Three Farewells to Manzanar

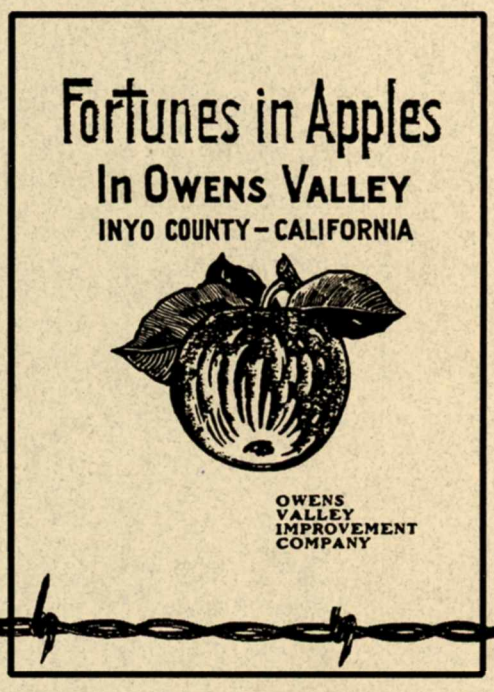
The Archeology of Manzanar National Historic Site, California

Part 2

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Chapter 10

Relocation Center Sites
Outside Manzanar National Historic Site

As described in Chapter 9, the authorized 550-acre Historic Site includes only the residential and administrative areas of the relocation center, once surrounded by barbed wire, and an adjacent cemetery. But the entire relocation center encompassed some 6,500 acres: beyond the barbed wire were a military police compound, a reservoir, a sewage treatment plant, hog and chicken farms, farm fields, a landfill, and other facilities used by the relocation center. These, and a World War II-era airport located east of the relocation center, were recorded as 22 separate sites (Figure 10.1, Table 10.1).

Most of the sites are on land owned by the City of Los Angeles and administered by the Department of Water and Power (LADWP). Two sites, the reservoir and a dam on Shepherd Creek, are on public land administered by the Bureau of Land Management (BLM). Two sites, both water distribution systems, cross both LADWP and BLM lands.

Each of these sites is discussed below. At 12 of the sites concrete features are inscribed with names, dates, Japanese characters, and graffiti. In all over 700 inscriptions were recorded; these are described in Appendix A. Detailed site records are on file at the California Historic Resources Information System's (CHRIS) Eastern Information Center (University of California, Riverside) and at the Western Archeological and Conservation Center (Tucson, Arizona).

Table 10.1.
Recorded Sites Outside Manzanar National Historic Site Associated with the Relocation Center.

Name/description	NPS Site Number
Military Police Compound*	MANZ 1993 A-32
Reservoir*†	MANZ 1993 B-29
Water Delivery System*†	MANZ 1993 B-11
Sewage Treatment Plant	MANZ 1993 B-28
Chicken Farm*	MANZ 1993 A-31
Hog Farm*	MANZ 1993 B-19
North Fields Irrigation System*†	MANZ 1993 B-12
South Fields Irrigation System*	MANZ 1993 B-15
Far South Fields Irrigation System*	MANZ 1993 B-17
Bairs Creek Irrigation System*	MANZ 1993 A-34
Georges Creek Ditch*	MANZ 1993 B-30
Shepherd Creek Dam†	MANZ 1993 B-13
North Wells*	MANZ 1993 B-38
Landfill	MANZ 1993 B-8
Disposal Pits	MANZ 1993 B-9
Factory Area Trash Deposits	MANZ 1993 A-35
Administration Area Trash Scatter	MANZ 1993 A-36
Shepherd Creek Bridge	MANZ 1993 B-36
South Fork Bridge	MANZ 1993 B-37
Abernathy Ranch Dutch Oven	MANZ 1993 B-20
Albers Ranch Dutch Oven	MANZ 1993 B-21
Manzanar Federal Airport*	MANZ 1993 B-27

* - inscriptions present † - on BLM land

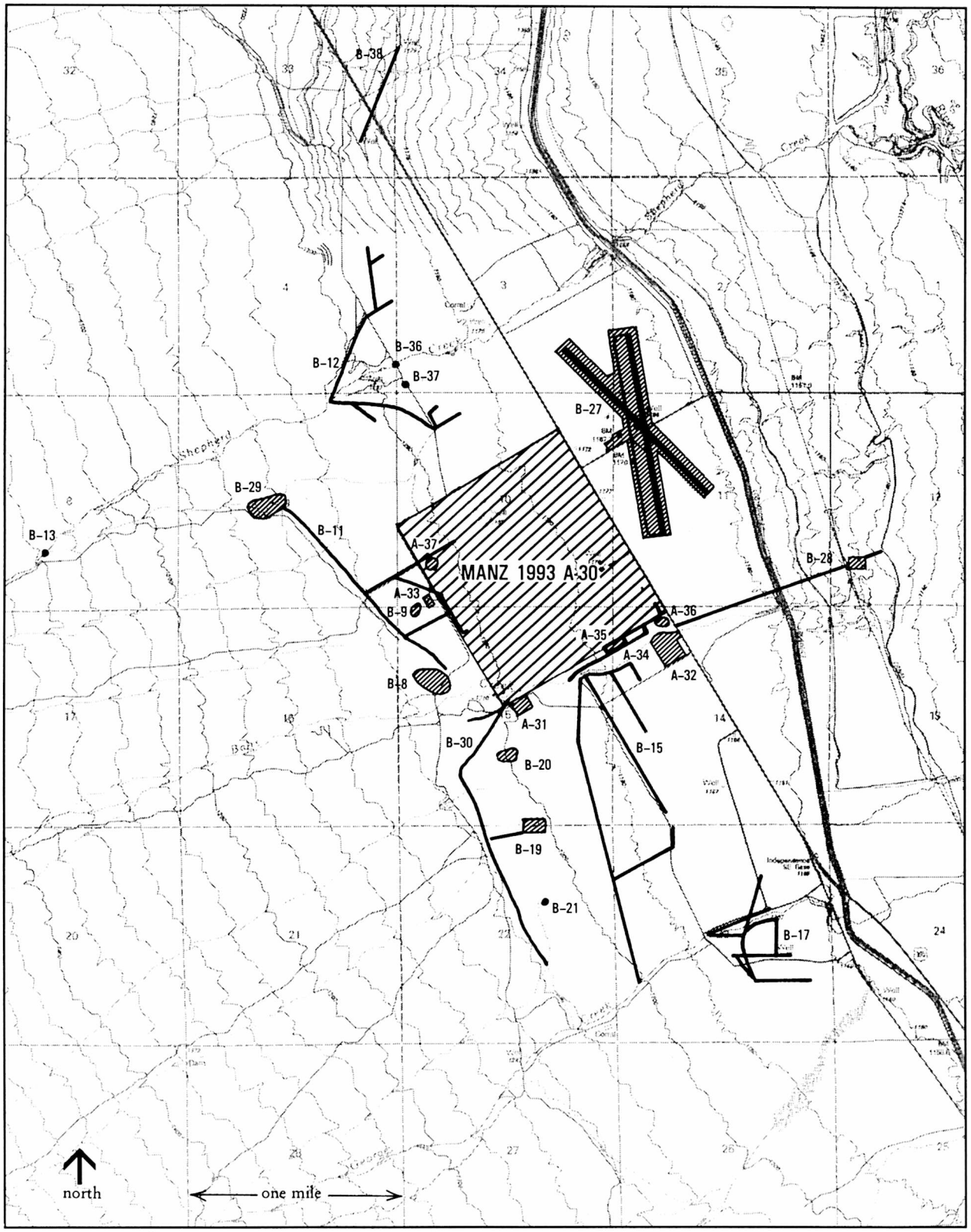


Figure 10.1. Relocation center-era sites recorded at Manzanar National Historic Site and environs. All were recorded in 1993; one-letter prefix is the project designation (adapted from 1982 USGS 7.5 minute maps Bee Springs Canyon, Independence, Manzanar, and Union Wash, California).

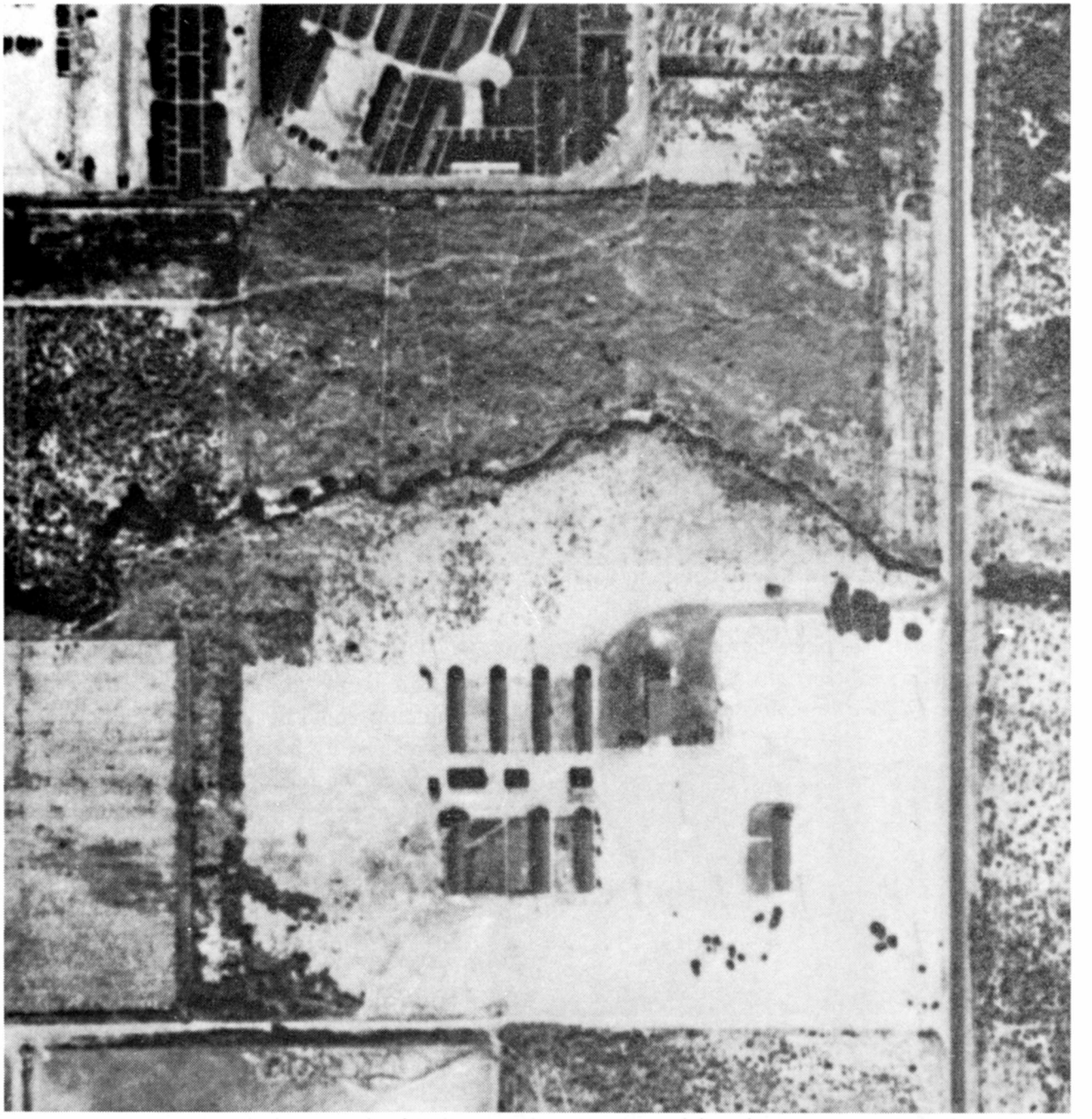


Figure 10.2. 1944 aerial photograph of Military Police Compound (north to top; courtesy of LADWP Bishop Office).

Military Police Compound
(MANZ 1993 A-32)

The military police compound, beyond the southeast quarter of the relocation center central area, was recorded as site MANZ 1993 A-32. The site covers an area of 17.5 acres south of Bairs Creek and west of Highway 395 (Figure 10.2).

Relocation center blueprints depict 13 buildings in this area (see Figure 4.10). These include eight 20 ft by 100 ft buildings (administration building, officers and doctors quarters, recreation building, mess hall, and four barracks) and five smaller buildings (guard house, latrine, first aid building, motor repair shop, and rock sentry house). The

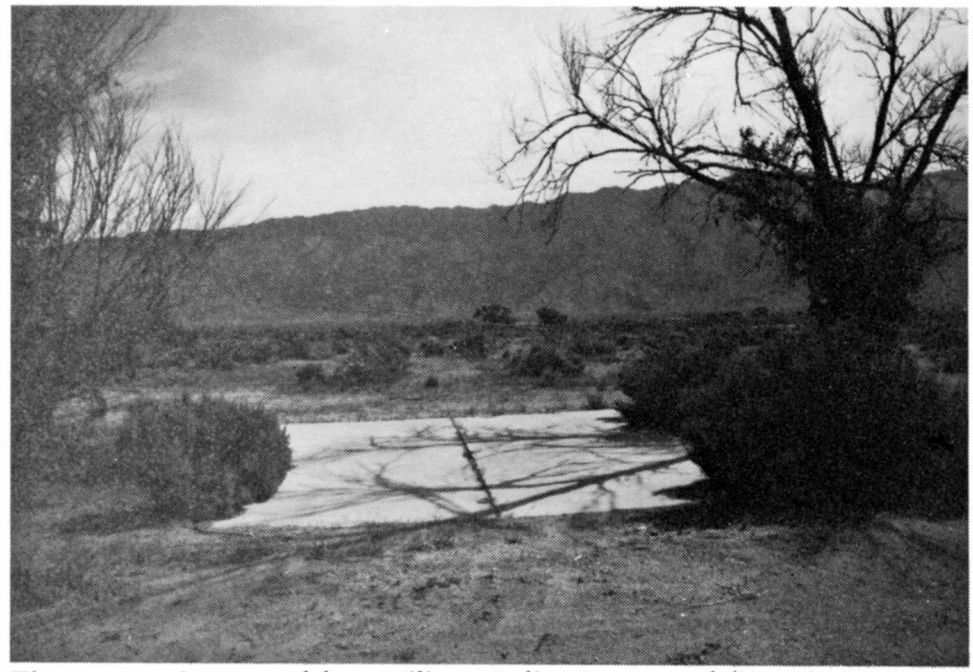


Figure 10.3. Concrete slab at Military Police Compound (MANZ 1993 A-32, Feature 4).

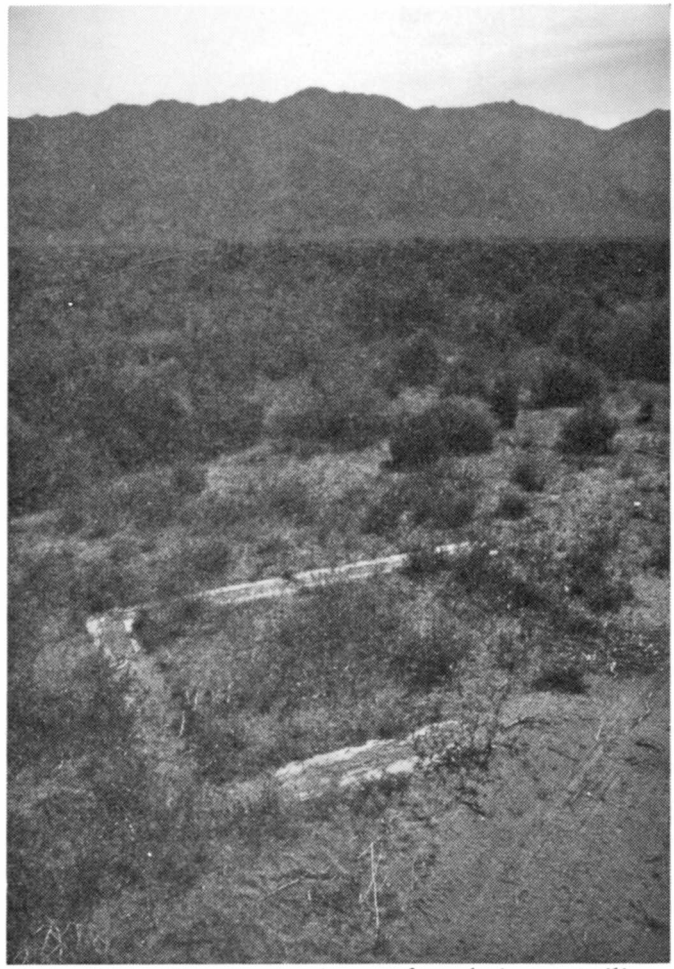


Figure 10.4. Concrete perimeter foundation at Military Police Compound (MANZ 1993 A-32, Feature 6).

locations of all, except the rock sentry building, could be discerned. Barracks could be defined by level areas, some with a few concrete footing blocks. The guard house (military personnel jail), latrine, and first aid buildings were evident by concentrations of wire nails, concrete chunks, and other structural debris. Most of the sizable rocks at the site have traces of white paint on them.

Six archeological features were designated at the site. Feature 1 consists of a series of short rock alignments located west of the mess hall. Feature 2 is a short rock alignment south of (in front) of the westernmost barracks. Feature 3, the former location of the motor repair shop, consists of a terraced area with six substantial concrete foundation blocks with embedded iron bars. Artifacts in the vicinity include a small electric motor core, over 25 metal bushings, and an electrical porcelain knob. Feature 4 is a 20 ft by 25 ft concrete slab (Figure 10.3) inscribed with three sets of initials (see Appendix A). No building is shown on the blueprints at this location, however the slab is visible on the

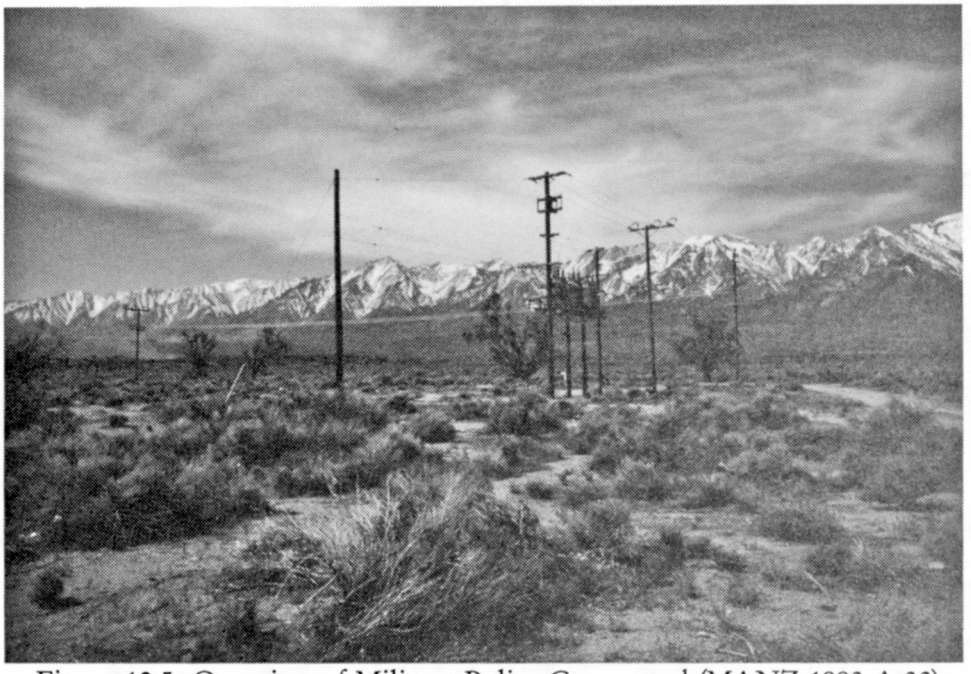


Figure 10.5. Overview of Military Police Compound (MANZ 1993 A-32).

1944 aerial photograph (see Figure 9.2). Feature 5 consists of rock alignments that outline a walkway and small yard west of the officers quarters. Feature 6, located south of the barracks area, is a 1-ft-wide concrete perimeter foundation, 7½ ft by 9½ ft in size (Figure 10.4). Three sewer manholes are still intact, others appear to have been destroyed.

Three artifact concentrations were noted at the site. One contains about 100 whiteware plate fragments, at least 100 brown glass fragments, and three sanitary seal cans (Locus A). The other two (Loci B and C) are recent trash dumps that include aluminum-top beer cans. Scattered throughout the area are hundreds of wire nails, over 100 sanitary seal cans, clear, brown, and blue glass fragments, whiteware fragments, a few fragments of purple glass, a clear medicine bottle with a plastic cap, crown caps, smooth wire, .22 caliber shell casings, concrete chunks, brick fragments, lumber fragments, powerpole hardware (nuts and bolts), and electrical porcelain fragments. There are no apparent subsurface historical remains.

The site has been subjected to a number of impacts. There is a large inline voltage regulator (transformer) on site and a powerline, several roads, a buried Contel fiber optics line, and a barbed wire fence cross the site (Figure 10.5). There are several small piles of recent trash and a pile of recently discarded roofing shingles within the site. The area around the transformer and the road leading to it from the highway appear to have been recently graded.

Reservoir

(MANZ 1993 B-29)

This site, covering about 8 acres of BLM land one-half mile northwest of the central portion of the relocation center, consists of the relocation center water reservoir and associated features. Relocation center blueprints depict an 800,000 gallon concrete reservoir, a settling basin, a sand trap, a chlorine house, and a store house (see Figure 4.10). The concrete reservoir replaced an unlined reservoir located downstream that was originally constructed for the

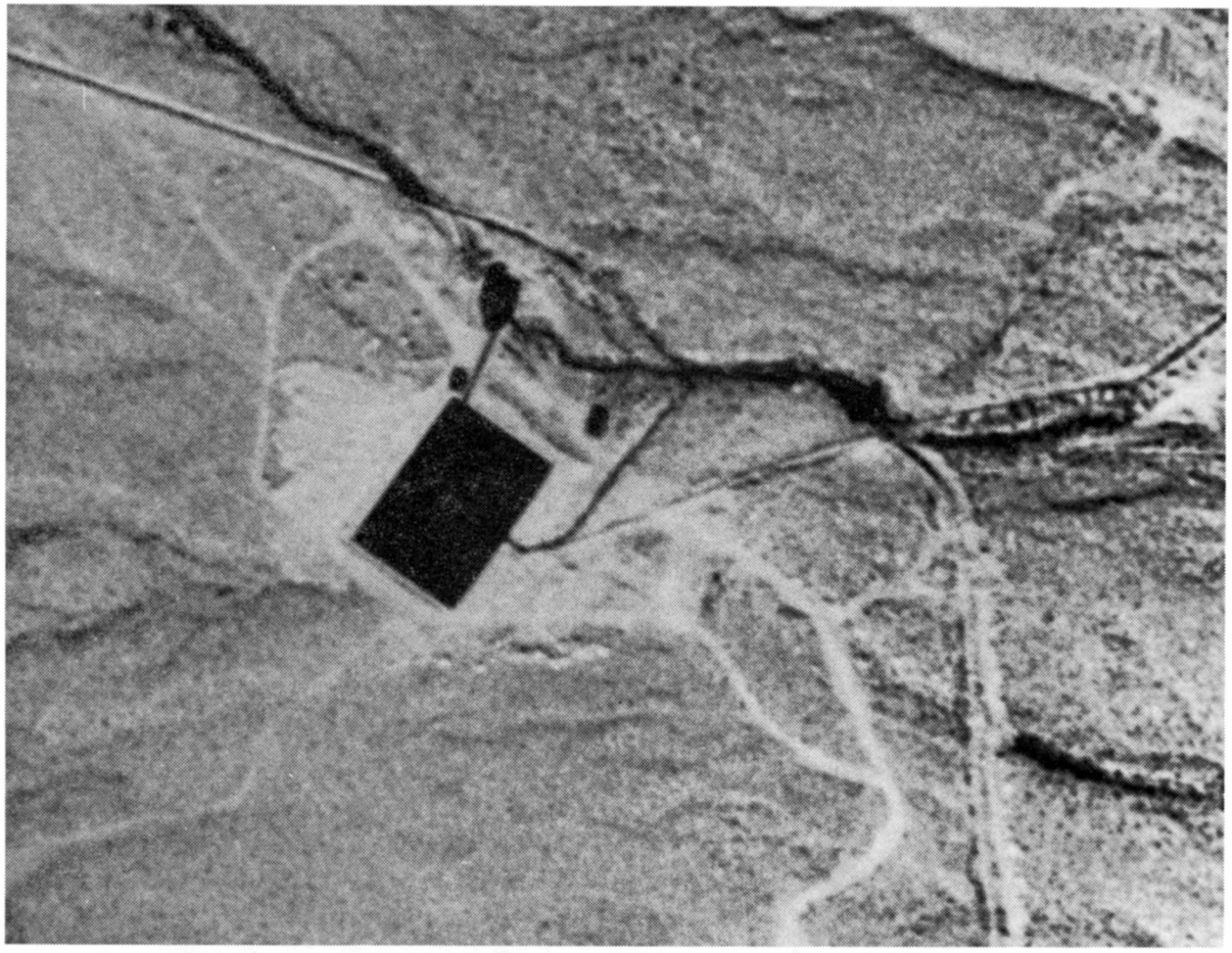


Figure 10.6. 1944 aerial photograph of the relocation center reservoir (north to top; courtesy of LADWP Bishop Office).

town of Manzanar. Water was transported to the reservoir from Shepherd Creek by means of an unlined ditch from a dam (see Shepherd Creek Dam, MANZ 1993 B-13, below) a little over a mile west. Most of the ditch has the appearance of a natural drainage, but the lower portion, near the reservoir, appears straightened; it may have been improved when the reservoir was built (Figure 10.6). The drainage originally diverted water from Shepherd Creek to the earlier dam below the reservoir where the flow was directed into pipes serving the town of Manzanar.

Thirteen features were designated at the site (Figure 10.7). Feature 1 is the concrete reservoir. It consists of a 120 ft by 180 ft concrete-lined pool with embankments sloping at 45 degrees (Figure 10.8). Two 14-inch "calico gates" regulated the outflow of water, one into a central spillway and another into a 14-inch supply line. The Reservoir was built under contract by Los Angeles contractors Vinson and Pringle (Merritt 1946). To raise the water level a low stone and concrete wall was added by an internee work crew in February 1943. Several inscriptions were made in the wet concrete of the low cap wall (Figures 10.9 and 10.10). These include Japanese characters, names and dates, and the notation "STONE WALL BY EMERGENCY CREW 2/25/43" made of embedded pebbles (see Appendix A).

Feature 2 is a large boulder along a dirt road on the west side of the reservoir plastered with a thin layer of cement and inscribed while wet with the Japanese character for "peace" (Figure 10.11).

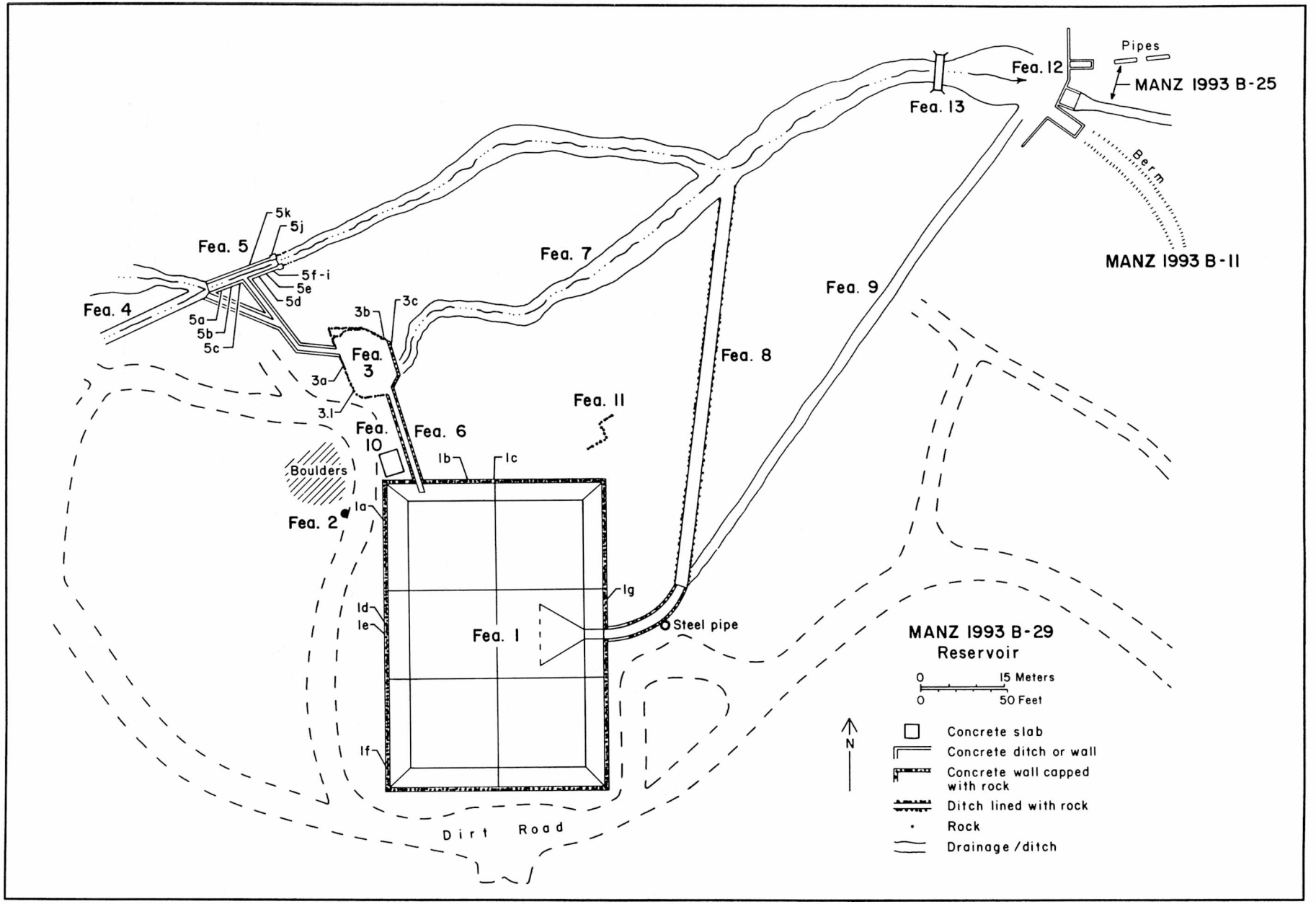


Figure 10.7. Relocation Center Reservoir (MANZ 1993 B-29).

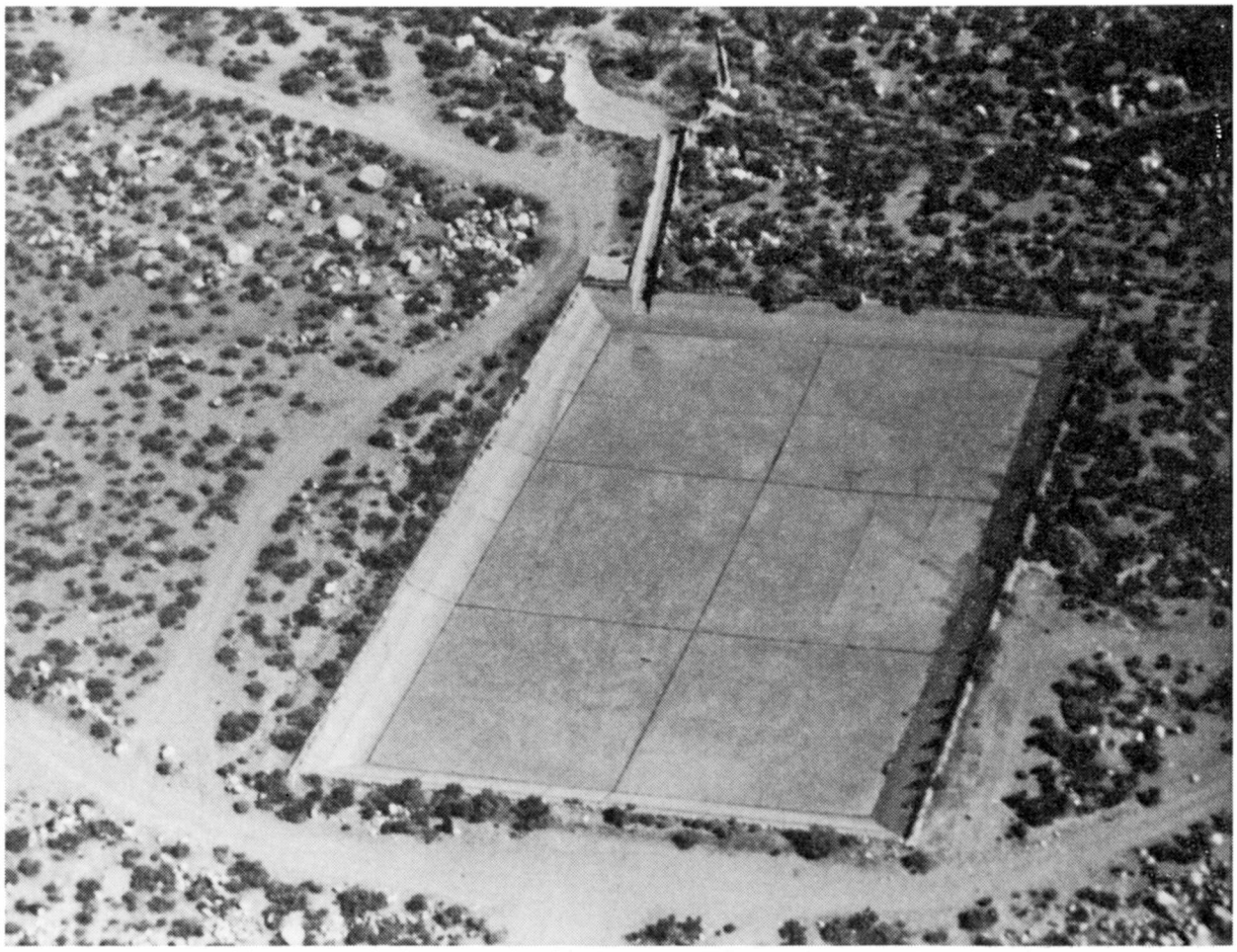


Figure 10.8. 1993 oblique aerial photograph of Relocation Center Reservoir (north to top; MANZ 1993 B-29, Feature 1).

Feature 3 is an irregularly shaped concrete-lined settling basin, approximately 75 ft by 80 ft. On the east end there is a concrete wall with an opening to the reservoir and a spillway for bypassing the reservoir (Figure 10.12). The edges of the basin are capped with rock and concrete. Several areas along the wall have bottle caps pressed into the concrete. Three groups of inscriptions made while the concrete was wet are on the settling basin sidewall. All Japanese characters, they have been translated as "the army of the emperor occupied territory, 2/17/43, to Manzanar," "banzai, the Great Japanese Empire, Manzanar Black Dragon Group headquarters," and "beat Great Britain and the USA" (see Appendix A, Figures 10.13 and 10.14).

Feature 4 is the straightened portion of the unlined ditch that directed water from Shepherd Creek to within 125 feet of the reservoir. At the end of the unlined ditch is a short section of massive-walled concrete ditch (Feature 5). This section of ditch is noted as the sand trap on the blueprints. A forked concrete- and rock-lined ditch directed water from the concrete ditch to the settling basin (Figure 10.15). The Feature 5 ditch itself could be used to bypass the reservoir and direct water and trapped sediments back towards Shepherd Creek. Numerous inscriptions were made on top of the ditch wall while the concrete was wet. Included are names, dates, Japanese characters, and the notation "CONSTRUCTED BY CHODO & INC. NOV. 9 '43" (Figures 10.16–10.19).



Figure 10.9. Inscription at Relocation Center Reservoir (MANZ 1993 B-29, Feature 1c).



Figure 10.10. Inscription at Relocation Center Reservoir translated as "loyal to the emperor and love the county" (MANZ 1993 B-29, Feature 1g).

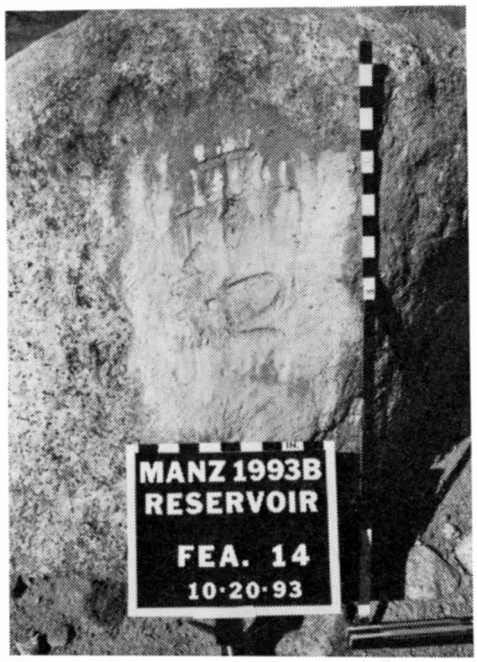
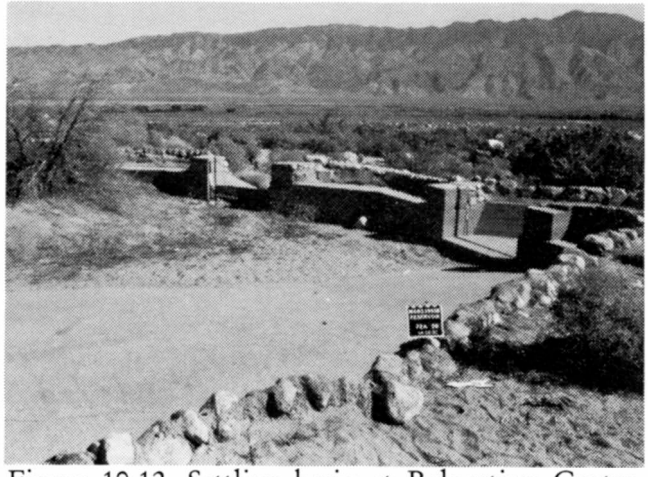


Figure 10.11. Inscription at Relocation Center Reservoir translated as "peace" (MANZ 1993 B-29, Feature 2a).


Figure 10.12. Settling basin at Relocation Center Reservoir (MANZ 1993 B-29, Feature 3).

Feature 6 is a concrete channel, capped with rock and concrete, connecting the settling basin and reservoir. Feature 7 is a drainage channel that carries overflow from the settling basin to the old town dam. Feature 8 is a ditch from the east side of the reservoir to the old town dam. The initial portion of the ditch is concrete with a concrete and rock cap; the remaining portion is only rock-lined. Feature 9 is an earthen ditch from the east side of the reservoir to the old town dam.

Feature 10 is a concrete slab approximately 7 ft by 10 ft at the northwest corner of the reservoir (Figure 10.20). This is apparently the foundation of the chlorine shed shown on the relocation center blueprints. Artifacts in the vicinity of Feature 10 include wire nails, window glass, roofing, and scattered fragments of drywall and wood. These are likely the remnants of the storeroom shown on relocation center blueprints. Feature 11 consists of rock alignments and concentrations of structural material at the northeast corner of the reservoir.

Feature 12 is a concrete dam originally built for the town of Manzanar water system which was modified for use by the relocation center (Figure 10.21). All of the area behind the dam (noted as the "old reservoir" on some relocation center blueprints) has been silted in. The dam originally appears to have had two concrete weir boxes incorporated into it to divert water into concrete pipelines that carried water to the north and south. The dam also has a central spillway that has been modified to connect to a concrete ditch (see Town of Manzanar Water System, in Chapter 12). The southern weir box has been completely replaced by a larger newer-looking weir box (Figure 10.22). This newer box was used to divert water to the relocation center. It was likely built by the Los Angeles Department of Water and Power when they constructed a steel pipeline and water storage tank for the relocation center in 1942 (Features 1 and 6 of MANZ 1993 B-11, below). Its use was probably discontinued when the concrete reservoir was completed upstream. There is a dilapidated wood footbridge and associated rock retaining walls (Feature 13) just upstream of the dam.

Artifacts noted during survey in the reservoir vicinity consist of two metal barrel hoops, a stovepipe collar, salt-glazed ceramic pipe fragments, the front of a metal file cabinet drawer, a



Figure 10.13. Settling basin inscription translated as "beat Great Britain and the USA" (MANZ 1993 B-29, Feature 3b).



Figure 10.14. Settling basin inscription translated as "banzai the great Japanese Empire Manzanar Black Dragon Group headquarter" (MANZ 1993 B-29, Feature 3c).

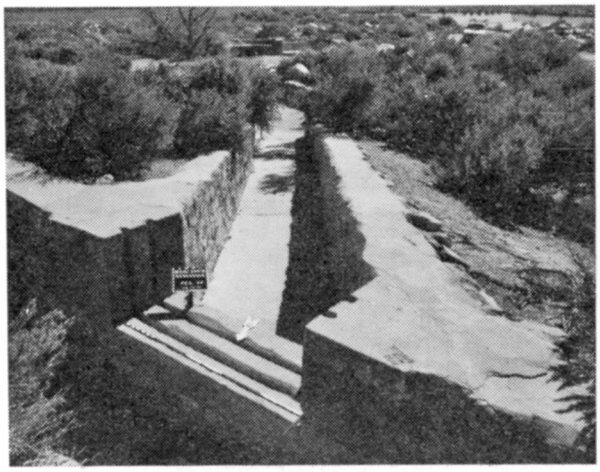


Figure 10.15. Concrete-walled ditch (MANZ 1993 B-29, Feature 5).



Figure 10.16. Inscriptions on concrete-walled ditch (MANZ 1993 B-29, Feature 5b).

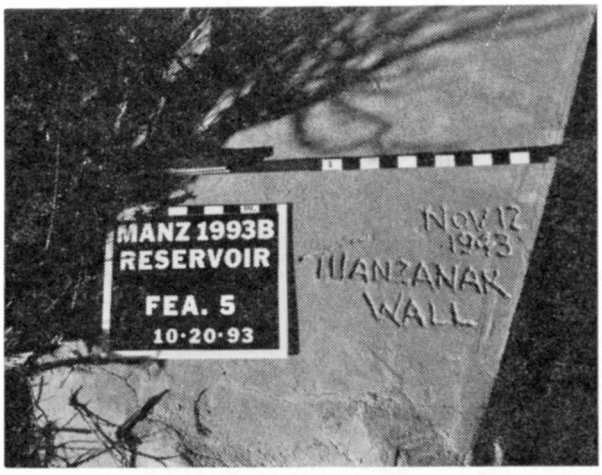


Figure 10.17. Inscriptions on concrete-walled ditch (MANZ 1993 B-29, Feature 5e).



Figure 10.18. Inscriptions on concrete-walled ditch (top to right) translated as "November 16, 1943 Nakahama" (MANZ 1993 B-29, Feature 5h).

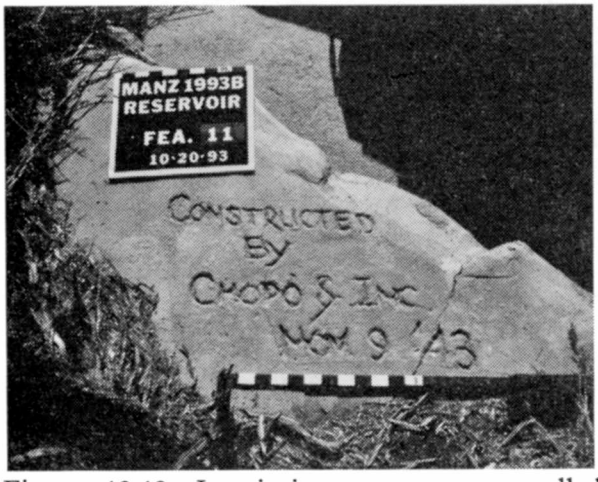


Figure 10.19. Inscriptions on concrete-walled ditch (MANZ 1993 B-29, Feature 5k).

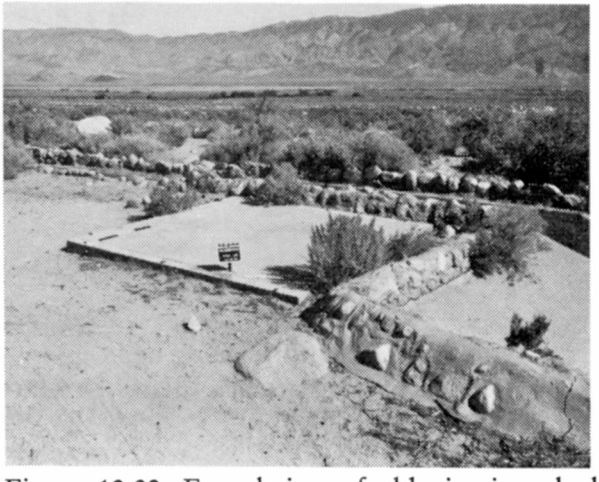


Figure 10.20. Foundation of chlorination shed (MANZ 1993 B-29, Feature 10).

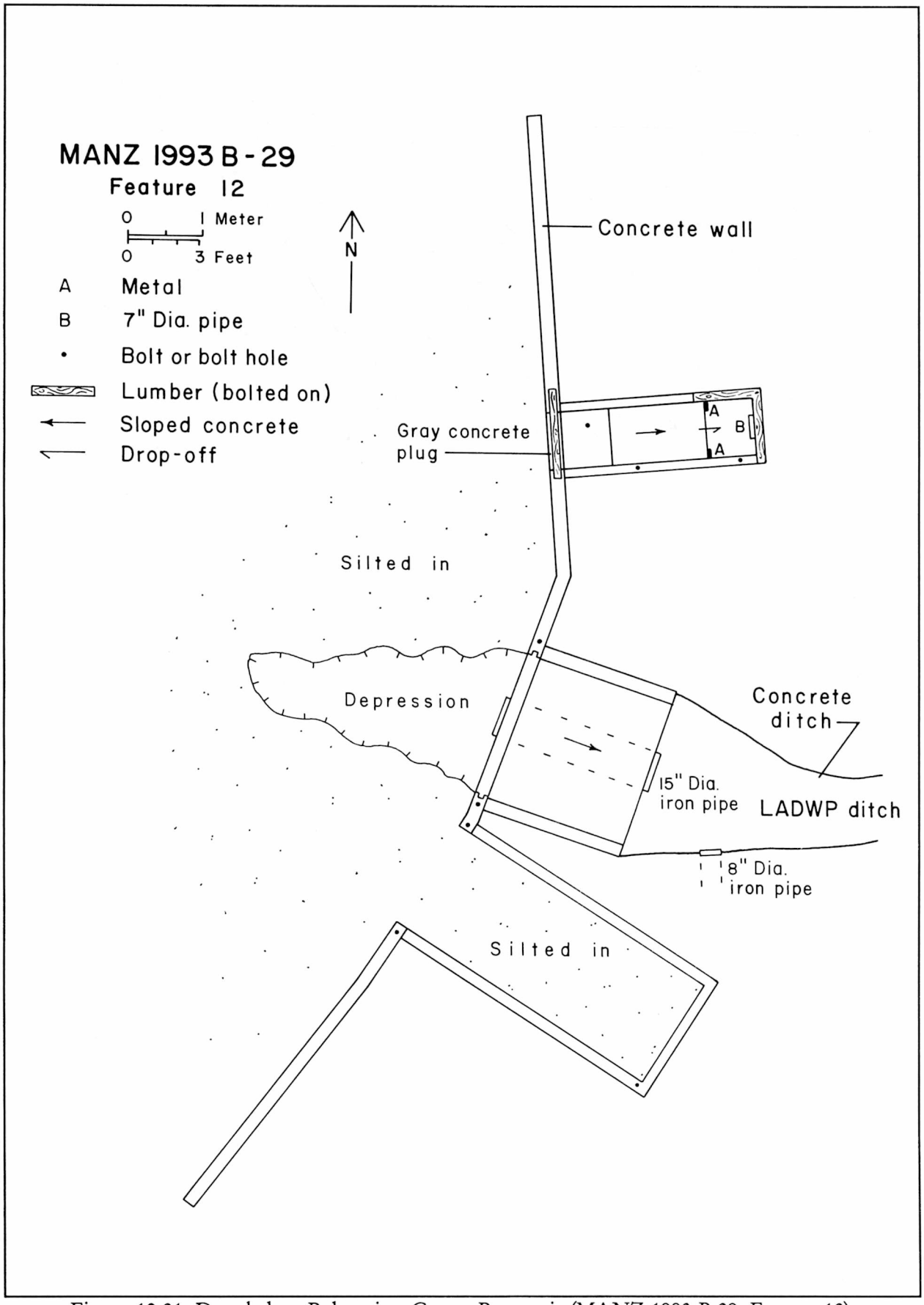


Figure 10.21. Dam below Relocation Center Reservoir (MANZ 1993 B-29, Feature 12).

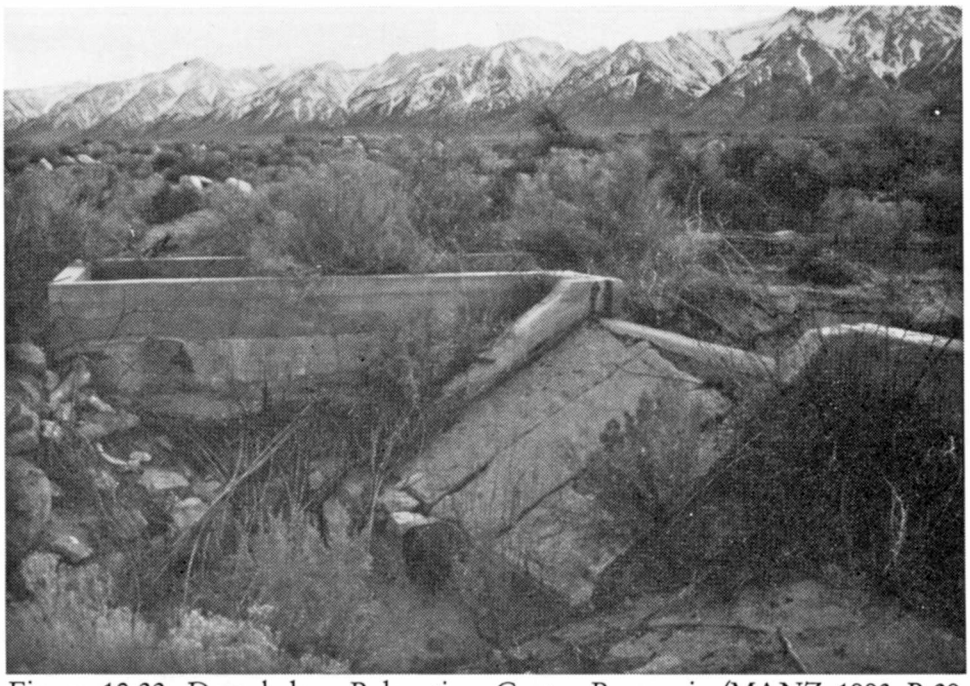


Figure 10.22. Dam below Relocation Center Reservoir (MANZ 1993 B-29, Feature 12).

large metal can, a few stoneware fragments, a large wooden screen, a tar canister, and a square metal lid. Recent litter (beer cans, bottles, etc.) is abundant near roads and parking areas.

Water Delivery System
(MANZ 1993 B-11)

The water distribution system supplied both drinking water and victory garden irrigation water to the relocation center. A steel pipeline carried water from the reservoir to both the irrigation ditch system and a chlorination tank 1/4 mile west of the relocation center's central area.

The site includes over 15,500 linear feet (2.9 miles) of open concrete- and rock-lined ditches and buried concrete pipelines, several concrete weir boxes, the concrete slab foundation of the chlorination tank, and other remains. All of the ditches are easy to follow, although many sections are damaged or silted in. Over half of the system is on BLM land.

Feature 1 is the largest ditch segment, which originally held a steel pipeline that ran from the relocation center reservoir to the chlorination tank. All of the pipe has been removed. What remains is a ditch over 4 ft wide by 3 ft deep paralleled by a berm on both sides for its entire length. The berm incorporates rock and other support material in some areas. Records indicate that the chlorination tank and steel pipeline were built for the relocation center by the Los Angeles Department of Water and Power (Merritt 1946).

Feature 2 consists of ditches that carry part of the water from the main pipe alignment to irrigate victory gardens within the central area of the relocation center (Figure 10.23). The ditches average 3 ft wide at the top and 1 ft wide at the bottom and are 1½ ft deep. Segments of concrete pipe are used to span washes. The first ditch is diverted from the pipeline approximately 2,960 feet southeast of the reservoir at a concrete weir box (Figure 10.24). Because the pipe itself has been removed, it is not clear how water was discharged from the pipeline to the weir box. East 700 feet along this ditch there is a concrete diversion box where another ditch segment turns

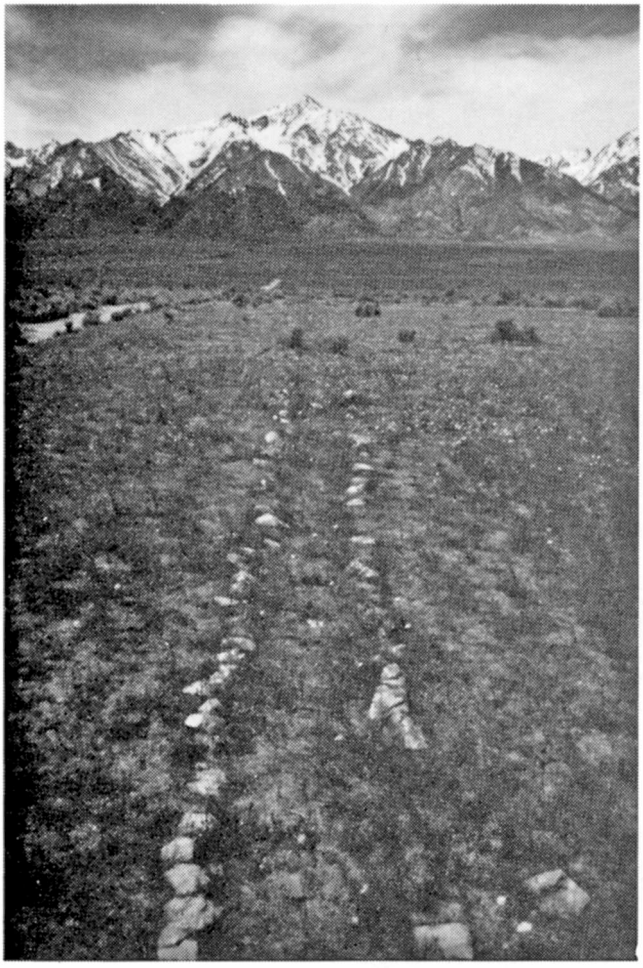


Figure 10.23. Irrigation ditch to victory gardens (MANZ 1993 B-11, Feature 2).

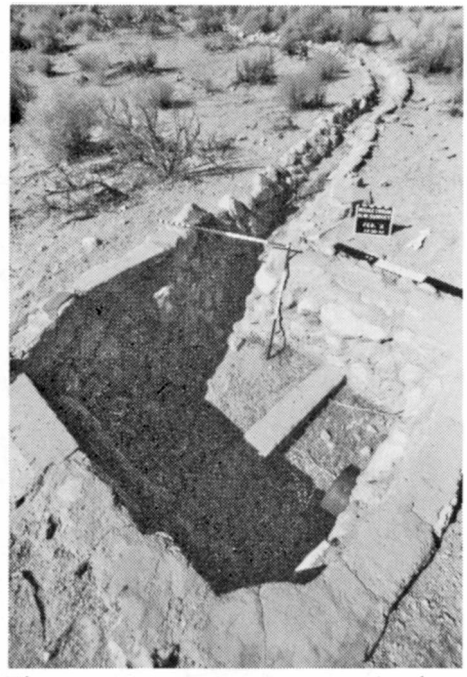


Figure 10.24. Concrete weir box (MANZ 1993 B-11, Feature 2).

off to the southeast. Along Feature 2 there are segments of metal pipe, fragments of glazed pipe, a square meat tin, corrugated tin (possibly a section of roofing), and a clear glass jar.

Feature 3 is a ditch that starts at the chlorination tank slab and heads east. The ditch probably held a steel pipeline for the relocation center water system that was dug up and removed when the center was closed. There is a concrete weir box along this ditch on the south side of the relocation center cemetery. Feature 4 is a concrete pipeline that runs from the chlorination tank to the southeast. This pipeline passes the east side of the relocation center landfill, where there are two concrete weir boxes, and then turns east toward the relocation center. The town of Manzanar used concrete irrigation pipe, and Feature 4 may be a remnant of that system.

Feature 5 consists of structural debris on the west side of the main pipeline ditch about 1,300 feet southeast of the reservoir. The area appears to have been bulldozed, but roofing, lumber (25 boards), drywall, six concrete footings, and metal hardware remain. An area 100 ft by 50 ft, possibly a structure location, appears burned. To the north of the burned area there is an eroding pit containing 10 ladles, 10 rectangular roasting or baking pans, two large 20-quart cooking pots, two round tubs, 32 ceramic fragments, a hinge and latch, two stovepipe collars, and wire nails. Relocation center records give no clue about the original function, and the location may have been a secondary disposal site.

Feature 6 is the chlorination tank concrete slab and surrounding area. The chlorination tank slab is 10-sided and 30 feet in diameter (Figure 10.25). Lines of rust stain the slab, marking where the seams on the bottom of the chlorination tank rested. There is a wood platform, now displaced, on the south side of the slab. Around the slab there are rock retaining walls and on the north

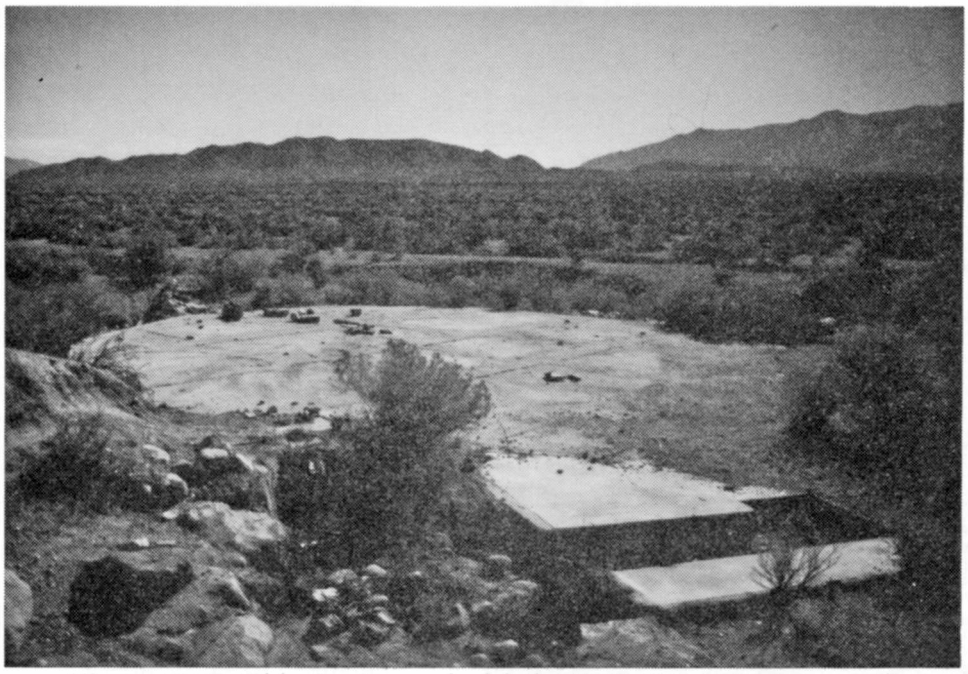


Figure 10.25. Chlorination tank slab (MANZ 1993 B-11, Feature 6).



Figure 10.26. Inscription at chlorination tank slab translated as "February 11, 1943 National Foundation Day" (MANZ 1993 B-11, Fea. 6b).

side of the slab there is a 4 ft by 5 ft slab with an L-shaped outlet that opens to a possible overflow ditch. The ditch runs along the west side of a north-south berm and is concrete-lined for the first 40 feet. Names, dates, and Japanese characters are inscribed in the concrete (see Appendix A, Figure 10.26).

Sewage Treatment Plant

(MANZ 1993 B-28)

The sewage treatment plant, located about 1 mile southeast of the relocation center residential area, covers approximately 4.5 acres (Figures 10.27 and 10.28). It is connected to the relocation center via a 4,600-ft-long sewerline. Seventeen features were designated at the site (Figure 10.29). No significant amount of artifacts were noted during the site recording.

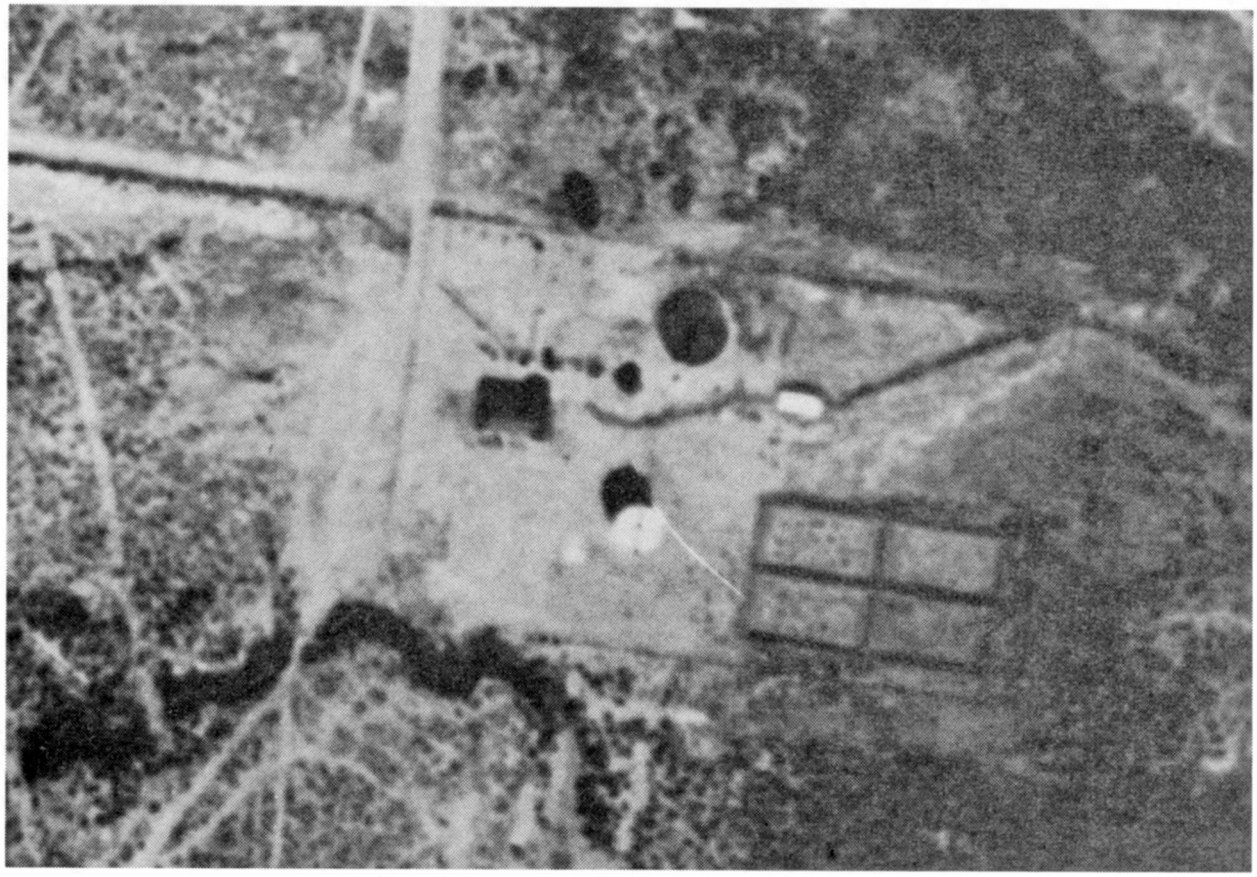


Figure 10.27. 1944 aerial photograph of the Relocation Center Sewage Treatment Plant (north to top; courtesy of LADWP Bishop Office).

Relocation center blueprints identify four of the structures at the plant site: a control house, a digester, a pump house, and a clarifier (see Figure 4.10). Relocation center records identify additional features and this information (Merritt 1946), along with contemporary and recent texts (Babbitt and Baumann 1958; Escritt 1956; Folwell 1936; Fuller and McClintock 1926; Kerri et al. 1992), form the basis of the reconstructed operational diagram in Figure 10.30.

Feature 1 is the remains of the control room, which was used for an office, laboratory, metering, chlorine control, and equipment storage (Merritt 1946). The feature consists of a 3-ft-high concrete slab foundation of a three room structure measuring 30 ft east-west by 60 ft north-south. The foundation is aligned with true north, rather than the skewed north of the relocation center. There are entry steps on the west side. Within the building, trenches in the slab, raised concrete blocks with protruding rebar, and protruding pipes indicate the locations of machinery (Figure 10.31 and 10.32). A 10-ft-long strip of metal imbedded in the floor along the southern edge of the easternmost room may have been a threshold for a garage door opening. Outside the northeast corner on the east side of the foundation there is a small concrete box; sections of six metal pipes protrude through the wall between the main building area and the box. There are remnants of a decorative rock alignment on the north side of the foundation.

Feature 2 consists of the sewage treatment plant headworks (Figure 10.33). It is a series of five



Figure 10.28. 1993 oblique aerial view of the sewage treatment plant (MANZ 1993 B-28).

concrete tanks of variable rectangular proportions connected by 18-inch diameter concrete pipe that totals nearly 220 feet in length. From west (inflow) to east (outflow) the concrete tanks are a bar rack and bypass channel, a grit chamber, a flow meter, a scum diversion box, and a small unidentified box.

The bar rack and bypass channel, 9 ft by 20 ft by 36 inches high, consists of four chambers (Figure 10.34), an inflow and an outflow chamber and two parallel chambers with wall grooves that apparently held bar racks and screens. One of the parallel channels could be used as a bypass channel to allow continued operation while clearing the debris caught by the rack and screens.

The grit chamber is a 7 ft by 17 ft by 36 inch high structure with an interior coating of asphalt; a portion of the box is roofed (Figure 10.35). The sand, gravel, eggshells, and other materials that settled out could have been removed either by hand or mechanically. The presence of a narrow one-course-high brick-lined channel within the box, likely added when flows became extremely low near the end of the relocation center use, suggests the box was cleaned with hand tools, since the brick channel would have impeded specialized mechanical equipment.

The flow meter is within a 6 ft by 18 ft by 45 inch high structure. It has a 24-inch-high steel-lined narrow constriction or "Parshall Flume." Concrete boxes 3 ft by 3 ft on either side of the flume, coated on the interior with asphalt and connected to the flume by 5½-inch-diameter

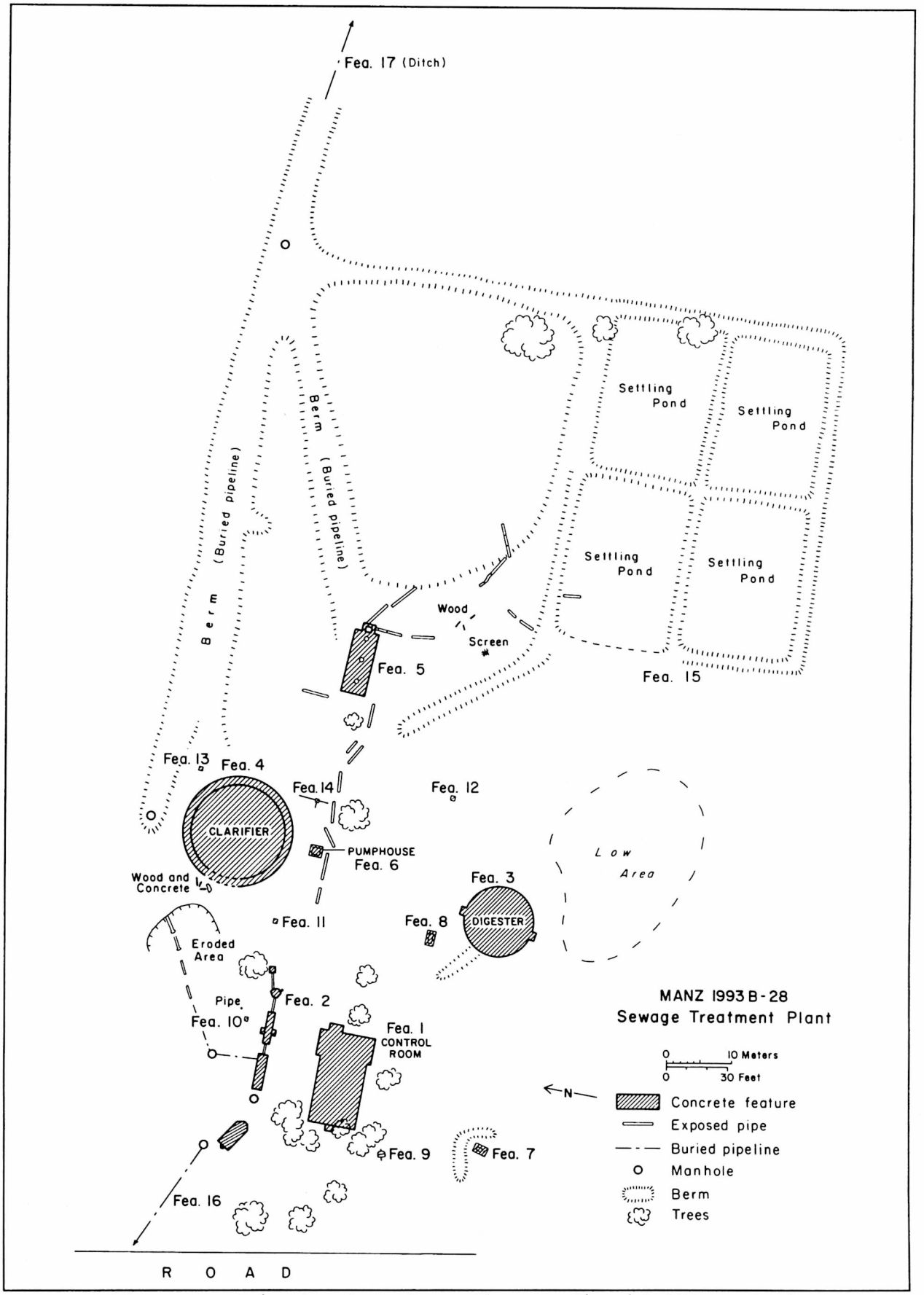


Figure 10.29. Relocation Center Sewage Treatment Plant (MANZ 1993 B-28).

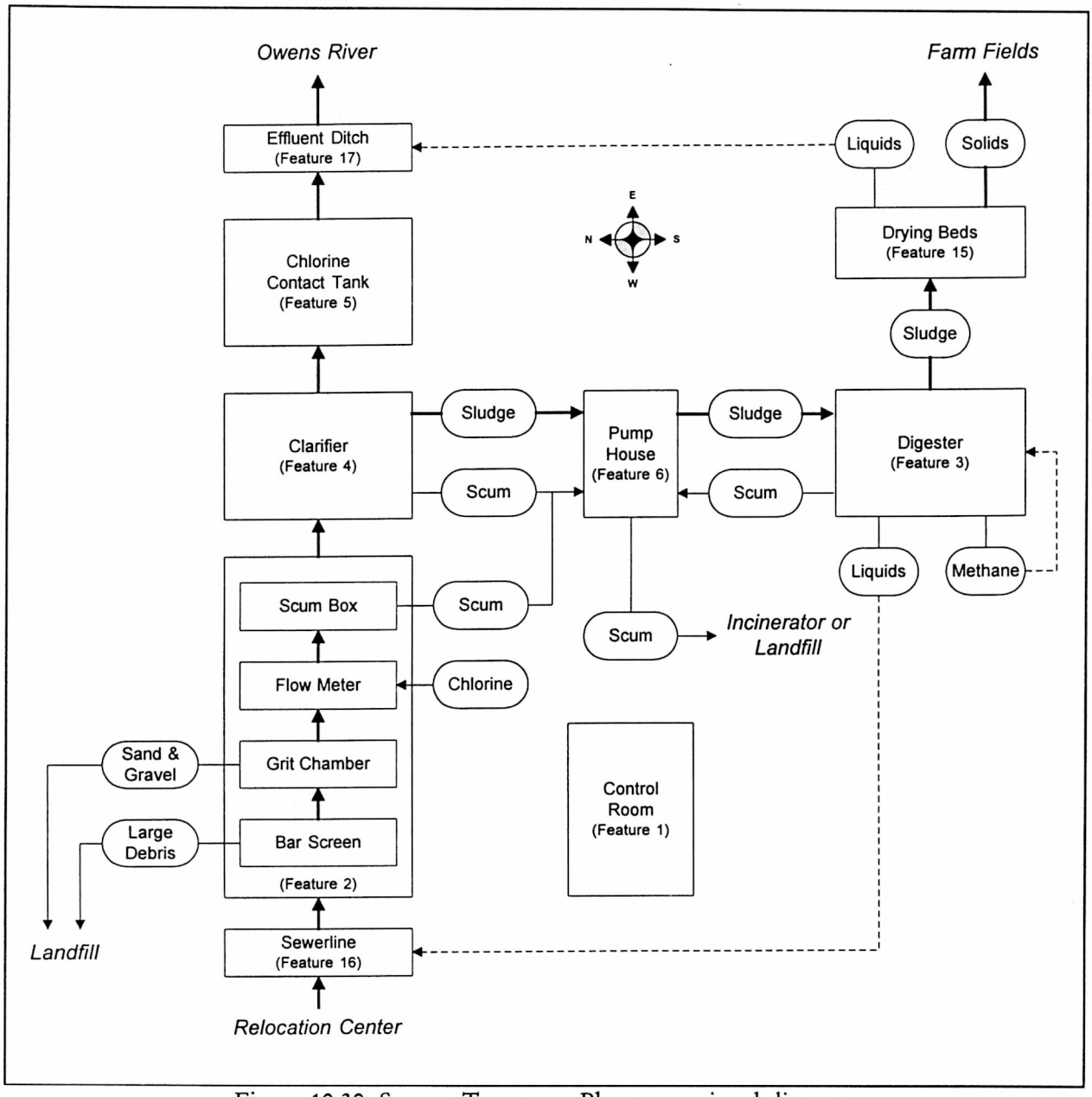


Figure 10.30. Sewage Treatment Plant operational diagram.

pipes, once housed float meters (see Figure 10.35). Pipes entering the box were used to add chlorine.

The 6 ft by 8 ft by 33 high scum diversion box originally had two calico gates (Merritt 1946) to allow the flow to be diverted either to the clarifier or towards the pumphouse. An 18-high diameter pipe enters the box and two 12-inch diameter pipes exit the box. A one-course wall of red brick within the box directs the flow towards the clarifier.

The function of the small concrete box, along the pipe to the clarifier, is not known. It measures 5 ft square and 7 inches high, and is askew the pipeline.

Feature 3 was an anaerobic sludge digester. It is an enclosed tank 42½ ft in diameter and 19½ ft high (Figure 10.36), extending below ground an additional 3½ ft. The tank has about 72 bullet holes on its west side. During operation the tank would have been heated and completely sealed from the air. Concrete protrusions on the north

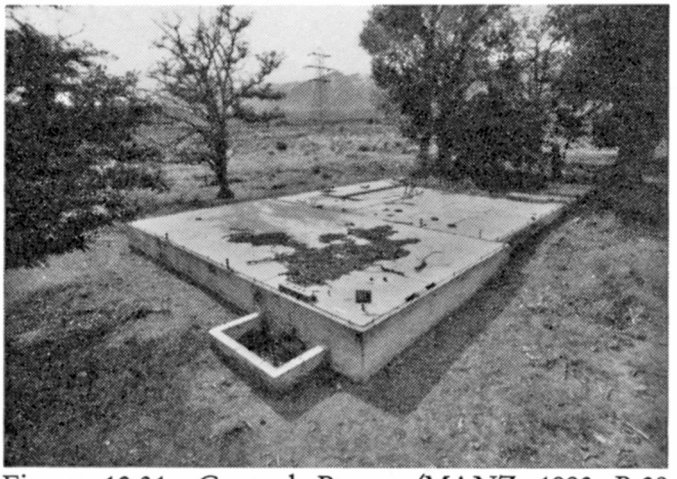


Figure 10.31. Control Room (MANZ 1993 B-28, Feature 1).

and south side of the tank likely housed heaters and circulation pumps (Figure 10.37). The end result of the digestion process was sludge, methane, and water. The methane may have been used to fuel the digester heaters and after drying the sludge could be used as fertilizer. Liquids were generally rerun through the treatment process.

Feature 4 was a clarifier (Figures 10.38 and 10.39). It is a partially buried, round open-topped tank approximately 65 ft in diameter, with an interior depth of about 11 ft. One side of the tank is broken out, and all equipment has been removed. Scrapers attached to a rotating arm pivoted slowly around the bottom of the tank, pushing settled sludge to a hopper in the center of the tank (Figure 10.40). Floating scum was removed by a rotating blade at the surface. The sludge was pumped to the digester, the scum was disposed of, and clear water was slowly removed from the tank for further treatment.

Feature 5 was a chlorine contact tank used for disinfection prior to effluent discharge. It is a rectangular concrete box measuring 36½ ft by 16½ ft, and extending 4 ft above the ground surface, with three round manhole-size openings on the top and a small 54½ inch by 60½ inch open concrete box on the outflow (east) end (Figure 10.41). Hollow inside and baffled like a grease trap, the tank appears to extend underground for at least 10 feet. Alignments of riveted metal pipe run east and west from the feature.

Feature 6 is the remains of the pump house. It is a concrete box about 7 ft square by 7 ft high, which presumably once housed sludge and scum pumps.

Both Features 7 and 8 are concrete boxes measuring 7 ft by 4 ft by 1/2 ft high, of unknown function. Feature 7 is enclosed on the north and east sides by a low berm. Features 9 through 13, located throughout the site, are possibly light fixture foundations. Each consists of a 30-inch-square concrete block with a protruding metal pipe. Feature 14 is a buried electrical junction box near the clarifier which has been exposed by soil deflation.

Feature 15 consists of four 50 ft by 100 ft rectangular settling ponds grouped together to form a larger 100 ft by 200 ft rectangle. A raised berm, originally 3½ ft high (Merritt 1946) defines the outer edge and the interior intersecting quarters of the ponds. Remnants of asphalt remain on the berms.

The ponds were evidently never used as settling ponds due to LADWP concerns that ducks landing on the ponds would spread contamination to the L.A. Aqueduct (*Owens Valley Progress*, 6/11/43). Instead, treated sewage (effluent) was discharged into the Owens River bed by means of an unlined ditch (Feature 17). The ponds were reportedly used as sludge drying beds (Merritt 1946), however in the 1944 aerial photograph they appear to have vegetation growing in them (see Figure 10.27).

Feature 16 is the sewerline that runs east from the relocation center to Feature 2 at the sewage treatment plant, a distance of approximately 4,600 feet (0.9 mile). West of the L.A. Aqueduct the pipeline is below ground paralleling a dirt

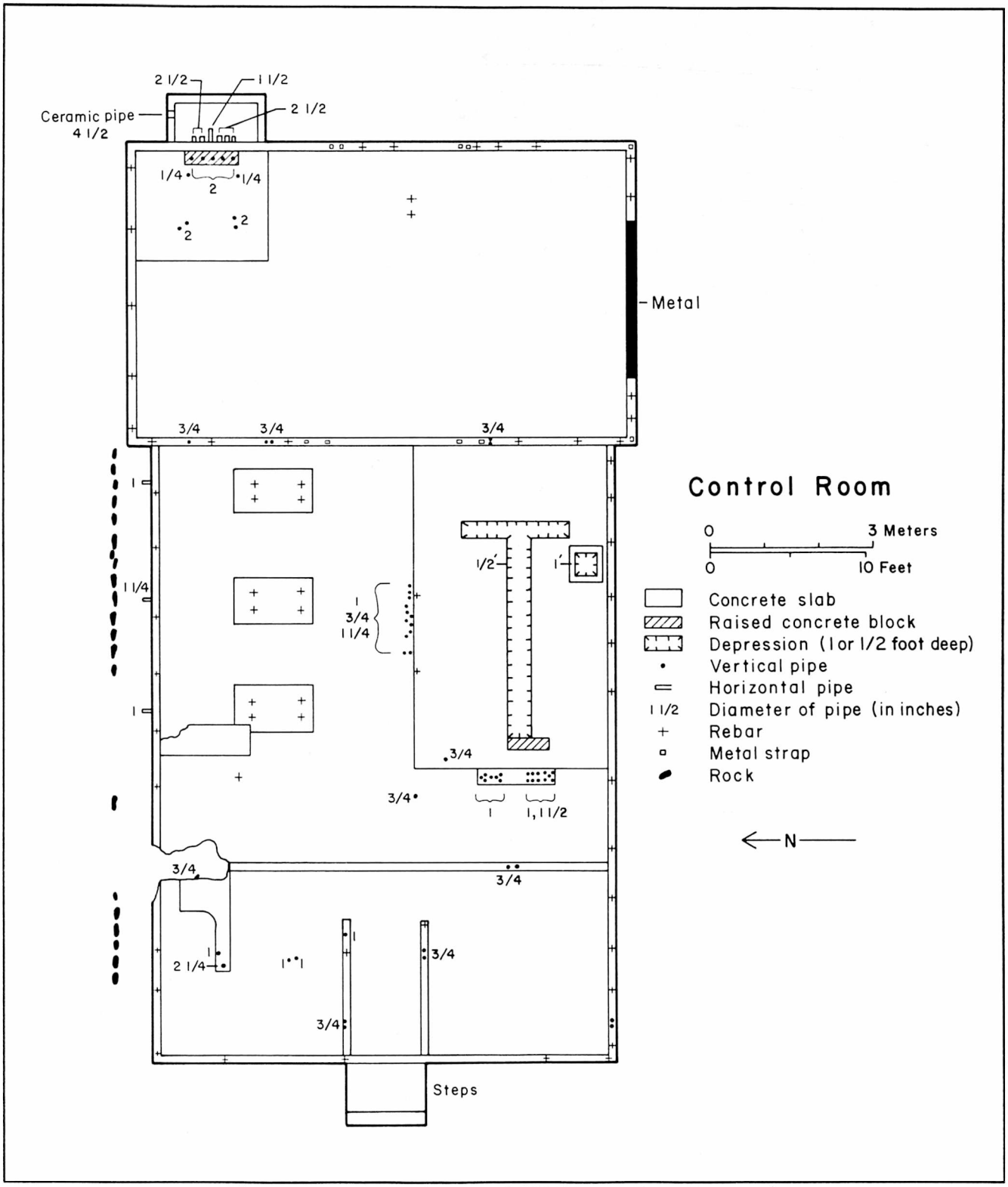


Figure 10.32. Control Room (MANZ 1993 B-28, Feature 1).

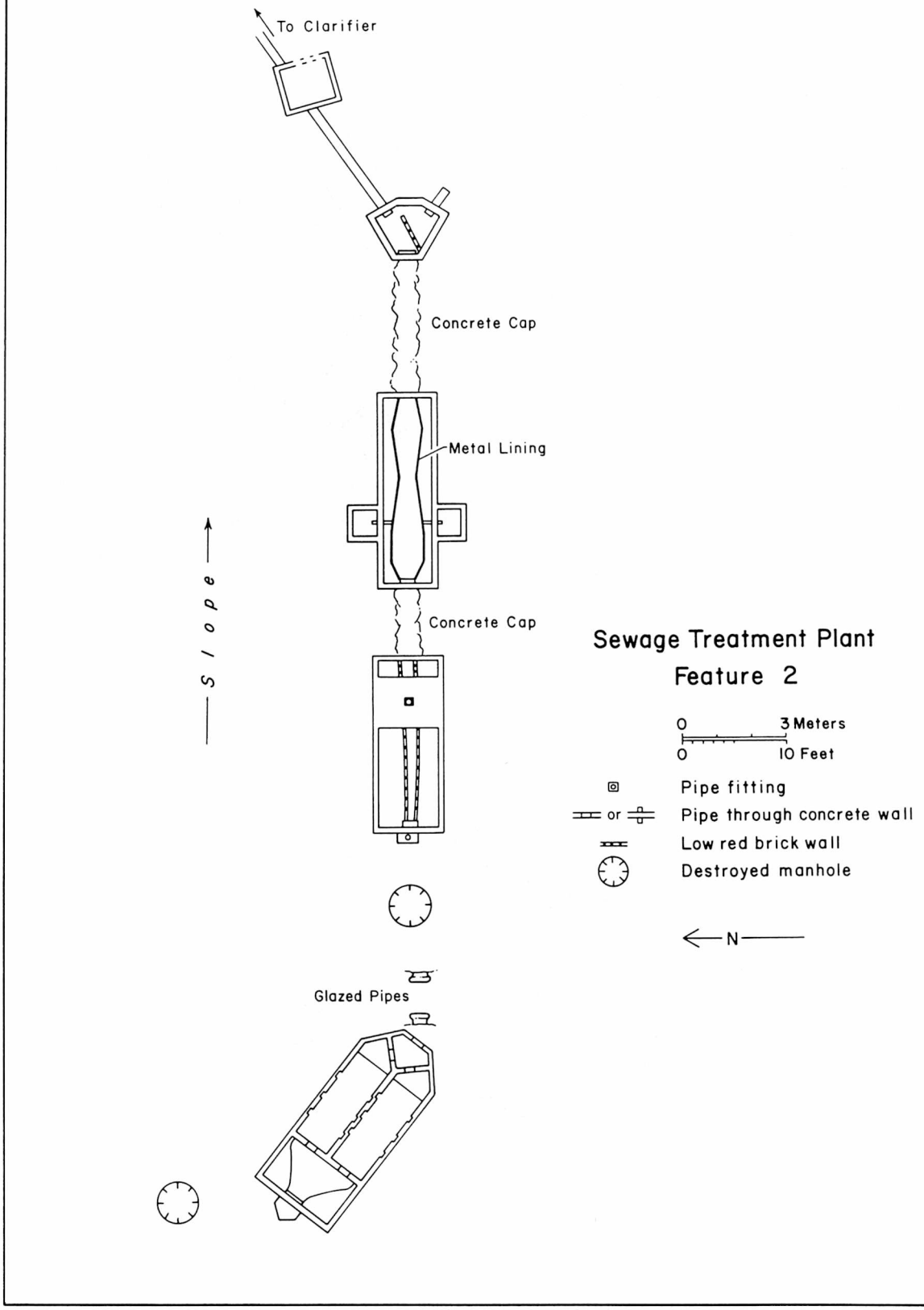


Figure 10.33. Sewage Treatment Plant headworks (MANZ 1993 B-28, Feature 2).



Figure 10.34. Detail of headworks showing bar rack and bypass channel (MANZ 1993 B-28, Feature 2).

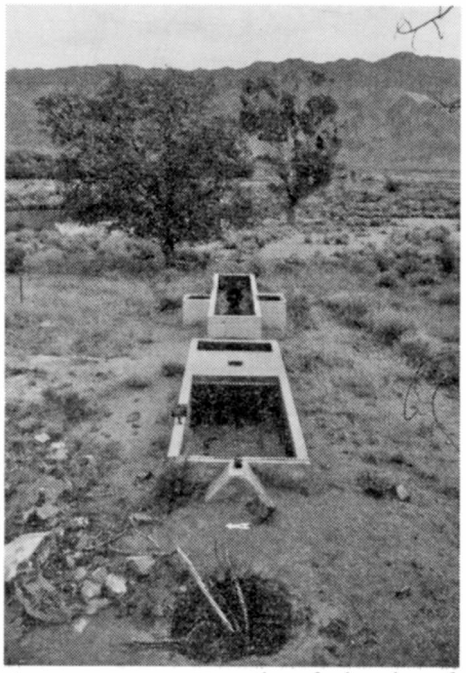


Figure 10.35. Detail of headworks showing grit chamber and flow meter structure (MANZ 1993 B-28, Feature 2).

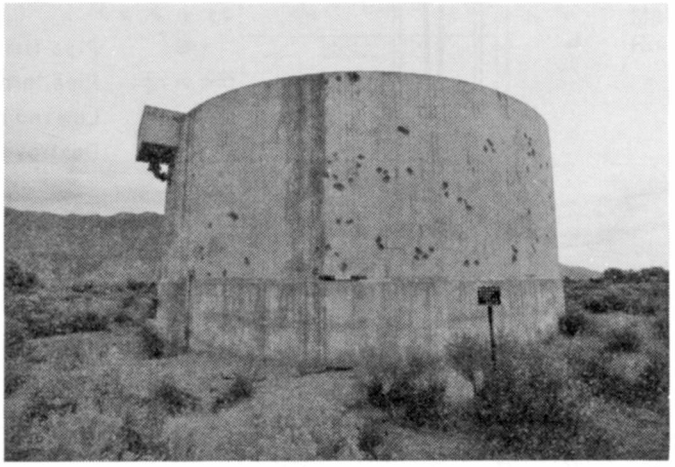


Figure 10.36. Digester (MANZ 1993 B-28, Feature 3).

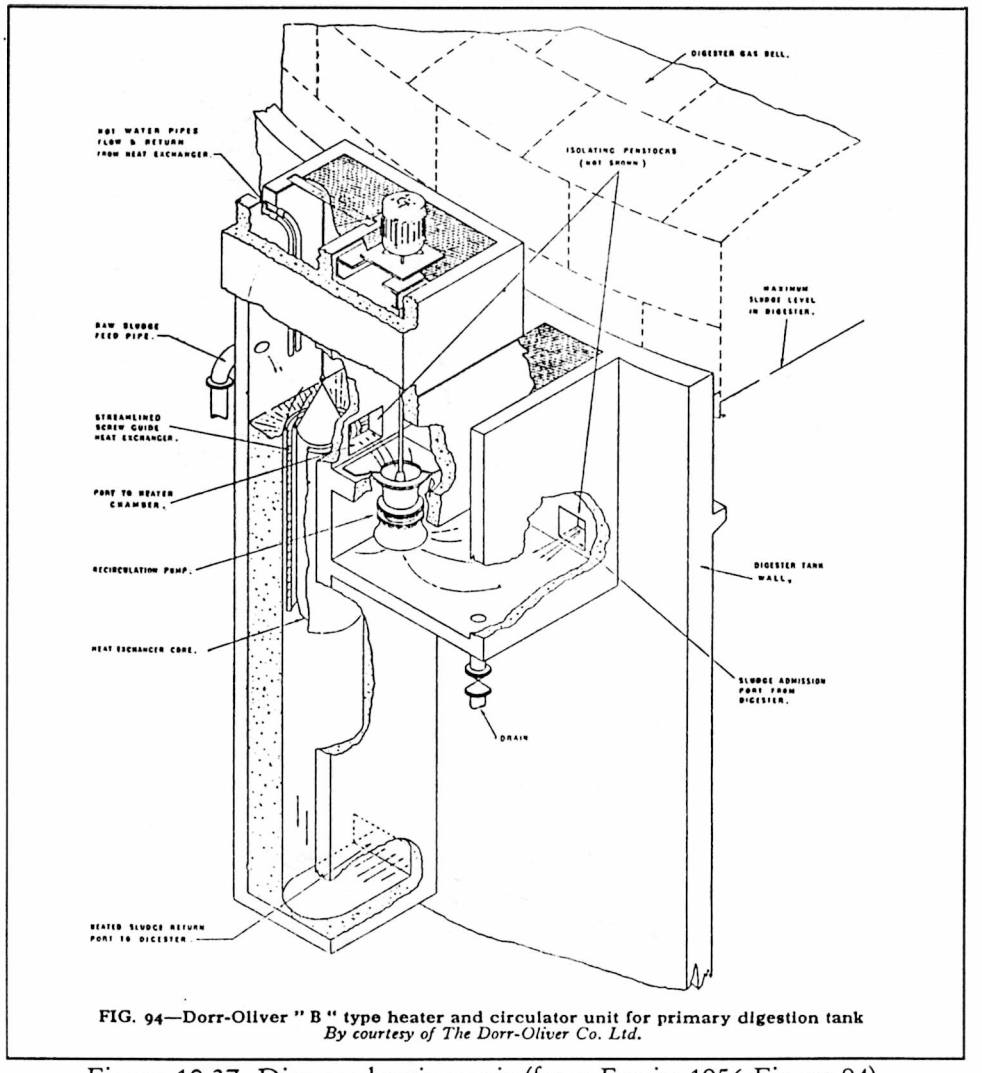


FIG. 94—Dorr-Oliver " B " type heater and circulator unit for primary digestion tank
By courtesy of The Dorr-Oliver Co. Ltd.

Figure 10.37. Digester heating unit (from Escritt 1956:Figure 94).



Figure 10.38. Clarifier (MANZ 1993 B-28, Feature 4).

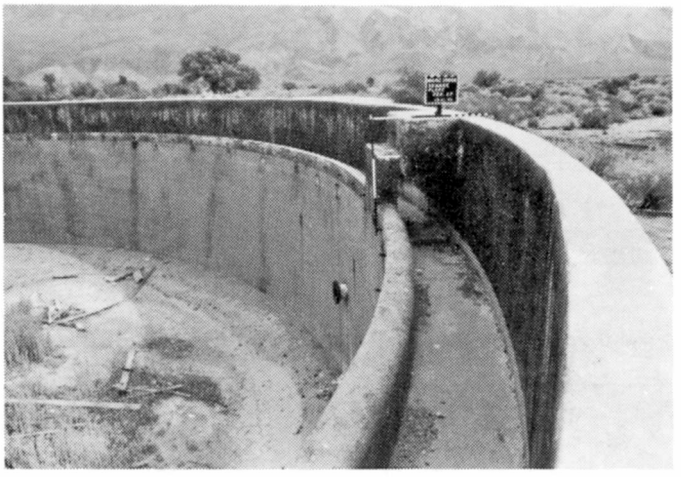


Figure 10.39. Detail of Clarifier (MANZ 1993 B-28, Feature 4).

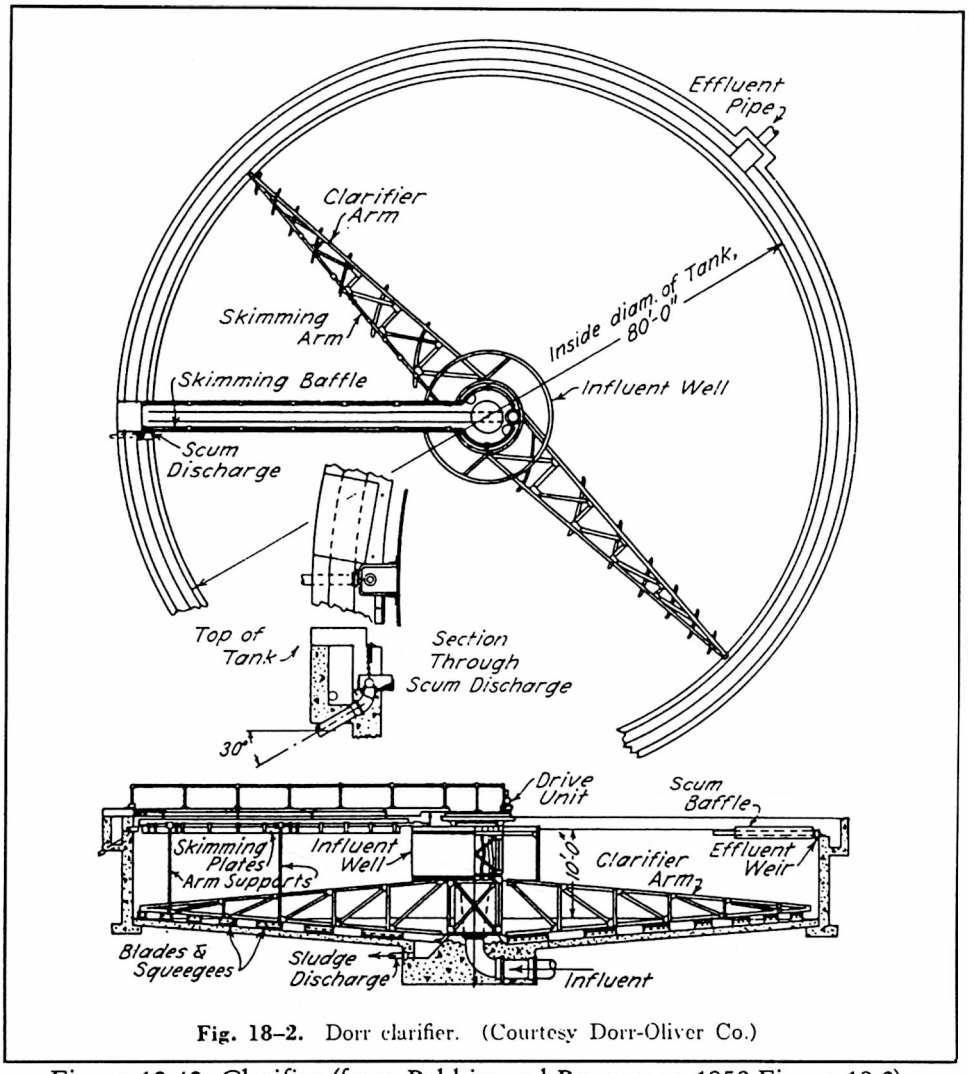


Fig. 18–2. Dorr clarifier. (Courtesy Dorr-Oliver Co.)

Figure 10.40. Clarifier (from Babbitt and Baunmann 1958:Figure 18-2).

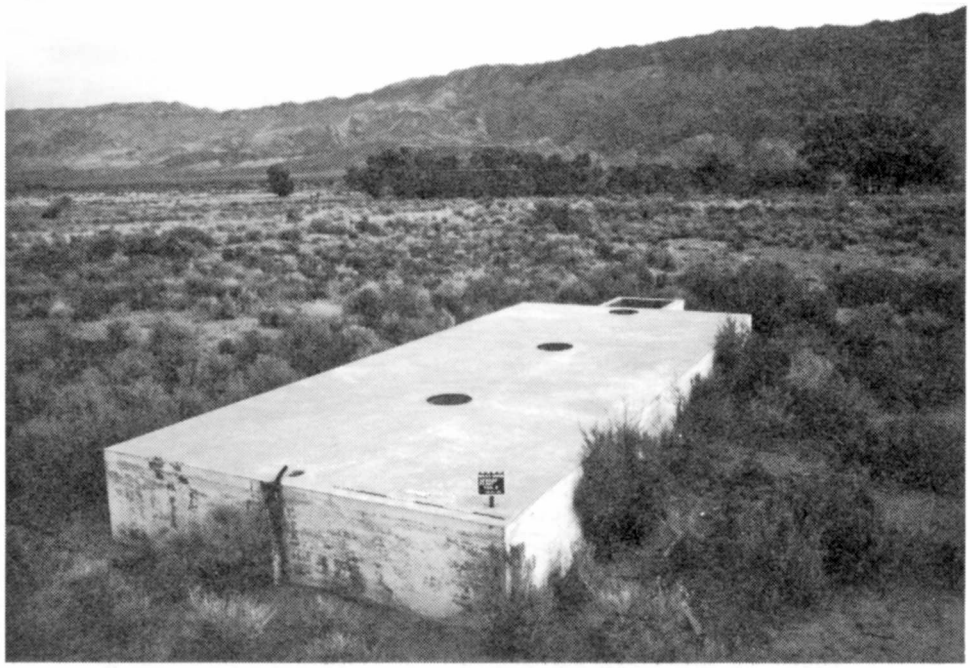


Figure 10.41. Chlorine Contact Tank (MANZ 1993 B-28, Feature 5).

road, to the east of the aqueduct the pipeline was laid above ground and covered by a berm up to 6 ft high. An inverted siphon carried sewage under the aqueduct. There is a small concrete box on the east side of the aqueduct. Manholes were spaced along the pipeline at 100 ft to 300 ft intervals, but many of the manholes west of the aqueduct have been destroyed. A sewerline across the northern edge of the sewer treatment plant could be used to bypass the plant.

Feature 17 is the earthen ditch that carried treated sewage to the Owens River. At the time of the survey, only the first 200 feet of the ditch could be followed; beyond that point the ditch alignment is obscured by a perpendicular irrigation ditch and irrigated pasture.

Chicken Farm

(MANZ 1993 A-31)

The relocation center chicken farm was located just outside the southwest corner of the fenced portion of the relocation center (Figure 10.42). The chicken farm, built by the internees, was begun July 8, 1943, and completed December 31, 1943. It remained in operation until November 1945. Relocation center blueprints and other records identify 15 buildings, four fire hydrants, a powerline, an incinerator, and other structures at the site (see Figure 4.10). The buildings include a combined office and processing plant, six chicken coops, and eight brooder coops.

Recorded at the 5-acre site were numerous concrete slab foundations, rock and concrete retaining walls, rock alignments, and an impressive rock and concrete incinerator (Figure 10.43). Rows of black locust trees enclose the site, and within the site there are many more black locust trees and one Arizona cypress (Figure 10.44). Sheet wash has buried portions of some slabs and some features are overgrown by brush and weeds. The site area is badly trampled by cattle who seem to prefer the area because of its many shade trees and nearby creek. Many of the trees have been cut for firewood and overnight campers were seen using the concrete slabs for parking RVs and trailers.

Feature 1 is the remains of the office and processing plant. It consists of a large 80 ft by 80 ft U-shaped concrete slab with a raised edge

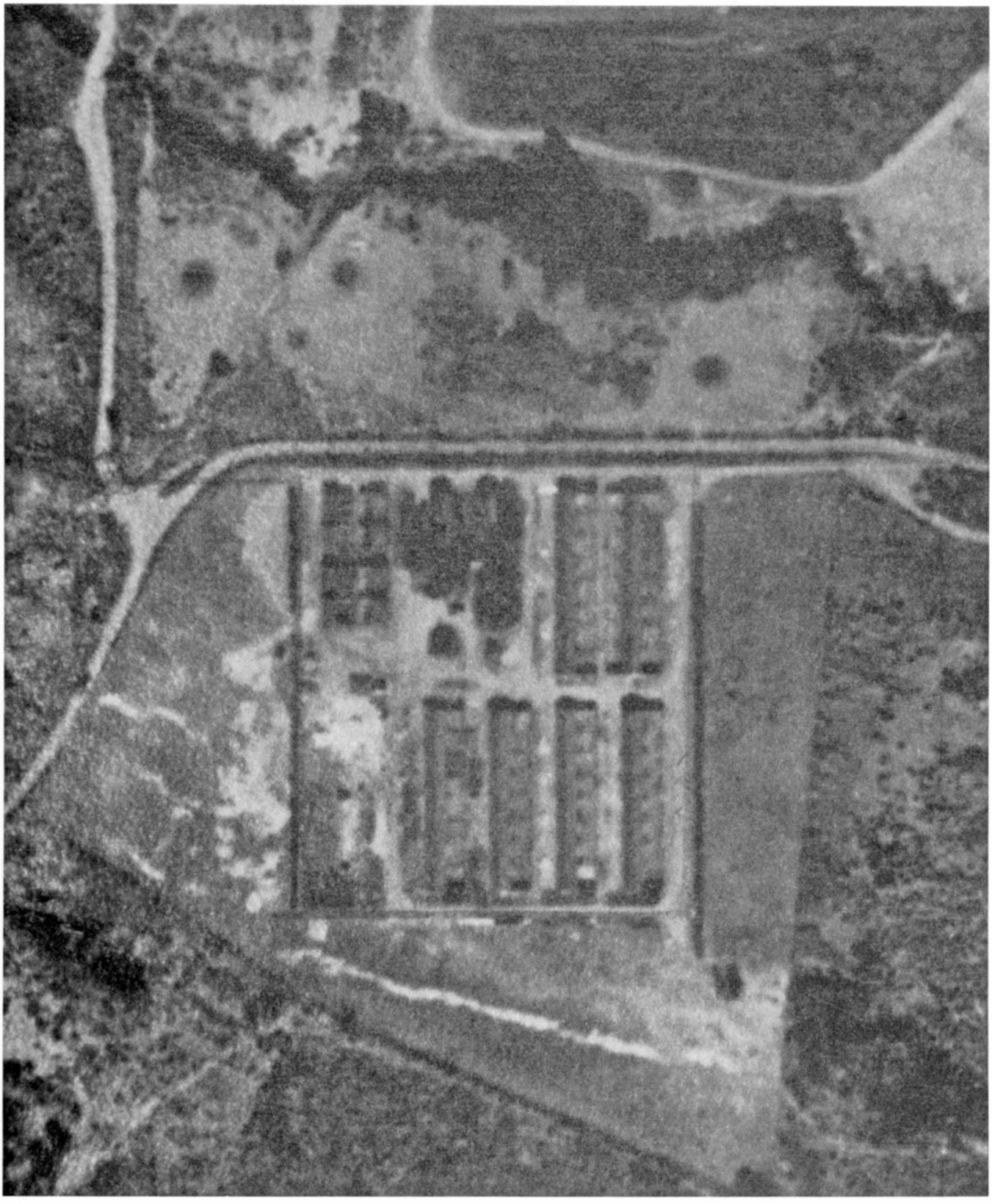


Figure 10.42. 1944 Aerial photograph of the Relocation Center Chicken Ranch (north to top; courtesy of LADWP Bishop Office).

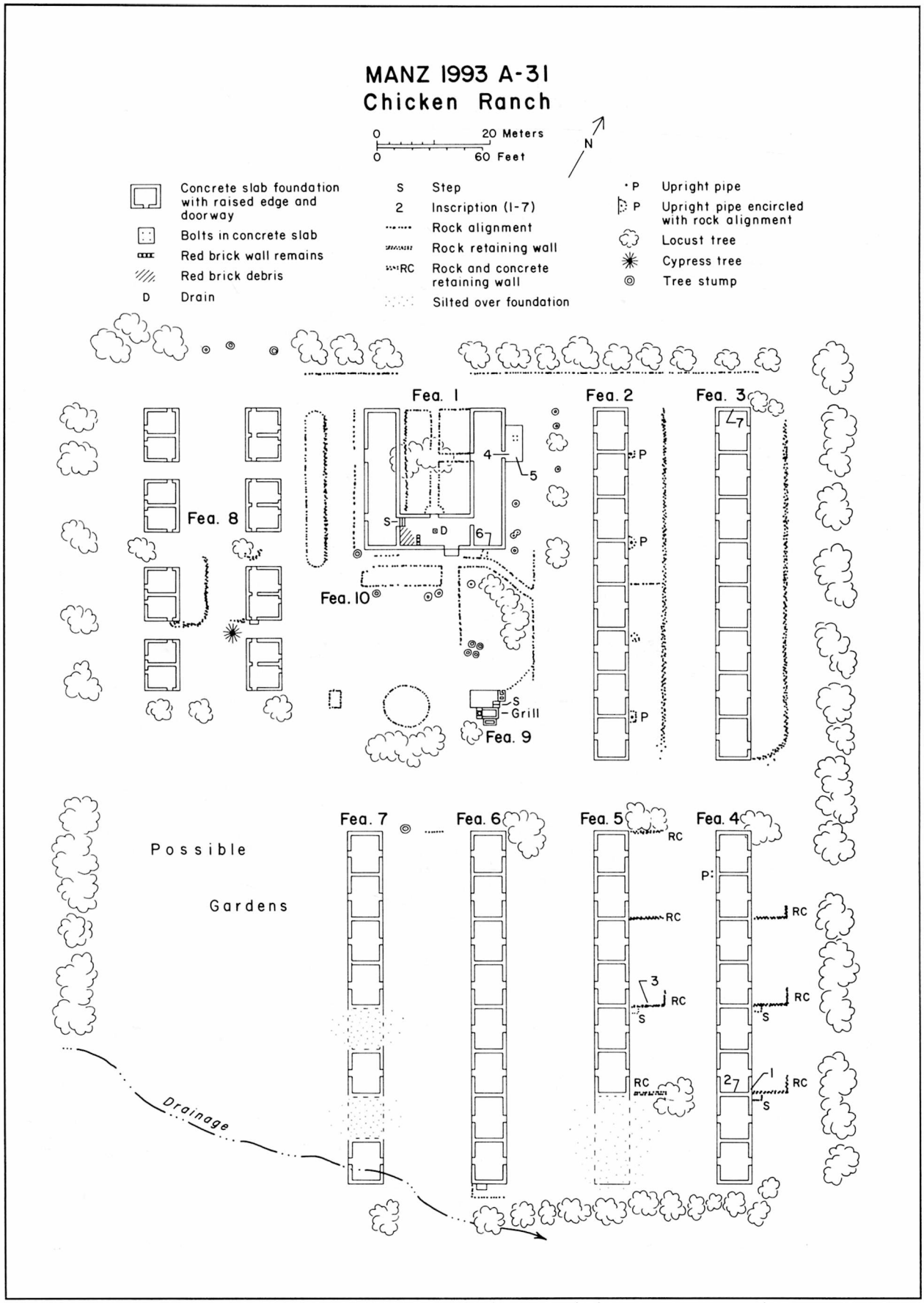


Figure 10.43. Relocation Center Chicken Ranch (MANZ 1993 A-31).



Figure 10.44. 1993 oblique aerial view of Chicken Ranch (MANZ 1993 A-31).



Figure 10.45. Office and processing plant foundation (MANZ 1993 A-31, Feature 1).

(Figure 10.45). The slab is divided into three rooms connected by doorways. On one of the low walls there is a Japanese inscription which would have been hidden by the finished wall, which translates as "penis" (see Appendix A). One room has a floor drain and the remains of a red brick enclosure, possibly the remains of a storage locker. On the east side of the slab there is an attached 10 ft by 20 ft concrete slab with four bolts (machine mounts); it has a partial name and a 1944 date inscribed in it (see Appendix A).

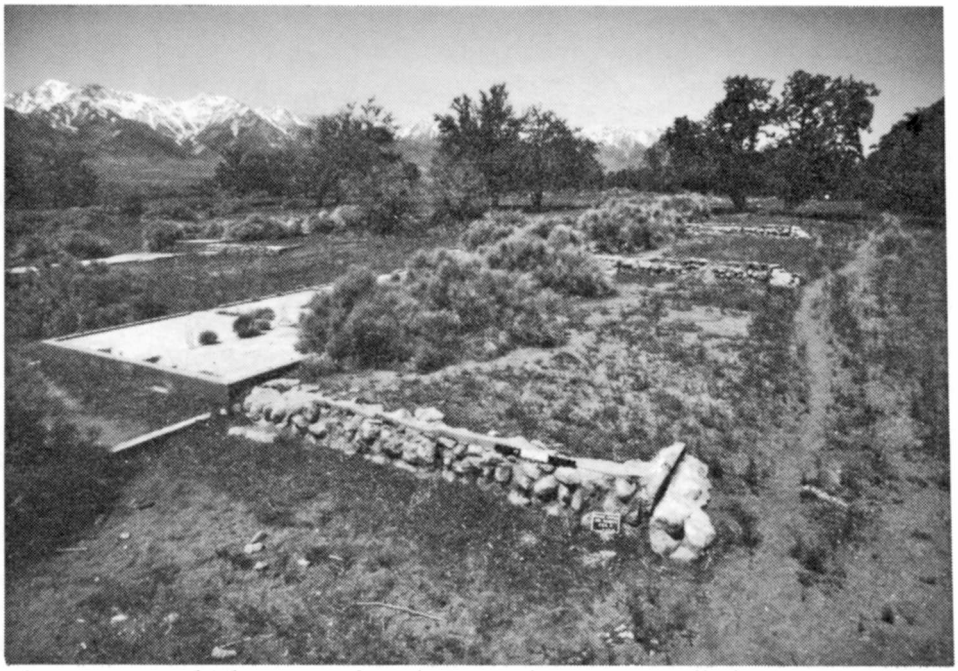


Figure 10.46. Chicken coop foundation and retaining walls (MANZ 1993 A-31, Feature 5).



Figure 10.47. Inscription at Chicken Ranch translated as "Oriental Steamship Company" (MANZ 1993 A-31, Inscription 1a).

Features 2 through 7 are the chicken coop foundations. Each consists of a 20 ft by 200 ft concrete slab with raised portions along the edges and at dividing walls. Each slab is divided lengthwise into eight 20 ft by 25 ft rooms, each room with an apparent doorway on its east and west side. On the east side of each slab there is a small extramural enclosure (chicken yard) indicated by rock alignments and retaining walls (Figure 10.46). Four inscriptions were noted on the low walls of the coops and eight were noted on the retaining walls. The inscriptions include mostly names and Japanese inscriptions (see Appendix A, Figure 10.47).

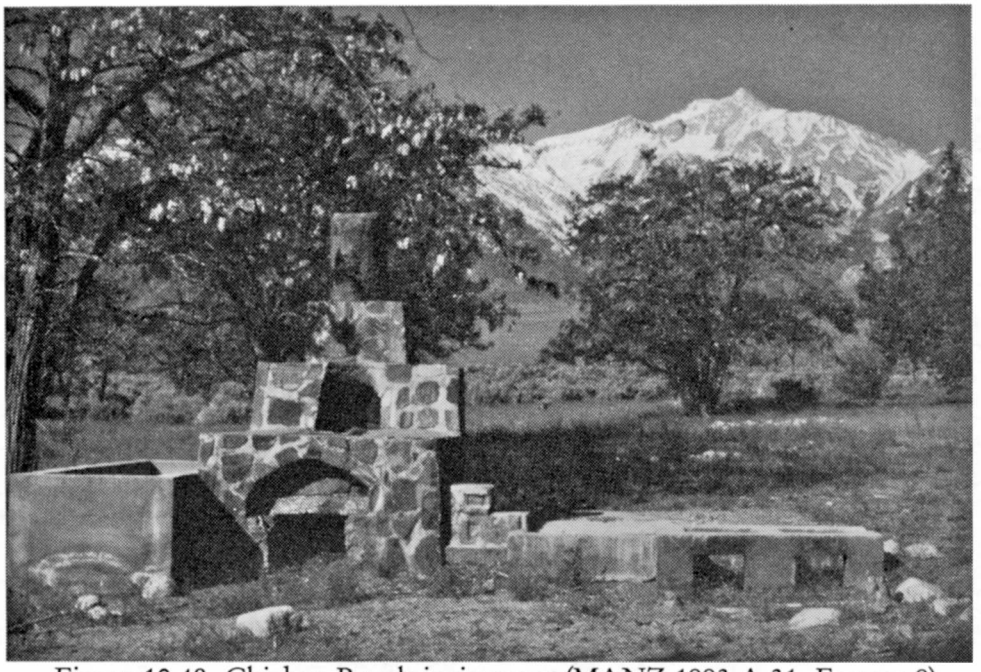


Figure 10.48. Chicken Ranch incinerator (MANZ 1993 A-31, Feature 9).

Feature 8 includes the breeder coop foundations. Located in the northwest portion of the site, the foundations consist of eight 14 ft by 24 ft concrete slabs with raised edges and low walls that divide each slab into two 14 ft by 12 ft rooms. All have at least two doorways and four have an additional interconnecting doorway.

Feature 9, the incinerator, is a large ornate rock and concrete grill with a 6-ft-high chimney (Figure 10.48). There is an attached trough on the south side and a concrete slab and step on the north side. A portion of metal rail, likely scavenged from a nearby mining operation, is incorporated into the grill.

Feature 10 consists of the numerous rock alignments and outlined walkways in the north central portion of the site. Alignments of ephemeral plants and remnants of a fence in the southwest corner of the site suggests there may have been a garden or possibly a disposal trench in that area.

Artifacts noted at the site during survey include over 1,800 window glass fragments, over 300 clear, brown, and green bottle glass fragments, about 60 whiteware and stoneware ceramic fragments, over 5,000 wire nails, about 50 assorted cans, 50 bits and pieces of lumber, over 80 bricks, over 150 salt-glazed and unglazed clay sewer pipe fragments, nine electrical porcelain knobs, four split automobile tires, and a metal file.

Hog Farm

(MANZ 1993 B-19)

The relocation center hog farm is located 1/2 mile south of the residential area. The location had to be specifically approved by LADWP, due to concerns that waste water from the daily cleaning of the hog pens would contaminate the aqueduct (Merritt 1946). Internee construction of the hog farm began in August 1943 and was completed by the end of April 1944. The first hogs arrived in November 1944 and the project operated until November 1945. Relocation center blueprints identify two buildings at the site, an office and a warehouse. Other structures depicted on the blueprints include hog pens, windbreaks and shelters, garbage feeders, a brooder house, and a loading chute. (Figure 10.49).

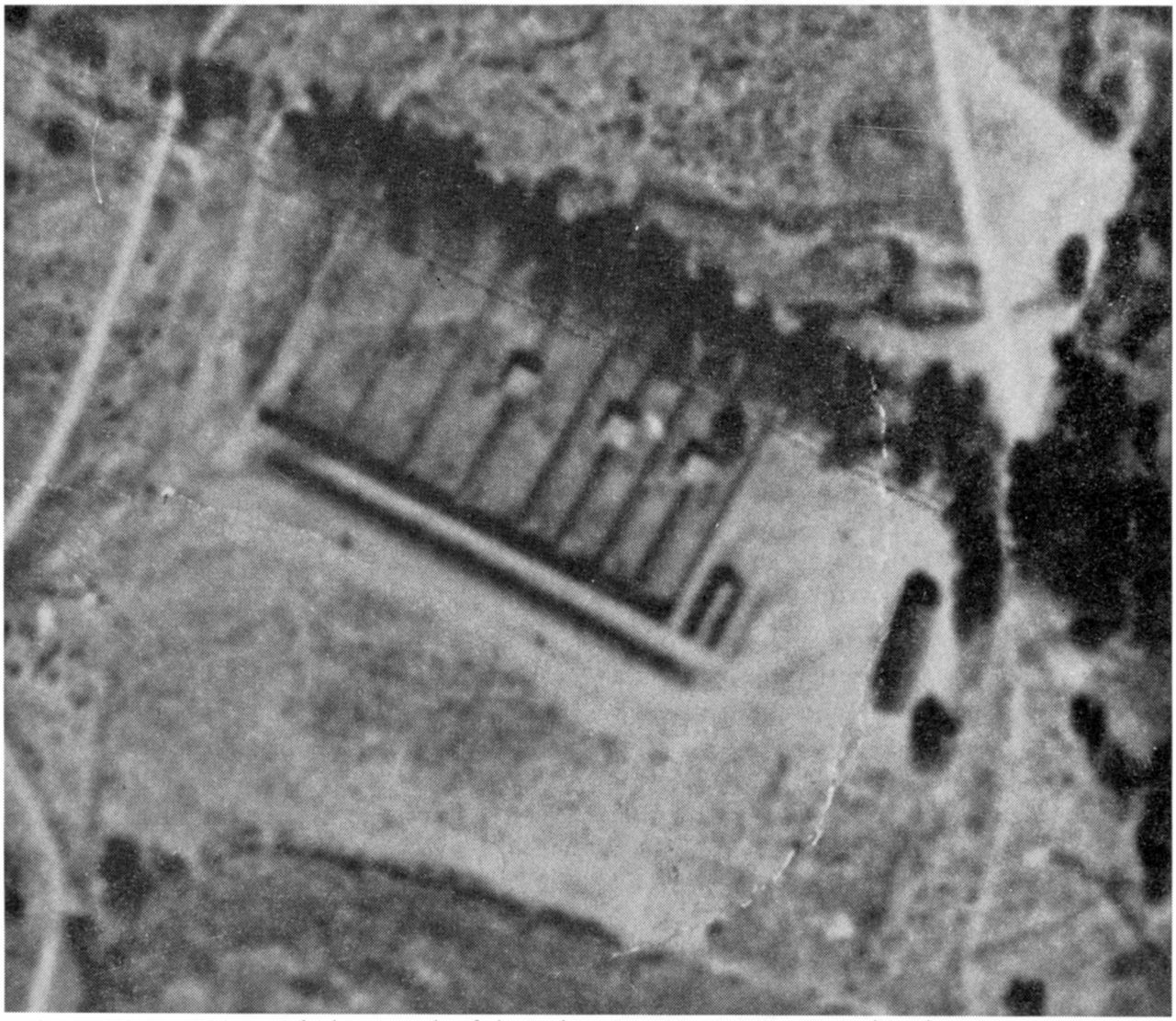


Figure 10.49. 1944 Aerial photograph of the Relocation Center Hog Farm (north to top; courtesy of LADWP Bishop Office).

The 6-acre site includes several concrete slabs, some with troughs, other related structures and features, and a 1,150 ft long access road and pipeline to the west (Figure 10.50). Eleven features were designated at the site. Sheet wash has obscured portions of some features in the southeast area of the hog farm and a drainage is forming along the pipeline alignment and access road.

Feature 1 is a concrete weir box and section of concrete-lined ditch where water was diverted from a dirt ditch (see George Creek Ditch, MANZ 1993 B-30, below) into a concrete pipeline to the hog farm. There is a partial 1940s date and a group of damaged Japanese inscriptions on a portion of the concrete ditch edge (Figure 10.51). The inscriptions were translated as seven family names and "Group B" (see Appendix A).

Feature 2 is the concrete pipeline that carried water to the hog farm and Feature 3 is an abandoned dirt road parallel to the pipeline. Feature 4 is a concrete diversion box along the pipeline at the southwest corner of the hog farm.

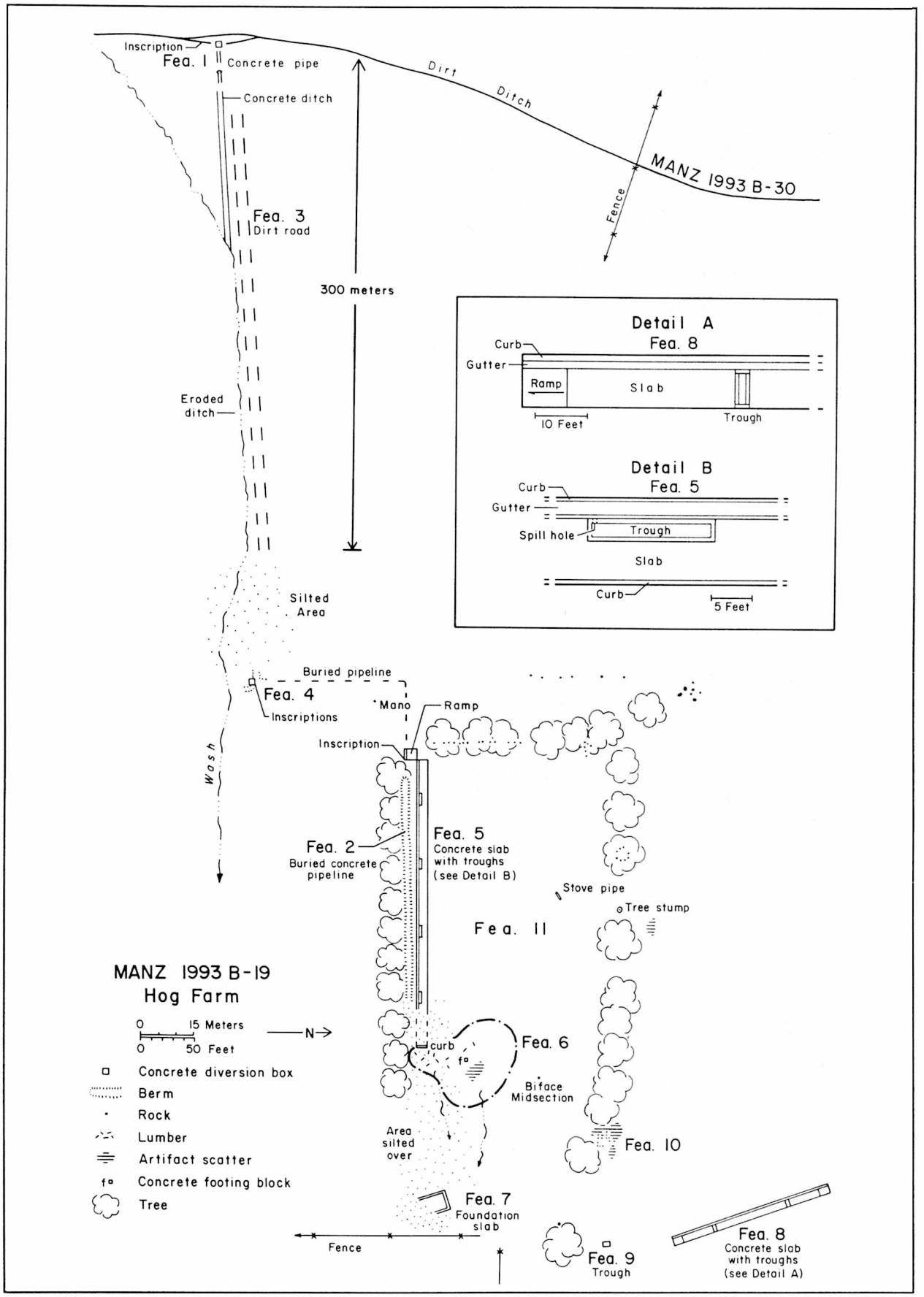
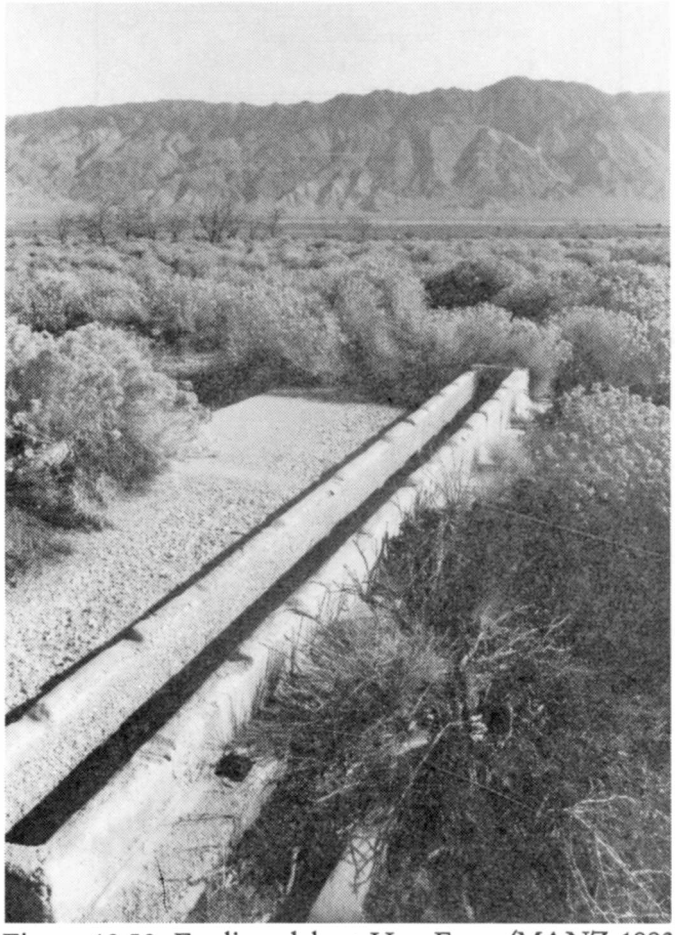


Figure 10.50. Relocation Center Hog Farm (MANZ 1993 B-19).



Figure 10.51. Inscription at Hog Farm translated as nine family names (MANZ 1993 B-19, Feature 1a-i).


Figure 10.52. Feeding slab at Hog Farm (MANZ 1993 B-19, Feature 5).

From the diversion box water was carried north 325 feet and then east along the south side of the hog farm where the concrete pipeline is visible as a low berm. There are three inscriptions on the diversion box, including initials, names, and a 9/22/43 date (see Appendix A).

Feature 5 is a concrete slab 250 ft by 10 ft with four feeding troughs (Figure 10.52). A gutter and curb run along the south edge of the slab. Offset at the west end of the slab there is a smaller square slab with a ramp on the south side. There is a name inscribed on the southeast corner of the ramp (see Appendix A).

Feature 6 consists of a couple of concrete footing blocks and other structural remnants at the former location of the brooder house. Feature 7 is a concrete slab with a lipped edge, indicating it was walled. Mostly silted over, it is estimated to be 20 ft by 50 ft in size. This is likely the foundation of the warehouse.

Feature 8 is a concrete slab 150 ft by 10 ft with two feeder troughs and ramps at the north and south ends. A gutter and curb run along the west edge of the slab (Figure 10.53). Feature 9, just south of Feature 8, is a small 3 ft by 2 ft concrete trough (Figure 10.54).

Feature 10 is a 10 ft by 15 ft rectangular rock alignment and a concentration of wire nails, whiteware ceramic fragments, purple glass fragments, brown glass fragments, a metal lid, and bits of wood. This feature may be the remains of the hog farm office.

Feature 11 is a rectangular area defined by alignments of black locust trees on the north, south, and west, and the brooder house remains (Feature 6) on the east. The wood-fenced hog pens and shelters were in this area.

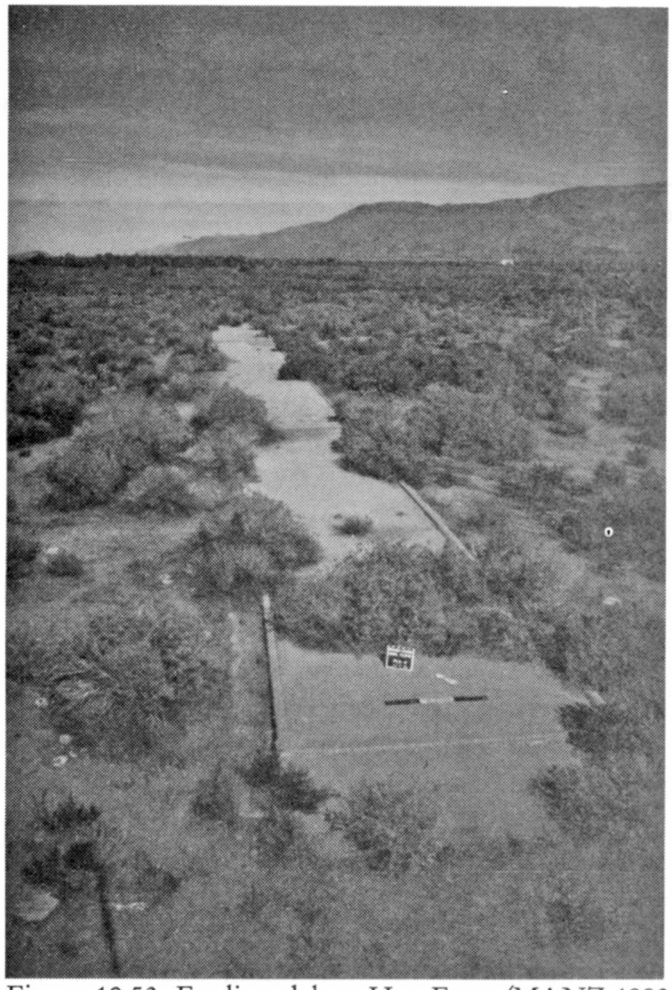


Figure 10.53. Feeding slab at Hog Farm (MANZ 1993 B-19, Feature 8).

