IR-058-01

[redacted]

TERRITORY OF ALASKA

DEPARTMENT OF MINES

COLLEGE, ALASKA

Report of Investigations and Itinerary of J. C. Roehm, Associate Mining Engineer for Territorial Department of Mines, in the Bonnifield District, Nenana Precinct, Alaska.

August 2 to 11 inclusive, 1949.

Summary

Four active placer operations comprise the total mining activities in the Bonnifield District. These consist of two bulldozer-hydraulic plants and two shovel-in operations with a total of nine men employed.

The road from Ferry across the divide to the Liberty Bell or Eva Creek mine prospect, a distance of eleven miles, is in good condition, and will remain such with the exception of small washouts and deterioration of some of the small wooden bridges. The continuation from Eva Creek to the Totatlanika another ten miles is in a poor state. This section of the road consists mostly of a rightaway made by bulldozing off the moss covering. This allows considerable water to stand in many sections, making the road next to impassible with the exception of caterpillar. Drainage ditches and gravel cover in the sandy and muddy sections would greatly improve this road and make it passable by truck.

The airfields at Totatlanika River and Eva Creek are usuable by light planes only during the winter and dry periods in the summer. Nels Jackson grades and improves these two fields each year. After heavy rains small but dangerous washouts occur in the graded loose gravels. Both the road and the airfields are used only slightly.

The placer deposits of the Bonnifield District are thawed, shallow and generally classified as low grade. The areas surrounding the deposits do not appear to have been actively glaciated. However the gravels, which are poorly sorted, and the occassional boulder, together with the charcter of the flat flakey gold, indicate the former placer concentrations have been disrupted and redeposited by glacial run-off water of apparently large volumes from the pre-existing ice-fields surrounding the Alaska Range to the south. As a result there exists in the district as a whole, abundant gravels with a low pay content. Moose and Eva Creeks probably represented or contained the highest grade deposits due to the great volume of thermal waters accompanying the structural weakness found in the sedimentary band that strikes east west across the distrct. These creeks have been mined nearly to thier heads. They lack benches and old channels.

Costs

Diesel oil landed at Ferry on the Alaska Railroad costs 24½ cents per gallon in tank car lots. Cost of hauling 21 miles to Jackson's camp on the Totatlanika costs three cents per gallon. Gasoline in drums costs 32.2 cents per gallon. Supplies have to be purchased in Fairbanks and this requires freight to Ferry and three to four cents haulage costs.

Uranium Mineral Reported on Thistle Creek, Tributary of Totatlanika.

Carnotite, a uranium-potassium vanadate, was reported as occurring on Thistle Creek in the placer concentrates. This creek is a tributary of the Totatlanika, entering on the left limit above Homestake Creek. Thistle Creek runs through coal measures over its entire length, except the upper two miles, in which the bedrock is Birch Creek Schists. There has been no operation of Thistle Creek for several years. No concentrates were obtainable from this creek in sufficient amounts to determine this mineral. Considerable native sulphur occurrs and with the surface concentrates, which apparently has been leached from the coal measures. It is possible that this yellow mineral has been mistaken for carnotite.

Concentrates from Totatlanika, California and Eva Creeks and from several of the surrounding lode discoveries were tested for radio-activity with negative results.

August 2. Fairbanks to Jackson Field, Bonnifield District.

Nels Jackson of Fairbanks owns forty placer claims in this district. Thirty- two of which are situated on the Totatlanika River extending from Daniels Canyon to Thistle Creek. Eight claims are situated on Flat creek, extending from the mouth upstream. His present workings are located on Claim No. 2 above Discovery or two claim lengths above the entrance to Murphy Canyon. Three miles of this ground, extending upstream from Murphy Canyon is suitable for dredge operation. The gravels range from five to six feet in depth. They are thawed and covered with moss and scattered timber. The pay width is six hundred feet and reported as averaging fifteen cents per bedrock foot. Below Daniels Canyon there exists two miles of ground, not held at present inwhich the gravels range from nine to ten foot in depth and the pay was reported as averaging about fifteen cents per bedrock foot. One and a half claim lengths was worked prior to the last war from the entrance to Murphy Canyon upstream by Pringle with a dry-land dredge fed by dragline. This dredge is situauted on the left limit of the Totatlanika three fourths of a mile above the entrance to Murphy Canyon at a point where the Ferry Road ends on the River.

