MAP No. 115-O-14, 116-B-3	RELEASED ASSESSMENT REPORT PROSPECTUS CONFIDENTIAL OPEN FILE	XX X?	**TYPE OF WORK:** Dawson MD Preliminary Geology

REPORT FILED UNDER	Teal Minerals Ltd. DOCUMENT NO. 12/001
DATE PERFORMED	Dec. 20, 1984 DATE FILED Nov. 28, 1985.
LOCATION - LAT.	64° 00' N AREA Bear Creek, Yukon
LONG.	139° 13' 23" W
CLAIM NO.	Placer claims: Cub Discovery, Myles 1-4, Kris, Rick, Joe, Ann, May, Dick, Bill, Lil, Jack, Jill, Fred, Porcupine, Sam, Owl, Raven, Wipeout, Judy, Bear 1, Junior 1, Creek Claim, George, Ed, Puffed Out, Fox, Rock, Rusty, Skidoo, Pop 1-5
VALUE $	Boiler 6, Lance Fr, Sam Fr, Jaye Fr, Pop Fr, Willy Fr, Sneaky Fr, Sonja Fr.
WORK DONE BY	R.T. Heard (R.T. Heard & Associates Ltd.)
WORK DONE FOR	Teal Minerals Ltd.
REMARKS	The report is a proposal to evaluate the 48 claim property as to the quantity & grade of gold-bearing gravels remaining on the property. A range of 8000 to 15000 oz of recoverable gold might be expected from lower creek gravels, side pay, bench and White Channel gravels. Approximately 2000 cubic yards of gravel is stockpiled beside a sluice plant on the BOILER 6 claim.

PROSPECTUS
Nov. 28, 1985

RELEASED

121001

PRELIMINARY REPORT

ON THE

BEAR CREEK PLACER PROJECT
DAWSON AREA, YUKON TERRITORY

FOR

TEAL MINERALS LTD.
201 - 1512 YEW STREET
VANCOUVER, BRITISH COLUMBIA
V6K 3E4

BY

R. T. HEARD, P. Eng.
R. T. Heard & Associates Ltd.
818 Clements Avenue
North Vancouver, B. C.

Lat. 64°00'N
Long. 139°13'23"W

December 20, 1984

RELEASED

SUMMARY

Teal Minerals Ltd. has acquired 12 and has negotiated an option on 36 for a total of 48 placer claims on Bear Creek in the Dawson Gold Mining District of the Yukon. Production from this creek has exceeded 90,000 ounces of raw gold and the property should yield another 8,000 to 15,000 ounces if all the parameters used in this evaluation remain valid.

An exploration/evaluation program to bulk test the claims has been designed and is estimated to cost $190,000 CDN. This program will be completed on the first 12 claims and based upon favourable results, the option to acquire the remaining claims should be exercised. This additional acreage would help support a full scale mining operation.

TABLE OF CONTENTS

LIST OF FIGURES

TERMS OF REFERENCE

The author was retained by Teal Minerals Ltd. to make a physical examination of the Bear Creek Placer claims, to review all of the available reports, records and documents which describe the area, and, if warranted, to design an exploration program to evaluate the project's economic potential which in turn would allow for management to decide if full scale production was warranted.

The above criteria were met. A review of the history and current status of the property was made and several personal conversations with the original owner, Mr. L. W. Steigenberger, with authors of reports written about this area; R.G. Hilker, P.Eng. (1981); M.D. Kierans, P.Eng. (1983); as well as the field examination in the company of J. Wallis, P.Eng. (1984) has added to the data base from which this report is drawn.

Acknowledgement is hereby given to Hilker, Kierans and Wallis for their contributions of time, reports and assistance.

INTRODUCTION

The Klondike gold fields are located east of the Yukon River, between north latitude 63°35' and 64°15'. The gold district is generally bounded by the Yukon River on the west; by the Klondike River on the north; by Flat Creek (a tributary of the Klondike) and Dominion Creek (a tributary of Indian River) on the east; and by the Indian River on the south. The area within these boundaries measures approximately 800 square miles. Most of the streams that drain the 800 square mile area are gold-bearing to some extent. The most productive streams have been Bonanza, Eldorado, Hunker, Bear, Quartz and Sulphur Creeks and related tributaries. A considerable number of gold-bearing creeks are located south of the main Klondike gold field and the Indian River. The area is centered around Henderson Dome and the Indian River to the north, Yukon and Stewart Rivers to the south, and

Eureka Dome to the east. The more notable creeks in this area are Henderson, Black Hills, Eureka, Maisy May and the related drainage tributaries. South of the Stewart River, the Scroggie Creek gold district is located in an area of approximately 600 square miles. The proven gold-bearing creeks in this area are Scroggie, Walhalla, Mariposa, Barker, Brewer, Thistle, Kirkman and Ballarat, as well as their related drainage tributaries.

During the period 1971 to the present, considerable interest has been revived in the Klondike and Sixtymile Yukon Territory placer gold fields due to the increase in the price of gold. Several of the creeks in the Dawson area are being re-prospected for the purspose of renewing gold placer mining operations. A few of the mining operations are small and considered to be 'sniping' clean-ups on the sides of creeks where dredging operations have been carried out in the past. On Hunker Creek, on bench claims of the White Channel gravels, a large-scale hydraulic monitoring operation started in June of 1973 for recovery of gold at approximately $1 per cubic yard in an estimated ten million cubic yard reserve. Several sluicing operations are being worked by independent miners by removing muck and pushing gravels by crawler-type tractors into metal sluice boxes. The sluicing operations are lcoated on Bonanza, Eldorado, Hunker, Dominion, Henderson, Black Hills, Sulphur, Quartz and Eureka Creeks, Sixtymile River, Miller, Glacier, Big Gold, Little Gold, Matson and Tenmile Creeks and in the Moosehorn Range and the gulches, tributaries and pups which drain into these areas.

The method of mining gold-bearing material in a creek bed or bench deposit has changed considerably during the period 1882 to the present. Since 1950, large-sized crawler-type diesel tractors have been developed, permitting substantial volumes of material to be moved mechanically. In earlier years (1886-1930) in the Klondike and Sixtymile gold fields, the main method of placer mining was by hand, hydraulic monitoring and dredging operations. This method moved gold-bearing gravels through a sluice box to

recover the high-density raw gold. In addition, it was necessary to thaw frozen muck and gravel by hydraulic or mechanical methods and costly steam points or water circulation methods. However, it is presently possible to move large volumes of gold-bearing creek material by using huge D8 caterpillars, motor scrapers or front-end loaders. The crawler-type tractor can be equipped with 'rippers' to break permafrost material and expose frozen muck and gravel to the warm atmosphere and sun to accelerate thawing.

