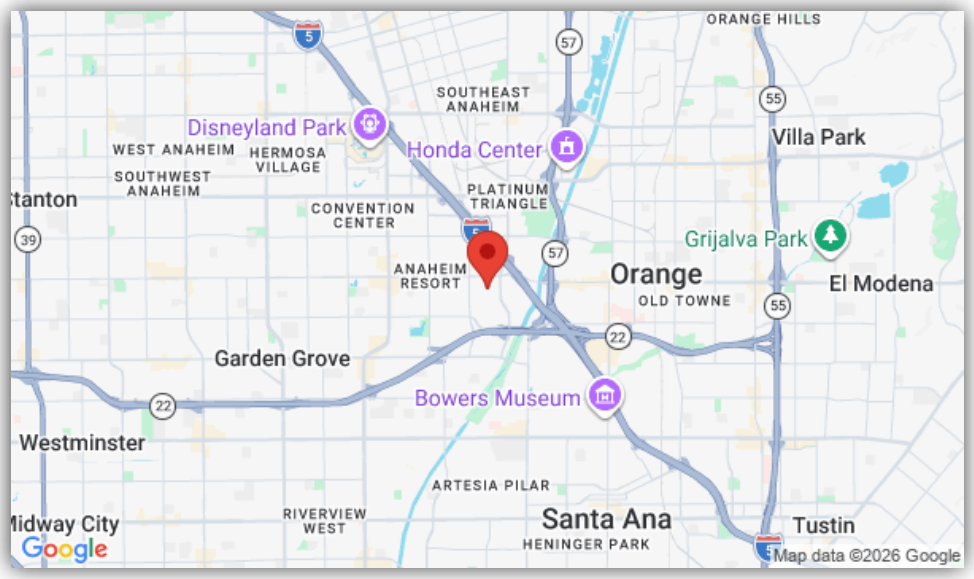
SITE SEISMIC HAZARDS REPORT



Report Generated for:

333 City Blvd E

Orange, CA 92868

Lat / Long: 33.7867041°, -117.8936811°

Date:

July 30, 2026

Report Generated by:

The SP3-*SiteHazards* module of the

Seismic Performance Prediction Platform (SP3)

Seismic Performance Prediction Program
by Haselton Baker Risk Group

Produced for:

Bosco Inc

TABLE OF CONTENTS

1. INTRODUCTION

This report was generated using SP3-SiteHazards of the SP3 Platform. It was created by aggregating publically available data at the specified site location with the goal of easily understanding and reporting on site hazards. Each data source is cited and the report is subject to the limitations and accuracy of those data sources.

2. SITE LOCATION

Address: 333 City Blvd E, Orange, CA 92868
Latitude: 33°47'12"N (33.7867041°)
Longitude: 117°53'37"W (-117.8936811°)

3. SITE STABILITY SUMMARY

Soil:

#1 - USGS Vs30 Database Soil Type	D/E
#2 - California Geological Survey Vs30 (2015)	D
#3 - U.S. Geological Survey Vs30 Boring Data for Nearby Sites	Per boring data figure.

Liquefaction:

#1 - California State Liquefaction	Not in a mapped Liquefaction zone.

Landslide:

#1 - U.S. Geological Survey Landslide - Induced by Causes Other than Earthquake, Shape Data	Not in a mapped Landslide zone.
#2 - U.S. Geological Survey Professional Paper 1183, Landslide Overview	Low Landslide Hazard
#3 - California State Landslide	Not in a mapped Landslide zone.

Fault Rupture:

Not in a fault rupture zone.

Tsunami:

There is no Tsunami data for the mapped region.

Dam Inundation:

#1 - Santiago Creek	Not in a mapped Dam Inundation zone.
#2 - Villa Park	Not in a mapped Dam Inundation zone.

4. SOIL

Definitions of Site Class

The site class bins used for assigning soil types are as follows:

Site Class		Site Class Based on VS30* (m/sec)	ASCE 7 Site Class Definition Vs30 (m/sec)
A	Hard Rock	≥1695	≥1500
A/B	A/B Boundary	1315-1695	--
B	Rock	945-1315	760-1500
B/C	B/C Boundary	660-945	--
C	Very dense soil and soft rock	460-660	360-760
C/D	C/D Boundary	315-460	--
D	Stiff soil	225-315	180-360
D/E	D/E Boundary	165-225	--
E	Soft clay soil	<165	<180
*Non-overlapping ranges for known Vs30 to define Site Class as proposed by Bozornia & Bertero, 2006 [https://www.crcpress.com/Earthquake-Engineering-From-Engineering-Seismology-to-Performance-Based/Bozorgnia-Bertero/p/book/9780849314391]			

Data Source #1 - USGS Vs30 Database Soil Type

The following soil types are estimated based on the typography of your site location.

The estimate of soil for this site is as follows:

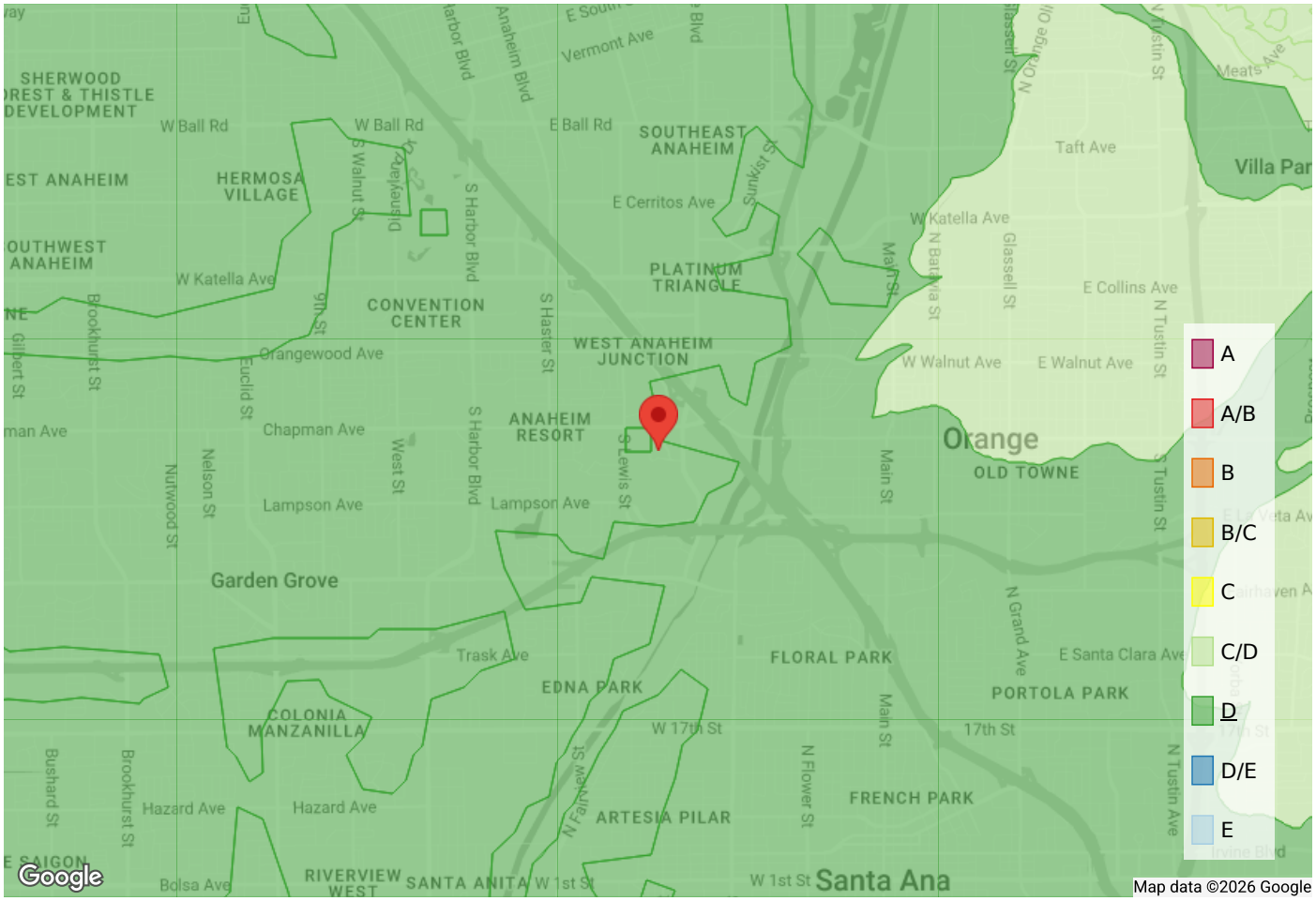
- Vs30 = 224 m/s
- Soil Class: D/E [165 - 225]

Source: U.S. Geologic Survey, Global Vs30 Model [https://earthquake.usgs.gov/data/vs30]

Data Source #2 - California Geological Survey Vs30 (2015)

The following shows the Vs30 and soil Site Class from the California Geological Survey (2015 release).

