made to this rule including keeping both the Dornier 328 Jet and Embraer 120 as they are unique aircraft without a ready replacement, as well as keeping the entirety of the general aviation[7] fleet the same. General aviation aircraft owners tend to keep their planes much longer than a jet charter or airline would and it is not unusual to frequently see aircraft that are 30 or 40 years old.

The goal of modifying the fleet mix was to more accurately represent the newer and often quieter and more efficient aircraft that are likely to be using the Airport under Future Conditions (2036). As the FAA continues to phase out older, noisier civil aircraft, some stages[8] of aircraft are no longer flown. According to FAA published information on FAA Noise Levels, Stages, and Phaseouts, by December 31, 2015, all civil jet aircraft, regardless of weight were required to meet Stage 3 or Stage 4 noise standards to fly within the contiguous U.S.

Table 5 provides a breakdown of the fleet mixes for both the Existing Conditions (2016) and Future Conditions (2036).

[7] Civil aircraft operations other than scheduled air services and non-scheduled air transport operations for compensation or hire.

[8] FAA regulates the maximum noise levels that individual civil aircraft can emit through certain noise certification standards. These standards designate changes in maximum noise level requirements by "stage" designation. For civil jet aircraft, there are four stages, with Stage 1 being the loudest and Stage 4 being the quietest.

Table 5 – Existing (2016) and Future Conditions (2036) Aircraft Fleet Mix

Aircraft Make/Model	Annual Operations			
	Existing Conditions (2016)	Future Conditions (2036)	Future Conditions (2036) – PAL 1	Future Conditions (2036) – PAL 2
Airline				
Bombardier 700	0	0	6,205	11,711
Embraer E-170	0	0	6,205	11,710
Bombardier Dash 8 Q200	0	0	2,190	4,133
Sub-Total	**0**	**0**	**14,600**	**27,554**
Jets				
Bombardier Challenger 600	1,754	2,365	2,365	2,365
Cessna Citation Bravo	506	682	682	682
Cessna Citation II	3,739	0	0	0
Cessna Citation CJ4	0	7,116	7,116	7,116
Cessna Citation Sovereign	867	1,169	1,169	1,169
Cessna Citation Ultra	1,539	0	0	0
Cessna Citation X	1,193	1,609	1,609	1,609
Dassault Falcon 2000	371	500	500	500
Dornier 328 Jet	6	8	8	8
Eclipse 500	1,638	2,209	2,209	2,209
Embraer 145	207	279	279	279
Gulfstream GII	389	0	0	0
Gulfstream GIV	958	0	0	0
Gulfstream G450	0	1,816	1,816	1,816
Gulfstream GV/650	1,045	1,409	1,409	1,409
Learjet 36	2,043	0	0	0
Learjet 70	0	2,755	2,755	2,755
Sub-Total	**16,255**	**21,917**	**21,917**	**21,917**
Turboprop				
Cessna 208 Caravan	4,031	8,332	8,332	8,332
Cessna Conquest II	947	0	0	0
Dash 6	2,666	7,354	7,354	7,354
Embraer 120	69	161	161	161
Piaggio P.180 Avanti	148	346	346	346
Piper Meridian	730	1,707	1,707	1,707
Sub-Total	**8,591**	**17,900**	**17,900**	**17,900**

Table 5 (cont.) – Existing (2016) and Future Conditions (2036) Aircraft Fleet Mix

Aircraft Make/Model	Annual Operations			
	Existing Conditions (2016)	Future Conditions (2036)	Future Conditions (2036) – PAL 1	Future Conditions (2036) – PAL 2
Piston-Propeller				
Beechcraft Baron	18,323	14,611	14,611	14,611
Beechcraft Bonanza	5,245	5,227	5,227	5,227
Cessna 172	50,373	50,196	50,196	50,196
Cessna 182	3,321	3,310	3,310	3,310
Cessna 206	2,266	2,258	2,258	2,258
Cirrus SR22	2,889	2,879	2,879	2,879
GASEVP	15,736	15,680	15,680	15,680
Piper Warrior	9,979	9,944	9,944	9,944
Sub-Total	**108,132**	**104,105**	**104,105**	**104,105**
Helicopter				
Eurocopter 135	15,367	28,507	28,507	28,507
Robinson R22	762	1,413	1,413	1,413
Robinson R44	3,047	5,653	5,653	5,653
Sikorsky SH-60 Seahawk	862	955	955	955
Sub-Total	**20,038**	**36,528**	**36,528**	**36,528**
Grand-Total	**153,016**	**180,450**	**195,050**	**208,004**

Notes:
(a) Due to the similar performance characteristics of the Gulfstream GV and G650, the aircraft types are combined in the AEDT model and represented under the AEDT Aircraft ID as GV. There is no specific G650 aircraft model type available in AEDT
Source: 2015 ANOMS, FAA TFMSC, Draft Airport Master Plan and C&S Engineers, Inc. 2017

Runway Utilization

Runway utilization refers to the percentage of total arrival or departure operations occurring on a specific runway. As a single runway airport, runway utilization at the Airport is greatly influenced by meteorological conditions, primarily wind direction. In order to enhance safety and aircraft performance, aircraft take off and land into the prevailing wind. The prevailing wind direction at the Airport is from the west (98 percent[9]). As aircraft depart into wind, the vast majority of the time the Airport operates in a west flow, using Runway 24 to depart from and land.

Figure 6 presents the runway layout at the Airport. The Airport's runway is identified by reference to the direction of heading referenced to magnetic north rounded to the nearest 10 degrees. For example, an aircraft departing or landing on Runway 24 has a magnetic heading of approximately 240 degrees. In addition, there is a helipad located on the southwest side of the Airport, designated as Helipad 1 (H1). Operations of smaller helicopters (R44 and R22) used for training typically land and depart from H1, but larger helicopters will hover taxi from their parking positions to the runway and depart using the headings typically flown by fixed-wing aircraft.

[9] *McClellan-Palomar Airport, Draft Airport Master Plan*, 2017



McClellan-Palomar Airport Master Plan

Airport Layout

Figure 6

Runway utilization was derived from the 2016 ANOMS data. All records for the year 2016 were analyzed to determine runway utilization for each aircraft type included in AEDT. The percentages of arrivals and departures on each of the runways for existing conditions (2016) were presented in **Table 2** and future conditions (2036) are presented on **Table 6**. As noted, due to the prevailing wind direction, Runway 24 is used the majority of the time for aircraft operations. Approximately 98 percent of fixed wing aircraft operations were on Runway 24 under existing conditions (2016). Due to reported historical weather trends, runway utilization under future conditions (2036) is not anticipated to change.

Table 6 – Future Conditions (2036) Aircraft Fleet Mix by Runway Usage

Aircraft Make/Model	Arrivals		Departures	
Airlines	**Runway 6**	**Runway 24**	**Runway 6**	**Runway 24**
Bombardier 700	0%	100%	0%	100%
Embraer E-145	0%	100%	0%	100%
Bombardier Dash 8 Q200	0%	100%	0%	100%
Jets				
Bombardier Challenger 600	1%	99%	2%	98%
Cessna Citation Bravo	1%	99%	4%	96%
Cessna Citation CJ4	1%	99%	3.8%	96.2%
Cessna Citation Sovereign	0%	100%	3%	97%
Cessna Citation X	0%	100%	1%	99%
Dassault Falcon 2000	1%	99%	0%	100%
Dornier 328 Jet	0%	100%	1%	99%
Eclipse 500	2%	98%	3%	97%
Embraer 145	0%	100%	0%	100%
Gulfstream G450	0%	100%	2%	98%
Gulfstream GV/650	0%	100%	6%	94%
Learjet 70	0.3%	99.7%	2.3%	97.7%
Turboprop				
Cessna 208 Caravan	2%	98%	2%	98%
Dash 6	0.35%	99.65%	1.05%	98.95%
Embraer 120	3%	97%	8%	92%
Piaggio P.180 Avanti	0%	100%	0%	100%
Piper Meridian	1%	99%	3%	97%
Piston-Propeller				
Beechcraft Bonanza	1%	99%	1%	99%
Beechcraft Baron	4%	96%	1%	99%
Cessna 172	0%	100%	1%	99%
Cessna 182	0%	100%	1%	99%

Table 6 (cont.) – Future Conditions (2036) Aircraft Fleet Mix by Runway Usage

Aircraft Make/Model	Arrivals		Departures	
Piston-Propeller	**Runway 6**	**Runway 24**	**Runway 6**	**Runway 24**
Cessna 206	0%	100%	1%	99%
Cirrus SR22	1%	99%	1%	99%
GASEVP[a]	1%	99%	1%	99%
Piper Warrior	1%	99%	1%	99%
Helicopter	**H1**	**24**	**H1**	**24**
Eurocopter 135	0%	100%	0%	100%
Robinson R22	90%	10%	90%	10%
Robinson R44	75%	25%	75%	25%
Sikorsky SH-60 Seahawk	0%	100%	0%	100%

Notes:
[a] High performance single engine piston aircraft
Source: 2015 ANOMS and C&S Engineers, Inc. 2017

Flight Tracks

Flight tracks are lines that represent the path an aircraft takes as it arrives or departs from the runway. The flight tracks that pilots take to arrive and depart from the Airport are at the pilots' discretion with guidance from the FAA Airport Traffic Control Tower. The County has no direct control over how aircraft operate once airborne but have developed voluntary departure and arrival procedures to help reduce noise over noise sensitive areas in close proximity to the Airport. To determine the location of these tracks, discussions with Airport staff and ANOMS radar data were obtained and analyzed for input into AEDT. The resulting flight tracks are representative of the most common flight tracks used at the Airport. The tracks are not inclusive of all paths used by aircraft, they are designed to represent the most common paths used by aircraft arriving and departing the Airport. For purposes of noise prediction and analysis, including the determination of cumulative noise exposure levels, flight tracks presented in this study accurately reflect all flight operations. **Figure 7** and **Figure 8** display the arrival and departure flight tracks that were used to perform the noise analysis for each runway.

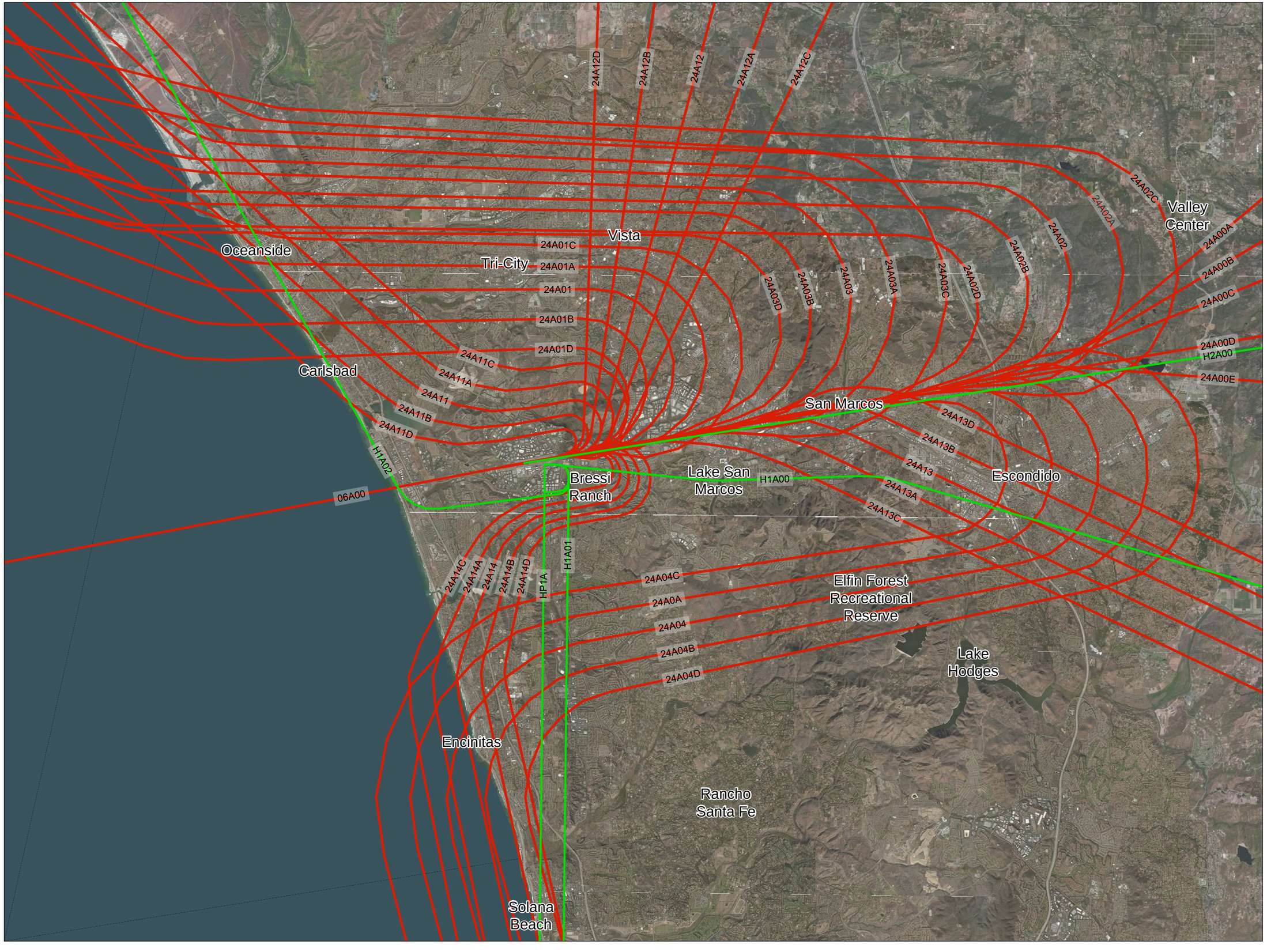
Under future conditions (2036), the proposed runway relocation and extension as proposed in the Airport Master Plan are anticipated to result in a corresponding shift in the flight tracks. The flight track allocations for both the existing conditions (2016) and future conditions (2036) were kept the same and are presented in **Table 7** through **Table 10.** The additional operations accounted for by commercial airlines in the future condition were modeled on existing arrival and departure flight tracks that have historically been used for

commercial operations. These were developed as part of the Airport's Voluntary Noise Abatement Program and include the following recommended flight procedures:

- Departing Runway 24: jet aircraft fly 250 degrees ground track, north of Palomar Airport Road until one (1) mile offshore then turn.
- Arriving Runway 24: jet aircraft fly the localizer when VFR/IFR. Remain on or above the glideslope

As part of the FAA's Next Generation Air Transportation System Southern California - Metroplex project[10], recommendations were made to adjust departure procedures at the Airport to extend the distance prior to turning (currently recommended at one mile) further over the Pacific Ocean. While these adjustments may eliminate early turning over coastal areas its overall impact to the size and shape of modeled noise contours at the Airport would be negligible given they take place over one mile from the Airport.

[10] http://www.metroplexenvironmental.com/socal_metroplex/socal_introduction.html



LEGEND

- Aircraft Arrival Flight Track
- Helicopter Arrival Flight Track

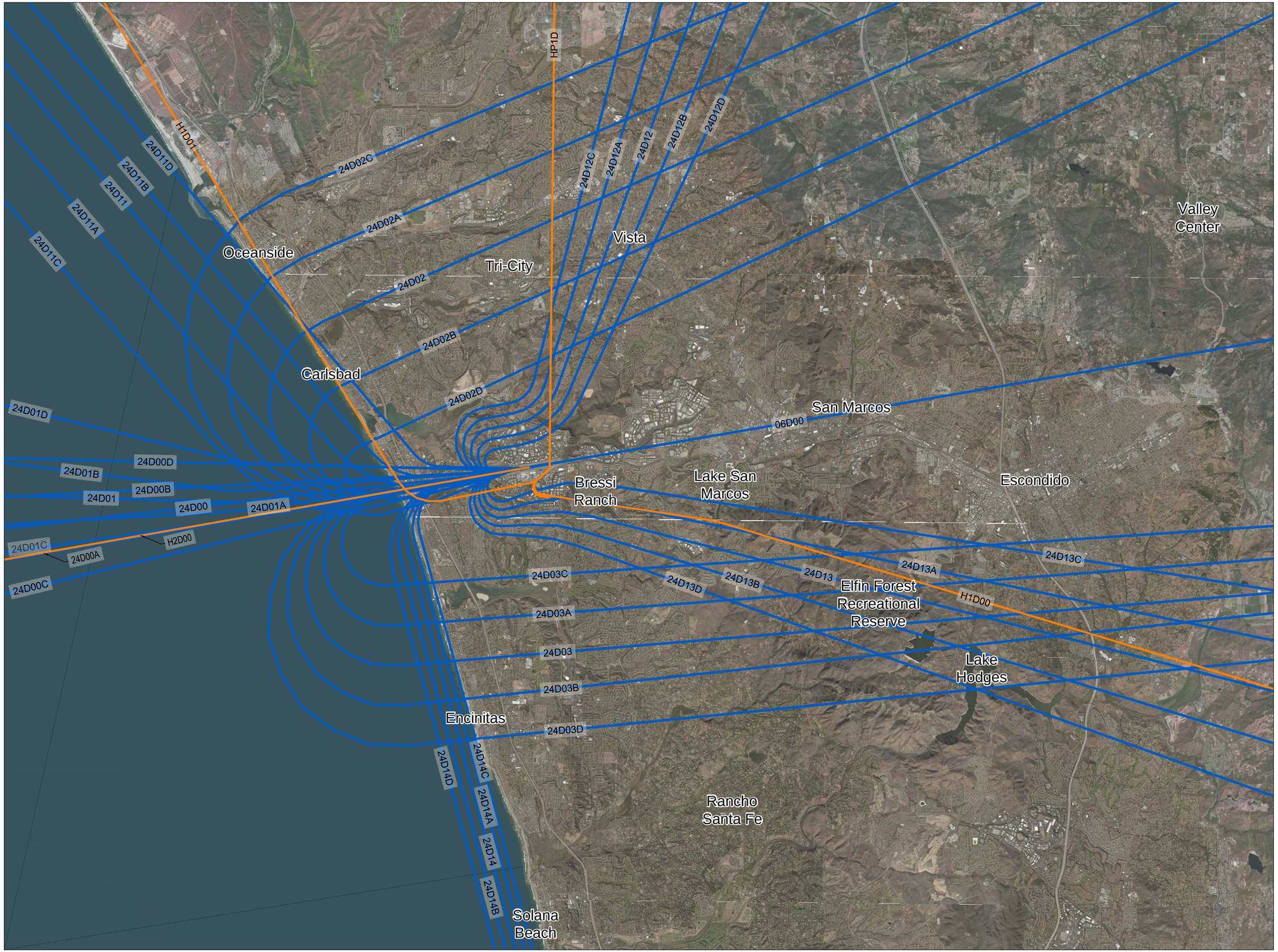
5000' 0' 5000' 10000'

C&S COMPANIES

McClellan-Palomar Airport Master Plan

Existing Arrival Flight Tracks

Figure 7



LEGEND

- Aircraft Departure Flight Track
- Helicopter Departure Flight Track

5000' 0' 5000' 10000'

C&S COMPANIES

McClellan-Palomar Airport Master Plan

Existing Departure Flight Tracks

Figure 8

Table 7 – Flight Track Allocation (Arrivals)

Track	Jets	Turboprop	Piston-Propeller	Track	Jets	Turboprop	Piston-Propeller
06A00	100%	100%	100%	**24A04B**	0.4%	0.5%	0.6%
24A00A	1.2%	1.0%	2.0%	**24A04C**	0.1%	0.1%	0.1%
24A00B	24.4%	5.3%	0.0%	**24A04D**	0.1%	0.1%	0.1%
24A00C	4.7%	2.0%	1.0%	**24A11**	1.6%	2.7%	18.0%
24A00D	5.9%	1.3%	3.3%	**24A11A**	0.4%	0.6%	4.3%
24A00E	6.7%	1.3%	2.0%	**24A11B**	0.4%	0.6%	4.3%
24A01	15.3%	28.3%	1.6%	**24A11C**	0.1%	0.2%	1.1%
24A01A	3.7%	6.8%	0.4%	**24A11D**	0.1%	0.2%	1.1%
24A01B	3.7%	6.8%	0.4%	**24A12**	0.0%	1.0%	14.8%
24A01C	0.9%	1.7%	0.1%	**24A12A**	0.0%	0.2%	3.5%
24A01D	0.9%	1.7%	0.1%	**24A12B**	0.0%	0.2%	3.5%
24A02	13.4%	17.3%	7.5%	**24A12C**	0.0%	0.1%	0.9%
24A02A	3.2%	4.2%	1.8%	**24A12D**	0.0%	0.1%	0.9%
24A02B	3.2%	4.2%	1.8%	**24A13**	0.0%	0.0%	5.2%
24A02C	0.8%	1.0%	0.5%	**24A13A**	0.0%	0.0%	1.3%
24A02D	0.8%	1.0%	0.5%	**24A13B**	0.0%	0.0%	1.3%
24A03	3.9%	4.3%	0.0%	**24A13C**	0.0%	0.0%	0.3%
24A03A	0.9%	1.0%	0.0%	**24A13D**	0.0%	0.0%	0.3%
24A03B	0.9%	1.0%	0.0%	**24A14**	0.0%	0.0%	7.9%
24A03B	0.9%	1.0%	0.0%	**24A14**	0.0%	0.0%	7.9%
24A03C	0.2%	0.3%	0.0%	**24A14A**	0.0%	0.0%	1.9%
24A03D	0.2%	0.3%	0.0%	**24A14B**	0.0%	0.0%	1.9%
24A04	1.6%	2.0%	2.3%	**24A14C**	0.0%	0.0%	0.5%
24A04A	0.4%	0.5%	0.6%	**24A14D**	0.0%	0.0%	0.5%

Source: 2016 ANOMS and C&S Engineers, Inc. 2017

Table 8 – Flight Track Allocation (Departures)

Track	Jets	Turboprop	Piston-Propeller	Track	Jets	Turboprop	Piston-Propeller
06D00	100%	100%	100%	**24D11**	0.0%	6.3%	22.5%
24D00	20.6%	10.3%	0.0%	**24D11A**	0.0%	1.5%	5.4%
24D00A	5.0%	2.5%	0.0%	**24D11B**	0.0%	1.5%	5.4%
24D00B	5.0%	2.5%	0.0%	**24D11C**	0.0%	0.4%	1.4%
24D00C	1.2%	0.6%	0.0%	**24D11D**	0.0%	0.4%	1.4%
24D00D	1.2%	0.6%	0.0%	**24D12**	1.2%	1.9%	16.3%
24D01	11.2%	32.2%	1.9%	**24D12A**	0.3%	0.4%	3.9%
24D01A	2.7%	7.7%	0.5%	**24D12B**	0.3%	0.4%	3.9%
24D01B	2.7%	7.7%	0.5%	**24D12C**	0.1%	0.1%	1.0%
24D01C	0.7%	1.9%	0.1%	**24D12D**	0.1%	0.1%	1.0%
24D01D	0.7%	1.9%	0.1%	**24D13**	0.0%	0.0%	6.9%
24D02	20.6%	6.9%	3.1%	**24D13A**	0.0%	0.0%	1.7%
24D02A	5.0%	1.6%	0.8%	**24D13B**	0.0%	0.0%	1.7%
24D02B	5.0%	1.6%	0.8%	**24D13C**	0.0%	0.0%	0.4%
24D02C	1.2%	0.4%	0.2%	**24D13D**	0.0%	0.0%	0.4%
24D02D	1.2%	0.4%	0.2%	**24D14**	2.5%	0.6%	8.1%
24D03	6.3%	4.4%	3.7%	**24D14A**	0.6%	0.1%	1.9%
24D03A	1.5%	1.0%	0.9%	**24D14B**	0.6%	0.1%	1.9%
24D03B	1.5%	1.0%	0.9%	**24D14C**	0.1%	0.0%	0.5%
24D03C	0.4%	0.3%	0.2%	**24D14D**	0.1%	0.0%	0.5%
24D03D	0.4%	0.3%	0.2%				

Source: 2016 ANOMS and C&S Engineers, Inc. 2017

Table 9 – Flight Track Allocation (Touch and Go)

Track	Piston-Propeller
06T00	100.0%
24T00	18.5%
24T01	28.0%
24T02	16.0%
24T03	21.0%
24T10	8.0%
24T11	8.5%

Source: 2016 ANOMS and C&S Engineers, Inc. 2017

Table 10 – Flight Track Allocation (Helicopters)

Track	R22	R44	EC35/H60
H1 - Arrival			
H1A00	54%	54%	0%
H1A01	5%	5%	0%
H1A02	2%	2%	0%
H1TA00	38%	38%	0%
H1 - Departure			
H1D00	45%	45%	0%
H1D01	17%	17%	0%
H1TD00	38%	38%	0%
Runway 24 - Arrival			
H2A00	0%	0%	100%
Runway 24 - Departure			
H2D00	0%	0%	100%

Source: 2016 ANOMS and C&S Engineers, Inc. 2017

Time of Day

The time of day an aircraft operation occurs at an airport plays a significant role in the size and shape of the CNEL noise contour as those that take place in the defined evening and nighttime periods are penalized in the CNEL noise metric. Any operation that occurs after 10:00 p.m. and before 6:59 a.m. is considered more intrusive and is penalized 10 dB. Therefore, the percentage of nighttime operations has a large influence on the CNEL noise contours. Similarly, any operation that occurs between 7:00 p.m. and 9:59 p.m. is penalized approximately 5 dB. Analysis of the 2016 ANOMS data was conducted to determine the actual time of day each operation was recorded at the Airport.

Under future conditions (2036) the time of day distribution for operations by aircraft type were kept similar to existing conditions (2016). For commercial operations not represented under existing conditions the time of day distribution was based on historical airline operations at the Airport. The percentage of operations in each time period for each aircraft type was calculated and provided on **Table 4** for Existing Conditions (2016) and **Table 11** for Future Conditions (2036).

Stage Length

Stage length is the distance an aircraft travels for each departure from a given airport to its final destination. In noise modeling, stage length is a surrogate for aircraft departure weight. Aircraft departure weight is important, as noise levels are higher for heavier aircraft of a given type. This is due to the decreased climb performance and higher thrust settings required by heavier aircraft. These factors do not apply to arriving aircraft.

The data used for this analysis includes standard AEDT aircraft weighing data based upon the average aircraft departure weights for given distances from the Airport to flight destinations. The AEDT includes different departure profiles based upon the departure procedures being used. The primary differences between departure profiles are aircraft engine thrust settings, flap configurations, airspeed, and climb gradient. Aircraft types and typical operations were examined to determine which of the departure profiles available in the AEDT best represent actual departure operations at the Airport. Based upon this analysis, the Standard AEDT departure profile and Stage Length 1 (flight length of 0-500 nautical miles) were used for all aircraft for the development of the noise contours under the existing conditions. While a review of the TFMSC data indicates that some operations may exceed 500 miles, the percentage of these operation in 2016 was determined to be insignificant and would have no impact on the shape and size of the noise contours.

Due to the increased runway length under the future conditions, this would allow heavier aircraft (i.e., carrying more fuel) to reach longer distances. As such, some commercial operations were given a Stage Length 2 (flight length of 0-1,000 nautical miles). For comparison, this stage length would be the equivalent of providing for a non-stop route capable of reaching as far as Denver International Airport.