The Sixtymile and Fortymile gold districts were first operated in 1882-1886. Mr. Ladue occupied the trading post at Ogilvie on the Yukon River and was consequently instrumental in the development of the Sixtymile gold camp. The Ladue and North Ladue Rivers were named after him for his activity in the area.

The Klondike placer district was discovered in 1896, and is still an important source of gold. With the increase in the price of gold, production can be expected for several more years. The price of gold will need to be above the $200-$400 Canadian per ounce mark to make placer mining in the area profitable, due to the high costs of labour and machinery necessary for a placer operation. Total gold production from the Klondike, Fortymile, Sixtymile, Mayo and Livingstone area has been approximately 12,000,000 ounces from 1896 to 1980.

Placer deposits occur along both sides of Bear Creek and in all of the tributaries and pups which flow into it, with the pay located both in the creeks and in bench gravels. These deposits have been mined intermittently since 1978.

In 1980, this author operated a placer mining operation on Quartz Creek to the south and an invitation to visit Bear Creek was presented and taken. G.W. Crawford was conducting two sluicing operations on the Bear Creek property during this season.

In September 1984 (20th through 24th), at the request of P.R. Reifel, president of Teal Minerals Ltd., a trip was made to Bear Creek to examine primarily the site of the 1984 operation as well as make a cursory examination of the rest of the creek.

LOCATION AND ACCESS

Bear Creek is located six and one-half miles southeast of Dawson City at which point it flows into the Klondike River from the south. Access to the property is easily provided by a two-wheel drive vehicle from the turnoff on the Klondike Highway via a fair gravel access road, which runs along the right limit of the creek for three and one-quarter miles to the Bear-Lindow junction.

Dawson City can be reached by scheduled air service or by good all-weather gravel highway from Whitehorse. The trip from Whitehorse takes about seven hours by automobile. There are daily scheduled 737 jet flights from Vancouver to Whitehorse. Dawson City is located about 480 km north of Whitehorse on the east bank of the Yukon River. The Yukon and Klondike Rivers are at elevations of about 1200' above sea level near Dawson City and Bear Creek. Geographical co-ordinates of the claims are 64°02' north latitude and 139°00' west longitutde. See Figure 1, Location Map, Page 5.

PHYSIOGRAPHY AND CLIMATE

The following account of the physiography of the Klondike District is adapted from Boyle. The "Klondike" is a thoroughly dissected upland, a part of the Yukon Plateau, marked by rounded hills and a multitude of small streams tributary to the main water courses. The valleys are flat and wide in their lower reaches but gradually narrow towards their heads into steep-sided narrow gulches ending abruptly in broad amphitheatres. Many of the lower slopes of the valleys are conspicuously terraced. The district has not been glaciated but is underlain by 70-85% permafrost, in places to depths of 200 feet.

TEAL MINERALS LTD.

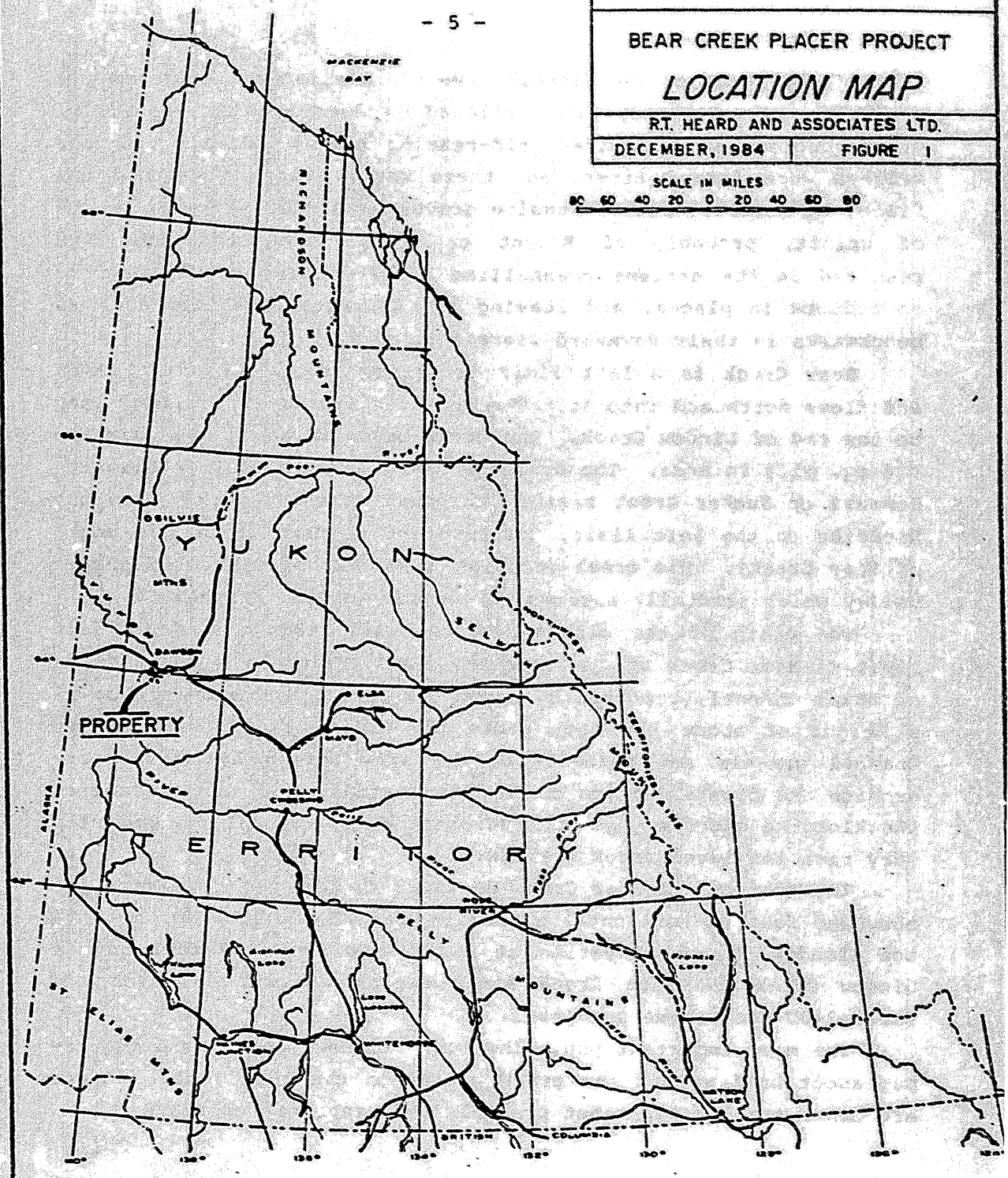
YUKON PROJECTS

BEAR CREEK PLACER PROJECT

LOCATION MAP

R.T. HEARD AND ASSOCIATES LTD.