Historical artifacts noted at the site during survey, other than those at listed above at Feature 10, include a shovel head, lumber, wire nails, a hinge, a barrel hoop, a stovepipe, wire, several sheet metal bushings, and a few fragments of abalone shell.

North Fields Irrigation System
(MANZ 1993 B-12)

This site comprises the irrigation system for the agricultural fields north of the relocation center. The fields encompass 160 acres north of Shepherd Creek and 50 acres south of Shepherd Creek (see Figure 4.46).

Features recorded at the site include a concrete dam on Shepherd Creek, 1.8 linear miles of ditches, and other related features. Metal and wood flumes were used to carry water over drainages and concrete weir boxes diverted water to the fields where it was distributed through a series of sluices. The dam and a small portion of the ditch system are on BLM land. The site likely includes modified and reused portions of the town of Manzanar irrigation system.

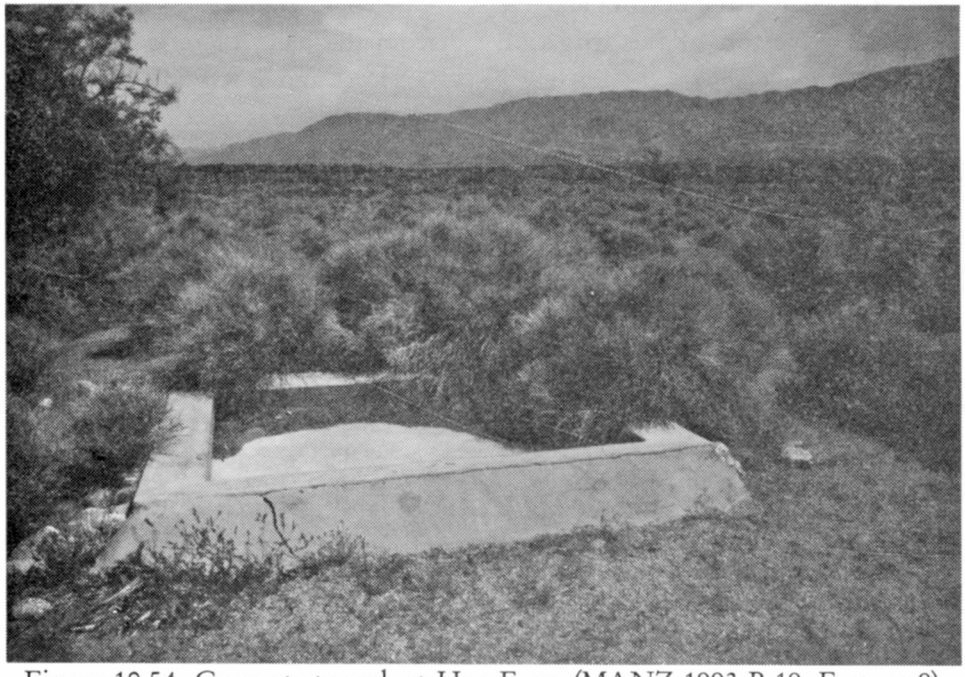


Figure 10.54. Concrete trough at Hog Farm (MANZ 1993 B-19, Feature 9).

Six features were designated at the site. Feature 1 is the dam on Shepherd Creek, measuring approximately 46 ft across and 4 ft high. The central and southern portions of the dam are buried by stream deposits. The 12-inch-thick concrete dam had two sluice gates, one 3 ft wide on its north side and one 4 ft wide to allow water back into the streambed. The north sluice gate is connected to a concrete- and rock-lined ditch that brought water to the relocation center fields. A similar ditch is on the south side of the creek, but its connection to the dam is apparently buried. The dam appears to predate the relocation center. Its height has been raised 18 inches by a concrete wall. Inscribed on top of this wall are the initials "TK" and "KO." Where the central portion of the dam is buried there is an 18-inch-high irregular rock and concrete wall offset from the dam alignment. The concrete used in these additions is notably darker and of a different texture than the dam itself.

As noted above, from the dam water was diverted into two rock- and concrete-lined ditches, one on each side of the creek. These ditches branched into other ditch segments of various lengths. The two main ditches are generally 6 ft wide at the top, 3 ft wide at the bottom and 3 ft deep. Lateral ditches are 3 ft wide at the top, 1 ft wide at the bottom and 1½ ft deep. The eastern portion of the irrigation system has been destroyed by a recent alfalfa farming project. Outside the alfalfa fields the ditches are in good condition and easy to follow.

The ditch system on the north side of Shepherd Creek (Feature 2) includes a 4,650-ft-long section of main ditch and several lateral ditches. About 130 feet from the dam the ditch flow enters a short (15 ft) metal flume to cross uneven terrain. Further east, approximately 280 ft from the dam, there is a 65-ft-long wooden flume where the ditch flow crosses a wash. Culverts are present at three road undercrossings. Five concrete sluice boxes distributed water to smaller ditches (Figure 10.55). These sluice boxes are generally L-shaped, designed to hold wooden sluice gates across the ditch and on the side facing the field. One sluice box is combined with a round-shaped concrete diversion pool, connected to a second pool by concrete pipes. Fourteen inscriptions were noted in the concrete of the ditches. These include names, dates, Japanese characters, and expressions of love (see Appendix A; Figures 10.56 and 10.57).

Feature 3 is the 3,350-ft-long main ditch on the south side of Shepherd Creek. A sluice box approximately 650 feet from the dam diverted water into a secondary ditch, recorded as Feature 4 (see below). To cross a small drainage 1450 feet from the dam, there is a wooden flume 100 ft long and 2 ft wide. About 560 feet further east there is another wooden flume, this one 23 ft long (Figure 10.58). Other ditch features include a concrete sluice box, a short section of rock retaining wall, rock and concrete boxes on both sides of a road where water was routed through an underground pipe, two concrete diversion boxes along the ditch at the west edge of a field, six large U-shaped concrete sluice boxes, ten L-shaped concrete sluice boxes (Figure 10.59), and a short segment of parallel curbing at the end of a ditch segment. Five inscriptions were noted in the concrete walls of the ditch, including names, initials, and a geometric design (see Appendix A). In addition, there



Figure 10.55. Concrete sluice box (MANZ 1993 B-12, Feature 2).



Figure 10.56. Inscription in concrete translated as "July 6 Oosuki" (MANZ 1993 B-12, Feature 2a).



Figure 10.57. Inscription in concrete translated as "Manzanar Great Japan" (MANZ 1993 B-12, Feature 2i).

are numerous apparently unintentional marks such as shoe prints and patterns created by fingers during the smoothing of the ditch walls.

Feature 4 is a 1,500-ft-long silted-in earthen ditch that diverted water from the main ditch on the south side of the Shepherd Creek (Feature 3). The ditch crosses under an abandoned dirt road that parallels the main ditch (recorded as Feature 6) and crosses under an abandoned fenceline (Feature 5). The ditch includes seven rock and wood sluice boxes, a few parallel rock alignments, and a roughly 7-ft-square rock-and-concrete reservoir. Water was directed from the dirt ditch into the reservoir through a rock-lined sluice box and a segment of riveted metal pipe. Water exited the reservoir through another metal pipe. The reservoir is near where the ditch appears to end at the edge of a rather wide wash.

During survey very few historical-era artifacts were noted along the ditches. Recorded were several beverage cans with church-key openings, some fragments of rubber, and several white-painted rocks, all along the ditch on the north side of Shepherd Creek (Feature 2).

South Fields Irrigation System
(MANZ 1993 B-15)

This site comprises the irrigation system for fields located just south of the relocation center. The irrigation system for fields further to the south along George Creek was recorded as a separate site (Far South Fields, MANZ 1993 B-17, below). No significant remains were noted at a 10½ acre dry-farmed potato field located between these two areas (see Figure 4.46).

The main field consisted of 105 acres on the south side of Bairs Creek irrigated by concrete-lined and dirt ditches. A separate 17-acre field to south of the main field (marked as tomatoes on a 4/12/43 blueprint) was irrigated by a pipeline.

Water was brought to the fields from a dam on George Creek via a concrete pipeline. Water was then distributed in open ditches with concrete distribution boxes and wood sluice gates. Most of the ditches are roughly finished concrete, some mixed with concrete rubble. They generally measure 3 ft wide at the top and 1 ft wide at the bottom and 1½ ft deep. The northernmost fields along Bairs Creek are in good condition, with the furrows still visible. To the south the fields are eroded and ditches and sluice boxes silted over.



Figure 10.58. Wood flume (MANZ 1993 B-12, Feature 3).

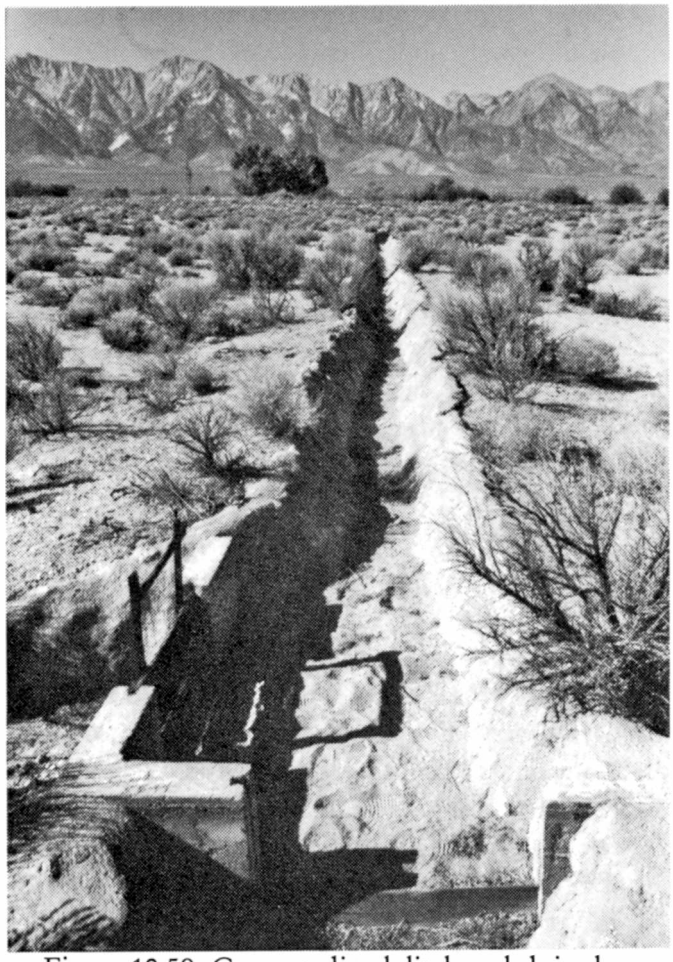


Figure 10.59. Concrete-lined ditch and sluice box (MANZ 1993 B-12, Feature 3).

Six features and three artifact concentrations were recorded at the site. Designated features include the dam on George Creek and 3.4 linear miles of pipeline and ditches. Some of the ditches follow pipeline alignments shown on 1930 LADWP plat maps (see Chapter 6) that were apparently reused by the relocation center. The patched condition of some of the concrete pipe used by the relocation center suggests that the pipe may have been scavenged from the earlier town irrigation system as well.

Feature 1 is a 45-ft-long dam across George Creek. The 5-ft-high concrete dam measures 12½ inches wide at the top and 22½ inches wide at the base. There are two sluice gates, one 16½ inches wide on the north side diverted into a concrete pipeline (Feature 2) and one 43 inches wide within allowed water back into the streambed. There are rock and concrete retaining walls and concrete reinforcing on the creek bank both upstream and downstream of the dam. Two courses of rock have been cemented to the top of the dam rasing its height 1 ft. This modification, similar to that noted at other dams in the area, suggests this dam likely pre-dates the relocation center (Figure 10.60).

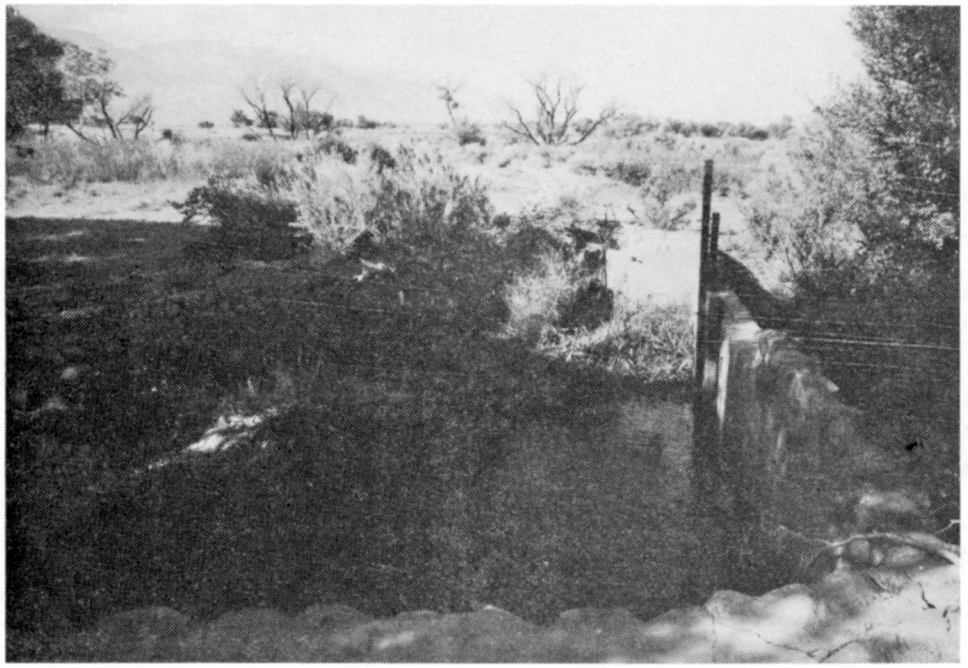


Figure 10.60. Dam on George Creek (MANZ 1993 B-15, Feature 1).

Feature 2 is a buried concrete pipeline. The pipeline alignment appears as a raised berm and the pipe itself can best be seen where it is exposed in shallow washes. Concrete piers were used to support the pipeline where it crossed washes and low spots. The top of two of these supports, on the south side of a small wash, each have a Japanese poem inscribed on them (see Appendix A, Figures 10.61 and 10.62). There are also three anti-siphon boxes (one with a 1944 inscription) along the surveyed portion of the pipeline.

Feature 3 is the system of concrete-lined and dirt ditches at the main field on the south side of Bairs Creek. The system has three parallel north-south segments connected by a 4,150-ft-long concrete-lined ditch along the southern edge of Bairs Creek. Concrete pipe segments, flanked by concrete-lined pools or boxes, were used to route water under roadways.

The westernmost segment, along a old town road, is concrete-lined for 8,600 feet. There is a rock and concrete distribution box at the beginning of the ditch segment, and a road undercrossing and 12 concrete sluice boxes along the lined ditch. The sluice boxes are L-shaped, designed to hold wood sluice gates across the ditch and on the side facing the field (Figures 10.63 and 10.64). Initials and an unreadable inscription were noted at one of the sluices (see Appendix A). There is a hollow concrete pillar where the water was routed under a road that may have served as anti-suction device. Beyond the end of the concrete-lined portion of the ditch, a silted-in earthen ditch continues another 4,100 feet, turns east, and disappears. There are ten intact wood sluice gates along the north-south portion of the ditch.

Roughly 2,500 feet east of the western ditch segment is the next, central ditch. The first 3,400 feet of the ditch are concrete-lined. Beyond that the ditch continues approximately 1,400 feet before disappearing. About 150 feet further south sections of exposed concrete pipe can be seen. Along the concrete portion of the ditch there are two road crossings and four sluices, nearly all with inscriptions. These included names, initials, dates, military slogans, and the greatest concentration of Japanese character inscriptions noted at the relocation center (see Appendix A, Figures 10.65-10.67).

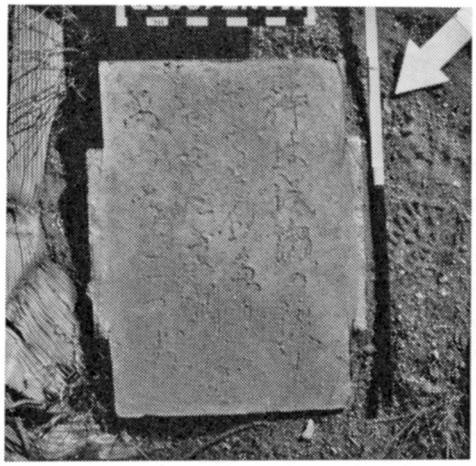


Figure 10.61. Japanese *tanka* inscribed on pipe support (MANZ 1993 B-15, Feature 2a).



Figure 10.62. Japanese *tanka* inscribed on pipe support (MANZ 1993 B-15, Feature 2b).

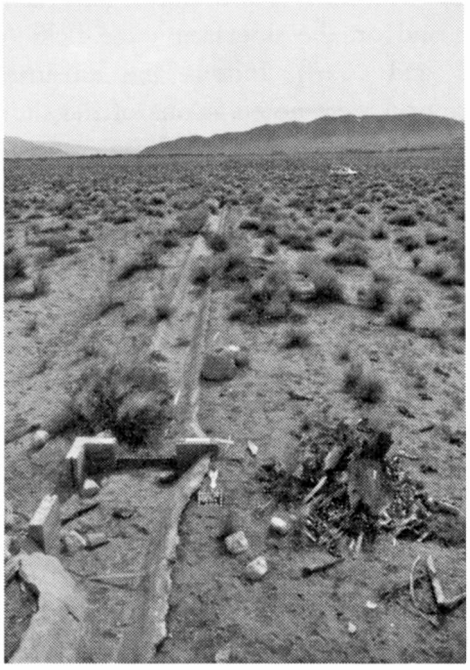


Figure 10.63. Concrete-lined ditch (MANZ 1993 B-15, Feature 3).

The easternmost ditch is 1,650 feet east of the central ditch. No features were noted along the 2,000-ft-long earthen ditch.

Feature 4 consists of three concrete weir boxes at the north end of the ditch system where the flow from the concrete pipeline (Feature 2) was diverted into the Feature 3 ditches. To the north there are numerous concrete pipe sections in the drainage of Bairs Creek.

Feature 5 is the concrete pipeline that brought water to the southern tomato field from the George Creek pipeline (Feature 2). At a road undercrossing near the pipeline terminus there is a rock and concrete diversion box with an inscription. The inscription is of a name (MAKIO) also recorded along a ditch at the north fields. Beyond the diversion box there are nine concrete and wood sluice boxes, connected by concrete pipe, to distribute water to the field.

Feature 6 is an abandoned section of old road that runs parallel to the westernmost ditch segment of Feature 3.

Four artifact concentrations were recorded within this site. Two adjacent areas of historical trash (Loci A and B) located just west of the



Figure 10.64. Wood sluice gate (MANZ 1993 B-15, Feature 3).



Figure 10.65. Inscription in concrete translated as "18th year [1943] March 1 E Group" (MANZ 1993 B-15, Feature 3).

main field south of Bairs Creek include eight fragments of lumber, four fragments of wood crating, fencing wire, a burned upright post, a metal tub, a bucket, three barrel hoops, a corroded battery, wire nails, over 100 fragments of clear, brown and aqua glass (90 percent clear), a square fuel can, five miscellaneous metal items, a pile of charred (but still readable) milk and butter cartons, 17 sanitary cans, and a pile of nine large cans with square holes punched in the can bottoms (perhaps used to grow seedlings).

Located at the northeast corner of the main fields south of Bairs Creek, Locus C is a small area containing a few barrel hoops and a metal tub. Locus D is a small concentration of historical trash at the far south end of the westernmost ditch segment of Feature 3. It includes various automobile parts (such as a windshield-washer motor, washer blades, a thermostat, safety glass, and an air filter), over 60 fragments of clear and aqua bottle glass, several fragments of a drinking glass with painted stripes (the same as ones seen at the relocation center landfill), a fuel can, nine can lids, a square meat tin, a screw-top can, three sanitary-seal cans, and four evaporated milk cans.

Far South Fields Irrigation System
(MANZ 1993 B-17)

This site comprises the irrigation system for relocation center agricultural fields located on both sides of George Creek, 1 mile south of the relocation center and just west of Highway 395. The internees farmed a little over 22 acres

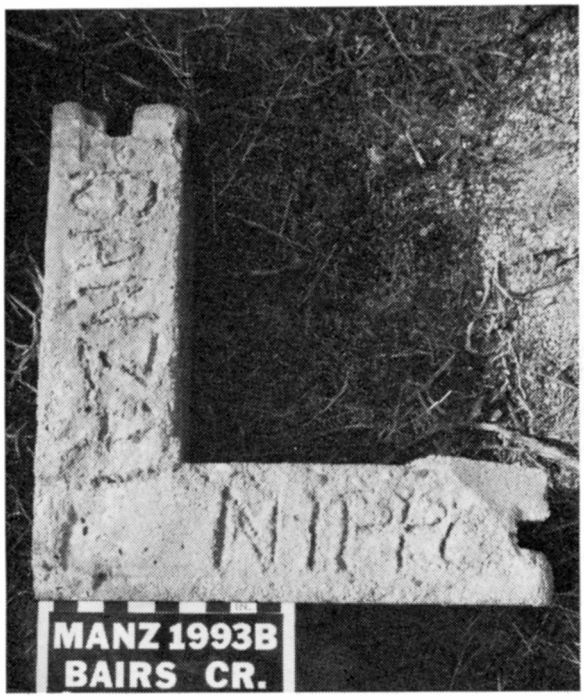


Figure 10.66. Inscription in concrete (MANZ 1993 B-12, Feature 3e).

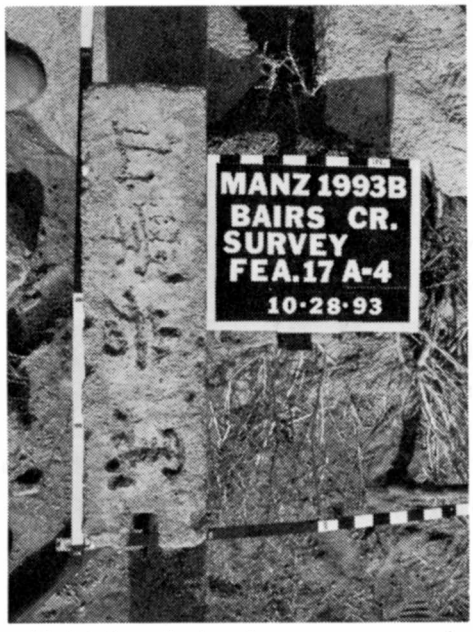


Figure 10.67. Inscription in concrete translated as a pen name and family name, written with top to right (MANZ 1993 B-12, Feature 3f).

on the north side of the creek and 68 acres on the south side of the creek (see Figure 4.46). The fields were irrigated by ditches from the creek, supplemented by wells.

Thirteen features were designated at the site. These include a dam, bridge, two wells, 1.6 linear miles of concrete-lined ditches and concrete pipelines, and various water control features. No associated historical artifacts were recorded during survey. Sheet wash has obscured much of the ditch system and portions on both sides of the creek have been destroyed by erosion. Part of a ditch on the south side of the creek has been destroyed by a powerline and road.

Feature 1 is a dam and adjacent retaining walls and wood bridge on George Creek (Figure 10.68). The actual dam is a small three-sided concrete structure (8 ft 8 inches by 7 ft 4 inches by 4 ft high by 8 inches thick) that straddles the narrow drainage channel. The dam has three sluice gates, one on the north side and one on the south side (each 30 inches wide) supplying separate ditch systems and a third sluice gate (48 inches wide) opening to the creek channel. Upstream, rock and concrete retaining walls support 65 linear feet of the creek bank forming a small reservoir. Across the retaining walls, about 50 feet west of the dam, is the wooden bridge still in use. An upright boulder and two smaller rocks are cemented as decorative elements on the wall at each corner of the 10 ft by 16 ft bridge. Six inscriptions in the concrete of the retaining walls and a nearby pipe support include names, place names, dates, and Japanese characters translated as "Built in March 1944" and "Built by E Group in March 1944" (see Appendix A, Figures 10.69 and 10.70). Of special interest are two place names, both "TUCSON," one dated "3/6/44."

Feature 2 is the 2,300-ft-long concrete-lined ditch system on the north side of George Creek. About 450 feet east of the outtake, a concrete weir box allowed water to be diverted from the ditch through a concrete pipe to a small field. Six hundred feet further east the ditch widens slightly into a small, closed, concrete-lined basin; at one end is a pipe through the basin wall that

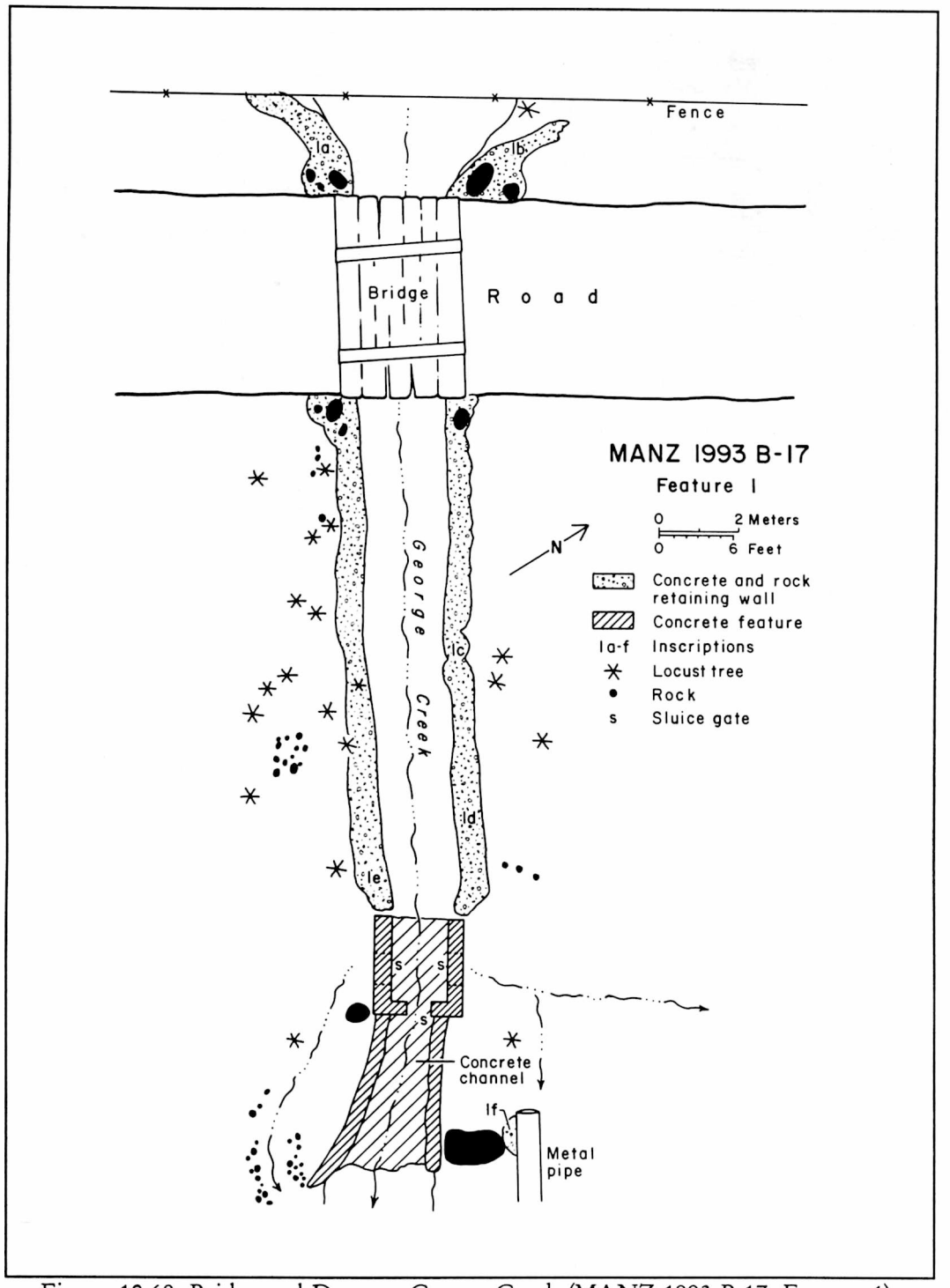


Figure 10.68. Bridge and Dam on George Creek (MANZ 1993 B-17, Feature 1).

would have allowed water to continue in the ditch, which turns to the north at this point. At the other end of the small basin is a roofed, cubical, concrete weir box with one pipe inlet and two pipe outlets, one each at the south and east sides of the box. A fourth pipe segment extends through the roof, probably an anti-suction device. Inscribed on the weir box are a 1943 date and Japanese characters translated as a family name (see Appendix A). Further along the main ditch 250 feet north is a third concrete weir box, beyond which the ditch continues for at least 650 feet.



Figure 10.69. Inscriptions in concrete retaining wall translated as "built in March 1944" (MANZ 1993 B-17, Feature 1).

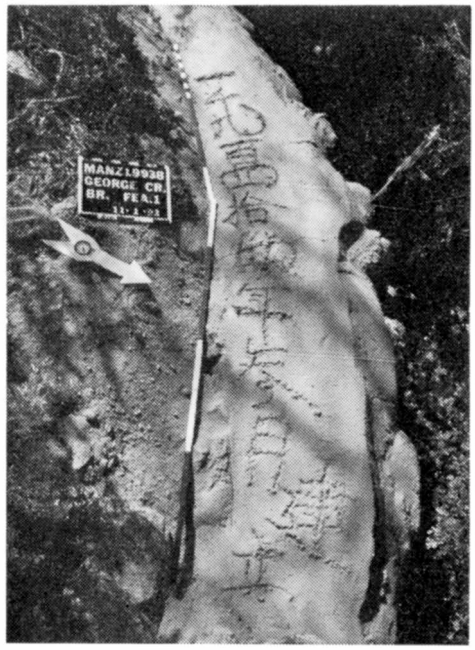


Figure 10.70. Inscriptions in concrete retaining wall translated as "built by E Group in March 1944, written with top at bottom (MANZ 1993 B-17, Feature 1).

Feature 3 is a series of eroded depressions that extend for 1,000 feet along the north side of George Creek which may have functioned as settling ponds. The ponds are connected by segments of steel pipe. The ponds could have been filled with water diverted from the creek at the dam area (Feature 1) where a riveted pipe leads from the dam to the first pond.

Feature 4, on the north bank of the creek, is Well 76. The well, currently in use, is shown on 1930s LADWP plat maps and relocation center blueprints.

Feature 5 is the irrigation system on the south side of George Creek which includes over 5,700 linear feet of concrete-lined ditch. A little over 1,000 feet from the outtake at the dam a series of sluices and gates could direct water either north or south in concrete-lined ditches (Figures 10.71 and 10.72). At this point, too, a concrete pipe connects this ditch system with Well No. 76 on the north side of the creek. The pipe crossing of the creek has been washed out and the entire alignment could not be traced, but it seems likely that the pipeline brought water from the well to the ditch system to supplement the flow diverted from the creek.

From the distribution area the northern ditch heads northeast 500 feet, then east 600 feet, and then back south 900 feet to the vicinity of Well No. 95 (Feature 7, below). Seven L-shaped concrete sluice boxes along the ditch diverted water to the fields.

The southern ditch goes 1,300 feet south, then curves to the east for another 1,500 feet. Ten L-shaped concrete sluice boxes along the first 1,300 foot ditch segment diverted water to the fields. Inscriptions noted on one of the sluice boxes include a 1944 date and Japanese characters translated as six possible family names and "Built 1944" (see Appendix A). Also along this section of ditch there is a concrete- and rock-lined diversion box where the main ditch flow was routed under an old road or into a branch pipeline (Feature 6, below). Three sluice boxes and a road undercrossing were noted along the last 1,500 foot of the ditch.

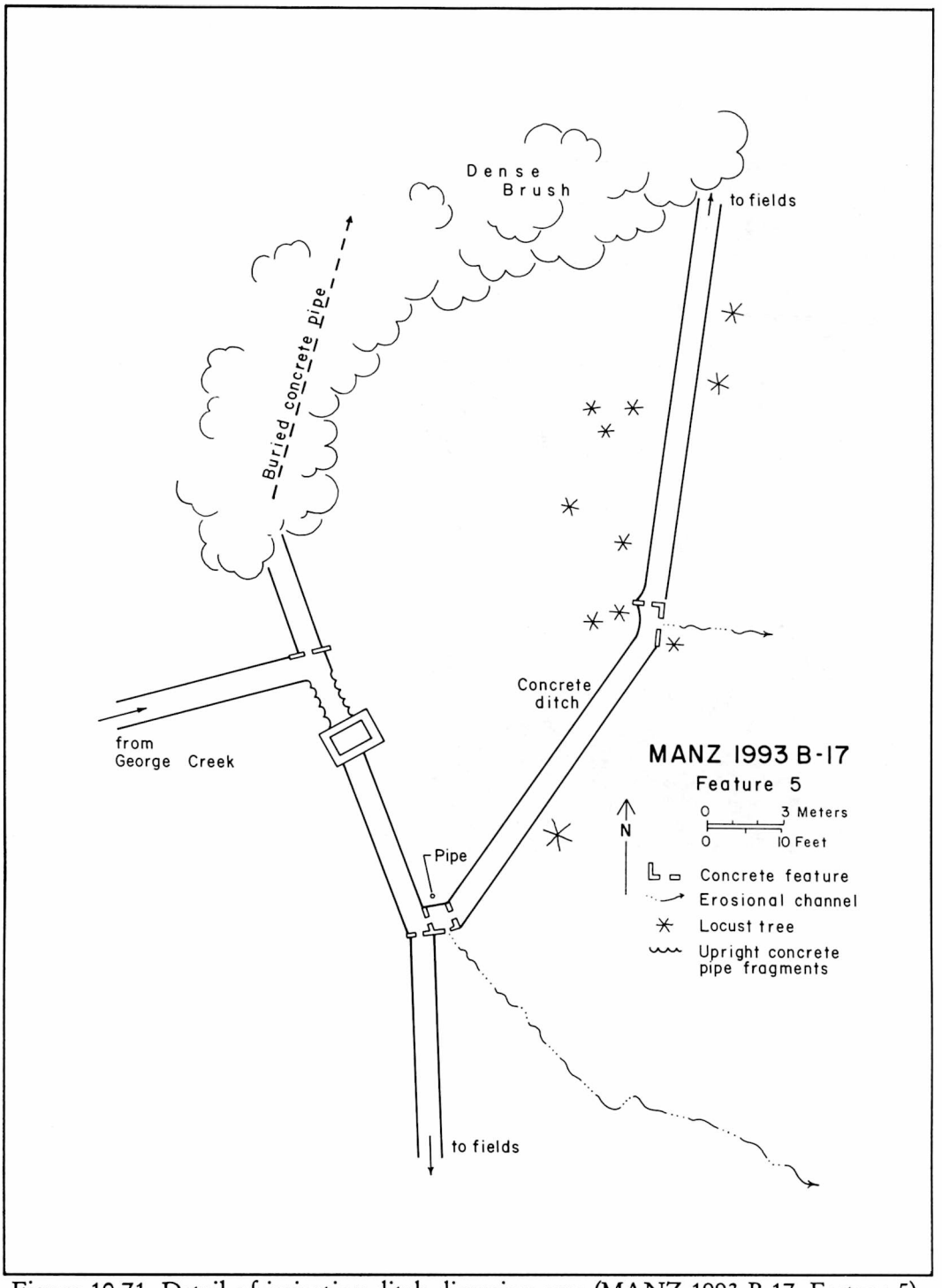


Figure 10.71. Detail of irrigation ditch diversion area (MANZ 1993 B-17, Feature 5).

Feature 6 is a pipeline which takes off from southern ditch 650 feet from the distribution area and heads east at least 1,300 feet and crosses near Well No. 95.

Feature 7 consists of the remains of a defunct well on the north side of a well-traveled dirt road. A replacement well (No. 403) is located to the northeast. Remains at the well consist of a 15-ft-square concrete slab with rust stains, equipment supports, piping and conduit, and a central 2-ft-square metal plate. The well was once surrounded by a chain link fence. On the north, east, and west sides of the slab there are ten 6-ft-

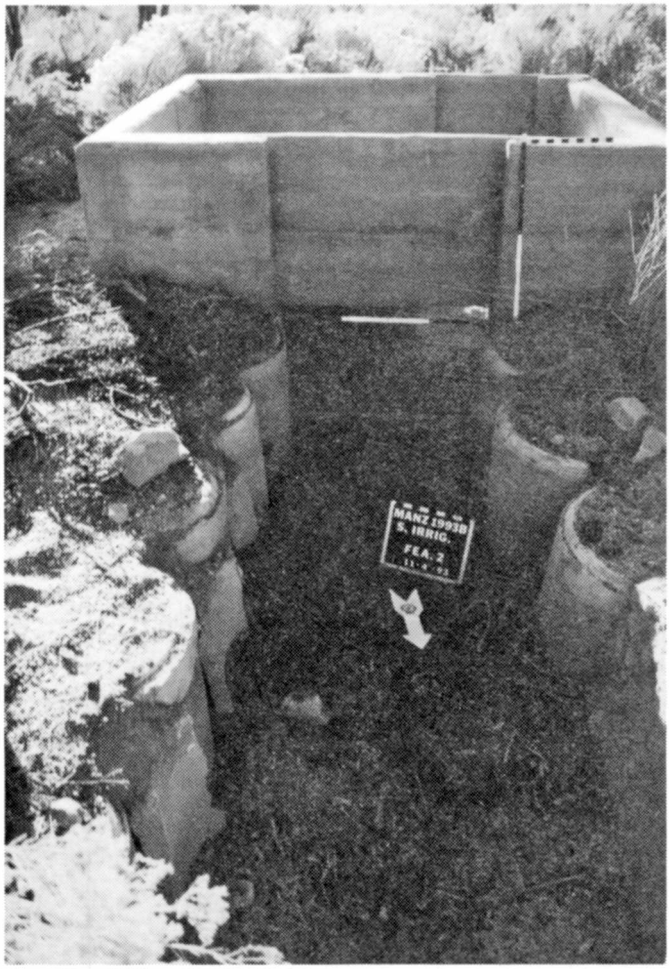


Figure 10.72. Detail of irrigation ditch diversion area (MANZ 1993 B-17, Feature 5).

high metal tube fence posts and on the south side there are two 7-ft-high posts and a central 2-inch-high post from an apparent gate. Spray painted on the slab is the number "95." Well No. 95 is shown in this location on 1930s LADWP plat maps and relocation center blueprints.

Features 8 through 11 were apparently for flood control. Feature 8 is a dirt ditch along the west side of the southernmost irrigation ditch. The ditch appears to have been dug to divert a small drainage away from the irrigation ditch. It is reinforced with boulders and rock in some areas. Features 9, 10, and 11 are earthen berms in the small drainage, which likely also functioned to keep water from eroding the irrigation ditch.

Feature 12 is an abandoned fence along the south side of the southernmost ditch. A portion of this fence was made of heavy square timbers and sheep wire; the rest is barbed wire and cut posts.

Feature 13 is a 50 foot long stretch of concrete fragments piled in a line 30 feet south of and parallel to a portion of the Feature 5 ditch. Located between the George Creek outtake and the distribution area, they appear to have been left over from ditch construction or possibly stockpiled for future use.

Bairs Creek Irrigation System
(MANZ 1993 A-34)

This site comprises an irrigation system that diverted water from Bairs Creek to two Victory Gardens in the relocation center, one southwest of the staff housing area and one east of the staff housing area. The ditch system and fields are visible on 1944 aerial photographs of the relocation center (see Figure 9.2). Recorded at the site were a dam, 800 linear feet of pipeline, 1,950 feet of main earthen ditches, over 1,000 feet of secondary ditches, field furrows, a settling basin, two field areas, and a small trash concentration.

The irrigation system begins at a small concrete dam originally on Bairs Creek (Feature 1). The northern end of the dam is buried by sediments and the creek, now just to the south, has cut a channel below the base level of the dam. The exposed portion of the dam is 24 ft long, with a 10 ft gap for a sluice gate. The dam is 10½ inches thick and over 40 inches high. An 11½-inch-high cap wall of dark gray concrete rests on top of the dam. Inscribed within the concrete of this cap wall is the date "1942."

The first 400 feet of the irrigation system consists of a concrete pipeline with an inside diameter of approximately 13½ inches. Heavily

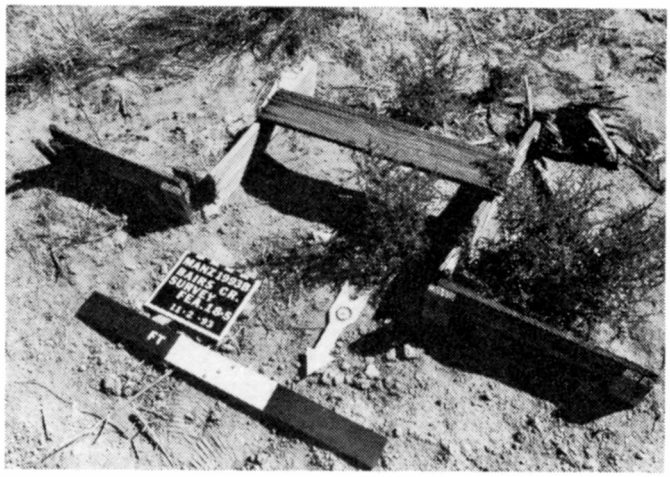


Figure 10.73. Wooden sluice gate (MANZ 1993 A-34, Feature 5).



Figure 10.74. Concrete diversion box (MANZ 1993 A-34, Feature 4).

patched with mortar, the pipe was likely scavenged from the town of Manzanar water system. From the end of the pipe, the irrigation system continues as an earthen ditch. To the east, 300 ft downstream are the scattered remains of a wood sluice; another 100 ft east a ditch branches off to the north to an 80-ft-square reservoir or settling basin that is enclosed by low earthen berms (Feature 2). Across from the reservoir, there is wood sluice gate on the main ditch; it is not clear if this gate was related to the reservoir, since it lies between (rather than at) the reservoir's intake and outlet ditches. The reservoir outlet ditch, lined with rock and concrete, connects back to the main ditch.

About 250 feet east of the reservoir is the first Victory Garden. At that point the main ditch turns north for 125 feet and then heads east 900 feet to a concrete diversion box (Feature 3). A secondary ditch runs along the south and east edges of the field to rejoin the main ditch at the Feature 3 diversion box. The ditches enclosed an area of approximately 2½ acres. Furrows are still discernable in the field. A branch ditch off the secondary ditch heads south towards Bairs Creek. The branch ditch begins at the remains of a concrete-reinforced wood sluice gate (Feature 5, Figure 10.73).

Along the main ditch, 150 feet east of the Victory Garden and Feature 3 diversion box is a low U-shaped concrete diversion structure (Feature 4, Figure 10.74) with several inscriptions, including names, initials, four 1943 dates, and a fallacious 1940 date (see Appendix A). From Feature 4, another branch ditch heads south towards Bairs Creek and a buried pipeline continues east.

A small artifact concentration which overlays the branch ditch just south of Feature 4 was recorded as Locus A. It includes four stove pipe sections, eight sanitary seal cans, numerous small can bits, about 100 glass fragments (brown, clear, green), a stoneware plate fragment, and a concrete chunk. Other artifacts associated with the relocation center are found scattered throughout the site vicinity. Two large concentrations adjacent to the ditch system were recorded as a separate site (MANZ 1993 A-35, below).

Approximately 400 feet east of the Feature 4 a diversion box the pipeline emerges at a 4 ft by 4 ft by 6 ft tall concrete diversion box that has an attached steel ladder inside (Feature 6). The Feature 6 diversion box apparently diverted water north to an upright large-diameter steel pipe (Feature 7), which in turn distributed water

to the Victory Garden indicated by furrows and the remains of wood sluices in a 4.5 acre area between the staff housing block and perimeter fence.

George Creek Ditch
(MANZ 1993 B-30)

This site consists of four features. Feature 1 is an earthen ditch, approximately 1.3 miles long, that diverted water from a branch of George Creek to Bairs Creek. A small ditch turns off from this ditch to carry water to the relocation center hog farm (MANZ 1993 B-19, above). According to the Manzanar Fixed Assets Inventory (November 15, 1945) the Feature 1 ditch was "constructed previously and of little use, deteriorated." A 12-inch diameter concrete pipeline was constructed in the early part of 1942 from a dam on George Creek to a junction box near Bairs Creek to replace the ditch (the pipeline was recorded as part of MANZ 1993 B-15, above). However, a segment of the ditch was probably still used to bring water to the hog farm.

Portions of the Feature 1 ditch are no longer intact due to erosion. Ditch features such as wooden sluices have been removed or otherwise destroyed and along the southern portion of the ditch metal outlet pipes have been placed at intervals on the east side of the ditch, perhaps by LADWP for use in its water spreading activities. The only artifacts noted include fragments of salt-glazed and unglazed clay pipe and bits of wood and wire from sluices.

Feature 2 is a 1,000 foot long "tributary" dirt ditch that connected Feature 1 to a well southwest of the relocation center. A well is depicted on the 1930 LADWP plat map in the general area of the upper end of Feature 2. The ditch from the well was likely constructed by the relocation center; based on the plat map, the alignment would have crossed several different landowners in the Manzanar townsite. Feature 2 brought the well water into the Feature 1 ditch beyond the hog farm, so the well was likely used by the relocation center to augment the flow of Bairs Creek.

Feature 3 is a concrete and rock U-shaped construction near the end of the Feature 1 ditch where the ditch water flows into a concrete pipe (now mostly gone) for the descent into Bairs Creek. Feature 3 likely functioned as a penstock for the transition from ditch to pipe (Figure 10.75). Inscribed on Feature 3 while the concrete was wet was a first name, initials, a date, and "JAP CAMP" (see Appendix A, Figure 10.76). "Summers 1942" was formed with pebbles pressed into the wet concrete. Charlie I. Summers was the local contractor from Lone Pine that built the relocation center watchtowers (Merritt 1946) and apparently this feature as well.

Feature 4 consists of rock alignments and a section of steel pipe along the Feature 1 ditch used as a culvert at the southwest corner of the relocation center near Watchtower 5.

Shepherd Creek Dam
(MANZ 1993 B-13)

This site, located on BLM land, includes a dam and related features on Shepherd Creek 1½ miles northwest of the central portion of the relocation center. The dam, at an elevation of 4360 ft, diverted water into a drainage channel that fed the relocation center reservoir (at an elevation of 4085 ft). The antiquity of this site is not known. However, in one form or another, its original use likely dates to the founding of the town of Manzanar (ca. 1910) and possibly earlier. Within the 450-square-meter site area there is a dam, a rock barrier, a ditch and an associated gauge, and a gauging station consisting of a weir, small shed, and box gauge. Six features were designated at the site; no associated artifacts were noted.

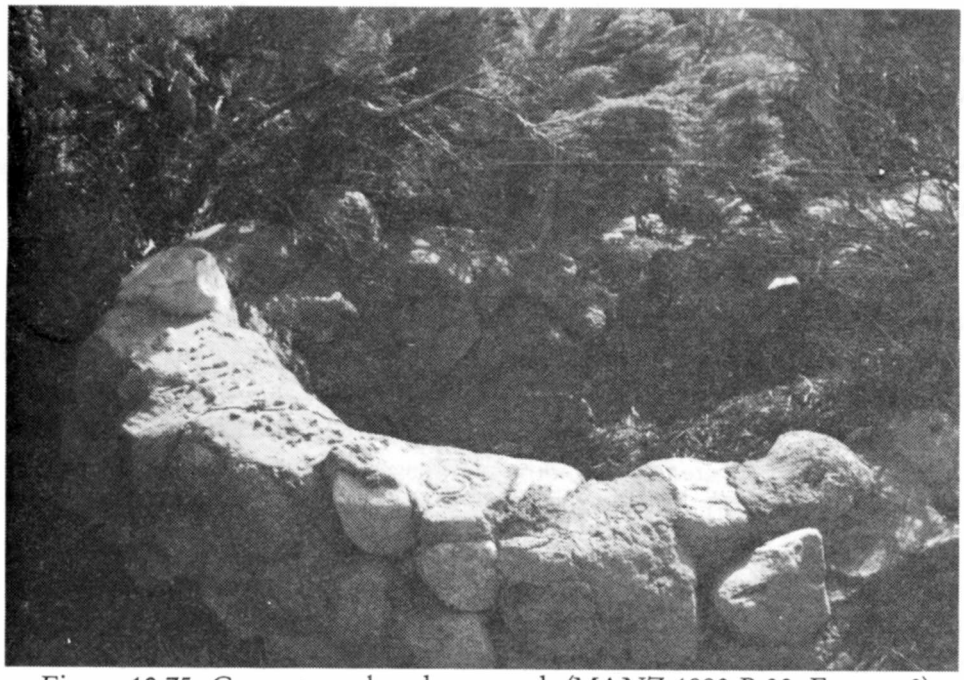


Figure 10.75. Concrete and rock penstock (MANZ 1993 B-30, Feature 3).

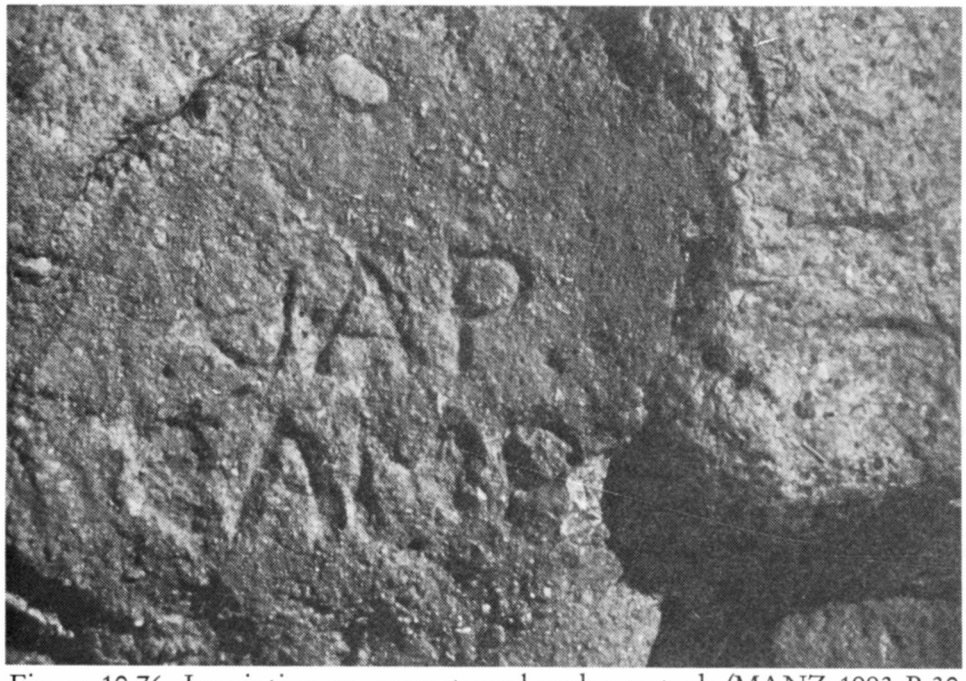


Figure 10.76. Inscription on concrete and rock penstock (MANZ 1993 B-30, Feature 3d).

Feature 1 is a concrete dam, 35 ft long and 7 ft high. The center portion of the dam has been broken out to allow the stream to flow unimpeded. Feature 2, upstream of the concrete dam, is a low curving 30-foot-long submerged barrier of piled rock. This feature is probably not very old and may be associated with LADWP water spreading activities.

Feature 3 is an earthen ditch on the south side of the creek that diverted water from just above the dam to the relocation center reservoir. A

wooden sluice frame, with a metal depth gauge fastened to its vertical center support, is still intact in the middle of the ditch where it turns from the creek. The ditch outlet has been modified by LADWP to allow water to be spread from the creek during periods of high runoff.

Features 4 through 6 are located 65 feet upstream of the concrete dam. Feature 4 is a wooden weir box measuring 13 ft long with rock and wood retaining walls at both ends. Feature 5, adjacent to the weir, is a small corrugated tin building measuring 5 ft by 7 ft by 7 ft high with a shed roof. A large metal pipe imbedded in a concrete slab is all that remains of a gauge that was once housed in the shed. Feature 6, located between the weir and the shed, is a 12 inch by 20 inch wood gauging box with a hinged lid.

North Wells
(MANZ 1993 B-38)

This site consists of two wells (Nos. 91 and 92) located on opposite sides of Highway 395, connected by a 2,750-foot-long concrete pipeline. No associated artifacts were noted. The two wells and the pipeline are shown on relocation center blueprints; only the wells are shown on 1930 LADWP plat maps.

Three features were designated at this site. Feature 1, on the east side of Highway 395, is Well No. 92. The well is currently in use: a steel pipeline carries water from the well to the Los Angeles Aqueduct. Fenced, the well pad is similar to the one recorded as Feature 2, below.

On the west side of the highway, just north of an alfalfa field, Feature 2 consists of a well pad on a low mound, a small concrete slab, and a portion of a concrete sluice gate. A modern well (No. 408) and a capped well (No. 815) are to the northeast. The well pad was once surrounded by a chain link fence. On the south, east, and west sides of the slab there are eight 5½-ft-high metal tube fence posts and at the midpoint of the south side there is a single post flush to the ground from an apparent gate closure. The well pad consists of a L-shaped 16 ft by 16 ft concrete slab with rust stains, equipment supports, piping and conduit, and a central 16-inch-diameter metal plate. Spray painted on the slab is the number "91." A portion of the slab has been reconstructed and there is a 4 ft by 6 ft concrete addition that appears rather recent. Inscribed within a large heart on the addition are the initials "TP+WG." Southwest of the well pad there is another concrete slab recent in appearance. The slab, measuring 8 ft by 10 ft, has rust stains and equipment mounts. Inscribed in the concrete on a corner is "87 Miller Jr." Between the well pad and the smaller concrete slab there is an in situ 22 inch by 5½ inch concrete wall that once apparently held a wooden sluice gate.

Feature 3 is an abandoned concrete pipeline that brought water from Well No. 92 to fields in the vicinity of Well No. 91. Portions of the pipeline have been destroyed. An upturned concrete support near Well No. 92 is inscribed with "FINISHED BY TOM FUJISAKI & CREW MAR. 23, 1944" (Figure 10.77). This date is one of the most recent dated inscriptions associated with the relocation center.

Landfill
(MANZ 1993 B-8)

This site, covering 18 acres northwest of Bairs Creek about 1,000 feet west of the fenced portion of the relocation center, comprises the relocation center landfill. The landfill consists of buried trash-filled trenches up to 6 ft deep on both sides of a 10-ft-deep gully apparently caused by LADWP water spreading activities.

Five features were designated at the site and each is discussed separately below (Figure 10.78). Features 1 and 2 appear to have been the main trash disposal areas at the relocation center. Trenches can be seen on 1944 aerial photographs in these locations. Feature 4 and 5,



Figure 10.77. Inscription on overturned concrete pipe support (MANZ 1993 B-38, Feature 3a).

possible structural remains, are also visible on the 1944 aerial photographs. Feature 3 is not visible on the 1944 photographs, suggesting it was in use later, possibly for the disposal of materials during the dismantling of the center.

The contents of some of the trenches are now partially exposed from the efforts of bottle collectors and erosion (Figures 10.79 and 10.80). Much material has been washed downstream. Bottle collectors have disturbed Feature 1 substantially and Features 2 and 3 to a lesser extent. Between Features 1 and 2 there is a 3 ft by 20 ft scatter of clear and brown bottle glass fragments, apparently the result of target shooting. Approximately 75 percent of the site appears to be intact.

Feature 1

This feature is a set of heavily vandalized trenches at the very edge of the gully, laid out on a northwest angle. There appears to have been at least three trenches, 200 feet to 260 feet long, between the gully cut on the south and a dirt road to the north.

Hundreds of thousands of artifacts have been exposed by bottle collectors at the two easternmost trenches. This includes dozens of intact bottles (mostly clear, with over 40 different shapes and sizes), some with readable paper labels. A representative sample of these bottles was collected and are curated at the Western Archeological and Conservation Center, Tucson, Arizona. Much of the material has been burned and metal is conspicuously rare.

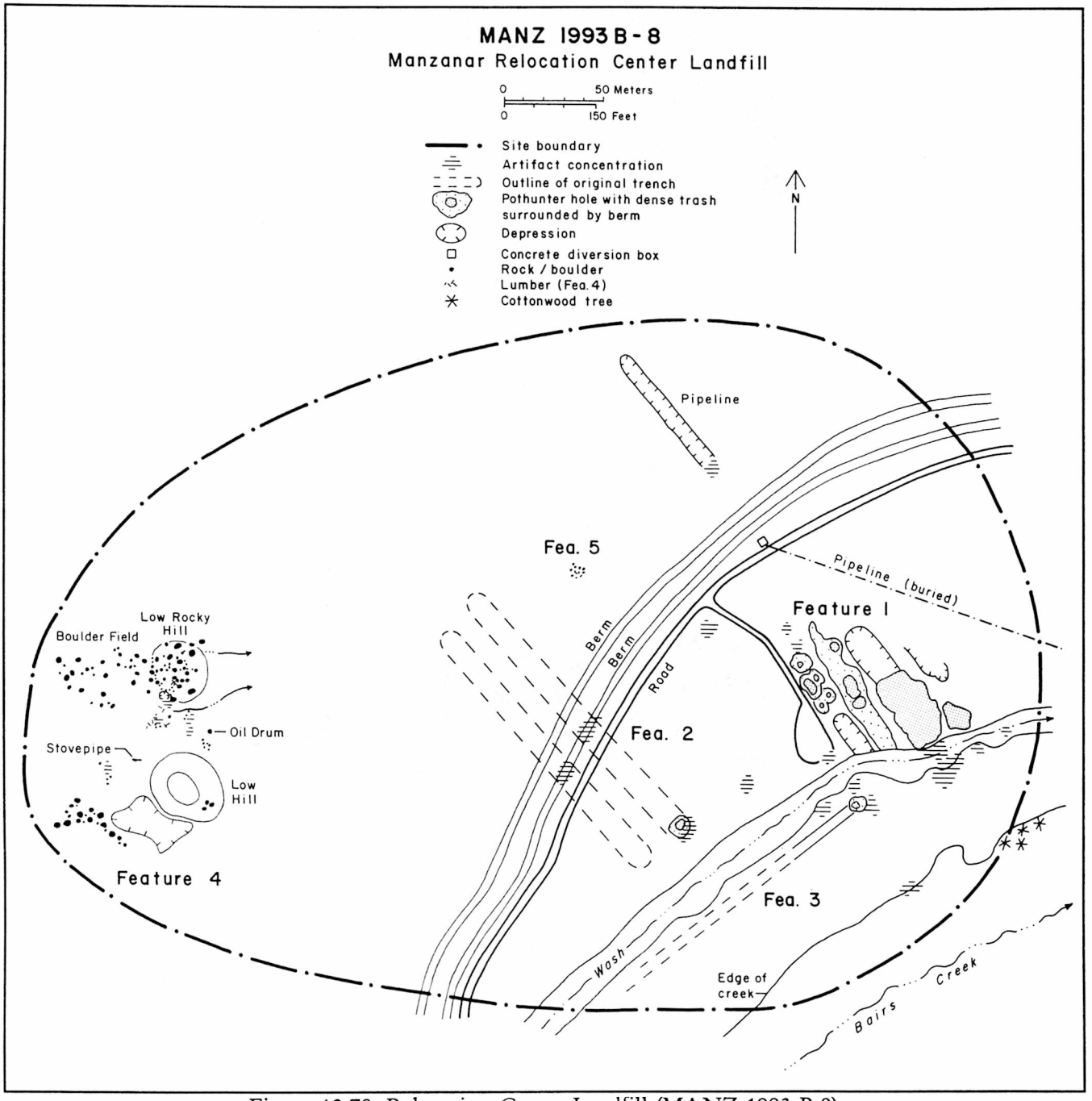


Figure 10.78. Relocation Center Landfill (MANZ 1993 B-8).

Marks noted on glass, ceramics, and other artifacts are summarized in Table 10.2.

Glass is by far the most abundant artifact type present. Clear glass artifacts noted include complete and broken mayonnaise jars, syrup containers, whiskey bottles, pickle jars, a small tequila bottle, ink bottles, perfume bottles, extract bottles, jelly jars, ketchup bottles, shoe polish bottles, corn syrup bottles, mustard jars, wine bottles, cosmetic bottles, milk bottle fragments, one gallon jugs, olive jars, rectangular jars, condiment jars, shot and beer glasses, and window glass. Brown glass artifacts noted include complete and broken one gallon jugs, small medicine bottles (with increments marked on the side), large jugs, whiskey, wine, and beer bottles. Green glass noted includes complete and broken



Figure 10.79. Vandalized area of landfill (MANZ 1993 B-8, Feature 1).

wine and soda bottles. White glass artifacts noted include complete and broken cold cream jars, "Mentholatum" jars, other small cosmetic jars, gravy boats, and baking dishes. Other glass artifacts noted include complete and broken yellowish green jugs, an aqua bottle spout, an opalescent candy dish with raised dots, "Coke" bottle fragments, glass marbles, and cobalt jar fragments.

Ceramics, the next most prevalent artifact class noted, include fragments of stoneware plates, cups, bowls, platters, pitchers, serving bowls, tea pots, and lids, fragments of whiteware plates, tea cups, bowls, and saucers, a doll's leg, figurine fragments, a brown stoneware plate, porcelain light fixtures, and glazed ceramic water pipe.

Cans noted include evaporated milk, tapered rectangular meat, vegetable, fruit, oil, juice, coffee, sardine, baking powder, and fuel cans. Other metal artifacts noted include barbed wire, crown caps, large bolts and screws, toothpaste tubes, a section of 9-inch diameter metal pipe, stove parts, a basin, a muffler, a



Figure 10.80. Gully erosion at landfill (MANZ 1993 B-8, Feature 1).

Table 10.2.
Marks Noted at the Relocation Center Landfill (MANZ 1993 B-8).

Glass
...ire Jr. (soda)
ACE 3 1/2 FL OZ 8
Anchor Hocking Corp. (1938+)
Armstrong Cork Co., Glass Division, W VA. (1938-1969)
Ben-Hur Mustard
Brockway Glass Co. (1925+)
Clorox
Coca Cola (Bishop, Calif. and Tacoma, Wash.)
Crown Products Corp. ...CAL. ...5...L.A. DES. PAT. 108592
Diamond Glass Co. (1888+)
Drener
Dr. Lyon's Tooth Powder (1938-1969)
Duraglass (1940-1963)
ELMO 12 (cold cream jar)
Fairmont Glass Co. (1945-1960)
Fitch's, F.W. Fitch Co. (1892+)
Glass Containers, Inc. (1945+)
Hazel-Atlas Glass Co. (1920-1964)
Herpicide Quality Products for the Hair and Scal... (1932-43)
J & J, Johnson and Johnson (1887+)
Jergen's Lotion 5 HA
Knox Glass Bottle Co. (1932-1953+)
L & F Prod Corp Made in U.S.A.
LaVida (soda)
Log Cabin Syrup
Made in U.S.A. Design Pat. 103709
MAROOIL SHAMPOO
Maywood Glass Co. (1930-1961)
Mentholatum Reg Trade Mark
Monk's Jug Patented No. 112387 Reg. Cal.
Noxema (cold cream jar)
Obear-Nester Glass Co. (1915+)
Owens Illinois Bottle Co. (1932+)
Penick & Ford Ltd Inc New Orleans LA
Pond's 16 (cold cream jar)
Pepsi-Cola
Purex (1915+)
Registered 8 2904-D 20 (diamond over circle) 1 B.P. Ltd.
Sani-Clor
Sani-Glass ⊕
Santa Cruz Chilies
Seven Up Bottling Co. 7-Up Los Angeles
Sloan's Liniment Made in U.S.A., Alton, Illinois (1929-1951)
USQMC (salt shaker base)
Whitall-Tatum & Co. (1935-1938)
White Magic
Wils... Club (soda)
Woodbury (cold cream jar)

Ceramics
Bauer USA Los Angeles (1930s+)
Buffalo China Made in U.S.A. C-12, Buffalo China Co. (1901+)
Cafe Au Lait Buffalo China
Carr China Co. Grafton W Va 42
China by Iroquois USA A.4 T
Crown (with Crown motif) Made in U.S.A. 7 42 (Crown Potteries Co., Evansville, Id 1942)
Homer Laughlin Made in U.S.A. L 42 N 6 (1942)
Homer Laughlin Made in U.S.A. A 43 N 6 (1943)
Made in Japan (numerous styles)
McNichol China Clarksburg, W.Va. 1941 X
Monteci ...
Noritake Japan M (with wreath motif)
O.P.CO. Syracuse China J-10 William Taylor (Onondaga Pottery Co., J Denotes 1929)
O.P.CO. Syracuse China S-1 (S Denotes 1938)
Shenango China Newcastle Pa
Shenango China Newcastle Pa U.S.Q.M.C.
Sterling China Company U.S. Army Medical Dept. ...41
Sterling China Company Vitrified West Liverpool O (ca. 1946-1954)
TEPCO U.S.A.
TEPCO China U.S.A. (1901+)
TEPCO China Vit-U.S.A.
U.S. Army Medical Department
U.S.Q.M.C. 5511-034
U.S.Q.M.C. W431-QM-46- (0.1.5205) Mar. 17, 1941
U.S.Q.M.C. 3511 0-I-I08I 0-13-40 (1940)
U.S.Q.M.C. ..... April 24, 1941
U.S.Q.M.C. ..... Mar. 17, 1943
Wallace China OH
Wallace China TM

Other
Kodak (steel film canister)
Upjohn (plastic cap)
Wildroot (plastic cap)

bucket, light bulb bases, a water sprinkler jet, a pot handle, a large door hinge, an enameled coffee cup, a platter, a cast iron grill, a small gas tank, heavy wire mesh, water pipe, a bracket, a circular saw blade, bicycle pedals, a measuring scoop, pieces of tin, and wire nails.

Other miscellaneous artifacts noted include fragments of rubber hose, rubber and leather shoe fragments, and plastic caps. Ecofacts noted include many fragments of abalone shell, bone (some cut), lumber, charcoal, and paper.



Figure 10.81. Vandalized area of landfill (MANZ 1993 B-8, Feature 3).

The westernmost trench of Feature 1 has a distinctively different artifact assemblage. Noted were a bed frame, an automobile frame, other automobile parts, a clothes washer, a trash can, a stove pipe elbow, a bucket, a gas spout adapter, small drum lids, two 50-gallon drums, a 30-gallon drum, and 15 large fuel cans. Southwest of this trench there is a small cluster of mostly metal artifacts including an oil drum, a large fuel can, a small water heater, a trash can lid, a stove, and three concrete pipe fragments.

Feature 2

This feature consists of two parallel trenches that run northwest for approximately 400 feet from near the gully edge, at the same angle as the Feature 1 trenches. Artifacts have been exposed by bottle collectors digging at the southeast end of the eastern trench and in berms near the center of both trenches.

In the berm of the eastern trench there is a 20 ft by 30 ft dense artifact concentration consisting of bits and pieces of metal, white, clear, olive green, and "Coke" bottle glass, glazed ceramic water pipe, and an electrical porcelain knob. Exposed in the berm crossing the western trench is a 10 ft by 20 ft concentration of green, clear, brown, and white bottle glass, some scattered roofing paper, and a few stoneware fragments.

Noted at the 20-foot-diameter collector's hole at the south end of the east trench (Figure 10.81) were brown, clear, and yellowish green glass fragments, terra cotta flower pot fragments, stoneware, trash cans, oil drums, car parts, wire, and a bucket.

Feature 3

This feature consists of a 160-foot-long trench in a west-east direction on the south side of the gully. The trench, where disturbed at the east end, contains mostly metal items. A 30 ft by 60 ft vandal hole contains sanitary seal cans, sheep fencing, a trash can lid, barbed wire, a bed frame, cast iron fragments, screws, wire nails, and a drum.

Noted in other portions of Feature 3 were green, clear, brown, blue, and "Coke" bottle fragments, white earthenware, a few terra cotta flower pot fragments, a dark purple glass marble, an embossed steel "KODAK" film canister[1], abundant roofing paper, electrical wire, chicken wire, concrete, bed springs, wire cable, pipe, wire nails, a large fuel can, 15 trash cans, stove parts, barrel hoops, and concrete pipe fragments.

To the east of the trenches, directly across the gully from Feature 1, there is a badly eroded deposit of roofing materials, drywall, and tens of thousands of fragments of government-issued plates, dishes, platters, and cups. This deposit might have been part of the Feature 3 trench. Noted in the gully itself were abundant ceramics, window glass fragments, brown bottle fragments, sanitary seal cans, oil cans, a trash can, a 30-gallon drum, ceramic sewer pipe, car parts, a large enameled cooking pot, a large fuel can, bed springs, barbed wire, chicken wire, smooth wire,

[1]Inquiries to the George Eastman House, which houses the Kodak archives, disclosed no record of Kodak using steel rather than aluminum for their film canisters. Steel was probably used for military orders due to the tight supply of aluminum during World War II (Dick Lord, personal communication, 1994).



Figure 10.82. Metal recycling facility (Toyo Miyatake photograph©, courtesy of Archie Miyatake).

a bucket, a section of metal pipe, and roofing paper.

Other Features

Feature 4 is a small low mound and a rocky circular area with lumber fragments, some burned artifacts, and ash. Located about 325 feet west of Feature 2, this enigmatic feature is visible on 1944 aerial photographs. The feature may be the remains of the metal recycling facility photographed by Toyo Miyatake (Figure 10.82)

Feature 5 is a 10-ft-diameter mound with concrete, bricks, lumber, glazed ceramic pipe, and other artifacts. It may be the remnants of a small structure.

Three additional small trash concentrations were noted at the site. Southwest of the road intersection to main dump area (Feature 1) there is a dense 15-ft-diameter concentration of clear and green soda bottle fragments, some clear brown, and blue glass fragments, many fragments of whiteware, and several can and jar lids. At the south end of site at the edge of Bairs Creek there is a concentration of large concrete slab fragments, some with embedded reinforcing wire. North of the road a narrow linear trench, possibly resulting from a removed concrete pipeline (there is still a pipeline alignment to the south), there is a 10 ft by 20 ft area of clear, brown, and green glass fragments, mayonnaise jars, white stoneware, sanitary seal cans, a spring, and metal bits and pieces.

Disposal Pits

(MANZ 1993 B-9)

A 2.5 acre area west of the relocation center cemetery is associated primarily with the abandonment of the relocation center. Within the site, six areas (Features 1–6) containing various materials have been exposed by bottle collecting activities (digging) and erosion. One area was used exclusively for the disposal of ceramics, others were used for the disposal of large debris, such as vehicles (Figure 10.83), vehicle parts, concrete, and other items. Portions of over ten partially buried vehicles were noted at the site (Figure 10.84).

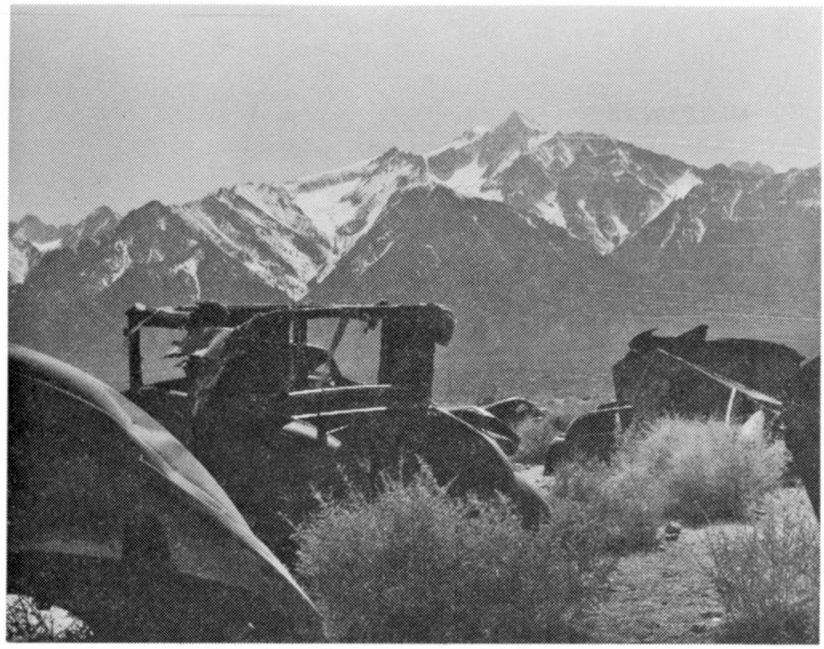


Figure 10.83. Abandoned evacuee vehicles at Manzanar (Toyo Miyatake photograph©, courtesy of Archie Miyatake).

Feature 1 is a series of shallow vandal holes in a 60 ft by 70 ft area covered with tens of thousands of ceramic fragments, virtually all government-issued heavy white stoneware with the exception of a few buff-colored fragments (Figure 10.85, Table 10.3). Noted were plates, coffee cups, soup cups, platters, serving bowls, bowls, lids, and pitchers. Most items are plain white, but others have simple green, red, black, or brown decorations.

Feature 2 is a 50 ft by 80 ft area where portions of buried vehicles are exposed (Figure 10.86). Noted were six partially buried vehicles and a couple of metal fragments.

Feature 3 is a 65 ft by 150 ft trash scatter at the edge of a drainage channel. Noted at this feature were about 100 sanitary seal cans, over 50 stoneware cup, bowl, and plate fragments, a clear glass jug, over 50 pieces of miscellaneous metal hardware and other items, two wheelbarrows, wheelbarrow parts, and a few barrel hoops.

Feature 4 consists of a 175-foot-long trench filled with concrete rubble. Feature 5 is a 10 ft by 20 ft scatter of approximately 60 stoneware plate fragments.

Feature 6 is a 100 ft by 100 ft trash scatter with several buried vehicles exposed in a drainage. Noted were at least five partially buried vehicles, hundreds of vehicle parts, hundreds of fragments of window and bottle glass (clear, brown, green, and purple), about 30 fragments of stoneware ceramics, and several beverage cans.

Feature 7 is a 30 ft by 75 ft area with five partially exposed vehicles. Feature 8 is a 10 ft by 25 ft concentration of brown and purple glass, with two green glass fragments, 30 stoneware fragments, and a metal can twist-key.

Noted in non-feature areas of the site were scattered glass and metal artifacts, lumber fragments, and another partially buried vehicle. More material may remain buried in other portions of the site as well.

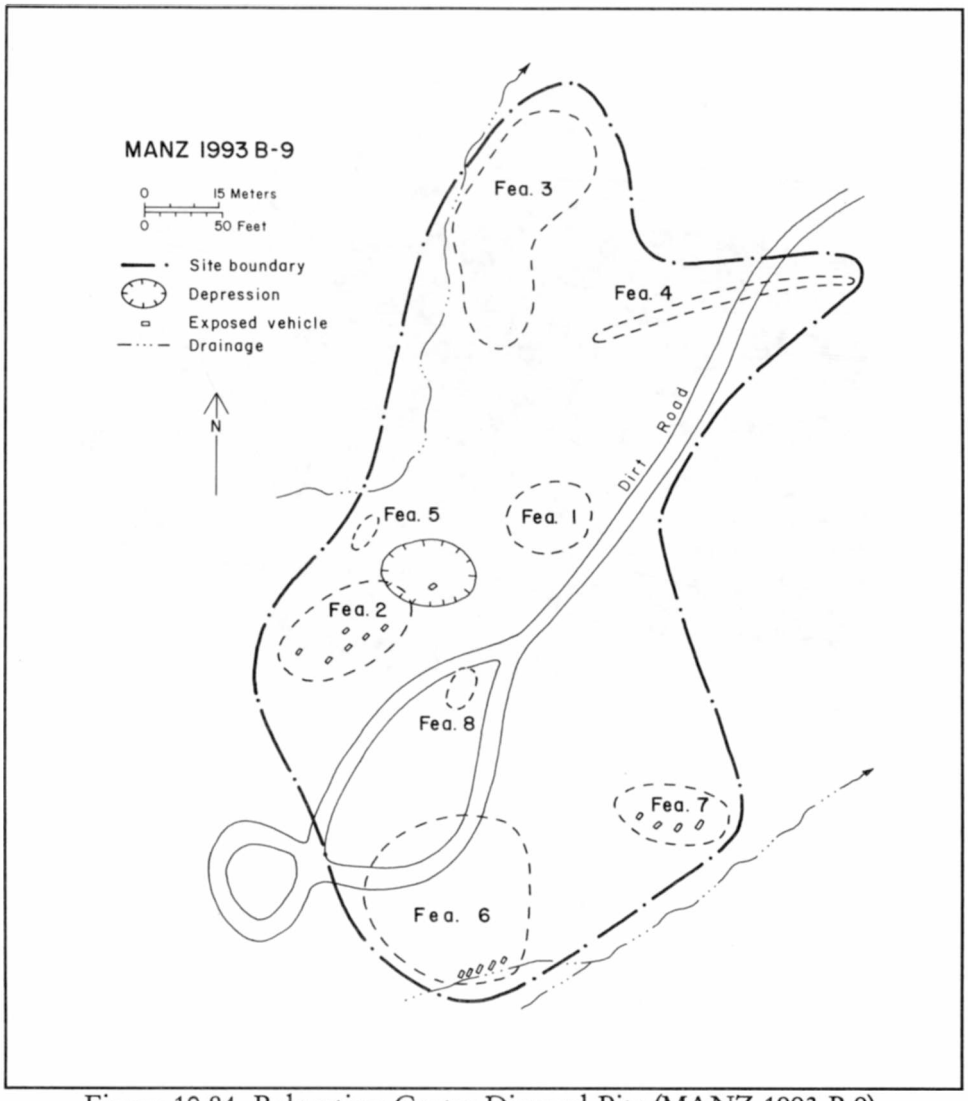


Figure 10.84. Relocation Center Disposal Pits (MANZ 1993 B-9).

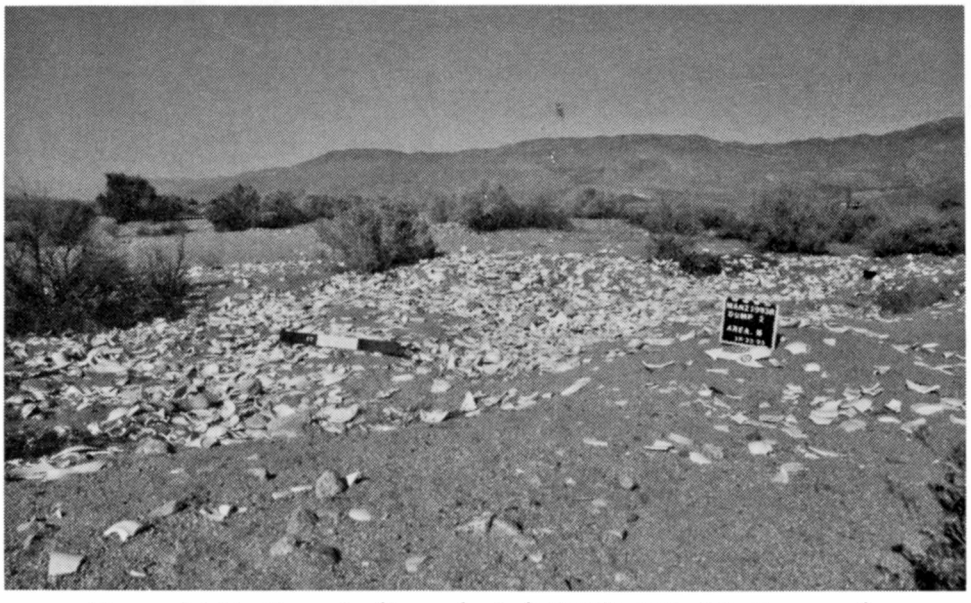


Figure 10.85. Ceramic disposal pit (MANZ 1993 B-9, Feature 1).



Figure 10.86. Exposed vehicle at disposal pits (MANZ 1993 B-9, Feature 2).

Table 10.3.
Ceramic Hallmarks Noted at the Relocation Center Disposal Pits (MANZ 1993 B-9).

..hall U.S.Q.M.C. ..4806 (0.1.6057) ..25, 1941
Cafe Au Lait Buffalo China
Homer Laughlin Made in USA K 42 N 6
McNicol China Clarksburg, W.Va. 99
McNicol China U.S.Q.M.C. ..... July 15, 19..
McNicol China U.S.Q.M.C. W 431-Q24-4631 (0.. Mar. 29..
Shenargo China New Castle, PA
Shenargo China New Castle, PA Inca Ware
Shenargo China New Castle, PA U.S.Q.M.C. 7
Sterling China Company Vitrified East Liverpool, Ohio
TEPCO U.S.A.
TEPCO China U.S.A.
TEPCO U.S.A. Vit China
U.S. Army Medical Department
U.S.Q.M.C. W 43 I 9 M.3266 CO...
Wallace China TM

Factory Area Trash Deposits
(MANZ 1993 A-35)

This site consists of two trash dumps (Locus A and B) and scattered artifacts in a 2½-acre area southeast of the Camouflage Factory. The site is bounded by irrigation ditches on the south and east, a settling basin on the north (MANZ 1993 A-34, above), and the fenced central portion of the relocation center on the north.

Artifacts noted during survey at Locus A (about 1 acre) include hundreds of barrel hoops (Figure 10.87) and several large piles of brown and clear glass jug fragments (over 10,000 fragments in all). Noted at Locus B (5,000 square ft) were hundreds of



Figure 10.87. Barrel hoops (MANZ 1993 A-35, Locus A).

small pieces of scrap lumber (some burned), pipe fragments, wallboard bits, sanitary seal cans and can bits, sheet metal, concrete, wire nails, tarpaper, and red brick fragments. A few barrel hoops are scattered to the south and west of the site. Locus A is likely refuse dumped during the operation of the center. Locus B may be waste from the construction or dismantling of the center.

Administration Area Trash Scatter
(MANZ 1993 A-36)

This site consists of scattered automobile parts and other artifacts in an 4-acre area west of U.S. Highway 395 and south of the relocation center administration area. The site is between the fenced central portion of the relocation center and the Military Police Compound (Bairs Creek). A recent water control ditch bisects the site.

Artifacts noted during survey include hundreds of small automobile parts such as fan belts, a shift knob, seat springs, upholstery buttons, spark plugs, screws, washers, small springs, bolts, clamps, thousands of automobile window glass fragments, and hundreds of headlight (including one embossed with "Ford") and tail light fragments (including one embossed with "Plymouth"). Other noted artifacts include a countersunk cap, a rubber hose, rubber fragments, iron parts and other hardware, a few sanitary seal cans, hundreds of can bits, a few pieces of sheet metal, lumber bits, about 100 plate fragments, a few purple and brown glass fragments, window glass fragments, "Coke" bottle fragments, a fragment of an "Independence Dairy" milk bottle, and a few abalone shell fragments. Some of the artifacts are burned or melted. The automobile parts are likely from impounded internee vehicles that may have been stored or dismantled there.

A small pile of debris at the western edge of the site across from the Staff Housing Block contains eight sanitary seal cans, about 100 bottle glass fragments (clear, brown, white, "Canada Dry"), crown caps, lumber bits, concrete fragments, hose fragments, corrugated fasteners, wire nails, a gasket, small metal parts, a few plate fragments, bone fragments, and a pine cone. Bottle marks include the hallmarks of the Obear-Nester Glass Company and the Owens Illinois Bottle Company.



Figure 10.88. Dutch oven at Abernathy Ranch (MANZ 1993 B-20).

Shepherd Creek Bridge
(MANZ 1993 B-36)

This site consists of a 12 ft by 30 ft bridge (Feature 1) across Shepherd Creek a little over one-half mile north of the relocation center. The concrete bridge platform has been replaced by steel girders and wood planks. Retaining walls made of rock, concrete, and cement-filled concrete pipe are still intact along the creek banks below the bridge. Feature 2 is a 12 ft by 16 ft asphalt pad 65 ft northwest of the bridge. The asphalt has cracked into 12-inch-wide strips, suggesting it may have been the driving surface of a wood plank bridge, possibly removed during reconstruction. No associated artifacts were noted.

Although the bridge is on a road originally associated with the town of Manzanar, relocation center records indicate a bridge here was built by the internees (Merritt 1946). The road would have provided access to relocation center agricultural fields. The construction methods and the use of recycled concrete pipe suggest the concrete version dated to the relocation center, and the steel girders are more recent. If so, no traces of the original, town-era crossing were found.

South Fork Bridge
(MANZ 1993 B-37)

This site consists of an 8 ft wide by 12 ft long bridge over a fork of Shepherd Creek, 0.2 mile south of and along the same road as the Shepherd Creek Bridge. The bridge appears to have been recently replaced by steel girders and wood planks. A nearby pile of rubble suggests the bridge was previously concrete. Rock and concrete retaining walls along the wash are still intact. As with the Shepherd Creek Bridge, above, relocation center records indicate a bridge was built at this location by the center (Merritt 1946).

Abernathy Ranch Dutch Oven
(MANZ 1993 B-20)

Here there is a 4 ft by 6 ft concrete oven within a small, now roofless, one-room concrete and rock structure. The oven, proportionally too large for the structure (Figure 10.88), was apparently built by internees of the relocation center. A relocation center blueprint notes two "Dutch ovens" in the general direction of this site from the central portion of the relocation center. The building itself is from a histor-



Figure 10.89. Stone building at Albers Ranch (MANZ 1993 B-21).

ical ranch that was in use from around the turn of the century until the mid-1930s (Abernathy Ranch, see Chapter 12). Although the term "Dutch oven" is more often associated with the cast-iron pot used for camp-fire baking, the term also can be used to denote other types of baking constructions.

The main compartment of the oven is a rectangular box approximately 3-ft-high with an open top and a rectangular front opening (probably for a door). On the north face the top opening has recessed slots, either for grating or a solid cover. The chimney at the back, approximately 5 ft high, supports a round flue constructed of concrete pipe, now broken off. No artifacts that could be specifically attributed to the relocation center use were noted, however alluvium, sheet wash, and erosion have clearly disturbed the area.

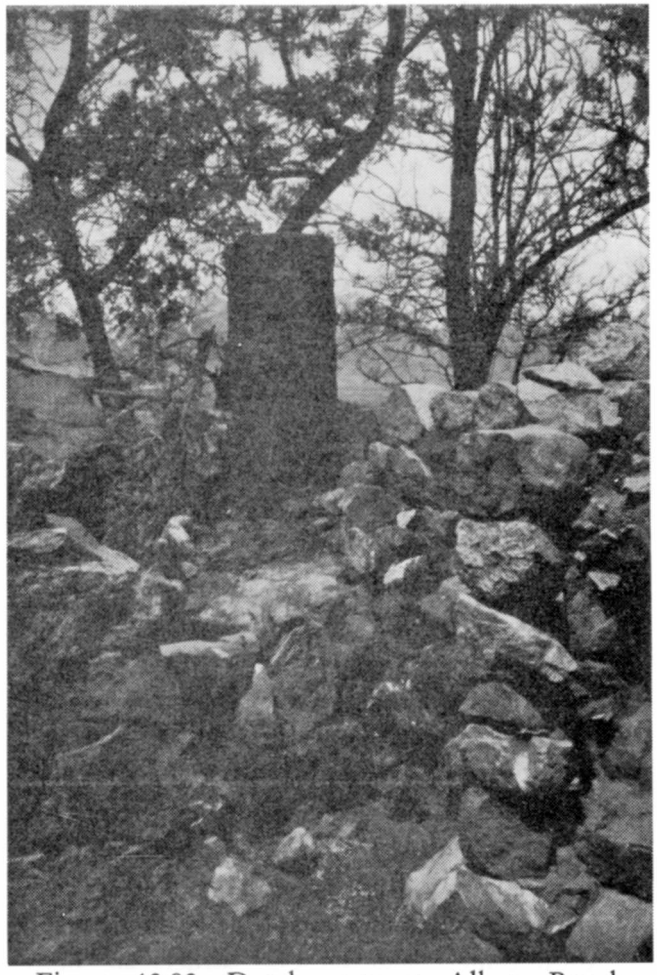


Figure 10.90. Dutch oven at Albers Ranch (MANZ 1993 B-21).

Albers Ranch Dutch Oven
(MANZ 1993 B-21)

The relocation center component of this site is a concrete and rock oven built by the internees within a two-room adobe-mortared rock building (Figure 10.89). The building and other

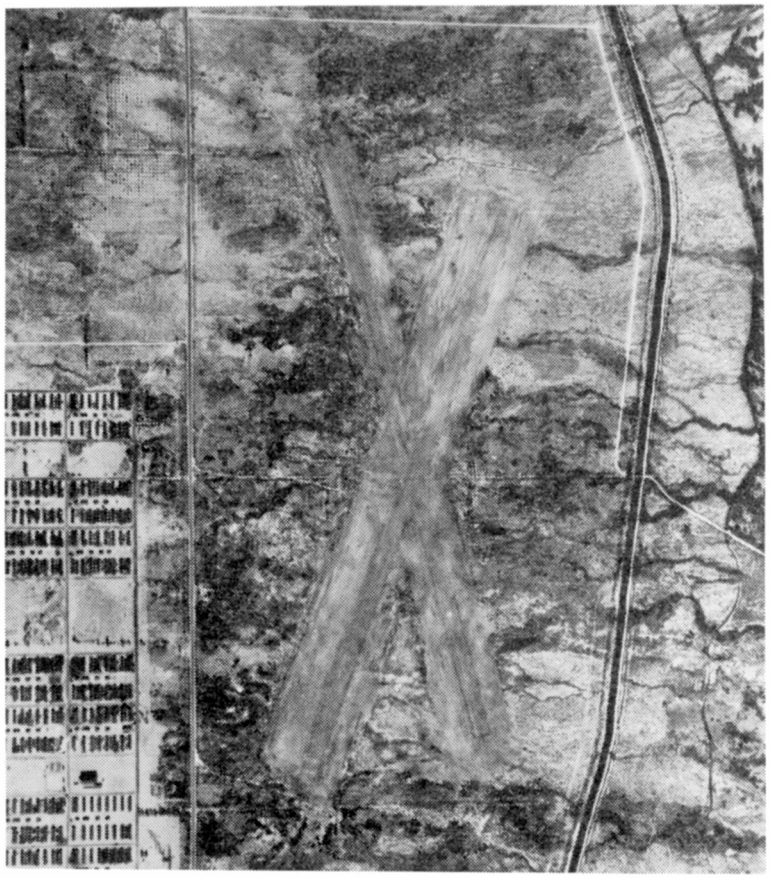


Figure 10.91. 1944 aerial photograph of Manzanar Airport (north to top; courtesy of LADWP Bishop Office).

nearby features are from the historical Albers Ranch (see Chapter 12). This oven is larger and more ornate, but otherwise very similar in construction to the one at the Abernathy Ranch discussed above.

The oven measures 5 ft by 7 ft, and the rectangular main compartment is approximately 4 ft high. The chimney at the back end, which supports the round concrete pipe flue, is approximately 6-ft-high (Figure 10.90). The exterior of the stove is faced with rock and the flue has been coated with concrete stained a reddish color into which a pattern, designed to mimic rock, was drawn in the wet cement.

No artifacts that could be specifically attributed to the relocation center use were noted, perhaps at least partly because of the litter collection and clean-up by relocation center residents allowed to used the area for picnicking and camping (*Manzanar Free Press* 4/19/43).

Manzanar Federal Airport

(MANZ 1993 B-27)

Although this abandoned World War II-era airport was located just across Highway 395, it apparently was never used by the relocation center. Built for the Army in 1941 it was used for bomber pilot training, testing experimental aircraft, and aircraft emergencies. The airport was referred to as the "Manzanar Federal Airport" in a local newspaper article (*Inyo Independent* 6/19/42).

The airport appears on 1944 aerial photographs, but its image has been purposefully blurred out (Figure 10.91); the top edge of the aerial photographs are marked "restricted." The airport includes two runways, a taxiway, and related structures and features. Nine features were designated at the 120-acre site (Figure 10.92).

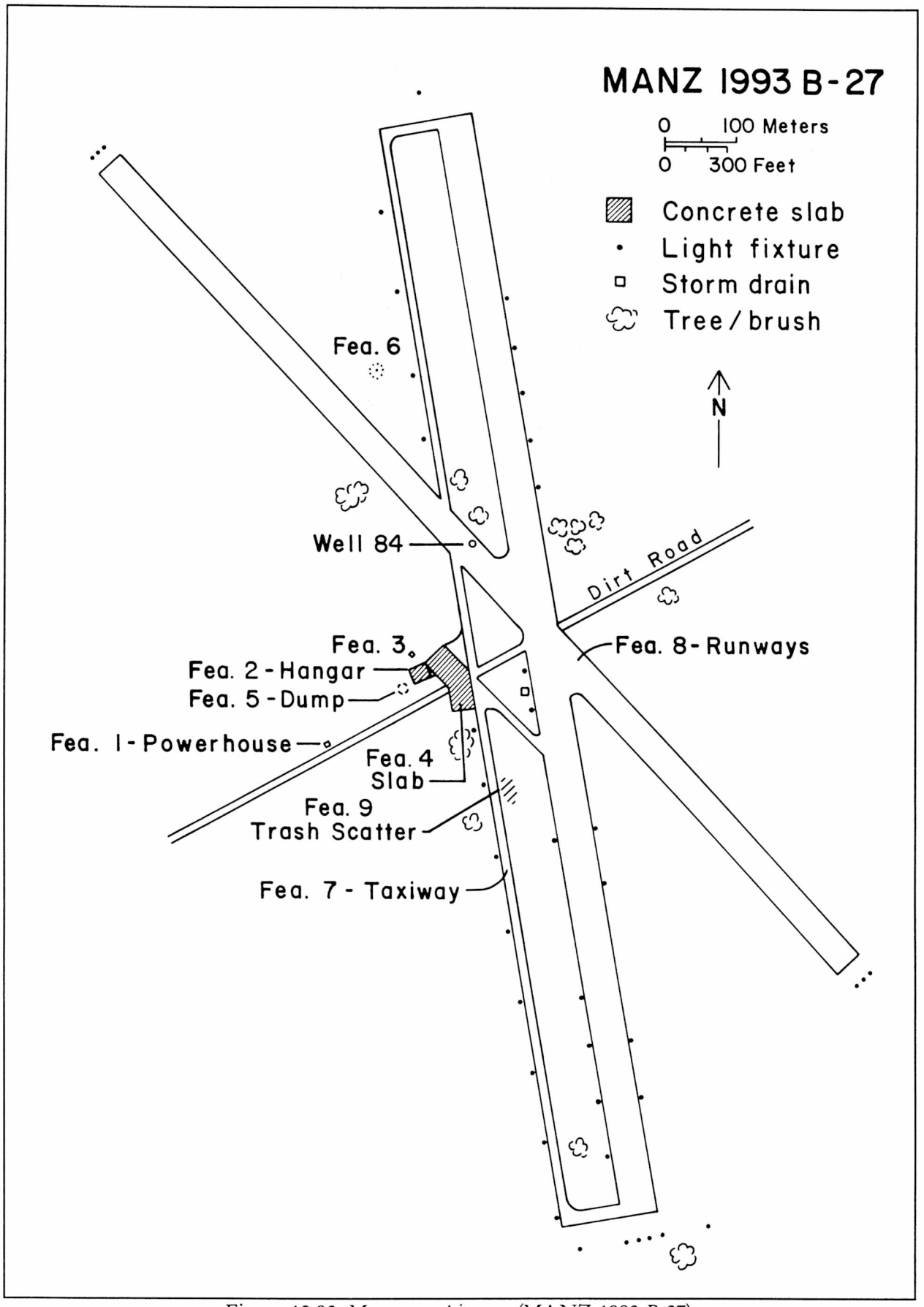


Figure 10.92. Manzanar Airport (MANZ 1993 B-27).

Feature 1, a powerhouse (Figures 10.93 and 10.94), is a 10 ft by 55 ft poured concrete building with a flat recessed roof. It has a 3 ft by 7 ft metal-clad door on the west side and a small 1½ ft square opening low on the north wall. There are pipes (some insulated with rubber) protruding from below ground level on both the interior and exterior of the structure. Just inside the door across the west end of the building a trench is molded into the concrete floor. There is a smaller trench in a raised concrete platform in the southeast corner. Metal plates appear to have been attached to the north and east exterior walls. On the exterior at the northwest corner of the north wall is part of a large switch handle in a vertical slot in the wall.

Feature 2 is the foundation of a hangar (Figures 10.95 and 10.96). It is a concrete slab 56 ft by 85 ft with a concrete lip around three sides with protruding bolts for attaching walls. There was a 12 ft wide workshop or office separated from the main hangar area along the north length of the structure, indicated by a concrete lip with protruding bolts, and a small latrine attached to the west end of the hangar. Inscribed in the concrete on the east side of the hangar are three sets of initials and a 1942 date (Figure 10.97). A plastic button was collected from atop the hanger slab (see Appendix E).

Feature 3 is a concrete slab foundation northeast of the hangar slab. It measures 13 ft by 20 ft and has a walkway on the south side (Figures 10.98 and 10.99). Around the edge of the slab remnant concrete walls stand up to 1 ft high. This building may have used for storage of flammable materials.

Feature 4, located between the hangar foundation and the taxiway, is an aircraft parking area or "apron." The apron is crossed by the Manzanar-Reward Road constructed before the airport (Francis Street of the town of Manzanar) and still in use today. The apron consists of two sections each about 100 ft by 135 ft in size connected at an angle to fit adjacent to the "X" of the runways and taxiway (Figures 10.100). The apron is for the most part paved with 12½ ft by 15 ft concrete slabs; V-shaped slabs fill in the angle between the two sections. Each section has 36 tie-down rings (Figure 10.101 and 10.102) and a centrally located recessed metal outlet embossed with "OPEN <—> CLOSED RUSSELL & STOLL CO NY." Within each section the tie-down rings are distributed in six groups 30 ft apart. Each of these groups has two rows of three rings spaced at 15 ft intervals.

Feature 5 is a dump and oil-disposal pit. It consists of a small depression and a berm behind the hangar. There are numerous metal airplane parts and other trash eroding from the berm. Noted were brackets, springs, metal rods, many unidentifiable airplane parts, tiny clear glass vials containing small white pills, clear and brown glass fragments, and a few ceramic fragments.

Feature 6 is the location of the wind direction indicator (Figures 10.103 and 10.104). The wind indicator was apparently a wind-T supported by a 4-ft-high concrete pillar, 3-ft-square at the bottom and tapering to 2-ft-square at the top. A pipe and three bolts remain on the top where the wind-T was attached (Froesch and Prokosch 1946:143). A circle 36 ft in diameter, formed of white quartzite cobbles, encircles the pillar. Two metal poles possibly for lights, one on the north and one on the south edge of the rock circle, flank the pillar.

Feature 7 is a 50-ft-wide asphalt-paved taxiway. The asphalt paved taxiway runs nearly north-south on the west side of the main runway (Figure 10.105). There are tip-over disconnect fittings (Froesch and Prokosch 1946:143) for light fixtures along the west (outside) edge of the taxiway at 310-ft intervals. Located 30 ft off the taxiway they consist of a 5-inch-square metal box with a hinged cover (embossed with"AEROLITES 1028 CALIF") set into round 42-inch-diameter concrete bases (Figures 10.106).

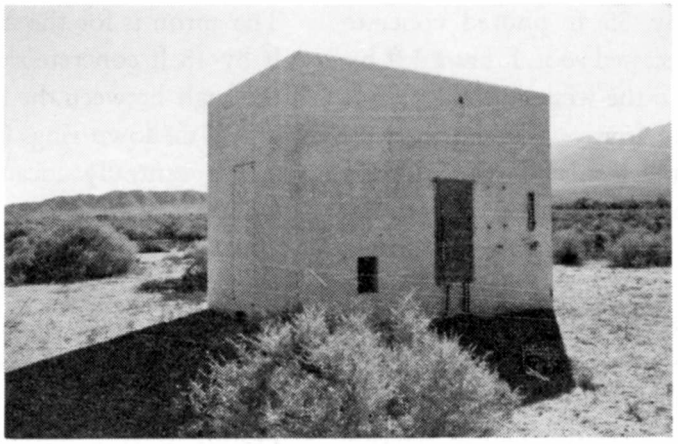


Figure 10.93. Powerhouse at Manzanar Airport (MANZ 1993 B-27, Feature 1).

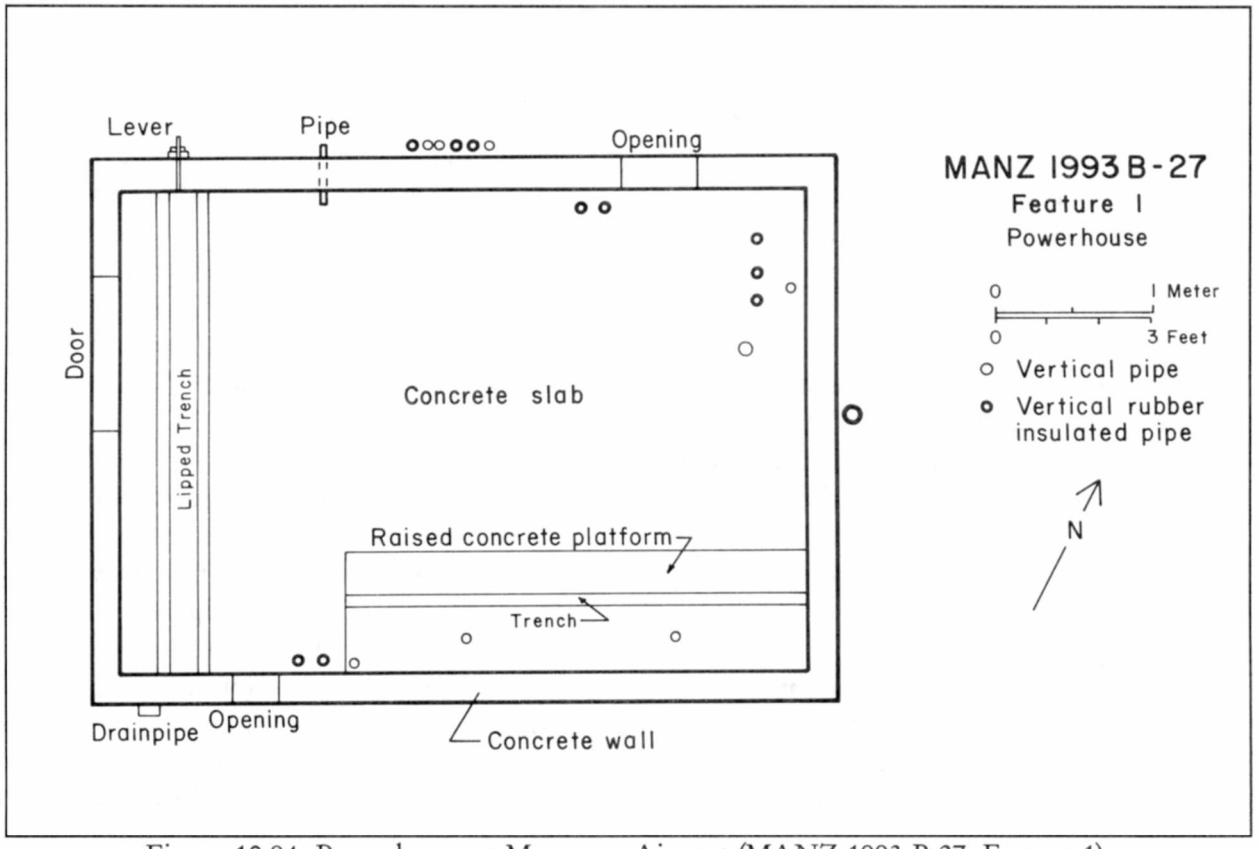


Figure 10.94. Powerhouse at Manzanar Airport (MANZ 1993 B-27, Feature 1).

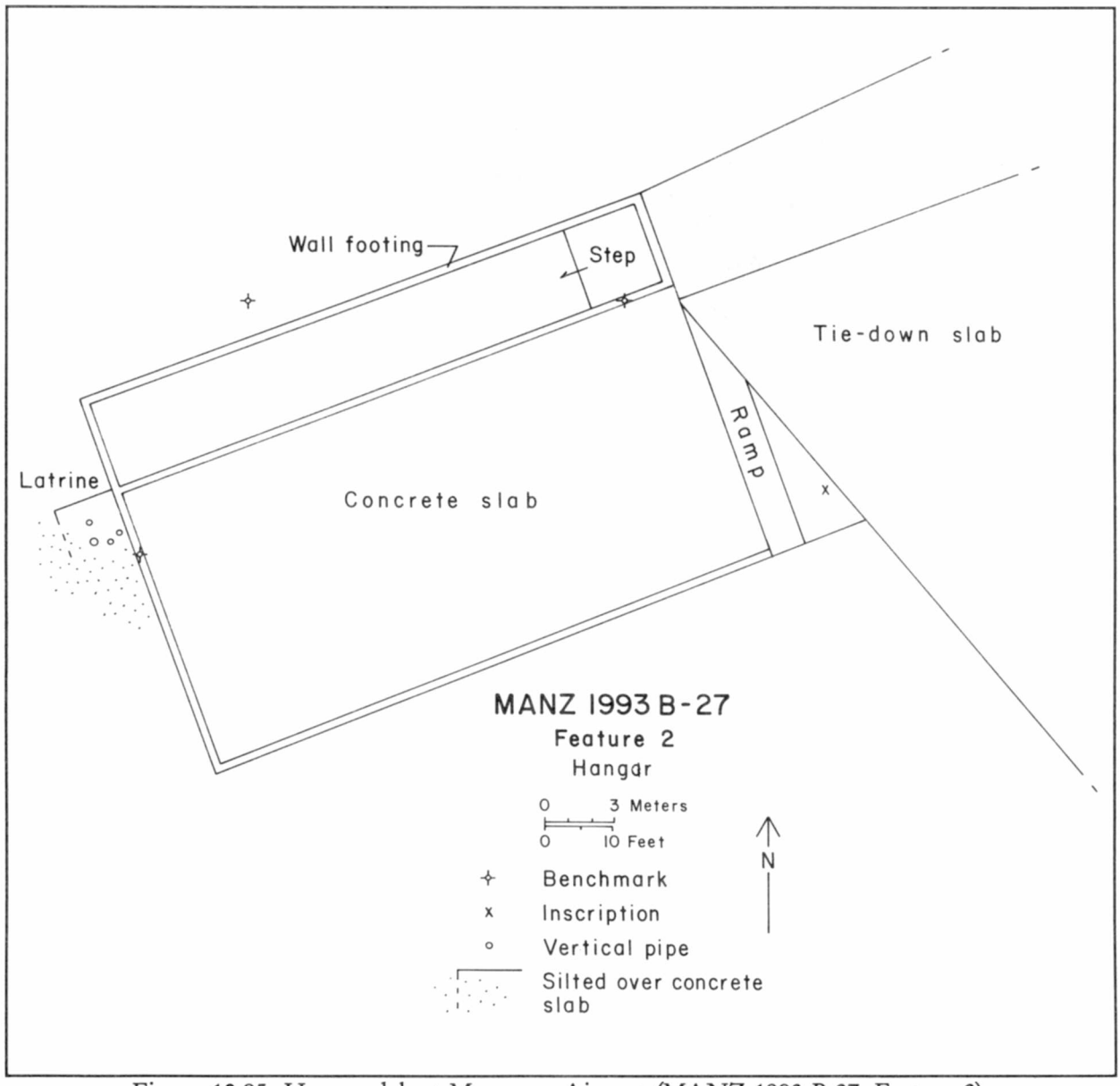


Figure 10.95. Hangar slab at Manzanar Airport (MANZ 1993 B-27, Feature 2).

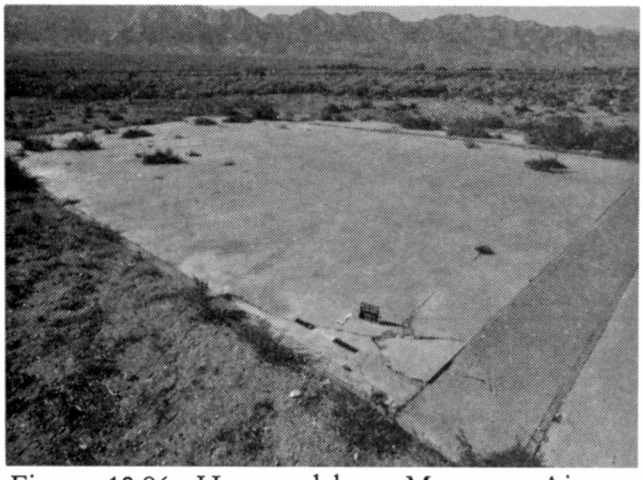


Figure 10.96. Hangar slab at Manzanar Airport (MANZ 1993 B-27, Feature 2).

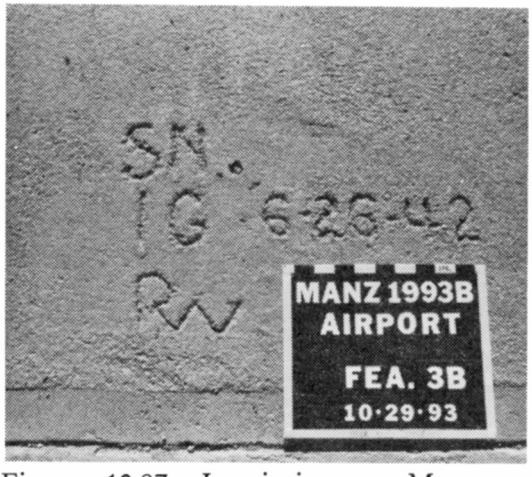


Figure 10.97. Inscription at Manzanar Airport (MANZ 1993 B-27, Feature 2a).

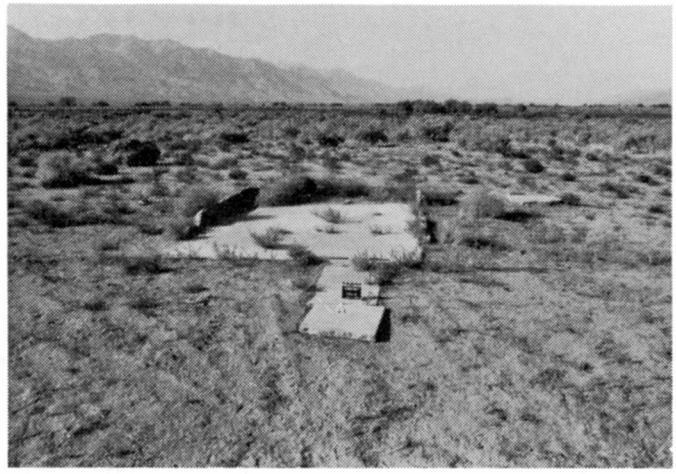


Figure 10.98. Foundation at Manzanar Airport (MANZ 1993 B-27, Feature 3).

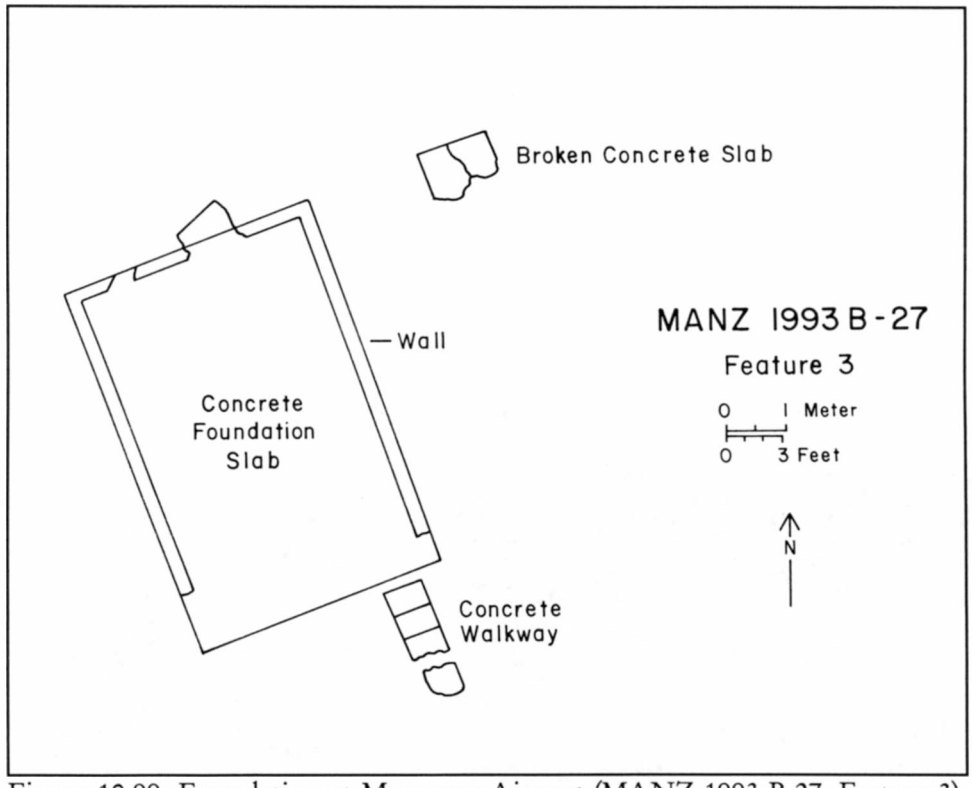


Figure 10.99. Foundation at Manzanar Airport (MANZ 1993 B-27, Feature 3).



Figure 10.100. 1993 oblique aerial view of the central portion of the Manzanar Airport (MANZ 1993 B-27).

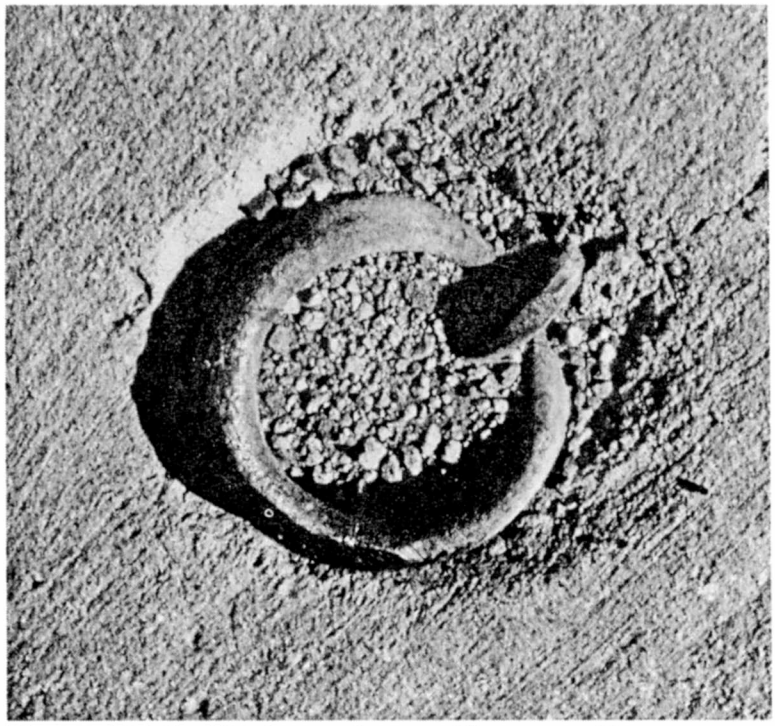


Figure 10.101. Tie-down ring at Manzanar Airport apron (MANZ 1993 B-27, Feature 4).

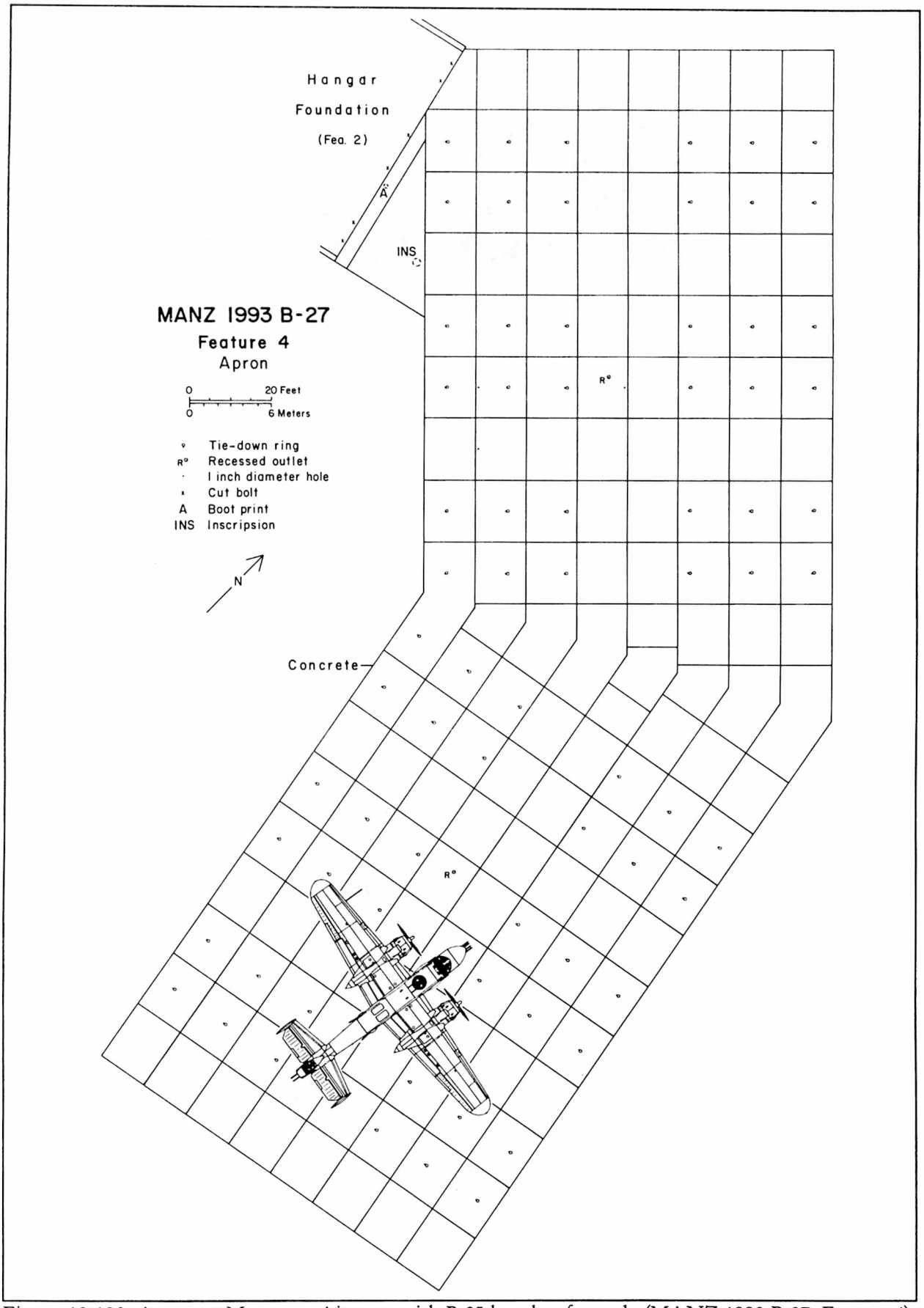


Figure 10.102. Apron at Manzanar Airport, with B-25 bomber for scale (MANZ 1993 B-27, Feature 4).

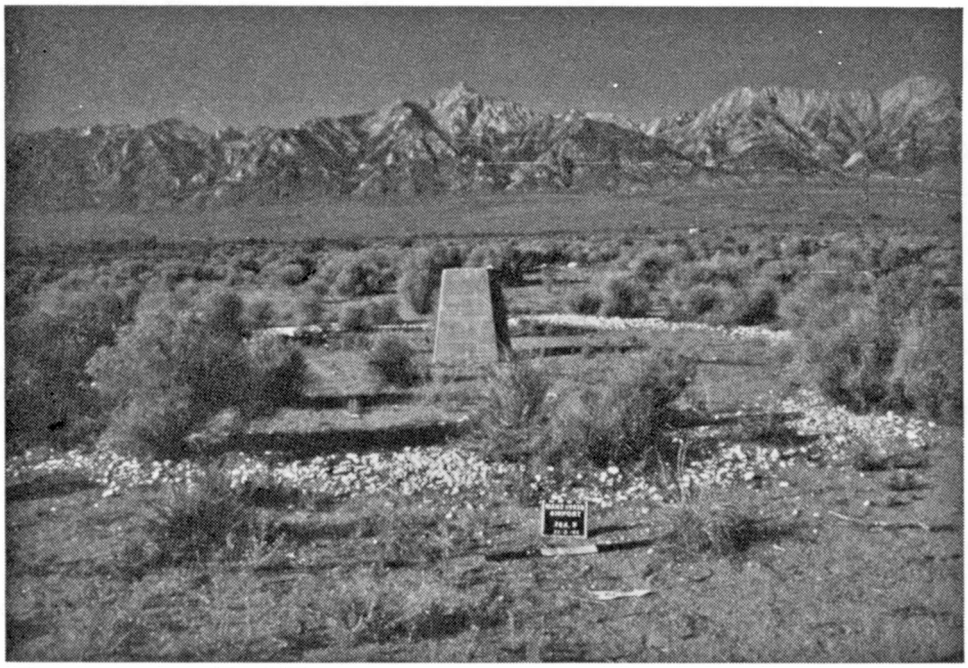


Figure 10.103. Wind-T support at Manzanar Airport (MANZ 1993 B-27, Feature 6).

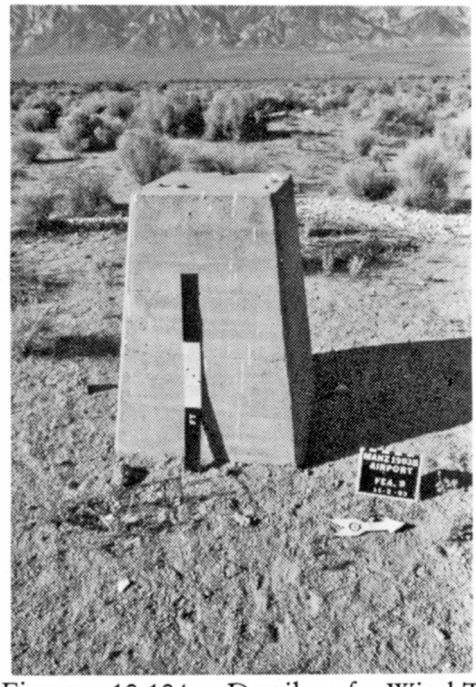


Figure 10.104. Detail of Wind-T support at Manzanar Airport (MANZ 1993 B-27, Feature 6).

Feature 8 consists of two 5,000-ft-long asphalt-paved runways. Vegetation has grown in cracks in the runway and the northern edge of the airport is lined with thick brush. Many of the concrete and metal light bases along the runways are obscured by silt. Artifacts noted during survey along the runways and taxiway include two cone-shaped lighting skirts, four tiny brown-colored glass vials containing about eight pills each, and fragments of clear and blue glass from "beehive" shaped taxiway lights. The runways had been built across the Manzanar-Reward Road, once the main east-west street of the town of Manzanar. After the airport was abandoned, the road came into use again.

The main runway runs nearly north-south (350 degrees) and is approximately 150 feet wide. The taxiway parallels this runway. There is a series of sockets for contact lights (Froesch and Prokosch 1946:146; Glidden et al. 1946:186, Figure 10-11) along the east and west edges of the runway at 210 ft intervals. Adjacent to the runway, these consist of concrete pads (21 inches by 26 inches to 49 inches by 49 inches in size) with an embedded 13-inch-diameter metal pipe, collar (embossed with RUNWAY SIDE), and other hardware (some embossed with the Westinghouse logo and a patent number) in various states of disrepair (Figures 10.107-10.110). Just south of

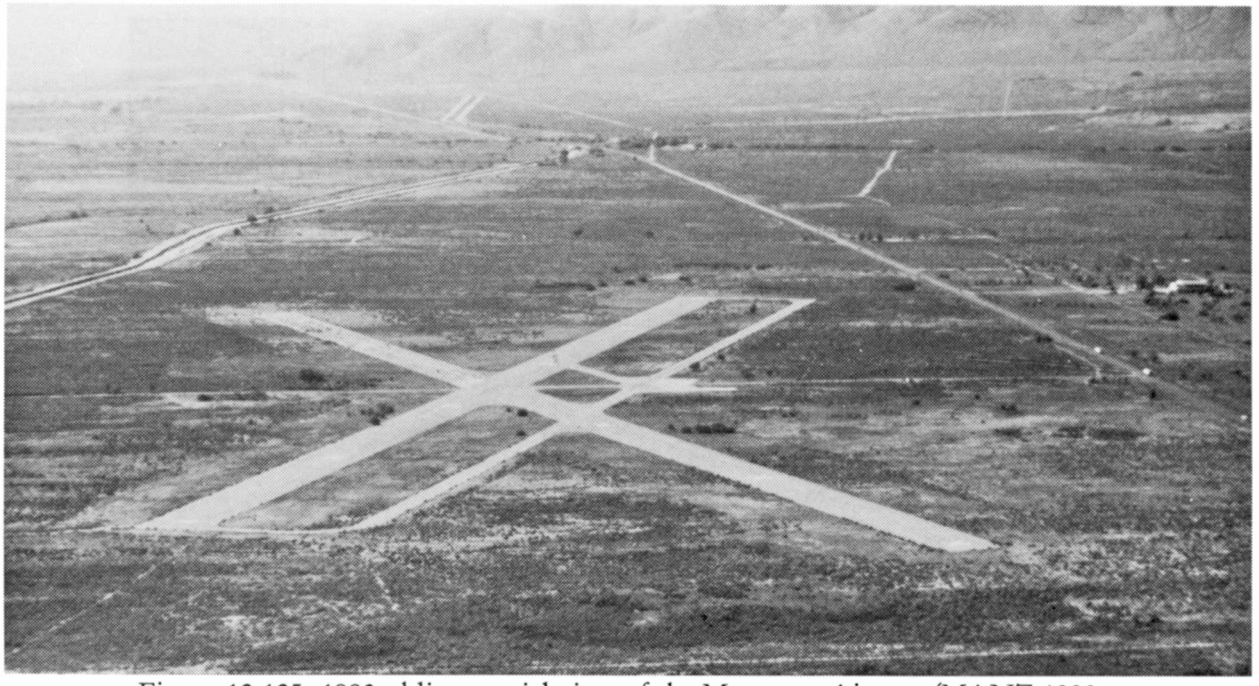


Figure 10.105. 1993 oblique aerial view of the Manzanar Airport (MANZ 1993 B-27).



Figure 10.106. Tip-over disconnect fitting at Manzanar Airport (MANZ 1993 B-27).



Figure 10.107. Contact light fixture at Manzanar Airport (MANZ 1993 B-27).

the Manzanar-Reward Road, along the western edge of the runway there is a rectangular concrete box covered by two 31½-inch-square metal grates, possibly a storm drain.

The second runway (at 315 degrees) crosses the first, forming an X (see Figure 10.105). This runway, also 150 feet wide, was apparently unlighted. On the northeast side of this runway, between the main runway and the taxiway, there is a capped well. It consists of a 6-ft-square

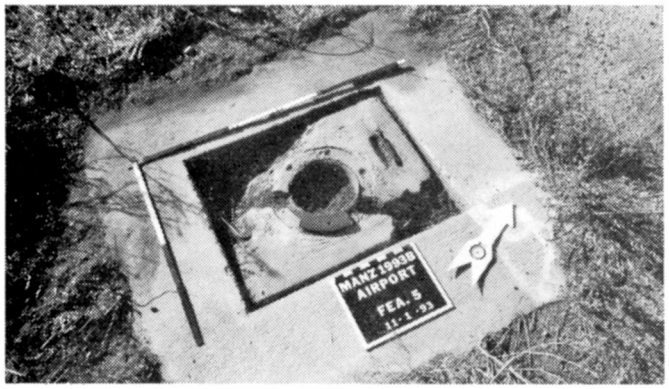


Figure 10.108. Contact light fixture at Manzanar Airport (MANZ 1993 B-27).



Figure 10.109. Lighting hardware found at Manzanar Airport (MANZ 1993 B-27).

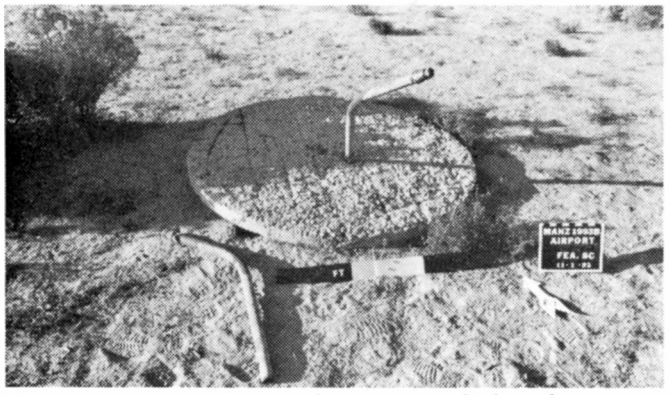


Figure 10.110. Inverted contact light fixture at Manzanar Airport (MANZ 1993 B-27).

concrete slab with a central 3-ft-diameter metal plate. Both are flush with the runway. The number "84" is spray painted on the slab. Ample water could be heard flowing far below the plate.

At 100 ft beyond the end of both the main and secondary runway there are tip-over disconnect fittings for range (threshold) lights. The main runway has a row of four light fittings spaced at 50-ft intervals and two additional fittings 215 ft further out. The secondary runway has three light fittings spaced at 50-ft intervals, one has been pulled out of the ground (Figure 10.110). Due to time constraints it could not be determined if fixtures for boundary or approach lights are present beyond the immediate area of the runways.

Feature 9 is a small trash scatter between the taxiway and main runway. It contains about 100 clear glass fragments, 30 brown glass fragments, 50 "Coke" bottle fragments, whiteware ceramic fragments, two sanitary seal cans, two can lids, a can key, a church-key-opened can, a military ration can, a metal washer, a few wire nails, and peach pits.

Other Noted Resources

Fourteen structures in the towns of Independence and Lone Pine noted in Eastern California Museum files as moved from the relocation center were visited and photographed. The condition of the moved structures was highly variable, but many still retain substantial architectural integrity (Figures 10.111 and 10.112, Table 10.4). Also found in Independence were the decorative concrete gate posts originally at the relocation center entrance (Figure 10.113).

Inscriptions carved into the clapboard siding of the Lone Pine train station (Figure 10.114) were also examined and photographed. Six internees worked at the depot, under military guard, unloading materials destined for the relocation center. Only two of six reported internee inscriptions (Garrett and Larson 1977:137-139) remain (Figure 10.115); others were stolen by removing the clapboard sometime in 1992, just after the depot was no longer watched by a caretaker (Bill Michael, personal communication, 1993).