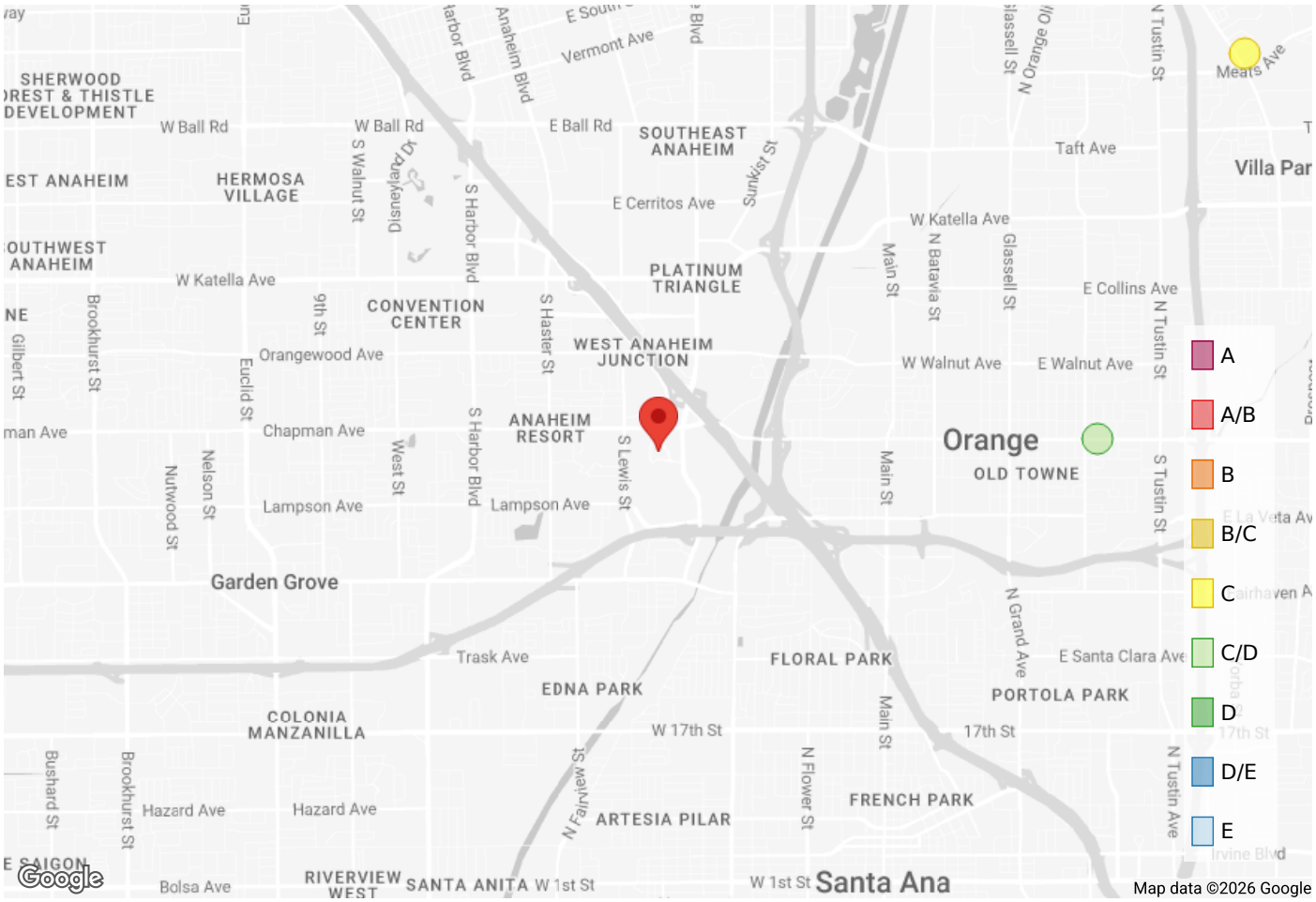
Based on the map below, this site is located in a Site Class **D** zone.



Source: *California Geological Survey [https://maps.conservation.ca.gov/cgs/DataViewer]*

Data Source #3 - U.S. Geological Survey Vs30 Boring Data for Nearby Sites

The following map provides any available soil boring data (with Vs30 estimates) for nearby sites. This comes from a database of Vs30 boring data compiled by the U.S. Geological Survey and other governmental agencies for 3,020 sites in the United States.

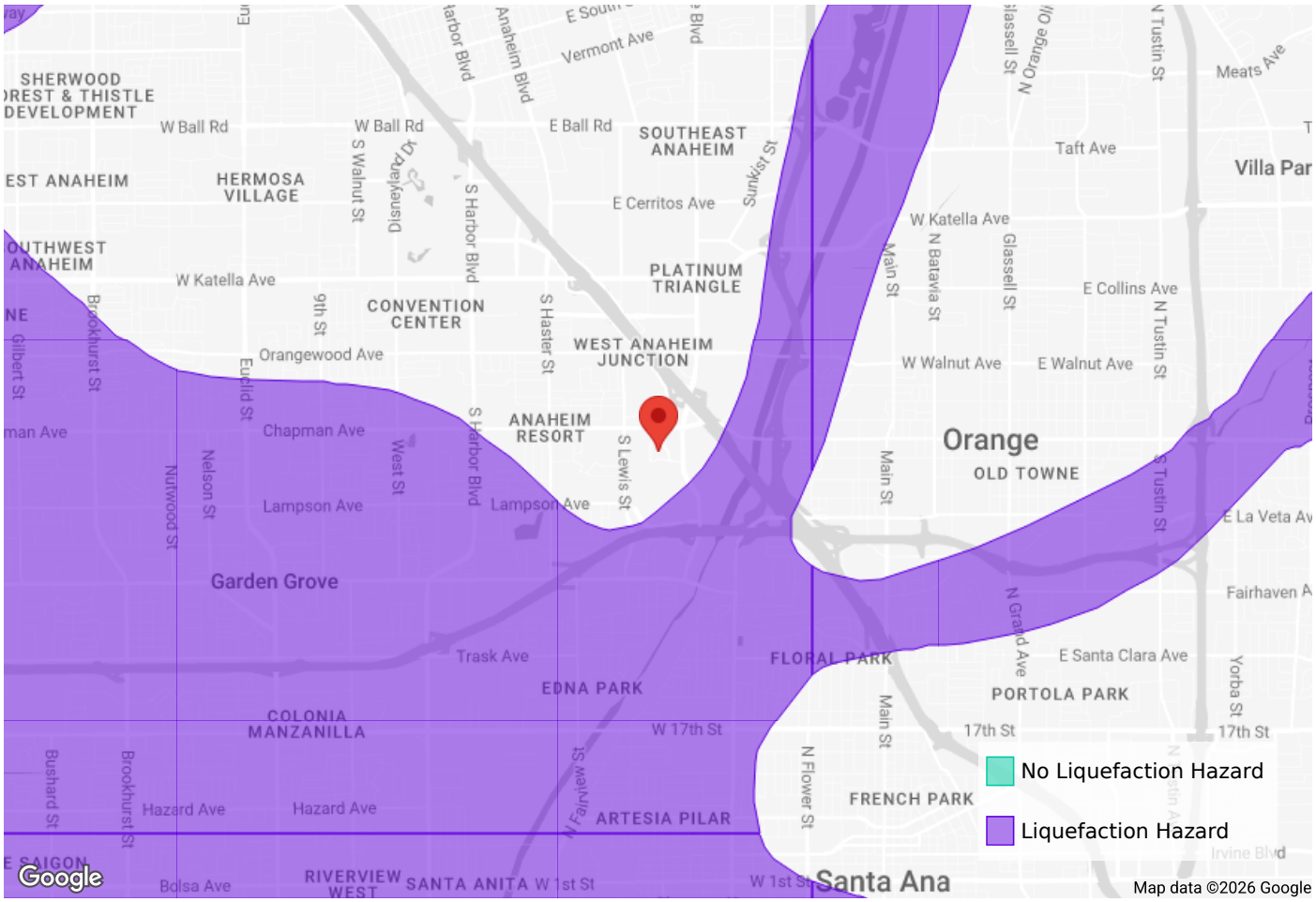


Source: *U.S. Geological Survey [https://earthquake.usgs.gov/data/vs30/us/]*

5. LIQUEFACTION

Liquefaction areas are delineated with respect to the underlying geological materials in a particular area. These maps are meant to provide information on where liquefaction may occur in a future earthquake (but not necessarily that it will occur for this specific site). This map provides a pre-screening approach for liquefaction potential, but a site-specific soil assessment would be needed if a more precise understanding of liquefaction potential is desired.

