

AEG San Francisco Section

Field Trip

Geology and Tectonics of the San Francisco North Bay Area

Saturday June 14, 2008

Leaders:

James Allen, CSU East Bay, Earth and Environmental Sciences

Peter Holland, Vector Engineering

James Wilen, BACE Geotechnical

Abstract:

A thorough understanding of the coeval depositional history and interfingering relationships of the late Miocene to Pliocene Petaluma Formation (PF) and Wilson Grove Formation (WGF) is necessary for palinspastic restoration of slip and deformation along the Hayward fault, other East Bay faults, and their North Bay equivalents. The PF/WGF basin is characterized as a through-going fluvial to marine depositional system that was deposited mostly over Franciscan Complex rocks and late Miocene Tolay Volcanics. We have mapped the area in which the two formations are interbedded as a transitional zone. The fluvial portion of the PF/WGF basin received largely Franciscan-derived detritus likely from the Diablo Range in the East Bay during the late Miocene. By Pliocene time, uplift in the East Bay provided a vast influx of detritus derived from Tertiary rocks mostly from the Monterey and Briones Formations. The PF/WGF Grove basin can be divided into two basic structural domains. The area between the Pacific Ocean/San Andreas fault and the towns of Petaluma & Cotati/Petaluma Valley fault is characterized by almost flat-lying, relatively undeformed rocks. East of Petaluma & Cotati/Petaluma Valley fault, the rocks have been relatively highly folded and faulted compared to the rocks to the west. This boundary in structural domains also roughly coincides with the ancient shoreline and the lateral transition between the marine WGF and the non-marine PF. This can cause confusion and lead researchers to erroneously believe that the less deformed WGF is younger than the PF. The locus of strike-slip displacement from the Hayward fault across San Pablo Bay and into Marin and central Sonoma counties is identified via these differing structural domains. Since the time of deposition, the

PF/WGF basin has been offset to the north along right-lateral strike-slip faults in the East Bay and North Bay. According to our model, strike-slip motion was substantial along the Hayward-North Bay fault system starting at about 5 Ma. More importantly, because the PF occurs on both sides of the Rodgers Creek fault (RCF), much of the major displacement reported from the Hayward fault must have occurred on a series of faults throughout Marin and central Sonoma counties: the Burdell Mountain fault, Petaluma Valley fault, Tolay fault, RCF, Bennett Valley fault, and Eastside fault or perhaps a fault along the western side of the Sonoma Valley. During this field trip, we will make 5 stops: **1) The Steinbeck Ranch**, where we will examine the typical lithology and stratification of the WGF. The underlying Franciscan Complex, Tolay Volcanics, as well as the interbedded Roblar Tuff (one of the best marker beds in the formation) will be observed at this stop. **2) Stony Point Rock Quarry**, where the lower and middle members of the PF, as well as underlying and interbedded Tolay Volcanics will be examined. Particular attention will be paid to the gravel composition of the middle PF. **3) Stony Point Road**, north of the Stony Point Rock Quarry, where a road cut exposure of the upper member of the PF will be examined. The gravel composition of the upper member will be discussed. **4) Taylor Mountain landslide**, where the head scarp exposes Tolay Volcanics thrust over PF. Active landslide features will also be observed. **5) Matanzas Creek** in Bennett Valley, where we will observe the PF east of the RCF and compare it with the PF west of the RCF.

Time & Departure:

Saturday June 14, 2008 at 9:00 AM. We will meet at the **Southbound** Park and Ride lot at Highway 101 and Rohnert Park Expressway, in Rohnert Park. Take the Rohnert Park Expressway exit. There are northbound and southbound lots, so go to the smaller lot on the **west** side of Highway 101 (Southbound lot). We will load the vans and leave at **9:30 AM** sharp. Bring boots, because access to the first exposure involves hiking about a 1/4 mile across a grassy hillside with cattle. We should finish by approximately 4pm. The remaining stops are within a major quarry, a road cut, an active landslide, and a creek.

Registration:

To reserve a spot, download the registration form and liability waiver, then send the completed form and waiver via FAX to the AEG SF Section treasurer, Sachiko Tanikawa (FAX number: 866-400-4068). Each participant must include their email address and signed liability waiver. One participant per registration form, please. Registration is on a first come, first served basis, and the maximum number of participants is 50. After completion of registration, you will receive an email confirmation.

Cost: \$50 for AEG San Francisco Section Members; \$55 for Non-Members

Instructions regarding payment will be included with the email confirmation.

AEG San Francisco Section
FIELD TRIP REGISTRATION FORM

Geology and Tectonics of the
San Francisco North Bay Area

Saturday June 14, 2008

Cost: \$50 AEG San Francisco Section Members
 \$55 Non-Members

To reserve a spot (one participant per registration form), please FAX this form to the AEG SF Section treasurer, Sachiko Tanikawa (866-400-4068).

You must include your email address on the registration form, and you must submit a signed liability waiver when you register. Please see the section web site (www.aegsf.org) for field trip details.

Name _____

Company _____

Email address _____

Phone Number _____

You will receive a confirming email that includes instructions regarding payment.

**ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS
SAN FRANCISCO SECTION**



**LIABILITY WAIVER
FOR FIELD TRIP PARTICIPANTS**

The undersigned having been fully advised as to the nature and possible dangers and hazards of the field trip, hereby acknowledges and agrees that:

1. (please print name) _____ (herein referred to as "Participant") intends to participate in a field trip sponsored by the Association of Environmental & Engineering Geologists - San Francisco Section (herein referred to as "AEG-SF").

The field trip for which this waiver is being made is to be held on June 14, 2008.

2. Participant agrees and understands that during such field trip(s), he/she will be under the direction and control of the trip leader approved by the AEG-SF, and specifically agrees to comply with all reasonable directions and instructions by the trip director during the course thereof.
3. Participant understands and acknowledges that there are risks of injury to person and/or property that are associated with field trips, including without limitation risks related to travel hazards, terrain, weather, eating and sleeping arrangements, and other circumstances. Participant hereby voluntarily assumes all risks connected with or arising out of his/her participation in field trip activities, and waives any claim against AEG-SF, its officers, directors, employees, agents and members for any injury, harm, damage or other liability arising out of field trip activities.
4. Participant understands and acknowledges that AEG-SF, its officers, and field trip leaders assume no liability for personal injuries or property damages to participants or to third persons arising out of field trip activities. Participant agrees to hold AEG-SF, its officers, and field trip leaders harmless from any liability for harm arising out of the acts or omissions of AEG-SF or Participant during any such field trip, and indemnify AEG-SF, its officers, and field trip leaders against any and all awards or judgments in favor of third parties for losses and damages (including attorney's fees and any costs involved because of said claims), on account of injury, death or property damage, or inconvenience or loss of money due to delay that may arise, by reason of Participant's participation in field trip activities.
5. I understand that my use of alcohol or drugs would impair my judgment and coordination, and I hereby waive, and will hold the AEG-SF harmless from, any and all claims of bodily injury or other harm arising from my use of either. I will indemnify AEG-SF against awards or judgments in favor of third parties for losses or damages (including attorney's fees and costs), of whatever nature, arising out of my use of alcohol or drugs while participating in field trip activities.

Date: _____ Signed: _____
Participant's Signature