DECEMBER, 1984 | FIGURE 1



SCALE IN MILES

80 60 40 20 0 20 40 60 80

"The placers of the Klondike owe their existence to a general uplift in late Tertiary time followed by deep secular weathering of the bedrock and contained gold-bearing quartz bodies. V-shaped valleys were formed first, and these were gradually widened and filled at maturity with extensive gravel deposits. A later period of uplift, probably of Recent or Late Pleistocene age, has resulted in the streams channelling their valleys deeply, almost to bedrock in places, and leaving the characteristic terraces as benchmarks in their downward migration."

Bear Creek is a left limit tributary of the Klondike River and flows northward into it. The creek is 8.0 km (5.0 miles) long to the end of Lindow Creek. The creek basin is about 40 square km (18 sq. mi.) in area. The drainage basin is much smaller than the Bonanza or Hunker Creek basins (tributaries which empty into the Klondike on the left limit, upstream and downstream of the mouth of Bear Creek). The creek occupies a narrow-bottomed, box-shaped valley which gradually narrows to a gulch towards its head.

The plain of the old valley is conspicuous along the left limit of Bear Creek up to Discovery pup. There is a small patch of White Channel, reported by McConnell opposite Discovery pup at a height of about 350 feet above the valley floor. The White Channel gravels are remnants of deposits formed by weathering, erosion and fluvial action during the Tertiary. At many places in the Klondike secondary concentration of White Channel has produced very rich low level creek gravels.

The gradient of Bear Creek is about 40 feet vertical drop per thousand feet of horizontal creek length. The mouth empties into the Klondike at an elevation of about 1200 feet and the ends of Lindow Creek and Bear Creek upper basins are at elevations of about 2400 feet above sea level.

The most important pup, other than Lindow Creek, is Discovery pup about half way up the creek valley on the left limit. There are other smaller pups that probably influence pay enrichment.

Immediate relief in the area of the creek is about 1,000 feet on the east side and about 1,400 feet on the west side. Hills are of the typical rolling Klondike type. Vegetation is mixed taiga and tundra. Immature stands of softwood timber are mainly limited to the creeks and valley floors. Because the creek flows in a north trending valley, the valley walls are symetrical. In east-west trending valleys the walls tend to form a flatter slope on the sun-facing side because of the influence of melting permafrost.

The region has a continental climate, characterized by low precipitation and a wide temperature range. Winters are intensely cold and long. The short summer season is pleasant with almost continuous daylight in June and July. Frost may occur at any time during the summer. Sluicing operations can usually begin about the end of May or early June and usually are forced to end by frost at about the end of September. Precipitation is only about 12 inches per year with more rain in summer than snow in winter.

HISTORY

The mining history of the Klondike has been well documented from the first discovery of gold in the Yukon in the 1850's, through the major discovery in 1881 on the Big Salmon River through the "Klondike Rush of '98" to the decline in 1966 which saw the shutdown of Yukon Consolidation Gold Corporation's last operating dredge; through a rejuvenation in the late 1970's created by the dramatic increase in gold prices.

The Bear Creek Discovery Claim was staked on September 24th, 1896 by Solomon Manberg and recorded in Fort Constantine on September 30th, 1896. Fort Constantine was the site at which coarse gold was found in 1886.

Eighteen claims were staked below Discovery Claim. These claims were staked to the confluence of Bear Creek with the Klondike River. Later most of these claims were acquired by Canadian Klondyke Mining Co. Ltd. and were dredged by Canadian Dredge No. 2 up to the year 1916. The limit of dredging on the creek was approximately 1,000 feet below the northern boundary of the present day Pop #5 placer claim. This dredging limit was at approximately six Below Discovery. The Discovery Claim and numbers one and two Above Discovery roughly correspond with the Ed, George and Creek Claim 38605. The records suggest that these claims were never worked.

In 1901 R.G. McConnell wrote that Bear Creek had not proved particularly rich, although some good claims were worked near its mouth and moderate pay is found almost to the Lindow Creek junction. He also noted that the "grade" was low. By this he meant that "fineness" was low. That is there is an abnormally high content of silver in the raw placer gold.

Memoir 284, of the Geological Survey of Canada, which is a compilation of out-of-print reports by officers and geologists of the G.S.C., does not mention Bear creek again in its various accounts of placer activities in the Yukon up to the year 1933. There is evidence of minor hand mining and drifting operations which were probably completed between 1901 and 1933.

To 1974, recorded production from Bear Creek was about 80,000 ounces of raw gold. This compares to about 350,000 ounces for Bonanza Creek and about 125,000 ounces for Hunker Creek for the same period.

Between 1974 to 1978 no production records are available. In 1978, large scale open cut surface mining operations were commenced by G.W. Crawford. Between 1978 and 1983 12,120 ounces of raw gold were produced as is shown on the following production summary.

PRODUCTION SUMMARY

YEAR	CREEK	BEFORE MELT NET WT. RECOVERED Troy oz.	AFTER MELT WT. Troy oz.	ESTIMATE OF GROSS VALUE $(CDN)
1978	UPPER BEAR	720	665 (EST.)	120,000.00 (EST.)
1979	UPPER BEAR	1,420	1,285 (EST.)	265,148.00[1]
1980	UPPER BEAR	1,205	1,052	517,373.30[2]
1981	UPPER BEAR	2,634	2,384	806,531.26[3]
1982	UPPER BEAR	1,274	1,150 (EST.)	450,000.00[4]
1980	LOWER BEAR	1,614	1,492	755,789.57[5]
1981	LOWER BEAR	2,723	2,239	769,945.25[6]
1982	LOWER BEAR	-	-	(No Production)
1983	LOWER BEAR	530	-	(Not Determined)[7]

---

1 Financial Statements - Goldfield Mining Joint Venture

2 Financial Statement - Goldfield Mining Joint Venture. 1980 gold sales $1,023,068.00 ($517,373.30 from Delta Smelting; does not include $505,694.70 of revenue from sales to Canadian Imperial Bank of Commerce and Alex Seeley in Dawson City, Yukon Territory).

