

SUMMARY OF EXPERIENCE

I have over 20 years of experience in the engineering geological and hydrogeological consulting profession evaluating geologic hazards for construction and land development projects throughout California. I hold three California professional licenses. I am the president and founder of Earth Focus Geological Services, Inc., an engineering geological consulting firm in Fremont, California. More recently, I have become involved in mentorship through teaching at the California State University East Bay, Hayward Campus (CSUEB).

TECHNICAL EXPERTISE

Earthquake Fault Hazard Evaluations (Alquist-Priolo Fault Studies): I have evaluated sites for residential construction along the Calaveras, Concord, Green Valley, and Hayward faults in northern California; and along the Malibu Coast, San Jacinto, Sierra Madre, Springville, and Whittier faults in southern California.

Landslide Investigations and Repair/Mitigation Techniques: I have investigated, mapped, instrumented, and repaired hundreds of landslides ranging from shallow debris flows to large-scale landslides.

Grading Inspection for Earthwork Developments: I have geologically mapped grading excavations for commercial and residential grading projects ranging in size from 5 thousand to 30 million cubic yards.

Telecommunication Facilities: I have provided engineering geological investigations for several cellular and microwave telecommunication sites in Contra Costa, San Benito, San Luis Obispo, Santa Barbara, Santa Clara, and Tuolumne Counties.

Down-Hole Logging of Large Diameter Borings (>24 inches): I have geologically logged over 150 large-diameter borings to depths exceeding 140 feet to explore landslides, faults, and bedrock structure.

Rock Core Logging: I have described and characterized hundreds of feet of rock core for several major San Francisco Bay area projects.

EDUCATION

M.S., Geology, 1999, California State University, Los Angeles, CA

B.S., Geology, 1985, West Virginia University, Morgantown, WV

PROFESSIONAL REGISTRATIONS AND CERTIFICATIONS

California Registered Geologist, 1993 (PG-5744)

California Certified Engineering Geologist, 1995 (CEG-1916)

California Certified Hydrogeologist, 1998 (CHG-573)

PROFESSIONAL HISTORY

Earth Focus Geological Services, Inc., Fremont, CA: President and Senior Engineering Geologist, 2002–present

Gilpin Geosciences, Inc., Walnut Creek, CA: Senior Engineering Geologist, 2001–2002

Geolith Consultants, Inc., Pleasant Hill, CA: Senior Engineering Geologist, 1998–2001

Rogers/Pacific, Inc., Pleasant Hill, CA: Senior Engineering Geologist, 1994–1997

Leighton and Associates, Inc., Diamond Bar, CA: Senior Staff Engineering Geologist, 1991–1994

Robert Stone & Associates, Inc., Van Nuys, CA: Soil Technician to Staff Engineering Geologist, 1987–1991

THIRD PARTY PEER REVIEW SERVICES

City of Concord Alquist-Priolo Peer Review – Acted as the City’s Engineering Geologist to provide peer review services on several fault hazard evaluations by private consultants along the Earthquake Fault Studies Zone for the active Concord fault. Duties included interacting with City personnel and consultants, observing fault trench exposures, reviewing fault evaluation reports, reviewing historic aerial photographs, and providing written comments to the City.

City of Fremont Hydrogeologic Peer Review – Acted as the City’s Hydrogeologist to provide peer review services for a proposed 8-lot residential subdivision located in the Warm Springs area of the City of Fremont. The Warm Springs area is historically known for its natural mineral springs related to the active Hayward fault. Duties included review of the development plans and consultants’ reports, interacting with City personnel, evaluating the potential hydrogeologic hazards of the site, and providing written comment to the City.

City of Orinda Down-Hole Logging Peer Review – Project Geologist and Down-Hole Logging Instructor for the City of Orinda in a peer review status for the initial geotechnical investigation for the Gateway Valley Development Project in Contra Costa County. This initial phase of the proposed development included subsurface exploration of large bedrock landslides by the developer’s geologic and geotechnical consultants. Duties included training developer’s geologists to down-hole log large-diameter borings placed within mapped landslides; peer review of final boring logs and landslide geometries based on exploration; and review of consultants’ geologic maps.

City of Pleasant Hill Peer Review – Acted as the Grading Inspector to provide engineering geologic peer review of grading operations for the City of Pleasant Hill, Contra Costa County during redevelopment of the old Pleasant Hill County Club. The project by Davidon Homes involved the grading of a 104-unit housing tract and a 9-hole golf course. The property was complicated by several large landslides and deep colluvial removals along an active stream. Duties included peer review of preliminary geotechnical and interim grading reports; consent on buttress keyways and subdrain locations, and removal of unsuitable materials; participation in weekly site meetings; and peer review of consultants’ as-built plans and construction summary reports.

