

**Preliminary Geotechnical Observations of the  
July 29, 2008  
Southern California Earthquake**

*Provided for:*

**Geo-Engineering Earthquake Reconnaissance (GEER) Association**



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August 11, 2008

## INTRODUCTION

On Tuesday, July 29, 2008 at 11:42:15 AM a magnitude  $M_w$  5.4 struck the Greater Los Angeles Area in Southern California. The epicenter of the earthquake was at a depth of 14.7 km at  $33.953^\circ\text{N}$   $117.761^\circ\text{W}$ , located 4 km (3 miles) southwest of Chino Hills, California (USGS). The earthquake was felt throughout the Los Angeles Basin area and in much of southern California as well as parts of Nevada and Arizona. Locations in which the earthquake was felt stronger (Intensity VI) were at Anaheim, Brea, Covina, Dimond Bar, Fullerton, Garden Grove, La Puente, Montclair, Pomona, Placentia, San Dimas, Walnut, West Covina and Yorba Linda. Figure 1 shows the shake map of the earthquake provided by USGS.

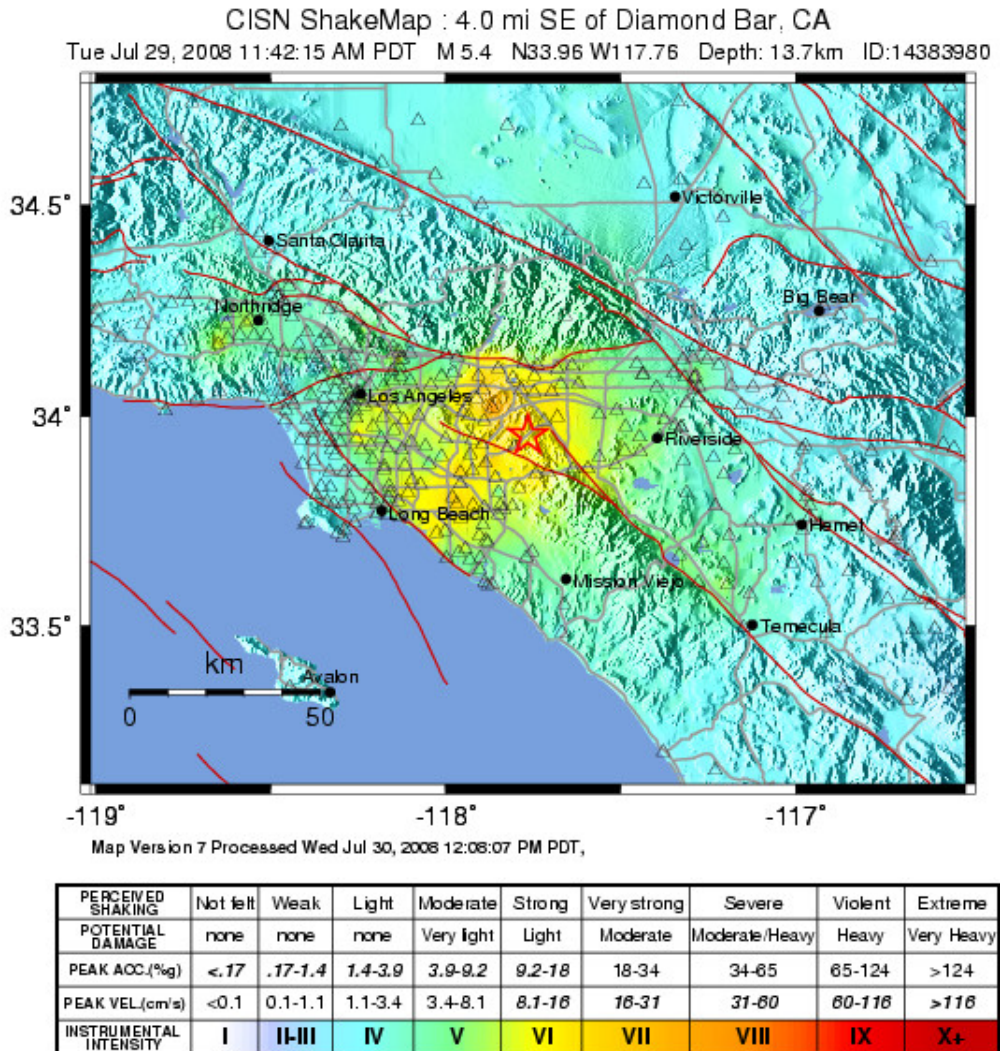


Figure 1: Shake map of the Southern California Earthquake on July 29, 2008 (USGS)

## **SELECTION OF THE AREAS OF RECONNAISSANCE**

The priority for reconnaissance was with areas where the likelihood of geotechnical damage, particularly liquefaction and liquefaction-related damage, was higher as a result of strong shaking. Therefore, two criteria needed to be met for the selection of the areas of reconnaissance:

- 1) Areas that experienced strong shaking in the USGS shake map.
- 2) Areas that were part of the “Zones of Required Investigations”, within the Seismic Hazard Zonation Program of the California Geological Survey (CGS) which encompass some potentially liquefiable sites.

