

***Reiling Gold Dredge***  
***Site 5ST880***

The Reiling Gold Dredge belonged to one of a relatively few placer gold-dredging operations in Colorado. The dredge complex lies on the south side of French Creek's floor approximately 2½ miles upgradient and east of Breckenridge. The complex consists of the remnants of the Reiling Dredge, an intact dredge pond, and a residential complex. French Gulch's south wall rises to the south, and it is heavily wooded with a second- and old-growth subalpine fir and lodgepole pine forest. Piles of dredge tailings extend in the other directions, and they constitute an excellent setting evocative of gold dredging. In general, the site retains a high degree of archaeological integrity and some engineering integrity. The dredge hull is largely intact and rests in its pond, and the associated buildings have been reduced to archaeological features.

Reiling Dredge History

Prospectors discovered placer gold in the Breckenridge area as early as 1859, and they panned, cradled, and sluiced the prized metal from the Blue River and its tributaries through the 1860s. The easily separated gold gave out within a short time, but the area's miners realized that placer deposits still remained in the form of gold particles disbursed throughout the deep gravel of the valleys. Such ground could not be worked with traditional labor-intensive methods and instead required processing in economies of scale.

In the early 1890s, a consortium of engineers and capitalists came together to solve the problems imposed by the deep river-gravel. At Bannack, Montana, Samuel S. Harper obtained options to mine placer gold from a group of claims on Grasshopper Creek. Harper explained the problem to Herman J. Reiling, an engineer in Chicago, who introduced the idea of applying a continuous bucket-line dredge to excavate the gravel, and Reiling probably devised the means of separating out the gold. Reiling and Harper then formed the Bannack Gold Dredging Company in 1894 and designed a working model.<sup>1</sup>

Reiling and Harper parted ways in 1895, and Reiling formed the Gold Dredging Company of Montana with the intent of completing a dredge to work the claims. Reiling hired a crew of expert carpenters who began constructing a barge-like hull at Bannack, and he began discussing bucket-lines and processing machinery with engineers at the Bucyrus Company in Chicago. Bucyrus produced the first elevator dredges in the late 1880s, which were used to deepen shipping channels in rivers. The design that the Bucyrus engineers and Reiling agreed upon utilized a bucket-line to deliver crude river-gravel to a grizzly, which was a large screen that separated out large cobbles and permitted fine gravel to pass through. The gravel entered a series of tubular trommel screens that allowed sand to drop into the hull's hold and ejected the larger gravel. Another bucket-line scooped the gold-bearing sand out of the hull and deposited it into sluice boxes floating along side the dredge. A third bucket-line stacked the rejected gravel and cobbles, known as tailings, behind the dredge. Reiling's first dredge, launched in 1895, recovered little gold, but he redesigned the sluice system, and the machine then proved highly profitable. In addition to creating this revolutionary means of processing river-gravel, Reiling powered the machinery with electricity, which as a power source, was under development during the 1890s.<sup>2</sup>

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<sup>1</sup> Ellis, 1967:20.

<sup>2</sup> Ellis, 1967:21.

While dredge builders such as Reiling termed their devices boats, a typical gold dredge was more like a floating factory. Similar to barges, dredge hulls were broad and flat with little draft. A heavy beam superstructure stood near the hull's center, and it supported gravel processing machinery, the ends of bucket-lines, and a power plant. One bucket-line delivered crude river-gravel to the processing machinery and the other stacked spent tailings far behind the dredge. Tall gantries erected on the dredge's prow and rear supported the bucket-lines. A cabin covered most of the deck, and it enclosed the processing machinery, the power plant, and onboard sluice systems. Large motors drove the bucket-lines, the trommel screens, and pumps. Last, a bridge fitted with controls for the machinery stood over the cabin's front.

