

GEOARCHAEOLOGY AT THE ARCO BURIAL SITE, CARSON, CALIFORNIA

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ABSTRACT

The ARCO burial site showed stratigraphy representing at least three distinct types of deposition. The lower layers, in which the burials were found, consist of homogenous and disturbed clays, krotovina and organic debris typical of midden deposits. The middle layers show bedding and cross-bedding consistent with aqueous deposition. The upper layers consist of several deposits of artificial fill.

THE GEOLOGIC SETTING

The ARCO Burial site (LAN-2682) is located on the ARCO Oil Refinery in Carson, Los Angeles County, California, which is located on an unsectioned area of Township 3 South, Range 13 West, previously part of the Rancho San Pedro. The refinery occupies the northwest corner at the intersection of Sepulveda Boulevard and Alameda Street. Within the refinery boundaries, the 15 meter by 15 meter burial site is located approximately 1,000 feet NNW from this intersection (Figure 1).

The ARCO site lies on the Downey Coastal Plain at an elevation of between 15-20 feet above sea level. The entire area between the Dominguez Hills, Palos Verdes Hills and Signal Hill is a broad marine terrace at about 50 feet above sea level. When sea level was at its lowest approximately 10,000 bp, the ancestral Los Angeles River had cut a wide trench into this terrace to a depth of 180 feet. With the rise of sea level, the river has been backfilling this trench with sediments. Today the modern Los Angeles River is confined to this old channel and has not altered it much (Zielbauer et al 1962:3-4). The width of the modern riverbed near the ARCO site is two and a half miles across and includes all the area east of the Dominguez channel to currently channelized LA River and a little beyond to the City of Long Beach. This area is marked on the Downey 1896 topo map (Figure 2).

THE GEOLOGY AND INTERPRETATIONS

Several cross section drawings of the sidewalls of the units were completed. These are the north sidewall of units 2, 3, 9, 11 and 16; the west sidewall of units 6 and the NW quad of 8; and the east sidewalls of units 1, 10 and 15. The sections drawn are indicated on the map in Figure 3. A review of all of the sections indicates the following deposits are present on the site. Not all cross sections are represented in this preliminary report.

Artificial Fill

Deposits consist of unsorted gravels and sands. Several layers of fill are noted in some areas as well as man-made rectangular trenches that are infilled, such as in Unit 2 (Figure 4).

The Pan-American, Richfield and ARCO refineries have occupied this land for the last 76 years, and this has caused the most recent changes to the topography. Many tanks, pipelines, and buildings have been added to the property since its purchase from Patrick Watson in 1923 (Gillingham 1961:363). Gillingham reports that "teams of men and mules levelled hills and dumped dirt into ditches and arroyos ... and generally flattened the land to prepare for construction of storage tanks."

Even though there are no storage tanks in the

vicinity of the burial ground, the Compton 1930 quad map shows several small structures directly over the ARCO site (Figure 5). Undoubtedly the presence of structures directly over the burials also necessitated the placement of gravel and fill to provide a level and firm foundation.

Recent Fluvial Deposits

Unit 3 sidewall (Figure 6) shows a moderately thick (20-45 cm) sequence of grey sand (10YR 5/1 to 6/1), dark grey silt (10YR 4/1) silt, light brownish grey (10YR 6/2) sandy silt, greyish brown (10YR 5/2) and dark greyish brown (10YR 5/6) silty sand and dark greyish brown (10YR 5/6) silty clay showing abundant trough cross-bedding. Lower beds in some units have inclusions of fine charcoal fragments. Dried surfaces show some salt crystallization on the surface. (Type A sterile overburden from flotation analysis)

Two thin (up to 10 cm) basal layers of medium grey and dark grey clay rich sediments with no stratification. Locally, a thin grey sand layer was deposited above the basal clay layer (in unit 1). In another locality (unit 2), a thin golden brown sandy clay layer was deposited above and partially below the clay layer.

A thicker (10-20 cm) basal layer of unstratified yellow brown (10YR 5/6) to grey (10YR 5/1) and dark grey (10YR 4/1) clay-rich sediments with points of iron staining is found locally, thickest in adjacent units 3, 11, and 2 (Figure 7). The base of the clay becomes darker and marly looking in unit 2. No carbon fragments. (Type B dense clay from flotation analysis).

A very fine to fine grained light grey silty sand, with darker heavy minerals, similar to a beach sand, was found in unit 15, levels 130-170, below the midden. A light brown, sandy silt was reported in the 70-80 cm level of unit 10. (Type D paleosol from flotation analysis)

The presence of trough cross bedding in the deposits is important and indicative of erosional scours and subsequent depositional infilling by a stream flow. In particular, a meandering stream rather than braided stream flow is implied. A braided stream deposit has a high percentage of gravels and sands while meandering channel

deposits show a high proportion of silt and clay (Selley 1976:266). The 1896 Downey sheet (Figure 8) shows a minimally impacted landscape, with only a few scattered small buildings, the Southern Pacific railway and several dirt roads. The ARCO site is seen to be between two contour lines at the 25 foot elevation, indicating the site is below 25 feet, in the bed of Compton Creek. Compton Creek is shown as a meandering watercourse.

At the ARCO site, basal clay layers underlie the cross-bedded silts, sandy silts and clays of the upper layer. Clays indicate periods of standing water which allowed the clays to settle out. Clays are the finest of all sediments and take the longest time to settle.

