PE-085-17

Preliminary Examination of Copper and Gold Mineralization in the Upper Moose Creek and Little Susitna River Drainage Area by Martin M. Jasper, Associate Mining Engineer, Territorial Department of Mines.

This investigation of an area for many years known to have low grade copper mineralization, was prompted by recent reported interest in the district. Search of U.S.G.S. publications revealed only brief mention of the area to date. These references are confined to -

1. U.S.G.S. Bulletin 500, 1912, page 95
"It is reported that sulphide mineralization has been found in the granite area of the upper part of Moose Creek".
(Reference is also made on same page to "Claims located on copper prospects in the basin of Kings River about 12 miles above the mouth have not been visited by members of the Survey, and no information about them is at hand").

2. U.S.G.S. Bulletin 662, 1916, page 47.
"A low-grade deposit of chalcopyrite ore has been found on Moose Creek, about 8 or 9 miles from Matanuska, and similar deposits are said to have been found on King River. It has long been known that there was some mineralization along the margin of the granodiorite mass of the Talkeetna Mountains. This mineralized area has a similar geologic position to that of the lodes of the Willow Creek District".

July 7, 1953. Left Palmer at 7:30 A.M. and arrived at Buffalo coal mine camp about 8:30 A.M. The forenoon and up to 2 P.M. was spent interviewing Mr. Colobuffalo, an original owner of the Buffalo coal mine. Mr. Colobuffalo was familiar with the Moose Creek copper area only in a general way, stating the "gossan" capping was visible and only 2½ to 3 miles upstream from the old Black Diamond coal mine.

Mr. Loyd Hill stated that he had spent some time tracing the Moose Creek mineralized zone for several miles, and that the copper values appeared to be too low grade to be of interest to him. Systematic prospecting of the area was not done and only a few scattered "grab" samples were reputedly taken by him. He advised that the easier approach to the area he considered to be from the Little Susitna River side, following the east fork of Lone Tree Creek, a Little Susitna tributary joining the latter 1 mile north of the Lonesome Mine camp.

Mr. Glen Cope, one of the owners of Lonesome Mine (a partnership of Glen Cope, E. Cope, and Robert Hardesty), was at camp and made himself available for investigation of the copper showings the following day.

Mr. Cope was not personally familiar with the mineralized zone. However, he stated that in 1916 or 1918 a brother had presented the Moose Creek copper area to a Kennicott field engineer as a "wide mineralized zone containing $5.00 to $6.00 gold values from samples he had taken". The engineer is reputed to have offered "a large sum (one million dollars was the figure Mr. Cope recalled) if a 1000 lb. sample he requested for mill tests went $5.00 and subsequent checking of the property proved satisfactory". The sample was shipped but values were found to be only $2.50 in gold (@ $20.62 per oz) and no further interest was shown or work done upon it. Mr. Cope did not recall any analysis made for copper content at that time.

July 9, 1953. Left Lonesome Mine camp at 8:30 A.M. with Glen Cope and returned to camp at 7:00 P.M.

Route followed was more or less along the 2500 foot contour from camp along east side of Little Susitna River for distance of 1 mile to Lone Tree Gulch, thence approximately 2½ miles upstream, following the easterly fork of this stream to the Little Susitna River-Moose Creek divide at approximately 4900 foot elevation.

At approximately ½ mile easterly of above noted forks where the main stream swings sharply to the south, the first wide "gossan capping" occurs at base of 600 to 800 foot precipitous slope. This highly oxidized outcrop--an estimated 500 feet above the "U" shaped "hanging-valley" floor which is at 3740 foot elevation--has a width of 75 to 100 feet or more; in this report it will be referred to as the No. 1 LT showing.

This mineralized zone extends easterly along the steep north slopes for a distance of over 1000 feet, and is more or less continuously exposed. Continuing easterly, this wide mineralized zone does not appear on northeast wall of a southeasterly trending valley ("U" shaped) which is about 1000 to 1200 feet in width. The mineralized zone does not reappear prominently for another 800 to 1000 feet to the east (an estimated 3000 feet easterly from the designated No. 1 LT showing), but from this point it is very prominent for the remaining distance to the divide (an estimated 1500-1800 feet) and thence down the Moose Creek side of the divide for a distance estimated at 2000 feet, from which point it plunges downward below a ridge which obscures its southeasterly continuation.

Talus slopes at a number of points cover the mineralized zone for distances of 300 to 600 feet. The southeasterly trending "U" shaped valley 1500 east of No. 1 LT showing is a fault zone which appears to have displaced the mineralized zone over 500 feet to the south.

The No. 1 LT (LT for Lone Tree Gulch) showing, which is the first exposure encountered in traversing the area from the Little Susitna River approach from the west and traveling easterly, is a persistent mineralized zone apparently lying in and close to (and paralleling) the diorite-sedimentary contact in this region.

With time limited to one day for the reconnaissance investigation and planning of more thorough examination of the area, the relatively difficult accessibility of the outcrops confined the study to abundant mineralized "float" in the talus.

