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REPORT ON  
KLONDIKE LODE GOLD MINES PROPERTY  
Dawson Mining District  
Yukon

## SUMMARY

In the Klondike gold fields, about \$200 million worth of gold has come from Bonanza and Eldorado Creeks with the indicated source of much of this gold lying on a ridge between these two creeks, now staked and held by Klondike Lode Gold Mines.

Variations in the placer gold suggest that the lode sources of this gold are concentrated in certain zones or localities, not widely scattered through a large volume of schist as previously supposed.

Although the area has been prospected in the past, extensive residual weathering, shallow overburden, permafrost, and vegetation conceal the gold-bearing localities so that prospecting by hand is hopelessly slow and discouraging. Modern bulldozer stripping and sampling for eluvial gold on the hillsides has proved very rapid and efficient for tracing sources of the gold, and an area of new prospects has already been discovered.

Further such work may reveal richer prospects or major concentrations of gold in stringer zones, stockworks, or shear zones where closely spaced veins or stringers may make a large mass of rock mineable.

It is recommended that \$100,000 be allotted to a bulldozer program next season, with reserve capital being available for followup drilling and underground exploration.

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## M A P S

Figure 1 ... Klondike District

Figure 2 ... Trenches at Gay  
Gulch

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October 13, 1960.

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INTRODUCTION

The Klondike district has produced about \$300 million in placer gold, of which two-thirds has come from Bonanza and Eldorado Creeks from some of the richest paystreaks ever mined.

The adjoining hills were prospected extensively for the mother lode but only a few lean prospects were found and production from these has been negligible. The search was gradually abandoned on the premise that the gold is widely scattered in small discontinuous veins in the schists and that the area has been thoroughly prospected. Neither of these presumptions are valid, for the source of the gold appears to be concentrated in certain areas and the extensive shallow residual soil, permafrost, and coating of vegetation has discouraged thorough prospecting by hand.

In 1960 Gordon R. Hilchey interested Dr. F.C. Buckland in the possibilities of this area, staked it for Klondike Lode

Gold Mines, and began bulldozer trenching and sampling to trace the source of some of the gold.

The writer examined the property on September 20-23, 1960, for Dr. J.C. Auckland.

