

Historical Overview: Copper and Chromite Mining in Northwestern Del Norte County, California

By
Thomas S. Keter
SolarArch.org

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Introduction

This contextual history of mining is focused on the prospecting, development, and production of copper and chromite in northwestern Del Norte County (Map 1). Historically, the three most important minerals that have been mined in Del Norte County are gold, copper, and chromite. As a result of numerous state mineral reports and county tax and property records there is a significant amount of historical data related to mining in Del Norte County. Portions of this overview are excerpted from the Smith River Watershed Assessment (WA) (Keter1995). [Appendix 1 of the Smith River WA consists of a database of over 100 mining claims in Del Norte County, including periods of activity, minerals that were mined, and USGS 7.5' maps displaying the mine locations.] The purpose of this historical overview is to provide cultural resources managers with the historical contextual data needed in order to make National Register Determination of Eligibility evaluations for the historical mining properties recorded in this area.

Although gold was the original impetus for miners coming to interior Del Norte County copper and chromite, at different times, have also been important economically to the county. Unlike the gold rush, the mining and production of copper and chromite were directly related to socio-economic conditions and events taking place at the national (and sometimes even global) level. Given the relatively small deposits of copper and chromite and the difficulty of profitably mining these minerals due to the fact that the deposits were so hard to access production has always been directly linked to demand and market conditions (i.e. price).

Gold (due to factors related to geology and deposition) was generally mined along riverine portions of the Middle and South Forks of the Smith River and a number of its tributaries, for example Myrtle Creek and Hurdy Gurdy Creek. Most gold mining areas were well away from the chromite and copper mines of the North Fork Smith River region that are the subject of this overview. There were also some gold mining operations at higher altitudes further south in Del Norte County where ditches were constructed to permit hydraulic gold mining operations at locations like Haines Flat and French Hill. Refer to the Smith WA (Keter 1995) for a more complete historical overview of gold mining in Del Norte County. Here, the discussion of gold mining is limited to its nexus with the development of interior northwest Del Norte County as it relates to the prospecting, production, and mining of copper and chromite.

Early Prospecting and Mining in Del Norte County

Historical development of Del Norte County was linked to the “gold fever” that was sweeping the nation after President Polk’s State of the Union speech to Congress in December of 1848 that included glowing reports concerning the discovery of gold in the Sierra Foothills at Sutter’s Mill. By the spring of 1849, Americans, as well as foreigners, were arriving by the thousands in California and heading to the gold fields. The initial discovery of gold was made along the American River in the Sierra Nevada Mountains east of Sacramento but this was followed closely by discoveries in the Trinity Mountains, along portions of the Klamath River near Happy Camp, and in the Yreka area. Thus, the first impetus to settle Crescent City (with its natural harbor) was in an effort to supply the mining camps located in the Yreka and Happy Camp areas of California as well as those located in southern Oregon. Gold was subsequently discovered in Del Norte County (at that time the area was part of Klamath County) along the Smith River in 1851. The discovery of gold in the mountains east of Crescent City spurred hundreds of miners to explore and stake mining claims in the 1850s at a number of locations including Myrtle Creek, Haines Flat, and French Hill.

The first settlement at Crescent Harbor was a shanty town of tents on the beach in 1852. By the spring of 1854 nearly 300 houses had been constructed and by the summer of that year, Crescent City had a population of 800 and its own weekly newspaper (first published on June 10, 1854). Initially, the principal impetus for growth, was as a supply center for the mines and a departure point for miners heading inland to the gold fields. As Doris Chase (1959:20) noted in her history of the region, “[i]t was the trails and people and the supplies that went over them that made Crescent City the most important seaport between San Francisco and Portland.”

Since Crescent City was the closest port along the coast connecting with the inland mines of northern California and southeastern Oregon, large numbers of miners passed through the city. During the summer of 1854, 39 steamers and nine sailing ships visited Crescent Bay bringing 4,000 tons of freight and 2,286 passengers (Chase 1959:25). While some of the freight was bound for Crescent City, most of it was destined for the inland mining areas as were many of the passengers. As a major supply center for the mines, the city had many businesses related to trade including flour mills, packing companies, and offices for some of the larger mines. By 1857, all of the ships that sailed along the coast advertised that they stopped in Crescent City.

It was recognized as early as 1854 that a wagon road for moving passengers and freight was needed to connect Crescent City with the mines in southern Oregon. Eventually, a company, the Crescent City Plank Road and Turnpike Company was organized. Capital was raised by local merchants and finally in 1857 construction began. Stage stops were built every ten miles or so. The road (today portions of County Road 308 and County Road 305, FS site # 05-10-51-02) passed through Low Divide. The first stage arrived in Crescent City from Jacksonville on May 19, 1858. This road, the "Pioneer Road" or "wagon road to Jacksonville," was relatively primitive with some portions covered with planks. It was a toll road and a two horse team paid

\$5, a four horse team \$8, and a six horse team \$10 to use the road. The stages could cross the North Fork of the Smith River when it was low, but there was a ferry which was used to provide passage across the river when it ran high. During the heyday of the mule trains traversing the trails of the Smith River Basin, thousands of men and tons of supplies were transported to the mining camps. One issue of the *Crescent City Herald* noted that 500 mules were packed out to the mines in just one week (Chase 1959:32).

Copper Mining in Del Norte County

In the first few years placer gold mining was quite profitable in the interior of Del Norte County. While a day's wages varied considerably, many of the men, working independently, could make as much as 20 to 40 dollar a day panning (Chase 1959:29). Men who worked for someone else might make five to fifteen dollars a day. As is often the case, however, some of the most profitable ventures were those related to supplying the miners with needed supplies--including tools, food, and liquor--all brought in via mule from Crescent City. The height of the gold mining boom in Del Norte County lasted from about 1852 to 1858. In 1858, gold was discovered along the Fraser River in British Columbia and most of the miners left Del Norte County for the new "diggings." This had a serious economic effect on Crescent City and mining activity declined precipitously in Del Norte County. The Fraser River gold rush was short lived and many of the miners returned to the county within a year.

