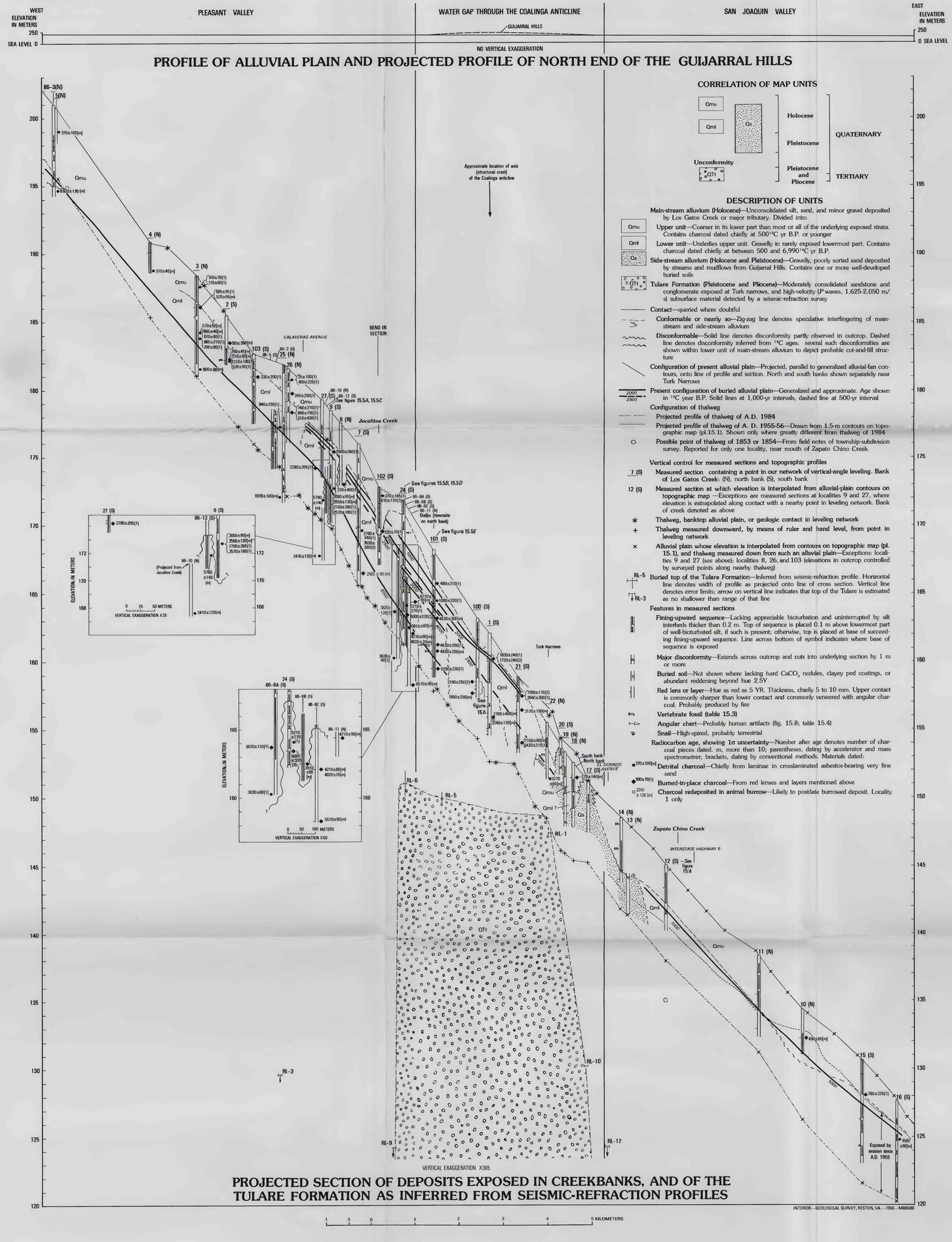

PROJECTED SECTION OF DEPOSITS EXPOSED IN CREEKBANKS, AND OF THE TULARE FORMATION AS INFERRED FROM SEISMIC-REFRACTION PROFILES

PROFILE AND SECTION ACROSS THE COALINGA ANTICLINE

CORRELATION OF MAP UNITS

Qmu	Holocene	QUATERNARY
Qml	Pleistocene	
Qs	Pleistocene and Pliocene	TERTIARY
Unconformity		

DESCRIPTION OF UNITS

Main-stream alluvium (Holocene)—Unconsolidated silt, sand, and minor gravel deposited by Los Gatos Creek or major tributary. Divided into:

Qmu — **Upper unit**—Coarser in its lower part than most or all of the underlying exposed strata. Contains charcoal dated chiefly at 500±14C yr B.P. or younger

Qml — **Lower unit**—Underlies upper unit. Gravelly in rarely exposed lowermost part. Contains charcoal dated chiefly at between 500 and 6,990±14C yr B.P.