The Cummins Diesel and generating plant on the dredge has been ruined due to high water and ice. The steel frame, stacker and rotary screen appear to be in usuable order. One mile of good pipe, 24 inches down to nine inches, is still in place on the right limit of the river. Jackson expects to use a portion of this line and has also one half mile of ditch.

Three tiers of low benches occur along some of the sections of the river both above and below camp. The first bench is five feet above the water level, the second bench is eight feet above the first, and the third bench is ten feet above the second. Pay on these benches according to Mr. Jackson run ninteen cents per bedrock foot. These benches could be worked better with bulldozer than the creek bed and are a few cents higher in pay.

Mr. Jackson plans on working the creek pay by bulldozing and hydraulicing into boxes set on bedrock. Tailings will require stacking with bulldozer. Sixty feet of steel boxes are to be used with hungarian type rail riffles and twenty-five feet of steel plate perforated with half inch holes with matting underneath. The mining problem with regard to the benches and creek bed is the hard thinly banded bedrock , which is difficult to clean with bulldozer blade. The creek bed also presents a water problem with regard to cleaning bedrock. A small heavy bucket line dredge could probably be utilized at a profit under normal operating prices.

Jackson has two bulldozers, one international T. D. 40 and one Caterpillar 30. He intends to mine two cuts this season and thence work of the airfields and the road for the Alaska Road Commission.

The banks of the Totatlanika are steep, and range upward to heights of from three to four hundred feet. They consist of banded and folded sedimentary schists with numerous sills of porphyry intrusives. The schists are mineralized with pyrite and traces of antimony and arsenic. They are bleached in many sections by the action of thermal solutions. Assays from several samples taken from these pyritic zones gave gold values ranging from one to two dollars. The placer gold source has been from these numerous scattered mineralized zones where thermal action is much in evidence. The presence of wood and stream tin, together with cinnabar, pyrite, stibnite and bismutite, and traces of copper, indicate a Tertiary mineralization. Evidence of considerable water flow, probably during the melting stage of the ice cap of the Alaska Range to the south, is shown in the unsorted character of the gravels. This water no doubt scattered the rich localized placers and made a uniform low grade deposit within the creek bed and low benches.

The gold is fine and flaky and distributed all through the unsorted gravels. This presents a mining problem of saving the gold in the sluices.

Jackson Airfield is situated one half mile east and four hundred feet above Jackson's camp on the right limit of the Totatlanika. The field extends in an east west direction and slopes to the east. It has a length of two thousand feet. The road from Ferry extends to the west bank of the river opposite Jackson's camp. Difficulty is experienced in crossing the river during high stages of water in the early spring. The section of this road from the Liberty Bell Mine to California Creek is in a fair condition and passable with the exception of a few mud holes. The section from California Creek to the Totatlanika consists only of a bulldozed bed with the moss removed. This section needs grading and numerous culverts and many sections should be gravelled. Jackson has a good camp consisting of seven small buildings, all in good order and of sufficient size to house fifteen men.

Aug. 3. Jackson's Camp to Homestake Creek and return.

XX-55-151

Joe Burns and Son of Fairbanks are operating a bulldozer-hydraulic plant on Homestake Creek, one half mile above its junction with the Totatlanika. Five men are employed and two Allis Chalmers caterpillars are used. Burns and Son are operating on a lease from Mrs. M. Heisler of Ferry. The lease covers nine placer claims, three are creek claims, consisting of associations, one creek claim on the Totatlanika below the mouth of Homestake, and two bench claims on the left limit of Homestake at the mouth. This group of claims was originally known as the Mc Curdy Group. This is the first season of operation on this creek since 1938.

