Gold in the Tailings

Michael David Newland

Recent field research of post-Gold Rush placer-mining operations along the Feather River suggests that placer tailings, the cleaned and processed rock and sediment waste of placer-mining operations, can contain important information about mining technique and landscape reconstruction. In addition, careful reconstruction of mining events can tie early mining claims with their mining operations. Two placer-mining sites, Spring Valley Gulch, worked in the 1860s-1870s, and the McCabe Creek Complex, worked in 1853-1860, both studied as part of the Oroville Relicensing Project, will be used as illustrations.

Placer tailings are features on the historic-period mining landscape that are typically ignored or recorded minimally, because researchers think that either there is no information potential there, or such features are too complex to address during field study. Placer tailings are found throughout the gold country of the west, and indeed around the world. Tailings are the bi-product of mining: the scraped, washed, or otherwise processed boulders, cobbles, and finer sediments left as a end result of mining; this paper focuses only on placer mining and not on other forms of gold extraction.

A lot has been said about tailings over the past two decades, and there have been several efforts to glean information from them. There was some thought at one time that stacked-stone tailings might be the result of Chinese miners, but researchers such as Ritter (1986, 1987), LaLande (1985), and others have put this to rest. Certainly, in the case of McCabe Creek, there are dozens, if not hundreds, of stacked-stone walls that are not Chinese origin.

Susan Lindström, John Wells, and Norman Wilson's article, *Chasing Your Tailings* in the 1999 SCA Proceedings is an excellent example of archaeologists, historians, and mining engineers getting together to sort out what information can be gotten from tailings. Lindstrom, Wells, and Wilson argue that tailings should no longer be ignored. They also raise a key point that was a cornerstone of the current study, which is that it might be possible to reconstruct the order of the mining events on a site through an analysis of tailings, an idea that will be explored shortly.

The evaluation of mining sites and analysis of tailings piles for the Oroville Relicensing project was framed around three important questions:

1) Can mining technique be determined based on the shape of the cut and the nature of the tailings?

2) Can sites be relatively dated based on the type of technology used? and

3) Can mining events be reconstructed, and if so, does that say something about the mining operation as a whole?

These three questions can be addressed using two sites as case studies: the Spring Valley Gulch complex and the McCabe Creek complex.

Two Case Studies: Spring Valley Gulch and Mccabe Creek

Spring Valley Gulch (CA-BUT-1872/H)

Spring Valley Gulch is filled with mining sites dating to the 1860s-1870s. The site represents the remains of at least three long, narrow, small-scale placer operations, and should not be confused with the famous Spring Valley Hydraulic Mine nearby. The Spring Valley Gulch complex contains over a dozen loci of mining and the remains of miners' shacks, but this paper focuses on eight related loci.

The site was mapped using GPS data collected with a Trimble XRS Pro and total station data collected with a 5605 Servo total station. Each cut, channel, tailing pile, and stacked-stone wall was given a context number. The crew was asked not only to get basic dimensions, but also to try to determine the order of construction. In most cases we could: tailings from one mining event were often dumped into the finished channel of another. In other cases, long, deep channels cut across several shallower ones (see Figure 1). This is essentially the law of superimposition, except that it is horizontal stratigraphy instead of vertical.

The crew also noticed that the main water-supply ditch was systematically blown out at each locus, a phenomenon that Lindström et al. describe in their article as a potentially useful means for determining the order of mining events across the site (2000:60). The crew could link eight loci together by a single water system.

Not surprisingly, the lowest diggings were worked first; if the upper digging were mined first, the lower ones would be clogged with sediment, a constant problem on these kinds of sites. The miners mined their way up, locus to locus, until they reached their dam. The ditch had to have been built long enough to reach the lowest diggings, but be high enough in elevation to clear the highest diggings. This in turn suggests that the ditch, and the diggings, were conceived of as a whole

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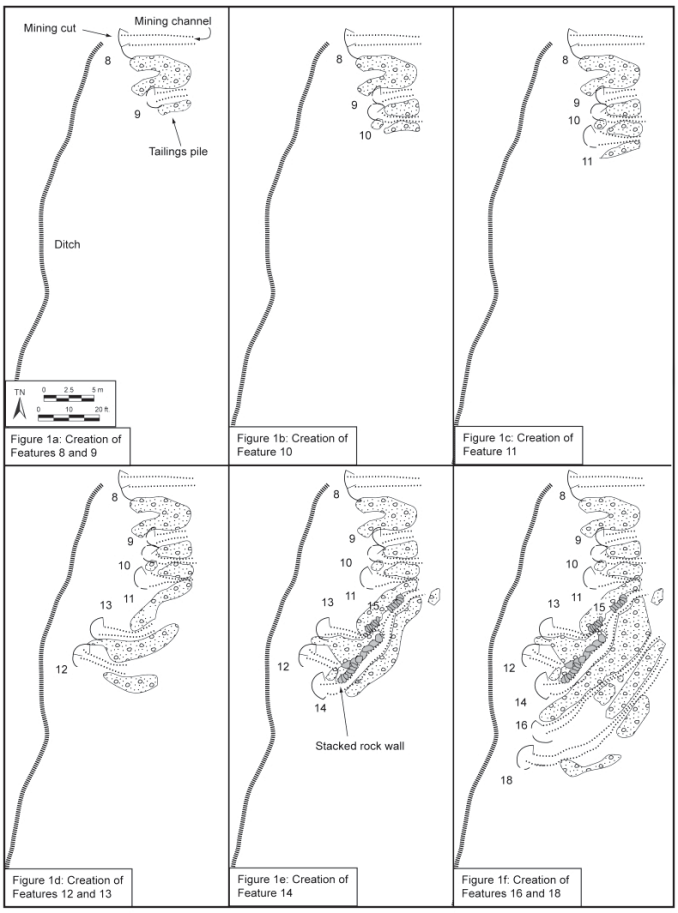

