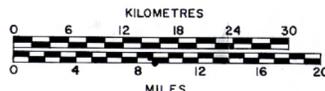


Symbols

- Geologic contact
- Fault; dashed where inferred dotted where concealed
- Axis of anticline; dashed where approximately located
- Axis of monocline



Legend

Freshwater - Bearing Formations

- Qal** ALLUVIUM. Includes stream channel and flood-plain deposits along the Sacramento, Feather, Yuba, Bear, American and Cosumnes Rivers. Consists of sand, gravel, silt and minor amounts of clay. Permeability and surface infiltration rates range from moderate to high. Includes dredger tailings.
- Qfb** FLOOD BASIN DEPOSITS. Fine-grained material, chiefly silt and clay, deposited in low-lying areas adjacent to major streams during periods of high runoff. Includes organic material in the north delta area. Permeability and surface infiltration rates are low.
- Qaf** ALLUVIAL FAN DEPOSITS. Mixed fluvialite sediments deposited on gently sloping alluvial plains by streams entering predominately from the west side of the valley. Permeability and surface infiltration rates are locally variable and range from low to high.
- Qv** VICTOR FORMATION. Layers of sand, silt and clay with enclosed ancient stream channel deposits of sand and gravel. Underlies much of the east side of the valley between the Sacramento River and the Sierra Nevada. Permeability is generally low except in ancient stream channels, where it is high. Surface infiltration rates are low due to presence of cemented subsoil horizons.
- Qg** PLEISTOCENE GRAVELS. Moderately- to strongly cemented gravels. Includes Red Bluff Formation on the west side and on the east side near Oroville, unnamed gravels south of Oroville and Arroyo Seco, and South Fork gravels southeast of Sacramento. Permeability and surface infiltration rates are low due to occasional cemented subsoil horizons.
- Tertiary-Quaternary Continental Deposits**. Old alluvial fan deposits laid down along the northeast edge of the valley by ancient streams draining the Cascade Range. Source of materials is the Tuscan Formation. Contains cemented gravels, sands, silts, and only a few uncemented layers of sand and gravel. Permeability is low to moderate. Surface infiltration rates are low due to presence of cemented subsoil horizons.
- Pliocene Volcanic Rocks**. Thick-bedded deposits of silt and clay with thinner lenticular zones of sand and gravel. Some tuffaceous material and hardpan may be present. Includes the Tehama Formation on the west side of the valley, and the Laguna and Fair Oaks Formations on the southeast side. Permeability and surface infiltration rates range from low to moderate.
- Pliocene Volcanic Rocks**. Well-bedded clay and volcanic (andesitic) sand with interbeds of tuff-breccia. Includes the Tuscan Formation on the northeast side of the valley, tuff-breccia surrounding Sutter Buttes, and the Mehrten Formation on the southeast side. Volcanic sands are highly permeable, tuff-breccias serve as confining beds.
- Miocene Volcanic Rocks**. Well-bedded clay and lesser amounts of volcanic (rhyolitic) granular material of the Valley Springs Formation in southeastern part of the valley. Beds of tuff and pumice are locally abundant. Permeability somewhat less than overlying Pliocene volcanic rocks.
- Eocene Continental Deposits**. Clay, sand and sandy- to gravelly clay in the lone Formation. Exposed mainly on the southeast side of the valley. Contains some zones of brackish water. Permeability and surface infiltration rates are low.

Non Freshwater - Bearing Formations

- Eocene Marine Rocks**. Shale and sandstone of marine origin exposed along southwest edge of the valley. May contain saline or brackish water.
- CRETACEOUS MARINE ROCKS**. Consolidated sandstone and shale of marine origin along the west side of the valley and in small isolated outcrops at Sutter Buttes on the east side. Usually contains saline connate water.

Igneous and Metamorphic Rocks

- UNDIFFERENTIATED TERTIARY VOLCANIC ROCKS**. Includes basalt at Table Mountain at Oroville and Orland Buttes, volcanic rocks at Sutter Buttes and andesite east of Marysville. Usually not water bearing.
- GRANITIC AND METAMORPHIC ROCKS**. Sierra Nevada basement complex rocks along the east side of the valley south of Oroville. May contain fresh ground water in fractures and joints.