Studies of the Los Angeles River indicate that the upper 50-70 feet of sediments in the river floodplain are "very fine sands, silts, and clays with interspersed sand lenses and stringers representing intermittent wet periods and river flood flows" (Zielbauer et al 1962:4).

Many recorded floods have occurred in the last 2 centuries in the Los Angeles basin associated with the Los Angeles River, 1.2 miles from the site. In the 19th century the river is recorded as changing its course 9 times up to one-half a mile. Between 1866 and 1884 were the times of most frequent flooding, leaving pools and swampy areas in good farmland and depositing silt in other areas. Major flooding occurred again in 1914 and 1916, spurring the formation of the Los Angeles Flood Control District, the building of dams in the mountains, and the cement channelization of the Los Angeles River (Gillingham 1961:231). The flooding in the vicinity of the ARCO site, the Watson ranch, from the 1914 floods is described in Grenier and Gillingham (1987:341) as both the Los Angeles River and the Dominguez Ditch "surging over" their banks, damaging the Watson home and carrying an estimated 4 million cubic tons of silt out to sea. Much of the rancho was also "left under water."

Ethnostratigraphic Deposit

A very fine grained silty sand, unstratified, with abundant small (< 0.5 mm) inclusions of charcoal fragments, several pockets of lighter colored sand,

light grey pebble-sized clay clasts and sparse marine shell fragments. Rodent burrows are evident in most units. Figure 9 shows a typical section from adjoining units 1 and 10. An erosional surface forms the upper boundary of this unit. Most of the burials, cremations and cultural artifacts are found in this layer. Color descriptions vary from dark grey (10YR 4/1) and dark greyish brown (10YR 4/2) to rich medium brown. (Type C cultural soil from flotation analysis).

The ethnostratigraphic zone lies within the recent fluvial deposits and it is likely that it was deposited within recent geologic time, between periods of flooding of the Los Angeles River and Coyote Creek. It was also eroded to some degree.

This deposit is thickest in units 8 and 10 at 80 cm. No unit showed a complete section. The sterile fine-grained light grey sand was found in Unit 15, below the midden, at approximately 150 cm (Figure 10). If the lower boundary of this midden is taken to be approximately 150 cm (unit 15), and the uppermost boundary to be at 40 cm (unit 10), a complete thickness for the ethnostratigraphic layer can be estimated at 110 cm.

Cross sections north-south and east-west through the site (Figure 3) show, however, that the top of the unit is not uniform at 40 cm. The upper surface of the unit is seen to slope downward from 40 cm in Unit 10 (Figure 9) in the south to 90 cm in Unit 3 (Figure 6) approximately 3 m to the north. Likewise for east-west cross sections, the top of the midden in Unit 8 in the west is at 30 cm and slopes downward to 115 cm in Unit 2 to the east over a distance of approximately 8 m (Figure 11). Taken together, the highest point of the top of the midden surface is in the south west and the lowest part of the top of the midden surface is in the northeast.

The upper surface of the midden deposit is not a horizontal planar surface as would be expected of conformable, sequential deposition. It is an undulating tilted surface indicative of erosion. Thus the total thickness of the midden may at one time have been a uniform 110 cm, but today the cross sections show it to be wedge shaped and varying in thickness. The direction of

the slope, to the northeast, is also the direction of the Los Angeles River and Coyote Creek. This highly suggests that portions of the ethnostratigraphic deposit have been naturally eroded by periods of flooding by the rivers. It also suggests that the midden may have been entirely eroded to the north and east, so no further burials would be expected in those directions. On the other hand, burials may possibly be encountered to the south or west if further digging is done. The finding of this site, previously unreported, along the banks of the ancient Los Angeles Riverbed, in a supposedly developed area, makes us wonder if there are not other sites buried below stream sediments all along the banks. Very few archaeological sites have been recorded in this area or anywhere along the Los Angeles River.

REFERENCES CITED

- Gillingham, Robert Cameron
1961 *The Rancho San Pedro: the Story of a Famous Rancho in Los Angeles County and of its Owners*. Cole-Holmquist Press, Los Angeles.
- Grenier, Judson A. and Robert Cameron Gillingham
1987 *California Legacy: the James Alexander Watson - Maria Dolores Dominguez Watson Family 1820-1980*. The Watson Land Company, Carson.
- Selley, Richard C.
1976 *An Introduction to Sedimentology*. Academic Press, London.
- Zielbauer, Edward J., Harry A. Kues, Willis L. Burnham and Arthur G. Keene
1962 *Coastal Basins Barrier and Replenishment Investigation, Dominguez Gap Barrier Project Geologic Investigation*. Los Angeles County Flood Control District.

