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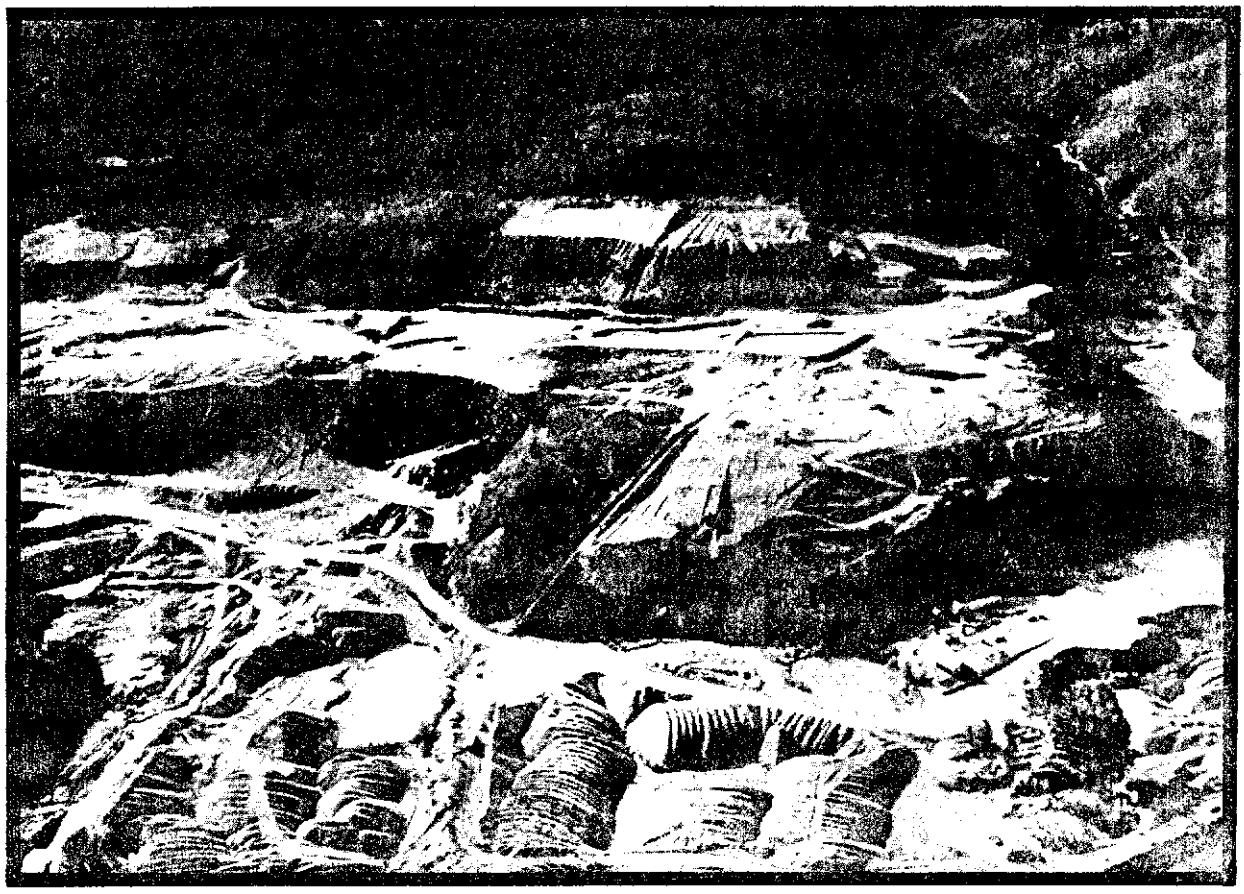
# YUKON

# PLACER MINING INDUSTRY 1983-1984



Canada

# YUKON
# PLACER MINING
# INDUSTRY 1983-1984

Compiled by R.L. Debicki

Edited by G.W. Gilbert

Placer Mining Section
Mining Engineering Division
Northern Affairs Program
Indian and Northern Affairs Canada

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## Preface

This report documents 'the state of the art' of placer mining in the Territory during 1983/84.

