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# YUKON PLACER MINING



Canada

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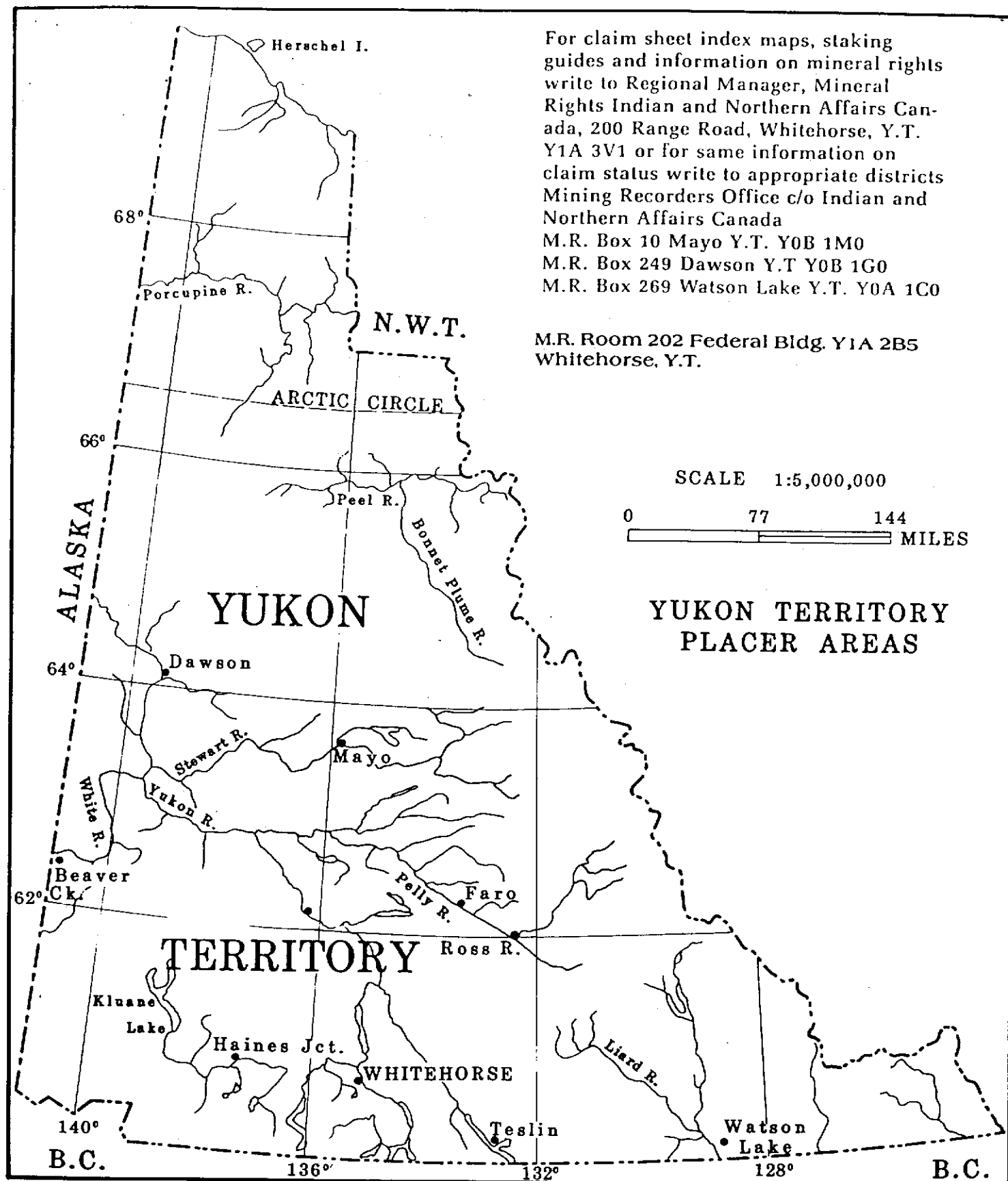
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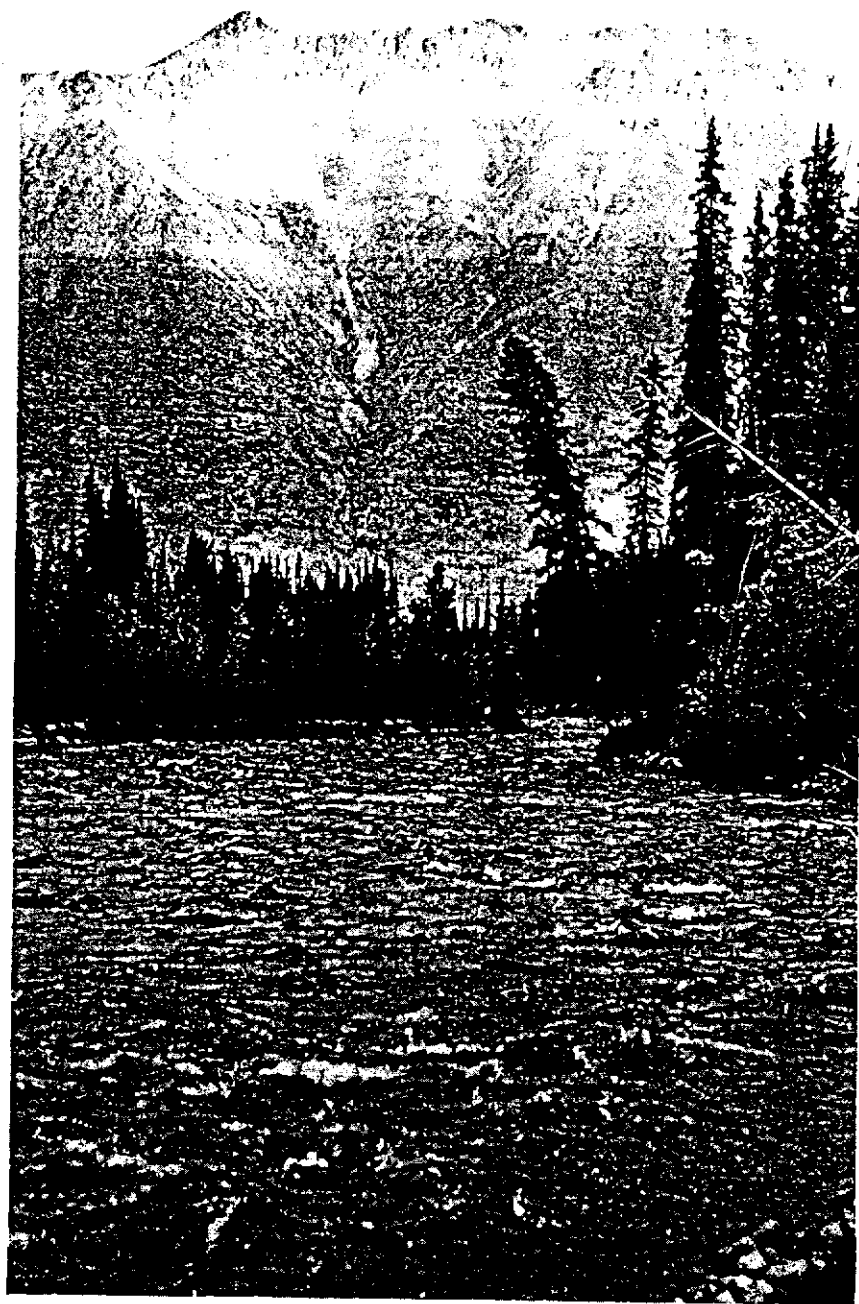
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# INTRODUCTION

While much of Yukon remains untamed wilderness, most areas in the territory which have potential placer gold deposits have been examined and staked, often several times. This is the Wheaton River.



As the price of gold rose by leaps and bounds over the past few years, interest in gold mining has been re-kindled all around the world. In the Yukon Territory this renewed enthusiasm has focused on placer mining and many have been tempted to make comparisons with the gold rush of 1898.

At that time, the territory was virtually an unknown wilderness, but in the space of a few months it was invaded by thousands of avid gold seekers. By July 1, 1899, according to government reports, some 18,000 placer claims had been staked, mostly on the Klondike River and its tributaries, the Stewart River system and other smaller streams feeding the Yukon River.

Dawson grew to be a bustling city of 30,000 and it seemed that the prosperity of the territory was assured. By the end of the twentieth century's first decade however, the severe climate, the isolation and the lure of gold strikes elsewhere were bringing this spectacular rush to an end.

The placer mining industry went into a long, slow decline and by March, 1971, there were no more than a dozen operations producing gold with only about 940 placer claims in good standing. Then in the early 1970's, an undervalued gold began to respond to the pressures of inflation, shrugging off the old \$35 an ounce price and climbing well past the \$100 an ounce mark. These prices brought a renewed interest in Yukon placer fields, stirring memories of the glorious days of the Klondike. Old claims were reactivated, old tailings piles were re-examined, and new creeks were explored. By August 31, 1979, when an ounce of gold was hovering at the \$400 U.S. mark, over 150 operations were producing gold and land held under placer claims or leases to prospect had again reached an equivalent of 18,000 claims. \*

This trend has continued into the 1980's and it is for this reason that the Department of Indian Affairs and Northern Development has produced this booklet. It is intended to give persons with little or no experience in the field information about the placer mining industry in Yukon. It is not a how-to-do-it manual but rather an introduction to the various aspects of placer mining and the placer mining environment in Yukon.

This booklet will be successful if it helps the reader to get a modern perspective on three myths that have been left over from the legendary "days of 98," when larger-than-life heroes made fortunes in the Klondike goldfields with every swirl of the pan.

The first myth we want to dispel is the notion that armed with a pan and shovel (and perhaps a rudimentary sluice box), a determined miner can make his fortune. Although the occasional lucky and skillful miner does manage to make a living using such manual methods, these cases are very rare.

Placer mining in the 1980's is a highly mechanized industry, where bulldozers, front-end loaders, motor-driven pumps and conveyor belts are the norm. The prospective placer miner must consider carefully the level of capital investment that this type of operation will require. If the finances aren't there then he should stick to recreational panning and sluicing, a hobby from which more and more people are receiving great satisfaction.

The second myth that must be discarded is that large areas of unclaimed placer ground are still waiting to be staked in Yukon. It is true that this is a vast territory, some of which has not been thoroughly explored. Most of the areas, however, which have a potential for placer gold deposits, have been

examined and staked, often several times.

The prospector should study with great care the claim sheets available from the Mineral Rights Division of DIAND in Whitehorse, Dawson City, Mayo and Watson Lake to determine the location of open ground. While it cannot be said that no new gold-bearing areas will be found in Yukon, it must be realized that the possibility becomes more remote with each passing season.

Third, the new prospector must rid himself of any distorted pictures of Yukon he might have. The territory is not a replica of more temperate parts of North America, for it lacks some of the comforts and conveniences that are taken for granted "outside." Telephones, electric power, public lodging and restaurants are scarce beyond the confines of the communities.

On the other hand, this is no lawless frontier on the model of the old west. Criminal law and more importantly for this discussion, mining and environmental regulations, are strictly enforced. The reality of Yukon lies somewhere between these two visions; it is an isolated, sparsely populated, largely undeveloped land where mining, tourism and government are the major industries.

There is potential here in Yukon, but there are also difficulties which must be considered carefully. The territory has confounded as many fortune-seekers as it has allowed to prosper. ■

*\* This figure includes regular placer claims and leases to prospect, a type of land disposition which did not exist at the time of the gold rush and which, on the average, is equivalent in area to about thirty placer claims*

# WHAT IS PLACER MINING?

Water plays an essential role in placer mining.

Placer is a Spanish word meaning a place where gold can be recovered from gravel. (It also means *pleasure*: an interpretation disputed by many miners.) In contrast to lode or hard-rock mining,



placer mining deals with loose material — gravel, sand or mud. It is essentially a way of using gravity to recover heavy materials from these lighter gravels with which they are mixed in nature.