#### LOCATION AND GENERAL CONDITIONS

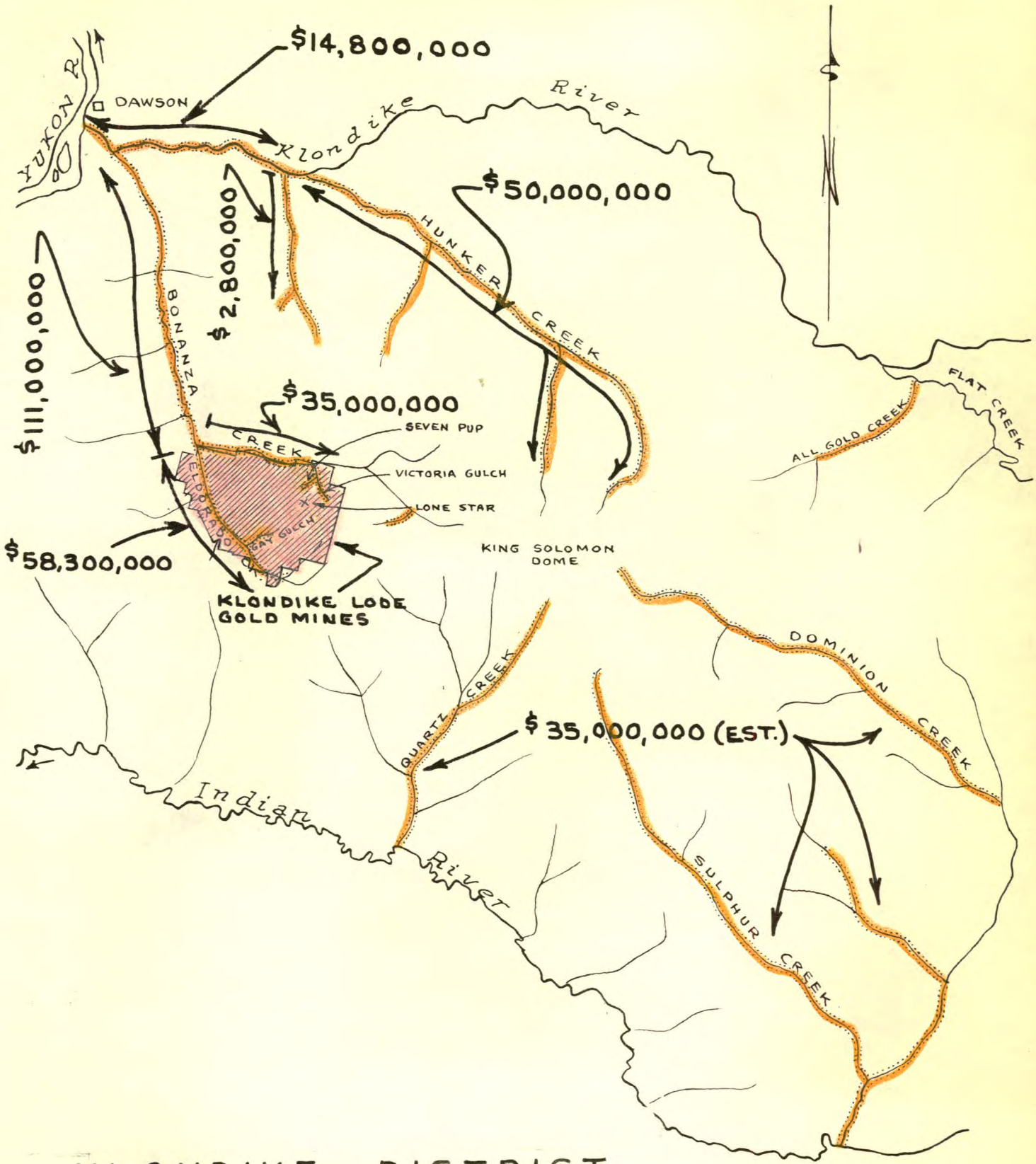
The Klondike Lode Gold Mines property consists of about 167 claims, including several crown grants, which cover about 10 square miles on the broad ridge between Sonanza and Eldorado Creeks 10 to 15 miles SSE of Dawson City in the Dawson mining district of Yukon. The ridge extends between 2000 and 3500 feet in elevation. The property can be reached easily by good road up Sonanza Creek to Grand Forks, then by rough unsurfaced road either up Eldorado or Upper Sonanza Creeks.

Dawson city, 432 miles by road from Whitehorse, has twice-weekly air service, thrice weekly bus, freight lines, telephone, telegraph, and other services.

Power lines extend up Sonanza Creek to within five miles of the property but the availability of this power would need to be investigated.

Water is available in the creeks and gulches but it is limited or absent on the higher slopes.

Timber is available from a sawmill at Flat Creek 35 miles outside Dawson. The entire Klondike district was



**KLONDIKE DISTRICT**  
 SHOWING  
 APPROXIMATE PLACER PRODUCTION  
 AND LOCATION OF  
 PROPERTY OF  
**KLONDIKE LODE GOLD MINES**  
 SCALE 1 IN. = 4 MI.  
 GOLD @ \$35 / OZ.

FIGURE 1

heavily logged and burned over in the early days so only small trees remain.

Climate, typical of central Yukon, is cool in summer and cold in winter with moderately low precipitation, but presents no difficulty in year around underground mining.

### HISTORY

Coarse, rich placer gold was discovered on Bonanza Creek in 1896 and, with discovery of unbelievably rich pay streaks on Bonanza and Eldorado, the most intense stampede in all history developed and miners and prospectors swarmed over the creeks and hills for several years.

