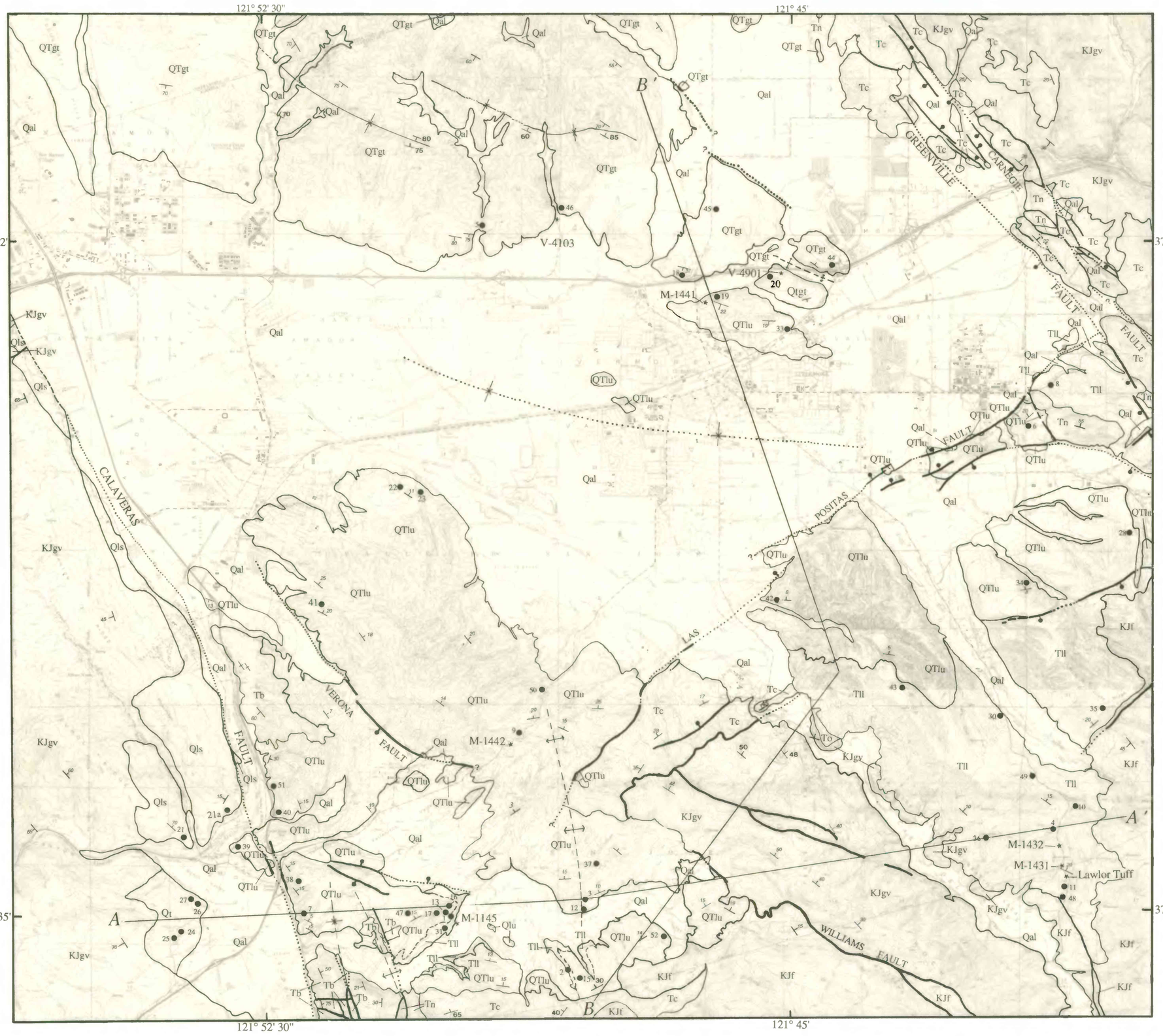
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

OPEN-FILE REPORT

88-516



CORRELATION OF MAP UNITS

Qal			Holocene	QUATERNARY
Unconformity	Age relation unknown	Qt		
Qls			Pleistocene	
Unconformity				
QTgt	Age relation unknown	QTlu / Tll	Pliocene	
Unconformity				
Tn			Miocene	TERTIARY
Tc				
Unconformity				
Tb				
To				
Unconformity				
KJgv				CRETACEOUS AND JURASSIC
KJf				

DESCRIPTION OF MAP UNITS

Qal **Alluvium (Holocene)** -- Unconsolidated sand and gravel, recent terrace deposits, stream deposits, and cemented fanglomerate