Gold, being one of the heaviest minerals, is the most common product of a placer operation. Platinum and the tungsten-bearing materials; scheelite and wolframite, and to a lesser extent cassiterite (stream tin), native copper and many of the metallic sulphides can also be obtained in this way, though not in economic quantities in Yukon.

In most cases water is used as the transporting or "washing" agent: the light, unwanted sand or gravel is carried away by a stream of water, leaving the heavy gold behind in the pan or sluice box.

Over the years, the methods for handling the "pay dirt" or material to be washed have improved greatly with the advent of trucks, bulldozers and power-operated diggers. But the system for recovering gold is basically the same as that used by placer miners in ancient times.

Homer's story of Jason and the golden fleece is surely a reference to the sheepskins used in sluice boxes in Asia Minor to collect gold — today, we use cocoa matting or astro-turf. Highly complicated systems of riffles have proven generally to be no more effective than simple ones. ■

## CHARACTERISTICS OF GOLD

Fortunately for the placer miner, gold has one attribute which distinguishes it from most other minerals — its density. A lump of pure gold is almost twice as heavy as a lump of lead the same size and it is approximately seven times as heavy as a lump of ordinary rock, or, in this case, the sand and gravel in which it is found. Were it not for this extreme density, of course, the placer operation technique would not work.

Other common, heavy gold-coloured minerals encountered by miners are pyrite (fool's gold) and chalcopyrite. Any confusion between these substances and gold can be easily overcome. For one thing, these minerals are brittle, whereas gold is the most malleable of all metals. It may be flattened into extremely thin sheets: a flat particle weighing one billionth of an ounce can be seen with the naked eye. Moreover, gold, though very soft, is resistant to oxidation and to most acids — thus, the "acid test" for gold. Perhaps most obvious of all is gold's characteristic colour and metallic sheen.

Pure gold does not occur naturally: it is always alloyed with silver and other metals. In Yukon, for example, the unrefined product varies from about sixty to ninety-five percent contained gold with the average being about eighty percent. ■

More than one miner "struck it rich" only to discover a deposit of pyrite, "Fool's Gold." Gold's density and malleability however can usually distinguish it from other minerals. Pure gold is almost twice as heavy as lead of similar size and approximately seven times as heavy as ordinary rock.





# PLACER DEPOSITS: WHERE ARE THEY FOUND?

Placer deposits are formed by the natural concentration of heavy minerals during the course of erosion and weathering of mineralized rock. As the rock is broken down, the finer and lighter fragments are transported downstream by run-off water, while the heavier minerals tend to sink towards bedrock and remain closer to their source.

Coarse pieces of gold will usually be found close to the rock from which they have been detached, whereas finely divided flakes and dust may turn up a considerable distance downstream. An example of the latter is the deposition of fine gold at the upstream end of river bars and islands.

Gold-bearing gravels are also likely to collect where tributaries enter larger streams and at points where the main stream meanders. "Bench-placers" are formed by a meandering stream which, having deposited its load of gravel — usually against a bank — then cuts its channel deeper and deeper, leaving the gravel high and dry on the valley wall, some distance above the present surface of the water.

It is interesting to note that these processes are rather like natural placer

operations, for they are made possible by the high specific gravity of gold and the presence of water as a transporting agent.

Placer deposits in Yukon are usually creek or bench deposits. River bar placers, because they are shallow and of limited extent, are of little importance, although this was the first type found and mined in the 1870's.

Typically, but more so in Yukon, the richest gravels are those closest to bedrock. In a few isolated cases, all the gold lies in cracks in the bedrock and none in the gravels. Most operators excavate the first two or three feet of bedrock, depending on the type of rock and the ease with which it may be removed. In extreme cases placer gold has penetrated as much as twelve feet into highly fractured bedrock.

Many of the placer deposits in Yukon are underlain by soft, decomposed schists which present few problems to the miner. Frequently, however, beds of hard rocks such as quartzites will be encountered and cleaning this type of bedrock with trowels, spoons or brooms will be necessary, a most time-consuming and laborious process.

Valley glaciation normally destroys any placer deposits. The prospector should study geological maps (available from the Exploration & Geology Division, DIAND, Whitehorse), showing glacial interpretation.

As a rough guide, glaciated valleys normally have a U-shaped cross section as opposed to the V-shape for unglaciated valleys. The existence of the Klondike goldfields is the result of long-since eroded gold-bearing quartz veins as a source, combined with the absence of glaciation in the northwestern part of the territory.

The location of a placer deposit is dependent on the history of the stream. The serious prospector will look for evidence of former stream channels in order to formulate theories about possible "pay streaks." Right or wrong, these theories must be checked out by actual testing of the gravels.■

# PANNING: BACK TO BASICS

For the initial testing of a stream, the gold pan is a useful and convenient tool. It is inexpensive and portable and the technique is easy to learn.\*

Crouched at the edge of a creek, the panner swirls and rocks his panful of gravel in such a way that the water carries just a little of the lighter material over the side with each movement. When he has thus disposed of all the lighter material, he can then discard the unwanted coarse gravel by hand and he will be left with heavy sand amongst which the gold flakes should be visible.

Many vacationers and "weekend miners" find that panning is a good way to combine a sense of history with a taste for fresh air and exercise. On the other hand, many prospectors find that stooping at the edge of a stream with their hands in the icy water is back-breaking, bone-chilling work.

For testing, the usual procedure is to work upstream, taking frequent pans from material as close to bedrock as possible. Additional pans should be taken at points where tributaries enter the main stream as reconcentration often takes place here.

By counting the number of particles or flakes of gold (colours) found in each pan and recording the location where each pan was taken, an idea of the best section of the stream can be obtained. Naturally, the size of the individual pieces of gold is also important.

The following terms have come into standard usage:

**coarse gold** — pieces larger than 1/10 inch diameter;

**medium gold** — 2,200 colours per ounce;

**fine gold** — 12,000 colours per ounce;

**flour gold** — 40,000 colours per ounce.

A rule of thumb with placer miners is that if a grain of gold, when dropped into the pan, gives an audible "ping," then it is probably worth fifty or sixty cents at today's prices (\$400 U.S./oz).

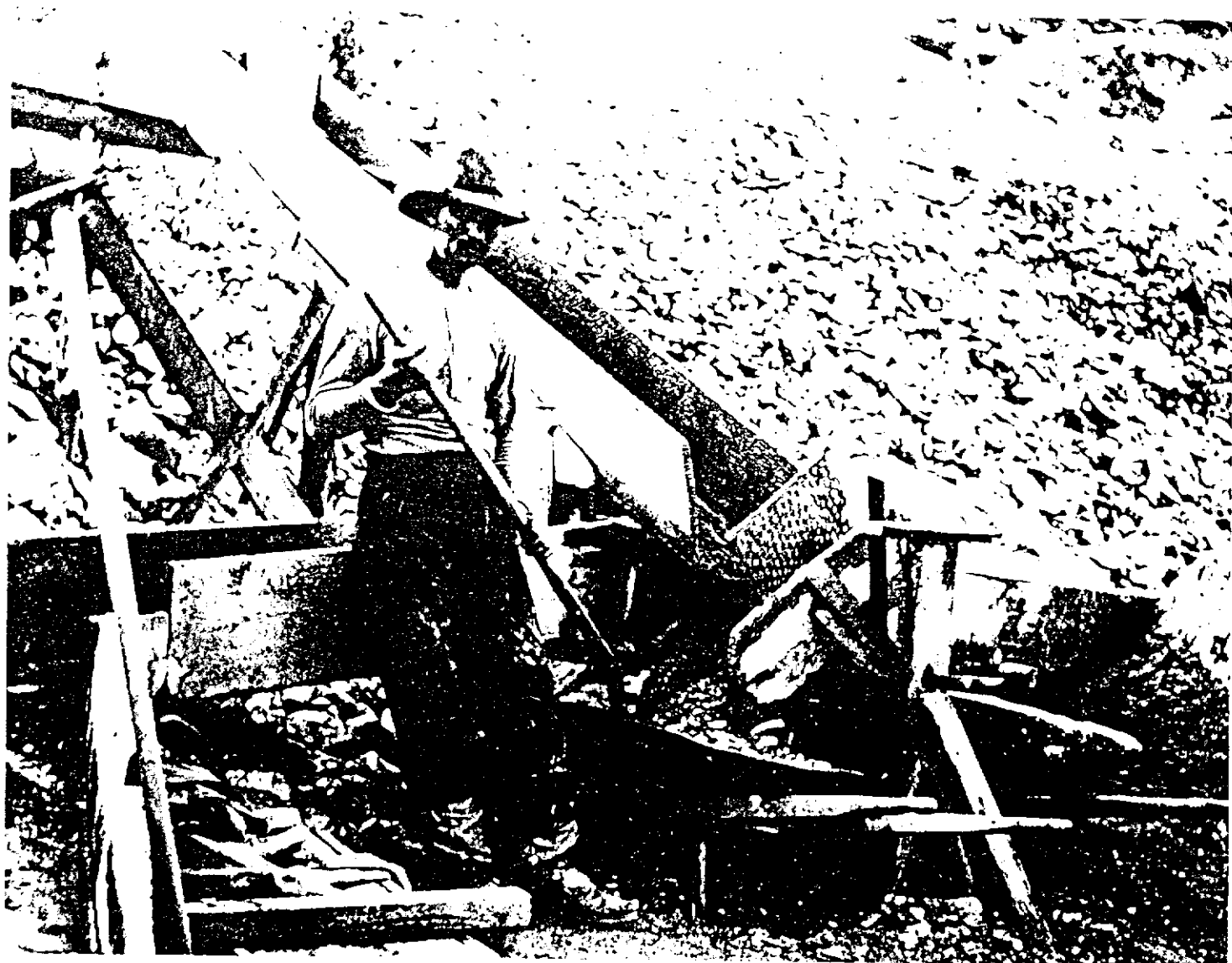
Panning has never been considered a means of gold production. The standard 16-inch pan will only hold about 1/180 of a cubic yard and the average panner would be hard-pressed to wash half a yard per day. The pan is useful, however, for preliminary testing, clean-up and for recreational purposes. For more intensive testing the prospector should consider a rocker, a hand-fed sluice or a suction dredge. ■

\* For an excellent description of panning techniques as well as other valuable information on placer mining, see *Placer Examination: Principles & Practice* by John H. Wells.

Many vacationers and "weekend miners" find gold panning is a good way to combine a sense of history with a taste for fresh air and exercise.



# AFTER PANNING THEN WHAT?



This "oldtimer" manually pushed gravel into the sluice box where it was washed and the gold was recovered.

The rocker is a device which, though it was sometimes used as a means of production at the turn of the century, is now used only for testing in areas where initial results seem promising. It is basically a long box or trough, elevated at one end, and mounted on a support which allows it to pivot from side to side — hence the term "cradle" by which it is also known.

The rocker is usually equipped with a "grizzly" or screen to keep out the larger pebbles (stories of nuggets so large they were thrown out with the gravel are as popular in the Klondike as those about the big fish that got away — and about as credible).

The finer particles which fall through the grizzly are propelled to the bottom end by a combination of a limited flow

of water and the rocking motion. The skillful operator can ensure that the gold particles remain behind, while the waste falls out the end.

Where water is scarce, the rocker is probably the most practical unit. It can be constructed with a minimum of materials and carpentry experience. Under the same conditions, a miner operating a rocker rather than a gold pan can increase the volume of gravel washed by about ten times, i.e., up to three yards per day. For a most efficient operation it is preferable to have two people, one to shovel in gravel and the other to rock and add water.

Where water is plentiful, sluicing with one or more small boxes may be the best technique. Here, the pay dirt is washed by water pressure alone. As the water flows through the box the lighter particles are carried away while the heavy ones are caught in a system of riffles or slats on the bottom of the box.