Qs — **Side-stream alluvium (Holocene and Pleistocene)**—Gravelly, poorly sorted sand deposited by streams and mudflows from Guijarral Hills. Contains one or more well-developed buried soils

QTt — **Tulare Formation (Pleistocene and Pliocene)**—Moderately consolidated sandstone and conglomerate exposed at Turk narrows, and high-velocity (*P* waves, 1,625-2,050 m/s) subsurface material detected by a seismic-refraction survey

Contact—queried where doubtful

Conformable or nearly so—Zig-zag line denotes speculative interfingering of main-stream and side-stream alluvium

Disconformable—Solid line denotes disconformity partly observed in outcrop. Dashed line denotes disconformity inferred from 14C ages; several such disconformities are shown within lower unit of main-stream alluvium to depict probable cut-and-fill structure

Configuration of present alluvial plain—Projected, parallel to generalized alluvial-fan contours, onto line of profile and section. North and south banks shown separately near Turk Narrows

2000 / 2500 — **Present configuration of buried alluvial plain**—Generalized and approximate. Age shown in 14C year B.P. Solid lines at 1,000-yr intervals, dashed line at 500-yr interval

Configuration of thalweg

Projected profile of thalweg of A.D. 1984

Projected profile of thalweg of A. D. 1955-56—Drawn from 1.5-m contours on topographic map (pl.15.1). Shown only where greatly different from thalweg of 1984

Possible point of thalweg of 1853 or 1854—From field notes of township-subdivision survey. Reported for only one locality, near mouth of Zapato Chino Creek

Vertical control for measured sections and topographic profiles

7 (S) — **Measured section** containing a point in our network of vertical-angle leveling. Bank of Los Gatos Creek: (N), north bank (S), south bank

12 (S) — **Measured section at which elevation is interpolated from alluvial-plain contours on topographic map** —Exceptions are measured sections at localities 9 and 27, where elevation is extrapolated along contact with a nearby point in leveling network. Bank of creek denoted as above

Thalweg, banktop alluvial plain, or geologic contact in leveling network

Thalweg measured downward, by means of ruler and hand level, from point in leveling network

Alluvial plain whose elevation is interpolated from contours on topographic map (pl. 15.1), and thalweg measured down from such an alluvial plain—Exceptions: localities 9 and 27 (see above); localities 8, 26, and 103 (elevations in outcrop controlled by surveyed points along nearby thalweg)

RL-5 / RL-3 — **Buried top of the Tulare Formation**—Inferred from seismic-refraction profile. Horizontal line denotes width of profile as projected onto line of cross section. Vertical line denotes error limits; arrow on vertical line indicates that top of the Tulare is estimated as no shallower than range of that line

Features in measured sections

Fining-upward sequence—Lacking appreciable bioturbation and uninterrupted by silt interbeds thicker than 0.2 m. Top of sequence is placed 0.1 m above lowermost part of well-bioturbated silt, if such is present; otherwise, top is placed at base of succeeding fining-upward sequence. Line across bottom of symbol indicates where base of sequence is exposed

Major disconformity—Extends across outcrop and cuts into underlying section by 1 m or more

Buried soil—Not shown where lacking hard $CaCO_3$ nodules, clayey ped coatings, or abundant reddening beyond hue 2.5Y

Red lens or layer—Hue as red as 5 YR. Thickness, chiefly 5 to 10 mm. Upper contact is commonly sharper than lower contact and commonly veneered with angular charcoal. Probably produced by fire

Vertebrate fossil (table 15.3)

Angular chert—Probably human artifacts (fig. 15.8; table 15.4)

Snail—High-spired, probably terrestrial

Radiocarbon age, showing 1σ uncertainty—Number after age denotes number of charcoal pieces dated. m, more than 10; parentheses, dating by accelerator and mass spectrometer; brackets, dating by conventional methods. Materials dated:

370±100[m] — **Detrital charcoal**—Chiefly from laminae in crosslaminated asbestos-bearing very fine sand

100±70(1) — **Burned-in-place charcoal**—From red lenses and layers mentioned above

Q24C ±120 [m] — **Charcoal redeposited in animal burrow**—Likely to postdate burrowed deposit. Locality 1 only

Radiocarbon ages from alluvium along Los Gatos Creek

[Samples are listed in descending order at each locality; localities, denoted by numbers to left of letters in field designations, are listed from west to east. Laboratory designations: C, AA, and V, accelerator and mass spectrometer, University of Arizona, (C, iron carbide target; AA, V, graphite target); BETA, liquid scintillation counter, Beta Analytic, Inc., Coral Gables, Fla.; USGS, proportional-gas chromatograph, U.S. Geological Survey, Menlo Park, Calif. Datum for height is the thalweg. Weight is before sample treatment in HCl and NaOH. Age is by 14C dating, with assumed 14C of −25 permil; uncertainty, 1σ counting error. do., ditto; n.d., not determined]

Sample designation Field	Laboratory	Height (m)	Inferred origin	Shape, with axial dimensions in millimeters	Weight (mg)	Number of pieces	Age (yr B.P.)
86–3C7	AA–2163	−1.02	Detrital	Subangular	5.1	Many	6,920±170
5A	USGS–2027	3.38	do	Well-rounded	1,170	Many	370±100
4A	USGS–2026	3.45	do	Well-rounded	6,120	Many	310±45
3E1	V–1761	6.55	do	Well-rounded, 9×4×1.5	28.9	1	100±70
3E2	V–1760	6.55	do	Well-rounded, 5×2×1	3.7	1	170±80
3D3	V–1771	4.96	Burned in place	Angular	n.d.	1	685±95
3D4	V–1770	4.96	do	do	20.0	10	520±55
3B	USGS–2025	3.15	Detrital	do	2,140	Many	570±50
3A	USGS–2034	2.75	do	Chiefly well-rounded	6,670	Many	665±40
3A1	V–1762	2.75	do	Subrounded, 20×20×9	510.9	1	670±80
3A3	V–1766	2.75	do	Subrounded, 7×6×2	35.3	1	860±210
3A4	V–1767	2.75	do	Well-rounded, 5×4×3	18.4	1	700±80
31	AA–2161	.5	do	Subrounded	28.49	Many	900±80
2C	C–1806	5.20	Burned in place	Angular	1.3	Many	50±390
2A	USGS–2023	4.05	Detrital	Rounded	3,300	Many	750±45
2B	USGS–2024	3.97	do	do	3,350	Many	510±50
2B1	V–1763	3.97	do	Angular, 12×8×5	220.9	1	1,210±190
2B2	V–1768	3.97	do	Well-rounded, 8×8×5	172.0	1	520±90
103A	C–1807	5.05	Burned in place	Twig	78.6	1	330±200
25B1	C–1831	3.64	do	do	5.8	1	940±230
25E	AA–2164	−1.66	Detrital	Subangular	4.4	Many	1,970±100
26E1	V–1813	8.7	do	Well-rounded, 4×4×3	13.4	1	25±100
26E2	V–1814	8.7	do	Well-rounded, 5×6×3	14.7	1	450±220
26D1	C–1777	7.7	Burned in place	Twig, hollow	2.2	1	260±200
26C1	C–1774	6.3	do	Twig, 12×2×2	10.0	1	740±210
26C2	C–1792	6.3	do	Twig, 6×2×12	4.7	1	640±190
26C3	C–1793	6.3	do	Angular, 4×2×3	2.2	1	510±430
27A	C–1775	3.9	do	Angular; twig	16.0	1	2,280±205
86–10C7	AA–2166	−2.7	Detrital	Subangular	1.58	Many	2,410±120