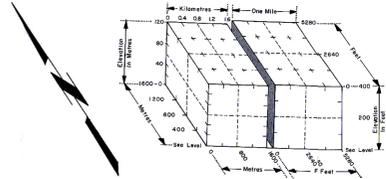
Source of data: Map was compiled from various sources including;

- (1) Geologic Map of California, California Division of Mines and Geology.
- (2) Various maps by California Department of Water Resources.
- (3) U.S. Geological Survey, Water Supply Paper 1497.
- (4) Soil Surveys by the U.S. Department of Agriculture and University of California.

GEOLOGIC MAP
SACRAMENTO VALLEY
GROUND WATER BASIN



Location of Diagrams



Legend

- **PREDOMINANTLY COARSE-GRAINED MATERIALS**
Includes mostly coarse, granular materials having a weighted average specific yield, by 3 metre (10-foot) intervals, of 13 to 25 percent. These materials are the most permeable and may yield large quantities of water to wells.
- **PREDOMINANTLY FINE-GRAINED MATERIALS**
Includes mostly fine, granular materials having a weighted average specific yield, by 3 metre (10-foot) intervals, of 1 to 12 percent. These materials are less permeable than the coarse-grained materials but may yield small quantities of water to wells.
- **ROCK**
Materials reported in well logs as various types of hard rock such as basalt and granite having a specific yield of less than 1 percent. Yields no or very little water to wells.

Explanation

Types of materials included in the 13 to 25 percent group are boulders, coarse, medium, and fine gravel, coarse, medium, and fine sand, and mixtures, such as sand and gravel, sandy gravel and gravelly sand. Finer grained materials such as clay and silt may be present, but not in sufficient quantities to cause the weighted average specific yield, by 3 metre (10-foot) intervals, to be less than 13 percent.

Similarly, types of materials present in the 1 to 12 percent group are clay, silt, gravelly clay and gravelly silt, sandy clay and silty clay, sandstone, cemented sand and cemented gravel. Small amounts of coarse-grained material may be present, but not in sufficient quantities to cause the weighted average specific yield, by 3 metre (10-foot) intervals, to be greater than 12 percent.

As shown in the diagrams, zones of similar specific yield ranges are correlated between wells if the well spacing is 16 kilometres (1 mile) or less. These correlations do not necessarily imply stratigraphic correlation, but only show relative amounts and possible continuity of the more highly permeable coarse-grained material and the less permeable fine-grained material. Well logs used to determine specific yields have not been field checked for exact location.