Table 11 – Future Conditions (2036) Percent Operations by Time of Day

Aircraft Make/Model	Arrivals			Departures		
	Day	Evening	Night	Day	Evening	Night
Airline						
Bombardier 700	74%	21%	5%	74%	16%	11%
Embraer E-170	74%	21%	5%	74%	16%	11%
Bombardier Dash 8 Q200	74%	21%	5%	74%	16%	11%
Jet						
Bombardier Challenger 600	83%	13%	4%	88%	9%	3%
Cessna Citation Bravo	85%	9%	5%	90%	7%	4%
Cessna Citation CJ4	86%	11%	4%	90%	8%	3%
Cessna Citation Sovereign	82%	11%	7%	89%	7%	4%
Cessna Citation X	89%	7%	4%	91%	7%	2%
Dassault Falcon 2000	90%	7%	3%	89%	8%	3%
Dornier 328 Jet	89%	7%	4%	91%	7%	2%
Eclipse 500	79%	14%	7%	87%	9%	4%
Embraer 145	82%	15%	3%	89%	8%	3%
Gulfstream G450	82%	13%	5%	88%	8%	4%
Gulfstream GV/650	76%	15%	9%	83%	11%	6%
Learjet 70	84%	12%	4%	89%	8%	3%

Table 11 (cont.) – Future Conditions (2036) Operations by Time of Day

Aircraft Make/Model	Arrivals			Departures		
	Day	Evening	Night	Day	Evening	Night
Turboprop						
Cessna 208 Caravan	90%	8%	2%	91%	7%	2%
Dash 6	82%	14%	4%	88%	10%	3%
Embraer 120	73%	13%	14%	78%	14%	8%
Piaggio P.180 Avanti	81%	15%	4%	87%	10%	3%
Piper Meridian	84%	12%	4%	89%	9%	2%
Piston-Propeller						
Beechcraft Bonanza	92%	7%	1%	93%	6%	1%
Beechcraft Baron	90%	8%	2%	92%	7%	1%
Cessna 172	88%	10%	2%	90%	9%	1%
Cessna 182	94%	5%	1%	93%	6%	1%
Cessna 206	92%	6%	2%	94%	5%	1%
Cirrus SR22	92%	6%	2%	92%	6%	2%
GASEVP	92%	7%	1%	93%	6%	1%
Piper Warrior	87%	10%	3%	89%	9%	2%
Helicopter						
Eurocopter 135	83%	6%	11%	78%	11%	11%
Robinson R22	94%	6%	0%	92%	8%	0%
Robinson R44	94%	6%	0%	92%	8%	0%
Sikorsky SH-60 Seahawk	70%	12%	18%	71%	14%	15%

Source: 2016 ANOMS and C&S Engineers, Inc. 2017

Section 2—Noise Sensitive Land Uses (NSLU) Affected by Airborne Noise

2.1 Guidelines for the Determination of Significance

The airport property and the surrounding area are located within the boundaries of the City of Carlsbad. The Airport is owned and operated by the County. Further, the County is the CEQA lead agency for the Proposed Project and responsible for determining the significance thresholds that would apply. Because neither the County nor City of Carlsbad guidelines identify how to analyze aircraft noise, impacts will be assessed using established FAA methodology as outlined in FAA Order 1050.1F. In addition, for any ground, traffic, or other operational-related noise emissions, County guidelines will apply. The following summarizes the relevant noise related policies that are applicable to the Proposed Project. A discussion of the City of Carlsbad guidelines and Airport Land Use Compatibility Plan (ALUCP) noise criteria are also provided for reference.

FAA Order 1050.1F

Policies and procedures for evaluating the environmental impacts associated with airport developments are described in FAA Order 1050.1F. The noise analysis related policies and procedures are presented in Appendix B of the Order. These requirements are also included in the *FAA Order 1050.1F Desk Reference*[11], which provides comprehensive guidance regarding the analysis of impacts in specific environmental impact categories.

For aviation noise analyses, the FAA has determined that the 24-hour cumulative exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level as FAA's primary metric. However, the FAA recognizes CNEL as an alternative metric that may be used for airport actions in California.

Analysis must be conducted through the use of modeled noise contours along with local land use information and general guidance contained in Appendix A of 14 Code of Federal Regulations (CFR) Part 150. As a means of implementing the Aviation Safety and Noise Abatement Act, the FAA adopted Regulations on Airport Noise Compatibility Planning Programs. These regulations are spelled out under 14 CFR Part 150 and include published noise and land use compatibility charts (see **Table 12**) to be used for land use planning with respect to aircraft noise.

Compatible or non-compatible land uses are determined by comparing the aircraft CNEL values at a site to the values in the FAR Part 150 land use compatibility guidelines (**Table 12**). Per FAA standards, a significant noise impact would occur if the analysis shows that the

[11] FAA Order 1050.1F Desk Reference, July 2015.

proposed project will cause NSLUs to experience an increase in noise of 1.5 dB or more at above CNEL 65 dB noise exposure when compared to the baseline condition. For example, if the Proposed Project results in an increase in noise levels over a NSLU, as defined in **Table 12** (i.e. residential home), to increase from 65.5 dB to 67 dB it is considered a significant impact, as is an increase from 63.5 dB to 65 dB.

Table 12 – Federal Aviation Regulation Part 150 Land Use Guidelines

Land Use	Yearly Day-Night Average Sound Level (dB)					
	<65	65-70	70-75	75-80	80-85	>85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N[1]	N[1]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
Public Use						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade—general	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y[2]	Y[3]	Y[4]	N	N
Photographic and optical	Y	25	30	N	N	N
Agriculture (except livestock) and forestry	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]	Y[8]
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y[5]	Y[5]	N	N	N	N
Outdoor music shells, amphitheaters	N	N	N	N	N	N
Nature exhibits and zoos	Y	N	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	N	N	N	N
Golf courses, riding stables and water recreation	Y	25	30	N	N	N

Table 12 (cont.) – Federal Aviation Regulation Part 150 Land Use Guidelines

Table Key:

Y (Yes)=Land Use and related structures compatible without restrictions.
N (No)=Land Use and related structures are not compatible and should be prohibited.
NLR=Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35=Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

Notes:

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal level is low.

(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

Disclaimer

The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

Source: FAA Aviation Circular 150/5020-1 (August 5, 1983)

Federal Interagency Committee on Noise Report of 1992

The use of the CNEL or DNL metric and the 65 dB criteria have been reviewed by various interest groups in order to assess its usefulness in assessing aircraft noise impacts. At the direction of the Environmental Protection Agency (EPA) and the FAA, the Federal Interagency Committee on Noise (FICON) was formed to review specific elements of the assessment of airport noise impacts and to make recommendations regarding potential improvements. FICON includes representatives from the Departments of Transportation, Defense, Justice, Veterans Affairs, Housing and Urban Development, the EPA, and the Council on Environmental Quality.

FICON was formed to review federal policies used to assess airport noise impacts and on the manner in which noise impacts are determined. This included whether aircraft noise impacts are fundamentally different from other transportation noise impacts; the manner in which noise impacts are described; and the extent to which impacts outside of 65 DNL should be reviewed in federal environmental impact statements.

The committee determined that there are no new descriptors or metrics of sufficient scientific standing to substitute for DNL or CNEL. The noise exposure metric and the dose-response relationships used to determine noise impact were determined to be proper for assessing noise from civil and military aviation in the general vicinity of airports. The report supported agency discretion in the use of supplemental noise analysis. The report recommended improvement in public understanding of the metric, supplemental methodologies, and aircraft noise impacts.

The report endorsed and expanded traditional FAA environmental screening criteria for potential airport noise impacts. FICON recommended that if screening analysis determines noise-sensitive areas at or above 65 dB DNL show an increase of DNL 1.5 dB or more, then further analysis should be conducted of noise sensitive areas between DNL 60-65 dB having an increase of DNL 3 dB or more.

County of San Diego – Noise Compatibility Guidelines and Noise Standards

The County's Noise Compatibility Guidelines and Noise Standards are presented in Chapter 8 (Noise Element) of the County's General Plan. According to Table N-1 of the Noise Element, the County has established outdoor noise standards of 60 CNEL for single-family, mobile home, senior housing, and convalescent home residential uses. The exterior noise standard for all other residential uses and churches is 65 CNEL. The County has also established an interior noise standard of 45 CNEL for all residential uses.

In addition, the County' has developed and published Guidelines for Determining Significance for noise[12].These significance thresholds are applicable for ground-level noise sources (e.g. traffic, industrial sources, amphitheaters) and are not applied to aviation noise sources.

McClellan-Palomar Airport Land Use Compatibility Plan

Airport Land Use Commissions (ALUC) were created by State of California Government Code Section 65302(f) and Section 4605.1 of the Health and Safety Code for the purpose of establishing a regional level of land use compatibility between airports and their surrounding environs. The San Diego County Regional Airport Authority acts as the County's ALUC. The Commission has adopted ALUCPs for County airports including McClellan-Palomar Airport, which was adopted in 2010 and amended in 2011[13].

The ALUCP provides compatibility policies and criteria applicable to local agencies in their preparation or amendment of general plans and to landowners in their design of new development. Projects located within the Airport Influence Area (AIA) of an adopted ALUCP are subject to specific criteria. From a noise compatibility standpoint, the ALUCPs establish noise/land use acceptability criteria for sensitive land uses at 65 CNEL for outdoor areas and 45 CNEL for indoor areas of residential land uses. These criteria are outlined under Chapter 3 of the ALUCP.

As part of the ALUCP, policies were established to specifically address potential noise impacts to areas surrounding the Airport. Included in the ALUCP analysis was the development of noise contours that reflected annual operations anticipated under the previous Airport Master Plan. Using the noise contours, policies (2.11.5 Avigation Easement Dedication) were adopted restricting noise sensitive development within the 65 CNEL noise contour without providing the County with an avigation easement allowing the right of flight in the airspace above the property.

City of Carlsbad

The City of Carlsbad's Noise Element is included in Chapter 5 of the City's General Plan. In addition, the City has published a Noise Guidelines Manual that provides further guidance in applying the policies and standards of the Noise Element.

The City's Noise Element specifies the 65 CNEL as the exterior noise exposure level allowable for residential uses in a mixed-use project and for residential uses within the Airport AIA, pursuant to the noise compatibility policies contained in the ALUCP. Similar to

[12] County of San Diego, Land Use and Environment Group, Guidelines for Determining Significance, Noise, First Revision, January 27, 2009.

[13] San Diego County Airport Land Use Commission, McClellan-Palomar Airport Land Use Compatibility Plan, Amended December 1, 2011.

the County noise standards and the ALUCP, interior noise levels should be mitigated to 45 CNEL when openings to the exterior of the residence are open or closed.

For new nonresidential development, it must comply with the noise compatibility criteria set forth in the Airport's ALUCP. The City will require dedication of avigation easements for new developments designated as conditionally compatible for noise in the ALUCP, and which are located within the 65 CNEL noise contour published in the ALUCP and included in the General Plan.

2.2 Potential Noise Impacts

This section discusses the potential noise impacts from the Proposed Project. As discussed, potential noise impacts created by the Proposed Project will be evaluated based on FAA Order 1050.1F guidance as the County or City guidelines do not contain thresholds for aircraft noise.

2.2.1 Potential Build-out Noise Conditions & Impacts

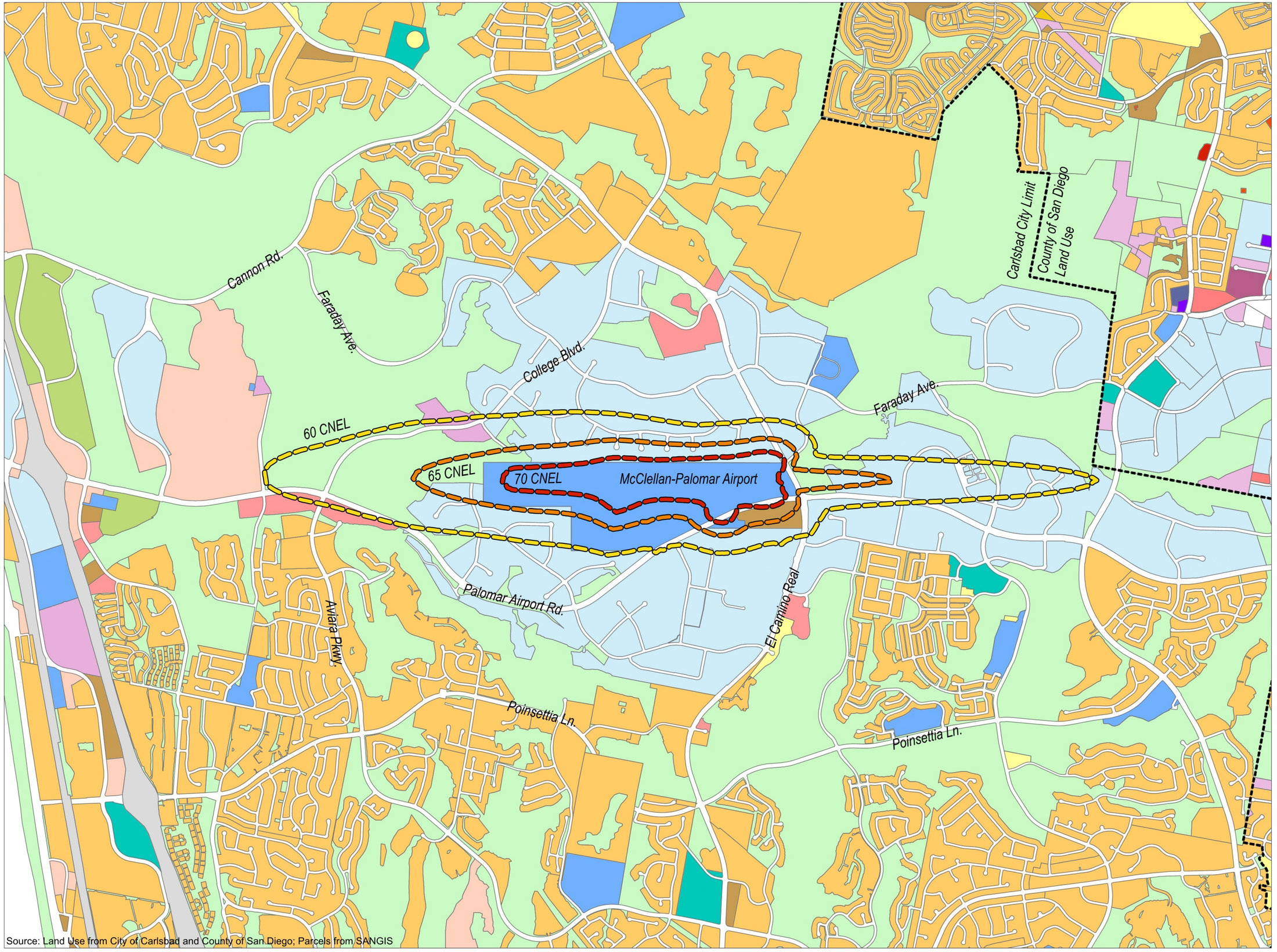
As discussed in Section 1.3.3, this study includes analysis of three different forecast scenarios: Forecasted Growth – 180,450 aircraft operations, PAL 1 – 195,050 aircraft operations and PAL 2 – 208,004 aircraft operations. In accordance with FAA criteria, the impact analysis was conducted by comparing the noise exposure areas modeled for the future no-project conditions versus the future proposed project conditions.

The results of the future proposed project conditions (scenario Forecasted Growth) noise modeling for aircraft operations are presented on **Figure 9** and **Table 13**. **Figure 9** shows the 70 CNEL, 65 CNEL and 60 CNEL contours over the existing land uses surrounding the Airport.

Table 13 – Future Conditions (2036) Proposed Project (Forecasted Growth) Noise Exposure

Noise Exposure (dB CNEL)	Area (acres)
60-65	513.3
65-70	186.4
>70	138.3
Total ≥60	**838.0**

Source: C&S Engineers, Inc. 2017



Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use

- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

County of San Diego Land Use

- Communications/Utilities
- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Future Noise Contours

- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour

1000' 0' 1000' 2000'

McClellan-Palomar Airport Master Plan

Future Conditions (2036) Proposed Project (Forecasted Growth) Noise Contours

Figure 9

The identification of noise-sensitive land uses is based on the noise and land use compatibility criteria outlined in **Table 12**. As directed by FAA guidance, all noise impacts were calculated by a combination of the noise contours set with Geographic Information System generated land use mapping. The underlying land use map used for the analysis was based on 2016 data provided by the City of Carlsbad.

Table 14 presents the increases in the noise exposure areas that are anticipated to occur with implementation of the Proposed Project under Future Conditions (2036) Forecasted Growth when compared to Future Conditions (2036) No Project conditions.

Table 14 – Change in CNEL Noise Exposure Area under Forecasted Growth (acres)

Noise Exposure (dB CNEL)	Future No Project Conditions (2036)	Future Proposed Project Conditions (2036) – Forecasted Growth	Increase Due to Project
60-65	522.5	513.3	-9.3
65-70	189.6	186.4	-3.3
>70	130.9	138.3	7.4
Total ≥60	**843.0**	**838.0**	**-5.1**

Source: C&S Engineers, Inc. 2017

The results of the future proposed project conditions (scenario PAL 1) noise modeling for aircraft operations are presented on **Figure 10** and **Table 15**. **Figure 10** shows the 70 CNEL, 65 CNEL and 60 CNEL contours over the existing land uses surrounding the Airport.

Table 15 – Future Conditions (2036) Proposed Project (PAL 1) Noise Exposure

Noise Exposure (dB CNEL)	Area (acres)
60-65	656.8
65-70	231.7
>70	156.5
Total ≥60	**1,045.0**

Source: C&S Engineers, Inc. 2017

Cannon Rd.
Faraday Ave.
College Blvd.
Faraday Ave.
Carlsbad City Limit
County of San Diego Land Use
60 CNEL
65 CNEL
70 CNEL
McClellan-Palomar Airport
Palomar Airport Rd.
Aviara Pkwy.
El Camino Real
Poinsettia Ln.
Poinsettia Ln.

Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use
- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

County of San Diego Land Use
- Communications/Utilities
- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Future Noise Contours
- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour

1000' 0' 1000' 2000'

McClellan-Palomar Airport Master Plan

Future Conditions (2036)
Proposed Project (PAL 1)
Noise Contours

Figure 10

Table 16 presents the increases in the noise exposure areas that are anticipated to occur with implementation of the Proposed Project under Future Conditions (2036) PAL 1.

Table 16 – Change in CNEL Noise Exposure Area under PAL 1 (acres)

Noise Exposure (dB CNEL)	Future No Project Conditions (2036)	Future Proposed Project Conditions (2036) – PAL 1	Increase Due to Project
60-65	522.5	656.8	134.2
65-70	189.6	231.7	42.1
>70	130.9	156.5	25.6
Total ≥60	**843.0**	**1,045.0**	**201.9**

Source: C&S Engineers, Inc. 2017

The results of the future proposed project conditions (scenario PAL 2) noise modeling for aircraft operations are presented on **Figure 11** and **Table 17**. **Figure 11** shows the 70 CNEL, 65 CNEL and 60 CNEL contours over the existing land uses surrounding the Airport.

Table 17 – Future Conditions (2036) Proposed Project (PAL 2) Noise Exposure

Noise Exposure (dB CNEL)	Area (acres)
60-65	790.1
65-70	272.3
>70	173.7
Total ≥60	**1,236.2**

Source: C&S Engineers, Inc. 2017

Table 18 presents the increases in the noise exposure areas that are anticipated to occur with implementation of the Proposed Project under Future Conditions (2036) PAL 2.

Table 18 – Change in CNEL Noise Exposure Area under PAL 2 (acres)

Noise Exposure (dB CNEL)	Future No Project Conditions (2036)	Future Proposed Project Conditions (2036) – PAL 2	Increase Due to Project
60-65	522.5	790.1	267.6
65-70	189.6	727.3	82.7
>70	130.9	173.7	42.8
Total ≥60	**843.0**	**1,236.2**	**393.1**

Source: C&S Engineers, Inc. 2017

Cannon Rd.
Faraday Ave.
College Blvd.
60 CNEL
65 CNEL
70 CNEL
McClellan-Palomar Airport
Faraday Ave.
Carlsbad City Limit
County of San Diego Land Use
Palomar Airport Rd.
Aviara Pkwy.
Poinsettia Ln.
El Camino Real
Poinsettia Ln.

Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use
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- Residential

County of San Diego Land Use
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- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Future Noise Contours
- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour

1000' 0' 1000' 2000'

McClellan-Palomar Airport Master Plan

Future Conditions (2036) Proposed Project (PAL 2) Noise Contours

Figure 11

As discussed in Section 2.1, the significance of noise impacts are based on a comparison of the projected increase in noise levels caused by the Proposed Project to the future No Project conditions. Noise impacts are considered significant when the Proposed Project would result in increased noise levels by more than 1.5 dB in areas exposed to noise levels at or above 65 CNEL. Per FAA guidance, where an airport improvement project has a potentially significant impact on noise sensitive areas (i.e., a 1.5 dB or more noise increase within the defined CNEL 65 dB noise contour), the noise analysis should further evaluate potential increases of 3 dB and greater between CNEL 60 and 65.

The maximum anticipated noise increase would occur under the Proposed Project (PAL 2) scenario. The Proposed Project (PAL 2) 65 CNEL contour extends over Planned Industrial and Open Space land use, located just north and east of the airport property. These land uses are not defined by the FAA or ALUCP as noise sensitive. Therefore, there are no noise sensitive uses that would be exposed to noise levels at or above 65 CNEL and result in an increase of 1.5 dB or greater (as shown on **Figures 9, 10** and **11)**. See **Figure 12**, **13** and **14** for a comparison of noise levels from the future No Project conditions versus the future with Proposed Project scenarios. The analysis shows that the Proposed Project will shift the 65 CNEL noise contour north, further away from noise sensitive land uses located south of Palomar Airport Road. **Appendix C** includes a comparison of the exiting 2016 conditions versus the future proposed project conditions for the PAL 2 scenario.

As a result, the Proposed Project will not result in significant noise level increases greater than the thresholds identified under FAA Order 1050.1F over noise sensitive land uses. Therefore, the Proposed Project will not result in a significant noise impact.

As discussed above, the significance of noise impacts are based on a comparison of the projected increase in noise levels caused by the Proposed Project to the future No Project conditions. However, for informational purposes, the following discussion also includes analysis comparing the highest planning scenario (PAL 2) to existing conditions (2016). Based on the Master Plan Update, the PAL 2 scenario identifies a maximum forecast of 208,004 annual aircraft operations. Further, the Master Plan Update deduced that natural growth of aviation activity at the Airport without any commercial airline activity would total 180,450[14]. This means the difference of 27,554 annual operations would occur as a result of the PAL 2 planning scenario. When combined with existing conditions (149,029), the total would equal 176,583 annual aircraft operations. A comparison of the Project noise contour under existing conditions is illustrated in Figure 15. Despite this increase in aircraft operations, there are no noise sensitive land uses that would be exposed to noise levels at or above 65 CNEL. Furthermore, this number of operations would still be below the noise

[14] The Airport Master Plan Update calculates that PAL 2 would result in 180,264 annual operations without commercial activity. However, for the purposes of this technical report, the PAL 1 forecast of 180,450 was used since it represents the highest planning scenario.

contours associated with the maximum planning scenario (PAL 2) in 2036, which similarly concluded that the Project would not expose noise sensitive uses at or above 65 CNEL to result in an increase of 1.5 dB or greater.

Table 19 – Existing Conditions (2016) Noise Exposure with Project (PAL 2)

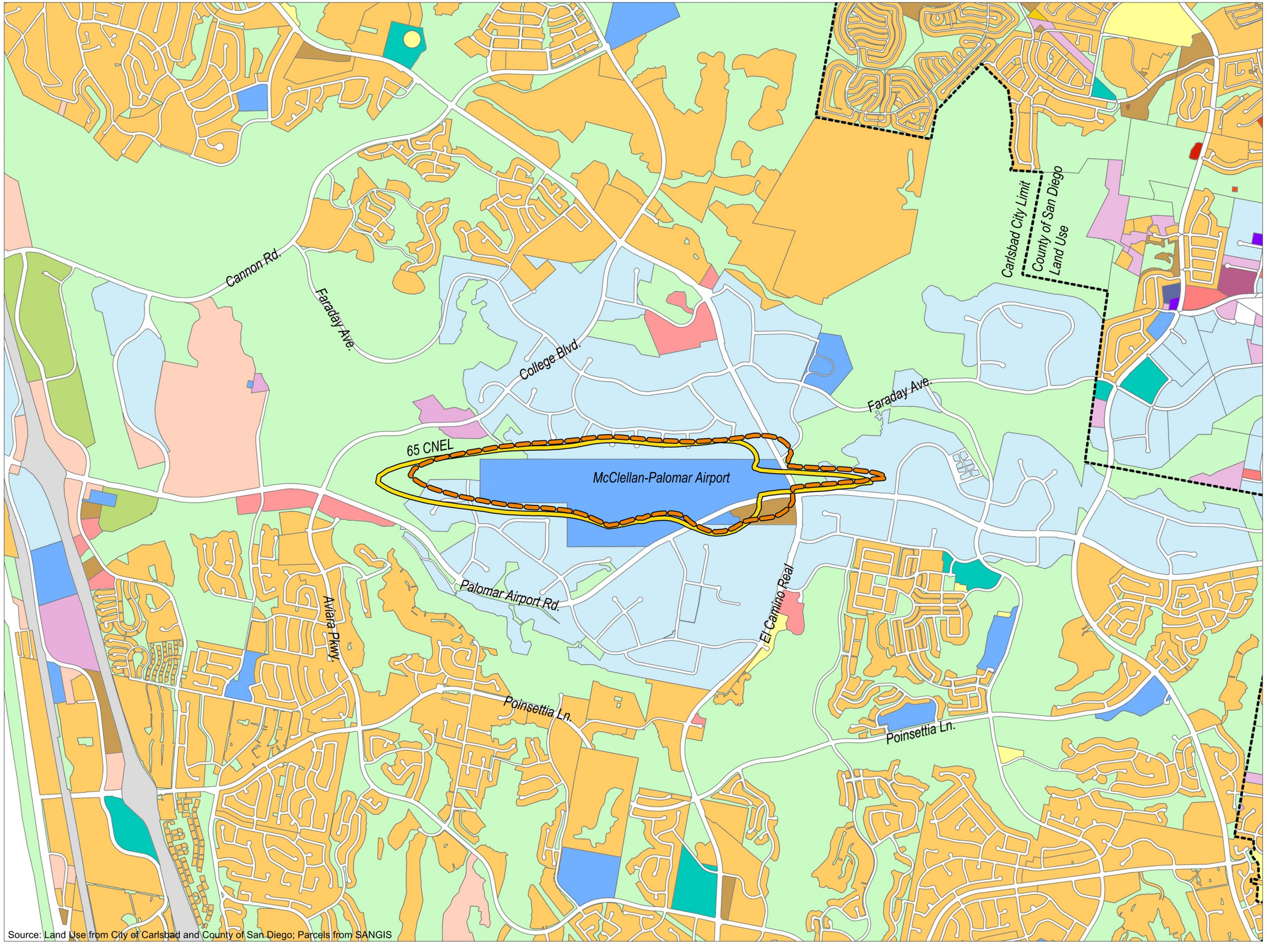
Noise Exposure (dB CNEL)	Area (acres)
60-65	649.1
65-70	229.6
>70	153.1
Total ≥60	**1,031.7**

Source: C&S Engineers, Inc. 2017

Ground-Level Noise

The closest signalized intersections to the Proposed Project are located at Palomar Airport Road/Yarrow Drive and Palomar Airport Road/El Camino Real. As noted, the forecasted increase in on-road vehicular trips to and from the Airport would occur regardless whether the Proposed Project is constructed. As noted on **Figure 3**, the closest noise sensitive receptor (Bressi Ranch) is located over a quarter-mile from the Airport.

