

HELIX Environmental Planning, Inc.  
7578 El Cajon Boulevard  
Suite 200  
La Mesa, CA 91942  
619.462.1515 tel  
619.462.0552 fax  
www.helixepi.com



June 7, 2016

SAC-02

Ms. Mikaela Klein  
Mt. San Antonio College  
Facilities Planning and Management Department  
1100 North Grand Avenue  
Walnut, CA 91789

**Subject: Noise Impact Planning for the Mt. San Antonio College (Mt. SAC)  
West Parcel Solar Project**

Dear Ms. Klein:

At your request, HELIX Environmental Planning, Inc. (HELIX) is providing construction noise control planning for the Mt. SAC West Parcel Solar (Project).

The Project analysis required the implementation of a noise control plan because of the Project site proximity to sensitive habitat areas with Venturan coastal sage scrub habitat (Habitat) occupied by the federally listed as endangered coastal California gnatcatcher (*Polioptila californica californica*; CAGN).

Guidelines produced by the U.S. Fish and Wildlife Service (USFWS) require that noise be limited to a level not to exceed an hourly limit of 60 dBA  $L_{EQ}$ , or the average ambient noise level, whichever is greater, at the edge of Habitat during the CAGN breeding season (February 15 to August 31).

## **NOISE METRICS**

All noise-level and sound-level values presented herein are expressed in terms of decibels (dB), with A-weighting, abbreviated "dBA," to approximate the hearing sensitivity of humans. Time-averaged noise levels of one hour are expressed by the symbol " $L_{EQ}$ " unless a different time period is specified. Some of the data also may be presented as octave-band-filtered and/or A-octave-band-filtered data, which are a series of sound spectra centered on each stated frequency,

with half of the bandwidth above, and half of the bandwidth below, the stated frequency. These data are typically used for machinery noise analysis and barrier-effectiveness calculations.

Noise emission data are often provided based on the industry standard format of sound power (noted by  $S_{WL}$ ), which is the total acoustic power radiated from a given sound source as related to a reference power level. Sound power differs from sound pressure (if notation is needed the abbreviation is  $S_{PL}$ ), which measures the fluctuations in air pressure caused by the presence of sound waves and is generally the format that describes noise levels as heard by the receiver. Sound pressure is the actual noise experienced by a human or registered by a sound level instrument. When sound pressure is used to describe a noise source, it must specify the distance from the noise source to provide complete information. Sound power is a specialized analytical method to provide information without the distance requirement, but it may be used to calculate the sound pressure at any desired distance.

## **LOCATION OF HABITAT**

As previously noted, the site and immediately adjacent areas (within the same property) were subject to previous biological surveys, which documented CAGN sightings and nests in the Habitat adjacent to the construction site. The Diegan coastal sage scrub and other (riparian) habitats on the portion of the site proposed for construction would be cleared outside of the breeding season. Additional areas of Habitat located immediately along the western and southern Project site boundaries will be maintained.

## **SITE VISIT AND EXISTING NOISE ENVIRONMENT**

An initial site visit was conducted on Thursday, May 12, 2016 at approximately 1:15 p.m. Several noise measurements were made at the site (not all reported). The highest measured noise level of 61.2 dBA  $L_{EQ}$  occurred at a point set back approximately 200 feet from North Grand Avenue. This measurement site is directly (west) from the access gate and has a clear (unobstructed) view of the road. A second measurement of 43.0 dBA  $L_{EQ}$  was observed at a site in the existing canyon area, with no view of the road.

In general, only the small entrance valley (non-habitat area) has any significant roadway noise. The habitat areas are set well back from the road and shielded by significant intervening topography; ambient noise levels at the planned construction site and the adjacent, unaffected Habitat areas are significantly below 60 dBA. As a result, the allowable noise limit during construction cannot exceed 60 dBA  $L_{EQ}$ , per the USFWS guidelines.

## **PROJECT SCHEDULE**

The general schedule for Project construction, with related assumptions and noise control requirements, is outlined below.

## **CONSTRUCTION PLANNING ASSUMPTIONS**

- The rough grading of the site is planned for the period between the 2016 and 2017 breeding season (i.e., September 1, 2016 through February 14, 2017).
- Solar panel mounts and panel installation (light equipment) would occur during the 2017 breeding season.
- Erosion containment and control systems (per the site's best management practices [BMPs]) would be in place during the 2017 breeding season. They would require only minor hand-maintenance activities once in place.

Rough grading and construction of the solar panel mounts and panel installation have the potential to exceed the noise thresholds for the unaffected CAGN Habitat specified in the USFWS guidelines. BMPs maintenance is assumed to have only minimal noise impacts.

