

ONSHORE STRATIGRAPHY

Ventura—near mouth, Ventura River

| Series | Formation | Feet | Description | Aquifers |
|------------------|---|---------------|---|---|
| Pleistocene | Alluvium | 400-800 | Coarse sand, gravel, silty clay | Aquiclude Mugu |
| | San Pedro Formation | 2200 | Sandy silt, sand, conglomerate and clay. Nonmarine. | Aquiclude Mugu Huameme Aquiclude Fox Canyon Aquiclude |
| Pliocene | Santa Barbara (Mud-Pit) Formation | 2000 | Fine sand, gravel Massive mudstone, thick conglomerate lenses. | Grimes Canyon ? None |
| | Pico (lower part commonly called Repetto) Formation | 11,000-12,500 | Alternating thick conglomerate and siltstone. Siltstone with locally thick sandstone and conglomerate interbeds. | |
| Miocene | Santa Margarita Formation | 1700-1800 | Massive diatomaceous mudstone; thin limy beds and concretions | |
| | Monterey Shale | 2200 | Siliceous shale, laminated, organic. Alternating laminated shale, hard limestone. | |
| | Rincon Mudstone | 2000-2500 | Massive mudstone, dolomite concretions. Fine-grained sandstone locally near base. | |
| | Vaqueros S.S. | | Sandstone and conglomerate. | |
| Oligocene | Sespe (nonmarine) Formation | 3500-6000 | Variegated mudstone; sandstone, grit, and conglomerate; massive to very thick bedding. | |
| | Coldwater Sandstone | 2500 | Hard, fine- to coarse-grained sandstone and silty claystone interbedded. | |
| Eocene | Cozy Dell Shale | 3000-3300 | Massive silty shale and micaceous mudstone. | |
| | Matilija Sandstone | 2500-3000 | Thin bedded hard sandstone; siltstone beds in upper and lower parts; middle part massive hard sandstone. | |
| | Juncal Formation | 5000-6500 | Thin bedded shale and mudstone; thin micaceous sandstone interbeds. Thin bedded, hard sandstone and shale; orbitoidal limestone locally at base. | |
| Upper Cretaceous | Unnamed | 2300 | Hard silty shale, massive 500 ft. conglomerate about 800 ft. below top. Shale, locally crushed in upper part; limy in lower. | |

Oxnard Plain—near Port Hueneme

| Series | Formation | Feet | Description | Aquifers |
|-------------------|-------------------------------------|----------|--|------------------------------------|
| Holocene | Alluvium | 160 | Channel deposits, oolite sands, gravel | Semi perched |
| | Clay cap | 160 | Silt and clay | Aquiclude |
| upper Pleistocene | Flood plain deposits | 225 | Fine to coarse sand and gravels | Oxnard |
| | | 130 | Silt and clay | Aquiclude |
| lower Pleistocene | | 240 | Fine to coarse sand and gravels | Mugu |
| | | 190 | Silt and clay | Aquiclude |
| Pliocene | San Pedro Formation | 1220 | Irregularly interbedded fine to coarse sand, silt and clay. Fine to medium sand & the gravel stringers interbedded silt & clay. | Hueneme Aquiclude Fox Canyon |
| | Santa Barbara (Mud - Pit) Formation | 0-1600 | Fine to coarse sand and gravel in upper part. Massive mudstone, thick conglomerate lenses. | Grimes Canyon None |
| Miocene | Pico Formation | 0-6500 | Alternating thick conglomerate and siltstone. Siltstone with locally thick sandstone and conglomerate lenses. Fine-grained sandstone interbedded with coarse sandstone and conglomerate. | |
| | Repetto Formation | 0-1000 | Very thick to thin conglomerate and sandstone units interbedded with silty s.s. | |
| | Santa Margarita Formation | 0-1200 | Massive diatomaceous mudstone, thin limy beds and concretions | |
| | Monterey Shale | 0-1800 | Siliceous shale, laminated, organic. Alternating laminated shale, hard limestone. | |
| Oligocene | Conejo Vol. | 600-1400 | Volcanics, interbeds of andesite, tuffs, and conglomerates | |
| | Topanga (Temblor?) | 800-1600 | Coarse sandstone and conglomerate. | |
| Eocene | Sespe (nonmarine) Formation | 2400 | Variegated mudstone, sandstone, grit, and conglomerate; massive to thick bedding. | |
| | Llajas Formation | 2000 | Conglomerate, fine sand, sandy siltstone, and shale. | |
| Paleocene | Santa Susana | 3800 | Shale | |
| | Martinez? | 1400 | Massive, basal conglomerate overlain by shale and sandstone. | |
| Upper Cretaceous | Chico | | Massive sandstone with thin beds of shale, calcareous sandstone and shale below sandstone. | |