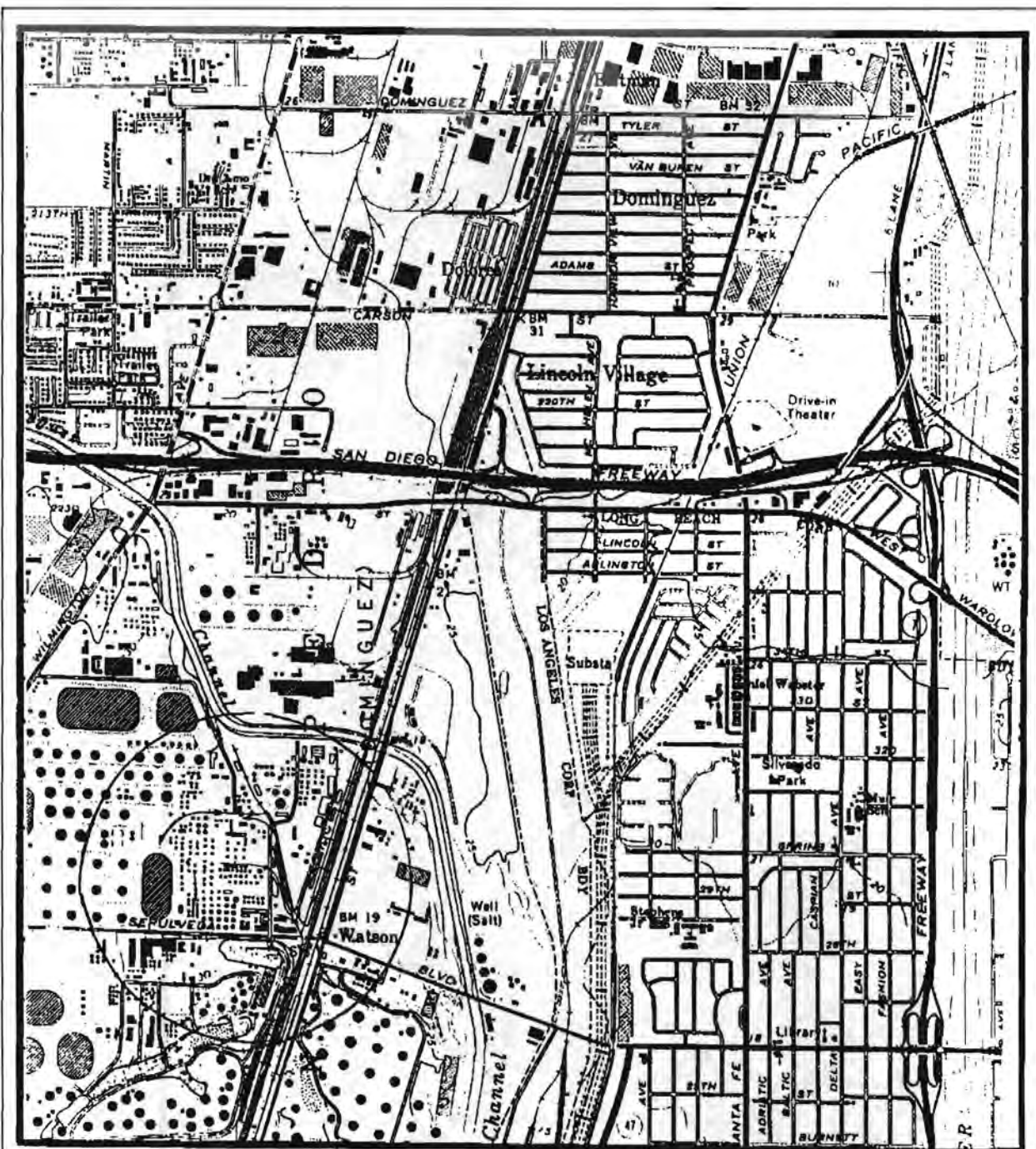


Figure 1. General locality of the ARCO site.