From this study and specimen obtained the predominant rock type showing the heaviest pyritization is a quartz porphyry dike. Associated with this--whether on hanging or footwall was not determined --is a dark (basic) ferromagnesian dike (slightly serpentized) with disseminated pyrite. A third rock type with a somewhat gneissic texture is also heavily pyritized (as disseminations and veinlets)--it may be a less oxidized section of the quartz porphyry dike. A fourth rock type in the talus, pyritized in lesser degree, has elongated narrow bands and small lenses of hornblende and biotite in a feldspathic groundmass similar to the "schlieran" described as common to the "outer zone" of the quartz diorite intrusive of the Willow Creek gold-quartz district (adjoining to the west).

Mineralization of this wide, persistent zone, is confined to pyrite (which appears to be "cupiferous" to some degree), a little chalcopyrite, probably appreciable pyrrhotite, and very minor amounts of fine-grained arsenopyrite are believed present. Only small trace of malachite was observed. The "gossan capping" (limonite) covers widths of 75 to 150 feet; it is suggested this was derived from the less stable pyrrhotite rather than the pyrite (or capriferous pyrite). From "float" the maximum depth of the limonite "capping" is probably within limits of 2 to 4 inches.

The overlying sediments dip 20 to 30 degrees to the south and strike is easterly.

The mineralized zone (dike) has a strike approximating S80E and a dip of 50 to 60 degrees south.

Structure and mineralization at No. 2 LT (approximately 3000 feet east of No. 1 LT), at No. 3 LT (on Moose Creek divide, approximately 4500 east of No. 1 LT), and No. 4 LT (an estimated 2000 feet down slope on Moose Creek side of divide), showings appear to be similar.

The outcrop at No. 4 LT, however, appears (from a distance) to be much greater. At this exposure the strongly oxidized outcropping on hanging-wall side (south side) and close to or at the sedimentary contact has an estimated width of over 100 feet; this is underlain by an equal width but less oxidized zone of a dark basic appearing dike (or phase of the diorite); and the latter is underlain by a 150 foot or greater width of similar dark rock type which shows a few bands of oxidation "stain".

Four pictures of exposures along the above described mineralized zone will be forwarded when received from printers, and are to be appended to this report.

Results of this preliminary investigation warrant a more thorough examination.

It is recommended that a week to ten days be devoted to this region this season. The persistent mineralization requires a systematic sampling across the full widths at a number of points to determine whether combined copper-gold values are of economic interest.

During course of the recommended program, it is suggested the area be checked for uranium occurrence. While there are no reported occurrences of the radio-active minerals in this district, geologic conditions are similar to a northern British Columbia region where appreciable uranium minerals occur, plans for recovery of which (as a by-product) may now be in effect.

PE
85-17

PRELIMINARY REPORT

ON

COPPER OCCURRENCES

IN

LITTLE SUSITNA RIVER-MOOSE CREEK AREA ~~PE~~ 85-62 & 85-

PALMER PRECINCT, ALASKA

by

M. W. Jasper

Associate Mining Engineer

Territorial Department of Mines

Anchorage, Alaska

December 1953

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ON
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IN
MOOSE CREEK-LITTLE SUSITNA RIVER AREA ~~X~~ 85-62 & 85-
PALMER PRECINCT, ALASKA

SUMMARY

The brief 1953 reconnaissance and preliminary examination of the Little Susitna River copper mineralization, which is the westerly extension of the Moose Creek deposit reported upon by Stephan R. Capps of the U. S. Geological Survey in 1917, resulted in location of an outcrop having more than passing interest.

This dioritic mineralized gneissic structure has been traced for several miles, with conditions considered encouraging for occurrence and location of low grade copper ore bodies having required magnitude in tonnage potentials for large scale operations.

The area justifies a more thorough study by the Territorial Department of Mines during the 1954 field season.

It is also considered to warrent the attention of competent mining companies on basis of limited information obtained todate.

INTRODUCTION

The preliminary investigation of a section of this long known mineralized zone was undertaken by the Territorial Department of Mines because of increasing interest and search for copper deposits in Alaska by well established mining companies.

Objective of the investigation was to determine whether, under present conditions, sections of this area might have "earmarks" for occurrences of and possibilities for development of large tonnages of lower grade copper (and other) mineralization in this 3 to 4 mile belt (reported to be of greater), and if so plan more detailed examination of the district next year.

Accompanied by Glen Cope, an owner of the Lonesome Mine which is 3 miles upstream from Little Susitna Lodge and who was familiar with location, one day was spent on western half of area July 10, 1953. Again on August 9th the section was revisited with Phil R. Holdsworth, Territorial Commissioner of Mines.

LOCATION AND ACCESSIBILITY

This easterly-westerly trending copper bearing zone lies between Moose Creek(a tributary of and joining the Matanuska River from the north at Mile 57 on the paved Glen Highway) on the east, and Little Susitna River on the west.

This mineralized belt lies approximately along Latitude 61° 48' North and between Longitudes 149° 00' and 149° 05' West.