Qt **Terrace deposit (Quaternary)**--Terrace deposit, formally included as Livermore Gravels. Predominantly graywacke, well imbricated, clast supported, with a western paleocurrent trend

Qls **Landslide deposits (Pleistocene)** -- Landslide depositswith clast compositions similar to those formed in the Oakland Conglomerate; contains abundant clasts of granitic rocks, siliceous feldspar and quartz porphyries, chert, and metavolcanic rocks

QTgt **Tassajara Formation of Clark (1943),undivided (Pleistocene and Pliocene)**--Red and maroon gravel and brown, blue, gray, and red siltstone and claystone. Also includes abundant andesitic tuff, interlayered limestone, and black, well-rounded chert nodules

Livermore Gravels of Clark (1943), undivided (Pleistocene, Pliocene, and Miocene) Units contacts are revised within Clark's original area. Locally divided into:

QTlu **Upper Part (Pleistocene Pliocene)**--Moderate-brown, poorly cemented, well-imbricated, clast supported, planar-bedded gravel, with interlayered sandstone and siltstone. Contains clasts of high-grade metamorphic rocks, altered volcanic rocks, abundant graywacke, and minor lithic sandstone 3-33 cm in diameter. Fossil dates suggest an age of younger than 2.5 Ma. Strong paleocurrent trend to northeast . Member averages 70 m in thickness

Tll **Lower Part (Pliocene and Miocene)**--Light-gray to light olive-gray gravel. Cyclical units of massive to thinly planar-bedded siltstone and mudstone; capped by paleosols;contains interlayered tuff beds and medium-scale planar-bedded gravel beds. Contains abundant clasts composed of gray, lithic sandstone and white-grey, vuggy "chert",.Lawlor tuff, K/Ar dated at 4.5± 0.5 Ma, as mapped by Sarna-Wojcicki (1976) and minor graywacke and traces of blue schist 2-7 cm in diameter. Strong paleocurrent trend to southwest. Locally 400 m thick

Tn **Neroly Formation (Miocene)**--Blue sandstone interbedded with minor, well-rounded, andesitic, cobble and pebble conglomerate beds. Bluish opalescent covering coats the sand grains in sandstones. Cobbles range from 2 to 5 cm diameter; composed of andesite porphyries-- predominantly augite-plagioclase, hornblende-plagioclase, and hypersthene-plagioclase. Formation is locally 180 m thick

Tc **Cierbo Sandstone (Miocene)**--Predominantly buff-tan to white quartzose sanstone; poorly sorted, coarse grained, massive to cross bedded. Beds are often friable and streaked with limonite. Locally 200 m thick. Black chert is common; tuff beds and carboniferous shale occur locally. *Ostrea* common

Tb **Briones Sandstone (Miocene)**--Gray, calcareous sandstone; subordinate conglomerate with sparse *Ostrea* and minor chert clasts occurs throughout unit. Also includes yellow to buff-brown limestone with sparse *Ostrea*.. Locally 600 m thick

To **Oursan Sandstone (Miocene)**--Massive, buff sandstone containing minor, pebble-to cobble-size clasts. Contains abundant shell fragments and locally 75-150 m thick

KJgv **Great Valley sequence (Cretaceous and Jurassic)**--Brown, massive, and, in places concretionary sandstone with subordinate, brown, thinly laminated siltstone and shale with local conglomerate lenses. Also includes grayish black, carbonaceous shale with dark-gray to black concretionary lenses; minor fossiliferous limestone

KJf **Franciscan assemblage (Cretaceous and Jurassic)**--Gray, brown, and green graywacke; brown and red sandstone and shale; red and green chert interbeded with minor greenstone, conglomerate, diabase, serpentinite, limestone, and blueschist