If the grade in the stream is steep enough (one foot drop in twenty-five feet), the miner may be able to take advantage of this natural pressure to feed his box through a pipe which brings the water from a point upstream of the work site. Otherwise, the purchase or rental of a small gasoline-driven pump complete with hoses and flexible waterlines may be in order. This is a particularly useful item in the Klondike where many streams are small and slow-moving. The working of bench placers, the thawing of frozen ground (see *PERMAFROST*) and hydraulic stripping are also facilitated by a pump.

It is a tribute to the imagination of placer miners that no two rockers, sluice boxes or sets of riffles look alike. Building plans and operating instructions are available in various publications and the reader is referred to the accompanying bibliography. \*

The suction dredge might best be described as a floating vacuum cleaner with a pump and a sluice box on behind. Gravel is sucked up from the stream bed and fed directly into the sluice box which is also receiving water pumped from the stream.

Very little data are available on the performance of these machines in Yukon. Models on the market differ widely with respect to power and recovery system. Initial cost is very high, compared to that of rockers and sluice boxes, and the prospective purchaser should study the manufacturer's specifications, especially in the areas of volume capability, maintenance and weight, before buying one.

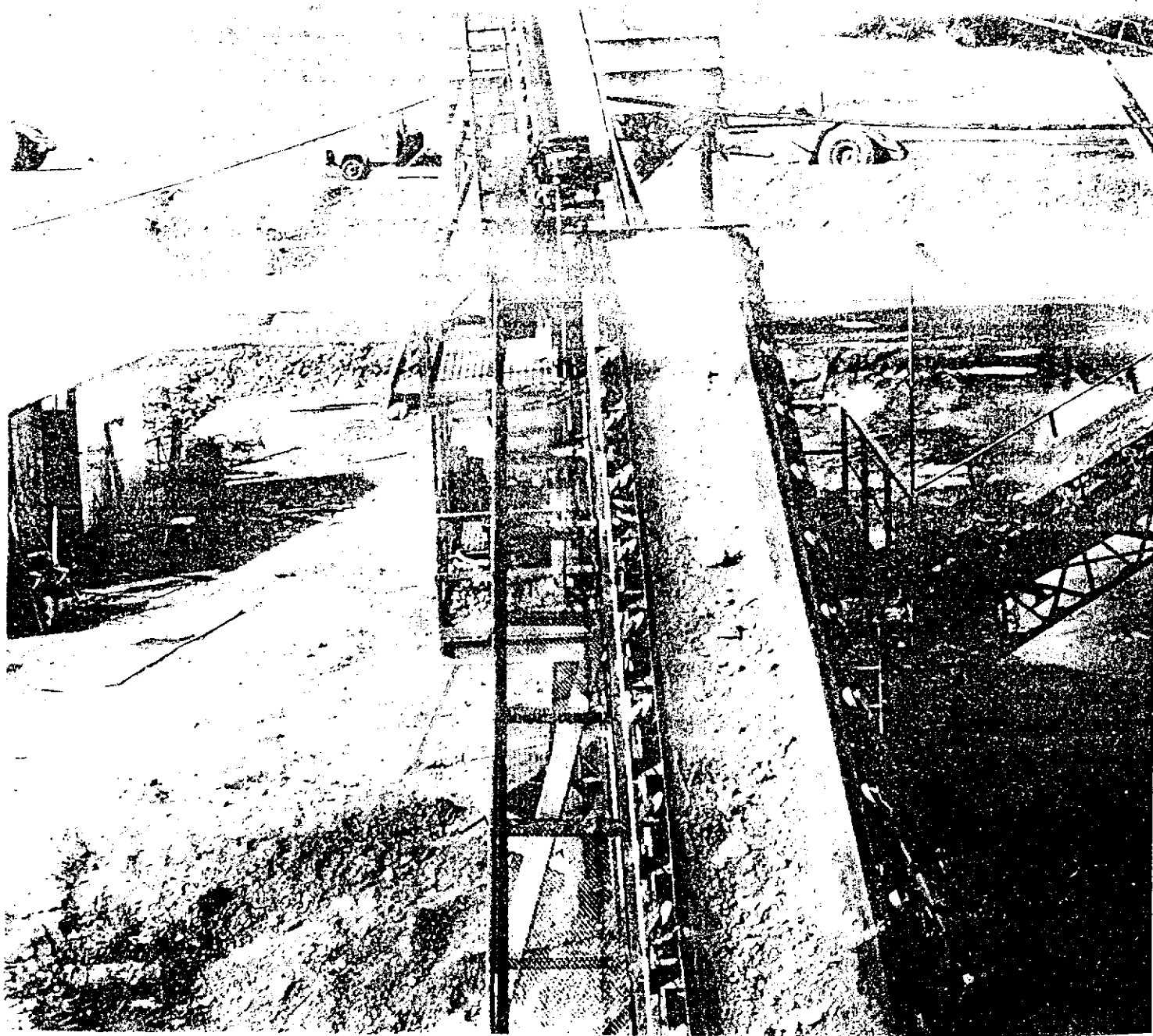
Before discussing larger operations, two important points must be made:

1. Shallow test pits (five feet) present few problems, but deeper pits or shafts usually require timbering and precautions unfamiliar to the amateur. Inexperience in shaft-sinking or "drifting" — horizontal digging into a hillside or wall of a shaft — can lead to very dangerous working conditions.
2. Both to comply with the law and in order to protect his own territory, the prospector should stake a claim or a lease to prospect (under Section 92 of the Yukon Placer Mining Act) at the earliest possible moment. (see *STAKING GUIDE*.) ■

\* See especially *Placer Examination: Principles and Practice* by John H. Wells.

Heavy equipment plays an essential part in modern-day placer mining. Today's methods are much more efficient than in years past.





# OPERATIONS: MEDIUM AND LARGE SCALE

A 1973 survey of a few randomly-picked operations in the Klondike area showed that for each ounce of gold produced, the amount of material processed (including stripping of muck and waste gravels) ranged from twenty to two hundred cubic yards. Volumes of gravel for hydraulic operations frequently averaged much higher.

From these figures it can be seen that using the equipment described so far, only the very richest of deposits could be processed rapidly enough by hand to be economically viable. Once the testing has been completed, therefore, if the prospector or hobbyist wishes to become a miner, he must decide which equipment will best suit the conditions on his ground.

This is not the place for a detailed discussion of the various types of mechanized operations presently found in Yukon, however, some general information can be given.

The most common method in Yukon today is the use of a bulldozer to supply gravel to a steel sluice box. The "cat" first strips off the overburden — the vegetation, soil and surface gravel. It then simply pushes the gravel into the top end of the sluice box and an appropriate amount of water is supplied by a pump.

The box may be anywhere from thirty to sixty feet long, although most of the gold is caught in the first few feet of the riffles. Waste gravel is ejected from the bottom end of the box and removed by 'dozer,' a loader or drag-line. It is often returned to the hole whence it originally came.

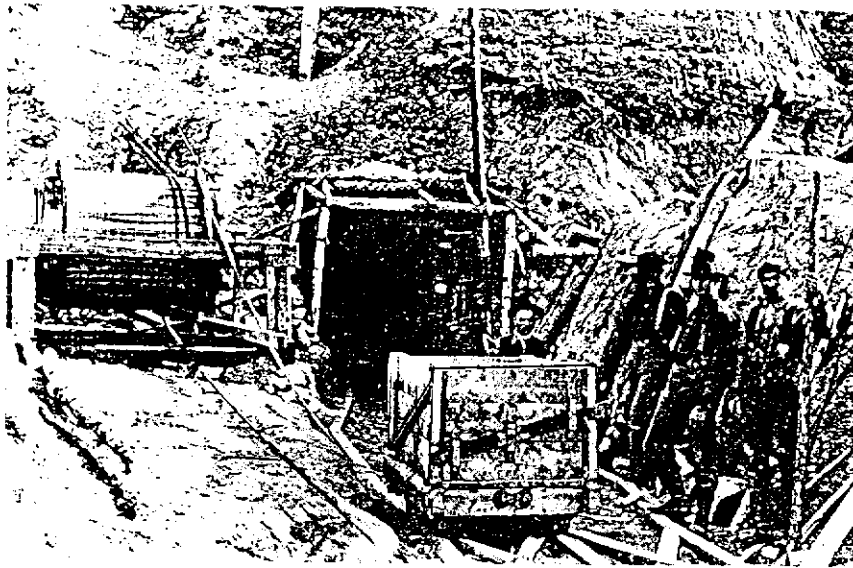
In a hydraulic operation the bulldozer is replaced by a monitor — a nozzle attached to a high-pressure pipeline. The jet of water emitted by the monitor is so powerful that it can strip off the overburden and in some cases (though not often in semi-arid Yukon) move the pay dirt into the sluice box.

Water from large scale placer operations is often allowed to find its own way back to the creek. It may contain large amounts of silt, however, and concern has been expressed about the effects of these suspended solids on fish and other aquatic life. Consequently, most operators are required by the conditions attached to the water licence (which every operator must have) to construct settling ponds or otherwise ensure water quality. (see **RULES AND REGULATIONS**). ■

Hydraulic mining in Yukon. The jet of water emitted from the monitor is so powerful that it can strip off the overburden and cut the gravel.



# PERMAFROST



The Magaw and Andrews Tunnel was "drifted" (horizontal digging) into the frozen hillside at the bedrock level.

Placer mining in one form or another has taken place in most parts of the world for many years. But one feature of northern placer operations sets them apart from temperate zone deposits — permafrost.

Much of the placer ground in Yukon is permanently frozen. The gold-bearing gravels are usually overlain by several feet of black muck, a mixture of fine silt, partially decomposed vegetation and fifty to seventy-five percent ice by volume. This frozen muck is well insulated by a thick layer of moss, but once the moss is stripped off, it thaws quite quickly, especially if subjected to running water.

Frozen gravels can be thawed by artificial methods such as steam, hot or cold water or wood fires, but the only economical way is by natural thawing and the application of water during the summer. Generally, use of heavy machinery and explosives has proven unsatisfactory.

In most cases frozen ground will not be a problem for the prospector, since he normally will be testing along a creek where the first thawing takes place. He can probably count on open water and snow-free ground for a season of about five months, from some time in May until some time in October. Should he wish to do any work below the surface or at a distance from the stream, he will probably have to deal with permafrost. ■

## WILL I MAKE A BUCK?

The answer to this question is, of course, "that depends." Some people have made their fortunes in the gold fields but most have not. Here are some of the factors that must be considered.

Gold production usually varies directly to the volume of gravel that is efficiently processed. This means, for each operation, finding a balance between sluicing each shovelful of pay dirt carefully and washing enough gravel to be profitable.

In average ground a panner would be unlikely to recover enough gold to even cover expenses. On the other hand, in 1977, an operator reported recovering seventy ounces from a quarter-yard remnant left by the "old-timers."

As suggested in the introduction, money breeds money in the mining business. Bulldozers, sluice boxes,

pumps and people to operate them represent a large capital investment without which the miner cannot hope to earn a living from his venture.

Generally speaking, a mineable placer deposit requires three main features: gold, water and tailings room. Specifically, factors that must be considered include:

- value per yard and extent of the pay gravels;
- amount of water readily or potentially available;
- amount of overburden or waste gravels to move;
- position of the water table;
- size of boulders;
- type and grade of bedrock;

- thawing frozen ground;
- location of the deposit with respect to access and downstream consequences;
- occurrence of heavy minerals other than gold;
- shape and size of gold;
- cost and feasibility of complying with environmental regulations.

Given that he has economic quantities of gold on his claim, dealing with the above factors will require of the successful miner that he be an engineer, a geologist, a woodsman, a carpenter and a mechanic. The additional ingredients are then simple hard work, patience and a good deal of luck. ■



What was worth \$45 in the Gold Rush days could be worth anywhere between \$800 and \$1000 with the price of gold in today's market.



