



Testimony of John Baldwin, Senior Geologist

I was asked to review the existing geologic and geotechnical data (LOR Geotechnical Group, Inc., 1/04 and 5/04) from the proposed Riverside Energy Resource Center site to determine if, in my professional opinion, the existing data is a reliable source for estimating the silt content of the material that will be disturbed during construction of the project.

Based on a review of existing geologic and geotechnical data, I believe that the silt content used in the Final Initial Study to estimate the air emissions during grading of the site is not representative of the entire site geologic conditions. The four sieve samples collected between 0 and 3 feet in depth from boreholes BH-2, BH-10, BH-11 and BH-26 were collected from portions of the site characterized primarily as bedrock (quartz diorite). Review of borehole sampling locations and lithologic descriptions of the subject borehole logs indicate that the sieve samples were collected from near-surface bedrock. The laboratory results of the sieve analysis indicate that the near-surface bedrock (weathered) has an average silt content of about 13%. This silt content is representative of the weathered bedrock present in the northern and central parts of the site in which bedrock is at or near the ground surface. However, the average bedrock silt content of about 13% likely is not representative of the topsoil/artificial fill logged in the southern part of the site and elsewhere. For instance, a review of the borehole and trench logs that provide lithologic descriptions (visually-made in the field) indicate that the average silt content is about 28% within the artificial fill/topsoil.

It is my opinion that the borehole and test pit logging was performed competently and to a relatively high degree of quality. I base this opinion on: (1) the relatively detailed descriptions of the soil and artificial fill that are suggestive of a skilled and qualified geologist; (2) lithologic descriptions of the top soil that are fairly consistent between boreholes and trenches; and (3) the LOR (1/04 and 5/04) reports are signed by a California Certified Engineering Geologist who presumably reviewed the data. It is likely that the field descriptions of the silt content are within $\pm 10\%$ of the actual silt content. Thus, the range of silt content within the artificial fill/top soil may range from about 18% to 38%.

In summary, the average silt content of 13% of weathered bedrock sieve samples collected primarily in the northern and central parts of the site is a relatively good representation of the likely silt content within ripped bedrock material derived from excavation and reworking in this area. I believe that the silt content of the topsoil/fill elsewhere on the site averages about 28% (+ 10%) based on review of the borehole and trench log descriptions.

John Baldwin, C.E.G. 2167
Senior Geologist



JOHN N. BALDWIN, M.S., C.E.G.
Senior Geologist

*Engineering Geology
Paleoseismology
Geologic Seismic Hazard Assessment
Quaternary Geology
Geoarchaeology*

EDUCATION

San Jose State University, San Jose, CA: *M.S., Geology, 1996*
University of California, Santa Cruz, Santa Cruz, CA: *B.A., Geology, 1987*

REGISTRATION

Certified Engineering Geologist, California, No. 2167, 1999
Registered Geologist, California, No. 6900, 1999

PROFESSIONAL HISTORY

William Lettis & Associates, Inc., Walnut Creek, CA, Senior Geologist, 1996-date
U.S. Geological Survey, Menlo Park, CA, Volunteer and Geologist, 1993 to 1996
Pacific Environmental Group, Santa Cruz, CA, Staff to Project Geologist, 1989 to 1993

AFFILIATIONS AND PROFESSIONAL DEVELOPMENT

Member, American Geophysical Union
Member, Northern California Geological Society
Member, Seismological Society of America
Member, Association of Environmental Professionals
Cal-OSHA 40-hr Hazardous Waste Operations Training and Confined Space Entry Training

REPRESENTATIVE EXPERIENCE

Mr. Baldwin is a Certified Engineering Geologist with over 13 years of professional experience throughout northern California in the fields of engineering geology, seismic hazard assessment, and environmental geology. He is experienced in the identification and mitigation of earthquake-related hazards, and the application of Quaternary geology and geomorphology as related to geotechnical and geoarchaeological investigations. A major emphasis of Mr. Baldwin's work has been assessing geologic hazards associated with development of transportation, water and gas conveyance systems, reservoirs, landfills, nuclear power facilities, schools, correctional facilities, and single-family residences. Mr. Baldwin is also familiar with numerous aspects of environmental geology having worked in the environmental industry conducting geologic and hydrogeologic investigations for Superfund and Leaking Underground Fuel Tanks (LUFT) sites.