Reiling experienced great success dredging placer claims in Montana during the 1890s, and he broadened his horizons to Colorado's goldfields. In 1904, Reiling assembled two dredges on Clear Creek near Golden. The gold was there, but it was too fine and disseminated, so Reiling sought to relocate the dredges. He shipped one to California and sent the other to Breckenridge, where several other dredges were already operating. In 1908, Reiling made an agreement with Mark G. Evans of Denver and William P. Bonbright of Colorado Springs to form the French Gulch Dredging Company, and they either purchased or leased a group of claims in Breckenridge's French Gulch. Bonbright had workers build a new hull for the dredge then purchased the machinery from Reiling's idle dredge near Golden and shipped it to French Gulch. The company's directors named the dredge the Reiling in honor of the instrumental inventor and engineer. Reiling served as the company's superintendent, and he had the financial backing of a group of Colorado investors.<sup>3</sup>

The dredge's bucket-line bit into the gravel of French Gulch in 1908, beginning over a decade of profitable operations. At the gulch mouth, workers ran the dredge for only nine months out of the year due to the seasonality of the climate. After four years, the dredge exhausted the richest gravel and profits abruptly declined. In response, the company decided to move the dredge approximately one mile upstream and east to a new tract of ground that it had acquired. Unfortunately, the Reliance Gold Dredging Company owned the land between the gulch mouth and the new claims upstream. Ordinarily, companies cooperated and allowed their dredges to work through intervening claims for a share of the profits. Reiling's company and Reliance, however, could not come to terms, and Reiling was forced to have his workers dismantle the dredge, move it overland, and rebuild it in a new pond. Moving the hull intact was a feat and, to accomplish this, the company built a special, broad-gauge rail line to carry the structure. When the dredge was reassembled in 1914, workers started the dredge machinery again, and the boat slowly made its way east and upstream. In 1919, workers turned the dredge around, and it slowly crept west. But because the principal channel of French Creek had been exhausted, the machine was restricted to the gulch's high, south margin where the gravel was thin and the boulders many.<sup>4</sup>

By 1920, the French Gulch company realized that the days of handsome profits were over. The company had dredged its best ground, and the remaining gravel deposits proved difficult to work and offered less gold. At the end of September, the company suspended operations, and within a short time, creditors filed liens against the company for unpaid debts. In 1922, the Florence Gold Dredging Company purchased the dredge and associated assets from the creditors for a pittance and resumed operations. Later in the year, the dredge's hull sprang a leak and sank, permanently ending operations.<sup>5</sup>

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<sup>3</sup> Ellis, 1967:98; "Current News" *Mining Science* 8/6/08 p117.

<sup>4</sup> Ellis, 1967:104; "Current News" *Mining Science* 4/22/09 p317.

<sup>5</sup> Ellis, 1967:104.