Since sites outside the “Zones of Required Investigations” are not expected to contain any liquefiable sediments, the areas inside these zones were used as a starting point to guide the reconnaissance effort in finding some potentially liquefiable sites. Shaking was felt most strongly at areas around the epicenter, particularly at a short distance northwest of the epicenter. “Zones of Required Investigations” that were shaken strongly within that area fell mostly in El Monte, Baldwin Park and La Habra Quadrangles of the California Geologic Survey (CGS) Seismic Hazard Zonation Program. Therefore, these were the areas of primary interest for reconnaissance. Figure 2 shows areas within the quadrangles that were investigated during the reconnaissance.

Reconnaissance investigations were started in Hacienda Heights (Baldwin Park Quadrangle) and Rowland Heights (La Habra Quadrangle), which were located about 8 miles northwest of the epicenter. This was followed by areas around the Whittier Narrows Recreation Area which were further away from the epicenter (around 18 miles). While areas closer to the epicenter might have experienced stronger shaking, they were fairly mountainous and did not fall into “Zones of Required Investigations” and thus were not investigated during the reconnaissance.

The GPS track records of the observed areas during the reconnaissance are shown in Figure 3. The focus during the reconnaissance was to investigate mostly areas where the surface manifestation of liquefaction is more likely to be observed. Therefore, areas near a body of water, such as channels and ponds were investigated more rigorously. Several areas near bodies of water were investigated, while no sign of liquefaction was observed at any of those sites. Figs 4 and 5 show two views of the land around the North Lake at Whittier Narrows Recreation Area, which is only an example of many of similar sites visited. Surface evidence of liquefaction, such as ground cracks and sand boils, is not evident in Figs. 4 and 5, and was not found at any of the investigated sites.

The track records of the areas of reconnaissance shown in Figure 3 are presented in a Google Earth file (ChinoHillsEarthquake.kmz) along with this report.