The forecasted increase in vehicle traffic trips to and from the Airport would progressively take place over the 20-year planning period, dependent upon the forecasted increase in commercial aircraft operations. Although, there is an anticipated increase in the use of ground support equipment to service commercial airline operations their use is limited to aircraft movement areas and would have no impact to noise sensitive receptors. The majority of GSE operating at the airport are electric and make little to noise footprint when operated.



City of Carlsbad Land Use

- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

County of San Diego Land Use

- Communications/Utilities
- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Future No-Project

- 65 CNEL Contour

Future With Proposed Project

- 65 CNEL Contour

1000' 0' 1000' 2000'

McClellan-Palomar Airport Master Plan

Future No-Project and Proposed Project Noise Contour Comparison (Forecasted Growth)

Figure 12

Cannon Rd.
Faraday Ave.
College Blvd.
Faraday Ave.
Carlsbad City Limit
County of San Diego Land Use
65 CNEL
McClellan-Palomar Airport
Palomar Airport Rd.
Aviara Pkwy.
El Camino Real
Poinsettia Ln.
Poinsettia Ln.

Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use

- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

County of San Diego Land Use

- Communications/Utilities
- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Future No-Project

- 65 CNEL Contour

Future With Proposed Project

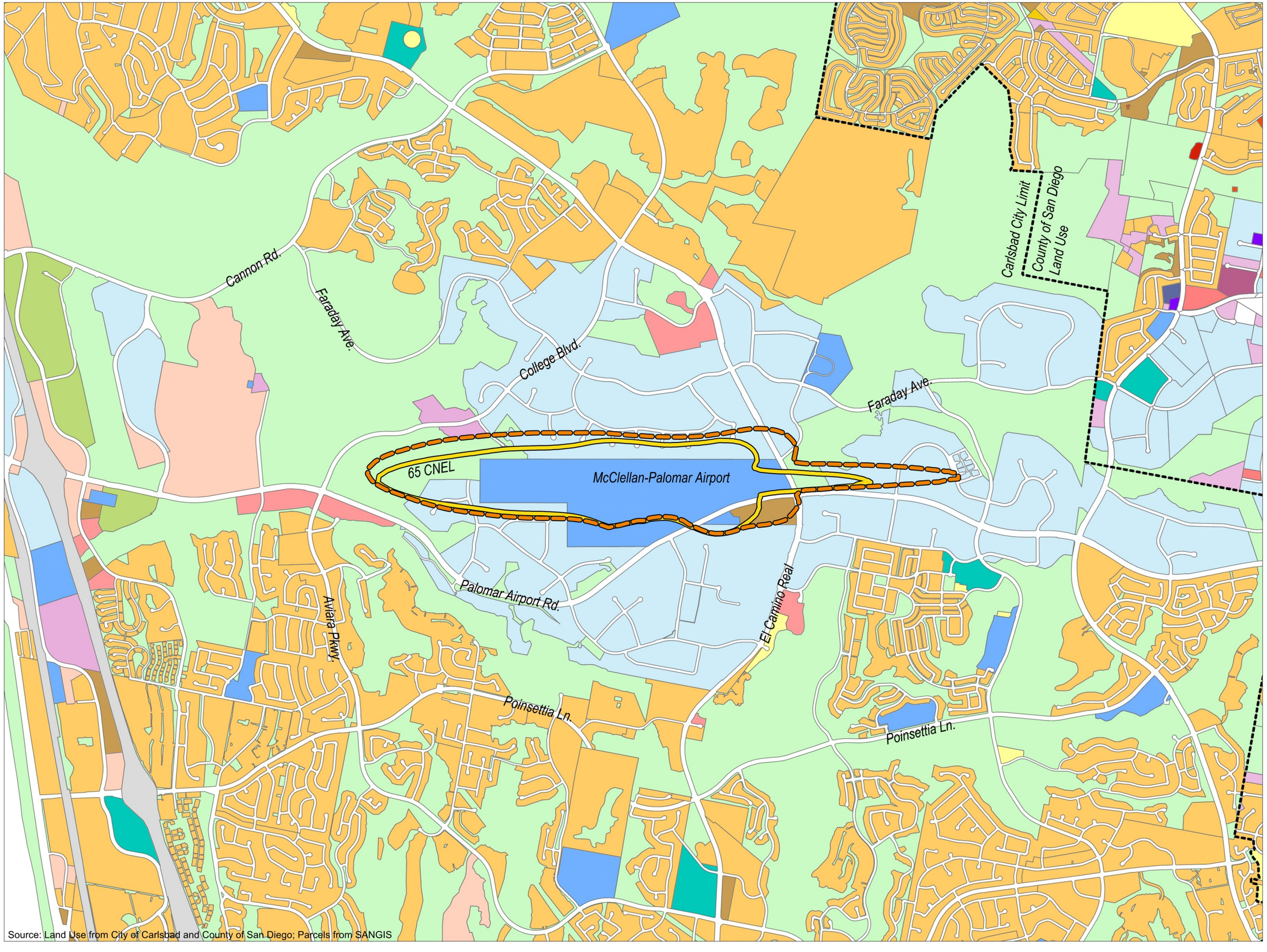
- 65 CNEL Contour

1000' 0' 1000' 2000'

McClellan-Palomar Airport Master Plan

Future No-Project and Proposed Project Noise Contour Comparison (PAL 1)

Figure 13



Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use

- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

County of San Diego Land Use

- Communications/Utilities
- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Future No-Project

- 65 CNEL Contour

Future With Proposed Project

- 65 CNEL Contour

1000' 0' 1000' 2000'

McClellan-Palomar Airport Master Plan

Future No-Project and Proposed Project Noise Contour Comparison (PAL 2)

Figure 14

Cannon Rd.
Faraday Ave.
College Blvd.
Faraday Ave.
Carlsbad City Limit
County of San Diego Land Use
60 CNEL
65 CNEL
70 CNEL
McClellan-Palomar Airport
Palomar Airport Rd.
Aviara Pkwy.
El Camino Real
Poinsettia Ln.
Poinsettia Ln.

Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use
- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

County of San Diego Land Use
- Communications/Utilities
- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Future Noise Contours
- 60 CNEL Contour
- 65 CNEL Contour
- 70 CNEL Contour

1000' 0' 1000' 2000'

C&S COMPANIES

McClellan-Palomar Airport Master Plan

Existing Conditions with Proposed Project (PAL2)

Figure 15

Section 3—Cumulative Noise Impacts

Under Section 15355 of the CEQA Guidelines, "cumulative impacts" are defined as individual effects which, when considered together, are considerable, or which compound or increase other environmental impacts. In order for two noise sources to result in a cumulative impact, the noise levels generated by each source need to generate similar levels that are just below or exceeding an applicable noise standard. Based on the County Guidelines for the Determination of Significance, this is most likely to occur in locations where existing noise levels are elevated or approach the applicable criterion of 60 dB CNEL for an exterior noise sensitive land use.

Figures 5 and **10** show that there are no noise-sensitive land uses located within the 60 CNEL contours under Existing Conditions (2016) or Future Conditions (2036) PAL 1 scenarios. Under the Future Conditions (2036) PAL 2 scenario the 60 CNEL does extend slightly over areas that have been designated as Residential land use (see **Figure 11**). However, there are no residential structures located within in these areas and portions located west of Aviara Parkway are actually being used as commercial space. See **Figure C2** in **Appendix C** for a more detailed look at the land use in this area.

A review of the City of Carlsbad's General Plan specified that there are no changes to the land uses surrounding the Airport, indicating that there are no anticipated major developments within close proximity (<1 mile) to the Airport which will be kept as open space and planned industrial. The closest new residential development (Uptown Bressi), which is currently under construction, is located approximately one mile from the approach end of Runway 24 and located outside of the 60 CNEL noise contour (see **Figure 3**). There are no future projects proposed that would locate noise sensitive land uses within the 60 CNEL noise contour modeled for the Future Conditions (2036) PAL 1 and PAL 2 scenarios, presented on **Figures 10** and **11**. For these reasons, the Proposed Project would not result in cumulatively significant noise level increases when combined with foreseeable projects. Therefore, the Proposed Project will not result in a significant cumulative noise impact when considered with other noise sources in the area.

Section 4—Summary of Project Impacts, Design Considerations, Mitigation and Conclusion

As discussed in Sections 2 and 3, the Proposed Project is not anticipated to result in unavoidable significant noise impacts. Therefore, no mitigation is required.

Section 5—Certification

C&S Engineers, Inc.
Ralph Redman, Managing Planner
Kara Young, Planner
Jake Shurer, Planner

RS&H, Inc.
David Full, Vice President, Aviation Environmental Service Group
Nick Kozlik, Aviation Environmental Specialist

Organizations Contacted
Federal Aviation Administration (FAA) – AEDT Helpdesk

Section 6—References

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U.S. EPA. (1974). Information on Levels on Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Martin of Safety (EPA 550/9-74-004). Office of Noise Abatement and Control. Washington DC: U.S. Environmental Protection Agency.

U.S. Department of Transportation, Federal Aviation Administration. (2007). Integrated Noise Model (INM) Version 7 User Guide.

U.S. Department of Transportation, Federal Aviation Administration Order 5100.38C Airport Improvement Program Handbook, June 28, 2005. (With Replacement Paragraph 812 included in [29])

Appendix A – AEDT Noise Analysis

Prepared by C&S Engineer, Inc. 2017

Study Input Report

Study Information

Report Date:	11/29/2017 2:30:05 PM
Study Name:	Palomar
Description:	McClellan-Palomar Airport
Study Type:	NoiseAndEmissions
Mass Units:	Kilograms
Use Metric Units:	No