Many prospected the hills for a mother lode, A few small lode prospects were found, but none produced anything of significance.

Most of the work was done on the Lone Star property which appeared to be strategically located on the ridge between Bonanza and Eldorado Creeks. It was staked in 1899, and between 1909 and 1914 several hundred feet of underground work was done and a glory hole was mined out. It produced \$24,978 (gold at \$20.67 per ounce) from 8435 tons by amalgamation and \$2,079 from 1680 lb of concentrates, using a 30-ton stamp mill, which gives an overall recovery of about \$3.20 per ton (about \$5.50 at present prices). The property then lay idle until 1946-47 when Yukon Consolidated Gold Corporation drove underground cross-cuts, drilled six churn drill holes, and dug several bulldozer trenches

for careful sampling.

From 1947 until the present program little or nothing has been done on lode prospects in the Klondike district.

#### GENERAL GEOLOGY

The Klondike district is underlain largely by quartz-sericite-chlorite schists and gneisses with minor limestone, chlorite schist and other variations, apparently derived by dynamothermal metamorphism of a complex of ortho- and paragneiss and schist. Foliation in the schist strikes northwesterly with a fold or cross-trend at King Solomon Dome and at the ridge between Bonanza and Eldorado Creeks. Dikes of altered feldspar porphyry and fresh basic rocks cut the schists. A major regional fault trench, the Tintina valley, bounds the schist area to the northeast while several major northwest faults probably slice through the schist area.

Gold-bearing quartz, copper sulfides, and galena have been discovered in several localities. Prominent veins or lenses of barren pegmatitic or "bull" quartz occur in the area, while the gold bearing veins are inconspicuous and cut across the schist, striking northwest and dipping moderately to steeply northeast.

#### SOURCE OF THE GOLD (See Figure 1)

During early or mid-Tertiary time the Klondike schists were slowly weathered down inch by inch over the centuries until thousands of feet had been removed. Under

these conditions the gold-bearing stringers, stockworks, or veins gradually crumbled away into the decaying soil where the vein fragments (float) and ragged, freed gold particles (eluvial gold) slowly crept down the gentle slopes into the creek valleys. There, ground and washed with quartz from various sources, the gold was concentrated into the placer paystreaks of the White Channel gravels. These gravels were later left as high level benches on the hillsides as the creeks once more eroded deeper into the valleys, forming their own paystreaks. This region of Yukon, unique in Canada, was never glaciated so the placers lie undisturbed in relation to their sources and eluvial gold on the slopes can be traced to a source uphill.

The variations in quantity and fineness (purity) of gold in the placer creeks suggest several local concentrated sources rather than a general scattered distribution. In Upper Bonanza Creek the gold came largely from Victoria Gulch with its rich little tributary, Seven pup, and to a much lesser degree from other gulches, some of which were essentially barren. On Eldorado Creek some gold with low fineness (higher silver) has apparently been derived from sources west of the creek, but most of the gold, with higher fineness, was derived from Gay gulch and others draining the same ridge between Eldorado and Bonanza.

Thus, much of the gold in these, the two richest creeks in the Klondike, must have come from a few localities along the ridge between them. The present program of Klondike Lode Gold Mines is designed to find these localities and explore them.

LONE STAR PROPERTY

The Lone Star property lies on the Klondike Lode Gold Mines holdings and has some similarity to newer discoveries. On this prospect contorted quartz-mica-chlorite schists strike about N 30°W and dip 40-60°SW. Many small faults cut the rocks, striking mostly northwesterly and northerly. Abundant barren pegmatitic quartz occurs in large outcrops; numerous veinlets or lenses of barren quartz with pyrite occur parallel to the schist; and younger gold-bearing quartz veins from a fraction of an inch to 2 feet wide cut across the schist at intervals, striking about N 20-30°W and dipping 25-35°NE. Specks of free gold in these younger veins tend to be associated with galena, pyrite, and rare sphalerite, sometimes in oxidized pyrite. No major shear or dominant structural control was seen and the gold-bearing veins are too widely separated to be economic. On the basis of this one prospect it has been assumed that all the gold in the area could have come from such veins and that no large veins or zones of commercial interest exist.

