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This map is designated as "Preliminary Geologic Map of the San Francisco South 7.5' Quadrangle, San Francisco Bay Area, California: A Digital Database", has been approved for public release by the Director of the USGS. Although this data has been reviewed and is substantially complete, the USGS reserves the right to make changes or revisions to the data and information, pursuant to further analysis and review. Furthermore, it is the responsibility of the user to determine the appropriateness of this data for a particular use. The USGS Government may be held liable for any damages resulting from its authorized or unauthorized use.

U.S. Department of the Interior  
United States Geological Survey  
Plot derived from  
Open-File Report 98-354

Base scanned from U.S. Geological Survey 1:24000 San Francisco South 7.5' Quadrangle and part of the Hunters Point 7.5' Quadrangle topographic maps, 1980 photovisualized edition.

StatePlane California Coordinate System Zone 3

This map is a plot derived from data contained in the digital database Open-File Report 98-354, "Preliminary Geologic Map of the San Francisco South 7.5' Quadrangle and part of the Hunters Point 7.5' Quadrangle, San Francisco Bay Area, California: A Digital Database". A PostScript file and a Microsoft Word document plot file of this map is included in the Open-File Report 98-354. The Open-File Report does not contain a paper copy of the map. The Open-File Report consists of the digital database and a pamphlet explaining the database and indicating how to use it. The pamphlet also contains the map as prepared as well as the PostScript and Microsoft Word files used to create the map. The pamphlet also explains how to use the map. The pamphlet also contains a plot of this map from a private vendor.

## PRELIMINARY GEOLOGIC MAP OF THE SAN FRANCISCO SOUTH 7.5' QUADRANGLE AND PART OF THE HUNTERS POINT 7.5' QUADRANGLE, SAN FRANCISCO BAY AREA, CALIFORNIA

By

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Digital Database Prepared By

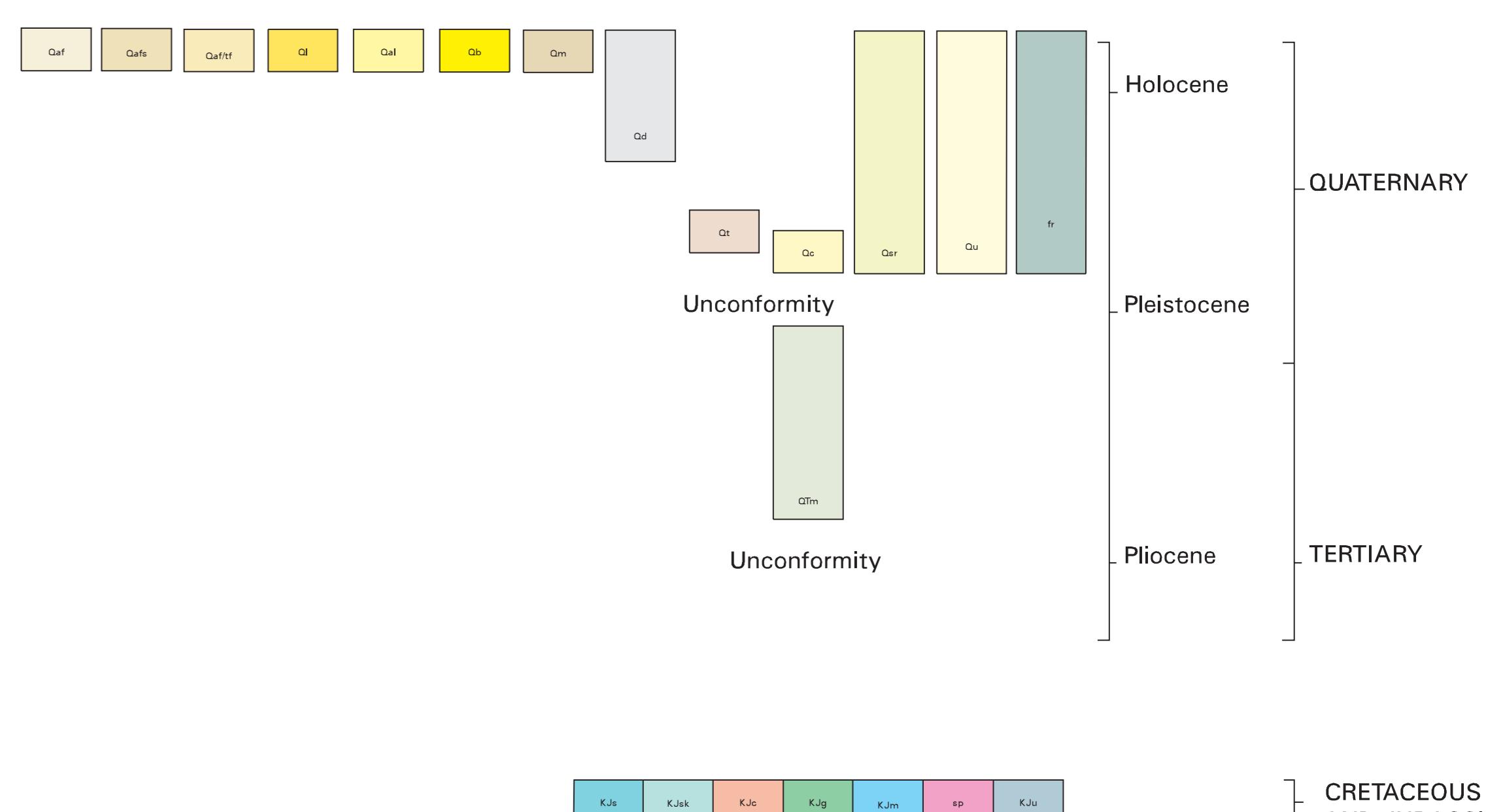
Carl Wentworth, Marjorie Lucks, Heather Schoonover, Scott Graham, and Thomas May