Data Source #1 - California State Liquefaction

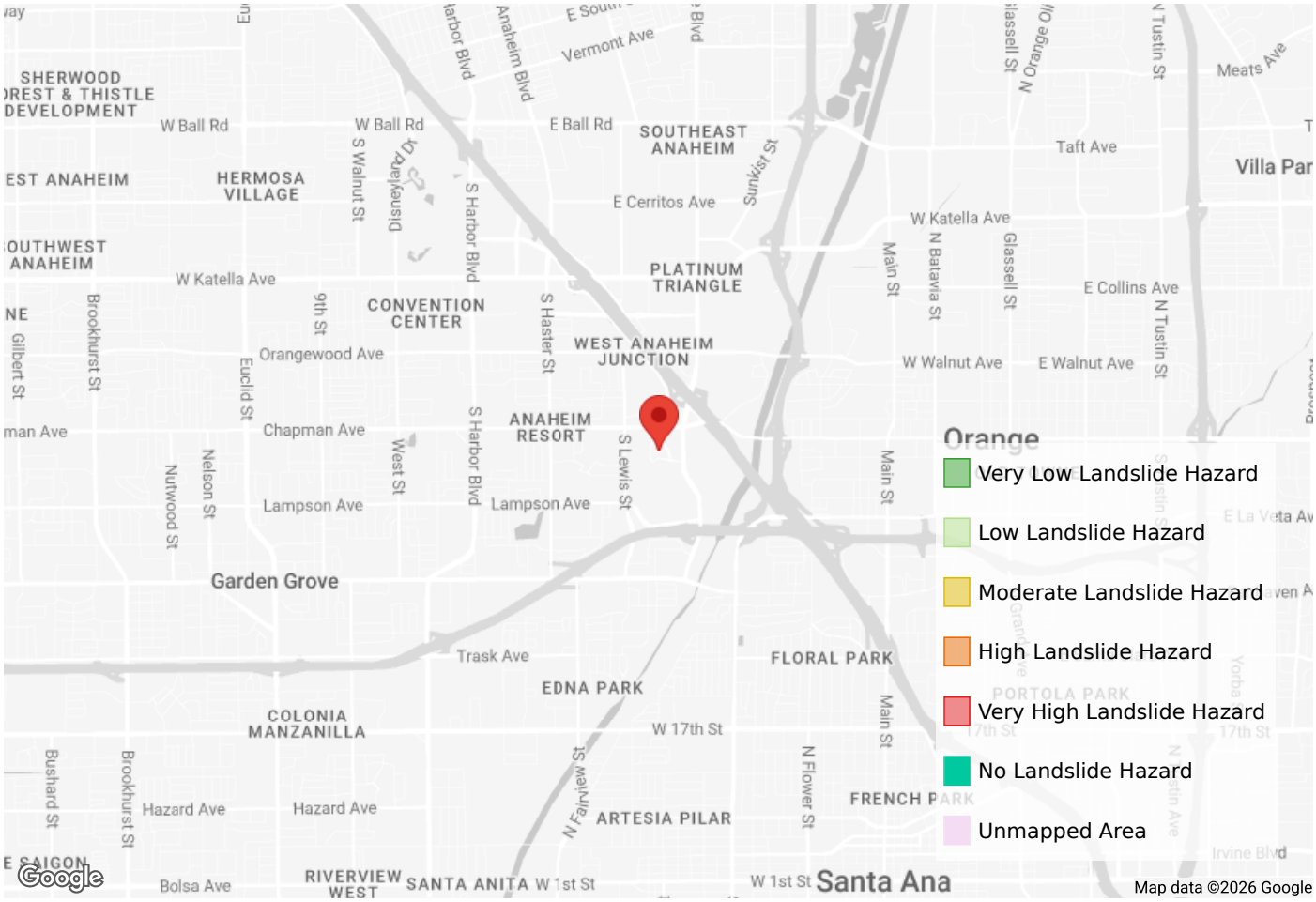


Source: *California Geological Survey [http://maps.conservation.ca.gov/cgs/informationwarehouse]*

6. LANDSLIDE

Landslide susceptibility indicates the severity of seismically induced landslide potential in an area.

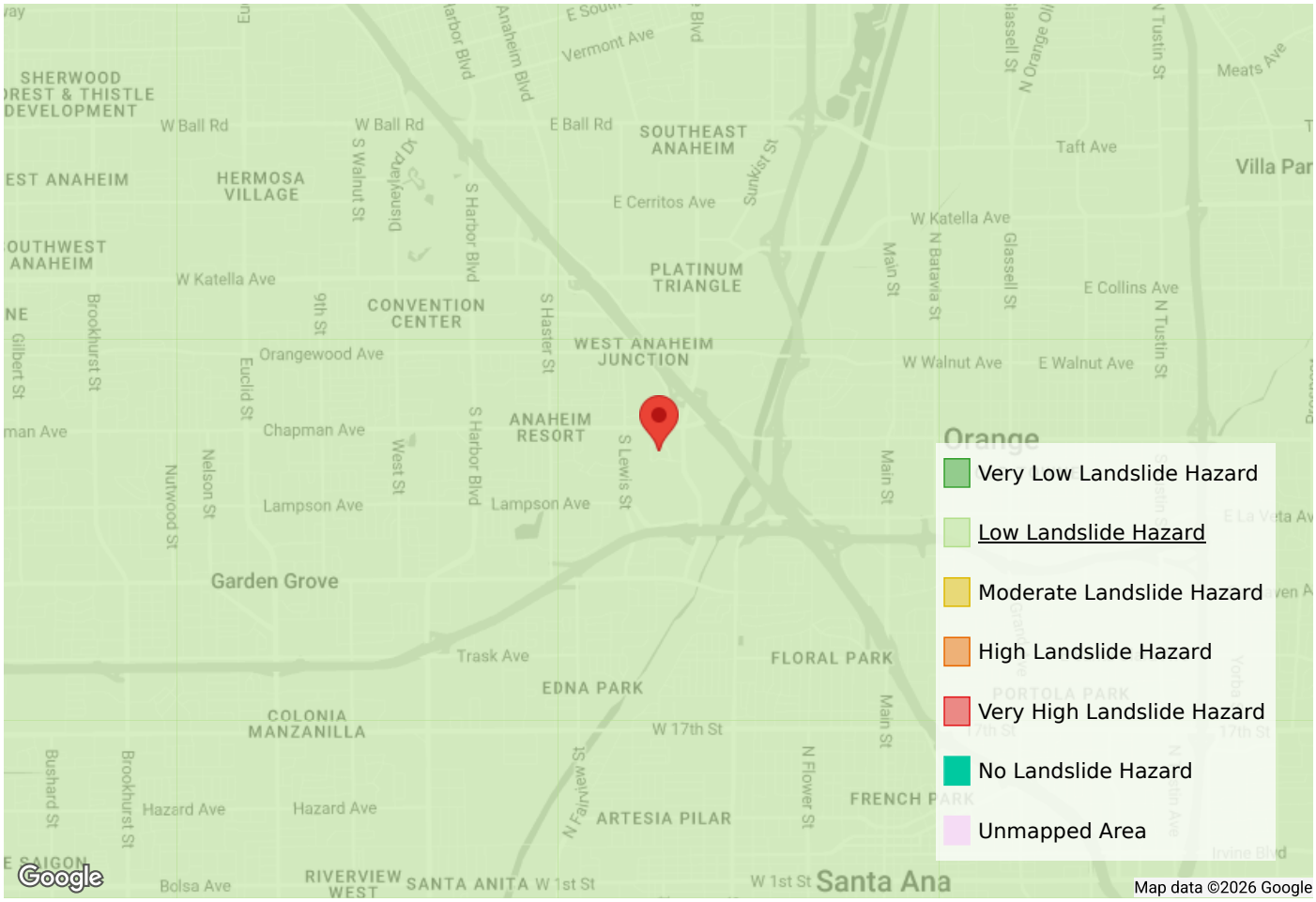
Data Source #1 - U.S. Geological Survey Landslide - Induced by Causes Other than Earthquake, Shape Data



Source: *U.S. Geological Survey [https://www.sciencebase.gov/catalog/item/61f326dfd34e622189b93308]*