9A2	C–1776	5.65	Burned in place	Angular	4.2	1	2,900±360
9Q	USGS–1486	3.0	Detrital	Rounded	n.d.	Many	2,050±90
9X	BETA–4239	3.0	do	do	2,700	Many	2,550±130
9X1	C–1783	3.0	do	Rounded, 8×8×4	16.8	1	2,700±260
9X3	C–1784	3.0	do	Angular, 4×4×3	16.0	1	2,570±190
86–12C5	AA–2167	2.2	do	Subrounded	34.0	Many	5,780±140
8C	C–1436	4.9	Burned in place	Angular, twig	10.9	1	[1]220±400
7Y1	C–1778	4.0	Detrital	Rounded, 5×2×1	5.0	1	2,790±340
7Y2	C–1790	4.0	do	Angular, 2×1×1	2.4	2	3,530±360
7G	AA–2162	.85	Burned in place	Angular	18.29	Many	2,900±90
102C1	C–1446	8.6	Detrital	Well-rounded, 11×6×2	31.1	1	[2]−270±185
102C2	C–1447	8.6	do	Well-rounded, 5×3×1	9.6	2	610±170
102B	V–1764	6.0	Burned in place	Angular	15.6	1	320±70
86–6AC11	BETA–20768	2.2	do	Twig	21,110	1	3,620±120
86–6AC22	BETA–20769	−.4	do	Log (wooden)	21,090	1	3,630±80
24C	C–1439	2.85	Detrital	Rounded, 8×7×2	41.3	1	5,210±270
24A2	C–1427	2.15	Burned in place	Angular	11.7	3	5,000±320
86–6BC8	BETA–20767	1.3	do	Twig, 17×17×4	10,470	1	3,910±80
86–6CC2	BETA–18395	.95	do	Angular, flat	70,000	Many	4,210±80
86–6CC2A	AA–2165	.95	do	Angular, flat	n.d.	Many	4,020±70
86–6CC21	AA–2168	−2.95	do	Angular	11.0	Many	5,570±90
86–1C4	BETA–20766	3.62	do	Angular, flat	127,920	Many	4,710±90
101X	C–1423	7.86	Burned in place	Square, flat	4.4	1	480±310
101G	C–1426	6.75	Detrital	Subangular	8.0	1	1,090±320
101F	C–1772	5.40	Burned in place	Angular	5.7	Many	4,630±300
101E	C–1424	3.45	do	Angular, black	13.2	1	4,630±390
101C	C–1313	2.90	do	Angular to subangular	15.6	57	4,830±290
101Z	C–1425	1.66	do	Angular, 4×3×2	10.2	1	5,290±230
100C	C–1435	4.20	do	Angular, twigs	8.8	2	[1]2,190±250
100A	C–1432	3.35	do	Subrounded	13.8	Many	1,860±250
1F2	C–1788	7.55	do	Angular, blocky	9.1	1	1,830±240
1F3	C–1789	7.55	do	Angular, prismatic	7.5	3	1,720±240
1A	C–1449	3.25	do	Angular; twigs	7.5	Many	[1]2,760±400
1C	USGS–2022	3.22	Redeposited in burrow	Angular	1,370	Many	2,240±120
21C1	C–1903	5.74	Burned in place	do	4.4	2	1,990±170
21C2	C–1804	5.74	do	Angular; twig	7.8	1	2,040±300
21B	C–1443	4.70	do	Angular; twigs	12.2	Many	2,170±190
21A	USGS–2031	2.30	do	Angular	1,210	Many	2,150±80
21A	C–1431	2.30	do	Angular; twig	19.7	1	3,420±310
22A	USGS–2032	2.90	Detrital	Angular; twigs	4,230	Many	3,270±80
18A	USGS–2030	6.05	Burned in place	do	1,200	Many	[2]−270±140
10A	BETA–4238	6.05	do	Angular	3,800	Many	490±60
15C	C–1312	6.44	do	do	10.7	1	780±225
16A	USGS–2029	4.50	Detrital	Rounded	1,440	Many	1,580±80

[1] Minimum limiting age; pretreatment with NaOH incomplete, allowing possibility that the dated material contained humic acids younger than the charcoal.
[2] Sample contains modern (A.D. 1945 or later) carbon.