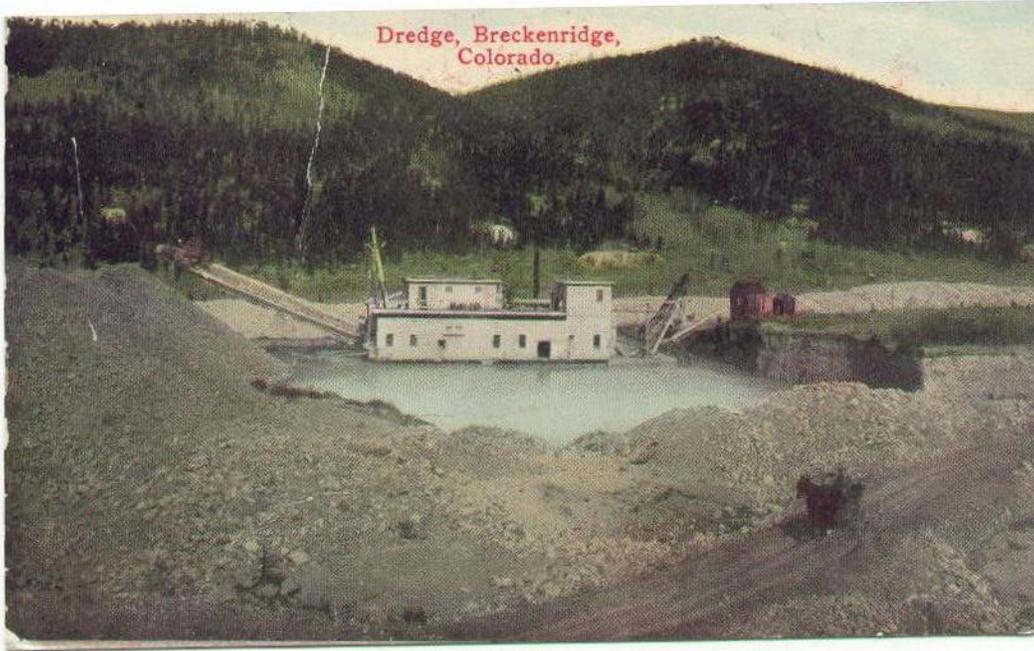


Figure 2.22: The historic post card illustrates the Reiling Dredge near the mouth of French around 1909. As the dredge made its way to the right, a bucket-line excavated the bank of virgin ground, and a tailings stacker dumped processed river gravel to the left.



Figure 2.23: The photo depicts the Reiling Dredge near the mouth of French Gulch around 1909. Note the dredge's closed-connected bucket-line at left. In the cabin at upper left, a worker operated winches that elevated the bucket-line and tailings stacker, and adjusted the mooring lines. Source: Denver Public Library, X-60158.



Figure 2.24: The rear quarter view depicts the Reiling Dredge hull in upper French Gulch, which was the last point of operation. The two posts left of center held the tailings stacker, and the bucket-line extended outward from the hull's far end. The hardware and superstructure have been dismantled. Overall, the site retains a high degree of integrity and includes the archaeological remnants of a base camp, out of view to the left. Source: Author.

### Reiling Dredge Site Description

Today, a legacy of archaeological and engineering features represents the dredging operation. The most obvious is the dredge ruin, which includes the hull and portions of the superstructure. Currently, the dredge's front faces west, the rear faces east, and the hull rests in an intact pond (F7). The dredge excavated the pond during its operation, and workers ensured that the pond remained filled by building an earthen dam along the north edge. As the dredge progressed west, it stacked tailings to the east, which are visible today. Banks of unexcavated sediments form the pond's south and west sides.

The dredge hull (F1) is 45 feet wide, 100 feet long, and 6 feet deep. A cabin, supported by a 4x4 post-and-girt frame sided with planks, enclosed the placer processing machinery and power plant once located on the deck. A portion of the cabin's wall still stands on the hull's southwest corner, and the remainder has fallen into the pond. The hull's deck consists of 3x6 planks nailed to 8x10 joists spaced every 32 inches. The joists are part of the hull's frame, which workers assembled with timber bolts. Some of the frame's vertical members extended up through the deck, and they served as components of the superstructure. Five access ports (F4) and pipe ports breach the deck near the hull's center, and anchor bolts for gravel processing machinery are visible on the deck.

Remnants of the gravel processing machinery and power plant stand on the hull. The housing for the excavation bucket-line (F2) remains partially intact in the center of the dredge's west half. The housing consists of tongue-and-groove plank siding nailed to diagonal, 12x12 beams that belonged to a superstructure, and it slopes from east to west. Many of the beams have been removed, and portions of the siding have fallen into the pond. Grey paint is visible on some of the siding.