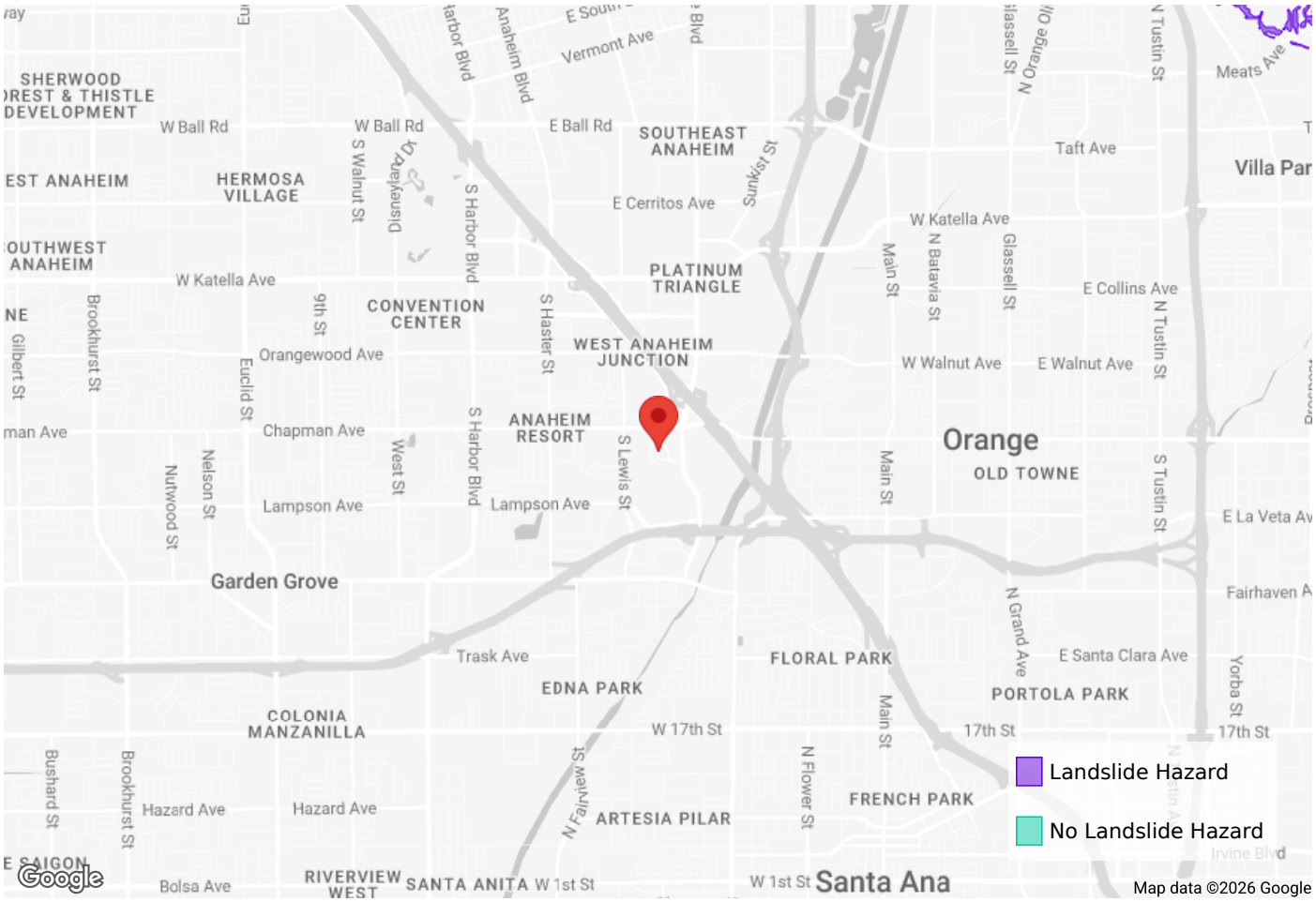
Data Source #2 - U.S. Geological Survey Professional Paper 1183, Landslide Overview

Based on the map below, this site is located in a **Low Landslide Hazard** area.



Source: *U.S. Geological Survey [https://www.sciencebase.gov/catalog/item/4f4e4ad5e4b07f02db6838e7]*

Data Source #3 - California State Landslide

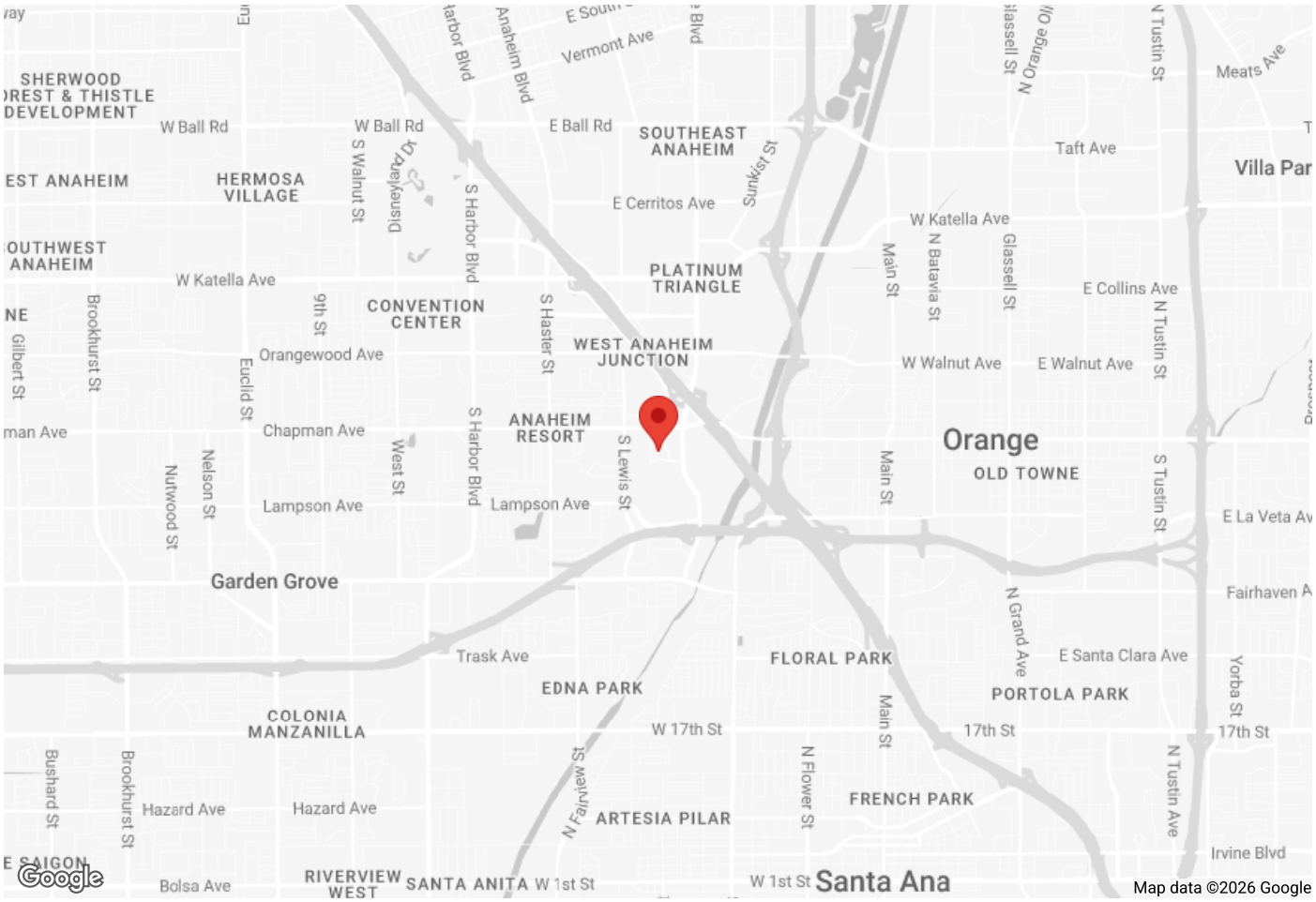


Source: *California Geological Survey [http://maps.conservation.ca.gov/cgs/informationwarehouse]*

7. TSUNAMI

Tsunami inundation zones are determined by modeling a group of maximum considered tsunami events. It is noted that these maps do not meet disclosure requirements for real estate transactions nor for any other regulatory purpose (please see associated disclaimers from California Geological Survey).

There was no Tsunami data found in the mapped region below. This could either mean that there is no earthquake induced Tsunami hazard or that this region was not mapped.