Study Database Information

Study Database Version: 1.54.2

Airport Layouts

Layout Name:	Future
Airport Name:	MC CLELLAN-PALOMAR
Airport Codes:	CLD, CRQ, KCRQ
Airport Description:	
Country:	US
State:	CALIFORNIA
City:	CARLSBAD
Latitude:	33.128250 degrees
Longitude:	-117.280083 degrees
Elevation:	331 feet
Runway:	06/24
Length:	4896 feet
Width:	150 feet
Runway End:	06
Latitude:	33.126987 degrees
Longitude:	-117.287922 degrees
Threshold Elevation:	330.6 feet
Approach Displaced Threshold:	297 feet
Departure Displaced Threshold:	0 feet
Crossing Height:	35 feet
Glide Slope:	3 deg
Effective Date:	1/1/1900
Expiration Date:	6/6/2079
Percent Wind:	0%
Runway End:	24
Latitude:	33.129522 degrees
Longitude:	-117.272214 degrees
Threshold Elevation:	0 feet
Approach Displaced Threshold:	n/a
Departure Displaced Threshold:	0 feet
Crossing Height:	53 feet
Glide Slope:	3.20000004768372 deg
Effective Date:	1/1/1900
Expiration Date:	6/6/2079
Percent Wind:	0%
Runway:	HP-1
Length:	0 feet

```
   Width:            0 feet
   Runway End:       HP-1
     Latitude:                    33.128024 degrees
     Longitude:                  -117.272434 degrees
     Threshold Elevation:           n/a
     Approach Displaced Threshold:  n/a
     Departure Displaced Threshold: n/a
     Crossing Height:          n/a
     Glide Slope:              n/a
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              HP-2
   Length:           0 feet
   Width:            0 feet
   Runway End:       HP-2
     Latitude:                    33.128250 degrees
     Longitude:                  -117.280083 degrees
     Threshold Elevation:           n/a
     Approach Displaced Threshold:  n/a
     Departure Displaced Threshold: n/a
     Crossing Height:          n/a
     Glide Slope:              n/a
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              FUT_06/FUT_24
   Length:           4896 feet
   Width:            150 feet
   Runway End:       FUT_06
     Latitude:                    33.127320 degrees
     Longitude:                  -117.288014 degrees
     Threshold Elevation:           0 feet
     Approach Displaced Threshold:  253.5863 feet
     Departure Displaced Threshold: 0 feet
     Crossing Height:          35 feet
     Glide Slope:              3 deg
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
   Runway End:       FUT_24
     Latitude:                    33.130270 degrees
     Longitude:                  -117.269738 degrees
     Threshold Elevation:           0 feet
     Approach Displaced Threshold:  246.5928 feet
     Departure Displaced Threshold: 0 feet
     Crossing Height:          53 feet
     Glide Slope:              3.20000004768372 deg
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              FUT_HP-1
   Length:           0 feet
   Width:            0 feet
   Runway End:       FUT_HP-1
     Latitude:                    33.128024 degrees
     Longitude:                  -117.272434 degrees
     Threshold Elevation:           n/a
     Approach Displaced Threshold:  n/a
     Departure Displaced Threshold: n/a
```

```
     Crossing Height:          n/a
     Glide Slope:              n/a
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              FUT_HP-2
   Length:           0 feet
   Width:            0 feet
   Runway End:       FUT_HP-2
     Latitude:                    33.128250 degrees
     Longitude:                  -117.280083 degrees
     Threshold Elevation:            n/a
     Approach Displaced Threshold:   n/a
     Departure Displaced Threshold:  n/a
     Crossing Height:          n/a
     Glide Slope:              n/a
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Gate:                FUT_GSE_Gate
     Latitude:       33.126903
     Longitude:      -117.278735
   Elevation:        0 feet
   Aircraft Size:    ANY
   SigmaY0:          n/a
   SigmaZ0:          n/a
   Release Height:   0 feet

Layout Name:         KCRQ
Airport Name:        MC CLELLAN-PALOMAR
Airport Codes:       CLD, CRQ, KCRQ
Airport Description:
Country:             US
State:               CALIFORNIA
City:                CARLSBAD
Latitude:            33.128250 degrees
Longitude:           -117.280083 degrees
Elevation:           331 feet
Runway:              06/24
   Length:           4896 feet
   Width:            150 feet
   Runway End:       06
     Latitude:                    33.126987 degrees
     Longitude:                  -117.287922 degrees
     Threshold Elevation:            0 feet
     Approach Displaced Threshold:   297 feet
     Departure Displaced Threshold:  0 feet
     Crossing Height:          35 feet
     Glide Slope:              3 deg
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
   Runway End:       24
     Latitude:                    33.129522 degrees
     Longitude:                  -117.272214 degrees
     Threshold Elevation:            0 feet
     Approach Displaced Threshold:   n/a
     Departure Displaced Threshold:  0 feet
     Crossing Height:          53 feet
     Glide Slope:              3.20000004768372 deg
```

```
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              HP-1
   Length:           0 feet
   Width:            0 feet
   Runway End:       HP-1
     Latitude:                  33.128024 degrees
     Longitude:                -117.272434 degrees
     Threshold Elevation:          n/a
     Approach Displaced Threshold:   n/a
     Departure Displaced Threshold:  n/a
     Crossing Height:          n/a
     Glide Slope:              n/a
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              HP-2
   Length:           0 feet
   Width:            0 feet
   Runway End:       HP-2
     Latitude:                  33.128250 degrees
     Longitude:                -117.280083 degrees
     Threshold Elevation:          n/a
     Approach Displaced Threshold:   n/a
     Departure Displaced Threshold:  n/a
     Crossing Height:          n/a
     Glide Slope:              n/a
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              FUT_06/FUT_24
   Length:           4896 feet
   Width:            150 feet
   Runway End:       FUT_06
     Latitude:                  33.127320 degrees
     Longitude:                -117.288014 degrees
     Threshold Elevation:          0 feet
     Approach Displaced Threshold:   253.5863 feet
     Departure Displaced Threshold:  0 feet
     Crossing Height:          35 feet
     Glide Slope:              3 deg
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
   Runway End:       FUT_24
     Latitude:                  33.130270 degrees
     Longitude:                -117.269738 degrees
     Threshold Elevation:          0 feet
     Approach Displaced Threshold:   246.5928 feet
     Departure Displaced Threshold:  0 feet
     Crossing Height:          53 feet
     Glide Slope:              3.20000004768372 deg
     Effective Date:           1/1/1900
     Expiration Date:          6/6/2079
     Percent Wind:             0%
Runway:              FUT_HP-1
   Length:           0 feet
   Width:            0 feet
   Runway End:       FUT_HP-1
```

```
        Latitude:                    33.128024 degrees
        Longitude:                  -117.272434 degrees
        Threshold Elevation:           n/a
        Approach Displaced Threshold:  n/a
        Departure Displaced Threshold: n/a
        Crossing Height:          n/a
        Glide Slope:              n/a
        Effective Date:           1/1/1900
        Expiration Date:          6/6/2079
        Percent Wind:             0%
    Runway:              FUT_HP-2
       Length:           0 feet
       Width:            0 feet
       Runway End:       FUT_HP-2
        Latitude:                    33.128250 degrees
        Longitude:                  -117.280083 degrees
        Threshold Elevation:           n/a
        Approach Displaced Threshold:  n/a
        Departure Displaced Threshold: n/a
        Crossing Height:          n/a
        Glide Slope:              n/a
        Effective Date:           1/1/1900
        Expiration Date:          6/6/2079
        Percent Wind:             0%
    Gate:                GSE Gate
        Latitude:        33.126903
        Longitude:       -117.278735
       Elevation:        0 feet
       Aircraft Size:    ANY
       SigmaY0:          n/a
       SigmaZ0:          n/a
       Release Height:   0 feet


--------------------------------------------------------------------------------
Receptor Sets
--------------------------------------------------------------------------------
       Receptor Set:     CRQ Program EIR - Base Scenario_CONTOUR_GRID
          Description:
          Type:          Receptor
          Number of receptors: 9604
          Longitude:     -117.438612 degrees
          Latitude:      32.994559 degrees
          X Count:       98
          Y Count:       98
          X Spacing:     0.1646
          Y Spacing:     0.1646
       Receptor Set:     CRQ_PRG_EIR_Base Case_CONTOUR_GRID
          Description:
          Type:          Receptor
          Number of receptors: 332929
          Longitude:     -117.438612 degrees
          Latitude:      32.994559 degrees
          X Count:       577
          Y Count:       577
          X Spacing:     0.0278
          Y Spacing:     0.0278
       Receptor Set:     CRQ_PRG_EIR_Future Scenario_CONTOUR_GRID
          Description:
          Type:          Receptor
```

```
      Number of receptors: 332929
      Longitude:     -117.438612 degrees
      Latitude:      32.994559 degrees
      X Count:       577
      Y Count:       577
      X Spacing:     0.0278
      Y Spacing:     0.0278
   Receptor Set:     INM Location Points
      Description:
      Type:          Receptor
      Number of receptors: 44
      Longitude:     -117.198392 degrees
      Latitude:      33.521256 degrees
      X Count:       0
      Y Count:       0
      X Spacing:     0.0
      Y Spacing:     0.0
   Receptor Set:     Base_Grid_Rev2
      Description:
      Type:          Receptor
      Number of receptors: 160000
      Longitude:     -117.438612 degrees
      Latitude:      32.994559 degrees
      X Count:       400
      Y Count:       400
      X Spacing:     0.25
      Y Spacing:     0.25
   Receptor Set:     Baseline_Dual_Grid
      Description:   Base Scenario Grid plus refined grid on arrival end
      Type:          Receptor
      Number of receptors: 49604
      Longitude:     -117.438612 degrees
      Latitude:      32.994559 degrees
      X Count:       98
      Y Count:       98
      X Spacing:     0.1646
      Y Spacing:     0.1646
   Receptor Set:     refined2
      Description:
      Type:          Receptor
      Number of receptors: 25200
      Longitude:     -117.280083 degrees
      Latitude:      33.128250 degrees
      X Count:       180
      Y Count:       140
      X Spacing:     0.01
      Y Spacing:     0.01
   Receptor Set:     ReceptorSet102116
      Description:
      Type:          Receptor
      Number of receptors: 25000
      Longitude:     -117.329691 degrees
      Latitude:      33.114881 degrees
      X Count:       250
      Y Count:       100
      X Spacing:     0.025
      Y Spacing:     0.025

--------------------------------------------------------------------------------
Annualizations
```

```
--------------------------------------------------------------------------------
      Annualization: CRQ Program EIR - Base Scenario
          Description:   Base case scenario
          Start Time:    Wednesday, September 21, 2016
          Duration:      1.00:00:00
          Air Performance Model: SAE_1845_APM
          Altitude Cutoff: n/a
          Fuel Sulfur Content: 0.0006
          Sulfur Conversion Rate: 0.024
          Taxi Model:    UserTaxiModel
          Use Bank Angle: True
          Airport Layouts: KCRQ
          Annualizations:
             CRQ Program EIR - Base Scenario
        Op group: CRQ Program EIR
            Description: Base Case (2015 operations)
            Source Type: SourceAircraft
            Start Time:  9/21/2016 12:00:00 AM
            Duration:    1.00:00:00
            Hourly Wx File:
          Op group: CRQ Program EIR_AirOps
              Description: Air operations for case CRQ Program EIR
              Source Type: SourceAircraft
              Start Time: 9/21/2016 12:00:00 AM
              Duration:  1.00:00:00
              # Air Operations:  5830
      Annualization: CRQ_PRG_EIR_Base Case
          Description:   Baseline case for CRQ Program EIR
          Start Time:    Wednesday, September 21, 2016
          Duration:      1.00:00:00
          Air Performance Model: SAE_1845_APM
          Altitude Cutoff: n/a
          Fuel Sulfur Content: 0.0006
          Sulfur Conversion Rate: 0.024
          Taxi Model:    UserTaxiModel
          Use Bank Angle: True
          Airport Layouts: KCRQ
          Annualizations:
             CRQ_PRG_EIR_Base Case
        Op group: CRQ Program EIR
            Description: Base Case (2015 operations)
            Source Type: SourceAircraft
            Start Time:  9/21/2016 12:00:00 AM
            Duration:    1.00:00:00
            Hourly Wx File:
          Op group: CRQ Program EIR_AirOps
              Description: Air operations for case CRQ Program EIR
              Source Type: SourceAircraft
              Start Time: 9/21/2016 12:00:00 AM
              Duration:  1.00:00:00
              # Air Operations:  5830
      Annualization: CRQ_PRG_EIR_Future Scenario
          Description:   Future case for CRQ Program EIR
          Start Time:    Wednesday, September 21, 2016
          Duration:      1.00:00:00
          Air Performance Model: SAE_1845_APM
          Altitude Cutoff: n/a
          Fuel Sulfur Content: 0.0006
          Sulfur Conversion Rate: 0.024
          Taxi Model:    UserTaxiModel
```

```
    Use Bank Angle: True
    Airport Layouts: KCRQ
    Annualizations:
       CRQ_PRG_EIR_Future Scenario
  Op group: CRQ Program EIR - Future Case
      Description: Future Case (2035 operations)
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
    Op group: CRQ Program EIR - Future Case_AirOps
        Description: Air operations for case CRQ Program EIR - Future Case
        Source Type: SourceAircraft
        Start Time: 9/21/2016 12:00:00 AM
        Duration:  1.00:00:00
        # Air Operations:  5376
Annualization: CRQ_Baseline_Aircraft
    Description:   CRQ_Baseline_Aircraft
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: KCRQ
    Annualizations:
       CRQ_Baseline_Aircraft
  Op group: CRQ Program EIR_AirOps
      Description: Air operations for case CRQ Program EIR
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
  Op group: Baseline_Heli
      Description: Baseline_Heli
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: Baseline Runups
    Description:   Baseline Runups
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: KCRQ
    Annualizations:
       Baseline Runups
  Op group: Baseline
      Description: Baseline
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
```

```
Annualization: Future Runups
    Description:   Future Runups
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       Future Runups
  Op group: Future
      Description: Future
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: Imported
    Description:
    Start Time:    Friday, October 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: n/a
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: n/a
    Annualizations: n/a
Annualization: Imported
    Description:
    Start Time:    Friday, October 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: n/a
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: n/a
    Annualizations: n/a
Annualization: FWPS2_Aircraft_Rev1
    Description:   FWPS2_Aircraft_Rev1
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       FWPS2_Aircraft_Rev1
  Op group: FWPS2_Aircraft_Rev1
      Description: FWPS2_Aircraft_Rev1
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
```

```
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: FWP_Aircraft_Rev1
    Description:   FWP_Aircraft_Rev1
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       FWP_Aircraft_Rev1
  Op group: FWP_Aircraft_Rev1
      Description: FWP_Aircraft_Rev1
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: FNP_Aircraft_Rev1
    Description:   FNP_Aircraft_Rev1
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       FNP_Aircraft_Rev1
  Op group: FNP_Aircraft_Rev1
      Description: FNP_Aircraft_Rev1
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: Imported
    Description:
    Start Time:    Friday, July 21, 2017
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: n/a
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: n/a
    Annualizations: n/a
Annualization: BASE_REV_072117
    Description:   BASE_REV_072117
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
```

```
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: KCRQ
    Annualizations:
       BASE_REV_072117
  Op group: BASE_REV_072117
      Description: BASE_REV_072117
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: FWP_REV_072117
    Description:   FWP_REV_072117
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       FWP_REV_072117
  Op group: FWP_REV_072117
      Description: FWP_REV_072117
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: FWPS2_REV_072117
    Description:   FWPS2_REV_072117
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       FWPS2_REV_072117
  Op group: FWPS2_REV_072117
      Description: FWPS2_REV_072117
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: Imported
    Description:
    Start Time:    Friday, July 21, 2017
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: n/a
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: n/a
```

```
    Annualizations: n/a
Annualization: PAL1
    Description:   PAL1
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       PAL1
  Op group: PAL1
      Description: PAL1
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: PAL2
    Description:   PAL2
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       PAL2
  Op group: PAL2
      Description: PAL2
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: CUSTOM_HELI_FWPS2
    Description:   CUSTOM_HELI_FWPS2
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
       CUSTOM_HELI_FWPS2
  Op group: CUSTOM_HELI_FWPS2
      Description: CUSTOM_HELI_FWPS2
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: PAL1_W-HELI
    Description:   PAL1_W-HELI
```

```
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: KCRQ
    Annualizations:
       PAL1_W-HELI
  Op group: PAL1
      Description: PAL1
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
  Op group: CUSTOM_HELI_FWPS2
      Description: CUSTOM_HELI_FWPS2
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: PAL2_W-HELI
    Description:   PAL2_W-HELI
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: KCRQ
    Annualizations:
       PAL2_W-HELI
  Op group: PAL2
      Description: PAL2
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
  Op group: CUSTOM_HELI_FWPS2
      Description: CUSTOM_HELI_FWPS2
      Source Type: SourceAircraft
      Start Time:  9/21/2016 12:00:00 AM
      Duration:    1.00:00:00
      Hourly Wx File:
Annualization: PAL1_W-HELI_WP
    Description:   PAL1_W-HELI_WP
    Start Time:    Wednesday, September 21, 2016
    Duration:      1.00:00:00
    Air Performance Model: SAE_1845_APM
    Altitude Cutoff: 10000
    Fuel Sulfur Content: 0.0006
    Sulfur Conversion Rate: 0.024
    Taxi Model:    UserTaxiModel
    Use Bank Angle: True
    Airport Layouts: Future
    Annualizations:
```

```
            PAL1_W-HELI_WP
        Op group: PAL1
            Description: PAL1
            Source Type: SourceAircraft
            Start Time:  9/21/2016 12:00:00 AM
            Duration:    1.00:00:00
            Hourly Wx File:
        Op group: CUSTOM_HELI_FWPS2
            Description: CUSTOM_HELI_FWPS2
            Source Type: SourceAircraft
            Start Time:  9/21/2016 12:00:00 AM
            Duration:    1.00:00:00
            Hourly Wx File:
      Annualization: PAL2_W-HELI_WP
          Description:   PAL2_W-HELI_WP
          Start Time:    Wednesday, September 21, 2016
          Duration:      1.00:00:00
          Air Performance Model: SAE_1845_APM
          Altitude Cutoff: 10000
          Fuel Sulfur Content: 0.0006
          Sulfur Conversion Rate: 0.024
          Taxi Model:    UserTaxiModel
          Use Bank Angle: True
          Airport Layouts: Future
          Annualizations:
             PAL2_W-HELI_WP
        Op group: PAL2
            Description: PAL2
            Source Type: SourceAircraft
            Start Time:  9/21/2016 12:00:00 AM
            Duration:    1.00:00:00
            Hourly Wx File:
        Op group: CUSTOM_HELI_FWPS2
            Description: CUSTOM_HELI_FWPS2
            Source Type: SourceAircraft
            Start Time:  9/21/2016 12:00:00 AM
            Duration:    1.00:00:00
            Hourly Wx File:

--------------------------------------------------------------------------------
Annualization: CRQ Program EIR - Base Scenario
--------------------------------------------------------------------------------

    ------------------------------------------------------------------------------
    Op group CRQ Program EIR
    ------------------------------------------------------------------------------

        ------------------------------------------------------------------------------
        Child Case: CRQ Program EIR
        ------------------------------------------------------------------------------
            Description:         Base Case (2015 operations)
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 0

        ------------------------------------------------------------------------------
        Child Case: CRQ Program EIR_AirOps
        ------------------------------------------------------------------------------
            Description:         Air operations for case CRQ Program EIR
            Start time:          00:00:00
```

```
            Duration:            01 days 00 hours
            Number of Operations: 5830

--------------------------------------------------------------------------------
Annualization: CRQ_PRG_EIR_Base Case
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group CRQ Program EIR
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: CRQ Program EIR
        ------------------------------------------------------------------------
            Description:         Base Case (2015 operations)
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 0

        ------------------------------------------------------------------------
        Child Case: CRQ Program EIR_AirOps
        ------------------------------------------------------------------------
            Description:         Air operations for case CRQ Program EIR
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5830

--------------------------------------------------------------------------------
Annualization: CRQ_PRG_EIR_Future Scenario
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group CRQ Program EIR - Future Case
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: CRQ Program EIR - Future Case
        ------------------------------------------------------------------------
            Description:         Future Case (2035 operations)
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 0

        ------------------------------------------------------------------------
        Child Case: CRQ Program EIR - Future Case_AirOps
        ------------------------------------------------------------------------
            Description:         Air operations for case CRQ Program EIR - Future
Case
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5376

--------------------------------------------------------------------------------
Annualization: CRQ_Baseline_Aircraft
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group CRQ Program EIR_AirOps
    ----------------------------------------------------------------------------
```

```
        ------------------------------------------------------------------------
        Child Case: CRQ Program EIR_AirOps
        ------------------------------------------------------------------------
            Description:         Air operations for case CRQ Program EIR
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5830

    ----------------------------------------------------------------------------
    Op group Baseline_Heli
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: Baseline_Heli
        ------------------------------------------------------------------------
            Description:         Baseline_Heli
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 41

--------------------------------------------------------------------------------
Annualization: Baseline Runups
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group Baseline
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: Baseline
        ------------------------------------------------------------------------
            Description:         Baseline
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 0

--------------------------------------------------------------------------------
Annualization: Future Runups
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group Future
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: Future
        ------------------------------------------------------------------------
            Description:         Future
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 0

--------------------------------------------------------------------------------
Annualization: Imported
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------
Annualization: Imported
--------------------------------------------------------------------------------
```

```
--------------------------------------------------------------------------------
Annualization: FWPS2_Aircraft_Rev1
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group FWPS2_Aircraft_Rev1
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: FWPS2_Aircraft_Rev1
        ------------------------------------------------------------------------
            Description:         FWPS2_Aircraft_Rev1
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5246

--------------------------------------------------------------------------------
Annualization: FWP_Aircraft_Rev1
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group FWP_Aircraft_Rev1
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: FWP_Aircraft_Rev1
        ------------------------------------------------------------------------
            Description:         FWP_Aircraft_Rev1
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5237

--------------------------------------------------------------------------------
Annualization: FNP_Aircraft_Rev1
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group FNP_Aircraft_Rev1
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: FNP_Aircraft_Rev1
        ------------------------------------------------------------------------
            Description:         FNP_Aircraft_Rev1
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5072

--------------------------------------------------------------------------------
Annualization: Imported
--------------------------------------------------------------------------------

--------------------------------------------------------------------------------
Annualization: BASE_REV_072117
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group BASE_REV_072117
    ----------------------------------------------------------------------------
```

```
        ------------------------------------------------------------------------
        Child Case: BASE_REV_072117
        ------------------------------------------------------------------------
            Description:         BASE_REV_072117
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5878

------------------------------------------------------------------------------
Annualization: FWP_REV_072117
------------------------------------------------------------------------------

    ------------------------------------------------------------------------
    Op group FWP_REV_072117
    ------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: FWP_REV_072117
        ------------------------------------------------------------------------
            Description:         FWP_REV_072117
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5430

------------------------------------------------------------------------------
Annualization: FWPS2_REV_072117
------------------------------------------------------------------------------

    ------------------------------------------------------------------------
    Op group FWPS2_REV_072117
    ------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: FWPS2_REV_072117
        ------------------------------------------------------------------------
            Description:         FWPS2_REV_072117
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5436

------------------------------------------------------------------------------
Annualization: Imported
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Annualization: PAL1
------------------------------------------------------------------------------

    ------------------------------------------------------------------------
    Op group PAL1
    ------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: PAL1
        ------------------------------------------------------------------------
            Description:         PAL1
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5435
```

```
--------------------------------------------------------------------------------
Annualization: PAL2
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group PAL2
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: PAL2
        ------------------------------------------------------------------------
            Description:         FWPS2_REV_072117
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5435

--------------------------------------------------------------------------------
Annualization: CUSTOM_HELI_FWPS2
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group CUSTOM_HELI_FWPS2
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: CUSTOM_HELI_FWPS2
        ------------------------------------------------------------------------
            Description:         CUSTOM_HELI_FWPS2
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 41

--------------------------------------------------------------------------------
Annualization: PAL1_W-HELI
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group PAL1
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: PAL1
        ------------------------------------------------------------------------
            Description:         PAL1
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5394

    ----------------------------------------------------------------------------
    Op group CUSTOM_HELI_FWPS2
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: CUSTOM_HELI_FWPS2
        ------------------------------------------------------------------------
            Description:         CUSTOM_HELI_FWPS2
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 41
```

```
--------------------------------------------------------------------------------
Annualization: PAL2_W-HELI
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group PAL2
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: PAL2
        ------------------------------------------------------------------------
            Description:         PAL2
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5394

    ----------------------------------------------------------------------------
    Op group CUSTOM_HELI_FWPS2
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: CUSTOM_HELI_FWPS2
        ------------------------------------------------------------------------
            Description:         CUSTOM_HELI_FWPS2
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 41

--------------------------------------------------------------------------------
Annualization: PAL1_W-HELI_WP
--------------------------------------------------------------------------------

    ----------------------------------------------------------------------------
    Op group PAL1
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: PAL1
        ------------------------------------------------------------------------
            Description:         PAL1
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5394

    ----------------------------------------------------------------------------
    Op group CUSTOM_HELI_FWPS2
    ----------------------------------------------------------------------------

        ------------------------------------------------------------------------
        Child Case: CUSTOM_HELI_FWPS2
        ------------------------------------------------------------------------
            Description:         CUSTOM_HELI_FWPS2
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 41

--------------------------------------------------------------------------------
Annualization: PAL2_W-HELI_WP
--------------------------------------------------------------------------------
```

```
    ------------------------------------------------------------------------------
    Op group PAL2
    ------------------------------------------------------------------------------

        ------------------------------------------------------------------------------
        Child Case: PAL2
        ------------------------------------------------------------------------------
            Description:         PAL2
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 5394

    ------------------------------------------------------------------------------
    Op group CUSTOM_HELI_FWPS2
    ------------------------------------------------------------------------------

        ------------------------------------------------------------------------------
        Child Case: CUSTOM_HELI_FWPS2
        ------------------------------------------------------------------------------
            Description:         CUSTOM_HELI_FWPS2
            Start time:          00:00:00
            Duration:            01 days 00 hours
            Number of Operations: 41

------------------------------------------------------------------------------
User-Defined Aircraft Profiles
------------------------------------------------------------------------------

------------------------------------------------------------------------------
User-Specified Aircraft Substitutions
------------------------------------------------------------------------------

------------------------------------------------------------------------------
Metric Results
------------------------------------------------------------------------------
       Metric Result 28
       Metric Result Name: Noise
       Metric Result Description:
       Metric: CNEL
       Receptor Set: ReceptorSet102116
          Run Start Time:  10/21/2016 11:39:03 AM
          Run End Time:  10/21/2016 11:39:06 AM
          Run Status:    Complete
          Run Options:   RunOptions_CNEL
            Result Storage Options:
              Dispersion Results:  None
              Emissions Results:  None
              Noise Results:  Case
            Modeling Options:
              Ambient:   False
              Ambient Screening:  False
              Analysis Year (VALE):
              Apply Delay & Sequencing Model On Taxi:  False
              Calculate Aircraft Engine Startup Emissions:  False
              Calculate Speciated Organic Gases:  False
              Atmospheric Absorption:  2
              Delta Ambient:  0
              Do Fixed Ambient Threshold:  False
              Fill Terrain:  False
              Fixed Ambient Threshold:  65
```

```
      Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
      Noise Line Of Sight Blockage:  False
      Terrain:   False
      Terrain Fill In Value:
      Track Angle Checking:  False
      Type Of Ground:  Hard
      Do Spectral Cutoff:  False
      Time Audible Start Time:  10/21/2016 11:16 AM
      Time Audible Duration:  00:00
      Do Number Above Noise Level:  False
      Background Concentrations:  False
      Emissions Dispersion Output Options:  False
      Enhanced nvPM:  False
   Annualization:  Baseline Runups
Metric Result 64
Metric Result Name: Noise
Metric Result Description:
Metric: CNEL
Receptor Set: ReceptorSet102116
   Run Start Time:  7/5/2017 8:33:05 AM
   Run End Time:  7/5/2017 8:33:07 AM
   Run Status:    Complete
   Run Options:   RunOptions_CNEL
     Result Storage Options:
       Dispersion Results:  None
       Emissions Results:  Case
       Noise Results:  Case
     Modeling Options:
       Ambient:   False
       Ambient Screening:  False
       Analysis Year (VALE):
       Apply Delay & Sequencing Model On Taxi:  False
       Calculate Aircraft Engine Startup Emissions:  False
       Calculate Speciated Organic Gases:  False
       Atmospheric Absorption:  2
       Delta Ambient:  0
       Do Fixed Ambient Threshold:  False
       Fill Terrain:  False
       Fixed Ambient Threshold:  0
       Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
       Noise Line Of Sight Blockage:  False
       Terrain:   False
       Terrain Fill In Value:
       Track Angle Checking:  False
       Type Of Ground:  Hard
       Do Spectral Cutoff:  False
       Time Audible Start Time:  7/5/2017 8:18 AM
       Time Audible Duration:  00:00
       Do Number Above Noise Level:  False
       Background Concentrations:  False
       Emissions Dispersion Output Options:  False
       Enhanced nvPM:  False
   Annualization:  Future Runups
Metric Result 72
Metric Result Name: Noise
Metric Result Description:
Metric: CNEL
Receptor Set: ReceptorSet102116
   Run Start Time:  7/21/2017 4:04:49 PM
   Run End Time:  7/21/2017 4:41:10 PM
```

```
   Run Status:    Complete
   Run Options:   RunOptions_CNEL
     Result Storage Options:
       Dispersion Results:  None
       Emissions Results:  Case
       Noise Results:  Case
     Modeling Options:
       Ambient:   False
       Ambient Screening:  False
       Analysis Year (VALE):
       Apply Delay & Sequencing Model On Taxi:  False
       Calculate Aircraft Engine Startup Emissions:  False
       Calculate Speciated Organic Gases:  False
       Atmospheric Absorption:  2
       Delta Ambient:  0
       Do Fixed Ambient Threshold:  False
       Fill Terrain:  False
       Fixed Ambient Threshold:  0
       Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
       Noise Line Of Sight Blockage:  False
       Terrain:   False
       Terrain Fill In Value:
       Track Angle Checking:  False
       Type Of Ground:  Hard
       Do Spectral Cutoff:  False
       Time Audible Start Time:  7/21/2017 4:04 PM
       Time Audible Duration:  00:00
       Do Number Above Noise Level:  False
       Background Concentrations:  False
       Emissions Dispersion Output Options:  False
       Enhanced nvPM:  False
   Annualization:  BASE_REV_072117
Metric Result 73
Metric Result Name: Noise
Metric Result Description:
Metric: CNEL
Receptor Set: ReceptorSet102116
   Run Start Time:  7/21/2017 4:43:37 PM
   Run End Time:  7/21/2017 5:18:42 PM
   Run Status:    Complete
   Run Options:   RunOptions_CNEL
     Result Storage Options:
       Dispersion Results:  None
       Emissions Results:  Case
       Noise Results:  Case
     Modeling Options:
       Ambient:   False
       Ambient Screening:  False
       Analysis Year (VALE):
       Apply Delay & Sequencing Model On Taxi:  False
       Calculate Aircraft Engine Startup Emissions:  False
       Calculate Speciated Organic Gases:  False
       Atmospheric Absorption:  2
       Delta Ambient:  0
       Do Fixed Ambient Threshold:  False
       Fill Terrain:  False
       Fixed Ambient Threshold:  0
       Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
       Noise Line Of Sight Blockage:  False
       Terrain:   False
```

```
      Terrain Fill In Value:
      Track Angle Checking:  False
      Type Of Ground:  Hard
      Do Spectral Cutoff:  False
      Time Audible Start Time:  7/21/2017 4:43 PM
      Time Audible Duration:  00:00
      Do Number Above Noise Level:  False
      Background Concentrations:  False
      Emissions Dispersion Output Options:  False
      Enhanced nvPM:  False
   Annualization:  FWP_REV_072117
Metric Result 75
Metric Result Name: Noise
Metric Result Description:
Metric: CNEL
Receptor Set: ReceptorSet102116
   Run Start Time:  7/21/2017 5:22:16 PM
   Run End Time:  7/21/2017 6:00:12 PM
   Run Status:    Complete
   Run Options:   RunOptions_CNEL
     Result Storage Options:
       Dispersion Results:  None
       Emissions Results:  Case
       Noise Results:  Case
     Modeling Options:
       Ambient:   False
       Ambient Screening:  False
       Analysis Year (VALE):
       Apply Delay & Sequencing Model On Taxi:  False
       Calculate Aircraft Engine Startup Emissions:  False
       Calculate Speciated Organic Gases:  False
       Atmospheric Absorption:  2
       Delta Ambient:  0
       Do Fixed Ambient Threshold:  False
       Fill Terrain:  False
       Fixed Ambient Threshold:  0
       Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
       Noise Line Of Sight Blockage:  False
       Terrain:   False
       Terrain Fill In Value:
       Track Angle Checking:  False
       Type Of Ground:  Hard
       Do Spectral Cutoff:  False
       Time Audible Start Time:  7/21/2017 5:22 PM
       Time Audible Duration:  00:00
       Do Number Above Noise Level:  False
       Background Concentrations:  False
       Emissions Dispersion Output Options:  False
       Enhanced nvPM:  False
   Annualization:  FWPS2_REV_072117
Metric Result 84
Metric Result Name: PAL1_WP
Metric Result Description: PAL1 ops with proposed runway location
Metric: CNEL
Receptor Set: ReceptorSet102116
   Run Start Time:  10/21/2016  11:39:03 AM
   Run End Time:  11/26/2017  12:09:20 PM
   Run Status:    Complete
   Run Options:   RunOptions_CNEL
     Result Storage Options:
```

```
      Dispersion Results:  None
      Emissions Results:  Case
      Noise Results:  Case
    Modeling Options:
      Ambient:   False
      Ambient Screening:  False
      Analysis Year (VALE):
      Apply Delay & Sequencing Model On Taxi:  False
      Calculate Aircraft Engine Startup Emissions:  False
      Calculate Speciated Organic Gases:  False
      Atmospheric Absorption:  2
      Delta Ambient:  0
      Do Fixed Ambient Threshold:  False
      Fill Terrain:  False
      Fixed Ambient Threshold:  0
      Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
      Noise Line Of Sight Blockage:  False
      Terrain:   False
      Terrain Fill In Value:
      Track Angle Checking:  False
      Type Of Ground:  Hard
      Do Spectral Cutoff:  False
      Time Audible Start Time:  11/26/2017  11:31 AM
      Time Audible Duration:  00:00
      Do Number Above Noise Level:  False
      Background Concentrations:  False
      Emissions Dispersion Output Options:  False
      Enhanced nvPM:  False
  Annualization:  PAL1_W-HELI
Metric Result 85
Metric Result Name: PAL2_WP
Metric Result Description: PAL2 ops with proposed runway location
Metric: CNEL
Receptor Set: ReceptorSet102116
  Run Start Time:  11/26/2017  12:10:31 PM
  Run End Time:  11/26/2017  12:47:51 PM
  Run Status:    Complete
  Run Options:   RunOptions_CNEL
    Result Storage Options:
      Dispersion Results:  None
      Emissions Results:  Case
      Noise Results:  Case
    Modeling Options:
      Ambient:   False
      Ambient Screening:  False
      Analysis Year (VALE):
      Apply Delay & Sequencing Model On Taxi:  False
      Calculate Aircraft Engine Startup Emissions:  False
      Calculate Speciated Organic Gases:  False
      Atmospheric Absorption:  2
      Delta Ambient:  0
      Do Fixed Ambient Threshold:  False
      Fill Terrain:  False
      Fixed Ambient Threshold:  0
      Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
      Noise Line Of Sight Blockage:  False
      Terrain:   False
      Terrain Fill In Value:
      Track Angle Checking:  False
      Type Of Ground:  Hard
```

```
      Do Spectral Cutoff:  False
      Time Audible Start Time:  11/26/2017  12:48 PM
      Time Audible Duration:  00:00
      Do Number Above Noise Level:  False
      Background Concentrations:  False
      Emissions Dispersion Output Options:  False
      Enhanced nvPM:  False
   Annualization:  PAL2_W-HELI
Metric Result 86
Metric Result Name: PAL1_NP
Metric Result Description: PAL1 ops on existing runway
Metric: CNEL
Receptor Set: ReceptorSet102116
   Run Start Time:  11/26/2017  1:06:05 PM
   Run End Time:  11/26/2017  1:53:28 PM
   Run Status:    Complete
   Run Options:   RunOptions_CNEL
     Result Storage Options:
       Dispersion Results:  None
       Emissions Results:  Case
       Noise Results:  Case
     Modeling Options:
       Ambient:   False
       Ambient Screening:  False
       Analysis Year (VALE):
       Apply Delay & Sequencing Model On Taxi:  False
       Calculate Aircraft Engine Startup Emissions:  False
       Calculate Speciated Organic Gases:  False
       Atmospheric Absorption:  2
       Delta Ambient:  0
       Do Fixed Ambient Threshold:  False
       Fill Terrain:  False
       Fixed Ambient Threshold:  0
       Lateral Attenuation:  ApplyLateralAttenuationToPropsAndHelos
       Noise Line Of Sight Blockage:  False
       Terrain:   False
       Terrain Fill In Value:
       Track Angle Checking:  False
       Type Of Ground:  Hard
       Do Spectral Cutoff:  False
       Time Audible Start Time:  11/26/2017  1:06 PM
       Time Audible Duration:  00:00
       Do Number Above Noise Level:  False
       Background Concentrations:  False
       Emissions Dispersion Output Options:  False
       Enhanced nvPM:  False
   Annualization:  PAL1_W-HELI
Metric Result 87
Metric Result Name: PAL2_NP
Metric Result Description: PAL2 ops on existing runway
Metric: CNEL
Receptor Set: ReceptorSet102116
   Run Start Time:  11/26/2017  2:01:28 PM
   Run End Time:  11/26/2017  2:49:52 PM
   Run Status:    Complete
   Run Options:   RunOptions_CNEL
     Result Storage Options:
       Dispersion Results:  None
       Emissions Results:  Case
       Noise Results:  Case
```

Modeling Options:
Ambient: False
Ambient Screening: False
Analysis Year (VALE):
Apply Delay & Sequencing Model On Taxi: False
Calculate Aircraft Engine Startup Emissions: False
Calculate Speciated Organic Gases: False
Atmospheric Absorption: 2
Delta Ambient: 0
Do Fixed Ambient Threshold: False
Fill Terrain: False
Fixed Ambient Threshold: 0
Lateral Attenuation: ApplyLateralAttenuationToPropsAndHelos
Noise Line Of Sight Blockage: False
Terrain: False
Terrain Fill In Value:
Track Angle Checking: False
Type Of Ground: Hard
Do Spectral Cutoff: False
Time Audible Start Time: 11/26/2017 1:06 PM
Time Audible Duration: 00:00
Do Number Above Noise Level: False
Background Concentrations: False
Emissions Dispersion Output Options: False
Enhanced nvPM: False
Annualization: PAL2_W-HELI

Appendix B – Acoustical Site Assessment Report

Prepared by Helix Environmental Planning, Inc. 2017

HELIX
Environmental Planning

McClellan-Palomar Airport Master Plan

Acoustical Site Assessment Report

December 2016

Prepared for:
County of San Diego
Department of Public Works
5510 Overland Avenue, Suite 410
San Diego, CA 92123-1239

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

McClellan-Palomar Airport Master Plan EIR

Acoustical Site Assessment Report

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December 2016

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LIST OF ACRONYMS

ANSI	American National Standards Institute
ARFF	Aircraft Rescue and Fire Fighting
CEQA	California Environmental Quality Act
City	City of Carlsbad
County	County of San Diego
CNEL	Community Noise Equivalent Level
CY	cubic yard
dB	decibel
dBA	A-weighted decibels
EIR	Environmental Impact Report
EMAS	Engineered Materials Arrestor System
FAA	Federal Aviation Administration
Hz	Hertz
in/sec	inches per second
kHz	kilohertz
L_{DN}	Day-Night level
L_{EQ}	equivalent sound level
L_{MAX}	maximum noise level
MALSR	Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights
mPa	micro-Pascals
NSLU	noise-sensitive land use
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
RSA	Runway Safety Area
SF	square feet/foot
SPL	sound pressure level
S_{WL}	sound power level

TNM	Transportation Noise Model
USDOT	U.S. Department of Transportation

EXECUTIVE SUMMARY

This report presents an assessment of potential construction noise impacts associated with the 16 construction phases of proposed airport improvements as part of the implementation of the McClellan-Palomar Airport Master Plan (project).

The project is located in the City of Carlsbad within the McClellan-Palomar Airport property. The airport is operated by the County of San Diego. Construction would involve multiple phases over a 20-year period. The project includes the demolition and improvements of existing airport infrastructure.

Anticipated construction noise from general construction and pavement crushing equipment would cause potentially significant noise impacts to nearby office buildings. Noise from general construction would be reduced to less than significant levels with the implementation of mitigation measure NOI-1. Noise from crushing would be reduced through noise reduction requirements defined under mitigation measure NOI-2. Noise from construction truck trips would not be significant.

The project would not result in exposure to excessive vibration.

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1.0 INTRODUCTION

1.1 Purpose of the Report

This report includes an assessment of potential construction noise and vibration impacts associated with improvements as part of the McClellan-Palomar Airport Master Plan (project). This report assesses the potential construction noise impacts associated with all planned future construction phases.

1.2 Project Location

McClellan-Palomar Airport is located in the City of Carlsbad (City), California north of Palomar Airport Road and west of El Camino Real (see Figure 1, *Regional Location Map,* and Figure 2, *Project Vicinity*). The construction area is located within the airfield, or non-publicly accessible, portions of the airport property. The airport is zoned M – Industrial with a land use designation of P – Public.

1.3 Project Description

The McClellan-Palomar Airport Master Plan is a phased 20-year strategy to prioritize future projects at the airport. The Master Plan uses technical studies, forecast data, Federal Aviation Administration (FAA) design engineering standards, and public involvement to support the modernization of the airport while maximizing use of the existing airport property. The Master Plan incorporates 15 project elements that are categorized either as airfield or landside based on the nature of each project element. Airfield elements are those that would take place in aircraft movement areas (e.g., runways, taxiways, and apron areas) while landside elements refers to those that would occur on portions of the airport property utilized for vehicle parking, passenger loading, business operations and other ancillary activities that do not require the direct use of aircraft.

The project involves multiple airfield elements divided into near-term, intermediate-term, and long-term phases. Near-term projects would be constructed within 1-7 years, intermediate projects between 8-12 years, and long-term projects between 13-20 years. See Figure 3, *Airport Layout Plan Drawings,* for the site layout and future construction projects.

1.3.1 Project Component Parts

Projects identified in this timeframe aim to enhance safety, extend the runway length, and make necessary improvements to allow for the future relocation of Runway 06-24 to meet the FAA-defined D-III design standards.

1.3.1.1 *Near-Term Projects (0-7 Years)*

Relocation of the Glideslope Building and Antenna

The glideslope building and antenna provide pilots with vertical guidance as they are making a descent to land in instrument meteorological conditions. The glideslope building and antenna will require relocation in order to remain clear of the future RSA when Runway 06-24 is shifted to the north. The building to be relocated is approximately 360 square feet and would be shifted

approximately 50 feet north of its current location to remain clear of the future RSA. Electrical utilities necessary to operate the equipment are already located in the proposed relocation area.

Relocation of Segmented Circle and Windsock Equipment

The segmented circle serves two functions at an airport: (1) to aid pilots in locating the airport and (2) to provide a centralized location for other signal devices such as a windsock. The windsock provides pilots with instant information on wind speed and direction that they utilize in order to make a smooth and safe landing. Relocation to the north is required so that the segmented circle and windsock remain clear of the future RSA when Runway 06-24 is also shifted to the north. Only minor grading improvements are anticipated to level the surface at this location.