## **CONSTRUCTION NOISE CONTROL REQUIREMENTS**

As previously noted, site grading is planned for completion prior to the start of the 2017 breeding season. Contingency planning, however, is required as part of the permit approval process to determine the feasibility of noise-control mitigation and applicability in the event that site grading is not completed prior to the start of the 2017 breeding season. The solar panel mount construction and panel installation would occur during the 2017 breeding season, and thus may require noise control.

## **SITE CONSTRUCTION PLANNING INFORMATION**

The grading of the solar panel pad area would require significant earth movement (after brush clearing), including the removal of two low separate hills. The excavated material, along with imported material, would be used to fill in a large valley area and create a single large pad. After grading, the nearby Habitat would be located upslope (south and west) of the finished pad elevation, with short, two-to-one grade slopes at the pad edges extending to the Habitat areas.

## **CONSTRUCTION NOISE**

Construction noise planning is broken into two separate construction phases, which would be done by different organizations with different equipment requirements:

1. Grading
2. Panel Installation

Reasonable and foreseeable on-site equipment (noise sources) used for the proposed Project would include:

### **Grading**

- (2) D8 or D9 CAT (class) or similar crawler dozers
- (3 or 4) 24 cubic yard (CY) or similar size scrapers
- (1 or 2) off-road dump trucks
- (2 or more) on-road dump trucks
- (2) 3 to 6 CY loaders
- (1) Rubber tired dozer
- (1) Water truck
- (1) Vibrating roller
- Other miscellaneous small equipment

### **Solar Panel Installation**

- Mobile drill(s) (small) for foundations
- Mobile (rubber-tired) crane(s)
- Concrete pumper (boom or hose)
- Concrete trucks
- Skylift or similar extending forklift (rubber-tired)
- Backhoe skip loader(s)
- Bobcat(s) or similar skid steer (rubber-tracked or -tired)
- Truck-mounted welding equipment
- Material delivery trucks

## **EQUIPMENT NOISE LEVELS**

Data to plan for construction equipment noise is extracted from three sources: (1) the Federal Highway Administration (FHWA) Construction Noise Data Base; (2) the Department of Food and Rural Affairs (DEFRA; England) Construction Noise Data Base; and (3) personal construction site noise measurements. Table 1, *Noise Source Data*, provides the octave spectra for the equipment used in this analysis.

<b>Table 1 NOISE SOURCE DATA</b>										
	<b>Noise Levels in Decibels<sup>1</sup> (dB) Measured at Octave Frequencies in Hertz (hz)</b>									<b>Overall Noise Level in A- weighted Scale (dBA)</b>
	<b>31.5 hz</b>	<b>63 hz</b>	<b>125 hz</b>	<b>250 hz</b>	<b>500 hz</b>	<b>1,000 hz</b>	<b>2,000 hz</b>	<b>4,000 hz</b>	<b>8,000 hz</b>	
Dozer	130.0	125.5	114.5	116.5	113.5	112.5	118.5	102.5	96.5	121.2
Scraper	105.1	115.4	125.6	117.1	120.7	116.1	107.4	107.3	103.4	121.1
Cement Truck	120.0	117.7	108.7	113.7	106.7	105.7	112.7	102.7	94.7	115.6
Cement Pumper	120.0	117.7	115.7	112.7	113.7	111.7	108.7	105.7	100.7	116.5
Loader	110.7	121.5	111.3	105.8	103.4	127.4	113.0	100.8	96.1	127.6
Small Drill	103.2	108.5	97.8	95	95.7	94.9	97.4	91.9	87.9	101.8
Backhoe / Loader	104.0	106.7	97.7	101.7	101.7	97.7	96.7	90.7	84.7	103.7
Concrete Saw	105.3	106.7	123.7	115.7	114.7	114.7	116.7	120.7	119.7	125.3
Mobile Crane	112.3	114.7	113.7	107.7	108.7	107.7	107.7	98.7	89.7	112.9
Backup Alarm <sup>2</sup>	12.7	12.7	12.7	12.7	12.7	109.7	12.7	12.7	12.7	109.7

<sup>1</sup> Based on Sound Power Levels (S<sub>WL</sub>)

<sup>2</sup> Backup alarms are highly directional but are assumed as non-directional sources in this analysis to provide a worst-case noise planning scenario.

## NOISE IMPACTS

Two separate scenarios have been analyzed for noise control planning:

1. The site grading is in process but not complete prior to the start of the breeding season.
2. Solar panel installation is occurring during the breeding season.