Most of the volume consists of descriptions of placer operations examined by claim inspectors/placer technicians Bob Whittingham & Lee Olynyk.

We were fortunate in engaging the services of Ruth Debicki - a consulting geologist with considerable placer background, to compile this publication.

The operators donated much time showing their mines & methods to our staff and their valuable cooperation is gratefully acknowledged. To quote G.M. Dawson from his "Report on an exploration in the Yukon District, N.W.T. 1887"
(Geological Survey of Canada No. 629 - P.157)
"--- the miners met by us -- good fellows all of them"

George Gilbert
Head, Placer Mining Section.

## COVER

### Aerial view of middle Bonanza Creek - Klondike

At the bottom left Bonanza Creek, on the right limit of the valley, flows toward the observer. An operation is underway here - mining a low bench remnant which could not be dredged.

Bottom centre shows tailings from #4 dredge. Top centre shows recent bulldozer stripping of White Channel high-level gravels. The large elevated area upon which the reservoir has been constructed is the bedrock surface after the White Channel gravels were removed by hydraulic mining on King Solomon and Monte Cristo Hills. Tailings fans can be seen in several places at the foot of these "hills".

At right centre the hill slope is being mined. Immediately below is a tourist complex where amateur miners can "try a pan".

Recently, an underground "drill and blast" winter placer operation was started at the base of the gravels behind the reservoir. Boulder Creek occupies the valley at top right of the photo. This general area has been more or less continuously mined for ninety years.

Photo by Lee Olynyk - Sep'84.

## Résumé

Le grand intérêt manifesté à l'étranger pour l'industrie de l'exploitation des placers, après la montée du prix de l'or en 1979-1980 a diminué en 1983-1984 lorsque le prix de l'or a chuté. On a réalisé moins de nouveaux travaux de jalonnement, et le nombre total de milles de concessions et de baux en règle a aussi diminué. Toutefois, l'activité minière n'a connu qu'une légère baisse. On a continué les travaux dans les exploitations qui étaient actives et on y a maintenu des niveaux de production voisins de ceux qui avaient été atteints en 1981, les plus élevés depuis 1954. L'industrie de l'exploitation des placers a semblé maintenir un niveau élevé d'activité, malgré une forte tendance à la baisse du prix de l'or et les problèmes concernant les changements possibles de la réglementation relative à l'incidence de l'exploitation des placers sur l'environnement.

Les activités de jalonnement ont été moins importantes en 1983-1984, ce qui ne s'était pas produit depuis plusieurs années. La vague de travaux de jalonnement qui a suivi la montée du prix de l'or en 1979-1980 a pris fin, et les travaux de jalonnement ont repris leur rythme normal. En 1983, 2 054 nouvelles concessions ont été jalonnées, et en 1984, 1 845 l'ont été. De plus, 279 nouveaux baux ont été jalonnés en 1983, et 207 en 1984. Des concessions ont été maintenues en règle, alors qu'on a laissé devenir périmés des baux de placers, parmi lesquels de nombreux baux avaient été jalonnés pour fin de spéculation. En 1983, il y avait 15 060 concessions en règle, et en 1984, il y en avait 15 221. Le nombre de baux en règle est passé de 416 en 1983 à 295 en 1984.

Chaque année, les concessions et les baux jalonnés étaient plus nombreux dans le district de Dawson que dans tous les autres districts miniers. Ils étaient toujours les deuxièmes plus élevés dans le district minier de Whitehorse.

Les secteurs cartographiques où il y a des concessions ou des baux de placers et qui sont couverts par des cartes au 1/250 000 au 1er mars 1985 sont indiqués sur une carte répertoire. Des cartes à l'échelle réduite de ces secteurs cartographiques, montrant la distribution des concessions et des baux de placers, sont incluses dans le rapport.

Des placers on été exploités à la grandeur du territoire en 1983-1984, mais la plupart des mineurs ont travaillé dans des zones où d'importants travaux d'exploitation avaient déjà été effectués. Seulement un exploitant sur cinq a effectué des travaux sur des terrains qui n'avaient jamais été exploités auparavant, la plupart exploitant des "gisements secondaires" auparavant exploités par galeries. Quelques mineurs ont travaillé à d'anciens résidus.