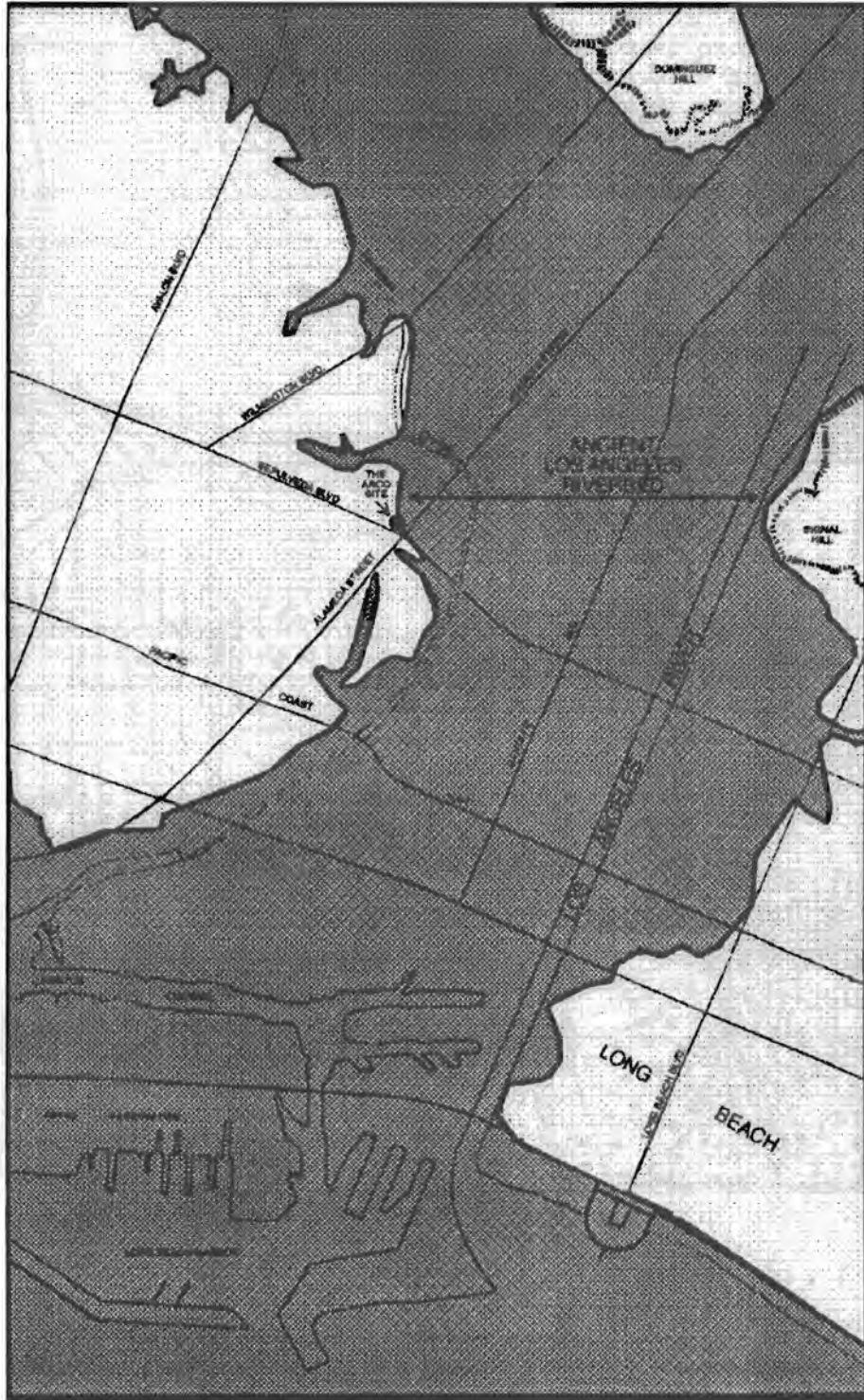


Figure 2. Location of the ARCO site and the ancient Los Angeles Riverbed, shaded. (After Zielbauer et. al. 1962:Plate 1).

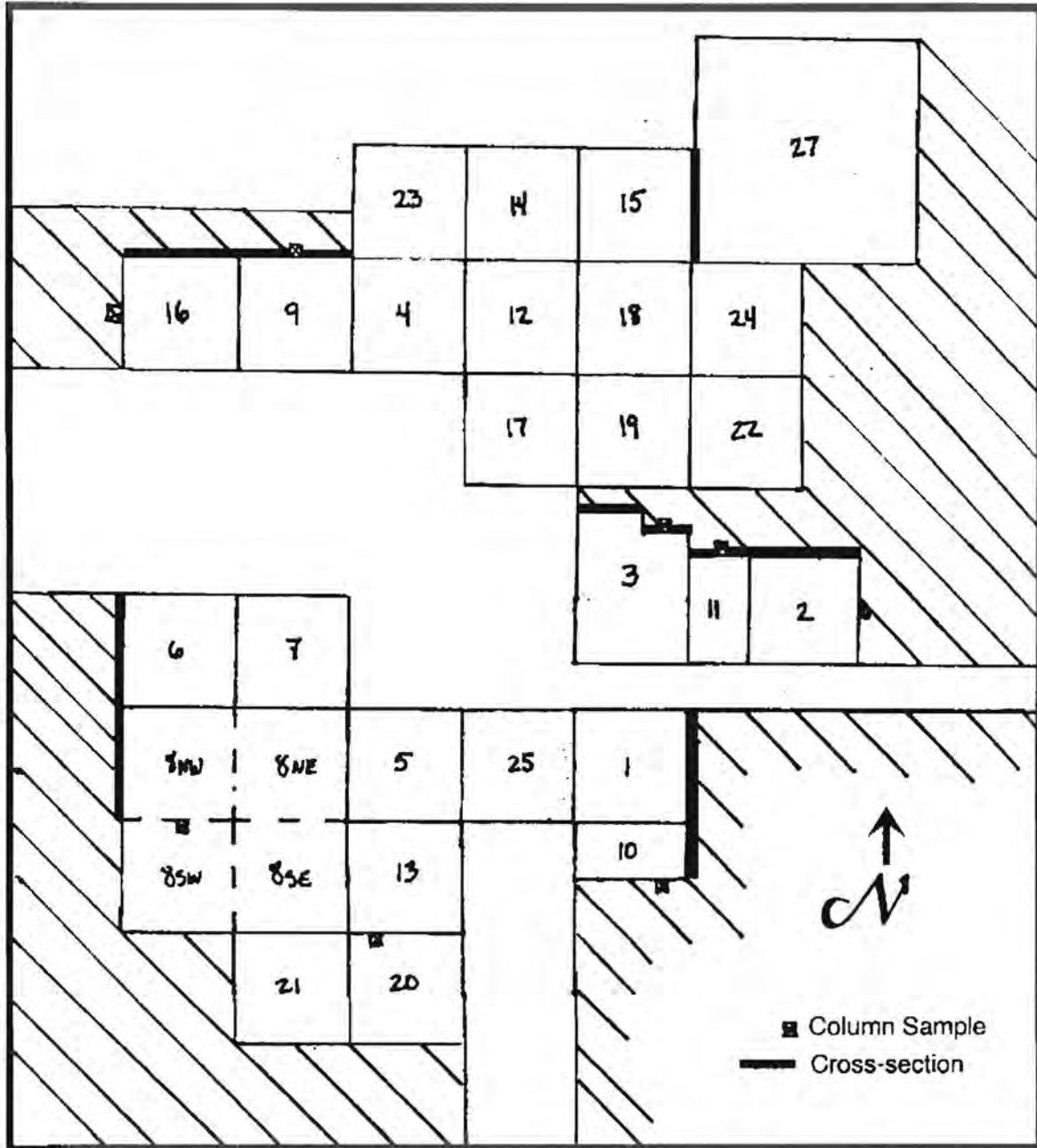


Figure 3. Site map showing units, locations of cross-sections and column samples taken.