Relocation of Aircraft Rescue and Fire Fighting Facility

The existing Aircraft Rescue and Fire Fighting (ARFF) facility located on the western side of the airport terminal will be improved to meet existing and forecasted aviation demands. Prior to September 2017, the Airport maintained an ARFF designation of "Index A" as defined by FAR Part 139.315(b)(2). As of September 2017, the FAA has changed the Airport's ARFF designation to "Index B" due to the aircraft length (i.e., Bombardier CRJ-700) utilized by the current air carrier. As identified in the Master Plan Update, additional vehicle bays and staff parking are needed at the ARFF facility to fully comply with "Index B" requirements. As a result, in accordance with FAA AC 150/5210-15A, the ARFF facility would be relocated south of the existing Airport Traffic Control Tower (ATCT) and east of the passenger terminal apron. The facility would encompass approximately 4,664 square feet and would include two vehicles bays, watch room, first aid room, storage room, and administrative offices. The proposed relocation site is currently a vehicle parking lot, and adjacent lots could accommodate the parking spaces lost to the relocation of the ARFF. In the interim prior to improvements, all equipment and personnel necessary to operate and comply with "Index B" standards will be provided at the Airport.

Construction of EMAS System on Runway 24

The RSA for a runway designated as D-III extends 1,000 feet past the runway end. In order to meet the D-III RSA design standard requirements without reducing the length of the runway, EMAS would be installed on the west end of the runway (i.e., departure end of Runway 24). EMAS is a bed of engineered material built at the end of a runway that is designed to stop an aircraft overrun to minimize human injury and minimize aircraft damage. The EMAS would be designed to be 350 feet long by 150 feet wide, and would begin 35 feet beyond the runway pavement. Once constructed, it would eliminate the pavement currently maintained as the blast pad located on the departure end of Runway 24.

A retaining wall and fill slopes would be constructed on the runway's west end to support the EMAS installation. This would allow for the relocation of a vehicle service road and localizer antenna. The road is only used by authorized staff for emergency and maintenance purposes. The localizer antenna is used in conjunction with other navigational aids to provide lateral guidance to the runway.



I:\PROJECTS\CCSE\CSE-01.08_PalomarAirportNoiseMap\Noise\Fig1_Regional.mxd CSE-01.07 11/17/2016 - NG

Regional Location Map

MCCLELLAN-PALOMAR AIRPORT NOISE REPORT

HELIX Environmental Planning

N 0 8 Miles

Figure 1



1:\PROJECTS\CSE\CSE-01 08_PalomarAirportNoise\Map\Noise\Fig2_Vicinity.mxd CSE-01 08 11/17/2016 - NG

Project Vicinity

MCCLELLAN-PALOMAR AIRPORT NOISE REPORT

HELIX Environmental Planning

N 0 650 Feet

Figure 2

CONCEPTUAL DEVELOPMENT PHASES/FEATURES:

NEAR-TERM (0-7 YEARS)

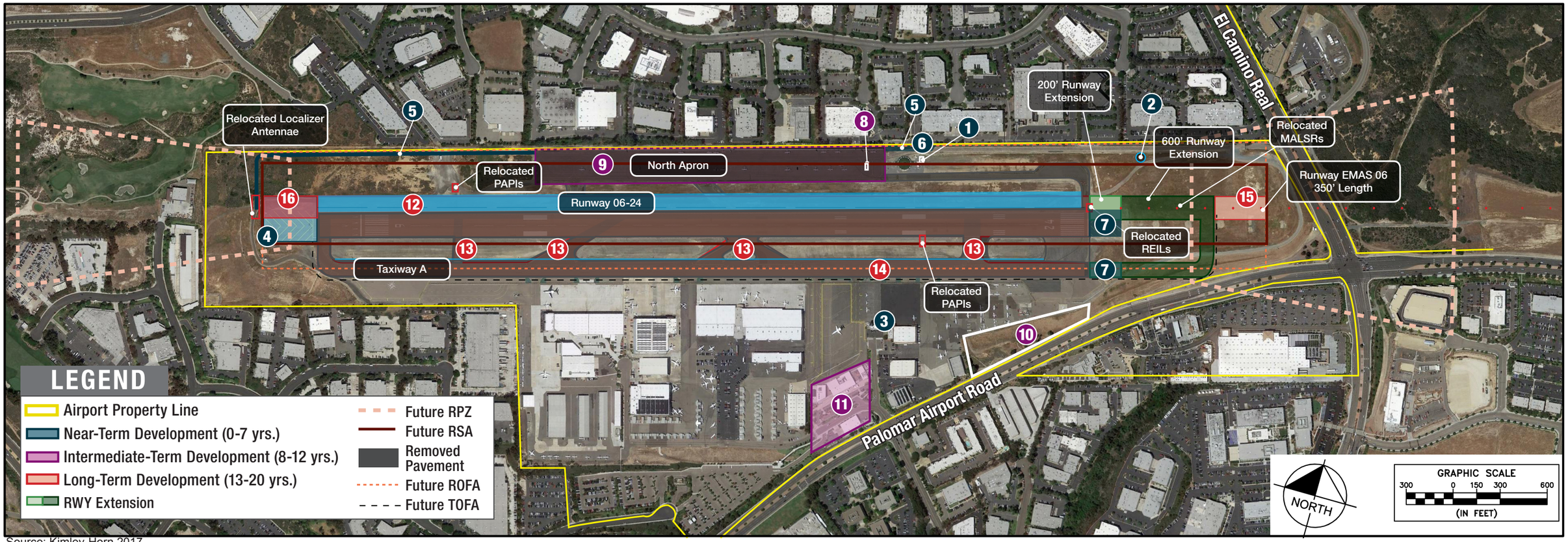
1. Relocation of the Glideslope Building and Antenna
2. Relocation of the Segmented Circle and Windsock Equipment
3. Relocation of ARFF Facility
4. Construction of EMAS System for RWY 24
5. Relocation of the Vehicle Service Road
6. Relocation of Lighting Vault
7. 200’ Extension of Existing RWY 06-24 and TWY A

INTERMEDIATE-TERM (8-12 YEARS)

8. Removal of Fuel Farm on North Apron
9. Removal of the North Apron and TWY N
10. Area Reserved for Future GA Parking
11. Passenger/Admin/Parking Facility Improvements

PHASE 3: LONG-TERM (13-20 YEARS)

12. Relocation 123’ North/Extension of RWY 06-24 (Includes REILs, PAPIs, Localizer Antennae and MALSRs)
13. Removal/Reconstruction of Existing Connector Taxiways
14. Removal/Reconstruction of Existing TWY A (Includes Lighting)
15. Construction of EMAS System for RWY 06
16. Relocation of EMAS System for RWY 24



Source: Kimley-Horn 2017

Airport Conceptual Layout

MCCLELLAN-PALOMAR AIRPORT NOISE REPORT

Relocation of the Vehicle Service Road

A portion of the vehicle service road, located along the north apron at the west end of the runway (i.e., approach end of Runway 06), would require relocation in order to remain clear of the future RSA. This would include construction of approximately 81,900 square feet of new pavement that would extend from the north apron around the RSA and EMAS installation on the western end of the runway. Portions of the pavement currently used for aircraft parking on the north apron would be maintained for the road.

Relocation of the Lighting Vault

The airport lighting vault is the point at which power is brought onto the airfield and then distributed to the various lighting systems. The vault will require relocation to remain clear of the future RSA when Runway 06-24 is shifted to the north. The 100 square-foot building would be relocated north of its current location. Minor trenching would be necessary to relocate electrical utilities to the proposed relocation site.

Extension of Runway 06-24 (200 feet to the East)

The current runway length at CRQ is 4,897 feet. As a near-term project, a 200-foot extension of the runway's eastern end and associated Taxiway A would occur over existing pavement. The conversion to an aircraft movement area requires only the reinforcement of the pavement strength to meet FAA standards, shifting of lights (discussed below) and re-marking.

The 200-foot extension would also require the relocation of the Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) located east of the runway. The MALSR is a system of lights that provide pilots with navigational assistance to the runway. It is estimated that with the runway extension, an additional light foundation would need to be constructed. The additional lighting system would be located on County-owned land that is currently vacant. A portion of this land is designated Open Space. However, the County is not responsible for these additional improvements. The FAA is the owner and responsible agency for this lighting system, and relocation of the lights would be considered a federal action.

1.3.1.2 *Intermediate-Term Projects (8-12 Years)*

Intermediate-term projects focus on the efficiency improvements to short-term vehicle parking and removal of the north apron and aircraft self-service fuel farm.

Removal of Fuel Farm on North Apron

In addition to providing small aircraft tie-downs, the north apron also has a self-service fuel farm available. Along with the north apron, the fuel farm would be removed in order to clear obstructions located in the future RSA when Runway 06-24 is shifted to the north. This will involve the removal of a 12,000-gallon aboveground fuel storage tank. There are no fuel distribution lines at the Airport; all fuel is delivered to the storage tank by tanker truck.

Removal of North Apron and Taxiway N

The north apron currently serves as an aircraft parking area used exclusively by small general aviation aircraft. The apron pavement would be removed in order to eliminate obstructions (parked aircraft) that penetrate the future RSA to allow for the northerly shift of Runway 06-24. Taxiway N, which is used by pilots to access the apron, would also be removed as it would no

longer be needed for aircraft movements. This involves the removal of approximately 387,000 square feet of pavement.

General Aviation (Aircraft) Parking

As shown in the Airport Master Plan Update, the forecasted number of general aviation operations is expected to increase during the Master Plan's next 20-year planning period. As such, an area along the Airport's southern property boundary will be reserved for future general aviation aircraft parking as demand or capacity is realized.

Passenger / Administration / Vehicle Parking Improvements

According to the Airport Master Plan Update, additional short-term vehicle parking spaces are needed to accommodate the forecasted demand. The existing parking area in front of the airport terminal would be reconfigured to the south by approximately 7,000 square feet adding 20 additional short-term parking spaces for loading and unloading.

1.3.1.3 *Long-Term Projects (13-20 Years)*

Long-term improvements include the relocation and extension of Runway 06-24 and associated project elements necessary to meet FAA's D-III design standards.

Relocation and Extension of Runway 06-24

Runway 06-24 would be shifted 123 feet to the north from its current position to increase the separation distance between the runway centerline and taxiway centerlines to 400 feet, which would meet FAA design standards for a D-III facility. While the ROFA on the runway's south side would meet the required 400-foot separation, the ROFA on the runway's north side could only accommodate 362 feet due to available space on the airfield. As a result, a modification of standards would be obtained from the FAA.

In addition, FAA design standards for a D-III facility require a 500-foot separation distance between the runway centerline and aircraft parking areas. On the south side of the runway, the proposed distance would total 493 feet due to available space on the airfield. As a result, a modification of standards would be obtained from the FAA since the Airport cannot accommodate the remaining 7 feet of separation distance.

The runway would also be extended to the east an additional 600 feet (beyond the 200-foot extension discussed under Near-term Projects), which would result in a total runway length of 5,697 feet and the runway width would be maintained at 150 feet. This project element would involve construction of approximately 738,000 square feet of new pavement, remarking the runway, and relocating runway and taxiway lights.

A portion of the runway extension and future EMAS system would be built over the existing landfill, which requires stabilization. In order to accommodate the full-length runway, EMAS, and taxiway extensions, it is anticipated that drilled displacement column piles would be driven into sections of the ground to support concrete slabs. The piles would extend through the landfill materials until bedrock or secure material is reached. Preliminary pile layouts could be spaced at 10 feet on center transversely to the runway/taxiway centerlines with 20 feet spans along the lengths of the runway/taxiway. However, this conceptual layout is preliminary as project-specific engineering design plans have not been prepared at this time.

Navigational aids would also need to be moved in conjunction with the runway shift. The Runway End Indicator Lights, Precision Approach Path Indicator system, and MALSR would have to be relocated in alignment with the runway's new centerline location. Minor trenching to connect electrical utilities to the new locations of the navigational aids would be necessary. However, the County is not responsible for these improvements. The FAA is the owner and responsible agency for this lighting system, and relocation of the lights would be considered a federal action.

Remove/Reconstruct Connector Taxiways

In order to facilitate the runway relocation and accommodate the increased distance between runway and taxiway, connector taxiways would be removed and reconstructed. This project element involves approximately 117,000 square feet of new pavement. As part of this project element, all taxiway connectors would be extended to the runway's new location except for the two high-speed connector taxiways located in the middle of the runway and the current connector to the runway's eastern end. These taxiways would be removed and the pavement reused where feasible.

Removal/Reconstruction of Taxiway A

Taxiway A is the main taxiway that runs parallel to Runway 06-24 and is used by pilots to transit from the runway to the passenger terminal and south apron area. In order to achieve the necessary 400-foot separation between the runway and taxiway while maintaining TSA and TOFA design standards, Taxiway A would be shifted 19 feet north and extended east 600 feet to match the end of Runway 06-24.

Construction of EMAS System on Runway 06

Once the runway is relocated northward and extended an additional 600 feet, EMAS would be installed on the runway's east end (i.e., departure end of Runway 06) in order to meet the D-III RSA design standard requirements. The EMAS would be 350 feet long by 150 feet wide and begin 35 feet beyond the runway pavement.

Relocation of EMAS System on Runway 24

In conjunction with the northerly shift of Runway 06-24, the EMAS system located on the runway's west end (i.e., departure end of Runway 24) would be shifted to match with the new alignment. As noted, the EMAS would be necessary in order for the Airport to maintain D-III RSA design standard requirements. Changes to the retaining wall and vehicle service road on the runway's west end would not be required with the shift, but the localizer antenna would be relocated in alignment with the relocated runway end.

1.4 Noise and Sound Level Descriptors and Terminology

1.4.1 Descriptors

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.

1.4.2 Terminology

Sound, Noise, and Acoustics

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 determines 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.

Frequency

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.

Sound Pressure Levels and Decibels

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals (mPa). One mPa is approximately one hundred billionth (0.00000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000 mPa. Because of this wide range of values, sound is rarely expressed in terms of mPa. Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA. The threshold of hearing for the human ear is about 0 dBA, which corresponds to 20 mPa.

Addition of Decibels

Because decibels are logarithmic units, SPL cannot be added or subtracted through standard 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 from one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dBA—rather, they would

combine to produce 73 dBA. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dBA louder than one source.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dBA changes in sound levels, when exposed to steady, single-frequency ("pure-tone") signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dBA are generally not perceptible. It is widely accepted, however, that people begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dBA increase is generally perceived as a distinctly noticeable increase, and a 10 dBA increase is generally perceived as a doubling of loudness.

No known studies have directly correlated the ability of a healthy human ear to discern specific levels of change in traffic noise over a 24-hour period. Many ordinances, however, specify a change of 3 CNEL as the significant impact threshold. This is based on the concept of a doubling in noise energy resulting in a 3 dBA change in noise, which is the amount of change in noise necessary for the increase to be perceptible to the average healthy human ear.

1.5 Noise and Vibration-Sensitive Land Uses

Noise-sensitive land uses (NSLU) are land uses that may be subject to stress and/or interference from excessive noise, such as residential dwellings, transient lodging, dormitories, hospitals, educational facilities, and libraries. Industrial and commercial land uses are generally not considered sensitive to noise. NSLUs are located in the vicinity of the project site. Off-site NSLUs include existing single-family residential development located southeast, north, northwest, and southwest of the project site. Aviara Community Park is located approximately one mile south of the project site.

Land uses in which ground-borne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (Federal Transit Administration [FTA] 2006) are considered "vibration-sensitive." The degree of sensitivity depends on the specific equipment that would be affected by the ground-borne vibration. Excessive levels of ground-borne vibration of either a regular or an intermittent nature can result in annoyance to residential uses. While medical and research laboratories are located in the area, no potential vibration-sensitive land uses located on or within 200 feet of the project site.

1.6 Regulatory Framework

Because the airport is located within the City of Carlsbad, it is subject to City standards. As a County-owned and operated facility, the County's noise impact significance thresholds are also applicable.

City of Carlsbad Municipal Code, Chapter 8.48, Noise

Section 8.48.010 - Construction operation limitations:
It shall be unlawful to operate equipment or perform any construction in the erection, demolition, alteration, or repair of any building or structure or the grading or excavation of land during the following hours, except as hereinafter provided:

a. After 6 p.m. on any day, and before 7 a.m., Monday through Friday, and before 8 a.m. on Saturday;
b. All day on Sunday; and
c. On any federal holiday.

Section 8.48.020 – Exceptions:

1) An owner/occupant or resident/tenant of residential property may engage in a home improvement or home construction project involving the erection, demolition, alteration, or repair of a building or structure or the grading or excavation of land on any weekday between the hours of 7 a.m. and sunset and on weekends between the hours of 8 a.m. and sunset, provided such project is for the benefit of said residential property and is personally carried out by said owner/occupant or resident/tenant.
2) The city manager may grant exceptions to Section 848.010 by issuing a permit in the following circumstances:
    a. When emergency repairs are required to protect the health and safety of any member of the community;
    b. In nonresidential zones, provided there are no inhabited dwellings within 1,000 of the building or structure being erected, demolished, altered or repaired or the exterior boundaries of the site being graded or excavated.

County of San Diego Noise Ordinance

In lieu of construction noise level limits in the Carlsbad Municipal Code for construction noise, standards from the County of San Diego Noise Ordinance will be used for the purpose of controlling excessive noise levels from construction activities.

San Diego County Code Sections 36.408 and 36.409, Construction Equipment, state that:

A. 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 dBA for an 8-hour period, between 7:00 a.m. and 7:00 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.

Section 36.410 of the County's ordinance provides additional limitation on construction equipment beyond Section 36.404 pertaining to impulsive noise. 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 1, *Maximum Sound Levels (Impulsive)*, 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.

Table 1
MAXIMUM SOUND LEVELS
(IMPULSIVE)

Occupied Property Use	Decibels (dBA) L_{MAX}
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

Source: County of San Diego Municipal Code Section 36.410

The minimum measurement period for any measurements is one hour. During the measurement period, a measurement must be conducted every minute from a fixed location on an occupied property. The measurements must 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.

2.0 ENVIRONMENTAL SETTING

2.1 Surrounding Land Uses

McClellan-Palomar Airport is surrounded by commercial and industrial uses. A business park is located along Rutherford Road north of the airport. The nearest commercial buildings are within 60 feet of the project construction areas. Nearby residential areas are located to the southeast, north, northwest and south of the airport. The nearest residential area, a neighborhood of single-family homes, is located to the southeast, approximately 3,100 feet from the eastern end of Runway 06-24 and potential staging areas. Aviara Community Park is located on a hillside overlooking the airport, approximately one mile south of future construction areas. A residential neighborhood is located on a hill approximately 3,100 feet southwest of Runway 06-24. A shopping center is located across Palomar Airport Road, approximately 300 feet south of the nearest potential staging area. Refer to Figure 2, *Project Vicinity* for nearby land uses.

2.1.1 McClellan-Palomar Airport

The project site is located within the McClellan-Palomar Airport property, and is therefore within the Airport Influence Area (AIA). The component sites are located within the 65 dBA CNEL noise contour, as shown in the Airport Land Use Compatibility Plan (ALUCP) (December 2011).

2.2 Existing Noise Environment

The noise environment for the neighborhoods surrounding the airport varies depending on location and proximity to flightpaths to and from the airport. Unless aircraft are taking off or landing, the noise environment in the commercial areas north to the construction site are dominated by traffic noise from nearby Rutherford Road, Priestly Drive, and El Camino Real. The commercial areas south of the airport are dominated by noise from El Camino Real, Palomar Airport Road, and internal roadways. The residential areas surrounding the airport are generally subject to less traffic noise.

2.2.1 Ambient Noise Survey

Twelve measurements in ten separate locations were included in the ambient noise survey. Measurement locations were chosen due to the proximity to the airport, and potential sensitivity to future construction noise. Nine locations were chosen for 15-minute ambient noise surveys. Of these nine locations, four were measured in areas north of the airport, four were located south of the airport, and one was measured just west of the airport runway. Five of these locations were measured in residential areas, and four were measured in commercial and industrial areas. Three 24-hour measurements were taken to understand the long-term ambient noise levels in residential areas near the airport. Two of these were measured from locations also measured in the 15-minute ambient noise surveys. A third measurement was taken in Aviara Community Park, south of the airport. (see Figure 4, *Noise Measurement Locations*, and Appendix A, *On-site Noise Measurement Sheets*, for survey notes). The results of the 15-minute noise measurements are shown in Table 2, *Short-term Ambient Noise Measurement Results*. See Appendix B, *Noise Measurement Data*, for full data including related environmental conditions, and Appendix C, *24-Hour Noise Monitor Charts*, for 24-hour data.

Table 2
SHORT-TERM AMBIENT NOISE MEASUREMENT RESULTS

Measurement Location	Land Use	Noise Levels (dBA)
1	Residential	45.5
2	Residential	66.0
3	Commercial	52.7
4	Commercial	60.6
5	Commercial	64.4
6	Commercial	54.3
7	Residential	59.2
8	Residential	55.2
9	Residential	51.8

Note: Daytime measurements were each 15 minutes in duration and were taken on September 21, 2016.



Noise Measurement Locations

MCCLELLAN-PALOMAR AIRPORT NOISE REPORT

HELIX Environmental Planning

0 1,100 Feet

Figure 4

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3.0 ANALYSIS METHODOLOGY AND ASSUMPTIONS

3.1 Methodology

3.1.1 Ambient Noise Survey

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

- Larson Davis System LD 831 and Model 720 Sound Level Meters
- Spark 706 and 706c Sound Level Meters
- Larson Davis Model CA250 and CA 150 Calibrators
- Windscreen and tripod for the sound level meter
- Sound level meter covers for 24-hour monitoring
- Digital camera

The sound level meter was field-calibrated immediately prior to the noise measurements to ensure accuracy. All sound level measurements conducted and presented in this report were made with a sound level 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.

3.1.2 Noise Modeling Software

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

Modeling of construction truck trips was accomplished using the Traffic Noise Model (TNM) version 2.5. The TNM was released in February 2004 by the U.S. Department of Transportation (USDOT), and calculates the daytime average hourly L_{EQ} from traffic data (Caltrans 2004).

3.2 Assumptions

3.2.1 Construction

3.2.1.1 *General Equipment Assumptions*

Construction would require the use of equipment throughout the site for the full term of each construction phase. Construction would require heavy equipment during multiple phases of the Master Plan, including for demolition, site preparation, grading, building construction, and paving. Refer to Appendix D, *Construction Equipment Assumptions*, for more specific information regarding construction equipment. The first Master Plan phase is expected to begin January 2018, with the last phase ending in 2030. Nighttime construction work is assumed to occur during multiple phases. Refer to Appendix E, *Anticipated Construction Schedule*, for more specific information regarding the schedule of construction activities.

On-site crushing and breaking may be required during multiple phases for demolition of existing pavement and cement such as Runway 06-24, taxiways, and aircraft aprons. Breaking operations would be conducted through the use of drilling and blasting to fracture pavement. Following breaking, the pavement would be fractured into gravel using a crusher in one or both of the potential staging areas and can be moved off-site with conventional earthmoving equipment.

The construction phase requiring work closest to occupied properties would be the demolition and removal of the North Apron and Taxiway during Phase 9. This would require the removal of 43,000 square yards (SY) of pavement, and would be located approximately 60 feet of nearby offices. The North Apron would also be the potential location of a staging area for other construction phases. Pavement breaking and crushing are expected to occur in these staging areas.

No project phases are expected to involve blasting. The most likely source of vibration closest to nearby receptors would be a vibratory roller, which may be used to achieve soil compaction as part of the foundation construction of the glideslope building during Phase 1.

3.2.1.2 *Construction Traffic*

Transportation routes for heavy truck trips related to construction activity would enter and exit the construction area via El Camino Real to the east. Exiting trucks would turn right onto the southbound lanes of El Camino Real. Trucks entering the construction area would arrive via El Camino Real from the north. The exact route on public roads is not known at this time, but it is assumed that trucks may arrive via El Camino Real and Palomar Airport Road to access nearby highways. Single-family homes are within 100 feet of the roadway along these routes.

The construction phase with the largest amount of demolition material would be the demolition and removal of Runway 06-24 during Phase 12. Demolition during Phase 12 would require the removal of approximately 115,374 tons, or 54,940 cubic yards (CY) of debris, including 82,000 square yards (SY) of pavement. Nearly 200 shifts would be required for debris removal for Phase 12 assuming 420 SY of pavement would be removed per eight-hour shift. Assuming approximately 5 CY of material per truck, complete removal of Runway 06-24 could be accomplished by a maximum of 11,000 truck trips over the course of six months. This equals at least 70 trips per day. Assuming 200 8-hour shifts would be required, approximately 55 trips per shift, or 7 trips per hour would be required as a worst-case scenario.

4.0 IMPACTS

4.1 Significance Thresholds

For the purposes of this analysis, the following thresholds are used to determine the significance of project impacts.

Threshold 1: *Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.*

The Carlsbad Municipal Code prohibits construction between 6 p.m. and 7 a.m., Monday through Friday, and before 8 a.m. on Saturday, and all day Sunday, and any federal holiday. Exceptions may be permitted if there are no inhabited dwellings within 1,000 feet of the construction area.

In the absence of specific noise level limits for construction included in the Carlsbad Municipal Code, this analysis incorporates limits used by the County of San Diego. Construction-generated noise is considered substantial, and therefore significant, if it exceeds an 8-hour average exterior noise level of 75 dBA, or a maximum impulsive noise level of 85 dBA when measured at the boundary line of the property where the noise source is located.

Threshold 2: *Expose persons to or generation of excessive ground-borne vibration or ground-borne noise levels.*

For the purposes of this analysis, excessive ground-borne vibration is defined as equal to or in excess of 0.1 in/sec peak particle velocity (PPV) and construction sources shall not exceed the "severe" criteria, as specified by Caltrans (2013), for residences of 0.4 in/sec PPV.

4.2 Construction Noise and Vibration Impacts

Construction of the project would consist of multiple phases. Construction would involve the demolition of existing infrastructure including pavement, grading, paving, and erecting new structures. The magnitude of the impact would depend on the type of construction activity, equipment, distance between the noise source and receiver, and any intervening structures. As noted under the construction assumptions, the loudest noise generation phase to nearby occupied properties would be from the demolition of the North Apron under Phase 9. Construction would generate elevated noise levels at nearby businesses and residences. The closest occupied properties (office buildings) to the construction areas are located approximately 60 feet to the north. The nearest occupied residences to the construction areas are located approximately 3,200 feet to the southeast.

Demolition activities would be required for multiple construction phases, and may include hard pavement breaking and crushing, which is typically significantly louder than other activities and has the greatest potential to create impacts to off-site NSLUs.

Nighttime demolition is expected to be required throughout construction. While the City of Carlsbad Municipal Code limits construction activity to the daytime hours between 7 a.m. and 6 p.m. on weekdays, an exception may be permitted if there are no inhabited dwellings within 1,000 thousand feet of the construction area. Because the nearest residences are beyond 1,000 thousand feet of the construction area, nighttime construction may be permitted.

4.2.1 General Construction Noise

Construction noise would involve multiple construction activities, including grading, breaking, and sawing of materials. Each construction phase would require different equipment depending on the type of construction being performed. Refer to Appendix D, *Construction Equipment Assumptions*, for more specific information regarding construction equipment. Construction noise for each construction phase was analyzed based on the proximity to nearby occupied

properties and the types of construction equipment used. The loudest pieces of equipment were analyzed to assess the worst-case scenario for each phase.

Generally, the nearest occupied properties to future construction sites are the offices north and south of the airport boundary. Demolition and construction would occur at distances as low as 60 feet from the nearest office buildings. Appendix F, *Construction Noise Modeling Outputs,* provides the noise levels for expected construction equipment at the distances for each phase.