During the 1850s while gold was still drawing miners into the hills and canyons of Del Norte County, some of the men noticed that there were also copper deposits at a number of locations. It was not until March of 1860, however, that several miners took some specimens in to be assayed by D. S. Sartwell and Dr. Henry Smith of Crescent City. The report indicated that the ore contained a large percentage of copper. With the advent of this news, just as the placer gold was playing out, a new rush began to establish mining claims on the rich copper deposits that could be found scattered throughout the interior region (Bledsoe 1881:66).

Chromite, copper, and other minerals (including nickel, manganese, and cobalt) are found in interior Del Norte County in several broad regions based on the presence of dunite or serpentine. Copper is found within the same bands of peridotite as chromite (see Wells 1946:Map). Generally, copper deposits occur as veins that widen and narrow in lenses along the strike and dip of peridotite deposits and are enclosed in serpentine (Jenkins 1952:276). Not all outcrops or deposits of dunite or serpentine have pods of chromite. Generally, chromite lenses or pods are associated with shear zones and formations where dunite has been altered to serpentine. There are two different type of deposits: pod and disseminated. Pod deposits are "clean ore" that can be mined, sorted, and shipped as lump ore. Thus, it is relatively easy to mine with little processing work involved. Nearly all of the chrome deposits in Del Norte County are of the pod type (Albers 1966:52). Historically, Del Norte County has been the largest producer of lump chromite in the United States (Jenkins 1952:268). Wells (1946) listed seventy-one chromite deposits that had been worked within Del Norte County. Total production for the region through 1952 is recorded as 70,000 long tons (Jenkins 1952:268).

The Discovery of Copper

Although prospectors had discovered copper ore in the Low Divide area (Map 1) as early as 1853 (Morris and Maniery 2004:19) most of the miners in Del Norte County were after gold. By the summer of 1860, however, the inland region of Del Norte County saw an influx of miners from as far away as San Francisco in search of copper ore. A company of Cornish miners proclaimed the copper ore at Low Divide the richest they had ever seen. The streets of Crescent City were almost deserted as men headed for the hills and not a horse or mule could be rented from McClelland's Livery Stable at any price (Bearss 1969:193). The first copper mine to open was located along the road to Oregon about one-half mile east of the Smith River and Black's Ferry (Randall, Map:1863). Several others were also located in that vicinity. Other prospects were scattered throughout the region. Most of the companies were organized during the summer of 1860. Unlike gold mining, where the lack of capital was not a problem since a man with a shovel and a pan could actually strike it rich if he was lucky, copper mining took a substantial investment of capital. For that reason many of the "companies" that were organized at that time were by speculators who never mined an ounce of copper.

Copper Production During the Civil War Era

In the spring of 1860, copper was discovered at Low Divide (Bledsoe 1881:140). On May 26, 1860 a meeting of miners at Low Divide established some mining laws for the area. These laws included the size of claims, the number of claims a person or company could hold, and the cost of filing claims. Also noteworthy was the size of the district: four miles square with Low Divide at the center (figure 1). Most of the early copper produced at Low Divide was mined by constructing adits following the copper veins located on the east side of north flowing Copper Creek a tributary of Rowdy Creek. The 1885 report *The Copper Resources of California* (Aubury 1908:136) indicates that:

The main vein follows a ridge on the east side of Copper Creek, course north and south, dip east 45 to 60°; with 4 to 6 feet[.] with considerable enlargement in places. Ore. fine grained sulphides, pyrrhotite, chalcocite, bornite, chalcopyrite, blackish green in appearance and generally high grade. *On this vein are located the principal mines* [emphasis added].

With the beginning of the Civil War, copper was in great demand by the federal government and the mines of Del Norte County contributed much copper to the union war effort. It was during the Civil War era that copper production reached its historical peak in Del Norte County. Copper was designated by the federal government a strategic mineral as it was needed in the manufacture of the casings of ammunition for the Union Army (Del Norte County Historical Society Files). For that reason, a subsidy was placed on copper making it very profitable to produce. The copper was shipped from Crescent City around "the Horn" to smelters in Swansea (a port city in Wales) and Germany. The refined ore was then shipped to locations in the northern U.S.

In 1862, at Low Divide, a small several acre flat lying in a saddle along the ridge at the head of the divide between north flowing Copper Creek and south flowing Hardscrabble Creek, 60 acres were surveyed by county surveyor R.B. Randal for the town of Altaville (Randal, Map:1863). The Alta California Mine at Low Divide was one of the first productive copper mines in California. The incline shaft to the copper deposit was 455' deep and the shaft was served by a steam hoist and compressor (Figure 2) (Jenkins 1952).

Another major mining operation within the Low Divide Mining District was the Superior Copper Mine (Smith River WA, Appendix 1, USGS High Divide Map: #90). This mine also, known as the Atlantic Pacific Mine, dates from the early 1860s. A State Mineral Report for 1904 (Aubury 1904:13-14) report contains the following information on the Superior Mine:

Superior Copper Mine....covers the Mammoth group of fourteen claims which join the Union mine on the north. The character of the vein is the same as that of the Salt Lake-California mine.

There are three tunnels on this property: No. 1, a crosscut, cutting the west vein ; No. 2 is 150 feet below No. 1, and is also a crosscut, 700 feet long. At a distance of 150 feet from the portal, a 4-foot vein of low-grade ore was cut which averaged about \$20 per ton in copper, gold and silver. This tunnel failed to cut the main vein. A distance of 250 feet above No. 1 tunnel, a third tunnel was run a distance of 500 feet, and cut a vein which was 2 feet wide. The vein pinched out, however, after some ore was shipped from it. The mine has been shut down for some years.

Copper mining operations required a substantial financial investment in equipment and workers. During the Civil War era many of the copper miners working at Low Divide were Welsh and were experienced in hard rock mining. Prior to this time Cornish miners had played an important role mining copper at Copperopolis in the Sierra Nevada. Chinese miners and labors (they often constructed roads and ditches used to convey water for hydraulic gold mining) were also present at Altaville. A Chinese ore cart dating from the 1870s is on display at the Del Norte County Historical Museum in Crescent City (Williams, Maniery, George 1982:26).

Altaville, typical of mining boomtowns at that time, quickly grew to hundreds of residents--one estimate by a local paper was that the population peaked at around 1,500 ([*Del Norte Triplicate*, June 27, 1981). Newspapers sent reporters from Sacramento and the San Francisco Bay area who filed glowing reports. The *Alta California*, for example, described the copper as "some of the finest specimens ever recovered." By 1863, Altaville boasted two hotels, several saloons, company houses, and a town square. There were also a number of businesses including a blacksmith shop, a general mercantile store, and cabins for miners.