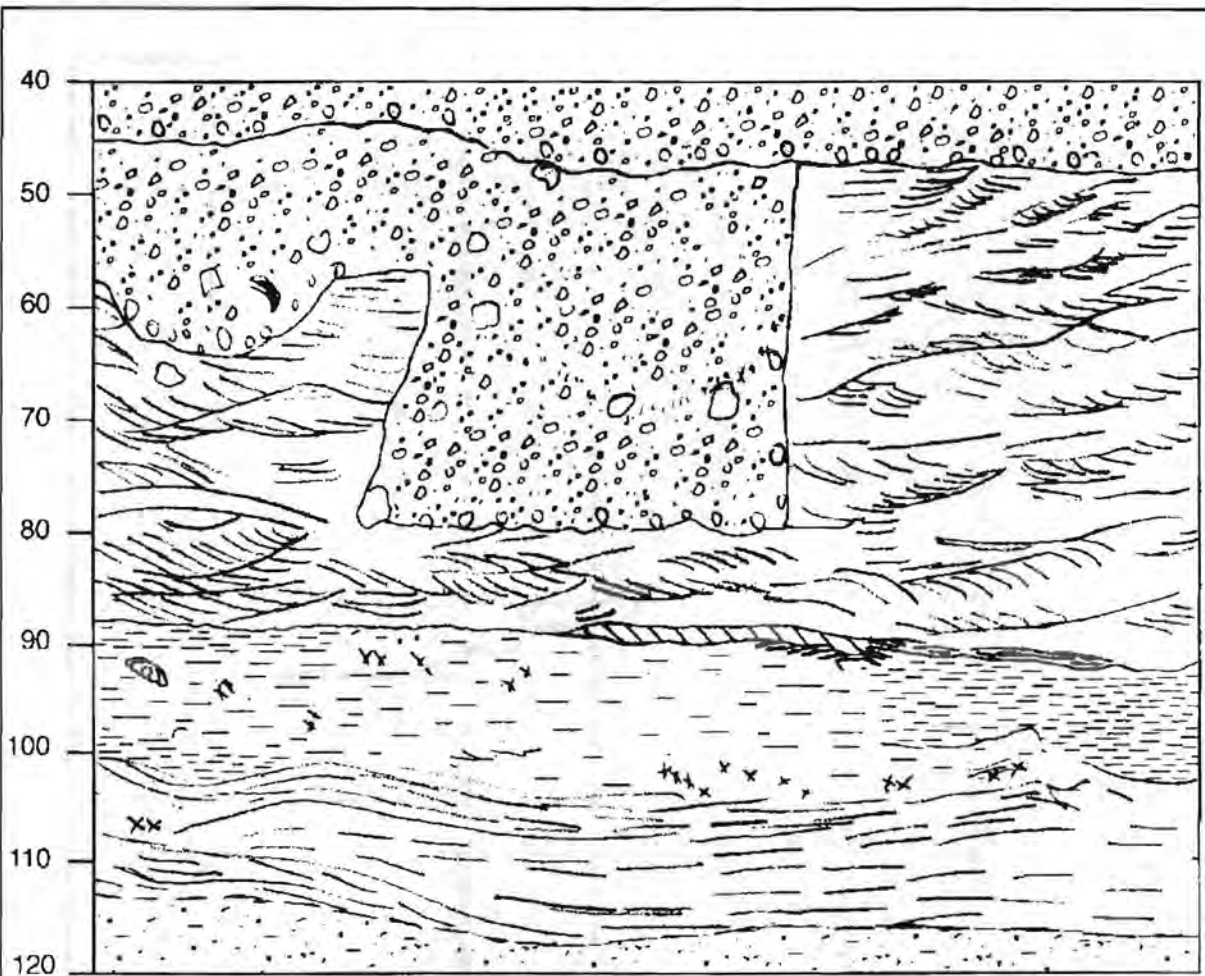


Figure 4. LAN-2682 (The ARCO Site) North Sidewall of Unit 2

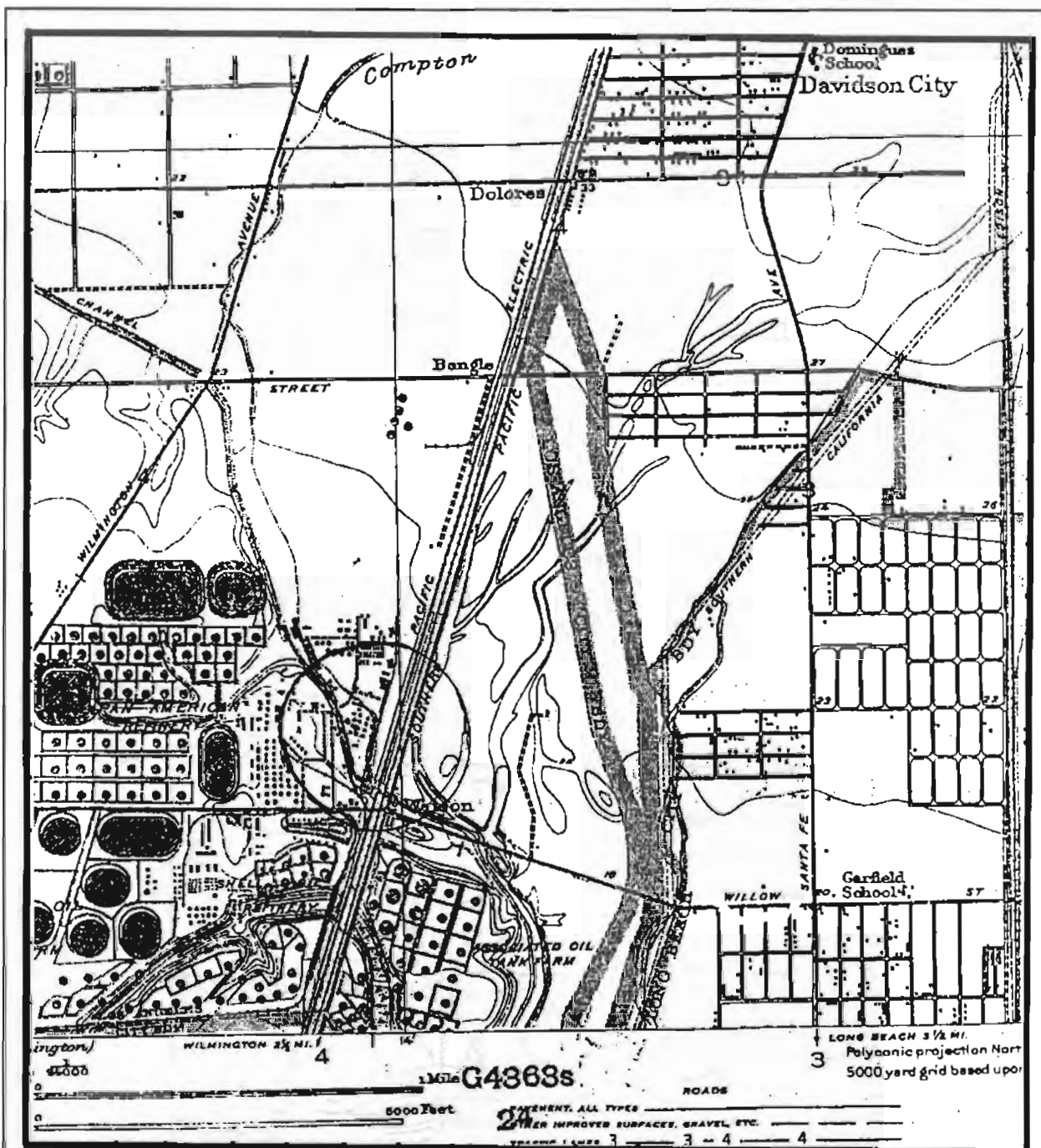


Figure 5. Compton 1930 quad