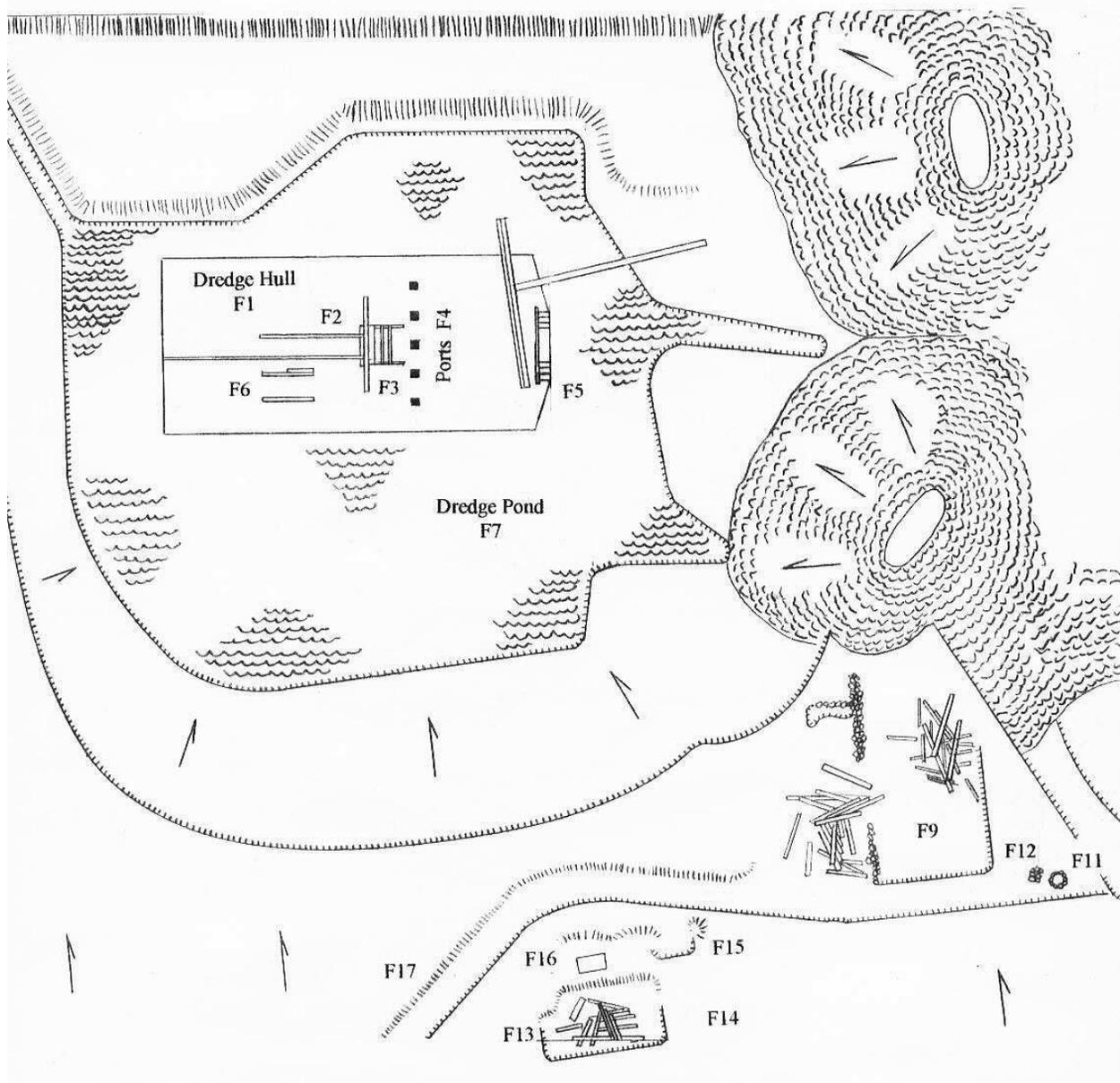


Figure 2.25: Plan view of the Reiling Dredge site's western portion. The eastern portion is continued on the following map.