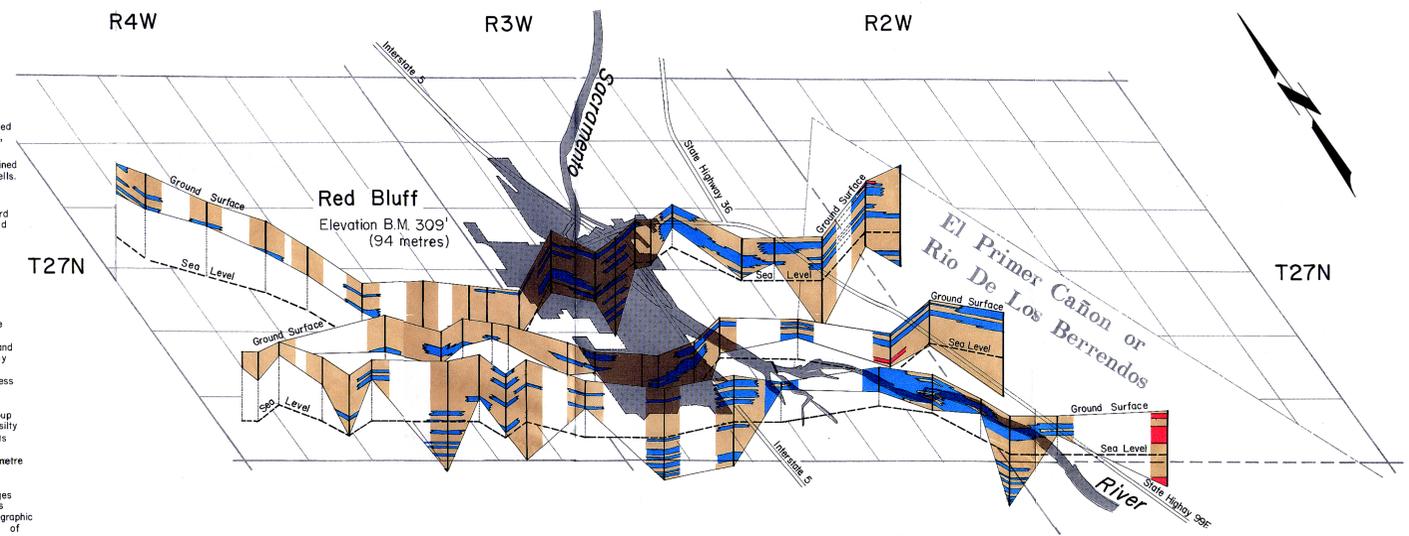


DIAGRAM A

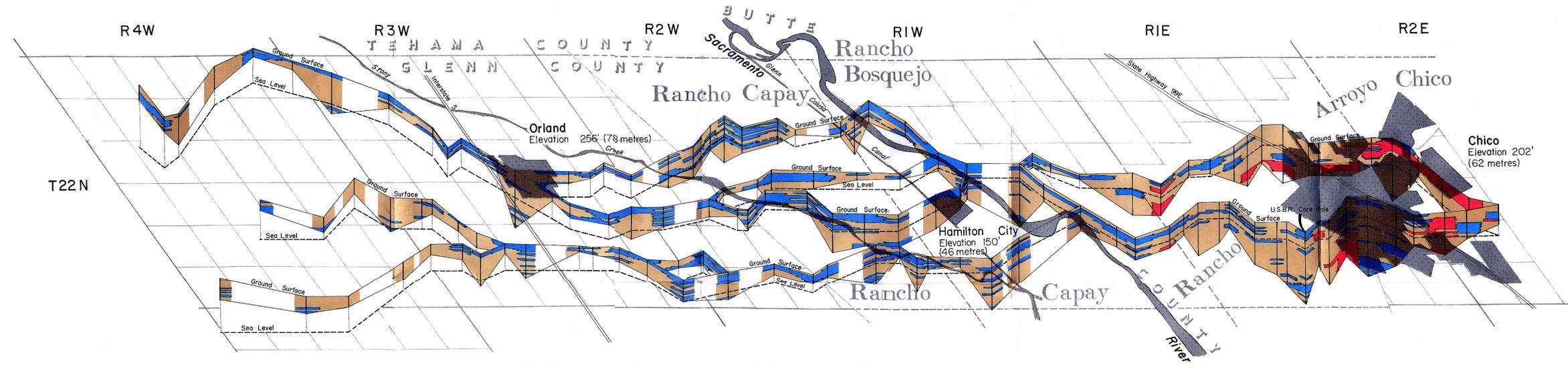


DIAGRAM B

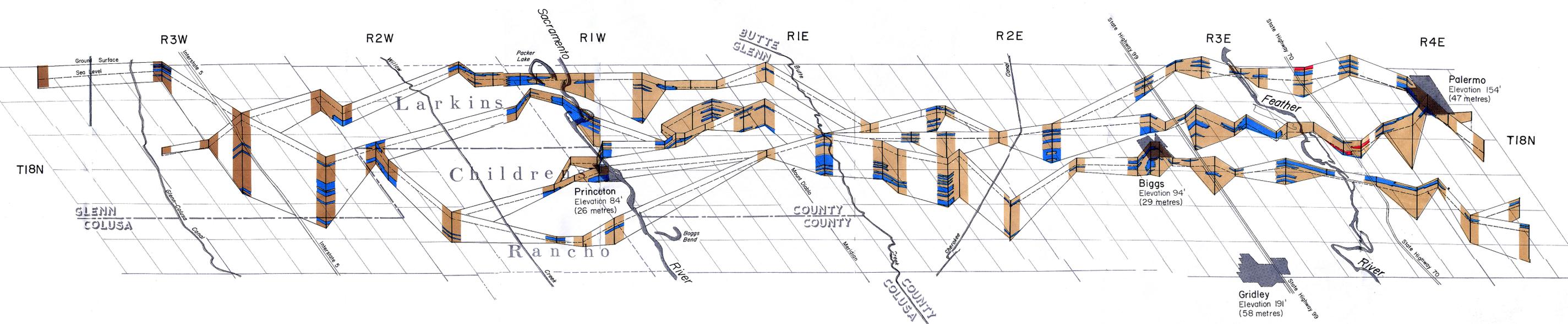