map showing structure over the ARCO site.

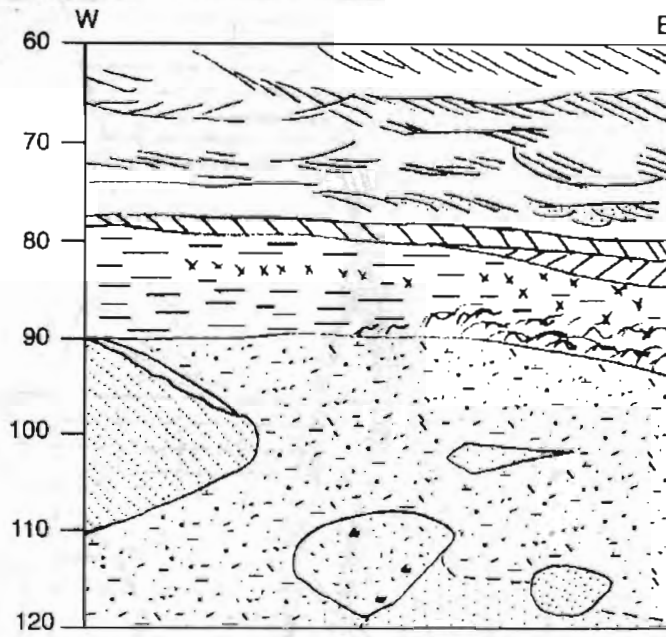


Figure 6. LAn-2682 (The ARCO Site) North Sidewall of Unit 3 (westernmost 60 cm only)