The site of mining is one half mile below a steep walled canyon, cut by Homestake Creek through andesite. Some old sluice workings were noted at the mouth of the canyon in the vicinity of the contact of the andesite and schists. The excessive amount of rocks and boulders, no doubt, made unprofitable mining in this section. The valley floor has a width of three hundred feet, and it is covered with small trees, brush and heavy moss. The banks of Homestake Creek rise abruptly, and there are no benches. Burns has a wing dam one half mile above the site of his cut with a ditch to another dam above the cut. A low pressure hydraulic nozzle will be used to move the bulldozed material through the boxes. Tailings will require some bulldozing. The creek has a six percent grade, however the coarse nature of the gravels and the small amount of water will limit mining and require some stacking of the tailings.

Fifty feet of steel boxes are to be used with a fan shaped steel plate, eighteen feet in length, in front of the boxes. Railroad rails are used, hungarian stype, for riffles; and an under-current is to be used in the last two boxes. The gold is fine and flat, but heavier than the Totatlanika gold. The rough bedrock, together with coarse gravels and some boulders, presents difficult mining. The pay on the creek has not been determined, however good pans were obtained on bedrock along the stream cuts.

Aug. 4. Jackson's Camp to Liberty Bell Mine.

J. J. Murphy is shoveling-in on his placer claims on Eva Creek below the Liberty Bell lode prospect. He holds three placer creek claims. KX-55-176

Along the left limit of the creek is found a stratum of conglomerate cemented with iron oxides. This stratum measures four feet in thickness and contains noticeable pieces of fine rough gold. The placer gold found in the creek bed appears to have originated from this conglomerate. This stratum is in a hard consolidated form and overlies rough angular gravel, which in turn overlies fine angular gravel, both of which are heavily iron stained. The stratum is held to have originated from precipitation of the iron oxides from extensive mineral solutions from the Liberty Bell fault zone and surrounding mineralized sections. This indicates the recent activity of the thermal solutions from the fissure-fault zone which extends in an east-west direction through the Liberty Bell lode.

The placer pay is found across a width of 125 feet along the creek, and a few feet below the level of the iron oxide conglomerate. A cross-section in Murphy's cut shows two feet of sand and moss, eighteen inches of heavy wash gravel, eighteen inches of mud and gravel mixed, and thence two and one half feet of fine gravel and sand that contains the pay. The bedrock is a soft mud made up of altered schist. The grade of the creek is three percent, and the pay streak widens to 250 feet on the last claim downstream. The gold is rough and flaky with wire gold common, and one to two cent pieces the largest found. Concentrates associated with the gold consist of hematite, garnets, native bismith, bismuthinite, stibnite, arsenopyrite, barite, chromite, ferberite, wolframite, scheelite and zircon. A portion of these concentrates have originated from outcrops and mineral waters of the Liberty Bell lode and others worn from the intrusive dikes and sills, that occur in the upper portion of the valley.

Aug. 5. Liberty Bell to Moose Creek and Return.

A trip on foot was made over the divide west from the Liberty Bell prospect to the head of Moose Creek and downstream through the Canyon. Mining was formerly carried on this creek by Triple X Placers, Inc.,. The remains of their plant, consisting of a large steel grizzly and steel boxes and considerable pipe, was found located a mile above the canyon on the Koski and Barlow ground. The creek is nearly work out, with the exception of one half mile of pay above the plant. The pay width in this section appears to be narrow and covered with considerable slide rock. KX-58-173

Moose Creek in the upper portion flows west following along a contact of quartzite and tuff. The quartzite is highly fractured and banded. Several seams along these bands have been subject to mineralized waters. Arsenopyrite, stibnite, bismuthunite, pyrite and their alteration products was observed in several of these fractures and seams associated with quartz. Below the canyon the creek bed fans out into a good width, and may contain dredge pay. This ground is held by Wm. Pringle.

E. M. Keyes was reported mining alone as shovel-in on the Tatlanika River. He was reported as the only person in that section.

Gordon Johnson of Fairbanks is holding considerable placer ground on Gold King Creek, but is not operating this season.