Little Susitna River Drainage Section

The west end of the zone is accessibleover 15 miles of good gravel surfaced road to Little Susitna Lodge, leaving the Glen Highway at Mile 50 - which is 50 miles from Anchorage and 2 Miles from Palmer. From the Lodge it is 3 miles to the Lonesome Mine camp at 2460 elevation, over a road having good grade but which will require $500 to $1000 to regrade and to rebuild a short bridge across the Little Susitna river to put it ingood condition. From the mine camp an old trail follows a pipeline to lower end of Lone Tree Gulch for one mile; from here it is about one mileast and up this gulch to west end of the zone, and an additional 1¼ mile easterly to Little Susitna-Moose creek divide at head of a "hanging" valley. With morainal material covering the Lone Tree Gulch valley floor and lower slopes, road construction should not be difficult or expensive.

The mineralized zone outcrops and is plainly visible on south side of the gulch's easterly tributary on 35° to 50° slopes

(precipitous in places) at elevations ranging from 4370 at west end and 4870 where it crosses the Moose creek divide. (Refer to pictures attached).

Moose Creek Drainage Section

The original discoveries upon which practically all work was concentrated in the past is located on the steep slopes on right limits (west side) of Moose creek. These showings lie on south side close to and parallel to Iron creek, a short tributary, between the 2300 and 4870 elevations.

The Moose creek section is accessible over the 5½ mile gravelled road serving the Buffalo coal mine; this road joins the Glen Highway at Mile 55.5. From the mine the old abandoned narrow gage roadbed may be followed 2½ to 3 miles to its terminus at the closed Black Diamond coal mine. From this point a trail, reported to be in fair condition, follows the east side of Moose creek(for the most part) for about 3 miles upstream to point a short distance below mouth of Iron creek. From here a "switchback" trail, used by pack-horses in early days, leads to the old working at about 3800 foot elevation - about 1600 feet above Moose creek.

While this end of the mineralized zone was not visited, observations made from upper end of old narrow gage roadbed indicates it to be fairly easy of access, although steep slopes along the canyon section probably has a snowslide hazard for few months a year.

The west or Little Susitna end is at present considered the more readily accessible.

TOPOGRAPHY

The area has the rugged topography at the higher elevations that is typical of the Willow ccreek and southwestern section of the Talkeetna Mountains region.

The valleys are generally U-shaped, with "hanging" valleys in upper sections of the drainage systems.

CLIMATE AND VEGETATION

Climatological records are not available for the region. However, snowfall reaches depths of 8 to 10 feet or more. Temperatures range from 20 to 30 below zero for short periods during the winter to 85 above during the summer. Precipitation probably exceeds 30 inches a year. Local rainstorms are frequent during summer and fall months.

Above the 2500 foot elevation vegatation is limited to scattered alder and willow brush, and heather and grass up to 5000 foot level; above 5000 the surface is bare of vegetation.

Mining timber is available in the valleys below the 1800 foot elevation.

HISTORY AND OWNERSHIP

This mineral belt has been known for at least 40 years. However, its apparent low grade copper content, low gold-silver values, and lack of good transportation facilities for many years, discouraged any serious exploration and development efforts.

The earliest written mention of activity in the area encountered is that of Stephan R. Capps in U. S. G. S. Bulletin 692, 1917. On pages 183-84 he notes -

"A group of 13 claims, called the Northwestern Mine, has been located on west side of Moose creek, about 3 miles above the canyon through which that stream emerges from the mountains..... The orebody, which is conspicuous on account of a rusty red gossan, has been developed by open-cuts, strippings, and a 33 foot tunnel.....No one was resident on the property at time of visit but assay certificates supplied by the principle owner showed from 0.04 to 0.08 Oz gold and 0.8 to 1.2 Oz of silver to the ton, and from trace to 5.6% copper. One also showed the presence of Ø.03% nickel."

Next mention was made by Theodore Chapin on page 206, U. S.G. S. Bulletin 714, 1919. The property was not visited that year but Chapin states -

"The following information is abstracted from a report by F. L. Thurmond of Anchorage.....The property consists of 2 groups of claims, one of 4 claims and one of 7 claims. These were located in 1914 and 1915 by J. H. McCallie and associates of Anchorage. The ore deposit is from 30 to 100 feet in width, strikes N 75 E and dips about 80° SE. It does not appear to have a well defined wall, however, and merges gradually into the quartz diorite country rock. At one place an open-cut has been made 25 feet diagonally across the deposit, which at this locality consists of pyrite, pyrrhotite, chalcopyrite, and sphalerite carrying gold and silver. It is said to have been traced for 7000 feet along the surface but has not been explored in depth. The copper, gold, and silver contents are said to be low, but the apparent size of the ore body and its proximity to the railroad and to the coal deposits recommend it for careful examination."

In U. S. G. Bulletin 907, pages 178-79, 1940, Mr. Capps again makes brief mention of the deposit, concluding -

"So far as known no important development work has been done on this property in recent years."