Construction equipment would not all operate at the same time or location. Furthermore, construction equipment would not be in constant use during the 8-hour operating day. RCNM defaults were used to calculate the percent operating time within a single hour. Specific pieces of construction equipment per phase were analyzed together for noise impacts due to their likelihood of being used in conjunction with one another. RCNM was used to determine the worst-case construction noise levels at nearby occupied properties.

The nearest occupied properties to the proposed grading areas are offices adjacent to the project site. Construction equipment is mobile and would be moving across the sites throughout the construction periods, and construction would occur within close proximity to the airport boundary. For modeling purposes, the construction equipment were assumed to operate at the closest distances from the nearest occupied properties for each construction phase.

A hydraulically operated impact hammer attached to a tracked excavator is commonly called a breaker. These units are used in site preparation to reduce pavement to a size where they can be transported off site, buried on site for fill, or used in a crusher. Demolition of the pavement and foundation structures on the site are analyzed assuming the use of a breaker.

Construction noise from general construction equipment was modeled to be above the significance threshold defined in Threshold 1 of 75 dBA L_{EQ} (8-hour) for phases 2, 5, and 9 along the airport's northern boundary. General construction noise impacts would be potentially significant for nearby offices. Refer to Table 3, *General Construction Noise Impacts,* for construction impacts by phase.

Table 3 GENERAL CONSTRUCTION NOISE IMPACTS			
Construction Phase	**Noise Level at Occupied Property (dBA L_{EQ})**	**Distance (feet)**	**Significant Impact?**
Phase 1	73.4	160	No
Phase 2	**75.5**	**160**	**Yes**
Phase 3	72.2	500	No
Phase 4	65.2	400	No
Phase 5	**85.7**	**60**	**Yes**
Phase 6	65.1	430	No
Phase 7	59.4	830	No
Phase 8	71.6	200	No
Phase 9	**85.3**	**60**	**Yes**
Phase 10[1]	N/A	N/A	No
Phase 11	68.1	300	No
Phase 12	68.6	470	No
Phase 13	70.9	300	No
Phase 14	66.1	570	No
Phase 15	65.2	400	No
Phase 16	63.2	500	No

Source: RCNM
Note: Bold rows indicate Phase with significant impacts.
[1] Phase 10 does not require construction equipment.

Mitigation measure NOI-1 would ensure that potential impacts are reduced to a less than significant level:

NOI-1 **Demolition and Construction Management Plan.** Noise levels from project-related demolition, grading, and construction activities shall not exceed the noise limit specified in San Diego County Code Sections 36.408 and 36.409 of 75 dBA (8-hour average), when measured at the boundary line of the property where the noise is located or any occupied property where noise is being received. A Demolition and Construction Management Plan that describes the measures included on the construction plans to ensure compliance with the noise limit shall be prepared by the Project Applicant and submitted to the County of San Diego Department of Public Works for approval prior to issuance of the grading permit. The following measures may be included to reduce construction/demolition noise:

- Construction equipment to be properly outfitted and maintained with manufacturer-recommended noise-reduction devices.

- Diesel equipment to be operated with closed engine doors and equipped with factory-recommended mufflers.

- Mobile or fixed "package" equipment (e.g., arc-welders and air compressors) to be equipped with shrouds and noise control features that are readily available for that type of equipment.

- Electrically powered equipment to be used instead of pneumatic or internal-combustion powered equipment, where feasible.

- Unnecessary idling of internal combustion engines (e.g., in excess of 5 minutes) to be prohibited.

- Material stockpiles and mobile equipment staging, parking, and maintenance areas to be located as far as practicable from noise sensitive receptors.

- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only.

- No project-related public address or music system shall be audible at any adjacent sensitive receptor.

- Temporary sound barriers or sound blankets may be installed between construction operations and adjacent noise-sensitive receptors. A sound wall at least 10 feet in height above grade, located along the northern airport boundary line between the North Apron and neighboring offices would mitigate noise levels to within acceptable levels. To reduce noise levels effectively, the sound barrier should be constructed of a material with a minimum weight of two pounds per square foot with no gaps or perforations and remain in place until the conclusion of demolition, grading, and construction activities.

- The County shall notify businesses within 100 feet of the construction area in writing within one week of any construction activity such as demolition, hard rock handling, concrete sawing, asphalt removal, and/or heavy grading operations. The notification shall describe the activities anticipated, provide dates and hours, and provide contact information with a description of a complaint and response procedure.

- The on-site construction supervisor shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process for the affected resident shall be established prior to construction commencement to allow for resolution of noise problems that cannot be immediately solved by the site supervisor.

4.2.2 Pavement Crushing

Crushing may be required for breaking up large pieces of pavement. Pavement crushing machinery may emit noise levels up to 95 dBA at 50 feet (Medlin & Associates 2014). Assuming a crusher could be located at the center of the North Apron staging area, a crusher would be

approximately 100 feet from the nearest occupied office building. If a crusher were located in the southern staging area, it would be located approximately 400 feet from nearby residences.

Assuming a noise attenuation rate of 6 dBA per doubling of distance, noise levels from the crusher would reduce to 84.0 dBA L_{EQ} at a distance of 60 feet and 71.9 dBA L_{EQ} at a distance of 400 feet. A crusher at the North Apron staging area would be above the limit in Threshold 1 of 75 dBA L_{EQ} for occupied properties, and under the impulsive 85 dBA L_{MAX} for commercial and industrial properties. If on-site rock crushing is required at the North Apron staging area, impacts would be potentially significant for nearby offices. A crusher located in the southern staging area would be below the limits in Threshold 1. Refer to Table 4, *Pavement Crusher Noise Impacts*, for construction impacts by phase.

Table 4
PAVEMENT CRUSHER NOISE IMPACTS

Construction Phase	Demolition Requiring Crusher	Significant Impact?
Phase 1	No	No
Phase 2	**Yes**	**Yes**
Phase 3	No	No
Phase 4	No	No
Phase 5	**Yes**	**Yes**
Phase 6	No	No
Phase 7	No	No
Phase 8	No	No
Phase 9	**Yes**	**Yes**
Phase 10[1]	No	No
Phase 11	No	No
Phase 12	**Yes**	**Yes**
Phase 13	**Yes**	**Yes**
Phase 14	**Yes**	**Yes**
Phase 15	No	No
Phase 16	No	No

Notes: Bold rows indicate Phase with significant impacts.
Crusher location is assumed to be in North Apron staging area.
[1] Phase 10 does not require construction equipment.

Mitigation measure NOI-2 would ensure that potential impacts for a crusher at the North Apron staging area are reduced to a less than significant level.

NOI-2 **Noise Reduction Measures Associated with Pavement Crushing**. If an on-site use of a crusher at the North Apron staging area is required, it should be located at the furthest safely feasible point from nearby offices and residences, where it will have minimal impact on occupied buildings. A temporary sound barrier shall be placed around the rock crusher to shield receivers to the north. All barriers should stand at least as tall as the highest part of the crusher, with a minimum of 8 feet. Pavement crushing shall not occur between the hours of 6 p.m. and 7 a.m. on any day Monday through Friday, and

before 8 a.m. on Saturday. No pavement crushing shall occur all day Sunday and on any federal holiday.

4.2.3 Truck Trips

TNM software was used to calculate the noise contour distances for construction-related truck trips. The off-site roadway modeling represents a conservative analysis that does not take into account topography or attenuation provided by existing structures. Export of fill material would require the export of 420 CY of material over an 8-hour shift. This would require nearly 200 8-hour shifts for debris removal. Assuming approximately 5 CY of material per heavy truck, the removal of 52,940 CY of material would require approximately 11,000 trips. The 200 shifts required of debris removal would use 7 heavy truck trips per hour over the course of approximately 10 weeks throughout Phase 12. Assuming construction-related truck traffic travelling at approximately 50 mph within 15 feet from the roadway edge, noise during a given hour would be less than 65 dBA L_{EQ} at the edge of the roadway. Construction-related truck traffic would therefore not exceed the 75 dBA L_{EQ} limit for construction-related activity.

4.3 Construction Vibration

An on-site source of vibration during project construction would be a vibratory roller (primarily used to achieve soil compaction as part of the pavement foundation and paving construction), which is expected to be used within 100 feet of the nearest occupied office buildings during Phases 1, 2, and 5 construction. A vibratory roller creates approximately 0.210 in/sec PPV at a distance of 25 feet. Using the Caltrans criterion of 0.4 in/sec PPV at 25 feet, the approximately 0.210 in/sec PPV vibration impact would be less than what is considered a “severe” impact. Therefore, although vibration may be perceptible by occupants of nearby buildings (the nearest of which would be 100 feet from the vibratory roller), temporary impacts associated with the vibratory roller (and other potential equipment) would be less than significant.

5.0 LIST OF PREPARERS

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6.0 REFERENCES

California Department of Transportation (Caltrans).
2004 California Department of Transportation, Traffic Noise Model (TNM).

City of Carlsbad
Municipal Code Ordinance No. 8.48 (Noise Ordinance), 2013.

County of San Diego
2009 San Diego County Code of Administrative Ordinances. Title 3, Division 6, Chapter 4. Noise Abatement and Control. January.

Medlin & Associates, Inc.
2014 Noise Impact Assessment Report Vista Vineyards. April 3.

U.S. Department of Transportation
2008 Roadway Construction Noise Model.

Appendix A

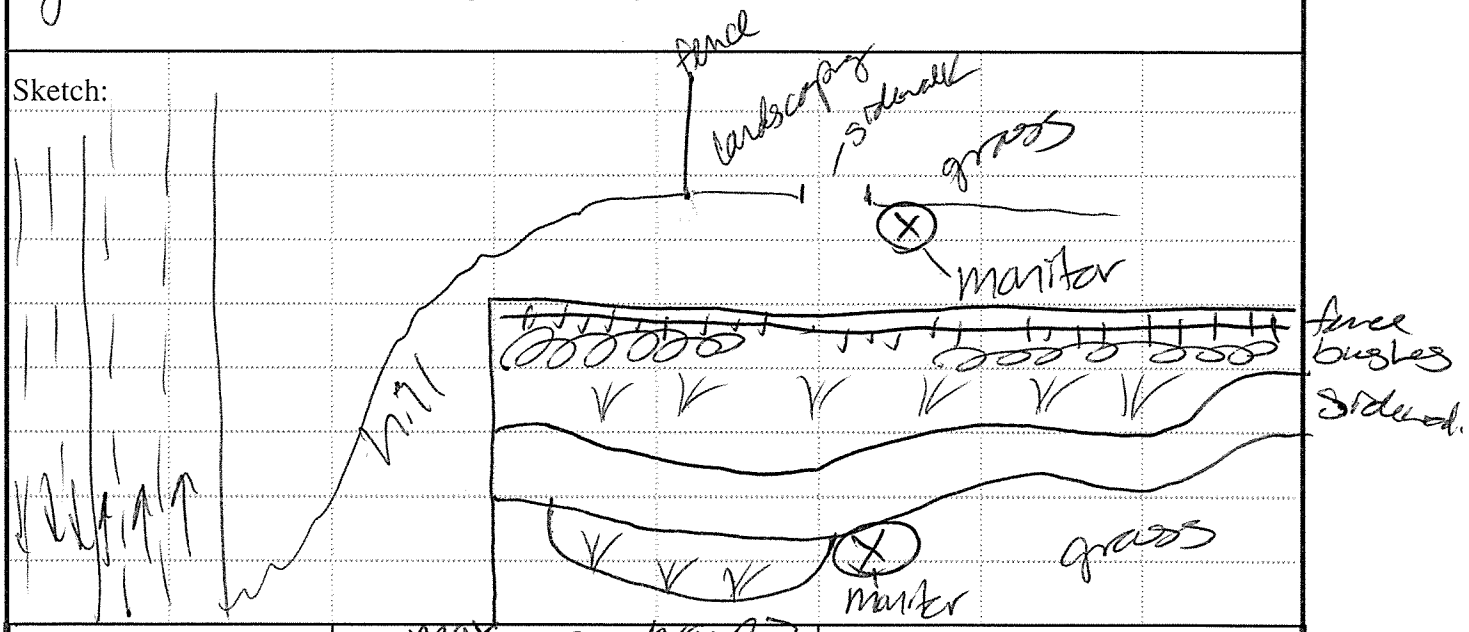
ON-SITE NOISE MEASUREMENT SHEETS

Site Survey

Job # CSE-01.08	Project Name: Palomar - McClellan Airport		
Date: 9/21/16	Site #: A1	Engineer: Amy	
Address: 1401 Sapphire Drive, Carlsbad			
Meter: LXT1	Serial #: 000013	Calibrator: CAL150	Serial #: 3688

Notes: lots of birds chirping. Mostly cloudy
gated recreation area

Sketch:



Temp: 73°	Wind Spd: max 5.8 avg 2.7 mph	Humidity: 97 %	
Start of Measurement: 11:27	End of Measurement: 11:42	55.2 dBA L_{EQ}	

~~Cars (tally per 5 cars)~~ N/A	Medium Trucks (MT)	Heavy Trucks (HT)
planes: 11 helicopters: 1		

Noise Measurement for Information Only

No Through Roadways

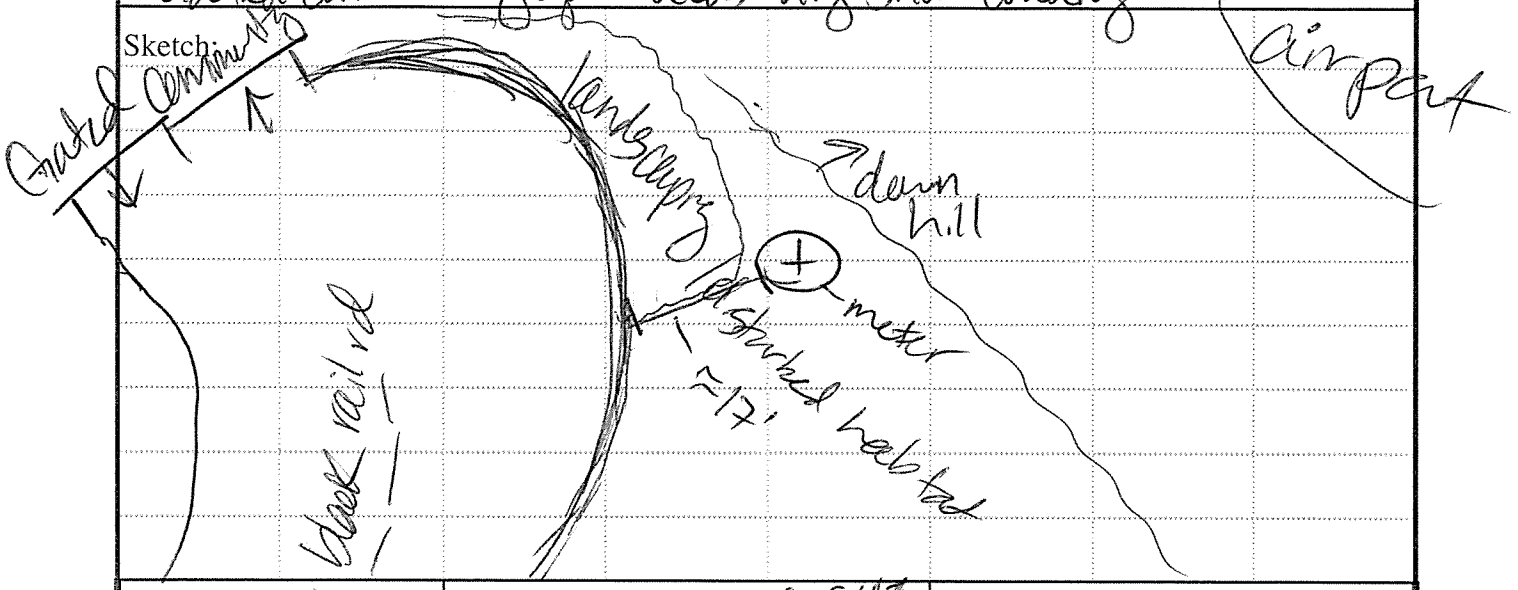
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: Palomar-McClellan Airport		
Date: 9/21/16	Site #: A2	Engineer: Amy	
Address: 1685 Black Rail Road, Carlsbad			
Meter: LxT1	Serial #: 0001013	Calibrator: CAL150	Serial #: 3688

Notes: Under buzzing power lines
9 steps from street (≈ ___ ft) estimate ≈ 17 ft from road
Gated community gate occasionally shut loudly

Sketch:



Temp: 76°	Wind Spd: MAX 6.6 avg. 4.3 mph	Humidity: 97 %	
Start of Measurement: 12:49	End of Measurement: 1:04	51.8 dBA L_{EQ}	

~~Cars (tally per 5 cars)~~ N/A	Medium Trucks (MT)	Heavy Trucks (HT)
planes: III helicopters: I		

Noise Measurement for Information Only

No Through Roadways

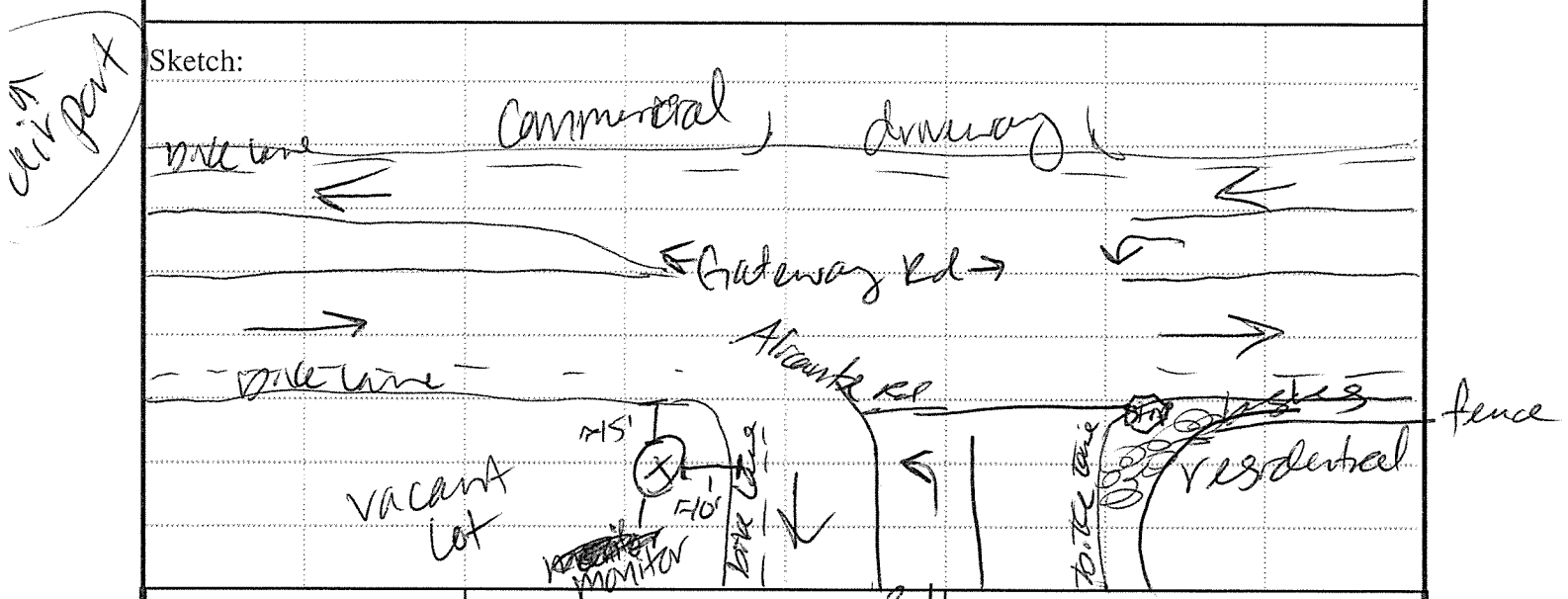
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: Palomar McClellan Airport		
Date: 9/21/16	Site #: A3	Engineer: Amy	
Address: 2510 Gateway Rd, Carlsbad			
Meter: LXT1	Serial #: 0001013	Calibrator: CAL150	Serial #: 3688

Notes:

Sketch:



Temp: 77	Wind Spd: max: 5.5 avg: 3.1 mph	Humidity: 97 %
Start of Measurement: 1:38pm	End of Measurement: 1:53	59.2 dBA L_{EQ}

~~Cars (tally per 5 cars)~~ N/A	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

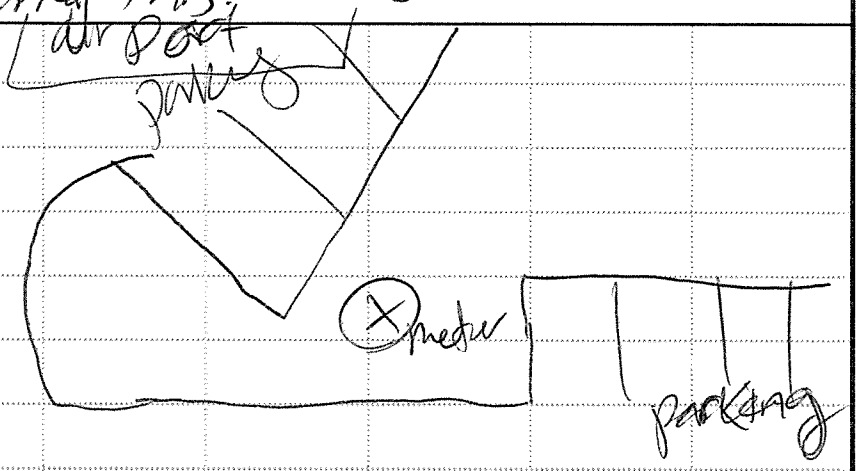
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: Palomar-McClellan Airport		
Date: 9/21/16	Site #: A4	Engineer: Amy	
Address: 6191 El Camino Real, Carlsbad			
Meter: LXT1	Serial #: 001013	Calibrator: CAL150	Serial #: 3688

Notes: person opened nearby storage container & was moving stuff around/making noise. Measurement was paused during this.

Sketch:



Temp: 80°	Wind Spd: max: 4.0 avg: 1.9 mph	Humidity: 97 %
Start of Measurement: 2:14	End of Measurement: 2:31	54.3 dBA L_{EQ}

~~Cars (tally per 5 cars)~~ N/A	Medium Trucks (MT)	Heavy Trucks (HT)

Noise Measurement for Information Only

No Through Roadways

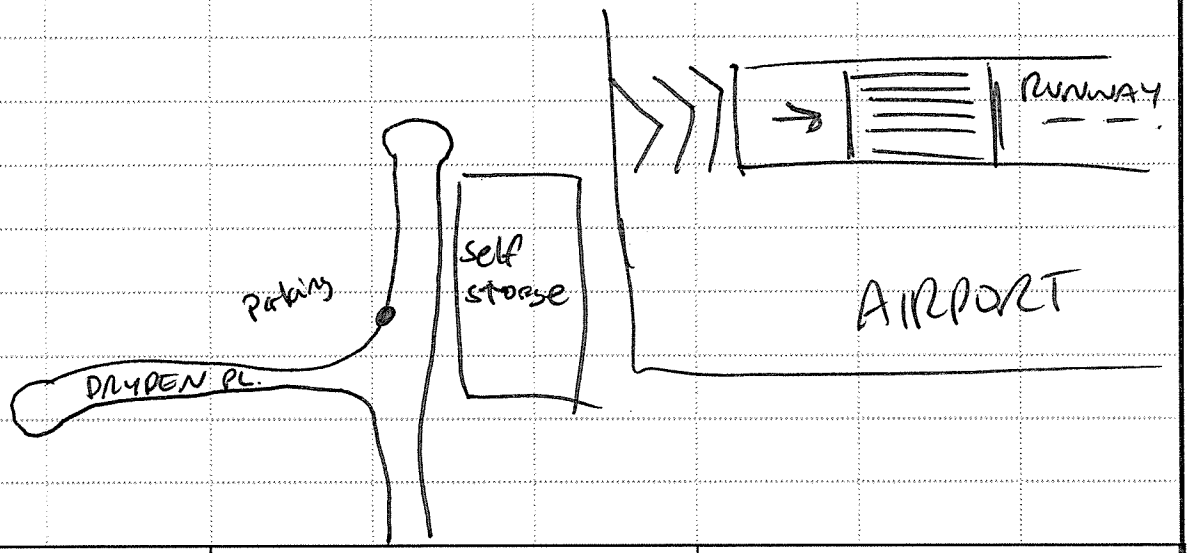
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: McClellan-Palomar Airport		
Date: 9/21/2016	Site #: A5	Engineer: *Jason Runyan*	
Address: Palomar Oaks Way/Dryden Place	33° 7' 32.51" N / 117° 17' 27.68" W		
Meter: LxT	Serial #: 1741	Calibrator: CA250	Serial #: 2621

Notes: Partly Cloudy. Quiet road, distant traffic. 3 plane flyovers directly above monitor. (takeoffs)

Sketch:



Temp:	75°F	Wind Spd:	~5 mph mph	Humidity:	76 %
Start of Measurement:	1531	End of Measurement:	1546		64.4 dBA L_{EQ}

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

Noise Measurement for Information Only

No Through Roadways

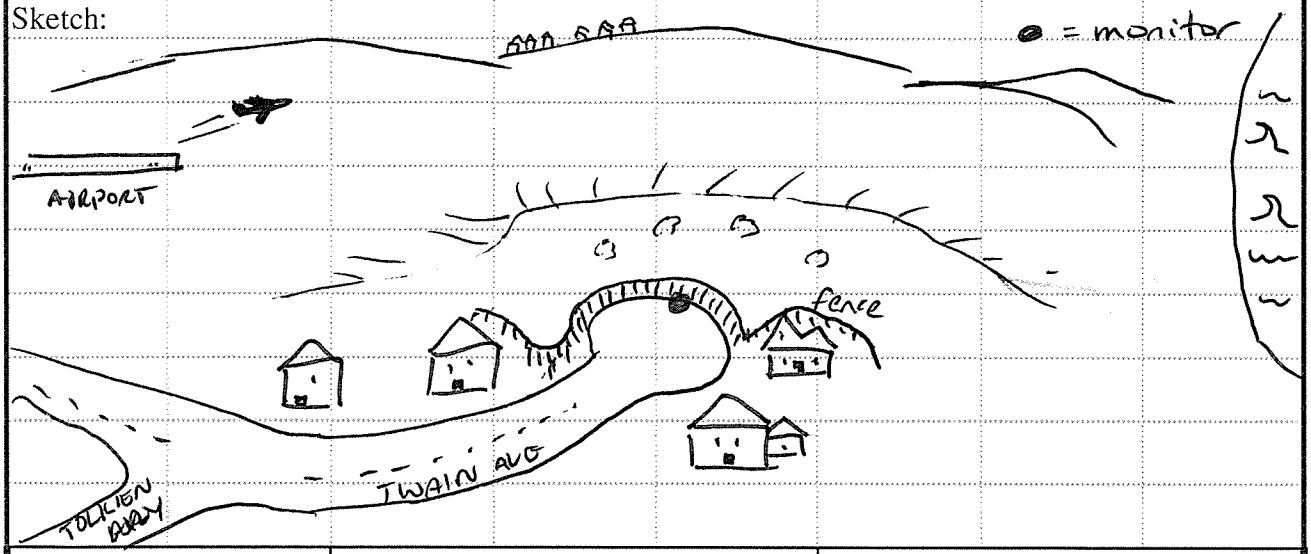
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: McClellan-Palomar Airport		
Date: 9.21.16	Site #: J1	Engineer: *Jason Runyan*	
Address: 2094 Twain Avenue	33° 8' 18.87" N / 117° 17' 54.67" W		
Meter: LxT	Serial #: 1741	Calibrator: CA250	Serial #: 2621

Notes: Partial Sun / Overcast. Ocean breeze. Distant plane noise from takeoffs. Distant siren - passed. Distant train horn Ambient Nature sounds

Sketch:



Temp: 73°F	Wind Spd: ~7 mph max mph	Humidity: 87 %
Start of Measurement: 1314	End of Measurement: 1329	45.5 dBA L_{EQ}

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

Noise Measurement for Information Only

No Through Roadways

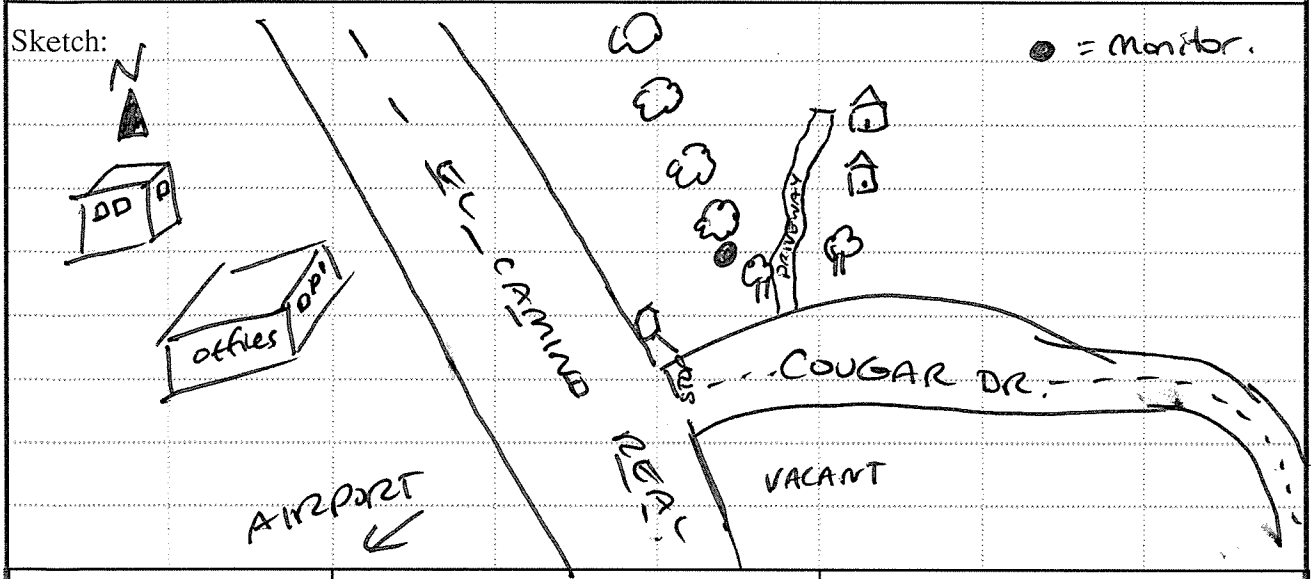
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: McClellan-Palomar Airport		
Date: 9.21.16	Site #: J2	Engineer: *Jason Runyan*	
Address: 2400-2498 Cougar Drive 33° 8' 27.54" N // 117° 16' 33.73" W			
Meter: LxT	Serial #: 1741	Calibrator: CA250	Serial #: 2621

Notes: Overcast conditions. Main noise source - El Camino Real traffic. Paused for fire truck. Helicopter flyover. Consistent breeze.