Table 10.4.
Buildings Moved From Manzanar Relocation Center.

Location	Original Building
Independence	
346 N. Edwards	partial barracks
101 Valley View	partial barracks
North Lone Pine	
152 Kellogg St.	staff apartment?
215 Kellogg St	barracks?
216 Pangborn St	barracks?
160-162 Pangborn St	staff apartment
Lone Pine	
Mt. Whitney Rifle Club	barracks
Willow Motel	three barracks
SW corner of Locust and Hay St.	staff apartment
333 Mountain View St.	partial barracks
160-164 Hay St.	staff apartment
American Legion Hall	unknown
VFW Building	barracks
350-352 Mountain View St	barracks

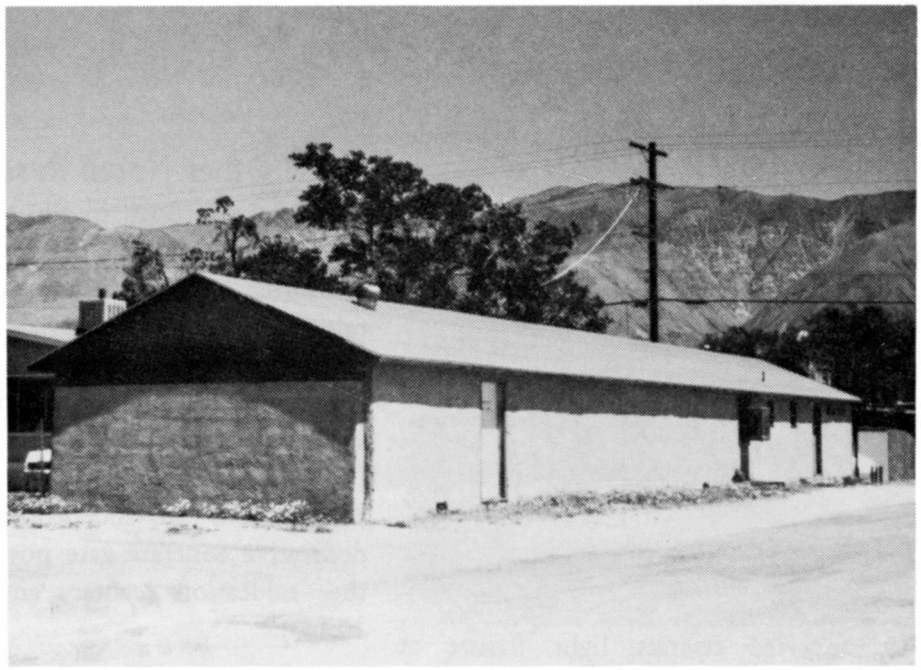


Figure 10.111. Modified barracks (Mt. Whitney Rifle Club, Lone Pine).

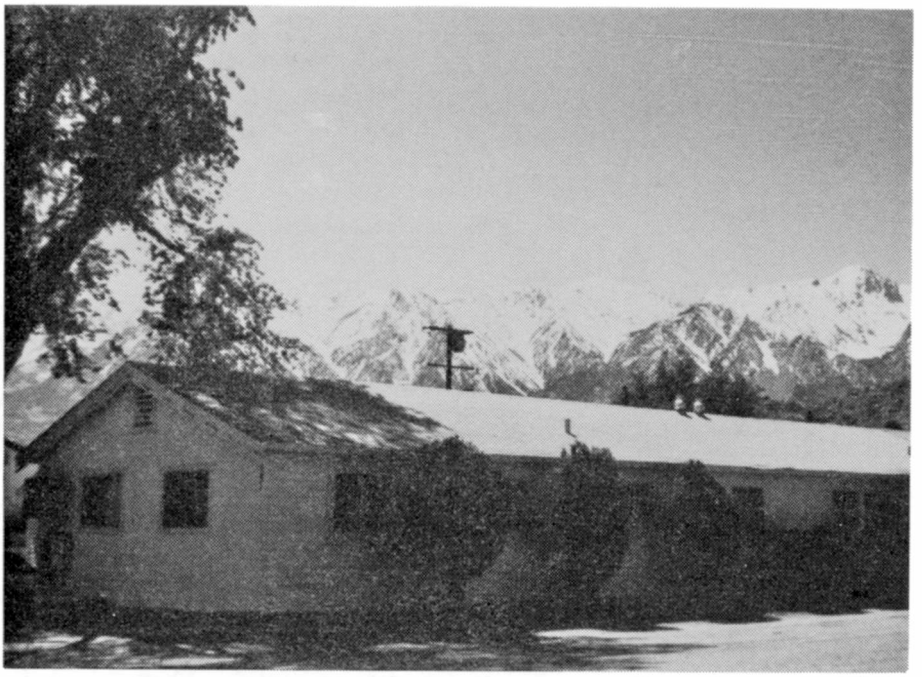


Figure 10.112. Modified staff apartment (Lone Pine).



Figure 10.113. Decorative concrete stumps from relocation center entrance (Independence).



Figure 10.114. Lone Pine Train Station.



Figure 10.115. Carved inscription at Lone Pine Train Station.

Chapter 11

Town of Manzanar Sites
Within Manzanar National Historic Site

Sixty-two of the 82 archeological sites recorded by the National Park Service at Manzanar have components associated with the former town of Manzanar or earlier ranches. Twenty-four of these are within the authorized 550-acre National Historic Site and are discussed here (Figure 11.1). All of the sites within the National Historic Site are on land currently owned by the City of Los Angeles and administered by the Department of Water and Power (LADWP). The 36 town-era sites recorded outside the National Historic Site are discussed in Chapter 12.

The 24 town-era historical sites within the National Historic Site can be divided into three general categories: residential and commercial (n=17), utilities (n=3), and trash deposits (n=4). Where possible these sites are referred to by their common name as derived from LADWP and other historical records. In addition to the recorded sites, eight other localities within the National Historic Site are known to have once had town-era structures, but now have little or no surface evidence (Figure 11.2; Table 11.1). These locations are also discussed below, as are traces of town-era roads, orchards, and other features noted during survey.

Detailed site records are on file at the California Historic Resources Information System's (CHRIS) Eastern Information Center (University of California, Riverside) and at the Western Archeological and Conservation Center (Tucson,

Table 11.1.
Historical Buildings Once Within the Boundaries of Manzanar National Historic Site.

Common Name	NPS Site Number
Bandhauer House	not relocated
Bandhauer/Hatfield Store	MANZ 1993 A-16
Bogart Farm	MANZ 1993 A-23, A-24
Bevis Place/Briggs	MANZ 1993 A-19
Campbell/Ed Shepherd House	MANZ 1993 A-28
Capps House	MANZ 1993 A-26
Christopher Farm	MANZ 1993 A-8
Community Building	MANZ 1993 A-16
Cornelius House	not relocated
Gilmer Farm	MANZ 1993 A-6
Graham Farm	MANZ 1993 A-11
Hatfield*	MANZ 1993 A-22
Kemp*	MANZ 1993 A-20
Lacey House	MANZ 1993 A-16
Lafon Farm	not relocated
Lenbek House	MANZ 1993 A-20
Lydston House	not relocated
Manzanar School	not relocated
Meyer Lumber*	MANZ 1993 A-17
A.L. Meyers Farm	not relocated
John Meyers Farm	MANZ 1993 A-10
OVI Headqtrs/Shepherd Ranch	MANZ 1993 A-13
Parker House	MANZ 1993 A-4
Smith Farm	not relocated
Wicks Place/Hawthorne	MANZ 1993 A-15
Wilder Farm	MANZ 1993 A-9
Wells Farm	not relocated

* presence based primarily on archeological evidence.

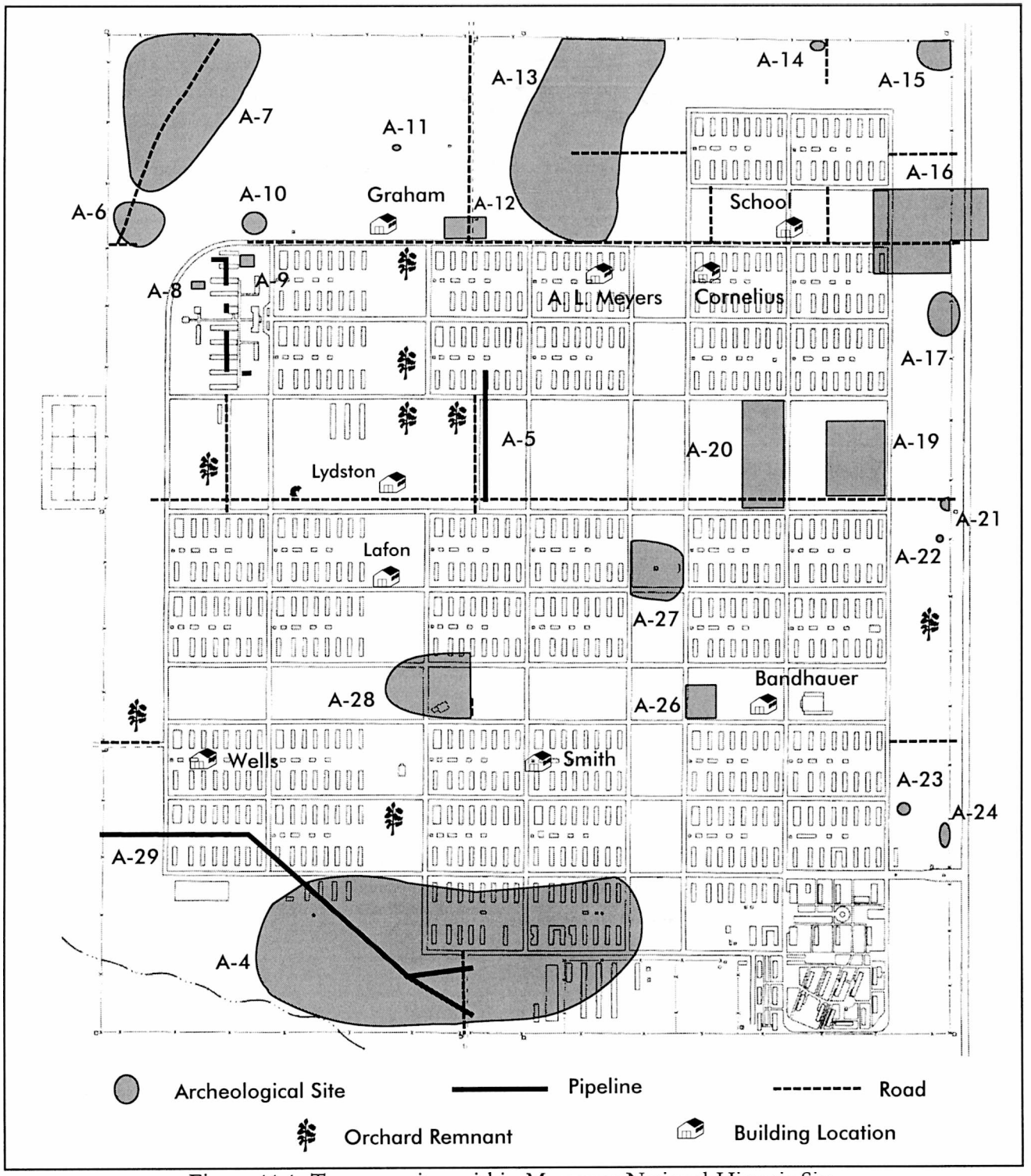


Figure 11.1. Town-era sites within Manzanar National Historic Site.

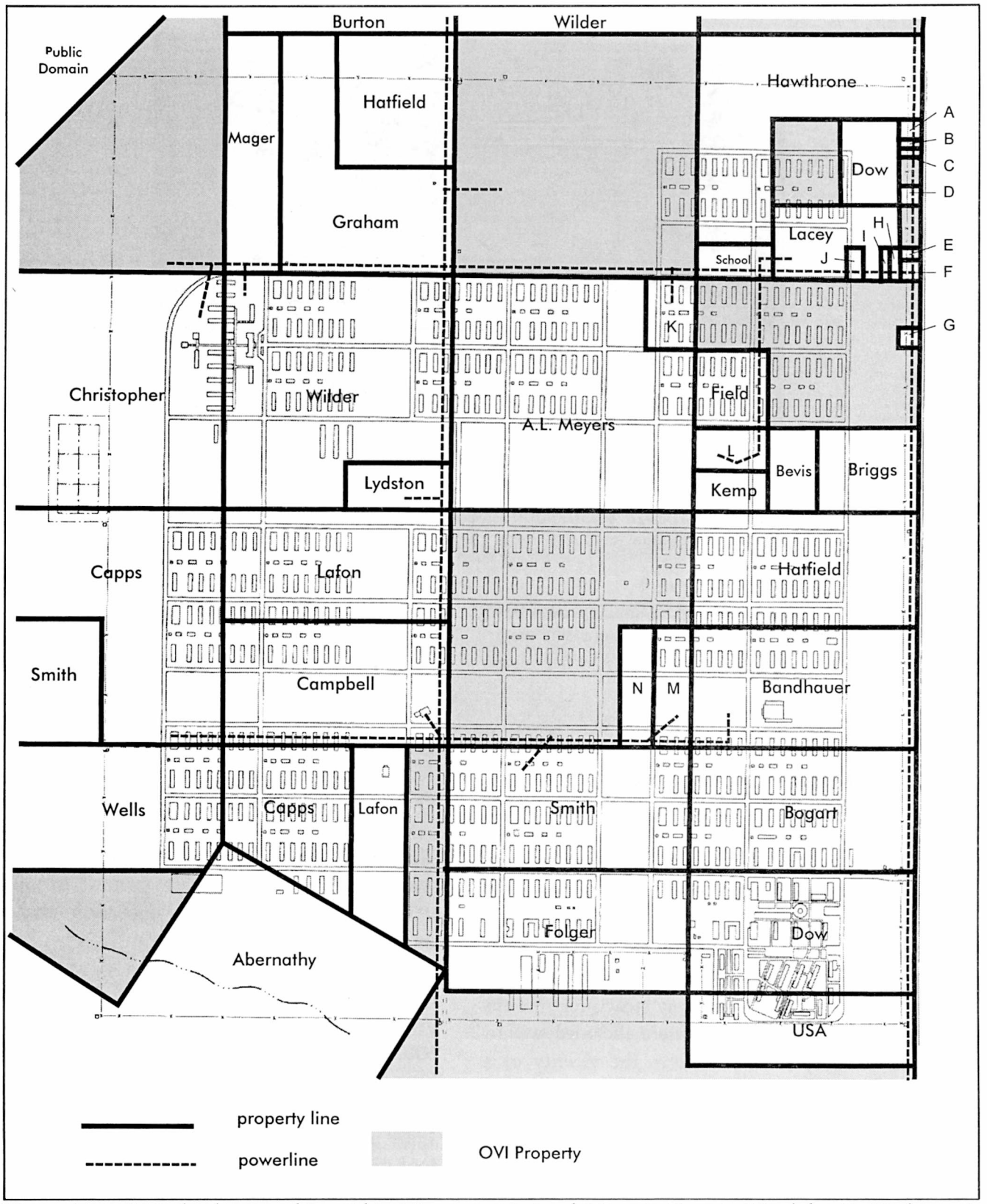


Figure 11.2. 1920s land ownership within Manzanar National Historic Site; A. Nordyke, B. Healton, C. Blaney, D. Forbes, E. Bandhauer, F. Hatfield, G. Meyer Lumber, H. Dow, I. Briggs, J. Hilman, K. Cornelius, L. Lenbek, M. Capps, N. unknown (compiled from LADWP plat maps and Eastern California Museum files).



Figure 11.3. 1929 photograph of Bogart House (courtesy of LADWP Bishop Office).

Arizona). Native American Indian sites and sites associated with the World War II-era Manzanar Relocation Center are described in other chapters.

Residential and Commercial Sites

Seventeen of the 24 town-era sites within the National Historic Site are classified as residential or commercial. Two of the sites, MANZ 1993 A-23 and MANZ 1993 A-24, are combined below, since both are apparently associated with the same farm (Bogart). While most of these sites contain some structural evidence, some do not. Sites without structural remains (generally trash scatters) were included within this category if they were in the vicinity of a known former building location as derived from historical records. Discussions of eight locations known to have had buildings once but that have little or no surface evidence are also included below.

Bogart Farm (MANZ 1993 A-23 and MANZ 1993 A-24)

Two sites near the current National Historic Site entrance appear to be associated with the Bogart Farm (Lot 125 of the Manzanar Subdivision). MANZ 1993 A-23 is a trash concentration and MANZ 1993 A-24 consists of an artifact scatter and a partially buried concrete weir box. U.S. Highway 395 is on the eastern edge of MANZ 1993 A-24, the relocation center residential area is just west of MANZ 1993 A-23, and the main relocation center entrance road is to the south.

LADWP records indicate that the Bogart property included a 10-acre apple orchard and a 10-acre alfalfa field. LADWP bought this parcel from W.V. Bogart in 1927 for $8,000; their records list nine structures there in March 1929. The structures included an 892-square-ft four-room rustic frame residence in excellent condition (Figure 11.3), a frame tent sleeping house noted as "expired," a garage in poor condition, a corn crib in fair condition, a pigsty in fair condition, a stable in poor condition, a chicken house in poor condition, a

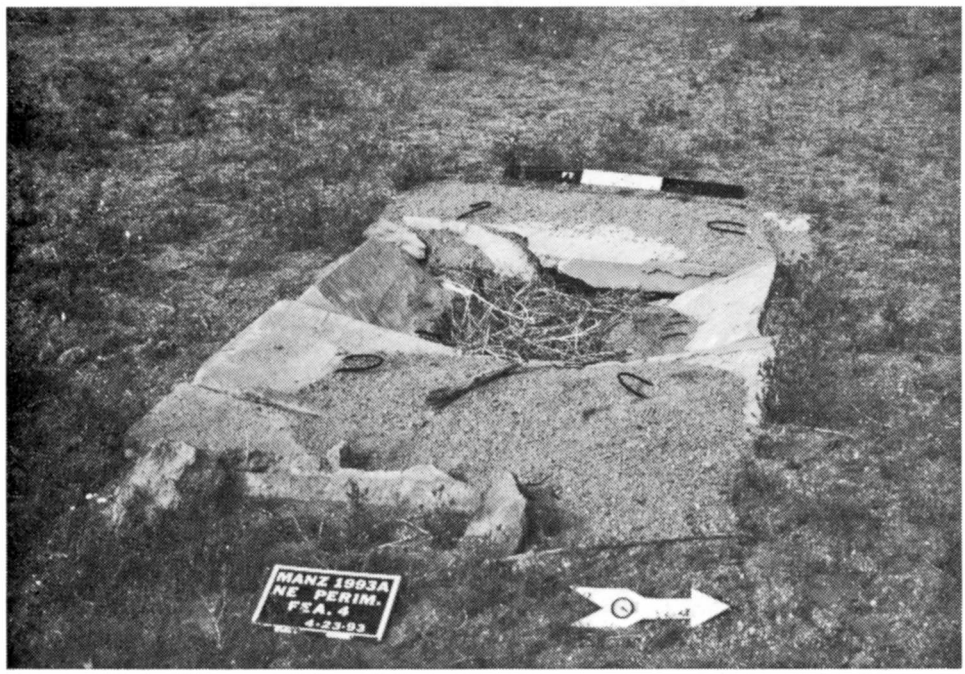


Figure 11.4. Concrete diversion box at Bogart House (MANZ 1993 A-23, Feature 1).

cellar in bad condition, and a shelter in fair condition. The residence is noted as having a concrete foundation, indoor plumbing, and electrical wiring. The total assessed value of the structures was $1,660.00. On May 14, 1934, it was recommended that the buildings be salvaged. On November 7, 1934, they were sold to Foster Smith for $250.00.

No building remains associated with the Bogart Farm were identified during survey. The entire area was likely bulldozed during construction of the relocation center. Some of the artifacts included within these sites may be from use of the relocation center. A recently completed buried Contel telephone fiber optics line bisects MANZ 1993 A-23. There are numerous brick and concrete slab fragments in the trench backdirt. However, the brick and concrete could be from a relocation center manhole known to be in this general area, rather than a building associated with the Bogart Farm.

MANZ 1993 A-24 consists of a 30-ft-diameter trash concentration around a lone black walnut tree. The artifacts may have been concentrated by bulldozers avoiding the tree during clearing for the relocation center. Noted at the site were thousands of window glass fragments, hundreds of clear glass fragments, a red painted "Independence Dairy" milk bottle fragment, green glass fragments, "Coke" bottle fragments, a ceramic cup fragment, a children's shoe sole, numerous wire nails, and wallboard bits.

MANZ 1993 A–23, located 250 ft east of MANZ 1993 A-24, consists of a 65 ft by 200 ft artifact scatter and a buried concrete weir box and cover (Feature 1; Figure 11.4). Artifacts there include over 20 brown glass fragments, 10 window glass fragments, a few "Coke" bottle fragments, a glass "Boyd" canning jar lid liner (1915+), approximately 10 whiteware plate fragments, 25 wire nails, a sanitary seal can, a muleshoe, and a few metal bits and parts. The concrete weir box measures 5 ft by 10 ft; a dog's foot print is impressed in the concrete cover.



Figure 11.5. 1929 photograph of Bevis House (courtesy of LADWP Bishop Office).



Figure 11.6. 1929 photograph of garage at Bevis House (courtesy of LADWP Bishop Office).

Bevis Place/Briggs Farm (MANZ 1993 A-19)

MANZ 1993 A-19 consists of two probable structure locations, two artifact concentrations, scattered artifacts, and an exposed portion of a once-buried concrete pipeline. The site is located in the northeast portion of the National Historic Site in a clearing north of the relocation center auditorium and between Blocks 19 and 25. Originally used as a firebreak (A-6), the area was later used for two ball fields by the relocation center. Presently, powerlines and a dirt maintenance road bisect the site.

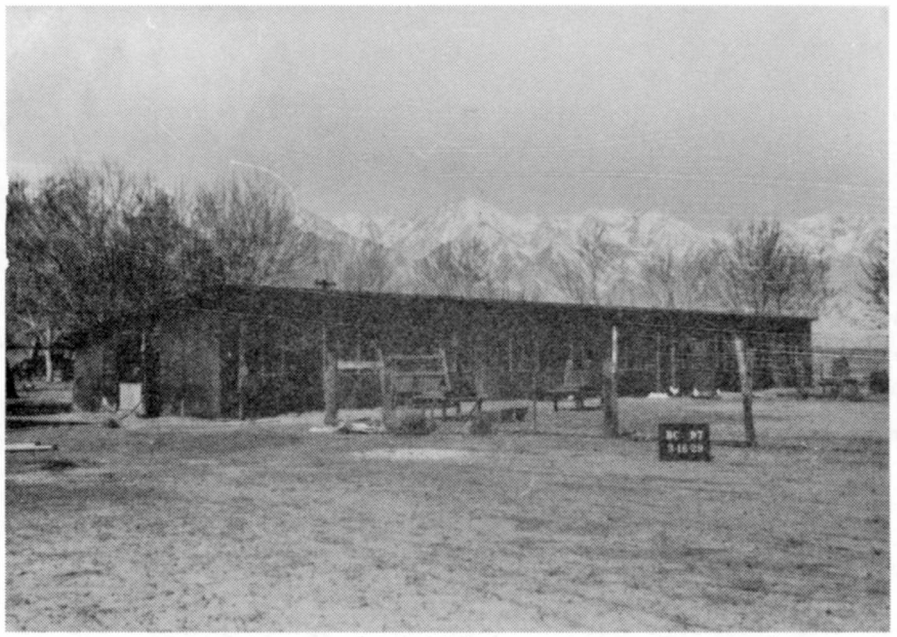


Figure 11.7. 1929 photograph of chicken coop at Bevis House (courtesy of LADWP Bishop Office).

The site encompasses Lots 13 and 14 of the former Manzanar Townsite. A 1910 Town of Manzanar plat map lists F.D. Briggs as the owner of Lots 14-17 and Bevis as the owner of Lot 13. The 1929 LADWP plat map (which does not show structures) shows a corral in this area. A 1931 aerial photograph of the town of Manzanar indicates that Lots 13 and 14 were predominately orchards (see Figure 6.14).

The 1929 LADWP Valuation Record designates Lots 13-16 as the Bevis Place. Ten structures with a total assessed value of $2,890.00 are listed. Four are noted as in fair or better condition and six are listed as in poor or bad condition. The structures include a 436-square-ft two-room residence (Figure 11.5), a latrine, a garage (Figure 11.6), three chicken houses (Figure 11.7), two brooder houses, a feed house, and a shelter. The residence is noted as having a sill foundation and electrical wiring and the garage as having a concrete floor. The record indicates that the garage and two of the chicken houses were built in 1929.

According to the LADWP Valuation Record, in April 1935 the porch of the residence, the feed house, the garage, and two of the chicken houses were removed and salvaged by unnamed tenants. On June 4, 1935, the third chicken house was salvaged. Eventually all of the buildings on the property were removed.

Three features (1-3) and two artifact concentrations (Loci A and B) were identified at the 1-acre site. Feature 1 is a section of buried concrete pipeline exposed by sheet wash. The pipeline, bearing north-south and doubtless part of the town water system, likely paralleled a town-era road.

Feature 2 is a series of 6-inch by 8-inch wood posts cut flush to the ground. The posts form an L-shape 16 ft east-west by 100 ft north-south. The LADWP Valuation Record lists one of the chicken houses constructed in 1929 as 1,800 square feet; Feature 2, estimated at over 1,600 square feet, may be the remains of that structure. Slight furrows to the south and east of the feature may be associated with a fenced chicken yard (Figure 11.8).

Feature 3, 150 feet northwest of Feature 2, consists of a shallow 6 ft by 6 ft depression,



Figure 11.8. Overview of Bevis Place/Briggs Farm (MANZ 1993 A-19).

within a leveled barren area 18 ft by 45 ft in size (810 square feet). The other 1929-constructed chicken house in the LADWP record is listed as 720 square feet in size, and Feature 3 may be the remains of that structure.

Locus A, an artifact concentration 50 ft east-west by 65 ft north-south, surrounds Feature 3. Artifacts noted include hundreds of whiteware plate fragments, about 120 glass fragments (mostly clear with some brown, white, blue, purple, and green), smooth wire, three sanitary seal cans, a sardine can, can lids, hundreds of wire nails, a few fence nails, a bucket strap, several triangular blade tips for a large agricultural mower, and a metal bar file.

Locus B, 100 ft east-west by 165 ft north-south in size, is located south and west of Feature 2. Artifacts noted include hundreds of whiteware plate fragments (mostly plain), a few stoneware ceramic fragments, 11 purple glass fragments, window glass fragments, blue glass fragments, a spoon, a can lid, an axe head, a cabinet latch, a metal strap, lumber, a muleshoe, a small horseshoe, red brick fragments, and electrical porcelain fragments.

Campbell/Ed Shepherd House (MANZ 1993 A-28)

MANZ 1993 A-28 includes structural remains (Feature 1), an eroding can dump (Feature 2), and scattered artifacts in a 3-acre area located within Lot 116 of the former Manzanar Subdivision. The site is in the central portion of the National Historic Site at what was the relocation center Judo House. The western portion of the site was used for victory gardens by the evacuees. There are numerous prehistoric artifacts in the northern portion of the site (see MANZ 1993 A–2, Chapter 13, below).

Four large cottonwood trees (one fallen), a large elm tree, and several large stumps at the Judo House location suggest a pre-relocation center habitation. The clearing of debris for mapping revealed additional evidence of a pre-relocation center structure. The condition and orientation of the uncovered concrete slabs of the Judo House storage building (not to true north or aligned with the town of Manzanar road grid) indicated that they likely were from a building that predated the town as well.

According to the 1929 LADWP plat map, Lot



Figure 11.9. 1930s oblique aerial view of Campbell House and vicinity (north to top).

116 was purchased from Lee Campbell in 1924 for $13,000. Campbell had 30 acres of farmland and a 10-acre orchard. The plat map shows a powerline ending in the site area. A 1931 aerial photograph of the town of Manzanar shows a group of large trees around several buildings in the area, surrounded by open fields (Figure 11.9).

The LADWP Valuation Record indicates that in 1929 the property included a 1,055-square-ft four-room frame residence with a stone foundation[1] (Figure 11.10), a 20-square-ft latrine, a 352-square-ft garage and corn crib (Figure 11.11), an 80-square-ft granary with a concrete foundation, a 240-square-ft chicken house, a 36-square-ft smoke house (Figure 11.12), a 384-square-ft pig-sty, and a 336-square-ft open shelter. The residence was noted to be in good condition, the shelter in poor condition and the remaining structures in fair condition. They had a total assessed value of $1,058.00. In May 1934 the buildings were recommended for salvage and on June 4, 1934, all of the buildings were sold to William Mason for $45.00 and removed.

A sketch map of Manzanar drawn by a past resident labels a building in this general area of the town as owned by Shepherd (Manzanar Community File, Eastern California Museum). Historical photographs indicate that two houses in the Manzanar area were built by the Shepherd family, one by John Shepherd and one by his son, Ed Shepherd. The Ed Shepherd House matches the LADWP photograph of the Campbell residence (Figure 11.13). Information gleaned from the tax assessors files curated at the Eastern California Museum indicates that Ed Shepherd built his home sometime between 1894 and 1900.

Feature 1 at MANZ 1993 A-28 consists of several interconnected concrete slabs (Figure 11.14). The three largest slabs form a rectangle roughly 30 ft

[1]examination of the LADWP photograph of this building suggests the square footage had been overstated by at least 100 percent. Measurements taken from the photograph yield an estimate of 400 square ft for the residence itself and 50 square ft for each of two porches.



Figure 11.10. 1929 photograph of Campbell House (courtesy of LADWP Bishop Office).



Figure 11.11. 1929 photograph of garage at Campbell House (courtesy of LADWP Bishop Office).

by 18 ft, with a cutout area 3 ft by 12 ft in the southeast corner. The single largest slab includes what appears to be a small home-made floor safe (Figures 11.15 and 11.16). At the northeast corner of the three largest slabs there are two small slabs and a raised step. The step and possibly one or both of the small slabs may have been added when the relocation center evacuees used the large slabs as the floor of a storage building attached to a wood frame Judo House. Decorative concrete and rock paths and rock alignments connecting to the large slabs were also likely added at that time.



Figure 11.12. 1929 photograph of smoke house at Campbell House (courtesy of LADWP Bishop Office).



Figure 11.13. Ed Shepherd House (courtesy of Eastern California Museum).

Probable town-era artifacts noted in the vicinity of the slabs include some purple glass fragments, a bottle lip fragment, a blue transfer print ceramic, numerous wire nails and crown caps, a shoe heel tap, a 1929-S penny, a section of cast iron water pipe, a metal spring, and four sanitary seal cans. To the west of Feature 1 there are abundant small fragments of bottle glass, wire nails, cans, and lumber.

Feature 2 at MANZ 1993 A-28 is a can dump exposed in a small gully 250 ft northeast of Feature 1 (within Block 26 of the relocation center). Noted were 10 sanitary seal cans of various sizes and six hole-in-top cans (most with puncture openings and several with "Puncture Here" embossed on both sides of the can bottom). An unknown number of cans are still buried.

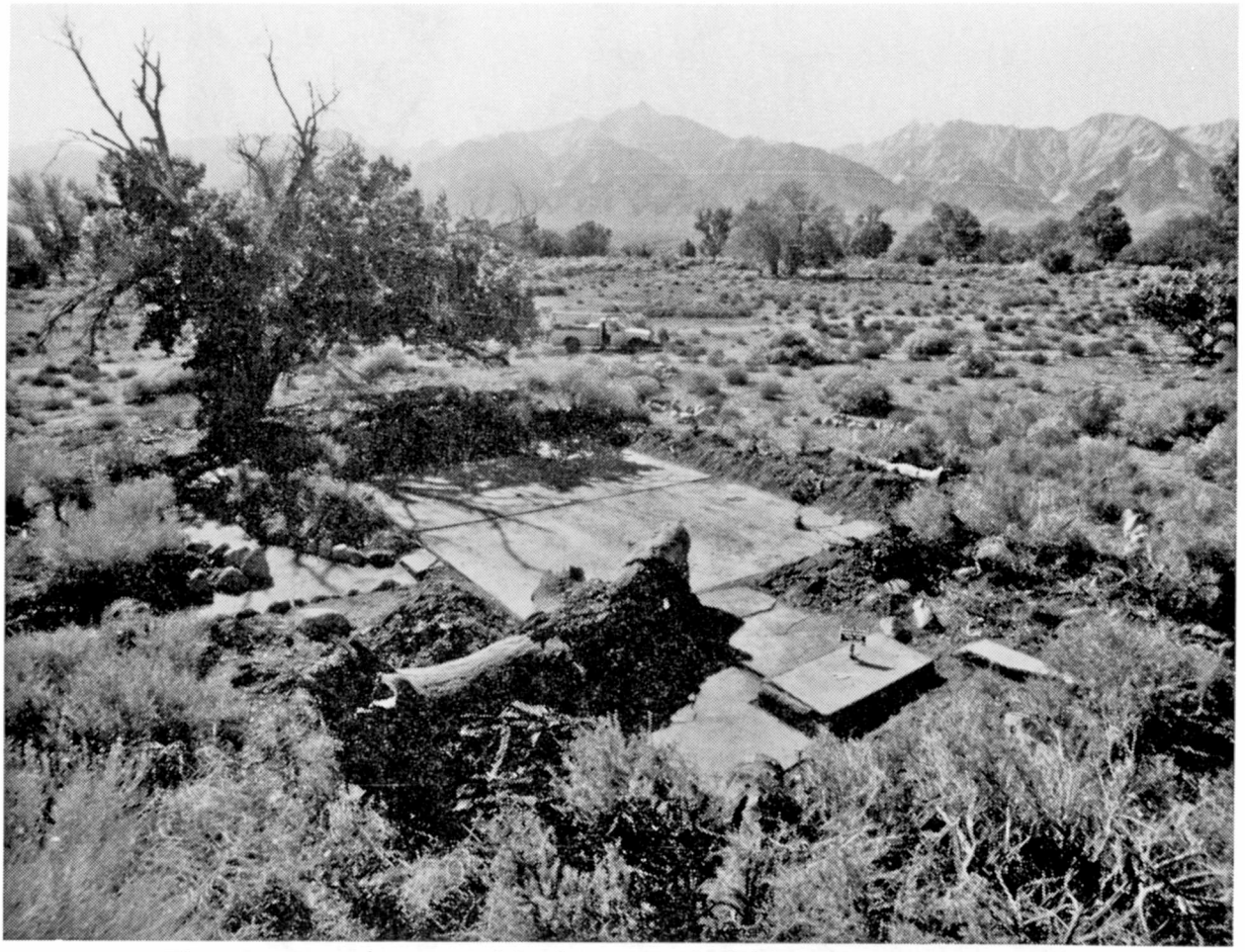


Figure 11.14. Judo House slab after removal of debris (MANZ 1993 A-28).

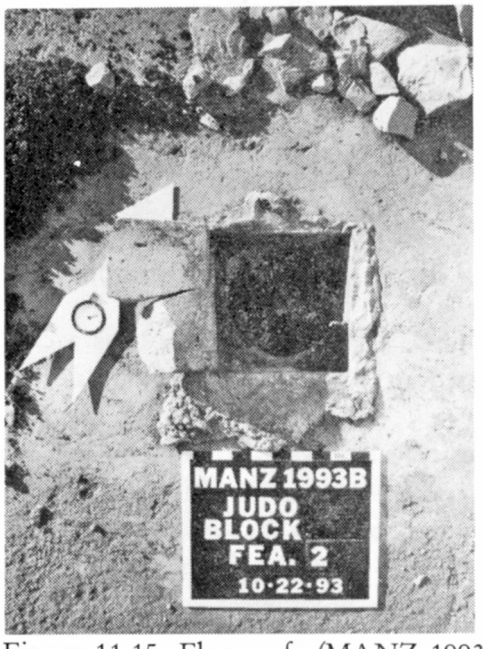


Figure 11.15. Floor safe (MANZ 1993 A-28).

Subsurface Testing

A 1 m by 1 m unit (Excavation Unit 23), placed 200 ft northwest of Feature 1 in an area once used for victory gardens, was excavated to a depth of 40 cm (Figure 11.17). Culturally-sterile very compact grayish brown (Munsell color 10 YR 5/2) silty sand was encountered in this unit at 25-30 cm. Above this level the soil consisted of slightly compact dark grayish brown (10YR 3/2) sandy silt.

Only 65 artifacts were recovered from the excavation unit and most of these appear to be related to relocation center use rather than the Campbell or Shepherd occupation. Charcoal bits and lumber fragments were present throughout the upper 10 cm of the deposit and apparent

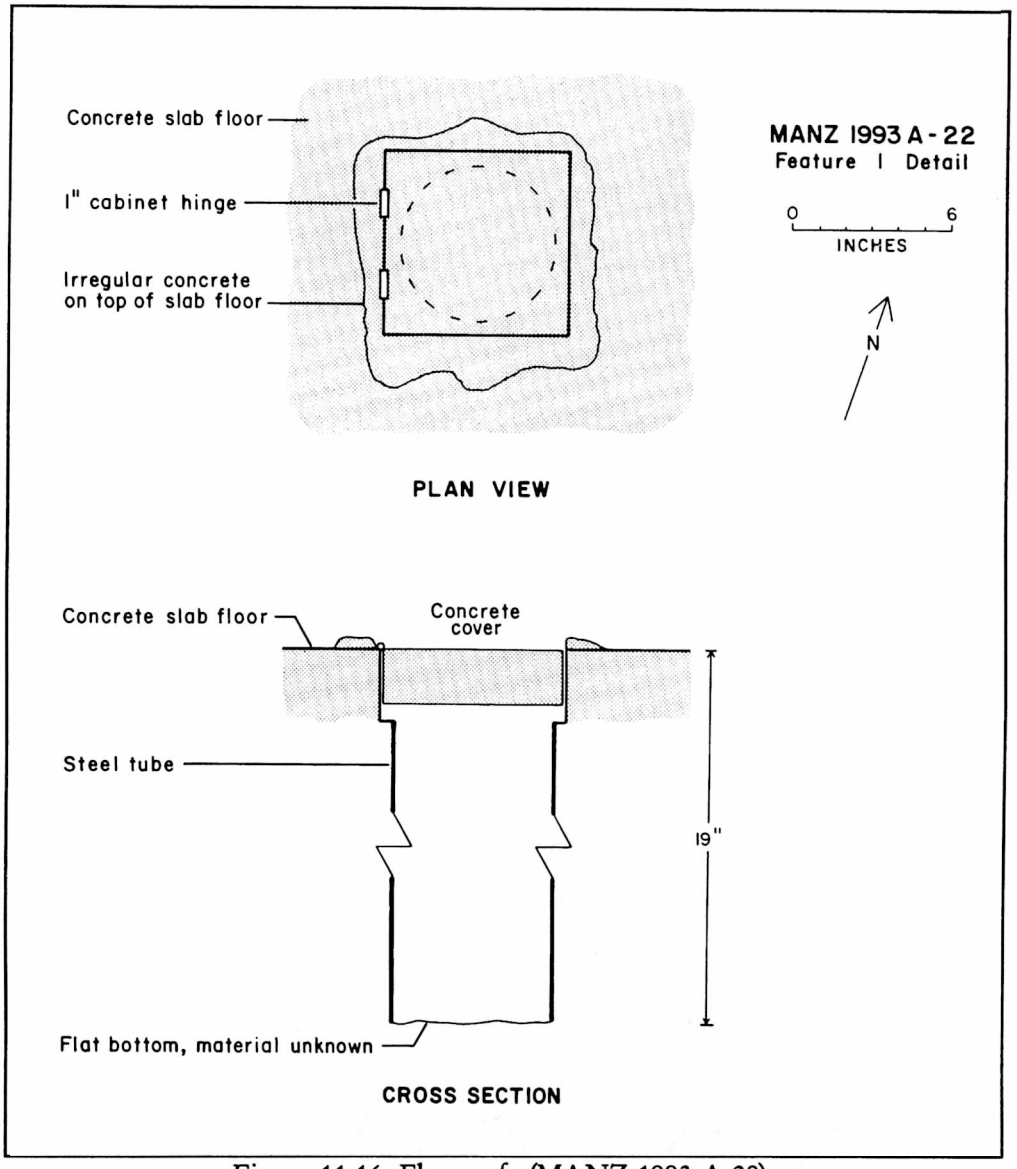


Figure 11.16. Floor safe (MANZ 1993 A-28).

rodent activity was noticeable throughout the unit as well. Where possible, the artifacts were classified by function using a system devised by Blee (1987) and Rhodes (1988). Artifacts recovered include glass, ceramic sherds, nails, and a few other items (Table 11.2).

Structural artifacts recovered consist of 17 nails and a lock washer. The nails include 15 common nails (2 3d, 1 4d, 5 6d, 1 8d, 1 16d, 1 20d and 4 fragments), a 1 inch roofing nail, and a 3/4 inch staple.

Items associated with food storage include 23 clear glass fragments (including one with a continuous thread lip), one purple glass fragment, three aqua glass fragments, and seven can fragments. The sole artifact associated with food serving was a porcelain cup or bowl fragment. Recovered food remains consist of six indeterminate ungulate bones.

The only artifacts recorded indicating a specialized activity, in this case toys, were two glass marbles. Unclassified artifacts include three wire fragments and a small leather fragment.

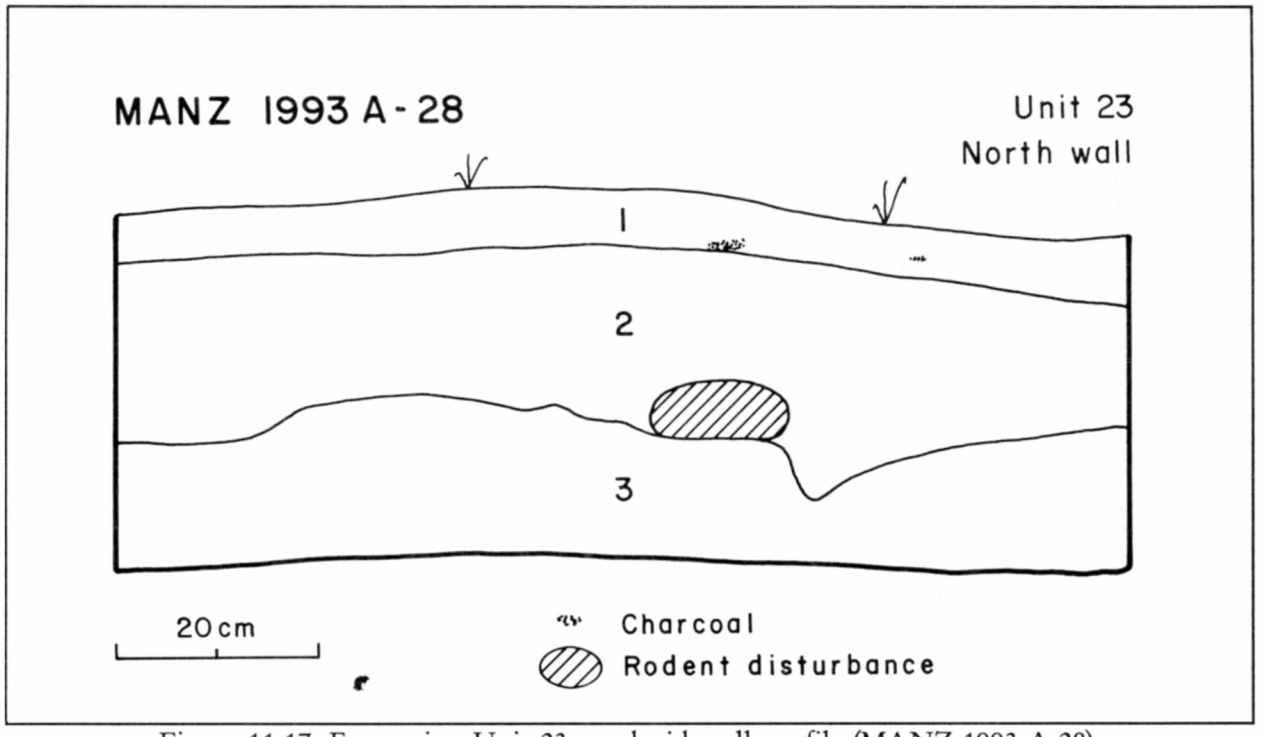


Figure 11.17. Excavation Unit 23 north sidewall profile (MANZ 1993 A-28).


Figure 11.18. 1929 photograph of Capps House (courtesy of LADWP Bishop Office).

Capps Homesite (MANZ 1993 A-26)

This site, a sparse artifact scatter, 130 ft north-south by 150 ft east-west, is located in the central portion of the National Historic Site, just west of the relocation center auditorium. The area was likely bulldozed during construction of the relocation center in 1942; the area was originally a firebreak (B3) and later was used for basketball, volleyball, and tennis courts.

Table 11.2. Artifacts Recovered from Excavation Unit 23 at Cambell/Ed Shepherd House (MANZ 1993 A-28).

Object Classification		Glass	Metal	Other
Structural	Structural Materials			
	Window Glass			
	Hardware		1	
	Nails		17	
	Utilities			
Domestic	Beverage Storage			
	Food Storage	27	7	
	Food Preparation			
	Food Remains			6
	Food Serving			1
	Furnishings			
	Pharmaceutical			
Personal	Clothing			
	Jewelry			
	Grooming and Hygiene			
	Money			
Activities	Ammunition			
	Leisure			
	Automobile			
	Miscellaneous Tools			
	Toys	2		
	Writing			
Unclassified			3	1

Located within what was Lot 117 of the Manzanar Subdivision, the 1929 LADWP plat map shows a powerline ending at this location

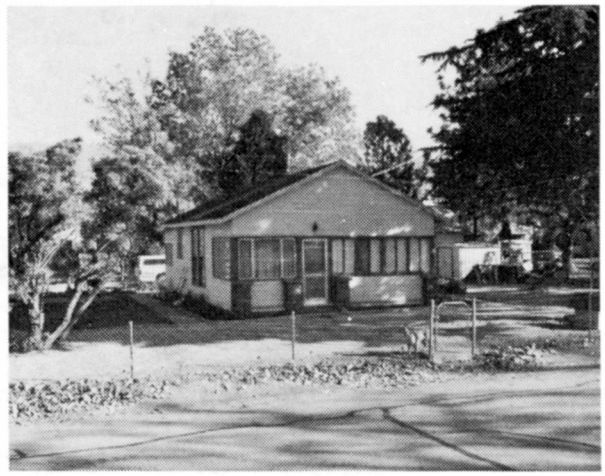


Figure 11.19. Capps House in Independence.

and the Valuation Record indicates Elbert C. Capps as the former owner. LADWP bought this property, which included a 5-acre orchard, 15 cultivated acres, and about 3 acres of brush, for $6,500. Improvements listed include a 593-square-ft four-room frame residence with a concrete foundation (Figure 11.18), indoor plumbing, and electrical wiring, a barn, a chicken house, a tent frame, and a small building made of scrap lumber. The residence was listed in good condition and the rest of the buildings are listed in fair or poor condition; the total assessed value of buildings is given as $572.00. In May 1934 the buildings were recommended for salvage and the barn and tent frame were removed. On February 21, 1935, the remaining buildings were sold to W.C. Lydston and moved to property owned by him. The residence is now located in Independence (Figure 11.19).

No building remains associated with the Capps home were identified at the site. Potential town-era artifacts noted at the site include 13 clear glass fragments, four brown glass fragments, three purple glass fragments, a "Bubble-Up" bottle fragment, two whiteware plate fragments, two electrical porcelain knobs with nails, around 100 wire nails, a shoe heel tap, a 1930 penny, a wood screw, a metal can lid, and a crown cap. Some of the artifacts may be from the use of the relocation center.



Figure 11.20. 1929 photograph of Christopher House (courtesy of LADWP Bishop Office).

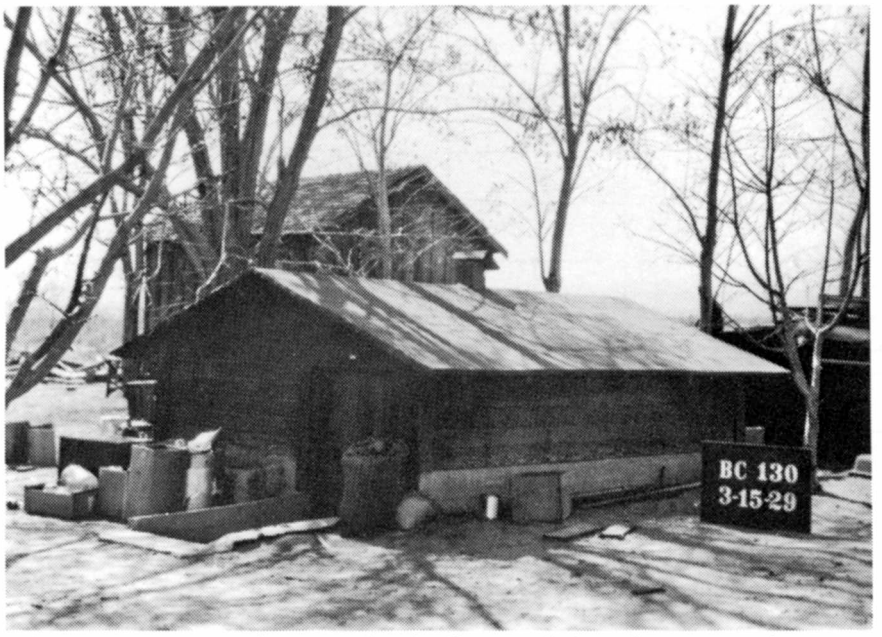


Figure 11.21. 1929 photograph of cellar at Christopher House (courtesy of LADWP Bishop Office).

Christopher Farm (MANZ 1993 A-8)

This site consists of the foundation remains of a substantial structure. Gully erosion has exposed the foundation; other associated features and artifacts may still lie buried. The site is located in the northwestern portion of the National Historic Site in an area once occupied by the relocation center hospital. The area was likely leveled and filled prior to construction of the hospital.

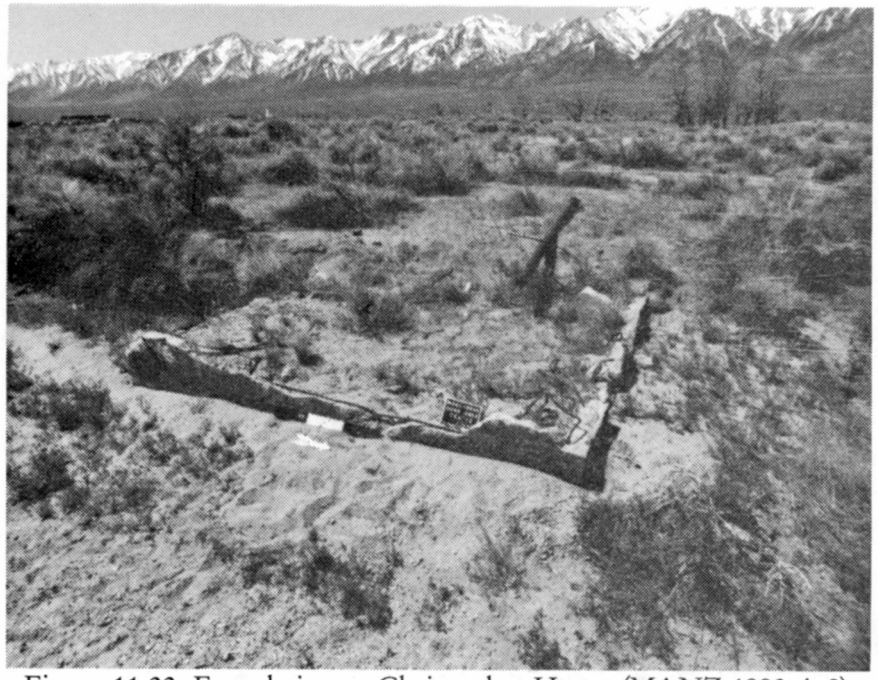


Figure 11.22. Foundation at Christopher House (MANZ 1993 A-8).

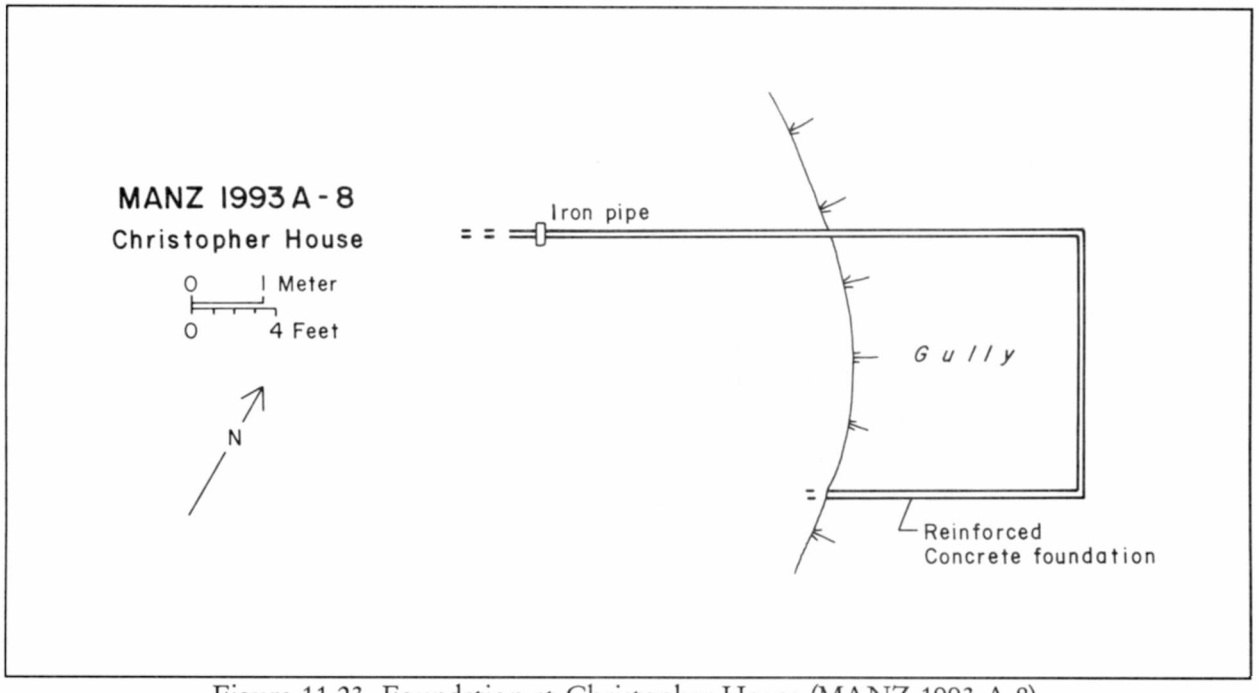


Figure 11.23. Foundation at Christopher House (MANZ 1993 A-8).

The foundation is located within what was Lot 97 of the Manzanar subdivision. Lots 97 and 99 formed the Christopher Farm, according to LADWP records. LADWP purchased the land from V.N. (Vic) Christopher in 1924 for $12,500. Both lots were predominately orchards (apples, peaches, and prunes), however the plat map shows a road and a powerline ending in the general area of the foundation.

Improvements listed in the LADWP Valuation include an 892-square-ft five-room wood frame residence with a concrete foundation and electrical wiring (Figure 11.20), a latrine, a 180-

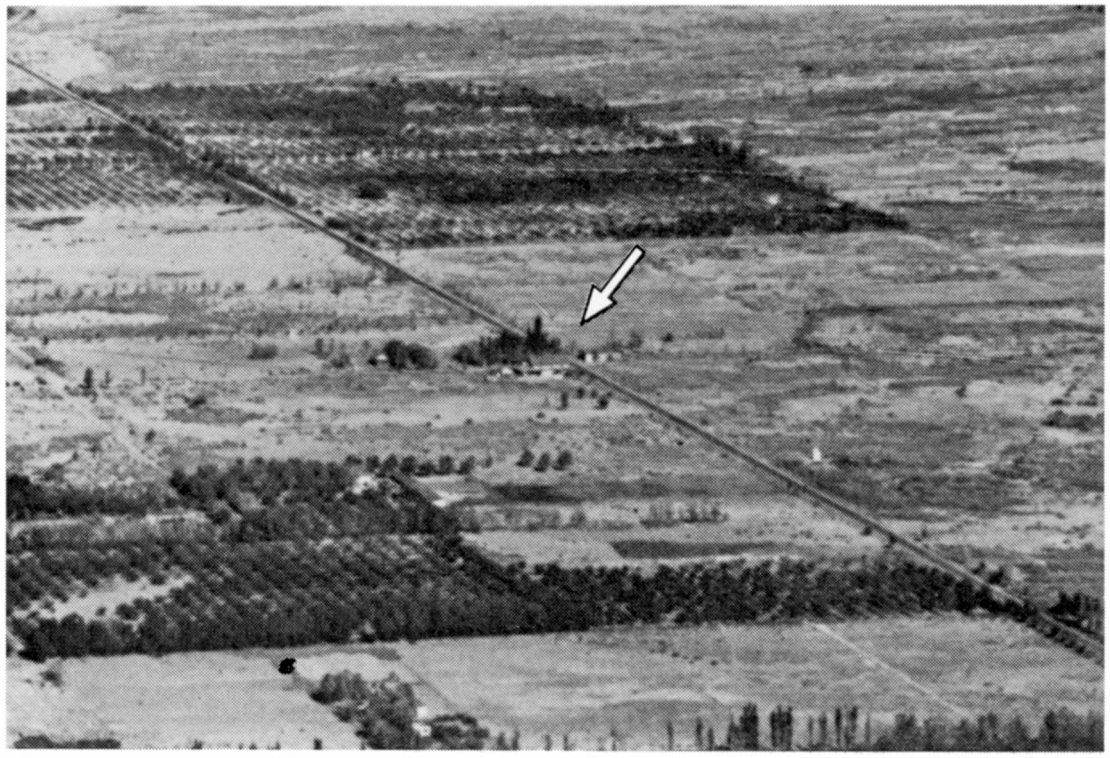


Figure 11.24. 1930s oblique aerial photograph of downtown Manzanar and vicinity (north to top).

square-ft bunk house, two cellars (Figure 11.21), two chicken coops, a turkey coop, and a shelter. The residence, one of the cellars, and the bunk house were listed as in good condition, the latrine in poor condition, and the remaining structures in fair condition. The total assessed value of structures was $1,126.00. In November 1933 the buildings were recommended for salvage. The chicken and turkey coops were noted as moved to the Paget farm and the bunk house as moved to the Lenbek Property. All other buildings were sold for $100.00 to William Skinner, who used the materials in Lone Pine.

The foundation at the site is likely that of the residence. It is a rectangular reinforced-concrete perimeter foundation 12 ft wide by over 30 ft long (Figures 11.22 and 11.23). An iron sewer waste pipe bisects the north wall of the foundation. A loose section of water pipe was also noted at the site. Its association with the site is unclear but it may have been dug up during construction of an adjacent flood control ditch. Other trash noted in the general vicinity of the foundation is most likely associated with the relocation center hospital (see Chapter 9).

Downtown Manzanar and Lacey Home (MANZ 1993 A-16)

This site comprises the central portion of the town of Manzanar. Included are structural remains, other possible homesites, several trash concentrations, and scattered artifacts in a 15-acre area in the northeast portion of the National Historic Site (east of Block 30 and Firebreak A9 of the relocation center). The site also extends outside the National Historic Site east of U.S. Highway 395.

Maps and photographs in the Manzanar Community file at the Eastern California Museum indicate that historically the intersection of Francis Street (now the Manzanar–Reward Road) and Independence Avenue (now U.S. Highway 395) was the center of the Manzanar townsite (Figure 11.24). Four of the former town lots encompassed by the site had im-

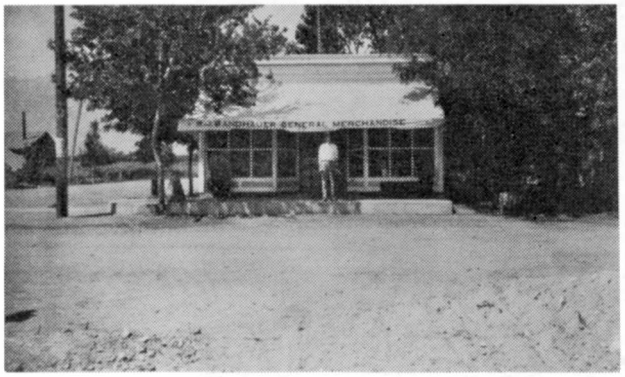


Figure 11.25. Manzanar Store (courtesy of Eastern California Museum).

provements listed in the LADWP Valuation. These included a store, a garage, a two-story community center and packing house, two homes, and numerous other buildings.

Lot 116 is at the northwest corner of the intersection of Francis Street and Independence Avenue. Listed in that lot are a 1,455-square-ft wood frame store with a 390-square-ft basement or addition (Figures 11.25 and 11.26), a 1,139-square-ft six-room wood frame residence with a concrete foundation (Figures 11.27 and 11.28), a garage, a shed with a concrete floor and plumbing, and two chicken houses. The store and residence were wired for electricity. The residence is listed as in good condition, the store as in fair condition, the garage in poor condition, the chicken houses in bad condition, and the shed as expired. The total assessed value of the structures was given as $2,944.00.

Built in 1911 or 1912, the store also served as the post office and housed the town's only telephone. Originally owned by the Hatfields, it was purchased in 1918 by the Bandhauer family, who owned it until 1924, when the property was purchased by LADWP. The residence, garage, and shed were sold and moved to Independence in July 1934 (Figure 11.29). The store and chicken houses were removed in May 1935.

Lot 143, at the southwest corner of Francis Street and Independence Avenue, included a 4,000-square-ft wood frame town hall with a concrete foundation (Figures 11.30 and 11.31), a small shed, and two latrines. The town hall had



Figure 11.26. 1929 photograph of Manzanar Store (courtesy of LADWP Bishop Office).



Figure 11.27. 1929 photograph of Bandhauer House (courtesy of LADWP Bishop Office).


Figure 11.28. Bandhauer House (courtesy of Eastern California Museum).

two large meeting rooms, four offices, and a landing platform at the rear. The town hall was listed as in good condition, the shed in poor condition, and the latrines in bad condition. The total assessed value of the structures was given as $2,369.00. All were noted as salvaged by LADWP with the materials stored in the Independence Warehouse as of September 1936.

At the northeast corner of the intersection of Francis Street and Independence Avenue, Lot 234 improvements noted include a 26,400 cubic ft concrete block garage (Figure 11.32) with a badly cracked concrete floor and an 8½-ft-long concrete walkway, two latrines with concrete floors and plumbing, and a small shed. The garage was noted as in fair condition and the rest in bad condition; the total assessed value of structures was $1,000.00. All were salvaged by LADWP on June 22, 1934.

Located on the north side of Francis Street west of the store was the Tom Lacey Place, Lot 103 of the Manzanar townsite. Improvements listed in the LADWP valuation include a 888-square-ft five-room wood frame residence with electrical wiring and a concrete floor (Figure 11.33), a latrine, a stable (Figure 11.34), and an old cellar noted as "going to pieces." All but the residence, in good condition, were noted



Figure 11.29. Bandhauer House in Independence.



Figure 11.30. Community Hall (courtesy of Eastern California Museum).

as in bad condition; the residence had an assessed value of $1,075.00, and no value was given to the other structures. The stable was removed prior to May 1934, when the remaining structures were recommended for salvage. All were sold to P.E. Ritch in March 1935 for an unknown amount.

Archeological remains noted at MANZ 1993 A-16 include eight artifact concentrations (Loci A-G) and the remains of three structures (Features 1-3). Other possible structure locations are apparent through vegetation patterns and trash scatters.



Figure 11.31. 1929 photograph of Community Hall (courtesy of LADWP Bishop Office).



Figure 11.32. 1929 photograph of Manzanar Garage (courtesy of LADWP Bishop Office).

Feature 1, within Lot 143, consists of scattered concrete fragments and rock along a recently dug Contel fiber optics line which parallels the west side of U.S. Highway 395. These are likely the remains of the town hall foundation.

Feature 2, within Lot 116, is a rubble-filled concrete-walled basement measuring 14 ft by 23 ft (Figures 11.35 and 11.36), approximately the same size as that noted for the store basement. Aligned with U.S. Highway 395, there is a stairway on the west (rear) side of the basement.



Figure 11.33. 1929 photograph of Lacey House (courtesy of LADWP Bishop Office).



Figure 11.34. 1929 photograph of stable (garage) at Lacey House (courtesy of LADWP Bishop Office).

Feature 3 is located on the east side of U.S. Highway 395 in what was Lot 234. It consists of a 3/4-inch-thick decayed concrete floor with some porcelain toilet bowl or sink fragments. It is likely the remains of one of the bathrooms noted by LADWP at the garage.

Locus A, a trash scatter measuring 130 ft north-south by 180 ft east-west, does not appear to be associated with a known structure. However, the nature and amount of artifacts at this locus suggest a structure may have been present at one time. Noted were thousands of whiteware plate

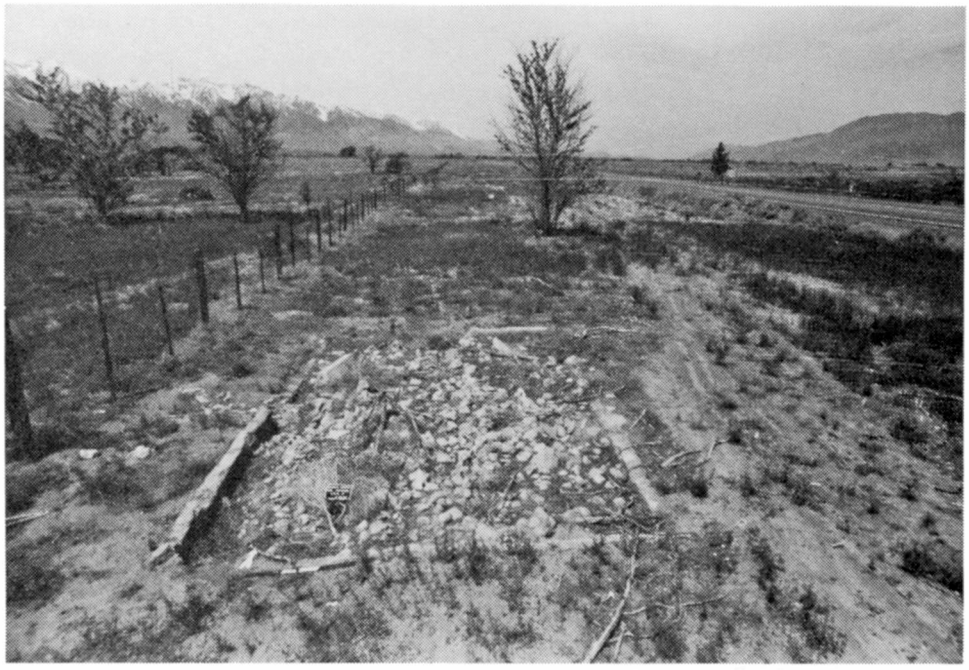


Figure 11.35. Store basement (MANZ 1993 A-16, Feature 2).

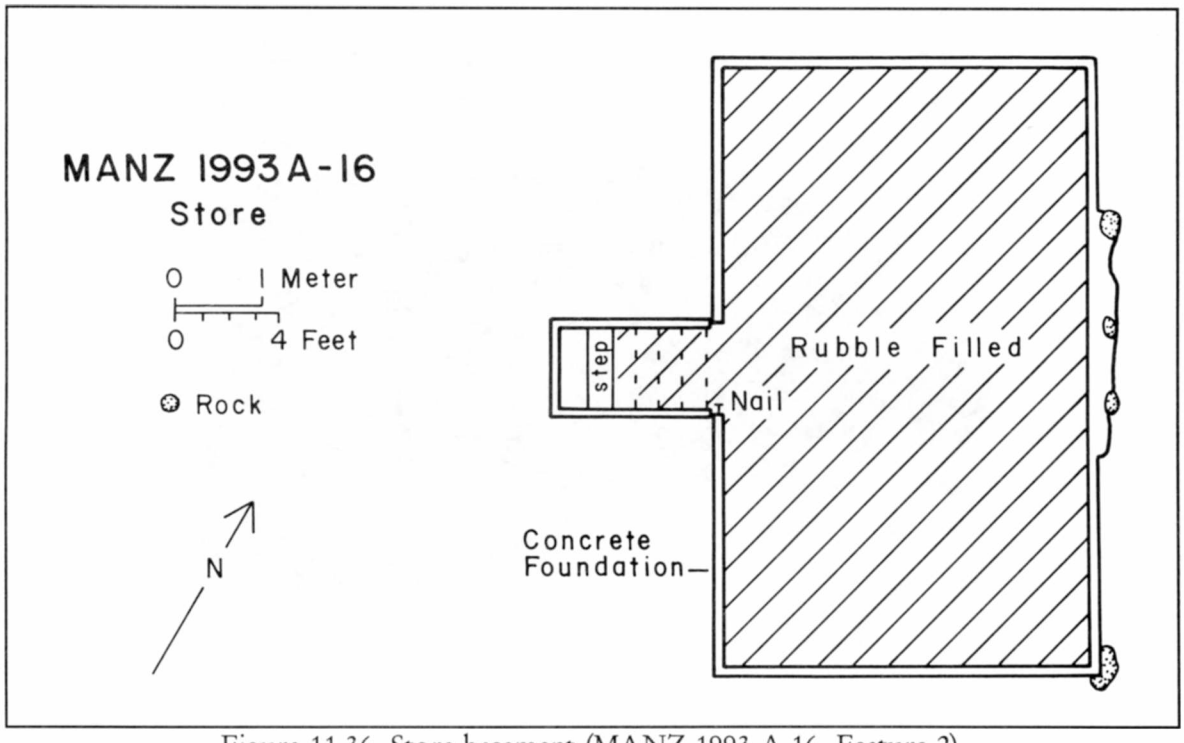


Figure 11.36. Store basement (MANZ 1993 A-16, Feature 2).

fragments, thousands of clear glass fragments (including crown cap finish bottle lips and a jar base embossed with "Best Foods"), thousands of brown glass fragments, numerous purple glass fragments, three enameled metal pans, an axe head, a few sanitary seal cans, can bits, a wood screw, a bolt and nut, a glass "Boyd" canning jar lid liner (1915+), glazed earthenware fragments, clay pipe fragments, and red brick fragments. The one ceramic collected from this locus

indicates a 1910s-1920s date (see Appendix D).

Locus B, measuring 80 ft north-south by 100 ft east-west, is north of (behind) the approximate location of the Lacey Home. It includes a low mound and shallow depression covered with thousands of clear and brown glass fragments, approximately 100 purple glass fragments, 10 sanitary seal cans, can bits, sardine cans, pocket tobacco tins, thousands of wire nails, a light bulb base, a watch part, a rivet, a "Champion" spark plug for a Ford, a "Ponds" cold cream jar base, fragments of a "Carter's Ink" bottle, and a rivet inscribed with "Scoville Mfg Co." Much of the material at this locus appears to have been burned. Makers marks and design styles on collected ceramics suggest a 1910s-1920s date (see Appendix D). The results of a 1 m by 1 m test unit excavated at this locus are discussed below.

Located between the Lacey homesite and the likely area of the Bandhauer house, Locus C measures 30 ft north-south by 60 ft east-west in size. It includes about 100 light aqua/clear, brown, blue, and window glass fragments, a "Boyd" canning jar glass lid, hundreds of wire nails, can bits, a horseshoe, crown caps, electrical porcelain fragments, and fragments of burned yellow fire bricks. Most of the artifacts are burned and within and around a 5 ft by 10 ft depression. Collected ceramics include one with a Vernon China, Vernon, California, basemark (1928-1948, see Appendix D).

Locus D, 50 ft in diameter, is located east of (behind) the likely location of the Bandhauer/ Hatfield House. It includes approximately 10,000 glass fragments (over half of them clear, with some white, blue, brown, and purple), hundreds of whiteware plate fragments, hundreds of wire nails, electrical porcelain fragments, clay flower pot fragments, over five light bulb bases, and a "Boyd" canning jar glass lid. Most of the artifacts are burned. Embossed bottle bases include the hallmarks of the Owens Illinois Bottle Co. (1932+), the Hazel-Atlas Glass Co. (1920-1964), and the Brockway Glass Co. (1925+). The results of a 1 m by 1 m test unit excavated at this locus are discussed below.

Locus E, 15 ft in diameter, is in the general likely location of the Bandhauer house. It includes a few aqua glass fragments, power pole hardware and ceramic insulator fragments, a sanitary seal can, an electrical porcelain fragment, a concrete pipe fragment, and a metal lid embossed with "Harriet Hubbard Ayer Famous Beauty Preparations U.S.A."

North and east of the store (Feature 2), Locus F is 80 ft by 100 ft in size. It contains hundreds of clear glass fragments, about 100 fragments each of green, brown, and window glass, around 100 whiteware plate fragments, a screw-type fuse, electrical porcelain fragments, crown caps, miscellaneous hardware, a paint can lid, and clay flower pot fragments. A collected ceramic dated to the 1930s-1940s (see Appendix D).

Locus G, in the former garage area (Feature 3) east of U.S. Highway 395, measures 165 ft north-south by 80 ft east-west. Noted artifacts include melted glass, window glass, purple glass, wire nails, and concrete foundation fragments.

Subsurface Testing

Two 1 m by 1 m excavation units were excavated at this site, one at Locus B and one at Locus D. Within these loci the units were judgmentally placed in the area containing the greatest concentration of surface artifacts.

Locus B

The Locus B unit (Excavation Unit 22) was excavated to a depth of 70 cm. Four soil strata were discerned based on texture, color, compaction, and cultural constituents (Figure 11.37). Stratum 1, the uppermost stratum, consists of thin layers of compact very dark gray (Munsell color 10YR 3/1) silt with abundant artifacts and charcoal. It extended to 15 cm deep. Within this stratum there is a 1-2 cm thick discontinuous

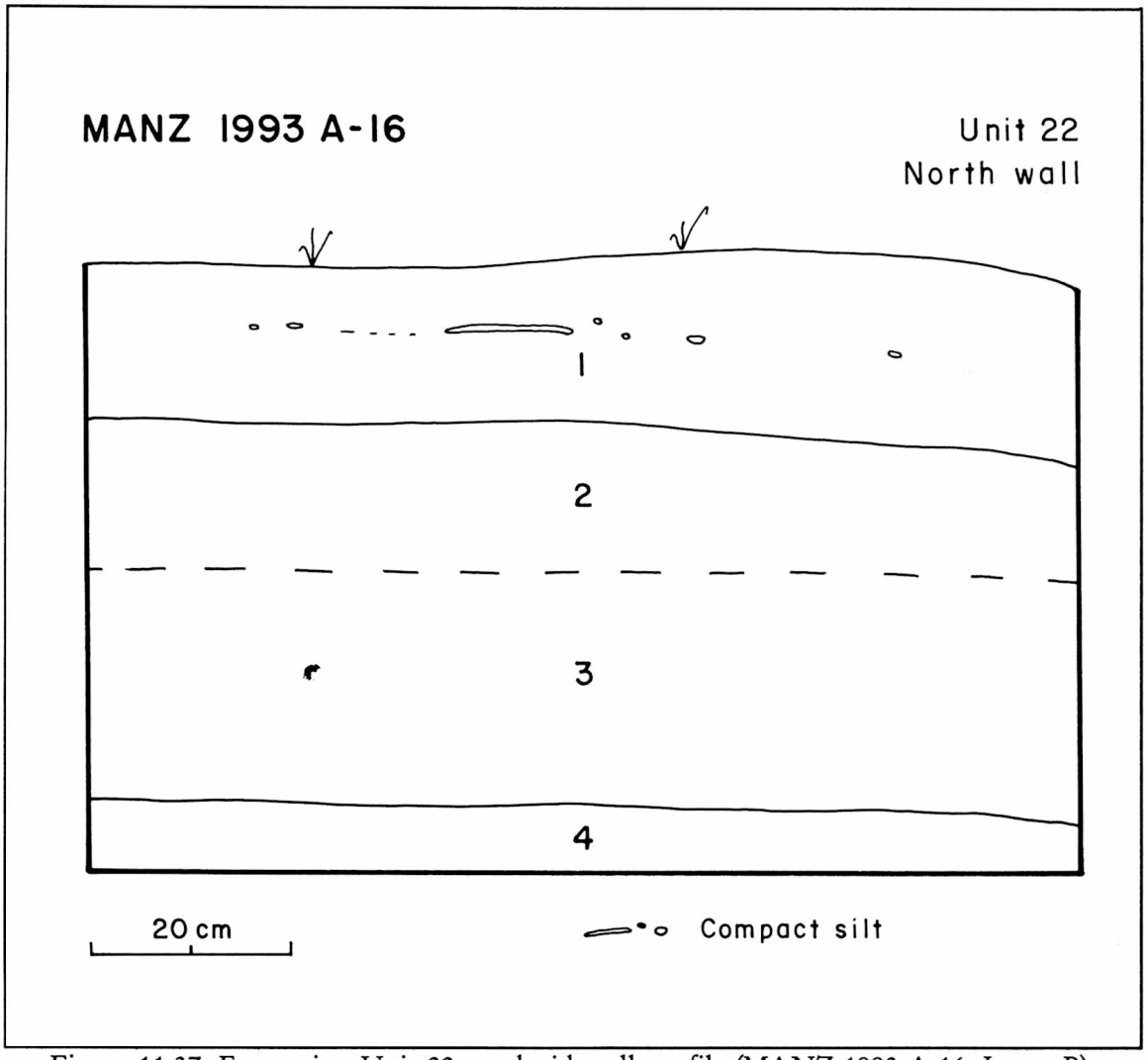


Figure 11.37. Excavation Unit 22 north sidewall profile (MANZ 1993 A-16, Locus B).

band of very pale brown (10 YR 7/3) silt. Below Below Stratum 1, Stratum 2 consists of very compact gray (10 YR 5/1) silt with brownish yellow (10 YR 6/8) carbonate streaks and a few artifacts. This stratum is approximately 15-20 cm thick. Below this, Stratum 3 consists of very compact gray (10 YR 5/1) silt with light gray (10 YR 6/1) carbonate streaks, sand, and gravels. Very few artifacts were recovered from this 20-25 cm thick layer. Stratum 4, the lowest stratum encountered, consists of culturally sterile very dark grayish brown (10YR 3/2) compact silt with light gray (10 YR 6/1) carbonate streaks. Stratum 4 began at a depth of 55 cm.

In all, 465 historical artifacts were recovered from the excavation unit; many were burned or melted and most (90%) were from above 20 cm. Where possible the historical artifacts were classified by function using a system devised by Blee (1987) and Rhodes (1988). Items recovered range from glass and ceramic sherds to nails and personal items (Table 11.3).

Structural artifacts recovered include 97 nails, two fence staples, a wood screw, and two fragments of glass brick. The nails include 86 common nails (1 2d, 18 3d, 20 4d, 14 5d, 11 6d, 2 7d, 6 8d, 1 9d, 2 10d, 1 16d, 3 20d, and 8 fragments), three machine-cut nails (1 4d and 2 8d), a 1-inch roofing nail, five staples (2 ¾ inch and 3 1½ inch), and a 2½-inch casing nail.

Table 11.3. Artifacts Recovered from Excavation Unit 22 at Locus B of Downtown Manzanar (MANZ 1993 A-16).

Object Classification		Glass	Metal	Other
Structural	Structural Materials	2		
	Window Glass			
	Hardware		1	
	Nails		99	
	Utilities			
Domestic	Beverage Storage	1	1	
	Food Storage	131	18	
	Food Preparation		1	
	Food Remains			145
	Food Serving			36
	Furnishings	2	1	
	Pharmaceutical	1		
Personal	Clothing		7	
	Jewelry			
	Grooming and Hygiene			
	Money			
Activities	Ammunition			
	Leisure		2	
	Automobile			
	Miscellaneous Tools		1	
	Toys			2
	Writing			
Unclassified		1	13	

Beverage storage is represented by a single green glass fragment and a crown cap bottle opener. Items associated with food storage include 88 clear (one Owens Illinois [1911-1929]), 37 aqua, six purple glass fragments, 15 can fragments, a sardine can, and two can keys.

Artifacts associated with food serving include 36 ceramics (see Appendix D). These include 26 non-vitreous white-bodied earthenware plate, platter, saucer, cup, and child's mug fragments. Decorative elements include a bluebird decal (1910s-1920s), floral decal, gold edge lining, green floral, blue line, and rim molding. The child's mug has a handpainted decal of a broom and fireplace scene with the saying "What A Goodboy Am I." It likely dates to the late nineteenth-early twentieth century. Other ceramics recovered include a green glazed stoneware fragment and nine fragments from porcelain cups, saucers, plates, and an elongated vessel. Decorative elements on these include a light blue overglaze over stencil, green bands, light green overspray with gold accents, and a pink exterior airspray overglaze.

Recovered food remains include 29 peach pits, eight plum pits, five squash seeds, four corn cob fragments, an apricot pit, three unidentified floral remains, and 37 bone fragments. Bones identifiable to species include cow, pig, sheep, chicken, and quail (see Appendix H).

Noted furnishings include two painted glass fragments and a clothespin spring. Pharmaceutical items consist of a purple prescription medicine bottle neck. Personal items recovered include three garter clips, a wire from a campaign-style button, a possible clothes fastener, an undergarment strap slide, and a metal shoestring eyelet.

Three specialized activities (leisure, children's play, and miscellaneous tasks) are represented by the artifacts recovered from Locus B. Leisure activities are represented by two pocket tobacco cans. Toys include a spout and body fragment of a green glazed toy teapot. Miscellaneous tools include a metal push-pin head.

Unclassified artifacts include unidentified artifacts

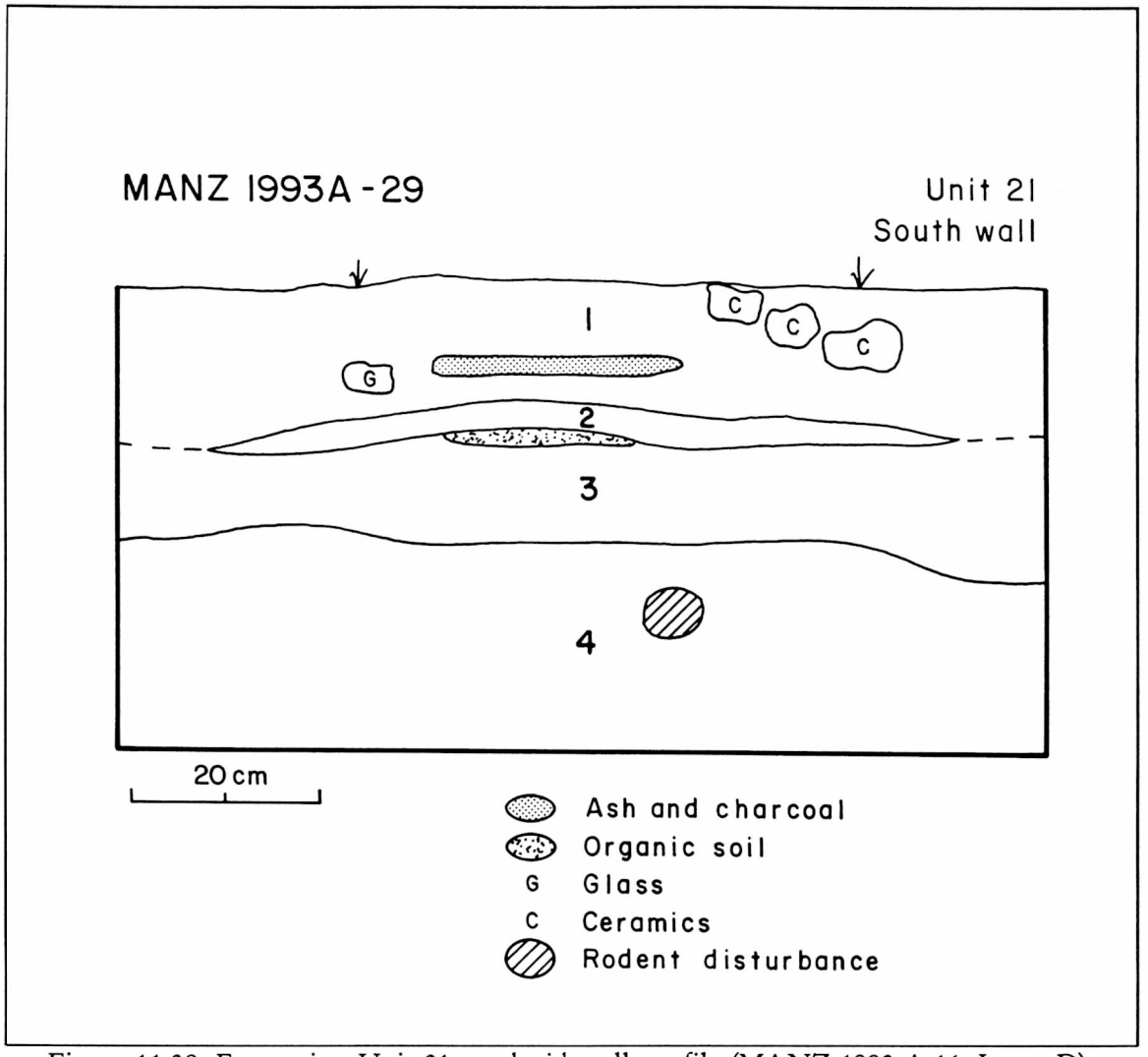


Figure 11.38. Excavation Unit 21 south sidewall profile (MANZ 1993 A-16, Locus D).

as well as artifacts with potentially multiple functions (such as wire) which hindered placing them in a particular category, and artifacts too fragmentary or altered to further classify. Unclassified items recovered include a melted glass blob, seven wire fragments, a homemade metal grommet, two metal straps, and three crate staples.

Locus D

The Locus D unit (Excavation Unit 21) was excavated to a depth of 50 cm. Four strata were discerned (Figure 11.38). Stratum 1, the uppermost stratum, consists of loose dark brown (Munsell color 10YR 4/3) silty sand with gravels and numerous artifacts and charcoal. It extended to 20 cm deep. Within this stratum there was a pocket of ash and charcoal 25 cm in diameter by 2 cm thick. Stratum 2 consists of a 1-cm to 6-cm-thick layer of slightly compact grayish brown (10YR 5/2) silt with a few artifacts. At the base of this stratum is a discontinuous 2-cm-thick layer of dark brown (7.5YR 3/2) organic soil. Stratum 3, approximately 10 cm thick, consists of compact dark brown (7.5YR 4/2) silty sand with a few artifacts. Stratum 4, the lowest stratum encountered, consists of culturally sterile brown (7.5YR 5/6) slightly compact silty sand with some gravels. It begins at a depth of 30 cm.

In all, 513 historical artifacts were recovered from excavation Unit 21; many were burned or melted and most (95%) were from above 30 cm. Where possible the historical artifacts were

Table 11.4. Artifacts Recovered from Excavation Unit 21 at Locus D of Downtown Manzanar (MANZ 1993 A-16).

Object Classification		Glass	Metal	Other
Structural	Structural Materials			
	Window Glass			
	Hardware			
	Nails		43	
	Utilities			2
Domestic	Beverage Storage	35	1	1
	Food Storage	218	34	
	Food Preparation			
	Food Remains			16
	Food Serving	2	1	71
	Furnishings	45	2	2
	Pharmaceutical	23	1	
Personal	Clothing		6	
	Jewelry			
	Grooming and Hygiene	17		
	Money			
Activities	Ammunition		2	
	Leisure			
	Automobile			
	Miscellaneous Tools		3	1
	Toys			10
	Writing		1	
Unclassified		1	6	

classified by function using the system devised by Blee (1987) and Rhodes (1988). Items recovered range from glass and ceramic sherds to nails and personal items (Table 11.4).

Structural artifacts noted include 43 nails, an electrical porcelain rotary switch knob (embossed with a "P"), and an insulator fragment. The nails include 30 common nails (5 2d, 2 5d, 5 6d, 4 8d, 1 10d, 3 16d, 1 30d, and 9 fragments), a 2 inch finishing nail, nine staples (seven 3/4 inch, one 1¼ inch, and one 1 inch), and two tack fragments.

Beverage storage is represented by 24 brown glass fragments, nine fragments of a clear "NEHI" soda bottle (Santa Monica, 1929-ca. 1946), two green glass fragments, a brown plastic whiskey bottle cap (30 ANCHOR C), and a melted lead wine bottle cork cover fragment.

Items associated with food storage include 205 clear glass fragments, 11 aqua glass fragments (six from "Perfect Mason" jars), two purple glass fragments, 27 can fragments, three can keys, three jar lids, and an aluminum cap embossed with "SMA 1." Embossed glass includes two pieces with "O-Ceder" (1908+), one with "He..aa made in USA," one with "CHESE... ...IAN," one with "...wl Dr...," three round bottle bases with the Hazel-Atlas Glass Company basemark (1920-1964), a ketchup bottle base with the Owens Illinois Bottle Company hallmark (1932+), a bottle base with "8110," and an extract shape bottle embossed with "Winona Memphis."

Artifacts associated with food serving include a metal plate fragment, two drinking glass fragments, and 71 ceramics (see Appendix D). The ceramics include fragments of 32 non-vitreous white-bodied earthenware cups, plates, saucers, and bowls. Decorative motifs include a molded rope border with a multi-color floral design (1930s-early 1940s), a gold line (ca. late 1930s), and a floral decal. Thirty-six porcelain cup, bowl, and saucer fragments were recovered. Decorative motifs include a plate with a molded accent on the rim, an Art Deco design, a black line on a rim, orange overglaze, multi-color overglaze, and airsprayed green, gray, and yellow. Other recovered ceramics include two semi-vitreous

white-bodied earthenware cup and bowl fragments and a buff paste stoneware serving bowl fragment with a molded grape motif (1930s-1940s).

Recovered food remains include 12 peach pits, one unidentified floral remain, and three bone fragments. The bones include two from chickens and one from an unidentified large mammal.

Furnishings include two light bulb bases, eight light bulb glass fragments, 36 lamp glass fragments, a white-painted glass fragment, and two terra cotta flower pot fragments. Pharmaceutical items consist of 20 light blue glass fragments (one embossed with "S... T...O...ILL...MP"), three fragments of a clear "Fletcher's" bottle, and a metal tube cap (embossed with "Norwich").

Personal items recovered include four cobalt blue glass fragments (including one embossed with "Vaseline" and one embossed with "...ER"), 13 white cold cream jar fragments (one embossed with "d and r ..Dell New York"), a garter clip, a butterfly undergarment strap fastener, and four shoe eyelets.

Several specialized activities, including those associated with firearms, writing, children's play, and miscellaneous tasks, are represented by the artifacts recovered from Unit 21. Ammunition consists of two .30-.30 cartridges. Toys include fragments of three porcelain toy plates, four toy saucers, and a toy cup (all with the same floral pattern), and two spout fragments from an undecorated toy vessel. Writing is represented by a metal band from a pencil. Miscellaneous tools include a thumbtack, a carbon rod from a battery, a complete D-cell battery with a paper label, and a staple.

Unclassified items recovered include an odd-colored glass fragment, three wire fragments, a metal strap, a copper fragment, and a small spring.

Gilmer Farm
(MANZ 1993 A-6)

This site consists of a small concrete-walled basement, a concrete well box, historical vegetation, several small artifact concentrations, and scattered artifacts. The three-quarter-acre site is located in the northwest portion of the National Historic Site in the perimeter northwest of the relocation center hospital. Sheet wash and gully erosion have eroded portions of the site. Structural material has been removed and the trash dumps have been vandalized. Most of the historical vegetation is dead and several trees have been cut, apparently for firewood.

The site encompasses Lots 72 and 84 of the Manzanar subdivision. According to 1929 LADWP plat maps this area was the site of an apple orchard owned by the Owens Valley Improvement Company; it was sold to LADWP in 1924. The LADWP Valuation Record lists Gilmer as the previous occupant. Structures in the Valuation Record include a 960-square-ft five-room wood frame residence with a concrete foundation (Figure 11.39), indoor plumbing, and electrical wiring, a garage with a concrete foundation (Figure 11.40), and a board-and-batten chicken coop. The garage was listed as in excellent condition and the other structures are listed as in fair condition; the total assessed value was given as $1,309.00. All were sold to and removed by F.B. Krater on June 8, 1934, for $175.00. This site may predate the town; the 1907 USGS map shows a structure in this general area.

Three archeological features were designated at the site (Figure 11.41). Feature 1 is a rubble-filled concrete-walled basement with an entryway on the east side. It measures 7 ft by 28 ft (Figure 11.42). Feature 2 is a two-chambered concrete well box east of the basement (Figure 11.43). The top consists of two concrete slabs, one of the slabs is removable and the other, pierced by a metal pipe and inscribed with "OTHER SIDE OF TOP OPENS," is not.



Figure 11.39. 1929 photograph of Gilmer Farmhouse (courtesy of LADWP Bishop Office).



Figure 11.40. 1929 photograph of outbuilding at Gilmer Farm (courtesy of LADWP Bishop Office).

Feature 3 is a vandalized trash dump or burn pile approximately 15 ft in diameter. Noted artifacts and ecofacts at the feature include hundreds of whiteware plate fragments, hundreds of window glass fragments, crown caps, over 20 purple glass fragments, over 50 blue glass fragments, clay sewer pipe fragments, terra cotta flower pot fragments, charcoal, and burned bone. Collected ceramics indicate a 1920s-1940s date.

There are several smaller trash concentrations to the west of Feature 1. Noted were about 50

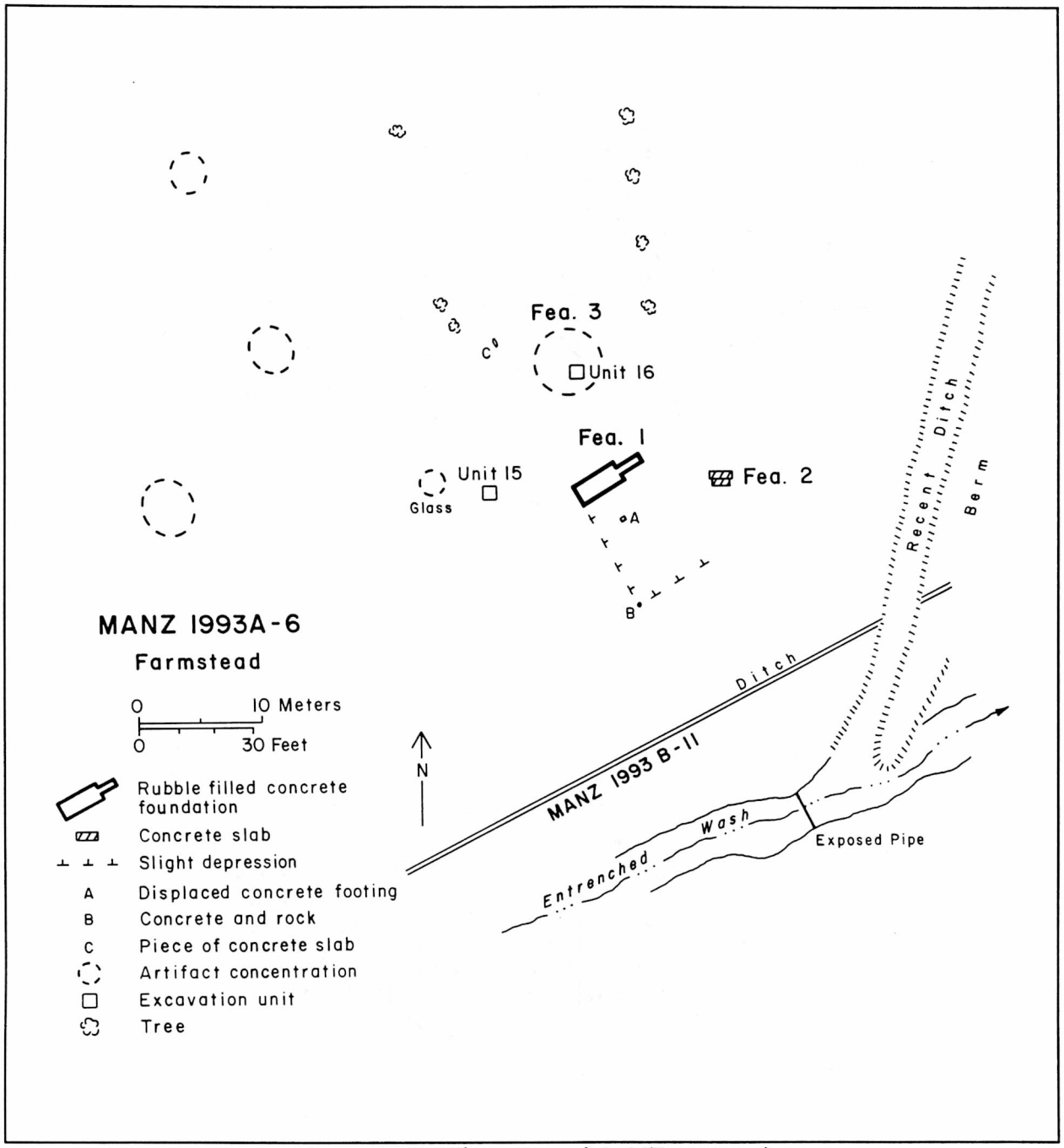


Figure 11.41. Gilmer Farm (MANZ 1993 A-6)

sanitary seal cans, knife-opened milk, sardine, and spice cans, a 3-in-1-oil can, a small log cabin syrup can, milk bottle fragments, clear glass jug fragments, two stove pipe sections, three clear glass fragments, a glass canning jar lid liner, three concrete/rock chunks, over 25 window glass fragments, over 10 aqua glass fragments, around 20 brown glass fragments, over 20 toilet bowl fragments, 15 whiteware plate fragments, and barbed wire. The milk can is of a size manufactured between 1917 and 1929.

Subsurface Testing

Two 1 m by 1 m units were excavated at this site. One was placed in an area west of Feature 1 (Excavation Unit 15) and one was placed within Feature 3 (Excavation Unit 16).



Figure 11.42. Basement at Gilmer Farm (MANZ 1993 A-6, Feature 1).

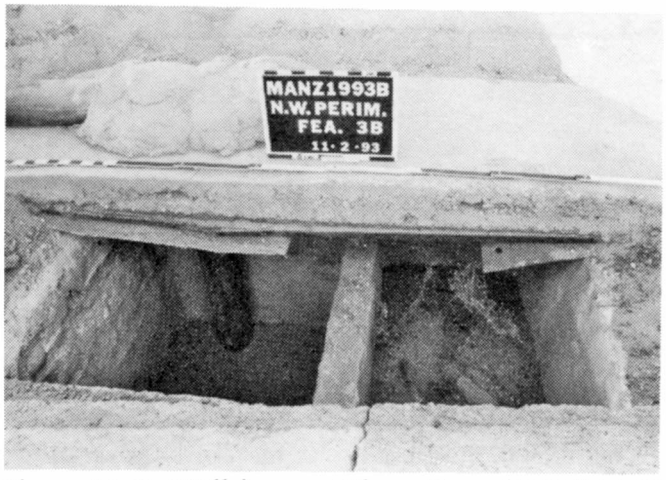


Figure 11.43. Well box at Gilmer Farm (MANZ 1993 A-6, Feature 2).

Unit 15 was excavated to a depth of 60 cm. Two major strata were discerned in this unit based on texture, color, compaction, and cultural constituents (Figure 11.44). Stratum 1, the uppermost stratum, consists of slightly compact brown (Munsell color 10YR 5/3) silty sand with gravels. It extended from the surface to 40 to 50 cm deep. Within this stratum there are two discontinuous layers or lenses. The first was encountered at approximately 12 cm below the surface. It consists of a 4-cm-thick layer of dark brown (7.5YR 4/2) silty sand with charcoal. Just below that is the next layer, a 2-cm to 10-cm-thick band of pale brown (10YR 6/3) silty sand. Artifacts recovered from Stratum 1 include two nails (4d and 12d), a small bundle of wire, a lumber shim, and a glass marble (20-30 cm). Stratum 2, the lowest stratum encountered, consists of yellowish brown (10YR 5/4) loose sandy silt with abundant gravels. No artifacts

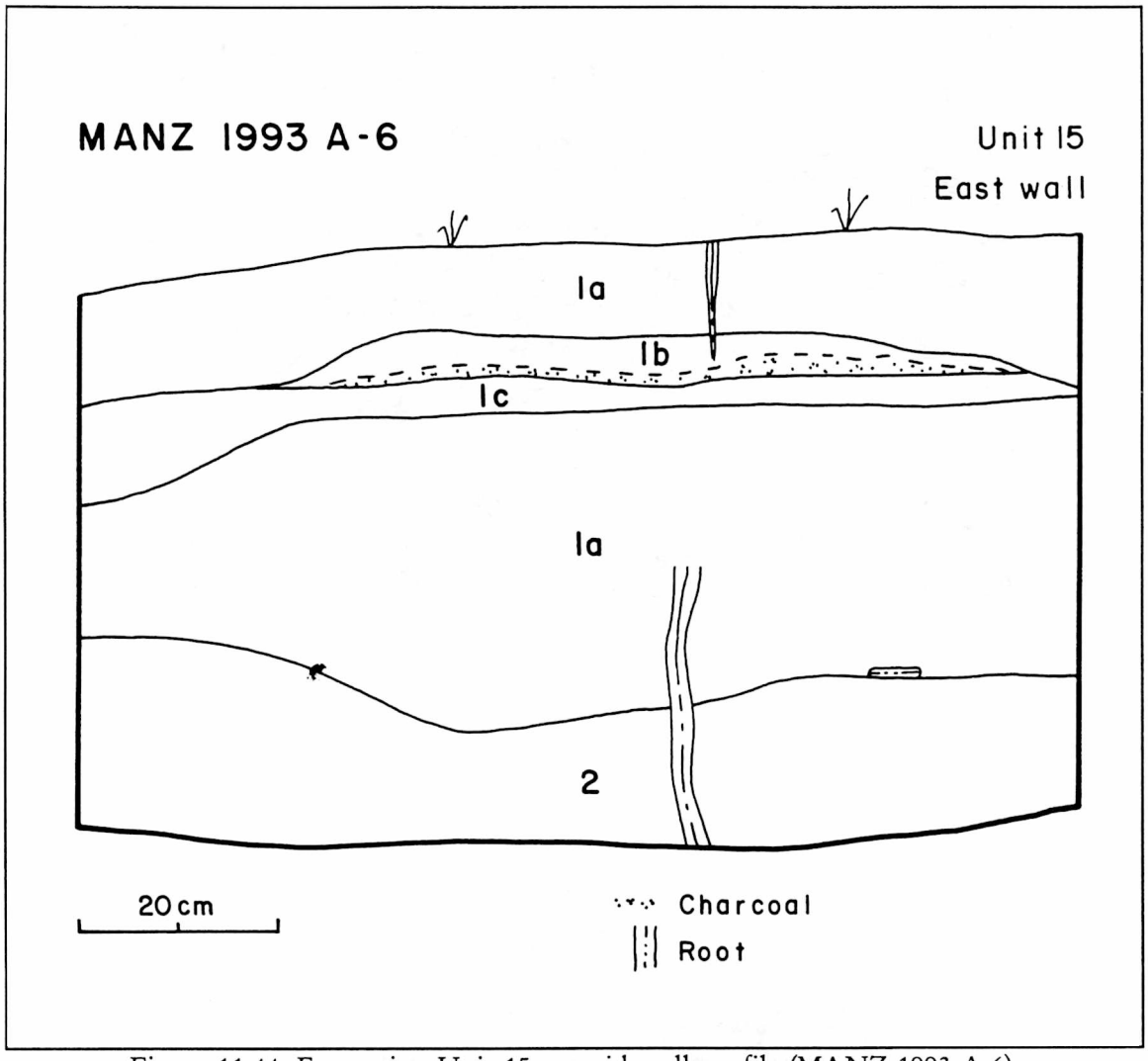


Figure 11.44. Excavation Unit 15 east sidewall profile (MANZ 1993 A-6).

were recovered from this stratum.

In Unit 16, excavated to a depth of 60 cm, four strata were discerned (Figure 11.45). Stratum 1, the uppermost stratum, consists of loose gray brown (Munsell color 10YR 5/2) sandy gravel with artifacts and bits of coal and charcoal. It extended up to 45 cm deep. Stratum 2 consists of a 5 cm to 10 cm thick layer of slightly compact brown (10YR 5/3) silty sand with a few artifacts. Rodent disturbance was evident in this and subsequent strata. Stratum 3 is a 5 cm to 12 cm thick layer of light grayish brown (10YR 6/2) silty sand. The only artifact recovered from this stratum was found near an apparent rodent burrow. Stratum 4, the lowest stratum encountered, consists of culturally sterile compact yellowish brown (10YR 5/4) sandy silt. It began at depths of 55-60 cm.

In all, 150 historical artifacts were recovered from excavation Unit 16; virtually all were from Stratum 1. Where possible the historical artifacts were classified by function using the system devised by Blee (1987) and Rhodes (1988). Items recovered range from glass and ceramic sherds to nails and personal items (Table 11.5).

Structural artifacts recovered include 15 window glass fragments, 23 nails, a wire staple, a machine screw, a door knob latch, a hardware part, a large screw and square nut, an electrical fuse, seven wood shingle fragments, and a small lumber fragment. The nails include 20 common

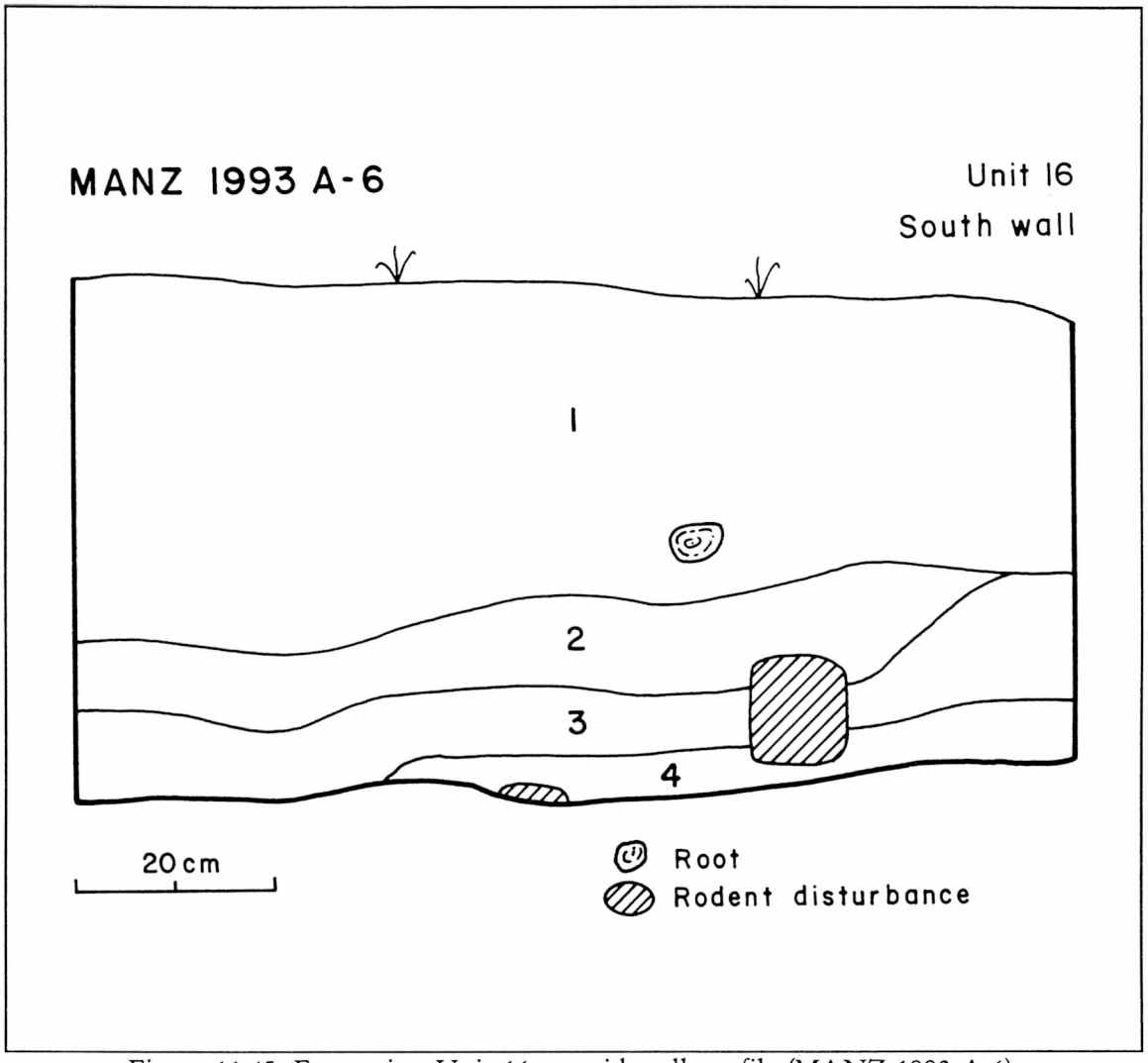


Figure 11.45. Excavation Unit 16 east sidewall profile (MANZ 1993 A-6).

nails (3 3d, 3 4d, 1 6d, 1 7d, 4 8d, 1 10d, 1 16d, and 6 fragments) and three finishing nails (two 2½ inch and one 1½").

Items associated with food storage include 14 can fragments, 20 clear glass fragments (including fragments of an extract bottle embossed with "ADS 6005-s" on the base, and a fragment embossed with "...GLYC... M"), and two aqua glass fragments. Artifacts associated with food serving include two non-vitreous white-bodied earthenware saucer fragments with a bluebird motif (see Appendix D).

Recovered food remains include 32 peach pits, 16 bone fragments and chicken egg shell fragments. Identified bones include two from cows, one from a pig, and one from a cottontail (Appendix H).

Pharmaceutical items recovered consist of a small clear glass oval-base liquid prescription medicine bottle (embossed with "3 ss" on side and "14 *f* 900" on the base). Potential pharmaceutical items include of six white glass fragments and two blue milk of magnesia bottle fragments.

The only personal artifact from the excavation unit was a small perfume bottle with no markings. Unclassified artifacts include two small metal fragments.

Table 11.5. Artifacts Recovered from Excavation Unit 16 at Gilmer Ranch (MANZ 1993 A-6).

Object Classification		Glass	Metal	Other
Structural	Structural Materials			8
	Window Glass	15		
	Hardware		4	
	Nails		24	
	Utilities			1
Domestic	Beverage Storage			
	Food Storage	22	14	
	Food Preparation			
	Food Remains			48
	Food Serving			2
	Furnishings			
	Pharmaceutical	9		
Personal	Clothing			
	Jewelry			
	Grooming and Hygiene	1		
	Money			
Activities	Ammunition			
	Leisure			
	Automobile			
	Miscellaneous Tools			
	Toys			
	Writing			
Unclassified			2	

Graham Farm
(MANZ 1993 A-11)

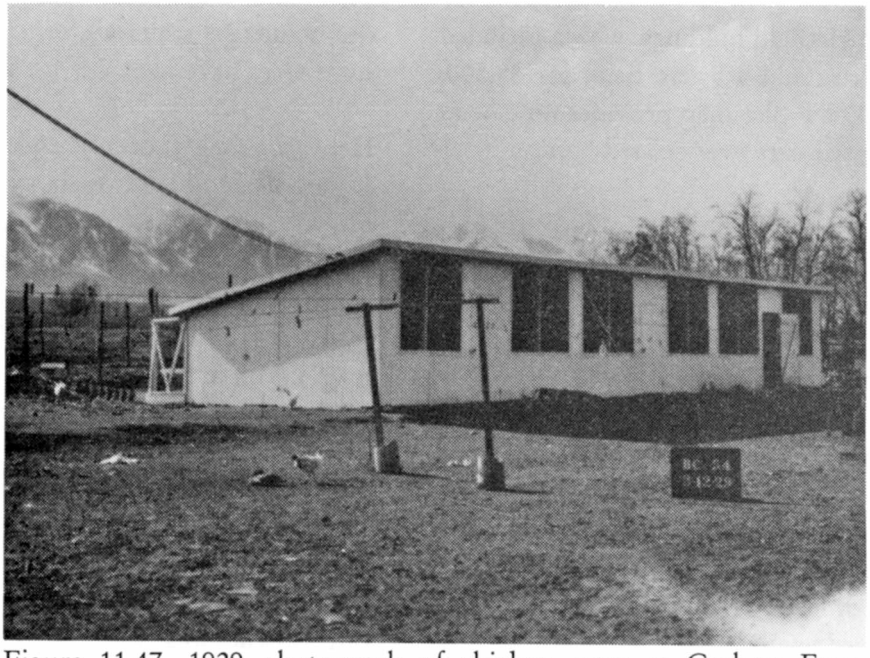
This site is a 30-ft-diameter trash deposit exposed in a drainage in the north-central portion of the National Historic Site. Most of the large vegetation in the immediate area of the site has been cut.

The site is within Lot 85 of the former Manzanar subdivision. In the LADWP Valuation Record portions of Lots 83 and 85 are listed as the Graham Farm. According to LADWP records, LADWP purchased this area from Roy Graham in 1924 for $6,500. The Graham property is listed as having had a 10-acre alfalfa field, a roughly 5-acre corn field, and a 5-acre orchard. Improvements noted at the property in 1929 include an 850-square-ft six-room wood frame residence with a concrete foundation (Figure 11.46), a garage, a 906-square-ft stone cellar with a concrete floor, a latrine, a shed, three chicken houses (Figure 11.47), and a rabbit hutch. The residence was listed as in good condition, the shed in fair condition, one of the chicken houses in excellent condition, and the remaining structures in bad or poor condition. The total assessed value of the structures is listed as $880.00. The garage was moved to Lone Pine and the remaining buildings were sold to A.R. Roger on January 24, 1934, for $50.00.

Surface artifacts noted include approximately 100 whiteware plate fragments (most plain white and some with a blue line around the rim), hundreds of clear glass fragments (embossed bottle bases include "SUNBU..." and "A S HINDS CO," [1870-1925?]), hundreds of brown glass fragments (one bottle base embossed with "CLOROX REG," [1929-1963]), about 20 purple glass fragments, 100 window glass fragments, over 20 green glass fragments, fragments of a "Kerr Self Sealing Wide Mouth Mason" glass jar (ca. 1920-1940), and fragments of "Kerr" porcelain canning jar lid liners (1915+). Collected ceramics (n=3) date to the late nineteenth century and the 1920s-1930s (see Appendix D). More trash is likely buried.



Figure 11.46. 1929 photograph of Graham Farmhouse (courtesy of LADWP Bishop Office).


Figure 11.47. 1929 photograph of chicken coop at Graham Farm (courtesy of LADWP Bishop Office).

Hatfield Property
(MANZ 1993 A-22)

This site consists of an enigmatic feature located in the east-central portion of the National Historic Site. The U.S. Highway 395 right-of-way fence crosses the eastern portion of the site. There is a recent water diversion ditch to the northwest. Remnant trees of a pear orchard are located to the south of the site.

Ira L. Hatfield was the last owner of the property that includes the site. In 1925 LADWP



Figure 11.48. 1929 photograph of Lenbek House (courtesy of LADWP Bishop Office).

purchased the Hatfield holdings, which included a 25-acre orchard and a 5-acre field, for $8,500. The 1929 LADWP plat map provides no clue as to whether a structure ever existed here.

The feature at MANZ 1993 A-22 consists of some structural iron deeply embedded in a low earthen mound. The iron appears to have been cut off. Abundant artifacts surround the feature, however virtually all appear to date to the relocation center-era. The only likely town-era artifacts in the immediate area are two small pieces of embossed purple glass. The immediate site area was likely bulldozed during construction of the relocation center. The feature may be the remains of a structure that could not be easily bulldozed away.

Lenbek and Kemp Homesites (MANZ 1993 A-20)

This site consists of several artifact concentrations and historical vegetation located west of the Bevis Place (MANZ 1993 A-19). North of the relocation center auditorium, the 2-acre site covers the eastern half of Firebreak B6. Sheet wash and gullies have eroded portions of the site, structural materials have been removed, and some trees have been cut for firewood.

Henry Lenbek (Lot 11), and Ralph Kemp (Lot 12) are listed as land owners on an August 1910 plat map of the Town of Manzanar. The Lenbek property, along with 80 acres of pasture and water rights to Hogback Creek, was purchased by LADWP for $7,000. The 1929 LADWP plat map shows a powerline ending in Lot 11. The LADWP valuation lists five buildings within Lot 11. These include a 344-square-ft two-room wood frame residence with a sill foundation (Figure 11.48), a latrine, a chicken house, a storeroom, and a shed. The residence was wired for electricity. The residence was in poor condition and the other structures were in bad condition; the assessed value of the residence was $51.00, the other structures had no value listed. The shed was noted as moved from the Christopher Property and later moved to the former Lutzow Property. The residence was moved to Lone Pine and the other buildings were sold to Dick Reed on November 19, 1934.

Vegetation alignments and artifact concentrations may denote the former locations of structures. A

large shallow depression within the site may have been created when a structure was removed. Six loci (A-F), all trash scatters, were designated at the site. Just west of the site there is a possible north-south town-era road alignment.

Locus A, measuring 65 ft north-south by 50 ft east-west, includes thousands of wire nails, a door handle, and a few other hardware pieces.

Locus B, 50 ft north-south by 30 ft east-west, includes a concrete block, barbed wire, a cup fragment, a clear glass lid fragment, wire nails, three sanitary seal cans, a can lid, aqua glass fragments (with embossed side panels "...E. PINK H..." and "..T TABLE CO..."), green glass fragments, over 100 clear glass fragments, can fragments, and an brown "Clorox" bottle fragment.

Locus C, 65 ft north-south by 50 ft east-west, includes a few chunks of plaster, aqua and white glass fragments, fencing nails, hundreds of wire nails, and can fragments.

Locus D, 30 ft north-south by 50 ft east-west, includes purple, clear, and white glass fragments, whiteware plate fragments, stoneware ceramic fragments, a glass lid fragment, and window glass fragments.

Locus E, 30 ft north-south by 65 ft east-west, includes a shell button, two brown whiskey bottles, brown glass fragments, a purple glass fragment, an embossed purple glass fragment, plate fragments (one dated to 1900-1925, see Appendix D), and hundreds of can fragments.

Locus F, 50 ft north-south by 50 ft east-west, includes 20 clear glass fragments, a glass "Boyd's Genuine Porcelain" canning jar lid liner (1915+), two jar lids, 10 aqua glass fragments, three purple glass fragments, a whiteware plate fragment, a can lid, and a harness buckle.

Artifacts noted in other site areas include several sanitary seal cans, a horseshoe, a shell button (ca. 1800+, see Appendix E), a door handle, smooth and barbed wire, a children's wagon handle, a "Coke" bottle fragment (embossed with "Bishop, California"), a few purple glass fragments, a lipstick tube (embossed with "Pond's Extract Co. N.Y. Made in U.S.A."), and a 3 inch by 1/4 inch metal machine tag (inscribed with "Manufactured by Standard Garage Works, Inc. 757-763 San Pedro St. Los Angeles").

Meyer Lumber (MANZ 1993 A-17)

This site consists of an artifact scatter, historical vegetation, and a possible structure pad. The site covers an area 200 ft north-south by 160 ft east-west, and is located southwest of the intersection of U.S. Highway 395 and the Manzanar-Reward Road. The highway right-of-way fence bisects the site and there is a recent water control ditch to the west. The site area may have been bulldozed or buried during construction of the relocation center.

The site encompasses Lots 151-153 of the Manzanar townsite. These lots are listed as Meyer Lumber on the 1910 Town of Manzanar plat map. LADWP records do not indicate if any structures ever existed in these lots.

The possible structure pad at the site is indicated by weeds growing in a distinct rectangular area 4 ft by 10 ft in size. The vegetation pattern could be caused by an infilled basement or some other feature that retains more moisture than the surrounding soil.

Artifacts at the site are widely scattered. Noted glass artifacts include approximately 100 brown glass fragments, about 50 clear glass fragments, and a few purple glass fragments. Other artifacts include about 25 whiteware plate fragments, a horseshoe, and a sanitary seal can. Embossed bottle bases noted at the site include two with the basemark of the Owens Illinois Bottle Company (one has an Oakland manufacturing number and a 1953 date and the other has a Los Angeles manufacturing mark and an ambiguous

date [date code=1]). Both of these were found south of the main site area, and postdate the town era; some of the other artifacts may reflect later occupation, also.

John Meyers Farm (MANZ 1993 A-10)

This site consists of an artifact scatter and historical vegetation in a one-half acre area in the northwestern portion of the National Historic Site, on the north side of 9th Street (Francis Street). An irrigation ditch associated with the relocation center crosses the site.

The site encompasses the western one-quarter of Lot 85 of the Manzanar subdivision. The LADWP Valuation Record attributes this parcel to John Meyers. According to LADWP records the land was purchased for $2,000 from Maggie Meyers (date unlisted) who had a 5-acre apple orchard and home here. The LADWP plat map shows a powerline ending in the site area. Improvements noted in the LADWP Valuation Record include a 1,030-square-ft four-room residence with a concrete foundation, a latrine, a 42-square-ft cellar, a combination garage and chicken house, and two other chicken houses. The residence, noted in poor condition, was wired for electricity. The assessed value of the residence was given as $63.00. The remaining structures, all in bad condition, had no value assessed. The garage was salvaged for repairs on the Graham property on April 24, 1931. The remaining buildings were recommended for salvage in 1933, and were sold to and removed by S. Branson in 1935.

All of the historical vegetation at the site appears dead. A 40 ft by 60 ft rectangular pattern of small dead trees and stumps may outline the former location of a structure. Metal artifacts noted at the site include approximately 20 cans (sanitary seal and condensed milk), jar lids, a large U-bolt, hundreds of wire nails, a metal washer, and miscellaneous hardware and other metal parts. Glass artifacts include thousands of clear glass fragments, hundreds of window glass fragments, hundreds of brown glass fragments, about 50 aqua glass fragments, about 50 blue glass fragments, and over 20 purple glass fragments. Embossed bottle marks include trademarks of the Hazel-Atlas Glass Co. (1920-1964) and the Owens Illinois Bottle Company with an Oakland manufacturing plant number (1932+), and "..s Chemical Co. Minneapolis." About 100 plate fragments are present at the site. Two of three collected ceramics date to between 1880 and 1910 and the other dates to the 1910s-1920s (see Appendix D).

OVI Headquarters/John Shepherd Ranch (MANZ 1993 A-13)

This site consists of structural remains, water control and other features, trash concentrations, and scattered artifacts covering 15 acres in the north-central portion of the National Historic Site. Two 1 m by 1 m test units were excavated at this site.

MANZ 1993 A-13 encompasses Lots 82 and 86 of the Manzanar subdivision. Sheet wash and gully erosion have eroded portions of the site and structural material has been scattered. Many of the trees within the site have been cut for firewood. This area was used as a park (referred to as "North Park") by the relocation center. Within the site there are three groups of large cottonwood trees (Figure 11.49). One group is in the southeast corner of the site and along Francis Street (9th Street of the relocation center), another group is in the central portion of the site, and the last group is in the northeastern portion of the site. These widespread groups of large trees suggest there was an extensive farm in this area prior to the relocation center. In fact, the 1907 USGS map shows a building in this area, the 1929 LADWP plat map shows a powerline ending here, and buildings are visible in this area in a 1931 aerial photograph of the town of Manzanar (Figure 11.50).



Figure 11.49. 1993 oblique aerial view of "North Park" (view towards southwest).

LADWP records list the Owens Valley Improvement Company (OVI) as the previous landowner. Indeed, a sketch map in the Manzanar Community file at the Eastern California Museum drawn by a past resident of the town of Manzanar labels a building there as owned by OVI. Comparison of LADWP photographs with earlier historical photographs indicate that the OVI headquarters was formally the John Shepherd Ranch (Figures 11.51-11.54). Information from the tax assessors files curated at the Eastern California Museum also indicates the Shepherd Ranch was at this location.

In 1924 LADWP bought all of the OVI land holdings and water rights in Owens Valley for $320,220. This included not only the old Shepherd Ranch buildings, but also 300 acres of orchards, 70 acres of alfalfa fields, 80 acres of other cultivated fields, 1,820 acres of pasture, 3,552 shares of the Manzanar Water Company, and water rights to Little Pine and Pine Creeks.

The LADWP valuation inventory lists three residences and seven other structures within Lots 82 and 86. The residences include a 1,757-square-ft wood frame Victorian house with a stone foundation, indoor plumbing, electrical wiring, tongue and groove ceilings, and a shingle roof (see Figure 11.54), a 798-square-ft wood frame building with a sill foundation and shingle roof (Figures 11.55-11.57), and a 523-square-ft four-room wood frame building with a sill foundation, electrical wiring, and a shingle roof (Figure 11.58). Other listed structures include a latrine (Figure 11.59), a 275-square-ft cellar with a concrete floor, an unidentified 20-square-ft four-room building wired for electricity, a garage with

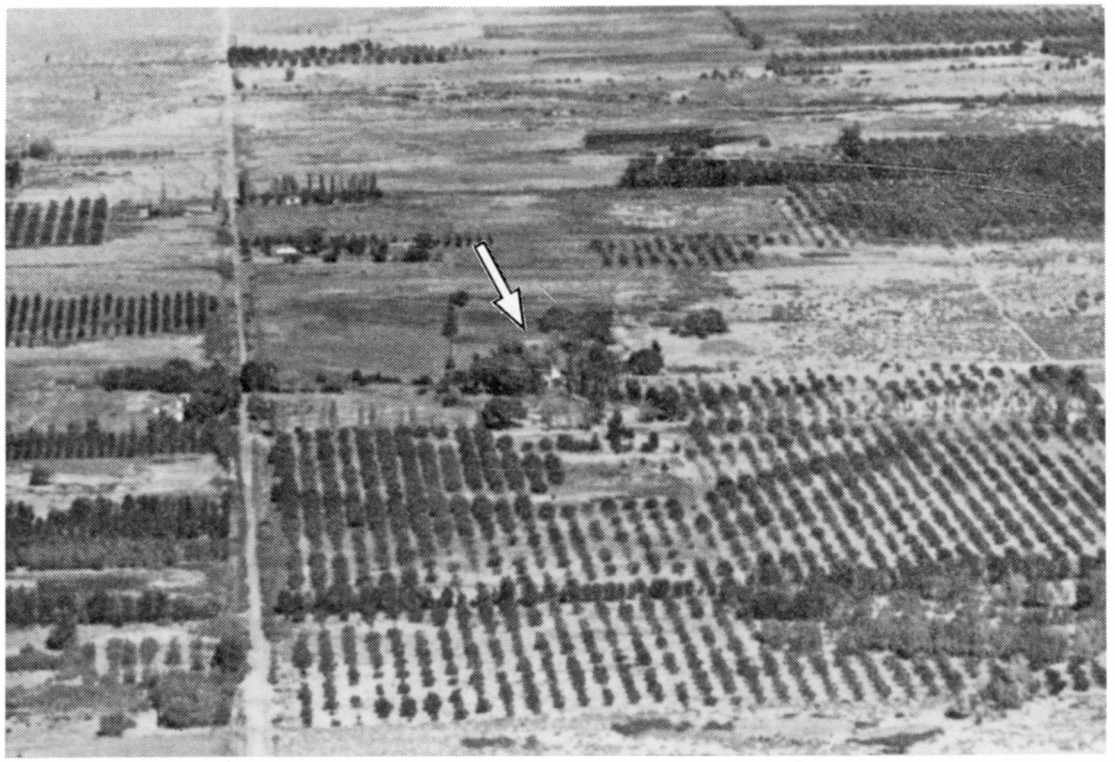


Figure 11.50. 1930s oblique aerial view of OVI headquarters and vicinity (north to top).



Figure 11.51. John Shepherd Ranch house (courtesy of Eastern California Museum).

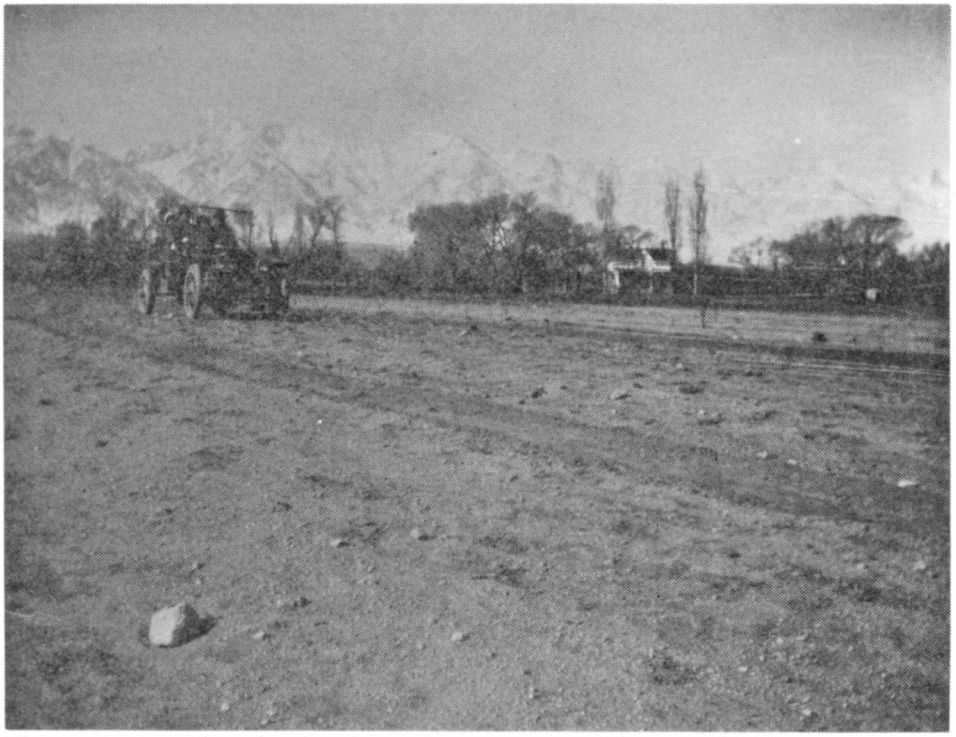


Figure 11.52. John Shepherd Ranch (courtesy of Eastern California Museum).