On July 9, 1953, Glen Cope reported that in 1918 or 1919 a brother was prospecting in the Moose creek area and stated samples (of gossan cappings) taken across "large widths" (actual widths not recalled by G. Cope) carried gold values of $5.00 per ton. Attention of large mining company was called to this deposit, and"a 1000 pound sample was requested which reputedly carried only $2.50 per ton in gold." Apparently the copper content was not determined as G. Cope had no recollection of copper values being reported.

The late Walter W. Stoll is reported to have had a large group of claims staked along this copper belt 5 or 6 years ago which were later dropped. The Mining Recorders records have not as yet been checked to verify this report.

LLoyd Hill, Palmer, Alaska, prospecter reported on July 8, 1953, he had spent some time past few years prospecting this zone from the Little Susitna side easterly to point mile or so east of Moose creek. No locations were made by him as he considered the copper content too low for him to attempt to develop.

In September 1953 W. A. Peterson and associates of Juneau reported locating 10 mineral claims along this belt. No other locations are known to be held at present time.

GEOLOGY

The Moose creek end was not investigated by M. W. Jasper during the past season. The U. S. Geological Survey work has been confined to Capps 1917 report.

With government geological coverage of area limited to above mentioned 1917 report (U. S. G. S. Bul. 692), and brief review of Capps work in U. S. G. S. Bulletins 714 and 907, these references are quoted with purpose of having all known published data included with results of Jaspers work in 1953.

Capps reported "The country rock of this vicinity exhibits a gneissic phase of the diorite mass that forms a large part of the Talkeetna Mountains. Near the south ridge of this mass, from Moose Creek westward across the basin of the Little Susitna River, the intrusive rock has a more or less well developed gneissic structure and locally shows a pronounced banding. Certain phases are also highly hornblendic. A short distance south of the property here described Tertiary arkoses overlap and conceal the gniessic granitic rocks.

"The orebody, which is conspicuous on account of a rusty red gossan, has been developed by open-cuts, strippings, and a 33

foot tunnel. It has been formed through the replacement of the gneissic rock by sulfides, chiefly pyrrhotite, pyrite, and chalcopyrite. Sphalerite is also reported.

"The banding of the gneiss, although somewhat wavy and twisted, has a general strike of N 60° to 75°W (apparent ?) and a dip of 65° S to vertical, and the orebody lies parallel to the gneissic structure.

"As shown by the workings, the area of heaviest mineralization appears to have a thickness of 25 to 30 feet, and disseminated sulfides occur for considerable distances on either side. The body of massive sulfides has been exposed by open-cuts along the strike for at least 80 feet, and gossan shows beyond the cuts in both directions. Within this orebody the sulfides range in abundance from scattered specks disseminated without any marked arrangement in rather massive diorite to bands of sulfides that follow the banding of gneissic materials and to massive sulfide masses in which no gangue or country rock appears.

"Each of the three principal sulfides - pyrite, pyrrhotite, and chalcopyrite - occurs in places in large, nearly pure aggregates, but more commonly the three are intermingled. The tunnel penetrates through the gossan into sulfides that are unoxidized, except along joints and down cracks which surface waters have circulated."

Theodore Chapins remarks in U. S. G. S. Bulletin 714, page 206, are again quoted (in part) as of general interest:-

"The Moose Creek copper claims, on the ridge between tributaries of the Little Susitna River and Moose Creek, have not been visited by members of the survey and the following information is abstracted from a report by F. L. Thurmond. **The claims are on the eastern border of the Willow Creek district ....at elevations ranging from 2300 to 4800 feet....

The ore deposit is 30 to 100 feet in width, strikes N 75°E and dips about 80° S. It does not appear to have a well defined wall, however, and merges gradually into the quartz diorite country rock. At one place an open-cut has been made 25 feet diagonally across the deposit, which at this locality consists of pyrite, pyrrhotite, chalcopyrite, and sphalerite carrying gold and silver. It is said to have been traced 7000 feet along the surface but has not been explored in depth. The copper gold, and silver contents are said to be low, but the apparent size of the orebody and its proximity to the railroad and to the coal deposits recommend it for careful attention."

The preliminary investigations made during 1953 were largely confined to the 1¼ mile section west of the Moose creek area covered in Mr. Capps report.(Refer to Plate 2 attached).

The gneissic phase is possibly more pronounced on the Little Susitna drainage basin side. Here the banding is highly developed and, as shown in View No. 2 on Plate 3, it is very wavy and badly twisted across an estimated 400 foot width where the zone crosses the Little Susitna-Moose creek divide. This location is marked No. 4 on Plate 2. From here to the presently known westerly end of this mineralized gneissic structure - to point marked No. 1 on Plate 2 - it does not appear as highly distorted where it outcrops at number of points in cliffs and through the talus on the steep slopes and in narrow draws. The apparent strike of the outcrops is N 60° to 75° E and dip within limits of 55° to 75° south.

Lloyd Hill reports acidic dikes occur in the 4 to 5 miles along this mineralized zone, and observed mineralization associated with them at a number of outcrops. These dikes were noted the past season at two points - at locations marked No. 3 and No. 4 - and in each case were found to be only sparsely mineralized. Their widths were estimated at 20 to 40 feet and they did not appear to be continuous between these points. "Float" from dikes of more basic types were noted in talus below several outcrops.