Sketch:



Temp: 75° F	Wind Spd: 7 mph	mph	Humidity: 82 %
Start of Measurement: 1358	End of Measurement: 1411		66.0 dBA L_{EQ}

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

Noise Measurement for Information Only

No Through Roadways

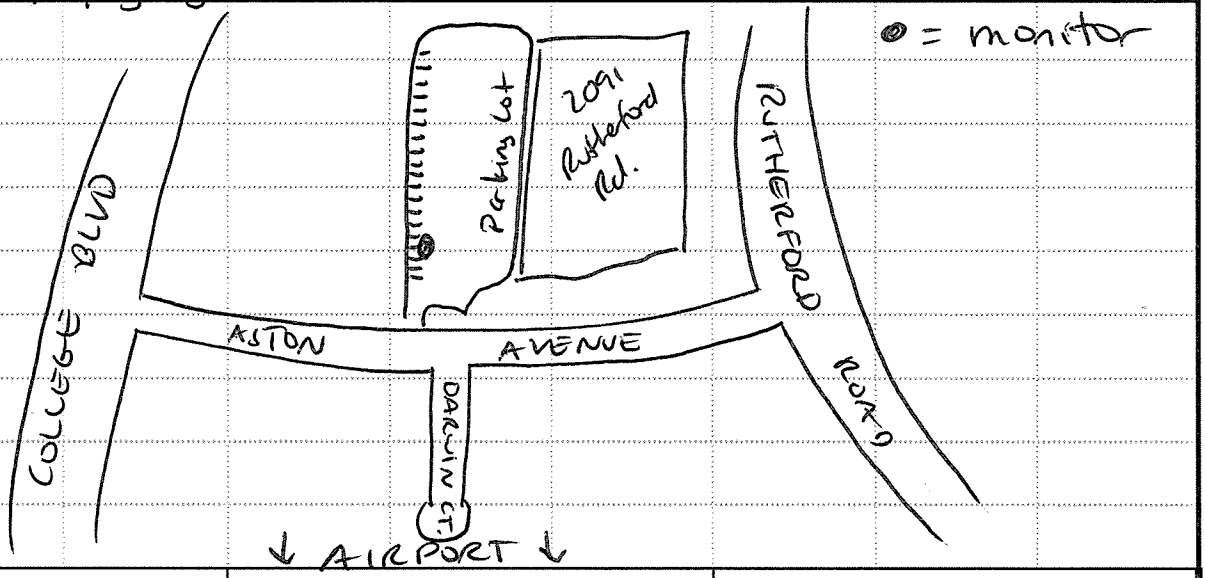
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: McClellan-Palomar Airport		
Date: 9/21/2016	Site #: J3	Engineer: *Jason Runyan*	
Address: Darwin Court/Aston Avenue 33°7'55.38"N / 117°17'9.58"W			
Meter: LxT	Serial #: 1741	Calibrator: CA250	Serial #: 2621

Notes: Overcast / Partly cloudy. Noise sources: traffic on Aston Ave, aircraft noise from takeoffs, workers nearby skateboarding & playing games

Sketch:



Temp: 75° F	Wind Spd: ~1-2 mph	Humidity: 76 %
Start of Measurement: 1502	End of Measurement: 1517	52.7 dBA L_{EQ}

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

Noise Measurement for Information Only

No Through Roadways

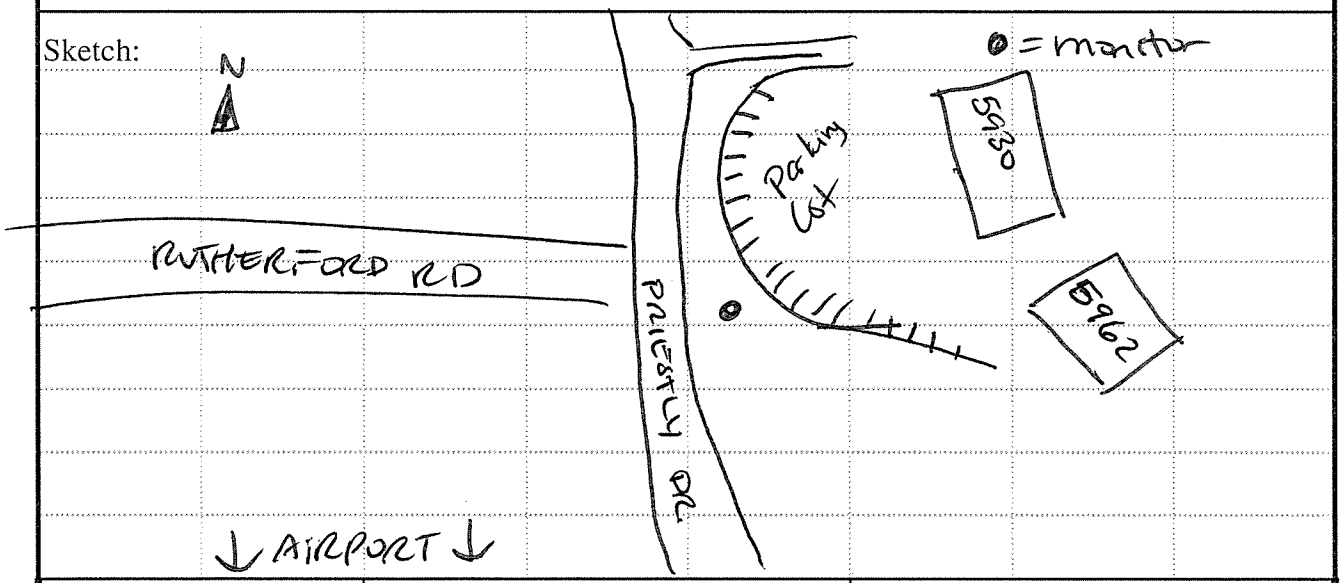
No Calibration Analysis Will Be Provided

Site Survey

Job # CSE-01.08	Project Name: McClellan-Palomar Airport		
Date: 9/21/2016	Site #: J4	Engineer: *Jason Runyan*	
Address: 5930 Priestly Drive 33° 8' 0.22" N / 117° 16' 23.50" W			
Meter: LxT	Serial #: 1741	Calibrator: CA250	Serial #: 2621

Notes: Airport Noise, traffic noise ~25mph. Partly Cloudy

Sketch:



Temp: 75° F	Wind Spd: ~4mph mph	Humidity: 79 %
Start of Measurement: 1438	End of Measurement: 1453	60.6 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

NOISE MEASUREMENT DATA

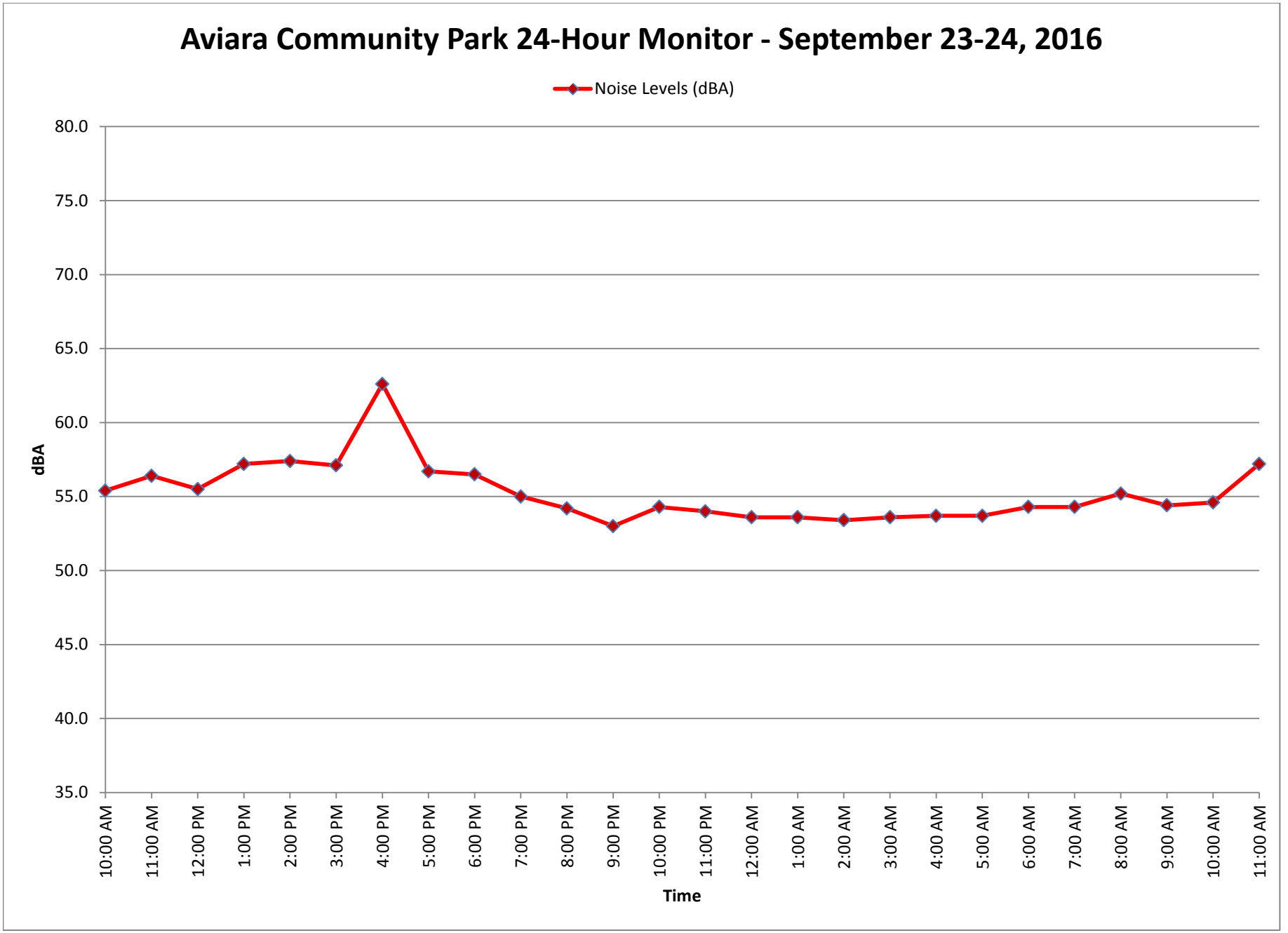
15-minute Measurements					
Measurement	**1**	**2**	**3**	**4**	**5**
Date	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016
Conditions	~7mph maximum breeze, temperature 73 degrees with 87% humidity. Partial sun/overcast	~7 mph breeze, temperature 75 degrees with 82% humidity. Overcast conditions	~1-2 mph breeze, temperature 75 degrees with 76% humidity. Overcast/partly cloudy conditions	~4 mph breeze, temperature 75 degrees with 79% humidity. Partly cloudy conditions	~5mph breeze, temperature approximately 75 degrees with 76% humidity. Partly cloudy.
Time	1:14-1:29 p.m.	1:56-2:11 p.m.	3:02-3:17 p.m.	2:38-2:53 p.m.	3:31-3:46 p.m.
Location	33° 8'18.87"N; 117°17'54.67"W	33° 8'27.54"N; 117°16'33.73"W	33° 7'55.38"N; 117°17'9.58"W	33° 8'0.22"N; 117°16'23.50"W	33° 7'32.51"N; 117°17'27.68"W
Noise Level	**45.5 dBA**	**66.0 dBA**	**52.7 dBA**	**60.6 dBA**	**64.4 dBA**
Notes	Ocean breeze, distant plane noise from takeoffs. Paused measurement for distant dsiren. Distant train horn can be heard. Mostly ambient nature sounds.	Main noise source from El Camino Real traffic. Paused for fire truck. Helicopter flyover. Consistent breeze.	Noise sources from traffic on Aston Avenue, aircraft noise from takeoffs, and from office workers playing games/skateboarding.	Airport and some traffic noise.	Quiet road, distant traffic. 3 plane flyovers directly above monitor (takeoffs)

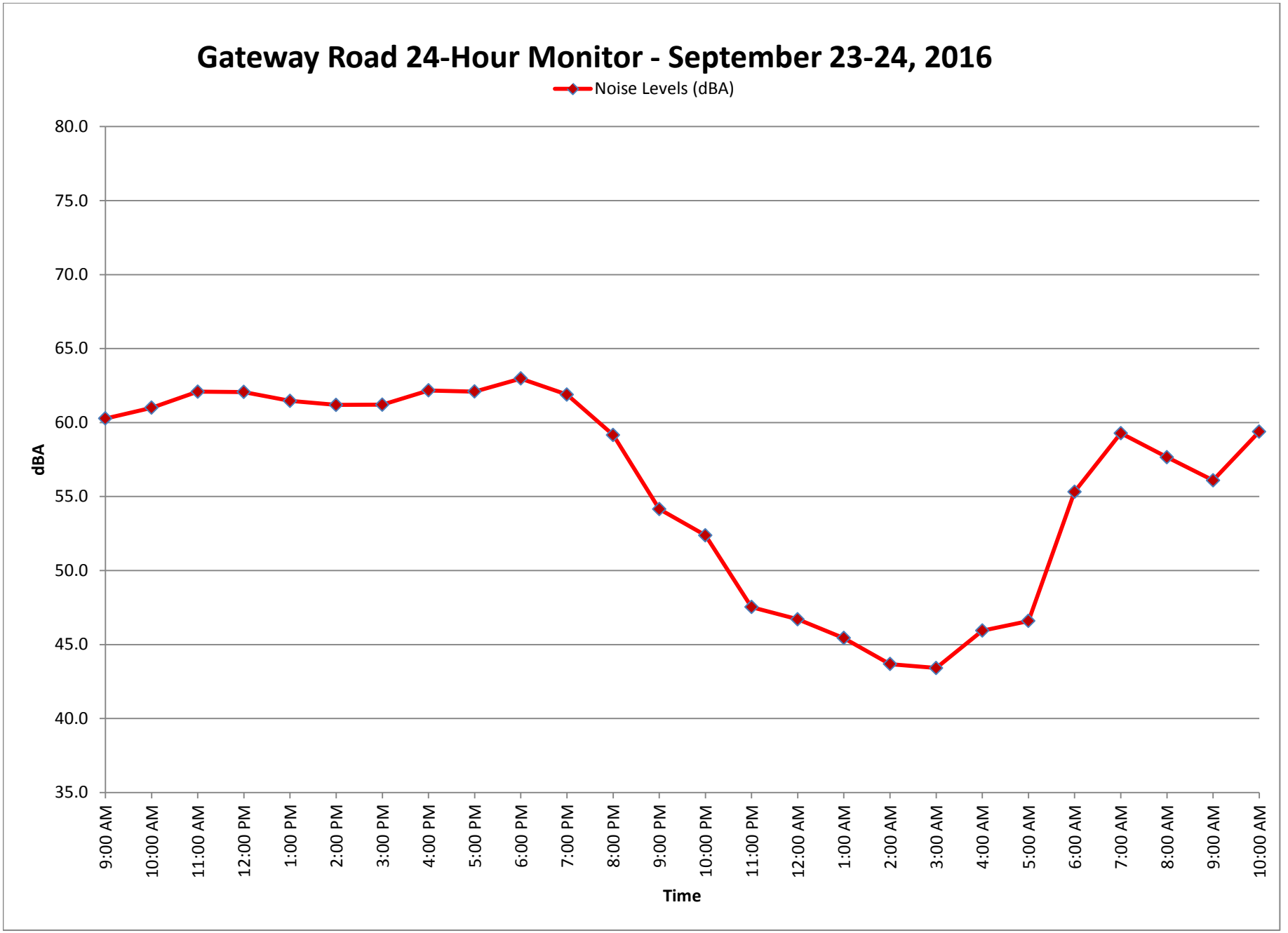
15-minute Measurements (cont.)				
Measurement	**6**	**7**	**8**	**9**
Date	9/21/2016	9/21/2016	9/21/2016	9/21/2016
Conditions	~ 2 mph breeze, temperature of approximately 80 degrees with 97% humidity.	~3mph breeze, temperature of approximately 77 degrees with 97% humidity.	~3 mph breeze, temperature of approximately 73 degrees with 97% humidity. Mostly Cloudy.	~4mph breeze, temperature of approximately 76 degrees with 97% humidity.
Time	2:14 -2:31 p.m.	1:38-1:53 p.m.	11:27-11:42 a.m.	12:49-1:04 p.m.
Location	33° 7'33.92"N; 117°16'10.62"W	33° 7'38.95"N; 117°15'41.81"W	33° 7'15.23"N; 117°17'43.45"W	33° 7'0.36"N; 117°17'17.21"W
Noise Level	**54.3 dBA**	**59.2 dBA**	**55.2 dBA**	**51.8 dBA**
Notes	Measurement was paused while person opened nearby storage container and loudly moved items.		Lots of birds chirping. Mostly cloudy. Gated recreation area.	Under buzzing powerlines, Estimate ~17 feet from road. Gated community gate occasionally shut loudly.

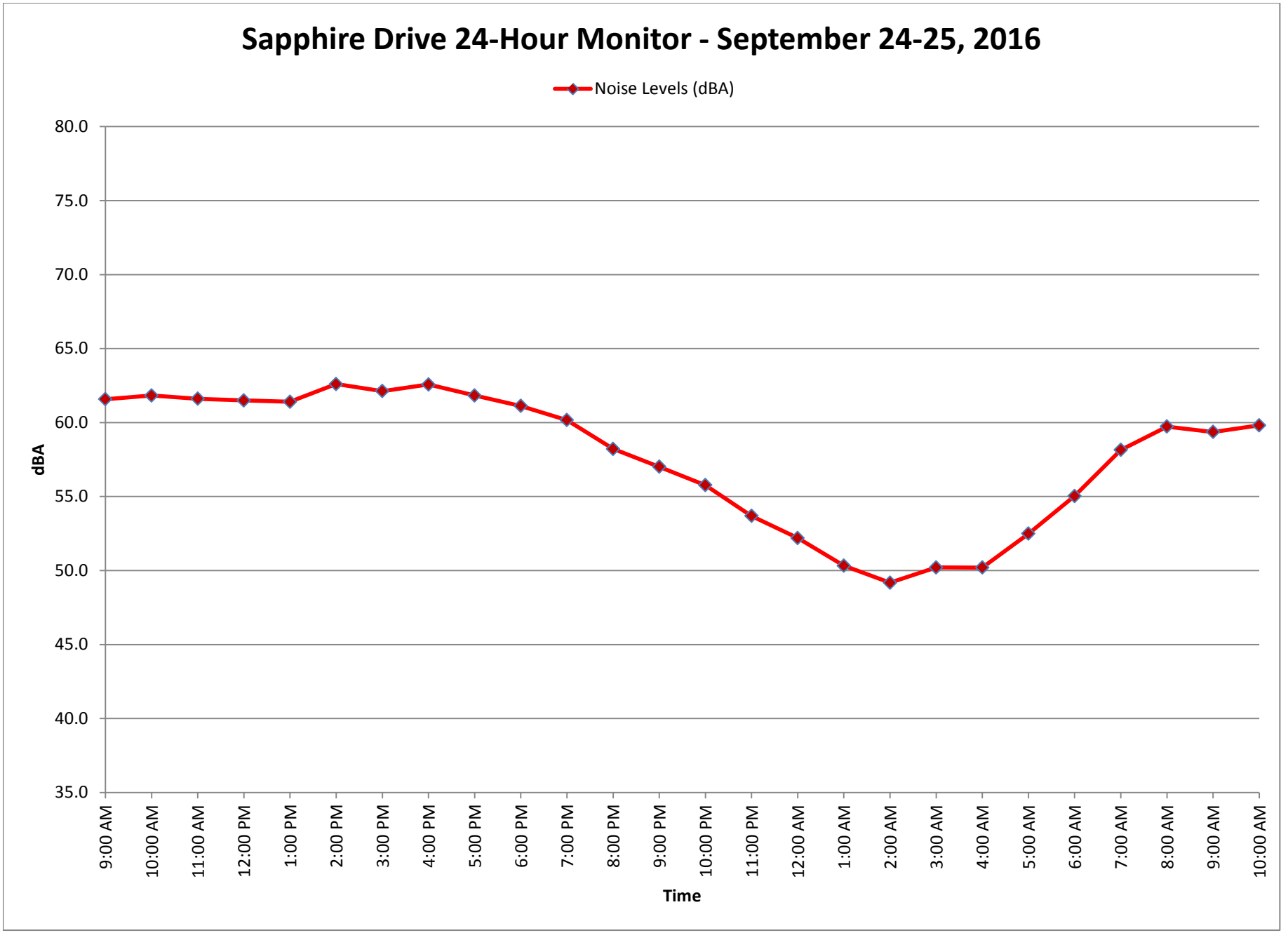
24-hour monitor			
Measurement N	10	11	12
Start Date/Time	9/23/2016, 9:00 a.m.	9/23/2016, 9:00 a.m.	9/23/2016, 9:00 a.m.
End Date/Time	9/24/2016, 11:00 a.m.	9/24/2016, 11:00 a.m.	9/24/2016, 11:00 a.m.
Location	33° 7'17.23"N; 117°17'44.1	33° 6'57.00"N; 117°16'46.2	33° 7'38.73"N; 117°15'41.95"W
Noise Level	**See Appendix C for Charts**	**See Appendix C for Charts**	**See Appendix C for Charts**

Appendix C

24-HOUR NOISE MONITOR CHARTS


Aviara Community Park 24-Hour Monitor - September 23-24, 2016
Noise Levels (dBA)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
dBA
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
Time


Gateway Road 24-Hour Monitor - September 23-24, 2016
Noise Levels (dBA)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
dBA
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
Time


Sapphire Drive 24-Hour Monitor - September 24-25, 2016
Noise Levels (dBA)
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
35.0
dBA
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
Time

Appendix D

CONSTRUCTION EQUIPMENT ASSUMPTIONS

Master Plan Project Phase	Construction Phase	OffRoad Equipment Type	Number of Units	Usage Hours (per day)
1	Site Preparation	Graders	1	8
1	Site Preparation	Tractors/Loaders/Backhoes	1	8
1	Grading	Concrete/Industrial Saws	1	8
1	Grading	Rubber Tired Dozers	1	1
1	Grading	Tractors/Loaders/Backhoes	2	6
1	Building Construction	Cranes	1	4
1	Building Construction	Forklifts	2	6
1	Building Construction	Tractors/Loaders/Backhoes	2	8
1	Paving	Cement and Mortar Mixers	4	6
1	Paving	Pavers	1	7
1	Paving	Rollers	1	7
1	Paving	Tractors/Loaders/Backhoes	1	7
1	Architectural Coating	Air Compressors	1	6
2	Demolition	Concrete/Industrial Saws	1	8
2	Demolition	Rubber Tired Dozers	1	1
2	Demolition	Tractors/Loaders/Backhoes	2	6
2	Site Preparation	Graders	1	8
2	Site Preparation	Tractors/Loaders/Backhoes	1	8
2	Grading	Concrete/Industrial Saws	1	8
2	Grading	Rubber Tired Dozers	1	1
2	Grading	Tractors/Loaders/Backhoes	2	6
2	Paving	Cement and Mortar Mixers	4	6
2	Paving	Pavers	1	7
2	Paving	Rollers	1	7
2	Paving	Tractors/Loaders/Backhoes	1	7
3	Site Preparation	Graders	1	8
3	Site Preparation	Tractors/Loaders/Backhoes	1	8
3	Paving	Cement and Mortar Mixers	4	6
3	Paving	Concrete/Industrial Saws	1	8
3	Paving	Pavers	1	7
3	Paving	Rollers	1	7
3	Paving	Rubber Tired Dozers	1	1

