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Quaternary Fault and Fold Database of the United States

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Rinconada fault zone, Espinosa section (Class A) No. 63a

Last Review Date: 2003-07-17

citation for this record: **Rosenberg, L.I., and Bryant, W.A., compilers, 2003, Fault number 63a, Rinconada fault zone, Espinosa section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 03:03 PM.**

Synopsis	**General:** Late Quaternary active, predominantly dextral strike-slip fault zone. The Rinconada fault zone is mapped at regional scales of mainly 1:62,500 and 1:24,000. In this compilation the fault zone is divided into 3 sections, from north to south the Espinoza [63a], San Marcos [63b], and Rinconada [63c] sections. No paleoseismic data is available for this fault. Wesnousky (1986 #5305) reported a preferred late Cenozoic dextral slip rate of 2.4 mm/yr, based on data from Durham (1965 #6189) and Hart (1976 #6197). Bird and Rosenstock (1984 #6183) reported a late Cenozoic slip rate between 2.4 mm/yr and 12 mm/yr, based on 53 km dextral offset of Oligocene (?) to early Miocene boulder conglomerate. Three sites have been investigated by trenching. At the Chicago Grade site [63c-2] two splays of the Rinconada fault zone offset Plio-Pleistocene Paso Robles Formation (GeoSyntec Consultants, 2002 #6195). Relative age estimates of carbonate

	horizon and fault relationships allowed GeoSyntec Consultants to estimate "seismic horizons" for the most recent paleoevents of 100-500 ka and 50-100 ka for faults F1 and F2, respectively. **Sections:** This fault has 3 sections.
Name comments	**General:** **Section:** The Espinosa section extends from near Monroe Canyon (about 12 km west of King City) southeast through the San Antonio Hills to near San Antonio Reservoir. Dibblee (1976 #6170) proposed that the Espinosa fault of Jennings and Strand (1958 #501) and Jennings (1959 #6199) is a part of the Rinconada fault zone and called this structure the Espinosa segment of the Rinconada fault zone. This section also includes part of the San Antonio fault, a northeast-dipping reverse fault or thrust fault named by Jennings (1959 #6199) and mapped by Walrond and Gribi (1963 #6204) on the eastern side of Lockwood Valley. **Fault ID:** Refers to number 239 (Rinconada fault) of Jennings (1994 #2878) and L01 (Rinconada fault) of Working Group on Northern California Earthquake Potential (1996 #1216).
County(s) and State(s)	MONTEREY COUNTY, CALIFORNIA
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Location of fault digitized from Hart (1985 #6198) at 1:24,000 scale.
Geologic setting	The Rinconada fault zone is a major, high-angle dextral strike-slip fault that is part of the San Andreas fault system. The fault zone extends from the hills west of King City southeast for approximately 120 km to the vicinity of Santa Margarita. Dibblee (1976 #6170) suggests that south of the Santa Margarita area, the boundary between Salinian block crystalline basement rocks to the east and Franciscan rocks to the west, delineated by a fault considered by many workers to be the southern part of the Sur/Nacimiento fault zone, is actually part of his Rinconada fault zone. The Rinconada fault zone marks the western margin of the La Panza Range and locally defines the western margin of the

	Salinian block. The Rinconada fault zone is thought to have accommodated as much as 60 km of Neogene dextral strike-slip displacement and 38 km of post- late Miocene dextral offset (Dibblee, 1976 #6170).
Length (km)	This section is 57 km of a total fault length of 122 km.
Average strike	N35°W (for section) versus N35°W (for whole fault)
Sense of movement	Right lateral *Comments:* The Espinosa section predominantly is delineated by dextral strike-slip faults (Gribi, 1963 #6196; Dibblee, 1976 #6170; Hart, 1985 #6198). The San Antonio fault is a northeast-dipping reverse or thrust fault with the east side thrust over the west (Walrond and Gribi, 1963 #6204; Dibblee, 1976 #6170).
Dip Direction	V; NE *Comments:* The Espinosa fault has a nearly vertical dip with apparent relative displacement of up on the northeastern side southeastward of Espinosa Canyon. Northwestward from Espinosa Canyon to Quinado Canyon, the southwestern block is higher (Dibblee, 1976 #6170). The San Antonio fault is a reverse oblique fault that dips to the northeast (1985 #6198).
Paleoseismology studies	
Geomorphic expression	The Espinosa section is delineated by geomorphic features indicative of late Pleistocene dextral displacement such as alignment of canyons, linear drainages, dextrally deflected drainages, linear troughs and scarps (Hart, 1985 #6198). Hart did not observe ephemeral geomorphic features indicating Holocene displacement. The San Antonio fault is geomorphically expressed as a linear, sharply defined range front. It also is demarcated by a series of discontinuous aligned saddles and drainages that cut older alluvial surfaces and low hills underlain by the Paso Robles Formation where they meet the range front (Klaus, 1999 #6200). Klaus (Klaus, 1999 #6200, p. 75-76) also noted about 3-6 m of post-depositional deformation of a 300-400 ka surface along this fault zone.
Age of faulted surficial	Youngest unit faulted is alluvium of probable late Pleistocene age, based on preservation of constructional surface morphology and

deposits	soil profile development (Hart, 1985 #6198).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Hart (1985 #6198) identified truncated older alluvium and associated alluvial fan surfaces between Loeber and Glau Canyons near Williams Hill. Based on moderate preservation of alluvial fan surfaces and soil profile development, Hart (1985 #6198) estimated that the offset surfaces are late Pleistocene.
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* Geomorphic expression of fault reported by Hart (1985 #6198) suggests a late Quaternary slip rate of about 1 mm/yr. Slip rate assigned to the entire Rinconada fault by Petersen and others (1996 #4860) for probabilistic seismic hazard assessment for the State of California was 1 mm/yr (with minimum and maximum assigned slip rates of 0 mm/yr and 2 mm/yr, respectively.
Date and Compiler(s)	2003 Lewis I. Rosenberg, San Luis Obispo County Planning Department William A. Bryant, California Geological Survey
References	#6183 Bird, P., and Rosenstock, R.W., 1984, Kinematics of present crust and mantle flow in southern California: Geological Society of America Bulletin, v. 95, p. 946-957. #6186 Dibblee, T.W., Jr., 1972, The Rinconada fault in the southern Coast Ranges, California and its significance, *in* Morrison, R.R., ed., Technical Program Reprints, Pacific Geology Basis for New Exploration: American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists Annual Meeting. #6170 Dibblee, T.W., Jr., 1976, The Rinconada and related faults in the southern Coast Ranges, California, and their tectonic significance: U.S. Geological Survey Professional Paper 981, 55 p.

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