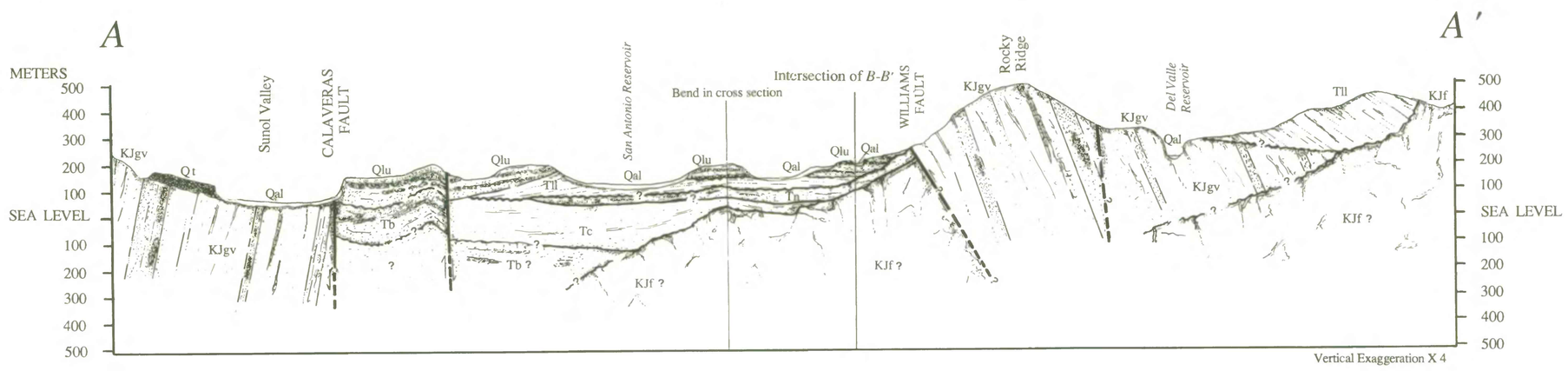
Base from U.S. Geological Survey, 1:24,000,
Altamont, 1953 (photorevised 1981); Dublin, Livermore, Niles,1961 (photorevised 1980);
La Costa Valley, 1960 (photorevised 1968); Mendenhall Springs, 1956 (photorevised 1971);

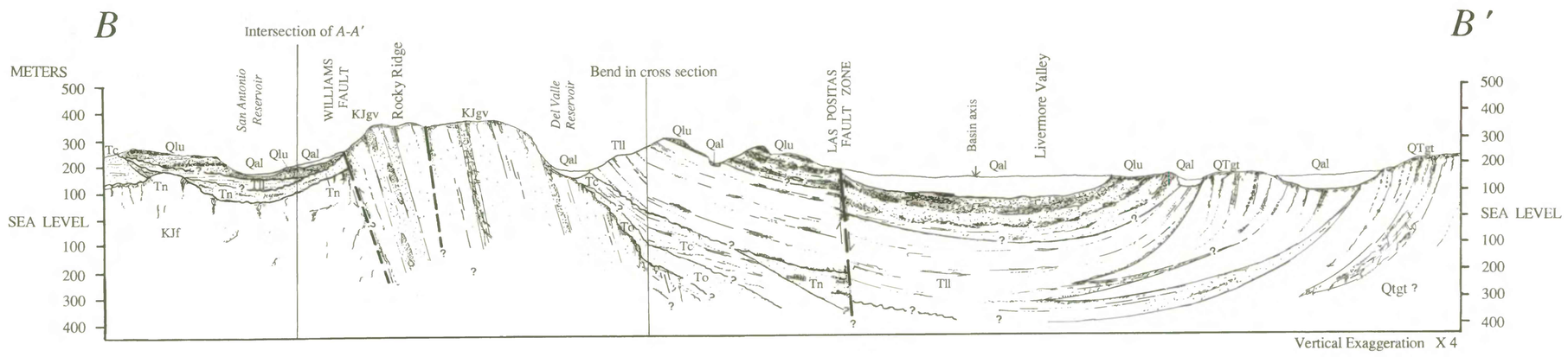
SCALE 1:24000
1 0 1 Mile
1 0 1 Kilometer
CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

Geology modified from Hall (1958), Herd (1977), and Dibblee (1980 a,b,c,d): field mapped by V.E.Barlock, 1985-87.

CONSTRUCTION OF MAP

The focus of this map is to revise the stratigraphy and distribution of the Livermore Gravels. This geologic map of the Livermore Valley, Sunol Valley, neighboring parts of the Diablo Range and the Altamont Hills was constructed by detailed clast composition studies of conglomerates throughout the area with emphasis on the Livermore Gravels. The stratigraphic nomenclature of previously mapped bedrock units in the Tesla quadrangle (Huey, 1948) and the Pleasanton quadrangle (Hall, 1958) have been used. The structure and placement of faults in the eastern Livermore Valley (Herd, 1977) have been retained.





Contact--Dashed where approximately located; dotted where concealed; queried in cross sections where uncertain

Disconformable contact--Queried where uncertain

Fault--dotted where concealed, dashed where inferred, queried where uncertain, ball and bar on down thrown side. In cross section, arrows indicate direction of relative movement

Anticline--Dashed where approximately located; dotted where concealed

Syncline--Dashed where approximately located; dotted where concealed

Strike and dip of beds

Apparent

45 Inclined

Vertical

●9 Sample locations used in this study

*M-1432 Fossil locations of Brabb (1980)

*V-4901 Fossil locations of Savage (1951)

GEOLOGIC MAP OF THE LIVERMORE GRAVELS, ALAMEDA COUNTY, CALIFORNIA

by

Vincent E. Barlock

1988

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