Irregular lenses of quartz, 2 to 10 feet in width were noted in a 300 to 400 foot section from west face of divide ridge westerly along the gneissic zone. In places the quartz is "sugary" with abundant granular pyrite; grab sample of this material showed no gold or silver values. This is only point at which quartz was noted.

From the divide westerly the mineralized outcrops are plainly visible, marked by varying degrees of oxidation. (Refer to Views 1, 2, and 3). The strongest discoloration is at the west end - location marked No. 1 on Plate 2 - which is also the section showing the most promising copper mineralization of the few points examined. Here more basic (hornblendic) phase of the banded gneissic structure is freshly exposed in bottom of narrow draw of 40° slope. It is well mineralized with fine discontinuous veinlets and disseminated chalcopyrite, pyrrhotite, and pyrite, which replace the hornblende and/or other basic minerals in the gneiss. No quartz was noted.

A "chip" sample was taken up and along bottom of this draw of the "fresh" and unaltered mineralization for a distance of 40 feet to base of a cliff. Similar mineralization is present at base and in face of cliff for an undetermined additional width. This chip sample, taken at approximately right angles to strike

of structure and representing a true width of 30 to 35 feet between 4370 and 4400 foot elevations, carried 3.3% copper, gold trace, and silver nil.

Grab sample of small irregular gossan masses in cliff face on west side of this draw carried no values; it was taken moreor less along strike of the formation and was for informative purposes only.

On steep but well rounded narrow ridge on east side of above noted draw (at location marked No. 1 on Plate 2), there is a residual highly oxidized cropping, several feet in depth, which extends 150 to 200 feet up the mountain slope. At its upper limits the oxidation was noted to extend westerly, although the irregular, rising, precipitous slope in that direction obscured its lateral extent.

To the east of above noted oxidized zone the gneissic structure is obscured for 400 feet or more as it crosses a deeper and wider talus filled draw, and reappears in the bluffs on the far side. (Refer to View No. 3). Evidence of mineralization was visible from a distance, although oxidation stain was light. This location is marked No. 2 on Plate 2.

Continuing easterly from last noted point the mineralized structure is largely covered by talus on the slopes and across a southeasterly trending glacial cirque basin for 1000 to 1200 feet, then reappearing at intervals as gossan cappings on cliffs and steep slopes to location marked No. 4 on Plate 2.

The mineralized gneissic structure is visible on east side of the precipitous, serrated ridge forming the Moose creek divide for several hundred foot vertical range. At base of this slope it is obscured for next $\frac{1}{4}$ mile (more or less) by talus and ice across bottom of a glacial cirque, reappearing on east side of the cirque in face of the precipitous ridge. This is at location marked No. 3 on Plate 2, and is shown in View No. 4 attached.

Here the outcrop at 4300 foot elevation is only sparsely mineralized with pyrite, pyrrhotite, and occassional grain of chalcopyrite. This is only point east of the divide that was briefly checked.

Two faults are shown on Plate 2. The more westerly one - 400 to 500 feet west of location marked No. 1 - is indicated by a nearly vertical, wide, open fissure near west end of ridge. Displacement to the south on the west side of the fault is believed to be of considerale magnitude as the mineralized gneissic structure was not observed along its strike west of the fault. A strong plane of weakness ~~was observed~~ was observed crossing ridge in west side of Lone Tree Gulch (south fork)

a short distance south of the Lonesome mine, which may be the continuation of this structural zone.

The second fault is about ½ mile east of the one mentioned above. It is suggested by the southeastly trending basin, as the mineralized zone on its projection from west to east appears to be offset several hundred feet to the south on the west side.

A number of hand specimen were obtained of rock types, and four were taken for assay. Results of the latter are as follows:-

SAMPLES

No.	Width ft	Au oz	Ag oz	Cu %	Remarks
1MO	40	nil	nil	3.33%	Location marked on Plate 2. Fine irreg. veinlets & dissem. sulfides oriented along the hornblendic gneiss banding. Chippedacross structure. True sample width 30 to 35 ft.
2MO	grab	nil	nil	tr	Chip grab of small gossan lenses for 60 ft along structure strike. Few residual sulfides. Takento determine whether appreciable Au enrichment present. West of #1MO
3MO	30	tr	nil	nil	Location marked No. 3. Sparsely dissem. pyrite, pyrrhotite, arsenopyrite. Chip sample nearbase of precipitious slope in a more silicious (acidic dike) zone. No copper minerals noted.
4MO	grab	tr	tr	nil	Location marked No. 4, Plate2. 12 to 15% (estimated) granular pyrite in sugary quartz.

The above samples were taken to determine values present in several types of mineralization, at widely separated points along mineralized gneissic zone. Qaulitative tests did not show any nickel present. Geiger counter shows no radioactivity.

CONCLUSIONS

Results of 1953 reconnaissance investigations, together with Stephan R. Capps 1917 findings on the Moose Creek side, warrant a more detailed study and mapping of this area.