3 Delta Smelting & Refining Co. Ltd. smelter sheets. Does not include $150,000.00 of revenue from sale to Alex Seeley in Dawson City, Yukon Territory).

4 Estimate based on average price of $350.00 per Troy ounce. L. Steigenberger witnessed cleanups for his royalty.

5 Delta Smelting & Refining Co. Ltd. smelter sheets. Does not include $442,210.50 of revenue from sales to Canadian Imperial Bank of Commerce and Alex Seeley in Dawson City, Yukon Territory.

6 Delta Smelting & Refining Co. Ltd. smelter sheets. Does not include approximately $150,000.00 of revenue from sales to Alex Seeley in Dawson City, Yukon Territory.

7 Production Records of L. Steigenberger and Sigma Group of Companies, Vancouver, B.C. for sluicing approximately 1,500 yards of pay gravels on Bear Creek from September 22 to October 14, 1983.

In 1983, L.W. Steigenberger gained control of 48 claims along the creek, which are the subject of this report. In 1983 the property was operated by the Sigma Group of Companies.

In 1984, Sigma terminated their agreement and Mr. Steigenberger performed the 1984 annual assessment requirements by stripping much and stockpiling approximately 2,000 cubic yards of pay gravels beside his Derocker and sluice plant which remains on-site and Teal Minerals Ltd. has arranged for purchase of this equipment.

REVIEW OF CURRENT STATUS

Claim Group

The property is comprised of 48 full and fractional claims divided into two distinct groups identified as the Upper and the Lower Bear Creek blocks. Claim details are as follows:

UPPER BEAR CREEK CLAIMS

CLAIM NAME	RECORD NUMBER
CUB DISCOVERY	P 24809
MYLES 4	P 24784
MYLES 3	P 24783
MYLES 2	P 24782
MYLES 1	P 24781
KRIS	P 4295
RICK	P 4294
JOE	P 4293
ANN	P 4292
MAY	P 4291
DICK	P 4290
BILL	P 4289
LIL	P 4288
JACK	P 4287
JILL	P 4286
FRED	P 4285
PORCUPINE	42176
SAM	42175
OWL	42037
RAVEN	42038
WIPEOUT	38881
JUDY	38880
BEAR 1	38783
JUNIOR 1	38776
CREEK CLAIM	38605
GEORGE	38875
ED	38874

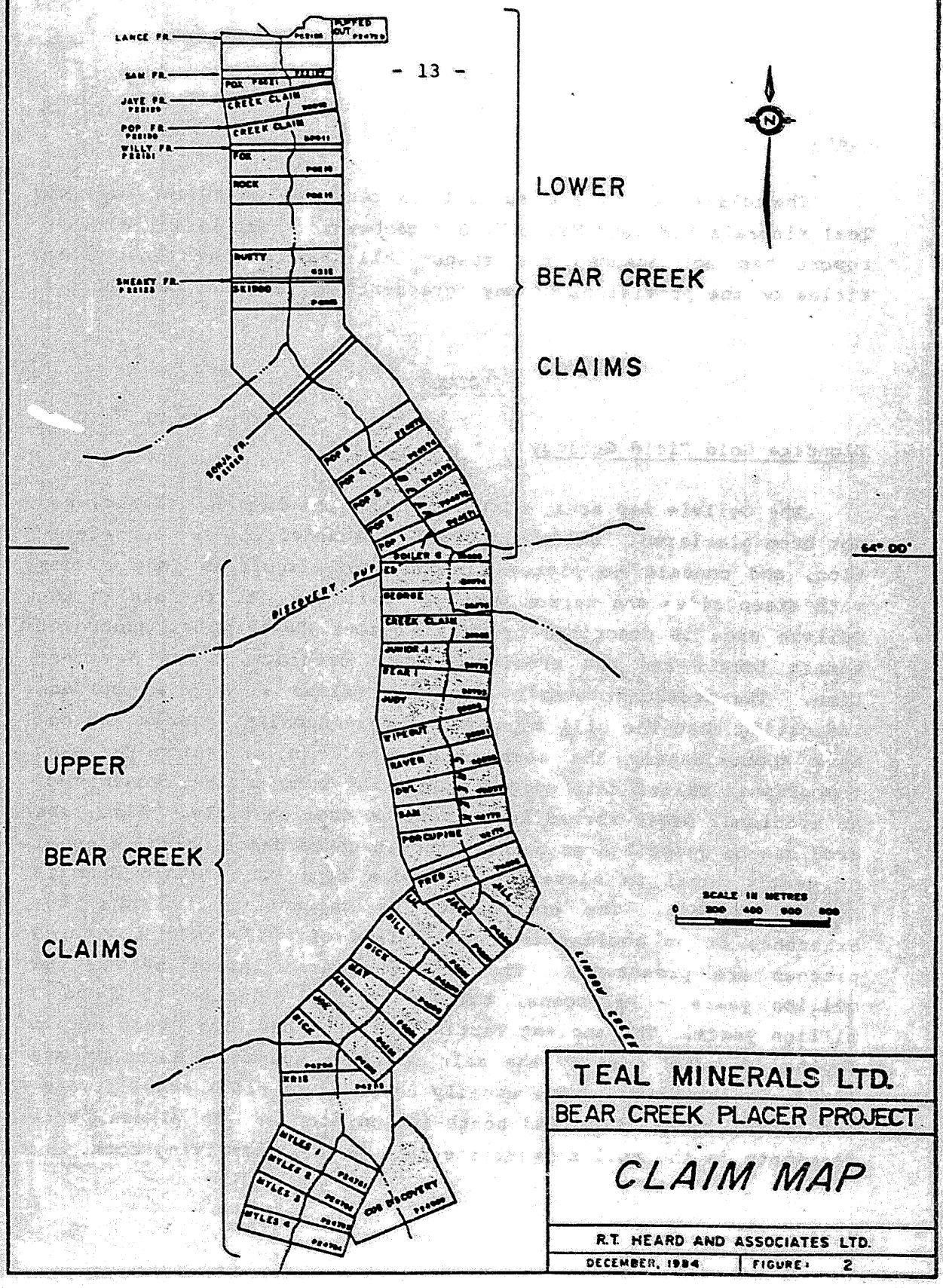
TOTAL: 27 FULL CLAIMS

LOWER BEAR CREEK CLAIMS

CLAIM OR FR. NAME	RECORD NUMBER
LANCE FR.	P 22128
SAM FR.	P 22122
JAYE FR.	P 22129
POP FR.	P 22130
WILLY FR.	P 22131
SNEAKY FR.	P 22123
SONJA FR.	P 21820
PUFFED OUT	P 24720
FOX	P 6621
CREEK CLAIM	38910
CREEK CLAIM	38911
FOX	P 0218
ROCK	P 0219
RUSTY	4212
SKIDOO	P 0813
POP 5	P 24575
POP 4	P 24574
POP 3	P 24573
POP 2	P 24572
POP 1	P 24571
BOILER 6	38800