# BUYING AND SELLING GOLD

From 1792 to 1934, the price of gold was about twenty dollars U.S. per ounce. In 1906 when the revised Yukon Placer Mining Act became law, the price was set at \$20.67 Canadian and it was on this basis that the royalty of 37.5 cents per ounce was fixed. (see *OTHER SERVICES OF THE MINING RECORDER*.)

Between 1934 and 1968, the price was pegged at thirty-five dollars U.S. per ounce but in 1968 price restrictions were removed. A complex network of factors drove the price steadily up during the 1970's until at the time this writing, it was approximately four hundred dollars U.S. per ounce. Buyers and sellers must check the price daily to judge the best moment to complete their transactions.

It should be remembered that gold and silver are measured in troy ounces, rather than in the avoirdupois system which North Americans use in their

everyday dealings. The troy ounce is slightly heavier than the avoirdupois ounce, being the equivalent of 31.1 grams whereas the latter equals 28.3 grams.

Furthermore, the price quoted refers to pure gold ("fine gold"). Yukon placer gold ranges from sixty to ninety-five percent "fine" and the exact value cannot be determined until final refining has been completed. The gold buyer, therefore, in addition to being entitled to a fee for his services, must take into account this unknown purity when stating a price, as well as allowing for shipping, insurance and refining charges.

The seller may be well advised to offer his coarse pieces and attractive nuggets for the manufacture of raw gold jewellery. Premium prices are usually available for these pieces and purity is less vital a factor than in gold destined for refining. ■

## RULES AND REGULATIONS

The Yukon Placer Mining Act was promulgated in 1906 and although now outdated, is still the major piece of legislation governing the industry. Instead

of one, there are three federal acts dealing with placer mining which unfortunately, appear to be conflicting with one another at times. The three acts, each designed to protect different elements, are the Fisheries Act, which says that fish habitat must be protected, the Yukon Placer Mining Act, which grants mining rights, and the Northern Inland Waters Act, which protects water quality.

In 1982, the Department of Fisheries and Oceans in cooperation with the Department of the Environment and Indian and Northern Affairs, Canada, drafted a set of proposed guidelines, governing the placer mining industry.

Basically, the purpose of the guidelines was to find a balance between the placer mining industry and the government's responsibility for good resource management practices. At the time of this writing, the guidelines had just undergone a public review process and the committee's report was due to be completed and publicly released later in the year.

As already stated, it is in the best interest of the prospector or miner to stake a claim as soon as he has decided that the piece of ground in question has some potential. The claim must be recorded at the appropriate district mining recorder's office.

Where mining of the submerged bed or bars of a river — defined as a watercourse having an average width of 150 feet or more — is contemplated, the miner must comply with the Territorial Dredging Regulations. Also falling under the Territorial Dredging Regulations are non-stable or unvegetated islands which are not open for staking claims or leases to prospect.

In particular, the following points should be noted:

1. any person of any nationality, legally present in Canada and eighteen years of age or older, may locate, and record claims. There is no requirement for a licence to stake or hold placer claims.
2. Within a given valley, one claim may be located every sixty days by one person.
3. Every claim must be marked by two posts.
4. The granting of leases to prospect is at the discretion of the Regional Manager, Mineral Rights, under delegation from the Commissioner of Yukon.
5. A claim or lease to prospect must be recorded within the travel time allowed by the act and in the district in which it is situated.
6. Claims are renewable annually upon completion of two hundred dollars worth of assessment work, as evaluated by the schedule provided for by the act.

7. A royalty (currently 37.5 cents per troy ounce) is payable on raw gold exported from the territory. \*

Apart from the basic functions of recording claims and collecting royalties, the mining recorder offers several services to the prospector. The mining recorders have available, at a cost of one dollar each, claim sheets showing all quartz and placer claims in their respective districts at a scale of half a mile to the inch, or larger. Coverage of the Yukon is available from the Regional Manager's office in Whitehorse, Yukon.

There are approximately 700 of these for the whole Territory, but for areas of concentrated placer activity, such as the Klondike, larger scale maps showing placer claims are available.

Other maps — topographical, aeronautical or geological — can also be obtained from the mining recorder's office for that district or from the Exploration and Geological Services Division of the Northern Affairs Program headquarters in Whitehorse. ■

*\* More complete information in the form of a staking guide and excerpts from the Yukon Placer Mining Act are appended at the back of this booklet.*



A typical single run sluice box, commonly used in Yukon today.

# USE OF LAND AND TREES

A smaller placer claim. Operations of this size are becoming a rarity in the gold-fields.



\* Resource management officers are located in DIAND field offices in Whitehorse, Teslin, Watson Lake, Ross River, Carmacks, Dawson City, Beaver Creek, Haines Junction and Mayo.

Most of the land in the Yukon Territory falls under the jurisdiction of the Government of Canada. The rules for the use of this land are found in the Territorial Lands Act and the Territorial Land Use Regulations which are administered by the Land Resources Division of Indian and Northern Affairs, Canada.

Briefly stated, any person who disturbs the surface of federal land must have a permit to do so. This includes such activities as driving a vehicle across the land, sorting materials on it, campsites, digging a ditch across it, etc. No land use permit is required for operations conducted within the boundaries of mineral claims or leases held by the potential permittee.

Under the terms of the Territorial Timber Regulations an individual may obtain from the resource management officer\* in his district a permit to cut trees on Crown land for such mining-related purposes as cabin construction, timbering for a shaft or fuelwood. He has the right to clear his claim without a permit and to dispose of the wood therefrom in whatever non-commercial manner he sees fit. A prospector engaged in testing at various sites can cut up to twenty-five cords (90 stacked cubic meters) of fuelwood per year without a permit. The purpose of a mining claim, however, is for prospecting/mining and not other unrelated activities such as logging, cabin building, etc. ■

# WATER USE REGULATIONS

In 1972, Sections 54 to 69 of the Yukon Placer Mining Act concerning water use by miners were revoked and the use of water was regulated by the Northern Inland Waters Act.

Water use for the purpose of placer mining requires a licence.\* Most

placer miners receive licences which may contain conditions for the items listed below.

1. Limiting the maximum rate of water use.
2. Restricting the type of mining in or adjacent to streams.
3. Requiring the settling of removal of suspended solids from water returned to the stream.
4. Requiring the stabilization of tailings and stream channels.

The complexity of the application, information required and the conditions attached to the licence will depend upon the location and scale of the proposed mining operation. In many areas

a licence to use water can be readily obtained once a completed application is received and a site water use inspection has been completed. In some areas, especially where other water users would be affected or where fish or fish habitat may be affected, a licence may be more difficult to obtain and the conditions may be more restrictive.

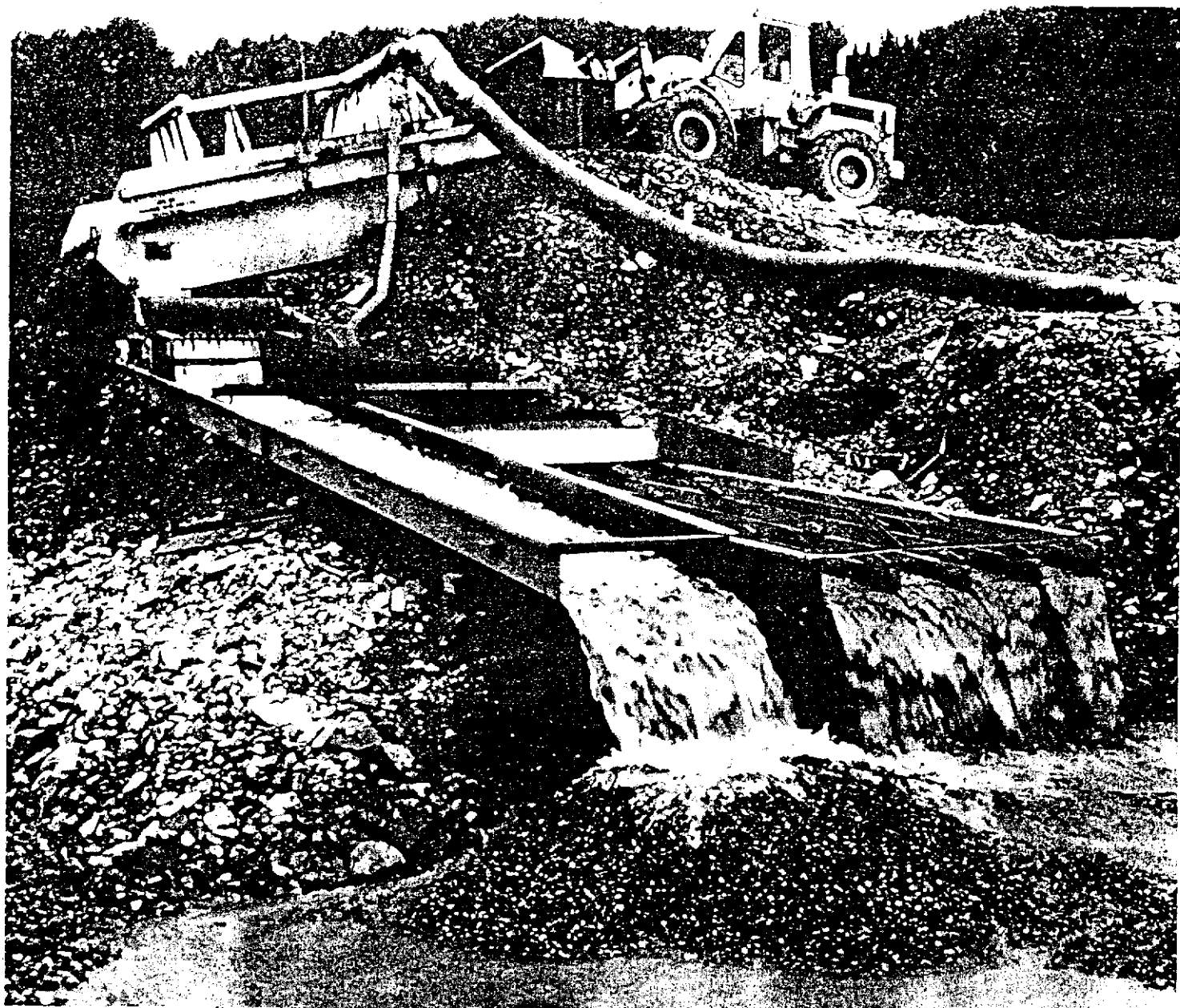
For information regarding the Northern Inland Waters Act and its water use licencing requirements, contact:

Yukon Territory Water Board,  
Suite 200, 4114 Fourth Avenue  
Whitehorse, Yukon Y1A 4N7  
(403) 668-4884. ■

*\* Use of a suction dredge to placer mine is limited to valid claims, or dredging leases, and a water licence must be obtained if use is over 50,000 gallons of water per day or a waste is to be discharged into any waters.*



A modern-day settling pond. Rules governing the use of water, soil, forests and wildlife are enforced in Yukon today.



This is an example of a modern sluice box which is able to process up to 200 yards of gravel per hour.

# HUNTING

## NOTE:

Unless indicated, publications are available from the Exploration and Geology Division of the Northern Affairs Program located at 200 Range Road Whitehorse, Yukon, Y1A 4V1.

For many people part of the appeal for placer mining in Yukon as a hobby or as a business lies in the prospect of "living off the land." For those entertaining such as idea, the following statement by the director of the territorial game branch should be noted:

"All animals and birds, wild by nature, are protected except those classified as game. Game birds and animals can be taken during the specified open season and at specified bag limits. No person shall hunt unless authorized by a

licence issued to him. No person under the age of fourteen is eligible for any licence. Persons between the ages of fourteen and sixteen can obtain a licence, but must be accompanied by a licenced hunter over the age of twenty-one. Holders of resident hunter licences may take snowshoe hares and ground squirrels (gophers). A non-resident, not being the holder of a valid hunting licence issued under the Game Ordinance or having other lawful occasion, shall keep all firearms securely stowed in the motor vehicle or trailer, boat or aircraft used by him."