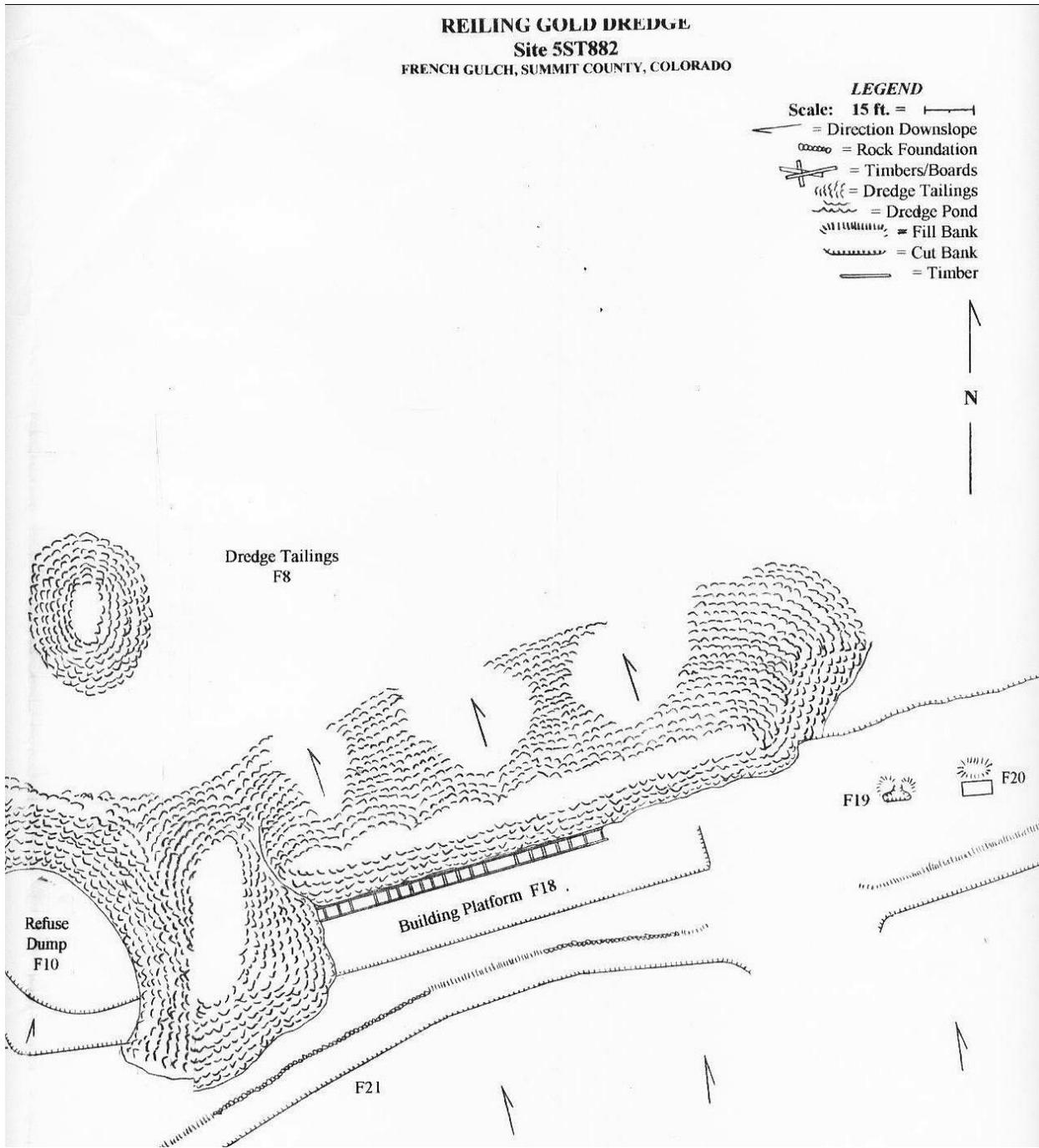


Figure 2.25: Plan view of the Reiling Dredge site's eastern portion.

A superstructure frame remnant (F3) stands in the center of the hull. The frame provided structural rigidity to the dredge, and it supported machinery linkages, gravel processing machinery, and bucket-lines. The frame consists of two sets of five beams, flanking the east end of the bucket-line housing. Diagonal, iron tie-rods, which have been cut away, braced the superstructure.

The tailings bucket-line gantry (F5) stands on the dredge's east end, and it served both as part of the dredge's superstructure framework and as a support for the tailings bucket-line. The structure consists of two pairs of 14x36-inch timber posts, sandwiching riveted, square girders. The pairs of posts are joined by 12x12 cross member, and heavy, diagonal beams and iron tie-rods braced the structure. Construction workers assembled the beam work with timber bolts and fish plates.