TOTAL: 14 FULL CLAIMS
7 FRACTIONS

All claims are located on National Topographic Series Claim Maps 115-O-14H and 116-B-3B, Dawson mining district. See Figure 2, Claim Map, Page 13.


LOWER
BEAR CREEK
CLAIMS
UPPER
BEAR CREEK
CLAIMS
N
64° 00'
DISCOVERY PUP
BONJA FR.
LANCE FR.
SAM FR.
JAYE FR.
POP FR.
WILLY FR.
SNEAKY FR.
LIMBOW CREEK
SCALE IN METRES
0 200 400 600 800
TEAL MINERALS LTD.
BEAR CREEK PLACER PROJECT
CLAIM MAP
R.T. HEARD AND ASSOCIATES LTD.
DECEMBER, 1984
FIGURE: 2

Status

The claim blocks are subject to terms of agreement between Teal Minerals Ltd. and Mr. L.W. Steigenberger. The writer of this report has not assumed the responsibility for verifying claim titles or the provisions of any agreements between any parties.

GEOLOGY

Klondike Gold Field Geology

The Ogilvie map area, containing the Klondike Gold Field, has not been glaciated. The ridge tops are rounded, of similar elevation, and contain no plateaux. This area includes long ridges with steep sides and narrow V-shaped valleys. The terrain in the Ogilvie area is described by H.S. Bostock as being at accordant summit levels and the erosive surface developed since Tertiary time. The accordant summit level is defined as a level surface indicating that the hill tops or mountain summits, over a region, have approximately the same elevation. In a region of high topographic relief this suggests that the summits are remnants of an erosional plain formed in a previous erosion cycle. Also, the area can be described as being a summit concordance which is equal or nearly equal in elevation of ridge tops or mountain summits over a region. The concordance is thought to indicate the existence of an ancient erosional plain of which only scattered patches are preserved. The Tertiary period spans between 65 million years - Paleocene, through to the Pliocene of 2 to 3 million years. The ancient Tertiary surface has since been cut to depths of 2,000 feet by the main drainage system. Outcrops are scarce in the area and are usually confined to ridge tops, stream-cut banks, stream beds and south-facing slopes. In places, rock fragments in the soil suggest the type of the underlying rock.

The quartz stringers and veins that occur in the metamorphic igneous or sedimentary source rocks of the Yukon Group are considered as the source of the gold in the Klondike, Sixtymile, Indian River and Scroggie districts (W.E. Cockfield, 1921). The quartz stringers and veins that carried gold would probably be of different ages and not all quartz veins carried gold. The possible source of the veins could be from Permian(?) and/or Triassic(?) age granitic and ultra-mafic intrusives. The gold was concentrated in the creek and bench gravels by the disintegration, weathering and erosional process into the valley bottoms since the Tertiary time period 65 million years ago.

The oldest rocks in the area (Table of Formations) are Precambrian and Later in age and consist of the Yukon Group - limestone, gneiss, quartzite, schist and slate - and the Klondike schist which contains sericite schist and minor chlorite schist. The aforementioned rocks are intruded by gneissic granite and ultra-mafic intrusives in parts. Palaeozoic, Mesozoic and Cenozoic aged sedimentary intrusive and extrusive rock types occur throughout the Ogilvie map area. Tertiary/Modern gravel stream deposits and Modern/Recent stream deposits are the source of the placer gold deposits within the Klondike district.

Lithology

The following description of the PPsn - Schist Gneiss, PPsqm - Klondike Schist and PPqc - Nasina Quartzite is quoted from the G.S.C. Paper (pp. 20 - 23) 73-41, Reconnaissance Geology of Aishihik Lake, Snag and Part of Stewart River Map-Areas, West-Central Yukon by D.J. Tempelman-Kluit, 1974.

SCHIST AND GNEISS

An unnamed assemblage of schist and gneiss (P Psn) is found in northeastern Snag map-area south of Yukon River and in eastern

parts of Stewart River map-area. These rocks are recessive weathering and generally poorly exposed except along the Yukon River and some of its tributaries. Some good exposures are seen on the ridge between the Yukon and White Rivers.

The unit is made up largely of nondistinctive and monotonous muscovite-biotite quartzite and quartz mica schist, but it locally includes granodiorite gneiss and augen gneiss like the Pelly Gneiss. Minor amounts of amphibolite and coarsely crystalline marble are interfoliated with the schists. The rocks are metamorphosed to biotite grade (upper greenschist facies) and have a well-developed schistosity.

The rocks probably represent or include somewhat higher grade metamorphic equivalents of the Klondike Schist and Pelly Gneiss, but on the ridge between the White and Yukon Rivers Klondike Schist apparently overlies (structurally) the Schist-Gneiss unit. Mertie's (1977) Birch Creek Schist (also see Foster, 1970) which is probably equivalent to the Schist-Gneiss unit is also thought to include metamoprhic equivalents of Foster. The schist and gneiss is equivalent to, and continuous with, unit E of Bostock (1942). The age of the rocks is unknown, but the unit was metamorphosed with the other rocks and it is therefore probably Paleozoic and/or older.

KLONDIKE SCHIST

The name Klondike Schist (PPsqm) is an informal one first applied by McConnell (1905a) to certain rocks in the Klondike district. The name as used here refers only to the characteristic lithologies and implies nothing regarding the age, thickness or stratigraphic relations of the rocks.

Rocks lithologically like McConnell's Klondike Schist (1905a) occur extensively in west-central Stewart River map-area and two small areas of these rocks are differentiated in northern Snag map-area. The rocks are recessive and weather a rather

distinctive orange colour; they are generally poorly exposed even on ridge tops. The best area in which to see these rocks is on the hill at the head of Rice Creek. Similar lithologies are included locally in the Schist-Gneiss unit.