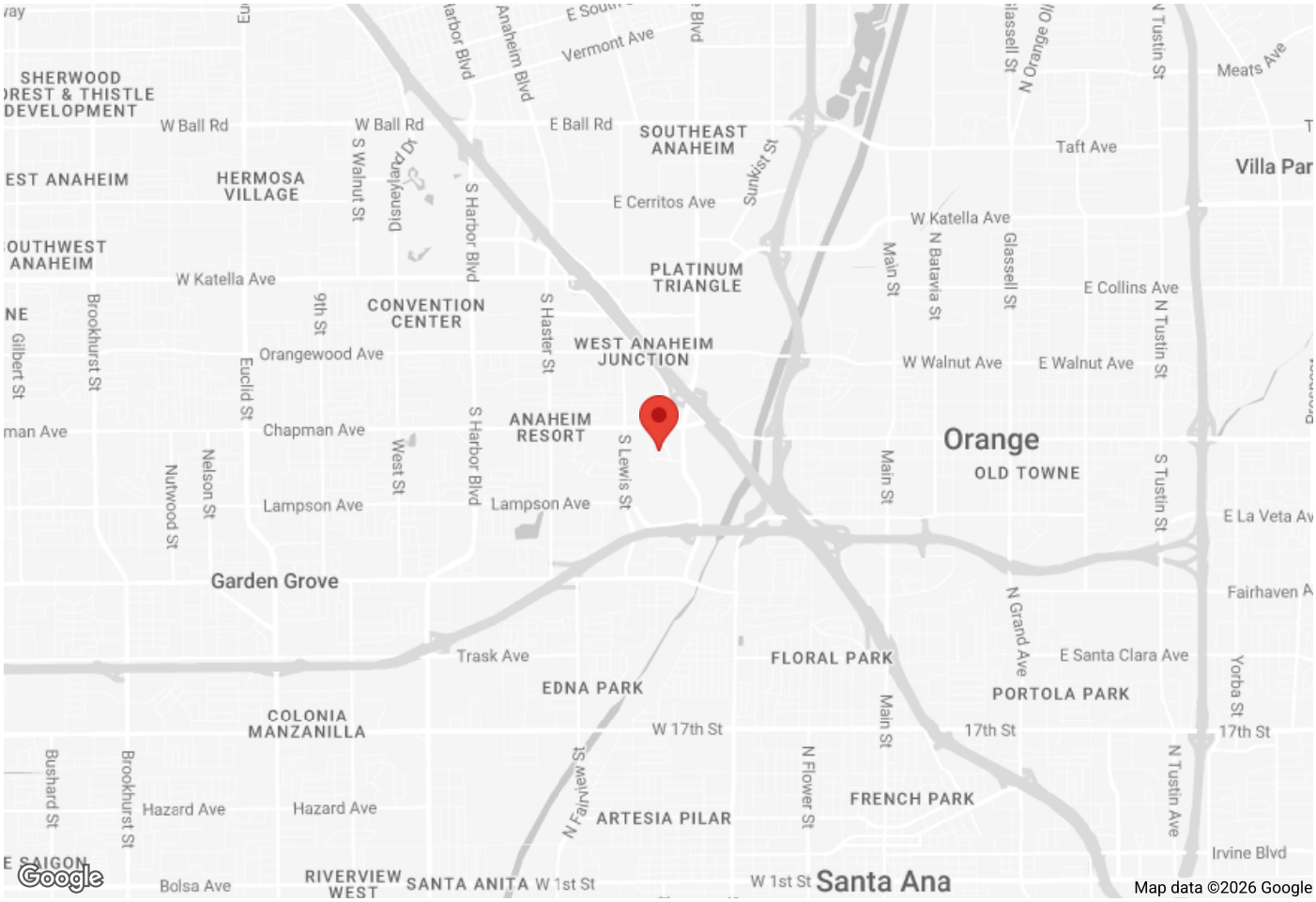


8. FAULT RUPTURE

Surface fault rupture (aka. fault rupture) is the result of fault movement that breaks to the surface of the earth either suddenly during earthquakes, or slowly due to a process known as fault creep, and is the result of tectonic movement that originates deep in the Earth. See https://www.conservation.ca.gov/cgs/Documents/Publications/Special-Publications/SP_042.pdf for more information.

There was no Fault Rupture data found in the mapped region below. This could either mean that there is no earthquake induced Fault Rupture hazard or that this region was not mapped.

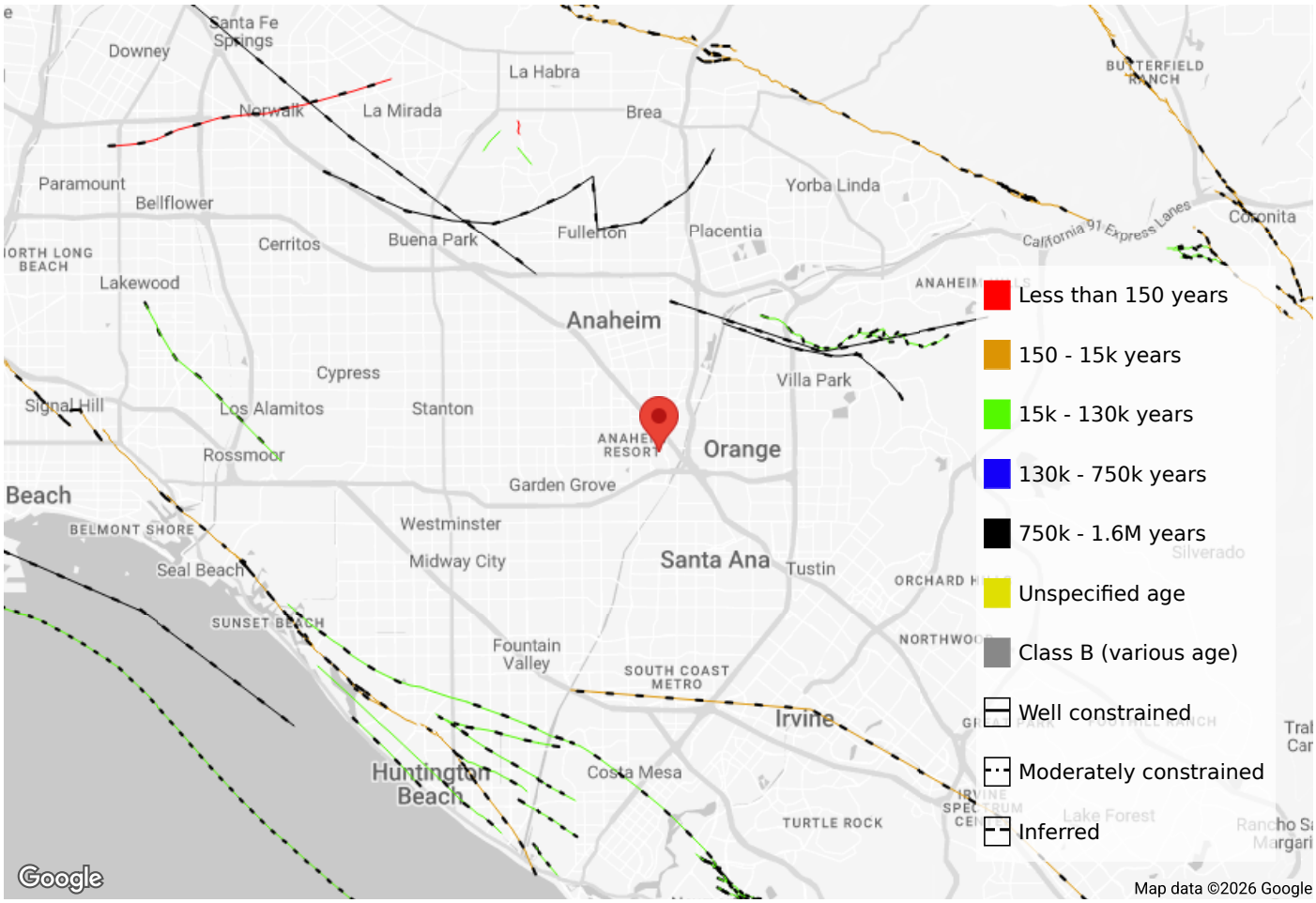
Based on the map below, this site is **Not** in a mapped Fault Rupture Zone



9. NEARBY FAULTS

Data Source #1 - U.S. Geological Survey Faults

This map shows known faults around this site.



Years shown in legend represent typical return period of characteristic earthquakes on the faults.

Source: *U.S. Geological Survey [https://earthquake.usgs.gov/hazards/qfaults/]*

10. GROUND SHAKING DISAGGREGATION

The following are the faults and possible future earthquake events that contribute to the 10% in 50 year hazard.