Contra Costa County Community Development Peer Review – Acted as the Grading Inspector to provide engineering geologic peer review of the Hidden Pond II Subdivision 7144 in the Pleasant Hill area of Contra Costa County. This 8-lot residential development by Kaufman & Broad Homes was underlain by two large bedrock landslides that extended onto adjoining residential tracts and public streets. A system of temporary cast-in-ground concrete caissons was used to underpin the existing uphill parcels during grading operations. Duties included part-time grading inspection; consent on all keyway excavations and subdrain locations; and considerable interaction with County staff, adjoining homeowners associations, and their attorneys.

REPRESENTATIVE LANDSLIDE INVESTIGATIONS AND SLOPE MOVEMENTS

Bettencourt Ranch Owners Association – Project Geologist to investigate and monitor slope movements impacting a residential street within a 400-unit housing tract located in Danville, Contra Costa County. The slope inclinometer results and monitoring of the cracks within the asphalt indicated that the street was underlain by a landslide in the initial stages of formation. Duties included review of old grading plans, logging and sampling of a small-diameter boring, installation of a slope inclinometer, slope inclinometer monitoring, and preparation of summary reports. Afterwards, testified as Expert Witness for Contra Costa County against the developer of the subdivision.

Mission Peak Landslide Inclinometer Monitoring Program – Project Geologist for the mapping and initial slope inclinometer monitoring of a large ancient landslide that reactivated during the heavy rains in 1998 along the west flank of Mission Peak in Fremont, Alameda County. The landslide, nearly a mile long, threatened several custom homes located near the landslide toe. Duties included geologic mapping; collecting readings of the five inclinometers extending to depths of over 100 feet; analyzing the inclinometer results and landslide geometries; developing an isopleth map of the basal rupture surface of the landslide; and preparing written comments to the City of Fremont. A geology field trip to the landslide was organized in 1999 (see publications list).

Felton Quarry – Project Manager for the long-term monitoring of the southwest quarry wall for the Granite Construction Company quarry in Felton, Santa Cruz County. A significant portion of the granitic rocks along the southwest quarry wall had failed in the early 1990s, which prompted Santa Cruz County to require a monitoring program for the quarry. Duties included installing slope inclinometers, collecting and reviewing inclinometer data, reconnaissance mapping and monitoring of fractures along the quarry wall, preparing periodic and annual reports submitted to Santa Cruz County.

Mission Viejo Company – Project Geologist and Operations Manager for a post-development study to evaluate alleged fill slope movements throughout a 1000-unit residential subdivision in Mission Viejo, Orange County. The project included several deep canyon fills in excess of 100 feet and multiple side hill fill slopes. Six geotechnical consultants including Rogers/Pacific were involved in drilling, sampling, testing, and logging several small and large-diameter borings within fill; logging and testing hand dug test pits; and installing slope inclinometers for monitoring purposes. Duties included managing all aspects of the field work and coordinating the various geotechnical consultants, down-hole logging of large-diameter borings, collecting slope inclinometer readings, and preparing summary reports.

Mariner's Bluff Subdivision – Field Geologist for a post-development study to evaluate the cause of fill settlement within a large residential subdivision in Laguna Niguel, Orange County. The project consisted of a deep and narrow canyon fill that passed under several distressed houses. Duties included drilling and sampling small-diameter borings, installing slope inclinometers and piezometers within the small-diameter borings, collecting readings from the installed instruments over an 18-month monitoring program, performing floor level surveys of individual residences, mapping cracks within streets and sidewalks, compiling field data and producing a map of damage areas, and interacting with homeowners.

Warm Springs Landslide – Expert Witness for the defendant in a suit involving a landslide located on two adjacent residential properties in the Warm Springs Area of Fremont, Alameda County. The landslide failed during the heavy rains of early 1998. Duties included historic aerial photographic review of the site, managing the preparation of a topographic survey of the area, selecting and interacting with the hydrologist, reviewing depositions, consulting with attorneys, and preparing an aerial photographic presentation for the arbitration meeting. The case settled in the defendant's favor largely based on the aerial photographic presentation.

Casten vs. City of Orinda – Expert Witness for the defendant involving a property owner claiming that the City had allegedly created a landslide by grading on the up slope property in Orinda, Contra Costa County. The case settled out of court in favor of the City of Orinda. Duties included review of historic aerial photographs and grading plans, consultation with attorneys, legal preparation, and participation in arbitration meeting.

REPRESENTATIVE FAULT EVALUATION PROJECTS

Hayward Fault, San Leandro Residence – Project Geologist for a fault hazard evaluation for the proposed construction of a residential duplex located along the active Hayward fault in San Leandro, Alameda County. Several previous fault evaluation studies on adjacent properties had located the active traces of the Hayward fault zone near the property. Duties included site reconnaissance mapping, review of historic aerial photographs, research and review of previous fault evaluation studies, compilation of data collected during the study, and preparation of a summary report.