Magnetic declination is 16.5 degrees east of north

### EXPLANATION

#### GEOLOGIC UNIT DESCRIPTIONS

water	
QUATERNARY	
Holocene	
Qaf Artificial fill Clay, silt, sand, rock fragments, organic matter, and man-made debris.	
Qaf/t Artificial fill over tidal flat Clay, silt, sand, rock fragments, organic matter, and man-made debris, placed over tidal flats.	
Qas Artificial fill, Native American shellmound. Dark silty to sandy soil containing shell fragments and rare intact shells.	
Ql Landslide deposits Composition and structure depend on the geologic formation involved and type of landslide.	
Qal Alluvium Mostly sand and silt but locally contains clay, gravel, or boulders; generally gray to brown.	
Qb Beach Deposit Predominantly well sorted medium-grained loose gray sand; locally consists of sand, gravel and cobbles.	
Qm Bay mud Soft (moist) to firm (dry) clay and silt; locally contains shell fragments, plant remains, and thin beds of sand.	
Qd Dune sand Well sorted fine-grained sand, gray and loose in most places, grayish orange to reddish brown and firm in a few places. Age extends into Pleistocene.	
PLEISTOCENE	
Qt Marine terrace deposits Predominantly friable well sorted fine-grained yellowish-orange to gray sand; includes alluvial gravel and colluvial clay.	
Qsr Slope debris and ravine fill Stony silty to sandy clay; locally silty to clayey sand or gravel; yellowish-orange to medium gray, unstratified or poorly stratified. Where it overlies the Merced or Colma Formation it is commonly a silty to clayey sand, or gravel.	
Qc Colma Formation Northwest and central parts of area, friable well sorted fine to medium sand containing a few beds of sandy silt, clay, and gravel. In southeast part of area, mostly sandy clay and silty sand; yellowish orange to gray.	
Qu Sedimentary deposits, undifferentiated	
fr Fault rocks Zone of gouge, breccia, fractured and sheared rock along the San Andreas fault. Gradational contact with surrounding rocks. Limits poorly known. Age extends into Holocene	
TERTIARY AND QUATERNARY	
Pleistocene and Holocene	
QTm Merced Formation Friable to firm sand, silt, and clay; minor amounts of gravel, lignite, and volcanic ash; medium gray to yellowish orange.	
CRETACEOUS AND JURASSIC	
Franciscan Complex and associated rocks	
Kjs Sandstone and shale Interbedded sandstone and shale, hard where fresh and intact, soft where weathered or sheared. Commonly medium dark gray where fresh, olive gray to yellowish brown where moderately weathered, and yellowish orange to yellowish gray where highly weathered.	
KJsk Sandstone and shale Sandstone generally containing more than two percent potassium feldspar.	
Kjc Chert Hard chert interbedded with firm shale; chert layers generally two or three inches thick, shale layers less than one inch thick; generally grayish red.	
KJg Greenstone Alterod volcanic rocks, fine grained, mostly basalt; hard where fresh, but weathered and firm to soft in most exposures; commonly grayish olive to moderate olive gray where moderately weathered, dark yellowish orange to light brown where highly weathered.	
KJm Metamorphic rocks Hard to firm, fine-to coarse-grained schistose, gneissose, or granulose metamorphic rocks; dark gray, dark greenish gray, or dark bluish gray.	
sp Serpentine Hard to soft, generally greenish gray; contains small bodies of gabbro and diabase.	
KJl Sheared rocks Sheared to large segments of hard rock in matrix of sheared rock. Matrix generally coherent and firm, but soft in places, especially where sheared. Dark gray where fresh, yellowish brown where weathered. Derived mostly from shale and sandstone of Franciscan Complex and serpentine.	