Fault Name and Rupture	Magnitude	Distance from Site [mi]	Azimuth	Epsilon	Percent Contribution
UC33brAvg_FM32	--	--	--	--	29.95%
Anaheim [0]	6.62	4.14	260.90	-0.12	1.66%
Peralta Hills [1]	7.28	4.68	21.28	0.03	1.36%
Richfield [1]	6.36	7.07	11.64	0.85	2.44%
Compton [0]	7.24	7.92	235.92	-0.21	2.53%
Puente Hills (Coyote Hills) [0]	7.27	7.94	347.46	0.42	1.94%
San Joaquin Hills [0]	7.18	8.14	184.49	0.49	1.81%
Newport-Inglewood alt 2 [1]	7.48	9.59	216.80	0.54	1.61%
Whittier alt 2 [3]	7.56	10.27	24.66	0.60	2.07%
Chino alt 2 [1]	6.87	14.68	52.13	1.36	1.13%
Elsinore (Glen Ivy) rev [0]	6.53	17.70	80.42	1.98	2.09%
Palos Verdes [7]	7.45	19.88	235.69	1.42	1.27%
San Jacinto (San Bernardino) [3]	8.10	39.20	55.64	1.69	1.03%
San Andreas (Mojave S) [14]	8.01	41.56	26.65	1.85	1.54%
UC33brAvg_FM31	--	--	--	--	29.68%
Anaheim [0]	6.60	4.14	260.90	-0.11	1.67%
Peralta Hills [1]	6.86	4.68	21.28	0.26	1.87%
Compton [0]	7.20	7.92	235.92	-0.19	2.42%
San Joaquin Hills [0]	7.54	8.14	184.49	0.28	1.44%
Newport-Inglewood alt 1 [1]	7.44	9.65	217.48	0.55	1.79%
Whittier alt 1 [4]	7.45	10.31	22.95	0.66	2.82%
Chino alt 1 [2]	6.64	12.75	48.41	1.39	1.55%
Elsinore (Glen Ivy) rev [0]	6.54	17.70	80.42	1.97	2.06%
Palos Verdes [7]	7.28	19.88	235.69	1.54	1.23%
San Jacinto (San Bernardino) [3]	8.10	39.20	55.64	1.68	1.05%
San Andreas (Mojave S) [14]	8.01	41.56	26.65	1.85	1.51%
UC33brAvg_FM32 (opt)	--	--	--	--	20.32%
PointSourceFinite: -117.894, 33.800	5.61	3.25	--	0.36	2.80%
PointSourceFinite: -117.894, 33.800	5.61	3.25	--	0.36	2.80%
PointSourceFinite: -117.894, 33.872	5.68	6.46	--	1.09	1.92%
PointSourceFinite: -117.894, 33.872	5.68	6.46	--	1.09	1.92%
PointSourceFinite: -117.894, 33.899	5.82	7.79	--	1.24	1.37%
PointSourceFinite: -117.894, 33.899	5.82	7.79	--	1.24	1.37%
UC33brAvg_FM31 (opt)	--	--	--	--	20.06%
PointSourceFinite: -117.894, 33.800	5.61	3.25	--	0.36	2.87%
PointSourceFinite: -117.894, 33.800	5.61	3.25	--	0.36	2.87%
PointSourceFinite: -117.894, 33.872	5.69	6.44	--	1.08	1.96%
PointSourceFinite: -117.894, 33.872	5.69	6.44	--	1.08	1.96%
PointSourceFinite: -117.894, 33.899	5.81	7.81	--	1.25	1.24%
PointSourceFinite: -117.894, 33.899	5.81	7.81	--	1.25	1.24%

11. GROUND SHAKING HAZARDS

The shaking hazard for your site is presented below in terms of peak ground acceleration (PGA) and spectral acceleration (Sa) at periods 0.2s and 1.0s. Where available the shaking hazard is provided for the Site Class specific to this location (based on estimated U.S. Geological Survey Site Class) and site classes B/C and D.

The Modified Mercalli Index (MMI) is also provided according to Trifunac & Brady (1975) based upon PGA. This method is applicable to intensity levels between IV and X; lower intensity levels are approximate.

Intensity		This Site: Site Class D/E				Baseline for Site Class B/C				Baseline for Site Class D			
Exceedance Probability	Return Period [years]	PGA [g]	Sa (T=0.2s) [g]	Sa (T=1.0s) [g]	MMI	PGA [g]	Sa (T=0.2s) [g]	Sa (T=1.0s) [g]	MMI	PGA [g]	Sa (T=0.2s) [g]	Sa (T=1.0s) [g]	MMI
50% in 30 years	43	0.1455	0.3757	0.2100	7.1	0.0917	0.2023	0.0557	6.5	0.1352	0.3409	0.1553	7.0
50% in 50 years	72	0.1900	0.4772	0.2843	7.5	0.1256	0.2794	0.0772	6.9	0.1789	0.4502	0.2129	7.4
50% in 75 years	108	0.2257	0.5626	0.3507	7.8	0.1562	0.3508	0.0981	7.2	0.2178	0.5424	0.2681	7.7
50% in 100 years	144	0.2546	0.6323	0.4065	7.9	0.1820	0.4112	0.1153	7.5	0.2483	0.6190	0.3123	7.9
20% in 50 years	224	0.3026	0.7294	0.4977	8.2	0.2249	0.5126	0.1455	7.8	0.3008	0.7357	0.3890	8.2
10% in 30 years	285	0.3280	0.7858	0.5530	8.3	0.2513	0.5761	0.1641	7.9	0.3294	0.8043	0.4377	8.3
10% in 50 years	475	0.3896	0.9209	0.6857	8.6	0.3149	0.7281	0.2098	8.3	0.4000	0.9726	0.5474	8.6
10% in 75 years	712	0.4438	1.0272	0.7984	8.7	0.3719	0.8676	0.2515	8.5	0.4607	1.0980	0.6532	8.8
5% in 50 years	975	0.4832	1.1069	0.8983	8.9	0.4231	0.9915	0.2894	8.7	0.5089	1.2061	0.7366	8.9
3% in 50 years	1642	0.5563	1.2528	1.0726	9.1	0.5117	1.2101	0.3561	9.0	0.6003	1.4094	0.8989	9.2
2% in 50 years	2475	0.6217	1.3811	1.2211	9.2	0.5932	1.4158	0.4194	9.2	0.6777	1.5655	1.0411	9.4
1.5% in 50 years	3308	0.6679	1.4752	1.3384	9.3	0.6571	1.5663	0.4662	9.3	0.7316	1.6778	1.1466	9.5
1% in 50 years	4975	0.7301	1.5901	1.5124	9.5	0.7457	1.7959	0.5385	9.5	0.8146	1.8493	1.3132	9.6

Source: *U.S. Geologic Survey, Dynamic: Conterminous U.S. 2014 (update) (v4.2.0)*

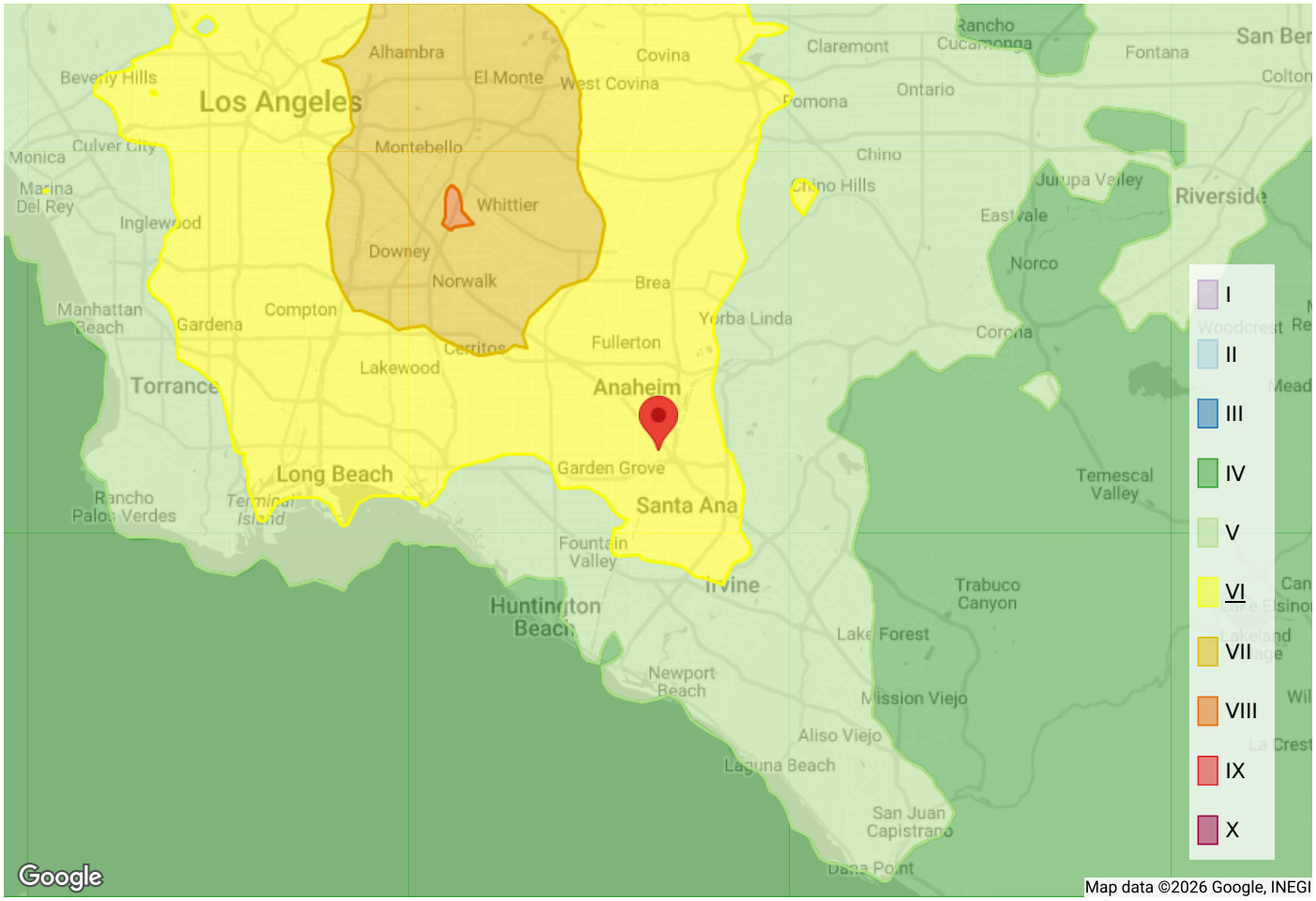
[https://earthquake.usgs.gov/hazards/interactive/]

12. SHAKE MAPS

Shake maps present the intensity of seismic shaking over geographic regions during significant earthquakes. The following map(s) provide information on the intensity of shaking demand from past seismic events that are pertinent to this site. Note that these maps estimate the intensity of shaking between observed data points and that a specific site may have experienced a different level of shaking in the event(s) presented below.