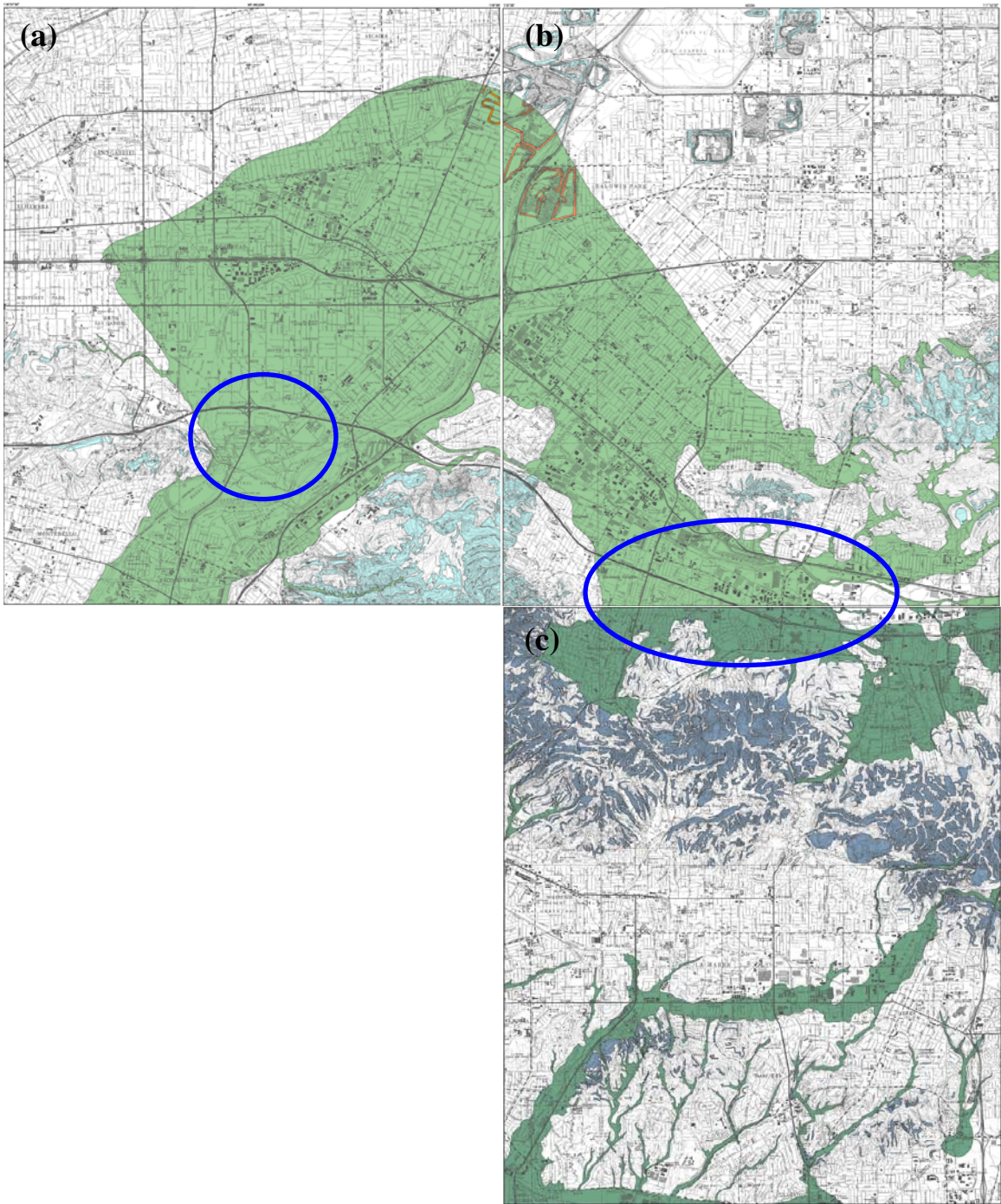


Figure 2: Areas of reconnaissance within the Zones of Required Investigation, (a) El Monte Quadrangle, (b) Baldwin Park Quadrangle, (c) La Habra Quadrangle, (CGS).