Cockfield (1921, p. 14-18), and Green (1972, p. 109-110) give detailed lithologic descriptions of the Klondike Schist. Rocks of the unit include pale green, fine-grained, chlorite-muscovite-quartz schist with minor augen gneiss and amphibolite. All rocks have a well-developed, rather irregular foliation. Compositional layering, where seen, is a flaser structure that results from strong shearing and granulation. The latest recrystallization of the rocks postdates strong shearing. Metamorphism was of moderate to upper greenschist facies. Lenses and boudins of white quartz are common in the Klondike Schist and may total 5 per cent of its volume. Amphibolite, an important constituent of this unit, is interfoliated with the micaceous schists and is itself an actinolite quartz schist.

The unit resembles map-unit B of Dawson map-area (Green, 1971) and map-unit B of Ogilvie map-area (Bostock, 1942). In Alaska similar rocks have been mapped by Foster (1970) as Klondike Schist.

Little is known of the stratigraphic relations of the Klondike Schist, but its spatial association with rocks of the Pelly Gneiss suggests that the two units are broadly contemporaneous. Their metamorphism is probably of the same age.

Cockfield (1921) and others give evidence suggesting that the Klondike Schist is metaigneous, but Green (1972) considers the unit metasedimentary.

Potassium argon age determinations of micas in the Klondike Schist in adjacent areas (Green, 1972, p. 116) suggest that this rock was last metamorphosed about early Mesozoic time and considering similar evidence for the Pelly Gneiss both units are probably pre-Mesozoic.

NASINA QUARTZITE

The name Nasina Quartzite (PPqc), first used by McConnell (1905a) refers to a group of rocks of distinctive lithology. The name is not intended to imply anything regarding age or stratigraphic relations. Nasina-type quartzite is found in small areas in northernmost Stewart River map-area, but in the project area its main exposures are in central Snag map-area. The unit is recessive weathering and good exposure are rare. The best area for study is on Stevenson Ridge where small exposures and plentiful float give a good impression of the unit. Some good exposures of these rocks are also found in Nisling River.

As detailed descriptions of the lithology of the Nasina Quartzite by Cockfield (1921, p. 14-15) and Green (1972, p. 108) are readily available only a summary is given here. Rocks of the Nasina Quartzite are dark grey to black, graphitic and micaceous quartzite with interfoliated graphitic biotite-muscovite scchist. Thin colour lamination, the result of alternating layers of light and dark grey quartzite, is common and characteristic. The unit includes local thick lenses of grey laminated marble. The Nasina rocks are metamorphosed to greenschist facies and are of metasedimentary origin. They have a fairly well-developed schistosity and their recrystallization continued after minor structures were formed.

The Nasina Quartzite, like most other rocks of the Yukon Group, is probably pre-Mesozoic. Its metamorphism, inferred from age determinations of other Yukon Group strata, is probably Triassic. The stratigraphic relations of the Nasina Quartzite are unknown and give no clue about the age of the rocks. Cockfield (1921, p. 16) contended that rocks of the Nasina 'series' 'are the oldest in the Sixtymile district, for they are cut or overlain by all the other rocks.' The writer saw no evidence to support this contention. Green (1972, p. 109) implies that the Nasina Quartzite is Paleozoic on the basis of fossils collected by him

and by Mertie (1937). No fossils were found in the present investigation. The area of Nasina Quartzite in central Snag map-area is new and has not previously been studied, unlike the area in northern Stewart River map-area. These rocks have unfortunately yielded no new information on their age. Rocks like those of the Nasina Quartzite are included by Muller (1967, p. 22) in his map-unit 1 which includes equivalents of several map-units described herein. Some quartzite like that of the Nasina is found in northwestern Aishihik Lake map-are where it is included in the Biotite Schist unit."

TABLE OF FORMATIONS
KLONDIKE - SIXTYMILE - INDIAN RIVER AND SCROGGIE DISTRICTS

CENOZOIC

QUATERNARY

22 - unconsolidated glacial and alluvial deposits

TERTIARY AND MODERN

21 - stream deposits, in parts gold bearing gravels (7-Bostock)

TERTIARY

20 - andesite and basalt; minor shale, sandstone and conglomerate (24-Green)

EOCENE OR YOUNGER

19 - Selkirk Series: basalt, andesite (6-Bostock)

18 - granite and sysenite porphyry (5-Bostock)

17 - Carmacks Group; andesit, basalt and flow breccia; dacite, trachyte, rhyolite, tuff, agglomerate (eTcv, 4-Bostock)

16 - conglomerate, sandstone, shale, coal, tuff (3-Bostock)

15 - quartz feldspar porphyry (eTvrp)

MESOZOIC

CRETACEOUS

14 - biotite granodiorite and biotite quartz monzonite (LMqm, 21a-Green)

JURASSIC OR LATER

13 - granite and granodiorite (2-Bostock)

PALEOZOIC

CARBONIFEROUS AND/OR PERMIAN

12 - sheared greenstone (PV)

PERMIAN AND/OR OLDER

11 - chert and metachert (Pt)

10 - foliated muscovite quartz mongonite (PPqmm)

9 - foliated biotite granodiorite (PPgd)

ORDOVICIAN OR LATER

8 - argillite, sandstone, conglomerate (Unit 1-Bostock)

PROTEROZOIC

"METAMORPHIC ROCKS SOUTHWEST OF TINTINA TRENCH"

7 - serpentinized Ultrabasic rocks (E-Green)

6 - gabbro, pyroxenite, periodite, serpentine (C-Bostock)

5 - greenstone, amphibolite gneiss; minor schist, quartzite and limestone (C-Green)

4 - Nasina Quartzite (PPdc, A-Green)

3 - Klondike Schist (PPsqm, B-Bostock and Green)

2 - Schist Gneiss (PPsn, E-Bostock)

1 - Pelly Gneiss (PPgdn, A-Bostock, D-Green)

Geology Compiled After:

H.S. Bostock, Ogilivie Map - 1942

L.H. Green and J.A. Roddick, Dawson Map, 1961

D.J. Tempelman-Kluit, Paper 73-41, Stewart Map, 1974

GOLD FIELD PERMAFROST CONDITIONS

The Klondike placer district is within the discontinuous permafrost zone and the creek gravels are not frozen in all parts. Of the areas dredged in one season by the Yukon Consolidated Gold Company's eight dredging operations on Bonanza, Eldorado and Hunker Creeks, 68.4% was frozen and required thawing by steam. The present method of thawing is to strip the surface vegetation off the muck and expose it to the sun. A second method of thawing is hydraulic monitoring of the surface vegetation and muck by producing a "head" of water with a high-pressure pump.