SEISMIC-REFRACTION PROFILES

P-wave first-arrival times for hammer-source seismic-refraction profiles

[All values in milliseconds; --, no data]

Line No. and orientation	Distance from hammer to geophone (m) 3	6	9	12	15	18	21	24	27	31	37	43	46	49	55	61	64	67	73	76	79	82	91	101	110
RL–1 W-E	--	--	27.0	--	--	54.0	--	--	64.0	--	67.0	--	72.0	--	75.5	--	82.0	--	--	--	--	--	--	--	--
RL–2 W-E	8.0	7.9	10.5	12.1	13.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
RL–3 E-W	--	--	22.5	--	--	43.5	--	--	64.8	--	84.5	--	103.5	--	117.0	--	136.0	--	148	--	--	160	176	184	208
W-E	--	--	24.0	--	--	44.0	--	--	63.0	--	83.0	--	105.0	--	121.0	--	139.0	--	151	--	--	164	174	--	204
RL–4 W-E	--	--	22.8	--	--	37.0	--	--	45.6	--	55.0	--	64.0	--	75.0	--	87	--	100	--	--	120	132	--	143
RL–5 S-N	--	--	25.6	--	--	51.5	--	--	56.5	--	62.0	--	67.0	--	72.5	--	72.0	--	80	--	--	88	96	103	--
N-S	--	--	26.0	--	--	50.5	--	--	54.0	--	58.0	--	65.0	--	68.0	--	72.0	--	--	--	--	78	81	86	--
RL–6 S-N	--	--	25.5	--	--	53.3	--	--	78.5	--	79.5	--	84.0	--	89.0	--	95.5	--	100	--	--	104	--	--	--
N-S	--	--	26.0	--	--	51.5	--	--	78.0	--	83	--	87	--	--	--	--	--	--	--	--	--	--	--	--
RL–9 W-E	--	--	39.0	--	--	70.0	--	--	92.0	--	112.0	--	124.0	--	132.0	--	140.0	--	148	--	--	152	162	164	167
RL–10 E-W	8.4	16.9	25.5	34.9	40.1	44.3	48.8	52.2	55.7	58.7	--	--	77.5	--		88	--	--	--	95	--	--	--	--	--
RL–12 E-W	--	16.6	--	34.3	--	44.2	--	55	--	64.8	76	83	--	90	99	103	--	106	109	113	--	--	--	--	--
W-E	--	17.1	--	32.1	--	40.9	--	52.6	--	61.7	71.0	82	--	89.9	95.2	101	--	103.5	109	114.5	--	--	--	--	--

P-wave velocities (V_P) and depths to the Tulare Formation from seismic-refraction profiles

Profile	Description
RL–1	Unconsolidated alluvium (V_P=340 m/s) overlies the Tulare Formation (V_P=2,050 m/s) at depth of 9 m
RL–2	Unconsolidated alluvium and dune sand (V_P=380 m/s) overlies the Tulare Formation (V_P=1,980 m/s) at depths of 0 to 1 m; line located in Turk Narrows (pl. 15.1) is not shown on cross section because the Tulare Formation is chiefly at ground surface
RL–3	Unconsolidated alluvium at least 37 to 49 m thick comprises, from the top down, 2 to 4 m of V_P=380–420 m/s, 11 to 15 m of V_P=470–590 m/s, and at least 24 to 30 m of V_P=740–770 m/s
RL–4	Unconsolidated alluvium at least 40 m thick comprises, from the top down, 3 m of V_P=400 m/s and at least 37 m of V_P=850 m/s; line is located just west of west end of cross section (pl. 15.1) and so not shown on cross section
RL–5	Unconsolidated alluvium (V_P=360 m/s) overlies the Tulare Formation (V_P=2,060 m/s) at depths of 7 to 8 m
RL–6	Unconsolidated alluvium (V_P=350 m/s) overlies the Tulare Formation (V_P=2,020 m/s) at depths of 10 to 12 m
RL–9	Unconsolidated alluvium overlies the Tulare Formation (V_P=4,570 m/s) at depth of 48 m and comprises, from the top down, 4 m of V_P=230 m/s, 12 m of V_P=440 m/s, and 32 m of V_P=1,160 m/s
RL–10	Unconsolidated alluvium overlies the Tulare Formation (V_P=2,120 m/s) at depth of 21 m and comprises, from the top down, 4 m of V_P=350 m/s, 2 m of V_P=700 m/s, and 15 m of V_P=850 m/s
RL–12	Unconsolidated alluvium at least 31 to 42 m thick comprises, from the top down, 3 m of V_P=360–380 m/s, 8 to 9 m of V_P=590–610 m/s, 8 to 15 m of V_P=900–920 m/s, and at least 12 to 15 m of V_P=1,330–1,740 m/s