In December 1863, reporter William H. Brewer visited Altaville and wrote in his journal, “a filthier, dirtier, nastier, noisier place I have not struck in the state” (Brewer 1966:486). At the time there were about 25 companies at work mining or prospecting in the area (Williams et al 1982:Map 3).

Between 1860 and 1863, 2,000 tons of high grade ore were shipped annually from the Alta and Union mines. With the high cost of labor and transportation, however, copper mining was not the profitable venture that had been expected. Peak production years were from 1863 to 1865. With the end of the Civil War and the end of a subsidy on copper the market collapsed and the boom at Altaville was over and Altaville began a steady decline.

By 1870 Altaville was nearly abandoned. In the county election of 1872, there were only eight registered voters in Altaville. Traffic on the road to Jacksonville had nearly disappeared and the Crescent City Plank and Turnpike Company allowed it to deteriorate. A new road (the current county road 308), the Wimer Road, was constructed from Altaville down Rowdy Creek drainage to Smith River Corners (Williams, Maniery, George 1982:12). In 1881, A.J. Bledsoe a businessman and Del Norte County promoter published a book the *History of Del Norte County California , with a Business Directory and Traveler’s Guide* and wrote about a visit to the old town site of Altaville(1881:97):

When copper and chrome was first discovered at Altaville and the mines worked, the little town was full of life and activity. Now it is deserted, and but few of the buildings remain. Black mouths of tunnels appear in the hillsides, and heaps of blueish [sic] colored rock show the locality of the mines...numerous ravines and hill-sides bear witness to the fact that prospecting was once extensively carried on here.

Once seen, Altaville clings tenaciously to the memory. It haunts one like a dream...

By the beginning of the twentieth century the only remaining resident of Altaville was Frank Zaar who was both caretaker and prospector. He continued efforts to make a financial success out of mining copper ore. The State Mineralogist Report (Aubury 1904:13-14) report summarizes the prospecting by Frank Zaar and notes that no actual production was taking place.

Frank Zaar Copper Mine. This consists of four claims held by location, the names being " Standard," formerly called Old Hanscom; "Nome," formerly the Copper Queen; "Discovery," formerly Lady Bell; and "A Beauty," formerly Copper Hill. The gossan [decomposed rock or vein material that results from oxidized pyrites] is prominent on these claims, 4 feet wide with serpentine walls. There is a crosscut tunnel on the Standard 500 feet long, which cuts a 4-foot vein carrying values in copper, gold and silver. From this tunnel there is a drift running

southwest 50 feet and a drift northwest 50 feet long, also a winze 60 feet deep. Six hundred feet below No. 1 tunnel, a second crosscut tunnel was run 500 feet to cut the vein deeper but failed to do so. On the "Nome" there is a 28-foot vertical shaft on the vein and an open cut on an iron dike which is 18 feet wide. On "Discovery" a 50-foot vertical shaft was sunk. This is now caved. A crosscut tunnel 400-feet long failed to cut the vein. On "A Beauty" there is a 40-foot vertical shaft sunk on a 6-foot vein which assays 10% copper. *Assessment work only is being done on these claims.* [Emphasis added]

Known mines within the Low Divide/Altaville area are listed in the Smith WA Appendix 1 (Keter 1995). Many of the claims in the Low Divide area have changed ownership and names over the last century-and-a-half. Refer to Cultural Resources Inventory Report 05-10-125 and Morris and Maniery 2004, for a list of mines that have operated in the Low Divide Mining District.

[The Altaville town site has been formally recorded (CA-DNO-239H, FS# 05-10-51-152) and the Low Divide Mining District has undergone extensive archaeological inventories (refer to Cultural Resources Inventory Report 05-10-125, Williams, Maniery, and George 1982). As a result, numerous sites related to mining operations have been recorded throughout the entire District. Over a period of three summers (1998-2000) archaeological excavations at the town site of Altaville (now abandoned with no standing buildings) were undertaken by Six Rivers cultural resources managers in partnership with archaeologists from Par Environmental Services and over 350 volunteers. The excavation report this project is on file in the Six Rivers National Forest Cultural Resources Library (Morris and Maniery 2004).]

Chromite Mining and the Next Mining Boom

The third most important mineral to be mined in Del Norte County after gold and copper was chromite. Like copper, chromite mining in Del Norte County has followed a boom-and-bust cycle. Prospecting and mineral production has coincided with national (and even global) events effecting the economy, such as war, depression, or the availability of inexpensive overseas sources. Chromite deposits are found in numerous locations in Del Norte County most often in conjunction with copper deposits. [Refer to Smith River WA Appendix 1 for a complete listing of chromite mines and prospects in Del Norte County.]

Prospecting for chromite is limited to those areas which contain peridotite outcrops and within these areas to locations that have deposits of dunite. Because of poor soils these areas are generally not heavily forested and often have unique endemic species of plants. Bledsoe notes that: "Attention was first directed to the chrome ores in 1868; claims were located, opened and worked in 1869" (1881:141). From 1869 to 1873 the Tyson Mining Company at its Mountain View Mine at High Divide (located directly to the west of Low Divide) produced a small amount of chromite from its mine.

By 1868, following the collapse in copper prices, chromite replaced copper as the most important mineral mined in Del Norte County. After the boom days of the Civil War era copper mining was never again a successful commercial venture in Del Norte County, although some prospecting and occasional efforts to mine commercially were attempted periodically. For example, the *State Mineralogists Report for 1890-1892* (Watt 1892:197) noted that at the time the report was issued there were no copper mines active within the county. In 1908, according to state mining records (Aubury 1908:136):

...only assessment work has been done on Diamond Creek [location of the Cleopatra Mine], but a number of prospects are being developed on Patrick and Shelly Creek (Monumental Post Office) along the stage road from Grant's Pass to Crescent City. Of greater importance, however, is the resumption of work [presumably by Frank Zaar) in the Low Divide district. [*W*]hich produced all of the ore shipped in former years to Swansea or elsewhere. [Emphasis added.]