Data Source #1 - Whittier Earthquake - M 5.9 (10/01/1987)

Based on the map below, this site is located in an MMI **VI** Zone for this event.



Source: *U.S. Geological Survey [https://earthquake.usgs.gov/earthquakes/eventpage/ci731691#shakemap]*

Mapped Values at Site Location:

MMI: 5.8

PGA: 0.12 (g)

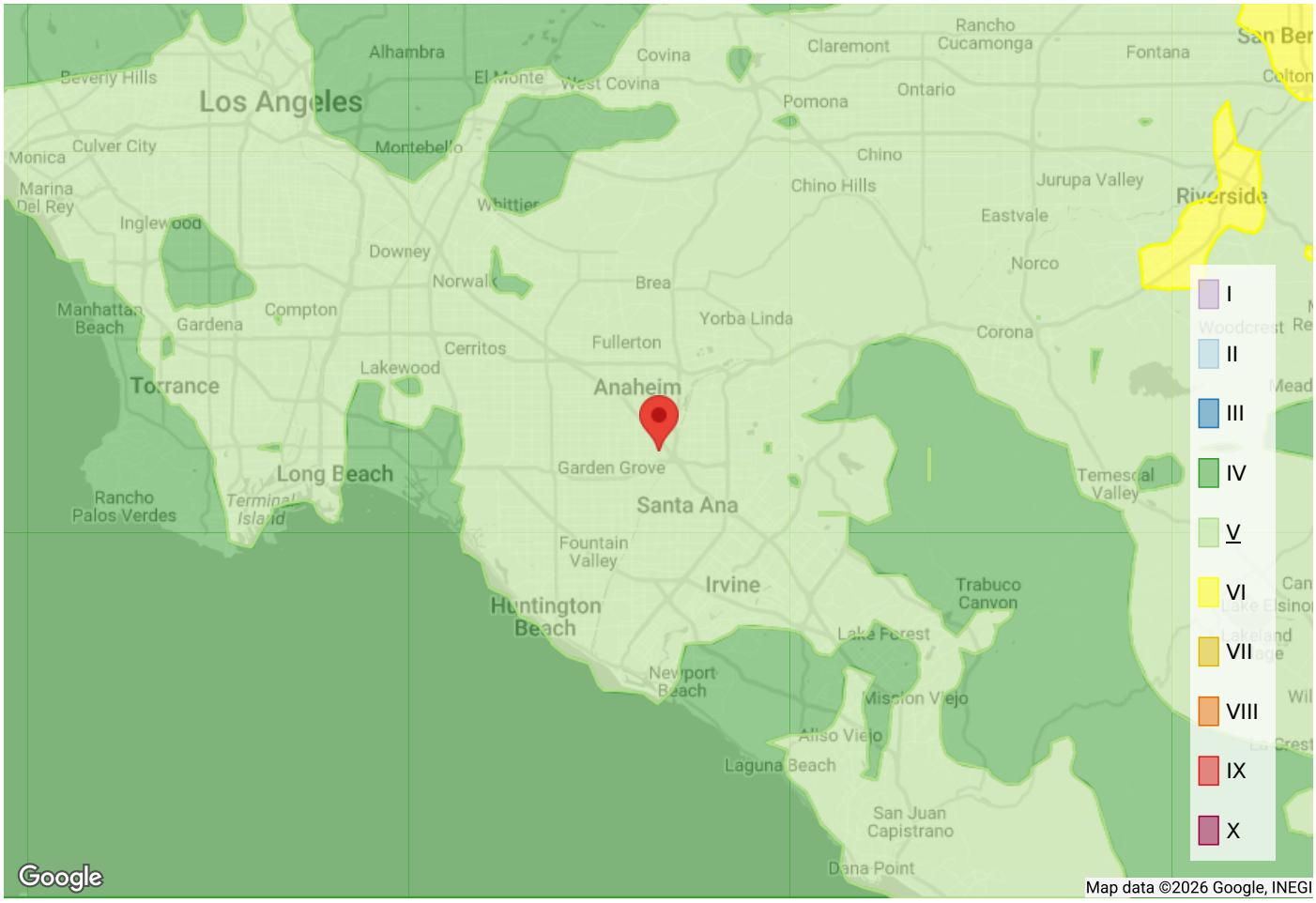
PGV: 10 (cm/s)

Sa (T = 0.3s): 0.28 (g)

Sa (T = 1.0s): 0.08 (g)

Data Source #2 - Landers Earthquake - M 7.3 (6/6/1992)

Based on the map below, this site is located in an MMI **V** Zone for this event.



Source: *U.S. Geological Survey [https://earthquake.usgs.gov/earthquakes/eventpage/ci3031111#shakemap]*

Mapped Values at Site Location:

MMI: 5.4

PGA: 0.08 (g)

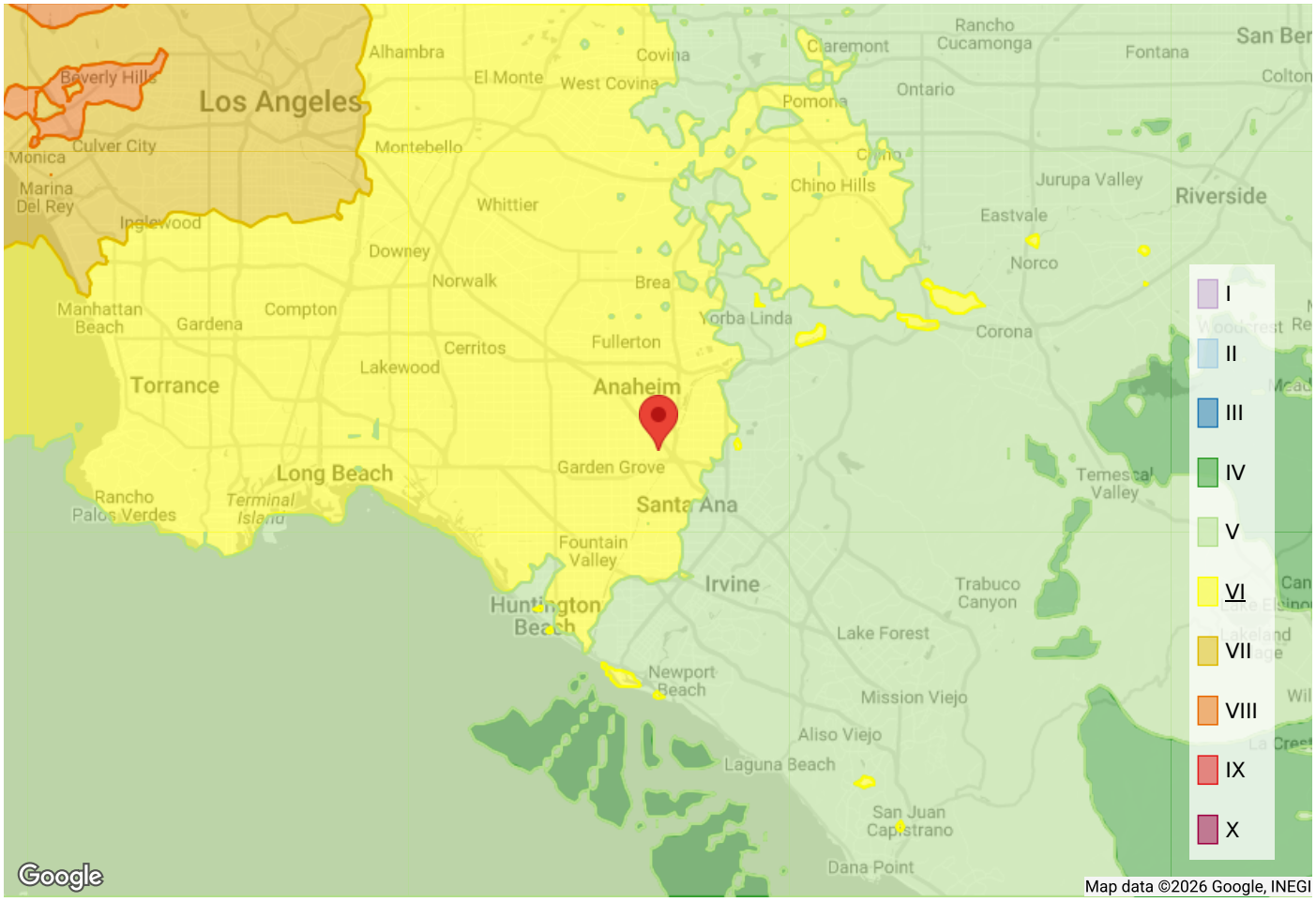
PGV: 8 (cm/s)

Sa (T = 0.3s): 0.16 (g)

Sa (T = 1.0s): 0.12 (g)

Data Source #3 - Northridge Earthquake - M 6.7 (1/17/1994)

Based on the map below, this site is located in an MMI **VI** Zone for this event.



