

(22.5, 9.8)

59° 22' N
150° 13' W

TERRITORY OF ALASKA

DEPARTMENT OF MINES

PROPERTY EXAMINATION REPORT

SURPRISE MINE

ALASKA EXPLORATION AND DEVELOPMENT CORPORATION

GOLD*QUARTZ PROPERTY

NUKA BAY, KENAI PENINSULA

by

M. W. JASPER
Associate Mining Engineer

April 1954

PE
104-4

104-2

CONTENTS

	<u>Page</u>
SUMMARY	<u>1</u>
INTRODUCTION	2
LOCATION AND ACCESSIBILITY	2
TOPOGRAPHY	2
CLIMATE	2
TIMBER AND VEGETATION	2
WATER SUPPLY	3
HISTORY AND OWNERSHIP	3
GEOLOGY	3
Mineralization	5
Sampling	5
CONCLUSIONS	6
RECOMMENDATIONS	7
APPENDED	
Plate 1. Key Map of Nuka Bay Area	
Plate 2. Plan of Mine Workings. Scale 1 in. to 20 ft.	
Plate 3. Plan of Mine Workings. Scale 1 in. to 100 ft.	
REFERENCES	
Mining Investigations and Mine Inspection in Alaska, Biennium ending March 31, 1933. Pages 31 to 34.	
U. S. Geological Survey Bulletin 587. Pages 209-238.	

REPORT ON
SURPRISE MINE
NUKA BAY, KENAI PENINSULA
SEWARD PRECINCT, ALASKA

SUMMARY

The August 1953 preliminary examination of the Surprise Mine, the gold-quartz prospect of Alaska Exploration and Development Corporation, in the Nuka BayKenai Peninsula, shows no ore in sight.

From 835 feet of lateral development on three levels, only one ore-shoot was located. This was mined from the 210 Level to surface at 318 foot elevation; it was apparently bottomed at the 210 Level. The ore-shoot produced an estimated 1000 tons, having a reported gold value averaging \$25.00 per ton (Au @ \$20.62 per ounce).

The quartz veins encountered in the graywacke to date have been short, irregular and discontinuous, with one wall generally poorly defined, and showing little or no gold values. The exception was the ore-shoot mined.

Of the 835 feet of lateral work 70 feet was in argillite, and balance in graywacke, 691 feet of which was driven on the 210 Level.

It is recommended that any future exploration and development work on this property be confined to drifting on the two veins cutting the argillite^{at} approximately right angles in the two most northerly drifts, extending these headings northerly a minimum of 100 feet in each case. These two veins have well defined^{WALLS}, occupy strong fissured or shear zones of good width and probable persistence. Cross faulting of these zones is to be expected in course of this work.

From present knowledge of the property, gained through study of the old workings, the argillites are believed to hold the best "prospects" for finding ore-bodies of importance. Results of this initial exploration program should give some idea as to whether or not the program should be expanded.

INTRODUCTION

Preliminary examination of the Surprise Mine -(the former Babcock and Downey-Sunny Fox Mining Company property)-was made at request of B. C. Rick, President, Alaska Exploration and Development Corporation, Anchorage, August 20th to 23rd, 1953.

A Brunton and tape traverse was made to tie-in the old mine workings and open-cuts, as no map of the property was available. This survey was made with assistance of the two men employed by the company, who were on the property.

LOCATION AND ACCESSIBILITY

The property is located at approximate Latitude $59^{\circ}-32'$ North and Longitude $150^{\circ}-29'$ West. It lies a mile north of Palisade Lagoon which is at head of Surprise Bay, a northeasterly trending branch of West Arm of Nuka Bay near southwest end of Kenai Peninsula. The nearest seaport is Seward which is about 55 airline miles to the northeast.

With no regular boat service into the Nuka Bay area, the trip was made with chartered "float" plane from Anchorage in 1 hour and 25 minutes, with landing made at mouth of Babcock creek at head of Palisade Lagoon.