Calaveras Fault, Church On The Hill – Project Geologist for a fault hazard evaluation for the proposed construction of an assisted living senior housing complex and expansion of the existing church along the active northern Calaveras fault zone in San Ramon, Contra Costa County. Over 2,000 linear feet of fault trench was logged. The trenches exposed ancient bedrock landslides and active faulting. Radiocarbon dating of charcoal samples indicated the last earthquake occurred at least between 2,000 and 3,000 years ago. Appropriate building setbacks were established for the planned structures. Duties included extensive review of aerial photographs, logging of all trench excavations, and the preparation of reports and geologic maps of the site. The results of the study were published in an abstract and orally presented at a major technical conference (see publications list).

Concord Fault Neotectonic Studies – Geologic Logger for a fault investigation team sponsored by the U.S. Geological Survey to study the central segment of the Concord fault within the City of Concord, Contra Costa

County. The purpose of the study was to determine the earthquake hazard potential of an active fault in a highly populated area. A series of trenches were excavated, logged in detail, and analyzed to establish a minimum slip rate or creep movement along the fault; determine the amount of Holocene movement; and estimated earthquake recurrence interval for this segment of the Concord fault. The results were published in NEHRP Final Technical Reports in 1995 and 1999.

Whittier Fault, Southern California Earthquake Center – Geologic Logger for a fault investigation team working jointly with the Southern California Earthquake Center and Southern California Edison in the Whittier Narrow area, Rosemead, Los Angeles County. The fault slip rate, recurrence interval, and structural kinematics for the northern terminus of the active Whittier fault zone were determined by 3-dimensional fault trenching and analysis. The results were published in an abstract (see publications list).

Malibu Coast Fault, The Malibu Vista Professional Center – Project Geologist for a fault hazard evaluation of a proposed 16-unit housing tract along the potentially active Malibu Coast fault zone in Malibu, Los Angeles County. Analysis of fault trenching and boring data revealed that the Central Splay fault is active within Holocene time. An approximate fault recurrence interval for this fault segment was established and appropriate fault set backs for the proposed homes were maintained. The results of this study were published in the 1992 Association of Engineering Geologist Special Publication No. 4 (see publications list) and lead to the establishment of an Earthquake Fault Studies Zone for the Malibu Beach and Point Dume quadrangle maps by the California Division of Mines and Geology.

SELECTED PUBLICATIONS

- Drumm, P. L., 2008, Assessing and Mitigating the Seismic Hazards of the Concord Fault for a Redevelopment Residential Complex: A Case Study: *in* Conference Program with Abstracts: Third Conference on Earthquake Hazards in the Eastern San Francisco Bay Area, 140th Anniversary of the 1868 Earthquake, October 22-24, California State University East Bay, Hayward, California.
- Drumm, P. L., Ramsdell, J. B., and Busing, A. V., 2000, Trench Exposure of Northern Calaveras Fault, San Francisco Bay Area, California: *in* Program and Abstracts: Joint Annual Meeting, Association of Engineering Geologists and Groundwater Resources Association, San Jose, California, p. 83.
- Drumm, P. L., 1999, A Study of the Late Cenozoic Faulting and Geologic Evolution of the San Antonio Canyon Watershed with Emphasis on Fill Terrace Deposits and Rock Avalanches, Eastern San Gabriel Mountains, Bordering Los Angeles and San Bernardino Counties, California: Unpublished Master's Thesis, Department of Geology, California State University, Los Angeles, 134 p.
- Rogers, J. D., and Drumm, P. L., 1999, Overview of the 1998 Mission Peak Landslide, Fremont, California: Northern California Geological Society Field Trip Guide – Saturday May 8, 1999, 15 p.
- Herber, L. J., and Drumm, P. L., 1998, San Antonio Canyon, Eastern San Gabriel Mountains; Geology and Human Development: Field Trip 3, April 4, 1998 (Guidebook), Cordilleran Section, Geological Society of America Meeting, California State University, Long Beach, California, 30 p.
- Gath, E. M., Gonzalez, T., Drumm, P. L., and Buchiarelli, P., 1994, Paleoseismic Investigation at the Northern Terminus of the Whittier Fault Zone, in the Whittier Narrows Area, Rosemead, California: *in* Engineering Geology: Past, Present and Future: Program and Abstracts – Association of Engineering Geologists 37th Annual Meeting, October 1–8, 1994, Williamsburg, Virginia, p. 47.
- Drumm, P. L., 1992, Holocene Displacement of the Central Splay of the Malibu Coast Fault Zone, Latigo Canyon Area: *in* Pipkin, B. W. and Proctor, R. J., eds., *Engineering Geology Practice in Southern California*: Association of Engineering Geologists Special Publication No. 4, pp. 247–254.