These veins undoubtedly contributed some of the gold to Victoria gulch, but they are not properly located to have given Seven pup its rich pay streak nor to account for most of the gold in other parts of the area.

## KLONDIKE LODE GOLD MINES

### Method of Exploration

Typical of this unglaciated region, the ridge which the property covers is broad and undulating, about 3 miles wide, and is crossed by well-graded gulches with gently rounded intervening slopes. These gradual slopes are almost entirely mantled with a few feet of residual soil cloaked in turn by moss, dwarf birch, and other stunted vegetation. Over half of the slopes are permanently frozen with a coating of moss and muck. Moreover, float from the gold-bearing veins, having crept downhill under the soil, is seldom exposed, and is never as conspicuous as the more abundant barren quartz. Thus manual prospecting, faced with lack of water for panning on most of the slopes, has been discouragingly slow, inefficient, and unsystematic.

Modern methods of prospecting, using a bulldozer to expose large continuous sections of hillside for sampling, rapidly overcomes these difficulties and gives systematic results as described below.

At the head or sides of a gulch which has been the source of rough placer gold, a long sidehill bulldozer trench is cut down to bedrock (usually 3 to 6 feet) and at 100-foot intervals a vertical channel sample of about 3 cubic feet of the residual soil and rock is cut to bedrock. These samples are taken to the creek, sluiced in a small sluice box, and the number of gold particles or "colours" are counted. Where

colours are encountered in a particular section, other trenches are dug and sampled higher up until a concentration of colours is found. Such a section is sampled more closely and the source is then located by a downhill trench.

This program has been successful in rapidly locating several sources of concentrations of eluvial gold on the thawed slope on the north side of Gay gulch at about 2400 feet elevation.

#### Prospects on Gay Gulch (See Figure 2)

The rocks at Gay gulch vary from quartz-chlorite-sericite schists on the northeast to chloritic quartz-mica-feldspar gneiss on the southwest. Foliation varies considerably in attitude partly due to faulting but mostly strikes N 35-90°W and dips 20-45°SW. Minor bodies of altered porphyry, altered basic rock, and fresh basic dike rock cut the schists in this locality.

Faulting is prominent at Gay gulch with the following systems having been exposed so far:

1. Several strong shear zones up to several tens of feet wide, striking N 45-70°W and dipping vertically to steeply NE. A major NW fault containing over 100 feet of gouge with local pyritic and graphitic sections is exposed in Eldorado Creek below Gay gulch.
2. Several fault zones with several feet of gouge, striking N 20°W to N 5°E and dipping steeply westerly.
3. A few faults with gouge up to 2 feet wide, striking N 30-45°E and dipping 30° to 70°NW.

Mineralization consists of the typical barren "bull" quartz veins and lenses, barren quartz lenses in the schist,

and gold-bearing porcelainous quartz veins and stringers cutting across the schist. The gold-bearing veins show scattered calcite and dolomite, specks and cubes of pyrite, rare galena or chalcop<sup>and</sup>pyrite, traces of manganese stain, selvages of dark green chlorite and ankerite. Local haloes of pyrite in the adjoining schist, from which rusty soil is sometimes derived, may be used as a guide to a mineralized section in places. The gold occurs as free gold in small specks or nuggets in the quartz, in and near pyrite grains or wall rock inclusions or edges of the vein, and rarely in the quartz itself.

The gold-bearing veins or stringers vary from a fraction of an inch to 3 feet in width; are lenticular, rarely more than a few tens of feet long; and occur singly or in sets of several over a width of 20 feet or more. Several are flat-lying and a few follow the fault zones, but most strike about N 50-70°W and dip 30-50°NE, cutting sharply across the southwest-dipping schists similar to such veins on the Lone Star property. However, faulting and structural complexity are much more prominent at Gay gulch and some of the veins are also thoroughly shattered and displaced by post-mineral faulting.