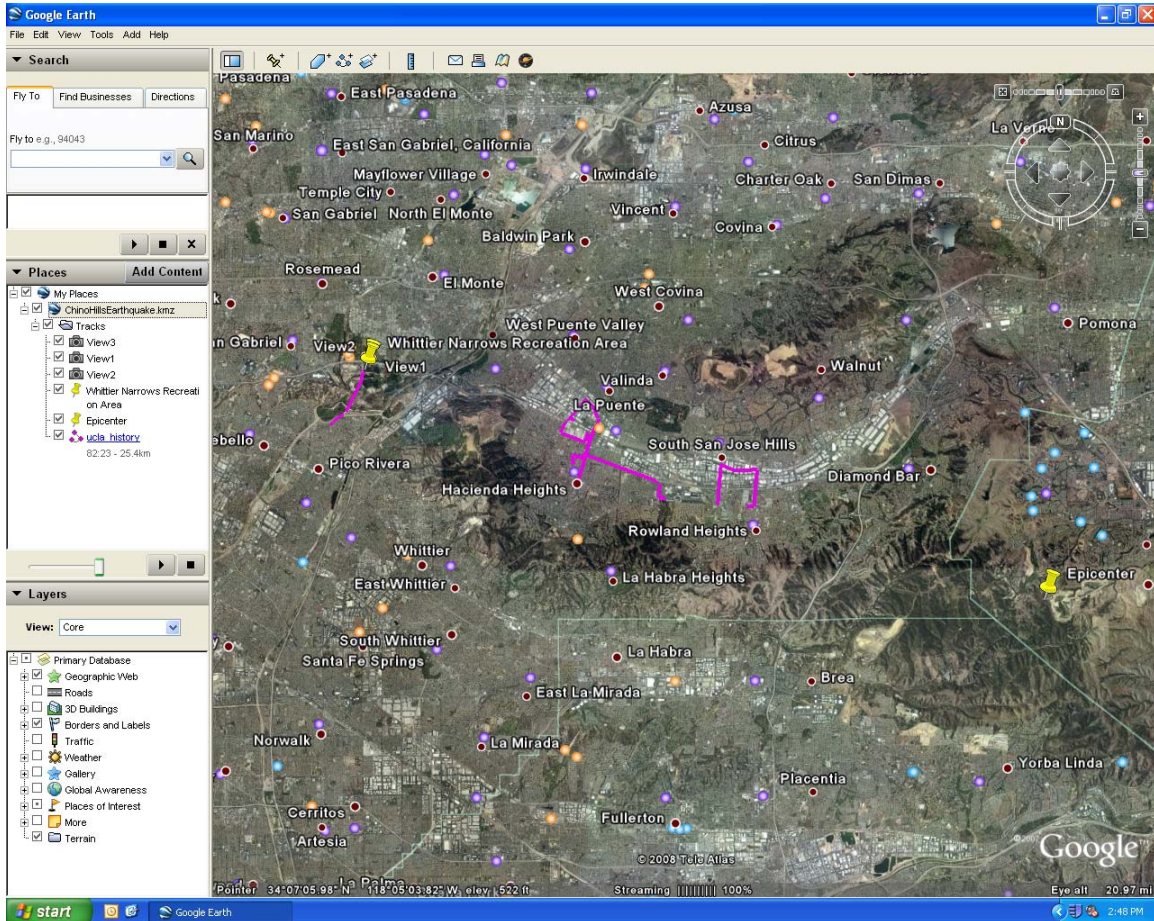


Figure 3: Snapshot of the track records of reconnaissance areas in Google Earth (ChinoHillsEarthquake.kmz)

## OBSERVATIONS

No signs of liquefaction or liquefaction-induced damage were observed during this reconnaissance effort in the areas that were investigated. While the focus of the investigation was mostly geotechnical, no signs of structural damage to bridges or buildings due to ground shaking or liquefaction were observed either. It was deduced that the ground shaking was probably not strong enough to cause liquefaction or liquefaction-related damage at areas of investigation around the epicenter of this Southern California Earthquake.



Figure 4: Close-up view of the land near North Lake in Whittier Narrows Recreation Area



Figure 5: Another view of the land near North Lake in Whittier Narrows Recreation Area .

## **ACKNOWLEDGEMENTS**

Professors Jonathan P. Stewart and Scott J. Brandenburg provided valuable insight and guidance for this reconnaissance effort. Their help is greatly appreciated.

## **REFERENCES**

*Seismic Hazard Zonation Program Maps* (2008). California Geological Survey.  
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