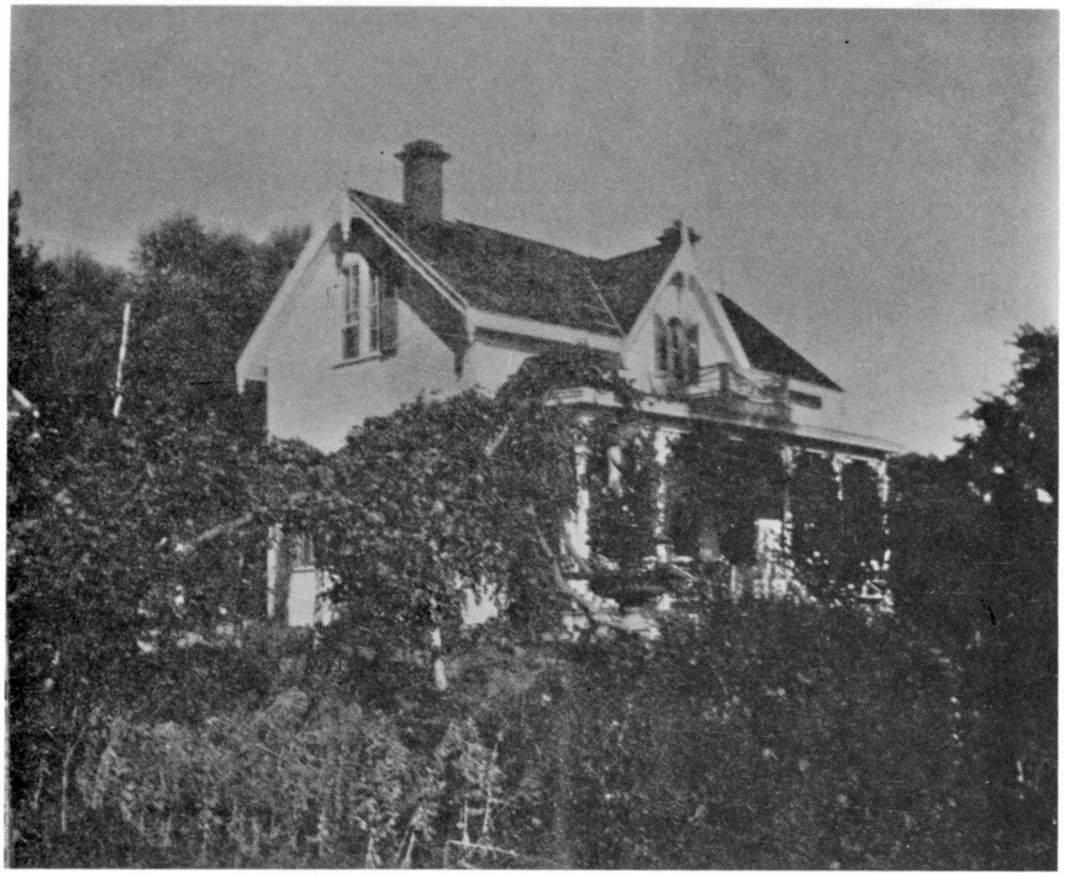


Figure 11.53. John Shepherd Ranch house (courtesy of Eastern California Museum).

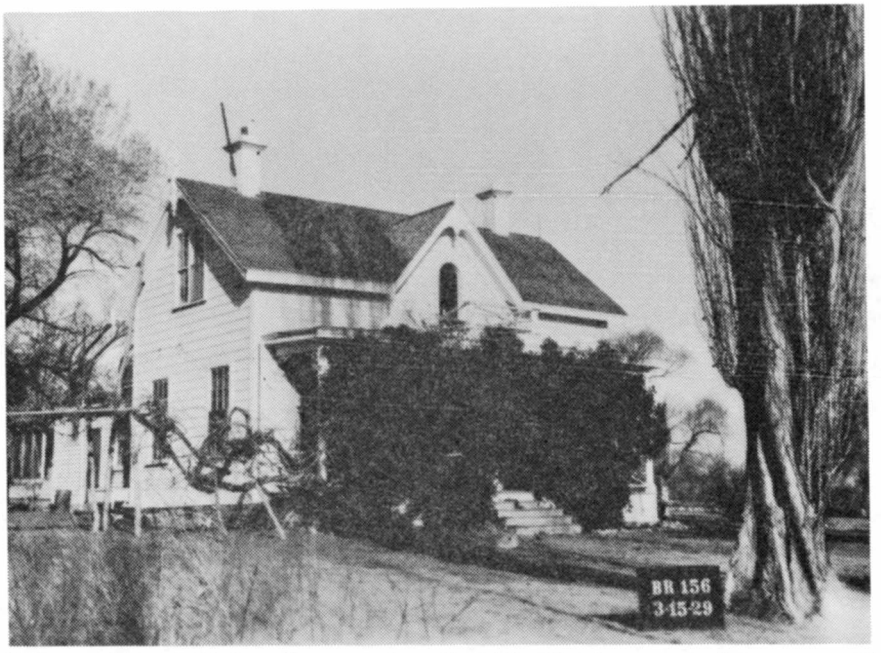


Figure 11.54. 1929 photograph of OVI Headquarters (courtesy of LADWP Bishop Office).

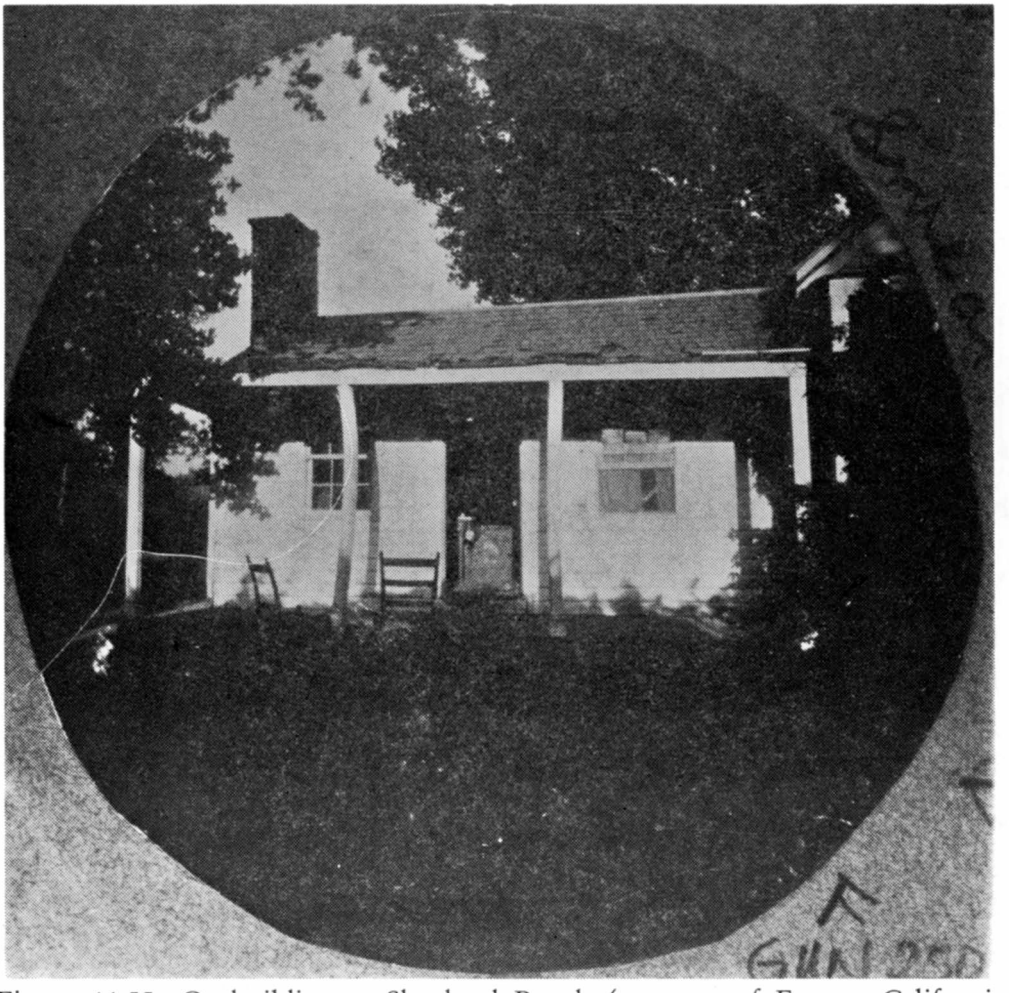


Figure 11.55. Outbuilding at Shepherd Ranch (courtesy of Eastern California Museum).



Figure 11.56. 1929 photograph of outbuilding at OVI Headquarters (courtesy of LADWP Bishop Office).



Figure 11.57. Outbuilding at Shepherd Ranch (courtesy of Eastern California Museum).

a concrete floor (Figure 11.60), a 424-square-ft blacksmith shop with dirt and plank floor, an 800-square-ft warehouse (Figure 11.61), a 2,280-square-ft horse barn, and a chicken house.

The Victorian residence, the garage, and warehouse are listed as in good condition, the blacksmith shop in fair condition, and the barn in bad condition. The remaining structures were noted as in poor condition. The total assessed

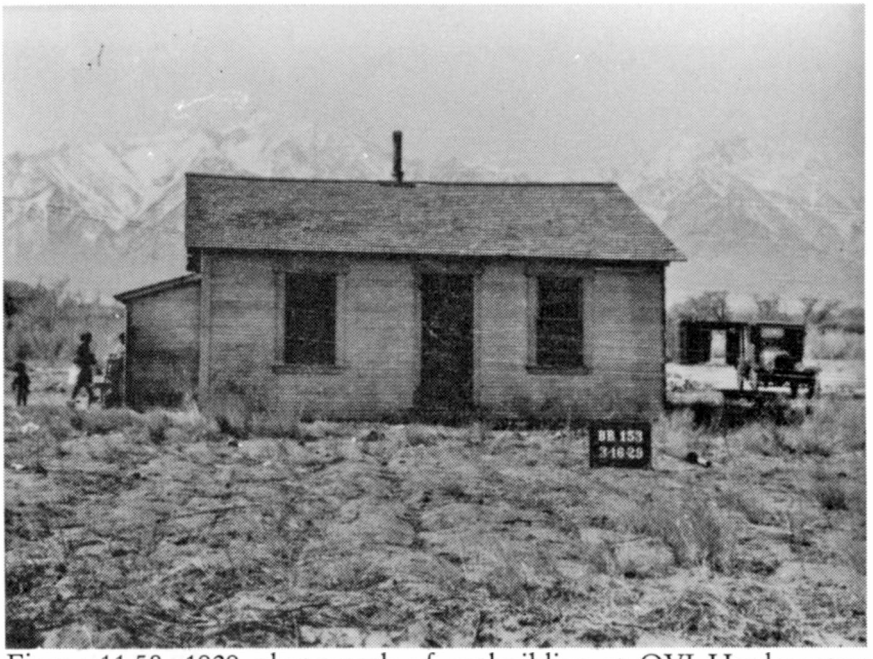


Figure 11.58. 1929 photograph of outbuilding at OVI Headquarters (courtesy of LADWP Bishop Office).

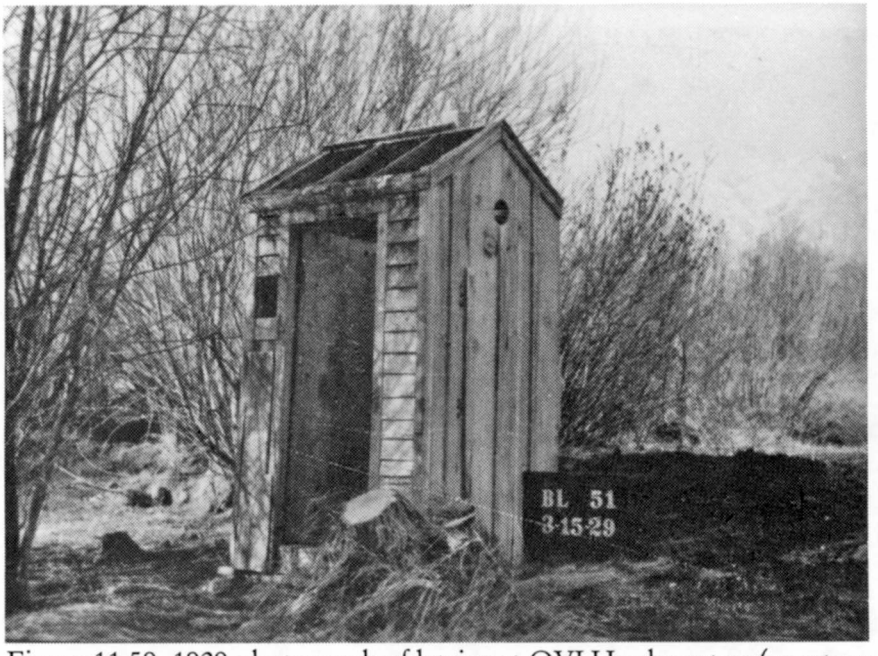


Figure 11.59. 1929 photograph of latrine at OVI Headquarters (courtesy of LADWP Bishop Office).

value of all of the structures was given as $3,937.00. The assessed value of the Victorian residence was $2,779, making it the highest-assessed residence within the town and second highest of those in the area (only a 1928-constructed wood frame residence at the Hay Ranch was listed as higher, see Chapter 12). The Victorian residence was noted as sold to Craig Wilson April 21, 1934, for $70.00. The warehouse was sold to R.T. Hatfield January 11, 1934, for $10.00. The horse barn was sold to J.R. Robinson August 25, 1933 for $10.00. The remaining buildings were sold to Craig Wilson on April 21, 1934 for $70.00.



Figure 11.60. 1929 photograph of garage at OVI Headquarters (courtesy of LADWP Bishop Office).

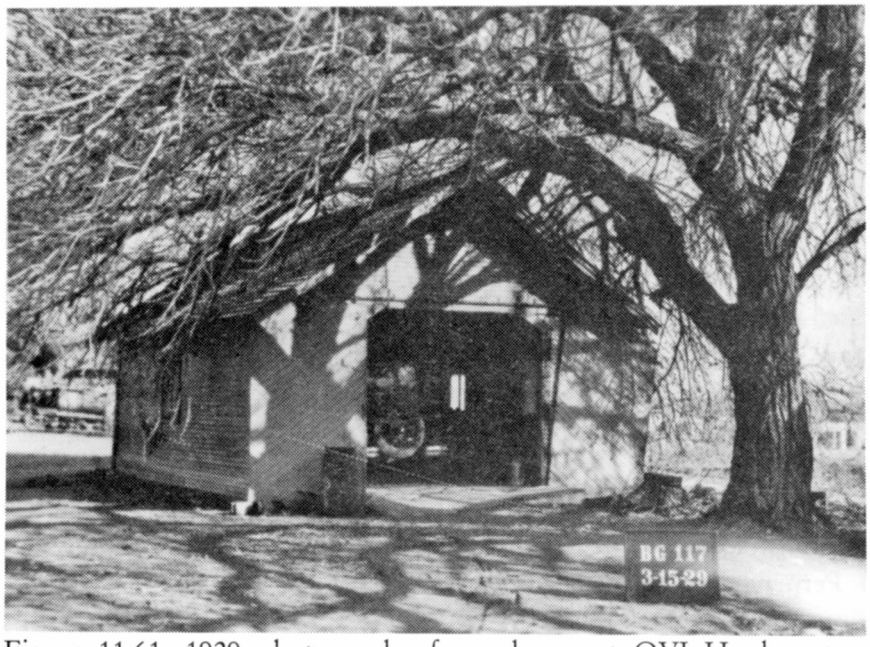


Figure 11.61. 1929 photograph of warehouse at OVI Headquarters (courtesy of LADWP Bishop Office).

Seven features (1-7) and nine artifact concentra tions (Loci A-I) were identified at the site. In addition, there are two relocation center-era features (grills) within the site boundary (see Features P-14 and P-15 in Chapter 9). Some artifacts at the site also likely date to the relocation center use. No definite town-era building remains were identified at the site. Such features may have been buried by tree litter and alluvium.

Feature 1 is a rock-lined dirt road that leads from Francis Street to the central site area (Figure 11.62). Several posts are incorporated into the

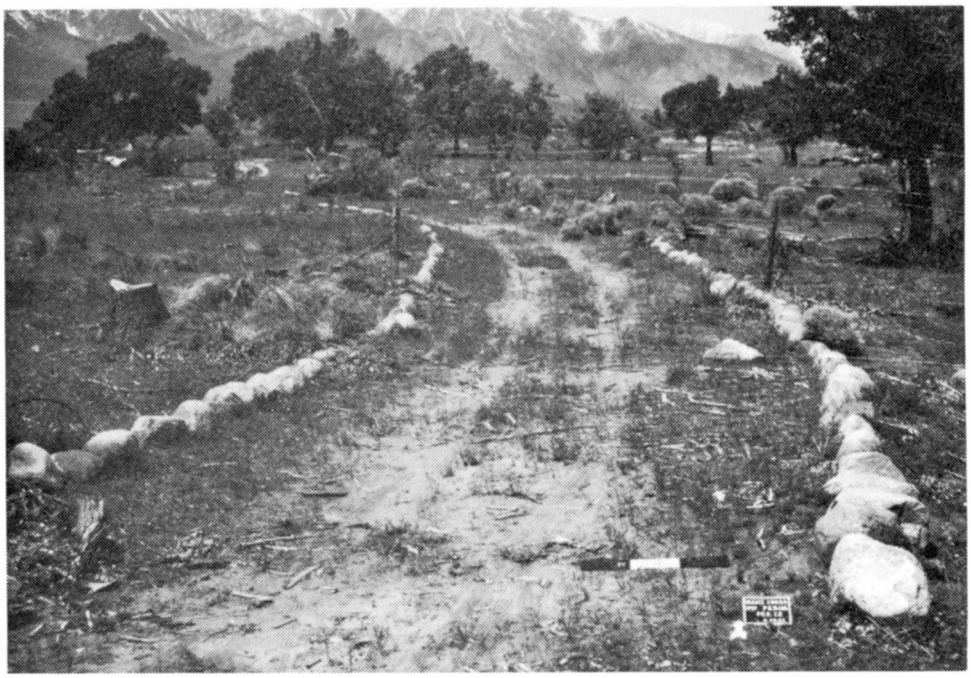


Figure 11.62. Rock-lined road (Feature 1) at MANZ 1993 A-13.

rock alignment. Large trees and stumps line the east side of the road. During the relocation center era, the road connected the residential area to North Park.

Features 2 and 7 consist of a north-south alignment of fence posts and a parallel earthen ditch. The two features, likely once continuous, are now separated by a drainage channel. Feature 3 consists of two earthen irrigation ditches that enter the western portion of the site and end within the site boundary.

Feature 4 consists of an east-west alignment of six concrete footings spaced at 10 ft intervals (Figure 11.63). Perpendicular to the alignment is another footing. Rectangular holes in the footings indicate each supported (encased) a wood post approximately 5 inches by 8 inches. They may have been part of a building foundation, corral, or fence.

Located north and south of Feature 4, Features 5 and 6 are 12-ft-long concrete troughs (Figures 11.64 and 11.65). One is 2 ft high and the other is 3½ ft high. The troughs were likely used to water livestock.

Locus A is a small (80 ft north-south by 30 ft east-west) trash scatter located in the western portion of the site just southwest of the central group of large cottonwood trees. Artifacts noted include hundreds of clear glass fragments, over 50 purple glass fragments, over 25 white glass fragments, a few brown, blue, and aqua glass fragments, over 100 plate fragments, crockery, a ceramic figurine fragment, small assorted metal parts, shell button (ca. 1800+, see Appendix E), a .30-.30 cartridge case, wire nails, and can bits. Collected ceramics indicated a 1920s-1930s date for the deposit (see Appendix D). The results of a 1 m by 1 m test unit excavated at this locus are discussed below.

Approximately 175 ft north of Locus A, Locus B covers an area 65 ft north-south by 30 ft east-west on the western edge of the central group of cottonwood trees. Noted artifacts include over 100 window glass fragments, over 100 very small can fragments, about 100 clear and brown glass fragments, about 100 plate fragments, over 20 purple glass fragments, blue glass fragments, "Kerr" canning jar lid liner fragments (1915+), a ceramic marble, and porcelain, bone, and metal buttons. Collected ceramics suggest an 1890-1930

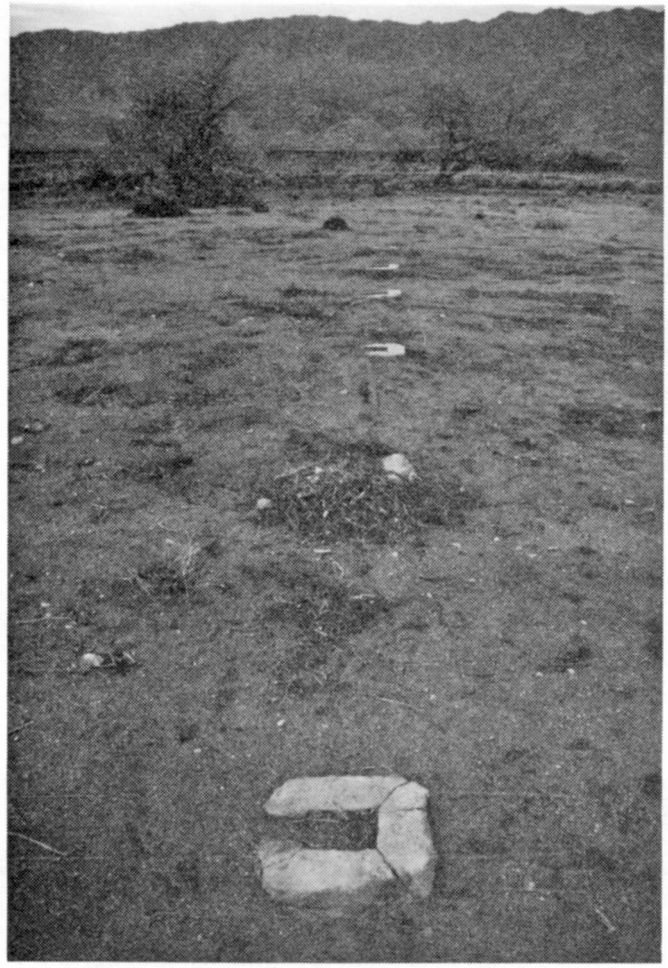


Figure 11.63. Foundation supports (Feature 4) at MANZ 1993 A-13.

date (see Appendix D). The results of a 1 m by 1 m test unit excavated at this locus are discussed below.

Locus C, located northeast of the central group of cottonwood trees, covers an area 100 ft north-south by 130 east-west in the central portion of the site. Much of this locus is within a dirt road and informal parking area. Noted artifacts include over a thousand plain white plate fragments, a few plate fragments with blue floral designs or a silver rim stripe, around 100 purple glass fragments, nearly 100 aqua glass fragments, hundreds of wire nails, fencing, and other miscellaneous hardware. Apparent recent trash at this locus includes hundreds of brown and green-colored beer bottle fragments.

Locus D is located on the north side of a shallow drainage in the south-central portion of the site. It covers an area 50 ft north-south by 30 ft east-west. Noted were about 25 clear glass fragments (one base is embossed with "143"), a few brown glass and window glass fragments, a glass canning jar lid liner, two metal bolts, four small metal machine parts, a metal washer, about 10 wire nails, concrete pipe fragments, a rivet, a .22 shell (with a "P" headstamp), a hose fragment, and a rubber fragment.

Locus E, just north of Locus D, covers an area 80 ft north-south by 80 ft east-west. Noted artifacts include approximately 30 machine cut square nails, a horseshoe nail, seven can fragments, two iron parts (one reworked), two whiteware plate fragments, four purple glass

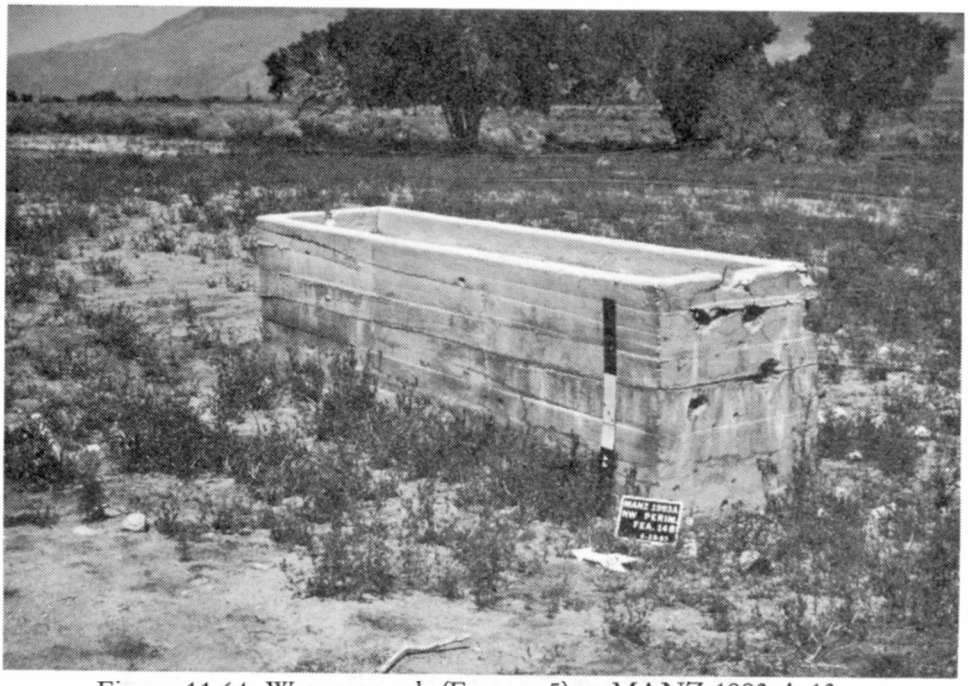


Figure 11.64. Water trough (Feature 5) at MANZ 1993 A-13.

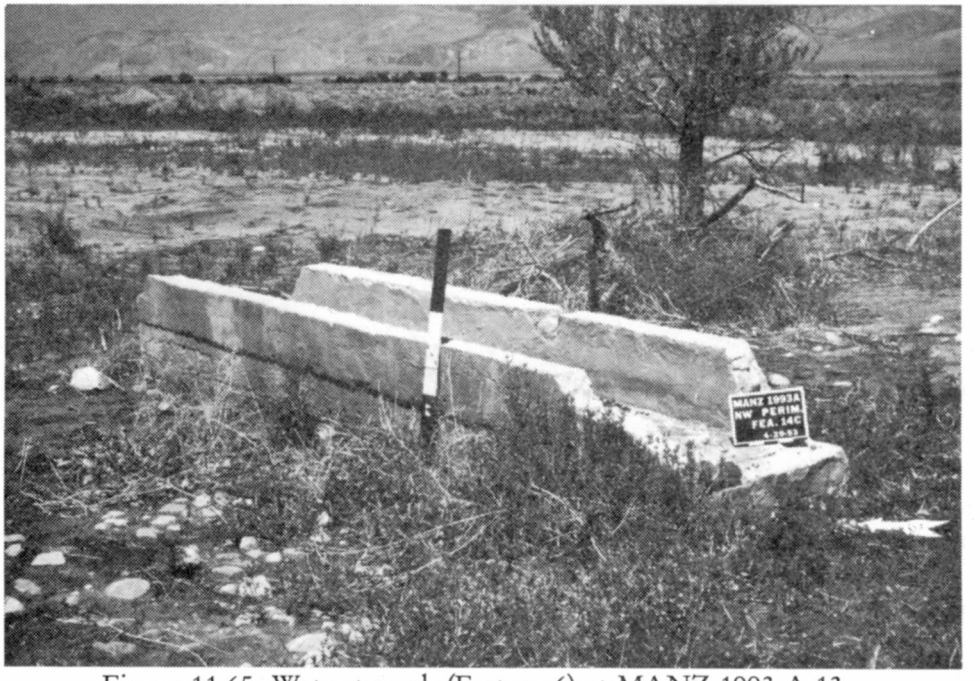


Figure 11.65. Water trough (Feature 6) at MANZ 1993 A-13.

fragments, three aqua glass fragments, three brown glass fragments, two clear glass fragments, crockery, and small fragments of decorative plaster. One bottle base had the hallmark of the Anchor Hocking Glass Corp. (1938+).

Locus F includes a roughly 250 ft north-south by 250 ft east-west area centered on Feature 4. Included are thousands of wire nails, a few large bolts, a spring, smooth wire, cable, over 100 brown glass fragments, approximately 100 green glass fragments, a few purple and aqua glass fragments, yellow clay pipe fragments, and lumber fragments.

Locus G, 100 ft north-south by 50 ft east-west, is located at the edge of a recently graded area at the northern end of the site. A graded road along the northern boundary of the National Historic Site is to the north. Artifacts noted at this locus include over 100 clear glass fragments, aqua and brown glass, "BEST FOODS" and "CLOROX" embossed glass fragments, purple glass fragments, window glass fragments, "Kerr" canning jar lid liner fragments (1915+), whiteware plate fragments, approximately 100 wire nails, a roofing nail, a horseshoe, a barrel hoop, smooth wire, three sanitary seal cans, and concrete pipe fragments. A collected ceramic suggests a turn-of-the century date (see Appendix D).

Locus H, in the northeastern portion of the site, covers an area about 165 ft in diameter. To the northwest is a group of large cottonwood trees. Artifacts noted at this locus include small fragments of concrete pipe, a few iron parts (possibly from farm machinery), over 25 purple glass fragments, five other glass fragments (blue, clear, brown), a bottle lip, thick green glass fragments, whiteware plate fragments, a concrete slab fragment, metal bits, a sanitary seal can, two can lids, smooth wire, and small rocks. One clear glass bottle base has the hallmark of the Owens Bottle Company (1911-1929).

Locus I is within a shallow drainage in the extreme northeastern corner of the site. Artifacts cover an area 30 ft north-south by 80 ft east-west. Noted were a pile of concrete and clay pipe fragments, small pieces of concrete slab, a "CLOROX" bottle lip, clear glass fragments, a cooking pan, can lids, a California license plate fragment, and an unidentified small metal part.

Most of the site is covered by a light scatter of metal and glass fragments. Noted artifacts outside of designated loci include purple glass fragments (one embossed on the base with "No. 5 Made in U.S.A."), a hand wrought hinged hook and latch, a wire clothes hanger, a porcelain button (1840-ca. 1900, see Appendix E), and a 9-mm-long translucent green hexagonal bead from near Locus A.

Subsurface Testing

Two 1 m by 1 m excavation units were excavated at this site, one at Locus A and one at Locus B. These units were generally placed within the central portion of these small loci.

Locus A

Within this locus, Excavation Unit 18 was excavated to a depth of 70 cm. Four major strata were discerned based on texture, color, compaction, and cultural constituents (Figure 11.66). Stratum 1, the uppermost stratum, consists of a 2-cm to 4-cm-thick layer of loose very dark gray (Munsell color 10YR 3/1) silt with abundant leaf litter. Stratum 2 consists of compact dark gray (10 YR 4/1) to very dark gray (10YR 3/1) silt with an occasional artifact. This stratum extended up to 50 cm in depth. Stratum 3 consists of a layer of compact grayish brown (10YR 5/2) silt 6 cm to 30 cm thick. Stratum 4, the lowest stratum, was encountered at depths ranging from 60 cm to 70 cm. It consists of culturally sterile slightly compact dark grayish brown (10YR 4/2) silt with sand. This stratum was noticeably less compact than preceding levels and included a large rodent burrow. Most of the artifacts recovered from this unit were from the upper 20 cm of this stratum, however faunal remains continued to be recovered up to 60 cm depth.

In all, 299 historical artifacts were recovered from excavation Unit 18 (Table 11.6). Structural artifacts recovered include an electrical porcelain insulator fragment, a window glass fragment, a 10d wire nail, and a cast iron pipe fitting.

Domestic artifacts collected include those associated with beverage storage, food storage, food serving, food remains, furnishings, and pharmaceuticals. Beverage storage is represented

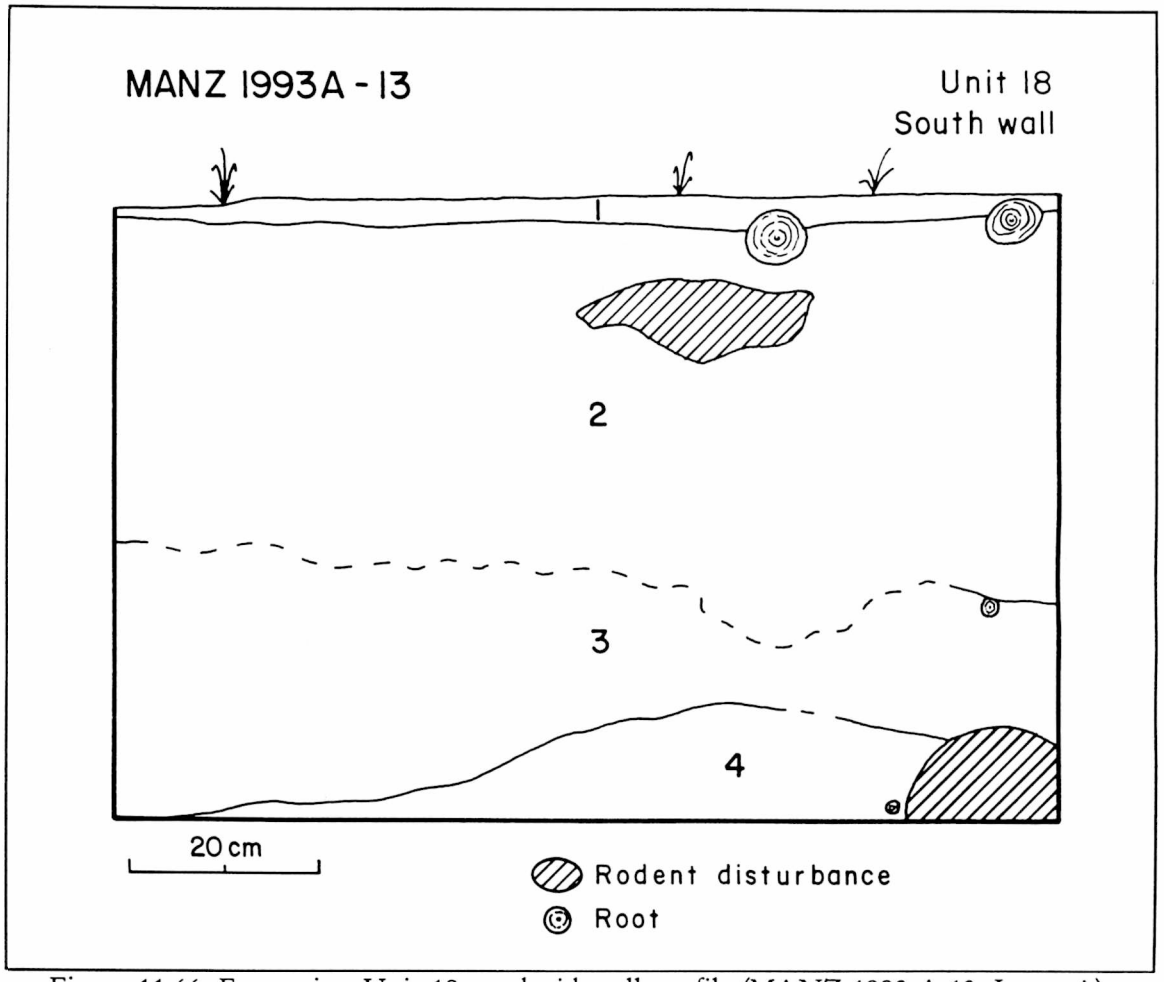


Figure 11.66. Excavation Unit 18 south sidewall profile (MANZ 1993 A-13, Locus A).

by 25 brown glass fragments, one embossed with "CONT..." Items associated with food storage include 176 clear glass fragments (including fragments of mayonnaise and extract lip finish jars), 10 purple glass fragments, seven aqua glass fragments, three can fragments, and five fragments of a cylindrical stoneware vessel. Recovered food remains include 24 bones. The bone assemblage is dominated by medium to large mammals; identifiable species in the assemblage include horse, pig, and sheep/goat (see Appendix H).

Artifacts associated with food serving consist of nine ceramics (see Appendix D). These include fragments of a clear glaze stoneware serving bowl, three stoneware bowls (including one with a bristol glaze, 1915+), a non-vitreous white-bodied earthenware bowl, a large yellowware bowl, and a semi-vitreous white-bodied earthenware plate and cup.

Noted furnishings include a light bulb base, a purple pressed glass fragment and a small green glass panel piece with attachment holes, possibly from a light fixture. Potential pharmaceutical items consist of two blue glass fragments. Personal items recovered consist of six white cold cream jar fragments (including two base fragments with no marks), a metal button (ca. 1825+), and a porcelain button (1840-ca. 1910).

Several specialized activities, including those associated with firearms, leisure, and miscellaneous tasks, are represented by the artifacts recovered from Unit 18. Ammunition consists of two .22 cartridges (one plain and one with a "U" headstamp). Leisure is represented by a 1/8-inch-

Table 11.6. Artifacts Recovered from Excavation Unit 18 at Locus A of OVI Headquarters/Shepherd Ranch (MANZ 1993 A-13).

Object Classification		Glass	Metal	Other
Structural	Structural Materials			
	Window Glass	1		
	Hardware			
	Nails		1	
	Utilities		1	1
Domestic	Beverage Storage	25		
	Food Storage	194	3	5
	Food Preparation			
	Food Remains			40
	Food Serving			9
	Furnishings	2	1	
	Pharmaceutical	2		
Personal	Clothing			
	Jewelry			
	Grooming and Hygiene	6		
	Money			
Activities	Ammunition		2	
	Leisure			1
	Automobile			
	Miscellaneous Tools		2	
	Toys			
	Writing			
Unclassified			2	1

thick phonograph record fragment. Miscellaneous tools include a drill bit and a safety pin. Unclassified artifacts recovered include a wire fragment, a metal fitting, and a small rectangular porcelain tile.

Locus B

Within this locus, Excavation Unit 17 was excavated to a depth of 50 cm. Three strata were discerned (Figure 11.67). Stratum 1, the uppermost stratum, consists of a blocky, possibly water-laid, deposit of friable very dark gray (Munsell color 10YR 3/1) sandy silt with numerous artifacts and some charcoal. It extended about 10 cm deep. Below this, Stratum 2 consists of slightly compact very dark grayish brown (10 YR 3/2) sandy silt. This stratum ranges from 15 cm to 20 cm thick. Artifacts were present only in the upper 5 cm of this stratum. Stratum 3, the lowest stratum encountered, consists of culturally sterile compact very dark grayish brown (10YR 3/1) silt. It began at a depth of 30 cm.

In all, 663 historical artifacts were recovered from excavation Unit 17 (Table 11.7). Structural artifacts recovered include four nail fragments, a screw fragment, and 55 window glass fragments.

Domestic artifacts recorded were those associated with beverage storage, food storage, food serving, food remains, furnishings, and pharmaceuticals. Beverage storage is represented by 73 brown glass fragments (including two brandy finish, one short brandy, one double bead finish, two plain bases, and an embossed fragment) and 51 olive green glass fragments (including a champagne base).

Items associated with food storage include a glass stopper embossed with "Lea & Perrins" (1880+), 175 clear glass fragments (including embossed fragments), 75 aqua glass fragments (one with an "84" basemark), three purple glass fragments, six can fragments, and an aluminum cap fragment. Recovered food remains include a walnut shell and 57 bone fragments. Bones identified to species include sheep/ goat, cow, pig, horse, chicken, cottontail, and jackrabbit (see Appendix G).

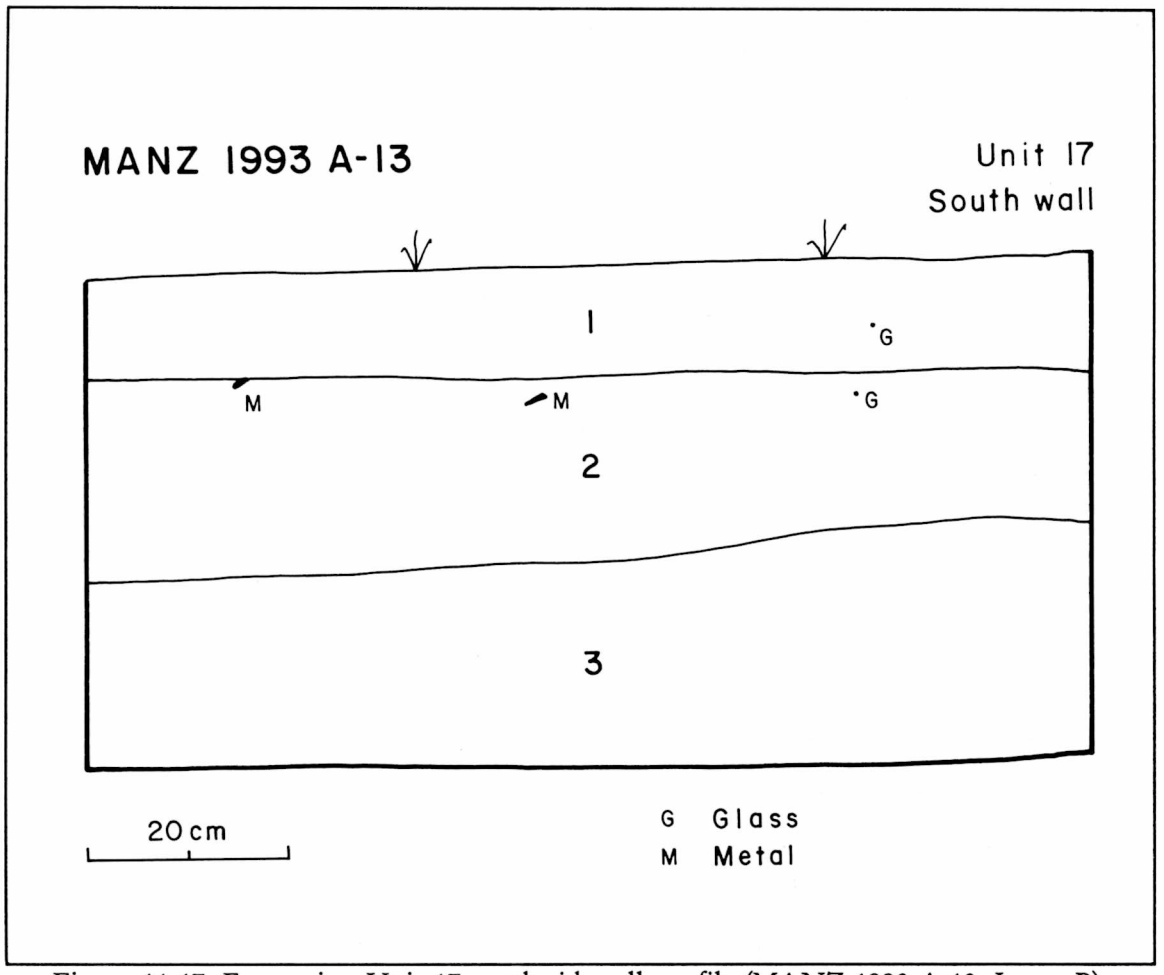


Figure 11.67. Excavation Unit 17 south sidewall profile (MANZ 1993 A-13, Locus B).

Artifacts associated with food serving include four drinking glass fragments (purple and composite green/white) and 79 ceramic fragments (see Appendix D). The ceramics include vitreous white-bodied hotelware, non-vitreous white-bodied earthenware, semi-vitreous white-bodied earthenware, and porcelain. The vitreous white-bodied hotelware consists of a cup and a plate fragment. The earthenware included cup, saucer, serving dish, bowl, plate, and ewer fragments. Most are undecorated, but two have floral designs. Basemarks include a crown and shield basemark (ca. 1870-1900), an impressed English basemark (1850s-1860s), and a partial English basemark (EN[GLAND], ca. 1891-1900s). Porcelain includes 16 bowl, saucer, cup, and mug fragments. Over half are decorated: designs include a floral transfer print and decals, blue lines, a pink line, and a light orange overglaze.

Noted furnishings include three plain and two decorative lamp glass fragments, two clear pressed glass fragments, one green pressed glass fragment, a non-vitreous/semi-vitreous white-bodied earthenware chamber pot fragment, and a terra cotta flower pot fragment. Potential pharmaceutical items consist of three fragments each of blue and white glass.

Personal items recovered include four brass rivets (one embossed with "L S & CO S.F." and three embossed with "PAT MAY 1878 L S & CO S.F."), three shoe eyelets, a metal snap (embossed with "PAT 7689 Mad..."), a metal button (ca. 1825-1930s, see Appendix E), a bone button (ca. 1700+), a porcelain button (1840-ca. 1910), and a translucent green hexagonal glass bead (11 mm long).

Table 11.7. Artifacts Recovered from Excavation Unit 17 at Locus B of OVI Headquarters/Shepherd Ranch (MANZ 1993 A-13).

Object Classification		Glass	Metal	Other
Structural	Structural Materials			
	Window Glass	55		
	Hardware		1	
	Nails		4	
	Utilities			
Domestic	Beverage Storage	124		
	Food Storage	254	7	
	Food Preparation			
	Food Remains			82
	Food Serving	4		78
	Furnishings	8		1
	Pharmaceutical	6		
Personal	Clothing		7	2
	Jewelry	1		
	Grooming and Hygiene			
	Money			
Activities	Ammunition		2	
	Leisure			
	Automobile			
	Miscellaneous Tools			
	Toys			
	Writing	1		1
Unclassified		7	26	

Two specialized activities, firearms and writing, are represented by artifacts recovered from Unit 17. Ammunition consists of two rifle cartridges (with a W.R.A. CO 32 W5 headstamp). Writing is



Figure 11.68. Ink bottle recovered from Unit 17 at MANZ 1993 A-13.

represented by a partially restorable ink bottle with an "S" basemark and a plain (non-screw) lip (Figure 11.68) and a black plastic bottle screw cap embossed with "Carter's Inks," apparently from a different bottle.

Unclassified items recovered include seven odd-colored glass fragments, 22 metal fragments, two melted metal blobs, a flattened lead pipe, and a 12-inch-long metal rod.

Parker Homesite (MANZ 1993 A-4)

MANZ 1993 A-4 covers 25 acres on the north side of Bairs Creek, in the south-central portion of the Historic Site. The town-era component at this multi-component historical and prehistoric site consists of four artifact concentrations (Loci A, B, G, and H) within an extensive area of scattered prehistoric and historical artifacts. A portion of a town-era water delivery system with an associated vegetation alignment (MANZ 1993 A-29, see below) is also within the site boundary. The site includes a likely protohistoric/historical Native American Indian component as well (see Chapter 13).

The area has been subjected to a variety of past impacts. Sheet wash and gully erosion have moved artifacts and altered the site surface. In the 1910s through the 1930s, orchards covered

most of the area and one home was located within the site boundary. During use of the relocation center the area was the site of warehouses, garages and other structures, and a golf course. Presently, numerous dirt roads and tracks crisscross the site and relocation center features and artifacts abound in the area. Relocation center remains within the site boundary are described in Chapter 9.

The Parker Homesite was within Lot 133 of the Manzanar subdivision. In 1924 LADWP purchased this property, which included 22 acres of cultivated fields and about 11 acres of pasture, from E.W. Parker for $9,000. The 1929 LADWP Valuation Record lists a 464-square-ft four-room box residence with a sill foundation, a latrine, and a chicken house. All were noted as in bad condition and there was no assessed value listed. All were sold on January 1, 1934 to A.C. Krater for $50.00.

The former location of the Parker homesite is approximately in the center of the west warehouse block of the relocation center. Besides a few fragments of purple glass, no likely town-era remains were noted in that area. It is not known which, if any, of the following trash concentrations are associated with the Parker homesite. Most are likely associated with general trash disposal from the town. Spatially, Locus B is closest to the homesite.

Six 1 m by 1 m test units were excavated at this site. One unit each was excavated in Loci A and E and two units each were excavated in Loci B and C. The primary goal of these units was to examine the prehistoric component of this site and hence few historical artifacts were recovered. No historical artifacts were encountered in the one unit excavated at Locus A. Historical artifacts were present in the upper 10 cm of one of the Locus B excavation units and in the upper 30 cm of both Locus C excavation units. The Locus E excavation unit had historical artifacts in the 0–10 cm and 90–100 cm levels.

Locus A, measuring 200 ft north-south by 100 ft east-west, is located adjacent to the south side of an historical vegetation alignment that parallels a buried town-era pipeline. Most of the artifacts within this locus are prehistoric, but likely town-era historical artifacts noted on the surface include approximately 10 pieces each of purple, clear, and brown glass, three aqua glass fragments, several plate fragments, and three sanitary seal cans. The historical material appears to be restricted to the surface: a 1 m by 1 m unit excavated at this locus encountered no historical material.

Locus B is located just south of the postulated location of the Parker Homesite. The locus measures approximately 325 ft in diameter and is primarily on the west side of a town-era road alignment. While the locus consists of a mix of prehistoric and historical remains, historical artifacts appear to be mainly concentrated along the road. Noted town-era artifacts include hundreds of clear glass fragments, about 100 purple glass fragments, around 100 whiteware ceramic fragments, a "Mission" soda bottle, a few sanitary seal cans, and phonograph record fragments. Most of the collected ceramics date to the 1920s and 1930s, one dates to between 1882 and 1900 (see Appendix D).

Locus G, measuring 100 ft north-south by 50 ft east-west, is just south of Locus B on the west side of the town-era road alignment. This locus is likely a continuation of Locus B, but it was defined as a separate locus because of a lack of prehistoric artifacts. Historical artifacts here include 15 sanitary seal cans, some purple and green glass fragments, and barbed and smooth wire.

Locus H covers an area 100 ft north-south by 130 ft east-west at the western end of the site. The locus is in an area heavily disturbed by vehicle traffic. An alignment of historical trees along a buried town-era pipeline and a riser from that pipeline are located on the southeastern boundary of the site. Noted at this locus were at



Figure 11.69. 1929 photograph of Wilder House (courtesy of LADWP Bishop Office).

least 100 clear glass fragments, about 20 white and green glass fragments, a few purple glass fragments, and a few plate fragments.

Likely town-era artifacts noted scattered throughout other areas of the site include a porcelain button (1840-ca. 1910), two shell buttons (post 1800 and post 1891, see Appendix E), fragments of purple and other colored glass, plate fragments, and a few tin cans.

Wilder Farm (MANZ 1993 A-9)

This site consists of the foundation remains of a substantial structure. This area was likely leveled and filled during construction of the relocation center. The site is located in the northern portion of the Hospital Block, 350 ft northeast of the Christopher house foundation discussed above (MANZ 1993 A-8).

The LADWP plat map shows a powerline ending in the site area. According to LADWP records, the land that includes the site was purchased from R.A. Wilder in 1922 for $17,000. Wilder's property included Lot 96 and part of Lot 100 of the former Manzanar subdivision. Included were a 25-acre pear orchard and a 10-acre cultivated field.

The LADWP Valuation Record lists eight structures with a total assessed value of $2,070.00 at the Wilder Farm. The structures included a 1,545-square-ft six-room concrete block residence with a concrete foundation and basement, indoor plumbing, and electrical wiring (Figure 11.69). The block building reportedly was built as a replacement for a wood-frame building that burned down in 1921 (Wehrey 1993). In the 1929 assessment the residence was listed as in good condition. Other structures included a latrine (in bad condition, wrecked in 1930), a wood frame garage (in good condition, moved to the Hay Ranch), a box garage (in poor condition, moved), a wood frame stock shed (in poor condition, sold to Dick Reed), a chicken house (in poor condition, wrecked 1930), a lath house (in bad condition, wrecked 1930), and a corn crib (in poor condition, sold to Dick Reed Nov. 31). Corrals at the farm were listed as "expended." Salvage was recommended on May 14, 1934, and all buildings were subsequently cleared and removed from the property.

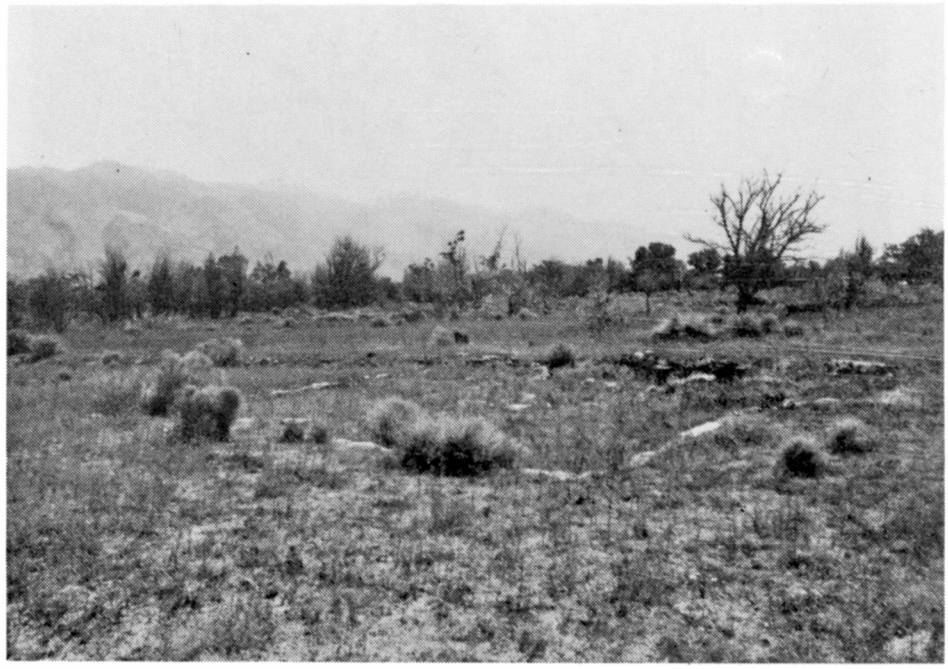


Figure 11.70. Foundation of Wilder House (MANZ 1993 A-9).

A photograph of Vic Christopher standing in front of the Wilder House was featured in an article on Manzanar in the *Los Angeles Times* "Farm and Orchard Magazine" (Finlay 1926). Vic Christopher was in charge of LADWP farm operations at Manzanar. He apparently moved from his nearby house and rented the more substantial Wilder house after LADWP purchased the town.

The concrete perimeter foundation at the site conforms with historical photographs of the Wilder residence (Figures 11.70 and 11.71). The rock-reinforced foundation forms a rectangle 29 ft wide by 42 ft long. There is a central 12 inch by 16 inch footing and a 4-ft by 6-ft concrete slab entryway on the west side. A 13½-ft-square basement in the southeast corner has been exposed by a 3-ft-deep gully.

Water pipes, likely leading to the structure, and a concrete pipeline for irrigation are exposed in the same gully to the west of the foundation. No other features or artifact concentrations associated with the Wilder Farm were identified, but may remain buried. Hundreds of historical artifacts are scattered throughout the area: while some are possibly associated with the Wilder Farm (such as purple glass), most are likely related to use of the relocation center hospital (see Chapter 10).

Wicks Place/Hawthorne Property (MANZ 1993 A-15)

This site consists of two trash dumps, scattered artifacts, and a depression and mound in the northeast corner of the National Historic Site. The site, bisected by a dirt road, covers approximately one-half acre.

This site is located within Lots 37 and 38 of the Manzanar Townsite. Lots 1-5 and 37-40 are shown as owned by Hawthorne on the 1910 Town of Manzanar plat map, but in the LADWP Valuation Record Lot 37 is designated "Wicks Place." Structures there included a 590-square-ft four-room wood frame residence in good condition with electrical wiring and a sill foundation, a 60-square-ft cellar in fair condition, a garage in bad condition, and a latrine in poor condition. The total assessed value of the structures was listed as $521.00. All buildings were noted as removed from premises, with

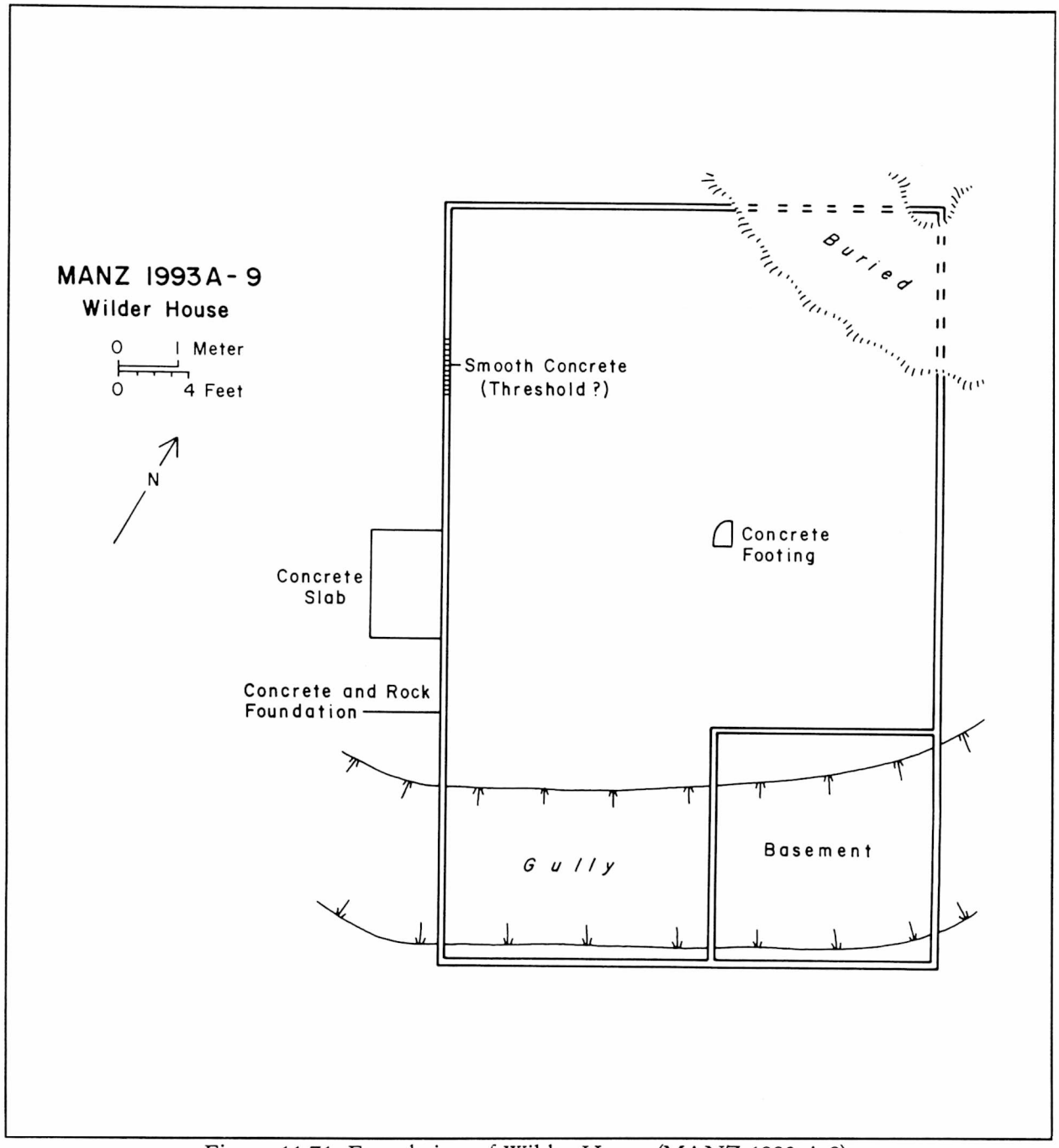


Figure 11.71. Foundation of Wilder House (MANZ 1993 A-9).

their disposition unknown.

Two loci were designated at the site, Locus A on the west side of the road and Locus B on the east side of the road. Each consists of a discreet trash dump.

Locus A measures 65 ft north-south by 50 ft east-west. Metal artifacts noted on the surface include approximately 100 sanitary seal cans, a few condensed milk cans, a few hole-in-cap cans, hundreds of wire nails, miscellaneous hardware, can bits, a pocket tobacco tin, meat cans, sardine cans, a spoon, a .22 shell casing, a mess kit fork, crown caps, a "J.B. Williams Co. U.S.A." shaving cream tube, and a "3-in-1 Oil Co." can. Glass includes approximately 50 purple glass fragments (including a plain bottle base and one embossed

Table 11.8. Tabulation of Artifacts in Three 2 m by 2 m Units at Locus A of Wicks Place/ Hawthrone Property (MANZ 1993 A-15).

Object Classification		Glass	Metal	Other
Structural	Structural Materials			
	Window Glass	30		
	Hardware			
	Nails		1	
	Utilities			
Domestic	Beverage Storage	4	1	
	Food Storage	52	274	
	Food Preparation			1
	Food Remains			1
	Food Serving		1	3
	Furnishings	3		
	Pharmaceutical			
Personal	Clothing			
	Jewelry			
	Grooming and Hygiene			
	Money			
Activities	Ammunition			
	Leisure		1	
	Automobile			
	Miscellaneous Tools		2	
	Toys			
	Writing			
Unclassified			2	

with three dots within a circle), hundreds of clear glass fragments, a clear bottle neck (beer bottle finish), and window glass fragments. Embossed bottle bases noted include "Corning Made in USA PAT 5-27-19," "WF&S MIL (William Franzen and Son, Milwaukee, 1900-1926), and the hallmark of the Obear-Nester Glass Co. (1915+). Other noted artifacts include plate fragments and fragments of electrical porcelain.

Locus B, measuring 50 ft north-south by 65 ft east-west, includes a shallow depression and a low mound, possibly the result of illicit digging, surrounded by historical trash. Noted metal includes wire nails, a "Norvege" sardine can, can bits, metal parts, a toy wheel, and an oval brass logo with a grill-like pattern. Glass includes thousands of fragments (including a large number purple fragments), a milk bottle lip, "Boyd" canning jar lid liner fragments (1915+), and "Coke" bottle fragments (1916-1948). Embossed bottle bases noted include "Gebhardt Eagle Chili Powder," "Packed by Ca... ..orp." (California Packing Corp., 1916+), and hallmarks of the Diamond Glass Co. (1924+) and the Owens Bottle Co. (1911-1929). Other noted artifacts include whiteware plate fragments, a red brick, and a rubber hot water bottle. Many of the artifacts are burned.

Surface Collection/Tabulation

At each locus, artifacts in three contiguous 2 m by 2 m units were tabulated, with representative artifacts collected or measured.

Locus A

In the three units at this locus, 376 artifacts were tabulated, which yields an average surface density of about 30 artifacts per square meter. Like the excavated artifacts, the tabulated artifacts were classified by function using the system devised by Blee (1987) and Rhodes (1988). The results of this tabulation are summarized in Table 11.8.

Structural artifacts noted in the tabulation units include 30 window glass fragments and a wire nail.

Beverage storage is represented by four brown glass fragments and a crown cap. Embossing on

Table 11.9. Tabulation of Artifacts in Three 2 m by 2 m Units at Locus B of Wicks Place/ Hawthrone Property (MANZ 1993 A-15).

Object Classification		Glass	Metal	Other
Structural	Structural Materials			1
	Window Glass			
	Hardware			
	Nails		1	
	Utilities			
Domestic	Beverage Storage	7		
	Food Storage	166	204	
	Food Preparation			
	Food Remains			3
	Food Serving	4		11
	Furnishings	2		
	Pharmaceutical			1
Personal	Clothing		2	
	Jewelry			
	Grooming and Hygiene			
	Money			
Activities	Ammunition		2	
	Leisure			
	Automobile			
	Miscellaneous Tools			
	Toys			
	Writing			
Unclassified				

the glass fragments includes "WF & S MIL 73" and an "N" basemark.

Artifacts associated with food storage include nine sanitary seal cans, three condensed milk cans, two lard can fragments, a sardine can, a rectangular hole-in-cap can, a key-opened can, three can lids, 254 small can fragments, 50 clear glass fragments, an aqua glass bottle lip, and an aqua glass bottle side panel fragment embossed with "...RIBUTION WITHOUT." Measurements of the condensed milk cans ($2^{15}/_{16}$ inches by $4^{5}/_{16}$ inches and 2½ inches by 2½ inches) indicate manufacture sometime between 1915 and 1925.

Artifacts associated with food preparation include a fragment of a "bakelite" object and three non-vitreous plate fragments with a floral decal (ca. 1930s; see Appendix D).

The only food remains noted in these units was a small unidentifiable animal bone fragment. The only artifacts associated with food serving was a mess kit fork. Noted furnishings were limited to three light bulb fragments.

Three specialized activities are represented by the artifacts: leisure activities by a pocket tobacco can, automobile use by a quart-size oil can, and miscellaneous tools by a spout from a small pocket-size oil can embossed with "PAT. PENDING 3 IN 1 OIL CO."

Unclassified items in the tabulation units include a piece of barbed wire and a 5⅛ inch by 3⅞ inch piece of rusted sheet metal.

Locus B

Four hundred and four artifacts were tabulated in the three units in this locus. This yields an average surface density of about 34 artifacts per square meter. The results this tabulation are summarized in Table 11.9.

Structural artifacts in the tabulation units were limited to a red brick and a wire nail.

Beverage storage is represented by four brown glass fragments, a green glass fragment, a "Coke"

bottle fragment, and a clear glass crown cap bottle lip.

Artifacts associated with food storage include two sanitary seal cans, 202 small can fragments, 162 clear glass fragments, one aqua glass fragment, one purple glass fragment, and a white glass fragment embossed with "BOYD CAP ..ASON JARS" (Boyd is a trademark of the Illinois Pacific Glass Company, 1915+). The clear glass fragments include mason jar fragments and fragments of a rectangular "Gebhardt Eagle" Chili Powder jar with a Diamond Glass Company basemark (1924+). Other embossed pieces include "...SIGN ...," "Premi...," and two unidentified basemarks (diamond dot and O in square).

Food remains consist of a small unidentifiable animal bone fragment and two egg shell fragments.

Food serving is represented by three glass bowl fragments, a drinking glass fragment, and 11 ceramics. The ceramics include plate, bowl, cup, and saucer fragments. Designs include relief molding on rim and lime green airbrush accent (early 1900s), a bluebird motif (late 1910s-1920s), light and dark lines, and an abstract decal (ca. 1920s-early 1930s, see Appendix D).

Furnishings consist of an ornate clear cut glass bowl lid and a possible clear glass vase fragment. The sole pharmaceutical item is a desiccated rubber hot water bottle. Personal items were limited to a single metal eyelet from a shoe. Artifacts associated with automobile use include a trailer hitch and a metal gasket. Miscellaneous tools are represented by a metal clasp.

Other Building Locations

Eight additional locations of Manzanar townsite buildings within the National Historic Site could be derived from historical records. However, no features or artifacts that could date to the town-era were observed at these locations either during initial survey or reinspection. The historical information and the current state of the derived locations are discussed below.

Bandhauer Farm

The Bandhauer Farm was located in Lot 116 of the town of Manzanar subdivision. Virtually all of Lot 116 was noted as under cultivation. The Capps Home (MANZ 1993 A-26) was located to the west of the farm. LADWP purchased the property from R.S. Bandhauer for $13,000. According to LADWP Valuation Records, improvements in Lot 116 included a 798-square-ft three-room wood frame residence with a sill foundation (Figure 11.72), an electrically wired cellar with a concrete floor, and two chicken houses (Figure 11.73). The total assessed value of the structures, listed in excellent to poor condition, was given as $628.00. One of the chicken houses was wrecked by a windstorm in February 1932 and sold to Robert Miller for $30.00. The remaining structures were recommended for salvage on May 14, 1934. Their final disposition is not known.

The Bandhauer Farm location is just west of the relocation center auditorium. This area, originally a firebreak (B3), was used by the relocation center for various sport facilities (see Chapter 9). This use, together with continued use of the auditorium after the closure of the center, has heavily disturbed the area. No remains associated with the former Bandhauer Farm could be identified. The flat barren topography of the area suggests none lie buried.

Cornelius House

This house and a 5-acre orchard were located in the eastern one-third of Lot 95 of the Manzanar subdivision. LADWP purchased the property for $2,500. The LADWP Valuation Record lists a residence with an assessed value of $150.00 and a latrine, both in fair condition. The residence is a 525-square-ft four-room wood frame building with electrical wiring, a sill foundation, and a



Figure 11.72. 1929 photograph of Bandhauer House (courtesy of LADWP Bishop Office).



Figure 11.73. 1929 photograph of Chicken coop at Bandhauer Farm (courtesy of LADWP Bishop Office).

basement (Figure 11.74). It was noted that the basement was caving in and that work would be needed to save the building. Salvage was recommended March 16, 1934. The final disposition of the structures is not listed.

The house would have been in the general vicinity of the relocation center Block 31 mess hall. There is an abundance of charcoal in this area, but the only likely town-era artifacts noted were a few pieces of dark olive green glass (see Chapter 9).



Figure 11.74. 1929 photograph of Cornelius House (courtesy of LADWP Bishop Office).



Figure 11.75. 1929 photograph of Lafon House (courtesy of LADWP Bishop Office).

Lafon Farm

The Lafon Farm was located in Lot 111 of the Manzanar subdivision. In 1924 LADWP bought this property, which included 10 acres of alfalfa, 10 cultivated acres, and 10 acres of brush, from William Lafon for $8,000. Noted improvements include a 799-square-ft wood frame residence with electrical wiring, a concrete foundation (Figure 11.75), and an 8 ft by 10 ft cellar, a latrine, a store house, a shelter, and three chicken houses. One of the chicken houses was noted as in good condition, the residence in fair condition, and the rest in poor or bad condition. The structures had an assessed value of $740.00.

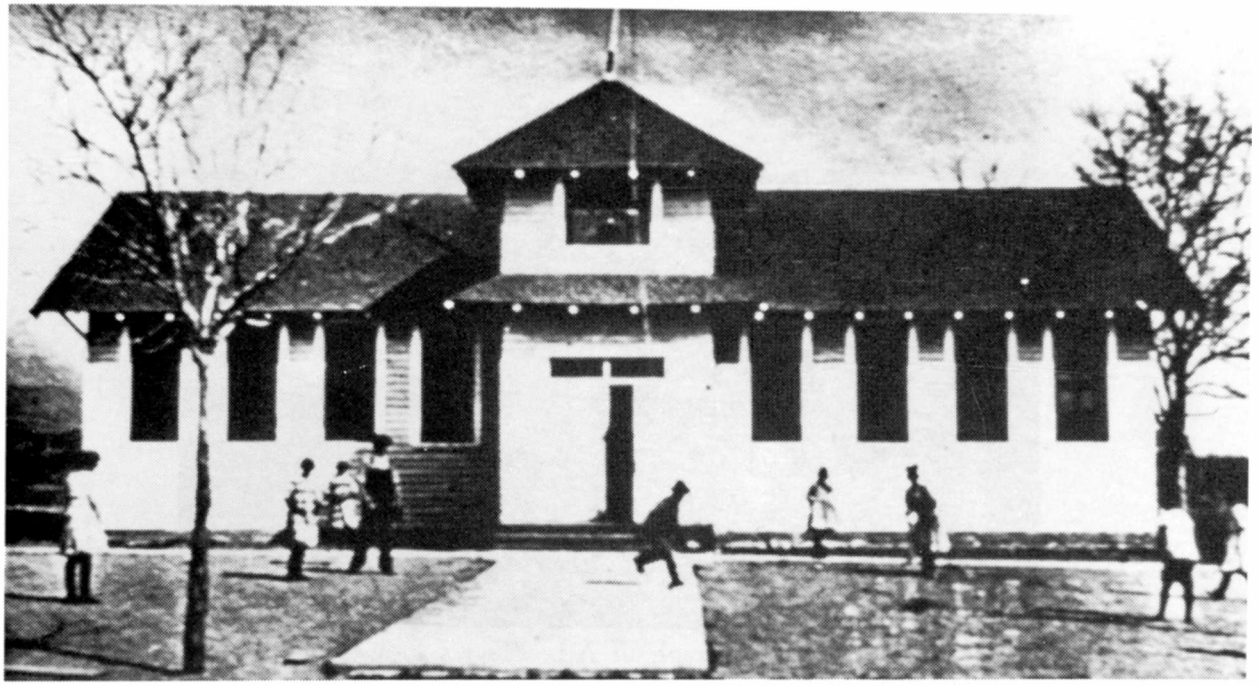


Figure 11.76. Manzanar School (Laws Museum and National Historic Site).

One of the chicken houses was moved to the Graham property and on November 7, 1943, the remaining structures were recommended for salvage. Their final disposition is not known.

The farm would have been located in the west end of Blocks 16 and 22. Most of this area is heavily wooded with abundant leaf litter. The only potential town-era artifacts noted during survey were a few purple glass fragments (see Chapter 9). Additional artifacts or features may lie buried.

Lydston House

The Lydston House was located on the southeast corner of Lot 100. LADWP bought this 5-acre property from Walter C. Lydston for $2,300. Noted improvements include a 704-square-ft wired four-room frame residence with a sill foundation, a latrine, a cellar, two chicken houses, and a honey house. The residence and honey house were noted as in fair condition and the remaining structures were listed in poor or bad condition. The buildings had an assessed value of $355.00. The chicken houses were noted as moved to the Lacey property and the honey house as moved to the Paget Farm. The remaining buildings were salvaged by M.W. Diehl for $15.00.

The Lydston House falls within the south-central portion of the large firebreak that housed the relocation center Children's Village. There are numerous large and varied trees in the former location, but no town-era artifacts or features were noted during survey. The area is heavily disturbed. A drainage cuts through the area and several large depressions, reportedly dug by the relocation center residents for ponds, are also in the area (see Chapter 9).

Manzanar School

The Manzanar grade school was located northeast of the Cornelius House in Lot 6 of the Manzanar townsite. The two-room schoolhouse was built in 1911-1912 and officially closed in 1935 (Figure 11.76). The disposition of the building is unknown and it is not included in LADWP records.

The former school location, in Firebreak A9 of the relocation center, is bisected by a relocation



Figure 11.77. 1929 photograph of A.L. Meyers House (courtesy of LADWP Bishop Office).

center road. A depression along the east side of the road may be left from the removal of the school building (see Chapter 9).

A.L. Meyers Farm

The A.L. Meyers Farm was located within Lots 95 and 101 of the Manzanar subdivision. In 1927 LADWP bought this property, which consisted of 30 acres of orchards and 5 acres of brush, for $12,000. LADWP records indicate there were four structures in these lots. These include a 486-square-ft four-room frame residence with electrical wiring and a concrete foundation (Figure 11.77), a latrine, a garage with a lean-to shelter, and a chicken correll (sic). The chicken correll, made of railroad ties and wire, was noted as "petty well shot - expendable." The residence was listed as in fair condition and the other structures in poor condition. The residence had an assessed value of $144.00 and the others none. All were recommended for salvage May 14, 1934, and sold to Mrs. H.W. Kennedy for $30.00 on May 22, 1934.

The extent of Meyers' holdings make the exact location of his farm buildings uncertain. The LADWP plat map and historical photographs suggest they were along Francis Street west of the Cornelius House. This would place the farm in Block 32 of the relocation center or possibly the adjacent firebreak (C8). However, no town-era artifacts or features were found in these areas.

Smith Farm

The Smith Farm, established prior to the town of Manzanar, is easily discernible on the 1931 aerial photograph of Manzanar since it is laid out north-south, rather than along the same alignment of the town roads (Figure 11.78). The Smith Farm would have been located in the west end of Block 9 of the relocation center. No trace of it was found.

George Smith is listed as the owner of Lots 126 and 127 of the Manzanar subdivision. LADWP purchased these lots, which included a roughly 12-acre orchard and 18 acres of cultivated fields, in 1924 for $10,000. The LADWP Valuation Record lists seven structures including a 1413-square-ft six-room wood frame residence with a concrete foundation (Figure 11.79), indoor plumbing, and electrical wiring, a 320-square-ft

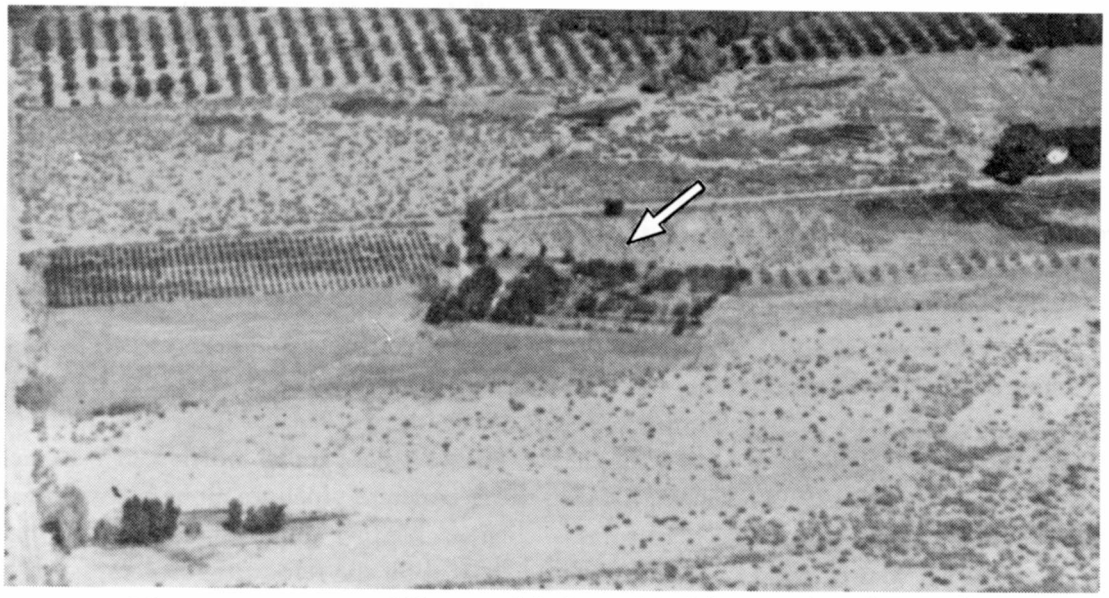


Figure 11.78. 1930s oblique aerial view of Smith Farm (north to top).



Figure 11.79. 1929 photograph of Smith House (courtesy of LADWP Bishop Office).

one-room residence, a garage with an attached lean-to, a chicken coop with an attached lean-to, a honey house, a shelter, and a granary. The six-room residence was listed in good condition, although an 8-ft by 8-ft cellar under the west side of the porch was listed in poor condition. The one-room residence, the garage, and the honey house were listed as in fair condition and the remaining structures were listed as in bad condition. The buildings had an assessed value of $1,285.00. Salvage was recommended May 14, 1934. On June 8, 1935, all were sold to and removed by J.W. Holland for $65.00.

Wells Farm

George M. Wells owned Lot 129 of the Manzanar subdivision. LADWP purchased the property, which included a 25-acre orchard and 10 acres of cultivated fields for $17,000. The LADWP Valuation Record lists numerous buildings in this lot. These include a 575-square-ft four-room frame residence with a concrete foundation, indoor plumbing, and electrical wiring (Figure 11.80), a 140-square-ft bunk house, a concrete-walled cellar (Figure 11.81), a latrine, two garages, a granary, two chicken houses, and a turkey house. The total assessed value of the structures was given as $1,297.00. One structure (chicken house) was listed as in excellent condition, four were listed as in good condition, one in fair condition, two in poor condition, and two in bad condition. The bunk house was noted as moved from the Abernathy Ranch. The granary, chicken house, and garage were later moved to other properties. The remaining buildings were sold to and removed by W.A. Jewett on June 14, 1935.

The Wells Farm would have been located in Block 12 of the relocation center, in an area just south of the former mess hall location. Most of this block is heavily wooded and covered with leaf litter, and very few artifacts of any kind were noted even during intensive tabulation and surface collection (see Chapter 9). It is possible that artifacts and features associated with the farm lie buried. There is a catalpa tree and a large Arizona cyprus near the relocation center Block 12 men's latrine foundation that may remain from the farm.

Utilities

Within the National Historic Site a well and portions of the town water system were recorded as three separate sites. Other noted town-era features within the National Historic Site include road and vegetation alignments, orchards, and a pipeline exposed by flooding in 1995. These are briefly descibed below. Many of these features were reused by the relocation center and hence were given relocation center feature designations (see Chapter 9).

Concrete Pipeline (MANZ 1993 A-5)

MANZ 1995 A-5, located along the west end of Firebreak E6 and in Block 27, consists of three sections of partially exposed concrete pipe covering 800 linear feet. The pipes were not exposed enough to allow measurement of their diameter. The 1929 LADWP plat map shows two parallel north-south 10-inch-diameter concrete pipelines along a town road in this area. Neither pipeline appears to have been reused by the relocation center.

Concrete Pipeline and Weir Boxes (MANZ 1993 A-29)

MANZ 1993 A-29 is located in the southwest portion of the National Historic Site. The site includes four sections of exposed concrete pipe and three concrete weir boxes that probably form an interconnected system totaling about 2,000 linear feet. These features were once likely connected to the pipeline west of the National Historic Site along Bairs Creek recorded as MANZ 1993 B-31 (see Chapter 12).

On the 1929 LADWP plat map the western portion of the pipeline is indicated as 18 inches in diameter and the eastern section is indicated as 10 inches in diameter. It does not appear that the pipeline was reused by the relocation center.

Three concrete weir boxes are located along the pipeline, as its alignment is inferred from the exposed sections and the 1929 map. The westernmost box, just east of a row of trees visible on the 1931 aerial photograph of the town of Manzanar (see Figure 11.9, lower left) that apparently follows the pipeline route, may be located at a juncture where the water system divided into two pipelines. Each line is about 300 ft long and presumably goes to one of the



Figure 11.80. 1929 photograph of Wells House (courtesy of LADWP Bishop Office).



Figure 11.81. 1929 photograph of cellar at Wells Farm (courtesy of LADWP Bishop Office).

two downstream weir boxes located about 240 ft apart on the east side of an old town road. The two eastern weir boxes are 2 ft by 5 ft by 3½ ft tall; one is filled with wallboard bits, metal, and glass. The western weir box is 2 ft by 3 ft by 7½ ft tall.

Four sections of concrete pipe have been exposed by erosion, two in a gully on the western boundary of the National Historic Site. These two sections, aligned with the town road grid, had an inside diameter of 13½ inches to 15 inches and an outside diameter of approximately 17 inches. The third pipe section recorded is in



Figure 11.82. Well No. 169 (MANZ 1993 A-12, Feature 3).

the same gully 600 ft east. This section is not aligned with the town grid, but appears to head towards the westernmost weir box at the same angle as the row of trees. This pipeline also had an outside diameter of approximately 17 inches. The fourth section of pipe, exposed by sheet wash just east of the westernmost weir box, appears to head towards the southern of the two weir boxes. It was not exposed enough to allow measurement of its diameter. Risers, upright sections of concrete pipe presumably connected to the pipeline, are located just east of the relocation center perimeter fence and at the west end of the historical tree alignment.

Well No. 169 (MANZ 1993 A-12)

This 2-acre site, within the central area of the relocation center, consists of a well and related features. The well, used by the Manzanar Relocation Center as a backup water supply, was originally used by the town of Manzanar and possibly earlier by the Shepherd Ranch. Three wells are shown in this area on 1929 LADWP plat maps (well Nos. 67, 68, and 69) and memoirs of town residents mention an artisan well in this area (Manzanar Community File, Eastern California Museum). The site is bisected by a town road that was also used by the relocation center to access farm fields to the north.

Three features were identified at the site. Feature 1 is an exposed corner of a buried concrete vault, possibly an irrigation weir box associated with the town irrigation system. Feature 2 is a 15-ft by 15-ft rough concrete slab about 2 inches thick and Feature 3 is a capped well painted with the number 169. The well pipe is surrounded by an 8-ft-square concrete slab with iron reinforced corners (Figure 11.82), a 32-inch-wide skirting of concrete and rock was likely added during the relocation center use.

The use and age of Feature 2 is not clear, but its proximity to the capped well suggests it may be functionally related. However, it may be a foundation associated with the nearby Graham Farm (MANZ 1993 A-11). Alternatively it may postdate the town era; it is similar to other slabs attributed to the relocation center. Scattered structural remains and other artifacts noted at the site are more likely associated with the relocation center (see Chapter 9).

Other Noted Utilities and Features

Other noted town-era features within the National Historic Site include roads, orchards, other vegetation, and a pipeline recently exposed by flooding (see Figure 11.1).

Roads

Only four of the town-era roads within the National Historic Site were reused by the relocation center. The relocation center's 9th Street follows the same alignment as Francis Street, the main east-west artery of the town. The south and north relocation center entrance roads and the road along west edge of Firebreak E6 were once parts of Baxter Avenue (originally the alignment of the main north-south Inyo County wagon road). The entrance road on the west side of the relocation center follows Valley Street. The road along the west edge of Firebreak H6 is also likely a town-era road alignment, since it falls on a lot boundary of the Manzanar subdivision.

Traces of some town-era roads that were not reused by the relocation center are still visible. These include a dirt road in the northwest corner of the National Historic Site associated with a large trash dump (see MANZ 1993 A-7, below), three tree-lined roads perpendicular to U.S. Highway 395 on the eastern perimeter of the relocation center, and one tree-lined road parallel to the highway in the northern perimeter. Faint road traces parallel to the highway were also noted in Firebreaks A9 and B-9.

An interesting feature is a row of black locust trees that extends across the relocation center parallel to, but 50 ft north of, 6th Street. The trees represent a town road alignment that could have been easily reused by the relocation center, but was not, perhaps because of a strict adherence to standardized plans.

Orchards and Other Vegetation

Remnant orchards and other historical vegetation not associated with a specific town-era site were noted throughout the National Historic Site (see Table 2.1). For example, a group of large cottonwood trees at the former Kendo House location can be seen in a historical aerial photograph of Manzanar (see Figure 11.9, lower left).

Remnants of five orchards were recorded within the National Historic Site. The largest consists of rows of pear trees in a 14-acre area encompassing Lots 96 and 100 of the former Manzanar subdivision (Wilder Farm). This includes portions of the relocation center Children's Village and residential Blocks 28, 29, and 34. Many of the trees in the northern portion of this orchard are dead or dying, while those in the southern portion appear generally healthy.

Relatively healthy apple trees are scattered in the eastern portion of residential Blocks 5 and 11 (Figure 11.83). This encompasses the western portion of Lot 128 of the former Manzanar township (Lafon Farm). Other orchard remains include rows of mostly dead pear trees in the perimeter east of Block 13 (Lot 109, Hatfield Farm), rows of dead apple trees in the perimeter west of Block 12 (E 1/2 Lot 113, Capps Farm), and rows of mostly dead pear trees in the Doctors and Nurses Quarters Block and adjacent Firebreak H6 (Lot 99, Christopher Farm).

Pipeline

Due to unusually high spring runoff in 1995, LADWP water spreading activities caused



Figure 11.83. Remnant orchard in Relocation Center Blocks 6 and 12.

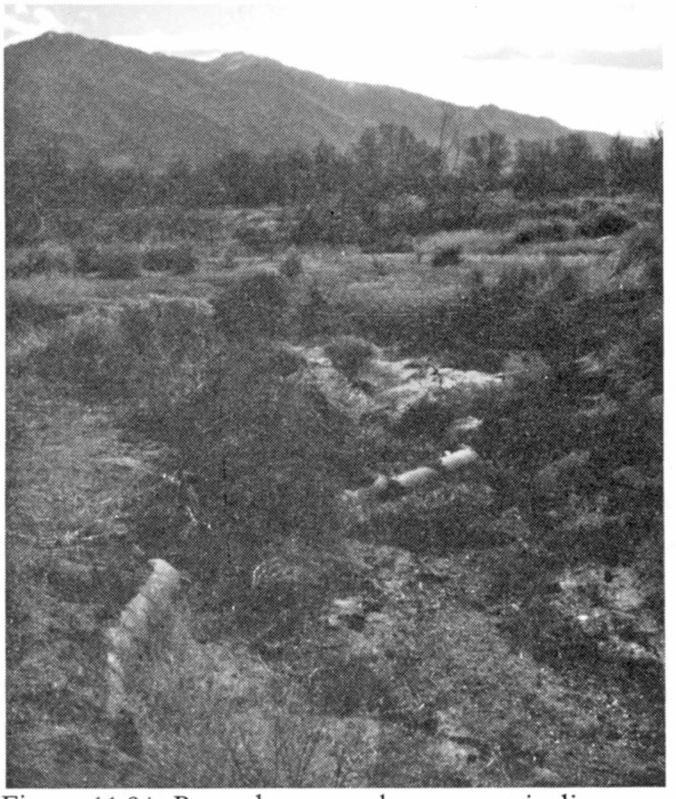


Figure 11.84. Recently exposed concrete pipeline west of Wilder House.

extensive downcutting and widening of several gullies within the National Historic Site. As a result two sections of a buried concrete pipeline were exposed within the Relocation Center Hospital Block (Figure 11.84). Both pipeline alignments are oriented with the town and relocation center road grid, however the route is not shown on LADWP plat maps or relocation center blueprints. One section is exposed in a gully in the northern portion of the block and the other is exposed in a different gully in the southern portion of the block. Time constraints

precluded recording these likely town-era features as a separate site.

The northern section consists of approximately 40 ft of exposed pipe. The pipeline is 50 ft south of and parallel to Francis Street (9th Street); about 50 ft west of Wilder House foundation (MANZ 1993 A-9) the pipeline makes a 90 degree turn to the south. The pipe has an inside diameter of 9½ inches to 10½ inches and an outside diameter of approximately 12½ inches.

About 500 ft south, along the same north-south alignment, is the other section of exposed pipe. This pipe makes a 90 degree turn east and continues for at least 150 ft. In this area the pipe has an inside diameter of 8½ inches and an outside diameter of 10½ inches. Occasionally there are broken pieces of larger diameter pipe shielding the pipe joints. Upstream within this same gully flooding has washed out a section of the relocation center sewer system. The sewer system, of salt-glazed clay pipe, was not as deeply buried as the concrete pipeline.

Trash Deposits

Four of the town-era sites within the National Historic Site are trash dumps with no known associated structure. These range in size from over 380,000 square ft (8.7 acres) at MANZ 1993 A-7 to 3,250 square ft at MANZ 1993 A-14. In addition to these distinct sites there are numerous potentially town-era artifacts scattered throughout the central area of the relocation center. Due to the difficulties in ascribing these artifacts to a particular time period with any certainty these were included in the relocation center block descriptions in Chapter 9.

MANZ 1993 A-7

This site consists of 10 dispersed trash dumps (Loci A-J) and scattered artifacts in 8.7 acres located in the northwest corner of the National Historic Site. Large boulders and rocks abound within the site area, which straddles the boundary of the Sierran bajada and the relatively level valley floor. Sheet wash and gully erosion have eroded portions of the site and a recent water-control ditch cuts through the eastern portion of the site. The site appears to be primarily surficial in nature, but with some potential for buried deposits. A few of the smaller loci are likely from single dumping events. The artifact inventory is characterized by domestic-related materials associated with the town of Manzanar and possibly earlier ranches. The Gilmer Farm (MANZ 1993 A-6) is just south of the site and a road trace, which is shown on the 1907 USGS map, crosses the site.

Locus A is an artifact concentration 65 ft north-south by 50 ft east-west located in the southern portion of the site just north of the Gilmer Farm. The assemblage includes five key-opened sardine cans, 15 other cans, can lids, a jar lid, a U-bolt, and an oil can.

Locus B, also in the southern portion of the site, covers an area 100 ft north-south by 50 ft east-west along the east edge of the road trace through the site. This locus includes both domestic and construction-related materials. Metal artifacts noted include at least 50 sanitary seal cans, an "Iodent Chemical Company" toothpaste tube, and stove pipe fragments. Glass includes at least 50 window glass fragments, a "Coke" bottle fragment, aqua glass fragments, porcelain canning jar lid liner fragments (some embossed with "Kerr Glass Manufacturing Company," 1915+), and two purple glass fragments. Ceramics consist of numerous whiteware plate fragments, including fragments of a floral design plate with a "Czechoslovakia Hand Painted" basemark (Figure 11.85), and six glazed earthenware fragments. Collected ceramics indicate a late 1910s to 1930s date for the deposit (see Appendix D). Other remains include concrete chunks and over 20 wood crate (produce box) fragments. There is a galvanized bucket to the north of Locus B.

Locus C is a trash concentration covering an area

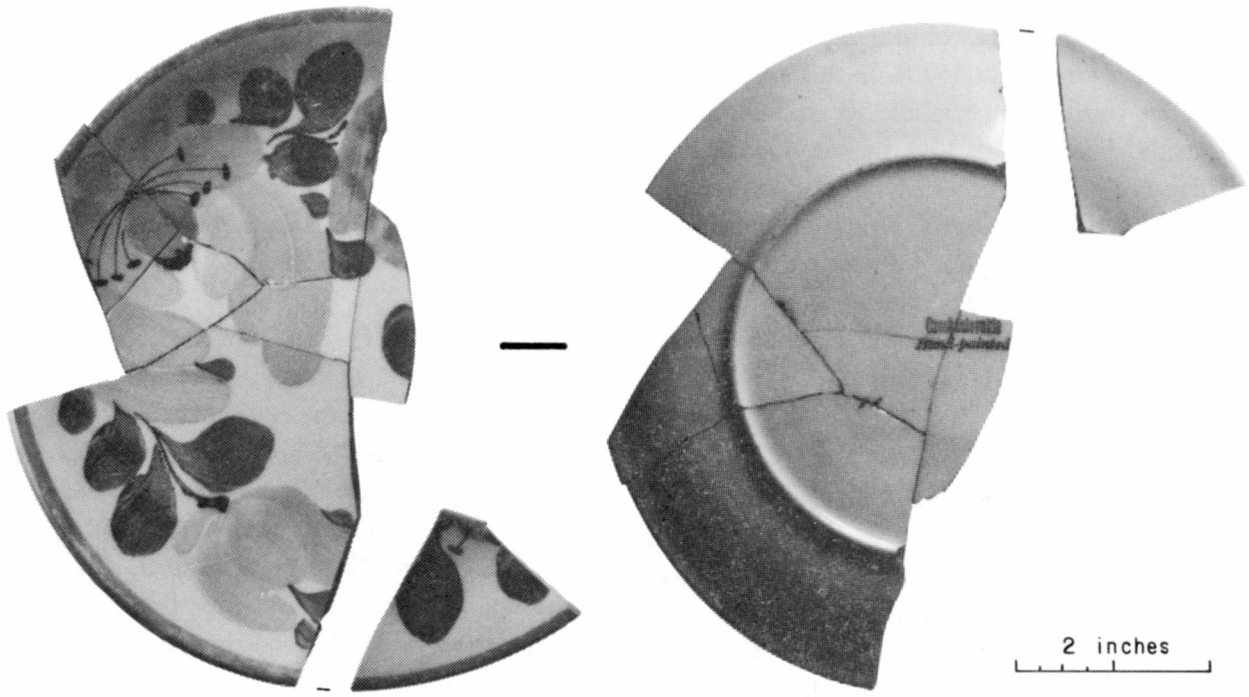


Figure 11.85. Broken plate found at MANZ 1993 A-7, Locus B.

about 50 ft in diameter. Artifacts noted at this locus include 25 sanitary seal cans, about 50 whiteware plate fragments, a "Crisco" can lid, and around 10 window glass fragments.

Locus D is located on both sides of the road trace through the site (Figure 11.86). Most of the artifacts at this locus are in two piles within an area of scattered artifacts covering an area 50 ft north-south by 65 ft east-west. Noted artifacts include 10 sanitary seal cans, three cut nails, a buckle, a hay fork blade, approximately 100 window glass fragments, 100 brown glass fragments, 100 aqua glass fragments, at least 50 purple glass fragments, 50 whiteware cup and plate fragments (mostly undecorated), crockery fragments, and around 100 small bone fragments.

Locus E consists of a scatter of about 20 sanitary seal cans in an area 100 ft north-south by 50 ft east-west along the east side of the road trace through the site.

Locus F covers an area 65 ft north-south by 150

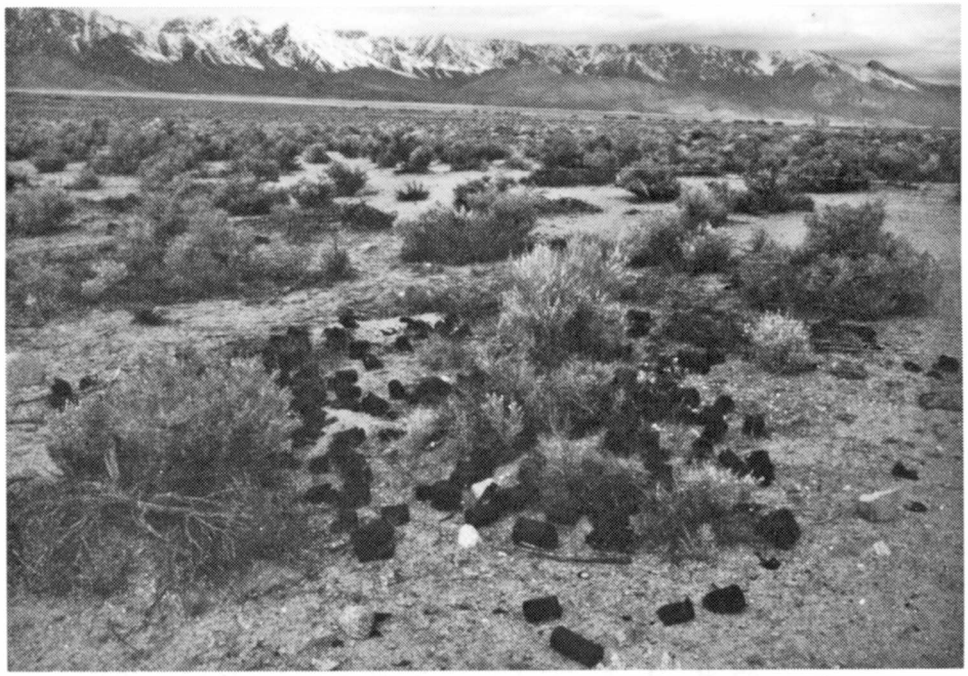


Figure 11.86. Trash dump (MANZ 1993 A-7, Locus D).

ft east-west. Of the 10 loci at the site this one by far contains the most material. Trash appears to have been dumped west of the road trace along a shallow drainage. Other than an occasional artifact buried in the drainage, the potential for subsurface material appears minimal. The results of detailed surface tabulation and collection of three 2 m by 2 m units are presented below.

A wide variety of material was noted at Locus F during survey. Metal artifacts include hundreds of tin cans including sanitary seal, spice, condensed milk "Norvège" sardine, "Lipton's Tea," "Ortega Chilis," and pocket tobacco cans, cooking pans, a car fender, miscellaneous metal parts, smooth wire, wire bits, and cast iron stove parts (one embossed with PHIL'A ..., P & CO.). The size of the measured condensed milk cans ($4\frac{7}{16}$ inches by $2\frac{15}{16}$ inches) suggest a manufacturing date between 1915 and 1930.

Glass includes hundreds of clear glass fragments, hundreds of window pane fragments, about 100 white glass fragments, hundreds of brown and green glass fragments, and at least 100 purple glass fragments (including a medicine lip neck fragment). Embossed glass marks include "THREE IN ONE," "FGW" (Fairmount Glass Co., 1898-1930), "Hollywood Dry Corp. 29" (possibly indicating a 1929 date of manufacture), "Kerr" (1915+), and "Aurelius S. Hinds" (1870-1925).

Other material at Locus F noted during survey includes hundreds of plate fragments (mostly plain white, some with embossed designs), a shoe heel, a shoe sole, a dry cell battery, crockery, light bulb parts, rubber bits, glazed pipe fragments (Douglas Clay Products Co.), concrete chunks, abundant charcoal, and tens of thousands of small burned bone fragments.

Locus G covers a 50-ft-diameter area northwest of Locus F. Noted at this locus were at least 100 tin cans (including sanitary seal, hole-in-cap, and condensed milk), a large milk container, cast iron stove parts, a galvanized bucket, cooking pans, a wire cable, an iron pipe fitting, wire fragments, four shoe fragments, over 10 brown glass fragments, over 10 clear glass fragments, at least 10 purple glass fragments, about 20 plate fragments, some glazed clay pipe fragments, a concrete pipe fragment, and 10 bone fragments.

Locus H is a sparse scatter of artifacts at the



Figure 11.87. "Durkee" salad dressing bottle found at MANZ 1993 A-7, Locus J (base not to scale).

northern edge of the site covering an area 50 ft north-south by 130 ft east-west. Noted artifacts include approximately 100 purple glass fragments, whiteware plate fragments, green glass fragments, white glass fragments, and a few sanitary seal cans. Collected ceramics suggest an 1892 to early twentieth century date for this locus (see Appendix D).

Locus I covers an area 65 ft north-south by 65 ft east-west on the east side of the road trace. Although it is along the same drainage as Locus F some of the material at this locus appears to be slightly older. Metal noted during survey includes over 50 can fragments, three pocket tobacco tins (one hinged), crown caps, a mason jar lid, a white enamelled metal cup with a blue handle, wire bits, a bolt, and hundreds of wire nails. Glass includes approximately 100 purple glass fragments (including one embossed with "California Fig Syrup"), and aqua and blue glass fragments. Ceramics include at least 100 plate and crockery fragments. Noted ceramic basemarks include John Maddock and Sons (England, 1906+) and Hass and Czjzek (Czechoslovakia, 1918-1939). Stylistically, collected ceramics suggest a ca. 1930s date (see Appendix D). Other items noted during survey include several shoe fragments and an unusually large number of small rocks and cobbles.

Locus J covers an area 45 ft north-south by 50 ft east-west in the northeastern portion of the site. Most of the artifacts at the site are along a recently dug water diversion ditch and berm and may represent material displaced from Locus I or from a buried deposit. The presence of artifacts within the berm fill suggests the latter may be more likely. Noted during survey at this locus were numerous metal, glass, and ceramic artifacts and a few shoe fragments. Metal includes a sanitary seal can, thousands of small can bits, and hundreds of wire nails. Glass includes a dozen or so purple glass fragments and a complete purple glass "Durkee" salad dressing bottle (1877-1900) that appears to have been recently broken by being stepped on by a cow (Figure 11.87). Ceramics at Locus J include scattered whiteware plate fragments and several large pieces of a group of matched plain whiteware plates with the Johnson Brothers trademark (England, 1838-1913; Figure 11.88).



Figure 11.88. Broken plates found at MANZ 1993 A-7, Locus J.

Surface Collection/Tabulation

At Locus F, artifacts in three 2 m by 2 m units were tabulated, with representative artifacts collected or measured. In all 637 items (yielding an average surface density of 53 per square meter) were tabulated in these units. These were classified by function using the system devised by Blee (1987) and Rhodes (1988). The results of this tabulation are summarized in Table 11.10.

Structural artifacts within these units were limited to an estimated 100 window glass fragments.

Domestic artifacts recorded were those associated with beverage storage, food storage, food serving, food remains, furnishings, and pharmaceuticals. Beverage storage is represented by eight brown glass fragments (one with the Fairmount Glass Co. hallmark [1898-1930], another embossed with "Hollywood Dry Corporation 29 7" [1929?]), a crown cap, a can lid embossed with "Lipton's Tea The Most Delicious the World Produces," and a cork bottle stopper.

Items associated with food storage were dominated by cans. These include 58 sanitary seal cans, 52 evaporated milk cans, nine key-opened meat cans, two can keys, nine pry-off lid cans, four sardine cans (Norvege), two oval meat cans, one spice can, seven miscellaneous cans, five can lids, and a mason jar lid. The sanitary seal cans include four sizes, the milk cans include two sizes, the key-opened cans three sizes, and the pry-off lid cans five sizes. Embossing on cans includes: "...OOY APROGADO...," "ESTAB...," "NORVEGE," "Ortega Chiles," "R.AREITY.. US...," "O ★ JJ," "PUNCH HOLES IN OPPOSITE CORNERS," "2 SSTAB-262 A," "TJ ZL," and "BB ★."

Non-metal artifacts associated with food storage include a small clear bottle with a metal cap, 111

Table 11.10. Tabulation of Artifacts in Three 2 m by 2 m Units at Locus F of MANZ 1993 A-7.

Object Classification		Glass	Metal	Other
Structural	Structural Materials			
	Window Glass	100		
	Hardware			
	Nails			
	Utilities			
Domestic	Beverage Storage	8	2	1
	Food Storage	113	152	2
	Food Preparation			
	Food Remains			250
	Food Serving			6
	Furnishings		1	
	Pharmaceutical			
Personal	Clothing			
	Jewelry			
	Grooming and Hygiene		1	
	Money			
Activities	Ammunition			
	Leisure			
	Automobile			
	Miscellaneous Tools	1		
	Toys			
	Writing			
Unclassified				

clear glass fragments (one with a 1915 date), fragments of a "Kerr" mason jar (1915+), a panel bottle fragment with an Owens Illinois Bottle Company (1932+) and embossed with "Aurelius S. Hinds Portland, Me" (1870-1925), two white glass fragments embossed with "...mason jar...," and two fragments of a cylindrical stoneware storage vessel.

Food remains consist of 250 very small animal bone fragments. Artifacts associated with food serving include six fragments of a non-vitreous earthenware plate with art deco style edge molding (1930s+, see Appendix D). The only noted furnishing was a light bulb. Personal items were limited to a shaving cream tube with a hole for hanging, embossed with "THE J.B. WILLIAMS CO. U.S.A." A deep aqua-colored "Three-in-one oil" bottle (1907+) is indicative of some specialized activity.

MANZ 1993 A-14

This site is a dump most likely associated with the town of Manzanar. It covers an area 50 ft north-south by 65 ft east-west in the northeastern portion of the National Historic Site, however most of the artifacts are confined to a 30-ft-diameter area. The site is bounded on the east by a road trace lined with dead and dying black locust trees and on the north by a barbed wire fence and graded road. The road trace is the remains of a road from the town of Manzanar; the graded road dates to the relocation center.

Most notable at the site is a large pile of cans that includes approximately 60 sanitary seal cans (many with church key openings, post ca. 1935), numerous can lids, and a few pocket tobacco and milk cans. Other artifacts noted at the site include hundreds of wire nails, a few electrical porcelain fragments, a screw-type fuse, at least 20 whiteware plate fragments, over 20 brown glass fragments, and about 10 purple glass fragments.

MANZ 1993 A-21

This site is an artifact scatter covering about one-half acre in the northeastern portion of the National Historic Site, just west of the U.S.

Highway 395 right-of-way fence. A recent water diversion ditch bisects the site, and the area may have been bulldozed during construction of the relocation center.

The site is likely associated with the town of Manzanar; a former town road now just a trace lined with dead and dying trees crosses a portion of the site. However some of the artifacts may be from use of the relocation center; the Watchtower 8 location is just east of the site.

Artifacts noted at the site include two sanitary seal cans, a can lid, about 100 clear glass fragments, at least 25 purple glass fragments, 10 "Coke" bottle fragments, over 100 whiteware plate fragments, and 50 terra cotta flower pot fragments. Collected ceramics suggest a ca. 1930s date for the site (see Appendix D).

MANZ 1993 A-27

This site is an artifact scatter, with up to 25 artifacts per square meter, likely associated with the town of Manzanar. Within the central portion of the National Historic Site, the site covers an area 360 ft north-south by 260 ft east-west (1.7 acres). Most of the artifacts are clustered around a group of tree remains in the southern portion of Firebreak C5. This firebreak was used for an outdoor theater by the relocation center residents. A concrete foundation block and an upright pipe noted within this site (Feature C5-1 in Chapter 9) is likely associated with the outdoor theater.

Although some of the artifacts listed below are undoubtedly associated with the relocation center, many appear to pre-date 1942. While the cottonwood tree at the site suggests a pre-relocation center structure may have been located here, no record of any town-era structure at this location could be found. A more likely alternative is suggested by a 1942 oblique aerial photograph of the relocation center (see Figure 4.9). In that photograph a large tree is clearly visible in the barren firebreak. This suggests the artifacts may be the remains of a town-era trash scatter inadvertently left by bulldozers avoiding the cottonwood tree during clearing of the firebreak and surrounding area.

Metal artifacts included within this site include a metal keyhole (door), wire nails, sanitary seal cans, pocket tobacco tins, a rusted enameled bucket, miscellaneous metal parts, a barrel hoop, a slate tile fragment, a shoe heel tap, and a carbon rod. Glass includes fragments of white, brown, green, clear, aqua, and blue bottles and jars, a moderate amount of purple glass fragments (including several bottle lips), and a glass canning jar lid liner (embossed with" PORCELAIN LINED CAP + FOR MASON FRUIT JARS +"). Embossed glass hallmarks include the Hazel-Atlas Glass Company (1920-1964), the Illinois Glass Company (1916-1929), the American Bottle Company (1905-1929), and the Owens Illinois Bottle Company (1932+). Other embossed glass includes pieces with "Davis Vegetable Painkiller," "California Fig ... Franc..," "Best Foods," "Blue P...," "GAP.3," and "M." Painted fragments of "Mission" and "Antelope" soda bottles were noted along the north edge of the site. Several dozen plate fragments were noted within the site and 15 were collected; for the most part these date to the late nineteenth-early twentieth century and the late 1920-1930s. Other noted artifacts at the site include brick fragments, an electrical porcelain plug, and two electrical knobs (one with a wire nail).


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Chapter 12

Town of Manzanar Sites Outside Manzanar National Historic Site

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Sixty-two of the 82 archeological sites recorded by the National Park Service at Manzanar have historical components that predate the World War II relocation center. Twenty-four of the recorded sites are within the authorized 550-acre National Historic Site and 38 are outside (Figure 12.1). This chapter concerns the 38 pre-relocation center historical sites located outside of the boundaries of the National Historic Site. Twenty-nine of the 38 sites are on land owned by the City of Los Angeles and administered by the Department of Water and Power (LADWP), six are on Public land administered by the Bureau of Land Management (BLM), and three sites, a trash dump and two water distribution systems, are on both LADWP and BLM lands.

The recorded sites, all associated with the former town of Manzanar or earlier ranches, can be divided into three general categories: residential (n=10), utilities (n=17), and trash deposits (n=11). Each of the sites is described below. Detailed site records are on file at the California Historic Resources Information System's (CHRIS) Eastern Information Center (University of California, Riverside) and at the Western Archeological and Conservation Center (Tucson, Arizona). A concordance of site numbers is included in Appendix P. Historical sites within the Historic Site boundary, sites associated with the Manzanar Relocation Center, and Native American Indian sites are described in other chapters.

As discussed in Chapter 8 (Research Objectives and Methods), recording historical sites not associated with the relocation center was not a primary objective of the fieldwork. Outside of areas subject to intensive survey, these sites were recorded only if encountered while recording sites and features associated with the relocation center. Therefore, the following sites likely represent only a small fraction of the remains in the area associated with the town of Manzanar and earlier ranches.

Residential Sites

Ten sites include features and artifacts indicative of occupation. Each can be linked to ranches and farms noted in historical records, and the historical names are used here to designate the sites (Table 12.1). Two of the sites (MANZ 1993 B-21 and B-24), located one-quarter mile apart, were later discovered to be part of the same ranch (Albers) and are discussed together below.

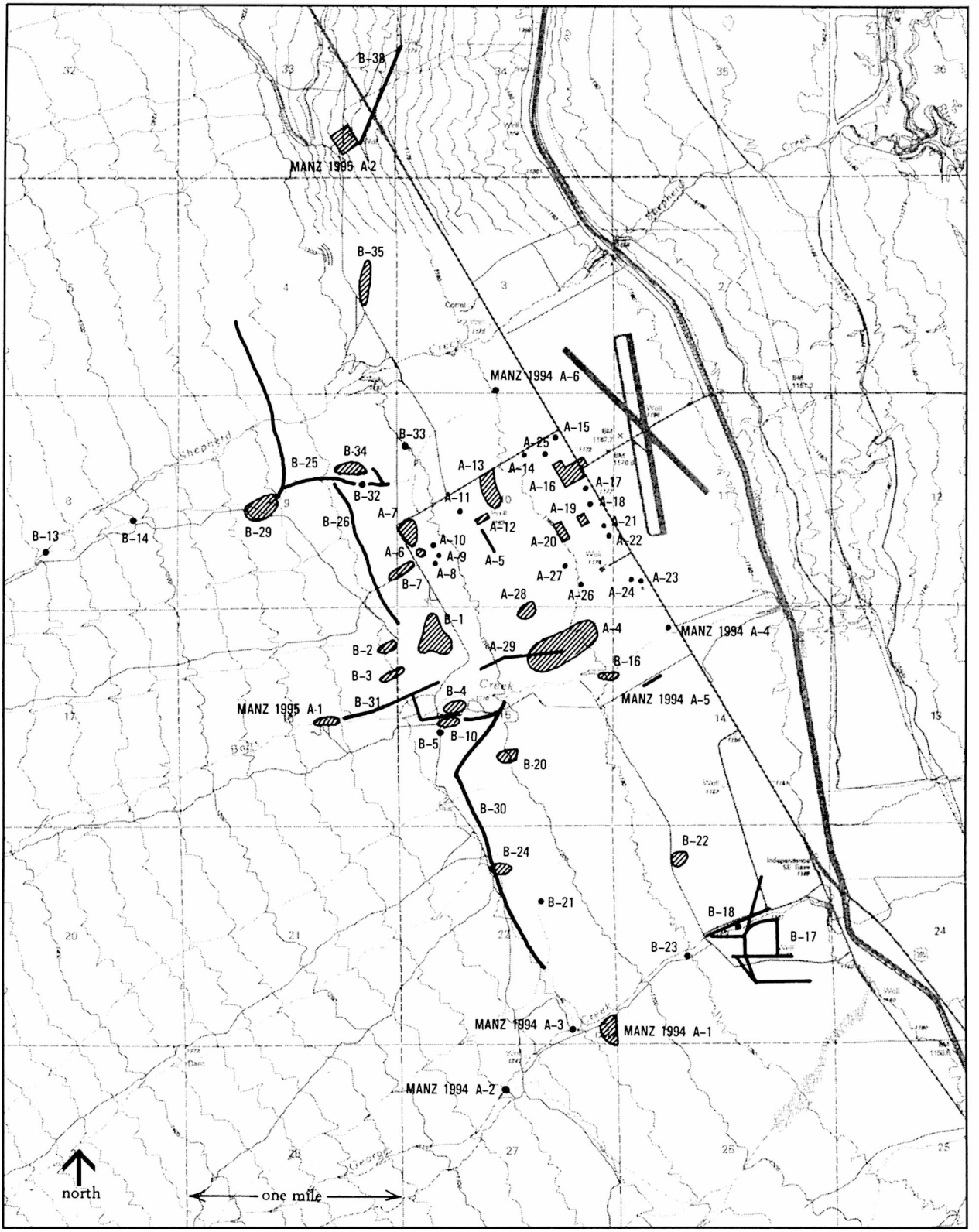


Figure 12.1. Town-era sites recorded at Manzanar National Historic Site and environs. Site numbers are prefixed by project designations; those with only a one-letter prefix were recorded in 1993 (adapted from 1982 USGS 7.5 minute maps Bee Springs Canyon, Independence, Manzanar, and Union Wash, California).

Table 12.1.
Historical Ranches and Farms Recorded Outside of Manzanar National Historic Site.

Common Name	NPS Site Number
Abernathy	MANZ 1993 B-20
Albers	MANZ 1993 B-22, B-24
Glade	MANZ 1993 B-23
Hay/Kispert	MANZ 1994 A-1
Kreider	MANZ 1993 B-33
Lacey	MANZ 1993 B-22
Lennington	MANZ 1995 A-2
Metzger/Correll	MANZ 1993 B-35
Paget	MANZ 1993 B-16

Abernathy Ranch (MANZ 1993 B-20)

This site, located about one-quarter mile south of the National Historic Site, was originally recorded for this project because an abandoned building at the ranch had been modified for use by internees of the relocation center (see Chapter 10).

The 1930 LADWP plat map shows fences, a powerline, two corrals, and what may be two wells in the site area. LADWP bought the Abernathy Ranch, along with water rights to 1/6 of George Creek, from James Abernathy in 1927 for $42,000. At that time the ranch included 50 acres of alfalfa, 40 acres of cultivated land, 94 acres of pasture, and 94 acres of brush.

The LADWP valuation of improvements record lists six structures in poor to fair condition, with a total assessed value of $659.00. These include a 1,261-square-ft five-room wood frame residence with a concrete foundation and tar paper roof (Figure 12.2), a box garage with a concrete floor and shingle roof, a corn crib with a concrete floor and tin roof, a 2,520-cubic-ft stone "cellar" with a concrete floor and shingle roof (Figure 12.3), a 480-square-ft shingle roof barn, and a latrine. An undated notation indicates the garage was moved to the Wilder residence. The remaining structures were sold for salvage April 24, 1934.

At this time, it is not known when any of the improvements noted in the LADWP records were constructed. Records at the Inyo County Recorders Office indicate that the original land entry for the property was filed by David Thomas in 1875 and Fred Strohmeyer owned the land by 1905. Abernathy did not take ownership of the land until the 1920s.

Salvage of the structures at the site along with reuse of the area by the relocation center has destroyed much evidence of its earlier use. More importantly, sheet wash and erosion have clearly disturbed the area as well. Deep alluvium covers much of the immediate area (Figures 12.3 and 12.4). In the 4-acre site area five features were recorded (Figure 12.5).

Feature 1 is the remains of a one-room rock structure mortared with concrete, the "cellar" noted on the LADWP inventory (see Figures 12.3 and 12.4). The cellar measures 13 ft by 18 ft with a doorway on the north. Walls stand from 3 to 4½ ft high. The cellar is now roofless, but originally had a wooden upper structure and roof, indicated by a concrete edge on the north wall. A "Russell Jennings" pattern twist auger bit was found 50 ft northeast of the cellar and part of an ornate iron bed headboard was found on top of the cellar wall. Feature 2, a 4-ft-by-6-ft concrete oven within the cellar, was constructed by internees of the Manzanar Relocation Center (see Chapter 10).

Feature 3 designates all the planted trees at the site. A line of black locust trees seems to follow an old road alignment (Feature 4) that passes in front of the stone cellar. Other alignments of black locust trees may follow former fencelines or roads. An area 100 ft west of the cellar with over 50 closely planted trees may indicate a former building location.

Feature 4 is the old road, vaguely defined by planted trees and a single fence post, that passes in front of the cellar.



Figure 12.2. 1929 photograph of Abernathy Ranch House (courtesy of LADWP Bishop Office).

Feature 5 consists of rock alignments and a small scatter of historical artifacts, 65 ft southeast of the stone cellar. This area is heavily disturbed, but there appears to be two linear remnants of what may have once been a structure foundation.

Artifacts noted at the site include 30 glass fragments (olive green, aqua, purple, clear, brown, and light green), a whiteware ceramic fragment, three porcelain fragments (one dating to the 1880s, see Appendix D), and bits of smooth wire. More artifacts likely remain buried under the deep alluvium.

Albers Ranch
(MANZ 1993 B-21 and MANZ 1993 B-24)

Located about 1 mile south of the Historic Site, the Albers Ranch encompasses two separately recorded archeological sites, MANZ 1993 B-21 and MANZ 1993 B-24. MANZ 1993 B-21, 100 ft north-south by 115 ft east-west, comprises the central portion of the ranch itself, while MANZ 1993 B-24 includes a group of outlying structures in a 3-acre area about one-quarter mile to the northwest. As at the Abernathy Ranch, the principle remaining structure at the Albers Ranch was modified by internees of the relocation center (see Chapter 10).

The 1930 LADWP plat map, which generally does not show any buildings, shows two buildings in the area of MANZ 1993 A-21. In addition, a road and fences are shown at the site location. To the north there is an apple orchard, and to the southwest there is an apple orchard and a corral. LADWP bought the Albers Ranch and water rights to one-sixth of George Creek in 1926 for $65,000. At that time the ranch included 110 acres of cultivated fields, 140 acres of pasture, and 10 acres of undeveloped land. LADWP's valuation of improvements record lists 17 structures at the Albers Ranch. Two were noted as in bad condition, five in poor condition, nine in fair condition, and one in good condition. Total assessed value of the buildings is listed as $1,688.00.

The buildings listed at the Albers Ranch include a 1,116-square-ft seven-room wood frame residence with a sill foundation, shingle roof, and



Figure 12.3. 1929 photograph of cellar at Abernathy Ranch (courtesy of LADWP Bishop Office).

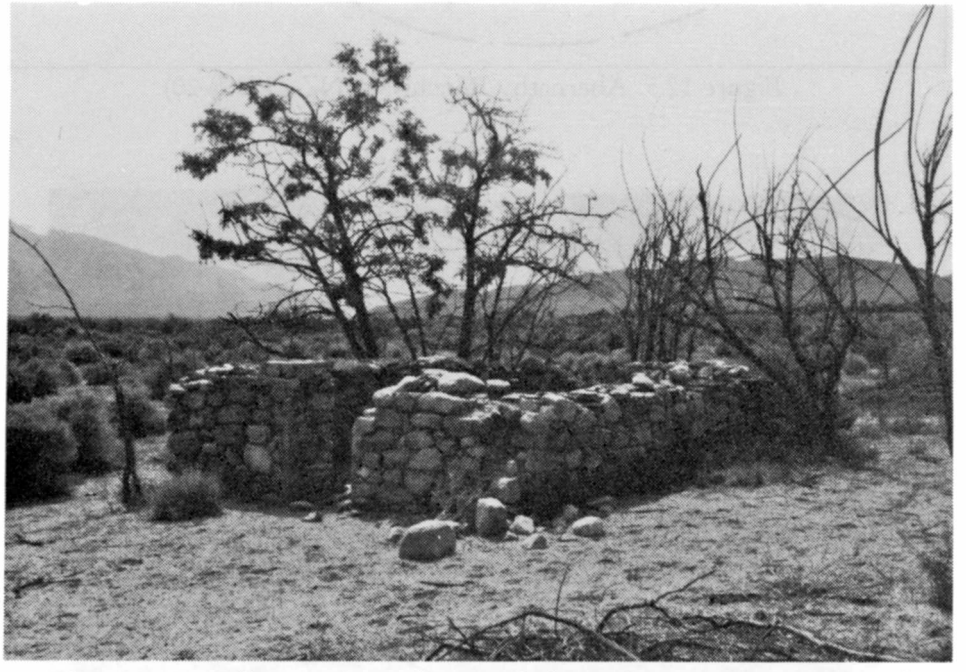


Figure 12.4. Cellar at Abernathy Ranch (MANZ 1993 B-20, Feature 1).

plaster-board finished interior walls and ceiling (Figure 12.6), a 8,265-cubic-ft stone "cellar" with a shingle roof (Figure 12.7), a 160-square-ft storeroom, a granary, a barn, two garages, a 1,076-cubic-ft concrete structure with a tarpaper roof, two latrines, a shed, a 120-square-ft smoke house with 3-ft-high stone walls, two chicken houses, a harness shed, a shelter, and a sod cellar (Figure 12.8). Only the residence and stone cellar were noted as wired for electricity. All were

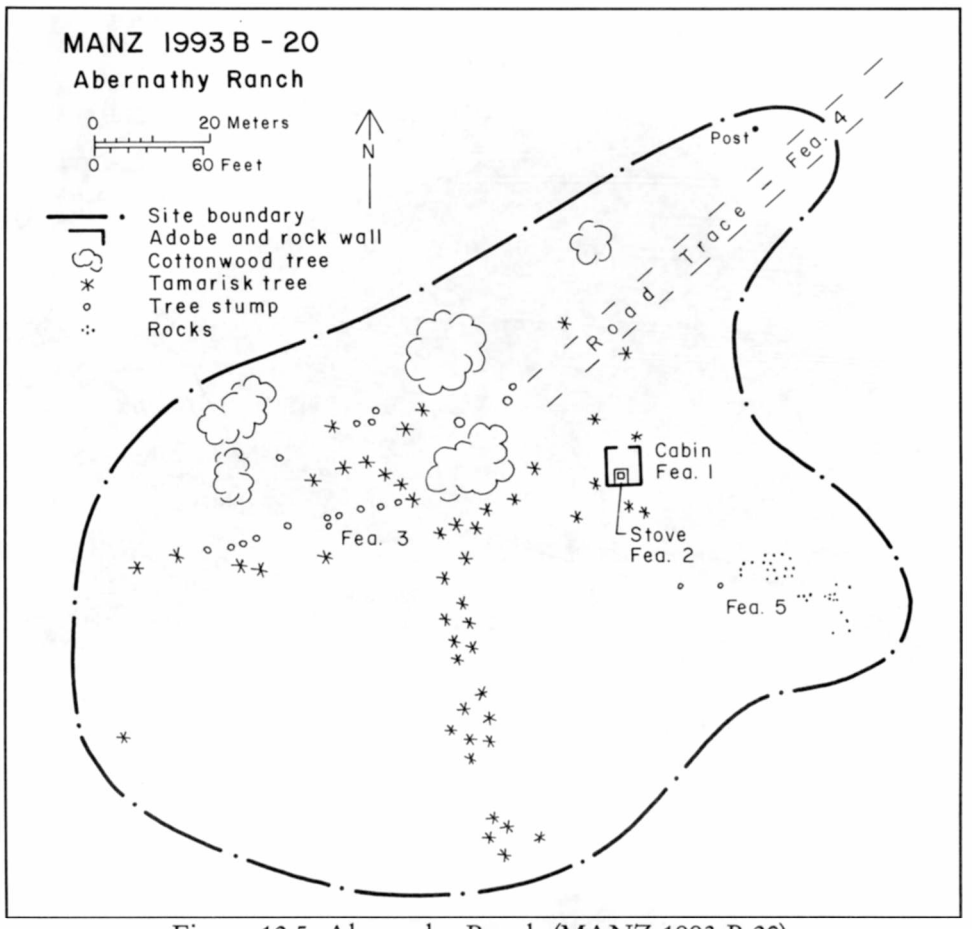


Figure 12.5. Abernathy Ranch (MANZ 1993 B-20).

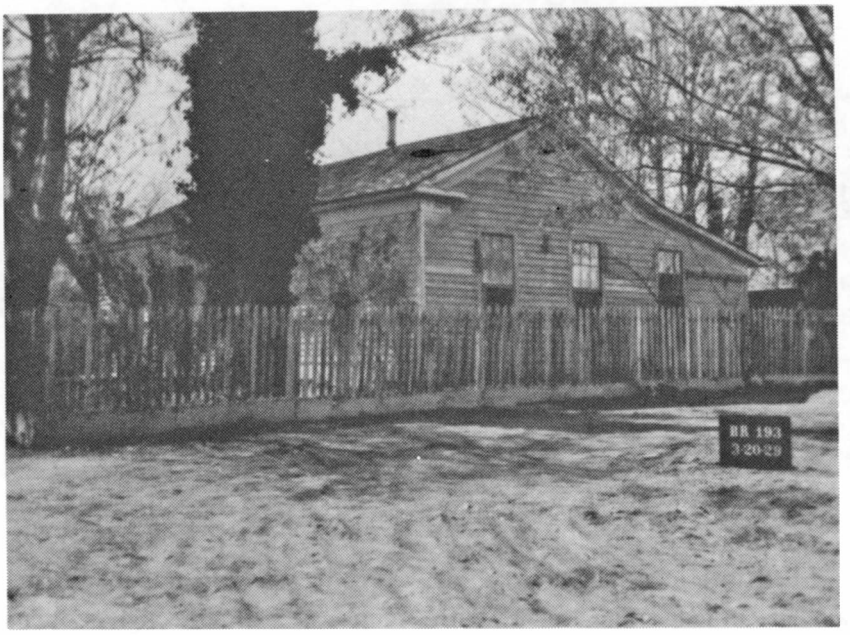


Figure 12.6. 1929 photograph of Albers Ranch House (courtesy of LADWP Bishop Office).

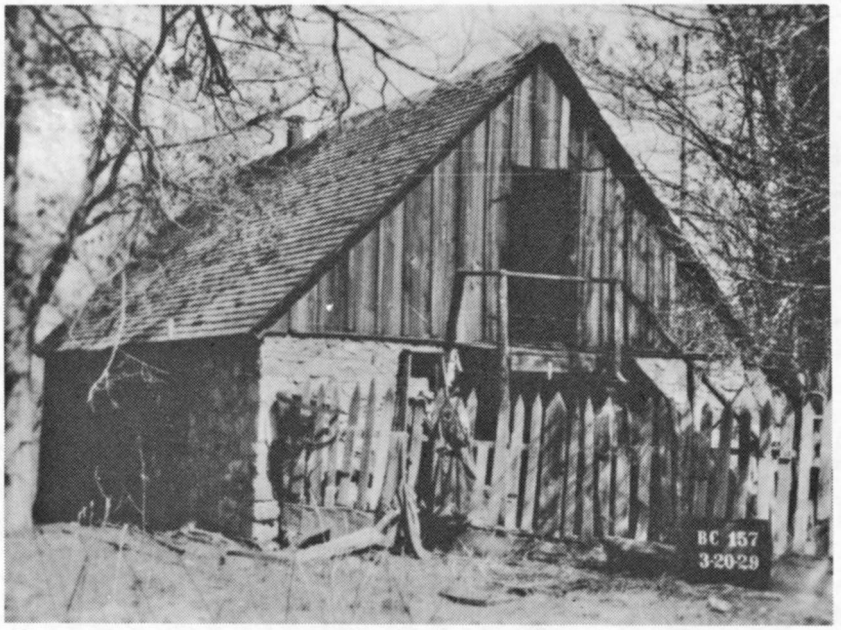


Figure 12.7. 1929 photograph of cellar at Albers Ranch (courtesy of LADWP Bishop Office).



Figure 12.8. 1929 photograph of cellar at Albers Ranch (courtesy of LADWP Bishop Office).

recommended for salvage February 8, 1935. In 1939 LADWP authorized their lessee of the property to remove the buildings and use the material to make repairs at the nearby Hay Ranch (Werner et al. 1939).

Construction dates of the various structures is not known at this time, however a photograph at the Eastern California Museum credited to ca. 1888 shows the Albers family posing in front of the wood frame residence shown in the LADWP inventory (Figure 12.9). Frederick Albers patented the property in 1884 and the Albers family held it until it was sold to LADWP.