### Grading

The following noise control conclusions are associated with assumed dozer and scraper operations in a general work area. Specifically, construction equipment operations would typically occur in a limited portion of the construction site at any given time.

- Normal site grading operations may occur without noise control requirements at any distance greater than 650 feet from any Habitat location. Figure 1, *Near Complete Grading/No Barrier*, shows the expected construction noise contours for the Habitat areas if grading occurs nearby.

- A 6-foot-high wall at the outer extents of the site grading (top of disturbed slope area) would reduce the construction setback requirement from Habitat to approximately 225 feet (the top of ungraded slope is typically about 15 feet above the finished pad elevation). Figure 2, *Near Complete Grading/6-ft Barrier*, shows the impacts that could occur at the Habitat if grading occurred at least 225 feet away and if there were a 6-foot-high noise control wall. As indicated on this figure, noise levels are locally projected at up to approximately 62 dBA within the Habitat. These noise levels reflect a worst-case scenario (due to topography) and work occurring only in this area. If work would occur only less than 225 feet from the Habitat, additional monitoring would be required, with the potential for limited construction hours.
- A 12-foot-high wall at the outer extents of the site grading (top of disturbed slope area) would reduce the construction setback from Habitat to approximately 180 feet.
- If grading is conducted at closer distances with normal heavy equipment, compliance with the 60 dBA  $L_{EQ}$  limit would not be feasible.

### **Panel Installation**

The following noise control conclusions are associated with the assumed operation of a mobile crane and a small drill rig for footings construction. While a cement truck would exhibit approximately the same noise generation as the crane, these two pieces of equipment likely would not operate simultaneously in the same area.

- Normal solar panel installation may occur at distances greater than 225 feet from the edge of the Habitat, assuming the use of a small drill rig for the panel footings. Operation of a normal mobile crane or cement truck(s) would require a minimum 450-foot setback from the Habitat without noise control. Figure 3, *Unmitigated Solar Construction*, shows the anticipated noise impacts for a single drill rig and crane operating at these distances.
- With an 8-foot-tall wall at the top of the slope adjacent to the Habitat, the noted setback distances would allow work within the full limits of the planned solar panel installation area (not the full pad area). Figure 4, *Solar Construction/8-ft Wall*, shows the anticipated noise contours for the same two pieces of equipment working in the site footprint with an 8-foot-tall wall.

### **Specific Notes and Limitations:**

- Construction equipment (and associated noise levels) and/or site conditions (grades, elevations, or materials) that vary from those analyzed in this report may result in higher noise levels than predicted herein.
- Noise planning for equipment used in close proximity to the specified distances from the perimeter wall does not include planning for a long and continuous backup alarm. Noise from a backup alarm under the described conditions may exceed the allowable limits.

Accordingly, alternate safety measures, including lights and/or flaggers, may be required during the grading phase of construction.

- All equipment must be operated in compliance with applicable safety rules and regulations. HELIX staff would not be responsible for the failure to operate construction equipment safely and/or accidents occurring from unsafe operation of construction equipment.

Figure 5, *Habitat and Sensitive Species Map/Project Footprint*, shows the current habitat limits.

## **NOISE BARRIER CONSTRUCTION**

All temporary sound attenuation walls will be constructed of plywood or construction noise-control blankets, with no cracks or gaps through or below the wall. Any gate(s) in such sound attenuation walls must be designed with overlapping closures.

Sound attenuation barriers may be either: (1) semi-permanent fencing or hanging noise control blankets with a laboratory specified minimum Sound Transmission Control (STC) of 18, and in-ground support systems (posts); or (2) similar temporary barriers mounted on K-rail, scaffolding, or another movable mounting system.

For very small noise-control barriers, a single sheet of ¾-inch-thick plywood with no cracks or gaps and a support system that holds the sheet(s) upright is sufficient for short-term, portable noise control.

If the barriers require semi-permanent ground installation as noted, the installation of the barrier must be completed prior to February 15. If construction extends past February 15, noise levels from the construction would need to be continuously and actively monitored in the Habitat immediately adjacent to the construction, including the installation of posts, pipes or telephone poles with cable attachments for the support cable.

Plywood barriers shall be made with either a single ¾-inch-thick layer of material with no cracks or gaps or a double layer of ½-inch-thick plywood mounted in a ships lap configuration.

The safe construction, placement, maintenance, use, and (if applicable) repair of noise barriers under all applicable conditions (e.g., rain or high winds) are the responsibility of the construction contractor.