Similar restrictions and licence requirements apply to fishing and trapping.

Interest in placer mining declined after the 1940's and most publications on the subject are now out of print. New books designed to instruct the "recreational" prospector have recently appeared in bookstores and the reader should investigate this source. A few of the government publications still available are:

**H.S. Bostock**, 1957, *Yukon Territory: Selected Field Reports of the Geological Survey of Canada 1898 to 1933*, Geological Survey of Canada, Memoir 284, Cat. No. M46-284; **\$12.00**

**A.H. Lang**, 1970, *Prospecting in Canada*: 4th edition, Geological Survey of Canada, Report No. 7; **\$24.95**

**Officers of the British Columbia Department of Mines and Petroleum Resources**, 1963, *Notes on Placer Mining in British Columbia*: Bulletin No. 21; **\$2.00**

**John H. Wells**, 1973, *Placer Examination: Principles and Practice*, U.S. Department of the Interior Bureau of Land Management, Technical Bulletin 4 \*

#### DIAND PUBLICATIONS:

**Department of Indian Affairs and Northern Development and of the Geological Survey of Canada**, 1933 to present, *Mineral Industry Report: Yukon Territory*. In 1979, this publication was renamed and is now entitled the *Yukon Exploration and Geology Report*. (These are published annually and report on mining activity in the territory.)

1979/80: **\$7.50**;

1981: **\$7.95**

1982: **\$9.95**.

**Department of Indian Affairs and Northern Development, Yukon Mineral Industry**, 1941 to 1959, compiled and edited by R.L. Debicki; free

**Department of Indian Affairs and Northern Development, Yukon Placer Mining Industry**, 1978 to 1982, compiled and edited by R.L. Debicki; **\$9.95**.■

\* Available from:  
Alaska Division  
Geological Survey  
P.O. Box 80007  
College, Alaska  
99708

# FINENESS OF YUKON PLACER GOLD

This incomplete list was compiled by G.W. Gilbert from Geological Survey of Canada reports, gold-buyer's lists and personal communications with placer miners.

Since fairly wide ranges of purity exist even on relatively small creeks, this list may be used as a guide only.

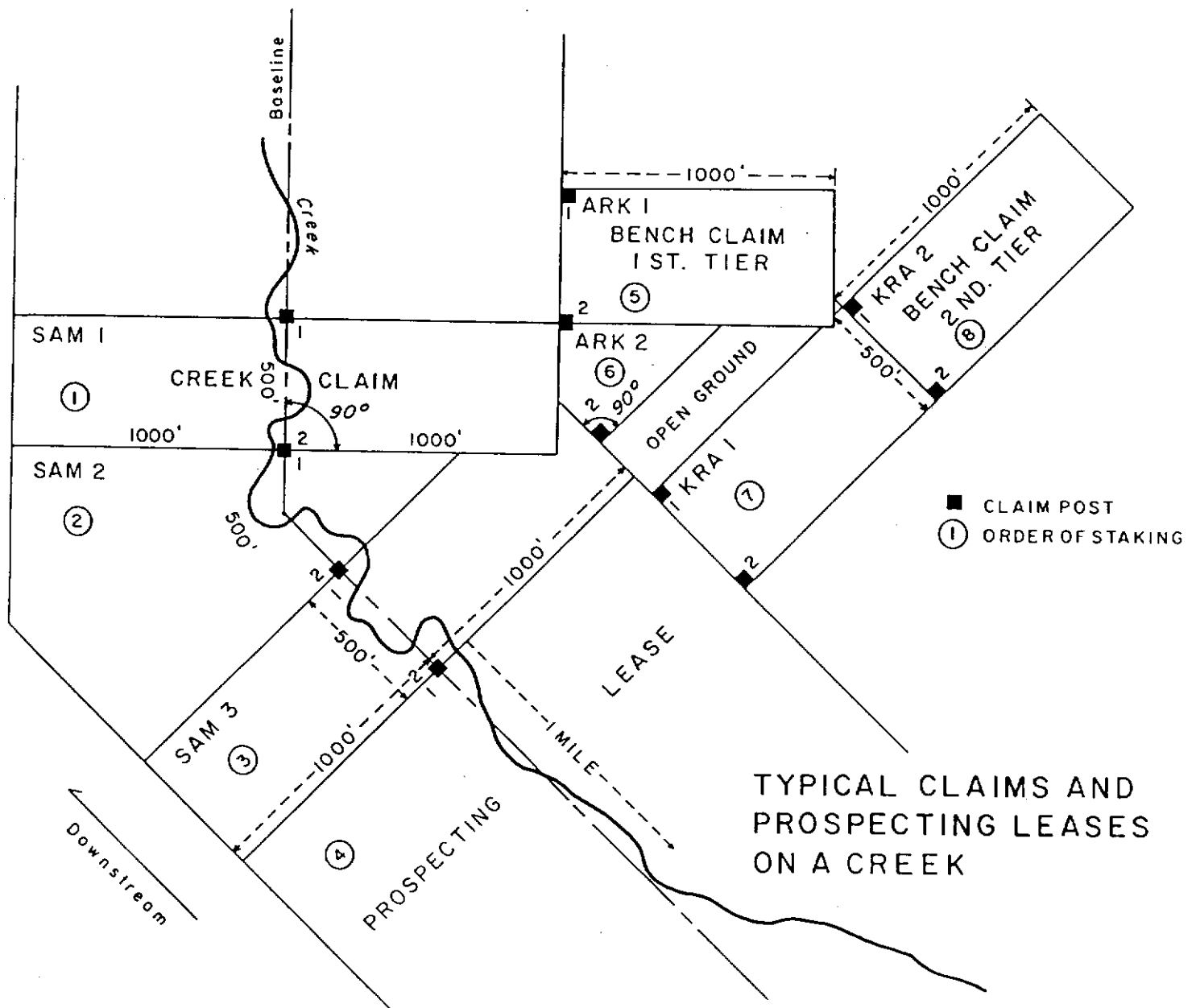
Figures tabulated are in fineness: i.e. — parts per thousand of pure gold; the remainder is usually silver, with minor amounts of base metals. To calculate the value of contained gold multiply the fineness by the current price of refined gold: e.g. — Allgold Creek, .860 x \$400. (U.S. dollars) = \$344. U.S. dollars per ounce of raw gold. The unweighted average fineness of this list is 800 and the range from 605 to 946. (In 1905, the average fineness of approximately 500,000 ounces shipped from the Klondike area was 755.)

A name in parentheses following the creek name refers to main drainage to aid in location on map.

<b>KLONDIKE AREA</b>	<b>RANGE</b>	<b>SIXTY MILE AREA</b>	<b>RANGE</b>
Adams Gulch (Bonanza)	615-746	Big Gold (Sixtymile R.)	854
American Hill (Bonanza)	864	Glacier (Sixtymile R.)	830-860
Allgold (Klondike R.)	860	Fortymile R. (Yukon R.)	814-820
Bear (Klondike R.)	644-726	Matson (Sixtymile R.)	775-890
Bonanza-upper (Klondike R.)	809-827	Miller (Sixtymile R.)	827-857
Bonanza-middle (Klondike R.)	781	Moose (Fortymile R.)	855
Bonanza-lower (Klondike R.)	739-798	Poker (U.S. side) (Fortymile R.)	873
Bonanza-Discovery (Klondike R.)	762	Sixtymile R. (Yukon R.)	808
Boulder (Bonanza)	800	Tenmile (Sixtymile R.)	830-845
Claffey Pup (Quartz)			
Caribou (Dominion)	816-840	<b>STEWART RIVER AREA</b>	<b>RANGE</b>
Cheechako (Bonanza)	750-785	Brewer (Stewart R.)	910
Dago Hill (Hunker)	798-859	Ballarat (Yukon R.)	852
Dominion-upper (Indian R.)	810	Barker (Stewart R.)	793-900
Dominion-lower (Indian R.)	847	Black Hills (Stewart R.)	750-855
Dominion-middle (Indian R.)	817-835	Henderson (Yukon R.)	725-730
Eighty Pup (Hunker)	797	Independence (Stewart R.)	780-794
Eldorado (Bonanza)	633-783	Kirkman (Yukon R.)	860-896
Eureka (Indian R.)	677-727	Mariposa (Scroggie)	900
French Gulch (Eldorado)	631-676	Scroggie (Stewart R.)	900-905
Gay Gulch (Eldorado)	780	Stewart R. (Yukon R.)	837-850
Gauvin Gulch (Bonanza)	664	Thistle (Yukon R.)	848-895
Gold Bottom (Hunker)	780-800	Canadian (Yukon R.)	864-883
Gold Run (Dominion)	848-860		
Gold Hill (Eldorado)	768	<b>MAYO-McQUESTEN AREA</b>	<b>RANGE</b>
Goring (Klondike R.)	738	Anderson (Mayo R.)	720-728
Henry Gulch (Hunker)	605-650	Clear (McQuesten R.)	828-860
Homestake (Hunker)	663	Davidson (Mayo R.)	840
Hunker (Klondike R.)	701-859	Dublin Gulch (McQuesten R.)	860-923
Hunker-Right Fork	802-804	Duncan (Mayo R.)	792-802
Hunker-Upper	798-859	Haggart (McQuesten R.)	885-895
Hunker-Mouth	701-726	Highet (Mayo R.)	832-845
Indian R. (Yukon R.)	843	Johnson (McQuesten R.)	760-820
Irish Gulch (Eldorado)	624-742	Ledge (Mayo R.)	808-820
Jackson Gulch (Klondike R.)	829-842	Lightning (Mayo R.)	830
King Solomon Hill (Bonanza)	785-800	Minto (Mayo R.)	827-835
Last Chance (Hunker)	683-832	Steep (Mayo R.)	931-946
Lombard Pup (Dominion)	860	Thunder Gulch (Lightning)	790-825
Lovett Gulch (Bonanza)	808-836		
Little Blanche (Quartz)	658	<b>MOOSEHORN RANGE</b>	<b>RANGE</b>
Montana (Indian R.)	770	Discovery (Scottie Cr.-Tanana R.)	820
Monte Cristo (Bonanza)	784-976		
Mint Gulch (Hunker)	851	<b>DAWSON RANGE</b>	<b>RANGE</b>
Oro Grande (Eldorado)	775	Revenue	850-880
Paradise Hill (Hunker)	735-802		
Quartz (Indian R.)	732-784		
Skookum (Bonanza)	605		
Sulphur (Dominion)	797-821		
Trail Hill (Bonanza)	800-805		
Victoria Gulch (Bonanza)	807-820		
<b>KLUANE AREA</b>	<b>RANGE</b>		
Burwash (Kluane R.)	871-876		
Bullion (Slims R.)	871		
<b>BIG SALMON AREA</b>	<b>RANGE</b>		
Lake (S. Big Salmon R.)	895		
Livingstone (S. Big Salmon R.)	880		