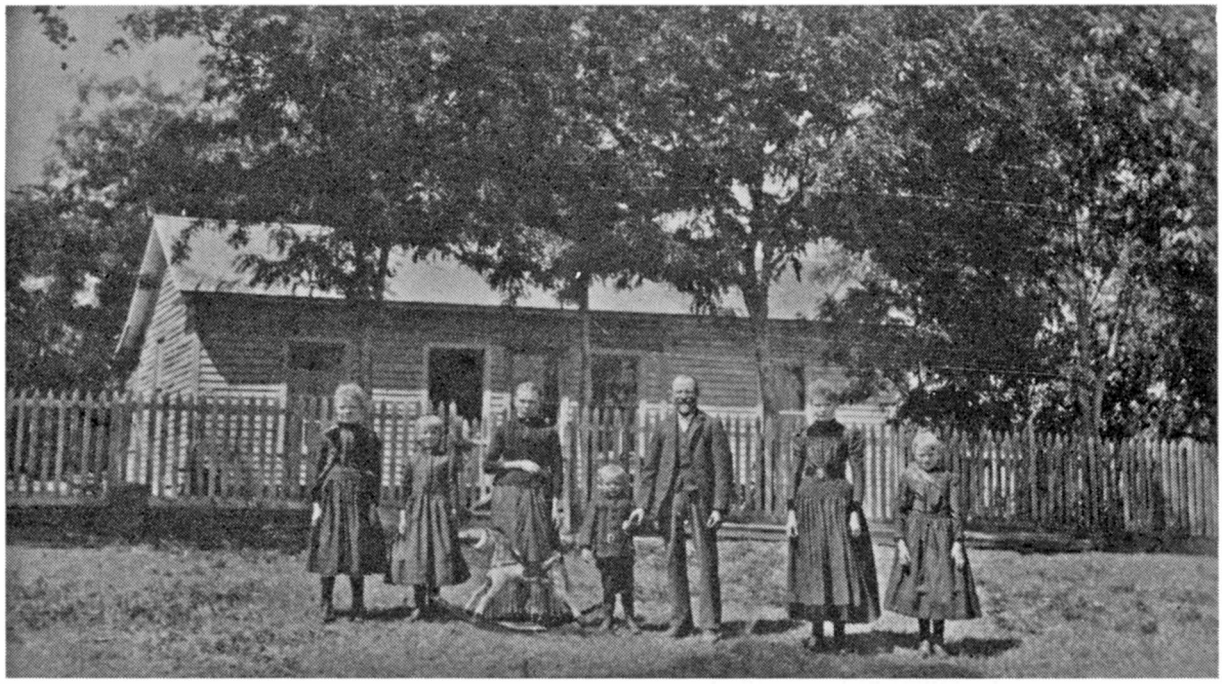


Figure 12.9. Albers Ranch House, ca. 1890 (courtesy of Eastern California Museum).

Seven features were recorded in the central portion of the ranch (MANZ 1993 B-21), including a two-room rock building, a foundation of a small outbuilding, and rock alignments on a low rise overlooking an irrigated pasture (Figure 12.10). Following are more detailed descriptions of each feature.

Feature 1 at MANZ 1993 B-21 (the cellar) is a rectangular two-room adobe-mortared rock building. The building measures 30 ft north-south by 20 ft east-west. It has a central dividing wall across the width and two door openings, one to each room, along the east wall (Figures 12.11 and 12.12). Presently the walls stand from 6 ft to 7 ft high. There are two windows, one in each room, and a small square opening in the west wall of the north room, probably for a stovepipe. The west, east, and north interior walls of the north room have been plastered with concrete. Feature 2 at MANZ 1993 B-21 is a 5 ft by 7 ft concrete oven within Feature 1 that was constructed by internees of the relocation center (see Chapter 9).

Feature 3, composed of a rock and concrete remnant measuring 1½ ft by 10 ft (Figure 12.13), is located 20 ft east of Feature 1. Comparison with historical photographs indicate it is where the main Albers residence was once located. It may be the remains of the foundation for the residence or a nearby structure.

Feature 4 consists of planted alignments of black locust trees to the east and southeast of Feature 1 that enclose a rectangular 2,000 square ft area. To the south of this area trees appear to be planted in rows.

Feature 5 is a wooden water trough south of Feature 4. Feature 6 is a 4 ft by 8 ft rectangular rock alignment, possibly a grave. It is located among some trees 60 ft southeast of Feature 1 at the edge of a drainage.

Feature 7, located 80 ft southeast of Feature 1, is the foundation and low wall of a rock and adobe outbuilding. It measures 12 ft square with standing walls about 2½ ft high (Figure 12.14). It has an opening on the south side, near the west corner, facing a drainage. Rock alignments, lumber, and trees on the west side may have

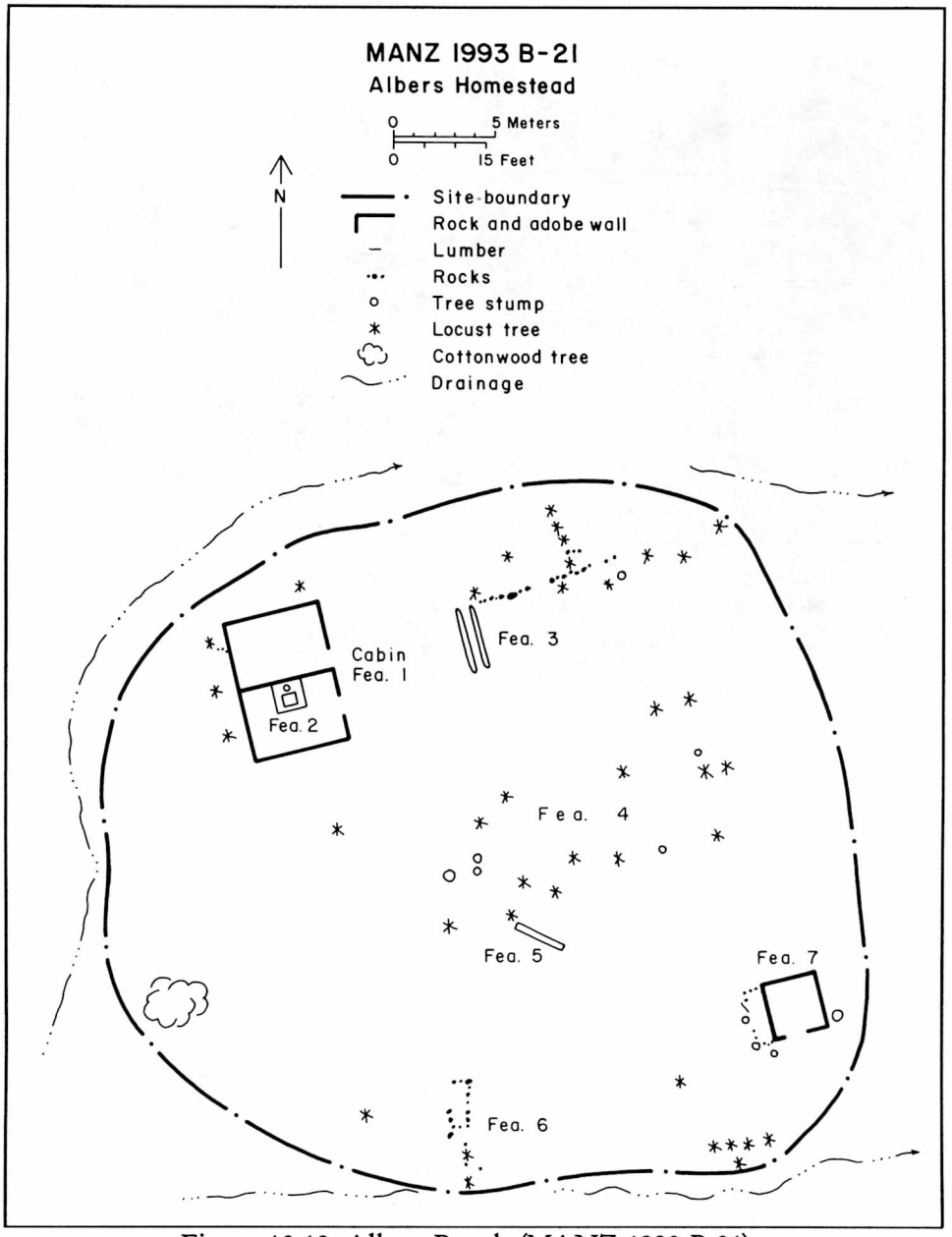


Figure 12.10. Albers Ranch (MANZ 1993 B-21).

once been incorporated into the structure, which is surrounded by rubble from fallen walls and is partly obscured by brush. In spite of the differences in square footage (144 square ft vs. 120 square ft in LADWP's valuation of improvements record), Feature 7 is apparently the smokehouse listed in the LADWP inventory.

The only artifacts noted at MANZ 1993 B-21 were a few pieces of metal strapping and a can. The lack of artifacts at the site and in the surrounding area may be attributed to litter collection and clean-up by relocation center residents allowed to used the area for picnicking and camping.

Seven features were recorded at MANZ 1993 B-24. These include a concrete house, a well, a small reservoir, a ditch, a corral, planted alignments of trees, and an associated scatter of historical trash. MANZ 1993 B-24 also includes a sparse scatter of prehistoric artifacts, described in Chapter 14.



Figure 12.11. Cellar at Albers Ranch (MANZ 1993 B-21, Feature 1).

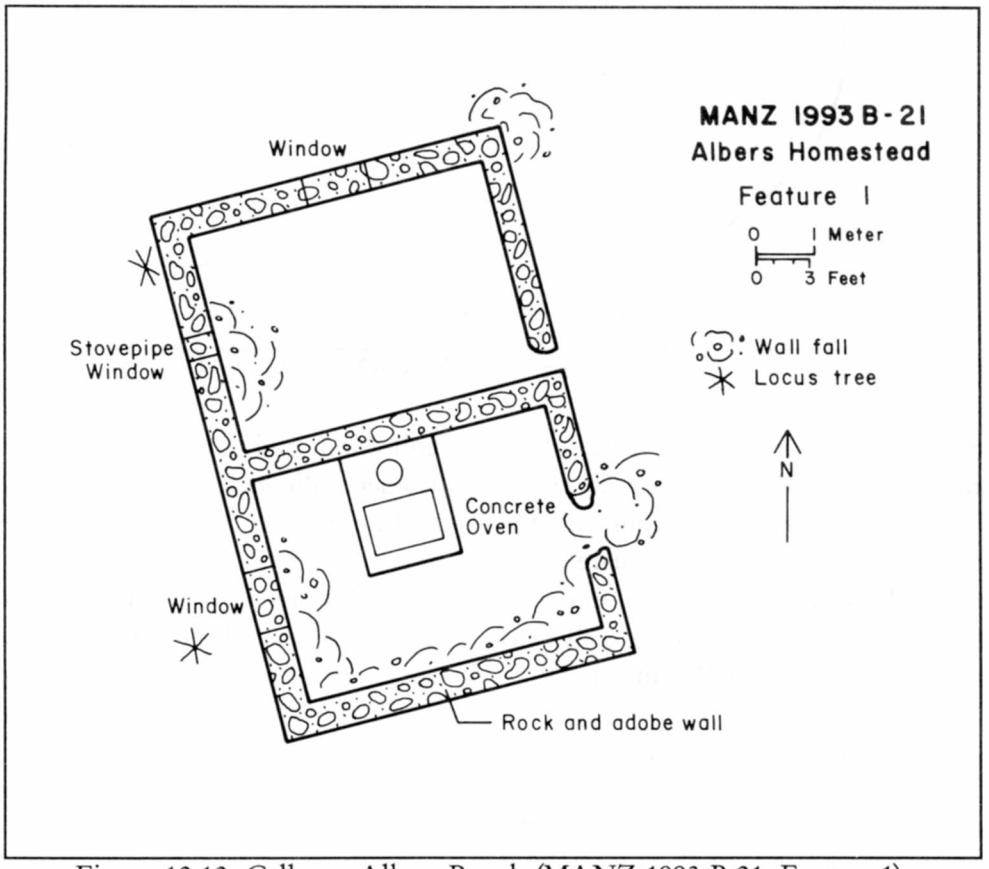


Figure 12.12. Cellar at Albers Ranch (MANZ 1993 B-21, Feature 1).

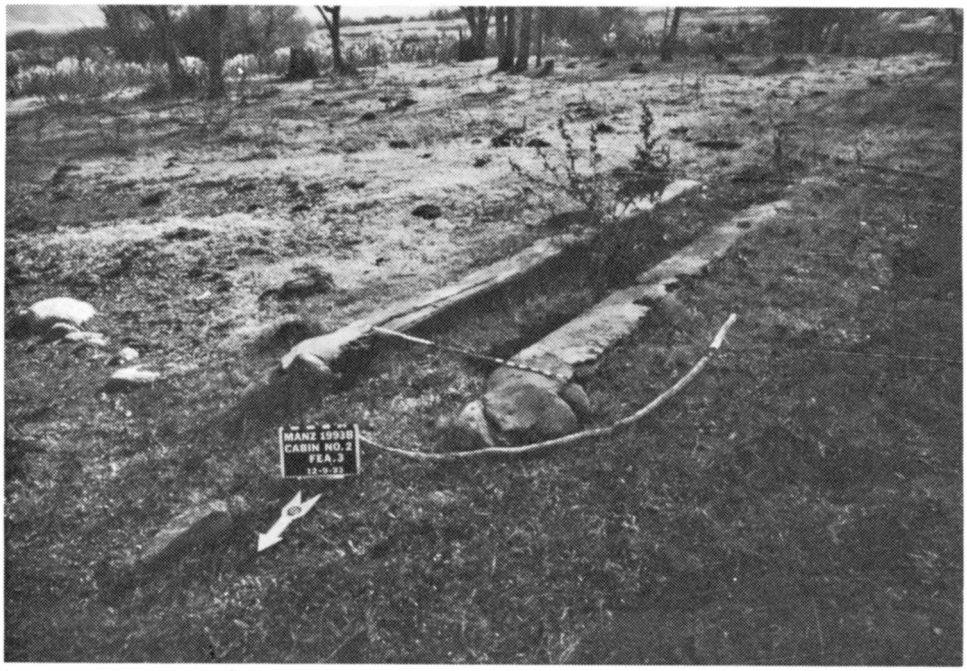
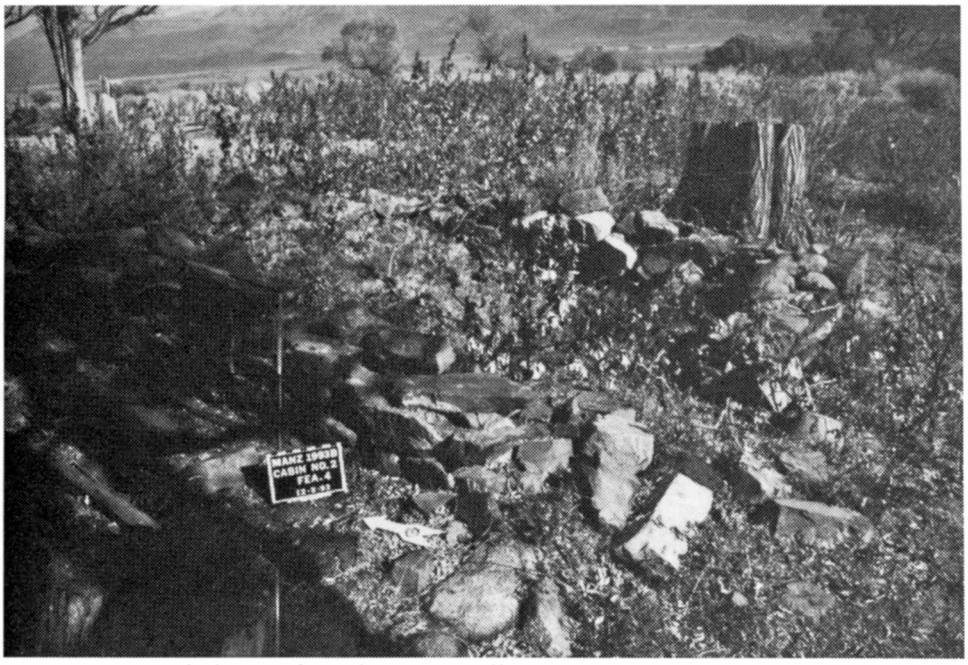


Figure 12.13. Foundation remnant at Albers Ranch (MANZ 1993 B-21, Feature 3).


Figure 12.14. Smokehouse foundation at Albers Ranch (MANZ 1993 B-21, Feature 7).

Feature 1 at MANZ 1993 B-24 is a poured concrete structure. This building is listed in the LADWP inventory, however, its function or use is not identified. Note that the present roof is different from the roof in the LADWP photograph (Figures 12.15 and 12.16). Associated features (see below) suggest the building served as a pumphouse. The walls enclose a space approximately 10 ft by 13 ft, a doorway faces east and there are windows in the north and south walls. The windows and doorway are framed with wood. The window frames are filled by angled vertical wooden slats (vents?). Above the 6-ft-high poured concrete walls are wood frame

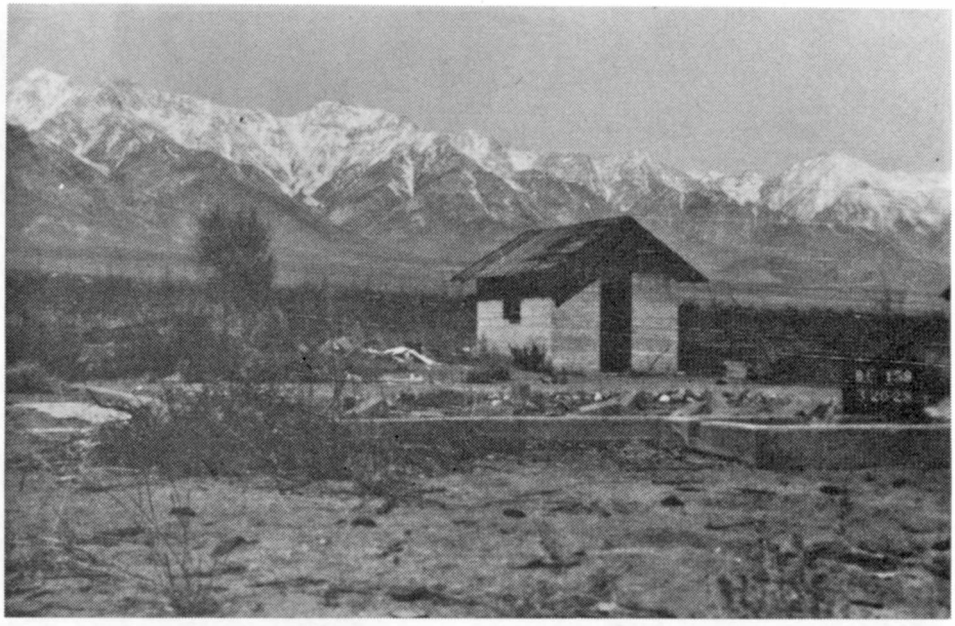


Figure 12.15. 1929 photograph of concrete structures at Albers Ranch (courtesy of LADWP Bishop Office).

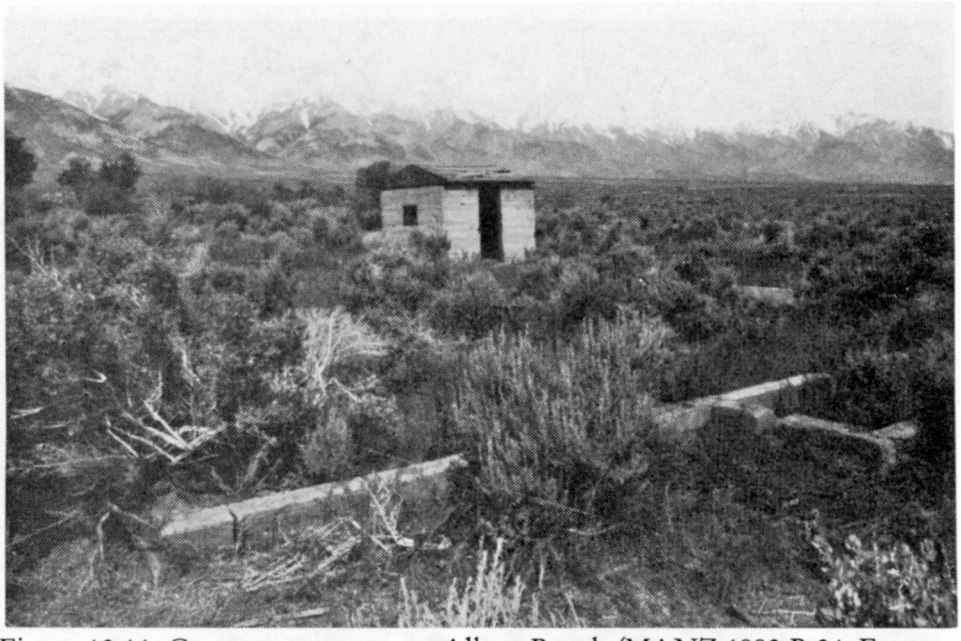


Figure 12.16. Concrete structures at Albers Ranch (MANZ 1993 B-24, Features 1 and 2).

walls, 3 ft high, that support the roof.

Feature 2 at MANZ 1993 B-24 is a shallow concrete reservoir. It consists of a 32-ft-square slab encircled by wide, low (2-ft-high) curbing. There are two outlets, one on the north and one on the south side of the feature, that may have held wooden sluices. A smaller (10 ft by 6 ft) slab with curbing on the east side of the feature also has two outlets, one on the north and one on the south side.

Feature 3 at MANZ 1993 B-24 is a depression, located south of the pumphouse and west of the

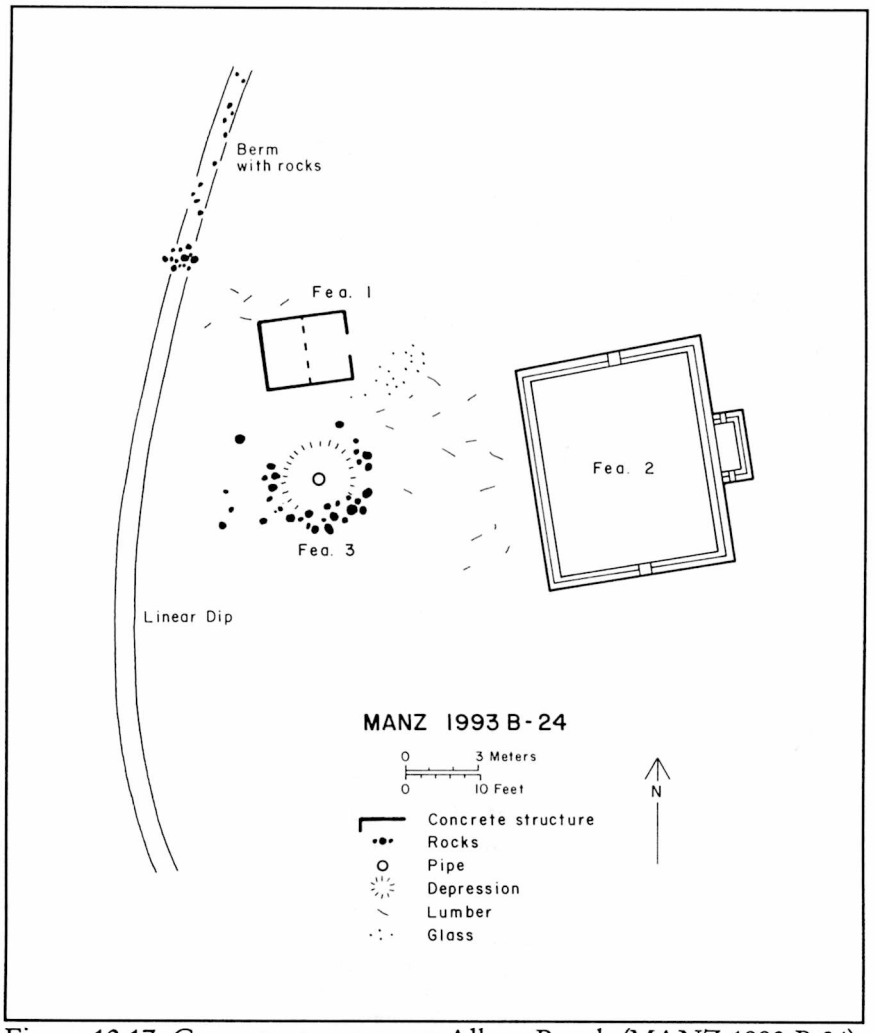


Figure 12.17. Concrete structures at Albers Ranch (MANZ 1993 B-24).

reservoir (Figure 12.17). The 12-ft-diameter depression is ringed with rocks and has a 12-inch-diameter metal pipe protruding into it. It is likely a collapsed well.

Feature 4 at MANZ 1993 B-24 is a linear swale indicative of a buried pipeline. Northwest of Feature 1 it becomes a rocky berm. The dirt ditch (recorded as site MANZ 1993 B-30) that diverted water from George Creek to Bairs Creek cuts through the site from southeast to northwest. Feature 5 consists of alignments of trees planted along the berm of the dirt ditch. Except for one cottonwood tree, all are black locust.

Feature 6 at MANZ 1993 B-24 is a corral formed by wooden posts and barbed wire enclosing an irregular 50 ft by 100 ft area abutting the dirt ditch. The south and west sides of the enclosure utilize trees as fence supports. Feature 7 is a wooden feed trough at the southeast corner of the corral.

Historical artifacts noted in the vicinity of Features 1 and 2 include 20 lumber fragments, 15 window glass fragments, a barrel hoop, a round meat tin, a sanitary seal can, and two small springs. Artifacts immediately north of Feature 1 include three meat tins, two milk cans, a pocket tobacco can, a sanitary seal can, two can lids, a mason jar lid ring, five crown caps, two barrel hoops, a hinge fragment, various pieces of hardware or machine parts, five white glass fragments, 20 aqua glass fragments, and 10 white-ware ceramic fragments.

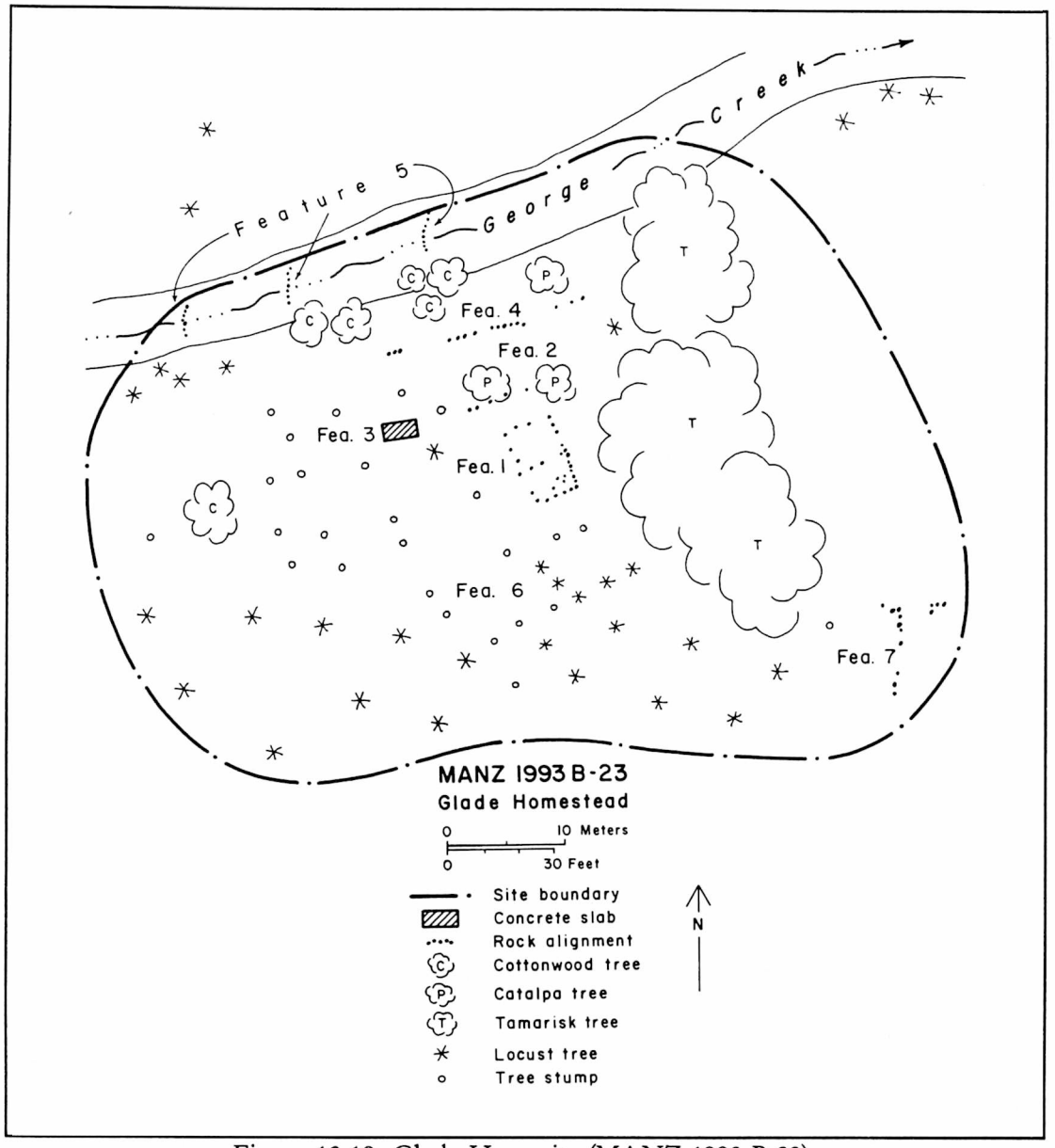


Figure 12.18. Glade Homesite (MANZ 1993 B-23).

Glade Homesite (MANZ 1993 B-23)

Remains at this site, located 1½ miles south of the National Historic Site, consist of a concrete slab, alignments of rock and non-native trees, rock check dams, and scattered artifacts. The site encompasses an area 150 ft north-south by 230 ft east-west on the south side of George Creek.

A building is shown in the general area of the site on the 1907 USGS map, however no structure is indicated on the 1930 LADWP plat map or in the LADWP valuation records. It is possible that the structures were removed prior to the LADWP inventory. Records at the Inyo County Recorders Office indicate that S. B. Akers was the first owner of the property in 1876. By 1905 the land was owned by H. Glade who sold the property to the Los Angeles Department of Water and Power in 1924.

Seven archeological features were identified at the site (Figure 12.18). The wooded site area is heavily used by cattle for shelter. Erosion and subsequent sheet wash have caused much of the

area to be covered with a loose layer of dark brown silty loam which, together with leaf litter and cow dung, make features difficult to discern.

Feature 1 appears to be the remains of a two-room structure. It consists of a rectangle 10 ft by 25 ft (250 square ft) divided in half, formed by rock alignments. The rocks are mostly buried, but a good corner formation was visible under a bush in the southeast corner.

Feature 2 is a 16-ft-long alignment of rocks that incorporates two catalpa trees. East-west trending and partially buried, it is located 10 ft north of Feature 1.

Feature 3 is a broken concrete slab feature that was reinforced with barbed wire and rock. It was originally 7 ft by 8 ft in size (56 square ft) with walls up to 3 ft high.

Feature 4 is a 50-ft-long alignment of small boulders along the creek. Feature 5 consists of three rock check dams in the creek.

Feature 6 consists black locust trees and stumps lining the south and west sides of Feature 1. There is a another group of locust trees west of Feature 1, laid out in four rows. A double line of locust trees runs southeast away from Feature 1, almost to the edge of a road that parallels the south side of George Creek, as if lining a walkway.

Feature 7 consists of disturbed rock alignments beyond the east end of the double line of planted trees (Feature 6).

Artifacts noted at the site during recording included 10 clear glass fragments, three brown glass fragments, a purple glass fragment, 10 whiteware ceramic fragments, a sanitary seal can, and two barrel hoops.

Hay/Kispert Ranch
(MANZ 1994 A-1)

This site consists of an historical ranch with a Native American Indian component (see Chapter 14). The site is located on the south side of George Creek 1¾ miles southwest of the National Historic Site. Noted at the 7.5 acre site were several building foundations, a rock building, a corral, a small trash dump, several small artifact concentrations, scattered artifacts, and a bedrock milling feature.

According to LADWP records the ranch and water rights to one-third of George Creek were purchased in 1924 for $51,500 from Thomas Hay and others. At that time the ranch consisted of 130 acres of cultivated land, 100 acres of pasture, and 170 acres of unimproved land. The LADWP plat map shows two structures and a corral at the site. The LADWP valuation record lists seven structures with a total assessed value of $4,518.00 at the ranch. One of the buildings is noted as in poor condition and the condition of the other structures is not listed.

The listed buildings include a 1,435-square-ft six-room two-story wood frame residence with a sill foundation (Figures 12.19 and 12.20). This residence was listed as salvaged by J. Gorman in 1951. Three structures were noted as built in August 1928: a 1,013-square-ft four-room wood frame residence with a concrete foundation and concrete porch (Figure 12.21), a garage (Figure 12.22), and a pump house (Figure 12.23). These three buildings were partially constructed by the Mt. Whitney packing plant (located 1½ miles southeast of the Hay Ranch along U.S. Highway 395) and completed by LADWP (Werner et al. 1939). The residence was destroyed by fire February 7, 1942.

Other structures included in the LADWP valuation record are a 2,565-cubic-ft stone cellar with a shake roof (Figure 12.24), a 420-square-ft barn with a shake roof, and a shelter (destroyed by fire 2/7/1942). All but the cellar and

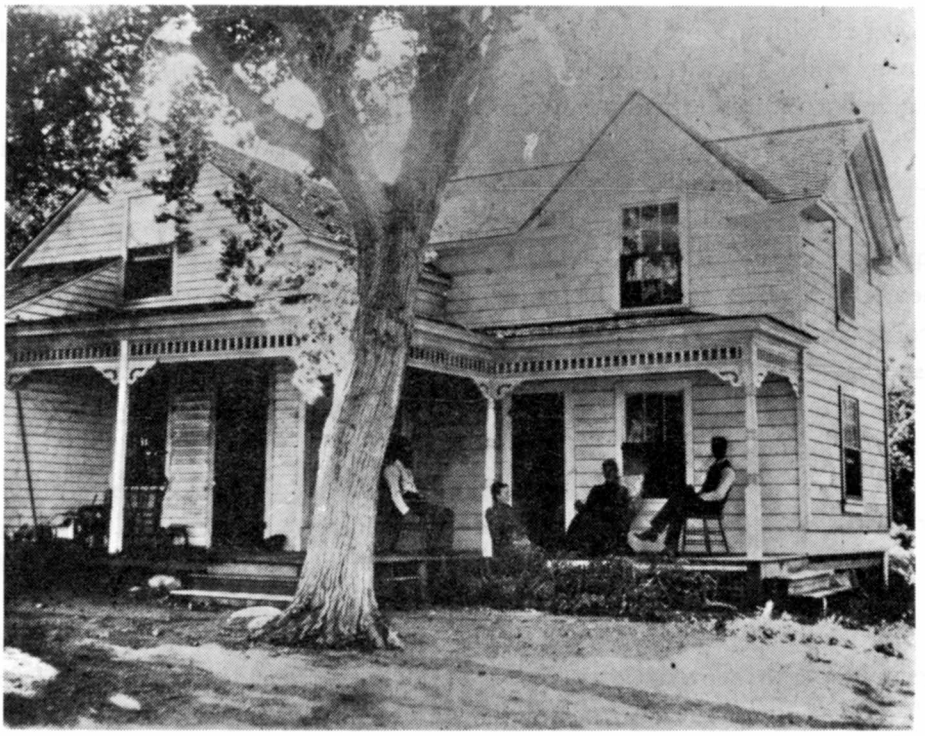


Figure 12.19. Kispert Ranch House, ca. 1890 (courtesy of Eastern California Museum).



Figure 12.20. 1929 photograph of two-story residence at Hay Ranch (courtesy of LADWP Bishop Office).

shelter were wired for electricity. Sometime in the mid- to late-1930s a branding chute, loading rack, and corrals were constructed at the ranch by a lessee (Reynolds) from materials salvaged from the Mt. Whitney packing plant stock yards (Werner et al. 1939).

Eight archeological features, including one associated with Native American Indian use, were designated at the site (Figure 12.25).

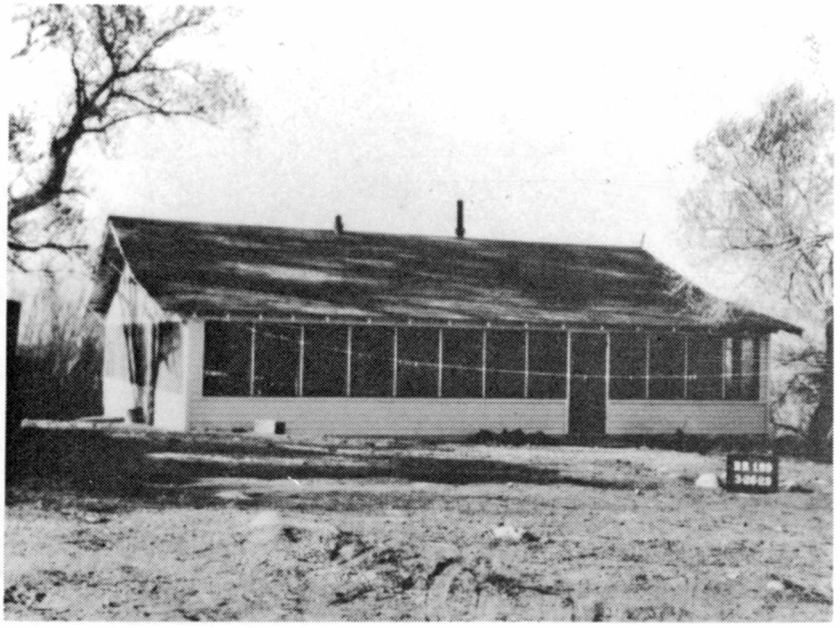


Figure 12.21. 1929 photograph of residence at Hay Ranch (courtesy of LADWP Bishop Office).



Figure 12.22. 1929 photograph of garage at Hay Ranch (courtesy of LADWP Bishop Office).

Features 1, 2, 3 and 4 are located between the south bank of George Creek and a dirt road that parallels the creek. The remaining features are south of the road.

Features 1, 2, and 3 are the remains of the structures built in 1928. Feature 1 is an L-shaped concrete slab measuring 33 ft by 40 ft (Figure 12.26). It is likely the porch mentioned in the description of the four-room residence. Feature 2, a low concrete wall and slab measuring 20 ft by 30 ft, is the garage foundation (Figure 12.27). Feature 3, a concrete perimeter foundation measuring 4½ ft by 6 ft, is the pump house

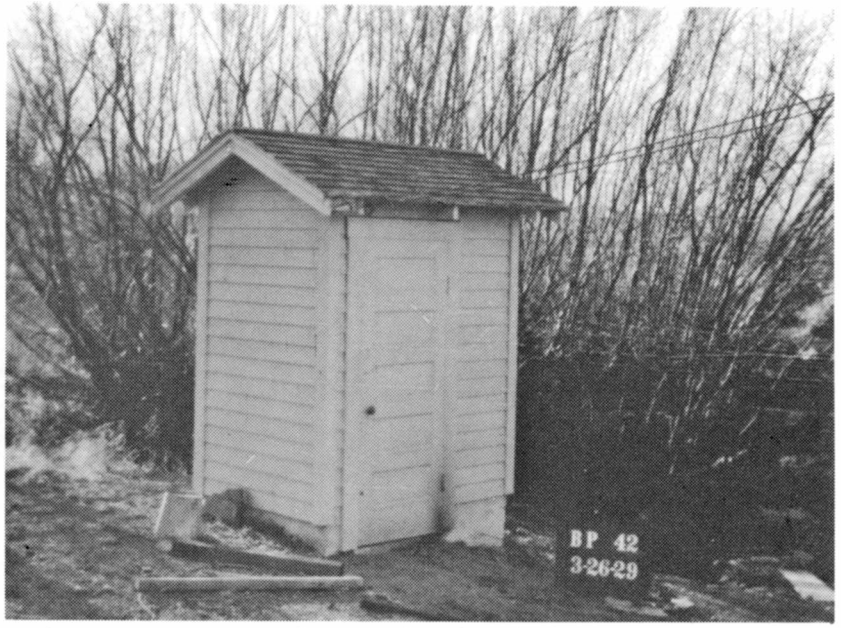


Figure 12.23. 1929 photograph of pumphouse at Hay Ranch (courtesy of LADWP Bishop Office).



Figure 12.24. 1929 photograph of cellar at Hay Ranch (courtesy of LADWP Bishop Office).

foundation.

In the vicinity of Feature 1 there are at least 25 whiteware ceramic fragments (including one with a "Made in Japan" basemark) and a porcelain wiring knob. Artifacts noted at a small dump overgrown by brush on the west side of Feature 2 included at least 20 sanitary seal cans, two shoes, fragments of clear milk bottle glass (including some with "Independence Dairy" in red paint), clear and purple glass fragments, hundreds of white and green ceramics, bolts, tin, a dry cell battery, and lumber fragments.

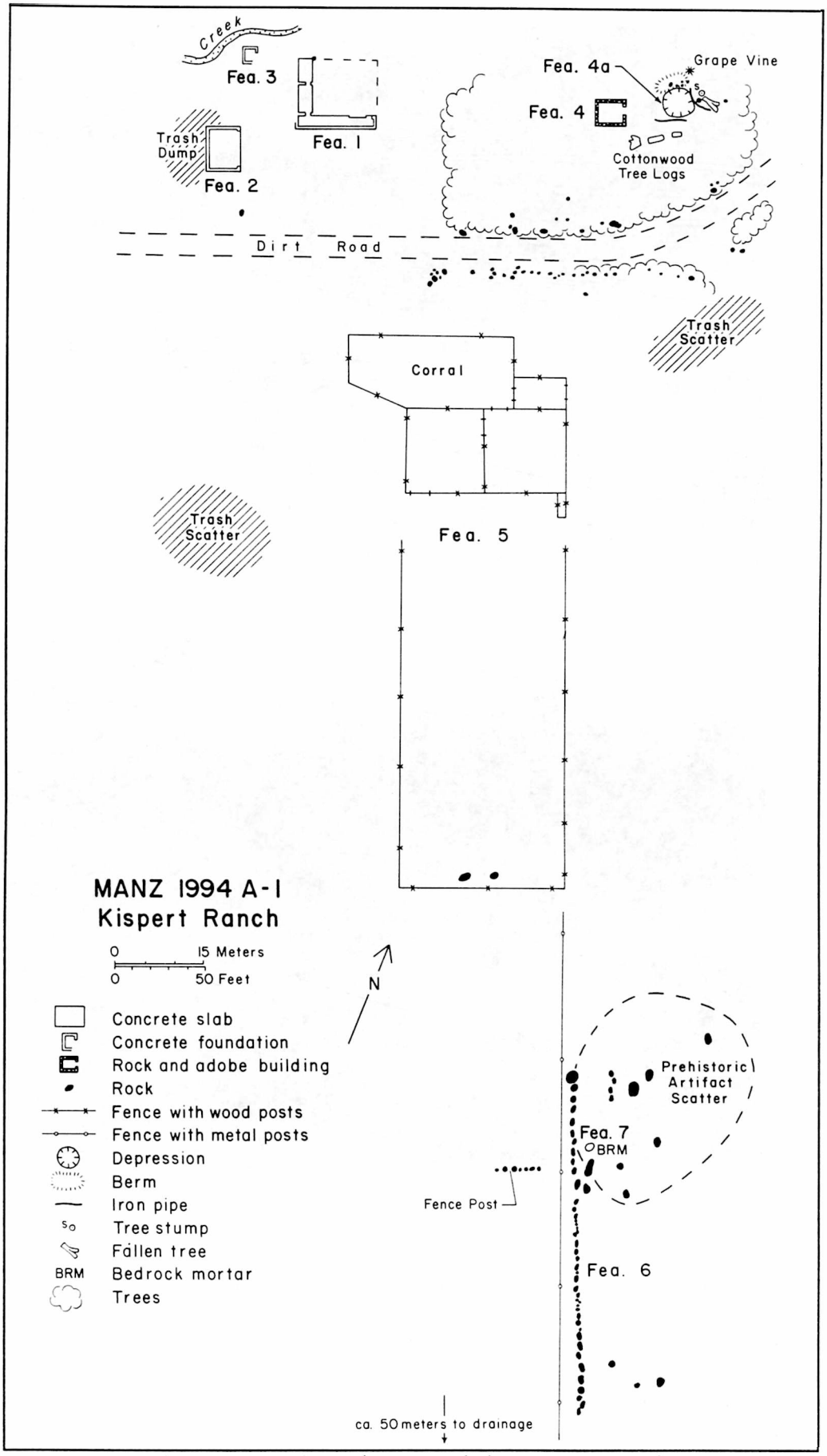


Figure 12.25. Kispert/Hay Ranch (MANZ 1994 A-1).



Figure 12.26. House foundation at Kispert/Hay Ranch (MANZ 1994 A-1, Feature 1).



Figure 12.27. Garage foundation at Kispert/Hay Ranch (MANZ 1994 A-1, Feature 2).

Feature 4 is located 130 ft east of Feature 1, in a dense Tree of Heaven thicket. Feature 4 is a roofless rock and adobe structure measuring 15 ft by 17½ ft by 5 ft high (Figure 12.28). Noted as a stone cellar on the LADWP valuation, it may be the original rock and adobe home built by John Kispert in the late 1870s (Wood 1977b). Feature 4a, adjacent to Feature 4, is a shallow 15-ft-diameter depression. It may be the location of the wood frame Victorian-style residence also built by Kispert (Manzanar Community file, (Eastern California Museum). Around the



Figure 12.28. Cellar at Kispert/Hay Ranch (MANZ 1994 A-1, Feature 4).

depression there is a section of water pipe, several large cottonwood logs, a grapevine, and a sparse scatter of glass and ceramic fragments.

Feature 5 is a currently-used wood corral. Built of wood rails, posts, and barbed wire, it is approximately 100 ft by 150 ft in size. It is likely the corral built by Mr. Reynolds in the 1930s.

Feature 6, south of the corral, is an alignment of large boulders over 200 ft long. Construction of this "wall" is credited to Kispert (Wood 1977b).

Feature 7, south of the corral and east of the rock wall, is a large low boulder with a milling slick and two mortars. The boulder is encircled by a scatter of prehistoric artifacts (see Chapter 14).

Kreider Farm
(MANZ 1993 B-33)

This site, located one-quarter mile north of the National Historic Site, includes a shallow depression, an artifact scatter, and other features in anarea 150 ft north-south by 325 ft east-west.

According to the LADWP plat map the land that includes the site was purchased from Claude M. Kreider in 1924 for $7,000. Kreider's holdings included a 7-acre orchard, five acres under cultivation, and roughly 21 acres of unimproved land. The LADWP plat map shows a powerline ending in the site area. The LADWP valuation records list five structures with a total assessed value of $1,214.00. These include a 985-square-ft three-room concrete residence noted in fair condition (Figure 12.29), a latrine in bad condition, a 127-square-ft concrete cellar in fair condition (Figure 12.30), a 168-square-ft storeroom in poor condition, a corn crib in bad condition, and a chicken house in poor condition. The residence was the only building wired for electricity. The corn crib is listed as moved and the remainder are listed as sold to the Power Operating Division, December 1933.

Three archeological features were designated at the site (Figure 12.31). The site is in fair to poor condition, the main disturbances being heavy sheet wash and impacts associated with agricultural activities of the Relocation Center. Feature 1 is a depression roughly 15 ft square by 3 ft deep (Figure 12.32). The depression is likely



Figure 12.29. 1929 photograph of Kreider Farmhouse (courtesy of LADWP Bishop Office).

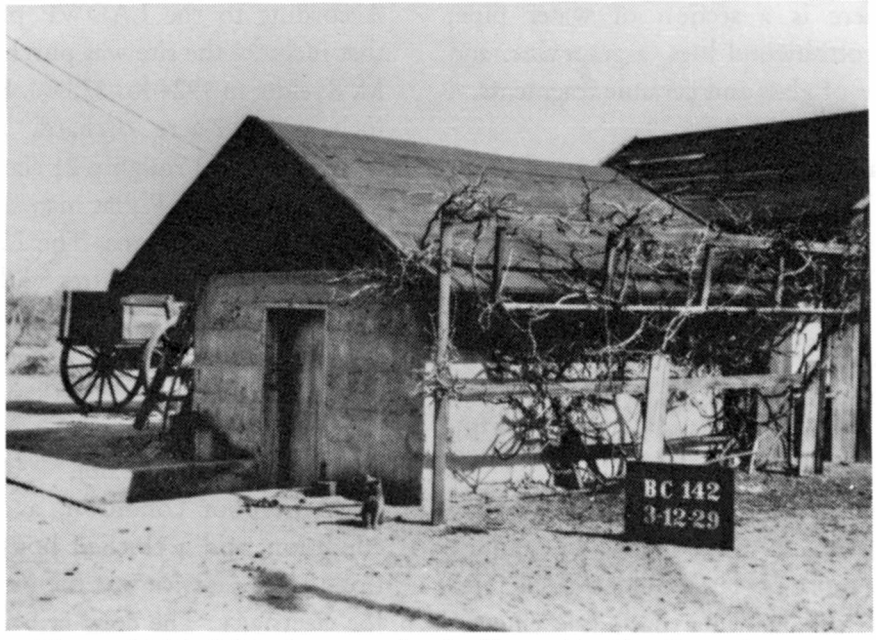


Figure 12.30. 1929 photograph of cellar at Kreider Farm (courtesy of LADWP Bishop Office).

the remains of a basement. Feature 2 is a low rock and concrete wall or curb to the south of the depression. Feature 3 is a concrete and rock culvert and section of exposed concrete pipe parallel to a road trace on the south edge of the site. It is likely at the driveway entrance to the farm.

Metal artifacts noted at the site include enameled kitchenware (two pans, a bowl, and a lid), numerous cans (milk, sanitary seal, meat, spice, and pocket tobacco), iron pipe, smooth wire, metal bits, a crown cap, and seat cushion springs. Non-metal artifacts include thousands of clear glass fragments, hundreds of brown glass frag-

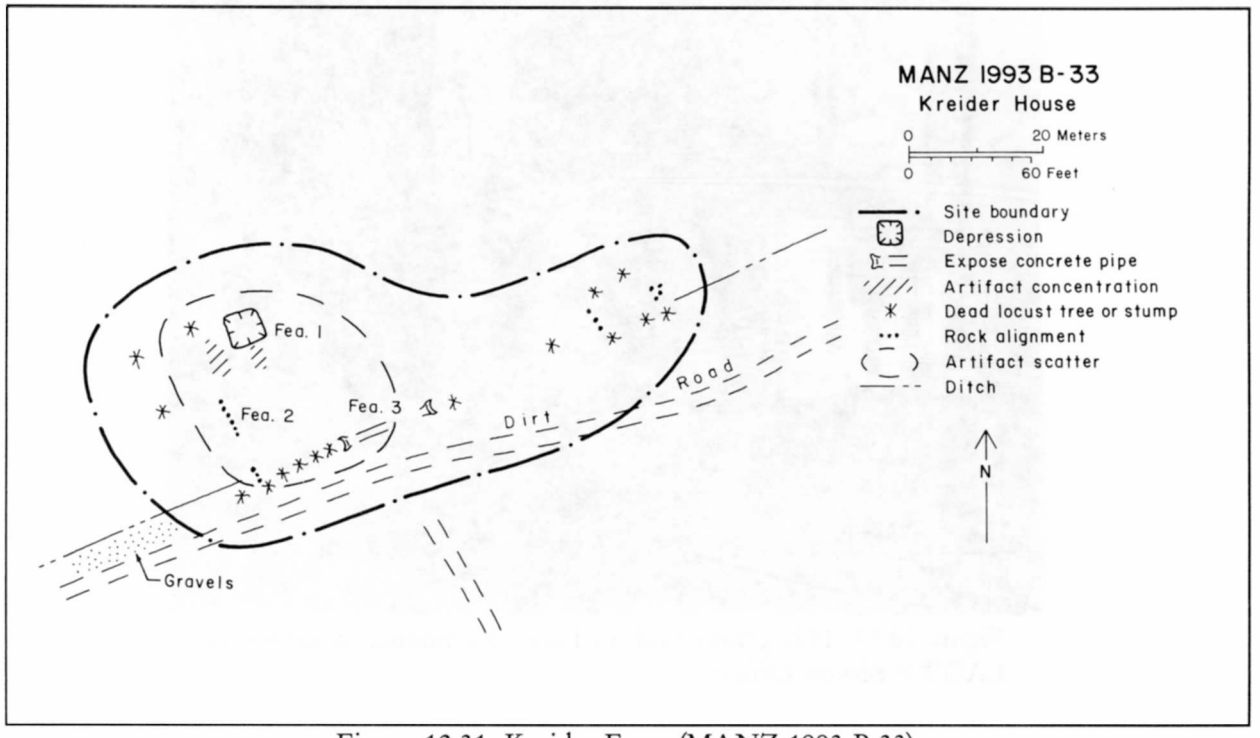


Figure 12.31. Kreider Farm (MANZ 1993 B-33).



Figure 12.32. Depression at Kreider Farm (MANZ 1993 B-33, Feature 1).

ments, and hundreds of purple glass fragments, blue, white, aqua glass fragments, thousands of whiteware ceramics, a black porcelain doorknob fragment, toilet bowl fragments, and rubber bits. Embossed glass includes a purple medicine bottle base with "OPTIMUS," a clear whiskey bottle base with "Federal Law Forbids ..." (1933-1964), and a white glass base with the hallmark of the Hazel-Atlas Glass Co. (1925-1964).



Figure 12.33. 1929 photograph of Lacey Farmhouse (courtesy of LADWP Bishop Office).

Lacey Farm (MANZ 1993 B-22)

This site is located 1 mile south of the National Historic Site on the east side of a dirt road that was once the main north-south Inyo County Wagon Road (Costello and Marvin 1992). Remains recorded at the 8-acre site include ruins of a one-room adobe-mortared rock building, a rock foundation, a well, a dump, and a ditch. Most of the site is on the north edge of a small drainage.

Records at the Inyo County Recorder's Office indicate the land that includes the site was first owned by John Meyer in 1905. By 1910 the property was owned by Anna Marie Lacey who sold it, along with water rights to one-third of George Creek, to LADWP in 1927 for $83,500. Prior to this, when the Manzanar Townsite was subdivided, Lacey exchanged a portion of her land north of the site for adjacent land owned by the Owens Valley Improvement Company.

The Lacy property included 105 acres under cultivation, 360 acres of pasture land, and 54 acres of unimproved land. The 1930 LADWP plat map shows a structure and a rock-lined well at the site location; a corral, corn field, and grain field are indicated to the east. The LADWP valuation lists a 2,289-square-ft nine-room residence with a stone foundation (Figure 12.33), a small bunk house (Figure 12.34), two latrines, a garage, and three sheds (Figure 12.35). Four of the structures are listed as in fair condition, three in bad condition, and one in poor condition. The total assessed value of the structures is listed as $427.00. All were recommended for salvage in 1931. The garage was moved to Independence and the rest were sold to Vieda Pierce for $50.00.

Eight archeological features were recorded at the site (Figure 12.36). It is not entirely clear which feature or features are associated with the structures noted in the LADWP valuation record. For example, Feature 1, a small rock building, is in the general location of the building shown on the LADWP plat map. However, the rock building is not shown in any of the LADWP photographs. The building may have been incorporated into the large wood residence.

Feature 1 is the remains of a one-room rock

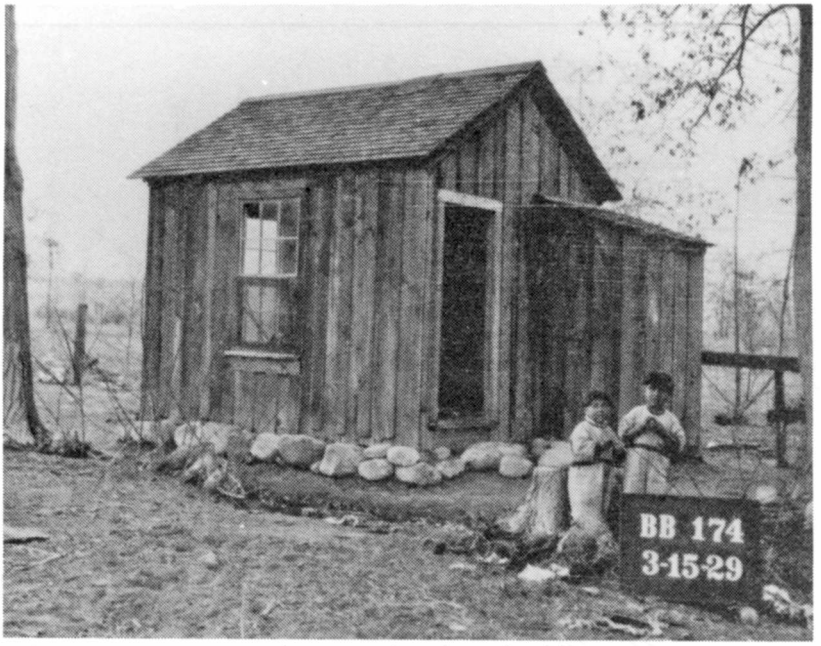


Figure 12.34. 1929 photograph of outbuilding at Lacey Farm (courtesy of LADWP Bishop Office).



Figure 12.35. 1929 photograph of outbuilding at Lacey Farm (courtesy of LADWP Bishop Office).

building mortared with adobe (Figures 12.37 and 12.38). It measures 16 ft north-south by 26 ft east-west (416 square ft). The walls stand from 6 ft to 7 ft high. There is a doorway flanked by two window openings on the south side. There may have originally been windows in the west and east walls. There is a small 16-inch-square opening in the north wall of the structure, probably an opening for a stovepipe. The walls were plastered with adobe, some of which is still intact. The building was constructed in 30-inch courses on a foundation of flat, rectangular rocks. Boards were set into the interior corners of the walls between four of the upper abode

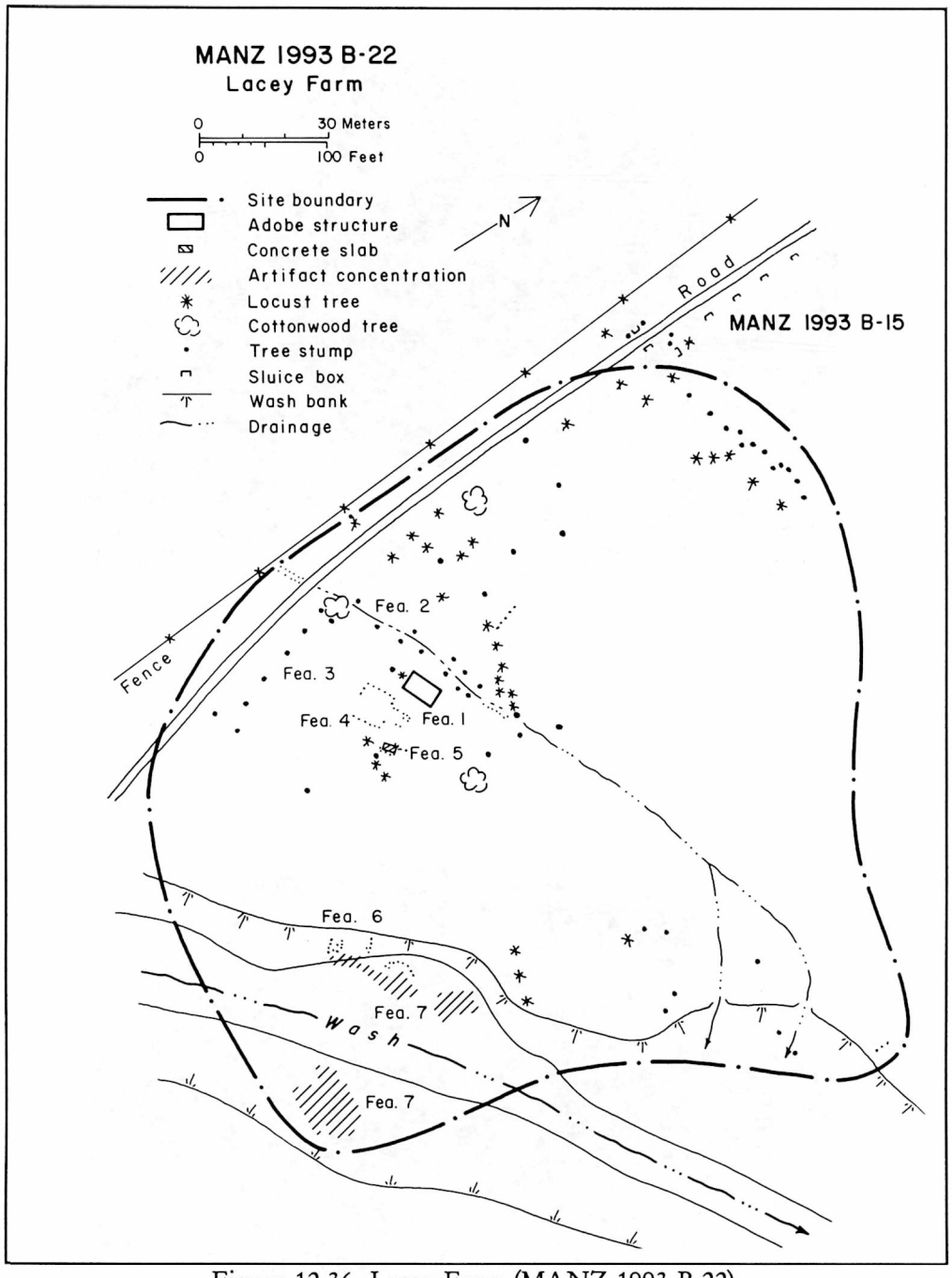


Figure 12.36. Lacey Farm (MANZ 1993 B-22).

block courses to serve as shelves. Two floor-level vents, possibly for a crawlspace, are centered in the east and west walls.

Historical artifacts noted in the vicinity of Feature 1 include hundreds of glass fragments (aqua, purple, clear, brown, olive, light green, white, and window glass), at least 25 fragments of plain and decorated porcelain, a fragment of a china doll's head, stovepipe, three can lids, three soldered seam cans, three sanitary seal cans, a hole-in-top can, five pieces of metal hardware, and about 30 square-cut and wire nails. Some of the artifacts at the site likely relate to the use of farm fields in the surrounding area by the relocation center evacuees: the bottom of a square clear glass bowl found near Feature 1 is the same as others noted at the Relocation Center dump (site MANZ 1993 B-8).



Figure 12.37. Adobe and rock building at Lacey Farm (MANZ 1993 B-22, Feature 1).

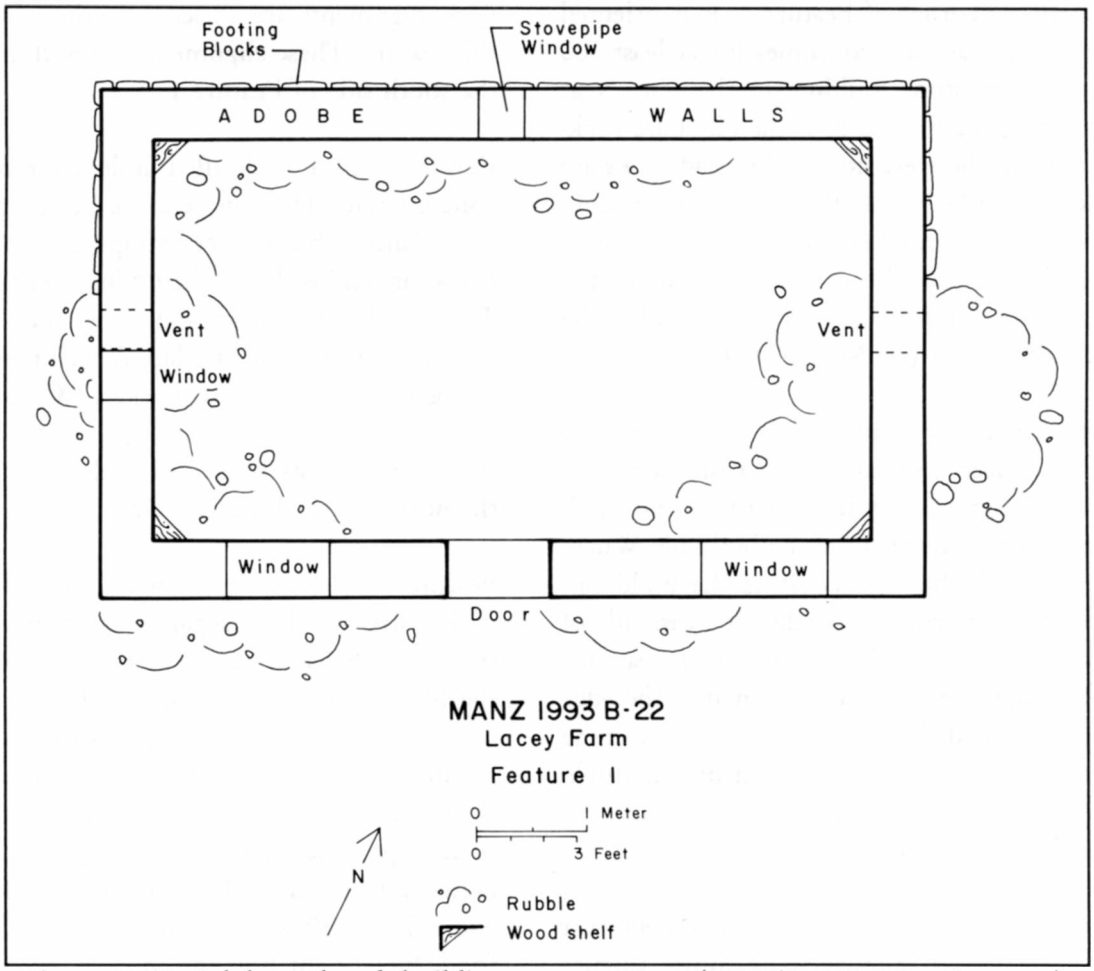


Figure 12.38. Adobe and rock building at Lacey Farm (MANZ 1993 B-22, Feature 1).

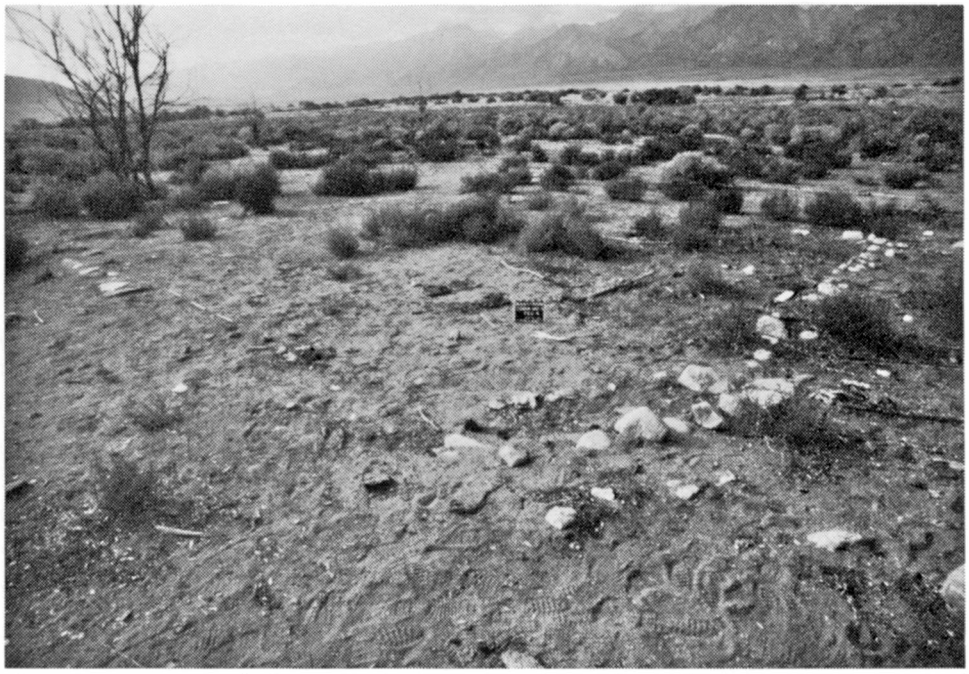


Figure 12.39. Foundation remains at Lacey Farm (MANZ 1993 B-22, Feature 4).

Feature 2 is a ditch that passes within 15 ft of the northeast corner of Feature 1. It is oriented roughly west-east and continues for at least 300 ft beyond the stone building to the east. Near the building the first 30 ft of the ditch are rock-lined and on the west side of the road rocks are visible. It is likely that the ditch was entirely rock-lined and is now silted over. A portion of this ditch may have been re-used as part of the agricultural activities associated with the Relocation Center (see MANZ 1993 B-15).

Feature 3 consists of planted black locust trees forming a large U-shape open to the east. One leg of the alignment follows part of the ditch immediately north of the stone building. Where the trees reach the road (west of the building), the line turns north and borders the east side of the road for about 325 ft. It then turns east for 200 ft. Some trees were also planted at the edge of the wash, and there is a line of stumps lining the east side of the road south from the ditch. These alignments of trees may indicate the former locations of fencelines or fields.

Feature 4 is a 30-ft-square rock alignment that may be a structure foundation or outline (Figure 12.39). Two other indistinct and possibly related rock alignments are adjacent to the east side of this feature. These alignments are within 15 ft of the south side of Feature 1.

Feature 5 is a rock-filled hole overlain by a concrete slab. The concrete was reinforced with miscellaneous bits of metal straps, pipe, and wire. Rocks are embedded in the underside of the slab. Two small bull's-eye-type designs and a "31" are inscribed in the concrete slab. A well is shown in this general location on the LADWP plat map.

Feature 6 consists of eroded rock alignments on the north-facing slope of a wash.

Feature 7 is a dump in the wash 150 ft southeast of Feature 1. Three separate concentrations of trash have been isolated by erosion. Two are at the bottom of the north bank of the wash and one is on the south side of the wash on a raised sandbar. Artifacts noted at the concentrations include about 25 automobile parts, 10 fragments of European ceramics, over 300 glass fragments (aqua, purple, clear, brown, olive, light green, and white), 30 sanitary seal cans (coffee, tea, food, fuel), eight hole-in-top cans, seven pocket

tobacco cans, six barrel hoops, a bucket, a rubber shoe sole, and part of a stove. Artifacts stranded on the sandbar on the south side of the wash included items that were clearly of an earlier date than the rest of the dump. A few of the cans in the dump on the north side of the deposit had holes punched in their bottoms and were possibly used for starting seedlings as at the relocation center (see Chapter 9).

Ten ceramics were collected from the dump; stylistically three dated to the 1880s, and one each dated to 1890-1906, 1928-1948, and the late nineteenth-early twentieth century (see Appendix D). Identifiable hallmarks include Vernon Pottery (California, early 1930s), Tunstall (England), and T & R Boote (England, 1890-1906).

Collected glass artifacts included an aqua packer finish bottle lip, an aqua extract-finish bottle lip, amber brandy-finish bottle lip, two purple prescription-finish bottle lips, a small rectangular bottle with a plastic cap embossed with "CUTEX" (a Northam Warren Corp. trademark, 1912+), and three embossed pieces. The embossed pieces include an aqua front panel with "DR ..ILMERS SWAMP-ROOT KIDNEY LIVER & BLADDER CURE (Dr. Kilmer and Company, mid 1870s-ca. 1906)", a round white glass container with "DAN-DRUFF...", and a purple side panel with "...HAR-MAC..."

Feature 8 is a short alignment of rock, a metal pipe segment, and a fragment of upright wood that could be the remnants of a corral or some other structure.

Lennington Farm (MANZ 1995 A-2)

This site, the remains of a home associated with the town of Manzanar, is located 1¾ miles north of the National Historic Site. It consists of structural remains and scattered artifacts in a 2¾-acre-area west of U.S. Highway 395. Sheet wash and gully erosion have eroded portions of the site and most structural material has been removed.

According to the LADWP plat map, the property that includes the site was purchased from Baltrus R. Lennington in 1924 for $3,000. Of the roughly 41 acre parcel, 10 acres was an orchard and the rest was unimproved. The plat map shows a road crossing the site and a powerline ending at the site. The LADWP valuation record has no information on this property. Five features and five artifact concentrations (Loci A-E) were recorded at the site (Figure 12.40).

Feature 1 is a concrete basement partially filled with rubble (Figure 12.41). With walls 8½-inches thick, it measures 10½ ft by 7 ft, with a 3½ ft by 6½ ft extension on the east side (likely entry steps). Feature 2 is a 10 ft by 12 ft divided rectangle formed by rock alignments. There is a cut post in one corner and large rocks along the west side. Feature 3 is an 8-ft-diameter depression, a little over 1 ft deep. Feature 4 consists of two imbedded posts, 10 ft apart, cut flush to ground. Feature 5 consists of two small boulders about 20 ft apart.

Artifacts noted at Locus A were a pocket tobacco tin, a paint can, two other cans, a barrel hoop, and barbed wire.

Artifacts at Locus B include 15 sanitary seal cans, 30 milk cans, 15 pocket tobacco tins, two sardine cans (embossed with Norvège), wire nails, miscellaneous hardware, 50 aqua glass fragments, 50 clear glass fragments, 40 brown glass fragments, a few purple glass fragments, and a small clear vial (2¼ inches tall by 1/2-inch in diameter). Embossed glass includes "...EINZ CO 57" with the Owens Bottle Co. trademark (1911-1929), a "C" basemark, a small brown medicine bottle base with "C W C CO," a purple medicine bottle fragment with "QUALITY ...URITY" on the front and "BLUE RIBBO.. 7" (a Standard Glass Co. trademark, ca. 1920-1930) on the base, and a brown side panel with "HOSTE... ...OMACH

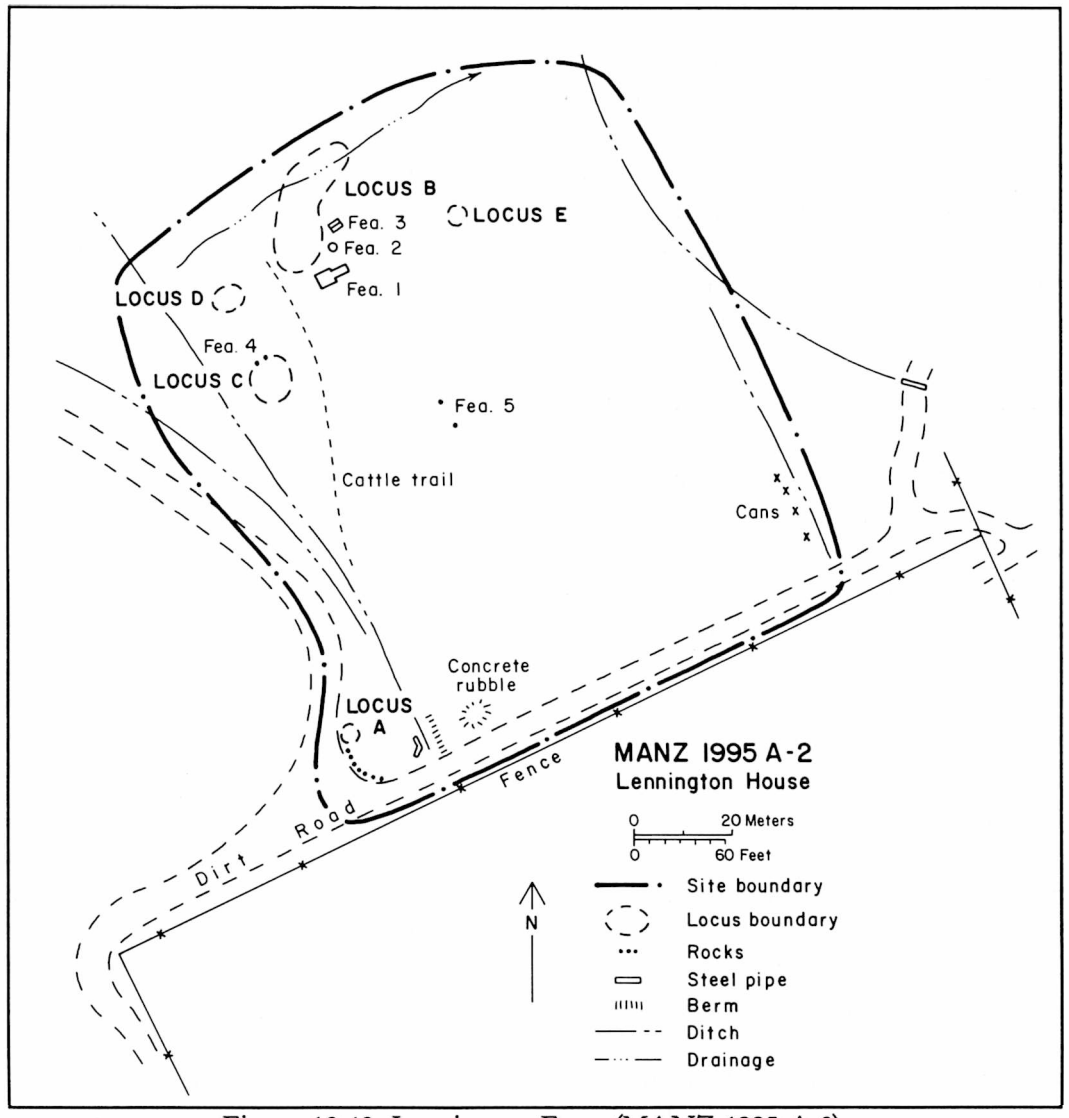


Figure 12.40. Lennington Farm (MANZ 1995 A-2).

BITTER..." (likely Hostetters Stomach Bitters, ca. 1858-1954).

Locus C includes hundreds of wire nails, 4 barrel hoops, a few lumber fragments, 20 crockery jug fragments, a purple glass fragment, 2 whiteware ceramic fragments, a transferware ceramic fragment with a purple floral pattern, a sardine can, smooth wire, miscellaneous small hardware, an automobile dashboard light bulb base, and a window screen fragment.

Noted at Locus D were lumber fragments, a nut and bolt, two types of chicken wire, and barbed wire.

Locus E, a low mound and depression, included two sanitary seal cans and a small aqua glass vial base 1/2-inch in diameter (similar to a clear vial found at Locus B).

Scattered artifacts noted in other areas of the site include a green glass champagne bottle base and scattered milk cans, glass fragments, and wire nails.

Metzger/Correll Property (MANZ 1993 B-35)

This site includes a concrete perimeter foundation (Feature 1), a dirt berm and swale (Feature 2), and four artifact concentrations (Features 3-

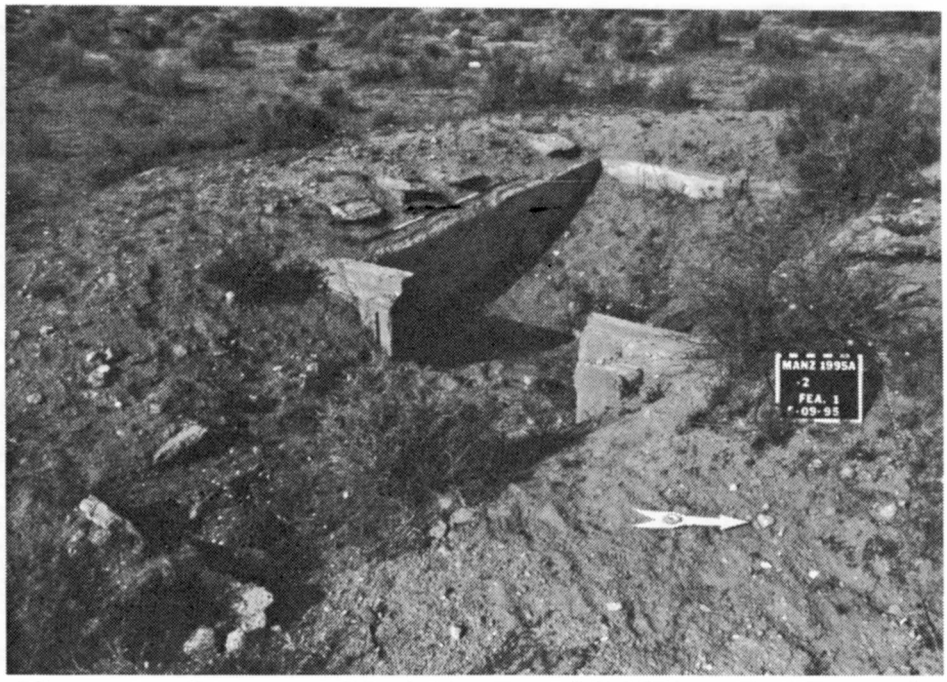


Figure 12.41. Basement at Lennington Farm (MANZ 1995 A-2, Feature 1).

6), located 1 mile north of the National Historic Site. The 3½-acre-site, bisected by roads and an irrigation ditch used by the relocation center, is likely associated with the town of Manzanar.

According to LADWP plat maps, the site overlaps parcels once owned by the Owens Valley Improvement Company, P. Correll, and J.S. Metzger. LADWP bought the Metzger parcel in 1927 for $12,000, at which time the entire 30-acre parcel was under cultivation. The adjacent parcels were purchased in 1929. Other than a concrete pipeline, the plat map depicts no improvements at any of the parcels; it simply designates the area as "brush." But, for the Metzger parcel the LADWP valuation lists two buildings, an old concrete cellar (161 square ft) in good condition but with the roof gone and a wood frame bunk house (120 square ft) in poor condition. The bunk house had no assessed value and the concrete cellar has an assessed value of $65.00. Both were recommended for disposal in November 1933.

Feature 1 is a 13 ft by 16 ft concrete perimeter foundation with protruding bolts (Figure 12.42). There is an upright capped 12-inch-diameter metal pipe at the southeast corner of the foundation. A dead black locust tree stands 15 ft south of the foundation. Feature 2, a berm and swale, may be the remnants of a town pipeline salvaged by the relocation center.

Artifacts at Feature 3 include a corroded battery, three barrel hoops, over 50 cans (oval meat, milk, spice, crimped seam food), three enamel pans, 10 decorated ceramics, a bucket, a fragment of a cheese grater, an automobile body part, 10 other automobile parts, 30 glass fragments (clear and purple), and two homemade "watering cans" (Figure 12.43).

Artifacts at Feature 4 include 12 brown glass fragments, 10 clear glass fragments, 10 aqua glass fragments, two purple glass fragments, a pocket tobacco can, a sanitary seal can, two square cans, a barrel hoop, barbed wire, and small bits of decomposing metal and rubber.

Feature 5 artifacts include a coffee can, a watering can, and a piece of 2-inch-diameter metal pipe.

Artifacts at Feature 6 include ceramic water pipe

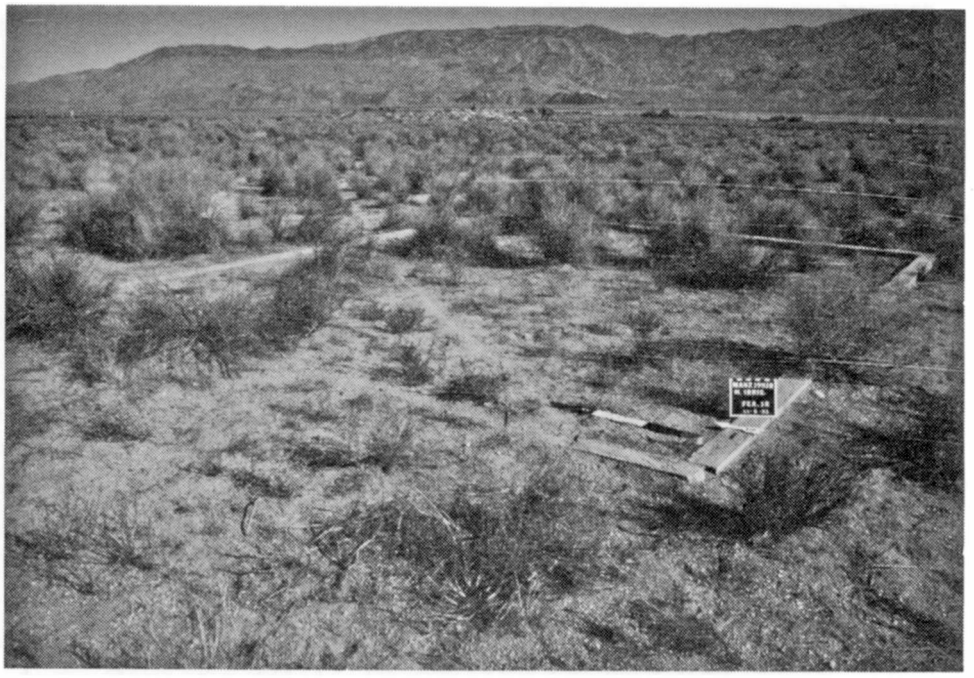


Figure 12.42. Foundation at Metzger/Correll property (MANZ 1993 B-35, Feature 1).



Figure 12.43. Trash scatter at Metzger/Correll property (MANZ 1993 B-35, Feature 3).

fragments, a corroded battery case, 15 crockery fragments, a barrel hoop, 20 cans (small and large food, pocket tobacco, milk, large drum), glass fragments (white, purple), and a coffee pot spout.

Paget Farm (MANZ 1993 B-16)

Located just south of the National Historic Site on the south bank of Bairs Creek, remains recorded at this 2½-acre-site include an aban-



Figure 12.44. 1930s oblique aerial view of Paget Farm.

doned orchard, other historical vegetation, an underground structure, a dump, and a scatter of historical artifacts.

At the site location, buildings, an orchard, and other features are clearly visible on a 1931 oblique aerial photograph of the town of Manzanar (Figure 12.44); a road and powerline are shown leading to the property on the 1930 LADWP plat map. LADWP records indicate Ralph Spencer Paget sold the property to LADWP in 1924 for $40,000. The Paget property included 60 acres of orchards (pear and apple), 20 acres of alfalfa fields, and 23½ acres of brush. According to records at the Inyo County courthouse, the property was first patented by W.L. Hunter in 1900. It was owned by John Baxter in 1911 prior to being bought and subdivided by the Owens Valley Improvement Company. Paget, an English diplomat, only visited the farm occasionally. He left the day-to-day operation of the farm to two German caretakers (Manzanar Community file, Eastern California Museum).

The LADWP valuation record lists five structures with a total assessed value of $479.00. These include a 676-square-ft wood frame residence with a sill foundation and indoor plumbing (Figure 12.45), a 171-square-ft wood frame bunk house with a garage and pit in the north end (Figure 12.46), a latrine (Figure 12.47), a 182-square-ft concrete cellar with a concrete floor and roof (Figure 12.48), and a corral with a 6 ft by 8 ft rabbit hutch (Figure 12.49). Also included in the record are seven portable rabbit hutches. The residence, bunk house, and one of the rabbit hutches were wired for electricity. The cellar is listed as in good condition, the corral in fair condition, and the remainder in bad or poor condition. All were sold to Russell T. Hatfield in November 1933 for $40.00.

No building foundations could be identified at the site. The area was apparently cleared before it was re-used by the relocation center for farm fields. A relocation center irrigation ditch cuts through the site and the orchard was likely cared for by the internees (Figure 12.50).

Feature 1 is a 65-ft-long east-west alignment of dead black locust trees that once likely lined an entry road to the farm.



Figure 12.45. 1929 photograph of residence at Paget Farm (courtesy of LADWP Bishop Office).



Figure 12.46. 1929 photograph of outbuilding at Paget Farm (courtesy of LADWP Bishop Office).

Feature 2, the cellar photographed by LADWP (see Figure 12.48), is an underground concrete structure measuring 6 ft by 7 ft (42 square ft) at the top (Figure 12.51). The roof extends 10 inches above the ground surface on the east side and 30 inches above ground on the west side. There is an opening on the west end and wood over part of the opening that may have been part of a door frame. The roof of the structure is vaulted and formed of concrete. There is a small segment of 2-inch-diameter metal pipe incorporated into the roof, possibly for ventilation.

Artifacts noted in the vicinity of Feature 2



Figure 12.47. 1929 photograph of latrine at Paget Farm (courtesy of LADWP Bishop Office).



Figure 12.48. 1929 photograph of cellar at Paget Farm (courtesy of LADWP Bishop Office).

include 15 wire nails, five lumber fragments, some drywall fragments, over 40 glass fragments (brown, purple, aqua, clear, and white), 35 porcelain fragments (some with designs), six cans (including one hole-in-top), at least 30 window glass fragments, two batteries, 10 pieces of miscellaneous metal hardware, and three crown caps.

Feature 3, once an orchard, consists of about 25 dead pear trees and stumps.

Feature 4 is a dump 500 ft east of Feature 2 at the edge of Bairs Creek. Artifacts in the dump



Figure 12.49. 1929 photograph of outbuilding at Paget Farm (courtesy of LADWP Bishop Office).

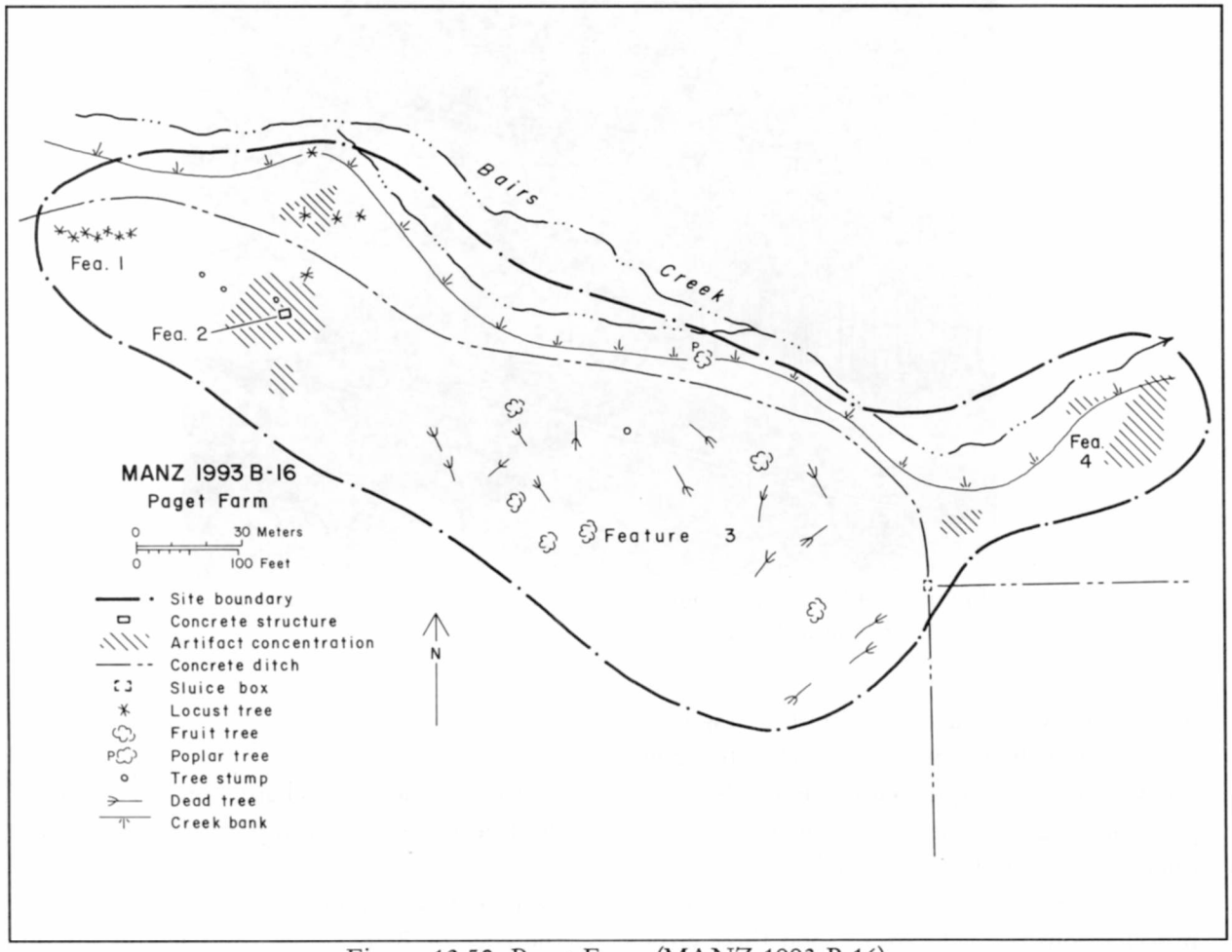


Figure 12.50. Paget Farm (MANZ 1993 B-16).

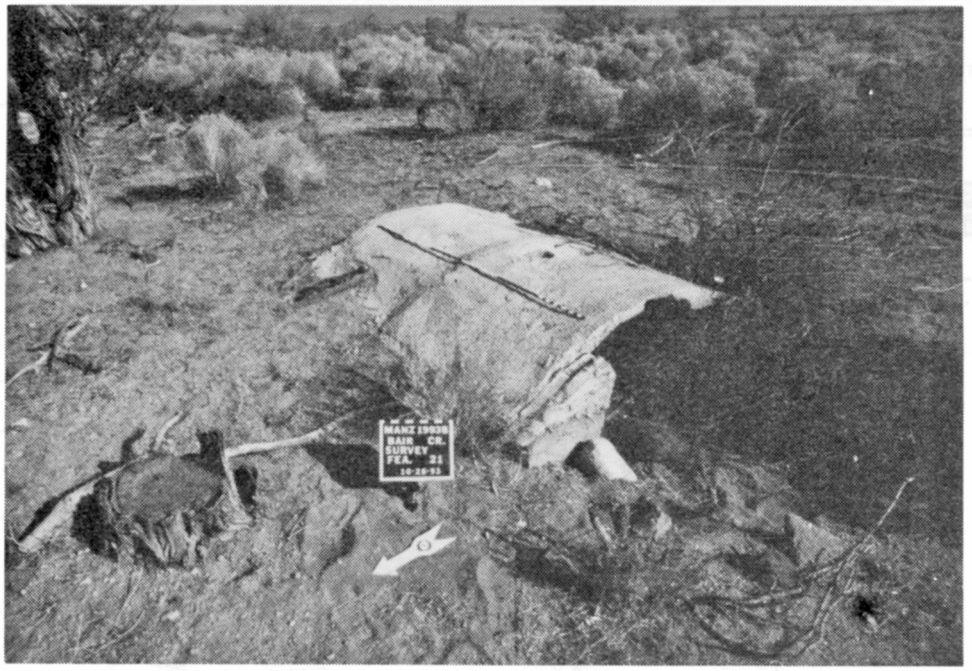


Figure 12.51. Cellar at Paget Farm (MANZ 1993 B-16, Feature 2).

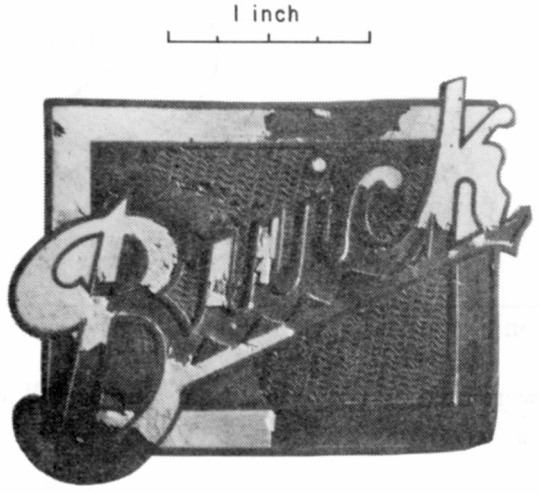


Figure 12.52. Buick logo found at Paget Farm dump (MANZ 1993 B-16, Feature 4).

include about 30 automobile parts (fenders, a Buick logo plaque, a windshield frame and glass, head and tail light fragments, and many other unidentifiable fragments), 20 cans (beverage, pocket tobacco, and fuel), a bucket, an enameled cooking pot and pan, 20 glass fragments (purple, aqua, and clear), nine crown caps, bits of balled-up wire, 10 short boards (likely from the nearby relocation center ditch), 12 fragments of glazed ceramic water pipe, and bits of screen.

Some of the artifacts in the dump may be associated with the relocation center, rather than the Paget Farm. The Buick logo (Figure 12.52) is similar to one recovered from an archaeological site at Mammoth Lakes (Burton 1994b:Figure 4.2). Associated material at that site dated to the 1950s. The dimensions of measured milk cans at the Feature 4 dump ($2^{8}/_{16}$ inches diameter by $2^{6}/_{16}$ inches high) indicate the manufacturing date of the cans was sometime between 1917 and 1930. Collected ceramics indicate a ca. 1930s to early 1940s date (see Appendix D). The metal frame of a baby buggy west of the dump may be associated with this site.

Utilities

Outside the boundary of the National Historic Site, 17 sites contain features classified as town-era utilities. In lieu of clear associations between features and temporally diagnostic artifacts, the classification of the various features to the town-era was based primarily on LADWP and WRA records. All of the sites, except a wooden bridge (MANZ 1993 B-14), are related to water delivery. One of the sites

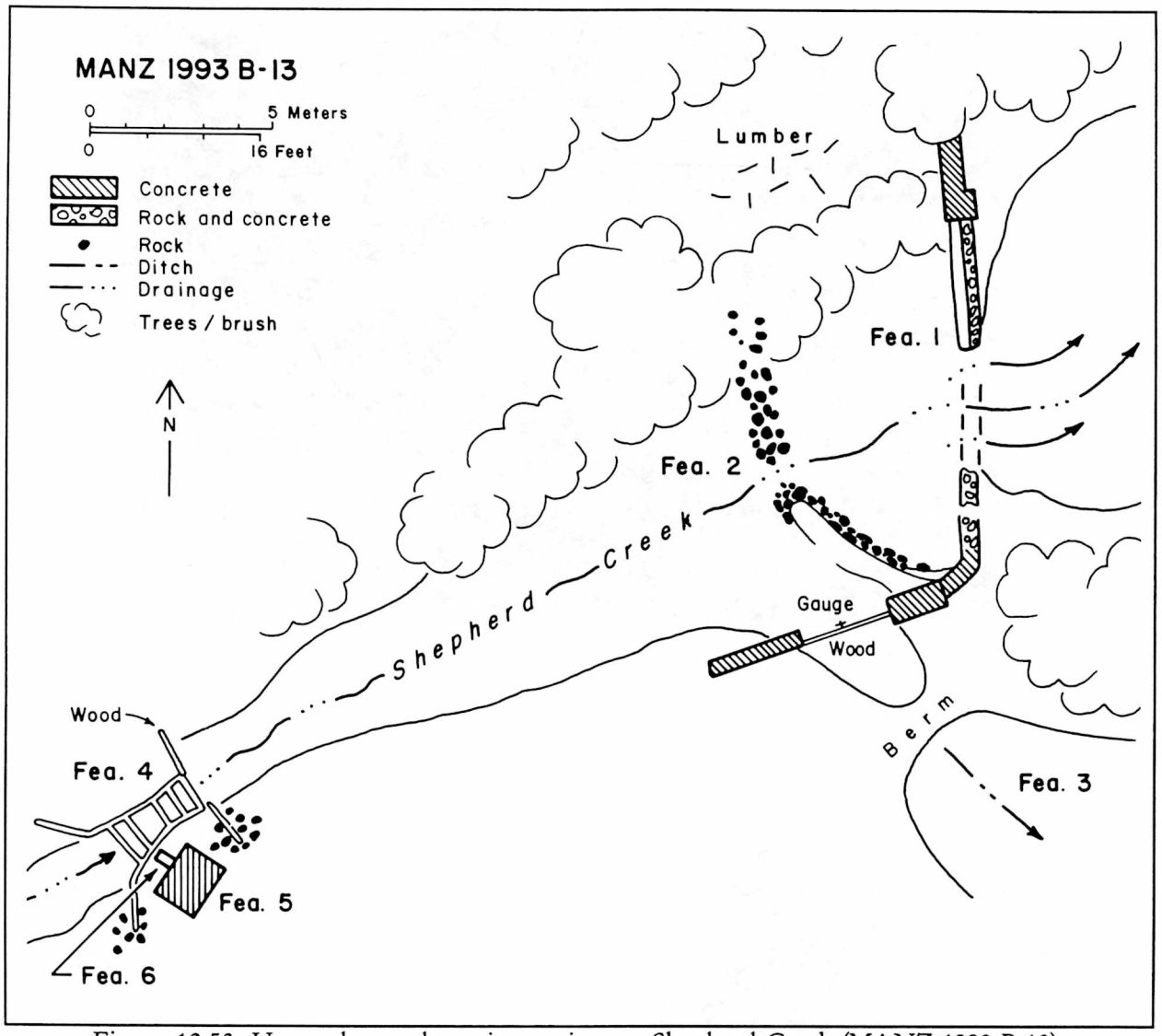


Figure 12.53. Upper dam and gauging station on Shepherd Creek (MANZ 1993 B-13).

and a component of another are wells, five are connected with Shepherd Creek, four are connected with Bairs Creek, and five are connected with George Creek.

Shepherd Creek

Shepherd Creek, one-half to three-quarters of a mile north of the National Historic Site, was the primary water source of both the relocation center and town of Manzanar water systems. Recorded features associated with the town water system include four dams, two pipeline systems, a concrete ditch, an unlined ditch, several concrete weir boxes, and an inscribed boulder. Several of these features were used by the relocation center as well as the earlier town.

Upper Dam (MANZ 1993 B-13)

This site consists of a gauging station, a dam, and a ditch on BLM land used by the Manzanar Relocation Center and town of Manzanar water systems. The dam is located 1¾ miles northwest of the National Historic Site at an elevation of 4460 ft. Six features were designated at the site (Figure 12.53); no associated artifacts were noted.

Feature 1 is a concrete dam, 35 ft long and 7 ft high. The center portion of the dam has been

broken out to allow the stream to flow unimpeded. Feature 2, upstream of the concrete dam, is a low curving 30-ft-long submerged barrier of piled rock. This feature is likely not very old and may be associated with LADWP water-spreading activities.

Feature 3 is an earthen ditch on the south side of the creek that diverted water from the dam to the town water system intake dam (MANZ 1993 B-29) and to the relocation center reservoir. A wooden sluice frame, with a metal depth gauge fastened to its vertical center support, is still intact in the middle of the ditch where it turns from the creek. The ditch outlet has been modified by LADWP to allow water to be spread from the creek during periods of high runoff.

Features 4 through 6 are located 65 ft upstream of the concrete dam. Feature 4 is a wooden weir box measuring 13 ft long with rock and wood retaining walls at both ends. Feature 5, adjacent to the weir, is a small corrugated tin building measuring 5 ft by 7 ft by 7 ft high with a shed roof. A large metal pipe imbedded in a concrete slab is all that remains of a gauge that was once housed in the shed. Feature 6, located between the weir and the shed, is a 12 inch by 20 inch wood gauging box with a hinged lid.

The antiquity of the various features at the site is not known. However, in one form or another, their original use likely dates to at least the founding of the town of Manzanar. Interestingly, the 1907 USGS map calls the Feature 3 ditch Shepherd Creek, rather than the present Shepherd Creek drainage.

Middle Dam
(MANZ 1993 B-25, Feature 1)

This site is located on BLM land 1¼ miles downstream from the upper dam at an elevation of 4100 ft. The dam consists of two concrete barriers 6 inches thick and approximately 4 ft high. One, about 20 ft long, is across the creek and the other, on the north side of the creek, forms a connected wing wall 12 ft long. The barrier across the creek has a central 8½-ft-wide opening for a sluice gate and the wing wall has a 3-ft-wide opening. The wing wall sluice gate diverts the creek flow into a concrete-lined pool that in turn feeds a buried pipeline. About 40 ft downstream there is another smaller concrete barrier that likely diverted water to a ditch. That barrier measures approximately 14 ft long, 4½ ft tall, and 6 inches thick. It has a central opening for a sluice gate 30 inches wide. The age of these various features is not clear. The buried pipeline and much of the concrete reinforcement appears to be rather recent.

Lower Dam
(MANZ 1993 B-12, Feature 1)

At an elevation of 3970 ft, this dam is one-third of a mile downstream from the middle Shepherd Creek dam. The dam diverted water into two rock and concrete ditches, one on either side of the creek. The ditches fed relocation center agricultural fields, but it is likely that the dam itself is a town-era construction. Its height has been raised 18 inches by a concrete wall. Where the central portion of the dam is buried there is an 18-inch-high irregular rock and concrete wall offset from the dam alignment. The concrete used in these additions is notably darker and of a different texture than the dam itself and probably dates to the relocation center-era.

The dam itself measures approximately 46 ft across and 4 ft high. The central and southern portions of the dam are buried by stream deposits. The 12-inch-thick concrete dam had two sluice gates, one 3 ft wide on its north side and one 4 ft wide to allow water back into the streambed. The north sluice gate is connected to a concrete- and rock-lined ditch that brought water to the relocation center fields. A similar ditch is on the south side of the creek, but its connection to the dam is apparently buried.



Figure 12.54. Town Intake Dam (WRA photograph, National Archives).

Town Water System Intake Dam (MANZ 1993 B-29, Feature 12)

MANZ 1993 B-29 consists of the Manzanar Relocation Center reservoir and associated features (see Chapter 10), but includes a modified dam (Feature 12) originally constructed for the town of Manzanar water system. The dam is located on BLM land at an elevation of 4100 ft.

The dam spans the town's main ditch, now an ephemeral drainage. The 1907 USGS map shows the drainage as the main course of Shepherd Creek, but now it flows only when water is diverted from Shepherd Creek as a result of LADWP water-spreading activities.

All of the area behind the dam, noted as the "old reservoir" on relocation center blueprints, has silted in. The dam is on the 1930 LADWP plat map, and a photograph in the Manzanar Free Press (March 20, 1943) credited as courtesy of the *L.A. Daily News*, shows "the old dam below the reservoir." There is also a WRA photograph of the dam that notes a larger reservoir is under construction (Figure 12.54).

The dam measures approximately 50 long by 4 ft high (Figures 12.55 and 12.56). It has a central spillway and apparently originally had two concrete weir boxes on each end connected to concrete pipelines, one to carry water to the north and one to carry water to the south. Portions of the old concrete pipelines north and south of the dam are still in place (see below). The central spillway has been modified to connect to a concrete ditch (MANZ 1993 B-25, Feature 2) and the southern weir box was completely replaced to serve the relocation center. The dam and original northern weir box are of light brownish gray concrete, the newer southern weir box and a plug in the northern weir box inlet are of gray concrete.

The new southern weir was apparently built in 1942 by LADWP when they constructed a steel pipeline and water storage tank to serve the relocation center (Merritt 1946). Its use was likely discontinued when a much larger concrete

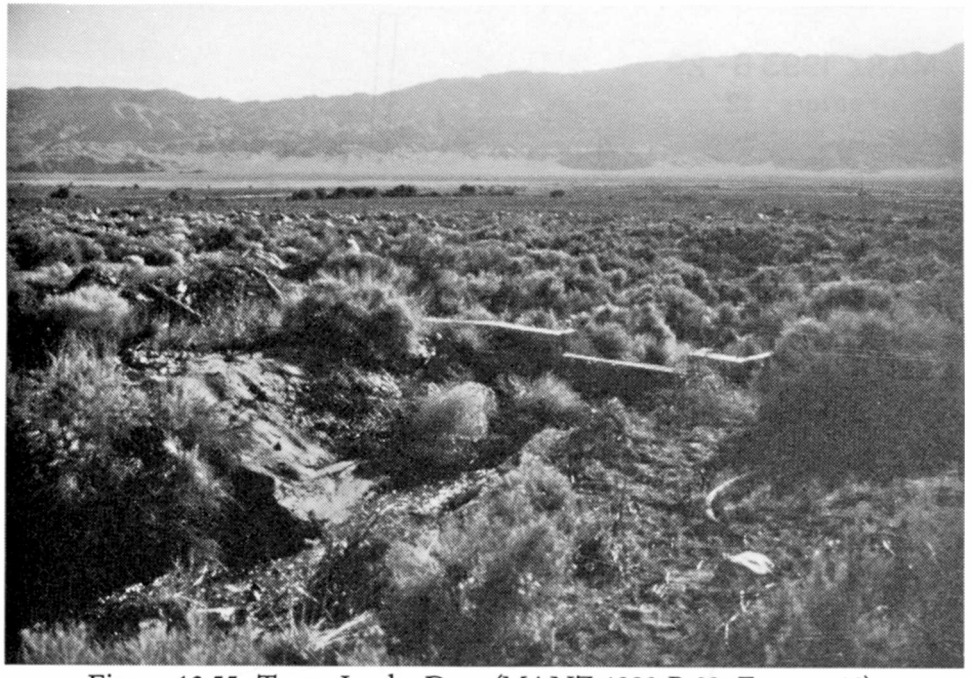


Figure 12.55. Town Intake Dam (MANZ 1993 B-29, Feature 12).

reservoir was completed upstream (see Chapter 10).

LADWP Ditch
(MANZ 1993 B-25, Feature 2)

Feature 2 at MANZ 1993 B-25 is a rock- and concrete-lined ditch. The ditch was apparently built by LADWP in the late 1920s to replace the northern pipeline of the town water system. The ditch is featured in an article on Manzanar in the *Los Angeles Times* "Farm and Orchard Magazine" (Finlay 1926).

The ditch begins at the town intake dam, heads north one-quarter mile, and crosses Shepherd Creek just west of the middle Shepherd Creek dam. Between the intake dam and Shepherd Creek there are two flumes that span shallow washes (Figure 12.57). One is metal with wood supports and the other, now partially collapsed, is concrete with concrete and rock supports (Figures 12.58 and 12.59). A third concrete flume once spanned Shepherd Creek. North of the creek the ditch continues one-half mile and ends at a shallow intersecting drainage. Portions of the concrete ditch have been silted in or washed out, but on the whole the ditch is in good condition (Figures 12.60 and 12.61). North of the creek there are two concrete weir boxes along the ditch, one 175 ft north of the creek and the other at the end of the ditch (Figure 12.62). Water was routed to the east from these boxes via buried concrete pipes. Just beyond the end of the ditch, is another box, from which a buried pipeline heads north.

Northern Town Water System Pipeline
(MANZ 1993 B-25, Feature 3)

Feature 3 at MANZ 1993 B-25 is a partially buried concrete pipeline that parallels the LADWP ditch (MANZ 1993 B-25, Feature 2). The ditch crosses the pipeline route in several areas and apparently replaced the pipeline. The concrete boxes along the LADWP ditch appear to have been originally part of this pipeline.

The age of the Feature 3 pipeline is suggested by an adjacent feature. Where the pipeline crosses Shepherd Creek there is a large 4-ft-high boulder plastered with a thin layer of cement and inscribed while wet with several names, initials, an April 1919 date, and the phrase "headmen of

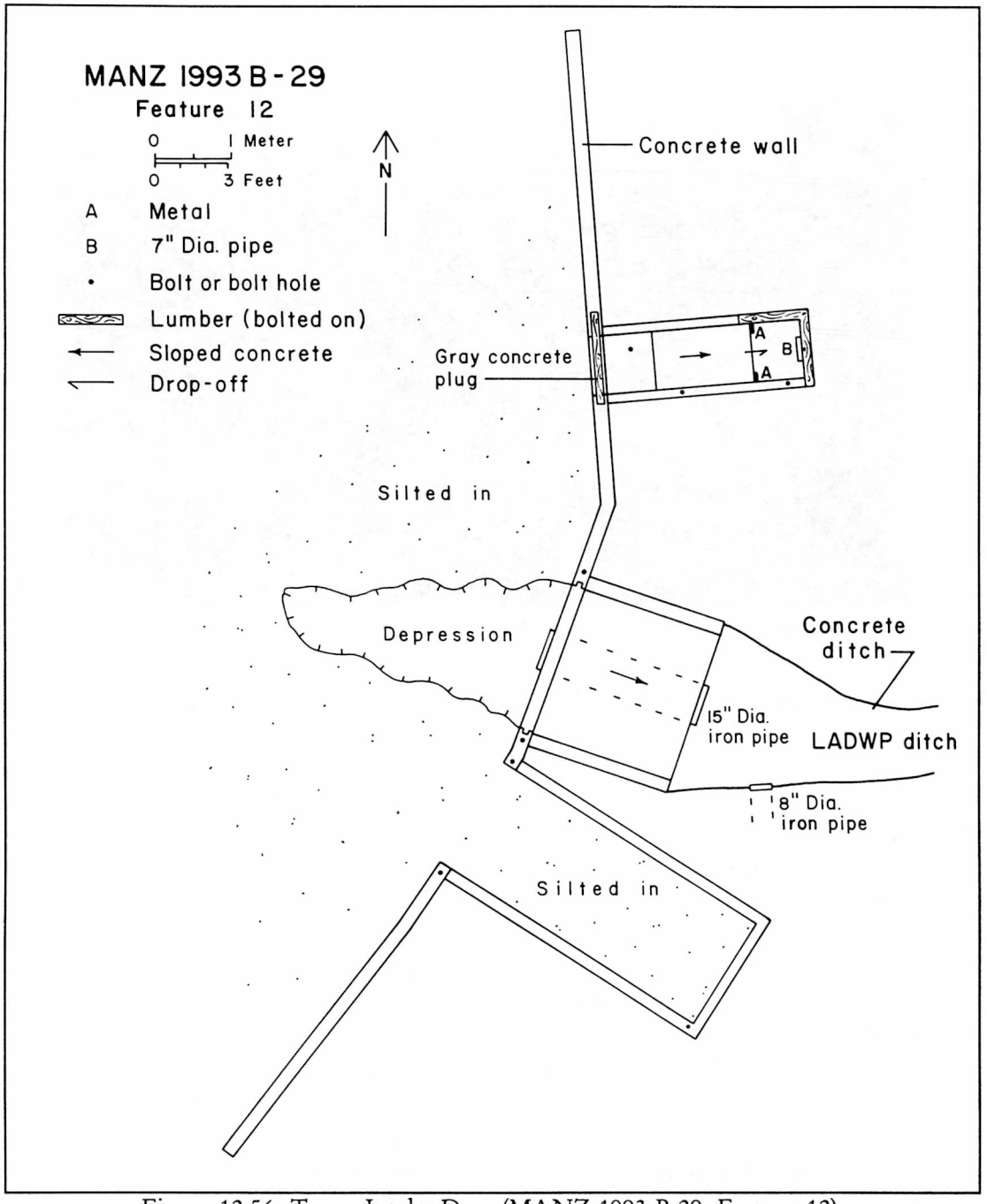


Figure 12.56. Town Intake Dam (MANZ 1993 B-29, Feature 12).

the pipeline." (Figures 12.63 and 12.64). The latter likely refers to the Paiute concept: those who oversaw ditch construction and maintenance were leaders of the community or "headmen."

Southern Town Water System Pipelines (MANZ 1993 B-25, Feature 4)

LADWP plat maps show two pipelines leading north and west towards the town intake dam (MANZ 1993 B-29). There is a section of concrete pipe visible in an erosion channel near the intake dam, but how this alignment and the known alignments connect to the dam is not clear. The original dam weir box has been removed.

The pipeline that served the southern portion of

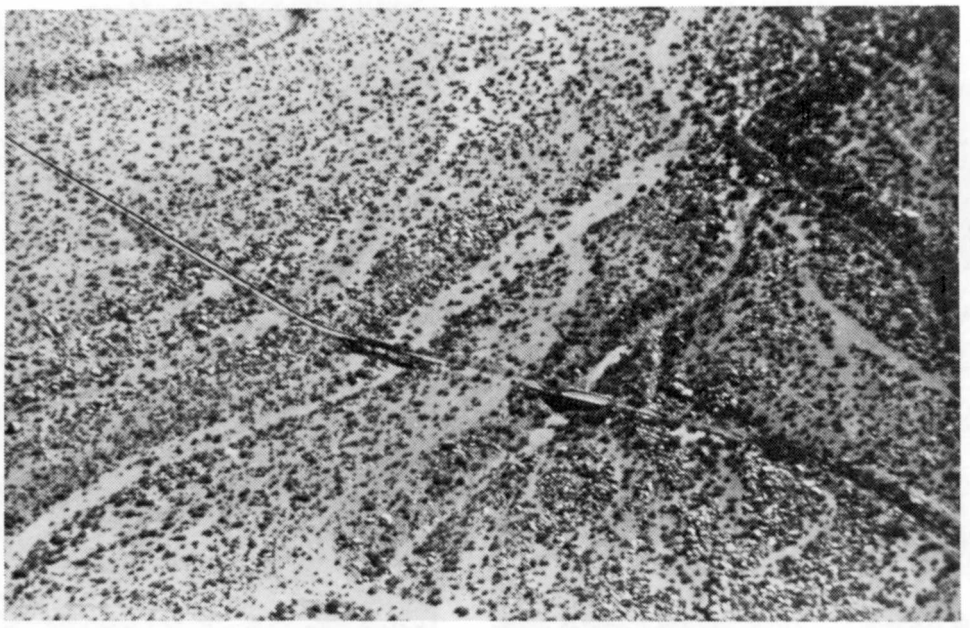


Figure 12.57. 1993 oblique aerial photograph of flumes along LADWP ditch (MANZ 1993 B-25, Feature 2).



Figure 12.58. Flume on LADWP ditch (MANZ 1993 B-25, Feature 2).

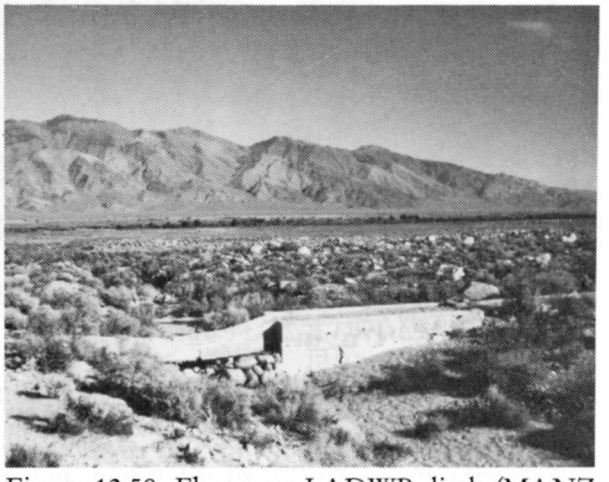


Figure 12.59. Flume on LADWP ditch (MANZ 1993 B-25, Feature 2).

the town was not found during survey. All evidence of it was likely destroyed when LADWP constructed their steel pipeline for the relocation center along the same route.

Feature 4 at MANZ 1993 B-25 is a pipeline alignment that heads east from the area of the town intake dam. The alignment has eroded and is now primarily an entrenched drainage, part of which bisects a small trash dump (MANZ 1993 B-32, below). At the lower end of the ditch, about one-half mile east of the intake dam, there is a three-chambered concrete weir box. Only one diversion could be traced: this pipe heads about an eighth of a mile north to several branching ditches or pulled pipelines, a concrete pipe culvert, and a ditch paralleling a town road.

Weir Boxes
(MANZ 1994 A-6)

This site, located 1/4 mile north of the National Historic Site, consists of two concrete weir boxes 75 ft apart along on the east side of an old town

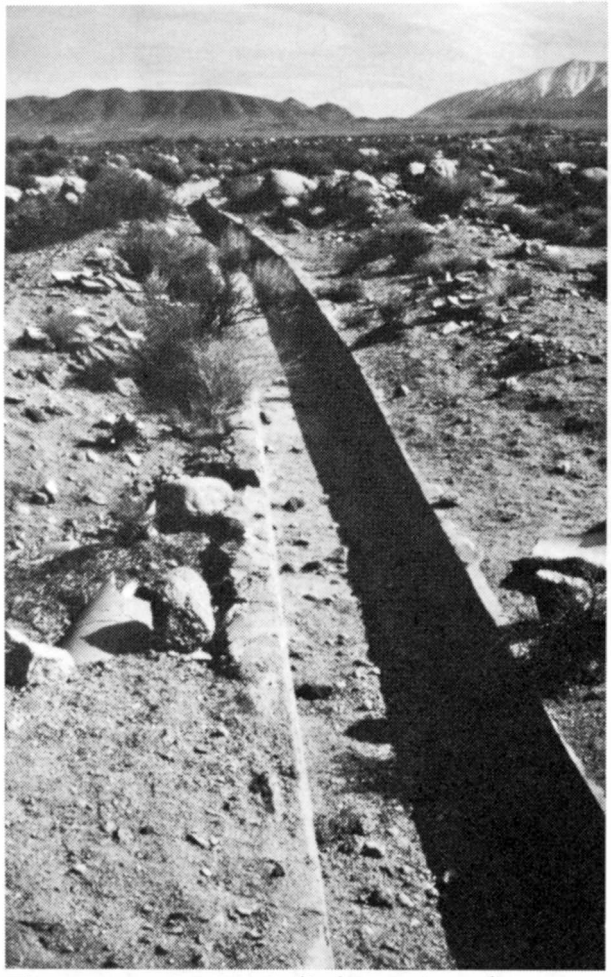


Figure 12.60. LADWP ditch, portion of concrete pipeline visible to left of ditch, view towards south (MANZ 1993 B-25, Feature 2).

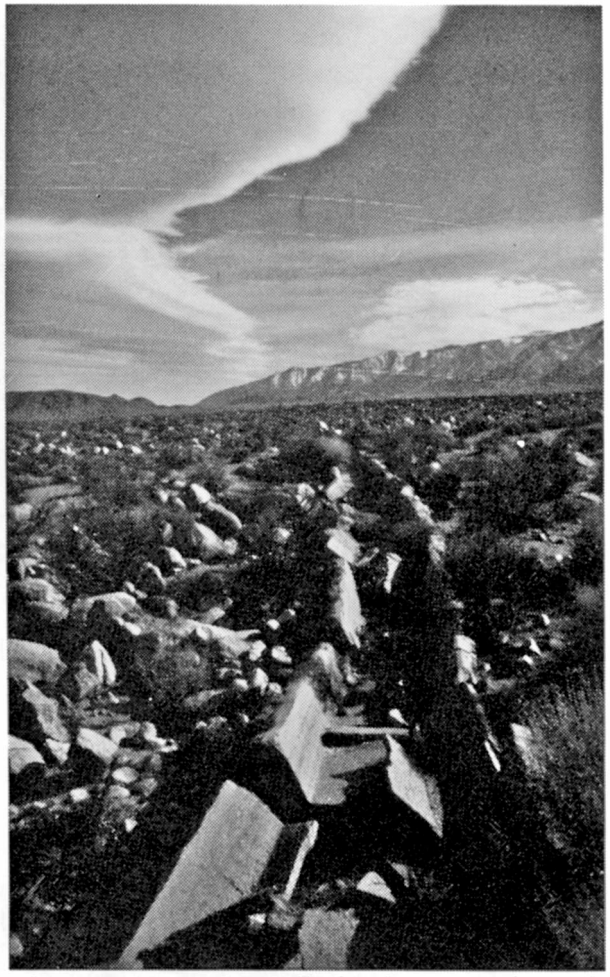


Figure 12.61. LADWP ditch, view towards south (MANZ 1993 B-25, Feature 2).

road (Figure 12.65). One of the weir boxes is shown on the 1930 LADWP plat map. The boxes measure 3 ft by 8 ft by 4½ ft high and are apparently associated with a buried concrete pipeline used for irrigation. There is a powerline to the east and an arroyo to the south. No associated artifacts were noted in the site vicinity.

Shepherd Creek Ditch (MANZ 1993 B-26)

This site consists of a three-quarter-mile-long unlined ditch. The antiquity of the site is unknown, although it could possibly date to as early as the 1880s. Located mostly on BLM land, the ditch begins one-quarter mile below the town intake dam, along the ditch shown as Shepherd Creek on the 1907 USGS map and heads south contouring the bajada slope.

The ditch is crossed by two dirt roads that led to the relocation center reservoir. North of these roads the ditch is well preserved, but elsewhere the ditch is eroded and silted-in. Preserved sections of the ditch measure 3 ft wide and a 1 ft deep. A swale defines the ditch near its south end before it becomes completely silted in, destroyed by erosion, sheet wash, and activities associated with the relocation center. There are some rocks along this portion of the ditch that may have been used as reinforcement.

Only one feature was noted along the alignment. It consists of a small pile of rocks on the ditch berm cemented together to hold a metal pipe.

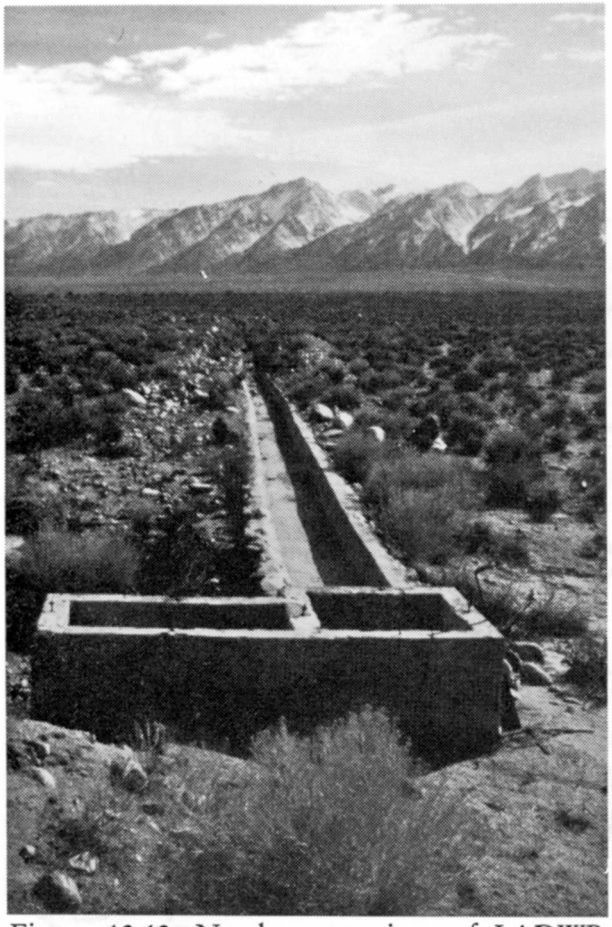


Figure 12.62. Northern terminus of LADWP ditch, view towards south (MANZ 1993 B-25, Feature 2).

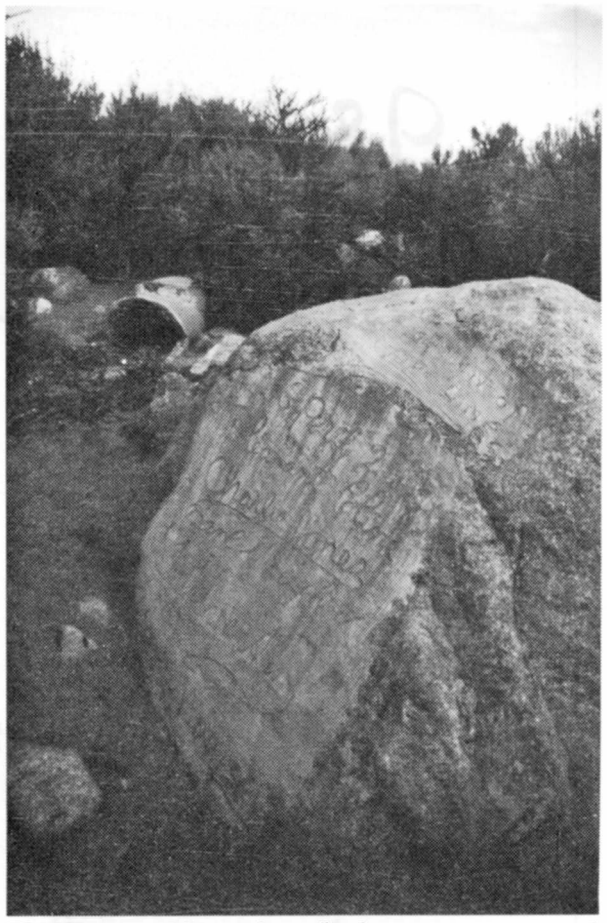


Figure 12.63. Names inscribed on cement-covered boulder (MANZ 1993 B-25, Feature 3.

Wire is wrapped around the pipe, as if something was once attached to it.

A portion of the ditch still occasionally carries water; the far northern end has recent water-borne trash from the reservoir area (beer and soda cans). Only a few other artifacts were seen along the ditch. A metal flask and the lip of a purple-colored glass bottle were the only artifacts recorded that may be associated with the use of the ditch.

Bairs Creek

Bairs Creek crosses the southwest corner of the National Historic Site. Generally dry in its lower reaches, water from creek was used to supplement the town water supply derived from Shepherd Creek. Recorded features associated with Bairs Creek outside the National Historic Site include pipelines, two dams, a gauging station, a rock wall, and a trash scatter.

Upper Dam (MANZ 1995 A-1)

This site encompasses about 2¾ acres along Bairs Creek one-half mile west of the National Historic Site, at an elevation of 4100 ft. Four archeological features were designated at the site. These include a concrete dam, a gauging station, a rock wall, and a trash scatter. There is a recent-appearing earthen berm along the south side of Bairs Creek and much of the upper site area appears to be regularly flooded.

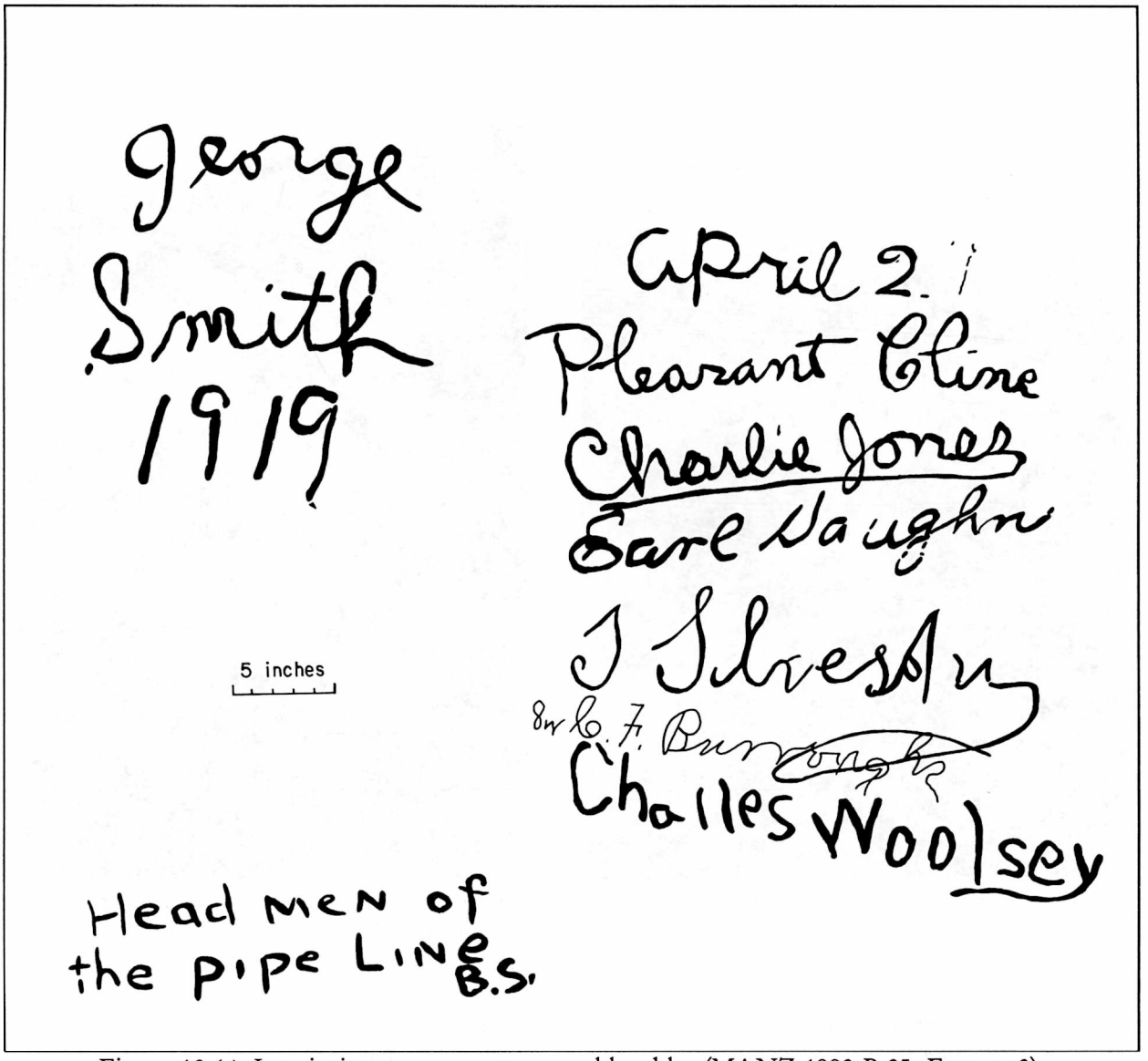


Figure 12.64. Inscriptions on cement-covered boulder (MANZ 1993 B-25, Feature 3).

