sent to Geo. T. Scholey
General manager. April 9th 1941 by Gudmund Jen

If you are interested, for information, Write to, Gudmund Jensen
P.O Box 1254 Juneau
Alaska
and R.S. Robertson attorney at law.
Juneau
Alaska.

if you are not interested I will thank you to
mail them back to Gudmund Jensen.

memorandum

This property was under bond and
option, to the Alaska Windham Gold mining Co., and
now has reverted back to the original owners.
the amount of claims were 23 Lode claims. and that
G. Jensen. claims, 3 of the Alaska windham claims
by location. & has a short map of the ground
of claims; that we did relocate in a working bond of
in statement to Gudmund Jensen,
P.O. Box 1254 Juneau
Alaska

ANALYSIS OF DATA
ON
ALASKA-WINDHAM GOLD MINING CO.

Leroy A. Palmer

ANALYSIS OF DATA
ON
[illegible] GOLD MINING CO.

TO
E. SCOTT SPALDING
[illegible] CO

FROM

[illegible]
MINING ENGINEER
[illegible]

CONTENTS

LARRY A. PALMER
Consulting Engineer
333 Montgomery Street
San Francisco, California

Mr. L. Scott Keeling

Olke Club

San Francisco

Dear Mr Knulling:

Pursuant with your request I submit herewith summary of data furnished me on the Alaska-Windham Gold Mining Co. at Windham, Alaska, with comment in same. It is understood that I have not made a personal examination of this property so that, while I believe all data that I have used to be entirely reliable, I cannot assume responsibility for the correctness thereof.

These data consists of the following reports:

Matthew L. Deese, March 15, 1936

Carl L. Willis, Nov. 9, 1926

" " " (Supplementary) 1927

John C. Hopper, July 15, 1936
original(French) and translation

Assayingical tests--Pan-American Engineering Co.

Mr. Deese is known to me as a competent mining engineer who has held many positions of responsibility. His report is based on six months experience at the mine in 1935 when he carried on an extensive development and sampling campaign. The report and maps are very complete and give evidence of much careful thought. While I have not agreed entirely with the estimates and conclusions, which is quite natural, my opinion of the report is that it is well considered and conservative.

The Hills reports are eight and nine years older than the Reese report. They go into considerable detail in some respects but do not have the sampling data that was available to Reese. Hills considers the mine more from the possibilities of its high grade ores for immediate future production but gives some attention to the low grade, of which he estimates a much larger possible tonnage than Reese.

The Hopper report is in French but a translation is furnished. It follows the Reese report very closely but goes into greater detail with respect to probable and possible ore.

Reese considers the mine solely from its possibilities as a large low grade producer. His report is the most conservative and for the purpose of this analysis I have drawn almost wholly on his data.

## Outline

As the principal matter to be considered is the desirability of the property from an investment standpoint I am, in a sense, putting the cart before the horse and summarizing that feature at this point. Data from which the figures are drawn are given in the analysis that follows.

It is proposed to build a 200 ton mill and to develop the mine for production on that scale. It is estimated that this will require $100,000. (Reese supplement) With the mine operating on a 200 ton basis development will be carried on to put it in shape for production of 500 tons per day. This development with additional equipment will cost $150,000(Reese Rep).

Total investment in the property will then be

| | |
|---|---|
| To date | $416,000 |
| For 200 ton production | 100,000 |
| Development for 2000 ton production | 152,000 |
| | $671,000 |

Ore reasonably assured amounts to 1,000,000 tons(Reese 12) which would supply a 200 ton mill for 15 years at an annual operating profit of $47,040 a total for the period of $705,000 to offset an investment of $670,000.

The above figures do not make allowances for taxes but they do show that if worst came to worst and further developments were entirely disappointing that practically the entire investment would be returned to the company. A consideration of the data following shows us that this is a contingency which need not give us serious concern.

If the ore bodies respond to development as expected the mine will be equipped for production on a basis of 2,000 tons per day at an additional expense of $1,218,000(Reese 10), giving a total of $1,889,000. As a matter of fact the amount will be less than the above amount as most of the 200 ton development will fit in with the enlarged program and the cost need not be duplicated.

The most conservative estimate of the probable ore is 72,000,000 tons (Reese 5). This would supply a 2000 ton mill for 109 years at an annual profit(if we could look that far into the future)$650,000. To look at it another way we will assume a 20 year amortization period and deduct $95,000 per annum for that per ton assuring an annual profit of $555,000 on an investment of $1,800,000 with the entire amount amortized at the end of the period.