The mineralization with 3.33% copper values found present at w est end has greater width than the 40 feet sampled. It is considered there is possibility that more thorough investigation of this fairly accessible section may disclose a large tonnage potential of low grade copper ore of economic importance - especially during periods of higher priced copper.

It is also believed that a systemmatic study of this extensive mineralized gneissic zone may locate other ore bodies having large tonnage possibilities of low grade ore.

Although appreciable amounts of nickel have not as yet been found, the "massive" pyrrhotite occurrences reported by Capps and others on the Moose Creek side should be checked for it.

The numerous reports of prospectors in past years, claiming gold-silver values of several dollars per ton, would be of real importance in mining a large body of low grade copper ore.

It is recommended that the Territorial Department of Mines make a thorough investigation of this mineralized belt in 1954.

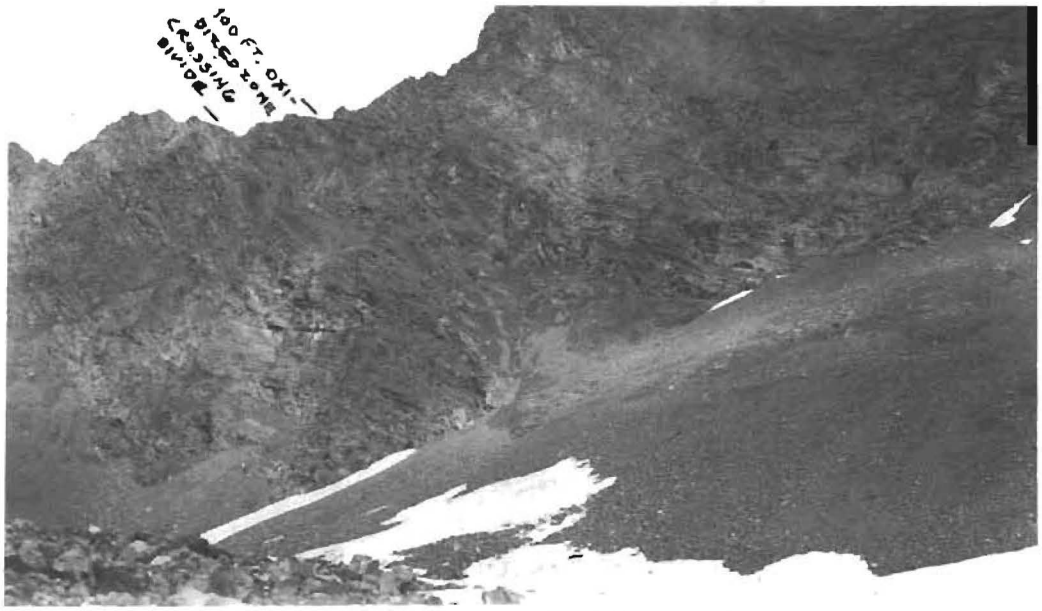
The area is believed to be one warranting investigation of mining companies looking for low grade copper properties having large tonnage possibilities.

Respectfully submitted,

By

M. W. Jasper
Associate Mining Engineer
Territorial Department of Mines

Anchorage, Alaska
December 31, 1953



July 10, 1953
View No. 1. Looking S88E to west side of Moose Creek divide, showing the banded and twisted mineralized zone at location marked No. 4 on Plate 2.

July 10, 1953
Looking S40W from Moose Creek-Liitle Susitna divide at 4870 elevation, showing outcrops and course of the mineralized gneissic zone. View No. 2

PLATE 3

August 9, 1953

View No. 3. Looking easterly and showing mineralized gneissic zone 1000 feet east of location marked No. 1.

July 10, 1953

View No. 4. Looking S65E from divide along course of mineralized zone on Moose Creek slope. Old workings on abandoned Northwestern mine claims are beyond ridge in center background at 3800 ft elevation.

July 8, 1953

View No. 5. Looking N10E up Moose Creek from dump of the old Black Diamond coal mine. The Moose Creek copper showings are on mountain slope of ridge at left center background. The lower end of Moose Creek canyon is in center foreground.

PLATE 5

July 11, 1953

Office Copy

ITINERARY REPORT

TO: Phil R. Holdsworth, Commissioner of Mines

FROM: M. W. Jasper, Associate Mining Engineer

SUBJECT: Preliminary examination of copper and gold mineralization in the upper Moose Creek and Little Susitna River drainage areas.

This investigation of an area for many years known to have low grade copper mineralization, was prompted by recent reported interest in the district. Search of U. S. G. S. publications revealed only brief mention of the area to date. These references are confined to -

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(Reference is also made on same page to "Claims located on on copper prospects in the basin of Kings River about 12 miles above the mouth have not been visited by members of the Survey, and no information about them is at hand").

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July 7, 1953. Left Palmer at 7:30 A. M. and arrived at Buffalo coal mine camp about 8:30 A. M. The forenoon and up to 2 P. M. was spent interviewing Mr. Buffalo, an original owner of the Buffalo coal mine; Mr. Browning, superintendent of the property, and a Mr. Smith, who is looking after the mine pumping equipment; Lloyd Hill, at present employed as helper on diamond drill (Boyles Bros., Salt Lake City contractors), engaged by the U. S. Bureau of Mines in exploration project determining extent of coal measures on Buffalo coal property area; and Slim McMahn, contractor building roads for the Bureau of Mines on the coal exploration program in the district.