Figure 1: Development of a portion of Locus A, Spring Valley Gulch (CA-BUT-187/H). Prepared as part of the Oroville Hydroelectric Relicensing Project for the California Department of Water Resources. Anthropological Studies Center, Sonoma State University.

unit. To take out a claim of this size would have require a number of partners forming a company and filing as a group.

One of the ongoing problems of trying to associate mining claims to early gold miners is that it is difficult to pin down the location of someone's claim. They are often registered in relationship to some landscape feature such as the "Big Pine" or the "Falls," or to the claims of the individuals on either side of them. Interestingly, only one claim on Spring Valley Gulch is large enough to be our site: in the 1860s-1870s, a group of Portuguese miners who had formed the Bedrock Flume Company claimed water and mining rights for a 2,400-foot section of Spring Valley Gulch (Butte County 1860a, 1860b). Our eight loci, linked together, are nearly that large. By pinpointing this claim, we also pinpointed others on the creek whose location descriptions are given in relationship to the location of this one.

In addition, several unlooted artifact deposits and associated possible collapsed residences that are on the tops of these cuts match the 1860s-1870s dates on the claims. By using tailings, cuts, and ditches to reconstruct mining order, we were able to establish the size of the diggings which lead to a mining claim, then to individual miners, and finally to an associated context for the artifact deposits and the site as a whole.

Spring Valley Gulch also gave indications of mining techniques. At one point in the upper loci, the narrow sluice cuts transition into broad, arching hydraulic cuts. The tailings from the hydraulic events were dumped into the abandoned trenches of the sluices. The feature where the miners switched techniques can be pinpointed. Looking at the elevation data, it was determined that many of the mining channels were too steep (above 15%) to actually allow the gold to settle out in sluice channels. This in turn suggested that in the lower-elevation loci near the lake edge, the site must continue under water, as the above-water features were too steep to run a viable operation. On the higher-elevation areas, it was determined that the sluice boxes may have crossed the creek and dumped the finer sediments on the opposite bank, giving the boxes a longer run. A study of the tailings and channel elevation gave us insight into site structure, and even pointed to features that must exist underwater.

The McCabe Creek Complex (CA-BUT-362/H)

With 15 historic-period loci, this placer-mining complex is longer than Spring Valley Gulch and five times as wide. The McCabe Creek complex has the remains of at least seven different historic-period residences, all but one of which have material dating to the 1850s-1870s. The site is in the fluctuation zone of the reservoir, and in an area that was designated fish habitat, so it was never grubbed like many other sites in the region.

A remarkable aspect of this site is its historic context. There are over 500 pages of letters home from two of the miners who worked McCabe Creek beginning in 1854—Seth and Asa Smith, brothers from Maryland. Their correspondence continued for over a decade and was packed full of details—what food they bought, who they hung out with, how they constructed their cabins, what kinds of mining techniques they used, even where they stashed their gold—which, they are clear to point out, they removed in its entirety prior to leaving McCabe Creek. Even more intriguing is that half of the letters were written by one brother to the other after he returned home. The brothers remained business partners, and the brother who stayed in California sent home letters filled with minutia—where they were digging, what equipment they were using, repairs that they were doing to the house, how the money was being invested and spent, and general gossip on everyone in the drainage. The brother at home knew every place, and everyone, that the brother in the mines did.

In this sense it is a polar opposite from Spring Valley Gulch; not only is there a tight association going into the site, it is known, to the day—December 28th, 1856—when they fired-up their hydraulic monitor for the first time. With their mining techniques known and their claims associated with the site, there would seem to be little else to be gained.

Unfortunately, it still is not as clear as that. It is still difficult to tell which claim is which. There were at least two or three other miners

working the drainage at the same time who were sometimes partners, and roommates, of the Smith brothers. It was unclear which diggings, and which residences, belonged to particular miners. The sheer size of the site prevents an analysis of the tailings in the same detail during this phase as was conducted on Spring Valley Gulch. While it is hoped that these questions will be addressed more specifically in the data recovery phase, some interesting patterns have been noted.