## DESCRIPTION OF PLANNED MONITORING

Active Monitoring: An individual trained in the operation of an appropriate noise meter will be used for the initial construction work, as well as for any unplanned or unusual requirements that may arise. The noise meter(s) will be located close to the edge of the Habitat and will be monitored at appropriate intervals (to be determined after construction schedules are finalized) to measure the hourly noise levels. Noise level results will be communicated to the project manager.

Passive Monitoring: Following the initial construction work, a noise monitoring system will be set up at one or more fixed locations beyond the new wall and inside the occupied Habitat. The monitoring system will be mounted on a 2-inch-diameter and 6-foot-tall metal pipe, or a 4-inch square wooden pole at the monitoring location. Data will be collected on a weekly basis, and the results will be communicated to the project manager weekly. Passive monitoring will continue for the duration of any construction during the breeding season and will not cease until all work at the site is stopped or the breeding season ends (i.e., after August 31).

## REPORTS

A hand-written, one-page, fill-in monitoring report will be submitted after each day of monitoring, showing the hourly  $L_{EQ}$  measurements at the associated monitoring site(s) when active monitoring is required. Passive monitoring data will be entered into a laptop computer weekly, and a standard compliance/non-compliance form with a noise level graph will be prepared and submitted to the project manager weekly. The Project Manager will then submit these reports to the appropriate agencies during the periods of noise control for sensitive species.

If, at any time the passive monitoring documents noise levels exceeding the allowable level of 60 dBA  $L_{EQ}$  for one or more of the three conditions listed below, the acoustics consultant will immediately attempt to determine the cause and develop a suitable mitigation methodology. If no such mitigation can be developed and implemented, the offending operation will be terminated until mitigation can be developed.

1. An exceedance of 64 dBA  $L_{EQ}$  during any one-half hour;
2. An exceedance of 61 dBA  $L_{EQ}$  during any two one-half hours in two consecutive days; or
3. An exceedance of 61 dBA  $L_{EQ}$  during any three one-half hours in a single day.

If mitigation is required, the next monitoring report will contain a brief description of the problem and the steps taken to correct it.



Specialty Notice

If the Project Manager is unavailable for any reason, the acoustics consultant will not attempt to stop the offending operation but will attempt to locate the Project Manager (or another qualified representative) at the construction trailer (or other applicable location) to provide notification of the condition and seek assistance.

**CERTIFICATION**

This report is based on the Project information provided to HELIX, as well as measured noise levels derived from monitoring conducted by HELIX. The resulting content and conclusions of this report represent a true and factual analysis of the acoustical impact issues associated with proposed construction at the Project site.