Mr. Buffalo was familiar with the Moose Creek copper area only in a general way, stating the "gossan" capping was visible and only 2½ to 3 miles upstream from the old Black Diamond coal mine.

Messrs Browning and Smith had no knowledge of the copper occurrence, but commented on recent interest being shown in it, stating that 5 or 6 men had passed through his camp the previous 2 weeks period, their reputed interest apparently being the copper showings. Mr. Joe Danich was

one mentioned making trip up the valley July 6. Mr. Cappy Faroe and Mr. Warren Rice were said to have made trip up the valley July 5th; questioning Mr. Faroe July 11th he stated his trip was concerned with coal. Names of others were not recalled by Mr. Browning.

Mr. Faroe confirmed the report that a man representing the Ventures Limited had been in area about two weeks ago, but that his visit had been limited to search of records at Commissioners office in Palmer, and stated he understood his visit was concerned with coal rather than copper. Identity of the Ventures agent is to be determined by Mr. Faroe.

Mr. Loyd Hill stated that he had spent some time tracing the Moose Creek mineralized zone for several miles, and that the copper values appeared to be too low grade to be of interest to him. Systematic prospecting of the area was not done and only a few scattered "grab" samples were reputedly taken by him. He advised that the easier approach to the area he considered to be from the Little Susitna River side, following the east fork of Lone Tree Creek, a Little Susitna tributary joining the latter 1 mile north of the Lonesome Mine camp.

Mr. McMahn had no personal knowledge of the Moose Creek copper deposit, but wished to make the trip. Neither Mr. McMahn or Mr. Hill were available (free) to make the trip the past week.

Mr. Buffalo reported that Walter W. Stoll had a large area staked along the mineralized zone a few years prior to his death, and engaged an engineer to examine and report on the deposit. The claims were reported to have been dropped by Mr. Stoll's estate.

From 2 P. M. to 5:30 P. M. a trip was made up Moose Creek for a distance of 4 miles above Buffalo mine camp, along southeast side of that stream. The old narrow gauge railway bed (which can be converted to a good truck road at reasonable cost) was followed to its northern end. The reported "gossan" capping was not visible from this area.

The trail up Moose Creek lies on west side of this stream; it is reported to be fairly well over ground with willows - especially in upper section.

The night was spent at Palmer, returning there at 7P. M.

July 8, 1953. Left Palmer at 7:30 A. M., arriving at Lonesome Mine camp on east side of Little Susitna River, about 3 miles above the Little Susitna Lodge, at 3:30 P. M.

With a low fog prevailing during the morning and road sign posts down, road to Independence mine was followed to the turnoff to Willow River. Returning drove to the Snowbird mine and thence back to Little Susitna Lodge for lunch. On leaving latter point the road to Lonesome Mine was found in poor repair, and at Mile 1.8 from highway was stuck in mudhole for a while,

requiring backing down ½ mile to a turn-out, as balance of road was impassible for private cars.

Mr. Glen Cope, one of owners of Lonesome Mine (apartnership of Glen Cope, E. Cope, and Robt. Hardesty), was at camp and made himself available for investigation of the copper showings the following day.

Mr. Cope was not personally familiar with the mineralized zone. However, he stated that in 1916 or 1918 a brother had presented the Moose Creek copper area to a Kennicott field engineer as a "wide mineralized zone containing $5.00 to $6.00 gold values from samples he had taken". The engineer is reputed to have offered "a large sum (one million dollars was figure Mr. Cope recalled) if a 1000 lb sample he requested for mill tests went $5.00 and subsequent checking of the property proved satisfactory". The sample was shipped but values were found to be only $2.50 in gold (@ $20.62 per oz) and no further interest was shown or work done upon it. Mr. Cope did not recall any analysis made for copper content at that time.

July 9, 1953. Left Lonesome Mine camp at 8:30 A. M. with Glen Cope, and returned to camp at 7:00 P. M.

Route followed was more or less along th 2500 foot contour from camp along east side of Little Susitna River for distance of 1 mile to Lone Tree Gulch, thence approximately 2½ miles upstream, following the easterly fork of this stream to the ~~to the~~ Little Susitna River-Moose Creek divide at approximately 4900 foot elevation.

At approximately ½ mile easterly of above noted forks where the main stream swings sharply to the south (refer to attached sketch map) the first wide "gossan capping" occurs at base of 600 to 800 foot precipitous slope. This highly oxidized outcrop - an estimated 500 feet above the "U" shaped "hanging-valley" floor which is at 3740 foot elevation - has a width of 75 to 100 feet or more; in this report it will be refered to as the No. 1 LT showing.