Alteration associated with the NW, N-S and NE faults, and the presence of occasional lenses of quartz along these structures suggest that the faulting is closely related to the mineralization, probably with movements before, during, and after gold deposition. The flat- to northeast-dipping veins may have formed by tensional fissuring across the foliation in

blocks of schist caught between the northeast shears, but more work is needed to arrive at valid conclusions on ore controls. Loose brecciation in the 1600 cut is post-mineral and probably Late Tertiary in age, such as that along Tintina Valley and at Paradise Hill (Post White Channel).

Free gold was seen in several veins at Gay gulch but sampling to date has shown (a) that the values are so erratically distributed (from traces to 2.8 oz/ton) that bulk sampling will be necessary to evaluate promising sections; (b) <sup>that</sup> the adjoining schist generally contains little or no gold; and (c) <sup>that</sup> no consistently well-mineralized section has been found in the limited prospecting so far. It can be expected, however, that other well mineralized localities will be found to the northwest and southeast along the extensions of the mineralized localities at Gay gulch. A major concentration may exist nearby, or in one of the other unexplored slopes on this southwest side of the ridge.

#### Prospects on Seven Pup

Because of abundant ragged gold extending in paying quantity to the extreme head of Seven pup, many prospect pits were sunk in the early days in an effort to trace the source of this gold. One shaft on the Victoria claim is reported to have gone down 50 feet into a lenticular dike of altered porphyry which carried considerable finely disseminated gold.

Bulldozer cuts along the slope at the head of this gulch are still largely in frozen overburden but work next

season should soon reveal the source of this gold; other sources may be discovered on this northeast slope of the ridge.

### CONCLUSIONS

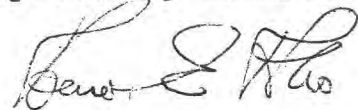
1. Variations in the rich placer gold deposits of the Klondike district suggest localized concentrations, probably in the form of stringer zones, stockworks, or mineralized shears, rather than discontinuous stringers widely scattered through large volumes of schist as previously supposed.
2. Little systematic manual prospecting has been feasible because float from such zones is inconspicuous, the slopes are all mantled with several feet of residual soil with a concealing cover of vegetation and moss, permafrost covers large parts of the area, and water for panning is usually far downhill.
3. These difficulties are rapidly and efficiently overcome by modern bulldozer stripping and sampling; in a short time nine miles of sidehill cuts were dug and sampled at Seven pup and Gay gulch at relatively low cost and several concentrations of gold were quickly discovered.
4. Strong structures and encouraging free gold mineralization discovered at Gay gulch warrant further exploration on strike and along the southwest slopes of the main ridge.
5. Abundant rough placer gold and other favourable indications at the head of Seven pup certainly warrant continuation of the work here and in other parts of this northeast slope.
6. The area held by Klondike Lode Gold Mines has been the source for much of the \$200 million placer gold in Bonanza and Eldorado creeks so this type of exploration in this locality could well lead to discovery of economically mineable lode gold deposits.

RECOMMENDATIONS

1. The bulldozer prospecting program should be continued next season with two bulldozers, one on the northeast slopes around Seven pup and the other on the southwest slopes, to explore extensions of the known prospects and to expose new ones.
2. \$100,000 should be allotted for this program roughly as follows:

Bulldozer stripping (two machines)	-----	\$ 70,000
Sampling, supervision, geology, supplies, etc	-----	30,000
		Total: <u>\$100,000</u>
3. Drilling should be used to prove continuity of promising structure and mineralization to depth, not for sampling or evaluation which must be done by underground exploration due to the erratic distribution of values.
4. Additional capital should be reserved for whatever followup drilling and underground work is warranted.

Respectfully submitted,



A.E. Aho, P.Eng.

Vancouver, B.C.  
October 13, 1960.

REFERENCES

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