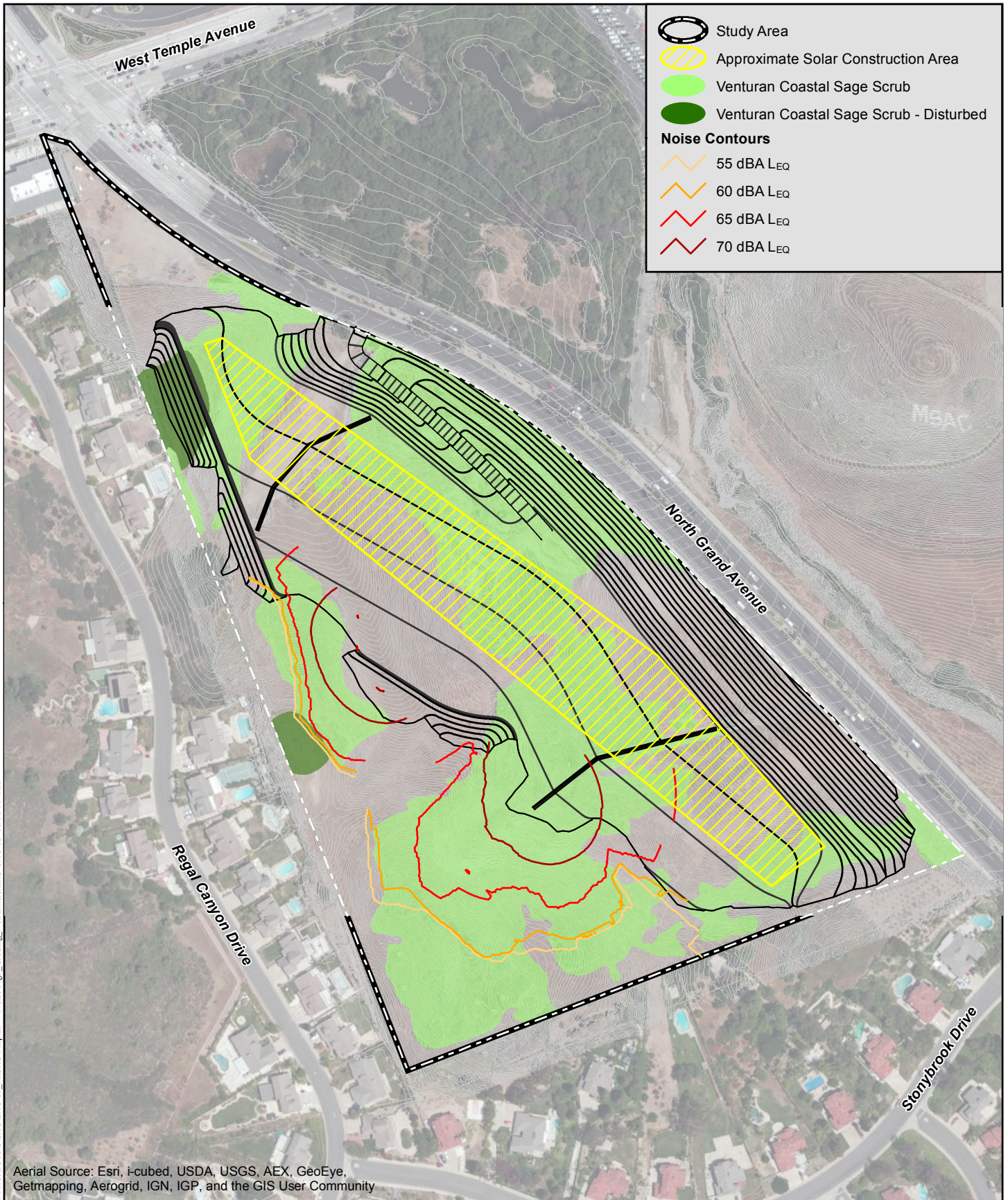
Regards



Charles Terry  
Senior Acoustical Analyst

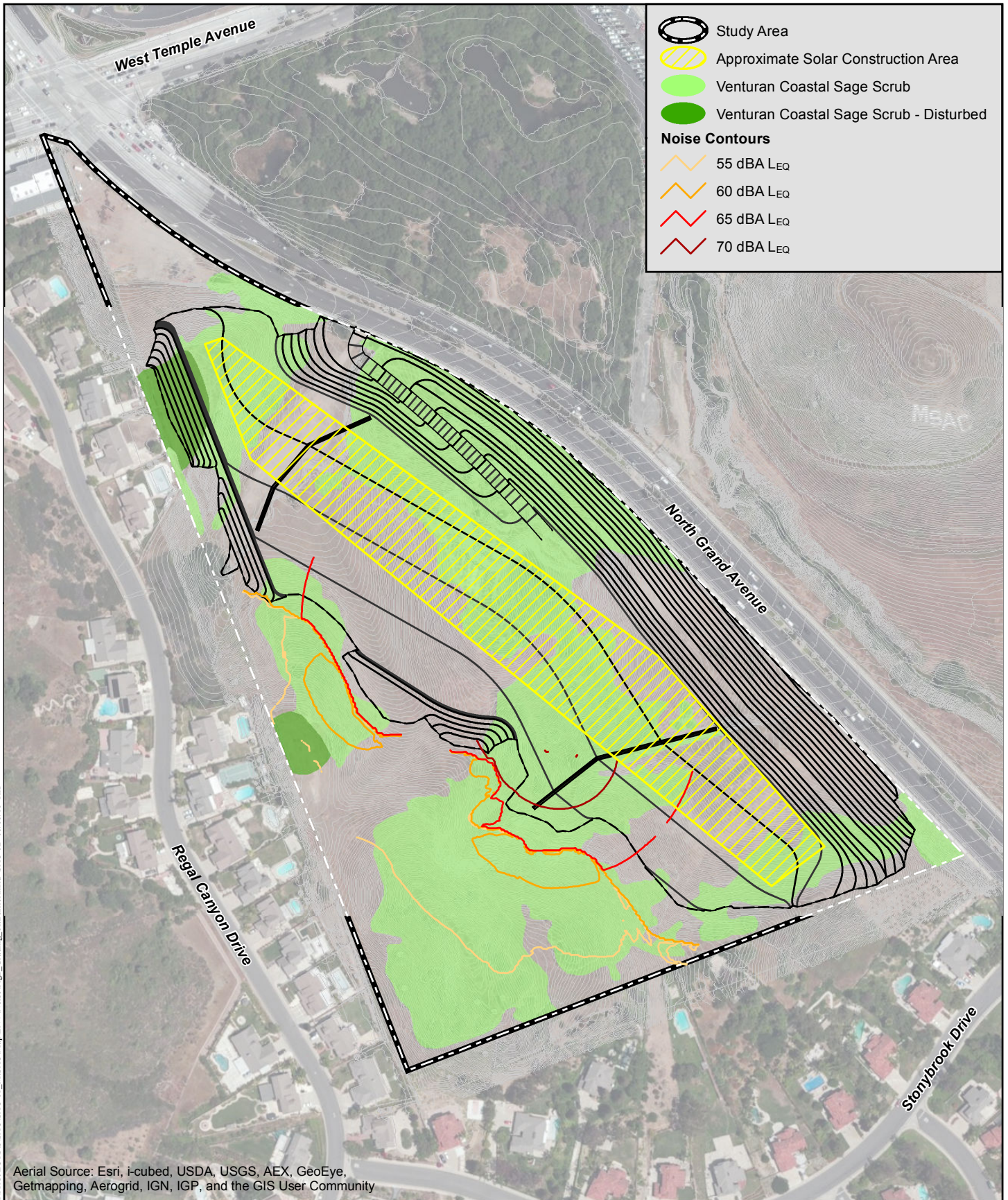
Attachments:

- Figure 1: Near Complete Grading/No Barriers
- Figure 2: Near Complete Grading/6-ft Barrier
- Figure 3: Unmitigated Solar Construction
- Figure 4: Solar Construction/8-ft Wall
- Figure 5: Habitat and Sensitive Species Map/Project Footprint



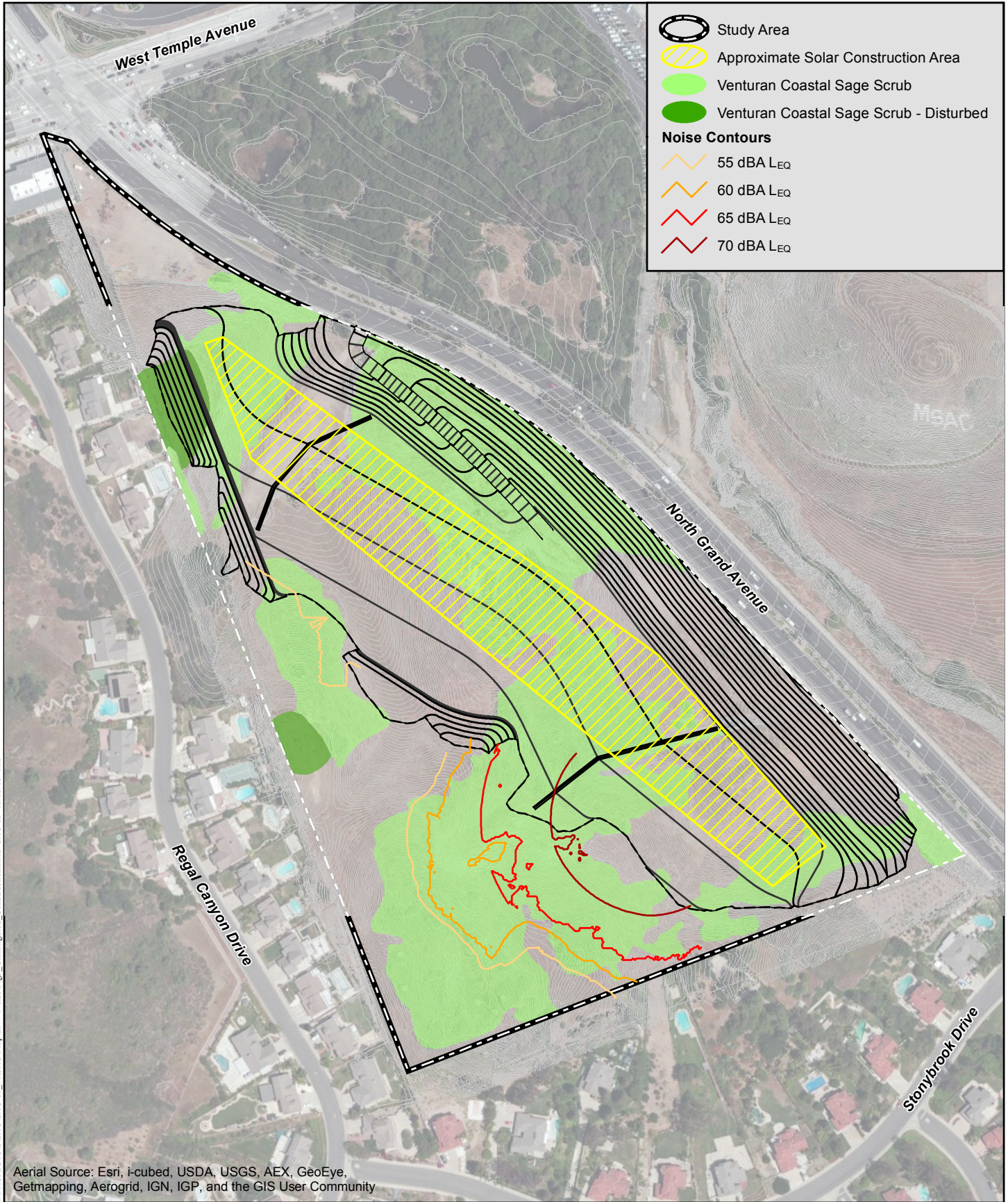
## Near Complete Grading/No Barriers

WEST PARCEL SOLAR PROJECT



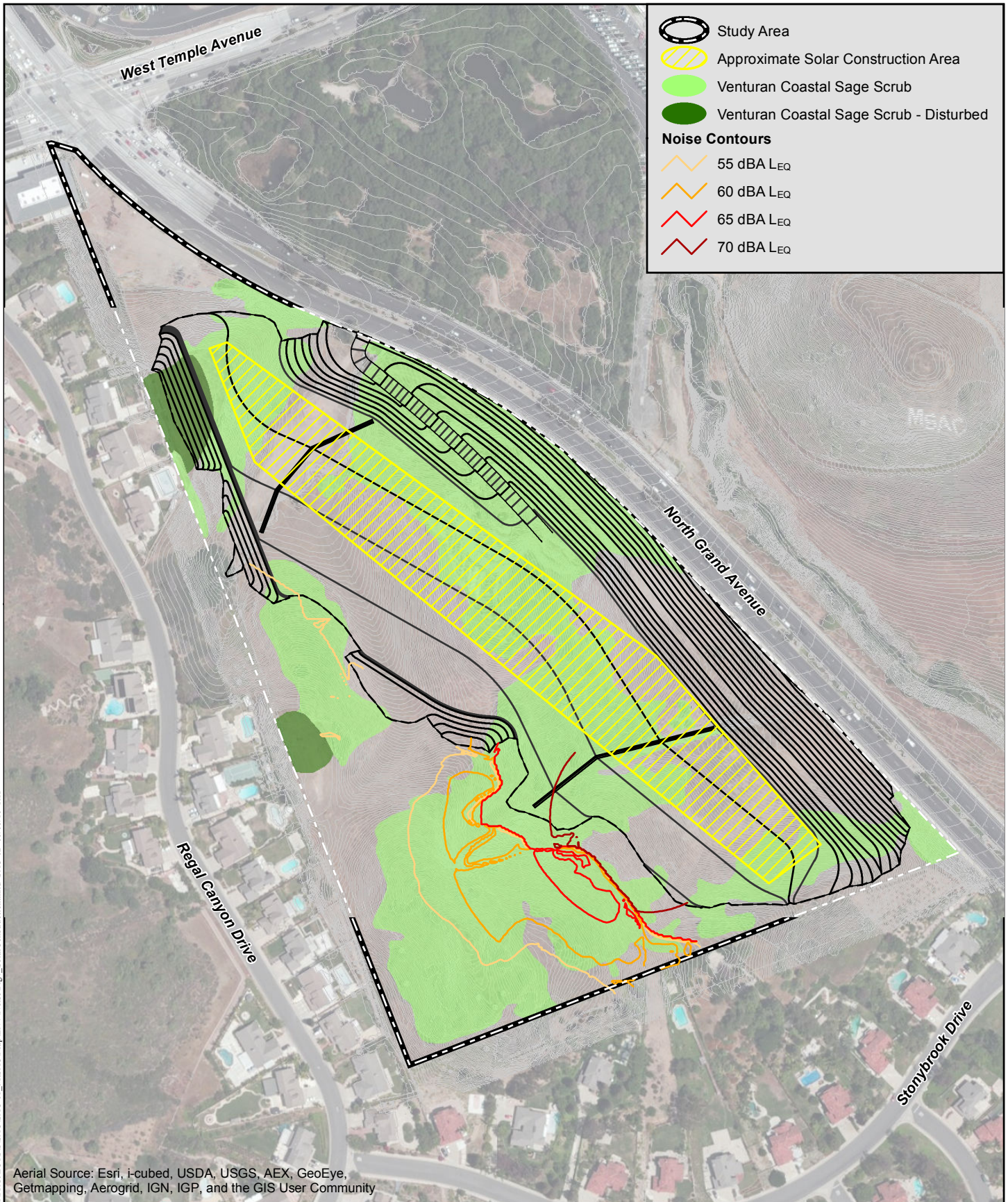
## Near Complete Grading/6-ft Barrier

WEST PARCEL SOLAR PROJECT