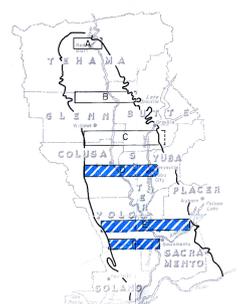
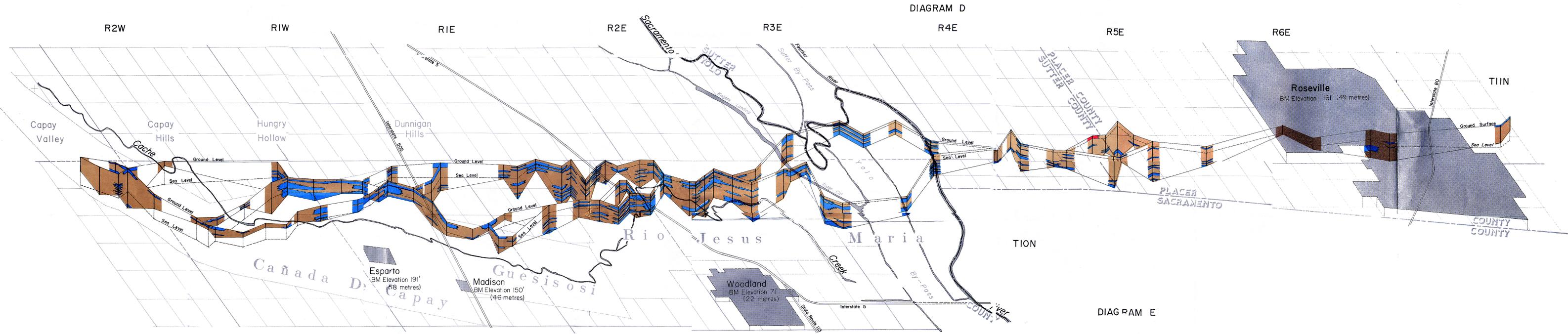
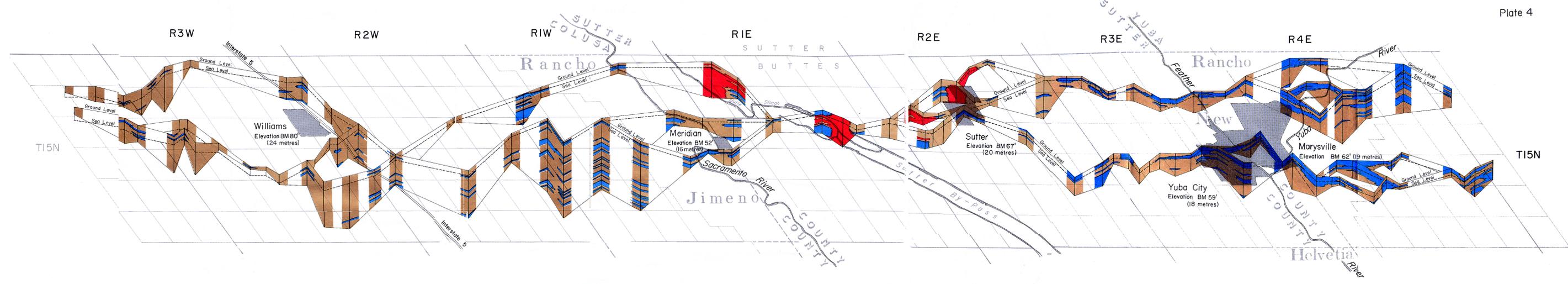