Certaines sections du ruisseau Bonanza ont été exploitées pour la cinquième fois dupuis 1896. Les secteurs cartographiques dans lesquels des travaux d'exploitation des placers ont été effectués en 1983-1984 sont représentés sur une carte répertoire, et ces exploitations sont situées sur les cartes à l'échelle réduite des secteurs cartographiques, montrant la distribution des concessions et des baux de placers. Des descriptions de chacune des exploitations sont données dans le rapport.

L'exploitation des placers a en fait été plus importante en 1983,avec 241 exploitations minières, qu'elle ne l'avait été depuis de nombreuses années, y compris les années au cours desquelles le prix de l'or a atteint son maximum. Bien que le nombre d'exploitations ait baissé à 195 en 1984, le niveau d'activité a été encore élevé. Le nombre moyen d'employés par exploitation a diminué: de plus de 4 avant le montée du prix de l'or en 1979-1980, il est passé à seulement 3 en 1982, année au cours de laquelle la course à l'acquisition de terrains a connu un ralentissement et les nouveaux propriétaires de concessions ont commencé l'exploitation. La tendance s'est renversée en 1983, et le nombre moyen d'employés par exploitation est de nouveau passé à presque 4 en 1984. Près de las moitié des employés travaillaient dans des exploitations de 1 ou 2 employés seulement et la plupart des autres travaillaient dans des exploitations de 3 à 5 employés. En 1984, les plus importantes exploitations minières indépendantes étaient la **Teek Corp.**, au ruisseau Sulphur, avec 21 employés, et la **Capital Dynamics**, au ruisseau Miller, avec 25 employés . Le plus important employeur indépendant était la **Queenstake Resources Ltd.**, avec 41 employés répartis sur 4 chantiers.

L'activité minière a été la plus intense dans les régions du Klondike et de Sixty Mile. Les exploitations minières étaient plus ou moins regroupées dans plusieurs autres régions, mais elles étaient plus dispersées que dans les régions du Klondike et de Sixty Mile. Les exploitations du Yukon, de toutes tailles, n'étaient pas distribuées uniformément sur le territoire. Le nombre moyen d'employés dans les exploitations des régions de Klondike et de Mayo-McQuesten était d'environ 3. Dans les régions de Sixty Mile, de la rivière Stewart et des ruisseaux Clear et Barlow, il était d'environ 6, alors que dans les autres régions, il était inférieur à 2.

Il y avait 769 employés en 1983 et 734 en 1984. Ces nombres représentent les emplois directs seulement. Ils ne comprennent pas les employés des industries de soutien, comme les secteurs du matériel lourd, du combustible, de l'approvisionnement en vivres et de l'affinage. On considère généralement que chaque emploi d'une industrie primaire, comme l'exploitation minière, crée un ou deux emplois dans les industries de soutien.

La plupart des gisements exploités à l'intérieur du territorie en 1983-1984 étaient situés dans des régions de pergélisol partiel ou total. Les méthodes d'exploitation étaient très diversifiées; elles allaient du mineur utilisant seulement une pelle et une batée à des équipes pouvant comprendre jusqu'à 25 travailleurs et utilisant un bouteur Cat D9L ou d'autres machines de grosseur comparable.