The mine camp is about 1 mile northeasterly from this point. The trail follows the old tractor "tote" road along center of the U-shaped glaciated valley, which is about $\frac{1}{2}$ mile in width, for $\frac{3}{4}$ mile to an elevation of 80 feet above sea-level. In last $\frac{1}{4}$ mile to camp the difference in elevation is 125 feet, the camp elevation being 205 feet, easily accessible to tidewater.

TOPOGRAPHY

The ridges bounding this glaciated valley are steep and precipitous, with elevations at ridge crests ranging from 1400 to 3300 feet.

The mine workings and camp are at and near the base of a "hanging-valley" slope, about 1000 feet west of Babcock creek, and apparently far enough out from the steep mountain slopes to be safe from the snowslide hazard.

CLIMATE

With prevailing temperatures said to range from monthly "mean" of around 20 degrees above zero in January to about 55 degrees in July and August, the climate is considered moderate.

TIMBER AND VEGETATION

The area has a good growth of spruce from sea-level to 1000 elevation,

with some timber observed to be around 100 feet in height and 3 feet in diameter at the base.

The alder, willow, and devil's club growth is fairly dense, especially on the mountain slopes up to timberline wherever the timber is scattered. Other vegetation is typical of Alaskan coastal areas.

WATER SUPPLY

Babcock creek carries an ample supply of water for mining and milling needs, but its flow is not sufficient for dependable power development throughout the year.

HISTORY AND OWNERSHIP

Babcock and Downey, of Seward, were the original developers of the property, transferring it to the Sunny Fox Mining Company^{which} was formed. The property included 6 lode claims - the Sunny Fox, and Sunny Fox No.s 1 to 5. Their development and small scale mining and milling operation was confined to the late 1920's and early 1930's.

Following suspension of the Sunny Fox Mining Company's operations, the claims were eventually abandoned.

Wyman Anderson and B. C. Rick relocated the ground in July 1951, and the property has since become known as the Surprise Mine, with Anderson and Rick transferring the property to the Alaska Exploration and Development Corporation upon its formation.

The last record encountered concerning the Sunny Fox company's operation, tonnage mined, and average value, states "Up to August 1, 1931, the property had produced about 1000 tons, which was said to have averaged \$25.00 per ton." (Reference:- Page 34, Biennium Report Ending March 31, 1933, page 34. By Earl R. Pilgrim, Associate Mining Engineer).

GEOLOGY

Formations in immediate vicinity of the Surprise Mine appears limited to deformed sediments composed of graywacke, argillite (slate), and some reported quartzite. Numerous fine grained acidic dikes have been mapped in the Nuka Bay area, but none were noted in vicinity of this property. (Refer to PLATE I, attached).

At the Surprise Mine graywacke is by far the most predominant rock type. Argillite is found in vicinity of the 287 Level (an adit 40 feet in length) and in bedrock exposures and the two open cuts to the east, as well as in bedrock exposures to the north and west of this level; elsewhere the only occurrences noted were on hanging-wall side of vein encountered near northeast end of the 210 Level cross-cut (at sample No. 1-AE location), and at extreme east end of the 210 Level East drift.

At this latter point the drift intersected a sheared argillite zone for a few feet. The sharp "U" turn made at point of sheared argillite intersection to return to the graywacke formation with no vein structure to follow, and the very limited exploration of the much stronger well defined fractures and vein systems cutting the argillites at sharp angles, indicates the original operators had no "faith" in chance of locating ore shoots in the latter formation.

With exceptions noted above, the development work was confined to the graywacke. (Refer to PLATE 2).

Locally the sediments stand at a steep angle. The argillite dips 70° to 80° west, and strike N 5° to 15° East. Both rock types - graywacke and argillite - show silicification to some extent at several points.

Faults of varying strike and dip were noted and mapped at number of points. (Refer to PLATE 2 for their location). The one intersected in north cross-cut, 55 feet from the East drift¹⁵ on the 210 Level. Its strike is N 65° to 70° E and dip is 80° north, and the fault zone has 3 to 12 inches of gouge and brecciated graywacke with an indicated displacement on its foot-wall side of 75 to 100 feet to the east. The other faults noted appear to have displacements (horizontally, at least) of minor magnitude, especially in the graywacke.