DIAGRAM C

Specific Yield Diagrams-North Sacramento Valley



Legend

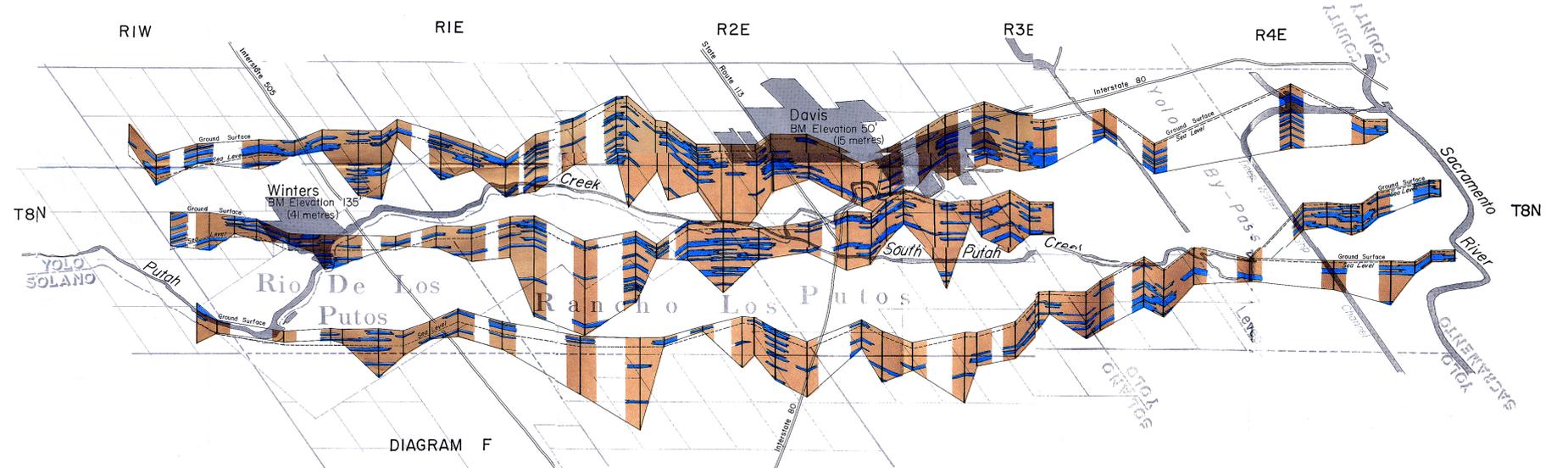
- PREDOMINANTLY COARSE-GRAINED MATERIALS**
Includes mostly coarse, granular materials having a weighted average specific yield, by 3 metre (10-foot) intervals, of 13 to 25 percent. These materials are the most permeable and may yield large quantities of water to wells.
- PREDOMINANTLY FINE-GRAINED MATERIALS**
Includes mostly fine, granular materials having a weighted average specific yield, by 3 metre (10-foot) intervals, of 1 to 12 percent. These materials are less permeable than the coarse-grained materials but may yield small quantities of water to wells.
- ROCK**
Materials reported in well logs as various types of hard rock such as basalt and granite having a specific yield of less than 1 percent. Yields no or very little water to wells.

Explanation

Types of materials included in the 13 to 25 percent group are boulders; coarse, medium, and fine gravel; coarse, medium, and fine sand; and mixtures such as sand and gravel, sandy gravel and gravelly sand. Finer grained materials such as clay and silt may be present, but not in sufficient quantities to cause the weighted average specific yield, by 3 metre (10-foot) intervals, to be less than 13 percent.

Similarly, types of materials present in the 1 to 12 percent group are clay, silt, gravelly clay and gravelly silt, sandy clay and silty clay, sandstone, cemented sand and cemented gravel. Small amounts of coarse-grained material may be present, but not in sufficient quantities to cause the weighted average specific yield, by 3 metre (10-foot) intervals, to be greater than 12 percent.

As shown in the diagrams, zones of similar specific yield ranges are correlated between wells if the well spacing is 1.6 kilometres (1 mile) or less. These correlations do not necessarily imply stratigraphic correlation, but only show relative amounts and possible continuity of the more highly permeable coarse-grained material and the less permeable fine-grained material. Well logs used to determine specific yields have not been field checked for exact location.



Specific Yield Diagrams - South Sacramento Valley