# APPENDIX I

## STAKING GUIDE





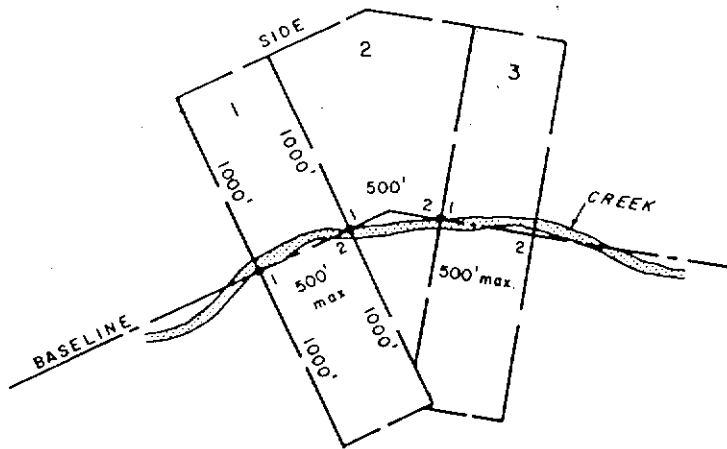


Figure 1.  
CREEK CLAIMS

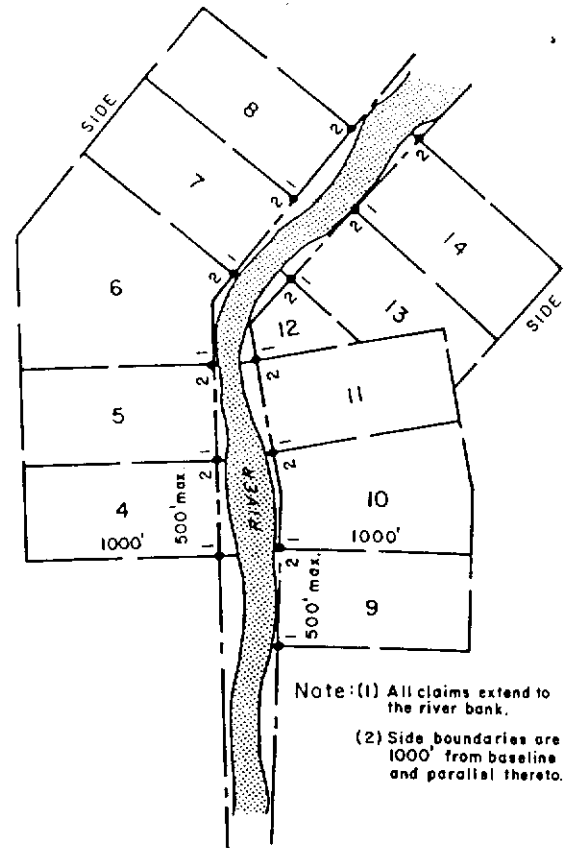


Figure 2.  
RIVER CLAIMS

Note: (1) All claims extend to the river bank.  
(2) Side boundaries are 1000' from baseline and parallel thereto.

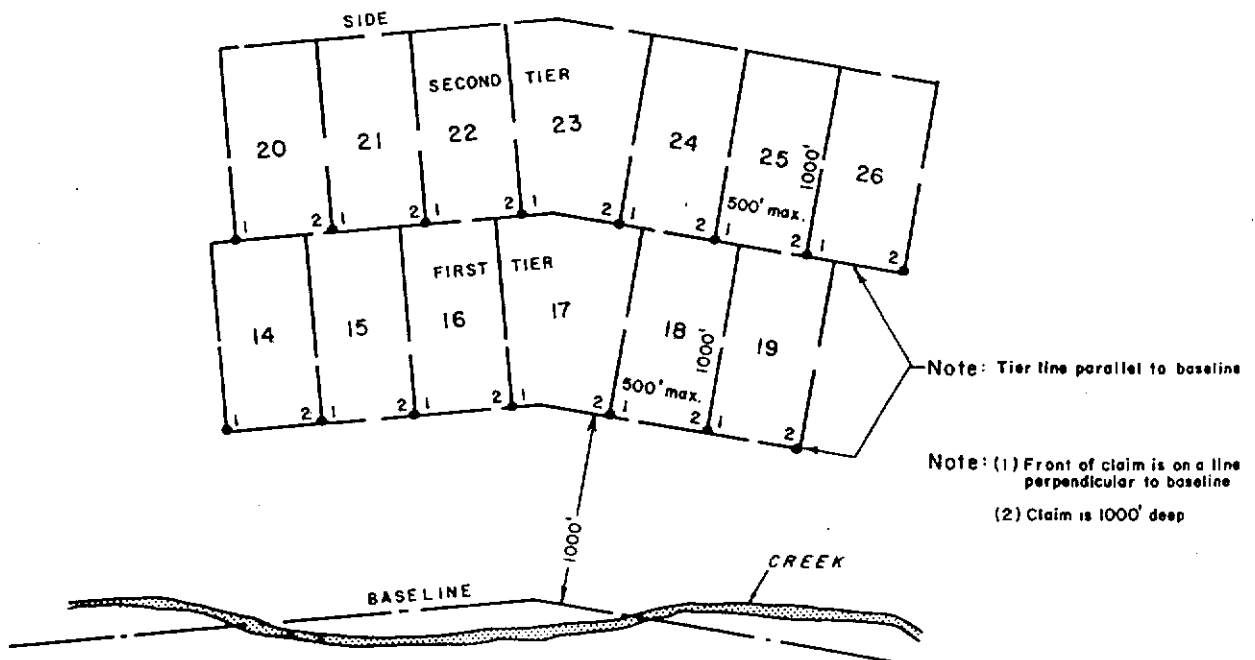


Figure 3.  
Claims other than on a creek or river  
BENCH CLAIMS

Note: Tier line parallel to baseline

Note: (1) Front of claim is on a line perpendicular to baseline  
(2) Claim is 1000' deep

River Claims (staked from P.L.)

STABLE VEGETATED ISLAND

Ark 1, Ark 2, Ark 3, Ark 4, Ark 5, Ark 6, Ark 7, Ark 8, Ark 9, Ark 10, Ark 11, Ark 12, Ark 13

Open Ground, Open

Job Island Claim, My Island Claim, Last Chance Island Claim

Post no. 1 P.L., Post no. 2 P.L., Post no. 1 P.L.

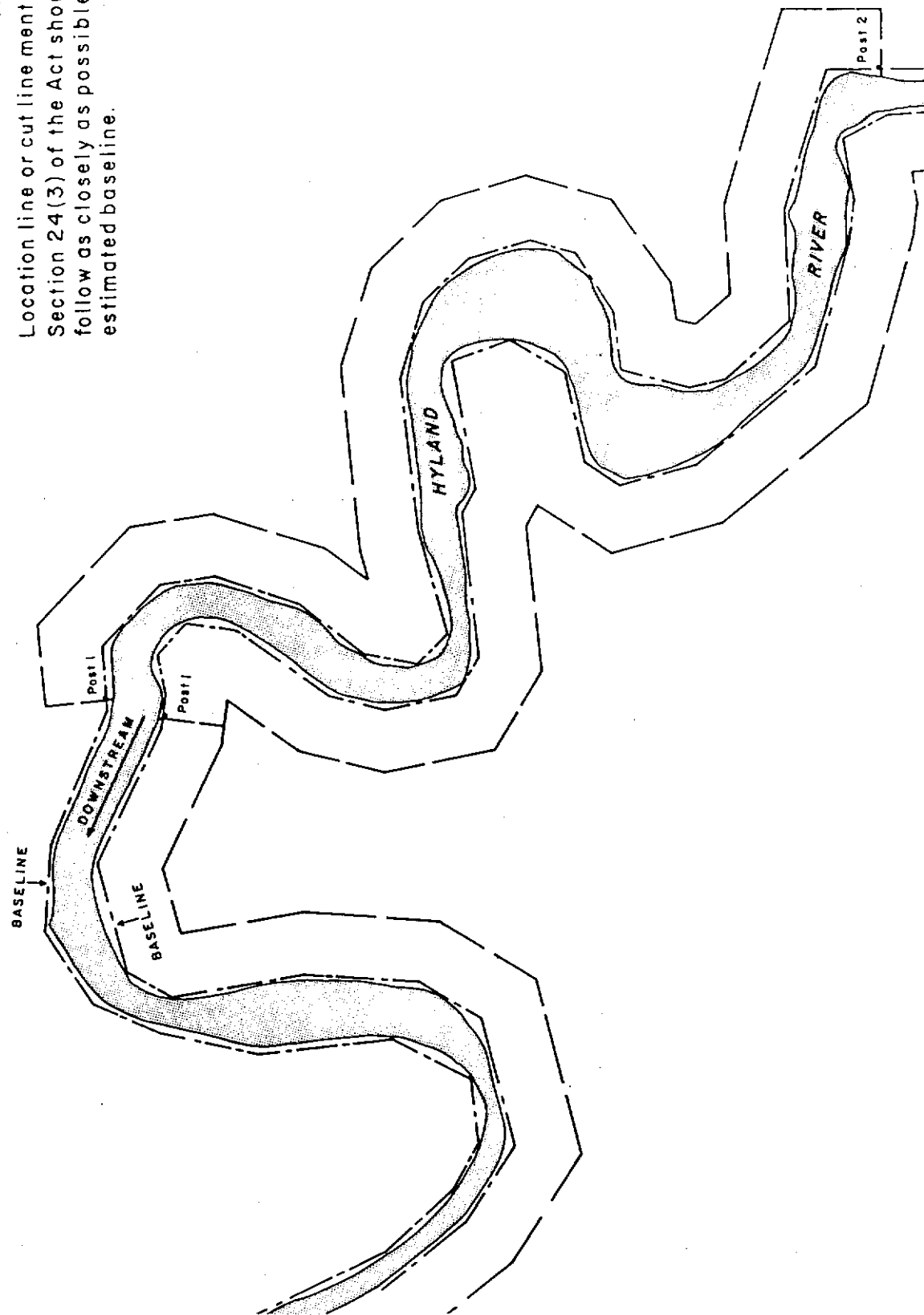
RIVER

9,000' P.L. Staked As A 2 Mile Lease

22

EXAMPLE SKETCH  
SHOWING STAKING OF  
RIVER PROSPECTING LEASES  
WITH BASELINES  
ON BOTH SIDES OF RIVER

Location line or cut line mentioned in  
Section 24(3) of the Act should  
follow as closely as possible to the  
estimated baseline.



# PROSPECTING LEASES



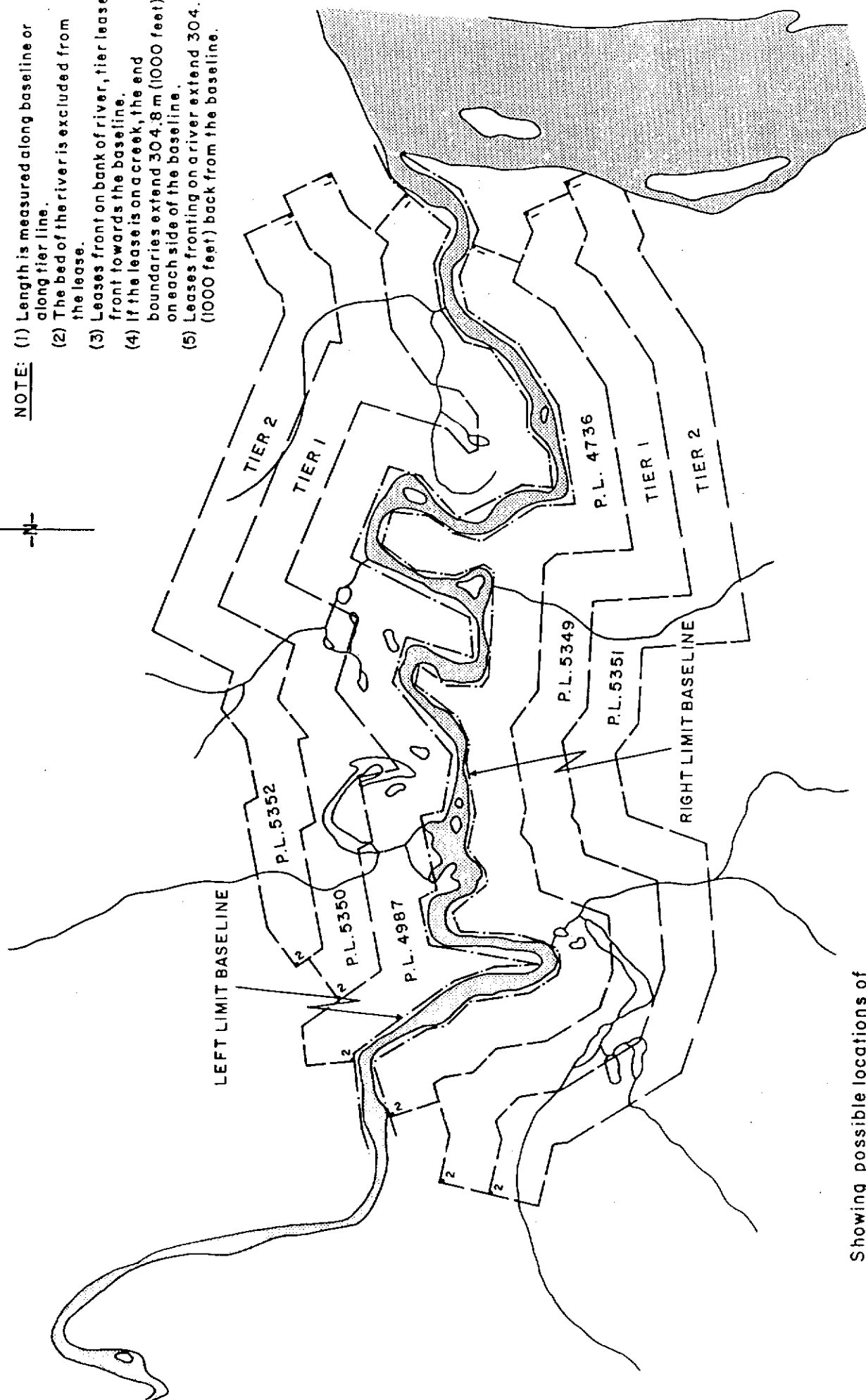
**NOTE:** (1) Length is measured along baseline or along tier line.