Liberty Bell or Eva Creek Lode Prospect. KX-58-53

The Liberty Bell Lode prospect is situated at the head of Eva Creek on the Ferry- Totatlanika Road, elven miles east of Ferry at an elevation of 2600 feet.

The adit portals are caved and the shafts are iced nearly to the collars. Considerable water flows from the east adit. The surface cuts and the prospect shafts are more or less filled, since there hasbeen no work or development for several years. As a result little could be determined as to the geological features underground and the existing ore bodies.

The surface geology shows a dioritic sill injected into foliated dark schists of a calcareous nature. At the east end of this injected sill a wide shear zone with an east-west strike is intersected by a north to northeast fault. Both fault and shear zone appear from surface indications to have steep dips. The schists have a low dip to the south.

Thermal mineralizing solutions appear to have penetrated the structure mainly along the shear and the foliation of the schists. Replacement is evident in the ore, but appears to be only in part or along favorable thin strata of the foliation of the schists. Occassional massive lens and kidneys were reported encountered while mining. The ore is of a very basic and complex type, but contains exceptionally high gold values.

A compiled sketch map of underground workings from old sketches found at the mine to gether with two hundred and thirty six channel samples, positions marked with widthes and descriptions is in preparation. The results of this mine sampling shows highly scattered values, and the highest values are mainly confined to narrow widths, or the highly mineralized shear seams.

The mineralization appears to be of Tertiary or later Geologic age penetrating pre-Cambriam sedimentary schists. The ore minerals consist of long blades bismuthite, stibnite, arsenopyrite, pyrite, scorodite and gold in a gangue of calcite, quartz, talc and clay from altered rock minerals.

The property consists of nine unpatented lode claims, and owned according to the following status,

Liberty Bell, Rose Quartz, Irene Claims,

3 and 3/4 ninths by J. J. Murphy 903 Third Ave., Seattle Wash.

2 and 3/4 ninths by Kenny Home Corp., Seattle, Wash.

One ninth by Mrs. Bernard, Fairbanks, Alaska

One ninth by Sobosky , Fairbanks, Alaska
One Half ninth by James Murphy, El Singande, California.

Liberty Bell No. 3 and Wild Goose Claim . Owned by J. J. Murphy.

Liberty Bell No. 4 Claim

One half interest owned by J. J. Murphy
One half interest owned by Kenney Home Corp.

Irene No.1 and No.3 Claims owned by J. J. Murphy.

The camp consists of two bunk houses, office building, store-room, blacksmith- shop, assay office, powder storage, and mill building. The machinery from the mill has been removed. The head frame of the main shaft next to the mill is in place and appears to be usable. A small tailing pond is located below the mill. Mr. Murphy reports the tailings to contain eight thousand dollars in gold and represents between two and three hundred tons.

Aug. 6. Eva Creek to Joe Burns Lode Prospect on Moose Creek.

Joe Koski of Ferry holds two lode claims located on the left limit of Moose Creek at the junction of the first tributary on the left limit below the head. This is at a point one mile downstream from the head. The claims were leased by Joe Burns of Fairbanks whom did the development.

The workings consist of two bulldozer cuts and two other rock trenches at the top of a small knoll at the junction and one hundred and fifty feet above the creek level. The showings consist of a two foot quartz vein and numerous small quartz stringer veins confined to a shear zone sixty feet in width. The veins and shear strike N. 62° west and have steep dips to the north. The enclosing formation is a buff colored quartzite, which is stained considerably along the veins and shears with iron oxides. This gives the entire zone a reddish surface appearance. The stratum of quartzite Strikes No. 80° west and can be traced from the Eva Creek Valley down Moose Creek through the canyon, a distance of over five miles. The north contact of the quartzite occurs in the stream bed and the right limit is tuffs. The south contact is between quartzite and calcareous schists. One bulldozer cut is along the strike of the shear and has a length of eighty feet. Several small veinlets of quartz and a four foot shear zone shows in this cut. The other bulldozer cut is across the shear and has a length of over a hundred feet. A two foot quartz vein is exposed in the south end of this cut, and numerous small stringer veins from mear seams up to six inches in width are uncovered.