An electric motor powered the gravel processing machinery, and it was bolted to a mount (F6) located adjacent to and south of the bucket-line housing. The mount manifests as two sets of parallel 10x10 timbers studded with anchor bolts for both the motor and reduction gearing.

The dredge apparently had an outboard sluice that enhanced gold recovery. The sluice rested on a heavy float that currently lies in the forest adjacent to and west of the dredge pond. The float is rectangular, approximately 12 feet long and 3 feet wide, and has a 2-foot draft. The float's gunwales were armored with sheet iron for durability.

In sum, the dredge remnant currently consists of portions of the superstructure framing, the cabin, a housing that enclosed the gravel-delivery bucket-line, and the tailings bucket-line gantry. Much of the cabin has fallen away into the dredge pond, and the machinery, the heavy beam work, and other iron items were salvaged following the dredge's abandonment.

Because the dredge operated relatively far from the nearest settlement, the French Creek company provided housing for the crew. Workers erected several frame buildings that they periodically relocated according to the dredge's progress. When the company moved the dredge to the upper portion of French Creek in 1914, it erected the buildings on a hillslope near the valley floor. During subsequent years, the dredge slowly worked its way back and forth across the valley and ironically ceased almost at the doorsteps of the buildings. Historically, the complex included two well-appointed boardinghouses, a separate frame building, several privies, and two roads. Today, all these aspects have been reduced to archaeological features.

The boardinghouses stood on platforms that workers graded with cut-and-fill methods. The western boardinghouse was a frame building approximately 60 by 65 feet in area, and it stood on a foundation (F9) of timber posts and dry-laid rocks. The main entry appears to have been in the south wall, and it opened onto a terrace that workers cut out of the hillside.

According to material evidence, the company provided its workers with reasonably comfortable quarters. The platform currently features a 1-inch water pipe, a lightning-rod ground, and associated artifacts including electrical insulators, curtain rod hangers, window screens, and stove clinker. These characteristics indicate that the boardinghouse had running water, electric lighting, heat provided by coal stoves, curtains for privacy, and screens to keep out mosquitoes. A cook-stove remnant also indicates that the boardinghouse included a kitchen and dining hall.

The residents did not spend all of their leisure time indoors. A fire hearth (F11) on the boardinghouse platform reflects time spent outdoors, probably during warm evenings.

The eastern boardinghouse was a frame building approximately 27 by 120 feet in area. The building stood on a foundation (F18) that consisted of timber posts and timber footers. The main entry appears to have been in the north wall, and it opened onto a plank porch that extended almost the length of the building. Like the western boardinghouse, the eastern structure had running water and electric lighting, and it apparently also had a terracotta drainpipe.

The residential complex included a third frame building that stood on a cut-and-fill platform (F13) near the western boardinghouse. The building was 18 by 30 feet in area, and it stood on a foundation of timber footers laid on the earthen platform. The structure probably served as a residence for the dredge's superintendent, but it lacked the amenities of the boardinghouses.

The complex's residents disposed of their refuse in the fashion common to the time. They threw solid waste behind the buildings and erected privies for personal use. The occupants of the western boardinghouse and the small frame building shared a common privy. The pit (F15) is currently visible, and it is lined with log lagging and is 4 by 6 feet in area and 3 feet deep. The pit probably contains meaningful buried deposits. The residents of the eastern boardinghouse used a privy east of the building, and two pits (F19, F20) currently remain. It seems likely that F19 was used first then backfilled when full. F20 was abandoned before it was filled and currently manifests as a pit 4 by 10 feet in area 6 feet deep. The remnants of the privy structure, including two toilet seats and plank flooring, lie around and over the pit. Both pits may contain meaningful buried deposits.

The residents of both boardinghouses threw their solid refuse downslope from the buildings. The accumulation of refuse generated in the western boardinghouse formed a small dump (F10) in a depression between mounds of placer tailings. The refuse associated with the eastern boardinghouse lies scattered across tailings mounds to the north. The residents of the small frame building threw their refuse to the east, forming a scatter there (F14). All the scatters are surficial and lack subsurface depth.

