

SUPPLEMENTARY INFORMATION USED FOR THE 2011 UPDATE OF ABAG'S LIQUEFACTION HAZARD MAPS

ABAG's liquefaction hazard maps show areas where the ground is susceptible to liquefaction AND that are likely to be shaken hard enough in a particular earthquake scenario to trigger liquefaction. Thus, ABAG's liquefaction hazard maps are made by combining two maps.

- The first map shows liquefaction susceptibility (that is the susceptibility of the geologic or soil materials and ground water levels to liquefaction).
- The second map shows the opportunity for liquefaction based on the shaking levels anticipated for any individual earthquake scenario.

The model used to combine liquefaction susceptibility and shaking maps to create the hazard map is based on statistics of damage patterns in past earthquake to aid in predicting the likelihood that those materials will actually liquefy enough to damage pipelines, roadways, and buildings in future earthquakes.

The (1) susceptibility mapping, (2) shaking hazard mapping, and (3) some damage statistics have all improved since 2001.

(1) The 2000 liquefaction susceptibility maps were extensively updated in 2006. These maps should now be used, not the 2000 version. The revised maps are available in the form of a digital spatial database at <http://pubs.usgs.gov/of/2006/1037/> (for the central Bay Area) and <http://pubs.usgs.gov/of/2000/of00-444/> (for the remainder of the Bay Area).

(2) The ABAG shaking hazard maps have improved since 2001, as well, due to improved registration with an improved street network and updated fault information. While this information has made the maps more accurate, they are still not site-specific and not a substitute for an engineering evaluation.

(3) The authors have re-examined the previous model used to generate the liquefaction hazard map in light of two new pieces of information.

- ABAG reanalyzed the statistics for water pipeline leaks in the Bay Area following the Loma Prieta earthquake because increased accuracy of the road network and the liquefaction mapping might impact the statistics. In addition, the estimates of the length of pipeline in the Bay Area have significantly lowered. In the previous 2001 statistical analysis, ABAG assumed that there was a water distribution pipeline under all roads except for freeways. In this 2010 analysis, only roads within water agency service areas are assumed to have a pipeline under them.
- Secondly, data has been generated by other researchers from the Northridge earthquake are incorporated, to the extent possible, into this mapping. Note, however, that, due to funding constraints, ABAG has not been able to fully reanalyze that information in the same manner as the Loma Prieta data.

In the end, however, reexamination of the statistical data was not believed to significantly impact the overall liquefaction hazard assessment enough to warrant a change in the modeling. Thus, the same model has been used in this 2010 update as was used in 2001, as depicted in the following table.

TABLE 1 – 2001 AND 2010 MODEL ESTIMATE OF LIQUEFACTION HAZARD BASED ON COMBINATIONS OF MODIFIED MERCALLI INTENSITY AND LIQUEFACTION SUSCEPTIBILITY

MMI Value	Description of Shaking Severity on Shaking Intensity Map	Liquefaction Susceptibility Category on Map				
		Very Low	Low	Moderate	High	Very High
V	Light					
VI	Moderate					
VII	Strong			Moderately Low	Moderately Low	Moderate
VIII	Very Strong			Moderate	Moderate	High
IX	Violent			High	High	High
X	Very Violent			High	High	High