Feature 1 is a gauging station just up stream of a lone cottonwood tree. The gauging station, in disrepair, consists of a wooden weir, a gauging box, low concrete retaining walls, and a tin shed with a missing roof.

Feature 2 is the remains of a 32-ft-long by 5-ft-high concrete dam and spillway on Bairs Creek (Figure 12.66). For the most part the dam is 1-ft thick, but at the base of the spillway the dam is at least 2-ft thick. Although a large portion of the dam is destroyed (Figure 12.67), it originally diverted water into a concrete pipeline that served the town of Manzanar. The pipeline alignment is washed out below the dam, but is clearly visible starting about 100 ft east (see MANZ 1993 B-31, below).

Feature 3 is a low rock wall 180 ft long (Figure 12.68). The wall is five course high, measures 4 ft wide by 18 inches to 30 inches high, and has a core of small rocks and gravels. A small portion of the wall has been removed where it crosses a small overflow drainage of Bairs Creek. Artifacts within the area bounded by the wall and Bairs Creek include a few lumber scraps in a small overflow drainage and a cast iron frying pan. The function of this wall is not known; it could

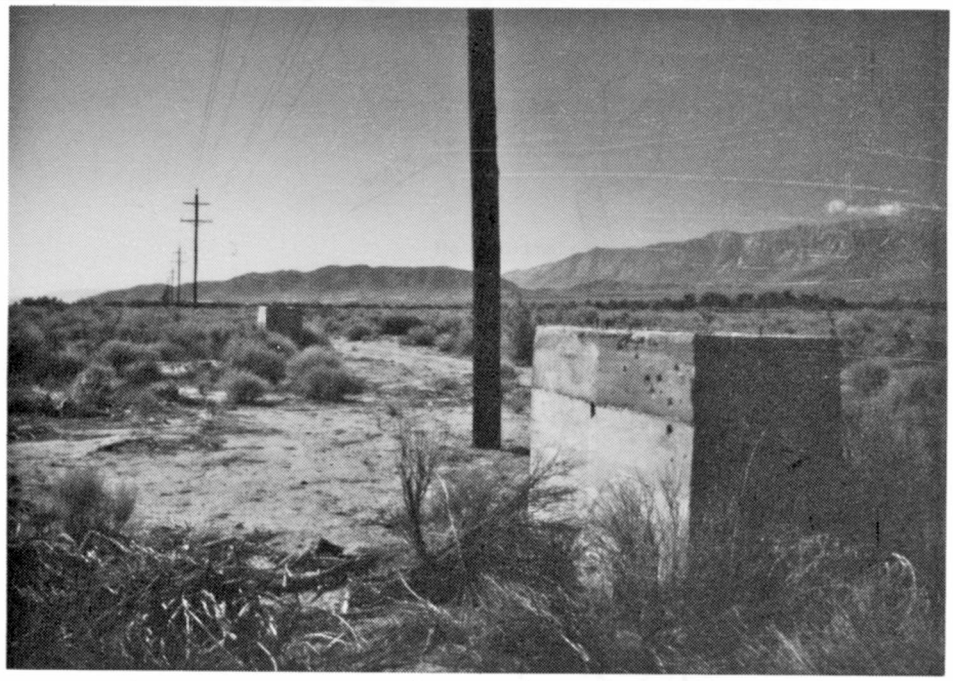


Figure 12.65. Concrete diversion boxes (MANZ 1994 A-6).



Figure 12.66. Bairs Creek Dam (MANZ 1995 A-1, Feature 2).

have been used for water control or possibly as a sheep corral.

Feature 4 is a trash scatter at the end of a road trace that leads to the site from the relocation center (and town). Artifacts noted include 40 sanitary seal cans, four milk cans, six church-key-opened all-steel beer cans, a cone top beer can, five crown caps, smooth wire, two purple glass fragments, 25 brown glass fragments, 20 clear glass fragments, a green wine bottle base, three leather shoe fragments, and two whiteware ceramics. Embossed glass includes two Owens Illinois Bottle Company hallmarks, one with a

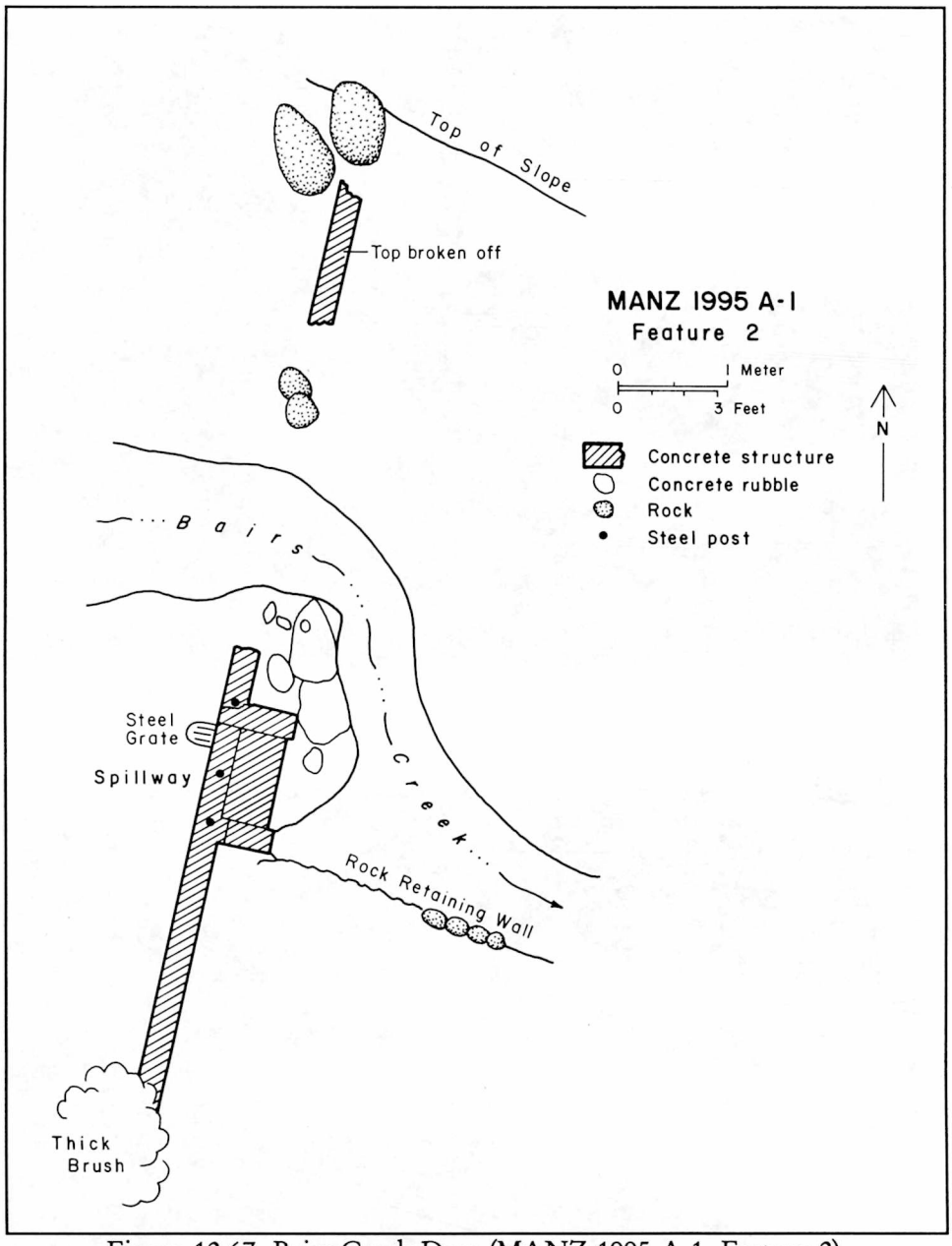


Figure 12.67. Bairs Creek Dam (MANZ 1995 A-1, Feature 2).

1944 date and one with a likely 1946 date, a Thatcher Glass Manufacturing Company hallmark with a 1946 date, an Illinois Pacific Glass Company hallmark ca. 1925-1930, "BEST FOODS REG," and a brown side panel with "SANFORD'S INKS ONE QUART LIBRARY PASTE." Other areas of the site contain recent trash and litter. Clearly the trash concentration represents an accumulation of items from several time periods.

Lower Dam
(MANZ 1993 A-34, Feature 1)

This dam is along Bairs Creek just south of the National Historic Site. The northern portion of the dam is buried by sediments and the creek, which has shifted to the south, has cut a channel below the dam's base level. The exposed portion of the dam is 24 ft long, with a 10 ft gap for a sluice gate. The dam is 10½ inches thick and over 40 inches high. An 11½-inch-high concrete cap wall, inscribed with the date "1942," has been added to the top of the dam.

Bairs Creek Pipeline
(MANZ 1993 B-31)
This site comprises the system of concrete pipes that once connected the town water system with Bairs Creek. A portion of this system is depicted on the 1930 LADWP plat map. Much of the concrete pipe was apparently salvaged for use elsewhere by the relocation center. However, nearly 6,000 linear ft of the system could be followed. Four features were designated at the site.

Feature 1 is a rocky ditch oriented east-west on the north side of Bairs Creek, strewn with concrete pipe fragments. The ditch originally held a concrete pipeline; one portion has seven connected pipe sections still in place. Feature 2 is a concrete weir box along the pipeline alignment 1,700 ft east of the Bairs Creek intake dam. The box diverted water south 500 ft to a weir box on the north edge of Bairs Creek (Feature 3). East of Feature 2 the pipeline alignment continues approximately 600 ft east towards the Manzanar townsite before being obliterated by the relocation center landfill. A pipeline recorded within the National Historic Site likely connected to this alignment (see MANZ 1993 A-29 in Chapter 11).

South of the Feature 3 weir box there are concrete footings in the creek that may be the remnants of a support system used to carry a pipeline across the creek. Feature 4 consists of segments of exposed concrete pipeline between Features 2 and 3 and a ditch on the south side of Bairs Creek that heads east towards the Manzanar townsite. The ditch is likely the result of a pulled pipeline as at Feature 1. The alignment heads east 800 ft and then turns and heads northeast 250 ft to the vicinity of a modern well. Beyond the well the alignment could not be traced.

Pipeline
(MANZ 1994 A-5)
Located southeast of the relocation center, this site consists of a 600-ft-long section of buried concrete pipeline exposed by sheet wash (Figure 12.69). The pipe has an outside diameter of 18 inches and an inside diameter of 14 inches.

The town-era ascription to this site is tenuous. It is based primarily on the condition of the pipe; pipe reused by the relocation center is generally heavily patched, unlike this section. The alignment is not shown on either Manzanar Relocation Center blueprints or the 1930 LADWP plat map. It parallels a town road, also used by the relocation center. A relocation center ditch along the same alignment ends well to the west of the pipeline. Further archival research may provide additional information on this pipeline.

Pipeline and Valves
MANZ 1993 B-15
Southeast of the National Historic Site on the extreme southern edge of a relocation center field, a concrete-lined relocation center ditch continues as an unlined ditch. The ditch was likely created when a town pipeline was removed for use elsewhere; further south along the same alignment sections of buried concrete pipeline are exposed in drainages. Along the ditch there are parts from metal valve gates that were likely once part of the pipeline. The round valves are embossed with "THE 'KT' VALVE NO 8½ / KI / PAT JUN 21 04 / AUG 1 11" (Figure 12.70).

The 1930 LADWP plat map shows a pipeline to the north along the same alignment but not in this location. This pipeline (and the one recorded above as MANZ 1994 A-5) may have been abandoned and forgotten by the 1930s.

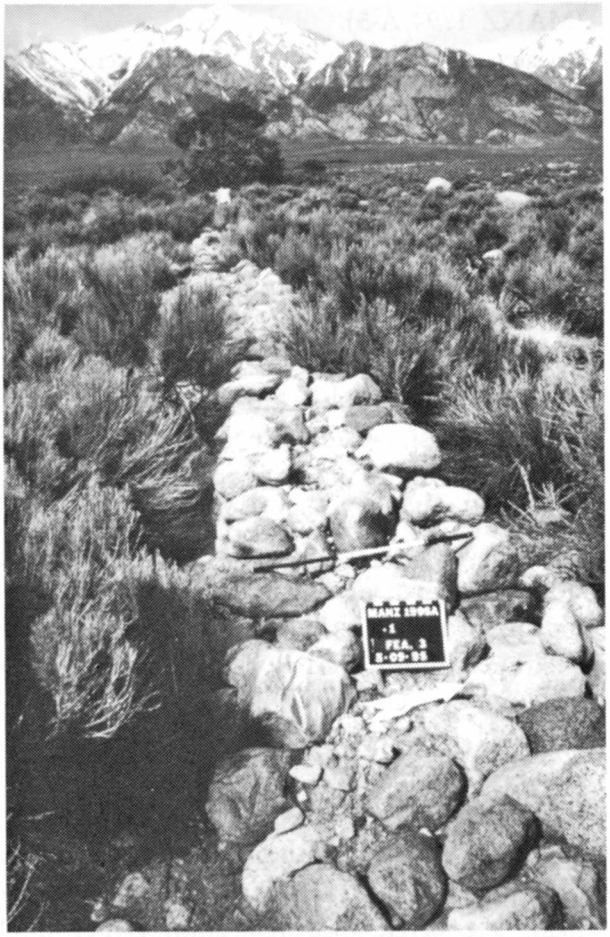


Figure 12.68. Rock wall above Bairs Creek Dam MANZ 1995 A-1, Feature 3).

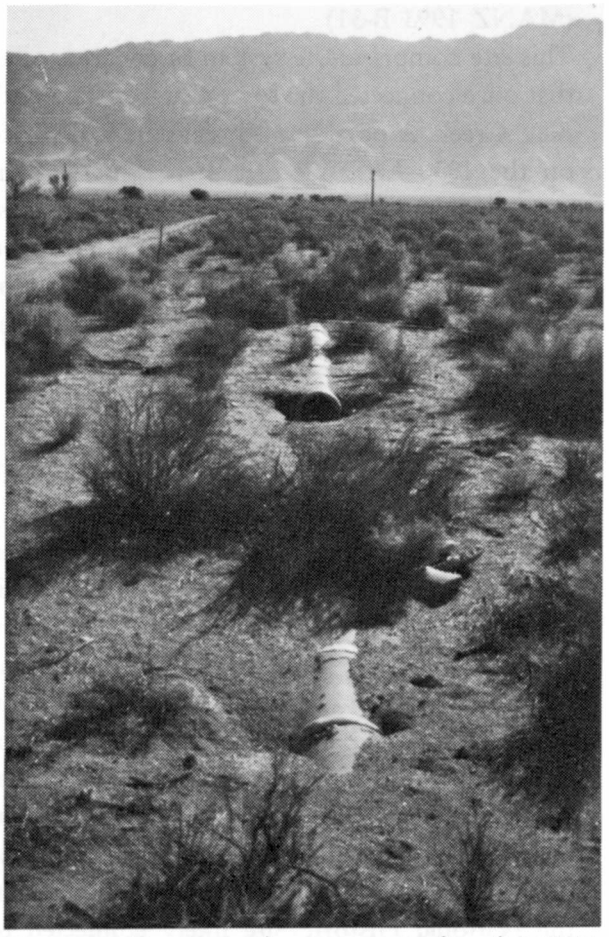


Figure 12.69. Exposed concrete pipeline (MANZ 1994 A-5).

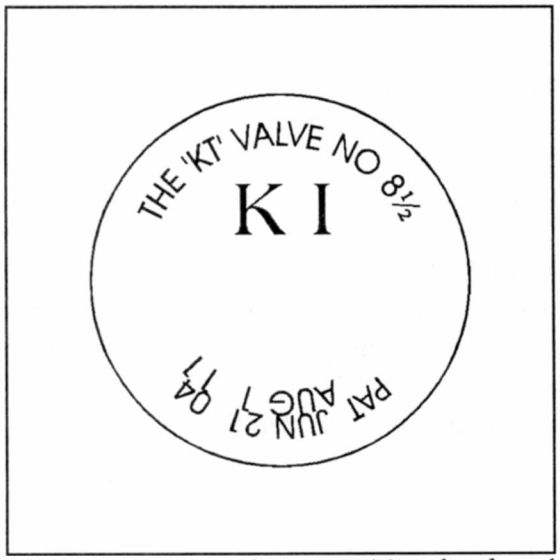


Figure 12.70. Lettering on "KT" valve found at MANZ 1993 B-15.

George Creek

George Creek, located 1½ miles south of the National Historic Site, was used to irrigate relocation center fields and earlier ranch lands. Recorded historical features along George Creek that likely predate the relocation center include two dams, two instream weirs, and an unlined ditch. Some of these features are still in use today and nearly all were modified and reused by the relocation center.

Upper Dam (MANZ 1993 B-15, Feature 1)

Feature 1 is a 45-ft-long by 5-ft-high concrete dam. It measures 12½ inches wide at the top and

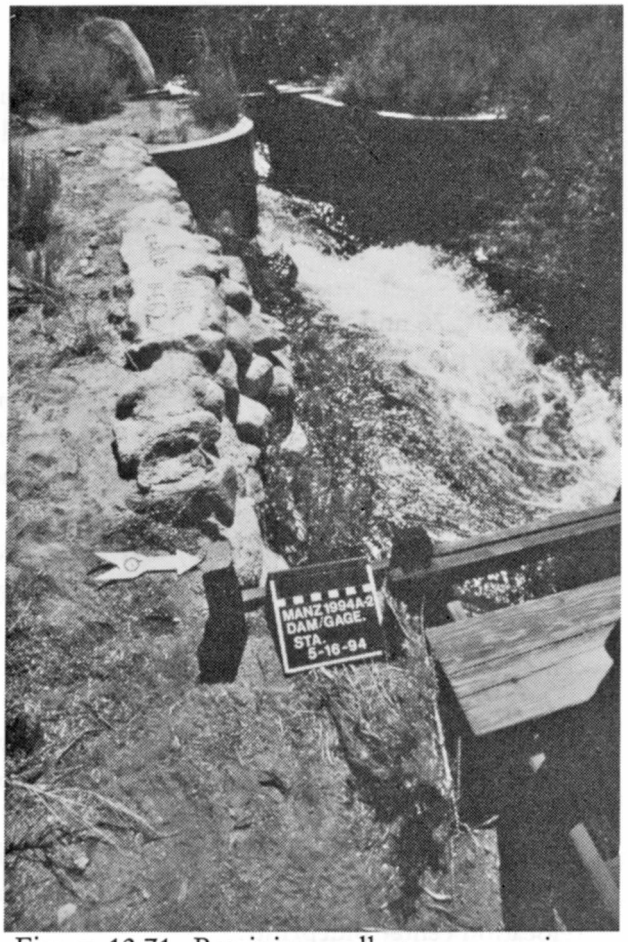
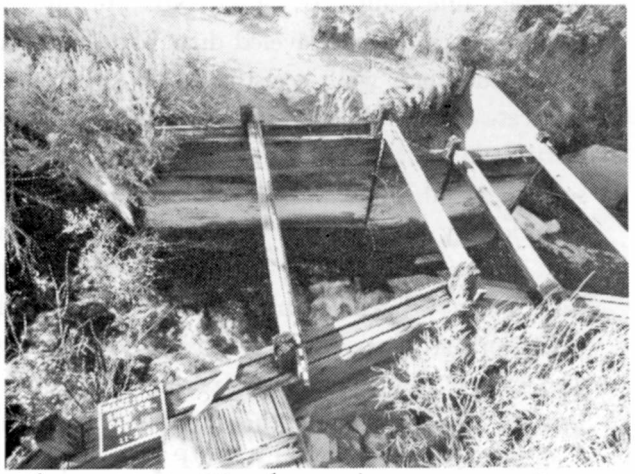


Figure 12.71. Retaining wall at upper weir on George Creek (MANZ 1994 A-2).


Figure 12.72. Wooden weir on upper George Creek (MANZ 1994 A-2).

22½ inches wide at the base. There are two sluice gates: one 16½-inches wide on the north side diverted water into a concrete pipeline used by the relocation center (see Chapter 10) and one 43-inches wide allowed water back into the streambed. Two courses of rock have been cemented to the top of the dam raising its height 1 ft, and there are rock and concrete retaining walls and concrete reinforcing on the creek bank both upstream and downstream of the dam. These modifications, similar to that noted at other dams in the area, likely date to the relocation center.

Lower Dam
(MANZ 1993 B-17, Feature 1)

Feature 1 at MANZ 1993 B-17 is a wooden bridge and dam on George Creek. The bridge is along a town road, but appears to have been greatly modified or entirely constructed by the relocation center internees (see Chapter 10). The dam, just downstream of the bridge, may predate the relocation center.

The dam is a small U-shaped concrete structure (8 ft 8 inches by 7 ft 4 inches by 4 ft high by 8 inches thick) that straddles the narrow drainage channel of George Creek. The dam has three sluice gates, one on the north side and one on the south side (each 30 inches wide) supplying separate ditch systems and a third sluice gate (48 inches wide) opening to the creek channel. Upstream of the dam, rock and concrete retaining walls support 65 linear ft of the creek bank forming a small reservoir. Inscriptions in these concrete retaining walls include 1944 dates.

Upper Weir
(MANZ 1994 A-2)

Located along George Creek 1¾ miles south of the National Historic Site at an elevation of 4120 ft, this site includes a wooden weir, gauges, and retaining walls. The weir diverts water south from George Creek into an unlined irrigation ditch. On the creek just upstream of the diversion, there is a substantial concrete gauge. Between the diversion and the gauge the stream bank has been reinforced with concrete and rock

retaining walls (Figure 12.71). A repaired section of the retaining wall has the inscriptions "CARLOS KELLER 11-6-62" and "Brolsma 1962." Along the ditch, below the diversion, there is a recent metal gauge.

The antiquity of this site is not known. No associated town-era artifacts were noted in the site vicinity and it is not shown on the 1930 LADWP plat maps or WRA maps. However, its proximity to the Hay/Kispert Ranch suggests it was associated with the ranching era. At present this diversion is used to irrigate a pasture on the south side of the ranch.

Lower Weir
(MANZ 1994 A-3)

Located a little less than one-half mile downstream of the upper George Creek Dam at an elevation of about 4000 ft, this site is a wooden weir on George Creek diverting water north into an earthen irrigation ditch (Figure 12.72). Along the ditch, below the diversion, there is a recent metal gauge. No associated artifacts were noted.

The age of the weir is not known, but it also likely dates to the use of the nearby ranches. The diversion is shown on the 1930 LADWP plat map. At present it furnishes water to irrigate pasture in the Albers Ranch area. At one time it apparently connected to the dirt ditch (MANZ 1993 B-30, below) that diverted water from George Creek to the Bairs Creek drainage.

George Creek Ditch
(MANZ 1993 B-30)

This unlined ditch was apparently used by both the Manzanar Relocation Center and the town of Manzanar. According to the Manzanar Fixed Assets Inventory (November 15, 1945) the ditch was "constructed previously and of little use, deteriorated." Approximately 1.3 miles long, the ditch diverted water from a branch of George Creek north to Bairs Creek.

Wells

In addition to wells recorded in conjunction with residential sites, four other town-era wells were recorded. Two are still in use and all were used by the relocation center.

Well Nos. 76 and 95
(MANZ 1993 B-17, Features 4, 6, and 7)

MANZ 1993 B-17 comprises the irrigation system for the far south fields of the relocation center. Located 1½ miles southeast of the National Historic Site, the site includes two town-era wells (Nos. 76 and 95) and associated pipelines. Riveted metal pipe at the site may have been scavenged for use by the relocation center from earlier town constructions as well.

Well No. 76 (Feature 4) is on the south side of a dirt road that parallels the north side of George Creek. The well, currently in use, has a plate that identifies it as Well No. 76. The well is shown on 1930s LADWP plat maps and relocation center blueprints.

Well No. 95 (Feature 7) is located about one-quarter mile south of Well No. 76 on the north side of a well-traveled dirt road. Remains at the defunct well consist of a 15-ft-square concrete slab with rust stains, equipment supports, piping and conduit, and a central 2-ft-square metal plate. The well was once surrounded by a chain link fence. On the north, east, and west sides of the slab there are 10 6-ft-high metal tube fence posts and on the south side there are two 7-ft-high posts and a central 2-inch-high post from an apparent gate. Spray painted on the slab is the number "95." The well is shown on 1930s LADWP plat maps and relocation center blueprints. A modern well (No. 403) is located about 100 ft northeast of Well No. 95.

The town-era component of Feature 6 consists of two sections of concrete pipeline. The layout and construction of these sections suggest they may well be town-era constructions. One

runs from Well No. 76 and appears as a berm on the north side of the road and is exposed in a drainage channel west of the well. The other is a concrete pipe exposed in a wash that cuts through the area north of Well No. 76.

Well Nos. 91 and 92
(MANZ 1993 B-38, Features 1 and 2)

This site consists of two wells and a pipeline located 2 miles north of the National Historic Site. Both the wells and the pipeline are shown on relocation center blueprints; the wells are shown on 1930 LADWP plat maps, but the pipeline is not.

Well No. 91 (Feature 2) is on the west side of U.S. Highway 395, just north of an alfalfa field. It consists of a well pad on a low mound, another small concrete slab, and a portion of a concrete sluice gate. A modern well (No. 408) and a capped well (No. 815) are to the northeast. The well pad was once surrounded by a chain link fence. On the south, east, and west sides of the slab there are eight 5½-ft-high metal tube fence posts and at the midpoint of the south side there is a single post flush to the ground from an apparent gate closure. The well pad consists of an L-shaped 16 ft by 16 ft concrete slab with rust stains, equipment supports, piping and conduit, and a central 16-inch-diameter metal plate. Spray-painted on the slab is the number "91." A portion of the slab has been reconstructed and there is a 4 ft by 6 ft concrete addition that appears rather recent. Inscribed within a large heart on the addition are the initials "TP+WG." Southwest of the well pad there is an 8 ft by 10 ft concrete slab recent in appearance. The slab has rust stains and equipment mounts. Inscribed in the concrete on a corner is "87 Miller Jr." Between the well pad and the smaller concrete slab there is an *in situ* 22 inch by 5½ inch concrete wall that once apparently held a wooden sluice gate.

Well No. 92 (Feature 1) is on the east side of Highway 395 and is currently in use; a steel pipeline carries water from the well to the Los Angeles Aqueduct. Fenced, the well pad is similar to the one at Well No. 91.

Wooden Bridge
(MANZ 1993 B-14)

This site consists of an old wooden bridge on BLM land 1¼ miles northwest of the National Historic Site. The bridge spans the diversion ditch that fed the Town of Manzanar water system and the later Manzanar Relocation Center reservoir.

The 12-ft-by-20-ft bridge platform is constructed of two-by-fours set on edge and supported by three six-by-ten inch beams that span the ditch. The bridge has low railings of two-by-fours about 3-ft high (Figure 12.73). The bridge is intact but structurally in poor condition. Old and desiccated, it sags ominously under even a small amount of weight, and would likely collapse under a large vehicle.

Trash Deposits

Eleven of the sites recorded outside of the National Historic Site have town-era components that can be typified as trash dumps or trash scatters. They range in size from very small (225 square ft at MANZ 1994 A-4) to extremely large (6½ acres at MANZ 1993 B-34). Several have prehistoric and historical Native American Indian components (see Chapter 14).

MANZ 1993 B-1

This site is located just west of the relocation center cemetery. Most of the material at this 9½ acre multi-component historical and prehistoric site appears related to historical and prehistoric Native American Indian use (see Chapter 14). A likely town-era component at the site consists of artifacts clustered around



Figure 12.73. Wooden Bridge (MANZ 1993 B-14).

two features (Features 1 and 2) located along an old road.

Feature 1 is a 40-ft-long trench along the north edge of the old road immediately west of a shallow drainage. Historical artifacts are scattered along the north edge of the drainage, downslope from the trench.

About 200 ft west of Feature 1, along the same road, Feature 2 is a shallow 4½-ft-diameter hole surrounded by a concentration of historical trash.

Historical artifacts noted at these two features include over 75 cans (sanitary seal, milk, square fuel cans) and at least 100 ceramic plates and cups fragments (one collected piece dates to 1878-1894, see Appendix D), porcelain plumbing fixtures, around 100 wire nails, several square cut nails, hundreds of bottle glass fragments (including the base of a dark green champagne bottle), and 150 fragments of window glass. Bottle glass colors include green, purple, clear, olive, and brown. Miscellaneous metal items include barbed wire, springs, a stovepipe collar, barrel hoops, a crow bar, and unidentifiable mechanical fragments. There are also several remnants of lumber.

MANZ 1993 B-2

The town-era component of this 4.5-acre multi-component historical and prehistoric site consists of a 60 ft by 100 ft dump (Locus C) and two rock alignments (Features 1 and 2). Located west of MANZ 1993 B-1, the site was disturbed by activities associated with the Manzanar Relocation Center.

The Locus C dump is in a shallow drainage on the north side of a dirt road. Artifacts noted include metal, glass, and ceramics. Metal artifacts consist of 15 sanitary seal cans, 10 hole-in-top cans, 10 milk cans, a square fuel can, rectangular, round, and oval meat cans, a hole-in-cap can, a shoe polish can, seven metal mason jar lid rings, jar lids, three barrel hoops, a stovepipe, wire nails, a curtain rod, and an unidentifiable metal object, possibly a modified stove part. Glass includes a thick aqua-color oil-finish bottle lip and over 50 fragments of purple and aqua bottle glass, clear glass fragments from square and round bottles, and window glass. Bottle basemarks include the Illinois Glass Co.

hallmark (1916-1929) and a crown with a possible pontil scar (pre-1912). The few ceramics present include a variety of decorated and plain whiteware ceramics. Hallmarks include "Eagle China Austria" and "J. & G. Meakin" (England, ca. 1890). The types of collected ceramics suggest a post-1890 date (see Appendix D). The presence of hole-in-top cans suggests an early 1900s date.

The age of the two rock features, located 130 ft north and 150 ft northeast of the Locus C dump, is unknown, but soil build-up and vegetation indicate they are not very recent. One (Feature 1) is in the shape of an arrow. It is 50 cm long and points to the southwest. The other rock alignment (Feature 2) is linear, about 40 ft long, and may delineate an old trail.

MANZ 1993 B-3

The town-era component of this multi-component historical and prehistoric site consists of a dispersed scatter of artifacts, most in the eastern portion of the 3.9-acre site. An alignment of four boulders in a wash at the site is also likely associated with historical use of the site. Like MANZ 1993 B-2, this site has been disturbed by activity at the Manzanar Relocation Center.

Historical artifacts noted at the site include a square 5-gallon can, a shoe heel, a sanitary food can, a hole-in-top can, two pocket tobacco cans, a pocket tobacco can lid, a jar lid, a scatter of over 30 aqua glass fragments, 20 other pieces of glass (brown, olive, window), five whiteware ceramics, two glass marbles, and a metal pail.

MANZ 1993 B-4

This 2-acre multi-component historical and prehistoric site is located outside the southwest corner of the National Historic Site on the south side of Bairs Creek. The town-era component consists of two features (Features 1 and 2) and two small artifact concentrations (Loci A and B).

Feature 1 is an L-shaped trench, 200-250 ft long. The trench is eroded and the northeast end opens into the creek. Historical and prehistoric artifacts in the trench were apparently washed into it.

Feature 2 consists of two excavated holes at the west end of the Feature 1. The holes are from 7 ft to 9 ft in diameter and are probably contemporary with the trench. Near the two holes there are two round metal pans, a few whiteware ceramic fragments, aqua and olive glass fragments, shoe leather, and a heavy metal strap.

Locus A is a deposit of trash in a shallow drainage at the edge of a dirt road 150 ft south of Feature 1. Artifacts are scattered for about 100 ft east of the drainage. Artifacts noted include 60 fragments of whiteware ceramics, 30 fragments of glass (purple, white, aqua, clear and olive; over half are purple), at least 36 cans, eight can lids, a shoe heel, a square-cut nail, two boards with wire nails, and part of a stovepipe. Noted cans include 21 sanitary seal, three lard, two hole-in-top, two milk, two spice, two with spouts, one 5-gallon square, one fuel, one pocket tobacco, and one baking powder. The measured dimensions of milk cans ($2^{7}/_{16}$ inches by $3^{5}/_{16}$ inches) indicate a manufacturing date sometime between 1915-1925.

Locus B, on the south side of a shallow drainage, includes a lard can, a square-cut nail, a shallow round metal pan, a modified bucket with a spout, a few sanitary seal cans, a baking powder can lid, a mason jar lid, a fragment of a metal spoked wheel, a barrel hoop, a small metal saucepan, and a harmonica fragment embossed with "...er Reed ...e in Germany." Other artifacts at this locus include a purple glass bottle lip, 15 other glass fragments (brown and olive bottle glass and clear window glass), 10 whiteware ceramic fragments, and boards of thin wood from a packing crate. Noted to the north of

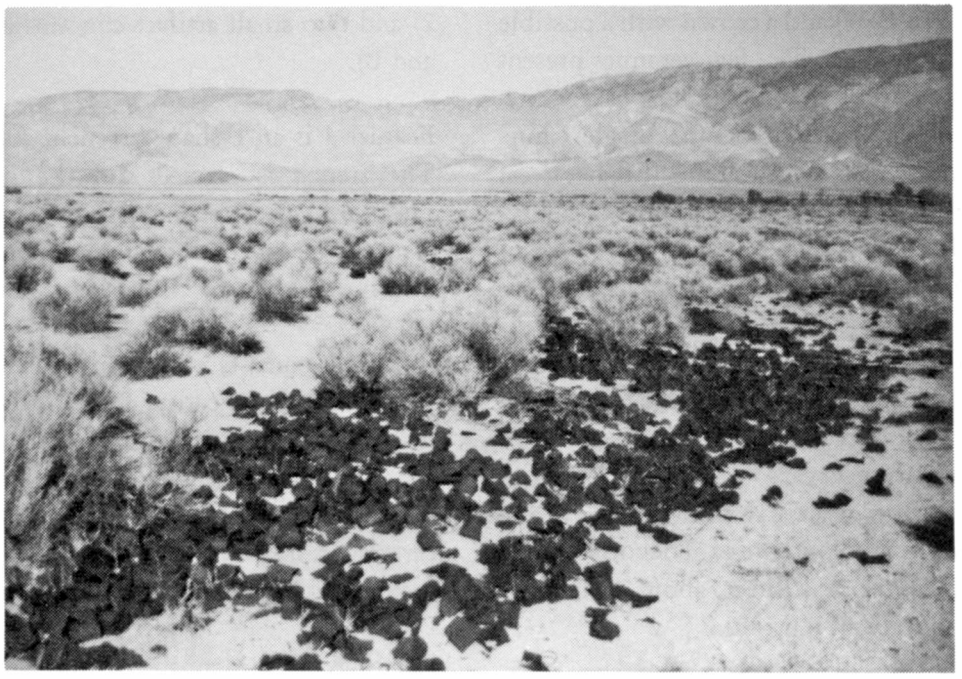


Figure 12.74. Can dump at MANZ 1993 B-7.

Locus B were five brown glass fragments, three whiteware ceramic fragments, and a piece of cut burned bone.

MANZ 1993 B-5

This site is located on the south side of Bairs Creek, just west of MANZ 1993 B-4. The town-era component of this three-quarter-acre multi-component historical and prehistoric site consists of an area 100 ft north-south by 130 ft east-west with historical artifacts that may be related to ranching activities.

Metal artifacts at the site include over 30 cans (including hole-in-top and sanitary seal cans of two sizes, milk cans [2$^{5}/_{16}$ inches by 2$^{1}/_{16}$ inches]), pocket tobacco cans, a cone-top beer can, and an 8-inch-tall beer can). Other artifacts noted include glazed pipe fragments, the bottom half of a small crock, a broken white plate with a design, a trough made from strips of wood nailed to a long piece of metal sheeting, and a long board nailed to a square sheet of metal.

The dimensions of measured milk cans indicate a manufacturing date sometime between 1915 and 1925. Some of the artifacts, however, post date the town and ranching era: the cone top beer can at the site is the high profile style made after 1945 (Rock 1980a).

MANZ 1993 B-7

This site, located west of the National Historic Site, is a 5-acre trash dump primarily associated with the town of Manzanar. The trash occurs along both sides of a dirt road that was formerly Francis Street, the main east-west artery of the town, beyond the areas developed. Most of the trash occurs on the north side of the road, but some scattered trash lies on the south side. The site is highly visible from the road and has likely been picked over by collectors. Features associated with part of the Manzanar Relocation Center water system (MANZ 1993 B-12) also have disturbed the site and artifacts from the relocation center are present as well.

Numerous concentrations, likely individual dumping episodes, are present. Most contain a variety of domestic items. Only one concentration is homogeneous, having hundreds of sanitary seal cans (Figure 12.74). These concen-

trations are most abundant at the east and west ends of the site and in a shallow drainage that parallels the road. Much of the material has been burned. Marks noted on glass, ceramics, and other artifacts are summarized in Table 12.2. A shell button collected dates to ca. 1800+ (see Appendix E).

Metal artifacts noted during survey include thousands of sanitary seal (coffee and food of various sizes), milk, fuel, spice, pocket tobacco, and meat cans, oil drums, paint cans, and hundreds of other artifacts including paint brushes, bedsprings, stove parts, barrel hoops, buckets, various bits of hardware, pans, wash-tubs, battery cases and carbon rods from batteries, light fixtures, and automobile parts. Dimensions of measured milk cans (2 7/16 inches by 2 7/16 inches, 2 15/16 inches by 3 1/16 inches, and 2 15/16 inches by 4 9/16 inches) indicate manufacturing dates from between 1915 and 1930.

Noted glass included hundreds of bottle fragments and window glass. Bottle glass colors include cobalt, aqua, clear, purple, green, brown, and white.

Ceramics include a few toilet bowl and sink fragments and hundreds of American, English, Japanese, and German stoneware, whiteware, and crockery fragments. A wide range of manufacturing dates are represented by the 61 ceramics collected from the site, however most date to between 1900 and 1930 (see Appendix D).

MANZ 1993 B-10

The town-era component of this multi-component historical and prehistoric site consists of widely scattered historical trash associated with early ranching or the town of Manzanar. The site covers nearly 4 acres on the south side of Bairs Creek, southwest of the National Historic Site. Located between MANZ 1993 B-4 and MANZ 1993 B-5, the site is heavily eroded and disturbed. A pipeline alignment associated with the town of Manzanar (MANZ 1993 B-31) crosses the northern portion of the site.

Two features were designated. Feature 1, at the southwest corner of the site, is a possible activity area where historical artifacts are concentrated. Feature 2 is a grey rock (17 inches by 20 inches by 8 inches) with the initials "WD" scratched onto its top flat surface.

Artifacts noted at Feature 1 include an enameled metal saucepan, two metal frying pans, a pocket tobacco can, a barrel hoop, two can lids, and 10 fragments of brown bottle glass.

Historical artifacts in other portions of the site include over 100 fragments of glass (purple, green, clear, brown, olive and aqua), some from panel bottles and liquor bottles, and a glass marble. Metal artifacts noted include six sanitary seal cans, two lard cans, four baking powder-type lids, five canister-type cans, a square meat tin, two pocket tobacco cans, a cone-top beer can, a modified 5-gallon square can, three other cans, a spoon, a cast iron frying pan, a shovel blade, a segment of 1-inch-diameter threaded metal pipe, five heavy pieces of hardware, bits of screen, a metal strap, and three clay pipe fragments.

MANZ 1993 B-18

This site, a small dump, is located along George Creek 1½ miles south of the National Historic Site. The site covers an area 15 ft by 30 ft at the edge of an erosion channel; it may be a remnant of a much larger deposit (Figure 12.75). Artifacts present indicate an early 1900s date.

Artifacts include three reconstructible purple glass bottles (two with round bases and one with a square base), the base of another round base purple bottle, a square-base brown bitters bottle, a long neck brown liquor bottle, two square-base aqua bottles, a long aqua bottle neck, an amber brandy finish bottle lip, an aqua packer finish bottle lip, two collar finish bottle lips (purple and aqua), a possible purple

Table 12.2.
Marks Noted at MANZ 1993 B-7

Glass

Anchor Hocking Glass Corp. hallmark (1938+)
ASEPTIC
Cedar MADE IN U.S.A., Channel Chemical Corporation (1908+)
CLOROX REG (in diamond)
Coca Cola Bishop Bottling Company
EASTSIDE w/in shield
H.J. HEINZ CO. (various)
IPG (in triangle), Illinois Pacific Glass Co. hallmark (1902-1930)
KERR SEALING TRADE MARK REG. MOU..., Kerr Glass Co. (1915-1946)
KERR GLASS MFG CO W P A AUG 31 1915 s SAND SPRINGS OKLA.
LB 5, Long Beach Glass Co. hallmark (1920-1933)
Owens Bottle Co. basemark (1911-1929)
Owens Illinois Bottle Company hallmark (1932+)
PACKED BY CAL. PACK. CORP. (1916+)
PERFUMER'S CO. NEW YORK
Rawleigh's TRADE MARK, W.T. Rawleigh Mfg. Co. (1925-1936)
REGISTERED w/figure holding a bottle, Cliquot Club
SERVICE ...'S PHARMACY ...Y COURTESY
W T CO. U.S.A., Whitall-Tatum & Co. hallmark (pre-1935)
WATKIN... (1885+)
WF & SMIL, William Franzen and Son, Milwaukee (1900-1926)

Metal

100% PURE GOOD TO THE LAST DROP w/cup design
CALUMET BAKING POWDER 1 lb ABSOLUTELY PURE
CALUMET 2 1/2 lbs. BAKING POWDER FULL WEIGHT ABSOLUTELY PURE (ca. 1927+)
COFFEE SCHILLINGS BEST
FOR DRIP OR VACUUM MAKERS
HILLS BROS w/man drinking (early 1900s)
KERR SELF SEAL WIDE MOUTH MASON JAR
LIPTON"S TEA THE MOST DELICIOUS THE WORLD PRODUCES (1920s-1940s)
Mein Jeronioen (and) REGISTER...912...042 (harmonica part)
OLD DUTCH CLEANSER CHASES DIRT TO SIFT PUSH IN PLUGS
Prince Albert Tobacco
SANFORD'S PREMIUM WRITING FLUID
THE J.B. WILLIAMS CO. U.S.A. (1840-1925)
TO POUR SYRUP PUNCH TWO HOLES TO CLOSE TURN COVER

Ceramics

..ADISSON W.S. GEORGE 6 4 1 (1920s-1940s)
C.C. Thompson Pottery CO. (ca. 1930s)
CHESTER HOTEL CHINA (1908-ca. 1930)
GERMANY
HOMER LAU... MADE IN D 6... (April 1926)
Johnson Bros. England (1913+)
LAUGHLIN ... S. A. (1920+)
MADE IN JAPAN (1921+)
Meakin England
PAD[EN CITY] POTT[ERY] W.V. USA (ca. 1930s)
POXON CHINA VERNON CALIFORNIA (1916-1928)
VERNON CHINA VERNON.CAL. (1928-1948)
WARRANTED K.T.& K. GRANITE, Knowles, Taylor and Knowles (1890-1900)

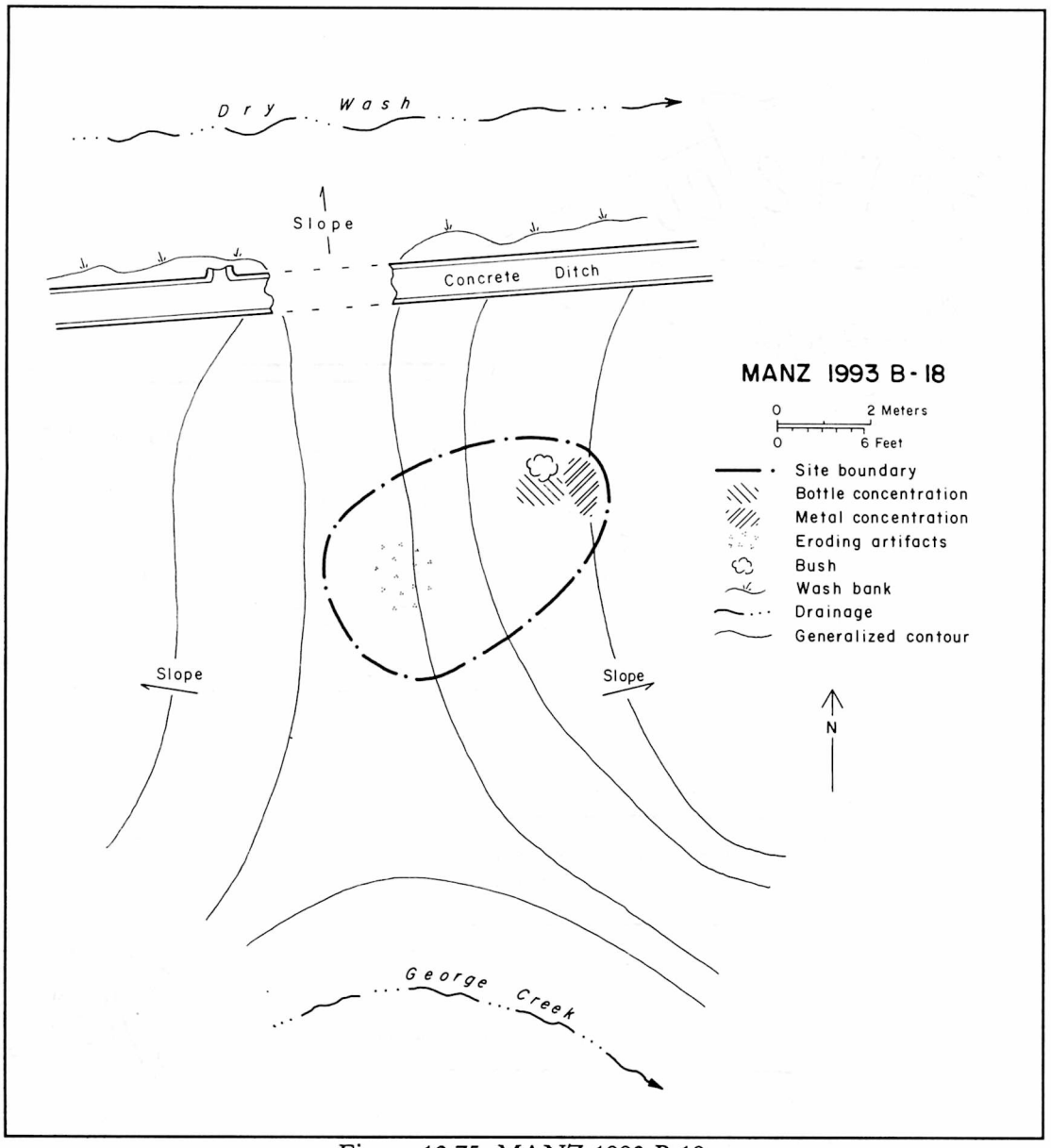


Figure 12.75. MANZ 1993 B-18.

glass vase fragment. Other artifacts include a door hinge, a heavy buckle, a coiled spring, two automobile parts, four other metal parts, a small ceramic insulator with a rubber ring, bits of leather and rubber, two porcelain plate fragments, and five chalkboard slate fragments. Other items remain buried.

Embossed glass includes an Owens Bottle Company basemark (1911-1929), an American Glass Works basemark (1908-1935), an "H" basemark, a purple bottle fragment with "Roth and Co. San Francisco" (1880-1890), portions of a "California Fig Syrup" bottle, portions of a "Scott's Emulsion Cod Liver Oil" bottle (1870-1947), and a bitters bottle fragment with "...ER'S ..ITTERS" (Figure 12.76).

MANZ 1993 B-32

This site is a small (15 ft by 30 ft) dump on BLM land one-quarter mile northwest of the National Historic Site. A building is depicted northeast of the site on the 1907 USGS map, however due to time constraints that area was not inspected.

While small, the site is dense with some apparent

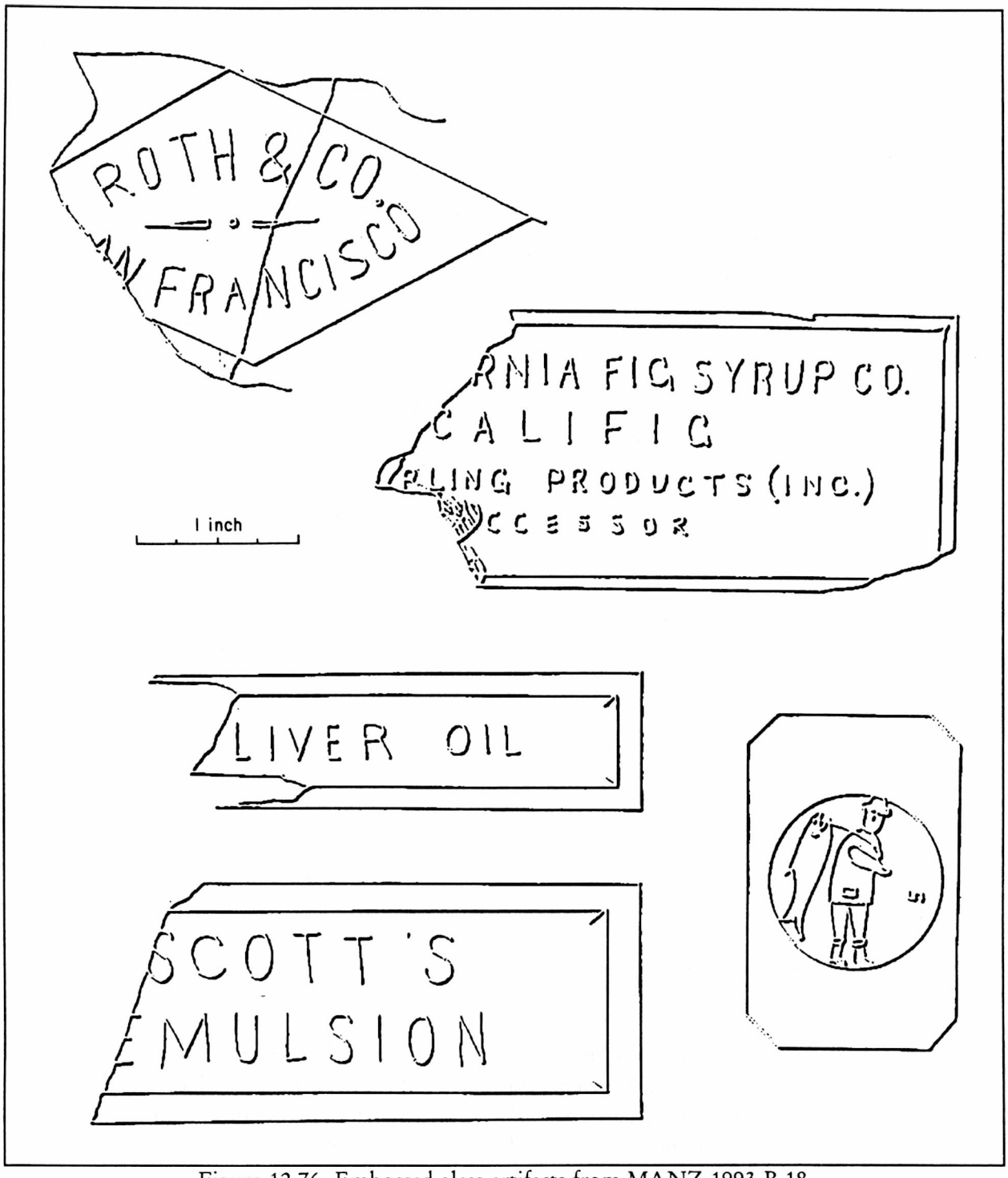


Figure 12.76. Embossed glass artifacts from MANZ 1993 B-18.

depth to the deposit (Figure 12.77). Noted were thousands of ceramic (cups, plates, crockery) and glass fragments (brown, aqua, purple, clear, and cobalt), cans (sanitary seal, hole-in-top, pocket tobacco), cut and hand-wrought nails, a heavy iron-toothed gear, a bucket, a porcelain button (1840-ca. 1910, see Appendix E), and many other artifacts.

Marks noted on glass, ceramics, and other artifacts at the site are summarized in Table 12.3. Manufacturer's marks and artifact types suggest a ca. 1900 date for the site.

Table 12.3.
Marks Noted at MANZ 1993 B-32.

Glass
... EE'S ...INE (nervine?)
...LERY COMPOUND..., probably Paine's Celery Compound (1885-1921+).
A.B.G.M.CO. A 2, Adolphus Busch Glass Manufacturing Company (1886-1928).
AB V15, American Bottle Co. basemark (1905-1929)
ALPERS, Alpers Chemical Company (ca. 1907)
Consolidated Fruit Jar ....y New York (1871-1882 and 1867+ styles).
DR. A. BOSCHEE'S GERMAN SYRUP (ca. 1872).
GOLDEN STAR FLAVORING EXTRACT TILLMANN & BENDEL, S.F.
McC, William McCully (1832-1886)
P.D. & CO. 31, Parke, Davis and Co. (1875+)
R&CO 24, Roth and Co. (1880-1890)
THE ...TED 1898... ...MEDICINE, The Celebrated HHH Medicine? (1898+)
Metal
PIONEER BAKING POWDER 8 OZ. NET. WEIGHT
SCHILLINGS BEST PIONEER 6 OZ. NET WEIGHT GUARANTEED PURE BAKING POWDER
Ceramics
B.R.C. Voltaire Germany
CHARLES MEAKIN ENGLAND IRONSTONE CHINA (1883-1889)
Homer Laughlin (ca. 1900)
KNOWLES, TAYLOR AND KNOWLES (1890-1904)
[Laugh]lin w/eagle and lion motif (pre-1900)
P.H. & S. Camb[ridge] (ca. 1880s)
POWELL and BISHOP ENGLAND [ROYA]L IRONSTONE CH[INA] (1876-1878)
Ralph Hammersly and Son (1884-1891)
T.& R. BOOTE ENGLAND ROYAL PREMIUM SEMI-PORCELAIN (1891-1906)
W.M. GRINGLEY & CO. ENGLAND (1914-1925)

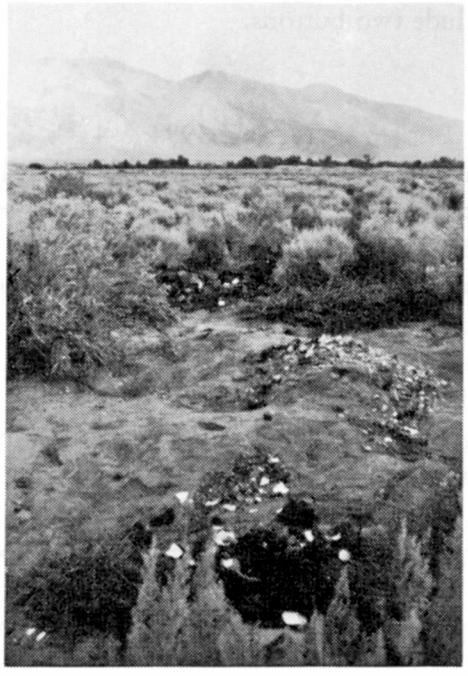


Figure 12.77. MANZ 1993 B-32, view towards north.

MANZ 1993 B-34

This site is an extensive (6½ acre) dump on BLM land one-half mile north of the National Historic Site. Associated with the town of Manzanar and possibly earlier ranching, abundant trash is scattered and concentrated along an old road that eventually leads to the town water system intake dam. The road appears little used today.

Due to time constraints the site was only briefly inspected and the surrounding area was not searched to any great extent. Noted were tens of thousands of metal, glass, ceramic, and other artifacts. Marks noted on these artifacts are summarized in Table 12.4.



Figure 12.78. Stripped vehicle at MANZ 1993 B-34.

Metal artifacts noted include abundant sanitary seal, hole-in-top, milk, various food, meat, spice, and pocket tobacco (with both hinged and press fit lids) cans, a stripped automobile body (Figure 12.78), numerous other automobile parts, cast iron stove parts, buckets, tools, a wire calf weaner, smooth and barbed wire, battery parts, and water pipe. Measured milk can dimensions ($2^{8}/_{16}$ inches by $2^{7}/_{16}$ inches, $2^{15}/_{16}$ inches by $4^{6}/_{16}$ inches, and $2^{15}/_{16}$ inches by $3^{14}/_{16}$ inches) date can manufacture to between 1917 and 1930.

Glass artifacts noted include abundant fragments of brown, purple, aqua, clear, and cobalt bottle glass, abundant window glass, a few white glass buttons, and a purple glass marble. Ceramic artifacts include numerous fragments of cups, plates, bowls, and platters, other crockery and stoneware, toilet and sink fragments, and a piece of a china doll. Wood artifacts include a broom handle and fragments of lumber. Shell artifacts include two buttons.

MANZ 1994 A-4

This site is a small (15 ft by 15 ft) trash scatter located along the west side of U.S. Highway 395 just outside the southeast corner of the National Historic Site. The site was originally recorded by Archaeological Research Services as a locus of the Manzanar Relocation Center (ARS 1993), but the age of most of the artifacts suggest it is likely associated with the town of Manzanar.

Artifacts noted at the site include approximately 25 brown glass fragments, three window glass fragments, three green glass fragments, two frag-

Table 12.4.
Marks Noted at MANZ 1993 B-34

Glass
Aurelius S. Hinds basemark (1870-1925)
Fairmount Glass Co. basemark (1898-1930)
Illinois Glass Co. Basemark (1916-1929)
J.A. Folger and Company basemark (1850-1929)
Reed Glass Co. basemark (1927-1956)
Whitall-Tatum & Co. basemark (1916-1929)

Metal
AMERICAN FISH AND OYSTER CO PACKERS ECLIPSE BRAND TRADE MARK CUT OUT SOFT TIN END
HERSHEY'S COCOA
LIBBY'S VEAL LOAF PORK & MEAT BY-PRODUCTS U.S. INSPECTED & PASSED ESTAB. 22
NEW PERFECTION No 3 (kerosene stove part)
R. ARGENTINA M.DEA. No 6 INSPECCIONIADO INDUSTRIA ARGENTINA
SCHILLINGS BEST PIONEER 6 OZ. NET WEIGHT GUARANTEED PURE BAKING POWDER
WALTER BAKER Co & Ltd 1/2 lb Net BREAKFAST COCOA

Ceramics
W.H. Grindley & Co. (1891-1914)

ments of a clear bottle lip, a purple glass medicine bottle lip, a glass brick fragment, two crockery fragments, a pocket tobacco can, and a crushed hole-in-top can.

Some depth to the deposit is likely; most of the artifacts are in an area recently disturbed by the installation of an underground fiber optics line. The relocation sewer system also passes through the site vicinity: an intact manhole is 50 ft north of the site.

TEAR OFF

Hang this up in your kitchen!

Save your WASTE FATS to make explosives!



1. The Need is Urgent. War in the Pacific has greatly reduced our supply of vegetable fats from the Far East. It is necessary to find substitutes for them. Moreover, fats make glycerine. And glycerine makes explosives for us and our allies—explosives to down Axis planes, stop their tanks, sink their ships. We need millions of pounds of glycerine and you housewives can help supply them.



2. Don't throw away a single drop of used cooking fat—bacon grease, meat drippings, frying fats—every kind you use. After you've got all the cooking good from them, pour them through a kitchen strainer into a clean, wide-mouthed can. Keep in a cool, dark place. Please don't use glass containers or paper bags.



3. Take Them to your meat dealer when you've saved a pound or more. He is cooperating patriotically. He will pay you *for* your waste fats and get them started on their way to the war industries. It will help him if you can deliver your fats early in the week.

SEE FURTHER INSTRUCTIONS ON THE REVERSE SIDE OF THIS SHEET

Chapter 13

Native American Indian Sites Within Manzanar National Historic Site

During the course of fieldwork at Manzanar 15 Native American Indian sites were discovered and recorded. Five of the sites (MANZ 1993 A-1, A-2, A-3, A-4, and A-19) are located within the authorized National Historic Site boundary and are discussed here (Figure 13.1). All are on City of Los Angeles land administered by the Department of Water and Power (LADWP). The remaining ten sites, located outside the National Historic Site, are discussed in Chapter 14.

Methods are discussed in detail in Chapter 8. Briefly, archeological work consisted of detailed surface inspection to delimit site boundaries and identify artifact concentrations, midden areas, and other features. As encountered, functionally or temporally diagnostic artifacts were collected. In addition, subsurface testing was completed at four of the five sites within the National Historic Site. Testing at the fifth site (MANZ 1993 A-19), a sparse and heavily disturbed lithic scatter, was not considered warranted at this time.

Each of these sites is discussed below. Detailed site records are on file at the California Historic Resources Information System's (CHRIS) Eastern Information Center (University of California, Riverside) and at the Western Archeological and Conservation Center (Tucson, Arizona). In addition to the recorded sites, "isolated" prehistoric artifacts (flakes, flaked and ground stone tools, and sherds) were observed throughout the National Historic Site.

The size of the five Native American Indian sites within the National Historic Site ranges from 182,200 square meters (45 acres) at MANZ 1993 A-2 to 3,770 square meters (1 acre) at MANZ 1993 A-1, with a mean of 63,530 square meters (16 acres). Site size can be somewhat misleading, however; since these sites have been affected by considerable ground disturbance, the boundaries are somewhat arbitrary.

A more realistic measure of site size may be the size of the recognized artifact concentrations or "loci" within each site. At both MANZ 1993 A-1 and A-3 one locus was defined, at MANZ 1993 A-2 three loci were defined, and at MANZ 1993 A-4 six loci associated with Native American Indian use were defined. No concentration of prehistoric remains was apparent at MANZ 1993 A-19. The loci vary in size from 470 square meters to 8,830 square meters, with an average size of 3,115 square meters (Table 13.1). Most encompass an apparent, although generally not

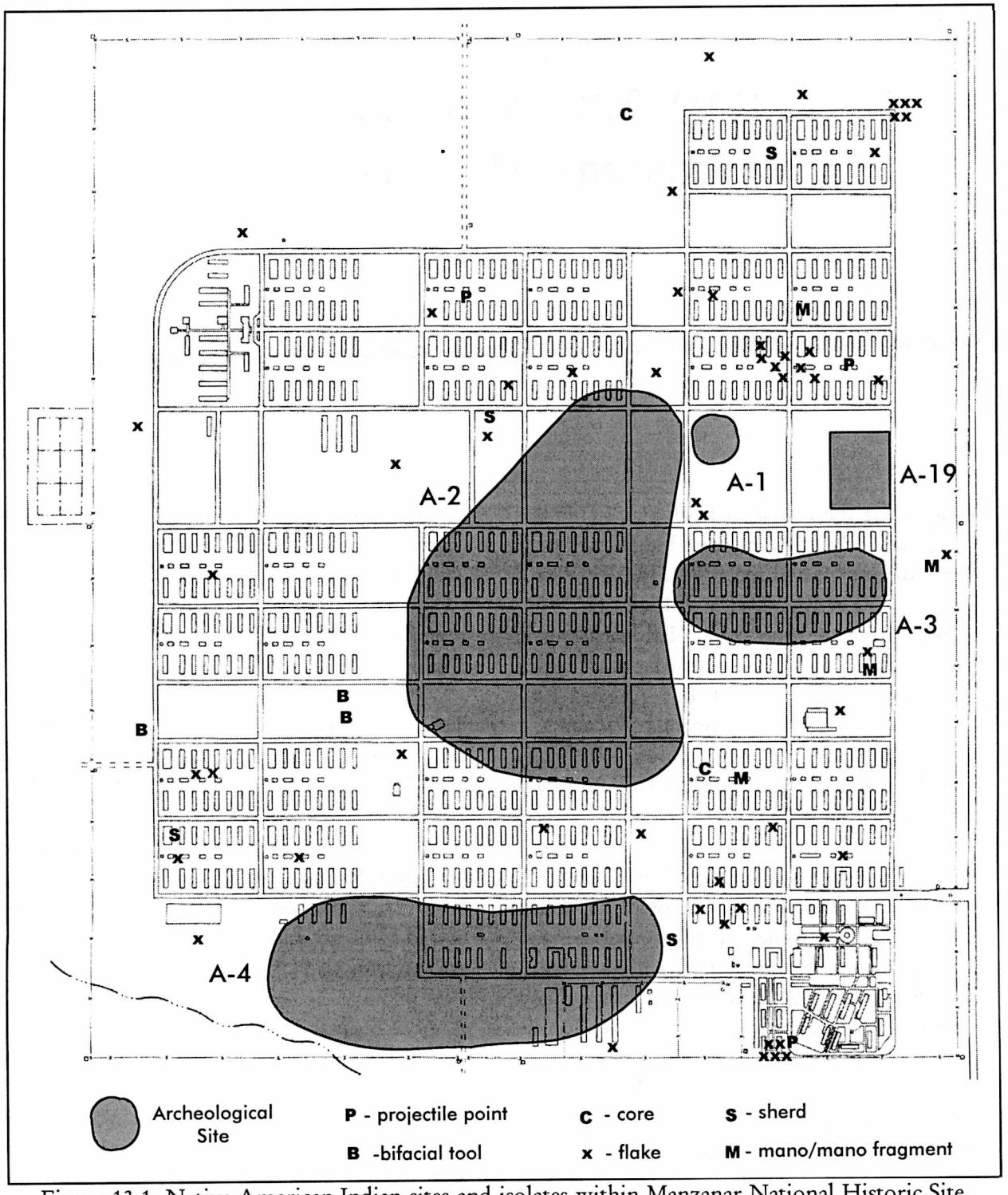


Figure 13.1. Native American Indian sites and isolates within Manzanar National Historic Site.

Table 13.1.
Characteristics of Native American Indian Sites within Manzanar National Historic Site.

Site	Locus	Size (m^2)	Midden	Historical NAI Use
A-1	A	960	yes	possibly
A-2	A	7,065	yes	no
	B	820	yes	no
	C	8,830	no	no
A-3	A	2,355	yes	no
A-4	A	1,410	yes	no
	B	7,850	yes	yes
	C	3,140	yes	yes
	D	470	yes	unknown
	E	2,950	no	no
	F	350	no	yes
A-19	-	1,175	no	no

spatially discrete, area of dark midden soil. Two subsurface features were encountered during testing, a possible house floor at MANZ 1993 A-2 and a burial at MANZ 1993 A-4.

Considering the intensive historical use the area within the National Historic Site has witnessed, a surprisingly large number of temporally diagnostic artifacts were found on the surface during survey. Owens Valley Brown Ware sherds, noted at all but one of the sites (MANZ 1993 A-19), indicate occupation after A.D. 1300. Other temporally diagnostic artifacts found include glass beads (post ca. 1850) at MANZ 1993 A-4, complete and fragmentary Desert Side-notched and Cottonwood projectile points (post A.D. 1300) at MANZ 1993 A-1, A-2, A-3, and A-4, complete and fragmentary Rose Spring Corner-notched projectile points (A.D. 600-1300) at MANZ 1993 A-2 and A-4, Elko series projectile point fragments (1200 B.C.-A.D. 600) at MANZ 1993 A-2, and a Little Lake series projectile point fragment (6000-1200 B.C.) at MANZ 1993 A-1.

MANZ 1993 A-1
(CA-INY-4861)

This site, in the north-central portion of the National Historic Site, consists of an artifact scatter covering 3,770 square meters and a small area (960 square meters) of apparent midden (Figure 13.2). Artifacts noted at the site during survey include over 100 Owens Valley Brown Ware sherds, 100 obsidian, basalt, and chert flakes, a heavily eroded base of an obsidian Pinto projectile point, a bifacial tool fragment, a basalt core, numerous ground stone fragments, a few freshwater shell fragments, a burned animal bone, and possible fire-cracked rock.

Sheet wash and erosion have evidently moved artifacts and altered the site surface. The site area was a cleared firebreak during use of the Relocation Center and the area was an orchard in the 1910s to 1930s. A recent erosion control ditch crosses the southern edge of the site.

Stratigraphy

Two 1 m by 1 m units were excavated within the midden area at MANZ 1993 A-1. Sediments from one of the units (Unit 1) were screened through 1/8-inch mesh, while sediments from the other unit (Unit 2) were screened through 1/4-inch mesh. Unit 1 was excavated to 100 cm deep and Unit 2 to 175 cm deep. Excavation revealed cultural material up to 100 cm deep. However, the deposit appears to have been subjected to considerable mixing, apparently from rodents; peach pits were found throughout the excavation units. Five major soil strata (Strata 1 through 5) were distinguished based on soil texture, color, compaction, and rock and gravel constituents (Figure 13.3).

Stratum 1 is apparent midden soil. It consists of a loose dark grayish brown to very dark grayish brown (Munsell color 10YR 4/2-3/2) sandy silt with gravels and abundant prehistoric artifacts. Charcoal bits and flecks occur throughout the stratum. Stratum 1 extended up to 40 cm deep in Unit 1 and 35 cm deep in Unit 2. Below this, small pockets of apparent midden soil can be attributed to rodent activity.

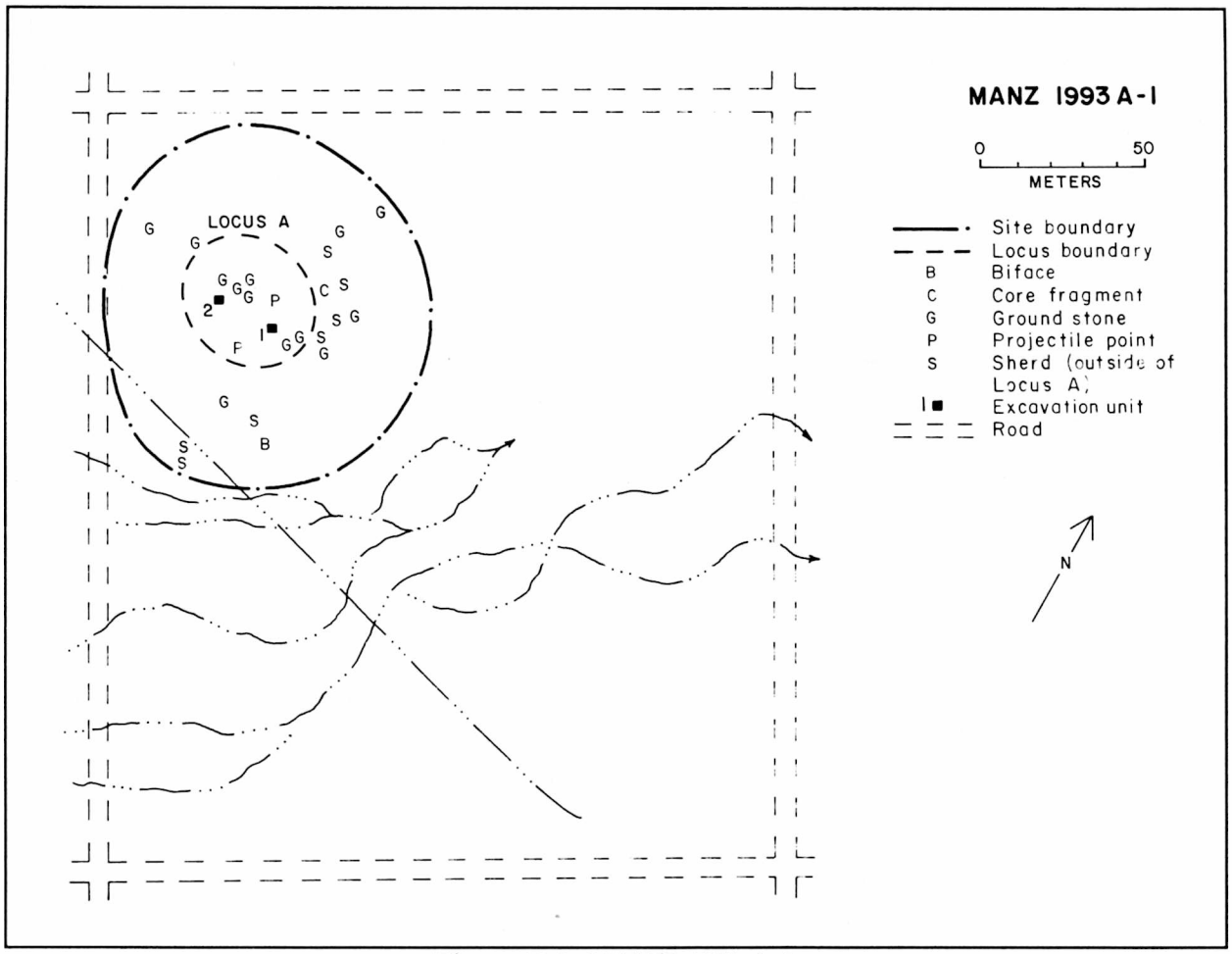


Figure 13.2. MANZ 1993 A-1.

Stratum 2 consists of a 10 cm to 30 cm thick layer of compact light brownish gray to brown (10YR 6/2-4/3) silt with gravels and sand. Excluding apparent rodent burrows, this and all underlying strata are culturally sterile.

Stratum 3 consists of loose sand. This stratum was subdivided into three units. The uppermost, Stratum 3a, is a discontinuous layer up to 14 cm thick of loose, gravelly, light brownish gray (10YR 6/2) sand. Below this, Stratum 3b, 20 cm to 40 cm thick, consists of loose dark brown to dark grayish brown (10YR 3/3-4/2) silty sand with gravels. Stratum 3c is very loose light brownish gray to very pale brown (10YR 6/2-7/3) sand with gravels and a few cobbles. This subunit was encountered at a depth of 70 cm in Unit 2; excavation was halted in Unit 1 before it was encountered. This loose material continually fell out of the sidewall during excavation making the excavation unit subject to collapse.

Stratum 4 consists of two subunits of silt encountered in Unit 2. Stratum 4a is a roughly 10 cm to 15 cm thick layer of very compact brown (10YR 5/3) silt with a few cobbles. Below this, Stratum 4b consists of a 4 cm to 12 cm thick layer of compact very dark grayish brown (10YR 3/2) silt with a few cobbles. The contact of these subunits may represent a buried surface; there were a few large rocks and cobbles present at the interface.

Stratum 5 consists of sand. Stratum 5a is a loose mottled dark brown to pinkish gray (7.5YR 4/2-6/2) sand with gravels up to 20 cm thick. Stratum 5b is slightly compact fine dark brown to pinkish gray (7.5YR 4/2-6/2) sand. First

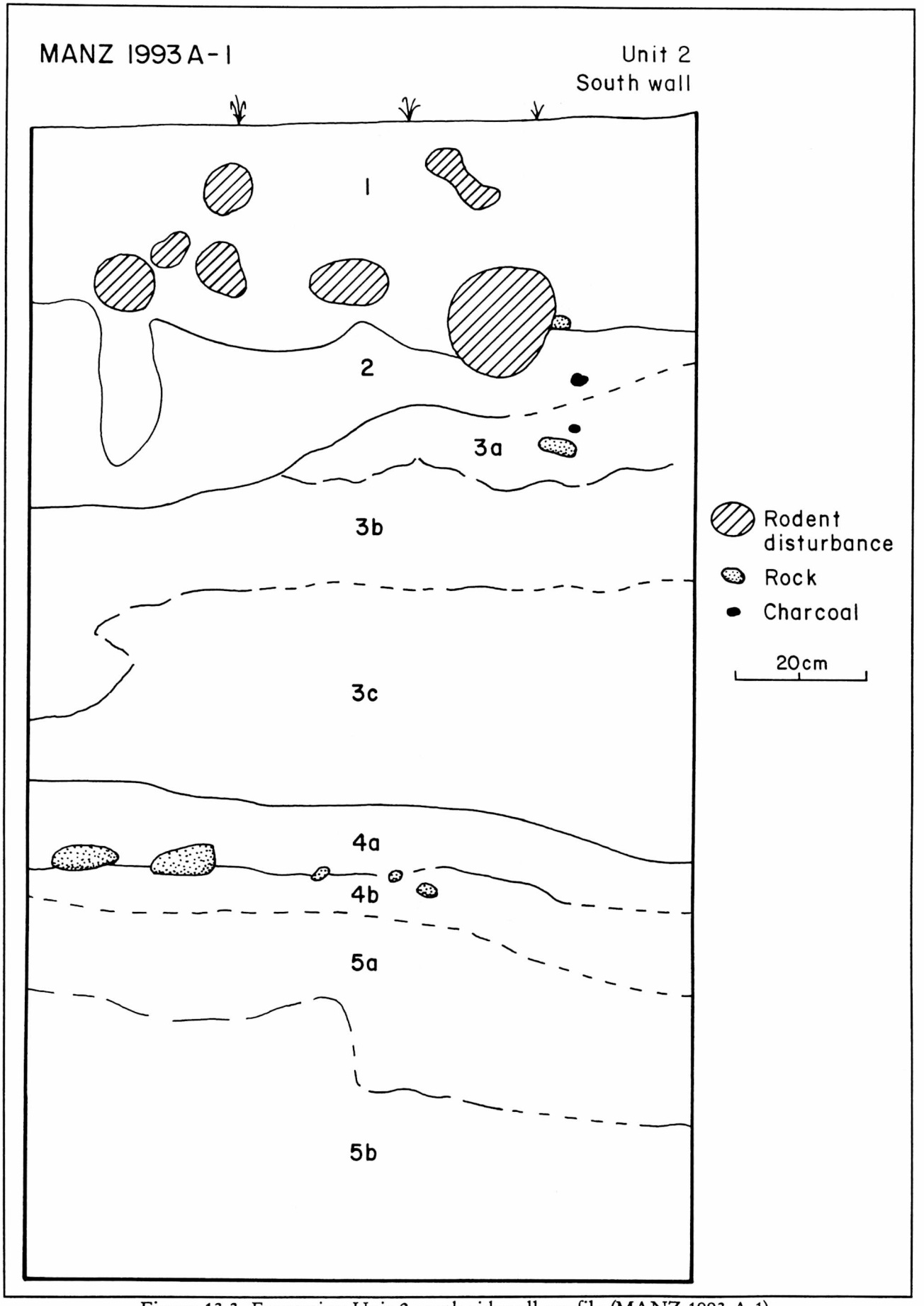


Figure 13.3. Excavation Unit 2 south sidewall profile (MANZ 1993 A-1).

Table 13.2. Distribution of Artifacts and Ecofacts in Excavation Unit 1 (MANZ 1993 A-1).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10		2			16	9	9	3	34 peach pits	1
10-20	DSN, PP		1		13	6	32	2		
20-30					3				1 peach pit	
30-40	CT		1		6	3	14	2		
40-50			1		2		21	4	bone bead fragment, 1 peach pit	
50-60	DSN				7		4			
60-70			2		7		35	3	1 peach pit	
70-80					4	1	13		1 peach pit	
80-90					2	2	15		2 peach pits	
90-100							3		1 peach pit	
Total	4	2	5		60	21	146	14	43	1

* DSN - Desert Side-notched, CT - Cottonwood Triangular, PP - unclassified fragment.

Table 13.3. Distribution of Artifacts and Ecofacts in Excavation Unit 2 (MANZ 1993 A-1).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10			1		8	3	4	2	48 peach pits	1
10-20			2		10	2	6		worked bone, bone bead, 4 peach pits	
20-30					3	1	8	5	6 peach pits	
30-40					1		2	3	2 peach pits	
40-50					1		4	2	3 peach pits	
50-60	CT				2	1	17	1		
60-70					2	1	4	2		
70-80			1	1	5				1 peach pit	
80-90					1		1			
90-100										
100-175										
Total	1		4	1	33	8	46	15	66	1

* CT - Cottonwood Triangular.

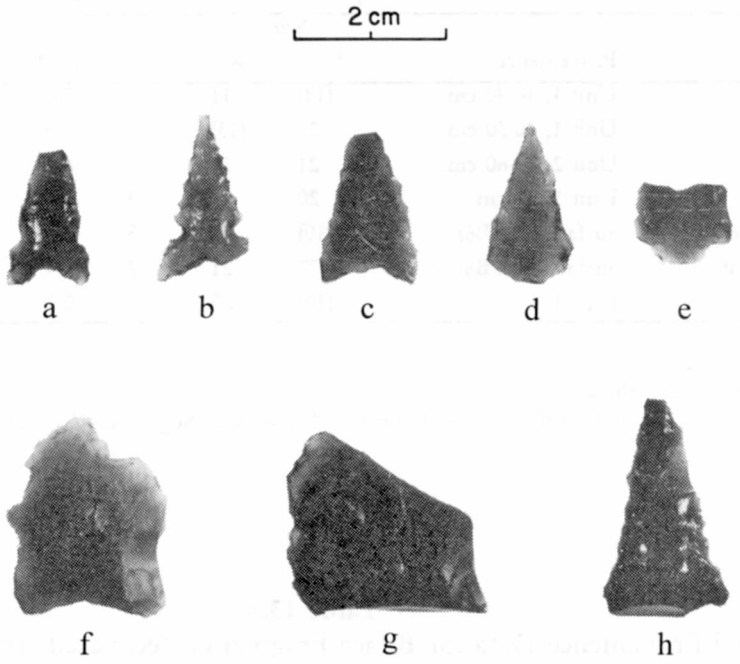


Figure 13.4. Projectile points and bifaces from MANZ 1933 A-1; a-b. Desert Side-notched points, c-d. Cottonwood Triangular points, e. Rose Spring point, f. Little Lake point, g-h. biface fragments.

encountered at 130 cm depth, it extends at least 45 cm deeper.

Assemblage

Recovered during excavation were five projectile points, two bifacial tools, eight utilized flakes, one core, 94 flakes, four fire-cracked rocks, 29 sherds, three bone artifacts, 186 animal bone fragments, 29 shell fragments, one human bone, 105 peach pits, and two intrusive historical artifacts (Tables 13.2 and 13.3). In addition, two projectile points, a bifacial tool, 13 ground stone fragments, five sherds, and a piece of unworked shell were collected from the site surface during initial recording.

Projectile Points

Seven projectile points or point fragments were recovered. All are obsidian and six could be assigned to standard Great Basin types. These include two Desert Side-notched, two Cottonwood Triangular, one Rose Spring Corner-notched, and one Little Lake projectile point (Figure 13.4). Metric and provenience data for the projectile points are provided in Table 13.4.

Both of the Desert Side-notched points from MANZ 1993 A-1 are nearly complete and have concave bases (General subtype). Both were recovered from excavation Unit 1 (10-20 cm, 50-60 cm). One, x-ray fluorescence (XRF)-sourced as Fish Springs obsidian, has a hydration value of 2.0. The other point was visually determined to be "Queen Imposter" obsidian.

The two Cottonwood Triangular points recovered from MANZ 1993 A-1 are complete. One, from Unit 2 (50-60 cm), was XRF-sourced as West Sugarloaf Mountain (Coso Hills) obsidian. The other, from Unit 1 (30-40 cm), was visually sourced as either Coso Hills or Fish Springs obsidian.

The single Rose Spring point recovered from MANZ 1993 A-1 was collected from the surface.

Table 13.4.
Metrical and Provenience Data for Projectile Points Recovered from MANZ 1993 A-1.

		Size (mm)†						
Description	Provenience	L	W	T	W(g)	Source**	OH	Cat. No.
DSN* (General subtype)	Unit 1, 10-20 cm	(18)	11	4	0.6	QI		B-29
DSN (General subtype)	Unit 1, 40-50 cm	22	(13)	4	0.5	**FS**	2.0	B-41
Cottonwood	Unit 2, 30-60 cm	21	11	3	0.4	FS/Coso		B-73
Cottonwood	Unit 1, 37 cm	20	13	3	0.6	**WS**		B-32
Rose Spring, basal fragment	Surface (Blk B6)	(10)	12	5	0.7	FS		A-58
Little Lake, basal fragment	Surface (Blk B6)	27	21	7	3.4	**FS**	W	B-6
Distal fragment	Unit 1, 12 cm	(10)	(7)	2	0.1	FS/Coso		B-20

* Desert Side-notched.
† incomplete measurements in parenthesis.
** FS = Fish Springs, Coso = Coso Hills, QI = Queen Impostor, WS = West Sugarloaf (Coso Hills); **bold** = XRF-sourced.

Table 13.5.
Metrical and Provenience Data for Biface Fragments Recovered from MANZ 1993 A-1.

		Size (mm)*						
Description	Provenience	L	W	T	W(g)	Source†	OH	Cat. No.
Distal fragment	Surface (Blk B6)	(29)	16	7	2.2	QI		B-15
Margin fragment	Unit 1, 0-10 cm	(5)	(15)	3	0.2	FS		B-19
Midsection	Unit 1, 10-20 cm	(24)	(24)	7	4.5	FS		B-26

* incomplete measurements in parenthesis.
† FS = Fish Springs, QI = Queen Impostor.

It is a basal fragment visually sourced as Fish Springs obsidian.

The Little Lake point recovered, also found on the surface, is a heavily eroded basal fragment. Fashioned of Fish Springs obsidian, it was too weathered to yield a hydration rim measurement.

The final projectile point recovered from MANZ 1993 A-1 is a distal (tip) fragment. The fragment could not be classified as to type, but its small size suggests use as an arrow point. The material could not be visually differentiated between Coso Hills and Fish Springs obsidian.

Bifacial Tools

Three bifacial tool fragments were recovered from MANZ 1993 A-1, two during excavation and one from the surface (see Figure 13.4). One of the specimens is a midsection, one is a distal (tip) fragment, and one is a margin fragment. Provenience and metrical data are provided in Table 13.5. Two were visually sourced as Fish Springs obsidian and one as Queen Imposter obsidian.

Utilized Flakes

Nine utilized flakes were recovered during excavation at MANZ 1993 A-1, which account for 32 percent of the flaked stone tool assemblage. Four of the utilized flakes are cryptocrystalline (chert), three are obsidian, and one is fine-grained basalt. Three of the four obsidian pieces were visually sourced as Fish Springs obsidian, and the fourth could not be differentiated between Coso Hills and Fish Springs.

Core

A small obsidian core fragment was recovered from the 70-80 cm level of Unit 2. The piece, measuring 1.8 cm by 2.4 cm by 1.0 cm in size and weighing 4.1 g, was visually sourced as Fish Springs obsidian.

Debitage

The debitage collection from MANZ 1993 A-1 is composed of 93 flakes. Sixty flakes were recovered from Unit 1 (screened with 1/8-inch mesh) and 33 flakes were recovered from Unit 2 (screened with 1/4-inch mesh). Sixty-five percent of the debitage was from the upper 40 cm of the deposit (see Tables 13.2 and 13.3). Material types include 51 percent cryptocrystalline materials, 49 percent obsidian, and a trace of fine-grained basalt. Based on visual criteria, obsidian sources present were estimated to be 74 percent Fish Springs, 15 percent Coso Hills, 5 percent Casa Diablo, and 2.5 percent each Queen and Queen Imposter.

Obsidian flake types are almost equally divided between early (48%) and later (52%) stage types. The majority are simple or complex interior flakes (31% and 28% respectively). Percussion/pressure flakes and cortical flakes each comprise 17 percent of the assemblage and biface thinning flakes comprise 7 percent. Cryptocrystalline flake types indicate a strong emphasis on early stage bifacial reduction, expressed by high percentages of simple interior (47%) and cortical flakes (36%). But, later stage reduction is also represented with over a quarter of the assemblage including complex interior flakes (14%), biface thinning flakes (3%) and percussion/pressure flakes (11%). The lone piece of basalt debitage is a cortical flake, associated with early stage bifacial reduction.

Ground Stone Artifacts

The ground stone assemblage from MANZ 1993 A-1 consists of six mano fragments and seven indeterminate fragments all collected from the surface of the site (Figure 13.5). All appear to be fire-cracked, but given the past disturbance at the site, the fracturing may be due to other causes.

Only two of the manos approach one-half complete; most are less than one-quarter complete. Identified types include two bifacial oval-shaped manos (2.0 cm and 5.3 cm thick), a unifacial oval-shaped mano (5.0 cm thick), and a well-polished unshaped cobble with bifacial use wear (4.0 cm thick). Two of the oval-shaped manos are of fine-grained basalt and the other is of vesicular basalt. The unshaped cobble specimen is of granite. The two remaining mano fragments are too fragmentary to further classify, they are of vesicular basalt and granite.

Unclassified ground stone fragments include two of granite and one each of fine-grained basalt, quartzite, pumice, micaceous schist, and silicifed sandstone.

Fire-Cracked Rock

In addition to the apparently fire-cracked ground stone noted above, four pieces of fire-cracked rock were noted during excavation of Unit 1. All granite, the largest piece measured 10 cm by 8 cm by 5 cm.

Ceramics

Excavation at MANZ 1993 A-1 produced 29 small Owens Valley Brown Ware sherds. In addition, five sherds were collected from the surface during initial site recording. All of the sherds are sand/grit-tempered plain brown ware manufactured by coiling and scraping. No slip, paint, glaze, or decoration was evident. Both exteriors and interiors of most of the sherds in the MANZ 1993 A-1 assemblage are rough, unsmoothed, and unpolished (Table 13.6). As at other sites in the region surface colors vary, ranging from gray brown (Munsell color 10YR 2.5-5/1-4) to reddish brown (2.5 YR 3-5/4). Surface luster is dull to earthy. Measured thicknesses range from 4.8 mm to 9.7 mm with a mean of 6.9 mm and a standard deviation of 1.3.

The ceramic collection includes five rim sherds, three from the surface and two from the

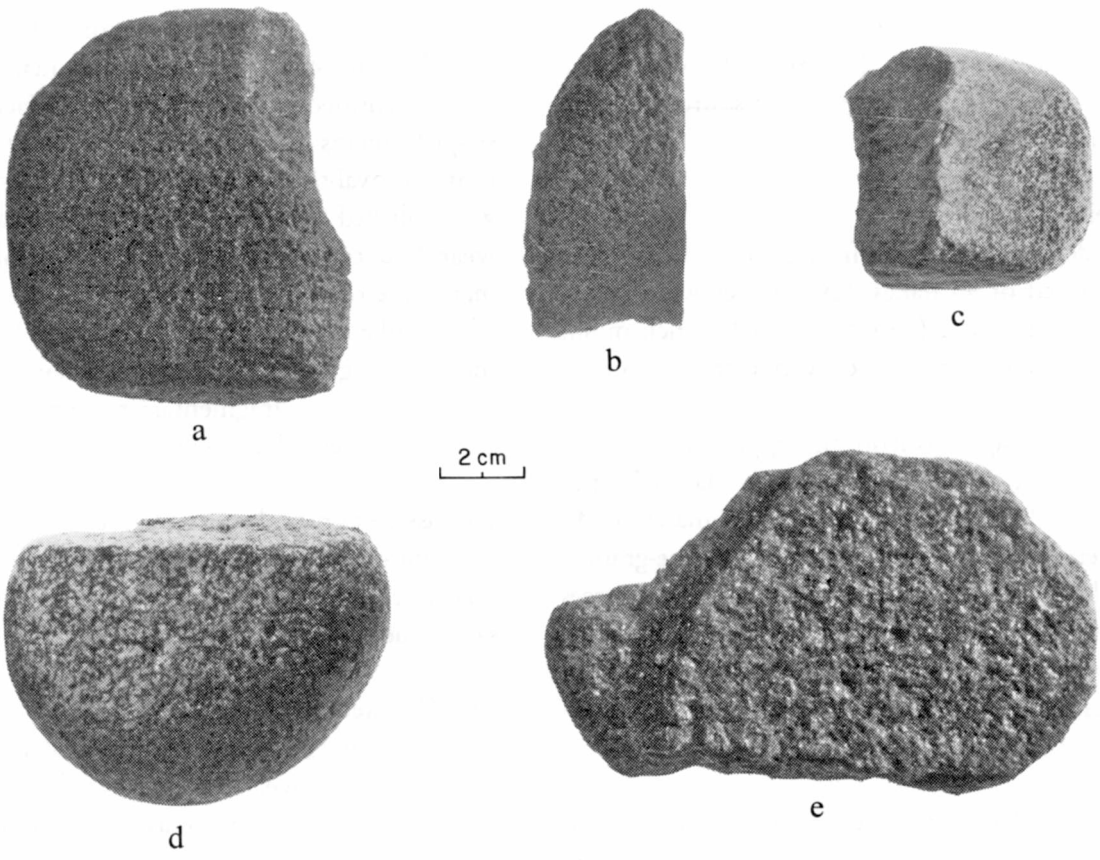


Figure 13.5. Mano fragments from MANZ 1933 A-1; a, e. unifacial, b-d. bifacial.

Table 13.6.
Surface Treatment of individual sherds from MANZ 1993 A-1.

Interior Surface	Exterior Surface				
	Smooth	Rough	Random Brushed	Parallel Brushed	Total
Smooth	2	1	-	-	3
Rough	1	17	3	2	23
Random Brushed	-	1	1	1	3
Parallel Brushed	1	3	1	-	5
Total	4	22	5	3	34

excavation units. Three have a rounded lip and exhibit a slight incurve, one has a flat lip and a slight incurve, and the final specimen has a flat to slightly rounded lip and no curving.

Bone Artifacts

Bone artifacts from MANZ 1993 A-1 include two tubular bead fragments and a possible awl tip (see Appendix H). All were recovered during excavation, one of the beads from Unit 1 (30-40 cm) and the other bead and the awl tip from Unit 2 (10-20 cm). Both beads are made of rabbit-sized metapodial bones. One is nearly complete, but burned; it measures 10.1 mm long and has a diameter of 2.8 to 3.4 mm. The awl fragment could not be classified as to type.

Vertebrate Faunal Remains

Not including the bone artifacts above, the 186 animal bone fragments recovered represent 12 taxa including mammals, amphibians, reptiles, and birds (see Appendix H). Forty percent of the bone assemblage was identifiable to the class level or lower. Forty-five percent was burned. Lagomorphs comprise 28 percent of the identifiable specimens, rodent species 22 percent, and artiodactyl remains 12 percent. Other identified remains include a burned mandible of a coyote or dog (*Canis* sp.), another *canid* element, 12 frog or toad elements, nine snake elements, and five bird specimens.

The amphibian bones and some of the rodent bones may be intrusive, rather than cultural: these have no visible surface modifications or evidence of burning or breakage. The Lagomorph bone is 71 percent jackrabbit (*Lepus* sp.) and 29 percent cottontail (*Sylvilagus* sp.) elements. Artiodactyl bone (n=9) includes a mandible fragment and an upper molar identified as bighorn sheep (*Ovis canadensis*). Two artiodactyl rib shaft fragments appear to have been cut with a coarse-toothed saw, which suggests they may represent later historical specimens. Both were found Unit 1, one from the 20-40 cm level and the other from the 70-80 cm level.

Invertebrate Fauna

In all, 30 small fragments of fresh-water bivalve shell were recovered from MANZ 1993 A-1. Twenty-nine were from the excavation units and one piece was surface-collected during survey. All are likely *Anodonta*, a mollusk still common today in the Owens River.

Human Remains

A human bone was recovered from the 20-30 cm level of Unit 1. The bone appears to be the first metatarsal of a subadult (see Appendix I). The bone was not associated with an intact burial: no other human remains were encountered.

Other Organic Remains

During excavation 105 whole or fragmentary peach pits were recovered. Seventy-eight percent of these were from the upper 10 cm of the deposit. Below this, nearly all of the recovered peach pits were from obvious rodent burrows.

Intrusive Historical Artifacts

A wire nail was recovered from the 0-10 cm level of Unit 1 and a metal fragment was recovered from the 0-10 cm level of Unit 2. It seems unlikely that either artifact is associated with the aboriginal occupation of the site. In fact, it is surprising that so few historical artifacts were recovered, given the large number of peach pits recovered in the excavation units and the intensive historical use of the immediate area.

Obsidian Hydration

Fourteen specimens visually- or XRF-sourced as Fish Springs obsidian were submitted for hydration analysis (see Appendix L). Four of the specimens had diffuse unreadable rims. Hydration rims of the readable specimens ranged from 1.2 microns to 6.7 microns, with a mean of 2.9 microns and a standard deviation of 2.9. Using the Fish Springs obsidian hydration rate used in Delacorte and McGuire (1993), all but two of the values fall within the Klondike and Baker periods, A.D. 600 to 1750 (Figure 13.6).

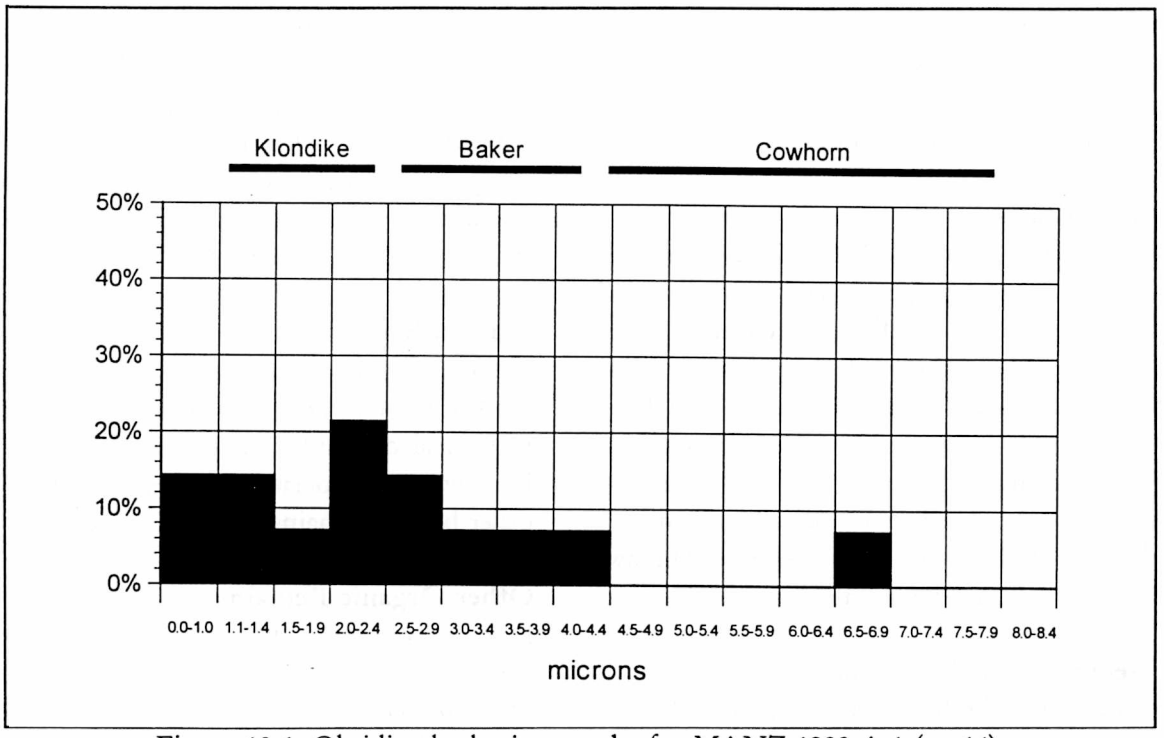


Figure 13.6. Obsidian hydration results for MANZ 1933 A-1 (n=14).

Site Summary

Testing at MANZ 1993 A-1 revealed a 40-cm-deep midden deposit. No subsurface features were encountered. The integrity of the site has been compromised to some extent by extensive rodent disturbance. However, in general this disturbance is rather limited and easily distinguishable. The recovery of a human bone suggests that additional human remains are likely present at the site.

Midden soil and a varied artifact assemblage indicate intensive use. The site appears to have been a base camp where a variety of subsistence and maintenance tasks took place. Obsidian hydration data indicate site use between about 650 B.C. and A.D. 1750. Projectile points, ceramics, and other data indicate that the site was utilized primarily during the Klondike period (A.D. 1300 to historical times). The presence of saw marks on two artiodactyl rib bone fragments may suggest use of the site into historical times. However, this seems unlikely given that no other historical-era remains attributable to the Native American Indian occupation were encountered during testing.

The Little Lake projectile point (3500-1200 B.C.) found on the surface does not appear to be associated with the principal occupation of the site, except possibly as a curated or collected piece. The point, along with three other obsidian pieces that have diffuse hydration rims, may indicate that an earlier component is present at the site. If so, it would likely be an example of horizontal rather than vertical stratigraphy, since it was not encountered in the testing which was limited to the central "midden" area of the site.

MANZ 1993 A-2

(CA-INY-4862)

MANZ 1993 A-2 covers over 182,000 square meters (45 acres) in the central portion of the National Historic Site. The site consists of four concentrations of prehistoric artifacts within an extensive, albeit sparse, scatter of debitage, flaked stone tools, ground stone, and sherds (Figure 13.7). Sheet wash, gully erosion, and historical activities have undoubtably moved artifacts and greatly altered the site surface. Recently, erosion control ditches have been

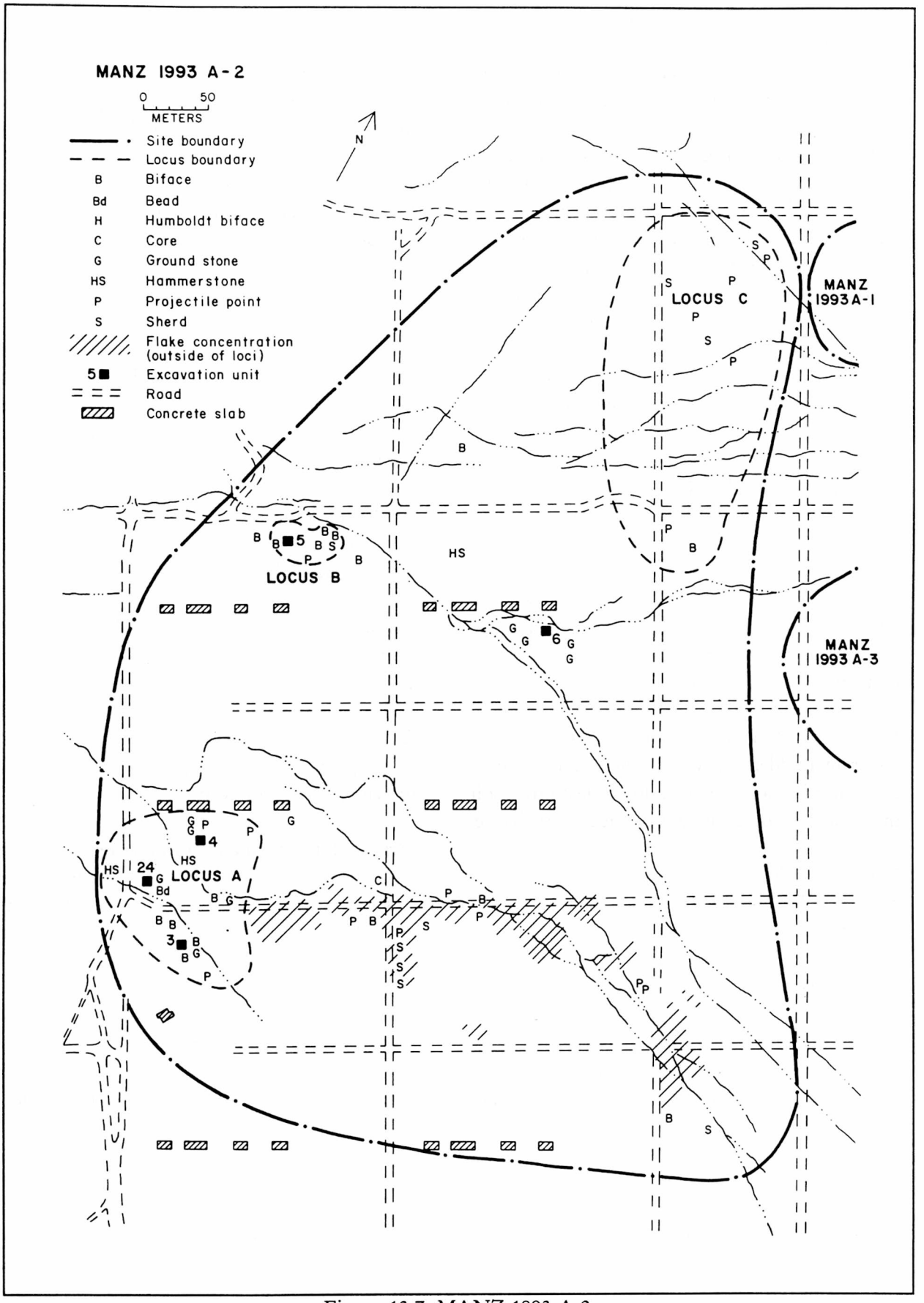


Figure 13.7. MANZ 1993 A-2.

dug throughout the site area. In the 1910s to 1930s there were orchards throughout the area. During the relocation center era much of the area was used for barracks and other structures.

Locus A covers an area of 7,065 square meters (120 m north-south by 75 m east-west), mostly within Block 15 of the relocation center and an adjacent firebreak. Noted on the surface were thousands of obsidian, basalt, metavolcanic, and chert flakes (up to 25 items per square meter), a chert and an obsidian Rose Spring Corner-notched projectile point, three obsidian biface fragments, seven ground stone fragments, a battered cobble, two hammerstones, and two Owens Valley Brown Ware sherds.

Locus B, fully within Block 22, includes about 820 square meters (20 m north-south by 45 m east-west). Noted on the surface were three obsidian biface fragments, an obsidian projectile point fragment, a quartz biface tip, two utilized flakes, an Owens Valley Brown Ware rim sherd, and several obsidian and basalt flakes (up to three items per square meter).

Both Loci A and B include small areas of apparent midden. However, these midden areas could not be easily defined due to leaf litter, soil movement, and apparent historical disturbance.

No midden deposit was apparent at the eastern-most and largest (15,300 square meters) of the artifact concentrations, Locus C. Artifacts at Locus C include two obsidian Rose Spring Corner-notched projectile points, an obsidian Cottonwood Triangular projectile point base, several Owens Valley Brown Ware sherds, a ground stone fragment, and scattered obsidian, basalt, and chert flakes (up to three items per square meter).

The fourth artifact concentration noted at the site consists primarily of eroded and redeposited material from Locus A (see Figure 13.7).

Stratigraphy

Five 1 m by 1 m units were excavated at MANZ 1993 A-2, three within Locus A (Units 3, 4, and 24), one within Locus B (Unit 5), and one in the eastern portion of the site (Unit 6). Units 4, 5, and 6 were screened through 1/4-inch mesh and Units 3 and 24 were screened through 1/8-inch mesh. Unit 3 was excavated to a depth of 60 cm, Unit 4 to 70 cm, Unit 5 to 100 cm, Unit 6 to 90 cm, and Unit 24 to 80 cm.

Four major soil strata (Strata 1-4) were discerned during testing on the bases of texture color, compaction, and rock and gravel constituents (Figures 13.8-13.11). Two of the strata (Strata 2 and 4) occur in all five of the excavation units. Stratum 1 occurred only in Units 5 and 6 and Stratum 3 was confined to Unit 4. In excavation Unit 24 a possible house floor was encountered within Stratum 2.

Stratum 1 consists of loose yellowish brown (Munsell color 10YR 5/4) sand with abundant gravels and some silt. Very few prehistoric artifacts were recovered from this stratum. In Unit 5 it extended from the surface up to 30 cm deep and in Unit 6 it extended from the surface up to 55 cm deep.

Stratum 2 is the main cultural deposit at the site. This apparent midden soil consists of loose dark brown to very dark grayish brown (10YR 3/3-4/2) sandy silt with abundant artifacts, charcoal, and gravels. This stratum varied in thickness from 70 cm in Unit 24 to approximately 6 cm in Unit 6. In Units 5 and 6 the midden was overlain by Stratum 1.

Within stratum 2 at 30 cm below the surface a possible house floor (designated Feature 1) was encountered in Unit 24. The feature is similar to house floors encountered at other sites in the region (Basgall and McGuire 1988; Burton 1985a; Delacorte and McGuire 1993). It consists of a thin discontinuous layer of charcoal, ash, and gravels. Associated with the layer were



Figure 13.8. Excavation Unit 3 south sidewall (MANZ 1993 A-2).

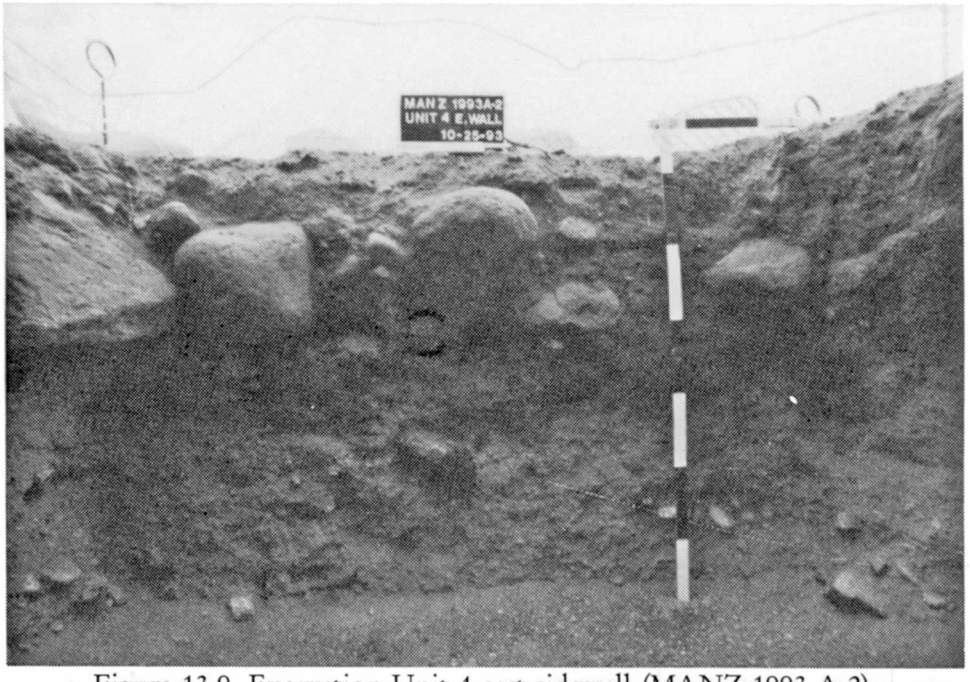


Figure 13.9. Excavation Unit 4 east sidewall (MANZ 1993 A-2).

numerous artifacts, including two manos, several cores, two projectile points, two bifaces, and a scraper. The manos and a core were found in a cluster just above the charcoal layer. The layer was not compacted and no hearth or other floor features were encountered within the test unit.

Stratum 3, dark reddish brown (5YR 3/3) sandy gravel, was encountered only in Unit 4, where it formed a 10-cm- to 25-cm-thick layer capped by a layer of cobbles and 12 cm to 25 cm of midden. Artifacts were present within this stratum but were significantly fewer in number than in the overlying midden.

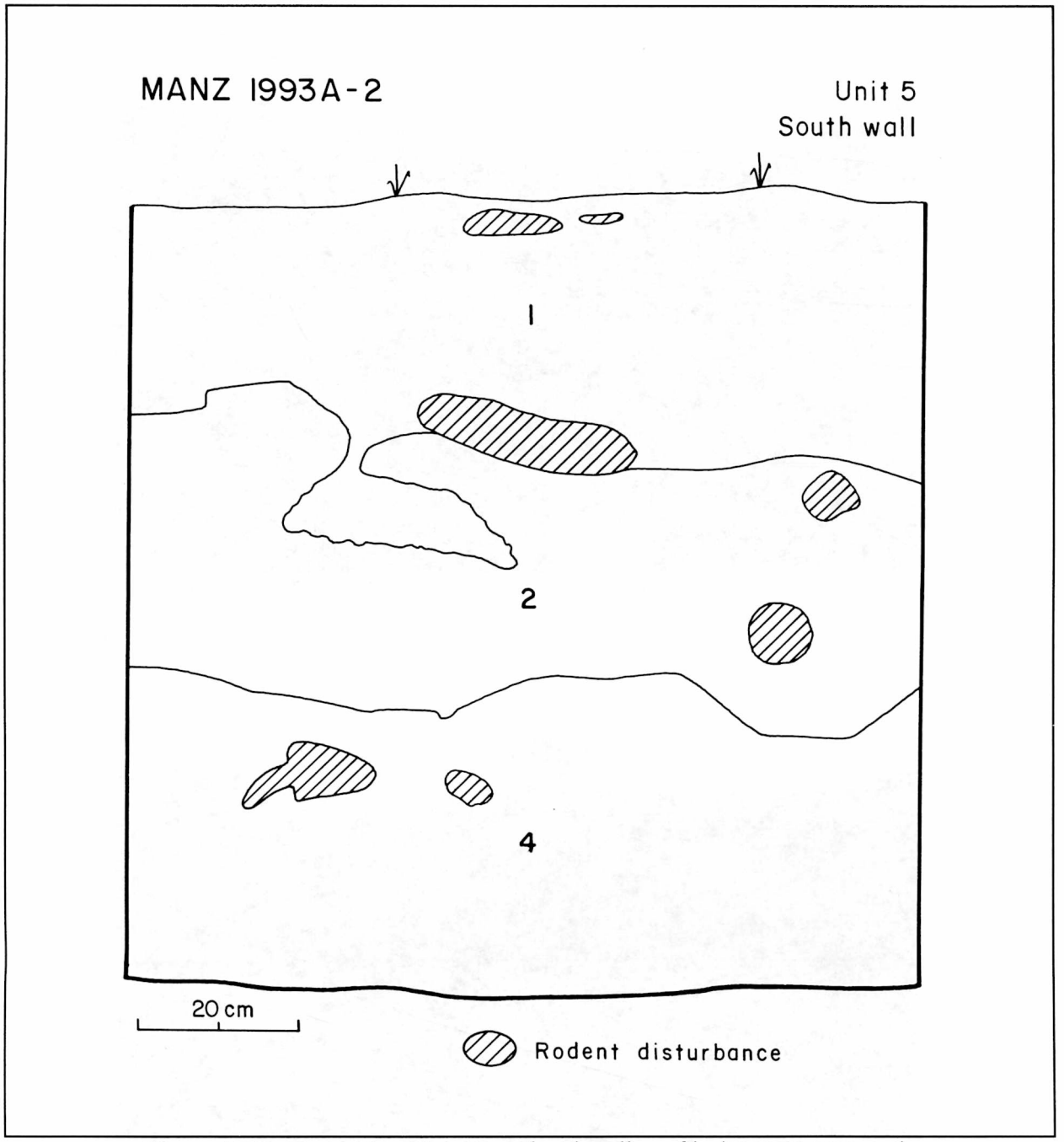


Figure 13.10. Excavation Unit 5 south sidewall profile (MANZ 1993 A-2).

Stratum 4, the lowest encountered, consists of very loose pale brown (10YR 6/3) culturally-sterile sand and gravel. Within this stratum in Unit 3, a cobble layer was encountered between 40 cm and 55 cm. This stratum began at depths ranging from 38 cm to 70 cm below the present ground surface.

Assemblage

Artifacts collected from the surface of MANZ 1993 A-2 during initial site recording include 14 projectile points, 32 bifacial tools and preforms, three utilized flakes, a core, two hammerstones, 13 ground stone artifacts, six sherds, a stone bead, and an incised stone. Additional artifacts recovered during testing included six projectile points, 11 bifacial tools,

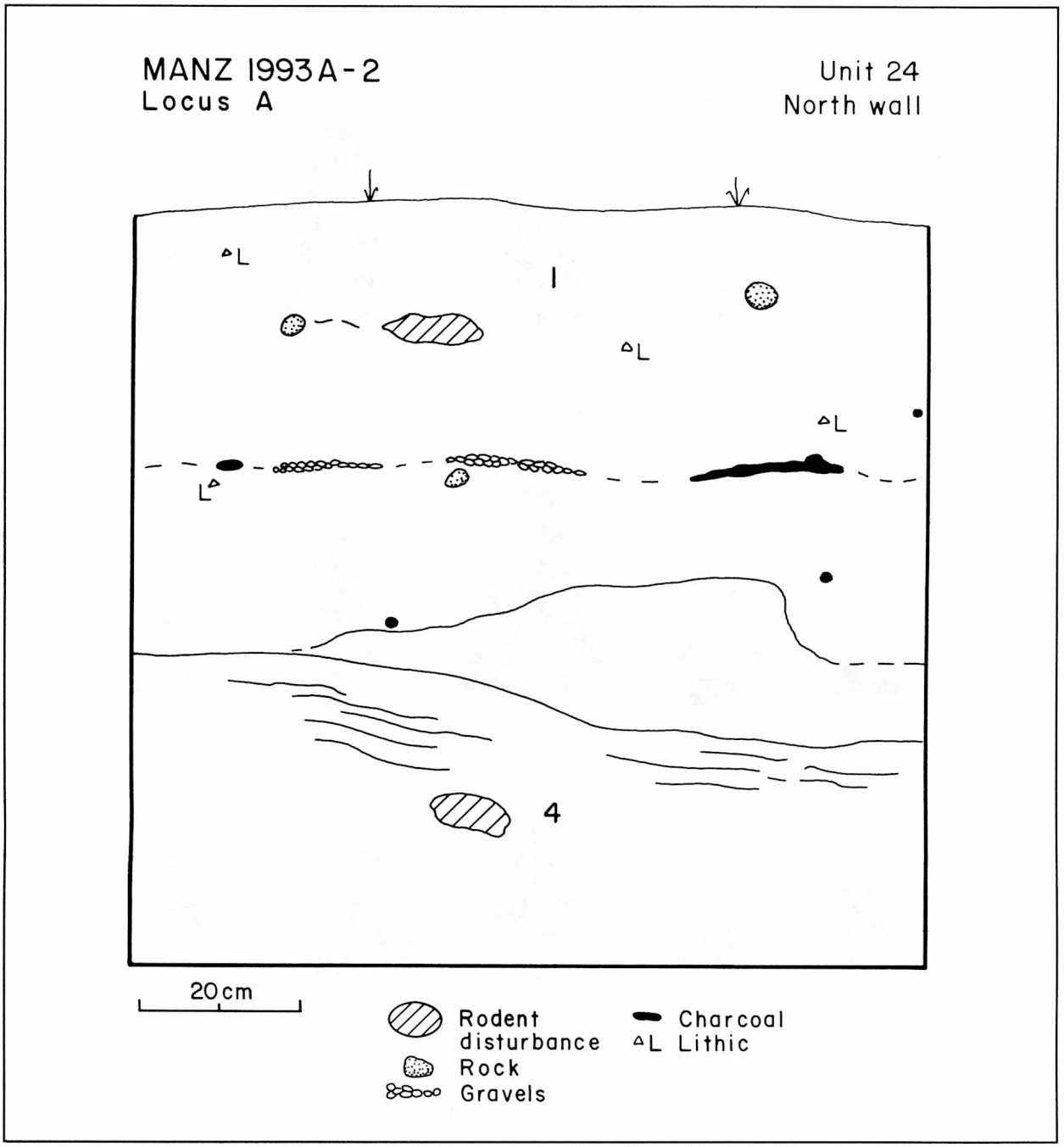


Figure 13.11. Excavation Unit 24 north sidewall profile (MANZ 1993 A-2).

two scrapers, 187 utilized flakes, 14 cores, 2,998 pieces of debitage, 11 ground stone artifacts, one sherd, four bone artifacts, 1,048 other bone fragments, three shell artifacts, 94 other shell fragments, 12 peach pits, 10 pieces of fire-cracked rock, and 117 intrusive historical artifacts (Tables 13.7-13.11).

Projectile Points

Fifteen of the 20 projectile points collected from MANZ 1993 A-2 could be assigned to standard Great Basin types. These include two Desert series points, 11 Rose Spring Corner-notched points, and two Elko series points (Figure 13.12). Metric and provenience data for the projectile points are provided in Table 13.12.

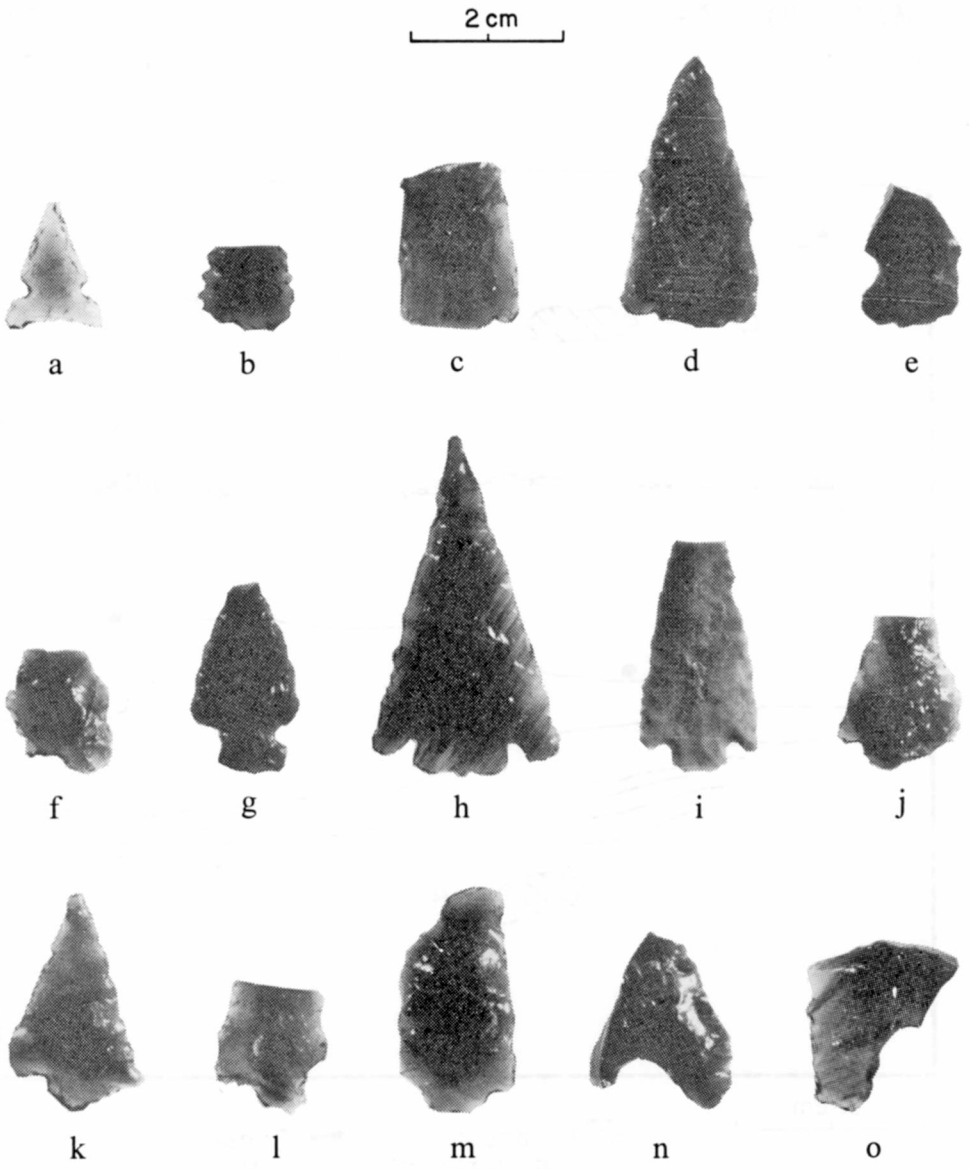


Figure 13.12. Projectile points from MANZ 1993 A-2 (a. Desert Side-notched, b. Cottonwood Triangular, c-l. Rose Spring Corner-notched, m. Rose Spring preform, n-o. Elko series fragments).

The Desert series points consist of one Desert Side-notched and one Cottonwood Triangular point. The Desert Side-notched point, of the General subtype (concave base), was recovered from the 10-20 cm level of Unit 24. It was XRF-sourced as Queen Imposter obsidian. The Cottonwood Triangular point, collected from the site surface, has serrated edges. It was visually identified as made of Queen obsidian.

One of the 11 Rose Spring Corner-notched projectile points is chert and the remainder are obsidian. All, save three from excavation Unit 24, were from the surface. Eight of the obsidian specimens appear to be of Fish Springs obsidian and the remaining two appear to be of Queen Imposter obsidian. The Fish Springs obsidian points include three heavily reworked specimens and a likely preform. Six of the eight Rose Spring points attributed to the Fish Springs source were submitted for obsidian hydration analysis. The hydration values range from 2.5

Table 13.7. Distribution of Artifacts and Ecofacts in Excavation Unit 3 (MANZ 1993 A-2).

Level (cm)	Projectile Points	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10		1	7		40		19		mano fragment	3
10-20			1		95		87	4		
20-30		1	1	1	41		22		1 peach pit	
30-40					29		30			1
40-50					1					
50-60										
Total		2	9	1	206		158	4	2	4

Table 13.8. Distribution of Artifacts and Ecofacts in Excavation Unit 4 (MANZ 1993 A-2).

Level (cm)	Projectile Points	Bifacial Tools	Retouched Pieces*	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10			3		16		1			48
10-20			1	1	74		1			32
20-30			4	1	32		4			5
30-40			1	1	5		1			
40-50			1		10					
50-60					5		1			
60-70										
Total			10	3	142		8			85

* includes scrapers

Table 13.9. Distribution of Artifacts and Ecofacts in Excavation Unit 5 (MANZ 1993 A-2).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10		1			28		11	18		4
10-20	PP	4	1		43		38	24		1
20-30		1	1		36		33	10	mano fragment, bone bead, 4 peach pits	
30-40			2		37		27		metate fragment, worked bone	
40-50		2	2		31		70	1		
50-60		1			16		30		mano	
60-70			1		12		20	2		
70-80					7		2			1
80-90					1					
90-100					1					
Total	1	9	7		212		231	55	6	6

* PP - unclassified fragment.

Table 13.10. Distribution of Artifacts and Ecofacts in Excavation Unit 6 (MANZ 1993 A-2).

Level (cm)	Projectile Points	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10					1		1		6 peach pits	11
10-20					1		1	4	1 peach pit	
20-30					1			2		
30-40										
40-50										
50-60			2		4					
60-70										
70-80										
80-90										
Total			2		7		2	6		11

Table 13.11. Distribution of Artifacts and Ecofacts in Excavation Unit 24 (MANZ 1993 A-2).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces**	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10		2	28		370		34	6	shell bead	18
10-20	DSN	1	23		518		129	12	shell bead, 4 ground-stone fragments	4
20-30	3 RS, 2 PP	3	24	5	527		148	14	shell bead, 2 manos	
30-40		1	24	3	348	1	88	2		
40-50		1	16		243		62			
50-60		3	23		261		94		bone bead fragment, mano	
60-70		1	15		160		81	1	2 bone awl fragments	
70-80			2		18		5			
Total	6	12	155	8	2,445	1	648	35	13	22

* DSN - Desert Side-notched, RS - Rose Spring Corner-notched, PP - unclassified fragment.
** includes scrapers

Table 13.12.
Metrical and Provenience Data for Projectile Points Recovered from MANZ 1993 A-2.

Description	Provenience	Size (mm)† L	W	T	W(g)	Source**	OH	Cat. No.
DSN* (General subtype)	Unit 24, 10-20 cm	17	13	3	0.4	**QI**		B-733
Cottonwood (serrated)	Surface (Blk C6)	(11)	(11)	(3)	0.4	Q		A-28
Rose Spring (reworked)	Surface (Blk 16)	28	16	4	1.4	FS	3.9	B-139
Rose Spring (reworked)	Surface (Blk 16)	(30)	16	3	1.7	chert		B-141
Rose Spring (preform)	Surface (Blk 22)	30	16	5	2.3	FS		B-150
Rose Spring	Surface (Blk D3)	(36)	18	4	2.7	FS	2.5	A-6
Rose Spring	Surface (Blk C6)	25	14	4	1.3	**QI**		A-27
Rose Spring	Surface (Blk J)	(18)	(13)	4	1.1	FS		A-10
Rose Spring	Surface (Blk C5)	(20)	15	4	1.7	FS	2.5	A-32
Rose Spring	Surface (Blk 21)	(17)	(14)	4	4.7	FS	3.2	A-44
Rose Spring	Surface (Blk D3)	(17)	19	6	1.5	FS		A-7
Rose Spring (reworked)	Unit 24, 20-30 cm	(17)	(19)	4	1.3	FS	3.0	B-740
Rose Spring (preform)	Unit 24, 20-30 cm	26	14	3	1.1	**FS**	3.7	B-750
Rose Spring/Elko	Unit 24, 20-30 cm	45	24	4	2.9	**QI**		B-857
Elko tang	Surface (Blk D3)	(24)	(21)	7	2.5	FS	3.7	A-5
Elko tang	Surface (Blk 16)	(24)	(15)	6	2.1	FS	4.9	A-39
Fragment	Surface (Blk J)	(19)	(14)	5	1.2	CD		A-9
Stem or tang	Surface (Blk 22)	(13)	15	6	0.9	**QI**		B-151
Midsection	Unit 5, 10-20 cm	(15)	11	3	0.5	FS		B-187
Distal fragment	Unit 24, 20-30 cm	(9)	6	2	0.1	chert		B-743
Distal fragment	Unit 24, 20-30 cm	(8)	6	2	0.1	Q		B-743

* Desert Side-notched.
† incomplete measurements in parenthesis.
** FS= Fish Springs, Q = Queen, QI = Queen Impostor; **bold** = XRF-sourced.

microns to 3.9 microns, with a mean of 3.1 microns and a standard deviation of 0.5.

One of the projectile points classified as Rose Spring Corner-notched based on its form could be classified as an Elko Corner-notched point based on metric criteria (Thomas 1981). The point has a basal width of 13 mm; in Thomas's data sets, basal width of Rose Spring points was less than 10 mm and basal widths of Elko points was greater than 10 mm. However, the point's association with a possible house floor with charcoal dated to ca. 1000 B.P. (see below) corroborates the Rose Spring ascription. The point, from the 20-30 cm level of Unit 24 (Feature 1), visually appears to be of Queen Imposter obsidian.

More definite Elko series points from MANZ 1993 A-2 consist of two tang fragments. Both were collected from the surface. Both visually fit the description of Fish Springs obsidian. One has a hydration rim of 3.2 microns and the other a hydration rim of 3.7 microns.