3	Paving	Tractors/Loaders/Backhoes	2	6
3	Paving	Tractors/Loaders/Backhoes	1	7
3	Building Construction	Cranes	1	4
3	Building Construction	Forklifts	2	6
3	Building Construction	Tractors/Loaders/Backhoes	2	8
3	Architectural Coating	Air Compressors	1	6
4	Site Preparation	Graders	1	8
4	Site Preparation	Rubber Tired Dozers	1	7
4	Site Preparation	Tractors/Loaders/Backhoes	1	8
4	Grading	Graders	1	6
4	Grading	Rubber Tired Dozers	1	6
4	Grading	Tractors/Loaders/Backhoes	1	7
4	Building Construction	Cranes	1	6
4	Building Construction	Forklifts	2	6
4	Building Construction	Generator Sets	1	8
4	Building Construction	Tractors/Loaders/Backhoes	1	6
4	Building Construction	Welders	3	8
5	Demolition	Concrete/Industrial Saws	1	8
5	Demolition	Rubber Tired Dozers	1	8
5	Demolition	Tractors/Loaders/Backhoes	3	8
5	Site Preparation	Graders	1	8
5	Site Preparation	Rubber Tired Dozers	1	7
5	Site Preparation	Tractors/Loaders/Backhoes	1	8
5	Grading	Graders	1	6
5	Grading	Rubber Tired Dozers	1	6
5	Grading	Tractors/Loaders/Backhoes	1	7
5	Retaining Wall	Cranes	1	6
5	Retaining Wall	Forklifts	1	6
5	Retaining Wall	Generator Sets	1	8
5	Retaining Wall	Tractors/Loaders/Backhoes	1	6
5	Retaining Wall	Welders	3	8
5	Pave Road	Cement and Mortar Mixers	1	6
5	Pave Road	Pavers	1	6
5	Pave Road	Paving Equipment	1	8

5	Pave Road	Rollers	1	7
5	Pave Road	Tractors/Loaders/Backhoes	1	8
6	Electrical	Graders	1	8
6	Electrical	Tractors/Loaders/Backhoes	1	8
6	Grading	Concrete/Industrial Saws	1	8
6	Grading	Rubber Tired Dozers	1	1
6	Grading	Tractors/Loaders/Backhoes	2	6
6	Building Construction	Cranes	1	4
6	Building Construction	Forklifts	2	6
6	Building Construction	Tractors/Loaders/Backhoes	2	8
7	Site Preparation	Bore/Drill Rigs	2	8
7	Site Preparation	Graders	1	8
7	Site Preparation	Tractors/Loaders/Backhoes	1	8
7	Grading	Concrete/Industrial Saws	1	8
7	Grading	Rubber Tired Dozers	1	1
7	Grading	Tractors/Loaders/Backhoes	2	6
7	Paving	Cement and Mortar Mixers	4	6
7	Paving	Pavers	1	7
7	Paving	Rollers	1	7
7	Paving	Tractors/Loaders/Backhoes	1	7
8	Demolition	Concrete/Industrial Saws	1	8
8	Demolition	Rubber Tired Dozers	1	1
8	Demolition	Tractors/Loaders/Backhoes	2	6
9	Demolition	Concrete/Industrial Saws	1	8
9	Demolition	Excavators	3	8
9	Demolition	Rubber Tired Dozers	2	8
11	Site Preparation	Graders	1	8
11	Site Preparation	Tractors/Loaders/Backhoes	1	8
11	Grading	Concrete/Industrial Saws	1	8
11	Grading	Rubber Tired Dozers	1	1
11	Grading	Tractors/Loaders/Backhoes	2	6
11	Paving	Cement and Mortar Mixers	4	6
11	Paving	Pavers	1	7
11	Paving	Rollers	1	7

11	Paving	Tractors/Loaders/Backhoes	1	7
12	Demolition	Concrete/Industrial Saws	1	8
12	Demolition	Excavators	3	8
12	Demolition	Rubber Tired Dozers	2	8
13	Demolition	Concrete/Industrial Saws	1	8
13	Demolition	Rubber Tired Dozers	1	1
13	Demolition	Tractors/Loaders/Backhoes	2	6
13	Site Preparation	Graders	1	8
13	Site Preparation	Tractors/Loaders/Backhoes	1	8
13	Grading	Concrete/Industrial Saws	1	8
13	Grading	Rubber Tired Dozers	1	1
13	Grading	Tractors/Loaders/Backhoes	2	6
13	Paving	Cement and Mortar Mixers	4	6
13	Paving	Pavers	1	7
13	Paving	Rollers	1	7
13	Paving	Tractors/Loaders/Backhoes	1	7
14	Demolition	Concrete/Industrial Saws	1	8
14	Demolition	Excavators	3	8
14	Demolition	Rubber Tired Dozers	2	8
14	Site Preparation	Rubber Tired Dozers	3	8
14	Site Preparation	Tractors/Loaders/Backhoes	4	8
14	Grading	Excavators	1	8
14	Grading	Graders	1	8
14	Grading	Rubber Tired Dozers	1	8
14	Grading	Tractors/Loaders/Backhoes	3	8
14	Paving	Pavers	2	8
14	Paving	Paving Equipment	2	8
14	Paving	Rollers	2	8
15	Site Preparation	Graders	1	8
15	Site Preparation	Rubber Tired Dozers	1	7
15	Site Preparation	Tractors/Loaders/Backhoes	1	8
15	Grading	Graders	1	6
15	Grading	Rubber Tired Dozers	1	6
15	Grading	Tractors/Loaders/Backhoes	1	7

15	Paved surface below EMAS	Cement and Mortar Mixers	1	6
15	Paved surface below EMAS	Pavers	1	6
15	Paved surface below EMAS	Paving Equipment	1	8
15	Paved surface below EMAS	Rollers	1	7
15	Paved surface below EMAS	Tractors/Loaders/Backhoes	1	8
15	Paved surface below EMAS	Forklifts	2	8
16	Site Preparation	Graders	1	8
16	Site Preparation	Rubber Tired Dozers	1	7
16	Site Preparation	Tractors/Loaders/Backhoes	1	8
16	Grading	Graders	1	6
16	Grading	Rubber Tired Dozers	1	6
16	Grading	Tractors/Loaders/Backhoes	1	7
16	Paved surface below EMAS	Cement and Mortar Mixers	1	6
16	Paved surface below EMAS	Pavers	1	6
16	Paved surface below EMAS	Paving Equipment	1	8
16	Paved surface below EMAS	Rollers	1	7
16	Paved surface below EMAS	Tractors/Loaders/Backhoes	1	8
16	Paved surface below EMAS	Forklifts	1	8

Appendix E

ANTICIPATED CONSTRUCTION SCHEDULE

CRQ Master Plan
Duration of Construction Projects

PHASE No.	PHASE	FEATURE	DURATION	SUPPORT
1	Near-Term	Relocation of the Glideslope Building	2 months	RS Mean: 02 43 13.13 - Building Relocation; CSPP, Utility, Miscellaneous Demo Mobilization and Staking: 2 weeks Runway Closure: 2 weeks Concrete Curing: 28 days Steel Building Relocation: 360 SF
2	Near-Term	Relocation of the Segmented Circle and Windsock Equipment	4 weeks	RS Mean: 02 41 13.17 - Demolish, Remove Pavement and Curb, Revegetation, Miscellaneous Demo, Equipment Relocation Mobilization and Staking: 2 weeks Concrete Curing: 28 days Pavement Removal: 6,900 SF
3	Near-Term	Relocation of ARFF Facility	8 months	RS Mean: 02 43 13.13 - Building Relocation; Mobilization, Staking, CSPP, Miscellaneous Demo Mobilization and Staking: 2 weeks Runway Closure: 2 weeks Concrete Curing: 28 days AARF Building Relocation: 4,700 SF
4	Near-Term	Construction of EMAS System on RWY End 06	10 months	RS Mean: 03 11 13.85 - Concrete Forms in Place, Walls; 31 23 23.17 - General Fill; 31 23 23.23 - Compaction of Embankment; 2 Production Crews Runway Closure: 2 weeks Earthwork: 190,000 CY Retaining Wall: 13,000 SF Construct EMAS Block: 5,900 SY
5	Near-Term	Relocation of the Vehicle Service Road	3 Months	RS Mean: 02 41 13.17 - Demolish, Remove Pavement and Curb; 31 22 16.10 - Finish Grading Runway Closure: 2 weeks New retaining wall Pavement Removal: 6,000 SY New Pavement: 6,000 SY
6	Near-Term	Relocation of Lighting Vault	4 months	RS Mean: 02 43 13.13 - Building Relocation, CSPP, Miscellaneous Demo Mobilization and Staking: 2 weeks Airfield electrical re-routing New Facility Lighting Vault Relocation: 100 SF
7	Near-Term	200' Extension of Existing RWY 06-24 and TWY A	4 months	RS Mean: CSPP, Drilled Displacement Columns Drilled Displacement Columns: 66,000 SF Night work New construction grading and RSA adjustments New Pavement: 3,000 CY
8	Intermediate-Term	Removal of Fuel Tank on North Apron	2 months	Building Demo and Removal; Possible environmental concerns Contact EPA: Approx. 1 month
9	Intermediate-Term	Removal of the North Apron and TWY N	4 weeks	RS Mean: 02 41 13.17 - Demolish, Remove Pavement and Curb, Miscellaneous Demo Mobilization and Staking: 2 weeks Runway Closure: 2 weeks Signage removal and restriping Pavement Removal: 43,000 SY (Full Depth)
10	Intermediate-Term	Area Reserved for Future GA Parking	No Action Req.	
11	Intermediate-Term	Near-Term Auto Parking Improvements	2 months	New Pavement: 800 SY
				RS Mean: 02 41 13.17 - Demolish, Remove Pavement and Curb; Signing and Striping, 2 Production Crews

12	Long-Term	Relocation/Extension of RWY 06-24	6 months	Mobilization and Staking: 2 weeks Runway Closure: 2 weeks Pavement Removal: 82,000 SY (Full Depth)
13	Long-Term	Removal/Reconstruction of Existing Connector Taxiways	8 weeks	RS Mean: 02 41 13.17 - Demolish, Remove Pavement and Curb Mobilization and Staking: 2 weeks Runway Closure: 2 weeks Pavement Removal: 4,000 SY (Full Depth) New Pavement: 1,800 CY
14	Long-Term	Removal/Reconstruction of Existing TWY A	5 months	RS Mean: 02 41 13.17 - Demolish, Remove Pavement and Curb Mobilization and Staking: 2 weeks Runway Closure: 2 weeks Pavement Removal: 39,000 SY (Full Depth) New Pavement: 15,000 CY
15	Long-Term	Construction of EMAS System on RWY 24	6 weeks	Drilled Displacement Columns, Miscellaneous Demo, 2 Production Crews Mobilization and Staking: 2 weeks Runway Closure: 2 weeks Construct EMAS Block: 5,900 SY
16	Long-Term	Relocation of EMAS System on RWY 06	2 month	RS Mean: 03 11 13.85 - Concrete Forms in Place, Walls; 31 23 23.17 General Fill; 31 23 23.23 - Compaction of Embankment; 2 41 13.17 - Demolish, Remove Pavement and Curb Mobilization and Staking: 1 week Runway Closure: 1 week Relocate EMAS Block: 5,900 SY

Assumptions: 2,000 CY of asphalt/concrete production per shift
2.1 CY per ton
420 SY of pavement removal can be completed per shift

Appendix F

CONSTRUCTION NOISE MODELING OUTPUTS

Phase 1 - Relocation of the Glideslope Building

Equipment	dBA Lmax (50 feet)	Base Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	89.6	N/A	N/A	N/A	83.5	#	160.0	73.4	#	75	132.6
Concrete Saw	89.6	20%	8	8	82.6	#	160.0	72.5	#	75	120.1
Dozer	81.7	40%	1	8	68.7	#	160.0	58.6	#	75	24.2
Loader	79.1	40%	4	8	72.1	#	160.0	62.0	#	75	35.8
Loader	79.1	40%	4	8	72.1	#	160.0	62.0	#	75	35.8

Note: Equipment during Grading phase of Phase 1 were analyzed to determine worst-case construction noise levels.

Phase 2 - Relocation of the Segmented Circle and Windsock Equipment

Base

Equipment	dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	90.0	N/A	N/A	N/A	85.6	#	160.0	75.5	#	75	169.7
Concrete Saw	89.6	20%	8	8	82.6	#	160.0	72.5	#	75	120.1
Dozer	81.7	40%	1	8	68.7	#	160.0	58.6	#	75	24.2
Loader	79.1	40%	6	8	73.9	#	160.0	63.8	#	75	43.9
Mounted Impact Hammer	90.0	20%	6	8	81.8	#	160.0	71.7	#	75	108.9

Note: Equipment during Grading phase of Phase 2 were analyzed to determine worst-case construction noise levels.

Phase 3 - Relocation of ARFF Facility

Equipment	dBA Lmax (50 feet)	Base Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	89.6	N/A	N/A	N/A	85.6	#	500.0	72.2	#	75	168.5
Concrete Saw	89.6	20%	8	8	82.6	#	500.0	62.6	#	75	120.1
Dozer	81.7	40%	1	8	68.7	#	500.0	48.7	#	75	24.2
Cement Truck	78.8	40%	6	8	73.6	#	500.0	53.6	#	75	42.4
Paver	77.2	50%	7	8	73.6	#	500.0	53.6	#	75	42.6
Roller	85.0	20%	7	8	77.4	#	500.0	57.4	#	75	66.1
Cement Truck	78.8	40%	6	8	73.6	#	160.0	63.5	#	75	42.4
Cement Truck	78.8	40%	6	8	73.6	#	100.0	67.6	#	75	42.4
Cement Truck	78.8	40%	6	8	73.6	#	100.0	67.6	#	75	42.4

Note: Equipment during Paving phase of Phase 3 were analyzed to determine worst-case construction noise levels.

Phase 4 - Construction of EMAS System on RWY End 06

Equipment	dBA Lmax (50 feet)	Base Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	85.0	N/A	N/A	N/A	83.2	#	400.0	65.2	#	75	129.1
Grader	85.0	40%	8	8	81.0	#	400.0	63.0	#	75	100.0
Loader	79.1	40%	8	8	75.1	#	400.0	57.1	#	75	50.7
Dozer	81.7	40%	7	8	77.1	#	400.0	59.1	#	75	64.0

Note: Equipment during Site Prep phase of Phase 4 were analyzed to determine worst-case construction noise levels.

Phase 5 - Relocation of Vehicle Service Road

Base

Equipment	dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	90.0	N/A	N/A	N/A	87.3	#	60.0	85.7	#	75	206.4
Concrete Saw	89.6	20%	8	8	82.6	#	60.0	81.0	#	75	120.1
Dozer	81.7	40%	8	8	77.7	#	60.0	76.1	#	75	68.4
Loader	79.1	40%	8	8	75.1	#	60.0	73.5	#	75	50.7
Loader	79.1	40%	8	8	75.1	#	60.0	73.5	#	75	50.7
Loader	79.1	40%	8	8	75.1	#	60.0	73.5	#	75	50.7
Mounted Impact Hammer	90.0	20%	8	8	83.0	#	60.0	81.4	#	75	125.7

Note: Equipment during site demolition phase of Phase 5 were analyzed to determine worst-case construction noise levels.

Phase 6 - Relocation of Lighting Vault

Equipment	dBA Lmax (50 feet)	Base Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	89.6	N/A	N/A	N/A	83.8	#	430.0	65.1	#	75	137.3
Loader	79.1	40%	6	8	73.9	#	430.0	55.2	#	75	43.9
Loader	79.1	40%	6	8	73.9	#	430.0	55.2	#	75	43.9
Concrete Saw	89.6	20%	8	8	82.6	#	430.0	63.9	#	75	120.1
Dozer	81.7	40%	1	8	68.7	#	430.0	50.0	#	75	24.2

Note: Equipment during Grading phase of Phase 6 were analyzed to determine worst-case construction noise levels.

Phase 7 - 200' Extension of Existing RWY 06-24 and TWY A

Base

Equipment	dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	89.6	N/A	N/A	N/A	83.8	#	830.0	59.4	#	75	137.3
Concrete Saw	89.6	20%	8	8	82.6	#	830.0	58.2	#	75	120.1
Dozer	81.7	40%	1	8	68.7	#	830.0	44.3	#	75	24.2
Loader	79.1	40%	6	8	73.9	#	830.0	49.5	#	75	43.9
Loader	79.1	40%	6	8	73.9	#	830.0	49.5	#	75	43.9

Note: Equipment during Grading phase of Phase 7 were analyzed to determine worst-case construction noise levels.

Phase 8 - Removal of Fuel Tank on North Apron

Equipment	Base dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	89.6	N/A	N/A	N/A	83.7	#	200.0	71.6	#	75	135.6
Concrete Saw	89.6	20%	8	8	82.6	#	200.0	70.6	#	75	120.1
Excavator	80.7	40%	1	8	67.7	#	200.0	55.6	#	75	21.6
Dozer	81.7	40%	6	8	76.5	#	200.0	64.4	#	75	59.2

Note: Equipment during site demolition phase of Phase 8 were analyzed to determine worst-case construction noise levels.

Phase 9 - Removal of the North Apron and TWY N

Base

Equipment	dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	90.0	N/A	N/A	N/A	86.9	#	60.0	85.3	#	75	196.5
Concrete Saw	89.6	20%	8	8	82.6	#	60.0	81.0	#	75	120.1
Excavator	80.7	40%	8	8	76.7	#	60.0	75.1	#	75	61.0
Dozer	81.7	40%	8	8	77.7	#	60.0	76.1	#	75	68.4
Mounted Impact Hammer	90.0	20%	8	8	83.0	#	60.0	81.4	#	75	125.7

Note: Equipment during site Demolition phase of Phase 9 were analyzed to determine worst-case construction noise levels.

Phase 11 - Near-Term Auto Parking Improvements

Equipment	dBA Lmax (50 feet)	Base Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	89.6	N/A	N/A	N/A	83.6	#	300.0	68.1	#	75	135.0
Concrete Saw	89.6	20%	8	8	82.6	#	300.0	67.0	#	75	120.1
Dozer	81.7	40%	1	8	68.7	#	300.0	53.1	#	75	24.2
Loader	79.1	40%	4	8	72.1	#	300.0	56.5	#	75	35.8
Loader	79.1	40%	6	8	73.9	#	300.0	58.3	#	75	43.9

Note: Equipment during site Grading phase of Phase 11 were analyzed to determine worst-case construction noise levels.

Phase 12 - Relocation/Extension of RWY 06-24

Base

Equipment	dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	90.0	N/A	N/A	N/A	88.1	#	470.0	68.6	#	75	225.2
Concrete Saw	89.6	20%	8	8	82.6	#	470.0	63.1	#	75	120.1
Excavator	80.7	40%	8	8	76.7	#	470.0	57.3	#	75	61.0
Excavator	80.7	40%	8	8	76.7	#	470.0	57.3	#	75	61.0
Excavator	80.7	40%	8	8	76.7	#	470.0	57.3	#	75	61.0
Dozer	81.7	40%	8	8	77.7	#	470.0	58.3	#	75	68.4
Dozer	81.7	40%	8	8	77.7	#	470.0	58.3	#	75	68.4
Mounted Impact Hammer	90.0	20%	8	8	83.0	#	470.0	63.5	#	75	125.7

Note: Equipment during Grading phase of Phase 12 were analyzed to determine worst-case construction noise levels.

Phase 13 - Removal/Reconstruction of Existing Connector Taxiways

Base

Equipment	dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	90.0	N/A	N/A	N/A	86.4	#	300.0	70.9	#	75	186.2
Concrete Saw	89.6	20%	8	8	82.6	#	300.0	67.0	#	75	120.1
Dozer	81.7	40%	1	8	68.7	#	300.0	53.1	#	75	24.2
Loader	79.1	40%	6	8	73.9	#	300.0	58.3	#	75	43.9
Loader	79.1	40%	6	8	73.9	#	300.0	58.3	#	75	43.9
Mounted Impact Hammer	90.0	20%	8	8	83.0	#	300.0	67.4	#	75	125.7

Note: Equipment during site Demolition phase of Phase 13 were analyzed to determine worst-case construction noise levels.

Phase 14 - Removal/Reconstruction of Existing TWY A

Base

Equipment	dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	90.0	N/A	N/A	N/A	87.3	#	570.0	66.1	#	75	204.9
Concrete Saw	89.6	20%	8	8	82.6	#	570.0	61.5	#	75	120.1
Excavator	80.7	40%	8	8	76.7	#	570.0	55.6	#	75	61.0
Excavator	80.7	40%	8	8	76.7	#	570.0	55.6	#	75	61.0
Excavator	80.7	40%	1	8	67.7	#	570.0	46.6	#	75	21.6
Dozer	81.7	40%	4	8	74.7	#	570.0	53.6	#	75	48.4
Dozer	81.7	40%	6	8	76.5	#	570.0	55.3	#	75	59.2
Mounted Impact Hammer	90.0	20%	7	8	82.4	#	570.0	61.3	#	75	117.6

Note: Equipment during site Demolition phase of Phase 14 were analyzed to determine worst-case construction noise levels.

Phase 15 - Construction of EMAS System on RWY 24

Equipment	Base dBA Lmax (50 feet)	Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	85.0	N/A	N/A	N/A	83.2	#	400.0	65.2	#	75	129.1
Grader	85.0	40%	8	8	81.0	#	400.0	63.0	#	75	100.0
Dozer	81.7	40%	7	8	77.1	#	400.0	59.1	#	75	64.0
Loader	79.1	40%	8	8	75.1	#	400.0	57.1	#	75	50.7

Note: Equipment during Grading phase of Phase 15 were analyzed to determine worst-case construction noise levels.

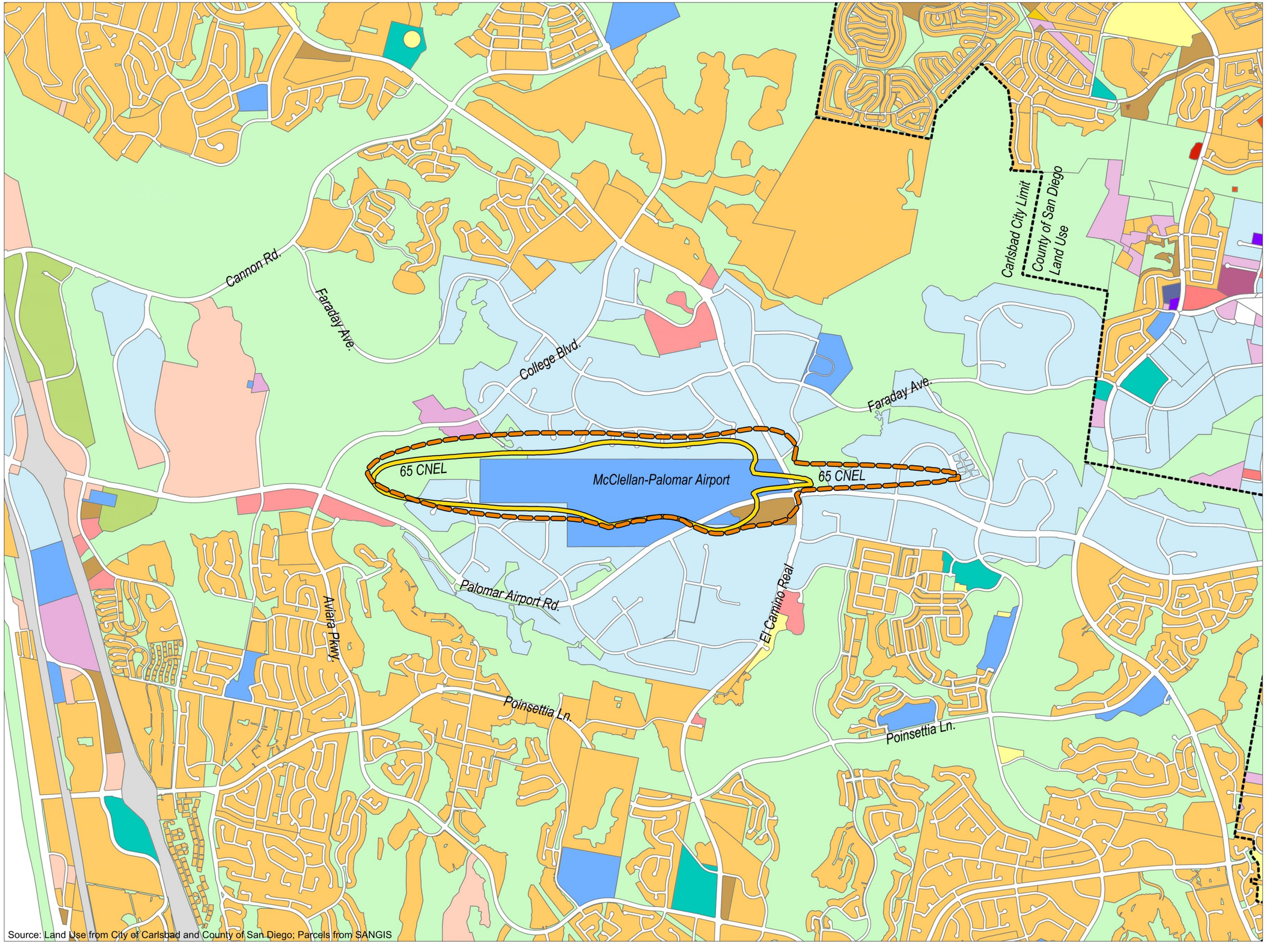
Phase 16 - Relocation of EMAS System on RWY 06

Equipment	dBA Lmax (50 feet)	Base Percentage	Use Per Day	Ordinance Hour Day	L_{EQ} dBA (Daily)		Distance	L_{EQ} dBA (Daily)		Distance Too:	Distance
Noise Sum	85.0	N/A	N/A	N/A	83.2	#	500.0	63.2	#	75	129.1
Grader	85.0	40%	8	8	81.0	#	500.0	61.0	#	75	100.0
Dozer	81.7	40%	7	8	77.1	#	500.0	57.1	#	75	64.0
Loader	79.1	40%	8	8	75.1	#	500.0	55.1	#	75	50.7

Note: Equipment during Demolition phase of Phase 16 were analyzed to determine worst-case construction noise levels.

Appendix C – Existing Conditions (2016) and Proposed Project

Prepared by C&S Engineer, Inc. 2017



Source: Land Use from City of Carlsbad and County of San Diego; Parcels from SANGIS

City of Carlsbad Land Use

- Community Facilities
- General Commercial
- Local Shopping Center
- Office
- Open Space
- Planned Industrial
- Planned Industrial/Office
- Public
- Regional Commercial
- Transportation Corridor
- Village
- Visitor Commercial
- Residential

County of San Diego Land Use

- Communications/Utilities
- Fire/Police Station
- Hotel/Motel
- Industrial
- Residential
- Open Space
- Healthcare
- Other Public Services
- Recreation
- Retail/Trade
- Warehousing
- School/Religious Facility
- Service Station
- Protected Natural Area
- Undeveloped Land

Existing Noise Contours

- 65 CNEL Contour

Future Noise Contours (PAL 2)

- 65 CNEL Contour

1000' 0' 1000' 2000'

C&S COMPANIES

McClellan-Palomar Airport Master Plan

Noise Contour Comparison

Figure C1