REPRESENTATIVE PROJECTS

PG&E Riverton Water Supply Project, California (1997-1998)

Geologic mapping and stability assessment of landslides and erosion affecting a 5-mile reach of the El Dorado canal in the American River canyon. Pervasive, constant landslides undermined or infilled the canal. The study included detailed landslide and erosion mapping, predictive susceptibility/hazard zoning, and development of monitoring and mitigation recommendations.

Chevron Bay Area Products Line, Northern California (1999)

Project Geologist responsible for assessment of potential seismic hazards along the Bay Area Products Line. Characterized hazards related to fault rupture at pipeline crossings of the Calaveras fault and slope instability in steep topography. The project included hazard characterization via trenching and drilling, and geologic/geotechnical input to finite-element modeling of pipeline fault rupture and mitigation design.



PG&E Gas Distribution Fault Crossing Studies, Northern California (2001-2002)

Mr. Baldwin was responsible for evaluating potential fault rupture hazards for natural gas pipelines along the Calaveras and San Andreas faults. Efforts at both fault crossings involved detailed fault mapping, and estimate of the location, amount, and width of possible ground deformation. The investigation included mapping and subsurface trenching to define the fault location and width of deformation to develop an appropriate rupture mitigation plan.

East Bay Municipal Utility District, Seneca Reservoir, San Leandro, California (2001-2002)

Mr. Baldwin completed a detailed subsurface investigation of East Bay Municipal Utility District's Seneca Reservoir to evaluate seepage and active faulting and landsliding along the reservoir's margins. Suspected causes of seepage included aseismic creep along secondary structures associated with the Hayward fault, complex bedrock fracturing, and regions of slope instability. Mr. Baldwin was responsible for geologic mapping and characterization of geomorphic features associated with aseismic creep and landsliding.

Monterey Regional Water Pollution Control Agency, Monterey, California (1998)

Mr. Baldwin conducted a seismic vulnerability assessment of the Monterey Regional Water Pollution Control Agency wastewater and treatment system that included over 100 miles of pipelines, pumping stations, and treatment plants. Characterized seismic sources and ground motions, and evaluated hazards from fault rupture, liquefaction, and slope instability.

Proposed LNG Plant, Vallejo, California (2002)

Mr. Baldwin recently completed an assessment of the seismic hazards associated with the siting of a liquid natural gas storage facility in the San Francisco Bay Area. Mr. Baldwin was responsible for the Quaternary geologic mapping of the site, as well as mapping the regional extent of Quaternary marine terraces with the intent to evaluate fault activity near the proposed LNG site. The investigation included compilation of local and regional geotechnical borehole data to provide constraints on the lateral extent of Quaternary marine deposits and to better constrain Quaternary geologic uplift and slip rates of nearby faults.

Liquefaction Susceptibility Assessment Bay Area Airports, Northern California (2000)

In collaboration with the Association of Bay Area Government's, Mr. Baldwin performed a preliminary liquefaction susceptibility assessment of San Francisco International, Oakland International and San Jose International Airports, respectively. The investigation included interpretation of aerial photography to assess land-use changes over time, Quaternary geologic mapping, compilation of existing geotechnical borehole information, and analysis of borehole information for the susceptibility of earthquake-induced liquefaction and differential settlement.

Liquefaction Susceptibility Mapping of East St. Louis, Missouri (2002-2003)

Currently developing large-scale (1:24,000) liquefaction and amplified ground shaking maps for the St. Louis area under a U.S. Geological Survey grant (National Earthquake Hazard Reduction Program). Hazard maps will be provided to local agencies, and presented at a number of professional symposiums, to facilitate their application for emergency response and development planning.

West Contra Costa Unified School District, San Pablo, California (2003)

Mr. Baldwin recently completed a seismic hazard evaluation of an elementary school within the West Contra Costa Unified School District, in San Pablo, California. Mr. Baldwin performed the study in compliance with criteria outlined in the California Geological Survey's Note 48 for public schools and hospitals. The seismic hazards assessed included surface-fault rupture, secondary deformation (folding and fracturing), earthquake-induced liquefaction (settlement and lateral spread), and strong ground motions. Investigative techniques included mud-rotary drilling and collecting geotechnical borehole data to assess the liquefaction susceptibility of late Holocene sediments. Borehole and trench data provided information on fault location. A probabilistic ground motion analysis using EZ-FRISK provided ground motion estimates for the site.