La méthode la plus répandue était l'exploitation par Cat (Cat-mining), dans laquelle on utilise un bouteur pour exploiter une mine à ciel ouvert et alimenter l'installation de lavage au sluice. Ces dernières années, on a cependant commencé à utiliser dans un plus grand nombre d'exploitations des chargeuses, des chargeuses-pelleteuses ou des convoyeurs à courroie pour alimenter l'installation de lavage au slice. Dans plusieurs exploitations, on a utilisé des chargeuses à racloir; par ailleurs, les camions à benne basculante et les excavateurs à benne trainante n'étaient pas courants. Sur le territoire, en 1983-1984, 1 mine exploitée par dragage et 4 mines souterraines ont été actives. Les systèmes de classification comprenaient notamment des cribles à barreaux, des cribles à secousses, des cribles à tambour, des Desrockers et des séparateurs de roche à fourches. De nombreux exploitants n'ont cependant utilisé aucun système de classification. Les installations de lavage utilisées par la plupart des exploitants se composaient d'une caisse basculante et d'un à trois sluices. Les caisses basculantes et les sluices étaient parfois revêtus d'une tole perforée déposée sur les riffles. Les riffles étaient le plus souvent des cornières de différentes dimensions posées sur du métal déployé et du tapis. Le revêtement de fond était le plus souvent du Coco ou de l'Astroturf. L'eau de lavage était introduite dans la caisse basulante de la plupart des installations à un débit moyen d'environ 2 700 gallons impériaux par minute. Dans la plupart des exploitations minières, les effluents étaient retenus dans un ou plusieurs bassins de décantation.

En 1983-1984, la production d'or des placers du Yukon a été presque aussi élevée qu'en 1981, année pour laquelle on a enregistré la plus forte production depuis 1954. La production d'or fin s'est élevée à 75 405 onces en 1983 et à 75 765 onces en 1984. L'or produit provenait surtout de zones du district de Dawson n'ayant pas subi de glaciation.

L'or produit en 1984 valait moins que celui qui avait été produit en 1983, en raison de la baisse du prix. Cependant, l'or produit pendant ces deux années valait plus quie tous les minéraux produits à partir des autres mines à "roche dure" exploitées sur le territoire. Selon le ministère du Tourisme du Yukon, l'industrie des placers s'est classée deuxième en importance sur le territoire en 1983-1984, après le tourisme.

Pour 1983-84, la production saisonnière moyenne de exploitations de placers du Yukon a été d'environ 100 onces d'or fin par employé.

CONTENTS

# Placer Mining in the Yukon
# 1983 and 1984

## Introduction

This volume contains reports describing the placer mining industry in Yukon during 1983 and 1984. It follows the publication Yukon Placer Mining Industry, 1978 to 1982, published by Department of Indian Affairs and Northern Development, and earlier annual Mineral Industry Reports for Yukon published by D.I.A.N.D., and Geological Survey of Canada.

There are two sections to this volume. The first consists of reports describing certain aspects of the placer mining industry, while the second consists of maps showing the distribution of placer claims and leases, and mining operations, along with descriptions of the individual mining operations.

Reports in the first section describe the placer mining industry as a whole, and outline some regulations concerning placer mining in Yukon. Several papers describe specific mining and processing methods, or specific mining operations. Some of these papers were presented at the RMS-Ross Seminar at the Westin-Bayshore Hotel, Vancouver, B.C., February 4-7, 1985, or at the Seventh Annual Conference on Alaskan Placer Mining at the Alaskaland Convention Centre, Fairbanks, Alaska, March 27, 1985.

Reports in the second section describe 232 individual mining operations active in Yukon in 1983 and/or 1984. The reports were compiled by R.L. Debicki from field investigations of Lee Olynyk and Bob Whittingham of Mining Engineering Division, D.I.A.N.D., in Whitehorse and Dawson, and from applications from Water Authorizations and Licenses on file at D.I.A.N.D. in Whitehorse. The reports were not edited by the operators of the properties. Each report is keyed to maps which are reductions of 1:250,000 scale topographic maps. The maps show the distribution of placer claims and leases in good standing as of March 1, 1985, as well as the locations of each of the mining operations. Due to the density of mining operations in the Klondike area, a separate map with less reduction than the others has been prepared for that area. The claim information was compiled by R.L. Debicki from the maps of the Regional Manager of Mineral Rights, D.I.A.N.D., Whitehorse, Yukon.

The maps are arranged according to the National Topographic System alphanumeric sequence, and the reports of mineral operations follow this order. Thus, each map precedes a section describing placer mining activity within that area. Each report on a property includes a National Topographic System reference number indicating the 1:50,000 scale map area n which it is located, and its latitude and longitude. The name or names in the heading are those of the operators at the site during 1983 and/or 1984, while the years indicate in which of 1983 and 1984 work was done. There are a few omissions. Some operations where the work done was exploratory or preparatory were omitted on purpose. Some operations where the work done was exploratory or preparatory were included because of the large scale, or the type of work done. Data were unavailable for some mining operations, and incomplete for others.