Returning to the first of the three questions, namely, can a relative date for the site be established based on the type of technology used, the answer is, unfortunately, no. Unless one is focusing only on the Gold Rush proper, i.e. 1848 to about 1853, hydraulic mining is introduced very early-on, and the letters are explicit about how the miners would rotate between hydraulic mining, sluicing, panning, quartz mining, and back again, all the same miners using different techniques depending on availability of water, time of year, number of people around to help out, expected pay-off, condition of equipment, and, frankly, their mood and their health. Just because one is researching a small-scale hydraulic-mining operation, one should not assume a later date, just as one shouldn't assume an early one based on the presence of gold pans or riddle plates for long toms.

What did become apparent, however, was that the stacked-stone walls were very informative, in that they represented active work areas. Stacked stone meant that the miner was doing something right there, next to the rock, rather than just having a discard pile away from the diggings. The stone walls define negative space—in this case, mining channels and work areas. Within the McCabe site, small flats and offset rows of stacked rock on top of the tailings could be seen; these probably were platforms for monitors. They line both sides of the channel rather than just one side, and they periodically repeat throughout the course of the channel. This suggests that the miners may have been using both sides of the channel.

A difference in mining techniques between two loci can also be seen. Two of the loci have marked differences in the length, width, depth, and spacing of the mining channels. There is an abrupt break between the two loci where one pattern ends and another begins. The new pattern continues around one bend and throughout the next locus. It is believed that the new pattern does not represent an attempt to accommodate increased amounts of rock, but rather a more structured, and perhaps more efficient, method of small-scale sluicing and hydraulic mining. Using the shape of the channels, defined by the tailings, one might even be able to differentiate between two episodes of mining at the most substantial locus on the site (see Figure 2). Each of these loci is reminiscent of a fingerprint, representing the individual and unique decisions that a miner makes on a claim-by-claim basis regarding what equipment to use and what approach to take. One final observation that was made is that, as Lindström et al. (2000:61) predicted, portions of relic landscape were identifiable as survivors of the mining activity, and it should be no surprise that these relics contain a goodly number of prehistoric artifacts from the Maidu site that predates the mining. These relic landscape features also provided

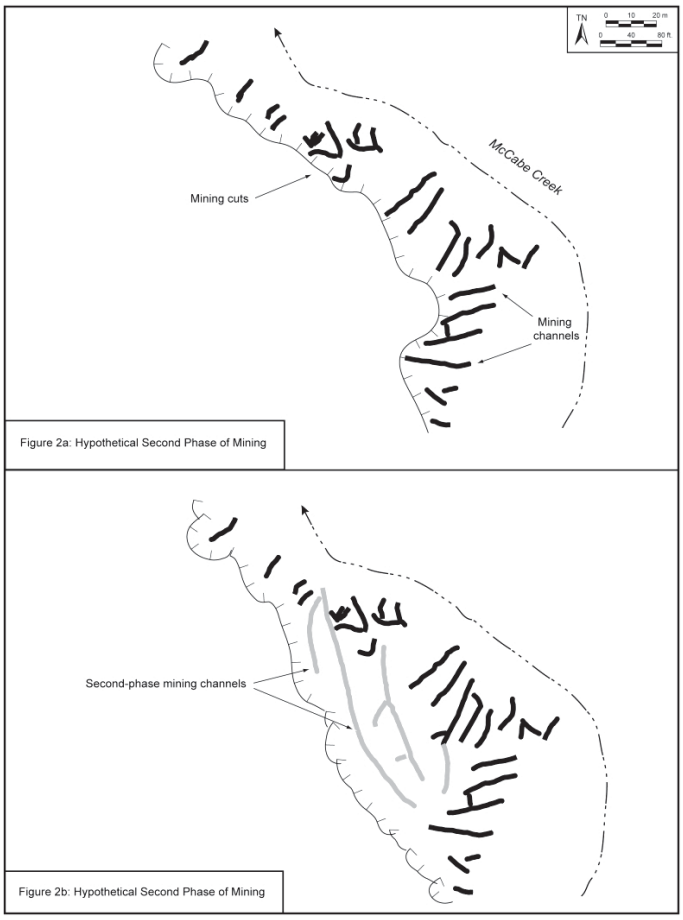

Figure 2. Hypothetical phased development of locus N, Mccabe Creek Complex (CA-BUT-36/H). Prepared as part of the Oroville Hydroelectric Relicensing Project for the California Department of Water Resources. Anthropological Studies Center, Sonoma State University.

an idea as to what the historic-period landscape looked like prior to mining.

Conclusion

In conclusion, answers to the three questions can be suggested from the field data:

1. Can mining technique be determined based on the shape of the cut and the nature of the tailings? The answer to that is, absolutely. There are clear differences between a hydraulic cut vs. a sluice cut, and the size and nature of the tailings indicate where the miners were working, how long their sluice boxes were, and if they might have been using hydraulic monitors.

2. Can sites be relatively dated based on the type of technology used? Unfortunately no, but tailings, ditches, and cuts can be used to relatively date the order of construction of features across a site.

3. Can mining events be reconstructed, and if so, does that say something about the mining operation as a whole? The answer to this is, yes, by analyzing the types of mining and the order of the features, one can recreate site structure, show the interactions between loci, even use the site characteristics to return to the claims and pinpoint an association.

It's not easy, but it is worthwhile, and if one was looking for "data-potential gold" in the tailings, it is there.

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