According to Bledsoe between 1869 and 1873 about 1,500 to 2,000 tons of chromite ore were shipped annually via Crescent City around Cape Horn by the Tyson Mining Company to Baltimore. In subsequent years production nearly ceased and Bledsoe (1881:142) notes that from 1873 to 1881--the year he published his *Business Directory*-- "shipments have been irregular and light, the amount annually taken out averaging about 600 tons." Ever the optimist and booster of Del Norte County, Bledsoe writes that the development of the copper and chromite deposits remained a vast untapped source of wealth (1881:167):

In the vicinity of Low Divide, Nature has scattered her mineral wealth with a lavish hand. Every hill is a mine of treasure, awaiting the practical miner with his improved machinery and his indomitable energy and perseverance.....All of the copper, chrome and iron mines in the county with the exception of the property owned by Tyson Company...could be purchased at a reasonable figure, and there is no better opportunity for the investment of a large amount of capital in the mining regions of the Pacific Coast.

Despite Bledsoe's glowing report, virtually no chromite production ensued. Mining records indicate that the Copper Creek Mine (Smith River WA Appendix 1: USGS High Divide map area #4) in the northern portion of the Low Divide Mining District was patented in 1886 by the Tyson Mining Company. Although some chromite mining activity took place here and 700 tons of ore were mined, none of the ore was shipped--either due to low chromite prices or the inaccessibility of the mine at that time (Wells et al 1946:21). Several other mines, for example directly to the east at Hole-in-the-Ground and in the Stone Coral area, were also "worked" during this era although there was little in the way of actual production. Also discouraging chromite production in Del Norte County, was the fact that several locations in the state (especially San Luis Obispo County) not only have more extensive deposits but they are more accessible.

Then in 1894, a tariff protecting chromite production and creating artificially high prices was removed. The market collapsed as shipments of chromite from Greece and Asia Minor

increased. The result was a total end to chromite production in Del Norte County since these mines were in remote, rugged terrain making shipment of ore (not only the distance and rough roads to Crescent City but the ship voyage around Cape Horn) too expensive to compete with foreign markets.

Early 20th Century Mining and the Establishment of the Forest Reserves

In February of 1905, 63 million acres of federal land (including public domain forested lands in California) were transferred to the Department of Agriculture from the Department of Interior. In April and May of that year, the Trinity and Klamath Forest Reserves were created and the Bureau of Forestry was renamed the Forest Service. In early 1907, nearly all public domain lands within the Smith River Basin (155,580 acres) were withdrawn by the Acting Commissioner of the Federal Land Office for possible future addition to the Klamath National Forest. On August 28, 1907 District Forester Olmstead approved the addition of 138,240 acres lying within the Smith River Basin to the Klamath National Forest.

Miners working within the Smith River basin at the time had supported the designation of public lands as Forest Reserves in order to prevent timber interests from acquiring the lands under the Timber and Stone Act and then closing them to mining. Del Norte County officials, led by John L. Childs, had opposed the action fearing a loss of the potential tax base these lands could provide the county. The designation of nearly all public domain lands in eastern Del Norte County by the federal government as National Forest lands marked the beginning of a significant change in the intensity of human land-use activities within the Smith River Basin. Although some activities such as mining continued, a more intensive development of the interior of Del Norte County began to take place--including trails, roads, guard stations, fire lookouts, telephone lines, and for the first time, recreational facilities.

Over the next half-century the boom-and-bust cycle of chromite production in Del Norte County can be traced through the various annual reports and bulletins issued by the California State Mining Bureau (many of these reports are available on the internet). The active period for most of the chromite mines in California during this era is linked to the two World Wars and the Korean War. In times of war, when inexpensive foreign supplies of chromite were not available and there was an increased demand for the metal, the price increased and mining was profitable. One of the most important uses of chromite is in the production of hardened steel alloys. For this reason, the use of chromite increased dramatically during the 20th Century--especially during times of war--when hardened steel was in demand for the manufacture of tanks, armor piercing projectiles, and armor plating (Personal communication with Lex Palmer, mining technology historian).

In 1915, just prior to the beginning of World War I, the State Mineralogist issued a report *Mines and Mineral Resources Del Norte County Humboldt County Mendocino County* (Lowell 1915) on the current status of mineral production. The report discussed in detail mineral resources,

including chromite, of the respective counties. The section of the report concerning Del Norte County (Lowell 1915:11-12) is summarized (in the original) below:

Chrome iron is fairly well represented in Del Norte County. There are several croppings in the Rattlesnake Mountains extending from the Bald Hills to the Klamath River. The deposits are in serpentine and are not being developed at this time. The two principal chrome iron deposits worked so far in the county are owned by the Tyson Mining Company, of Baltimore, Md.

French Hill Mines [located south of Gasquet Flat]. These mines consist of two patented claims situated on French Hill, in Sees. 5 and 6, T. 16 N., R. 2 E., H. M., at an elevation of 1750 feet. The chromite is in the form of kidneys in serpentine. The deposit strikes northwest-southeast, and dips 60° NE. It is 8 feet thick at the point where the development has been done. One hundred fifty tons of ore are on the dump, and about 200 tons were shipped to Swansea some years ago and proclaimed excellent.

There is a wagon road 3 miles in length from the county road [at Gasquet Flat] to the property. The mine is owned by the Tyson Mining Company, of Baltimore, Md. It has not been worked for some years.

Low Divide Mines. These mines, consisting of three patented claims, are situated on Copper Creek, 1 mile from the old town of Alta, in Secs. 33, 34, and 35, T. 18 N., R. 1 E., and about 8 miles east of Smith River Corners, at an altitude of 1450 feet. The chromite is in serpentine. An open cut exposes the vein, which is 14 feet wide. There are about 500 tons of ore on the dump. This property is also owned by the Tyson Mining Company, of Baltimore, Md., *but is not working now*. [Emphasis added]

With the entry of the United States into World War I, as the *USGS Press Bulletin* for January 17, 1918, entitled *Chromite on the Firing Line* made clear, there was a need for chromite to support the war effort: "At present we are facing a deficit in the supply of chromite and we should spare no effort to increase the supply of this country as well as that of adjacent countries" (*in SMR* 1922:26). As a result of the war demand increased and financial incentives made working the chromite deposits in Del Norte County profitable again. The U.S. Government issued a plea urging prospectors and miners to produce chromite for the war effort as overseas sources were lost (Wells et al 1946:17). As chromite was critically needed for use in armament production a government subsidy again made chromite mining profitable. During World War I chromite ore from Del Norte County was shipped to a purchasing depot ran by the Metals Reserve Company in Grants Pass.