#### CHANGES FROM EARLIER MAPS

This digital map is based on the 1952-1957 mapping that was released in earlier paper maps (Bonilla, 1965, 1971), modified as described below.

The revisions of the 1971 map are of four general types: 1) increase in area of artificial fill near San Francisco Bay shoreline; 2) changes in representation of structural geology; 3) corrections of errors in the earlier map; and 4) changes to accommodate the digital format. Water boundaries on the San Francisco Peninsula have changed owing to the addition of artificial fill since 1971, both at the shoreline and inland, necessitating changes in the database. The bayward boundary of the San Francisco Bay area from the 1952-1957 paper map to a recent study of geophysical, geomorphic, and paleogeological data found evidence supporting the existence of the hypothetical San Bruno fault as a mapable structure (U.S. Geological Survey, 1997), and the fault has been deleted. Fold axes, mostly within the Merced Formation, have been added (Bonilla, 1996); axes classed as probable or possible in the latter report are shown as "approximately located" in this database. Errors and omissions in earlier versions of the map (Bonilla, 1965, 1971) have been corrected, including changes in the orientation of the San Bruno fault and the San Francisco International Airport from KJs to KJsk, adding a few areas of bedrock that had been omitted, and correcting some structural attitudes. A cartographic error that placed the Serrí Fault too far east near Sneath Lane has been corrected. The zone of shearing along the San Andreas fault and isolated shear zones, both formerly shown by a symbol, and old tidal flats, formerly shown by an overprint, are all treated as map units in the digital version.

#### FAULTS AND LANDSLIDES

This map is intended to be of general use to engineers, land-use planners, and others. However, its small scale does not provide sufficient detail for site development or engineering purposes. It does not delineate areas of fault-rupture hazard zones designated by the California State Geologist (Hart and Bryant, 1997). The map shows mapable landslides as they existed about 1959. Although many of the landslides still exist, many others have been removed by urban development or by natural processes, and post-1959 landslides are not shown. Landslides and other ground failures that occurred since 1959 were caused primarily by heavy rainfall in 1968 through 1982 (Nissen, and others, 1976; Els and Wieczorek, 1988), the 1989 earthquake (Star, 1991; Tinsley and others, 1998), and the heavy rainfall of 1997-1998.

#### REFERENCES CITED

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SCALE 1:24000

1 MILE

KILOMETER

0 1 2 3 THOUSAND FEET

CONTOUR INTERVAL 25 FEET