Source: *U.S. Geological Survey [https://earthquake.usgs.gov/earthquakes/eventpage/ci3144585#shakemap]*

Mapped Values at Site Location:

MMI: 5.8

PGA: 0.08 (g)

PGV: 10 (cm/s)

Sa (T = 0.3s): 0.28 (g)

Sa (T = 1.0s): 0.12 (g)

Ground Shaking Scale Descriptions

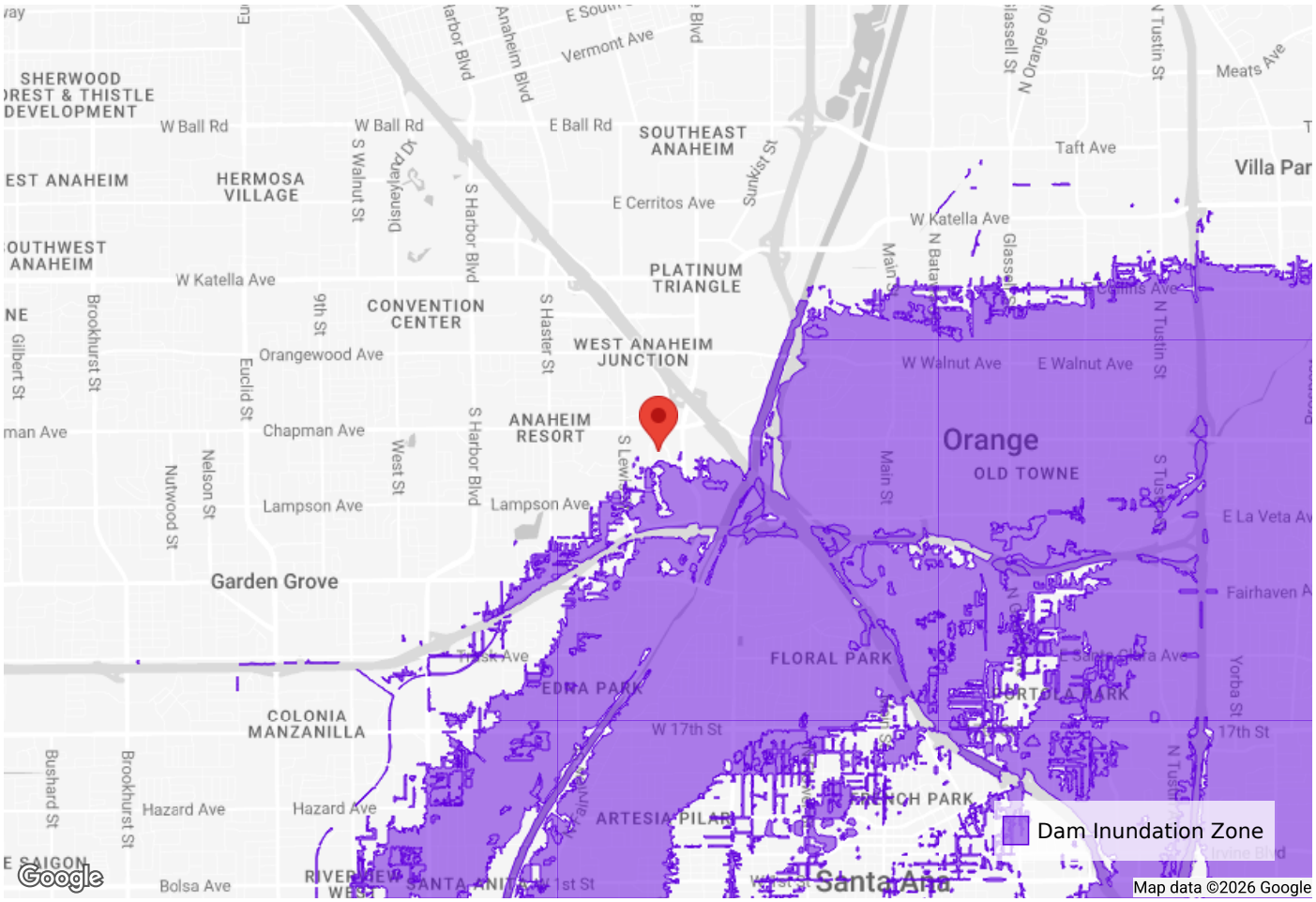
Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

Source: *U.S. Geologic Survey*

13. DAM INUNDATION

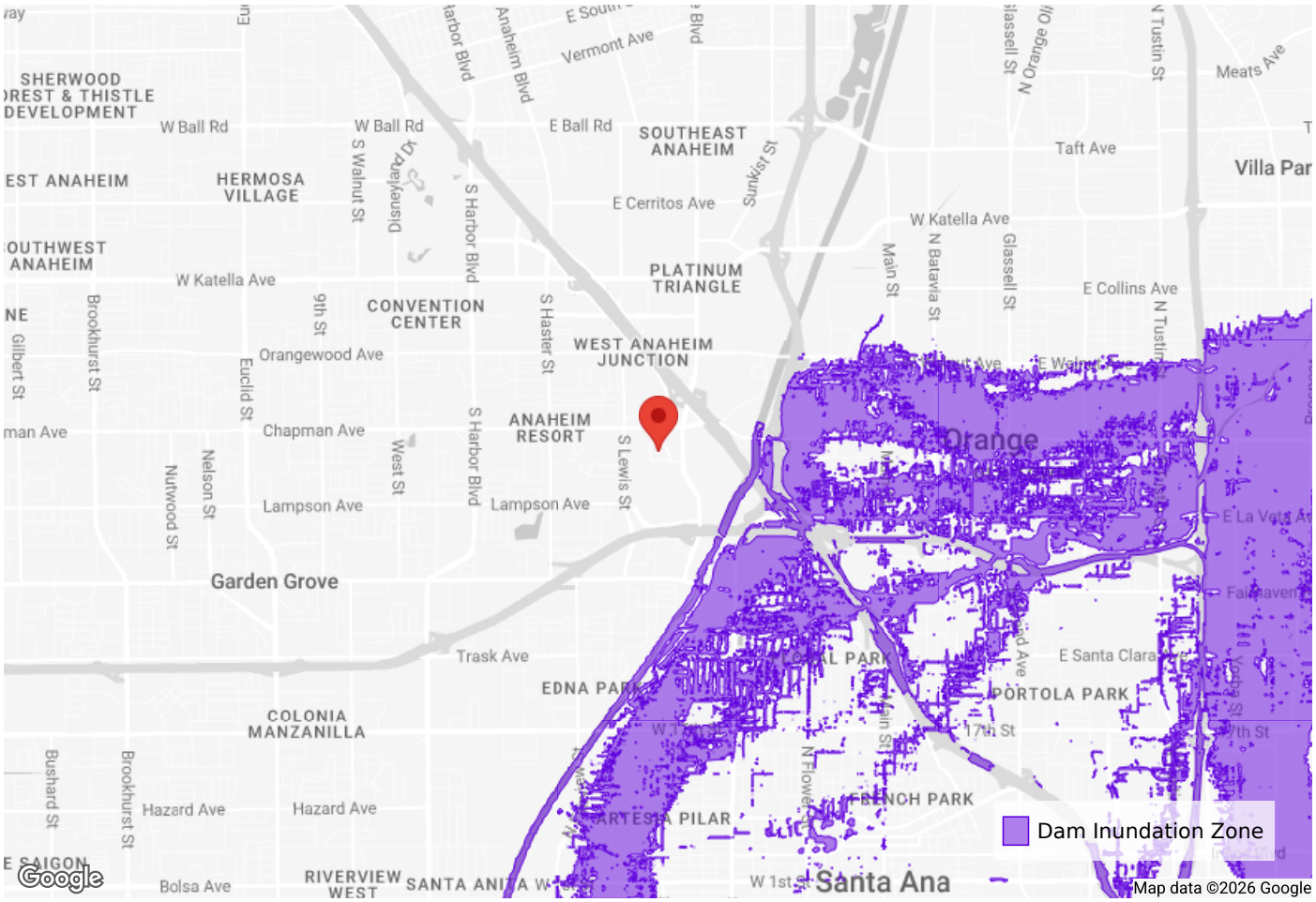
An Inundation map shows flooding that could result from a hypothetical failure of a dam or its critical appurtenant structure.

Data Source #1 - Santiago Creek



Source: *California Department of Water Resources [https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2]*

Data Source #2 - Villa Park



Source: *California Department of Water Resources [https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2]*