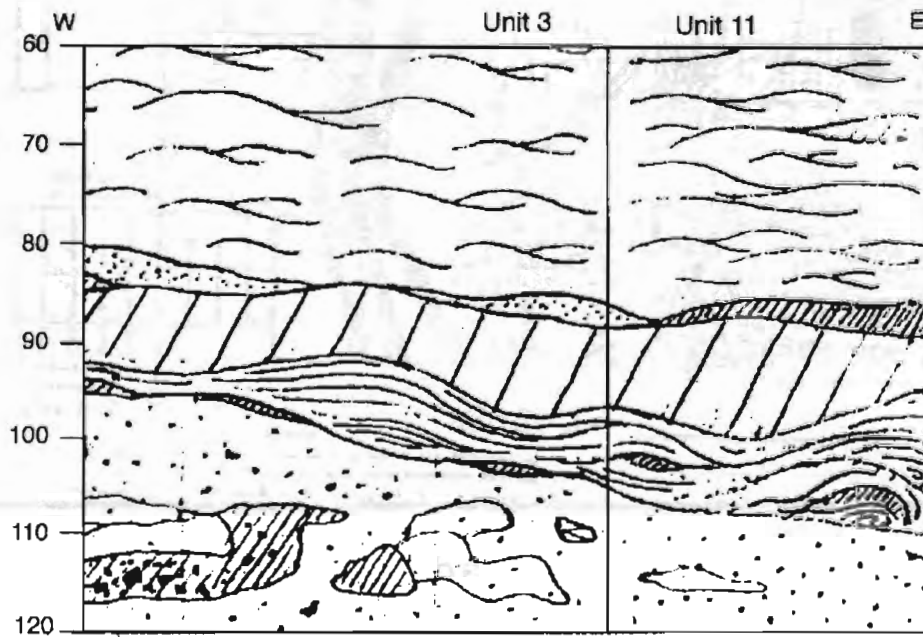


Figure 7. LAn-2682 (The ARCO Site) North Sidewall of easternmost 60 cm of Unit 3, all of Unit 11.

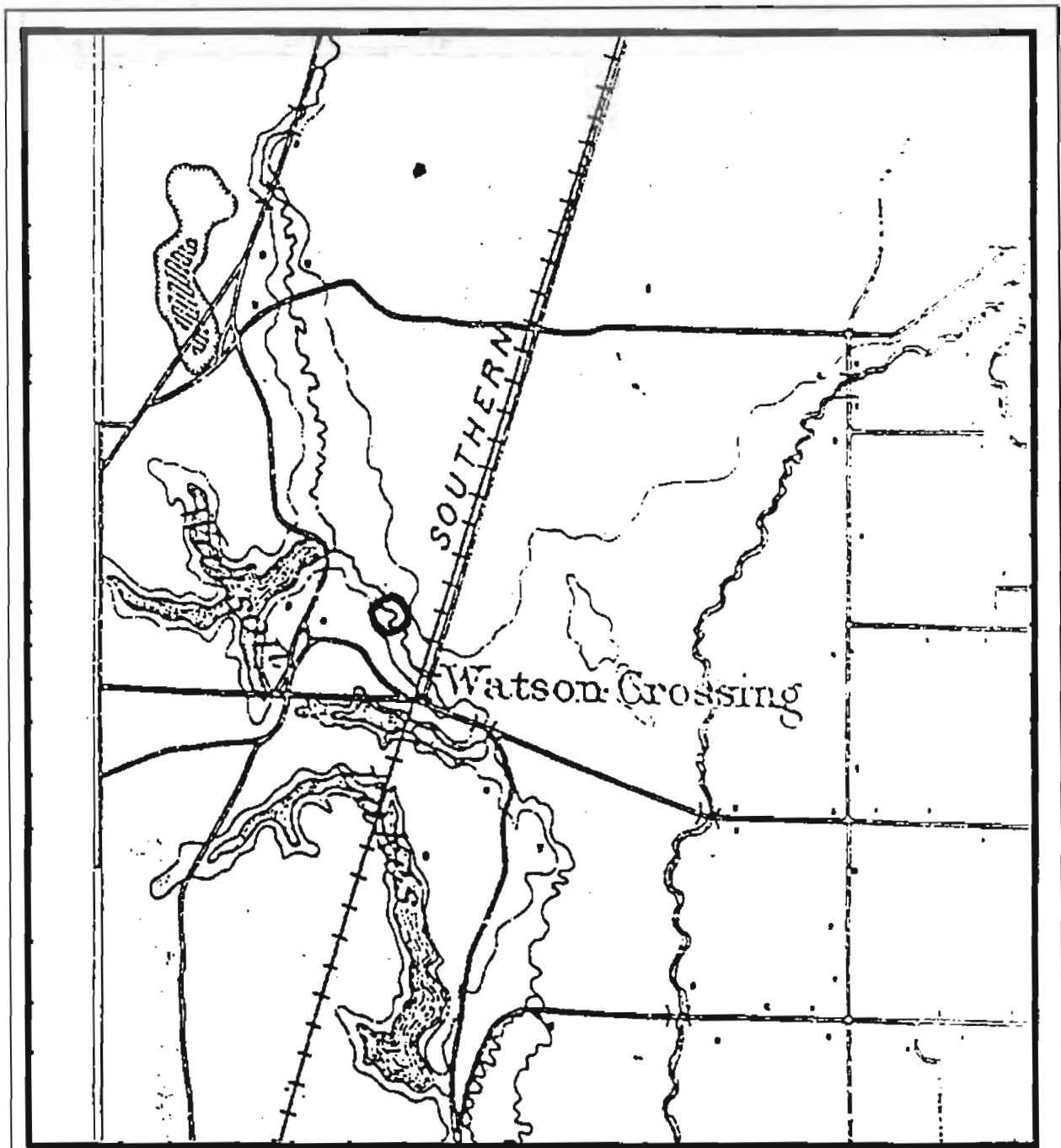


Figure 8. The 1896 Downey sheet showing Compton Creek as a meandering watercourse.