At this time, many of the prospectors who had been searching for gold in Del Norte County began looking for deposits of chromite. In some places, chromite outcrops projected above the ground. For example, at High Mountain Plateau (location of the Diamond Creek Mining District

and the Cleopatra Mine), there were massive chromite outcrops standing 6 feet above the ground. Mining began there almost immediately and also at Low Divide, High Divide and a number of other locations. Beginning in 1916 over the next 18 months until the Armistice was signed in 1918, over 50 chromium deposits were worked in Del Norte County.

Within the Low Divide Mining District production began in 1918. A road was constructed in order to provide access to the old Copper Creek Mine. The road was built by the American Exploration and Construction Company of Portland for R.D. Adams and C.S. Maltby owners of the Humboldt Bank Building in San Francisco (California State Mining Bureau field report for June 26, 1917) who had subleased the mine from the Tyson Mining Company (State Mining Bureau Report 1917, filed by E. Huguenin). This road as of 1982, when it was recorded as a cultural resources feature, was still in use (Site # 05-10-51-168).

With the end of World War I, and the renewed availability of a cheap foreign supply, chromite production again came to an end in Del Norte County (Williams, Maniery, and George 1982:12). The market for chromite production collapsed, literally, overnight. The California State Mining Bureau report *A Review of Mining for 1919* (California Mining Bureau 1920:11) notes that within the state of California:

...chrome mining became an important industry...during the war, as many deposits were developed in the serpentine areas of Del Norte, Shasta, Siskiyou, Tehama, and Trinity counties. The sudden collapse of the market last year put an abrupt end to it. Many of hundreds of tons of chrome ore were hauled to points along the railroad in both Shasta and Siskiyou counties just before the market broke, so it was not shipped...

Chrome mining...has nearly ceased, and from January 1 to July 1, 1919, only two properties were under operation in San Luis Obispo. These two properties have recently ceased operations. Owing to the lack of demand and to the low prices offered for chromite, the outlook is not very favorable for any activity in this field.

Following the war chromite production in Del Norte County declined to almost nothing for the period 1919 to 1935. The Report of the State Mineralogist for 1925 (pp.329) comments on the boom and bust cycle of mining in Del Norte County.

The vicissitudes of mining [in Del Norte county] are vividly brought to mind by a visit to the Low Divide District, now deserted except for one resident, Frank Zaar), and it is difficult to avoid 'romanticizing' when one realizes that over the same road that 5-ton auto trucks transported chrome ore in 1917-1918 "to save democracy," wagon-loads of high grade copper ore were being hauled out during the Civil War in 1863-64 bound for Swansea and Germany. The once lively copper camp at Altaville, with several hundred inhabitants and some substantial buildings, has completely disappeared. But the mines are still there, and the recent abrupt ending of chrome mining and the cessation of copper mining at an

earlier day, have this basis in common; neither operation ceased on account of the mines being worked out. Economic conditions alone have ended mining in the district for the present.

Whenever nearby smelters are available, better transportation facilities are obtained, cheaper methods of recovery developed, or the price of copper advances sufficiently, the copper mines will again become active....

During the 1920s and 1930s, as a result of the low price for chromite there was little mining activity in Del Norte County related to chromite, and the 1927 *Annual Report for the State of California* states that there was no chromite production within the entire state of California for 1926 (*Bulletin* 100:1927). During this period in the Low Divide/Altaville area the Forest Service issued some (summer) grazing permits to local residents and a telephone line was strung from Gasquet to Low Divide and on to the fire lookout at Stone Coral. Frank Zaar, a local miner, served as caretaker at Altaville from the 1920s until his death in the mid-1930s. He had a house and shed on the Altaville parcel. He also reopened some of the old mines in the area. In 1926, the Union Mines were acquired by a group of investors from Crescent City. A cookhouse was built at Altaville when the mines reopened. This venture was short-lived and later the cookhouse was dismantled for lumber (Williams, Maniery, George: 1982:14).

Mining for chromite in Del Norte County began again when Germany invaded France and it became likely that the United States would soon be going to war causing the price of chromite ore to rise precipitously. After the start of World War II, chromite was classified by the government as a "strategic material" needed for the war effort and many of the old chromite mines in Del Norte County were reopened. During this period of activity (1940-1945) most of the chromium produced came from previously worked mines, for example, the Copper Creek and Mountain View mines at Low Divide were again reopened. The Copper Creek Mine was also at different times called the Low Divide or Rowdy Creek Mine. It had been patented in 1886 as Mineral Lot 39. Operations ceased at the Copper Creek Mine in 1943 when C.A. Gillis was fatally injured in a rock fall in the underground workings (Wells 1946:21, Jenkins 1952: 27) and no further production took place.

The Cleopatra Mine located in the Diamond Creek Mining District was also reopened and production of chromite began again in 1942. At that time the mine had been inactive for years (probably since World War I) and all of the buildings on the site had collapsed (Jenkins 1951:270). The mine proved profitable since the chromite was being sent east via the Wimer Road to the federal government's Strategic Metals Reserve center in Grants Pass making the trip over rough mountain roads to the collection point about fifteen miles shorter than the chromite ore mined at Low Divide.

Some new prospecting in Del Norte County was also undertaken and over 20 new deposits were located, although they accounted for only about five percent of the chromium produced at this time (Wells et al 1946:17). The *Division of Mines Bulletin* (Wells et al 1946) discussion on chromite mining for 1946 indicates that as of 1944, seventy-one deposits of chromite had been

located and worked within Del Norte County.

Production of chromite in Del Norte County again ceased with the end of World War II when the market collapsed. In the early 1950s, with the start of the Korean War new prospecting activity again occurred in the Low Divide area. Bulldozers cut into hillsides prospecting for chromite and a cabin housing several miners was built on the old Altaville site and four shafts were opened up near the town. There was however, little in the way of actual production during this brief period and with the end of the Korean War, mining activity again ceased (Williams, Maniery, George 1982:14).