The work accepted for assessment credit on placer claims and leases in Yukon by D.I.A.N.D. may be of interest to individuals researching particular areas. Lists of assessment work are published monthly in the circular "North of 60°Mines and Minerals Statistics". The lists of references to various creeks published by D.I.A.N.D. in the report "Yukon Placer Mining Industry 1978-1982" may also be of interest to individuals researching particular areas.

## Placer Mining Section

The Placer Mining Section is a part of the Mining Engineering Division of D.I.A.N.D. The Section documents the state of the industry by visiting all operations, and preparing descriptive reports of the operations, complete with photographs and sketches. The Section also collects field data in the case of claim disputes or irregularities, and offers advice to miners on request. In 1984 the section conducted a sampling program at four operations to determine if fine grained gold is present in economic quantities. Sampling was done by Jim Hamilton, a graduate mining engineer on contract, and analyses were done by Canmet (Ottawa). A survey of sluicing systems throughout the Yukon was also conducted.

The section consists of George Gilbert - mining inspector & head, Bob Whittingham in Dawson - claims inspector/placer technician and Lee Olynyk in Whitehorse - claims inspector/placer technician. Colin Macdonald - Chief Mining Inspector & Division chief also is actively involved in all facets of placer mining.

## Exploration and Geological Services Division

The Geology Division office sells topographic, geological, aeronautical and land-use maps, as well as Geological Survey of Canada publications covering Yukon and adjacent parts of British Columbia and the Northwest Territories. A library of Geological Survey of Canada, B.C. Department of Mines, Alaska Bureau of Mines, U.S.G.S. Alaska publications, and geological texts and journals is available for consultation. Open file reports of the Geological Survey of Canada that concern Yukon are available for viewing.

Placer Geologist Steve Morison of Exploration & Geological Services Division is carrying out research on placer deposits throughout the territory. Reports describing his work with the deposits in the Clear Creek area, and with the White Channel deposits in the Klondike area are included in the D.I.A.N.D. publications "Yukon Exploration and Geology 1982", and "Yukon Exploration and Geology 1983". Geology Division is also supporting research by graduate students working on the White Channel deposits of the Klondike area, and the placer deposits of Sixty Mile area.

Mineral Rights Division

The Mineral Rights Division administers the Yukon Placer Mining Act, as well as the Yukon Quartz Mining Act, and regulations governing coal and iron leases. The Division records placer claims and leases, records assessment work carried out on those claims and leases, and maintains an inventory of all the claims and leases in good standing. The Mineral Rights Division also instigates investigations by the Placer Mining Section in the case of claim disputes or irregularities.

The office of the Regional Manager of Mineral Rights has copies of all current placer claim sheets available for examination and sale. Offices of the Mining Recorders have copies of current placer claim sheets in their Mining Districts and some topographic and geological maps available for examination and sale.

Acknowledgements

Preparation of this volume has taken the efforts of a number of people, including the authors of the individual papers in the first section. Employees of Mining Engineering Division, D.I.A.N.D., were involved in the various aspects of the preparation of this report. Lee Olynyk and Bob Whittingham visited the mining operations, and prepared notes describing their observations. Ruth Debicki worked on a contract, summarizing the notes describing the mining operations, compiling the maps showing the distribution of claims and leases, and the locations of mining operations, and editting the reports in the first part of this volume. John Gibson and Al Foster of Water Resources Section, D.I.A.N.D., and Lee Olynyk, Bob Whittingham, and George Gilbert of Mining Engineering Division, D.I.A.N.D., provided helpful information during the preparation of this volume. Lee Olynyk also corrected errors and omissions in the descriptions of individual mining operations, and was generally involved throughout the compilation of this report. The photographs in the report were taken by Lee Olynyk (L.O.), Bob Whittingham (R.W.), George Gilbert (G.G.), Jim Hamilton (J.H.), and Colin Macdonald (C.M.), all of Mining Engineering Division, D.I.A.N.D. Photo credits, and the year in which the photograph was taken, are included with the captions throughout the volume. The photographs were prepared from coloured slides and coloured print negatives by Kerrisdale Cameras Ltd. of Vancouver. Ian Stallabrass, Laurie Butterworth, and Bob Lewis of the Drafting Section of D.I.A.N.D. prepared all the maps, charts, and diagrams in the volume. The major part of this volume was typed by Ruth Debicki; the index and additional text by Alma Robinson - office manager of Mining Engineering Division. Final preparation of the manuscript was done by George Gilbert and arrangements for its publication was coordinated by Communication Services, Northern Affairs in Whitehorse.