The quartz in the veins is of a hard milky white to gray type with frozen walls and contains numerous black oxide seams. The zone of most intense shearing shows best in the upper bulldozer cut. This has a width of four feet and the quartzite and small quartz stringers have been crushed to a softened state.

Both the shear zone and the quartz veins contain scattered pyrite, small amounts of antimony and bismuth sulphides, arsenopyrite and their alteration products.

Sample J.C.R. NO.,1423 was a channel sample taken across the width of the intense shear zone in the upper bulldozer cut. This gave assay results of 0.04 ounces of gold per ton and nil in silver.

Sample J. C. R. No.1424 was a channel sample across the two foot quartz vein in the south end of the lower bulldozer cut. This sample gave results of 0.08 ounces of gold per ton and nil in silver.

Aug. 7. Eva Creek to California Creek.

California Creek in its northward direction of flow cuts across the entire series of geological formations found in the Bonnifield District. Its two main head creeks, Elsie and Margarite Creeks cut across the Coal Measures and Birch Creek Schists at the upper portion, thence California Creek cuts across the younger pre- Cambrian Schists and tuffs. For two miles below the bridge on the Ferry Road, Califonia Creek is contained in a steep high walled canyon. This canyon section shows a good cross-section of the schists and tuffs.

Three small high grade antimony-lead-silver veins were found exposed in this cross-section with float of another similar vein. These veins appear to occupy east-west faults, which appear to be thrust block faults, which are spaced rather regularly at one half mile intervals.

The first vein encountered is locally known as the Wm Pringle prospect, since it was discovered by Pringle during the construction of the road. The vein is exposed a distance of forty feet on the north side of the road at a point one half mile up Eva Creek from its mouth or junction with California Creek. The vein ranges in width from four to six inches and occupies a fault zone with nearly an east-west strike and a steep dip to the south. The vein is made up of nearly massive sulphides of galena, antimony, iron pyrite, and probably bismuth.

Sample J.C.R. No. 1430 across six inches gave assay results of 0.16 ounces of gold per ton, thirty six ounces of silver and 17.92 percent lead. Assays for antimony and bismuth were not made.

The next vein moving north or downstream across the strike of the formations is situated on the east bank of California Creek, one half mile below the junction of Eva Creek and California. This is approximately one half mile north of the Pringle vein. This vein is locally known as the Danzenger No. 2

vein. Both the Danzenger veins No. 1 and No. 2 were discovered by Edward Quin in 1917. Quin did not develop these veins, and they were later in 1920 taken up by Abbey, Peterson and Danzenger. The adits on both veins were driven, and it was reported that some ore was shipped.

No. 2 Vein occupies a fault zone, striking N. 85° east and dips 76° north. The vein is followed by an adit 200 feet in length driven along the strike to the east with the portal on the east bank of California Creek, ten feet above the water level. This fault vein is contained in fractured tuffs, which appears from a hand specimen as an andesite porphyry. The width of this vein is two feet with eighteen inches of this width consisting of schisted tuff material. The remaining six inches of this vein consists of nearly massive sulphides and occupies a position of the hanging wall. The metallic mineral content noted in the vein were galena, stibnite, pyrrhotite, pyrite and their alteration rpoducts.

Sample J. C. R. 1428 was taken across twelve inches from the roof of the adit at a point a few feet in from the portal. This sample gave assay results of 0.28 ounces of gold per ton, trace of silver and 6.72 percent lead. No assay was made for antimony.