Santa Monica Mts—near Point Mugu

| Series | Formation | Feet | Description | Aquifers |
|-------------|-------------------------------------|--------------|---|----------------------------|
| Holocene | Alluvium | 0-600 | Channel deposits, oolite sands, gravels, silt, and clay | Oxnard Mugu |
| Pleistocene | San Pedro | 0-600 | Sandy silt, sand, conglomerate and clay, gravel | Fox Canyon |
| Pliocene? | Santa Barbara (Mud - Pit) | 0-500 | Fine sand and gravel Massive mudstone | Grimes Canyon Aquiclude |
| Miocene | Conejo Volcanics | 500-1600 | Volcanics; basalt flows with andesite, porphyritic andesite, buff, thin pebble conglomeratic and arkosic interbeds. | |
| | Topanga - Vaqueros undiff. deposits | 8000-10,000? | Coarse sandstone and conglomerate. | |
| Oligocene | Sespe (nonmarine) Formation | | Conglomerate and sandstone interbedded with shale. | |

Modified after:
State of California (1965)
Paschall, R.H., Carson, C.M., Nesbit, R.A., Off, T., and Stark, H.E. (1956)
Ogle, B.A. (1959)
Kew, W.S.W. (1924)

Modified after:
Gamble (1957)
Poland, J.P., Garrett, A.A., and Mann, J.F. (1948)
Paschall, R.H., Carson, C.M., Nesbit, R.A., Off, T., and Stark, H.E. (1956)
Ogle, B.A. (1959)
Turner, J. (1971, oral commun.)
Kew, W.S.W. (1924)
Campbell, R.H., and Yerkes, R.F. (1971, oral commun.)

OFFSHORE STRATIGRAPHY

Easternmost Santa Barbara Basin

| Series | Formation | Maximum Thickness | Acoustic Description |
|-------------------|-----------------------------|-------------------|---|
| Holocene | Qh | 100? | Poorly reflected, incoherent signal |
| upper Pleistocene | Qp | 100? | Weakly to strongly reflected energy, some incoherency |
| lower Pleistocene | San Pedro Formation Qs | 600 | Weakly reflected seismic energy, incoherent, and high acoustical transparency. Reflectors are generally lacking or discontinuous. |
| | Santa Barbara Formation QTs | 2300 | Weakly reflected seismic energy with a large amount of acoustical transparency and high seismic attenuation or poor reflectivity. Prominent reflectors are discontinuous or lacking altogether. |
| Pliocene | Pico Formation Tp | 500 | Strongly reflected acoustical energy with little seismic incoherency. Reflectors are broad, continuous, and widely spaced. |
| | Monterey Shale undiff. Tm | 1200? | Strongly reflected, coherent seismic energy with all defined parallel to sub-parallel, tightly spaced reflectors that suggest rhythmic bedding. |
| Miocene | Conejo Volcanics Tv | ? | Strongly reflected seismic signal, no internal acoustical reflectors, hyperbolics. |

Ventura Shelf

| Series | Formation | Maximum Thickness | Acoustic Description |
|-------------------|-----------------------------|-------------------|---|
| Holocene | Marine & alluvial deposits | 150 | Poorly reflected, incoherent signal |
| upper Pleistocene | Qp | 180 | Weakly to strongly reflected energy, some incoherency |
| lower Pleistocene | San Pedro Formation Qs | 1500 | Weakly reflected seismic energy with much random, incoherent, acoustical energy and transparency. Reflectors are generally lacking or discontinuous. |
| | Santa Barbara Formation QTs | 2500 | Weakly reflected seismic energy with a large amount of acoustical incoherency and high seismic transparency or poor reflectivity. Prominent reflectors are discontinuous or lacking altogether. |
| Pliocene | Pico Formation Tp | >6000 | Strongly reflected acoustical energy with little seismic incoherency. Reflectors are broad, continuous, and widely spaced with thin, fairly discontinuous reflectors in between. |

Hueneme—Mugu Shelf

| Series | Formation | Maximum Thickness | Acoustic Description |
|-------------------|-------------------------------|-------------------|---|
| Holocene | Marine & alluvial deposits | 200 | Poorly reflected, incoherent signal |
| upper Pleistocene | Qp | 200 | Weakly to strongly reflected energy, some incoherency |
| lower Pleistocene | San Pedro Formation Qs | 1000 | Weakly reflected seismic energy with much random, incoherent, acoustical energy and transparency of the seismic signal. Reflectors are generally lacking or discontinuous. |
| | Santa Barbara Formation QTs | 1500 | Weakly reflected seismic energy with a large amount of acoustical incoherency and high seismic transparency or poor reflectivity. Prominent reflectors are discontinuous or lacking altogether. |
| Pliocene | Pico Formation Tp | 500? | Strongly reflected acoustical energy with little seismic incoherency. Reflectors are broad, continuous, and widely spaced. |
| | Conejo Volcanics Tv | ? | Strongly reflected seismic signal, continuous reflectors; little or no seismic incoherency; some internal reflectors beneath main reflector, hyperbolics. |
| Miocene | Topanga - Vaqueros undiff. Tt | ? | Fairly strongly reflected seismic energy, few hyperbolics, some acoustical incoherency. Reflectors discontinuous and widely spaced. |

Modified after:
Vedder, J.G., Wagner, H.C., and Schoellhamer, J.E., (1969)
Paschall, R.H., Carson, C.M., Nesbit, R.A., Off, T., and Stark, H.E. (1956)
Mann, J.F. (1959).

STRATIGRAPHIC COLUMNS CONSTRUCTED FROM SEISMIC REFLECTION PROFILE DATA IN THE WESTERN VENTURA BASIN- OXNARD PLAIN AREA