(2) The bed of the river is excluded from the lease.

(3) Leases front on bank of river, tier lease front towards the baseline.

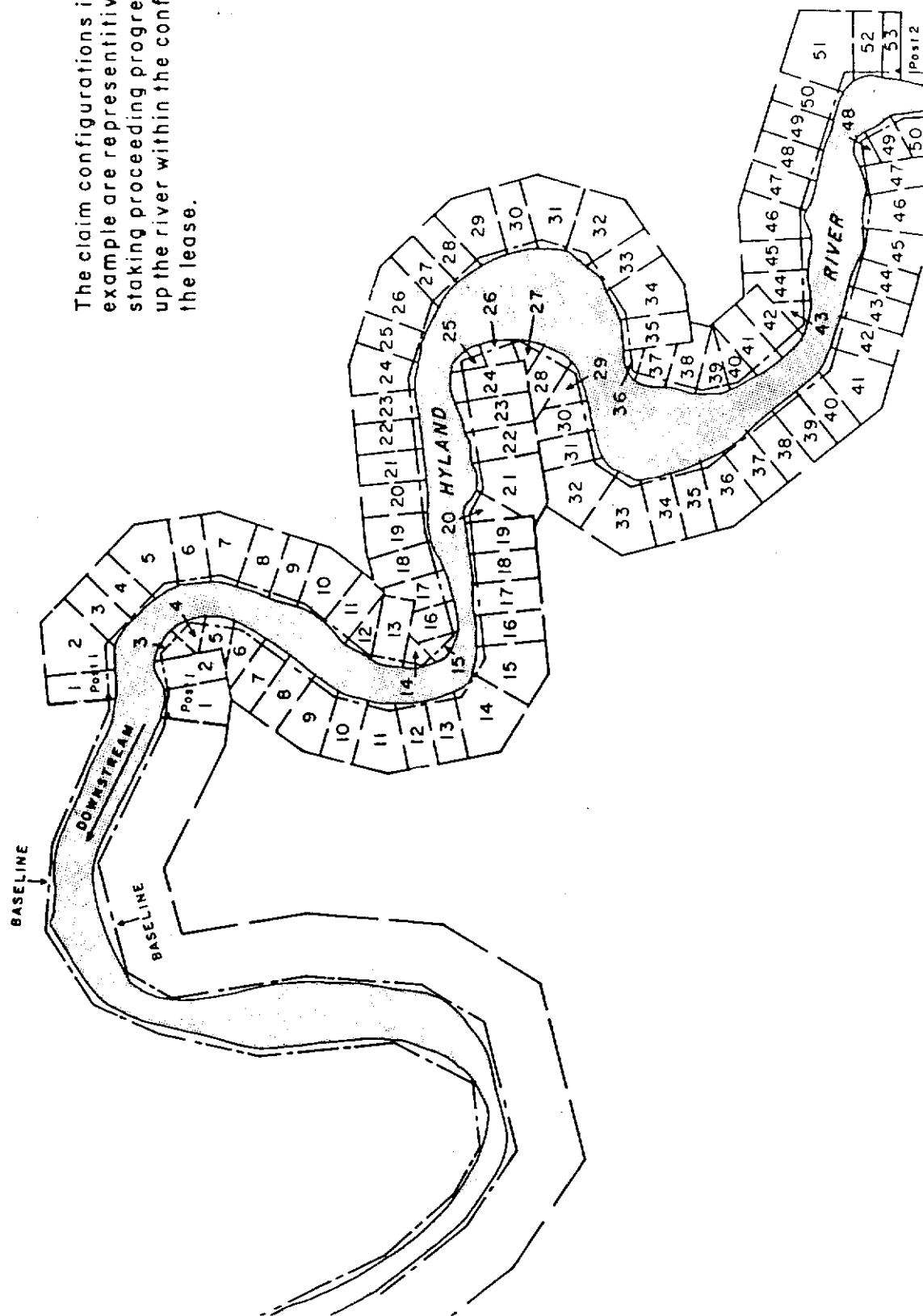
(4) If the lease is on a creek, the end boundaries extend 304.8 m (1000 feet) on each side of the baseline.

(5) Leases fronting on a river extend 304.8 (1000 feet) back from the baseline.

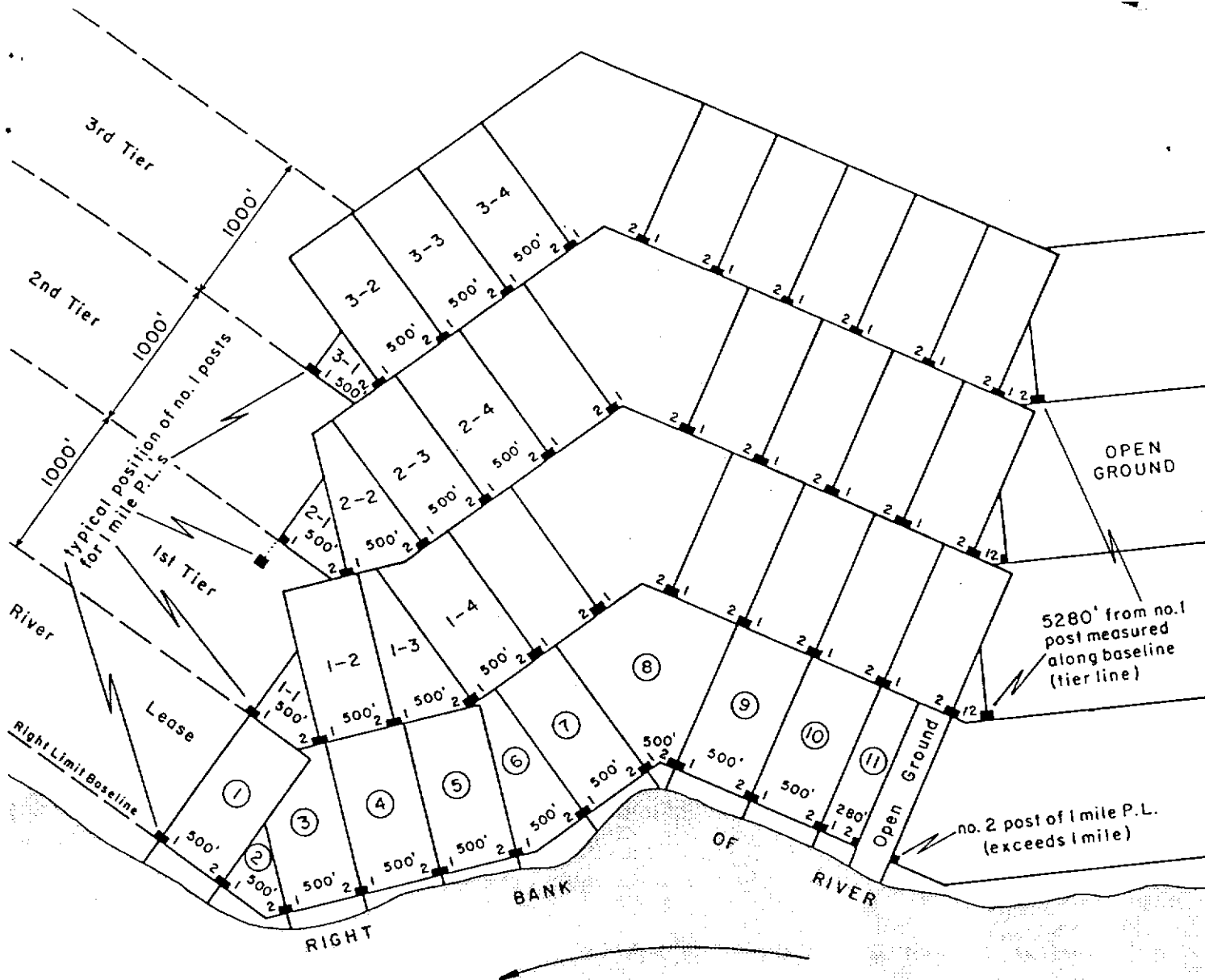


Showing possible locations of  
Left limit and right limit baselines

EXAMPLE SKETCH  
SHOWING STAKING OF  
RIVER PROSPECTING LEASES  
STAKED TO CLAIMS  
WITH BASELINES  
ON BOTH SIDES OF RIVER



The claim configurations in this example are representative of staking proceeding progressively up the river within the confines of the lease.



⑩ ——— INDICATES PRIORITY OF STAKING

### ONE - MILE PROSPECTING LEASES STAKED INTO CLAIMS

Each tier ideally is made up of 10... 500 foot claims and one 280 foot claim.

Claims start at no. 1 post of P.L. and end at either the no. 2 post or 5280 feet, whichever comes first. At no time do they exceed a total length of one mile, measured along baseline (or tier line).

Internal fractions cannot occur using this system as long as the claim lengths, measured along the baseline or tier levels, do not exceed the allowable 500 feet.

Note that the segment between the baseline and the river bank is included in each claim even though it makes the width of the claim more than 1000 feet. All distances are horizontal and are measured along the baseline or (tier line).

# APPENDIX II

## EXCERPTS FROM THE YUKON PLACER MINING ACT

### CHAPTER Y-3

An Act respecting placer mining in the Yukon Territory.

### SHORT TITLE

1. This Act may be cited as the Yukon Placer Mining Act R.S., c. 300, s.1.

### INTERPRETATION

#### Definitions

2. (1) in this Act

#### **"base line" (ligne)**

"base line" of a creek or river means a traverse line following the general direction of the centre bottom lands of the valley of the creek or river, surveyed and established under the direction and with the approval of the Commissioner;

#### **"claim" "mining property" (claim)**

"claim" means any parcel of land located or granted for placer mining, and "mining property" includes besides claims, any ditches or water rights used for mining thereon, and all other things belonging thereto or used in the working thereof for mining purposes;

#### **"Commissioner", etc. (commissaire)**

"Commissioner", "Council" and "Commissioner in Council", respectively, have the same meaning as they have in the Yukon Act;

#### **"creek" (creek)**

"creek" means all natural water-courses, whether usually containing water or not; and that portion of any stream below the point where it enters the valley of the parent stream; but does not include streams that may be considered rivers under the dredging regulations, that is, streams having an average width of one hundred and fifty feet;

#### **"legal post" (borne)**

"legal post" means a stake having a diameter throughout of not less than five inches, standing not less than four feet above the ground and flatted on two sides for at least one foot from the top, each of the sides so flatted measuring at least four inches across the face, and includes also any stump or tree cut off and flatted or faced to the aforesaid height and size;

### RIGHT TO ACQUIRE CLAIMS

#### **Who may locate claims**

17. (1) Subject to this Act, any individual eighteen years of age or over, on his own behalf, on behalf of any corporation authorized to carry on business in the Territory, or on behalf of any other individual eighteen years of age or over, may enter for mining purposes, locate, prospect and mine for gold and other precious minerals or stones upon any lands in the Territory.