Of course if the mine comes up to its apparent possibilities production would not be restricted to 2000 tons a day but would be expanded so as to afford the most economical operation and the greatest return on the investment. Mr. Reese estimates that by driving a tunnel from sea level 150,000,000 tons can be made available and other estimates run as high as 300,000,000 tons. When we consider these figures it is impossible to say at this time what the ultimate capacity may be.

Following is some detail on which the above conclusions have been based.

## Location

The group consist of about 50 claims, covering three miles of the lode, situated at the head of Windham Bay, and arm of Stephens Passage. The main workings are about a mile and a half by good trail from the little settlement of Windham on the beach. The adjacent mountains rise to elevations of 3000 to 5000 ft. The location is 65 miles down the coast from Juneau.

## Harbor and Transportation

Windham is a postoffice at which a sailboat calls so that light freight can be brought in in the summer and winter by that manner. The bay is deep, the shallowest sounding showing seven fathoms, so that any freighters that come in can reach the floating wharf maintained by the company. Climatic conditions are essentially the same as at Juneau and with the customary precautions for winter operations there should be no interruption on account of weather.

Hydroelectric power to the extent of 200 horsepower is available

for about six months of the year./ For additional power Diesel-electric units would be used.

There is ample timber supply on the holdings for the mine and construction purposes.

## EQUIPMENT

At the mine is a bunkhouse for 15 men, cookhouse and office and superintendents residence. At the beach is a floating wharf and gasboat, stable and packmules.

There is a mill with crusher, Lane mill and plates but this equipment is not of much service. There is an equipped assay office. An aerial tram connects the mill with the View Peir tunnel.

Mine equipment consists of two air compressors, one air and one gas driven, drifters, jackhammers, stopers, sharpener, tugger hoist, mine car, rails, tools, pipes, etc. In fact the mine is well equipped for medium scale operation and has ~~be~~ accomodations for the necessary crew.

## GEOLOGY

The claims are situated in the belt of slates, greenstones and schists which follows the coast for many miles to a point beyond Juneau. The Alaska-Juneau mine is in this same belt.

The above rocks have been steeply tilted and intruded by granitoid rocks and as a result broad fractures zones have been formed. The fractures have been healed by quartz stringers varying in width from a fraction of an inch to 10 inches or more. The stringers are not persistent in length nor regular in strike so that as a whole they make up a network in the fracture zones and are sufficiently numerous that the quartz comprises an important part of the whole mass.

The veinlets are mineralized, free gold and pyrite being the most important minerals with subordinate amounts of other sulphides. About 60 % of the gold is free. Individually the stringers often carry high values but they are so small that, except in rare cases, the only feasible method of mining the deposit is to break down the entire mass on a large scale.

The general strike of the lodes is northwesterly with southwesterly dip of 70 to 75 degrees.

Two principle ore zones occur on the property, the lower (geologically) at the contact of slate and greenstone and the upper at the contact of greenstone and an overlying calcareous schist. Most of the work has been in the latter zone. The lower zone, which is known to be the productive mineshoots, is practically undeveloped on this property.

## Mine Workings

The mineral zone has been developed by six tunnels at elevations ranging from 340 to 2640 ft.

### Main Tunnel

The principal tunnel is the adit at elevation of 2640. It is 150 ft. long and 8X10 ft. in cross section, driven for double track. There are several crosscuts aggregating 470 ft. and 150 ft. of raises. By means of these workings the mineralized zone has been proven for a length of 565 ft. and an average width of 191 ft.

Keith Tunnel

The Keith Tunnel at elevation 1670 is 150 ft. long and 8x7 ft. in cross section. It is driven in the mineralized zone on an irregular course so as to develop the lode over a length of 120 ft. and a width of 35 ft.

Jensen Tunnel

The Jensen or View Pair tunnel is at an elevation of 2640 ft. It was driven as a crosscut for 50 ft. and then turned 40 ft. northwesterly and 200 ft. southeasterly on a high grade ledge.

Yates and Jackson Tunnels

The Yates at 1 '00 ft. and the Jackson at 2500 ft. are the two tunnels of which no sampling maps were furnished.

Prince Tunnel

The Prince Tunnel at elevation 450 is on the opposite side of Spruce Creek from the other tunnels. It is in the mineralized zone and driven almost at right angles to the lode. It is entirely within it except for a few feet beyond the face. Seven crosscuts, aggregating 110 ft. have been drive, developing the lode a maximum of 7 ft. along the strike.

## Ore Development

Berry Tunnel

The Berry Tunnel and connected workings were sampled carefully by channel and drill samples and by careful sampling of ore taken out during development. These three methods gave an unusually close check with an average of $2.00 per ton in gold and an estimated one-half ounce of silver.