The site possesses a full and rich artifact assemblage that reflects several periods of occupation. According to material evidence, the two boardinghouses were inhabited primarily during the late 1910s. Nearly all the cans were sanitary and vent-hole vessels, and only six were of the hole-in-cap variety. By the 1910s, food packers had almost totally phased out hole-in-cap cans in favor of sanitary and vent-hole types. Some of the cans were opened with a hopper can-opener, which was introduced during the late 1890s for use with hole-in-cap vessels. When hole-in-cap cans became obsolete, so did hopper openers. Sanitary cans opened with a hopper opener date to the 1910s transition period.

In terms of fragmented bottles, more than half were machine-made while the rest were hand-finished. During the 1910s, glass makers phased out hand-finished bottles with machine-made types. Approximately one-quarter of the glass fragments exhibited selenium solarization, which postdates World War I. Much of the glass was solarized to amethyst and aqua hues, which predates the war. One hand-finished beer bottle base featured a maker's mark used between 1904 and 1907. It should be noted, however, that brewers reused bottles for years.

In contrast to the above timeframe, the artifacts associated with the small, frame building indicate that it was erected long before the French Creek company built the residential complex. Most of the food cans were hole-in-cap vessels made with inner-rolled and soldered side seams, and a small proportion was sanitary vessels. Such a ratio indicates that the building was inhabited during the 1890s and was reused during the late 1910s by the dredging operation.

### Reiling Dredge Site Interpretation

The Reiling Dredge site represents a successful, well-organized, heavily financed placer mining operation. The area worked by the dredge is extensive, indicating that the mining company processed a high volume of auriferous gravel. The operation appears to have been typical of other dredges located some distance from settlements in that it featured workers' housing. While dredge companies usually moved residential buildings in parallel with the work, the French Gulch outfit provided semipermanent housing, which required the workers to commute by foot to the dredge.

The site's excellent artifact assemblage allows us to draw a few additional conclusions regarding the support facilities and workers.

The near-constant operation of a dredge required support from shop facilities where machinists, blacksmiths, and carpenters repaired and manufactured machinery, hardware, and woodwork. Usually, the shop was stationary and was located near a settlement or transportation center because the equipment and facilities did not lend themselves to being mobile. The French Creek company, however, located its shop amid the residential complex, which the company periodically moved with the dredge. According to material evidence, the company kept a shop in the eastern boardinghouse, which explains the building's elongated footprint. Industrial artifacts such as unwound cable, forge-cut iron scraps, hardware, and hand tools reflect shop work.

From the beginning of operations, the French Creek company used electricity to power the dredge. This manifests today in the form of a motor mount on the hull. In addition, numerous electrical artifacts associated with the building platforms indicate that the operation also had electric lighting.

The domestic refuse scattered around the site reflects aspects of the workers and their demography. The paucity of miscellaneous and decorative items suggests that the workers were men who belonged to a lower socioeconomic status. Artifacts such as work boots, a canteen, a miner's lunchpail, a comb, and a small arms cartridge are typical of male occupation. The crew ate a Victorian diet similar to that consumed in industrialized mining districts. The abundance of food cans represents preserved vegetables, fruits, and meat, which the cook almost certainly supplemented with baked goods, beans, grains, salt pork, and bacon. According to butchered bones, the crew consumed a wide variety of fresh meat. The bones reflect beef steak, roasts, stews, and ribs, as well as pork and chicken. The artifact assemblage includes relatively few liquor and medicine bottle fragments, indicating that the mine crew drank little alcohol or opium-based medicines on site.

### Reiling Dredge Site Significance

The Reiling Dredge site is a very important resource because of its content, type, and historical associations. The hull, pond, and residential complex possess a high degree of archaeological integrity and some engineering integrity. The setting is of exceptional quality and constitutes a cultural landscape that clearly represents the unique impacts of gold dredging. The site is also likely to yield important information in the form of engineering features and buried archaeological deposits. For the above reasons, the site is recommended eligible for the NRHP under Criteria A, C, and D, and for the SRHP under Criteria A, C, and E.