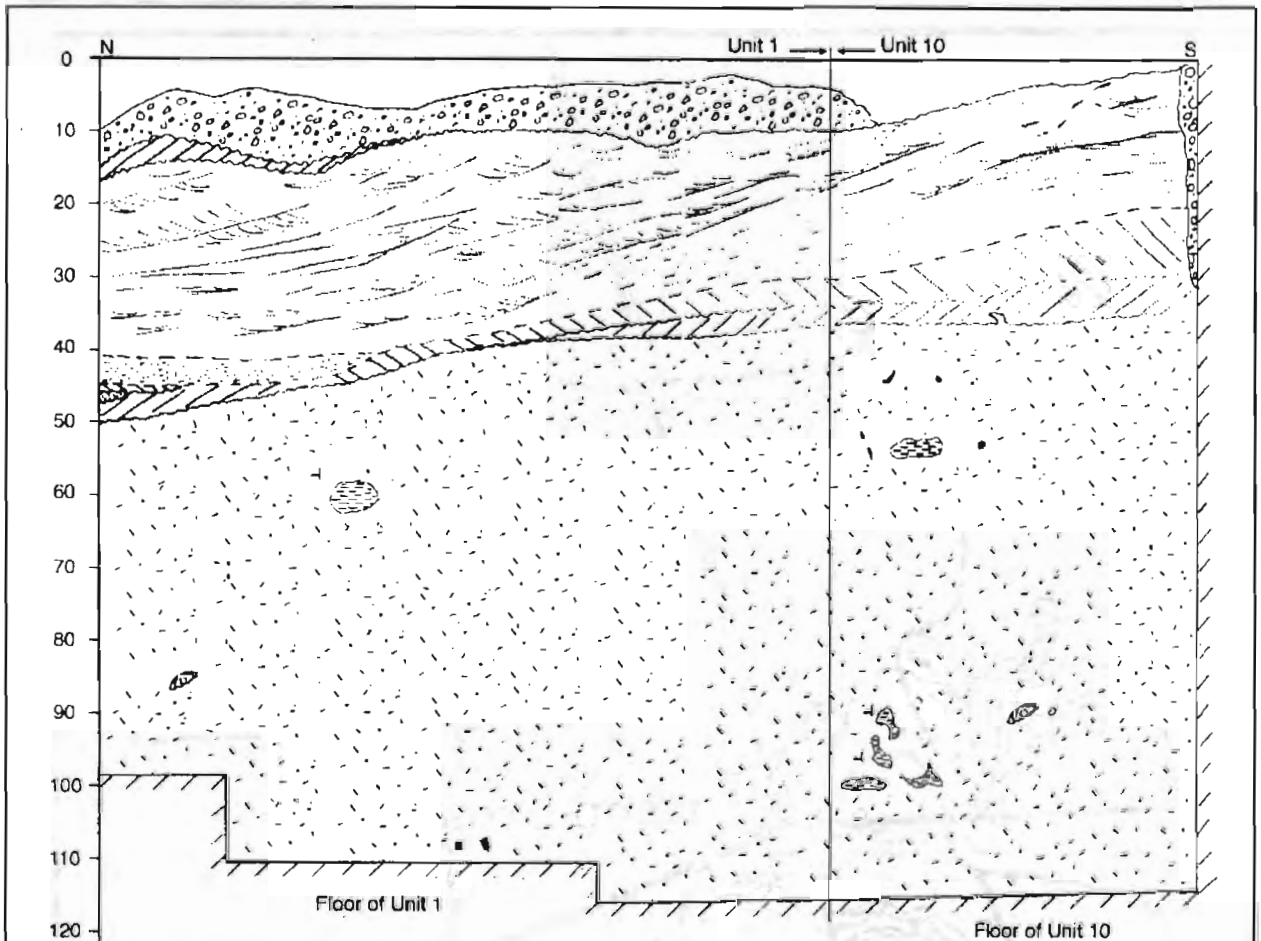


Figure 9. LAn-2682 (The ARCO Site) East Sidewall of Unit 1 and Unit 10.

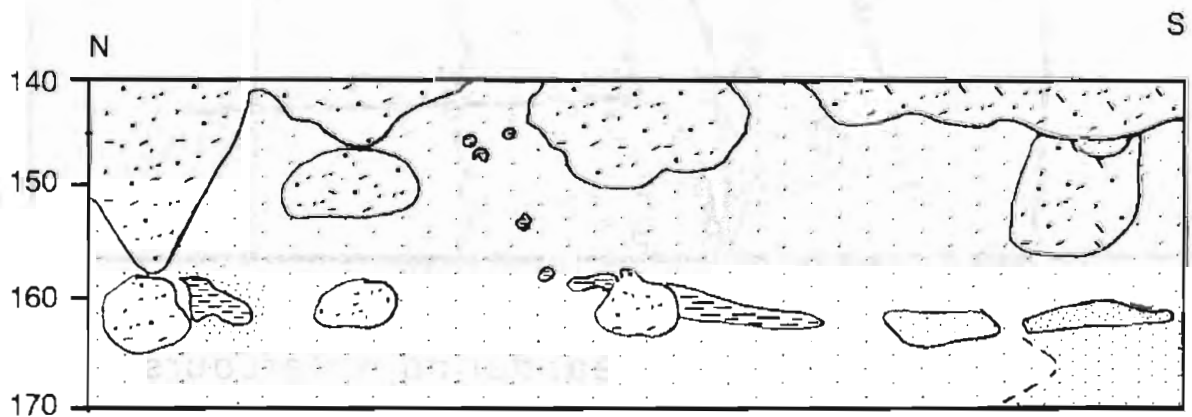


Figure 10. LAn-2682 (The ARCO Site) East Sidewall of Unit 15 in floor of trench.

Figure 11. LAn-2682 (The ARCO Site) North Sidewall of Units 3, 11 and 2