#### **Restrictions on locating claims**

(2) Subsection (1) does not apply to lands

(a) to which the National Parks Act applies;

(b) used as a cemetery or burial ground;

(c) lawfully occupied for placer mining purposes;

(d) set apart and appropriated by the Governor in Council for any purpose described in paragraph 19(d) of the Territorial Lands Act;

(e) entry on which the purpose of prospecting for minerals and locating a claim is prohibited by order of the Governor in Council under section 93 of this Act except on the terms and conditions set out in the order;

(f) under the administration and control of the Minister of National Defence, unless the consent of that Minister has been obtained in writing;

(g) within the boundaries of a city, town or village as defined by any ordinance of the Commissioner in Council, unless under regulations approved by the Governor in Council; or

(h) occupied by a building or within the curtilage of a dwelling house. R.S., c. 49 (1st Supp.), s.1.

#### **Security for damages**

18. No person shall enter for mining purposes, locate, prospect or mine upon lands owned or lawfully occupied by another until he has given adequate security, to the satisfaction of the mining recorder, for any loss or damage that may be thereby caused, and persons so entering, locating, prospecting or mining upon any such lands shall make full compensation to the owner or occupant of such lands for any loss or damage so caused, such compensation, in case of dispute, to be determined by a court having jurisdiction in mining disputes. R.S., c. 300, s. 18.

### SIZE, FORM, etc., OF CLAIMS

#### **Nature and size of claims**

20. (1) A claim on a creek shall not exceed five hundred feet in length, measured along the base line of the creek, established or to be established by a Government survey, as hereinafter provided.

#### **Side boundaries**

(2) The side boundaries of a claim shall be lines on either side of the base line, parallel thereto and one thousand feet distant therefrom.

#### **End boundaries**

(3) The end boundaries of the claim shall be lines drawn at each end of the claim, at right angles to the base line, and extending not more than one thousand feet on either side thereof.

#### **If base line not established**

(4) In the event of the base line not being established, the claim may be staked along the general direction of the valley of the creek, but in such case, when the base line is established, the boundaries thereby defined shall be conformed to R.S., c. 300, s. 20.

#### **Claims elsewhere than on a Creek**

21. A claim situated elsewhere than on a creek shall not exceed five hundred feet in length parallel to the base line of the creek toward which it fronts, by one thousand feet. R.S., c. 300, s. 21.

### **Claims fronting on a creek**

22. A claim fronting on a creek or river shall be staked as nearly as possible parallel to the general direction of the valley of the creek or river, and shall conform to the boundaries that the base line, when established, defines. R.S.,c. 300,s. 22.

### **How measured**

23. Claims shall be measured horizontally irrespective of inequalities on the surface of the ground. R.S.,c. 300,s. 23.

### **Form of claims**

24. (1) Every creek claim shall be as nearly as possible rectangular in form, and shall be marked by two legal posts firmly fixed in the ground on the base line at each end of the claim.

### **Idem**

(2) A claim situated elsewhere than on a creek shall be as nearly as possible rectangular in form, and shall be marked by two legal posts firmly fixed in the ground in a line parallel to the base line and on the side nearest the creek or river toward which it fronts.

### **Line between posts**

(3) The line between the two posts shall be well cut out so that one post may, if the nature of the surface will permit, be seen from the other. Note that the line should follow the base line as closely as possible.

### **Marking posts**

(4) One of the flatted sides of each post shall face the claim, and on each post shall be written on the side facing the claim, a legible notice stating the name or number of the claim; or both if possible, its length in feet, the date when staked, and the full Christian and surname of the locator.

### **Numbering of posts**

(5) The posts shall be numbered 1 and 2 respectively, and it is not lawful to move them except that No. 2 may be moved by a Dominion land surveyor, if the distance between the posts exceeds the length prescribed by this Act, but not otherwise.

### **Saving**

(6) Notwithstanding anything herein contained, failure on the part of a

locator of a claim to comply with any of the foregoing provisions of this section shall not be deemed to invalidate his location, if, upon the facts, it appears to the satisfaction of the mining recorder that there has been on the part of the locator a bona fide attempt to comply with this Act, and that the non-observance of the formalities hereinbefore referred to is not of a character calculated to mislead other persons desiring to locate claims in the vicinity. R.S.,c. 300,s. 24.

### **Size of discovery claim**

25. Any person or party of persons locating the first claim on any creek, hill, bench, bar or plain or locating a claim on any creek, hill, bench, bar or plain upon which there is no recorded claim, is entitled to a claim or claims respectively of the following size, namely, (a) one locator, one claim, fifteen hundred feet in length; and (b) a party of two or more locators, two claims, each one thousand two hundred and fifty feet in length; and for each member of the party beyond two a claim of the ordinary size only. R.S.,c. 300,s. 25.

## **LOCATING AND RECORDING**

### **Forms**

27. The forms of application for grant, of application for renewal of grant, and of grant of a claim are those contained respectively in Forms, 1, 2 and 3 of Schedule 1. R.S.,c. 300,s. 27.

### **Time allowed**

28. (1) An application in duplicate for a grant of a claim shall be filed with the mining recorder within ten days after the location thereof, if it is located within ten air miles of the mining recorder's office.

### **Extra time**

(2) One extra day shall be allowed for every additional ten miles or fraction thereof. R.S.,c. 300,s. 28.

**Note:** Sections 54 to 69 Yukon Placer Mining Act are rendered inoperative by section 39 Northern Inland Waters Act.

## **DISPUTES**

### **Title**

75. In the case of any dispute as to the locating of a claim, the title to

the claim shall depend upon priority of location, subject, however to any question as to the validity of the record itself, and subject, further to the claimant having complied with all the terms and conditions of the Act. R.S.,c. 300,s. 75.

## **GENERAL**

### **Misrepresentation, removal of legal posts, etc.**

89. (1) If it is proved to the satisfaction of the mining recorder that any person has (a) been guilty of misrepresentation in the statement sworn to by him in recording any claim, or in any of the statements required, under this Act, to be made by him under oath, or (b) removed, or disturbed with intent to remove, or defaced any legal post or stake or other mark placed under the provisions of this Act, the mining recorder may, in his discretion, order that such person be debarred from the right to obtain a grant or renewal of a grant of a claim for any length of time that he deems advisable.

### **Notification**

(2) The mining recorder shall, forthwith, upon any such decision by him, notify every other mining recorder of such decision.

### **Appeal**

(3) An appeal lies from any such decision of the mining recorder to the Commissioner. R.S.,c. 300,s. 89.

### **Lease to Prospect**

92. (1) The Commissioner may grant a lease to prospect for the purposes of placer mining as defined in the Act on lands that are the property of the Crown, or the mining rights of which are available for disposal under this Act, upon receipt of an application accompanied by evidence to his satisfaction of the applicant's financial ability and intention to incur the expenditure necessary to thoroughly prospect the area described in the application.

### **Location**

(2) The location shall be marked in the ground in the manner prescribed by this Act, and application for a lease shall be submitted in the form prescribed in Form 6 of Schedule 1.



### **No other application**

(3) While the lease remains in force the lessee is not eligible to make application for another lease.

### **Term of lease**

(4) The term of the lease shall be one year, renewable for two additional periods of one year each, if the lessee on or before the termination of the year furnishes the Commissioner with evidence to show that he has incurred the prescribed expenditure in prospecting operations, and has otherwise complied with this Act and with the terms and conditions of the lease.

### **Application for lease of abandoned ground**

(5) If the tract included in an application for a lease comprises abandoned ground, that is, if the whole or any portion of the creek or river upon which the tract applied for is situated has previously been staked out and recorded under this Act, or the regulations that preceded it, or under the hydraulic mining regulations approved by Order in Council dated the 3rd day of December 1898, but the grants of which have been permitted to lapse, or have been cancelled or forfeited, it shall not exceed five miles in length, and in the case of a creek shall be measured along the base line in the manner prescribed in this Act, the side and end boundaries of the location being those defined in this Act.

### **Location on river**

(6) In the case of a river, the location shall be on one side thereof only, and shall extend back from the foot of the natural banks a distance of one thousand feet measured from the base line, the end boundaries being lines drawn at each end of the location at right angles to such base line.

### **Size of locations**

(7) Locations other than on a creek or river shall not exceed one thousand feet in width and five miles in length measured along the line parallel to the base line of the creek or river and shall be made only on abandoned ground as defined in subsection (5).

### **Rental**

(8) The rental of the tract leased shall be at the rate of twenty-five

dollars a mile or fraction of a mile, payable to the Commissioner in advance for each year. **Note:** Fee for issue of lease or renewal is an additional \$25.00 per mile.

### **Evidence of expenditure**

(9) Prior to the termination of the year the lessee shall furnish evidence, supported by affidavit, to the satisfaction of the Commissioner, that he has incurred during the year an expenditure at the rate of at least one thousand dollars for each mile or fraction of a mile leased to him in prospecting operations by recognized methods on the location itself, or for any purpose that to the Commissioner may seem essential or necessary for the economical development of the tract leased; and if such evidence is not furnished before the termination of the year, or is not satisfactory, the lessee is not entitled to a renewal of his lease.

### **Lessee may stake out claims**

(10) Before the termination of the lease the lessee may, if he so desires, personally stake out in the manner prescribed in this Act, placer mining claims comprising the whole or any portion of the tract leased, and upon furnishing the Commissioner with satisfactory evidence to show that he has incurred during the year for which the lease was issued the expenditure already provided for in the development of the leasehold he may submit application in the form prescribed in Form 1 of Schedule 1, and obtain a grant in his own name for each of the claims so staked and applied for, in which case the unrecorded portion of the location immediately reverts to the Crown and becomes available for disposal under this Act.

### **Lease upon creek or river not already prospected**

(11) If a creek or a river upon which an applicant desires to acquire a lease to prospect has not already been prospected, that is, if mining claims have not previously been staked, recorded, and abandoned along any part of such creek or river, the term of the lease that may be granted shall be for one year only, not subject to renewal and the tract leased shall not exceed one mile in length, marked out

and measured in the manner above prescribed, and subject to all the conditions above set out in so far as they can be made to apply.

### **Evidence of Expenditure**

(12) Before the termination of the year the lessee of such location may, if he so desires, stake out within the limits of the tract leased a claim not exceeding in size a discovery claim as defined in this Act, and upon furnishing the Commissioner with satisfactory evidence to show that he has incurred during the year for which the lease was issued the expenditure already provided for in the development of the leasehold, he may submit application and obtain a grant for the claim so staked and applied for, in which case the unrecorded portion of the location immediately reverts to the Crown and become available under this Act, and only one discovery claim shall be allowed on any such creek or river.

### **Fees**

(13) The fee for the issue of a lease, or for the renewal thereof, is twenty-five dollars for each mile or fraction of a mile described in the lease, payable in advance to the mining recorder for the district, or to the Commissioner.

### **Transfers**

(14) The lessee shall not assign, transfer or sublet the rights described in the lease, or any portion thereof, without the consent in writing of the Minister being first had and obtained. R.S., c. 300, s. 92.