In computing ore reserves developed by the Verity Tunnel, Mr. Reese assumed(p.3) that the ore extended 25 ft. below the tunnel and 25 ft. above the raise ~~#1~~ that was not carried to the surface. As length he took the length of the tunnel and an average width the average of the several crosscuts. This impresses as a very conservative figuring. This gave a block 2,5 ft. long, with an average width of 191 ft. and an average height of 116 ft. blocked in three sides. On the basis of 12 cu. ft. per ton, which is allowable for this ore, this would give 1,043,000 tons.

In round numbers we can estimate ore tributary to the Verity Tunnel as 1,000,000 tons carrying 0.06 oz. gold and 0.5 oz. silver.

Keith tunnel

Sampling in the last two courses of the Keith Tunnel give the best indication of the result of sampling at right angles to the lode. Five samples projected as to widths across the lode show a total width of 32 ft. with an average value of $10.03 per ton gold. The total width of the mineralized zone as developed at this point is 40 ft. Four other samples taken in the tunnel but more nearly along the vein than across it give an average of $6.12 and one sample taken over a width of 4 ft. assayed $609.30.

There has been no raising from the Keith tunnel and no estimate of ore in connection with it is attempted.

Treece Tunnel

The Treece tunnel is 320 ft. long. Ten samples taken lengthwise of the tunnel and hence across the lead have a total length of 159 ft. and show a balanced average of $2.60 in gold. If we disregard one assay of .43 in this series the average of the other is $2.94.

In his report Mr. Reese states (p4) the Treece tunnel averages $1.40 from channel sampling and that our samples from a 30 ft. raise assayed $3.30.

View Fair Tunnel(Lessen)

The View Fair Tunnel is driven along the lead following a high grade shoot that has been developed over a length of 76 ft. Fourteen samples were taken over widths of 12 to 18 in. showed an average of 15 inches @$260.86 per ton.

POSSIBILITIES

The distance between the extreme points of the tunnels listed is 4500 ft. and the difference in elevation from the highest to the lowest is 1700 ft. This territory is not fully developed by any means but when we consider that ore has been found at both extremes, both vertically and horizontally, and over a great width it can be seen then that there is justification for Mr. Reese's statement(p.5) "It would not be far-fetched to say that about 75,000,000 tons of $2.00 gold ore plus silver content, should be eventually developed in this area."

This estimate is by far the most conservative of the three submitted. Hillis(.11) divides the property into seven different areas computing the tonnage for each at from 10,000,000 to 114,000,000 tons with a total of 335,000,000 tons.

He states (p.12)"a safe general average for the whole mineralised zone appears to be from $1.75 to $1.90 per ton" (1956-$1.90=$3.67).

Hopper(translation 15) makes a classification of ore in sight, probable ore and possible ore as follows:

| | |
|---|---|
| Ore in sight | 1,962,450 tons |
| Probable ore | 855,491,756 " |
| Possible ore | 475,729,920 " |

He then divides his estimates of probable and possible ore by two as a factor of safety and classifies one-half of ore in sight as probable ore, submitting his estimates of tonnage and value summarised as follows(translation 17)

| Classification | Tonnage | Value | Total |
|---|---|---|---|
| Ore sight | 981,225 | $2.50 | $2,453,063 |
| Probable | 127,745,978 | 2.45 | 313,366,954 |
| Possible | 237,864,960 | 2.00 | 475,729,920 |
| Total | 366,591,063 | | 790,551,936 |

It will be noted th t Hopper's estimate of t nnage checks Hills' estimate within 1%.

Obviously such estimates as above must be taken with a great deal of allowance. They are however, based on data gathered in field examination and do XXX go to show that exploration of the property may open up a truly enormous deposit.

## Possibilities

### Recoverable Values

The only points on which I am hesitant to take issue with the above reports are the grades that will be recovered in the operating mode.

I do this with some hesitency as I fully appreciate Mr. Reese's standing as an engineer and his familiarity with this particular mine. I also realize that I am frequently charged with being over-conservative but inasmuch as the whole thing, at this stage of the development, is a matter of estimate in which it is impossible to foresee all contingencies I prefer that any error should be on the side of conservatism.

In computing annual return Mr. Reese has announced(p.12) a recovered value equal to the assay value of the ore, namely $2.08 gold and $0.35 silver, a total of $2.43. The metallurgical tests by the Pan-American Engineering Corporation show the recovery effected on two samples but they do not offer an entirely satisfactory comparison as one is on much higher and the other on much lower grade than the ore under consideration.

The report on the tests remarks on the great similarity between this ore and that of the Alaska-Juneau and it is interesting to note that the 1935 average of the latterth t went through the mill after sorting out coarse tailings was 0.0672 oz. gold, whereas the average of the Marty tunnel ore was 0.0584 oz. hence a comparison of the two should not be far amiss.