It is expected that frozen gravel and muck conditions exist on Bear Creek.

> "Throughout almost all the mining districts in the Yukon Territory, with the exception of Kluane, the gravels are covered by a body of black frozen muck which varies from 4 to 20 feet in thickness. The muck can be picked, but no impression can be made on the frozen gravels, which have to be thawed. The thickness of the frozen stratum varies considerably and is less on the ridges than in the valleys and less on southern than on northern slopes. A shaft sunk on the ridge south of Eldorado Creek reached unfrozen ground at a depth of 60 feet, while one in the valley of Eldorado Creek was stopped by running water at a depth of a little over 200 feet. Another shaft sunk through gravel on the plateau between Bonanza Creek and the Klondike River passed through the frost line at a depth of 175 feet; near the head of Quartz Creek, a shaft tapped running water at a depth of about 216 feet. The summer heat has little effect on the frozen layer except in the few places where the surface is unprotected by moss. Exposed gravel beds in favourable positions thaw out to a depth of from 6 to 10

feet, but where moss is present frost is always encountered close to the surface. The depth of gravel varies from 3 feet on some of the creeks to 30 and 40 feet on Lower Dominion and from 80 to 100 feet on Quartz Creek. The frozen muck which overlies the gravels forms an exceedingly firm roof and no timbering is required in the drifts. The shafts in which self-dumpers are operating, however, are usually timbered as well as the tunnels leading from the bottom of the shafts to the face of the drifts. Underneath the frozen muck, large chambers can be excavated during the winter. In one case on Dominion Creek, a muck roof, unsupported by pillars, covered a vault said to measure 140 feet by 230 feet, and remained unbroken until mid-summer. Examples of muck roofs spanning vaults over 100 feet in width are quite common."

BEDROCK IN PLACER GOLD CREEKS

The following bedrock data is quoted from "The Yukon Territory: Its History and Resources", page 27:

"The greater part of the gold, both in the hill and creek gravels, occurs on or near bedrock, either in the lower 4 to 6 feet of gravel or sunk for some distance in the bedrock itself. The distribution depends largely on the character of the bedrock. Soft schists such as those underlying the rich portion of Upper Dominion Creek prevent the gold from descending and it accumulates in a thin layer at the base of the gravels. In many of the rich claims between the two discoveries on Dominion Creek, a thin stratum of gravel resting immediately on bedrock proved extraordinarily rich,

while the bedrock and upper gravels were comparatively lean. On Bonanza Creek the bedrock as a rule is harder and more flaggy, and the action of frost has parted the layers and allowed a portion of the gold to descend along them. From 3 to 5 feet of bedrock are usually mined at a profit and the gold has been found in some quantity at a depth of 12 feet, and probably descends still deeper. On a couple of claims on Hunker Creek, below the mouth of Seventy Pup, practically all the gold occurred in a shattered porphyry bedrock, the overlying gravels proving almost barrent. The bedrock underlying the hill of White Channel gravels is more decomposed than that in the creek bottoms, does not open out in the same way and retains most of the gold at or near the surface. In a few places, gold has been found in paying quantities in the schist partings under the decomposed layer but, as a rule, only the upper few inches are mined."

The foregoing points out the fact that the high density gold accumulates in the "natural riffle" on the bedrock surface. It is therefore important that one foot or more of the decomposed or soft bedrock surface be mined in areas of the paystreak gravels. Gold would also be expected to accumulate in the gravels where natural bedrock crevices occur and the paystreak gravels have crossed these natural barriers.

FIELD EXAMINATIONS

The recent (1980 - 1984) mined areas and dumps were examined in detail. The on-site equipment which includes a Derocker equipped with a four foot x 24 foot sluice run and the camp area were also examined.

There are approximately 2,000 yards of pay gravels stockpiled beside the derocker on the Boiler No. 6 placer claim. No attempt has been made to assign a grade to this material but free gold can be panned out of it. There appears to be a section of virgin ground along the left limit of Bear Creek at the junction of Discovery Pup. This ground is bench ground and should, theoretically, be enriched significantly on both the right and left limits of Discovery Pup at the confluence of Bear Creek and also downstream of the confluence on both the left and right limits of Bear Creek which is covered by the Pop 1 through 5 and the Boiler 6 placer claims. This area warrants a test program of bulk sampling to establish grade.

Another area of significance is at the headwaters of Bear Creek, covered by the Cub Discovery and the Myles 1-4 placer claims. This area should contain an auriferous quartz zone which would trend north-south through these claims. This same zone may be seen at the upstream end of Discovery Pup. This area warrants some bulk sample testing as it might contain significant reserves.

United Keno Hill Mines Ltd. are going to drill for bedrock analysis through the Owl, Raven, Wipeout and Judy placer claims. They have agreed to collect samples through the overburden section for analyses which should add to the data base for this part of the property.

There should also be some sections of side pay adjacent to the old dredge piles. Detailed sampling here is required.

RESERVES

Reserves are extremely difficult to address. Mr. Kierans estimates that there could be in the order of 8,500 ounces of recoverable gold in the lower creek gravels. We feel that this is a valid conservative number. There should be well in excess of this amount when the side pay, bench gravels and white channel gravels are added. A range of 8,000 to 15,000 ounces is not beyond reasonable expectations.

The grade of the deposit is another nebulous factor. In 1983, Sigma produced 530 ounces of gold from 15,000 sluiced yards for an average grade of 0.035 ounces per cubic yard.

IF this grade can be assumed for the recommended bulk sampling program, then 700 ounces of gold would be produced. At $300 U.S. per ounce gross revenue would approach 700 x 300 x 1.30 = $273,000 CDN. Average value per sluiced yard would be 0.035 x 300 x 1.3 = $13.65 per yard. This value per yard figure will be reduced by the percentage of waste material removed and by calculation of fineness.

The costs to complete the bulk test program are estimated at 190,000/20,000 = $9.50 per yard, which would realize in excess of $4.00 per yard if the assumptions above remain valid.

The gold recovered from the recommended bulk test program should exceed its cost.