This mineralized zone extends easterly along the steep north slopes for a distance of over 1000 feet, and is more or less continuously exposed. Continuing easterly, this wide mineralized zone does not appear on northeast wall of a southeasterly trending valley ("U" shaped) which is about 1000 to 1200 feet in width. The mineralized zone does not reappear prominently for another 800 to 1000 feet to the east (an estimated 3000 feet easterly from the disignated No. 1 LT showing), but from this point it is very prominent for the remaining distance to the divide (an estimated 1500-1800 feet) and thence down the Moose Creek side of the divide for a distance estimated at 2000 feet, from which point it plunges downward below a ridge which obscures its southeasterly continuation.

Talus slopes at a number of points cover the mineralized zone for distances of 300 to 600 feet. The southeasterly trending "U" shaped valley 1500 east of No. 1 LT showing is a fault zone which appears to have displaced the mineralized zone over 500 feet to the south.

The No. 1 LT (LT for Lone Tree Gulch) showing, which is the first exposure encountered in traversing the area from the Little Susitna River approach from the west and traveling easterly, is a persistent mineralized zone apparently lying in and close to (and paralleling) the diorite-sedimentary contact in this region.

With time limited to one day for the reconnaissance investigation and planning of more thorough examination of the area, the relatively difficult accessibility of the outcrops confined the study to abundant mineralized "float" in the talus.

From this study and hand specimen obtained the predominant rock type showing the heaviest pyritization is a quartz porphyry dike. Associated with this - whether on hanging- or footwall was not determined - is a dark (basic) ferromagnesian dike (slightly serpentized) with disseminated pyrite. A third rock type with a somewhat gneissic texture is also heavily pyritized (as disseminations and veinlets) - it may be a less oxidized section of the quartz porphyry dike. A fourth rock type in the talus, pyritized in lesser degree, has elongated narrow bands and small lenses of hornblende and biotite in a feldspathic groundmass similar to the "schlieren" described as common to the "outer zone" of the quartz diorite intrusive of the Willow Creek gold-quartz district(adjoing to the west).(Ref. U.S.G.S.Bul.849,p 177).

Mineralization of this wide, persistent zone, is confined to Pyrite (which appears to be "cupiferous" to some degree), a little chalcopyrite, probably appreciable pyrrhotite, and very minor amounts of fine-grained arsenopyrite are believed present. Only small trace of malachite was observed. The "gossan" capping (limonite) covers widths of 75 to 150 feet; it is suggested this was derived from the less stable pyrrhotite rather than the pyrite (or cupriferous pyrite). From "float" the maximum depth of the limonite "capping" is probably within limits of 2 to 4 inches.

The overlying sediments dip 20 to 30 degrees to the south and strike is easterly.

The mineralized zone (dike) has a strike approximating S80E and a dip of 50 to 60 degrees south.

Structure and mineralization at No. 2-LT (approx 3000 feet east of No. 1-LT), at No. 3-LT (on Moose Creek divide, approx 4500 feet east off No. 1-LT), and at No. 4-LT (an estimated 2000 feet down slope on Moose Creek side of divide) showings appear to be similar.

The outcrop at No. 4-LT, however, appears (from a distance) to be much greater. At this exposure the strongly oxidized outcropping on hanging-wall side (south side) and close to or at the sedimentary contact has an etimated width of over 100 feet; this is underlain by an equal width but less oxidized zone of a dark basic appearing dike (or phase of the diorite); and the latter is underlain by a 150 foot or greater width of similar dark rock type which shows a few bands of oxidation "stain".

Four pictures of exposures along the above described mineralized zone will be forwarded when received from printers, and are to be appended to this report.

Results of this preliminary investigation warrant a more thorough examination.

It is recommended that a week to ten days be devoted to this region this season. The persistent mineralization requires a systematic sampling across the full widths at a number of points to determine whether combined copper-gold values are of economic interest.

During course of the recommended program, it is suggested the area be checked for uranium occurrence. While there are no reported occurrences of the radio-active minerals in this district, geologic conditions are similar to a northern British Columbia region where appreciable uranium minerals occur, plans for recovery of which (as a by-product) may now be in effect.

Returned to Palmer night of July 9th at 9 P. M.

July 10, 1953. Returned to Anchorage at noon.

Return to Anchorage night of July 9th was delayed because of suspension of highway travel by the Highway Patrol due to poor visibility caused by eruption of Mt. Spurr.

Scheduled trip to Nuka Bay Friday was postponed by Mr. B. Rick until July 13th, which if previously advised would have permitted two more days on the Moose Creek project.

Respectfully submitted,

M. W. Jasper
Associate Mining Engineer

"KEY" MAP
SHOWING
LITTLE SUSITNA - MOOSE CREEK
MINERALIZED ZONE
Scale: 1" = 4 MI. 7/13/53
(U.S.G.S. ANCHORAGE QUAD. TOPOG. MAP)
(1951 EDITION)

SKETCH MAP
SHOWING
LOCATION LITTLE SUSITNA RIVER
AND
MOOSE CREEK MINERALIZED ZONE
SCALE:- 1" = 1 MI. 7/13/53
(FROM U.S.G.S. BUL. 849-PLATE 11)
Mu Gasper