It was found at Alaska-Juneau that during the above year the amount of gold and silver for which pay was actually received, after allowing for milling andtreatment losses, was 84% of the assay value of the heads. Applying this factor to the Marty tunnel ore would give an over all recovery of $2.04 in gold and silver per ton.

Operating Costs

Mr. Reese has made an estimate (p.10-11) of costs based on a production of 2000 tons a day which tonnage can be easily sustained if his estimates of possible ore works out.

These costs are:

| | |
|---|---|
| Mining | $ .3855 |
| Milling | .2397 |
| Miscellaneous | .0855 |
| Contingency | .0284 |
| TOTAL | $ .7191 |

It is not clear from the report whether the above includes the expense of shipping and treating concentrates. In the absence of mill tests showing the value of the mill product and the concentration ratio it is difficult to compute this item accurately but from such as above at hand I have estimated a concentration ratio of 137 and a shipping and treatment cost of $13.60 which would equals 10¢ per ton of crude ore. Adding this figure to the above estimate gives 82 cents. The estimate in the report does not specifically include such items as compensation insurance, general overhead, etc. It may be that the item of contingencies was intended to cover these but as a matter of being on the safe side I would prefer to add them. Having all allowances I believe that 85 cents per ton should cover all operating expenses and overhead. Insuring office, etc. this would equal $1900 per day on a 2000 ton basis.

It is proposed to equip an initial unit of 200 tons per day as a pilot plant. Operating costs will be somewhat higher in this case due to disproportionate overhead. Making due allowances therefor I would say $ 1.50 should cover costs on the basis of 200 ton per day operation.

Operating profit

The Reese report(p.12) figures operating costs covering a full year but with only the equivalent of 300 days actual production. I really feel that this gives the mine the worst of it as with the plant broken in to smooth operation loss time should be less than 10% unless something unexpected happens. As a matter of fact when a shutdown occurs certain expenses stop but as it is difficult to estimate just what these will be it is customary to charge the full expense in order to be on the safe side.

On the basis of 2000 tons per day we have:

| | |
|---|---|
| Receipts | |
| 330 days-2000 tons-$5.04 recovered per ton | $ 1,346,400 |
| Expenditures | |
| 365 days operation-$1900 per day | $ 693,500 |
| Operating profit | $ 652,900 |

On the basis of 200 tons per day we have:

| | |
|---|---|
| Receipts | |
| 330 days-200 tons-$2.04 recovered per ton | $ 134,640 |
| Expenditures | |
| 365 days operation-$240 per day | $ 87,600 |
| Operating profit | $ 47,040 |

In considering these figures one should bear in mind that all estimates are based on values shown in the Marty tunnel, from which the lowest returns were secured. For example the Keith tunnel showed 32 ft. of $10 ore. While it is entirely reasonable to expect that the average of the ore developed will be higher than that in the Marty tunnel with a corresponding increase in profit we have no data that will enable us to translate this into figures.

## [illegible]

It is proposed (Assay Supplement) first to equip the mine for production at the rate of 2 0 tons a day. Tentative plans have been prepared for a mill and for such development of the mine as will secure production on the above basis as follows:

| | |
|---|---|
| Mill | $60,000 |
| Mine machinery and supplies | 12,500 |
| | $72,500 |

The development campaign outlined will cost about $[illegible],000 but all of this need not be provided in advance as there will be some return from operations once the mill is on production.

On the basis of an operation of 1000 tons per day equipment and development costs are estimated as follows (Assay 2-10):

| | |
|---|---|
| Equipment and development of Morty tunnel | $165,600 |
| Electric haulage equipment | 42,000 |
| Mill, machine shop, etc. | 790,000 |
| Transportation system-Ley to Millsite | 120,000 |
| Additional mine power | 11,000 |
| Mine supplies | 25,000 |
| | $1,123,000 |
| Working Capital | 250,000 |
| | $1,373,000 |

## Total Investment

Investment to dat is reported as follows:

| | |
|---|---|
| Alaska-Windham Gold Mining Co. | $165,000 |
| Predecessors | 251,000 |
| Total | $416,000 |

It is proposed to expend $97,500 to put the mine on production at the rate of 200 tons daily and, if expectations are realized, a further sum of $1,373,000 for production of 1000 tons per day. Total investment would then be:

| | |
|---|---|
| Expended to date | $416,000 |
| For 200 ton operation | 97,500 |
| " 2000 " " | 1,373,000 |
| Total | $1,886,500 |

In round numbers we can say that this will be a $2,000,000 enterprise by the time it is fully equipped.

A general summary of the possibilities of the project appears in the first pages of this analysis.

Respectfully submitted,

Leroy A. Palmer (signed)

San Francisco, California

April 20,1937