Finally, in the late 1970s and early 1980s California Nickel Corporation bought up many of the mining claims in the Low Divide area and the private parcel centered on Altaville. They spent a significant amount of time and capital prospecting in the region centered on Low Divide. Eventually they halted all prospecting work. Today they still own the private parcel and maintain active mining claims but no production work ever took place.

Additional Information Concerning Mining Districts and Mines in Northwestern Del Norte County

This section summarizes additional relevant historical data related to several of the mines located within the study area not included in the above Historical Overview (refer to Map 1).

Diamond Creek Mining District (Map 1)

Located about 15 miles east of Low Divide by a rough and steep wagon road (the County Road 305 is still rough and steep today) the Diamond Creek Mining District was the site of some minor copper production during the Civil War and later a significant amount of chromite production during World War I and World War II. The District is centered on the High Plateau Mountain region just to the east of the North Fork Smith River and less than a mile south of the California/Oregon state line.

The occurrence of copper and chromite within the Diamond Creek Mining District were known by 1863 (Randal 1863:Map). Records indicate that the property was first located (a mining claim was filed) at that time as the Crystal, Crukshank, and Diamond claim groups and some minor production was reported. The 1863 *Map of the Copper Region of Del Norte County* (Randall 1863) displays the copper ore outcrop belts extending in a generally north to south orientation for the Smith River, Low Divide, and Diamond Creek regions. The map also displays the various mining claims and ownership parcels within the three mining districts. The map shows that at that time there were four copper claims filed for the Diamond Creek Mining District; the Pearl, Grulkshank, Crystal, and Diamond mining claims (Randal 1863:Map). There was some minor copper production, however, as noted earlier, the Diamond Creek Mining District is about fifteen more rugged mountainous miles from Crescent City via the Wimer Road than Low Divide.

The High Plateau-Diamond Creek Mining District produced what is considered the highest grade chromite ore to have ever been mined in Del Norte County and was second only to French Hill (located to the south of Gasquet Flat) in the amount of ore produced (Wells et al 1946:32). There were numerous mines in this area and as elsewhere the highest periods of activity in the area were during the World Wars. In addition, during the depression era, some minor gold prospecting and mining took place in this area..

Prior to World War I it appears that there had been no substantial efforts to mine chromite at this location. The *State Mineralogist Report 1904* provides a brief description of the newly active Cleopatra mining operations (Aubury 1904:14):

DIAMOND CREEK DISTRICT.

Cleopatra Copper Claims. These claims are owned by James D. Lacey. There were formerly twenty-five claims held by location and known as the Dietrick group. Lacey lapsed in assessment work [this would include the Cleopatra Mine] on all of the claims except one, which he retains. The claim is in T. 18 N., R. 2 E., H. M., at an altitude of 2600 feet, and is close to the California-Oregon line.

The claim was located in 1894, and is a contact vein with serpentine hanging and porphyry footwall. The strike is north and south and the dip 45° E. A 100-foot crosscut tunnel with a 40-foot north drift and a south drift of 80 feet. No. 2 crosscut tunnel is 180 feet long, and No. 3 crosscut tunnel is 130 feet long but did not cut the vein. *About 200 tons of ore are on the dump but none has been shipped. Work ceased in 1911.* [Emphasis Added]

The 1908 *State Mineralogist Report* includes the following list of mining claims within the Diamond Creek Mining District (Aubury 1908:135). [Quoted from the original.]

DIAMOND CREEK DISTRICT.

Bear's Nest Group.—Eight claims on west side of the North Fork of Smith River, near the Oregon and California state line; owned by Isaac Dietrick, of Smith River, Malone Bros., Mr. McNamara et al. Developed by a long tunnel and open cuts ; ore forming a lode 9 feet in thickness and consisting of pyrrhotite and other sulphides, with some gold and silver.

Five Diamonds Group.—Five claims, situated on Diamond Creek; owned by C. AV. Baker, of Medford, Oregon. Harvey Colson et al.

Keystone Group.—Two claims situated on the North Fork of Smith River, near the State line; owned by Isaac Dietrick. Developed by short tunnels and open cuts. The formation is serpentine. The ores are copper glance, red and black oxides, carbonates and native copper. Five tons of ore which was shipped to a reduction works had a reported value of 62 per cent of copper. Magnetic iron also appears in the claims. [This would include the location of the Cleopatra Mine.]

McKee Claims.—Three or more claims situated near the mouth of Diamond Creek on the North Fork of Smith River; owned by Simon McKee, Smith River.

Forest Service records (on file Six Rivers National Forest Engineering) tracing the ownership and operations concerning the Cleopatra Mining Claim are summarized below.

In 1902, the area was relocated by the Cleopatra Mining Company and surveyed for patent in 1906. By 1908 there had been a small amount of production (Hershey 1980, p.429). The property was relocated by the Perfect Day group in 1957, and the Copper Ore group and Edna groups in 1971. *Bulldozer work during this period obliterated older workings* and reworked surface exposures on mineralized structures. In 1982, the present Owners, D Kartes, J. Plaskett, both of Azalea, Oregon, located Cleopatra Nos. 1-15. Activity since 1982 consist[s] of geologic evaluations by Molycorp Inc. and Ronald Parker, consulting geologist. The claims [are active] are listed in the Bureau of Land Management claim recordation file as serial number 11426-114440. [Emphasis added.]

In 1908 according to state mining records (Bulletin 50, 1908:136):

...only assessment work has been done on Diamond Creek, but a number of prospects are being developed on Patrick and Shelly Creek (Monumental Post Office) along the stage road from Grant's Pass to Crescent City. Of greater importance, however, is the resumption of work [presumably by Frank Zaar) in the Low Divide district. [*W]hich produced all of the ore shipped in former years to Swansea or elsewhere* [emphasis added].

Aurora Mine (Map 1)

There was little historical data that could be located on the Aurora Mine. Several mines in Del Norte County have gone by that name. The following information is contained in the *13th Annual Report of the State Mineralogist* (1896:58) (quoted from the original):

Aurora Mine--This lies E. of Alta, at 2,050' altitude, and is a new location on the old Copper Hill property. The country rock is gray serpentine. The new shaft is 70' deep and shows a vein of rich sulphurets of copper and iron 6' thick. It courses N.E. and S.W., and tips at 45°. The hillside below the croppings of the vein is

littered with ore rich in oxide of copper, and said to assay 40% copper. Idle. D. R. Miller of Crescent City, owner.

