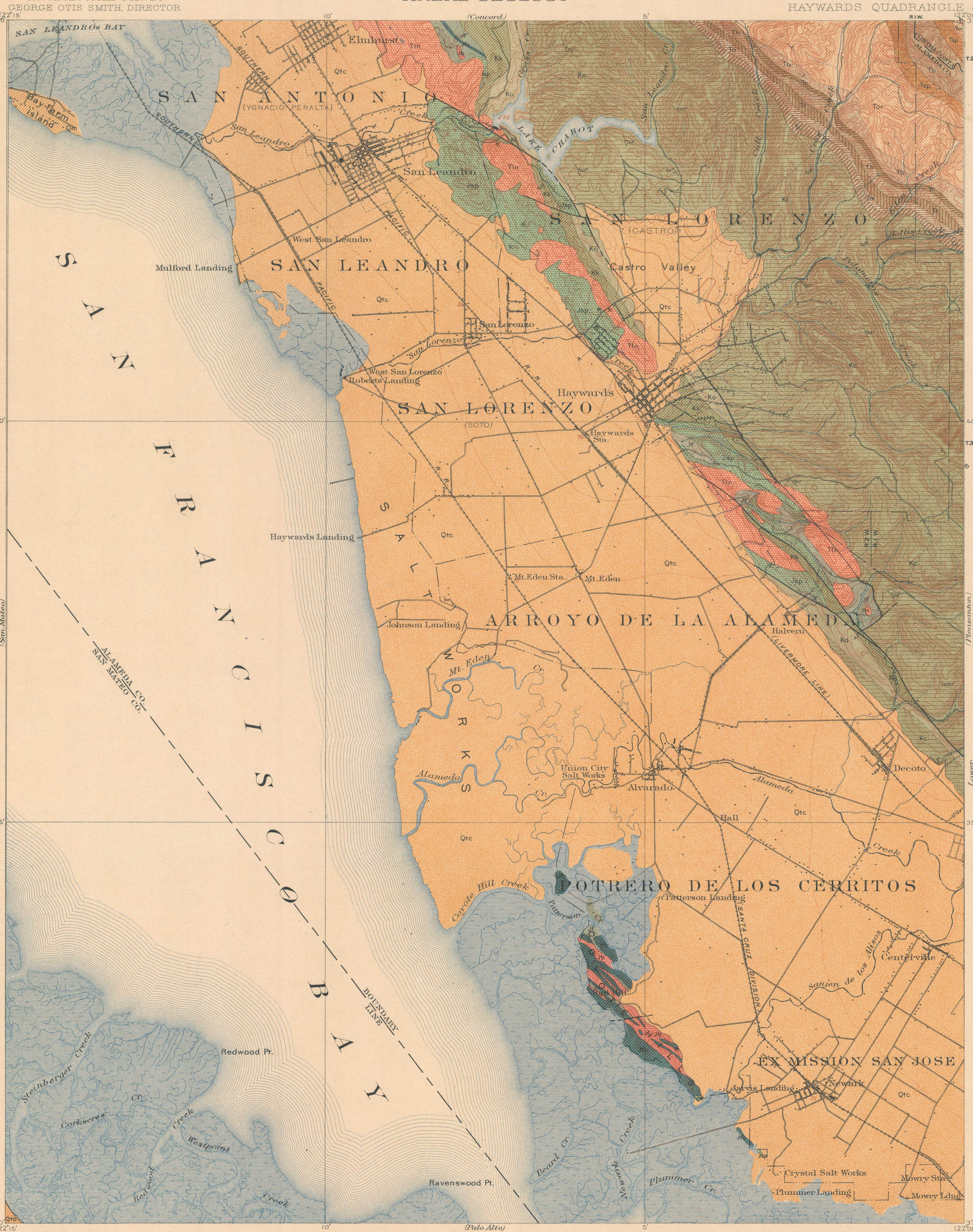
U.S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