In terms of Criterion A, the Reiling Dredge is associated with important events and trends. First, the dredge was a highly profitable and successful constituent in a wave corporate of dredge mining that peaked in the West during the 1910s. As such, the dredge participated in the shift from small, surface placer mining outfits to operations that processed deep gravel using economies of scale. This shift permitted placer mining to continue at Breckenridge, as well as at other placer mining areas, well into the twentieth century after the easily accessed gold had been extracted. Second, the Reiling Dredge was part of a technological movement by which deep, river placers were mined with advanced engineering. The movement, which spread from Summit County to the rest of the western states during the 1910s, was important because it allowed the deep, river gravels to be exploited for placer gold. Prior to the 1900s, few, if any, economical methods for such mining existed.

On a local level, the Reiling Dredge contributed to the Breckenridge area in several ways. First, when the dredge was constructed, Summit County was recognized as a center of gold dredge engineering and innovation. By operating successfully, the Reiling Dredge helped

Summit County to maintain this role in the greater placer mining industry. Second, the dredge was an important contributor to Breckenridge's economy. The gold produced by the machine, the wages paid to workers, and the dissemination of investment made their ways into the local economy.

In terms of Criterion C, the Reiling Dredge site encapsulates several important aspects of dredge mining. First, the dredge hull and portions of the superstructure are excellent examples of dredge engineering. In general, gold dredges were relatively rare but important to the placer mining industry, and only a handful of examples currently survive. Second, the Reiling site is particularly important because it not only includes the remnants of the dredge, but also the associated base camp. In general, nearly every dredge operation required the support of facilities such as a shop and workers' residences. These aspects, however, tend to be poorly represented at dredge sites today because they were destroyed by land development, additional placer mining, and natural decay. The total assemblage of features and artifacts at the Reiling site constitute an excellent archaeological example of a complete dredge operation. The total assemblage of features and artifacts clearly reflects the dredge, its environment, the mining operations, the shop facilities, and the workers' residences. Third, the land-locked features and artifacts present an archaeological glimpse into the demography of dredge workers. This is uncommon because, as noted above, nearly all dredge sites lack residential features and artifacts, leaving little material evidence capable of conveying aspects of the workers such as diet, substance abuse, health, and socioeconomic status.

The Reiling Dredge is a component of, and its vast tailings constitute, an important historic landscape. The entire floor of French Gulch was overturned by the Reiling and other dredges for a length of several miles and now appears as piles, windrows, and mounds of tailings. This landscape is one of a few left in Colorado that clearly conveys the massive scale of gold dredging.

In terms of NRHP Criterion D and SRHP Criterion E, the Reiling Dredge site is likely to yield information important in several arenas. First, detailed documentation and analysis of the hull will contribute to the existing body of knowledge regarding gold dredge engineering and construction. The Reiling Dredge presents an uncommon opportunity because few wooden hulls remain intact in the West. Second, the site's residential complex includes three privy pits and three residential building platforms that offer buried archaeological deposits. Excavation of these deposits will probably yield information regarding dredge workers in addition to that conveyed by surface materials. Little is currently known about gold-dredging, and even less is known about the lifestyles, behaviors, and demography of the workers.

### Reiling Dredge Site Management Recommendations

Management recommendations suggest several actions. First, the site should be preserved. It should be noted that this is paramount given the site's importance and rarity. Currently, the dredge hull lies half submerged in its pond, and sediments and revegetation are accelerating the decay of the exposed portions of the deck. The hull should be stabilized under the consultation of maritime cultural resource experts.

Second, the site should be developed as a heritage resource. A recreational trail has been graded to the site and several observation platforms constructed. Signage should be added, and the dredge can be included in a self-guided tour of the area's other important historic resources. The signage should draw attention to the base camp and its role in the dredging operation.

Third, the privy pits should be excavated and the residential platforms probed for items lying below the duff and sod cover. Subsurface exploration of the residential features is likely to yield information that will enhance the currently dim understanding of the lifestyles of dredge workers.