Aurora Extension Mine.-- It lies N.E. of the Aurora at 2,100' elevation, and is also a new location on Copper Hill property. Some shallow surface work exposes a 6' vein, carrying carbonate and black oxide of copper, Idle. A.B. Townsend of Crescent City, owner.

It appears despite the lack of information a significant amount of chromite mining took place in the general vicinity and possibly some minor copper mining during the Civil War era. During the late 1970s and early 1980s Cal Nickel Corporation undertook a significant amount of prospecting in this area. A number of historic sites related to mining were recorded at that time (CA-DNO-240H, 241H, and 242H). During this period as the site records note-- "bottle hunting has occurred" --and as a result of Cal Nickel operations several areas were undergoing road construction and prospecting (earth disturbing) activities in the general vicinity (CA-DNO-241H).

Del Norte Mine (Map 1)

There were only a few references identified that referred to the Del Norte Mine. The 1896 Report of State Mineralogist (Vol. 13:232) contains the following reference (quoted from the original):

Occidental Mine.-- It lies 10 miles E. of Smith River P.O., and S. of the Alta Mine, at 1,440' to 1,650' elevation. The property was relocated in 1895, and embraces the following claims: Lookout, Lookout Extension, Pride of Del Norte, and Pride of the West. The country rock is serpentine. The old workings, which are quite extensive have caved. The present owners were engaged in cleaning out the shafts and drifts, and retimbering them where necessary. The vein courses N. and S., and dips 30° to 80°E. It is from 4' to 12' wide, and carries red and black oxides near the surface, which change to pyrite, tetrahedrite, and metallic copper below. John Murray et al., of Crescent City owners.

The mine is also mentioned in the 1908 state report (Aubury 1908: 139): "Del Norte Group.-- Two Claims one mile north of Adams station. Smith River owned by Mary Adams: good ore found consisting of sulphids with some magnetic iron."

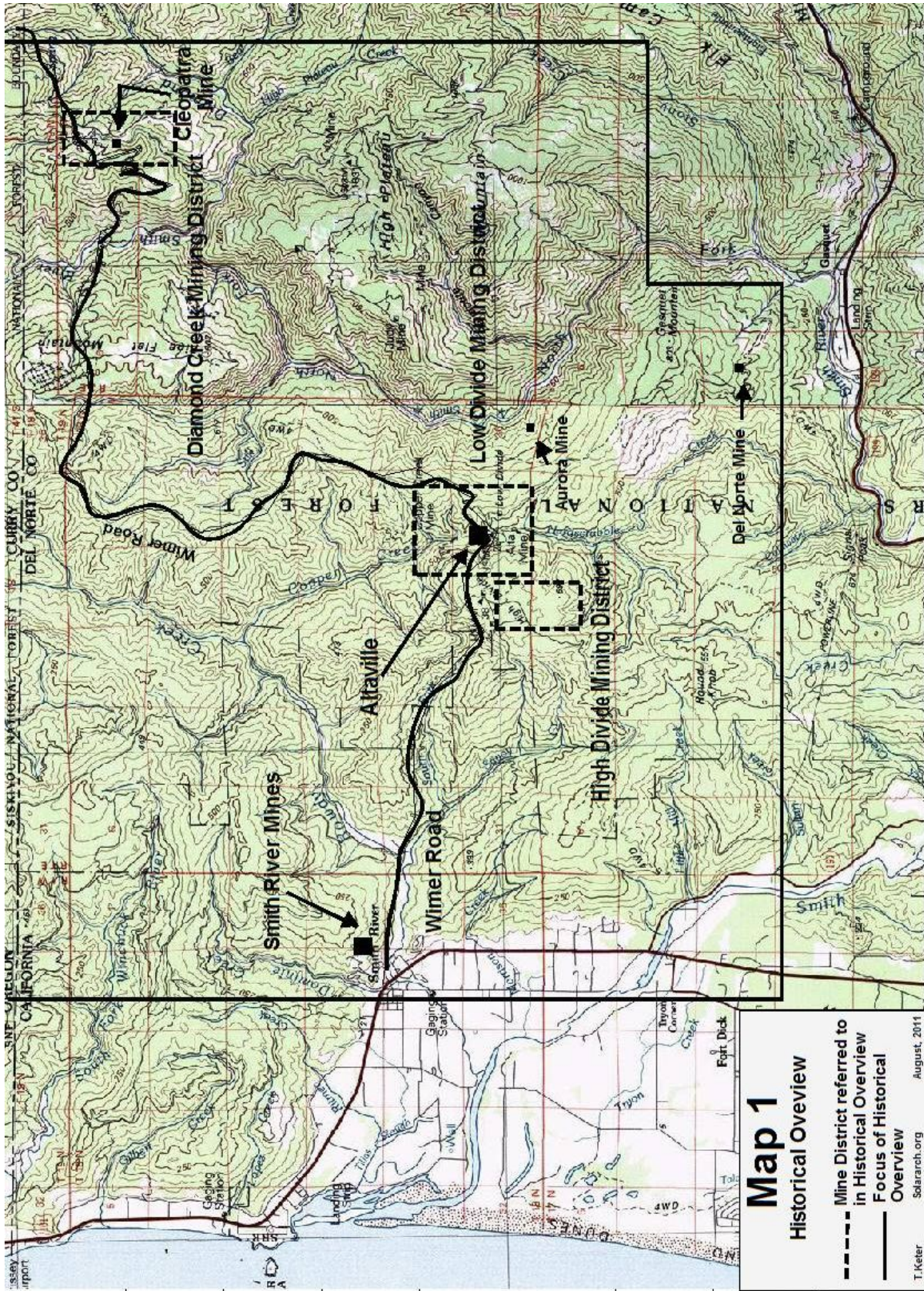
Pappas Flat is located within the Gasquet Area Chromite District just to the south of the Del Norte Mine. Records indicate that chromite has been mined within three-fourths of a mile to the north of Pappas Flat (this is possibly at or near the Del Norte Mine claim). Lubetkin (1988), who summarized mining operations in the area, wrote that;

"...mining occurred during the major World Wars, and was limited to only a few tons of medium grade chromite. Little or no ore reserves still exist at any of these historic mines...an old ditch line provided water from the unnamed creek on the parcel to an area in the southern portion, where ground sluicing appears to have taken place during the 1930s or earlier, and was prospecting in nature, with no subsequent extensive development...the Pappas Flat parcel has a moderate potential for occurrence of an economic deposit of placer gold and platinum within the terrace gravels and river channel alluvium, based on the geologic setting along with past and present prospecting and mining."