Unclassifiable projectile point fragments include two surface-collected pieces and three from excavation units. The surface-collected pieces include a stem or tang XRF-sourced as Queen Imposter obsidian and a medial fragment visually identified as Casa Diablo obsidian. Point fragments from the excavation units include a midsection which appears to be Fish Springs obsidian from Unit 5 (10-20 cm) and two distal (tip) fragments from Unit 24 (20-30 cm), one of chert and one of Queen obsidian (XRF-sourced).

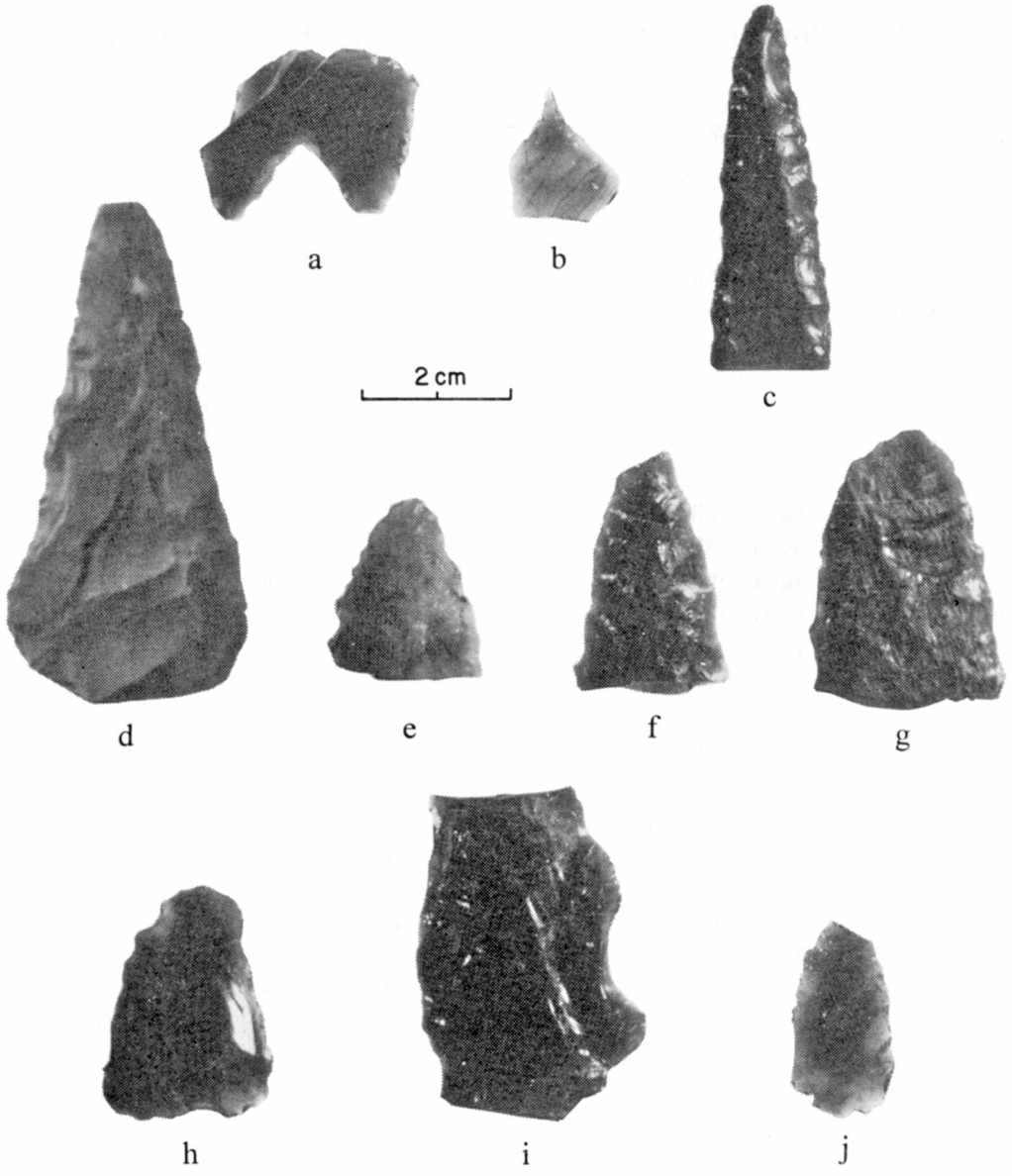


Figure 13.13. Bifaces from MANZ 1993 A-2 (a. Humboldt, b. drill, c-g. finished tools, h-j. preforms).

Bifacial Tools

Forty-three bifacial tools were collected from MANZ 1993 A-2. This includes 28 finished bifacial tools, two drills, a Humboldt biface, and nine preforms (Table 13.13, Figure 13.13).

The finished bifacial tools include 24 of obsidian, three of chert, and one of quartz. Visual characteristics suggest the obsidian sample includes seven Fish Springs, five Coso Hills or Fish Springs, five Casa Diablo, four Queen, and three Queen Imposter specimens. Surface-collected bifacial tools include a complete chert biface from Block 9 of the relocation center, five distal (tip) fragments (one quartz), two basal fragments, three midsections, and a margin fragment. Recovered from the excavation units were four distal fragments (one chert), one basal fragment, five margin fragments (two chert), nine small nondescript fragments, and an extensively reworked projectile point. A distal fragment from Unit 24 (50-60 cm), which was visually-sourced as from Fish Springs, has a hydration rim value of 7.7 microns.

Table 13.13.
Metrical and Provenience Data for Biface Fragments Recovered from MANZ 1993 A-2.

Description	Provenience	Size (mm)* L	W	T	W(g)	Source†	OH	Cat. No.
Humboldt (reworked)	Surface (Blk 27)	(25)	(28)	8	3.8	FS	5.7	B-181
Drill, complete	Unit 5, 20-30 cm	18	12/2	3	0.5	Coso/QI		B-192
Drill, distal fragment	Unit 24, 20-30 cm	(10)	4	2	0.1	CD		B-743
Reworked point	Unit 5, 50-60 cm	22	12	4	0.8	FS/Coso		B-205
Tool, complete	Surface (Blk 9)	67	32	5	12.7	chert		B-1049
Tool, margin fragment	Surface (Blk 16)	(20)	(19)	6	2.1	FS		B-135
Tool, basal fragment	Surface (Blk 16)	(15)	(14)	4	1.1	Q		B-622
Tool, midsection	Surface (Blk 22)	(18)	(23)	5	2.1	CD		B-146
Tool, distal fragment	Surface (Blk 22)	(24)	21	6	3.4	quartz		B-149
Tool, midsection	Surface (Blk 22)	(8)	21	5	1.3	FS/Coso		B-220
Tool, distal fragment	Surface (Blk C6)	(49)	16	6	4.8	**LM**		A-26
Tool, distal fragment	Surface (Blk E3)	(29)	22	9	5.1	QI		B-123
Tool, basal fragment	Surface (Blk E3)	(8)	24	4	0.7	FS/Coso		B-104
Tool, midsection	Surface (Blk J)	(13)	(23)	6	1.4	Q		B-128
Tool, distal fragment	Surface (Blk J)	(20)	(20)	5	2.6	CD		B-130
Tool, distal fragment	Unit 3, 0-10 cm	(29)	(20)	6	2.8	chert		B-105
Tool, fragment	Unit 3, 20-30 cm	(4)	(12)	3	0.2	Q		B-119
Tool, distal fragment	Unit 4, 20-30 cm	(31)	20	7	3.7	FS/Coso		B-167
Tool, margin fragment	Unit 5, 0-10 cm	(17)	(20)	7	2.7	chert		B-185
Tool, basal fragment	Unit 5, 10-20 cm	(12)	(10)	3	0.5	FS		B-189a
Tool, fragment	Unit 5, 10-20 cm	(10)	(8)	(4)	0.3	Q		B-189b
Tool, fragment	Unit 5, 10-20 cm	(14)	(21)	6	2.0	CD		B-189d
Tool, fragment	Unit 5, 40-50 cm	(8)	(16)	(6)	0.7	FS		B-202
Tool, fragment	Unit 5, 40-50 cm	(15)	(15)	7	1.7	FS		B-202
Tool, distal fragment	Unit 24, surface	(13)	(18)	5	0.9	QI		B-725
Tool, fragment	Unit 24, 0-10 cm	(8)	(12)	4	0.2	FS		B-737
Tool, fragment	Unit 24, 10-20 cm	(14)	(12)	4	0.6	CD		B-737
Tool, margin fragment	Unit 24, 20-30 cm	(8)	(17)	5	0.7	QI		B-743
Tool, margin fragment	Unit 24, 20-30 cm	(14)	(13)	5	1.0	chert		B-745
Tool, distal fragment	Unit 24, 30-40 cm	(36)	26	7	6.6	**SM**		B-864
Tool, margin fragment	Unit 24, 40-50 cm	(8)	(22)	(4)	0.6	**WS**		B-870
Tool, fragment	Unit 24, 50-60 cm	(22)	(15)	6	2.6	CD		B-872
Tool, margin fragment	Unit 24, 50-60 cm	(5)	(15)	(5)	0.4	FS		B-872
Tool, distal fragment	Unit 24, 50-60 cm	20	(14)	4	0.9	FS	7.7	B-874
Tool, fragment	Unit 24, 60-70 cm	(4)	(9)	4	0.1	FS/Coso		B-879
Preform, distal fragment	Surface (Blk 16)	(27)	18	7	2.9	FS		B-132
Preform, midsection	Surface (Blk 21)	(43)	(30)	9	2.6	FS		B-532
Preform, midsection	Surface (Blk 22)	(13)	(23)	(7)	2.0	FS		B-143
Preform, fragment	Surface (Blk 22)	31	22	6	3.4	FS		B-144
Preform, distal fragment	Surface (Blk 22)	(34)	17	11	5.5	FS		B-148
Preform, distal fragment	Surface (Blk 22)	(22)	(13)	5	1.4	FS		B-221
Preform, midsection	Surface (Blk J)	(12)	22	8	2.4	CD		B-129
Preform, margin fragment	Surface (Blk J)	(20)	(15)	11	4.1	FS/Coso		B-127
Preform, fragment	Unit 5, 10-20 cm	(17)	(27)	(11)	4.4	FS		B-189c

* incomplete measurements in parenthesis.

† FS = Fish Springs, CD = Casa Diablo, Coso = Coso Hills, LM = Lookout Mountain (Casa Diablo), SM = Sugarloaf Mountain (Coso), Q = Queen, QI = Queen Impostor, WS = West Sugarloaf (Coso); **bold** = XRF-sourced.

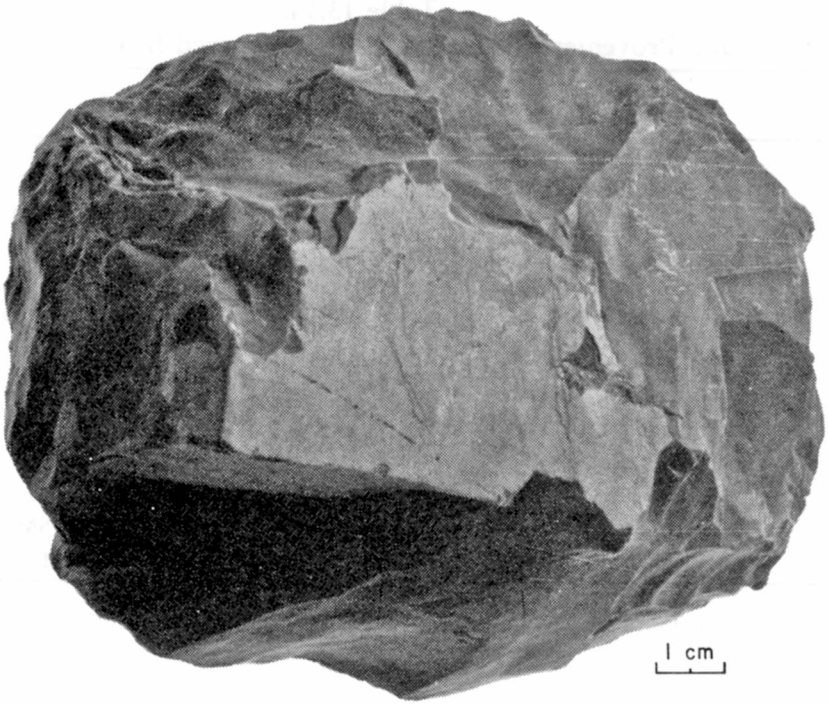


Figure 13.14. Basalt core from MANZ 1993 A-2.

The two drills include a complete and a fragmentary specimen. The complete drill was recovered from Unit 5. Visually it could be either Coso Hills or Queen Imposter obsidian. The drill fragment, a tip, was recovered from Unit 24. Visually it has the appearance of Casa Diablo obsidian.

The Humboldt biface, a basal fragment, has been reworked. It was collected from the surface of Block 27 of the relocation center. Visually-sourced as Fish Springs obsidian, it has a hydration rim value of 5.7 microns.

Nine bifacially worked artifacts from MANZ 1993 A-2 are classified as preforms. Eight were collected from the surface and one was from Unit 5. All are fragmentary; they include three distal fragments, three midsections, and three margin fragments. All are obsidian: seven appear to be Fish Springs obsidian, one could be either Coso Hills or Fish Springs obsidian, and one appears to be Casa Diablo obsidian.

Scrapers

Two scrapers were recovered from Locus A. A complete specimen from Unit 4 (10-20 cm) is of fine-grained igneous rock. Resembling a scraper-plane, it has steep-angled edges that have been worked, and cortex remaining on its upper surface. The other scraper is a quartzite fragment recovered from Unit 24 (20-30 cm). It appears to be about one third of a narrow, elongated piece with steep-angled worked edges on both lateral margins.

Utilized Flakes

A total of 187 utilized flakes were collected from MANZ 1993 A-2 (three collected from the surface during initial site recording are not considered here). This comprises 74 percent of the flake stone tools recovered from MANZ 1993 A-2. Material types include 161 obsidian, 16 fine-grained basalt, four basalt, five chert, and one limestone. Visually the obsidian appears to include 73 Fish Springs, 62 either Coso Hills or

Table 13.14.
Metrical and Provenience Data for Cores Recovered from MANZ 1993 A-2.

Description	Provenience	Size (mm) L	W	T	W(g)	Source†	OH	Cat. No.
Bifacial	Surface (Blk 21)	116	98	67	808.9	FGI		B-538
Unifacial, exhausted	Unit 3, 20-30 cm	42	45	22	42.0	QZ*		B-116
Unifacial	Unit 4, 10-20 cm	56	53	23	75.5	FGI		B-163
Unifacial	Unit 4, 30-40 cm	42	49	27	79.4	QZ*		B-172
Irregular	Unit 24, 20-30 cm	39	44	28	39.4	FS*	3.4	B-858a
Fragment	Unit 4, 20-30 cm	55	27	31	46.0	FGI*		B-169
Fragment, irregular	Unit 24, 20-30 cm	35	40	12	22.8	FS*		B-858c
Fragment	Unit 24, 20-30 cm	44	33	26	25.6	FS*	3.7	B-859
Fragment	Unit 24, 20-30 cm	39	29	17	20.9	FS*	3.5	B-858b
Fragment	Unit 24, 20-30 cm	54	22	15	25.4	QZ		B-749
Fragment	Unit 24, 30-40 cm	52	25	25	46.3	chert		B-863
Fragment	Unit 24, 30-40 cm	40	25	14	10.9	**SM***	3.4	B-865a
Fragment	Unit 24, 30-40 cm	20	26	16	8.2	**FS**	3.5	B-865b

† FGI = fine grained igneous, FS = Fish Springs, QZ = quartzite, SM = Sugarloaf Mountain (Coso); **bold** = XRF-sourced.
* = with cortex

Fish Springs, 15 either Coso Hills or Queen Imposter, seven Casa Diablo, one Queen, and four indeterminate specimens (Coso Hills, Fish Springs, or Queen Imposter).

Most of the utilized flakes were from the Locus A excavation units, and of those the vast majority were from Unit 24. Unit 24 utilized flakes included 150 of obsidian, six of igneous rock, and one of basalt. Recovered from Unit 3 were three of basalt, four of igneous rock, one of chert, and one of obsidian. Unit 4 yielded ten utilized flakes, five of igneous rock, one of chert, two of obsidian, and one of limestone.

Unit 5 within Locus B yielded ten utilized flakes, eight of obsidian, one of chert, and one of igneous rock. Unit 6 had two utilized flakes, both of chert.

Cores

Thirteen cores or core fragments were collected from MANZ 1993 A-2 (Table 13.14). All but one surface-collected specimen were from the excavation units. Six are obsidian, three are quartzite, three are fine-grained igneous (basalt), and one is chert.

All six of the obsidian cores were from Unit 24 and all but one have some amount of cortex. Two are fragments of irregular multidirectional cores and the others are too small to classify as to type. Hydration rims of four of the five cores that were visually or XRF-sourced as from Fish Springs range from 3.4 microns to 3.7 microns. The sixth obsidian core, XRF-sourced as from Sugarloaf Mountain (Coso Hills), has a hydration rim of 3.4 microns.

The three quartzite cores are complete. All are unidirectional, one has cortex, and one is exhausted. The exhausted example is from Unit 3 (20-30 cm) and the other two are from Unit 4 (10-20 cm, 30-40 cm).

The fine-grained basalt cores include a complete bifacial core with cortex collected from the surface (Figure 13.14), a complete unifacial core from Unit 4 (10-20 cm), and a core fragment, also from Unit 4 (20-30 cm).

The sole chert core recovered is a small nondescript fragment without cortex. It was from the 30-40 cm level of Unit 24 (Feature 1).

Debitage

Nearly 3,000 pieces of debitage (n=2,998) were recovered from the five excavation units at MANZ 1993 A-2. The amount of debitage recovered from the excavation units varied greatly throughout the site; over 75 percent was from Unit 24. In Units 3, 5, and 24 the greatest numbers of artifacts were recovered from the 10 to 40 cm levels, in Unit 4 the greatest number were from the 10 to 30 cm levels, and in Unit 6 four of the seven pieces of debitage recovered were from the 50-60 cm level.

Obsidian constitutes 84 percent (n=2,512) of the debitage, cryptocrystalline materials 14.5 percent (n=437), and fine-grained basalt/igneous 1.5 percent (n=46). Based on visual inspection 71 percent of the obsidian debitage appears to be from the Fish Springs source, 17 percent from the Coso Hills source, 9 percent from the Queen Imposter source, 2 percent from the Casa Diablo source, and 1 percent from the Queen source.

In the obsidian assemblage, late stage biface production is indicated by a high percentage of complex interior flakes and percussion/pressure flakes combined with a modest percentage of biface thinning flakes. The absence of primary decortication flakes and low percentages of secondary decortication flakes and simple interior flakes supports the interpretation of late stage biface reduction.

Obsidian in Unit 24 includes flake types from the entire reduction sequence. It is the only unit where distinct pressure flakes were identified, in addition to those in the broad percussion/pressure flake category. Some primary and secondary decortication flakes and simple interior flakes suggest some early-stage bifacial reduction is represented. But the majority of the assemblage indicates late stages of bifacial production, with high percentages of complex interior flakes, pressure/percussion flakes, biface thinning flakes, and pressure flakes.

In contrast, the cryptocrystalline and basalt flake types suggest earlier stages of biface or flake production. Over a quarter of the cryptocrystalline materials are cortical. Simple interior flakes represent 42 percent of the assemblage, complex interior flakes 27 percent and biface thinning flakes 4 percent. This distribution may indicate the production of flake blanks from cores.

Cortical flakes comprise a quarter of the cryptocrystalline materials assemblage from Unit 24 as well. Nearly equal percentages of simple interior flakes and complex interior flakes, with much smaller amounts of biface thinning and percussion/pressure flakes, suggest early stage biface production.

For the basalt, early stage reduction is suggested by 29 percent cortical and 46 percent simple interior flakes. Complex interior flakes comprise 21 percent of the assemblage and biface thinning flakes 4 percent. Within Unit 24, a high percentage of secondary decortication flakes and of simple interior flakes with a comparatively low percentage of complex interior flakes suggest early stage reduction of basalt material quarried elsewhere.

Hammerstones

Two hammerstones, one granite and one quartzite, were collected from the surface of Locus A (Figure 13.15). The granite specimen, found 20 m west of Unit 24, measures 9.1 cm by 7.7 cm by 5.8 cm and weighs 534 g. Both ends show signs of battering. The quartzite hammerstone, found 20 m northeast of Unit 24, measures 6.7 cm by 5.9 cm by 4.8 cm and weighs 281 g. All of its edges have been battered with several large flakes removed.

Ground Stone Artifacts

Thirty-four ground stone artifacts were collected from MANZ 1993 A-2. The specimens include five complete manos, seven mano fragments, four metate fragments, and five unclassified fragments. Thirteen ground stone artifacts were collected from the surface and 11 were recovered during

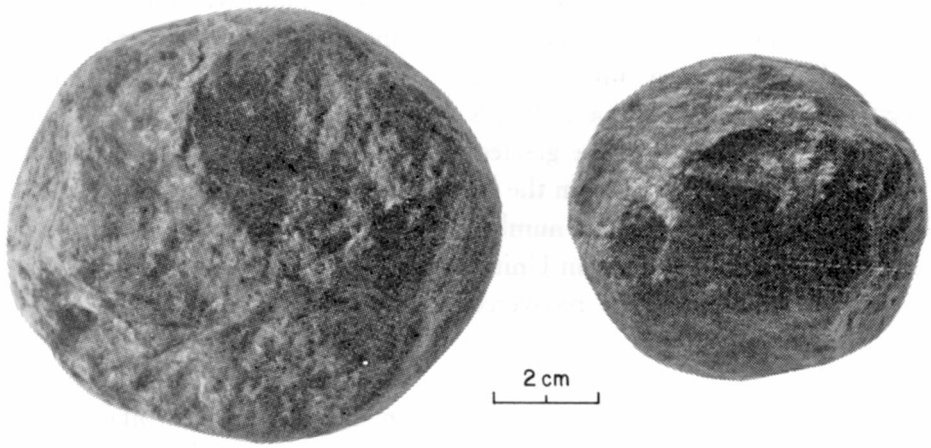


Figure 13.15. Hammerstones from MANZ 1993 A-2.

excavation. Seven were recovered from Unit 24 alone.

Metrical attributes for the complete manos are given in Table 13.15. They include three bifacial oval-shaped manos, two granite specimens from the surface and one quartzite specimen from the the 20-30 cm level of Unit 24 (Figure 13.16). One of the granite specimens and the quartzite specimen were apparently also used as a hammerstones. Both have battered ends and the quartzite mano has had several large flakes removed from one end to form a smaller striking platform. Other complete manos include two unifacial unshaped granite cobble specimens (one from Unit 5 and one from Unit 24) and a bifacial unshaped granite cobble specimen (from Unit 24). These have flat to slightly convex polished grinding surfaces.

The mano fragments include seven shaped specimens and one small fire-cracked fragment. All of the shaped fragments appear to have been from oval manos and all but one are bifacial (Figure 13.17). Measurable thicknesses range from 30 mm to 45 mm with a mean of 36 mm. Material types include six granite and one quartzite, and the sole unifacial shaped specimen is vesicular basalt.

Three metate fragments, all from the surface and all of granite, are all portions of small- to medium-sized boulder basin metates. A fire-cracked granite metate fragment was recovered from the 30-40 cm level of Unit 5.

Unclassifiable ground stone fragments include a unifacial vesicular basalt piece collected from the surface, and four fire-cracked granite pieces from Unit 24 (10-20 cm).

Fire-cracked Rock

In addition to the six fire-cracked ground stone artifacts noted above, ten pieces of fire-cracked granite were recovered during excavation. This includes three pieces from the 0-20 cm levels of Unit 3, one piece from the 20-30 level of Unit 5, five pieces from the 10-30 levels of Unit 24, and a large 35-cm-thick piece from the 40-50 cm level of Unit 24.

Miscellaneous Stone Artifacts

A disk bead and an incised stone were collected from the surface 2 m southeast of Unit 24. The bead is likely steatite; it measures 7.6 mm by 3.4 mm and has a 2.3 mm diameter hole. The incised stone is an elongated quartzite cobble fragment, measuring 64 mm by 35 mm by 10 mm. The cobble is subrectangular in cross-section and the intact end has had a flake removed to form a

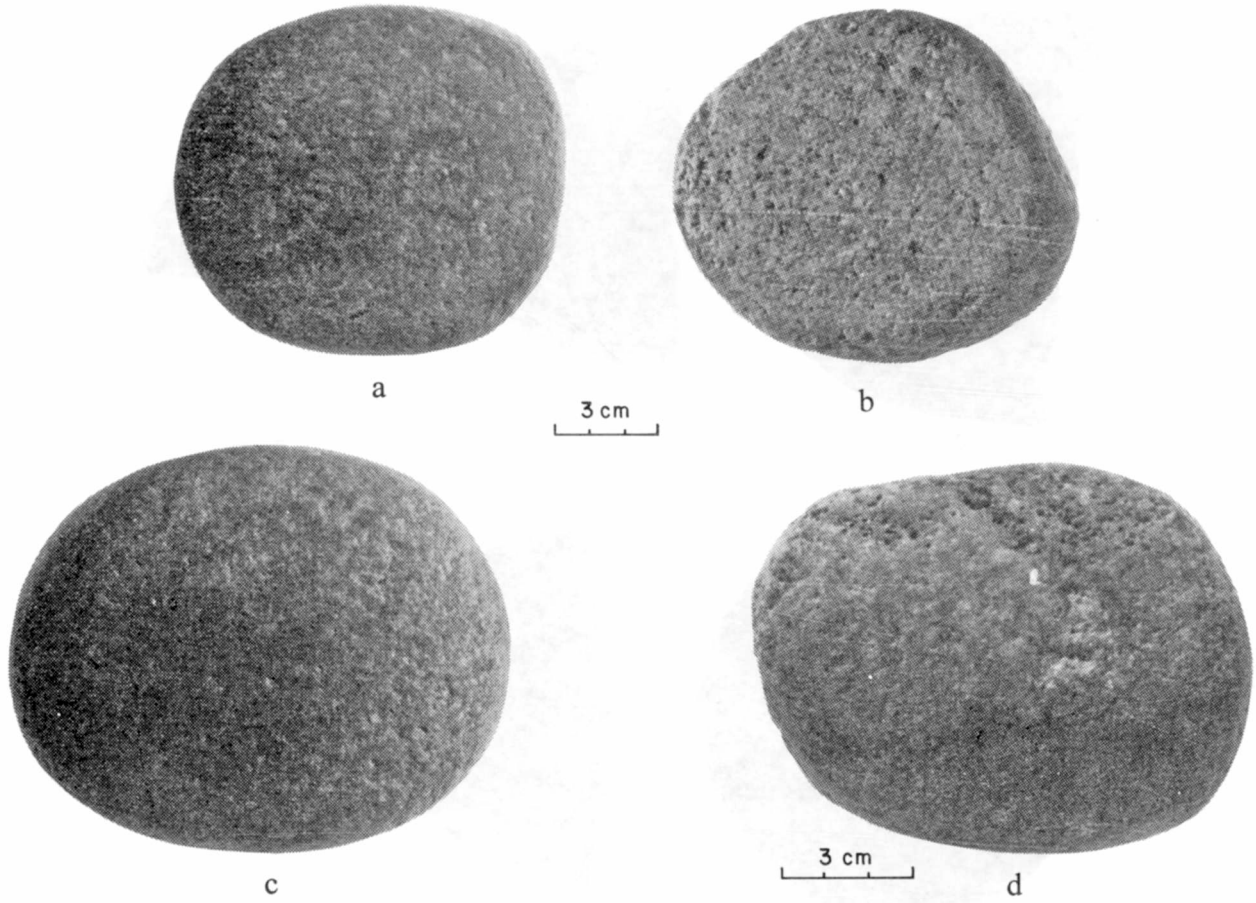


Figure 13.16. Manos from MANZ 1993 A-2; a, d. bifacial mano/hammerstone, b. unifacial, c. bifacial.

Table 13.15.
Metrical and Provenience Data for Complete Manos Recovered from MANZ 1993 A-2.

		Size (mm)					
Description	Provenience	L	W	T	W(g)	Material	Cat. No.
Bifacial, oval-shaped	Surface (Blk 21)	113	113	63	1665	granite	B-155
Unifacial, unshaped	Unit 5, 50-60 cm	115	100	46	774	granite	B-207
Bifacial, oval-shaped/Hammerstone	Unit 24, 30 cm	109	109	57	907	granite	B-867
Bifacial, unshaped	Unit 24, 30 cm	102	102	44	585	granite	B-895
Unifacial, unshaped	Unit 24, 50-60 cm	114	107	71	1298	granite	B-871

beveled end. The artifact has the appearance of a broken adze, except for some unusual markings (Figure 13.18). The sides are incised with irregularly-spaced parallel lines, which extend onto the edges of the face. Down the center of each face are two parallel incised lines; on the flaked face they extend from the broken end 20 mm, on the opposite face they extend from the unbroken end 40 mm.

Ceramics

Seven Owens Valley Brown Ware sherds were collected from the surface during initial site recording and one sherd was recovered during testing. All are sand/grit-tempered plain brown ware manufactured by coiling and scraping. No slip, paint, glaze, or decoration is evident. Surface colors range from gray brown (Munsell color 10YR 2.5-5/1-4) to reddish brown (2.5 YR

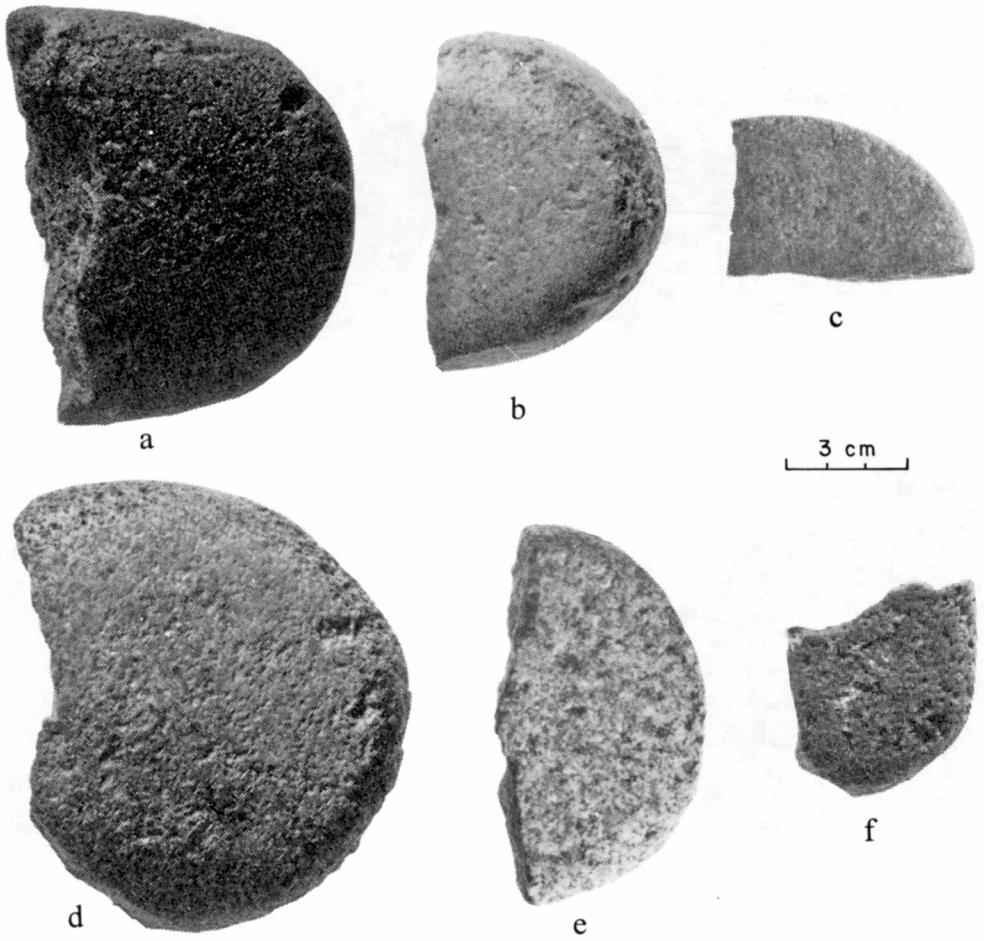


Figure 13.17. Mano fragments from MANZ 1993 A-2; a. unifacial, b-f. bifacial.

3-5/4). Surface luster is dull to earthy. Surface textures are predominately rough and parallel brushed (Table 13.16). Measured sherd thickness ranges from 4.7 mm to 7.6 mm with a mean of 6.5 mm and a standard deviation of 0.8. Three have carbon streaks, one has a very rough corrugated-like surface, and one has abundant mica (Unit 24, 30-40 cm). The single rim sherd collected is incurved with a rounded rim.

Bone and Shell Artifacts

Three shell and five bone artifacts were recovered during excavation at MANZ 1993 A-2. All three shell artifacts are beads recovered from Unit 24, one each from the 0-10 cm, 10-20 cm, and 20-30 cm levels. All are tiny saucer *Olivella* beads (Type G1, Bennyhoff and Hughes 1987). This type is not considered to be temporally diagnostic. The beads measure: 3.4 mm by 1.5 mm, with a 1.8 mm diameter hole; 3.9 mm by 1.4 mm, with a 1.1/2.1 mm diameter hole; and 3.9 mm by 1.2 mm, with a 1.1/1.3 mm diameter hole.

Recovered bone artifacts include two beads and three other worked fragments (see Appendix H). A complete tubular bone bead was recovered from Unit 5 (20-30 cm). Made of a rodent-sized long bone and very highly polished, it measures 16.9 mm long and has a diameter of 2.9 mm to 2.1 mm. The other bone bead is a fragment from the 50-60 cm level of Unit 24. Measuring 12.1 mm long and highly polished, it was made from a long bone of a large eagle-sized bird.

Two possible bone awl fragments were recovered from the 60-70 cm level of Unit 24. Both are polished large mammal long bone with striations. One measures 1.0 cm long and the other measures 1.4 cm long. A charred artiodactyl rib-shaft fragment with one end cut off has striations and polish on both flat surfaces. It was recovered

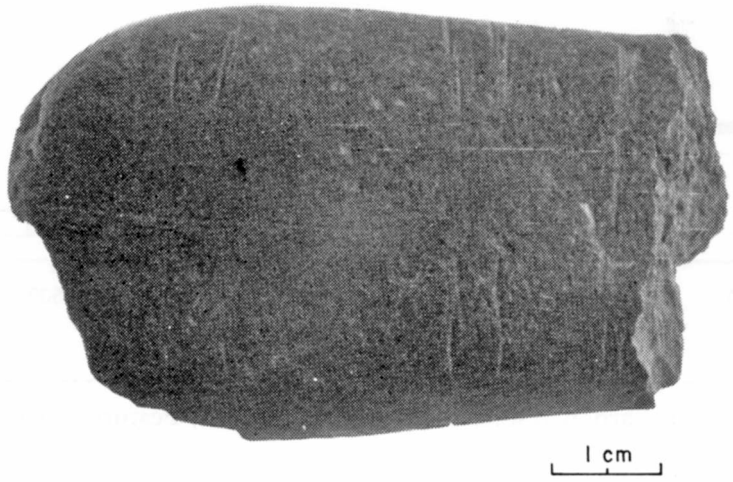


Figure 13.18. Incised stone from MANZ 1993 A-2.

Table 13.16.
Surface Treatment of Individual Sherds from MANZ 1993 A-2.

Interior Surface	Exterior Surface				
	Smooth	Rough	Random Brushed	Parallel Brushed	Total
Smooth	-	1	-	-	1
Rough	-	2	1	1	4
Random Brushed	-	-	-	1	1
Parallel Brushed	-	1	-	1	2
Total	-	4	1	3	8

from the 30-40 cm level of Unit 5.

Vertebrate Faunal Remains

Test excavations at MANZ 1993 A-2 produced 1,048 animal bone fragments, over half (n=651) from Unit 24. Thirteen taxa are represented in the faunal assemblage including mammals, fishes, amphibians, reptiles, and birds (see Appendix H). Twenty percent were identifiable to the class level or below, while 67 percent are burned.

Lagomorphs constitute 66 percent of the identifiable specimens and artiodactyls 18 percent. Seventy-two percent of the lagomorphs are jackrabbit (*Lepus* sp.), 26 percent are cottontail (*Sylvilagus* sp.), and 2 percent could not be identified to species level. The 39 artiodactyl remains furthe identified include a left maxilla with teeth, two fragmented upper teeth, a lower molar fragment, and a proximal radius all identified as from bighorn sheep (*Ovis canadensis*). As noted above under bone artifacts, a charred artiodactyl rib-shaft fragment with a cut end exhibits striations and polish on both sides.

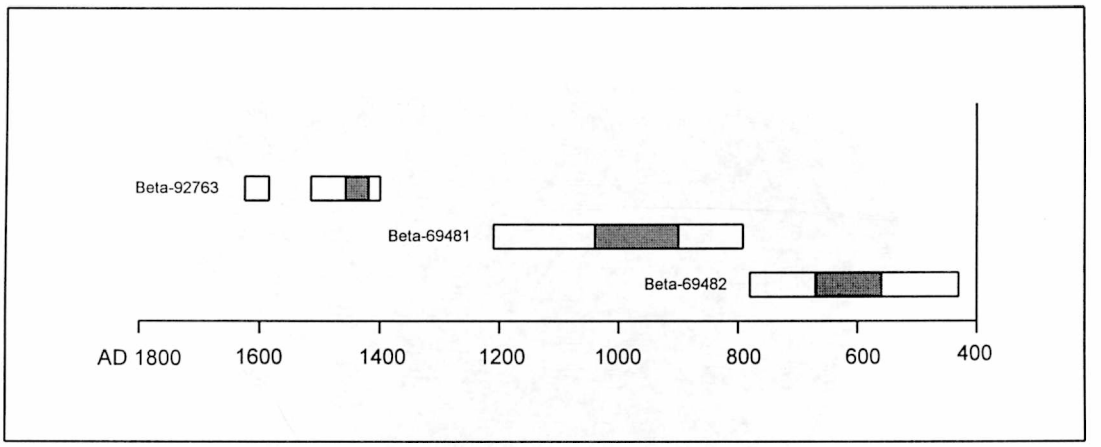


Figure 13.19. Radiocarbon results for MANZ 1993 A-2, Feature 1, showing 1 and 2 sigma range.

Other identifiable mammal remains include three isolated incisors, a burned distal humerus, and a tarsal of coyote or dog (*Canis* sp.), a mandible fragment and humerus of a northern pocket gopher (*Thomomys talpoides*), a tibia of a bushy-tailed wood rat (*Neotoma cinerea*), and a lower molar of a California meadow mouse (*Microtus californicus*).

Other remains include two indeterminate fish bone fragments, two frog/toad elements, lizard elements (one burned), an indeterminate immature snake element, and eight bird specimens (including three eggshell fragments).

Invertebrate Fauna

Ninety-three small fragments of freshwater bivalve shell and a snail shell were recovered during testing at MANZ 1993 A-2. Four of the shell fragments were from Unit 3, 54 were from Unit 5, six were from Unit 6, and 29 were from Unit 24. All are likely *Anodonta*, a mollusk still common today in the Owens River. The snail shell was recovered from Unit 5 (40-50 cm).

Other Organic Remains

A total of 12 peach pits were recovered during testing. None are believed to be associated with the aboriginal occupation of the site. One was from Unit 3 (20-30 cm), four were from Unit 5 (20-30 cm), and seven were from Unit 6 (0-20 cm).

Intrusive Historical Artifacts

Ample historical artifacts (n=117) were recovered during testing at MANZ 1993 A-2. Most are believed to be associated with use of the relocation center, rather than the town of Manzanar or the aboriginal occupation of the site. Historical artifacts were present in the upper 10 cm of all excavation units. They include two glass fragments and a metal fragment from Unit 3, 46 wire nails, a glass fragment, and a metal fragment from Unit 4, three wire nails and a metal fragment from Unit 5, seven glass fragments and four wire nails from Unit 6, and 13 glass fragments, four wire nails, and a metal fragment from Unit 24. Below 10 cm historical artifacts included 37 wire nails in the 10-20 cm and 20-30 cm levels of Unit 4, a metal fragment in the 10-20 cm level of Unit 5, two glass fragments and two wire nails in the 10-20 cm level of Unit 24, a glass fragment in the 30-40 cm level of Unit 3, and a wire nail in the 70-80 cm level of Unit 5.

Radiocarbon Dating

Three samples from Unit 24 (Locus A) were submitted for radiocarbon (C-14) dating (Appendix M). All were spatially associated with the possible house floor (Feature 1) encountered in that unit. The feature itself was not distinct: it consisted of a discontinuous layer of ash, charcoal, and small gravels, defined as a possible house floor because of the number and

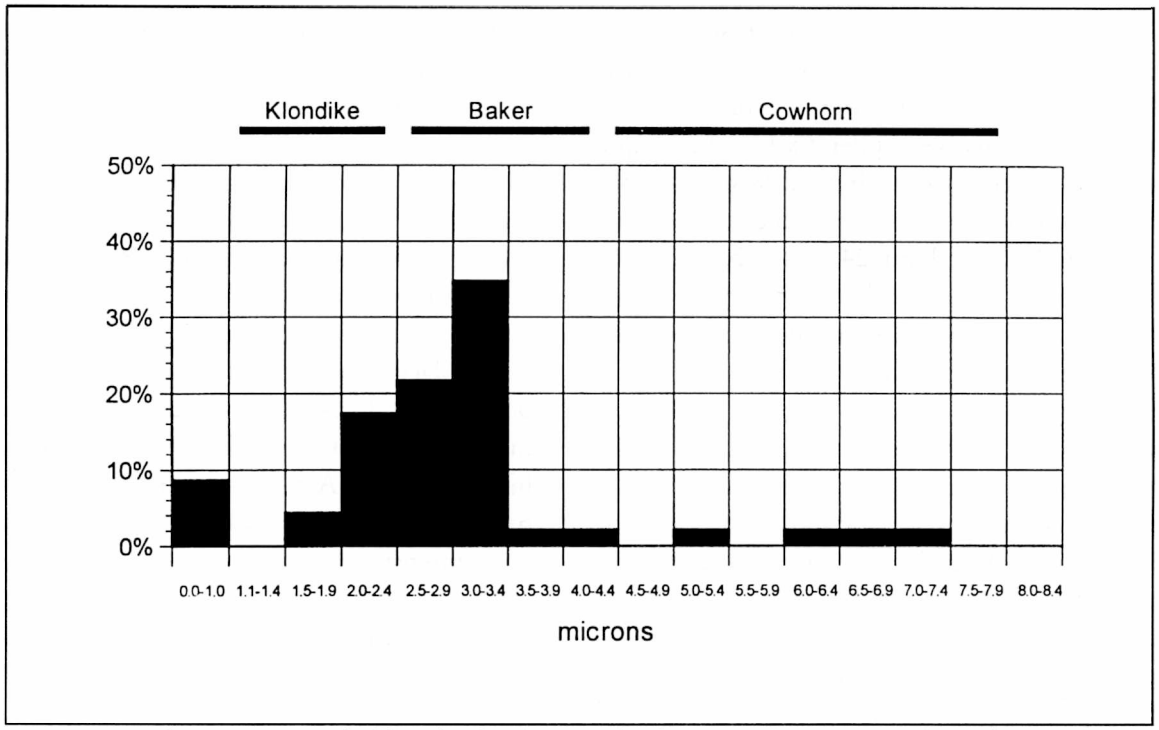


Figure 13.20. Obsidian hydration results for MANZ 1993 A-2 (n=49).

kinds of artifacts associated with it. The first sample (Beta-69481), consisting of small bits of charcoal collected from the ash and charcoal layer itself, dated to 1430±90 B.P. The second sample (Beta-69482), consisting of small charcoal bits from the 30-40 cm level and a few charcoal pieces from the ash and charcoal layer that were pulled from the sidewall profile, dated to 1050±90 B.P. The third sample (Beta-92763) consisted of charcoal flecks from two separate flotation samples, one from the 20-30 cm level and the other from the 30-40 cm level. Originally submitted as two separate samples, after laboratory processing the samples had to be combined for even the accelerator (AMS) method. This sample dated to 470±60 B.P.

Converting the laboratory dates to calendar dates, the first sample becomes A.D. 560-670 at 1 sigma and A.D. 430-780 at two sigma, the second A.D. 900-1040 at 1 sigma and A.D. 790-1040 at 2 sigma, and the third A.D. 1420-1460 at 1 sigma and A.D. 1400-1625 at 2 sigma (Figure 13.19). The third date is inconsistent with other temporal data from the excavation unit and is rejected as representing later intrusions. Collected from flotation samples both above and below the possible floor feature, these pieces were smaller and could have been more affected by pedoturbation. The other two dates both fall within the early Baker period and are consistent with the Rosegate projectile points recovered from the 20-30 cm level. But these dates do not overlap, even at the two sigma range and the older date was from the stratigraphically higher sample. The disparate dates and the provenience suggest the charcoal represents the scattered remains of one or more hearths, rather than any architectural features. Fuel used for heating and cooking generally includes wood of various ages collected opportunistically from the vicinity. Ages can easily vary hundreds of years in desert environments conducive to preservation (Schiffer 1986). These two assays were averaged using University of Washington Quaternary Isotope Lab Radiocarbon Calibration Program (1993). The average suggests a date between A.D. 687 and 885 at one sigma and A.D. 662 and 967 at two sigma. However, if the charcoal does indeed represent the remains of a hearth, the date of the more recent sample, ca. A.D. 1000, may more accurately reflect site use.

Obsidian Hydration Analysis

Forty-nine specimens visually- or XRF-sourced as Fish Springs obsidian were submitted for hydration analysis (see Appendix L). The sample includes 14 pieces from Unit 5, 28 pieces from Unit 24, and seven pieces from the surface. The larger sample from Unit 24 was submitted not only because this unit had by far the most cultural material, but also to allow comparison with the radiocarbon dating results.

Readable hydration rims for the site as a whole ranged from 1.1 microns to 7.7 microns, with a mean of 3.4 microns and a standard deviation of 1.3. Using the Fish Springs obsidian hydration rate used in Delacorte and McGuire (1993), 20 percent of the values fall within the Klondike period, 70 percent fall within the Baker period, and 10 percent fall within the Cowhorn period (Figure 13.20).

Each provenience yielded a similar range as the site as a whole. Unit 5 values range from 1.1 to 6.5 microns, with a mean of 3.0 microns and a standard deviation of 1.2. Unit 24 values range from 1.2 to 7.7 microns, with a mean of 3.5 microns and a standard deviation of 1.4. Rim values of surface specimens range from 2.5 to 5.7 microns, with a mean of 3.8 microns and a standard deviation of 1.1.

For the nine specimens (including two cores, a projectile point, a biface, and five flakes) from the 20-30 cm level of Unit 24, the mean is 3.7 microns. This converts to a mean of ca. A.D. 950, very close to the most probable date of charcoal (ca. A.D. 1000) from the feature in the same level.

Site Summary

Testing at MANZ 1993 A-2 revealed a midden deposit up to 70 cm in depth. The integrity of the site has been compromised to some extent by historical use. However, this disturbance appears limited to the upper levels of the deposit. In spite of the extensive disturbance an intact occupation surface, possibly a house floor, was encountered 30 cm below the surface in one of the excavation units (Unit 24).

The possible house floor, midden soil, and a varied and abundant artifact assemblage indicate intensive prehistoric use. The site appears to have been a base camp or "village" where a variety of subsistence and maintenance tasks took place. Sherds and identifiable projectile point styles (Desert, Rosegate, and Elko series) indicate use of the site between 1200 B.C. and historical times. Artifact type frequency, obsidian hydration, and radiocarbon dating indicate the most intensive use of the site was between A.D. 600 and 1300. The Elko points, both small fragments, may indicate ephemeral use of the area prior to A.D. 600. Alternatively, they may have been scavenged by the site occupants from elsewhere for reuse at the site.

MANZ 1993 A-3

(CA-INY-4863)

This site, located in the east-central portion of the National Historic Site, consists of a sparse scatter of prehistoric artifacts within an area of 31,100 square meters (7½ acres). Within this sparse scatter there is a 50 m north-south by 60 m east-west (2,355 square meters) artifact concentration located within Block 20 of the relocation center, that includes an approximately 475-square-meter area of slightly darker soil (Locus A; Figure 13.21).

Historical remains (both features and artifacts) abound in the area. In the 1910s-1930s most of the site area was covered by orchards. During use of the Manzanar Relocation Center the area was used for barracks and other structures. In addition, sheet wash and gully erosion have moved artifacts and altered the site surface. A power line and road cross the eastern end of the site.

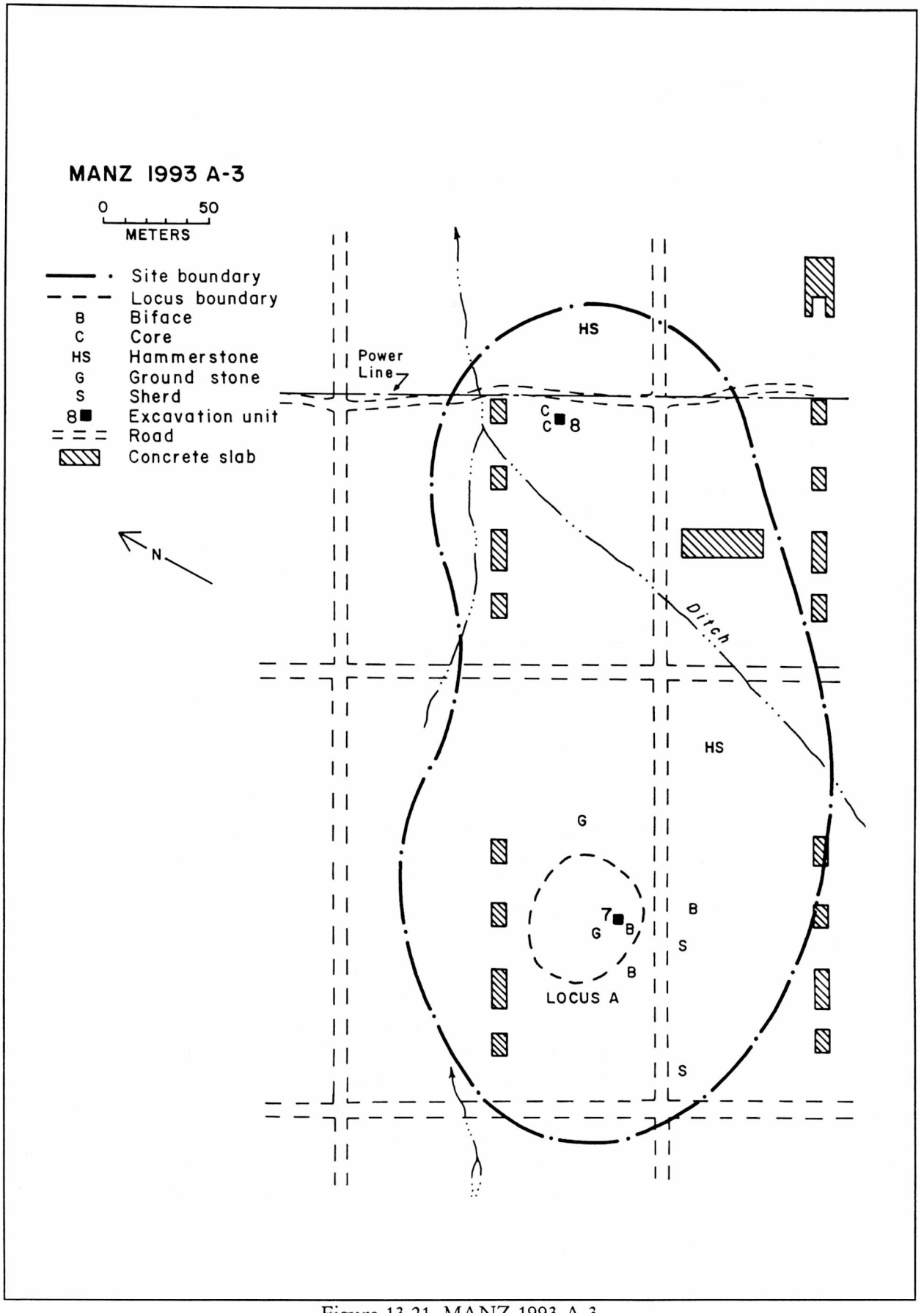


Figure 13.21. MANZ 1993 A-3.

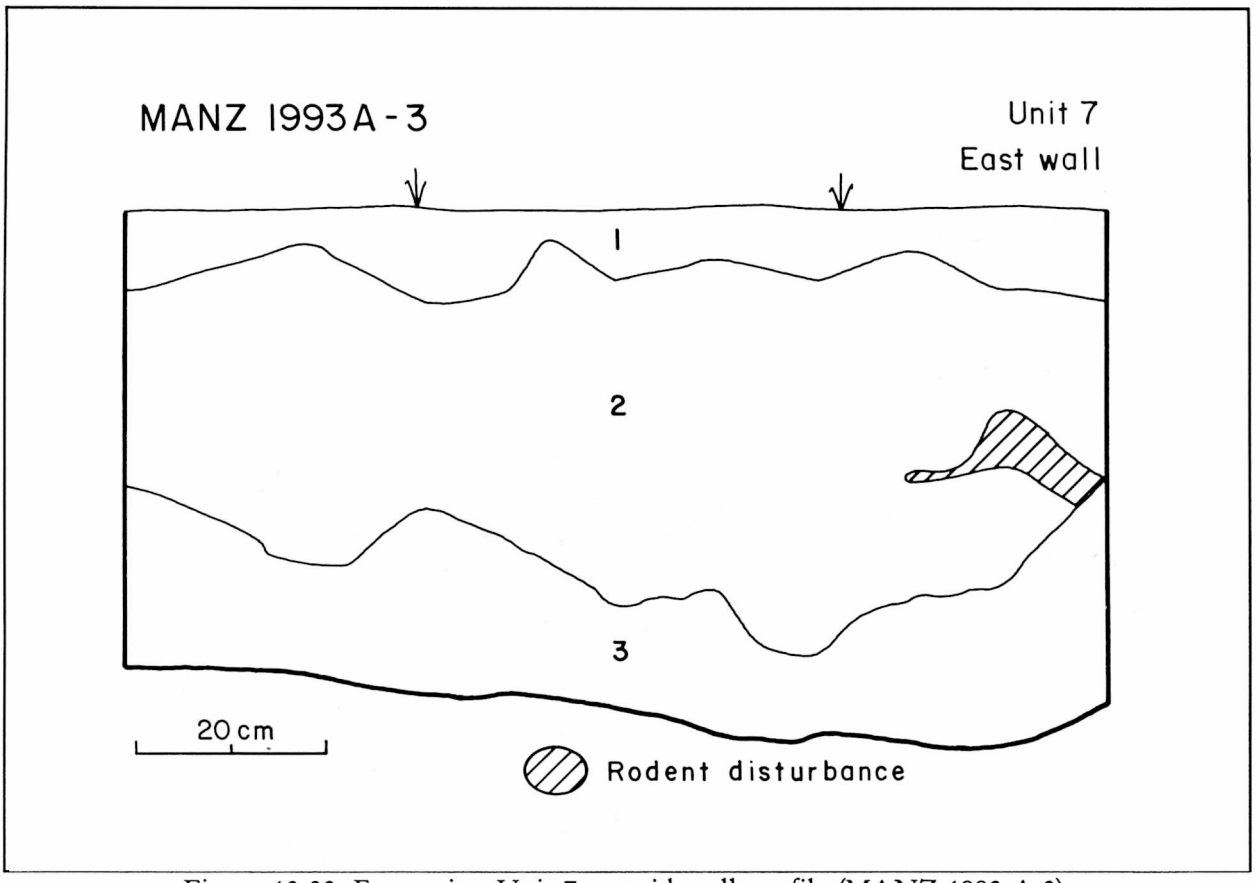


Figure 13.22. Excavation Unit 7 east sidewall profile (MANZ 1993 A-3).

Noted at the site during survey were approximately 100 obsidian and basalt flakes (no more than 4 per square meter), an obsidian projectile point fragment, an obsidian biface fragment, two obsidian core fragments, a basalt core, a chert core, a mano, a ground stone fragment, a chert hammerstone, and five Owens Valley Brown Ware sherds.

Stratigraphy

Two 1 m by 1 m test units were excavated at the site, one (Unit 7) within the possible midden area at Locus A and the other (Unit 8) in the eastern portion of the site. Both were screened through 1/8-inch mesh. No prehistoric material was encountered in Unit 8, which was excavated to 50 cm. Sediments in this unit consisted of compact to very compact dark grayish brown to yellowish brown (Munsell color 10YR 4/2-5/2) silt with abundant gravels.

Unit 7, excavated to 60 cm, revealed a radically different stratigraphy. Three strata were discerned (Figure 13.22). Stratum 1, the uppermost, consists of loose yellowish brown (10YR 5/4) sand with gravels. It extends up to 10 cm deep. Stratum 2 consists of loose dark grayish brown (10YR 4/2) sandy loam. This apparent midden deposit ranged from 15 cm to 35 cm in thickness. Below the midden, Stratum 3 consists of a very loose light brownish gray to very pale brown (10YR 6/2-7/3) sand with gravels and a few cobbles. It was encountered at depths ranging from 35 cm to 45 cm below the surface. No artifacts were recovered from this stratum. Excavation was halted at 60 cm; sediment was collapsing into the excavation unit nearly as quickly as it could be removed.

Table 13.17. Distribution of Artifacts and Ecofacts in Excavation Unit 7 (MANZ 1993 A-3).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10	PP		4		14		2			11
10-20		1	1		16				shell bead	1
20-30	DSN				5	1	1			1
30-40					1		1			
40-50										
50-60										
Total	2	1	5		36	1	4		1	13

* DSN - Desert Side-notched, PP - unclassified fragment.

Table 13.18. Distribution of Artifacts and Ecofacts in Excavation Unit 8 (MANZ 1993 A-3).

Level (cm)	Projectile Points	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10									walnut shell	26
10-20										3
20-30										
30-40										
40-50										
Total										29

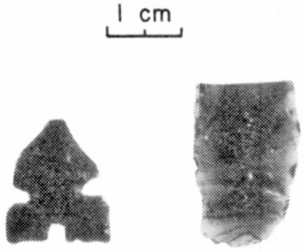


Figure 13.23. Desert Side-notched projectile point (right) and bifacial tool (left) from MANZ 1993 A-3.

Assemblage

The artifact assemblage from MANZ 1993 A-3 includes two projectile points, five bifacial tools, five utilized flakes, 36 pieces of debitage, two ground stone artifacts, a sherd, a shell bead, four animal bones, a walnut shell, and 42 intrusive historical artifacts (Tables 13.17 and 13.18). Four of the bifacial tools and the two ground stone artifacts were collected from the surface of the site. No prehistoric remains were recovered from excavation Unit 8, located outside of the identified midden area.

Projectile Points

Two projectile points were recovered from Unit 7 (Table 13.19, Figure 13.23). Only one could be assigned to a specific type. That point is a Desert Side-notch, Sierra subtype (basal-notched), recovered from the 20-30 cm level. The point was XRF-sourced as Lookout Mountain (Casa Diablo) obsidian. The other projectile point recovered is a distal (tip) fragment recovered from the 0-10 cm level, visually identified as either Coso Hills or Fish Springs obsidian. Neither point was submitted for hydration analysis.

Bifacial Tools

Four finished bifacial tools and one preform were collected from MANZ 1993 A-3 (see Table 13.19, see Figure 13.23). The finished bifacial tools include a basal fragment of a Humboldt Concave Base biface collected from the surface 50 m southeast of Unit 7 and three indeterminate biface fragments. The indeterminate fragments include a basal portion collected from the surface 25 m south of Unit 7, a distal portion collected from the surface 25 m southwest of Unit 7, and a distal portion from the 10-20 cm level of Unit 7. All were visually sourced as Fish Springs obsidian. The Humboldt biface has a hydration rim value of 6.0 microns. Hydration values of two of the indeterminate bifaces are 2.4 microns and 4.0 microns.

The preform, a basal fragment, was collected from the surface of Locus A. Visually-identified as from the Fish Springs source, it has a hydration rim value of 3.2 microns.

Utilized Flakes

Five utilized flakes were recovered from excavation Unit 7. They comprise 42 percent of the flaked stone tools from MANZ 1993 A-3 and include one chert, one obsidian, and two basalt specimens from the 0-10 cm level and an unidentified igneous specimen from the 10-20 cm level. The obsidian piece (opaque black) appears to be from the Casa Diablo source.

Debitage

Thirty-six pieces of debitage were recovered from Unit 7. Cryptocrystalline materials constitute 34 percent of the debitage, obsidian 58 percent, and basalt 8 percent. Visual inspection of the obsidian yielded the following source estimates: Fish Springs 67 percent, Coso Hills 14 percent, Queen Imposter 10 percent, Queen 5 percent, and Casa Diablo 5 percent.

The small amount of debitage recovered limits the reliability of any interpretations. Of the obsidian, there were six complex interior flakes, three simple interior flakes, one secondary decortication flake, one biface thinning flake, and five pressure flakes, possibly suggesting late-stage reduction of obsidian.

Early-stage bifacial reduction may be suggested by the profile for cryptocrystalline materials,



Figure 13.24. Mano from MANZ 1993 A-3.

Table 13.19.
Metrical and Provenience Data for Projectile Points and Bifaces Recovered from MANZ 1993 A-3.

		Size (mm)†						
Description	Provenience	L	W	T	W(g)	Source**	OH	Cat. No.
DSN* (Sierra subtype)	Unit 7, 20-30 cm	16	14	3	0.5	**LM**		B-260
Point, distal fragment	Unit 7, 0-10 cm	(6)	(6)	2	<0.1	FS/Coso		B-246
Humboldt, basal fragment	Surface (Blk 13)	19	22	7	2.6	CD	6.0	B-510
Biface, basal fragment	Surface (Blk 13)	(22)	14	4	1.4	FS		B-504
Biface, distal fragment	Surface (Blk 20)	(19)	14	3	0.7	FS	2.4	B-218
Biface, distal fragment	Unit 7, 10-20 cm	(35)	21	6	3.2	FS	4.0	B-255
Preform, basal fragment	Surface (Blk 20)	(29)	(32)	12	13.0	FS‡	3.2	B-226

* Desert Side-notched.
† incomplete measurements in parenthesis.
** FS = Fish Springs, CD = Casa Diablo, Coso = Coso Hills, LM = Lookout Mountain (Casa Diablo); **bold** = XRF-sourced.
‡ with cortex.

with a high percentage of simple interior flakes (70%) compared to complex interior flakes (20%) and biface thinning flakes (10%). Two of the three basalt flakes recovered are secondary decortication flakes and the third is a complex flake, hinting at bifacial reduction.

Ground Stone Artifacts

Two ground stone artifacts were collected from the surface of the site. These include a unifacial circular granite mano fragment found on the surface 30 m east of Locus A (Figure 13.24) and a unifacial micaceous schist ground stone fragment with a concave grinding surface found on the surface in Locus A.

Ceramics

One Owens Valley Brown Ware sherd was recovered from the 20-30 cm level of Unit 7. It is a very small body sherd, 5.8 mm thick, with a smooth interior and exterior.

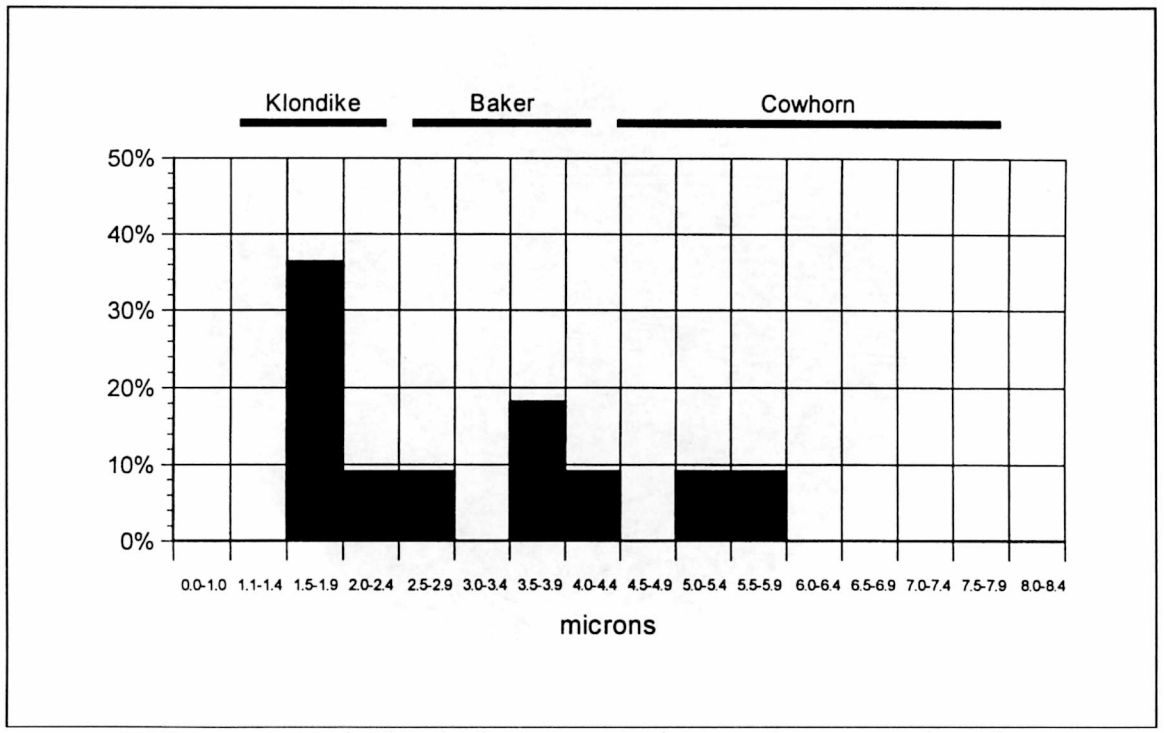


Figure 13.25. Obsidian hydration results for MANZ 1993 A-3 (n=11).

Shell Bead

One *Olivella* bushing bead (Bennyhoff and Hughes 1987, type K2) was recovered from the 10-20 cm level of Unit 7. The bead measures 3.8 mm by 2.2 mm and has a hole 1.4 mm to 1.5 mm in diameter. This bead type is a tentative Klondike phase marker in Owens Valley (post A.D. 1300; Bettinger 1989:151, 269). In the Central Valley of California it postdates A.D. 1500.

Vertebrate Faunal Remains

Only four faunal specimens were recovered during testing at MANZ 1993 A-3 (see Appendix H). These include two jackrabbit elements (one burned), the front portion of a pocket gopher skull, and a fragment of a small- to medium-sized mammal. The pocket gopher skull, relatively complete and with a fresh appearance, is probably a recent intrusion.

Other Organic Remains

Other organic remains from MANZ 1993 A-3 consist of a walnut shell from the 0-10 cm level of Unit 8. It is probably not associated with the prehistoric use of the site.

Intrusive Historical Artifacts

Historical artifacts recovered during excavation include 10 wire nails and three glass fragments from Unit 7 (85 percent from the 0-10 cm level) and 20 wire nails and six glass fragments from Unit 8 (90 percent from the 0-10 cm level).

Obsidian Hydration Analysis

Ten specimens visually sourced as Fish Springs obsidian were submitted for hydration analysis (see Appendix L). Hydration rims ranged from 2.1 microns to 6.0 microns, with a mean of 3.6 microns and a standard deviation of 1.4. Using the Fish Springs obsidian hydration rate used in Delacorte and McGuire (1993), 80 percent of the values fall within the Klondike and Baker periods (Figure 13.25).

Site Summary

Testing at MANZ 1993 A-3 yielded a sparse yet diverse artifact assemblage. The small midden deposit tentatively identified at the site during survey was confirmed, but for the most part it appears buried under 10 cm of alluvium.

Therefore, additional subsurface testing would be necessary to determine the areal extent of the midden deposit. Testing on the extreme eastern edge of the site indicates that much of the widespread surface artifact distribution may be the result of past disturbances.

Obsidian hydration data indicate site use between 240 B.C. and A.D. 1550. The Owens Valley Brown Ware sherd, shell bead, and Desert Side-notched projectile point recovered from the midden deposit indicate a post-A.D. 1300 occupation. The surface-collected Humboldt biface may indicate that an earlier component is present as well. However, scavenging, curation, or other site formation processes are more likely the reason for its presence given the other chronometric data recovered from the site.

MANZ 1993 A-4

(CA-INY-4864/H)

This site is located in the southwestern portion of the National Historic Site, along the north side of Bairs Creek. The site consists of eight concentrations of historical and prehistoric artifacts within a sparse scatter of artifacts covering an area of over 100,000 square meters (25 acres). Six of the artifact concentrations (Loci A-F) contain material reflecting Native American Indian use. These range in size from less than 500 square meters to nearly 8,000 square meters. Six 1 m by 1 m units (Units 9-14) were excavated at the site (Figure 13.26). A burial was discovered in one of the excavation units placed within Locus C.

Numerous dirt roads and tracks crisscross the site and historical remains (both features and artifacts) abound in the site area. Sheet wash and gully erosion have moved artifacts and altered the site surface. During use of the Manzanar Relocation Center the area was used for warehouses, garages, and a golf course. In the 1910s-1930s several homes were located in the area and orchards covered much of the site.

Prehistoric artifacts noted at the site include tens of thousands of obsidian, basalt, and chert flakes, numerous flaked stone tools and cores, several hundred sherds, numerous metate and mano fragments, and a few hammerstones. Identifiable projectile points, Desert Side-notched and Rose Spring Corner-notched, and ceramics at the site indicate a post A.D. 600 to 1300 date of occupation. Other artifacts, such as hexagonal blue glass beads found at four of the six loci, suggest a historical or protohistoric Native American Indian component is present at the site as well.

Locus A covers an area 30 m north-south by 60 m east-west (1,410 square meters) in the west central portion of the site. It includes areas of dark soil, apparently midden. An alignment of trees along a buried pipeline from the town of Manzanar coincides with the northern boundary of the locus. Noted on the surface during recording were an obsidian Rose Spring Corner-notched projectile point, an obsidian biface fragment, an obsidian core fragment, a hammerstone, a ground stone fragment, a shell bead, 20 Owens Valley Brown Ware sherds, 40 obsidian flakes, 15 basalt flakes, and a chert flake. There are also historical artifacts present, including approximately 10 pieces each of purple, clear, and amber glass, three aqua glass fragments, several plate fragments, and three sanitary seal cans (see Chapter 11). One test unit (Unit 11) was excavated at this locus.

Locus B encompasses the central portion of the site. It covers an area roughly 100 m north-south by 100 m east-west (7,850 square meters). Areas of apparent midden are present. This locus has been subjected to a number of impacts. During use of the relocation center the northern portion of the site was covered by warehouses. A town road (also the original Owens Valley Wagon road) and two buried pipelines cross the locus and abundant town-era trash is strewn across the area.

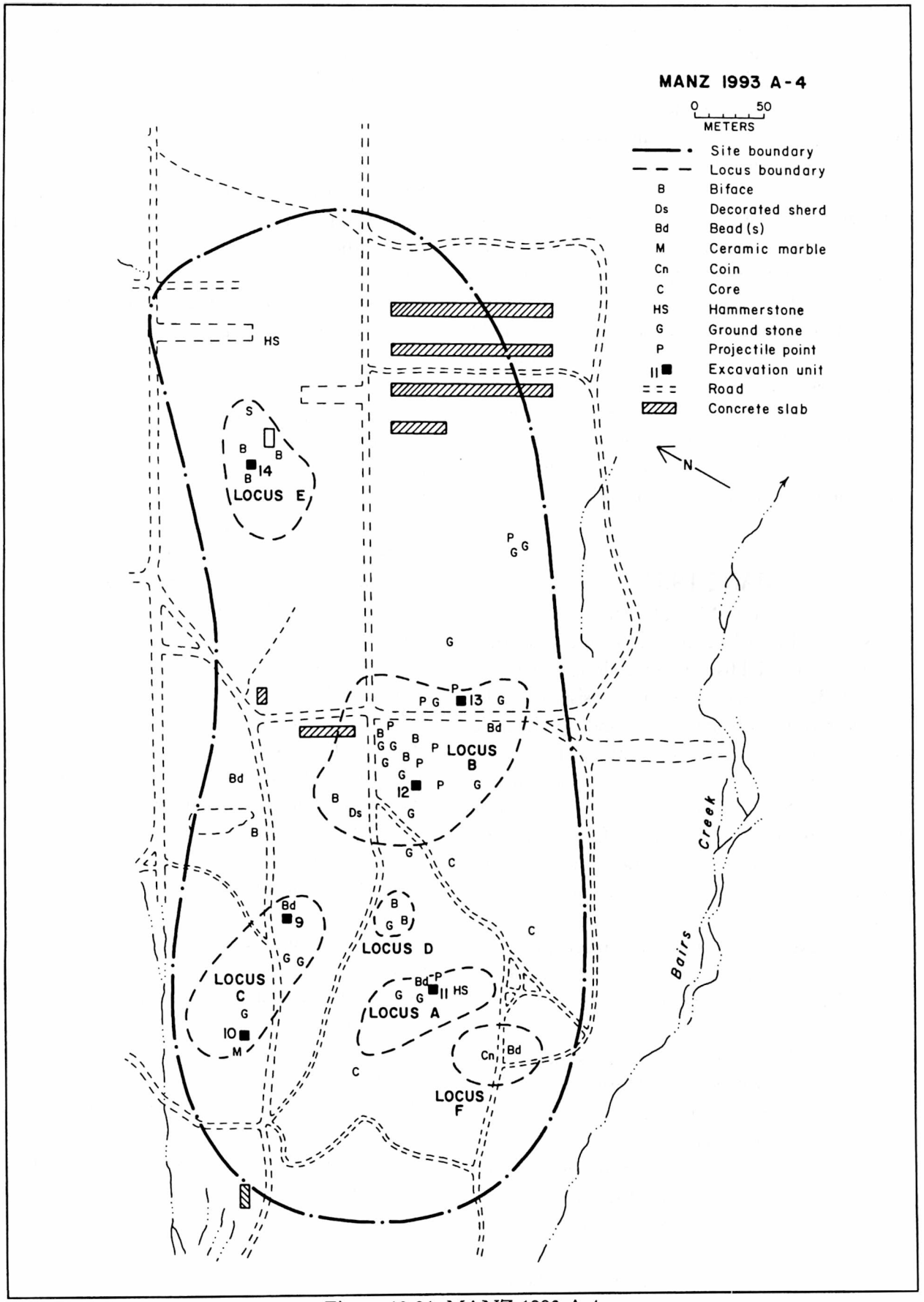


Figure 13.26. MANZ 1993 A-4.



Figure 13.27. 1854 half dollar found at MANZ 1993 A-4, Locus F.

Noted at Locus B were an obsidian Cottonwood Triangular projectile point, numerous obsidian projectile point and biface fragments, two chert biface fragments, a mano, two mano fragments, a metate fragment, three other ground stone fragments, a blue hexagonal glass bead, and over 10,000 obsidian, metavolcanic, and chert flakes (up to 10 per square meter). The locus also includes hundreds of clear glass fragments, about 100 purple glass fragments, about 100 whiteware ceramics, a soda bottle, a few cans, several phonograph record fragments, animal bone, shell, and peach pits (see Chapter 11). Two test units (Units 12 and 13) were excavated at this locus.

Locus C is in the northwestern portion of the site. It covers an area 40 m north-south by 100 m east-west (3,140 square meters). Dark soil, indicating midden, is present. A dirt road bisects the locus and during use of the relocation center the extreme western portion of the locus was covered by garages. Artifacts noted include 100 obsidian flakes, 20 basalt flakes, two mano fragments, a blue hexagonal glass bead, a ceramic marble, and a few other historical artifacts. Two excavation units (Units 9 and 10) were completed at this locus. A burial was encountered in Unit 9. Found (and reburied with) the burial were three projectile points, a chert biface, and a stone pipe.

Locus D covers an area 20 m north-south by 30 m east-west (470 square meters) in the center of the southern half of the site. Dark soil, possibly midden, is present at this locus. Within this locus there is what appears to be a recently-placed mound of dark soil that includes numerous prehistoric artifacts. Noted on the surface at Locus D were an obsidian biface tip, a metate fragment, approximately 100 flakes, and a piece of shell. No subsurface testing was conducted at this locus.

Locus E is in the eastern portion of the site, in the approximate center of the east warehouse block of the relocation center. It covers an area 50 m north-south by 75 m east-west (2,950 square meters). Noted in this area were three biface fragments and approximately 50 obsidian and basalt flakes. One test unit (Unit 14) was excavated within this locus.

Locus F is a 30 m north-south by 15 m east-west (350 square meters) scatter of mostly historical trash just south of Locus A. Two dirt roads cross the locus and deep sand (recent alluvium deposited by Bairs Creek) covers most of the area to the south and east. The depth of this surface deposit is attested to in several spots where people apparently have had to dig their stuck vehicles out of the sand. Artifacts noted on the surface of Locus F during site recording were a few obsidian flakes and brown ware sherds, an 1854 silver half dollar (Figure 13.27), nine blue hexagonal glass beads, fragments of cast iron, three purple glass fragments, two buttons (see Appendix E), and two glass marbles. No subsurface testing was conducted at this locus.

Stratigraphy

All but one of the six units excavated at MANZ 1993 A-4 were placed within apparent midden deposits. The exception was Unit 14 at Locus E. This unit was placed in an area with quantities of surface artifacts relatively higher than the immediate vicinity to determine if the

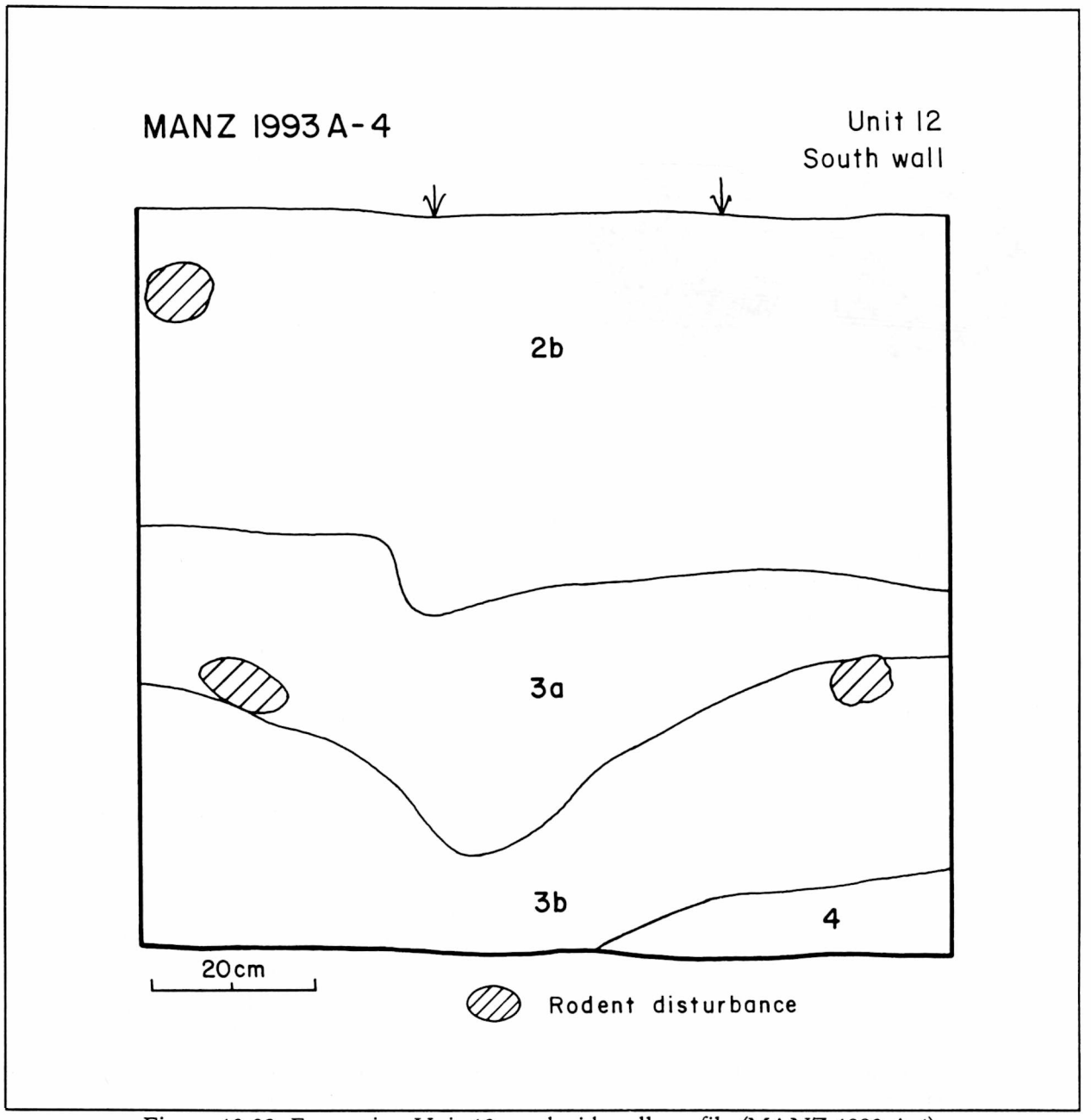


Figure 13.28. Excavation Unit 12 south sidewall profile (MANZ 1993 A-4).

extensive disturbance had brought these artifacts to the surface from a buried cultural deposit. The maximum depths of the excavation units placed within the middens varied from 80 cm to 120 cm. Outside the identified midden areas, Unit 14 was virtually sterile until 60 cm depth, where Stratum 2 (the main cultural deposit at the site, discussed below) was encountered.

Five major soil strata (Strata 1 through 5) were distinguished at MANZ 1993 A-4 based on soil texture, color, compaction, and rock and gravel constituents (Figures 13.28 and 13.29). Stratum 1 was present only in excavation Unit 14. It consists of loose yellowish brown (Munsell color 10YR 5/4) sandy gravel that extended from the surface up to 70 cm deep. Much rodent disturbance was apparent within this stratum, yet very few artifacts were encountered.

Stratum 2, which contains most of the prehistoric cultural deposit at the site, was encountered

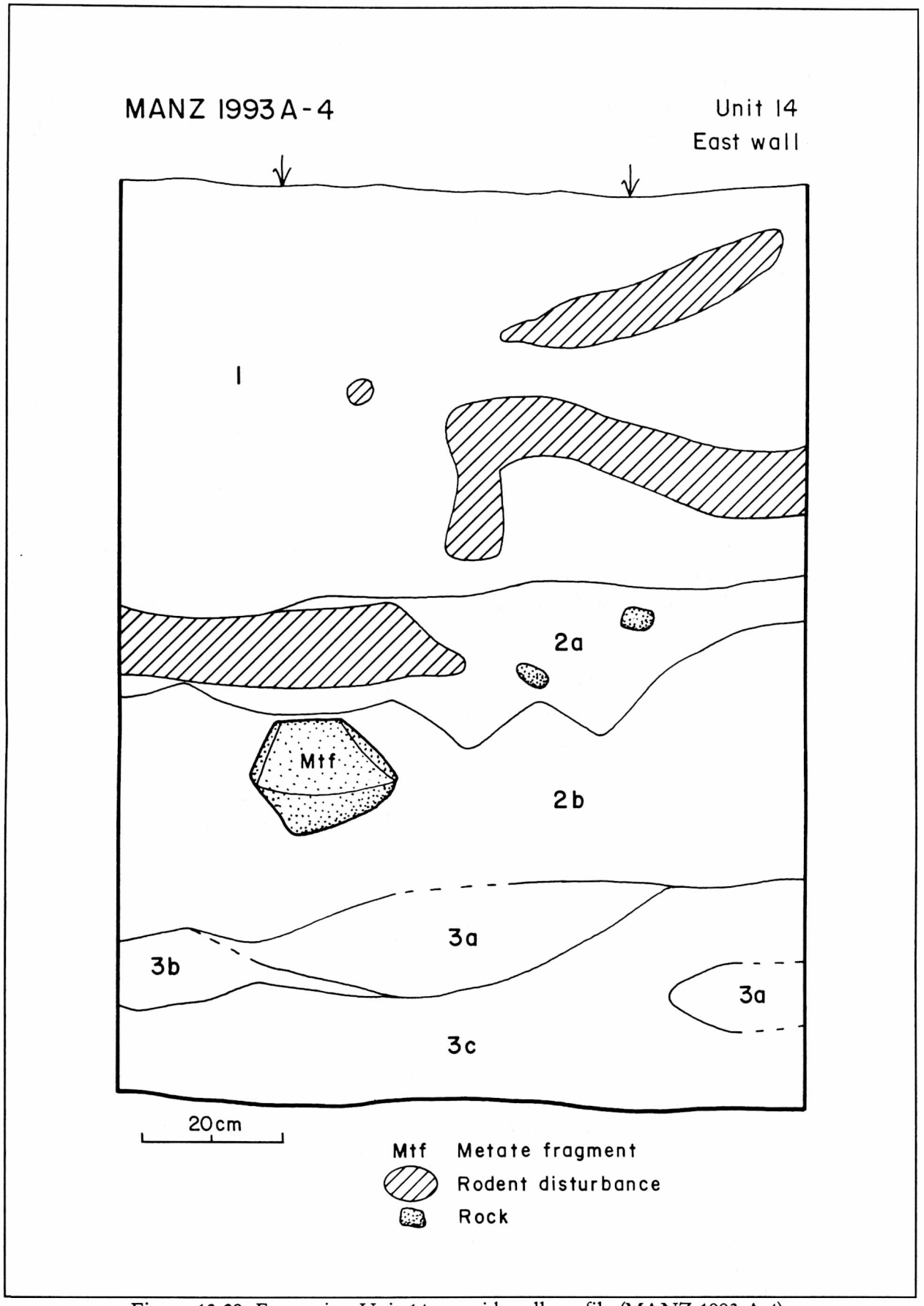


Figure 13.29. Excavation Unit 14 east sidewall profile (MANZ 1993 A-4).

in all of the excavation units. This stratum consists of loose sandy silt with gravels. Based on color, compaction, and to some extent the amount of artifacts present, this stratum was subdivided into three units. Stratum 2a is compact light brownish gray to brown (10YR 6/2-4/3) in color and generally contained few artifacts. It was present in Units 10 and 14 and varied in thickness from 10 cm to over 50 cm thick. However, Stratum 2a likely represents two different strata; in Unit 10 it underlies Stratum 2b and in Unit 14 it overlies Stratum 2b.

Stratum 2b is dark midden. It ranges in color from dark grayish brown to very dark grayish brown (10YR 4/2- 3/2). This stratum contained the greatest density of artifacts. It was present in Units 9, 11, 12, and 13. In Unit 9 it extended, intermingled with Stratum 2c (see below), from the surface to 90 cm deep. In Unit 11 it extended from the surface up to 80 cm deep and in Units 12 and 13 it extended from the surface to up to 50 cm deep.

Stratum 2c is a lighter-colored midden. It ranged from dark grayish brown to grayish brown (10YR 4/2-5/2) in color. Relatively few artifacts were present in this stratum. It was encountered in Units 9, 10, and 14. Within Unit 9 it was intermingled with Stratum 2b. In Unit 10 it extended from the surface up to 20 cm deep and in Unit 14 it consists of a 30 cm thick layer buried by 70 cm of virtually sterile sandy gravel (Stratum 1). The uppermost portion of the burial discovered in Unit 9 was within this stratum at a depth of 72 cm. The burial pit continues into the underlying stratum (Stratum 5) at least 10 cm.

Stratum 3 consists of sandy soil divided into three subunits. Very few artifacts were recovered from any of these subunits. Stratum 3a consists of loose silty sand with gravels, dark brown to dark grayish brown (10YR 3/3-4/2) in color. Encountered in Units 11, 12, 13, and 14, it varied in thickness from 10 cm to over 50 cm, but averaged about 25 cm. Stratum 3b consists of very loose sand with gravels and a few cobbles, light brownish gray to very pale brown (10YR 6/2, 7/3) in color. Present in Units 12 and 14 it was 30 cm and 40 cm thick, respectively. Stratum 3c consists of loose, gravelly, light brownish gray (10YR 6/2) sand. It was only encountered at the bottom of Unit 14, where it was over 30 cm thick.

Stratum 4 consists of culturally-sterile compact to very compact silt with a few cobbles. It varies in color from very dark grayish brown to pale brown (10YR 3/2-6/3). It was encountered in Units 10, 11, and 12 at depths varying from 58 cm to 94 cm. In Unit 10 this layer is 6 cm thick; in the other two units excavation was halted within this layer. In Unit 11 it is over 18 cm thick and in Unit 12 it is over 10 cm thick.

Stratum 5, also culturally sterile, is loose yellowish brown to grayish brown (10YR 4/4-5/2) sand with gravels. It was encountered only in Units 9 and 10, at depths of 100 and 68 cm, respectively. The pit for a burial discovered in Unit 9 extends into this stratum for at least 10 cm.

Assemblage

Collected from the surface of MANZ 1993 A-4 were eight projectile points, nine bifacial tools or preforms, nine ground stone artifacts, a decorated sherd, 14 glass beads, and a shell bead. Recovered during subsurface testing were nine projectile points, eight bifacial tools or preforms, 88 utilized pieces, a core/hammerstone, 773 pieces of debitage, eight ground stone artifacts, 14 sherds, five bone artifacts, 171 other animal bones, 14 shell fragments, fire-cracked rock, a walnut, a piece of burned daub, and 28 intrusive historical artifacts (Tables 13.20-13.25). In addition, a burial was encountered in one of the excavation units (Unit 9). Associated with the burial (and reburied) were three projectile points, a biface, a pipe bowl, and three refitting pieces of worked steatite.

Table 13.20. Distribution of Artifacts and Ecofacts in Excavation Unit 9 (MANZ 1993 A-4).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10	CT				20		4		worked bone	4
10-20	RS, PP		1		34					3
20-30			4		34		8			1
30-40					21		4			
40-50	CT				9		3			
50-60	RS				40		5			
60-70					5		1			
70-80					14		1			
80-90					2		2			
90-110†	3 RS	1							basalt pipe bowl, worked steatite	
Total	8	1	5		179		29		3	8

* CT - Cottonwood Triangular, RS - Rose Spring Corner-notched, PP - unclassified fragment.
† burial context.

Table 13.21. Distribution of Artifacts and Ecofacts in Excavation Unit 10 (MANZ 1993 A-4).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10			3		22		1			8
10-20	EES		7		38		3		burned daub	6
20-30			2		21	1	3	3	walnut	1
30-40			2		22					
40-50			2		13		1		worked bone	1
50-60					9		8			
60-70										
70-80										
Total	1		16		125	1	16	3	3	16

* ESS - Eastgate Expanding Stem

Table 13.22. Distribution of Artifacts and Ecofacts in Excavation Unit 11 (MANZ 1993 A-4).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10		1	2	1	11	1	4			
10-20	CLS		3		28	1				
20-30	CT	3	7		26	1	5	1	bone spatula	
30-40			5		16		4		groundstone fragment, worked bone	
40-50			3		21	1	7			
50-60			1		5	1	4	1		
60-70			1		5		1			
70-80					2					
80-90								1		
90-100										
Total	2	4	22	1	136	5	25	3	3	

* CLS - Cottonwood Leaf-shaped, CT - Cottonwood Triangular.

Table 13.23. Distribution of Artifacts and Ecofacts in Excavation Unit 12 (MANZ 1993 A-4).

Level (cm)	Projectile Points*	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10			6		36		5			
10-20	PP		5		56		8		bone pendant fragment	
20-30			6		45		10			
30-40		1	3		27		22			
40-50		1	6		38		31			
50-60			3		21		6			
60-70	PP		4		14		3			
70-80					6		2			
80-90					2		1			
Total	2	2	33		245		88		1	

* PP - unclassified fragments.

Table 13.24. Distribution of Artifacts and Ecofacts in Excavation Unit 13 (MANZ 1993 A-4).

Level (cm)	Projectile Points	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10			2		14	5	1			1
10-20			1		19	3	1	3		
20-30					15		3	4	groundstone fragment	
30-40					9					
40-50					11					
50-60					7		1	1		
60-70					3					
70-80					1		1			
Total			3		79	8	7	8	1	1

Table 13.25. Distribution of Artifacts and Ecofacts in Excavation Unit 14 (MANZ 1993 A-4).

Level (cm)	Projectile Points	Bifacial Tools	Retouched Pieces	Cores/ Fragments	Debitage	Sherds	Animal Bone	Shell Fragments	Other Artifacts and Ecofacts	Historic Artifacts
0-10			2		5					2
10-20							1			
20-30							6			
30-50			1		1		1			
50-70			2		18					
70-80					2					
80-90			1		1		3		metate fragment	
90-100					3					1
100-110			1		1					
110-120					2					
120-130										
Total			7		113		11		1	3

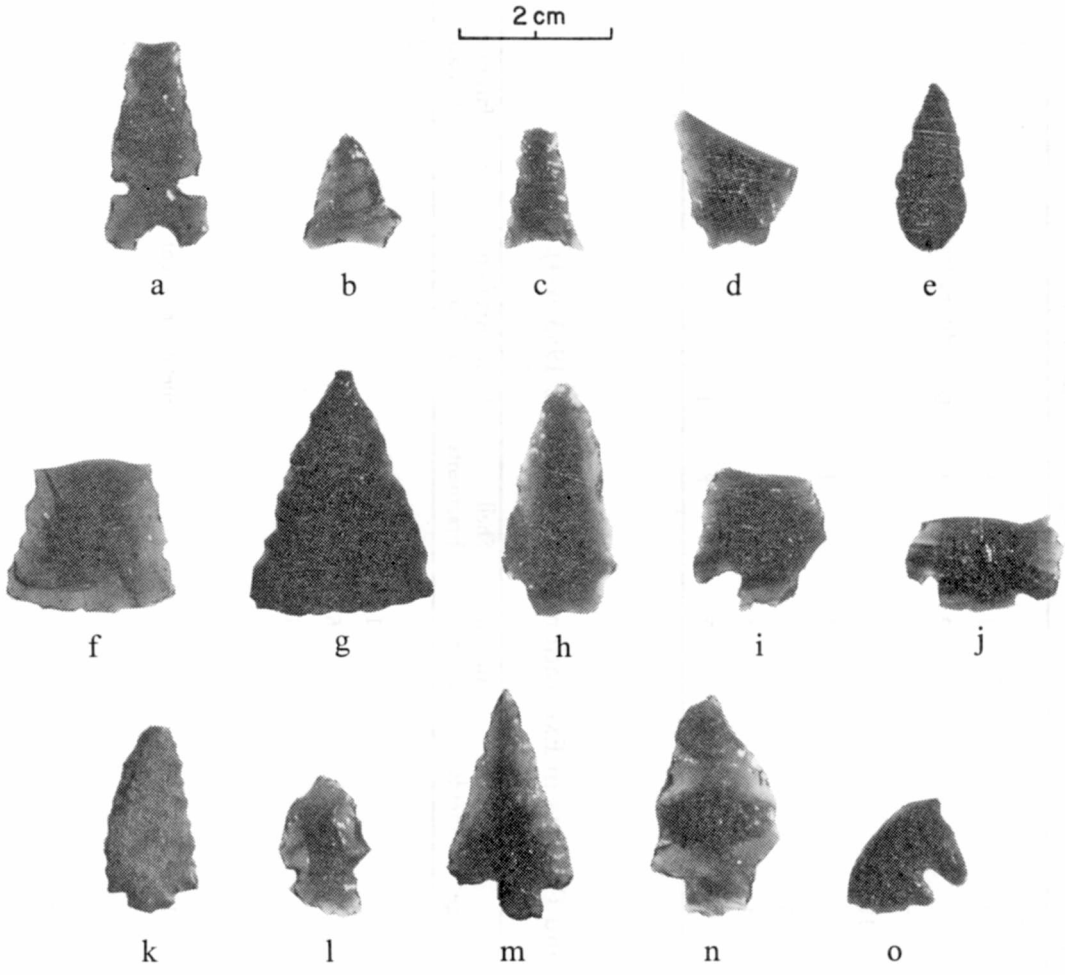


Figure 13.30. Projectile points from MANZ 1993 A-4 (a-b. Desert Side-notched, c. Cottonwood Triangular, d-e. Cottonwood Leaf-shaped, f-g. Rose Spring preforms, h-n. Rose Spring Corner-notched, o. Eastgate Expanding Stem).

Projectile Points

In all, 19 points were collected from MANZ 1994 A-4. Ten were from the surface and nine were recovered from excavation units (Table 13.26, Figure 13.30). In addition to these points, three projectile points found associated with a burial were reburied with the human remains. These points were photographed, drawn, and measured in the field (see Table 13.26, Figure 13.31).

All but four of the projectile points could be assigned to standard Great Basin types. These include seven Desert series points (Desert-side notched, Cottonwood Triangular, Cottonwood Leaf-shaped) and 11 Rosegate series (10 Rose Spring Corner-notched and one Eastgate Expanding Stem) points.

Two Desert Side-notched projectile points were surface collected. One, a Sierra subtype (basal-notched), was found 100 m southeast of Locus B. XRF-sourced as Fish Springs obsidian, it has a hydration rim value of 3.0 microns. The other Desert-side notched point, a General subtype (concave base), was collected from within Locus B. Visually it could be of either Coso Hills or Fish Springs obsidian.

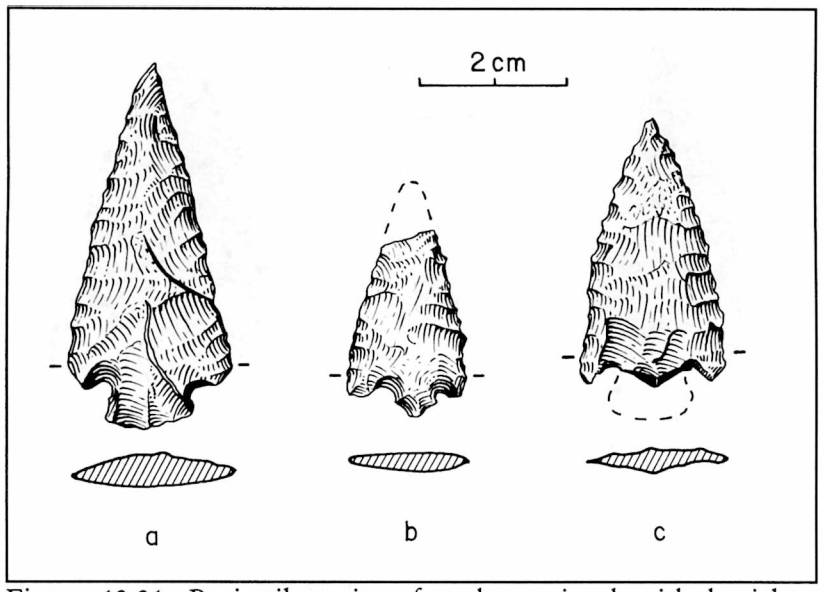


Figure 13.31. Projectile points found associated with burial at MANZ 1993 A-4.

Table 13.26.
Metrical and Provenience Data for Projectile Points Recovered from MANZ 1993 A-4.

		Size (mm)†						
Description	Provenience	L	W	T	W(g)	Source**	OH	Cat. No.
DSN* (Sierra subtype)	Surface (Blk R)	(27)	14	4	1.1	**FS**	3.0	A-156
DSN (General subtype)	Surface (Blk C)	16	(13)	3	0.5	FS/Coso		B-287
Cottonwood Triangular	Unit 11, 20-30 cm	(16)	10	3	0.4	FS/Coso		B-394
Cottonwood (RS preform)	Unit 9, 0-10 cm	32	24	3	1.8	FS/Coso		B-270
Cottonwood (RS preform)	Unit 9, 40-50 cm	(20)	22	4	1.7	Q		B-312
Cottonwood Leaf-shaped	Surface (Blk W)	(19)	16	5	1.2	FS		B-289
Cottonwood Leaf-shaped	Unit 11, 10-20 cm	22	9	3	0.7	chert		B-387
Rose Spring	Surface, Locus A	25	13	3	1.0	chert		B-274
Rose Spring	Surface, Locus B	(14)	14	3	0.8	FS		A-176
Rose Spring (reworked)	Surface, Locus B	18	12	4	0.8	FS		A-176
Rose Spring	Surface, Locus B	(13)	21	3	1.0	FS	2.4	B-284
Rose Spring	Surface, Locus B	31	16	4	1.9	FS/Coso		B-1050
Rose Spring	Unit 9, 50-60 cm	29	16	4	1.8	FS/Coso		B-317
Rose Spring	Unit 9, 10-20 cm	31	17	3	1.2	**SM**		B-306
Rose Spring	Unit 9, Burial, A4	(25)	16	3	–	Coso/QI		n/a
Rose Spring/Elko	Unit 9, Burial, A1	49	22	5	–	Q/QI		n/a
Rose Spring/Elko	Unit 9, Burial, A3	(35)	20	4	–	Coso/QI		n/a
Eastgate	Unit 10, 10-20 cm	(17)	(14)	3	0.7	QI		B-364
Midsection	Surface, Locus B	(9)	12	3	0.4	FS/Coso		B-327
Distal fragment	Unit 9, 10-20 cm	(19)	9	3	0.4	FS		B-304
Stem fragment	Unit 12, 10-20 cm	(7)	(9)	3	0.2	CD		B-414
Distal fragment	Unit 12, 60-70 cm	(16)	10	3	0.5	FS/Coso		B-426

* Desert Side-notched, RS = Rose Spring.
† incomplete measurements in parenthesis.
** Coso = Coso Hills, CD = Casa Diablo, FS = Fish Springs, SM = Sugarloaf Mountain (Coso), Q = Queen, QI = Queen Impostor; **bold** = XRF-sourced.

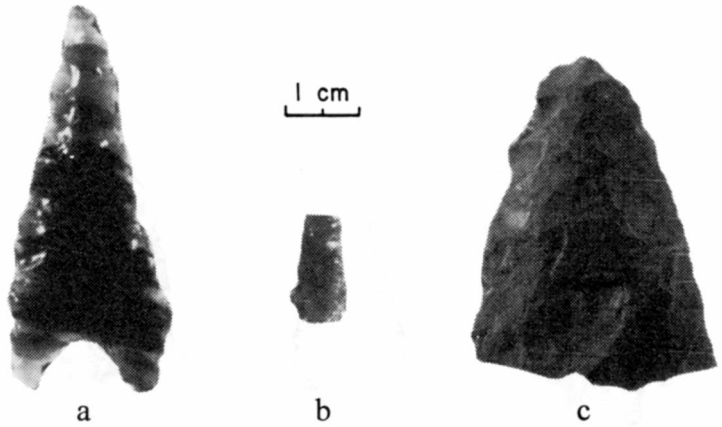


Figure 13.32. Bifaces from MANZ 1993 A-4 (a. Humboldt, b. drill, c. preform).

One Cottonwood Triangular point was recovered from Locus A and two were recovered from Locus C. The Locus A specimen was recovered from Unit 11 (20-30 cm); visually it appears to be either Coso Hills or Fish Springs obsidian. Both of the Locus C specimens were from Unit 9, one from the 0-10 cm level and one from the 40-50 cm level. One was visually identified as Queen obsidian and the other could be either Coso Hills or Fish Springs. Neither were submitted for hydration analysis. One was apparently fashioned from a very old flake, it has a portion of weathered rind (cortex-like in appearance) in the center portion of both sides. Both Locus C examples are rather large for Cottonwood Triangular points (1.7 g and 1.8 g); they may instead be preforms for Rose Spring projectile points. Given the high number of Rose Spring points recovered from Unit 9, this seems a likely possibility.

Two Cottonwood Leaf-shaped points were recovered, one of obsidian and one of chert. The chert specimen was from the 10-20 cm level of Unit 11 (Locus A). The obsidian specimen was surface collected from Locus E (Cat. No. B-287). Visually it could be either Coso Hills or Fish Springs obsidian. It was not submitted for hydration analysis.

Rose Spring points collected include one from the surface within Locus A, four from the surface within Locus B, and three from excavation units within Locus C. The collected points include one chert, three Fish Springs, two Coso Hills/ Fish Springs, and one XRF-sourced as Sugarloaf Mountain (Coso Hills). One of the Fish Springs specimens has a hydration rim of 2.4 microns.

The sole Eastgate Expanding Stem projectile point from the site is a basal fragment recovered from the 10-20 cm level of Unit 10. Visually it appears to be of Queen Imposter obsidian.

Unclassified projectile point fragments include two distal (tip) fragments, a midsection, and a stem fragment. One was surface-collected from Locus B, one was recovered from Unit 9, and two were recovered from Unit 12. Visually one appears to be Casa Diablo obsidian, one appears to be Fish Springs obsidian, and two could be either Coso Hills or Fish Springs obsidian.

Three points found associated with a burial within Locus C were not collected, but were measured, photographed, and drawn in the field before reburial (Figure 13.31). All three points are triangular bladed, corner-notched specimens. One, found near the right fibula, is of Queen or Queen Imposter obsidian. The point has a basal width of 12 mm, which according to Thomas's (1981) key, makes it a small Elko series point. Just above the vertebrae was a point fragment,

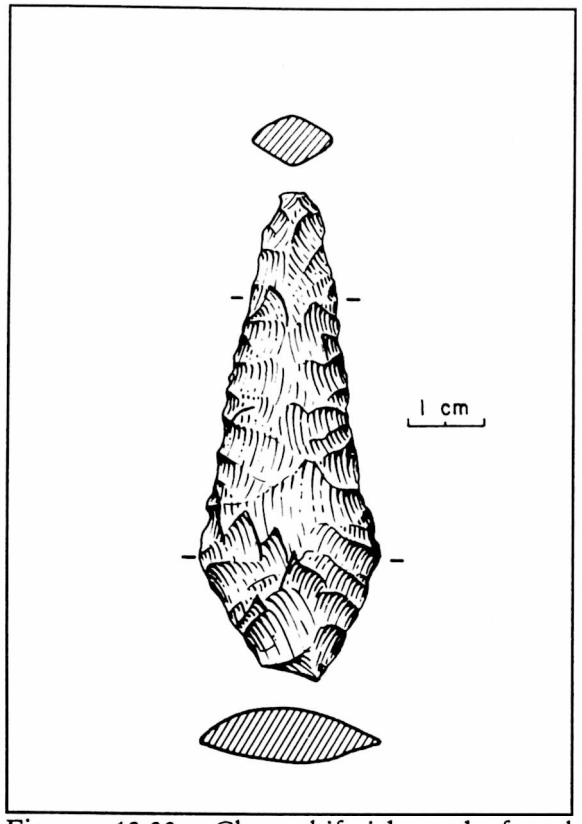


Figure 13.33. Chert bifacial tool found associated with burial at MANZ 1993 A-4.

with the stem missing, of Coso Hills or Queen Imposter obsidian. Its basal width of an estimated 10 mm places it at the boundary between Rose Spring and Elko points. The third point is also a fragment, but with the tip missing, of Coso Hills or Queen Imposter obsidian. It was found next to the left femur along with a stone pipe and chert biface. With a basal width of 6 mm it falls within the Rose Spring type.

Bifacial Tools

Bifacial tools include 11 finished tools, a drill, a Humboldt biface, and two preforms. Provenience and metrical data are provided in Table 13.27. Representative specimens are illustrated in Figure 13.32.

Surface collected finished bifacial tools include three distal fragments and one midsection of obsidian and a midsection and margin fragment of chert. Three were from Locus B (one chert), two were from Locus E, one was from between Locus C and D (chert), and one was from north of Locus B. Visual inspection of the obsidian specimens indicates that two are from the Fish Springs source, one could be from either the Coso Hills or Fish Springs source, and one is from the Casa Diablo source.

Finished bifacial tools recovered from the excavation units include a midsection, two margin fragments, and a small nondescript fragment of obsidian and a midsection and base of chert. Visually three of the obsidian specimens appear to be from the Fish Springs source and one appears to be from the Queen source. One of the obsidian bifaces was from Unit 11 (Locus A), one was from Unit 12 (Locus B), and two were from Unit 14 (Locus E). The chert bifaces were from Unit 11 (Locus A) and Unit 12 (Locus B).

The sole drill recovered is a midsection from the 0-10 cm level of Unit 11 (Locus A). Visually it appears to be fashioned of Fish Springs obsidian.

A complete Humboldt Concave Base biface was collected from the surface of Locus B. The distal end has been reworked to from a relatively short triangular tip. Visually it appears to be from the Queen obsidian source.

The two collected preforms include a chert distal fragment found on the surface of Locus D, and a basal fragment, of obsidian, from the 20-30 cm level of Unit 11 (Locus A). The obsidian piece, visually identified as Fish Springs obsidian, has a hydration rim of 3.0 microns.

In addition to the collected bifaces a complete chert biface was found with the burial encountered in Unit 9 (Locus C). The biface, measuring 6.5 cm long, has a triangular blade, and a contracting stem or base. The edges of the base, one quarter of the length of the artifact, have been ground, suggesting use as a hafted knife (Figure 13.33).

Table 13.27.
Metrical and Provenience Data for Biface Fragments Recovered from MANZ 1993 A-4.

Description	Provenience	Size (mm)* L	W	T	W(g)	Source†	OH	Cat. No.
Humboldt (reworked)	Surface, Locus A	51	21	7	5.2	Q		B-1051
Drill, midsection	Unit 11, 0-10 cm	(15)	8	3	0.4	FS		B-383
Tool, margin fragment	Surface (Blk C)	(15)	23	7	2.0	chert		B-328
Tool, distal fragment	Surface, Locus B	(20)	12	4	0.8	CD		B-284
Tool, distal fragment	Surface, Locus E	(13)	22	8	2.2	QI		B-290
Tool, midsection	Surface, Locus E	(11)	35	10	3.5	CD		B-291
Tool, distal fragment	Surface, Locus E	(23)	(18)	5	1.7	FS/Coso		B-292
Tool, midsection	Surface	(21)	(36)	7	6.6	chert		B-301
Tool, nearly complete	Unit 9, Burial, A2	65	24	8	–	chert		n/a
Tool, basal fragment	Unit 11, 20-30 cm	(12)	(13)	4	0.5	chert		B-389
Tool, midsection	Unit 11, 20-30 cm	(15)	(10)	3	0.6	FS		B-395
Tool, midsection	Unit 12, 30-40 cm	(11)	(20)	5	1.0	FS		B-420
Tool, margin fragment	Unit 12, 40-50 cm	(14)	(16)	5	0.8	chert		B-421
Tool, margin fragment	Unit 14, 20-30 cm	(13)	(12)	4	0.6	Q		B-493
Tool, fragment	Unit 14, 50-70 cm	(17)	(9)	8	0.9	FS		B-441
Perform, distal fragment	Surface, Locus D	(44)	32	9	14.3	chert		B-1049
Preform, basal fragment	Unit 11, 20-30 cm	(42)	(25)	12	13.0	FS	3.0	B-396

* incomplete measurements in parenthesis.
† FS = Fish Springs, CD = Casa Diablo, Coso = Coso Hills, Q = Queen, QI = Queen Impostor; **bold** = XRF-sourced.

Utilized Flakes

A total of 88 utilized flakes were recovered during excavation at MANZ 1993 A-4. This comprises 73 percent of the flaked stone tools recovered from MANZ 1993 A-4. Material types include obsidian (97%), chert (3%), and fine-grained basalt (1%). The only piece with cortex was obsidian. Visually 45 percent of the obsidian specimens appear to be Fish Springs, 45 percent could be Coso Hills or Fish Springs, 4 percent each Casa Diablo and Queen Imposter, and 1 percent each Queen and Coso Hills or Queen Imposter.

Utilized flakes recovered from Unit 11 within Locus A include 21 of obsidian and one of chert. One piece has a small pointed projection that could have been used as a perforator. Unit 12 within Locus B had 32 obsidian and one basalt utilized flake, and Unit 13 had three obsidian utilized flakes. Within Locus C, Unit 9 had four obsidian and one chert utilized flakes, while Unit 10 had 15 obsidian and one fine-grained basalt utilized flake. A small obsidian utilized flake from the 0-10 cm level of Unit 10 with serrated edges on opposite edges can be classified as a denticulate. Unit 14, within Locus E, had six obsidian and one chert utilized flake.

Core/Hammerstone

A complete bifacial core was recovered from the 0-10 cm level of Unit 11. Of basalt and still retaining some cortex, it measures 58 cm by 63 cm by 28 cm and weighs 123.6 g. Since both ends have been battered, the core was also apparently used as a hammerstone.

Debitage

The six excavation units at MANZ 1993 A-4 yielded 773 pieces of debitage. With two exceptions, the highest amounts of debitage occurred in the 10-20 cm level. Within Unit 9 the greatest number of flakes was recovered from the 50-60 cm level and in Unit 14 the greatest number was recovered from the 50-70 cm level. Below these maximum levels, flake counts decreased steadily



Figure 13.34. Manos from MANZ 1993 A-4; a-b. unifacial, c. bifacial.

for up to 60 cm and then rapidly dropped off.

Debitage material types include obsidian (80%), cryptocrystalline rock (17%), and basalt (3%). Visual inspection of the obsidian yielded the following source ascription estimations: Fish Springs 78 percent, Coso Hills 14 percent, Queen Imposter 4 percent, Queen 2 percent, and Casa Diablo 1 percent.

The obsidian flake types present suggest late stage bifacial reduction. Primary decortication flakes are not well represented and there are low percentages of secondary decortication flakes and of simple interior flakes compared to complex interior flakes, and a modest amount of biface thinning flakes.

Early stage bifacial reduction is indicated for the cryptocrystalline materials by a higher percentage of simple interior flakes compared to complex interior flakes, and a high percentage of cortical flakes. A low percentage of biface thinning flakes and percussion/pressure tends to support this interpretation. This pattern may suggest the preparation of flake blanks from cores.

Only 13 basalt flakes were recovered: seven are simple interior flakes, three are complex interior flakes, and three are cortical flakes. Though the sample is small, it may suggest core reduction and early stage bifacial reduction.

Ground Stone Artifacts

The ground stone assemblage includes eight manos, five metate fragments, three unclassifiable fragments, and a vesicular basalt pipe. The pipe, associated with a burial encountered during testing, was not collected.

All of the manos from MANZ 1993 A-4 were from the surface. Two are complete and six are fragments (Figure 13.34). The complete specimens are both granite cobbles with use wear on one face. One is an unshaped cobble from Locus A. It measures 12.1 cm by 10.1 cm by 5.4 cm

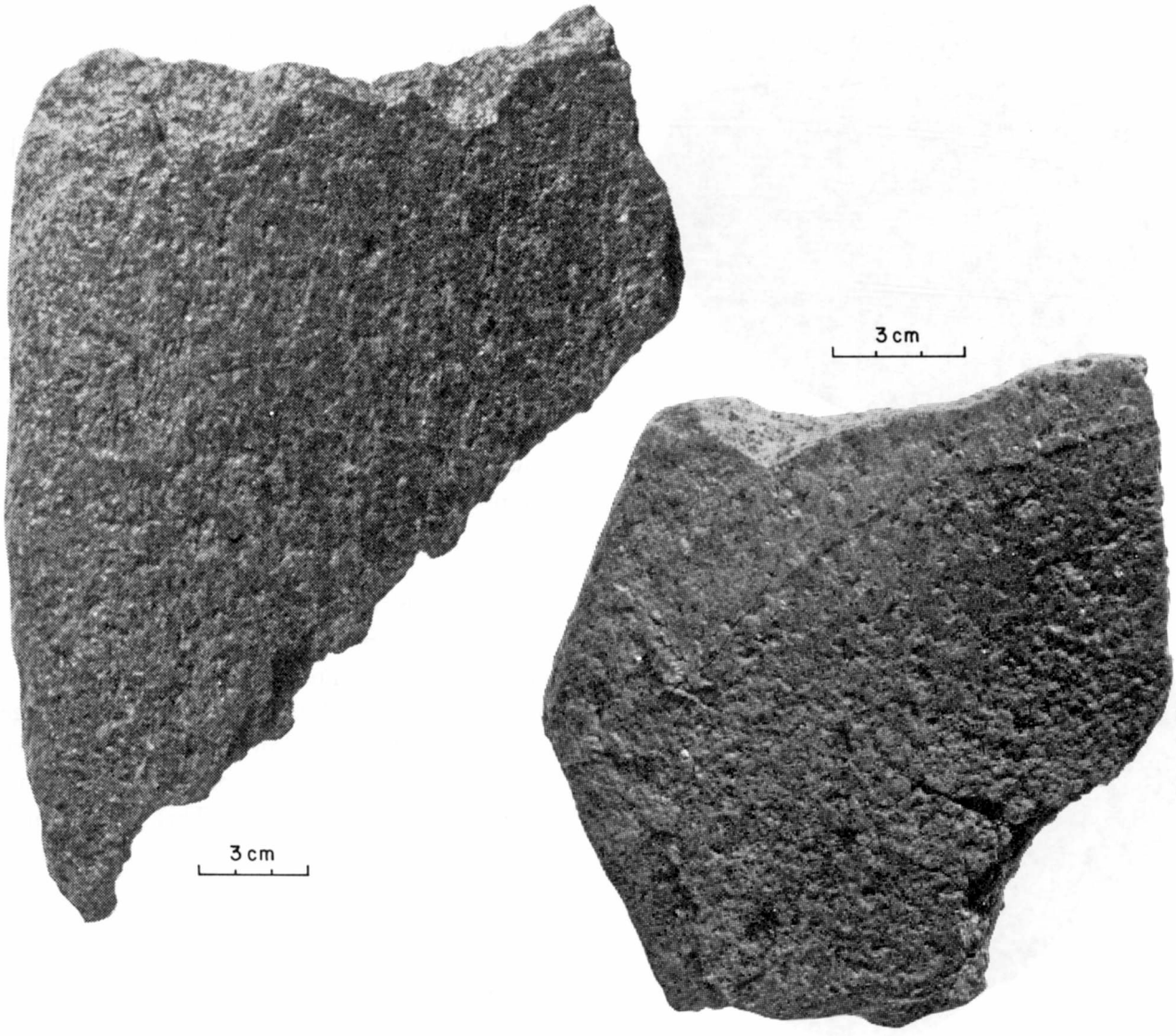


Figure 13.35. Metate fragments from MANZ 1993 A-4.

thick and weighs 907 g. The other complete specimen is irregularly-shaped. Collected from Locus B, it measures 12.9 cm by 10.1 cm by 7.5 cm thick and weighs 1194 g.

The mano fragments include a bifacial oval-shaped granite specimen from Locus C, a bifacial oval-shaped basalt specimen from Locus E, a bifacial quartzite mano fragment from Locus B, a bifacial basalt mano fragment from east of Locus B, a unifacial oval-shaped vesicular basalt mano from Locus C, and a bifacial oval-shaped micaceous schist mano found with a micaceous schist metate fragment 100 m southeast of Locus B. Measurable thicknesses of the bifacial specimens range from 2.4 cm to 3.9 cm with a mean of 3.2 cm. The unifacial specimen measures 2.6 cm thick.

Five metate fragments were collected, four from the surface and one from an excavation unit (Figure 13.35 and 13.36). Collected from the surface of Locus A was a concave fragment of micaceous schist. Collected from the surface of Locus B was a 66-mm-thick granite slab metate fragment. Collected from the surface of Locus D



Figure 13.36. Metate fragment from MANZ 1993 A-4, Locus B.

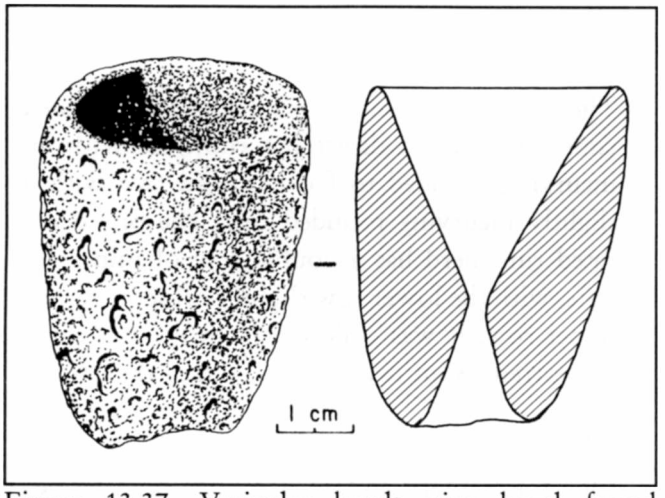


Figure 13.37. Vesicular basalt pipe bowl found associated with burial at MANZ 1993 A-4.

was a 49-mm-thick unifacial granite slab metate fragment. The convex micaceous schist slab metate fragment, collected 100 m southeast of Locus B along with the micaceous schist mano fragment, was also 49-mm-thick, was The specimen from excavation is a fragment of medium-sized granite boulder with a concave grinding surface from the 80-90 cm level of Unit 14 (Locus E).

Unclassified ground stone fragments from MANZ 1993 A-4 include a unifacial granite fragment collected from the surface of Locus B, a ground granite cobble fragment from the 30-40 cm level of Unit 11, and a fire-cracked granite fragment from the 20-30 cm level of Unit 13.

A vesicular basalt pipe bowl (Figure 13.37) was found with the excavation Unit 9 burial. Sub-conical in shape, it is 5.0 cm long, tapering from 3.6 cm in diameter at the bowl end to 1.8 cm in diameter at the stem end. The bi-conically drilled perforation is 2.9 cm in diameter at the bowl end, 0.3 cm in diameter at the narrowest point, and 1.3 cm in diameter at the stem end. The walls vary in thickness from 0.3 cm at the ends to 1.4 cm at the narrowest point. The narrowest point is 3.2 cm from the bowl end and 1.8 cm from the stem end. No pitch, tobacco, or other residue was noted on the artifact.

Three fragments of worked steatite were found with the Unit 9 burial near the stone pipe bowl. The fragments, 2.0 cm, 1.2 cm, and 3.8 cm long, are black, highly polished, and striated. They fit together to form a longitudinal fragment of a 5.0-

Table 13.28.
Surface Treatment of Individual Sherds from MANZ 1993 A-4.

Interior Surface	Exterior Surface				
	Smooth	Rough	Random Brushed	Parallel Brushed	Total
Smooth	1	1	-	-	2
Rough	-	6	-	-	6
Random Brushed	-	2	3	-	5
Parallel Brushed	-	1	-	1	2
Total	1	10	3	1	15

cm-long, 0.8 cm diameter tube. The other half of the stem is presumably in the unexcavated portion of the burial pit. The pieces are likely part of a pipe stem. Along with the pipe bowl they likely formed a complete pipe.

Thick conical/cylindrical pipes are rare in the Great Basin. An unfinished pipe fragment from Gatecliff Shelter in central Nevada was recovered from a Reveille Phase (ca. 1300 B.C.-A.D. 700) deposit along with numerous Elko Series projectile points (Thomas 1983:239). In the Central Valley of California specimens have been found in Early and Middle Horizon (ca. 2000 B.C.-A.D. 500) contexts (Moratto 1984:182, 304). In the southwestern United States cylindrical pipes are commonly found at Basketmaker sites dating to between A.D. 1 and A.D. 700 (Burton 1991; Hough 1903; and others).

Ceramics

Seven body sherds and seven rim sherds were recovered from the excavation units. In addition, a decorated sherd was collected from the surface during initial site recording. All are sand/grit-tempered Owens Valley Brown Ware sherds manufactured by coiling and scraping. No slip, paint, or glaze was noted. Surface colors range from gray brown (Munsell color 10YR 2.5-5/1-4) to reddish brown (2.5 YR 3-5/4). Surface luster is dull to earthy. Surface texture is predominately rough and random brushed (Table 13.28). Two of the sherds have abundant mica. Measured sherd thickness ranges from 3.4 mm to 7.9 mm with a mean of 6.5 mm and a standard deviation of 1.1.

The rim sherds include three with direct rounded rims, one with a direct flat rim, one with an incurving rounded to flat rim, and two with a slightly incurving rounded rim. The one decorated rim sherd has a double row of impressed dots, with the lower row slightly off-set from the upper row. It was collected from the surface in the extreme southwestern portion of the site.

Glass Beads

One fragmentary and 14 complete blue faceted glass beads were recovered from the surface. Two were from Locus B, three from Locus C (Unit 9 vicinity), eight from Locus F, and one was outside any of the designated loci. All fit either Meighan's (1979) types 149 or 154, which he dates to the trapper/Mexican period (post 1830).

Shell Bead

An *Olivella* saucer bead was collected from the surface of Locus A. The specimen measures 10 mm by 3 mm and has a 2-mm-diameter hole. It fits Bennyhoff and Hughes (1987) type G2,

which dates to the Middle period in Central California (200 B.C.-A.D. 700). Within the Great Basin this bead type is most abundant between 200 B.C. and A.D. 100.

Bone Artifacts

Fragments of five bone artifacts were recovered during the 1993 excavations at MANZ 1993 A-4. These include a charred spatulate tool, a possible pendant, and three charred pieces of worked bone (see Appendix H). In addition, a worked bone was found in association with the burial.

The spatulate tool was recovered from Unit 11 (20-30 cm). Manufactured from a long bone shaft of a large mammal, it is striated and polished on the cortical surface and beveled on the distal end, probably from use. The interior surface does not appear to be worked. The possible pendant fragment consists of a notched or drilled large mammal bone fragment. The break in the specimen bisected the hole. No other modification was evident.

Other worked bone includes a highly polished large mammal rib shaft with striations on both surfaces and the unbroken edge smoothed thin, and two other small fragments with striations or polish. The first piece was recovered from Unit 9 (0-10 cm) and the other two were recovered from Units 10 (40-50 cm) and 11 (30-40 cm).

Vertebrate Faunal Remains

One hundred seventy-one faunal specimens were recovered from the five excavation units at MANZ 1993 A-4. There are seven taxa represented in the faunal assemblage, including mammal and bird remains (see Appendix H). Twenty-seven percent of the bone assemblage was identifiable to the class level or below. Fifty-four percent are burned and six, all but one small- to medium-sized mammal long-bone fragments, have cut marks.

Lagomorphs constitute 51 percent of the identifiable specimens and artiodactyl specimens constitute 34 percent. The artiodactyl specimens include five bighorn-sheep (*Ovis canadensis*) elements similar in development to a less-than-one-year-old lamb. These immature remains suggest a fall/winter or possibly spring occupation at MANZ 1993 A-4.

Other identified bone remains include a burned raccoon (*Procyon lotor*) humerus, a mandible fragment assigned to *Neotoma* sp., and five bird specimens. The bird remains include a sternum fragment tentatively identified as quail or pheasant, three possible sternum fragments from a medium-sized bird, and one unidentifiable fragment. With the exception of the two charred specimens, it is unclear if the bird remains recovered are related to the prehistoric occupation of Manzanar since they represent local taxa that could be recent intrusives.

Invertebrate Fauna

Fourteen small fragments of freshwater bivalve shell were recovered from the excavation units at MANZ 1993 A-4. These include three pieces from Unit 10, eight from Unit 11, three from Unit 12, and eight from Unit 13. All are likely *Anodonta*, a mollusk common in the Owens River.

Human Remains

A pedal phalanx was recovered in the 0-10 cm level of Unit 9 (Locus C), but no other human bone was found in the unit until 72 cm depth. At that point the top of a human cranium was found in an upright position; no other articulated bone was visible. Excavation was continued to expose enough of the burial to identify its antiquity and cultural affiliation and assess its integrity. No human bone was moved and the burial, including all associated artifacts, was reburied in place.

The human remains were examined in the field by a physical anthropologist who determined they were those of a young adult Native American Indian male (see Appendix I). No cause of death could be determined. The individual was in a seated position with the legs fully

flexed at the hips and knees. The torso was bent completely forward, the legs were to the right side, and the head was upright facing south. Artifacts found with the burial (at depths ranging from 91 cm to 104 cm) include three obsidian projectile points, a chert biface, a basalt pipe bowl, and three fragments of a steatite pipe stem (see descriptions above). The lower portion of the body was not excavated, but it is assumed that the pedal phalanx found in the upper level of the unit could be part of this burial, displaced perhaps by rodents.

Fire-cracked Rock

Besides the fire-cracked ground stone specimen from Unit 13 noted above under Ground Stone Artifacts, the only other fire-cracked rock recovered during excavation was a small granite piece from the 0-10 cm level of Unit 9.

Other Collected Materials

Other collected materials include a piece of burned daub and a walnut shell. The daub was recovered from the 10-20 cm level of Unit 10. It is very small (30.9 g) with stick and vegetation impressions. It may indicate that a burned aboriginal structure was in the vicinity of Unit 10. A walnut shell was found in the 20-30 cm level of Unit 10. Unburned and in fairly good condition, it is not thought to be associated with the Native American Indian occupation of the site. It is likely a recent intrusive from historical farms and orchards once located nearby.

Intrusive Historical Artifacts

Historical artifacts were recovered from the upper levels (0-20 cm) of four of the six excavation units at MANZ 1993 A-4. These include five glass fragments, a wire nail, and a lumber fragment from Unit 9 (Locus C); six glass fragments, two wire nails, and six small metal fragments from Unit 10 (Locus C); a glass fragment from Unit 13 (Locus B); and two wire nails from Unit 14 (Locus E). Below 20 cm, historical artifacts were noted in three excavation units: Unit 9 had a small metal fragment in the 20-30 cm level, Unit 10 had a small metal fragment each in the 20-30 cm and 30-40 cm levels, and Unit 14 had a glass fragment in the 120-130 cm level. All of these artifacts apparently postdate 1900, and are most likely debris from the relocation center or town of Manzanar.

Obsidian Hydration Analysis

Thirty-eight specimens visually- or XRF-sourced as Fish Springs obsidian were submitted for hydration analysis (see Appendix L). The sample includes 17 pieces from Unit 9, nine pieces from Unit 11, 11 pieces from Unit 12, and one piece from the surface. Three pieces have diffuse unreadable rims.

Readable hydration rims for the site as a whole ranged from 2.3 microns to 8.5 microns, with a mean of 3.3 microns and a standard deviation of 1.0. Using the Fish Springs obsidian hydration rate used in Delacorte and McGuire (1993) all but one of the values fall within the Baker phase, A.D. 600 to 1300 (Figure 13.38).

Hydration values for different proveniences reflect the values for the site as a whole. Unit 9 values range from 2.3 to 8.5 microns, with a mean of 3.5 microns and a standard deviation of 1.4. Unit 11 values range from 2.4 to 3.6 microns, with a mean of 3.0 microns and a standard deviation of 0.4. Unit 12 rim values range from 2.7 to 4.1 microns, with a mean of 3.2 microns and a standard deviation of 0.4.