Of the faults noted in the argillite the one cutting the formation at a tangent, striking N 35° E and with dip of 70° NW, is the stronger, its movement developing 2 to 5 inches of gouge. This fault was intersected at face of the 287 Level adit displacing the vein drifted upon from portal and as yet undetermined distance. The face of this adit - on foot-wall of the fault - shows disseminated as well as fine veinlets of pyrite, and the argillite has been somewhat silicified.

Near portal of 287 Level there is a sheared zone paralleling the fault noted above at the face, cutting the argillite at a N 40° E strike. It has a width of 54 inches, contains several quartz stringers, and the zone as a whole is somewhat silicified.

The fault at face of the short (18 foot) drift on vein at north end of the 210 Level offsets the vein 18 inches to south on footwall side of fault. At the face the argillite is graphitic, and the fault roughly follows the strike and dip of the Graywacke-argillite contact.

The sheared zone at east end of the 210 Level East drift is of undetermined width, has no vein quartz but shows some silicification, and its strike and dip also parallels Graywacke-Argillite bedding contact. This zone is considered to be the "offset" continuation of fault at face of this Levels north cross-cut drift.

The graywacke as a whole has been highly fractured, and contains numerous small irregular quartz lenses. The larger of these, entirely within the

graywacke, was the only one located by original owners with sufficient gold values to warrant mining. The stronger fractures and sheared zones continuing into the argillites will probably prove ~~the~~ to be the more persistent and favored area for exploration.

Mineralization

The minerals noted were limited to little disseminated pyrite and arsenopyrite, with some fine pyrite veinlets at several points. Chalcopyrite was noted at only one point; this was found in small dump containing scattered grains and small "blebs" in a "milky" quartz. This dump having an estimated 5 tons, which was apparently taken out of the adit 6 feet in length located on west side of dry creek at the 287 Level.

No free gold was noted at any point, although it was reported to have been present in the mined area.

The smelter analysis of concentrate shipment mentioned in Earl R. Pilgrims report, of August 1931 date shows 0.2% lead, 1.3% zinc, but no copper, indicates presence of small amounts of galena and sphalerite. The assay sheet also reports 6.11% arsenic, 11.3% iron, 4.9% sulfur, 55.8% silica, 5.9% Al_2O_3 , and 1.3% insolubles. Gold content was reported to have averaged \$25.00 per ton for the 1000 tons milled, and was probably associated with the arsenopyrite rather than the pyrite. The concentrates were said to have averaged \$125.00 a ton, indicating a concentration ratio of approximately 5 to 1.

A grab sample of the sorted quartz showing little chalcopyrite showed only 0.02 ounces of gold, which indicates the chalcopyrite has no significance with respect to gold values.

The vein filling of the several veins exposed in the old workings is largely a "milky" (bull) quartz. The vein followed in the 287 Level adit is filled with brecciated quartz and argillite. The vein in 18 foot drift to east at north end of the 210 Level north cross-cut has two generations of quartz filling; here there is 15 inches of a crushed (brecciated) graphitic argillite and gray "birdseye" quartz with 33 inches of "milky" quartz on the hanging-wall side, with both quartz types carrying a little disseminated pyrite and little arsenopyrite. Although this gray quartz section was the "liveliest" quartz noted, the sample taken of the drift face carried no values.

Sampling

Only three samples were taken in the mine workings, as these points were the only ones noted that were considered of possible interest.

While the stoped area appeared to be open, the walls of the stope were not examined as the stulls looked rotten and the "back" of stope appeared "slabby", and conditions were considered too hazardous to explore the old working.