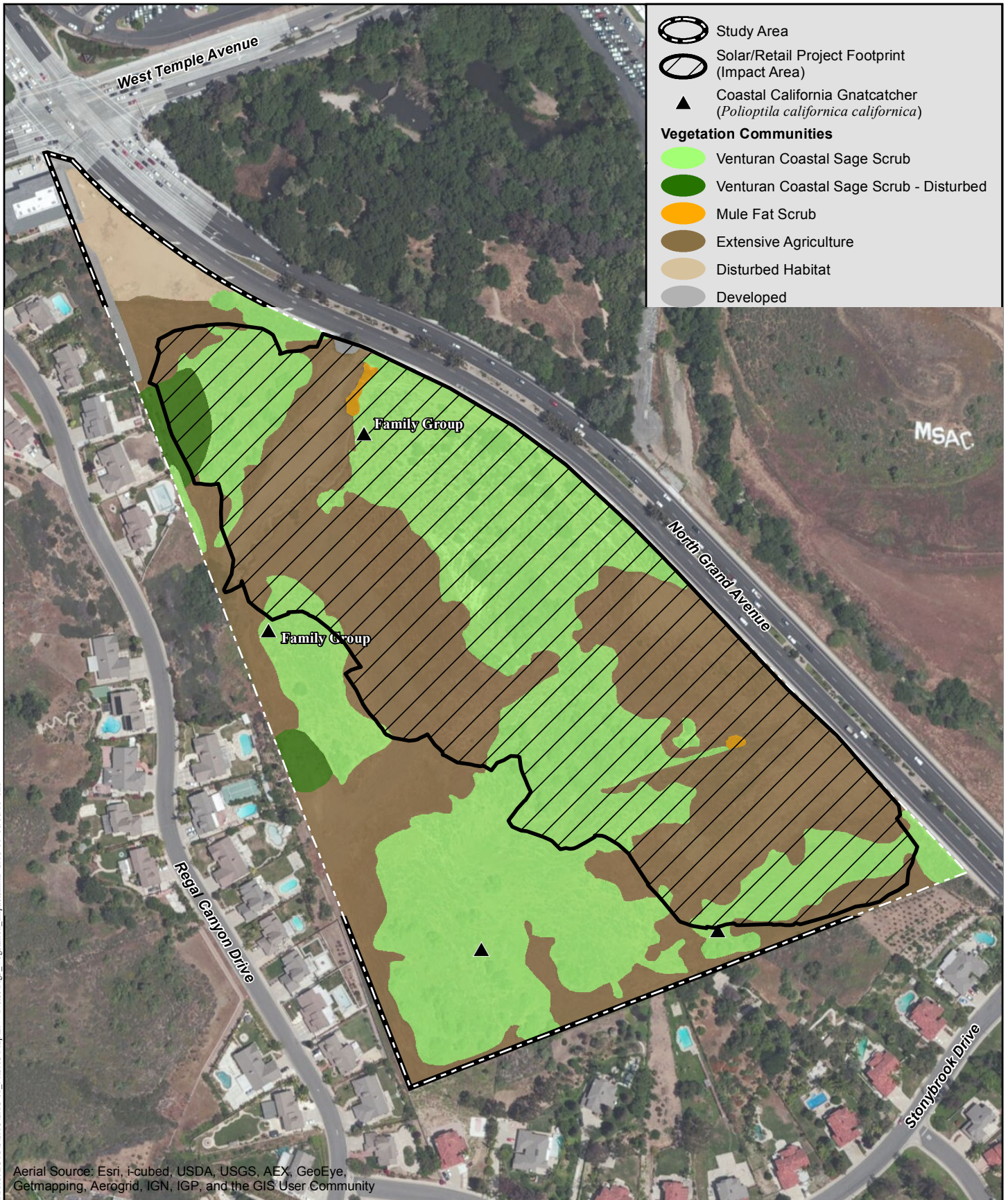
## Umitigated Solar Construction

WEST PARCEL SOLAR PROJECT



## Solar Construction/8-ft Wall

WEST PARCEL SOLAR PROJECT



## Habitat and Sensitive Species Map/Project Footprint

WEST PARCEL SOLAR PROJECT