Danzenger No. 1 Vein is also situated on the east bank of California Creek, one mile below No. 2 Vein. The adit portal is located thirty feet above water level, but is covered with slide rockand noticable only by the protruding portal timbers and the small dump below. Another adit is located eighty feet downstream and only five to six feet above water level. This adit is caved at the third set of timber. This lower adit was reported driven diagonally to the vein. The dump from this adit has been washed away. Its length was reported as three hundred feet. The vein was not observed by the writer, but was reported by J. J. Murphy as striking east-west and varied in width from six inches to one foot. From this vein Danzenger was repotted to have mined and shipped a few tons of ore. The ore was reported to have netted over one hundred dollars per ton. The surface float from this vein is stained a light green color which apparently is a silver chloride stain. Several small pieces of ore were observed on the dump. The vein appeared to be situated in a fractured zone of tuff which occurs along the fault zone. The apparent position of the vein above the adit is covered with slide rock. This slide ranges upward very steeply for three hundred feet. Directly across California Creek a steep draw shows the position of the fault, but the vein has not been uncovered.

The ore is very fine grained, dense and black in color with green stains on the edges. The sulphides of lead and antimony were noted and the dense black is apparently an altered silver mineral.

A sample J.C.R. No. 1429 was made up from several pieces of ore found on the dump. This sample gave assay results of 0.32 ounces of gold, 154.56 ounces of silver and trace of lead per ton. No assay for antimony was made. Traces of copper were noted and the copper mineral probably was tetrahedite.

Similiar green stained float was found on a steep slide by the writer on the east bank of California Creek one half mile above Danzenger No. 1 Vein. Another faulted and schisted zone was noted crossing the river at this point. But due to the steepness of the slide and the great amount of talus rock, the vein was not located. Upon breaking these green flaat pieces, the fresh ore was metallic black in color and contained lead and antimony sulphides. It apparently contains a high silver content.

Aug. 8,9&10. Three trips up Fourth of July Mountain.

Three days were spent trying to reach a small draw at the head of Red River near the top on the north slope of Fourth of July Mountain. The mountain has an elevation of over four thousand feet, and it is situated north of the road between California Creek and the Totatlanika.

J. J. Murphy sixteen years ago found a wide ledge which he stated was a porphyry sill or dike in a draw down from the top on the north slope of Fourth of July Mountain. Contained in this porphyry were galena crystals of uniform one half inch square. He reported the ledge as several feet wide and was traceable several hundred feet. He did not consider base metals as worth holding in that area at the time.

On August 8 Murphy and the writer ascended Fourth of July Mountain from the road on the south slope. As the top was reached heavy fog covered the north slope and the draw was not located. On the ascent two small veins both ranging in width from four to six inches were noted at an elevation of 3400 feet. These veins were two hundred feet apart and had parallel east-west strike. They showed float pieces up to six inches in thickness of nearly pure stibnite. The veins were reported as having been discovered by Mike Lody. A few shallow cuts were observed along their strike.

Sample J.C.R. NO. 1427 taken across a six inch width of nearly pure stibnite gave assay results of 0.01 ounces of gold, a trace of silver and 52.58 percent antimony.

An attempt was made to climb Fourth of July Mountain from the California Creek or west slope. Fog and rain descended and the trip was ended.

On August 10 the writer made a trip over the divide north of the Liberty Bell prospect thence east to the mouth of Red River, and thence up Red River to the top of Fourth of July Mountain. The right limit of Red River consists of a ridge four to five hundred feet above the level of the valley of California Creek. This ridge is a brilliant red color and extends for over two miles. Investigation of this ridge showed the existence of a burnt coal measure and Tertiary sediments overlying the pre-Cambrian tuffs. Small burnt sections were noted ranging from one thousand to two thousand higher up the slopes of Fourth of July Mountain on the north and northwest slopes. In fact the area east-west from California Creek and north of Fourth of July Mountain contained numerous of these burnt sections but at a low elevation. From a distance these burnt zones appear to be highly mineralized sections. The apparent heat from these measures have leached the tuffs beneath to the extent that the ferro-magnesium minerals in the tuffs have turned white in color. This gives the tuffs the appearance of porphyry.

At the head of Red River on the north slope, several draws were found. A search was made for the existing lead ledge, but it was not found. No true porphyry was noted. Further search for this ledge may be warrented, since it may be a deposit of pre-Cambrian age.

August 11. Return to Liberty Bell Prospect, thence to Ferry, and Fairbanks.