CONCLUSIONS

The Bear Creek Placer Project is located in a well-known placer basin which has produced in excess of 90,000 ounces of raw gold since its discovery. Teal Minerals Ltd. has acquired by agreement and option 48 placer claims, including 7 fractional claims, virtually along the entire drainage. Approximately 2,000 cubic yards of material are prepared and stockpiled beside a sluice plant on site and both are available to Teal Minerals Ltd. Free gold has been panned from this reserve.

Based on a review of available literature and personal communications with previous operators and property owners, an evaluation program has been designed.

Results from the recommended exploration program should enable management to decide if full scale production is feasible.

RECOMMENDATIONS

A single stage evaluation program is recommended, and only favourable results will lead to a full scale production decision or subsequent stage.

A geologist/engineer should be employed to select several areas for bulk sampling through Boiler 6 and Pop 1-5 claims and the Cub Discovery and Myles 1-4 claims. Accurate volumetric determinations of waste, pay gravels and bedrock must be recorded. Records of every aspect of the operation must be maintained so management will be able to decide with confidence whether or not a full-scale mining operation is warranted. Records such as equipment (working, standing, moving, etc.), yards of material moved per piece of equipment (dozer, loader, etc.) cross sectional values of pit faces, drill hole sections (U.K.H.M. data), pumping hours, fuel consumption, man hours, gold weights, etc. are required.

Overburden stripping should begin about May 15 with a D9 bulldozer on a two-shift basis to prepare bulk sample sites. Two main areas should be tested - the Boiler 6 and Pop 1-5 claims and the headwaters area covered the Cub Discovery and Myles 1-4 claims.

The United Keno Hill Mines drill samples should be washed out by wet screening the individual samples (two foot drill hole intervals is best) to minus one half inch and hand panned to a concentrate. Recover the particles of visible gold, weight it, and plot these weights onto drill sections prepared with visible descriptions of the samples and then use these data to calculate dollar values per year and reserves.

Several other small bulk samples should be collected and washed along the edge of the dredge limits, along the creek and also of previous operators tailings to determine if these have any value.

After the gravel has been prepared sluice using the derocker and plant on-site the individual bulk samples. The plant will be fed with a front end loader. The Derocker wastes the plus two inch material and the minues two inch is put through the sluice run equipped with siffles, mats, etc. Volumetric determinations are crucial here, as are results from the individual clean-ups, as these numbers will dictate the economic viability of the entire project.

In all 15,000 to 20,000 yards of material should be washed, including the 2,000 yards stockpiled on the Boiler 6 claim.

The time frame to complete the test should be approximately 45 days; 25 days stripping and 20 days sluicing.

COST ESTIMATES

1.	Geologist/Engineer/Surveyor/Supervisor:		$ 15,000
2.	Assistant to 1: (drafting, survey helper, etc. clean ups etc.)		$ 7,500
3.	D9 bulldozer:		
	1 months lease rate $27,720 x 2 months	$55,440	
	Operators wages $12,000 x 2 months	24,000	
	Fuel and lubricants, 90 gal/shift $9,500 x 1 3/4 months	16,625	
	Ground engaging tools and parts	6,000	
	Freight to Dawson	7,000	$109,065
4.	Front end loader:		
	1/2 month lease rate	$10,500	
	Fuel and lubricants	6,000	$ 16,500
5.	Sluice plant operation:		
	1/2 month	$ 5,000	
	Carpet, expanded metal, riffles, etc.	2,500	$ 7,500
6.	Accommodation and Meals:		
	Supervisory and assistant		$ 4,500
7.	Transportation:		
	4 x 4 pick-up truck including fuel		$ 2,500
8.	Clean up equipment:		$ 3,000
	Sub-Total		$165,565
	Contingency		24,435
	Total Cost		$190,000

NOTE: The above cost estimates are based on current Yukon lease rates. It may be in the company's best interest to lease purchase the major equipment items in order to gain some equity if a production decision is warranted by the results of the Stage I evaluation program. The auction market and reputable dealers should be investigated as good, used heavy duty equipment is readily available at extremely reasonable prices.

BIBLIOGRAPHY

Bostock, H.S. (1934): Mining Industry of the Yukon, Department of Mines, Bureau of Economic Geology, Geological Survey of Canada, Memoir 178.

_____ (1935): a/a Memoir 193.

_____ (1936): a/a Memoir 209.

_____ (1937): a/a Memoir 218

_____ (1938): a/a Memoir 220

_____ (1939 and 1940): a/a Memoir 234

_____ (1957): Selected Field Reports of the Geological Survey of Canada, 1898 to 1933, Memoir 284.

_____ (1942): Map 711A, Ogilvie, Yukon Territory. Geology by H.S.B. 1935, 1936 and 1937.

Boyle, R.W. (1979): The Geochemistry of Gold and its Deposits, Geological Survey of Canada, Bulletin 280.

Cairns, D.D. (1917): Scroggie, Barker, Thistle and Kirkman Creeks, Yukon Territory, Geological Survey of Canada, Memoir 97.

Cockfield, W.E. (1921): Sixtymile and Ladue River area, Yukon, Geological Survey of Canada, Memoir 123.

Dawson, G.M. (1887 - 1888): Annual Report, Geological Survey of Canada, Volume 3, Part 1.

Heard, R.T. (1983): Geological Report on the Klondike City Placer Project, Dawson Area, Yukon Territory.

Hilker, R.G. (1981): Placer Gold Evaluation Report - Bear Creek Area, Yukon Territory.

Hilker, R.G. (1982): Placer Gold Evaluation Report - Sixtymile Gold District, Yukon Territory on Tenmile Creek.

Kierans, M.D. (1983): Mineral Evaluation Report of Bear Creek, Klondike Gold Placer Mining Camp, Dawson Mining District, Yukon Territory.

McConnell, R.G. (1901): Annual Report, Geological Survey of Canada, Volume XIV - Report on the Klondike Gold Fields.

Milner, M.W. (1977): Geomorphology of the Klondike Placer Goldfields, Yukon Territory.

Roche, W.J. (1916): The Yukon Territory: Its History and Resources, Issued by direction of the Honourable W.J. Roche, Minister of the Interior.

Robinson, A.H.A. (1932): Gold in Canada, Canada Department of Mines, Mines Branch.

Tempelman-Kluit, D.J. (1974): Reconnaissance Geology of Aishihik Lake, Snag and part of Stewart River Map Areas, West-Central Yukon, Paper 73-41.

Wells, J. (?): Placer Examination, Principles and Practice, United States Department of the Interior, Bureau of Land Management, Technical Bulletin 4.