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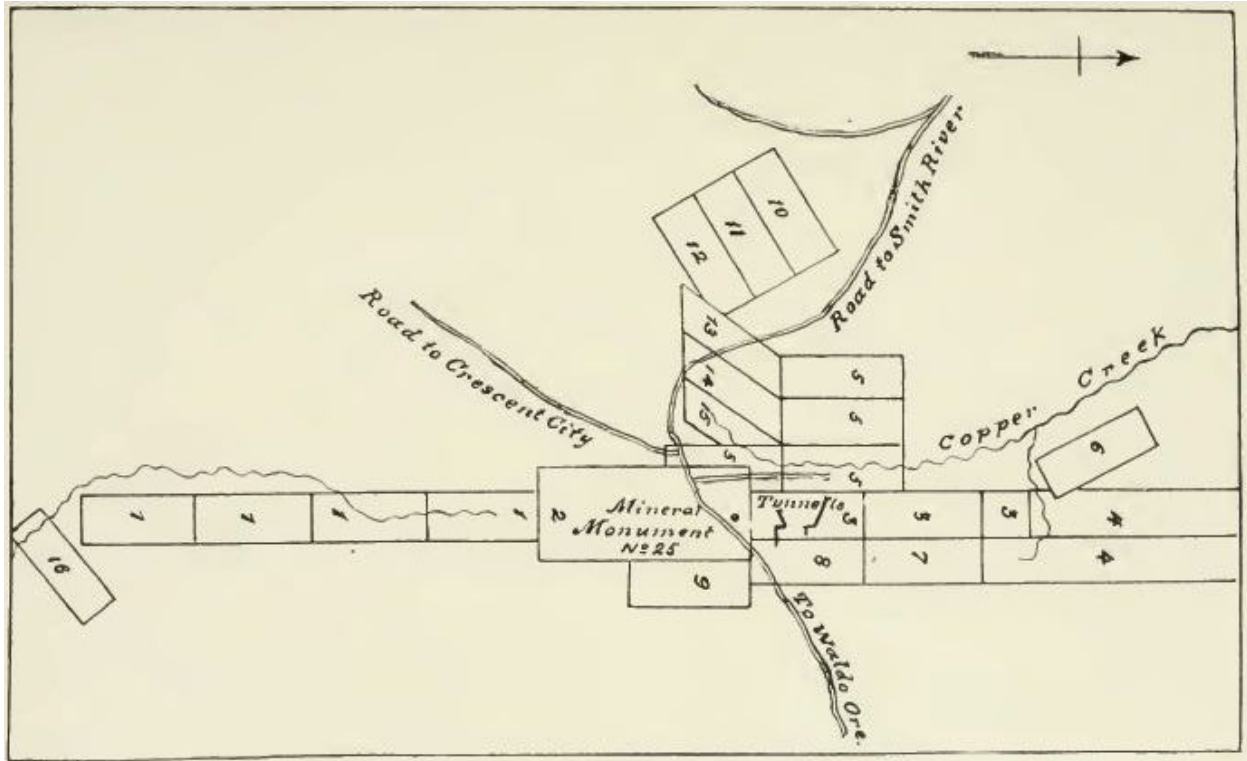
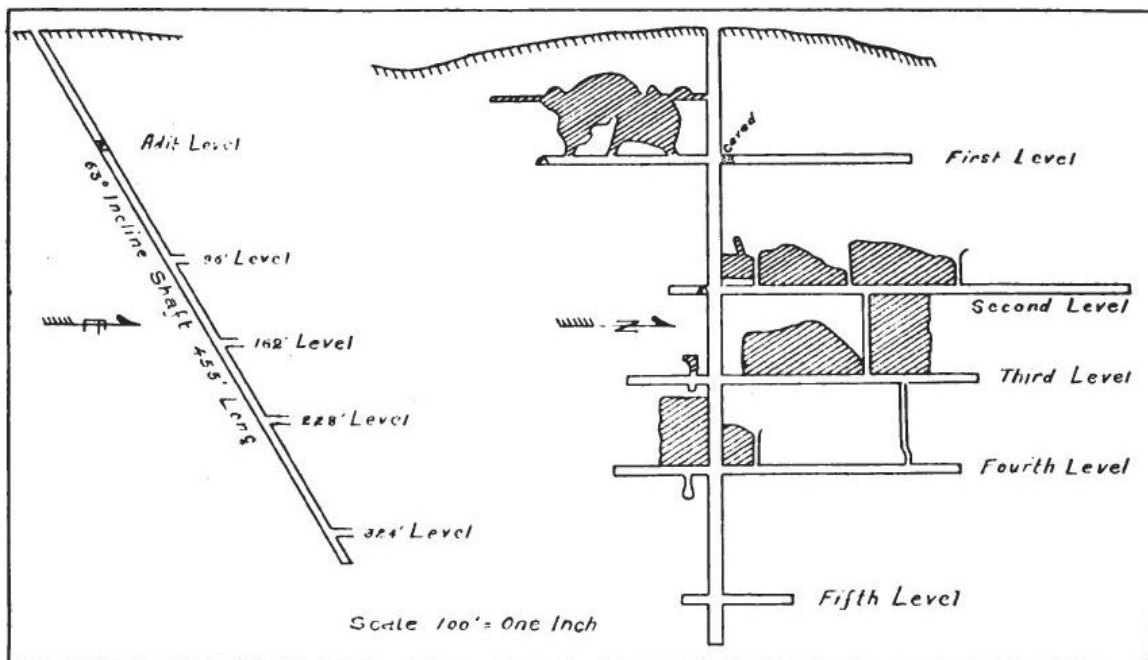


Figure 1 (Aubury 1908:135)
 Claims at the Low Divide Mining District



Alta California Mine, Low Divide, Del Norte County, Cal.

Figure 2 (Lowell 1915:12)
 Alta California Mine Shaft