Location of the samples are shown on PLATE 2. Assay results and description of the samples are as follows:-

Sample results					
Sample No.	Width in.	AU oz	AG oz	Value /ton	Description
1-AE	45	nil	nil	nil	210 Level at point of vein intersection of north x-cut. 22" milky qtz & 23" sheared argillite. Little dissem. sulfides in qtz & few fine pyrite veinlets in sheared argillite.
2-AE	54	nil	tr	nil	Drift face 18' east of #1-AE. 8" sheared graphitic argillite, 33" milky qtz & brecciated argillite, 15" gray "birdseye" qtz & graphitic sheared argillite. Some pyrite in gray quartz.
3-AE	33	0.06	nil	\$2.10	287 Level 5' from portal. Brecciated qtz and argillite. Few fine pyrite veinlets & dissem. grains.
4-AE	Grab	0.02	tr	0.70	Dump grab of qtz with little chalcopyrite, from 8 ft adit 25 ft NW of 287 Level portal.
5-AE	33	0.44	tr	15.40	Sample of mill tailings pond near old mill. Taken to depth of 33".
6-AE	36	0.26	tr	9.10	Sample of mill tailings pond 100' SW of old mill.

The above samples were assayed by R. C. Rowe, Assayer, Anchorage office, Territorial Department of Mines.

CONCLUSIONS

Examination of the Old Surprise Mine workings shows no ore in site or possible ore-shoots indicated. The lateral development on the 3 levels completed by the past operators totaled 1835 feet. Of this total footage 691 feet was driven on the 210 Level (elevation), 99 feet was driven on the 255 Level, and 45 feet on the 287 Level. This work was confined to a vertical range of only 108 feet and developed only one mineable ore-shoot and produced only an estimated 1000 to 1500 tons of \$25.00 ore.

The 80 Level (elevation 80 feet above sea level, by altimeter) was started on an apparent barren quartz vein. This heading, whose portal is 750 feet

south of the 210 Level portal, is reported to have been directed to explore and search for downward extension of the mined ore-shoot.

Completion of this project is to be discouraged and is presently not justified.

Before undertaking the driving of this heading 750 feet, good practice dictates the best policy to follow would be to sink a prospect winze 50 to 100 feet below the 210 Level from a point directly below center of the stoped area to determine whether that ore-shoot continues downward or whether another ore-shoot can be located. It should be kept in mind that the past developments at this property have ^{proven} the quartz lenses to ~~be~~ be small, irregular and discontinuous in the gray wackes, and that only one of these (of limited tonnage) has been found to carry gold values of interest.

From the examination made in August 1953 the opinion was formed that one or more of the veins cutting across the strike of the argillites offer more encouraging possibilities for exploration than the graywacke horizon.

It is believed that the vein drifted upon for 45 feet in the 287 level, and the vein followed for 18 feet at north end of the 210 Level north cross-cut will be much more persistent than anything found to date in the graywackes. Both of these veins have well defined walls, and are in the argillites. Although appreciable gold values are not present in these short sections, there is more mineralization present in form of pyrite and minor arsenopyrite than noted elsewhere on the property.

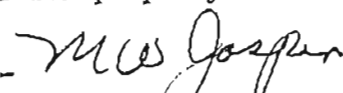
RECOMMENDATIONS

Results of examination suggests following procedure be followed when the company undertakes a development program:-

1. Drift a minimum of 100 feet on the 287 Level vein. The shear zone cutting this adit 5 feet from portal should be stripped and checked for values.
2. Drift on vein, intersected and followed for 18 feet at north end of the 210 Level north cross-cut. This vein should be followed a minimum of 100 feet easterly. Results obtained while driving these 2 drifts will determine whether they should be extended and for what distance.
3. All branch vein should be explored for several rounds as encountered, if values warrant it.
4. Careful sampling should be done following each round.
5. Sinking of prospect winze from 210 Level from point below mined area may be done during same period as drifting progresses elsewhere, but is believed it should be a secondary consideration.
6. With faults to be expected as work progresses experienced supervision should be obtained.

Results from above will determine long range plans for property's development.

Anchorage, Alaska
April 7, 1954

By- 
M. W. Jasper, Assoc. Min. Eng.
Territorial Department of Mines