AREAL GEOLOGY

CALIFORNIA
HAYWARDS QUADRANGLE



LEGEND

SEDIMENTARY ROCKS

(Areas of subaqueous deposits are shown by patterns of parallel lines, subaerial deposits by patterns of dots and circles)

QUATERNARY

Recent

Salt-marsh deposits *(clay and silt)*

Qtc — Temescal formation *(alluvium)*

UNCONFORMITY

Pleistocene

Qm — Merritt sand *(marine)*

UNCONFORMITY

TERTIARY

Pliocene

Tor — Orinda formation *(fresh-water conglomerate, sandstone, clay, limestone, and thin layers of tuff)*

UNCONFORMITY

Miocene ?

Tsp — San Pablo formation *(coarse gray to blue sandstone with admixture of tuffaceous material)*

UNCONFORMITY

Miocene (Monterey group)

Tb — Briones sandstone *(light-colored, coarse to pebbly quartzose sandstone)*

Tr — Rodeo shale *(chiefly chalky bituminous shale, stained by iron, with some cherty beds)*

Th — Hambre sandstone *(medium-textured, slightly ferruginous sandstone, with some sandy shale)*

Tt — Tice shale *(white to pink bituminous shale, prevailingly chalky)*

To — Oursan sandstone *(fine-grained, light-colored, soft sandstone)*

Tc — Claremont shale *(white chalky bituminous shale and yellowish chert rhythmically interbedded with thin shales)*

UNCONFORMITY

CRETACEOUS

Upper Cretaceous

Kc, Ko — Chico formation with Oakland conglomerate member at base *(massive sandstone and shale with lenses of conglomerate and limestone, and conglomerate member, Ko, at base)*

Lower Cretaceous (Shasta)

Kk — Knoxville formation *(dark carbonaceous and arenaceous shale)*

UNCONFORMITY

JURASSIC ? (pre-Knoxville)

Franciscan group

Jf, Jfc — Undifferentiated sandstone of Franciscan group and radiolarian chert lentils of undetermined horizon, Jfc

IGNEOUS ROCKS CHIEFLY INTRUSIVE

(Areas of igneous rocks are shown by patterns of triangles and rhombs)

TERTIARY

Post-Cretaceous Pliocene ?

Tln — Leona rhyolite *(lava flows of undetermined age)*

JURASSIC ? (pre-Knoxville)

Intrusive into Franciscan group

Jsp — Serpentinized peridotite with associated gabbro and pyroxenite

Jb — Basalt and diabase *(commonly show spheroidal or ellipsoidal structures)*

Faults

Concealed faults *(covered by younger deposits)*

65° Strike and dip of stratified rocks

Crushed-stone quarries

R.U. Goode, Geographer in charge.
Triangulation by U.S. Coast and Geodetic Survey.
Topography by L.C. Fletcher, R.B. Marshall, and U.S. Coast and Geodetic Survey.
Surveyed in 1896.

TRUE NORTH — MAGNETIC NORTH — $18\frac{1}{4}°$
APPROXIMATE MEAN DECLINATION 1913.

Scale $\frac{1}{62500}$

1 ½ 0 1 2 3 4 Miles

1 ½ 0 1 2 3 4 5 Kilometers

Contour interval 25 feet.
Datum is mean sea level.
Edition of Sept. 1913.

Geology by Andrew C. Lawson, assisted at various times by students of the University of California.
Surveyed 1896 to 1910.

(Santa Cruz) $\frac{1}{125000}$

Economic note: *Crushed stone can be obtained from sandstone and chert of Franciscan group, cherty shale of Monterey group, Leona rhyolite, serpentine, and intrusive basalt and diabase; brick clay from Knoxville, Orinda, and Temescal formations and salt marshes; salt from sea water on marshes; manganese occurs in chert of Franciscan group; small quantities of asbestos, chromite, talc, and magnesite in serpentinized peridotite; and large quantities of water in gravels underlying the Temescal formation.*