Site Summary

Subsurface testing at MANZ 1993 A-4 revealed a midden deposit up to 100 cm in depth. The integrity of the site has been compromised to some extent by historical use. However, this disturbance is generally limited to the upper 20 cm of the deposit. An intact burial was encountered 90 cm below the present ground surface in one excavation unit. The chance discovery of this burial, the first burial discov-

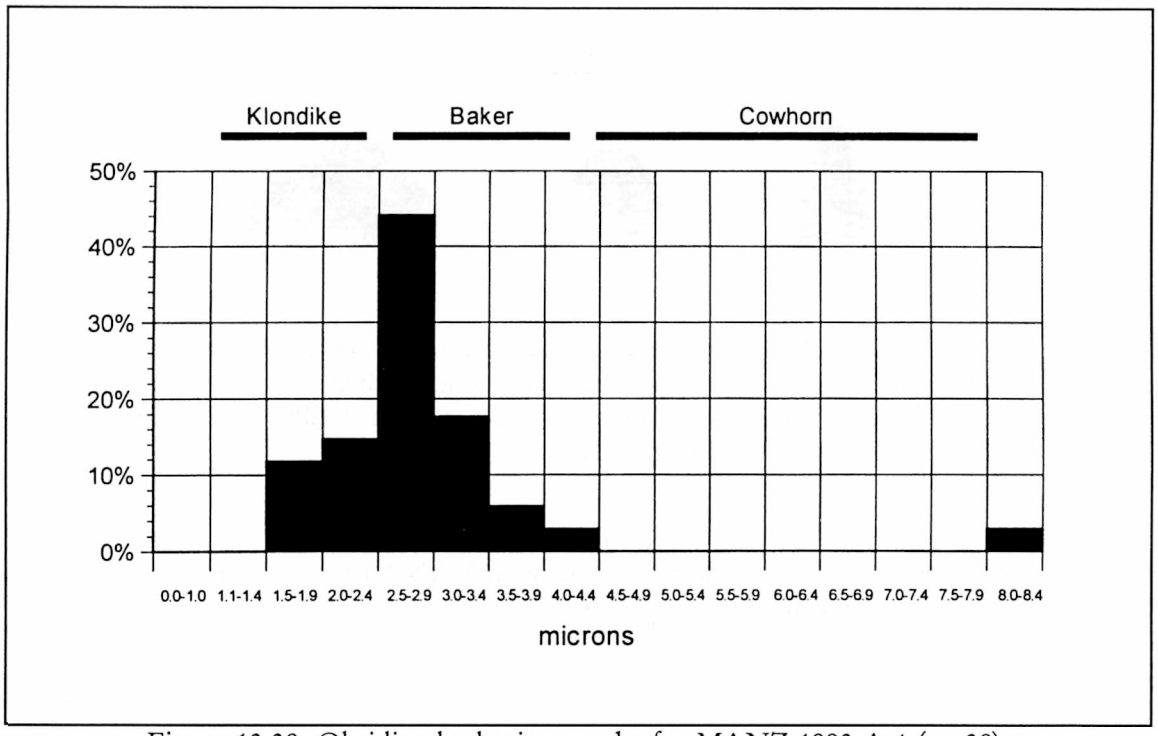


Figure 13.38. Obsidian hydration results for MANZ 1993 A-4 (n=38).

ered during an archeological excavation in the Owens Valley, suggests more human remains are likely present at the site.

The burial, midden deposits, and a varied and abundant artifact assemblage indicate intensive use of the site area. The site appears to have been a base camp or "village" where a variety of subsistence and maintenance tasks took place. Projectile point styles, ceramics, glass beads, and other chronometric data indicate use of the site area from A.D. 600 into the historical period. The large number of glass beads found on the surface (and possibly a ceramic marble from Locus C and an 1854 half dollar from Locus F) suggests a substantial historical Native American Indian component is present at the site even though it was not encountered during the limited subsurface testing conducted for this project.

The association of Rose Spring and Elko points with the burial discovered at the site suggest an early Baker period occupation. The burial is intact enough that it appears undisturbed. Surrounding sediments and artifacts indicate the burial was excavated into a Baker period midden, suggesting the burial dates to that period or later. Indeed, one, or perhaps two, of the associated projectile points appear to be Rose Spring Corner-notched forms, dated to the Baker period. But one, and possibly two, of the points fit Thomas's criteria for Elko Corner-notched points, dating to the preceding Cowhorn period. Even if the larger point(s) are significantly older, their presence in a Baker period burial could be explained easily enough: they might have been found, collected, and reused.

However, the Elko and Rose Spring projectile point forms may overlap more than Thomas's criteria suggest. The forms are very similar, in fact Thomas found that only basal width provided a meaningful distinction. Since basal width of points would likely reflect the size of the attached shaft, larger basal widths would seem appropriate for dart points (Elko series), and the smaller basal widths for arrow points (Rose Spring), when bow-and-arrow technology was adopted. Although Thomas's points at Gatecliff Shelter (Thomas 1983), upon which he developed his operational key, broke into distinct groups, other studies have shown

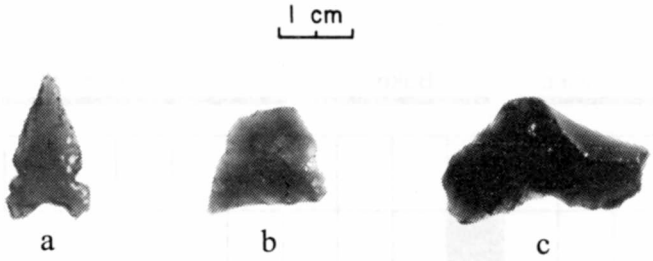


Figure 13.39. Miscellaneous flaked stone artifacts found at Manzanar National Historic Site (a. isolated Desert Side-notched projectile point, b. isolated Cottonwood Triangular projectile point, c. Elko series point fragment from MANZ 1993 A-19).

Table 13.29.
Metrical and Provenience Data for Projectile Point from MANZ 1993 A-19 and Isolated Projectile Points and Bifaces from within Manzanar National Historic Site.

		Size (mm)†						
Description	Provenience	L	W	T	W(g)	Source**	OH	Cat. No.
DSN* (General subtype)	Surface (Blk 33)	19	11	4	0.5	FS	2.5	A-116
Cottonwood Triangular	Surface (Blk Se)	(13)	16	3	0.6	FS/Coso		A-190
Rose Spring	Surface (Blk 25)	(20)	16	4	1.3	FS		A-77
Elko tang	MANZ 1993 A-19	(28)	(18)	6	2.2	FS	4.9	A-55
Biface, midsection	Surface (Blk F3)	(22)	(19)	5	2.2	FS		A-202
Biface, margin fragment	Surface (Blk F3)	(19)	(15)	5	1.5	FS/Coso		A-202

* Desert Side-notched
† incomplete measurements in parenthesis.
** FS = Fish Springs, Coso = Coso Hills, LM = Lookout Mountain (Casa Diablo), SM = Sugarloaf Mountain (Coso), Q = Queen, QI = Queen Impostor; **bold** = XRF-sourced.

morphological overlap between Rose Spring and Elko. At CA-INY-30 (Basgall and McGuire 1988) three out of 25 Rose Spring points have a basal width over 10 mm and the smallest Elko had a basal width of 12 mm. Delacorte and McGuire (1993) recovered one Rose Spring point with a basal width of 11.7 mm and their smallest Elko has a basal width of 10.6 mm. This overlapping is likely not a reflection of misclassification.

A burial excavated at the Rose Spring Site in Rose Valley, 45 miles south of Manzanar, had both Elko and Rose Spring points (Lanning 1963). The overlap may reflect the existence of a transitional style — new technology such as the bow and arrow may be adopted slowly or perhaps parts of a familiar tool kit would be retained, for some time, for whatever reason. Just how long the transition lasted is impossible to determine without additional data. In any event, the co-occurrence of these two distinct time markers in a single context indicate caution should be exercised in ascribing time periods based on a single projectile point.

MANZ 1993 A-19

(CA–INY–4879/H)

This site, a historical artifact scatter associated with the town of Manzanar (Bevis Place, see Chapter 11), includes a dispersed scatter of prehistoric artifacts. Sheet wash has eroded portions of the site and a powerline and dirt road bisect the site. The site area was likely bulldozed during construction of the relocation center, since the area was originally used as a

firebreak (A6). It was later used for two baseball fields (see Chapter 9). Given time constraints and its sparse and disturbed nature, subsurface testing at this site was not considered warranted at this time.

Prehistoric artifacts noted in a 50 m north-south by 30 m east-west area (1,175 square meters) in the eastern portion of the site include an obsidian projectile point fragment and 10 obsidian flakes. The point fragment may be a tang from an Elko series projectile point (Figure 13.39). Visually it appears to be of Fish Springs obsidian. Submitted for hydration analysis, it has a rim value of 4.9 microns. Using the hydration rate in Delacorte and McGuire (1993), this suggests a date of ca. A.D. 370, well within the time range postulated for Elko series points. However, its presence at the site may be the result of scavenging and reuse, as evident at other sites within the National Historic Site, rather than any substantial Elko-age occupation.

Isolates

In addition to the recorded sites, isolated flakes, flaked and ground stone tools, and sherds were found throughout the National Historic Site during survey. These "isolated finds" were recorded and plotted as they were encountered. They include three projectile points, three bifacial tools, two manos, two mano fragments, three Owens Valley Brown Ware Sherds, two cores, and 55 pieces of debitage. Isolate locations are depicted in Figure 13.1. Representative or diagnostic specimens were collected.

Metrical attributes for collected flaked stone artifacts are given in Table 13.29. Two of the three collected projectile points are illustrated in Figure 13.39. A Desert Side-notched point visually identified as Fish Springs obsidian was submitted for hydration analysis. It has a rim value of 2.5 microns. Using the rate in Delacorte and McGuire (1993), this suggests a date of ca. A.D. 1420 for this specimen.

The two complete manos were collected. One, from Block 8 of the relocation center, is an oval-shaped vesicular basalt mano with unifacial use wear. It measures 9.3 cm by 6.9 cm by 3.1 cm and weighs 149 g. The other complete mano was found within the relocation center perimeter 75 m east of Block 13. It is a bifacially used oval-shaped micaceous schist mano, measuring 12.7 cm by 9.9 cm by 2.8 cm and weighing 540 g.


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Chapter 14

Native American Indian Sites Outside Manzanar National Historic Site

Jeffery F. Burton and Lynne M. D'Ascenzo

During the course of fieldwork at Manzanar 15 Native American Indian sites were discovered and recorded (Figure 14.1). The ten sites recorded outside the authorized National Historic Site boundary are discussed here. Eight have historical town-era components as described in Chapter 12. All are on land owned by the City of Los Angeles and managed by the Department of Water and Power (LADWP). No subsurface testing was conducted at any of these sites. Archeological work consisted of detailed surface inspection to delimit site boundaries and identify artifact concentrations, midden areas, and other features. As encountered, functionally or temporally diagnostic artifacts were collected. Each of these sites is summarized below.

Detailed site records are on file at the California Historic Resources Information System's (CHRIS) Eastern Information Center (University of California, Riverside) and at the Western Archeological and Conservation Center (Tucson, Arizona). In addition to the recorded sites, scattered prehistoric artifacts (flakes, flaked and ground stone tools, and sherds) were observed and noted during the recording of outlying relocation center sites. Time constraints precluded detailed investigation of these "isolates;" brief descriptions are included below to facilitate future research.

The size of the ten Native American Indian sites recorded outside the National Historic Site ranges from 117,750 square meters (29 acres) at MANZ 1993 B-6 to 750 square meters (1/4-acre) at MANZ 1995 A-3, with a mean of 26,080 square meters (6½ acres). For the most part these sites have not been affected by the considerable ground disturbance evident at sites within the National Historic Site.

Features are present at two of the sites recorded outside the National Historic Site. These include a midden deposit and a rock-lined pit at MANZ 1993 B-2 and a bedrock milling feature at MANZ 1994 A-1. In general, the surface artifact density at the sites recorded outside the National Historic Site is comparable to that at sites within the National Historic Site.

Somewhat surprisingly, temporally diagnostic artifacts were relatively scarce at the sites outside the National Historic Site. Owens Valley Brown Ware sherds, noted at all but two of the sites, indicate occupation after A.D. 1300. Other temporally diagnostic artifacts found during survey outside the National Historic Site include a glass bead (post ca. 1850) at MANZ 1993 B-1, a Desert Side-notched projectile point (post A.D. 1300) at MANZ 1993 B-2, and two isolated Rose Spring Corner-notched projectile points (A.D. 600-1300).

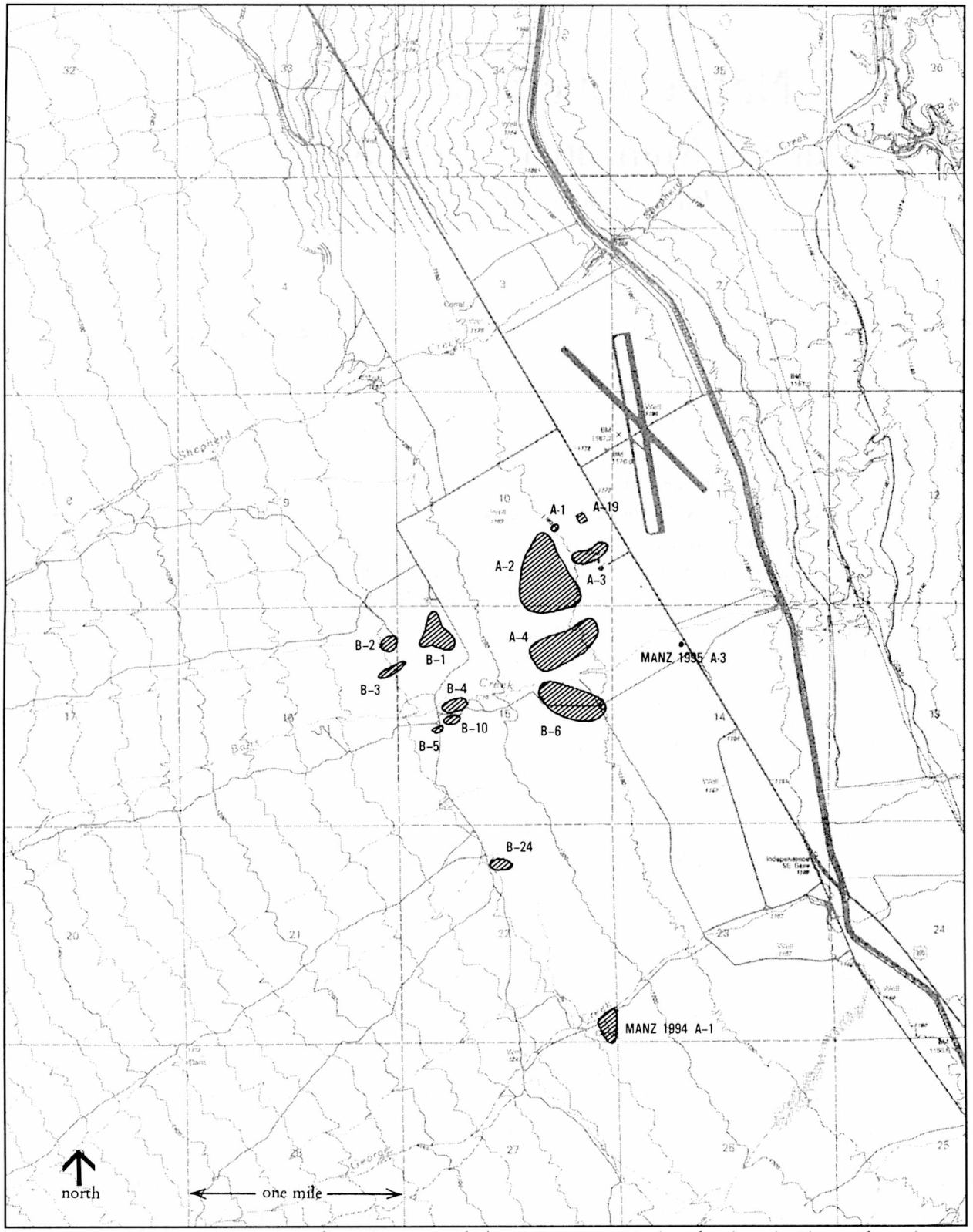


Figure 14.1. Native American Indian sites recorded at Manzanar National Historic Site and environs. Site numbers are prefixed by project designation; those with only a one-letter prefix were recorded in 1993 (adapted from 1982 USGS 7.5 minute maps Bee Springs Canyon, Independence, Manzanar, and Union Wash, California).

It appears that the Native American Indian sites recorded outside the National Historic Site date to the same general time span as the well-dated sites within the National Historic Site. As discussed in Chapter 13, occupation at those sites dates to between A.D. 1000 and the historical period.

MANZ 1993 B-1
(CA–INY–4898/H)

This multi-component prehistoric and historical site covers a 9½-acre area (38,200 square meters) on the rocky bajada slope just west of the National Historic Site. The site includes prehistoric and historical period artifact scatters and historical features. No prehistoric features were noted. Prehistoric artifacts are most conspicuous in four discrete areas (Loci A-D) that are separated from each other by shallow drainages (Figure 14.2).

Portions of the site have been impacted by the construction of a road, pipeline, and berm associated with the relocation center. Other impacts at the site include some minor rodent disturbance and erosion. The depth of the cultural deposit at this site is unknown.

Beyond historical material clustered around two likely town-era features (see Chapter 12), the relationship of the historical and prehistoric materials at the site is equivocal. However, it does appears that at least one locus of the site (Locus D) may represent historical Native American Indian use. Historical artifacts there include a glass bead of a type commonly found at historical Paiute village sites.

Locus A is the largest locus at the site measuring 140 m north-south by 60 m east-west (6,600 square meters). It consists of a dispersed scatter of prehistoric artifacts including 50 Owens Valley Brown Ware sherds, 30 obsidian, basalt, and chert flakes, a granitic mano, a schist metate fragment, and 15 pieces of abalone shell.

Locus B measures 75 m north-south by 25 m east-west (1,470 square meters). It consists of a scatter of prehistoric and historical artifacts on a low ridge north of Locus A. The artifacts are clustered in two groups. One cluster is at the eastern end of the ridge and has ten basalt and obsidian flakes, six Owens Valley Brown Ware sherds, a sandstone mano fragment, and a chert scraper. The second cluster 30 meters west includes two sherds, a mano fragment, three cans, a hinged metal lid, several fragments of brown glass, and three white shell fragments.

Locus C is a 25-m north-south by 20-m east-west (390 square meters) scatter of prehistoric artifacts north of Locus B. Observed at this locus were 15 large pieces of chert and obsidian debitage, most with use wear, a porcelain button (1840-ca. 1910, see Appendix E), a round flat metal object with embossed dots, and a piece of unidentified thin white shell.

Locus D is a scatter of prehistoric and historical artifacts in a 50-m north-south by 35-m east-west area southeast of Locus A. Artifacts observed include ten sherds, five obsidian flakes, a slate tool with a worked/utilized edge (Figure 14.3a), two schist metate fragments, a blue hexagonal glass bead, a "Levi-Strauss" pants grommet, two square-cut nails, two shovel blades, a heavy metal rod, 20 fragments of amber, brown, olive, and clear glass, and two fragments of white shell. One of the shovel blades has a rectangular cut taken out of one edge (Figure 14.4).

MANZ 1993 B-2
(CA–INY–4899/H)

This multi-component historical and prehistoric site is on the rocky bajada slope southwest of the relocation center cemetery. It covers an area 130 m north-south by 180 m east-west (18,369 square meters). The Native American Indian component at the site consists of two artifact concentrations (Loci A and B), one of which includes a midden deposit and a possible roasting pit (Figure 14.5). The town-

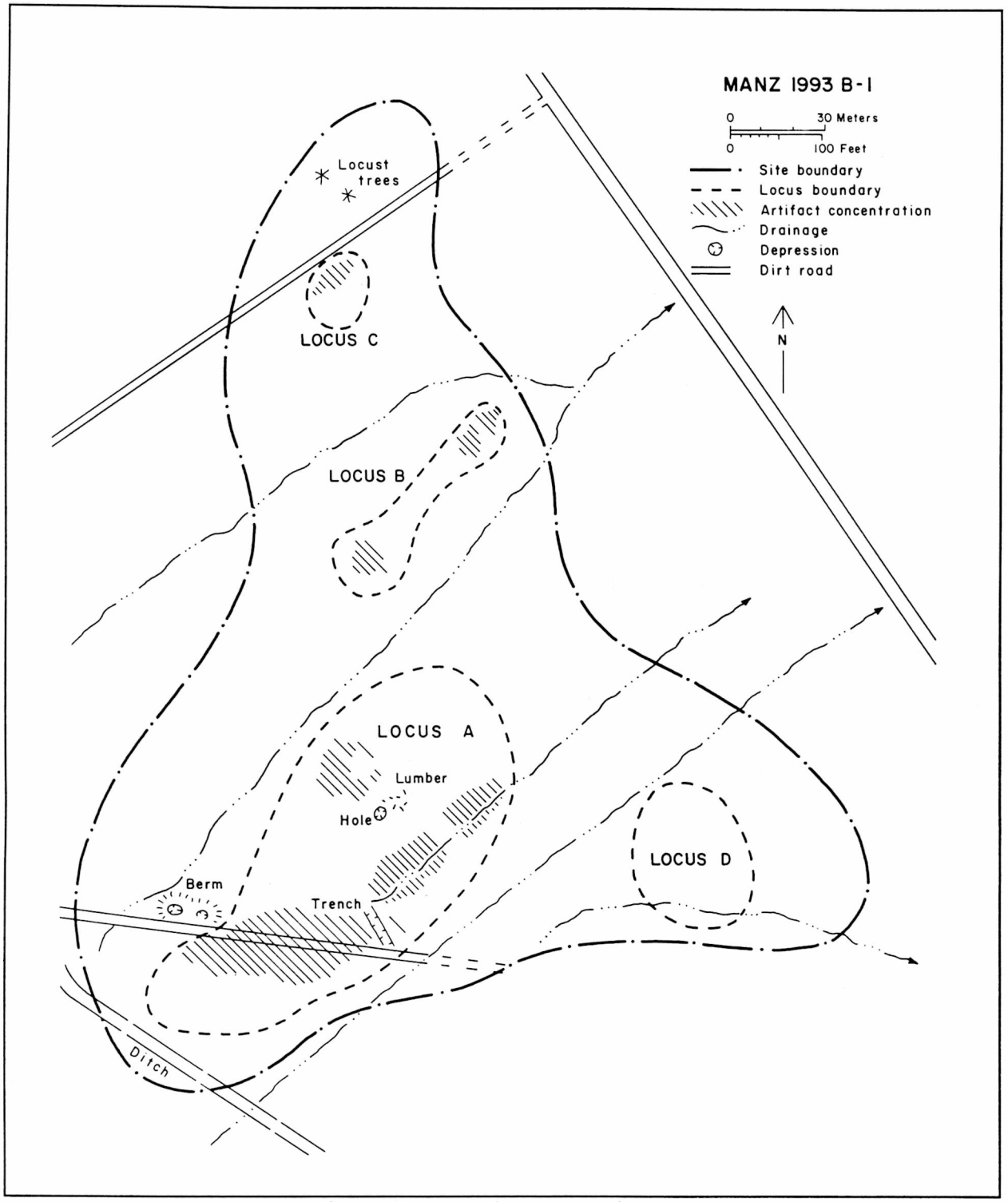


Figure 14.2. MANZ 1993 B-1 site map.

era component includes a trash dump in a wash along a road (Locus C) and two enigmatic rock alignments (Features 1 and 2, see Chapter 12). Noted impacts at the site include some rodent disturbance, minor erosion, and disturbances associated with use of the relocation center.

Locus A measures 100 m north-south by 70 m east-west (5,500 square meters). It consists of a scatter of prehistoric artifacts centered on a low

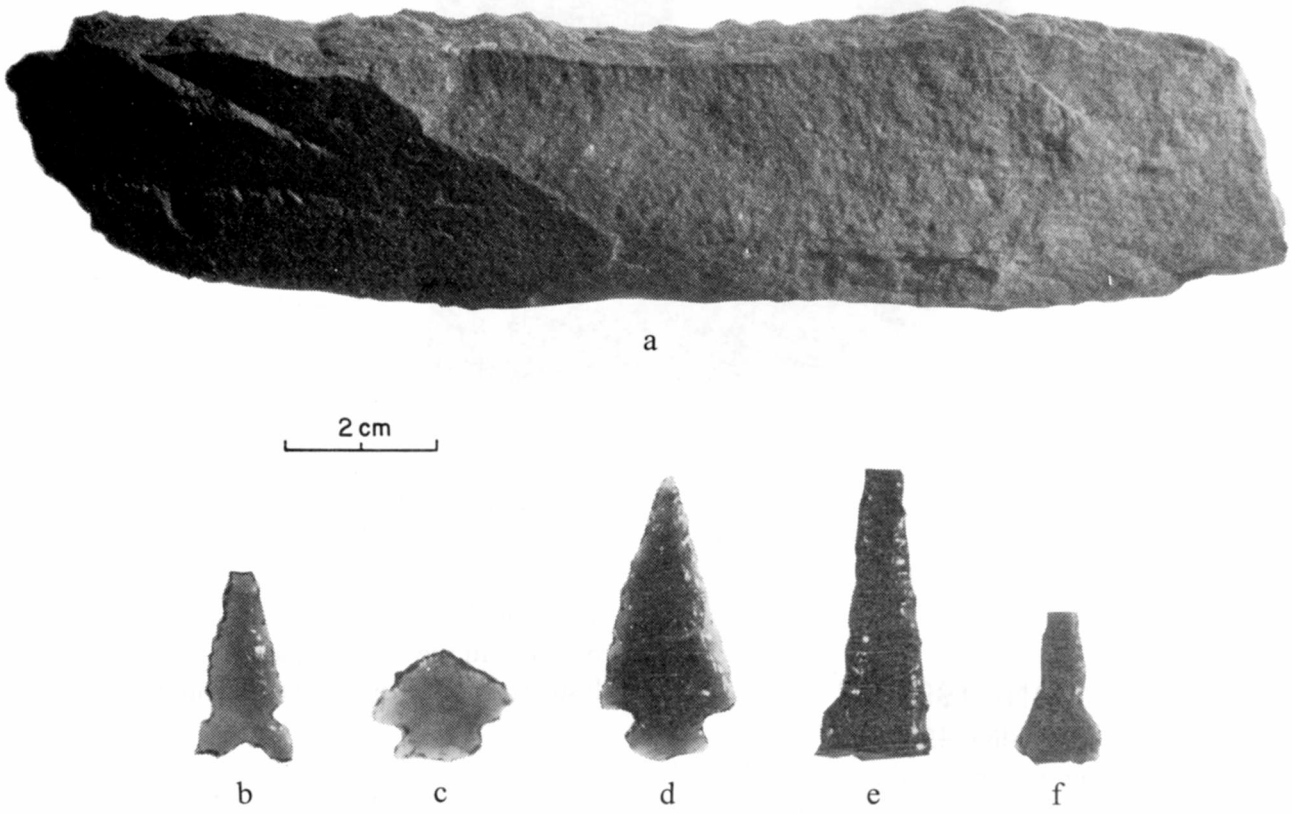


Figure 14.3. Flaked stone artifacts found outside Manzanar National Historic Site; a. worked slate tool (MANZ 1993 B-1, Locus D), b. Desert Side-notched point (MANZ 1993 B-2, Locus B), c. Rose Spring point (isolate within MANZ 1993 A-31, d. Rose Spring point (isolate within MANZ 1993 B-8), e. bifacial tool fragment (isolate within MANZ 1993 B-7), f. drill (isolate within MANZ 1993 B-15).

hill bordered on the north by a shallow wash. There is a small area of dark soil (midden) on the southwest-facing side of the hill (Feature 4) and a 2.5-m-diameter hole (Feature 3) on the north-facing slope of the hill. The hole, possibly the remains of a roasting pit, has rocks around the edges and lining the interior. Surface artifact density in the midden area averages ten items per square meter. Artifacts observed include obsidian, chert, and basalt flakes and two animal bone fragments. Scattered flakes continue to the west of the midden for about 30 meters.

Aside from the midden area, artifacts within Locus A are concentrated on the west side of the hill and along the north side of the wash north of the hill. About 20 meters south of the midden area there is a cluster of groundstone fragments that includes four schist metate fragments, two basalt mano fragments, and a granitic mano fragment.

Locus B is 100 m southeast of the midden area of Locus A. It is a 40-m-diameter artifact scatter composed of approximately 15 Owens Valley Brown Ware sherds, 20 chert and obsidian flakes, and an obsidian Desert Side-notched projectile point (Figure 14.3b; Table 14.1). Artifacts in this

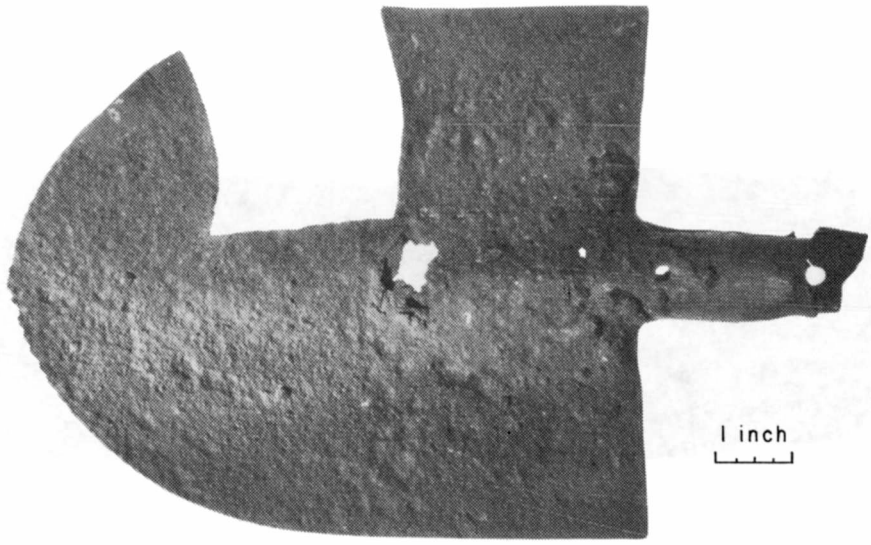


Figure 14.4. Cut shovel blade found at MANZ 1993 B-1, Locus D.

locus are concentrated in disturbed areas along a road and near some concrete slabs associated with the relocation center.

MANZ 1993 B-3
(CA–INY–4900/H)

This multi-component prehistoric and historical site is 75 m south of MANZ 1993 B-2 on the rocky bajada slope southwest of the relocation center cemetery. The site covers an area 80 m north-south by 250 m east-west (15,700 square meters). It includes a sparse scatter of prehistoric artifacts along the edges of a wash, a concentration of prehistoric artifacts in a flat area on the south side of the wash at the west end of the site, and an area of historical artifacts at the east end of the site (see Chapter 12). Impacts noted at the site include some rodent disturbance and erosion and minor disturbances associated with the Relocation Center landfill located near the east end of the site.

Prehistoric artifacts observed at the site include 30 Owens Valley Brown Ware sherds, 20 obsidian, basalt, and chert flakes, and two schist ground stone fragments. Several fragments of thin white shell were noted within the concentration of prehistoric materials at the west end of the site. The depth of the cultural deposit is unknown and no prehistoric features were apparent. There is a small rock alignment of four boulders in the wash, apparently associated with historical use of the site (see Chapter 12).

MANZ 1993 B-4
(CA–INY–4901/H)

This multi-component prehistoric and historical site is located southwest of the National Historic Site on the south side of Bairs Creek. The Relocation Center Chicken Ranch is located to the east of the site. The site, covering an area 75 m north-south by 150 m east-west (8,840 square meters), consists of a sparse scatter of prehistoric artifacts and two concentrations of historical artifacts. The historical component of this site is described in Chapter 12. Sheet wash and erosion have obviously moved artifacts and altered the site surface. A ditch near the site and a capped well indicate that historical and recent activities have likely disturbed the site as well.

Prehistoric artifacts observed include ten Owens Valley Brown Ware sherds, 15 obsidian and basalt flakes, a basalt core, two granitic mano fragments, and a large granitic metate fragment.

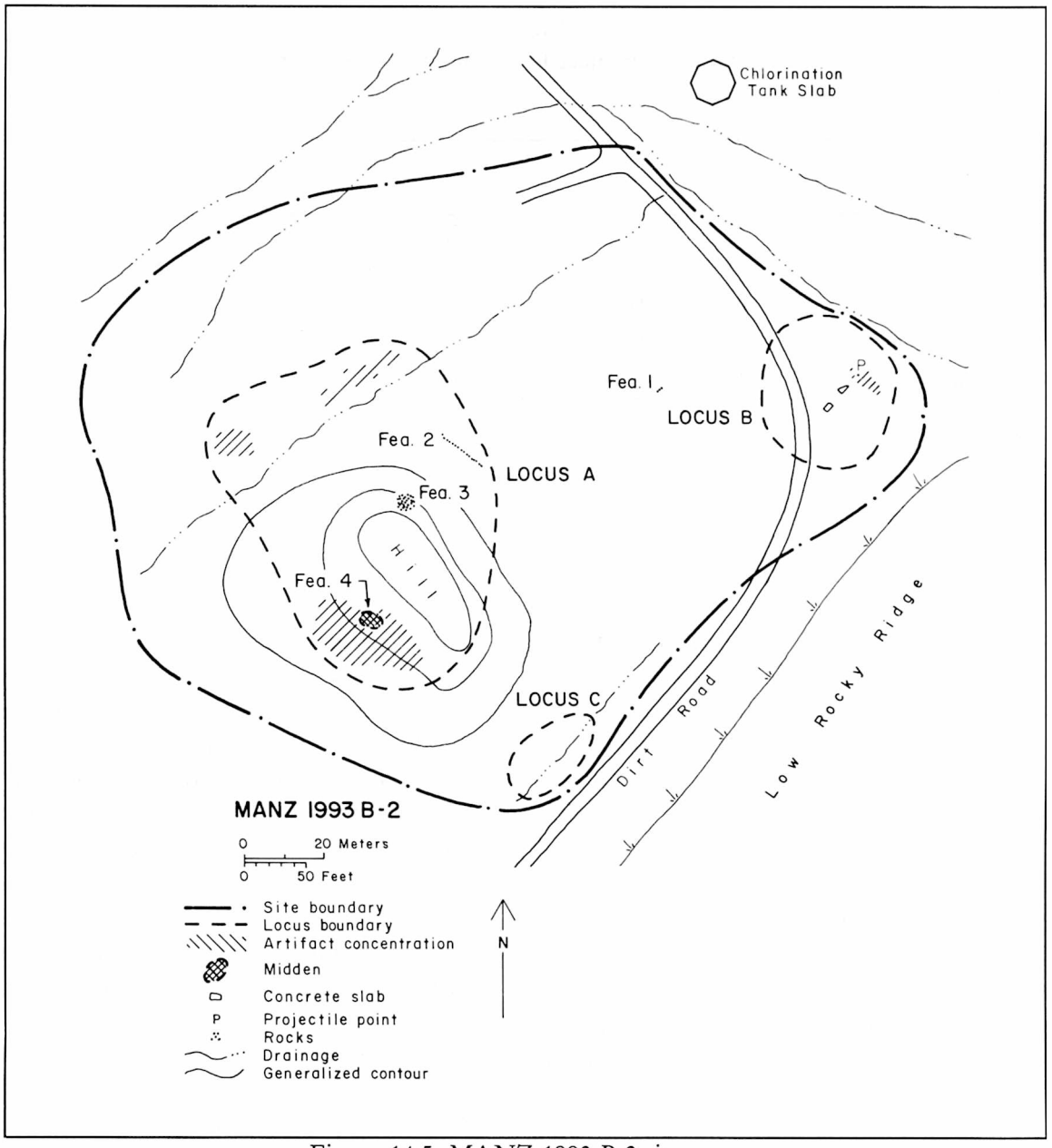


Figure 14.5. MANZ 1993 B-2 site map.

Several tiny fragments of thin white shell appear to be associated with the prehistoric scatter. No prehistoric features were seen and the depth of the cultural deposit is not known.

MANZ 1993 B-5

(CA–INY–4902/H)

This multi-component prehistoric and historical site is on the south side of Bairs Creek southwest of MANZ 1993 B-4. Located southwest of the National Historic Site, the site, covering an area 50 m north-south by 80 m east-west (3,140 square meters), straddles a small wash. Prehistoric artifacts are on the south side of the wash in a 15 m north-south by 10 m east-west area and historical artifacts are on the north side of the wash. The historical component of this site is described in Chapter 12.

Prehistoric artifacts noted at the site include three Owens Valley Brown Ware sherds, five obsidian and basalt flakes, a basalt core, and a large schist metate fragment. No features were

Table 14.1.
Metrical and Provenience Data for Projectile Points and Bifaces Collected Outside Manzanar National Historic Site.

		Size (mm)†					
Description	Provenience	L	W	T	W(g)	Source**	Cat. No.
DSN* (General subtype)	MANZ 1993 B-2	25	13	3	0.8	Q	B 785
Rose Spring	MANZ 1993 B-8	37	18	5	2.4	**SM**	B 793
Rose Spring (reworked)	MANZ 1993 A-31	15	19	4	1.0	QI	B 1052
Drill, nearly complete	MANZ 1993 B-15	20	12	3	0.7	FS/Coso	B 800
Biface, distal fragment	MANZ 1993 B-19	(38)	15	5	2.6	CD	A 201

* Desert Side-notched.
† incomplete measurements in parenthesis.
** FS = Fish Springs, CD = Casa Diablo, Coso = Coso Hills, SM = Sugarloaf Mountain (Coso), Q = Queen, QI = Queen Impostor; bold = XRF-sourced.

apparent and the depth of the cultural deposit could not be discerned. The prehistoric component of the site may have been much larger than apparent from surface evidence. There are obvious signs of recent erosion at the site; a metate fragment is halfway down the wash bank.

MANZ 1993 B-6
(CA-INY-4903)

This site is an extensive scatter of prehistoric artifacts on the south side of Bairs Creek. The site covers an area 500 m north-south by 300 m east-west (117,750 square meters) just south of the National Historic Site. The site has been impacted by erosion and disturbance from historical farming, but most of the site is located on the only section of land south of Bairs Creek within the survey area where there has been no apparent cultivation. Intrusive features within the site boundary include dirt roads, two asphalt strips (possibly paved road segments), and two pipelines.

The main area of prehistoric artifacts at the site is northeast of the Relocation Center Chicken Ranch along a drainage channel that parallels a dirt road. Surface artifact density in this area ranges up to 20 items per square meter. The concentration covers approximately 7,500 square meters, decreasing significantly in density as it extends into disturbed areas such as the wash floodplain to the south and abandoned agricultural fields to the east. Artifacts observed at the site include five Owens Valley Brown Ware sherds, over 300 pieces of chert, basalt, and obsidian debitage, a projectile point fragment, a large basalt core, several obsidian biface fragments, a hammerstone, and 15 mano and metate fragments of vesicular basalt, schist and granite.

There are occasional artifacts and clusters of artifacts in disturbed areas east of the site. These artifacts appear to have been displaced by farming and erosion (see Isolates, below). Prehistoric occupation in this area extended well beyond the site boundaries and there may be buried cultural deposits both at the site and in the surrounding area.

MANZ 1993 B-10
(CA-INY-4907/H)

This multi-component prehistoric and historical site is located on the south side of Bairs Creek southwest of the National Historic Site. Site MANZ 1993 B-4 is located to the north and MANZ 1993 B-5 is located to the south-

west. The site is heavily eroded and disturbed; a ditch associated with the relocation center crosses the northern portion of the site (MANZ 1993 B-31, see Chapter 10).

MANZ 1993 B-10 covers an area 120 m north-south by 160 m east-west (15,080 square meters). The Native American Indian component at the site consists of a dispersed scatter of prehistoric artifacts within an area of widely scattered historical trash associated with the town of Manzanar or early ranching (see Chapter 12).

Noted prehistoric artifacts include five Owens Valley Brown Ware sherds, a few chert and obsidian flakes, a sandstone mano fragment, a schist metate fragment, and a granitic metate fragment. Non-artifactual constituents at the site possibly associated with the prehistoric component include a few fragments of cut bone and shell. The depth of the cultural deposit is unknown and no prehistoric features were apparent.

MANZ 1993 B-24

(CA–INY–4916/H)

This multi-component prehistoric and historical site is located one mile south of the National Historic Site. The site consists of a historical well and associated structures and artifacts (see Chapter 12) and a sparse scatter of prehistoric artifacts in an area 100 m north-south by 150 m east-west (12,750 square meters). Impacts at the site, other than that from historical activities associated with use of the well, appear limited to some minor erosion. Prehistoric artifacts noted at the site include 15 obsidian flakes, five Owens Valley Brown Ware sherds, and a granitic mano. Most were found in the northern and western portions of the site where few historical remains are present. The depth of the cultural deposit is unknown and no prehistoric features were apparent.

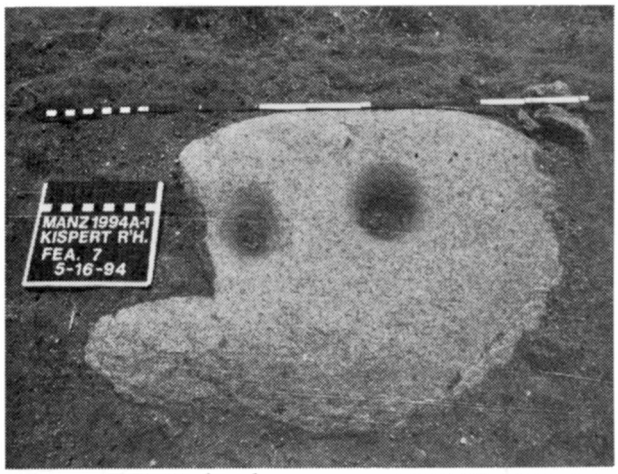


Figure 14.6. Bedrock mortar at MANZ 1994 A-1 (Hay/Kispert Ranch).

MANZ 1994 A-1

(CA–INY–4925/H)

Site MANZ 1994 A-1 is the historical Kispert Ranch on George Creek 1¾ miles southwest of the National Historic Site. Historical features recorded in the 7½-acre site area include several foundations, a corral, a small trash dump, and scattered historical artifacts (see Chapter 12). Within the historical site is a bedrock milling feature and a small concentration of prehistoric artifacts.

The bedrock milling feature consists of two mortars and a slick on a large low boulder (Figure 14.6). The mortars, roughly 20 cm in diameter, measure 7 cm and 12 cm deep. The milling slick is 20 cm by 26 cm in size. The boulder is within a clearing, likely an old road, that parallels a fenceline and rock wall. Impacts to the site include sheet wash, gully erosion, cattle grazing, and historical use of the area.

Prehistoric artifacts, concentrated in a roughly 35-m-diameter area centered around the bedrock milling feature (see Figure 12.25), include obsidian and basalt flakes and freshwater shell. Surface artifact density averages 5 items per square meter. The likelihood of a subsurface deposit appears to be good. Partially buried boulders and meadow grasses indicate considerable soil buildup, and artifacts were present in rodent back-dirt.

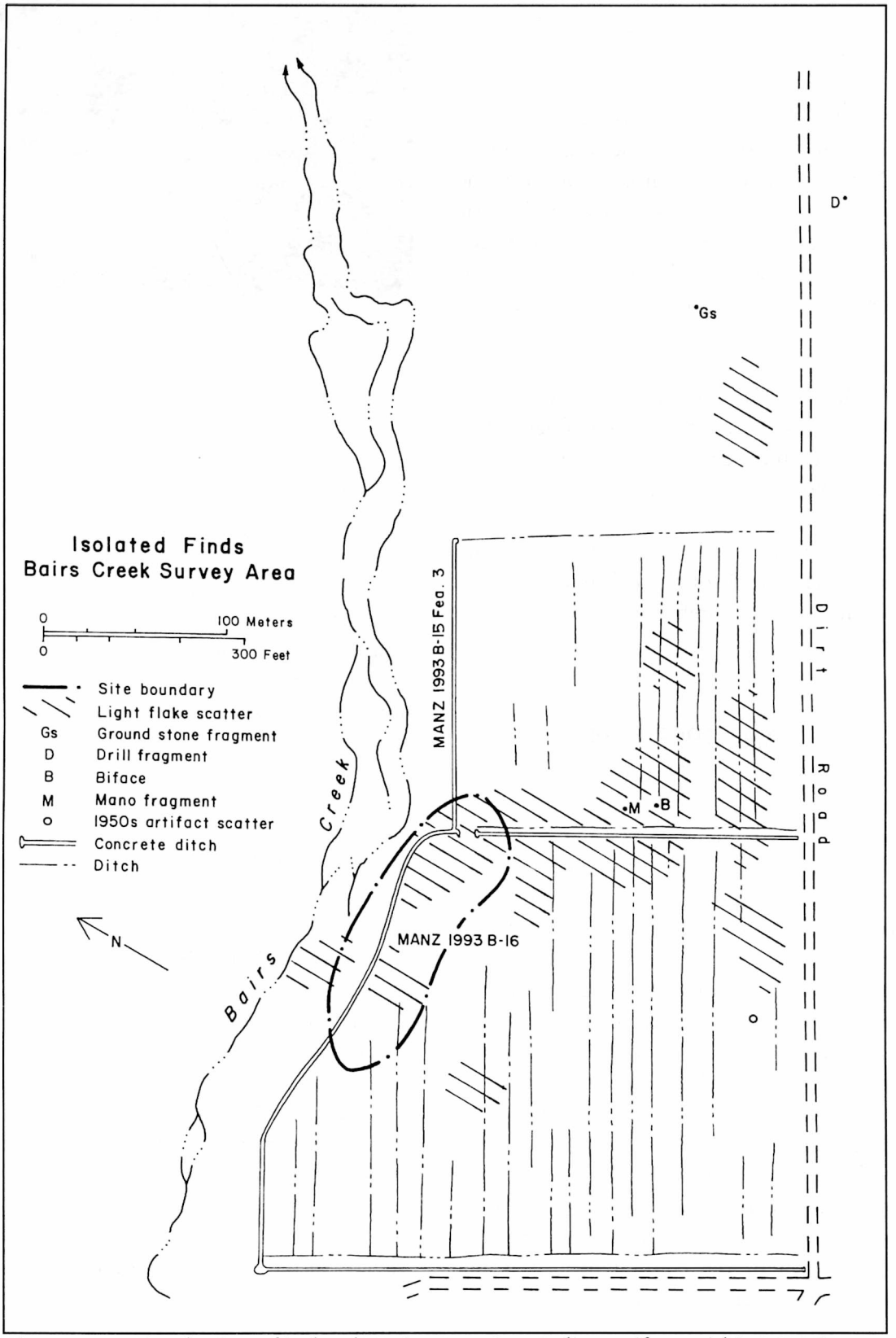


Figure 14.7. Distribution of isolated Native American Indian artifacts within MANZ 1993 B-15 and MANZ 1993 B-16 (Relocation Center South Fields).

Although it is likely that Paiute worked and lived at the Kispert Ranch (patented in 1876), the lack of Owens Valley Brown Ware, glass beads, or other artifacts commonly associated with historical Paiute camps suggests a prehistoric occupation.

MANZ 1995 A–3
(CA–INY–4860)

This site is a sparse scatter of flaked stone artifacts located between the Relocation Center Military Police Compound (MANZ 1993 A-32, see Chapter 10) and U.S. Highway 395. It was originally recorded by Archaeological Research Services (ARS) in 1993.

The site covers an area 30 m north-south by 25 m east-west (750 square meters). Artifacts observed include two obsidian biface fragments, a retouched obsidian flake, an obsidian core fragment, eight obsidian flakes, and three chert flakes. The artifacts may indicate a buried site; the immediate area has been disturbed by a variety of historical and modern activities.

A Humboldt biface noted by ARS would indicate use of the site sometime between 1200 B.C. and A.D. 1300. However, on reinspection the artifact appears to be a non-diagnostic biface tip.

Isolates

In addition to the recorded prehistoric sites, scattered prehistoric artifacts were noted during the recording of outlying relocation center and other historical sites. Time constraints precluded detailed investigation of the source of these "isolates;" brief descriptions of these remains are included below in order to facilitate future research.

MANZ 1993 A-31

Prehistoric artifacts noted during recording of the 5-acre Relocation Center Chicken Ranch include an obsidian Rose Spring Corner-notched projectile point (Figure 14.3c, see Table 14.1), three obsidian flakes, an Owens Valley Brown Ware sherd, and a mano fragment.

MANZ 1993 A-36

Three obsidian flakes were observed north of Bairs Creek while recording this 4-acre historical trash scatter just west of U.S. Highway 395.

MANZ 1993 B-7

Two obsidian flakes were noted at the east end of this 5-acre dump associated with the town of Manzanar.

MANZ 1993 B-8

An obsidian Rose Spring Corner-notched projectile point (Figure 14.3d, see Table 14.1) and a few widely scattered obsidian flakes were seen while recording the 18-acre Relocation Center Landfill.

MANZ 1993 B-15

This site, which comprises the historical features of the Relocation Center south fields in the area south of Bairs Creek, includes isolated Owens Valley Brown Ware sherds, obsidian, basalt, and chert flakes, an obsidian biface fragment, an obsidian drill (see Table 14.1), a mano fragment, and two groundstone fragments. This material may be a continuation of prehistoric site MANZ 1993 B-6 which is located just to the west. However, no meaningful artifact concentrations could be defined (Figure 14.7). Nearly all of this area has been disturbed by past agricultural activities associated with the relocation center and town of Manzanar.

MANZ 1993 B-16

Ten obsidian, basalt, and chert flakes were observed while recording the 2½-acre Paget Farm.

MANZ 1993 B-17

Prehistoric artifacts noted while recording features associated with the Relocation Center Far South Fields include three Owens Valley Brown Ware sherds, 12 basalt and obsidian flakes, and a granitic mano. Two of the flakes are in the vicinity of Well No. 95 (Feature 7). The remaining artifacts are on the north side of George Creek along a ditch (Feature 2) and near a series of holding ponds (Feature 3).

MANZ 1993 B-19

Prehistoric artifacts noted during recording of the 6-acre Relocation Center Hog Farm include a vesicular basalt mano, a vesicular basalt groundstone fragment, an obsidian biface midsection (Figure 14.3e, see Table 14.1), and ten chert and obsidian flakes.

MANZ 1993 B-22

Prehistoric artifacts noted at the 8-acre Lacey Farm include three basalt flakes on the south edge of a wash and two basalt flakes near an adobe and stone building (Feature 1).

Chapter 15

Conclusions and Recommendations



The National Park Service's 1993-1995 field work at Manzanar National Historic Site included survey of over 1,200 acres, site recording, detailed mapping, subsurface testing, and photography. The primary goal was to identify the archeological remains within and around the National Historic Site. The work was designed to estimate the horizontal and vertical extent of archeological resources, their structure and integrity, their age, and whether they contain data that could address identified research questions.

The entire 550-acre authorized National Historic Site was intensively surveyed, as were 430 acres adjacent to the western and southern boundaries. An additional 270 noncontiguous acres were surveyed while relocating and recording known relocation center facilities in the surrounding area. Eighty-four archeological sites were discovered and recorded. Twenty-five of these sites are related to the relocation center, 62 have components associated with the town of Manzanar and earlier ranches, and 15 have Native American Indian components. Sixteen areas or features within the National Historic Site and six features outside were mapped in detail. Controlled surface collection and tabulation were confined to historical components within the National Historic Site.

Twenty-six 1 m by 1 m test units were excavated. Subsurface testing of the Relocation Center component was limited to two units excavated at a small dump (site MANZ 1993 A-37) west of the relocation center hospital location, and one unit each at two small trash scatters located just north of Block 35 (Features P-18 and P-19).

To assess the data potential of the town-era component, subsurface testing was conducted at the Gilmer Farm (MANZ 1993 A-6) in the northwest portion of the National Historic Site, at two artifact scatters at the Owens Valley Improvement Company Headquarters/John Shepherd Ranch (MANZ 1993 A-13) in the north central portion of the National Historic Site, at two small trash deposits in "downtown" Manzanar (MANZ 1993 A-16) on the eastern edge of the National Historic Site, and at the former location of the Campbell/Ed Shepherd House (MANZ 1993 A-28) in the central portion of the National Historic Site.

Four of the five Native American Indian sites within the National Historic Site were also tested. Due to extensive historical disturbance, testing at the fifth site (MANZ 1993 A-19) was not considered crucial at this time.

Relocation Center Sites

The Manzanar Relocation Center encompassed some 6,500 acres. The authorized 550-acre National Historic Site includes only the central portion of the relocation center, that is, the residential and administration areas, once surrounded by barbed wire, and an adjacent cemetery. Most of the features and artifacts dating to the use of the relocation center within this area were recorded as a single site (MANZ 1993 A-30). However, the cemetery and a dump with a post-relocation center component were recorded as separate sites (MANZ 1993 A-33 and MANZ 1993 A-37).

Over 800 archeological features were recorded within the central portion of the relocation center. These include three standing buildings, concrete and rock walls, various types of foundations, basement depressions, roads, parking areas, sidewalks, concrete steps and stoops, manholes, sewer and water lines, rock alignments, ponds and gardens, orchards and other historical vegetation, ditches, victory gardens, athletic fields, and charcoal, rubble, and artifact concentrations.

By far the most prevalent artifact types present within the central portion of the relocation center are window and bottle glass fragments and wire nails. However, a tremendous variety of other artifacts dating to the relocation center use was encountered. These range from ceramics and food remains to personal items such as cosmetics, buttons, coins, and toys. Whole artifacts within the relocation center consisted mostly of small items, such as utensils, perfume bottles, marbles, jacks, "Go" pieces, and other easily lost items.

Outside the authorized National Historic Site boundaries were other relocation center facilities, including the military police compound, a chicken ranch, a hog farm, the agricultural and domestic water systems, a sewage treatment plant, trash disposal areas, and recreation facilities. These, and a World War II-era airport located just east of the relocation center, were recorded as 22 separate sites. At 12 of these sites concrete features are inscribed with names, dates, Japanese characters, and graffiti. In all over 700 World War II-era inscriptions were recorded.

Fourteen structures in the towns of Independence and Lone Pine, noted in the files of the Eastern California Museum as moved from the relocation center, were visited and photographed. Also relocated in Independence were the decorative concrete gate posts originally at the relocation center entrance. Inscriptions carved into the clapboard siding of the Lone Pine train station reportedly by some of the Japanese Americans who worked there were also examined and photographed.

Surface Collection/Tabulation

Four evacuee residential blocks and the staff housing area were subjected to intensive surface collection and tabulation. As a densely populated town, the relocation center had regular trash pickup. Two kinds of artifacts, therefore, would be most likely in the residential and administrative areas: small items lost during occupation, and trash or architectural debris left at abandonment. A third type of artifact representing contraband stashed or cached away might also be present, but might not be observable in a surface survey.

The four evacuee blocks examined were Blocks 12, 13, 14, and 21. In Block 12, where duff and leaf litter covered most of the ground, only 625 items (mostly associated with food and beverage storage) were tabulated. Blocks 13 and 14 contained about three times as many artifacts, but these higher numbers might reflect the proximity of the auditorium, used after the relocation center was closed. Block 13, where 1,751 items were tabulated, contained lots of nails, window glass, food and beverage storage artifacts, plus a variety of other items. Numerous automotive parts and related artifacts (e.g. oil cans) and tool parts were also observed, likely related to the recent use of the adjacent

auditorium for vehicle maintenance by Inyo County. Groups of liquor bottles with late 1940s dates are contemporaneous with the auditorium's use as a social hall by the VFW. Block 14, with 1,900 items tabulated, contained items similar to those in Block 13, but without liquor bottles or automobile and tool parts.

Block 21, with 1,484 items tabulated, is probably more representative of a block without later use, or obscuring formation processes. As at the other blocks tabulated, the surface assemblage was dominated by structural materials (window glass, nails, and other items) and fragments of glass beverage and food storage containers. Noted artifacts associated with food preparation and serving included a coffee pot lid, a salt shaker top, and government-issued and "Made in Japan" ceramics. Food remains were limited to abalone shell fragments and peach pits. Other items included furnishings, pharmaceutical items, personal artifacts, a "Go" piece, and toys.

The staff housing area is about 25 percent larger than an evacuee residence block and housed less than a third as many people. Nevertheless, artifact density was over twice that in the evacuee blocks, with over 5,000 items tabulated. These were mostly structural (nails and window glass), domestic (food and beverage storage, numerous bottle caps, beef bones), pharmaceutical, and automobile-related. The higher amounts and diversity of artifacts in the Staff area may be partly explained by the administrative personnel's easier access to goods, higher pay, and use of vehicles. In addition, portions of the staff housing area were re-used for a veteran's housing project for a few years, and some of the artifacts may date to that period.

Subsurface Testing

The four relocation center features tested proved to be from a variety of contexts. Two were small trash concentrations between Block 35 and the relocation center perimeter fence. In both trash areas, artifacts were found to about 30 cm depth. But in one (Feature P-17), the abundance of window glass and other structural remains suggests the burning of building debris and left-behind trash at abandonment, rather than day-to-day trash. In contrast, the other trash area (Feature P-18) appears indicative of domestic trash disposal near the end of occupation, when trash pickup may have been curtailed. The excavation unit in this trash area yielded jackrabbit bone, the only evidence of the use of indigenous animals in a relocation center context.

The other two areas tested were within site MANZ 1993 A-37, a trash scatter north and west of the relocation center hospital location. One unit was excavated in what appeared to be a surface artifact scatter west of the hospital. Over 2,600 historical artifacts, including numerous intact bottles, were recovered to 75 cm depth. The apparent surface scatter, then, was a portion of a landfill likely exposed by bottle collectors. Well over 75 percent of the artifacts are directly medical or dental related (e.g. prescription bottles, test tubes, microscope slides, syringes, teeth). The others are also consistent with hospital trash, for example, office supplies, food remains, and "Go" gaming pieces. WRA records indicate there was an incinerator in this area, but the landfill is not mentioned. The condition of the recovered artifacts indicates that much of the hospital trash was not incinerated.

The other portion of MANZ 1993 A-37 tested was originally thought to be unusual for a relocation center trash deposit because it contained a large number of metal artifacts (during the war, metal was recycled). The trash deposit encountered turned out to be 40 cm thick and densely packed with trash that dates to the late 1940s. A much wider variety of items than that noted at relocation center trash deposits was encountered. The area apparently served as a dump for the veteran's housing project located in the staff housing area. Below the trash deposit, extending to 145 cm depth, was a filled pit or gully containing a few pieces of structural materials; the depression was probably filled

when the relocation center was built or torn down.

Research Questions

The present study has determined that most facilities associated with the relocation center are intact (from an archeological standpoint), and that there is a wide range of artifacts and features which could, in more intensive studies, address the research questions outlined in Chapter 8 and other potential research topics.

Confinement

The primary archeological manifestations of confinement at Manzanar are the remains of watchtowers and fences. Five of eight watchtower foundations are still in place. The other three, along the northern boundary, have been pulled from the ground and dumped along a graded road. But the displaced foundations are as informative as the in-place examples, since their thickness is easier to see: the size (depth) shows each would have supported a substantial tower.

Although the evacuees were required to run and maintain many of the relocation center facilities, they were not, of course, involved in constructing the more obvious symbols and tools of their confinement. An inscription near one of the watchtower foundations that includes the name of the local contractor who built the towers provides some insight into the local attitude towards the relocation center. It includes the term "Jap Camp," a derogatory misnomer.

A three-strand fence had been hastily constructed when the relocation center was first developed. WRA records indicate this first fence was replaced by a 5-ft high, five-strand fence; remnants of this more substantial fence remain at the site today. Several of the relocation center fencing's 4-inch by 4-inch and 4-inch by 6-inch lumber posts form part of the current range fencing on the west, north, and possibly east sides of the National Historic Site, although the top and bottom barbed wire strands have been removed. Isolated posts also still stand along the southern boundary. The effectiveness of this perimeter fence can be seen in the artifact distribution: Manzanar lacked small trash scatters outside the central area of the relocation center. Such trash scatters were abundant at the unfenced Gila River Relocation Center in Arizona (Sawyer-Lang 1989; Tamir et al. 1993).

More subtle measures of confinement can be found in ways the evacuee area differs from the administrative and staff housing areas. There is much more substantial construction in the administration area, including individual water heater slabs, more garbage can racks (16 of 35 at the center), massive patio walls for privacy, and designated parking areas. There also appears to be much more trash debris in the administration and staff housing areas, although accurate comparison will require separating out possible later, post-relocation center materials.

The presence of vegetation and abundant rocks collected from outside the fenced central portion of the relocation center, as well as two picnic areas south of the fenced area, indicate that the confinement was not absolute, or that confinement became less stringent through time. Carved names in the siding of the Lone Pine train station and Japanese inscriptions in concrete features show that even outside the center the evacuees were not under constant watch.

The relocation center confinement meant not only loss of freedom, but also loss of property. Although most of the evacuees' possessions were disposed of before they arrived at Manzanar, vehicles of the first, voluntary evacuees were confiscated. Automobile parts are scattered outside the fenced area between the military police compound and administration areas, suggesting that was where the vehicles were temporarily stored and stripped of usable parts.

Ethnicity

Even though the Japanese Americans were imprisoned because of their ethnic background, they did not hide their Japanese heritage: ceramics include numerous rice bowls, tea cups, and other "made in Japan" objects. Fragments of saki bottles and "Go" gaming pieces were also found, and faint traces of Japanese baths were noted at a few latrine slabs.

Evacuee-constructed features, such as landscaping, gardens, ponds, and irrigation systems, also reflect the Japanese heritage. The Judo house has much landscaping and elaborate walkways, perhaps indicating the importance placed on this aspect of traditional Japanese culture. The cemetery monument has prominent Japanese inscriptions. Even the evacuee-constructed buildings at the relocation center entrance have an unmistakable Japanese influence.

Japanese writing in concrete features within the central portion of the relocation center is rare, but more common at outlying features. Possibly it was harder to circumvent the ban on Japanese writing under the closer scrutiny of camp confines.

Evacuees also constructed facilities that could be considered typically "American:" in the archeological record at Manzanar there are features associated with sports (remains of baseball, basketball, and tennis courts were recorded) and toys such as marbles and jacks. Perhaps the young, who were more likely to participate in these activities, were more "Americanized." On the other hand, pieces from the traditional Japanese game of "Go" mostly came from the hospital landfill and blocks near the hospital reserved for persons needing medical care. This population would likely include a good proportion of elderly persons, who might spend their leisure time in more traditional Japanese recreational activities.

Resistance

The examples of ethnicity noted above may be the most obvious archeological evidence of resistance. Less subtle manifestations of resistance could include sabotage, deliberate waste, or pro-Japanese graffiti.

As mentioned above, there is abundant Japanese writing outside the central area of the relocation center. Some of this graffiti is anti-US and pro-Japan; some, including some of the most inflammatory, was secret, hidden below water at the reservoir settling pond, within construction at the chicken ranch, or under concrete pipes, and not exposed until the relocation center was dismantled.

No evidence of waste or sabotage was encountered. In fact just the opposite appears to be the case, if the thoroughness of recycling is any indication. The relocation center landfill was largely devoid of metal, and even small metal objects such as bottle caps were rarely encountered during surface examination.

Overall, given that 10,000 people lived there, the amount of surface artifacts at the site is lower than might be expected. The only example of excess or waste found associated with the relocation center was perpetrated by the WRA at the center's close: the institutional dinnerware used at the center was purposefully broken and discarded in disposal pits to the west of the relocation center, to avoid unfairly flooding the market.

Daily Life

Artifacts and features at Manzanar indicate that it was not a "normal" American city, as Tamir et al. (1993) suggested for the Gila River Relocation Center. At Manzanar the effects of confinement and ethnicity are both apparent, as are the effects of war-related shortages. It appears that all aspects of day-to-day life were affected to some degree.

Apparently due to war-related recycling, there is a lack of metal at the landfill, and an abundance and variety of glass containers. Laundry facilities had grease traps which served not only to reduce clogging but also allowed waste fats from laundry detergents to be recycled for the war effort. There were also substantial remains of victory gardens, including ditches, sluice gates, and garden plots.

Abundant fragments of rice bowls and other personal dinnerware in the landfill and scattered throughout the residential area suggest there was some persistence of individualism or family life even in the forced communal setting. No hot plates were found, in contrast to the Gila River Relocation Center (Jensen 1993:115), but the rice bowls and other personal dinnerware may have been used for non-cooked foods, or evacuees may have been able to use their heating stoves for cooking more frequently at Manzanar than in the Arizona desert.

Manzanar was set up to be as self-sufficient as possible, but there is evidence of much government-supplied food and other items at the relocation center landfill. More detailed studies at the landfill might augment the archival records to determine whether the proportion of imported goods changed after farms were established or when the potential work force was reduced prior to closing.

Perfume and cold cream jars were relatively common at Manzanar, in spite of toiletries like these not being supplied through the government quartermaster; these items could have been procured through the Manzanar Coop, by shopping in nearby towns, or by mail order (both J.C. Penny and Sears Roebuck opened outlets in Lone Pine when the relocation center was in operation).

The elaborate landscaping at Manzanar, including ponds and ornamental gardens, may reflect the specific professions or backgrounds of many of the evacuees. For example, there are several features with particularly fine concrete work, stained and textured to resemble wood, that appear to have been done by an experienced cement mason. Ray Kobota, a professional landscaper, helped design several gardens and inscribed his name into two features he constructed.

Other factors may have affected the built environment at Manzanar, too. For example, the Manzanar evacuees may have felt a sense of relative permanence that encouraged their efforts to beautify their bleak surroundings with landscaping. In other areas of California, evacuees were first confined in Assembly Centers for three to six months, then transferred to relocation centers. Since Manzanar was an assembly center and then a relocation center, many of its residents spent their entire confinement at one location.

Differences in the elaborateness of gardens within Manzanar might reflect the degree of residential block cohesiveness. For example, Block 9, occupied almost exclusively by people from Terminal Island, had a spectacular garden complex outside its mess hall. The block residents, mostly families of deep sea fisherman, had worked and lived together in a small close-knit community prior to evacuation. Oral history and archival research in conjunction with the archeological record could provide more insight about these questions.

To this day some individuals charge that the evacuees were "coddled" with expensive cuts of meat, or excessive goods. But considering there were up to 10,000 people living within one square mile, an enormous amount of supplies would be necessary just for basic subsistence. A few "luxury" items (such as abalone) would not mean general extravagance.

While a detailed study of the relocation center landfill could provide more conclusive data, meat bones from relocation center contexts were almost exclusively from chickens and pigs, both

of which were raised at the center.

In addition, the pre- and post-relocation center occupations at Manzanar provide a baseline for comparison. The relocation center assemblage (derived from 10,000 people) is much less diverse than the earlier townsite assemblage, which arose from only 200 or so people. What little diversity there is in relocation center contexts is more apparent than real. For example, government-supplied ceramics found are from 12 different manufacturers, but all made virtually the same wares. Eight different styles of condiment bottles found were all for ketchup.

Only a rather limited selection of toys was found. These included ubiquitous marbles, a few jacks and toy car wheels, and a couple of small metal whistles. One of the most intriguing toys found within the relocation center residential area is a metal cowboy-style six-shooter.

Relocation center contexts include relatively high proportions of "Purex" and "Clorox" bottles, suggesting the disinfecting necessary in close group living, and perhaps the increasing use of liquid disinfectants after 1928 (Clorox 1996).

Evacuee blocks are virtually devoid of automobile parts, other than those associated with later re-occupation. Townsite contexts in surrounding areas invariably contained automobile parts.

Alcoholic beverages were prohibited in the relocation center, and liquor containers appear to be rare in the center landfill. A few bottles and bottle fragments were found, including saki from Japan and Hawaii, "Old Quaker" whiskey, other whiskey, and scotch, in the residential blocks, firebreaks, and perimeter. The bottles were most likely smuggled in, and empties disposed of surreptitiously.

Soft drinks were apparently the recreational drink of choice at Manzanar. Sixteen different types were found, including Antelope, Barq's, Bubble-Up, Canadian Club, Canada Dry Ginger Ale, Coca Cola, LaVita, Mission, Mission Dry, Nehi, Pepsi-cola, Sparkletts, Squirt, Seven-Up, Wilson Club, and Wilshire Jr. Antelope, Coca Cola, and Seven-Up were the most common brands; some of the others, such as Pepsi-cola, were represented by only a single fragment.

Most of the soft drinks were obtained from Southern California bottlers. Coca Cola was almost exclusively from Bishop, however, one bottle had a Safford, Arizona, basemark and another had a Tacoma, Washington, basemark. While these "return-for-deposit" bottles could have easily been added to the local suppliers inventory though a variety of processes, it is conceivable that they arrived with the evacuees. The bottle from Tacoma may have been brought by the Bainbridge Islanders. The bottle from Safford is more problematic, however at least one person at the relocation center was apparently from southern Arizona: "Tucson 1944" is inscribed in evacuee-constructed retaining walls along lower George Creek.

Town of Manzanar Sites

Sixty-two of the 82 archeological sites recorded at Manzanar have components associated with the former town of Manzanar or earlier ranches. Twenty-four of these are within the authorized 550-acre National Historic Site and 38 are outside.

Sites within the National Historic Site include 17 residential or commercial sites, six of these with building remains. Downtown Manzanar (MANZ 1993 A-16) includes the Manzanar Store basement, debris from the Manzanar garage and service station, and foundation remnants of the community hall. At the Gilmer Farm (MANZ 1993 A-6), a basement and well box were recorded. Foundation slabs were noted at the Campbell/Ed Shepherd House site (MANZ 1993 A-28), and foundations were found at both the Christopher House and Wilder House sites (MANZ 1993 A-

8 and MANZ 1993 A-9). At the Owens Valley Improvement Company Headquarters/John Shepherd Ranch (MANZ 1993 A-13) post supports possibly from a building foundation were recorded.

At the other 11 residential sites minor features, artifact scatters, or artifact concentrations were recorded at or near known building locations. Eight additional locations of Manzanar townsite buildings within the National Historic Site could be derived from historical records. However, no features or artifacts that could be dated to the town era were observed at these locations.

Non-residential sites recorded within the boundaries of the National Historic Site include two irrigation pipelines (MANZ 1993 A-5 and A-29), a well (MANZ 1993 A-12), and four trash deposits (MANZ 1993 A-7, A-14, A-21, and A-27). Other town-era resources noted within the National Historical Site but not given separate archeological site designations include road traces, orchards and other vegetation, and a concrete pipeline recently exposed by flooding.

Temporally diagnostic artifacts and archival information indicate that at least four of the sites recorded within the National Historic Site predate the founding of the town of Manzanar. These include the Shepherd Ranch, the Ed Shepherd House, the Gilmer Farm, and portions of the trash dump designated MANZ 1993 A-7.

The 38 recorded pre-relocation center historical sites located outside of the boundaries of the National Historic Site include 10 residential sites, 17 sites associated with irrigation, agriculture, or transportation, and 11 trash deposits. Six of the residential sites located south of the National Historic Site were established before the town of Manzanar was founded. These include the Abernathy Ranch (MANZ 1993 B-20), the Albers Ranch (MANZ 1993 B-22 and B-24), the Glade Farm (MANZ 1993 B-23), the Hay/Kispert Ranch (MANZ 1994 A-1), and the Lacey Farm (MANZ 1993 B-22). All of these residences continued to be used into the town era, but some of the recorded dumps appear to contain only pre-1900 trash. Early irrigation features are primarily unlined ditches.

Dating to the town period are residences of Krieger (MANZ 1993 B-33), Lennington (MANZ 1995 A-2), Metzger/Correll (MANZ 1993 B-35), and Paget (MANZ 1993 B-16). Extensive dumps dating to the town period are located on the periphery of the townsite. Irrigation features from the town are mostly concrete pipelines. The most recent town era feature recorded is the concrete-lined ditch built by LADWP to water orchards after Los Angeles had acquired all the town property.

Much more of the former town of Manzanar likely remains in areas not surveyed, to the north and east of the National Historic Site.

Surface Collection/Tabulation

At each of three town-era trash dumps within the National Historic Site, artifacts in three contiguous 2 m by 2 m units were inventoried and representative samples collected. All three locations appeared to be primarily surface scatters. At Locus F of MANZ 1993 A-7, 637 items (53 per square meter) were tabulated; at MANZ 1993 A-15 376 artifacts were tabulated at Locus A (around 30 per square meter) and 404 artifacts were tabulated at Locus B (about 34 per square meter).

All three trash dumps appear to date to the same time period, from the early 1900s to the early 1930s, with most datable artifacts falling between 1915 and 1930. Most of the tabulated materials are domestic trash. The few structural remains present (<2%) were mostly limited to window glass fragments. Most of the artifacts are related to food storage (up to 92%). Food remains comprised 39% of the assemblage at MANZ 1993 A-7, but most of these are small fragments that may have deteriorated from one or two specimens. Food remains at MANZ 1993 A-15 (n=4)

were limited to small unidentifiable animal bone fragments and egg shell. There were also a few food serving, beverage, and miscellaneous personal artifacts at each site and a few automobile-related artifacts at MANZ 1993 A-15.

Subsurface Testing

Subsurface testing was completed at a representative sample of town and pre-town features within the National Historic Site. Tested sites included the Shepherd Ranch, the Gilmer Farm, downtown Manzanar, and the Campbell/Ed Shepherd House.

One of the first historical ranches in the area was the Shepherd Ranch, established in the 1860s. At the ranch site, there are a few features (troughs and posts), but no definitive building remains. Two of several trash concentrations at the site were tested, each with one 1 m by 1 m excavation unit.

Within one of the tested concentrations (Locus A) most artifacts were recovered from the upper 20 cm. However, faunal remains continued to be recovered up to 60 cm depth. The 299 historical artifacts included only a few structural remains; most were related to food storage (68%) or beverage storage (8%). Recovered faunal remains included horse, pig, and sheep or goat. Artifacts date to the early twentieth century, likely between ca. 1900 and 1920.

The other trash concentration tested at the Shepherd Ranch (Locus B) appears to be somewhat older. In all, 663 historical artifacts were recovered from the deposit, which extends only 15 cm deep. Again food and beverage storage items formed the bulk of the materials encountered, but numerous food remains (including pig, cow, sheep or goat, cottontail, jackrabbit, and chicken bones, and a walnut shell) and food serving artifacts were also recovered. Ceramics and other items suggest a ca. 1890 to 1900 date for the deposit, which includes a variety of personal artifacts and fragments of a chamber pot. Although structure locations were not found at the Shepherd Ranch site, the discrete trash loci appear to represent distinct time periods, indicating good potential for chronological control at the site.

The Campbell/Ed Shepherd House was built around 1900. Features at the site include a sparse artifact scatter, a small can dump, and a series of interconnected concrete slabs. In contrast to the diverse and dense trash deposits encountered at the Shepherd Ranch site, a 1 m by 1 m unit excavated to a depth of 40 cm recovered only 65 artifacts, most apparently dating to relocation center use.

The Gilmer Farm was likely established prior to 1900. During survey substantial structural remains and several trash concentrations were recorded. One excavation unit placed in a non-feature area at the site recovered only a few artifacts (two nails, a wire, and a glass marble) to 30 cm depth. The second excavation unit at the site, placed within a trash concentration (Feature 3), was more productive. In all, 150 historical artifacts were recovered from this excavation unit, virtually all from the upper 45 cm. Structural artifacts composed about a quarter of the materials recovered, food storage another quarter, and food remains (including peach pits, egg shell, and cow, pig, and cottontail bones) almost a third. The only intact personal artifact was a small perfume bottle. Artifacts recovered suggest a post 1900 date for the tested deposit.

Two 1 m by 1 m excavation units were excavated at the site of downtown Manzanar. Both units were placed within concentrations of surface artifacts, one near the former store location (Locus D) and one near a former residence (Locus B). Both appear to be domestic trash dumps: they contain a wide variety of artifacts, most in the upper 20 or 30 cm, and many are burned or melted. Four hundred sixty-five artifacts were recovered from the Locus B test unit and 513 artifacts were recovered from

the Locus D test unit. Artifacts from Locus B suggest a 1910s or 1920s date; those from Locus D are slightly later, with bottles and ceramics dating to the 1930s.

Recovered food remains from these units included peach, apricot, and plum pits, squash seeds, corn cob fragments, and cow, pig, chicken, sheep, and quail bone. Both loci had fragments of toy plates, saucers, and teapots. Locus D, closer to the store, had more beverage remains (7% of the assemblage). There were hardly any beverage containers at Locus B.

Research Questions

Both the early ranching and town periods are well represented in the archeological record at Manzanar, with many sites and features located. More importantly, it is notable that many of the town-era trash deposits encountered, even those within the central portion of the relocation center, appear substantially intact with fairly dense, diverse, and well-preserved deposits. The limited scope of the present work limits interpretations, but with further work all of the sites appear likely to yield data that could address a number of specific research questions.

Frontier Urbanism

The limited archeological data derived from the present study suggest the transition from large ranches to small farms at Manzanar was accompanied by changes in the degrees of economic self-sufficiency and dependency. Some of these differences may be temporal, as various manufactured goods became more available, and some may be due to differences in the types of occupation and economic strategies.

Information from town era sites relating to food indicate a primary reliance on purchased foods. At town-era sites canned goods included milk, meat, pork by-products, beef from Argentina, sardines from Norway, oysters, lard, "Crisco," "Calumet" baking powder, "Ortega Chilies," "Schillings" and other spices, "Hershey's Cocoa," "Walter Baker Breakfast Cocoa," and "Log Cabin" syrup. Many sanitary seal cans held either canned fruit or vegetables. Glass containers include condiment and extract bottles and jars embossed with "Best Foods," "Blue Ribbon," "Gebhardt Eagle Chili Powder," "Heinz," and "Hinds." Other food items found include peach, apricot, and plum pits, walnut shells, squash, corn, and cow, pig, sheep, and chicken bone. Evidence of home canning of garden produce, reflected by fragments of mason jars, canning jar liners, and canning jar lid bands, was found at nearly every town-era site. Hunting is represented by cartridge shells and quail and cottontail bone.

Evidence of beverages consumed at town-era sites include milk (Independence Dairy and unidentified milk bottle fragments and a large metal milk container), soft drinks (crown caps and fragments of "Bubble-Up," "Coca Cola," "Hollywood Dry," "Nehi," and possibly "Antelope" and "Mission" soda bottles), coffee (cans and coffee pot parts), and Lipton's tea (cans). Beer, whiskey, and other liquor bottles were relatively rare, probably reflecting the fact that Prohibition was in effect from 1920 to 1933, much of the town's history.

Packaged goods were less common at pre-town era sites. Canned goods were limited to "Pioneer" and "Schillings" baking powder, meat, and milk. Glass included "Best Foods," "Lea and Perrins Worcestershire Sauce," "Durkee Salad Dressing," and flavoring extracts. Other food remains include cow, pig, sheep, and chicken bones and a walnut shell. Hunting is represented by cartridge shells and cottontail and jackrabbit bone. Even though the Shepherd Ranch was a cattle ranch, a wide variety of bones was found in the tested trash deposits. Evidence of beverages at pre-town sites include numerous liquor and beer bottles.

Food preparation and serving items were common at both town and pre-town sites. At town sites these included cooking pans, eating utensils, a cheese grater, drinking glass fragments, and ceramics from California and other U.S. companies, England, Germany, Japan, Austria, Czechoslovakia, and possibly France and other European countries. Food preparation and serving items at pre-town sites included cooking pans, an enameled metal cup, and ceramics from England, Czechoslovakia, and Germany. The ceramics follow patterns noted in other regions of the United States: pre-town sites have mostly English ceramics, early town sites have mostly ceramics from the eastern U.S. and later town sites (post 1920) have more local wares (in this case from California companies).

Furnishings noted at town sites include light fixtures, light bulbs, furniture parts, curtain rods, flower pot fragments, buckets, a pail, a broom handle, a wash tub, "Clorox" bottles, and "Old Dutch Cleanser" cans. Cut and pressed glass artifacts such as candy dishes are more common at sites near downtown Manzanar. Furnishings at pre-town sites were more limited in both quantity and diversity. These artifacts included chamber pot fragments, flower pot fragments, a vase fragment, a figurine fragment, a clothes hanger, and a bucket.

A wide range of structural remains was noted at town sites including lumber, wire nails, a few square-cut nails, nuts, bolts, screws, door knobs and hinges, sash weights, electrical porcelain, sink and toilet fragments, enameled metal stove parts, cast iron stove parts, and stove pipe. Structural remains noted at pre-town era sites were limited to stove pipe, cut and hand-wrought nails, a hand-wrought hinged hook, and a door hinge.

Pharmaceutical items at town era sites included cold cream jars, "Vaseline" jars, toothpaste tubes, and tooth powder jar. Pharmaceutical items at pre-town era sites included an "Alpers Chemical" Company jar, a "Cutex" bottle, an anti-dandruff shampoo bottle, and a "Scott's Emulsion Cod Liver Oil" bottle. Patent medicines, much more common in pre-town contexts, included "Dr. Kilmer's Swamp Root Kidney Liver and Bladder Cure," "California Fig Syrup," "H.H.H. Medicine," "Paine's Celery Compound," "Vegetable Pain Killer," and "Dr. A. Boschee's German Syrup."

Personal artifacts in both town and pre-town contexts included buttons and other clothing parts, shoe parts, and numerous other items. Cosmetics and perfume bottles were only found at town-era sites. Children's artifacts at town-era sites include a shoe sole, a broken mug, toy dishes, a toy teapot, a wagon handle, glass marbles, a toy wheel, and two harmonica parts (at least one is from Germany). Only two children's artifacts were found at pre-town era sites: a china doll's head and a ceramic marble.

A range of activities are represented at town sites: farm-related items include mule and horse shoes, a wire calf weaner, blade tips from an agricultural mower, and numerous pieces of wood fruit-packing boxes. Other tools likely related to farming found at town-era sites include an axe head, a shovel blade, a bar file, and a crow bar. Items associated with adult leisure activities include pocket tobacco cans and thick phonograph record fragments. Writing and related tasks are represented by Carter's and Sanford's ink bottles, pencil parts, push pins, staples, and thumb tacks. Other miscellaneous town-era items include dry cell batteries, barrel hoops, machine parts, fuel cans, a machine tag, three-in-one oil cans and jars, paint cans, and paint brushes.

The emerging car culture is well represented at the town era sites by abundant automobile parts, ranging from stripped car bodies to spark plugs, and numerous oil cans. The location of trash dumps, along roads at the edge of town, also reflects the ease of transportation with the advent of the car.

Activities at pre-town era sites are not well represented: noted were a horseshoe, some automobile parts including a California license plate fragment, a few pocket tobacco cans, a "Carter's Ink" bottle, possible chalkboard fragments, barrel hoops, miscellaneous hardware, and a few machine parts.

Neither the early ranchers nor the town residents were subsistence farmers: ranchers focused on cattle raising, and the town on fruit production. Still, there are more diverse activities represented at the town sites, and more manufactured goods.

Economics and Land Use

The sites could also provide data useful in studying economics and land use; for example, there appears to be sufficient material pre-dating 1900 to determine how the 1890s depression was manifest in ranch consumption and production.

The archeological data present could also help estimate how accurately the historical record reflects actual land use patterns, and provide insight into whether Manzanar was the garden spot many oral histories depict, or the run-down settlement described and pictured in LADWP records.

Archeological data suggest the truth likely lies somewhere between these two extremes. Varied structural remains and features indicate some houses were rather substantial and others were not. Although few luxury items, such as stemware and fine china, were encountered, the amounts and kinds of trash, including imported goods, automobiles, and canned foods, indicate the town inhabitants were able to purchase ample manufactured goods and were not just surviving.

Irrigation and Water Control

The trajectory of historical settlement in the Manzanar area illustrates the importance of water in the arid Owens Valley. First settlements were at water sources; settlements expanded outward from natural water sources, first using unlined ditches, then concrete pipes, as use became more intensive.

Another indication of the importance of water to early settlement can be seen in the distribution of non-native trees. The Shepherd Ranch site and most of the other early ranches, situated near water sources, still have large healthy trees, while trees at many of the later-established town farms are dead.

The more intensive irrigation development associated with the town included several innovations, such as a community-based water company, concrete pipelines, and the only inverted tile ditches in the Owens Valley.

The "fall" of the town of Manzanar did not begin with the most irrigation-dependent parcels: Wilder was the first to sell out to Los Angeles, but the Wilder orchard is doing the best today without artificial irrigation. Wilder's farm was apparently one of the more successful at Manzanar: it had one of the most modern houses in the town (concrete block with indoor plumbing). Further historical research may disclose Wilder's motivation in selling out to Los Angeles.

George Chaffey's vision of water being the key to Manzanar's development was most certainly true: all of the other towns he founded still exist and prosper, while the large-scale transfer of water to Los Angeles destroyed the rural society of the Manzanar townsite.

Native American Indian Sites

During the course of field work at Manzanar 15 Native American Indian sites, including five within the National Historic Site boundary, were discovered and recorded. Intact features, a diverse artifact assemblage, and abundant faunal remains indicate a substantial Native American

Indian occupation both within and adjacent to the National Historic Site. Temporally diagnostic artifacts, obsidian hydration analysis, and radiocarbon assays indicate occupation from 3500 B.C. to the historical period, with the most intensive occupation between A.D. 600 and 1300. Ethnographic information indicates there were historical Paiute villages at Shepherd and George creeks. The sites recorded at Manzanar may represent an additional village associated with Bairs Creek.

Subsurface Testing

Subsurface testing was conducted at four of the five Native American Indian sites within the National Historic Site. Two excavation units were completed at MANZ 1993 A-1, five at MANZ 1993 A-2, two at MANZ 1993 A-3, and six at MANZ 1993 A-4.

MANZ 1993 A-1, a sherd and lithic scatter covering approximately 1 acre, includes a small area of apparent midden. Noted at the site during survey were copious sherds, flakes, and ground stone fragments, a projectile point fragment, a biface fragment, a basalt core, shell, and burned animal bone. The two 1 m by 1 m units excavated within the midden area indicated a cultural deposit from 30 to 50 cm deep, with some material up to 100 cm deep. Two Desert Side-notched projectile points and two Cottonwood Triangular projectile points corroborate the Klondike period (A.D. 1300 to historical times) temporal ascription suggested by the abundant pottery observed on the surface.

Other artifacts recovered during testing at MANZ 1993 A-1 include bifacial tools, retouched pieces, debitage, sherds, shell fragments, animal bone, and one human bone. The deposit appears to have been extensively mixed, apparently by rodents; numerous peach pits were found throughout the deposit. The diversity of artifacts and the relatively abundant bone present suggests a small occupation site, intermittently occupied, with a diverse subsistence base.

MANZ 1993 A-2 is an artifact scatter covering over 45 acres in the central portion of the National Historic Site. Noted during survey were two areas of midden deposits, several projectile points, bifaces, hammerstones, manos, shell fragments, a few sherds, and thousands of obsidian, basalt, and chert flakes. The site has the highest surface density of lithics within the National Historic Site boundary.

The five 1 m by 1 m units excavated at MANZ 1993 A-2 indicate a cultural deposit extending up to 80 cm deep. The sole excavation unit placed outside of the identified midden areas was virtually sterile, except for a few flakes and charcoal bits from a roughly 5-cm-thick layer 55 cm deep.

An apparent house floor marked by a discontinuous layer of charcoal was encountered in one of the excavation units at a depth of 30 cm. Associated with this floor were two manos, several cores, two Rose Spring projectile points, two bifaces, and a scraper. Radiocarbon assays and obsidian hydration analysis indicate a ca. A.D. 850 date for the house floor.

Recovered from the test units and the surface at MANZ 1993 A-2 were one Desert Side-notched projectile point, one Cottonwood Triangular point, 11 Rose Spring Corner-notched points, two Elko point fragments, a Humboldt Concave Base biface, 43 bifacial tools, two scrapers, 187 utilized flakes, 13 cores, nearly 3,000 flakes, two hammerstones, 34 ground stone artifacts, seven sherds, three beads, 93 shell fragments, over 1,000 animal bone fragments, and fire-cracked rock. The few sherds recovered were from the surface or upper levels of the test units. The ground stone assemblage is dominated by formal shaped specimens.

The apparent house floor, midden, and diverse and abundant artifact assemblage at MANZ 1993

A-2 indicate an intensive occupation. The site appears to have been a base camp or village where a variety of subsistence and maintenance tasks took place. Sherds, identifiable projectile points styles (Desert and Rosegate series), and obsidian hydration analysis indicate use of the site between A.D. 600 and historical times, with the most intensive use between A.D. 600 and 1300. The Humboldt biface and Elko point fragments suggest an earlier component may be present as well.

MANZ 1993 A-3, a sparse artifact scatter covering 7 acres, contained a diverse, albeit sparse, subsurface deposit. Noted at the site during survey were obsidian and basalt flakes, a projectile point fragment, a Humboldt Concave Base biface, two manos, a core, and a sherd. One unit excavated within a possible midden area yielded a Desert Side-notched projectile point, a point fragment, a biface, five retouched flakes, a bone bead, a sherd, four bone fragments, and 36 flakes, all in the upper 35 cm. A second excavation unit, outside of the identified midden area, contained no prehistoric material. Sherds and the Desert Side-notched projectile point indicate a post-A.D. 1300 date for this site. The Humboldt biface may indicate an earlier component, as well.

MANZ 1993 A-4, , the densest artifact scatter tested, covers 20 acres in the southwest portion of the National Historic Site. Noted during survey were tens of thousands of obsidian, basalt, and chert flakes, numerous projectile points, other flaked stone tools, cores, and sherds, numerous metate fragments and manos, and several hexagonal blue glass beads. Identifiable projectile points collected from the surface included Desert and Rosegate series types.

Four discreet areas of midden, indicated by dark soil and high artifact densities, were identified at the site. These range in size from less than 500 square meters to nearly 8,000 square meters. Glass beads were recovered from the surface of all but one of the middens. A small scatter of mostly historical artifacts adjacent to one of the middens included six glass beads, two buttons, and an 1854 silver half dollar.

Six 1 m by 1 m units were excavated at MANZ 1993 A-4, all but one of the units placed within apparent midden deposits. These units indicated a cultural deposit from 80 cm to over 130 cm deep. The sole unit not in apparent midden deposits, downslope from the main site area, was virtually sterile to 60 cm: a ground stone fragment was encountered at 63 cm, a metate fragment at 82 cm, and a few other artifacts and bone were recovered to 130 cm deep.

A burial of a young adult Native American Indian male was encountered in one of the midden test units at a depth of 90 cm. Found with the burial were an Elko projectile point, a Rose Spring point, a point that could be classified as either an Elko or Rose Spring point, a chert biface, a basalt pipe bowl, and fragments of a steatite pipe stem. The human remains and associated artifacts were left in place and reburied.

Projectile points recovered during excavation at MANZ 1993 A-4 include three Cottonwood Triangular, one Cottonwood Leaf-shaped, three Rose Spring Corner-notched, and one Eastgate Expanding-stem points. Also recovered were numerous flaked-stone tools, fire-cracked rock, ground stone, faunal remains, sherds, and burned daub.

The midden, burial, and diverse and abundant artifact assemblage at MANZ 1993 A-4 indicates an intensive village occupation. Projectile point styles, ceramics, and the glass beads indicate use of the site from A.D. 600 into the historical period. The abundance and ubiquity of glass beads, the 1854 half dollar, and other historical artifacts noted on the surface suggest a historical Native American Indian component is present even though not encountered during the limited subsurface testing.

Research Questions

Subsurface testing at Manzanar National Historic Site revealed a substantial Native American Indian occupation. All of the tested sites contain abundant and varied artifact assemblages. For the most part historical disturbance appears limited to the upper 10 cm. This, along with the discovery of two intact features during testing, suggests that the potential for additional subsurface features is very high.

Data collected during survey and testing are most pertinent to questions of chronology and subsistence, but some inferences relating to the other research questions identified in Chapter 8 are also possible. Given the limited scope of the present work the interpretations that follow should, of course, be considered tentative.

Chronology

The temporal placement of the Manzanar sites is largely based on artifact cross-dating, obsidian hydration dating, and three radiocarbon assays.

Temporally diagnostic projectile points recovered during survey and testing at Manzanar include 17 Desert series points, 30 Rosegate series points, three Elko series points, and one Little Lake projectile point (Table 15.1). The wide range of projectile point types indicate use from 3500 B.C. to historical times. Heaviest use, at least for hunting-related activities as suggested by projectile point frequency, appears to have been during the Baker period (A.D. 600 to 1300). Earlier use was likely infrequent and minor: the Elko and Little Lake points were recovered from the surface, while later point types were recovered from midden contexts.

Other temporally diagnostic artifacts recovered at Manzanar include two Humboldt bifaces, an *Olivella* bushing bead, glass beads, and ceramics. The Humboldt bifaces, with a time span between 2500 B.C. and A.D. 1300, provide little additional chronological information.

Shell beads have been dated primarily in contexts outside east-central California. The one temporally diagnostic bead from Manzanar, an *Olivella* bushing bead, was recovered during testing at MANZ 1993 A-3. This bead type is considered to post date A.D. 1500; other chronometric data from MANZ 1993 A-3, which indicate the site dates to the Klondike period, does not controvert this ascription.

Owens Valley Brown Ware, a Klondike period time marker, was found on the surface of nearly every site during survey. Ceramics recovered during subsurface testing display a more restricted distribution, mainly from Klondike components. At MANZ 1993 A-1 ceramics were recovered from throughout the cultural deposit, at MANZ 1993 A-2 and A-3 only one sherd each was recovered, and at MANZ 1993 A-4 ceramics were generally restricted to the upper levels of the deposit.

Additional chronological data are provided by obsidian hydration analysis. Obsidian hydration dating is widely used in California and the Great Basin, partially due to the abundance of obsidian and the relative paucity of other dateable material. In all 110 source-specific obsidian hydration readings were obtained from the four tested sites. These included a sample of formal artifacts and debitage from each level of selected units of each site. All of the specimens submitted were either XRF- and visually-sourced as Fish Springs obsidian. Hydration rim values were converted to calendar dates using the Fish Springs obsidian rate formula in Delacorte and McGuire (1993), i.e. years B.P. = $120.23x^{1.62}$. Taken together, the obsidian hydration data from the four tested sites suggest use of the Manzanar area from about 3500 B.C. to historical times, with peak occupation around A.D. 1000. Assuming obsidian use and occupation are correlated, the hydration data suggest there was sporadic use of the Manzanar area during the

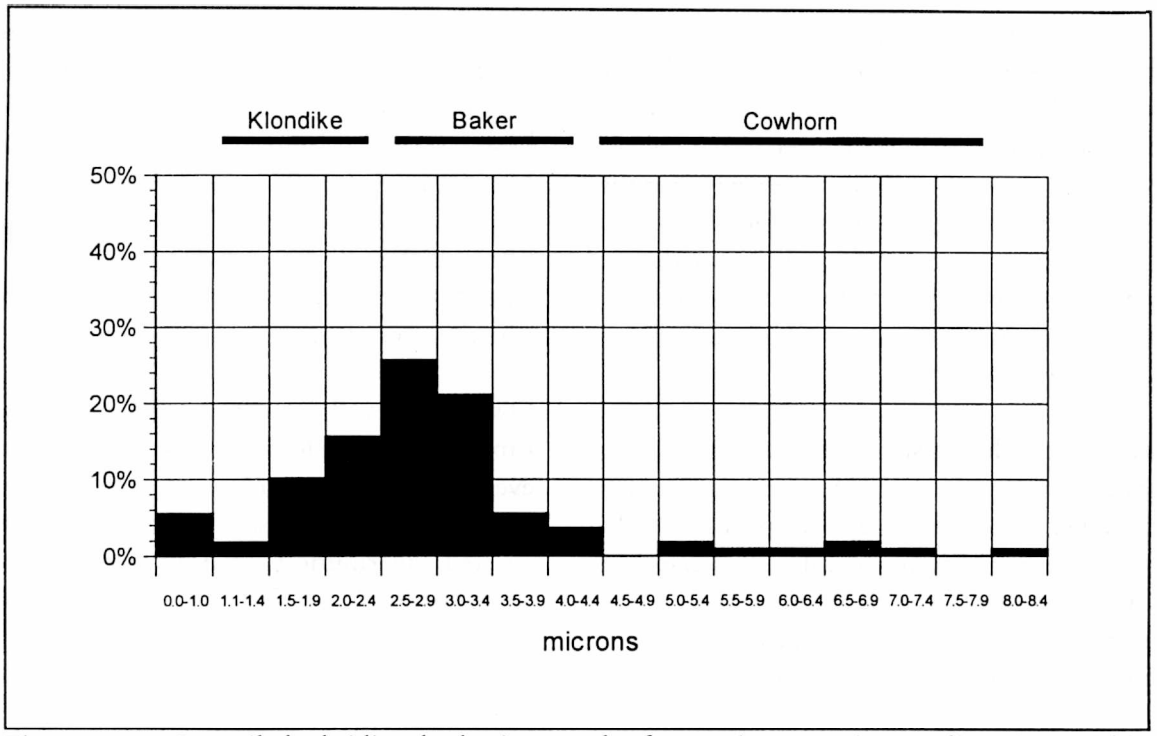


Figure 15.1. Compiled obsidian hydration results for Native American Indian sites within Manzanar National Historic Site.

Cowhorn and Clyde periods, increasing use during the Baker period, and declining use during the Klondike period (Figure 15.1).

In sum, the most intensive Native American Indian use of the Manzanar area occurred during the Baker and Klondike periods (from ca. A.D. 600 to historical times). Two of the tested sites, MANZ 1993 A-2 and A-4, date primarily to the Baker period. The other two tested sites, MANZ 1993 A-1 and A-3, date to the Klondike period. Use of the Manzanar area prior to A.D. 600 appears to have been sporadic. Historic Native American Indian use is indicated by glass beads collected from the surface of two sites, MANZ 1993 A-4 and B-1.

Subsistence Change

Direct evidence of subsistence activities was found at each of the four tested sites. If ethnographic analogy holds, all of the tested sites were occupied by family groups; both male- and female-related tasks are represented by the artifacts present. Manos and metates indicate the processing of plant foods, while the presence of

Table 15.1.
Temporally Diagnostic Artifacts Recovered During Survey and Testing at Manzanar National Historic Site.

	A-1	A-2	A-3	A-4	others	total
Desert Series	4	2	1	7	3	17
Rosegate Series	1	11	-	15	3	30
Elko Series	-	2	-	-	1	3
Little Lake Series	1	-	-	-	-	1
Humboldt Bifaces	-	1	-	1	-	2
Ceramics	many	rare	sparse	sparse	n/a	-
Beads	-	-	post A.D. 1500	post A.D. 1850	-	-

projectile points, bifaces, and other artifacts indicates hunting-related tasks. Extensive midden deposits suggest intensive, perhaps year-round, occupation.

The house floor and burial discovered during testing suggest this intensive occupation began in the early Baker period. During the subsequent Klondike period occupation may have waned; sites MANZ 1993 A-1 and A-3 are sparser and smaller. The flaked tool assemblage at all four tested sites is dominated by expedient flake tools.

Bone fragments from the four tested sites indicate jackrabbit, cottontail, fish, mussel, bighorn sheep, birds, small mammals, and possibly raccoon were important food sources. In contrast to the pattern noted at other sites in the region (e.g. Delacorte et al. 1995), at Manzanar mussel shell is equally abundant in Baker and Klondike components.

No floral remains were recovered, but the abundance of ground stone artifacts in both the Baker and Klondike components indicates a reliance on seed plants. However, the importance of seed processing at the Manzanar sites may have decreased though time: Baker period manos appear to be predominately formal oval-shaped specimens, while later Klondike period manos are mostly expedient, casual, and unshaped. The different ground stone technologies may be an indication of the change from the pre-Numic subsistence strategy to the Numic strategy.

Social Organization, Territoriality, and Exchange

No evidence of craft specialization or production for trade was encountered during survey or testing. In fact, the evidence for exchange is meager or circumstantial, consisting of a few shell beads, and possibly the few steatite beads.

The obsidian source data, which elsewhere have been used to infer territoriality (Bettinger 1982b), are ambiguous at Manzanar. Obsidian at the sites came from the Fish Springs, Coso Hills, Queen (and Queen Impostor), and Casa Diablo sources. As would be expected with either direct procurement or exchange, nearer sources were used the most. The Fish Springs source is only 25 miles north, while the Coso Hills source is 50 miles south. Both the Casa Diablo and Queen sources are farther, 75 miles and 85 miles north respectively.

Fish Springs comprises 74 percent of the obsidian debitage at the four tested sites, Coso Hills 21 percent, Queen (and Queen Imposter) 3 percent, and Casa Diablo 2 percent. Obsidian flaked stone tools are 64 percent Fish Springs obsidian, 18 percent Coso Hills, 11 percent Queen (and Queen Imposter), and 6 percent Casa Diablo.

Two anomalies in the obsidian source data may be revealing. First, differences in percentages between finished tools and debitage may suggest trade: the Queen (and Queen Impostor) and Casa Diablo specimens are mostly finished tools, which may have been acquired through trade. Second, there is up to twice as much Queen obsidian as Casa Diablo, although the Casa Diablo source is slightly closer. This preference for Queen obsidian may be due to perceived quality differences as well as territoriality or customary travel routes.

More plausible evidence of territoriality may be manifested in the percent of Fish Springs obsidian at the Manzanar sites, compared to recently excavated sites to the south. Five miles south of Manzanar at the Alabama Gates sites, only 26 percent of the obsidian is from the Fish Springs source, 58 percent is from Coso Hills, and 16 percent is from other sources (Delacorte et al. 1995). Yet this area is only about 30 miles from the Fish Springs source, and 45 miles from the Coso Hills source. Fifteen miles south of Manzanar at the Lubkin Creek site 16 percent of the obsidian is from Fish Springs, 75 percent is from Coso Hills, and 5 percent is from other sources (Basgall and McGuire 1988). Lubkin Creek is about equal distant between the Fish Springs and Coso Hills sources.

The change from 16 to 26 to 74 percent Fish Springs obsidian within a space of 15 miles may indicate a boundary possibly related to territoriality between these two areas. In any event, obsidian source percentages of the Baker and Klondike period components at Manzanar are fairly consistent, suggesting the cultural patterns that would account for these archeological patterns were in place by the Baker period (A.D. 600-1300).

Acculturation and Adaptation

Survey and testing indicated good potential for addressing questions concerning acculturation and adaption: glass beads were found on the surface at MANZ 1993 A-4, and other early historical artifacts found at MANZ 1993 A-4 and at MANZ 1993 B-1 may be associated with the Native American Indian occupation. Historic accounts indicate that Native American Indians employed at the Shepherd Ranch lived in the area. However, this historical component was not encountered during subsurface testing. The historical Native American Indian use of the Manzanar area is intriguing, and further work could show how subsistence and settlement patterns were affected by the loss of traditional territory and the shift to wage labor.

Recommendations

Following is a summary of site conditions and impacts, and an assessment of archeological significance. Management recommendations and suggestions for future research are also provided.

Impacts

Almost all buildings were sold and removed after the relocation center closed. The previous town and ranch structures had also been sold and removed or burned. The integrity of the features remaining at the site varies, with impacts stemming from a variety of sources. For example, the auditorium had been modified for use as an Inyo County Maintenance Facility and the staff and administration areas were used as veterans housing for a short period. Remaining architectural elements have been subject to scavenging and natural decay.

There are also broader on-going impacts, both natural and human caused. The Los Angeles Department of Water and Power (LADWP) spreads water across the area to recharge the watertable, thereby accelerating gully erosion and alluvium deposition. For example, gullies in the relocation center landfill have reached well over 8 ft deep. Much of the relocation center road grid remains, but roads in the western third of the National Historic Site generally are buried or overgrown with vegetation. Many other roads are cut by gullies, and major portions of two roads (1st and 7th Streets) have been destroyed by erosion. Water control ditches and berms built by Inyo County to protect its maintenance facility and Highway 395 from seasonal flooding have caused considerable ground disturbance within the National Historic Site.

Grazing and off-road driving (mostly for wood cutting) have resulted in the deterioration of features and the crushing of artifacts. Hunting and target shooting also occur periodically. Other impacts include new roads, a powerline, and two recently drilled and capped wells, all of which have caused visual impacts and as well as ground disturbance. A recent agricultural field north of the National Historic Site has destroyed a relocation center field and associated ditches.

Vandalism takes the form of casual artifact collecting and digging at the relocation center dump and disposal pits, and at dumps associated with the town of Manzanar. Various other activities may be causing intermittent minor disturbance — the cemetery parking area has been used as a drop-off point for sheep herds and a landing spot for hang gliders, and campers use foundation slabs within the National Historic Site and at the chicken ranch and the airport east of the National Historic Site. Travelers along U.S. Highway 395 throw trash out along the

highway, and at least one movie company drove trucks and equipment off roads to film within the National Historic Site (Matzer 1995).

Significance

The Manzanar Relocation Center was designated a California Registered Historical Landmark in 1973 and was listed on the National Register of Historic Places in 1976 for its association with events that have made a significant contribution to the broad patterns of U.S. history (Criterion A), specifically the internment of Japanese Americans during World War II. Being less than 50 years old at the time of nomination and therefore normally excluded from listing on the National Register, the relocation center was deemed to be of exceptional importance. Manzanar was designated a National Historic Landmark in 1985 and a National Historic Site in 1992. The significance of the National Historic Site is without question. The present project was designed to identify archeological resources (both relocation era and earlier) within and near the National Historic Site, and assess whether they contain important data that should be protected, as well.

The legal guidelines for evaluation and management of archeological sites on public land are outlined by the *National Historic Preservation Act*, as amended, and specified in the Code of Federal Regulations, Title 36, Section 60.4, which states:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> (A) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (B) that are associated with the lives of persons significant in our past; or
>
> (C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (D) that have yielded, or may be likely to yield, information important in prehistory or history.

Archeological sites are usually evaluated against National Register criterion D: the ability to provide information important in prehistory or history. Implicit in National Register criterion (D) is the need to measure sites against viable research questions. However, this quality of significance, the ability to provide information in history and prehistory, or address scientifically consequential research questions, has been subject to much discussion. The Advisory Council on Historic Preservation, in *Treatment of Archaeological Properties: A Handbook* (1980) states that sites "... are important ... because they may contribute to the study of important research problems" (Principle III, p. 8).

The evaluation of archeological sites would ideally consider (1) the relative abundance of the resources to be affected, (2) the degree to which specific kinds of data are confined to the study area, (3) the range of research topics to which the resources may contribute, and (4) recognized deficiencies in current knowledge of cultural history in and near the project area (Scovill et al. 1972:21). The first two factors are often difficult to apply, given our incomplete knowledge of the resources in the region. Developments in archeological methodology, in general, and past research in the region do provide information for the last two factors.

While it can be argued that some data can be recovered from any site, such work is not always justifiable. Reliable reconstructions of past behavior rely first upon the strength of the data. Strong analytic cases are those sites that contain numerically large samples of high-resolution data that are relatively undistorted by natural and cultural formation processes. Weak analytic cases are characterized by numerically small samples of low resolution data, distorted natural contexts,

multiple occupations, or vandalism. Lack of attention to the analytic strength of archeological cases creates suspicion about the reliability of the inferences generated from them and limits the data's usefulness in subsequent analysis by other researchers (Reid and Whittlesey 1982:18-19). Archeological sites that constitute strong analytic cases are more likely to yield important information, and are therefore more significant than sites that constitute weak analytic cases.

Historical sites are often evaluated in terms of National Register criteria A, B, and C, reflecting associations with events, persons, or styles important in history. Historical events and trends of the eastern Sierra Nevada are briefly outlined above, and sites associated with early mining, ranching, farming, aqueduct construction, or military occupations that retain sufficient integrity of feeling, association, workmanship, materials, etc., may be eligible for the National Register under these three criteria. It is under Criterion A that Manzanar has been determined significant.

But historical sites are also evaluated by Criterion D, since historical archeological sites can often provide more complete and to some degree different information than historical records (Schuyler 1978:1). For example, historical records often reflect only the major events of the more elite part of society, neglecting more mundane matters of everyday life, and often ignoring transitory or low-income populations. Yet it is often the day-to-day living, and social, political, and economic relationships of the entire community, that forms the basis of our American culture. Historical archeology sites that can broaden our understanding of history are therefore significant.

The following significance assessments are made with all four criteria in mind: the relocation center, listed on the National Register under criterion A, is also eligible under criterion D, for its data potential. All relocation center sites, even those outside the National Historic Site are eligible for the National Register under criteria A and D as contributing elements.

Because testing showed that disturbance in many locations is less than previously thought, all tested sites, both prehistoric and historical, with the possible exception of Campbell/Ed Shepherd House site, have proven to contain sufficient data potential to be eligible under criterion D. Sites not tested at this time may also be eligible under criterion D. Further archeological work, including subsurface testing, would be needed to adequately characterize these sites.

Recording completed for this project has effectively exhausted the research potential of the water conveyance systems, dams, bridges, and isolates, although some of these features may likely be eligible under criterion A on their own or as contributing elements within a multiple property district.

Boundary Adjustment

The boundary described in the act of Congress (P.L. 102-248) that established Manzanar National Historic Site was set before the extent of resources at the site was fully known. The act included language to allow boundary modification. Some of the most significant relocation center remains are located outside the current authorized boundary including four of the five remaining *in situ* watchtower foundations, the military police compound, the landfill, disposal pits, the chicken ranch, the hog farm, the sewage treatment plant, the reservoir, and agricultural fields. At a minimum, sites along the western and southern boundary should be added to the National Historic Site.

While the boundary proposed here follows section and half section lines for convenience, it would also allow for more cohesive management than an irregular boundary drawn to minimally include selected features. The recommended boundary, incorporating approximately 240 additional acres, is depicted in Figure 15.2.

The additional lands along the southern boundary include the military police compound, Watchtowers 6 and 7, the chicken ranch, an example of the farms operated by the evacuees including several concrete-lined ditches, several relocation center trash deposits, remains of the town-era Paget farm, a Native American Indian site, and the greatest concentration of Japanese inscriptions noted during survey.

The western addition encompasses the relocation center landfill and disposal pits. Other notable resources within this area include watchtowers 4 and 5, several irrigation ditches, the chlorination tank slab and associated inscriptions, numerous buried automobiles, a portion of an extensive dump from the town of Manzanar, and two relatively undisturbed Native American Indian sites, one of which is likely the historical camp associated with Shepherd Ranch.

A conservation agreement or easement with LADWP should be sought to protect other outlying relocation center sites such as the hog farm, sewage treatment plant, and agricultural fields. The National Park Service should also seek a cooperative agreement with the Bureau of Land Management to manage the relocation center reservoir located on BLM land.

To protect archeological resources, the U.S. House of Representatives passed legislation in July 1996 to add approximately 300 acres to the land previously authorized for Manzanar National Historic Site. This addition includes the 240 acres recommended above. A companion bill was introduced in the U.S. Senate in September 1996.

General Management Recommendations

Current National Park Service policy dictates preservation, except where archeological excavation is necessary to mitigate the effects of projects (NPS-28.3.12). *In-situ* preservation of a site is the preferred manner of avoiding damage to archeological resources. Preserving the site is more important than preserving the artifacts alone because the relationship of the artifacts to each other in the site provides valuable information than can be lost when the artifacts are removed. Further, preserving the site keeps it available for more sophisticated future research methods. Preservation may also avoid conflict with the religious or cultural values of groups associated with the site.

Preservation may be accomplished by many approaches including: (1) planning construction to avoid archeological sites, (2) planning open space to incorporate archeological sites, or (3) covering archeological sites with a layer of soil before building parking lots or similar facilities. There are several prerequisites to capping sites, however. Capping may be used where the soils to be covered will not suffer serious compaction, the covering materials are not chemically active, natural processes of deterioration at the site have been effectively arrested, and the site has been adequately recorded, which generally includes some amount of subsurface testing.

Due to past filling and leveling, the presence of buried prehistoric and historical deposits virtually anywhere within the boundaries of the National Historic Site cannot be ruled out. The presence of substantial buried deposits outside of identified features or midden areas appears minimal, but all ground-disturbing activities within the National Historic Site, even in areas with no apparent surface remains, should be monitored by an archeologist.

For the Manzanar area, several actions could aid in site preservation: (1) control LADWP water spreading so that existing vegetation remains watered, but features and sediments are protected; (2) arrest existing erosion, particularly at the relocation center landfill; (3) consider removing dead vegetation to reduce fire hazard and eliminate or control firewood collecting; (4) exclude grazing from the National Historic Site; and (5) mark a driving route from the relocation entrance to the cemetery monument to lessen the impact of vehicles driving all over the site to find a route.

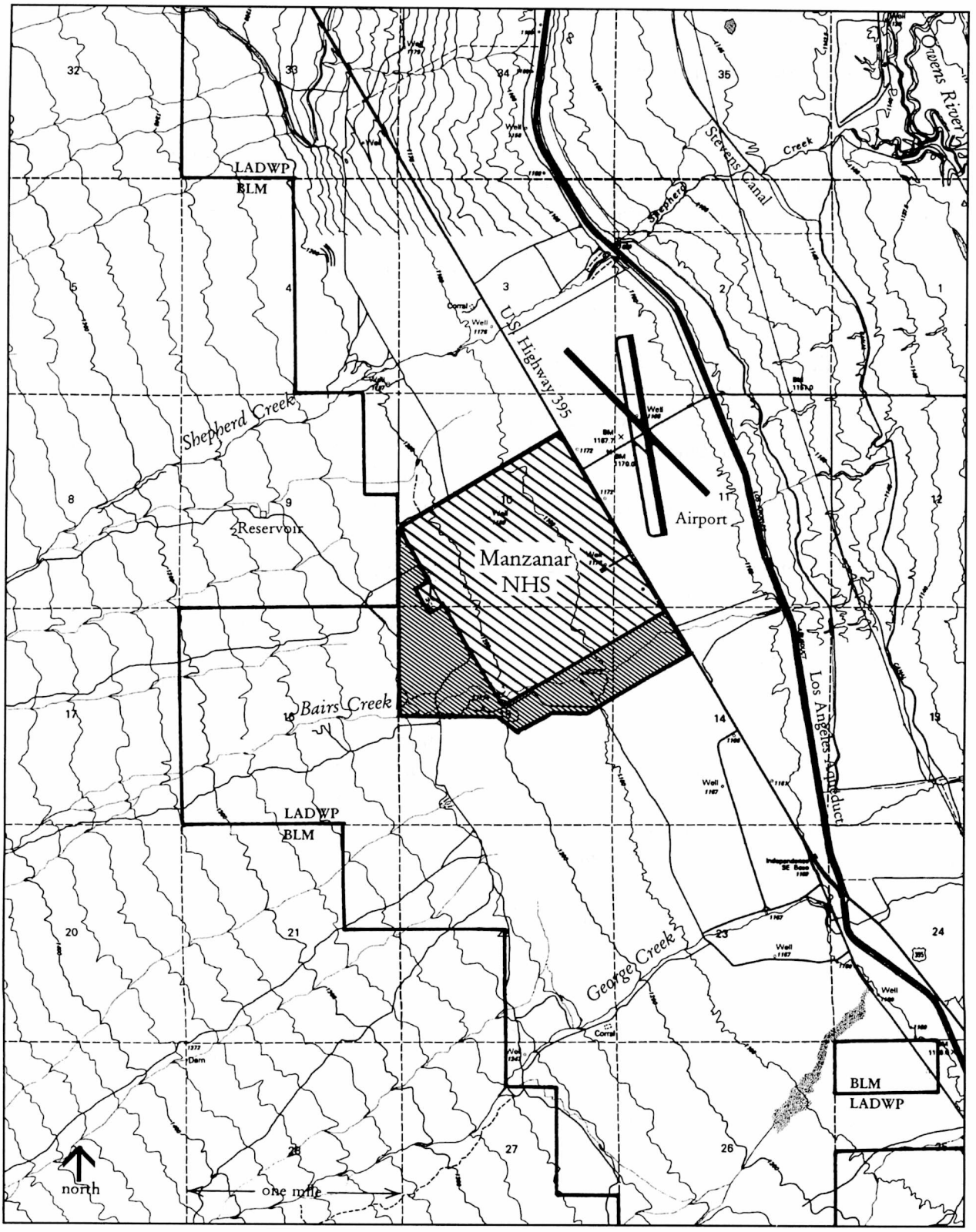


Figure 15.2. Manzanar National Historic Site and recommended addition.

Because of the extensive village remains with historical and protohistoric components and the potential for additional Native American Indian burials, work in the vicinity of Native American Indian sites should proceed only with a Native American Indian monitor or prior consultation with Native American Indian groups who have expressed an interest in Manzanar.

Specific Management Recommendations

The draft General Management Plan (GMP) for the Manzanar National Historic Site (NPS 1995) outlines developments and facilities proposed to interpret the National Historic Site to the public. Proposed facilities include parking lots, tour roads, wayside exhibits, trails, a visitor center at the auditorium, and "demonstration blocks" at which features would be delineated and signed. Specific comments were made during the preparation of the draft GMP, but a few pertinent points are reiterated here.

Demonstration Blocks

The potential impact of increased artifact collecting due to increased visitation is considered to be negligible over the National Historic Site as a whole, and has been adequately mitigated by the surface recording completed for this project. However, there may be greater impacts where people are directed to demonstration blocks. Any block chosen as a demonstration block should be surface-collected to mitigate potential visitor impacts, in the same manner as the surface collection and tabulation completed at Blocks 12, 13, 14, 21, and the staff housing area.

Parking Lots

A parking lot placed anywhere within the Auditorium Block would not impact any significant archeological resources. Depending on the final plans, construction of the north parking lot may require further archeological work. Even if the lot is placed to avoid directly impacting significant remains, several nearby trash scatters may need to be surface collected to mitigate potential indirect impacts, such as casual collecting of artifacts by visitors.

Construction of the southwest parking lot at the location depicted in the GMP maps 3 and 4 would impact prehistoric site MANZ 1993 A-4, which contains at least one human burial. It is recommended the parking lot location be moved to southwest of the Guayule Lath house, near Bairs Creek. This location would avoid the prehistoric site. In addition, the parking lot could then be used not only for general access to the relocation center, but also as a trailhead for a possible trail to the Chicken Ranch and a potential picnic area along the creek.

Perimeter Road

The perimeter loop tour road should be paved. Historically (at least by 1944) nearly all of the camp roads were paved or heavily oiled, and a paved tour road would require less routine maintenance, eliminate dust, and help define the route. It would also make it possible to post "driving off pavement prohibited" signs; otherwise barriers may be needed to keep people from driving off the designated route. A one-way road system would allow pull-outs to be within original roadways and reduce disturbance to historical resources. Visitor trails should be along existing roads to lessen impacts

Reconstructions

To mitigate the effects of reconstruction and rehabilitation, historical features should be mapped in detail and associated artifacts surface-collected before areas are cleaned up. Some of this work has been completed at the Judo House and a few other features. Because the areal extent of the completed work was limited, additional work may be needed even at these features. Mapping, surface collection, and clean up of additional features could be completed by any interested group under the supervision of an archeologist.

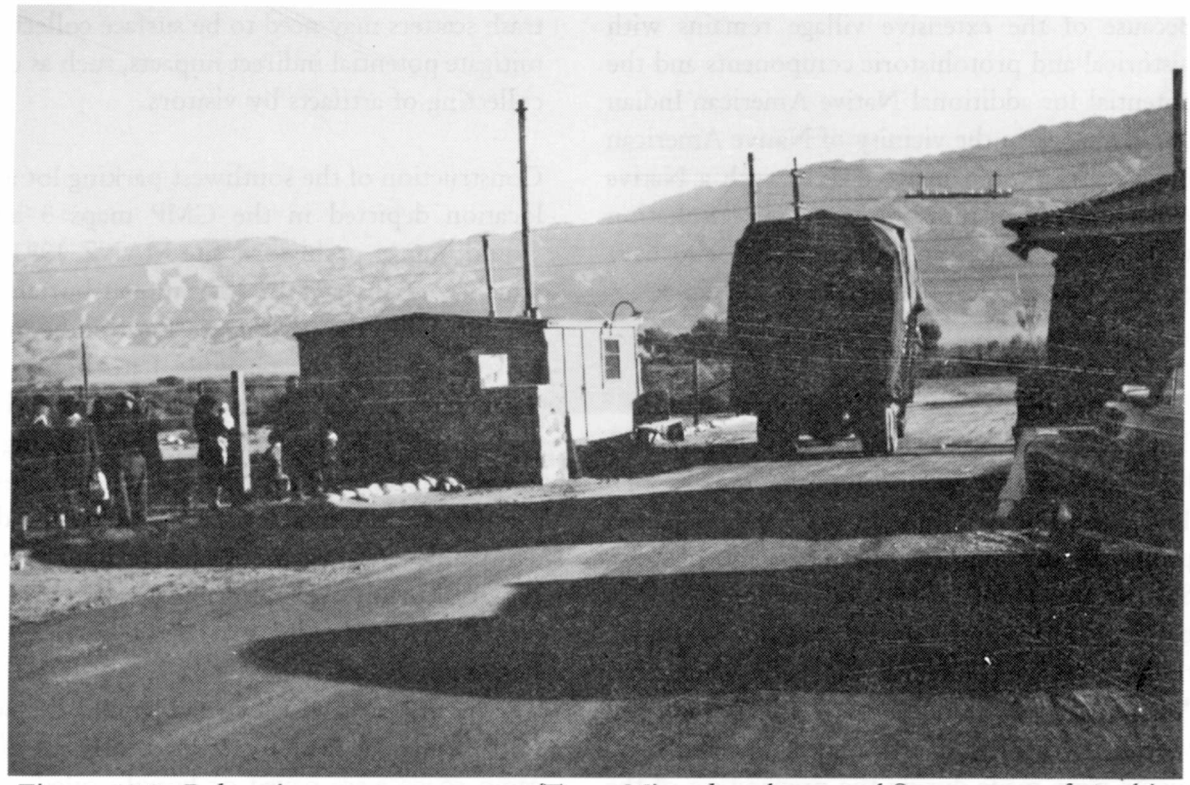


Figure 15.3. Relocation center entrance (Toyo Miyatake photograph©, courtesy of Archie Miyatake).

Perimeter Fence: the remaining original fence posts should be left in place and utilized if structurally sound.

Barracks: if possible, one or two original building(s) should be moved to the National Historic Site; several are still in use in the nearby towns of Independence and Lone Pine.

Watch Tower: although valuable for interpretation, reconstruction of the watch tower may cause indirect impacts to archeological deposits since visitors would be attracted to the area of the tower. Detailed surface collection at nearby features is recommended.

Entrance: The original decorative concrete entry posts that had been at the entrance have been moved to Independence. Replacing these posts will not only enhance the historical scene, but would protect the entrance buildings from vehicle damage (Figure 15.3). The current owners had previously offered the posts to the Manzanar Committee but the committee did not have the means to move them back to the relocation center at that time (Sue Embrey, personal communication, 1994). The National Park Service should acquire the posts so they can be reinstalled.

Interpretive Recommendations

Specific features and locations discovered and recorded during archival research and archeological survey seem particularly suited to public interpretation (Figure 15.4).

Major interpretive features from the relocation center include the entrance, administration and staff areas, auditorium, hospital, Judo House, Children's Village, cemetery, orchards, parks, baseball fields, victory gardens, watchtower foundations, ponds and gardens, chicken ranch, guayule farm, camouflage factory, and farms. Outlying relocation center features that could be interpreted through an auto tour include the reservoir and sewage treatment plant. The airport east of the National Historic Site could

also be interpreted, as a different aspect of World War II history.

Town and ranch era features with good potential for interpretation include the Manzanar store basement, the school location, foundations of the Wilder and Christopher houses, the Owens Valley Improvement Company Headquarters/Shepherd Ranch location, the foundation at the Campbell/Ed Shepherd House, and remains at the Gilmer Farm. Outlying features that could be interpreted through an auto tour or short hike include the town intake dam and concrete pipelines near the relocation center reservoir and the Bairs Creek Dam and pipeline west of the National Historic Site.

No on-site interpretation should take place at Native American Indian sites since they are particularly susceptible to vandalism and surface collecting. Native American Indian use of the Manzanar area could be recounted via off-site demonstrations, museum displays, books, and audio-visual materials.

Research Recommendations

Further archeological work at Manzanar National Historic Site could contribute to some of the research questions identified in Chapter 8. While not directly related to immediate management, research can help identify future management needs and goals, and provide information for public interpretation.

First, detailed mapping of evacuee-constructed features should be continued to document existing conditions and provide baseline data for monitoring, as well as to acquire information for interpretation. Second, the relocation center landfill and disposal pits should be tested to provide more information on data potential and address identified research questions.

Third, more information about the town of Manzanar should be acquired by surveying areas to the north and west of the National Historic Site, recording additional town features, and conducting additional work at the Shepherd Ranch and the Campbell/Ed Shepherd House to locate structural remains. Fourth, to better characterize the protohistoric and early historical periods, subsurface testing should be conducted to confirm the presence of protohistoric and historical Native American Indian components within the National Historic Site, and historical Native American Indian villages on Shepherd and George Creek should be located and recorded.

Synopsis

An unexpectedly large amount and diversity of cultural material was encountered during archeological field work at Manzanar National Historic Site. In spite of historical and recent disturbance, and reuse and removal of most of the structures of both the town of Manzanar and the relocation center, hundreds of features remain. All components of the National Historic Site have good archeological as well as interpretive potential. Each component identified (Native American Indian, Manzanar Townsite, Manzanar Relocation Center) is considered eligible for the National Register of Historic Places for its potential to yield information important in history and prehistory.

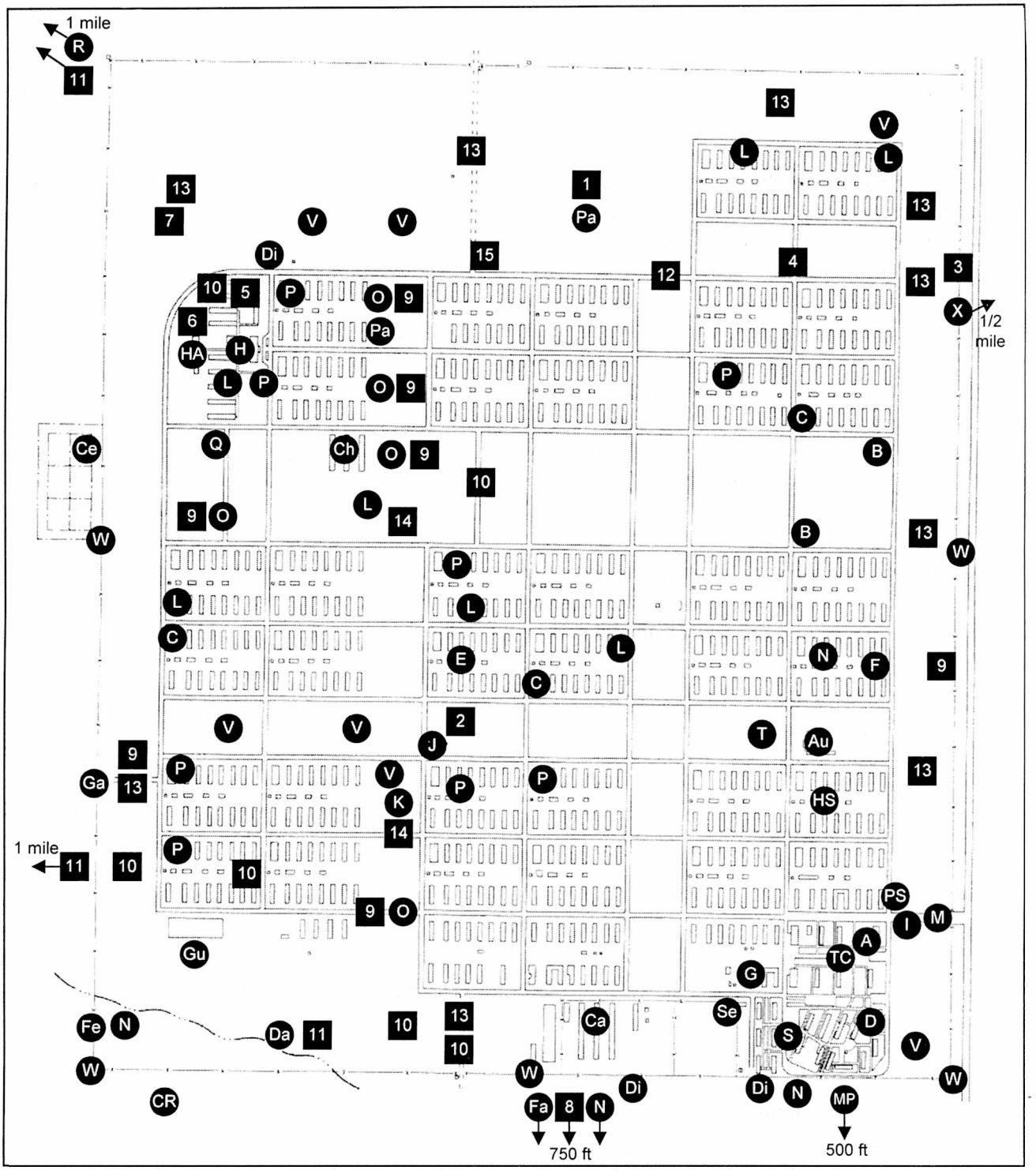


Figure 15.4. Major interpretative features at Manzanar National Historic Site. Relocation Center features: A. administration building; Au. auditorium; B. baseball field; C. church; Ca. camouflage net factory; Ce. cemetery; Ch. Children's Village; CR. chicken ranch; D. director's residence; Da. dam; Di. ditch; E. elementary school; F. fire station foundation; Fa. farm fields; Fe. fence G. garage foundations; Ga. guard post; Gu. guayule plantation; H. hospital; HA. hospital auxiliary buildings; HS. high school; I. internal police post; J. judo house; K. kendo platform location; L. landscaping; M. military police post; MP. military police compound; N. inscription; O. orchard; P. pond/garden; Pa. park; PS. police station foundation; PW. patio wall; Q. Caucasian doctor's and nurse's quarters; R. reservoir; S. staff housing; Se. Service station and motor pool; T. tennis courts; TC. traffic circle; V. victory gardens; W. watchtower foundation; X. Manzanar Federal Airport. Town features: 1. Owens Valley Improvement Company Headquarters/John Shepherd Ranch location; 2. Campbell/Ed Shepherd House foundation; 3. Downtown Manzanar and store basement; 4. Manzanar School location; 5. Wilder House foundation; 6. Christopher House foundation; 7. Gilmer Farm basement; 8. Paget Farm; 9. orchard; 10. water system; 11. dam; 12. Francis Street; 13. road remnant; 14. vegetation; 15. well.

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