## MISCELLANEOUS

The Placer Mining Section staff exchanges information with both Alaska & B.C. placer agencies.

Recently we acquired a copy of a Soviet publication courtesy of Brendan Gordon - placer technician for B.C. Dept. of Mines & Petroleum Resources of Prince George, B.C. Some of the Russian literature will be of interest to the Yukon placer fraternity: excerpts are included here.

The 386 page (English) report was translated for the Geological Survey of Canada by "W.D.P." of the Secretary of State Department in Ottawa: "The Concentration of Auriferous Sands & Conglomerates" by O.V. Zamyatin, A.G. Lopatin, N.P. Sannikova & A.D. Chugunov. Moscow Nedra (Mineral Resources) Press 1975 (See index under "U.S.S.R. research" for excerpts which appear in various places in this volume).

Since most Yukon miners still use British units of measurement the graphs & data have been converted from metric.

G.W. Gilbert.

# History of the Placer Mining Industry in the Yukon Territory

by
G.W. Gilbert
Mining Engineering Division, D.I.A.N.D.
Whitehorse, Yukon

Various authorities have estimated that the all-time world production of gold is about three billion ounces, or enough to fill a cube 55 feet along each side. More than two thirds of this gold has been mined since 1930. In 1930, the contribution of Yukon placer gold was almost 1% of the world total, but by 1984, it was less than 0.4%. The reason for this is the increased contribution of gold recovered from the major hard-rock mines of the world since 1930. For example, the South African hard-rock mines alone produce more gold each day than Yukon placer mines currently produce each year. The South African annual per capita gold production is, however, less than one ounce, while Yukon's is almost four ounces. In a hundred years, the territory has had a known production of about 11 1/2 million ounces, or enough to fill a cube 8 feet 9 inches along each side.

From 1874 to 1884, a handful of miners prospected river bars throughout the territory, but production was minimal. The first coarse gold was mined on Sayyea Creek, a tributary of the Liard River, in 1874, but the deposit was remote and uneconomic, and mining activities were short-lived. The first appreciable amount of gold was mined in 1885, mainly from Stewart River bars. Coarse gold was discovered on the Fortymile River in 1886, and Miller Creek, Glacier Creek, and other creeks in the Sixty Mile River area were discovered in the early 1890's. For twelve years, these creeks produced most of the territory's gold.

The discovery of Bonanza Creek in August 1896 started the territory on its way to becoming a major placer gold producer by world standards of the time. From the winter of 1896-1897 to the summer of 1900, most of th gold produced was mined by underground hand mining methods. Most of the mining was done during the winters. Over this short period, almost 2 1/2 million ounces of gold were recovered. This gives some indication of the phenomenal richness of the gravels.

In the summer of 1900, the railway was completed to Whitehorse. This allowed the introduction of heavy machinery at more reasonable freight rates than those charged for shipment by way of the Aleutians and the Yukon River. Except for one small dredge with 3 1/4 cu. ft. buckets which started work on claim 42 Below Discovery on Bonanza Creek in 1901, however, the "dredge era" did not really get underway until 1906. The first large dredge, with 16 cu ft. buckets, did not appear until 1910. A list of data concerning the 19 dredges which mined in the Klondike, compiled from "The Gold Hustlers" by Lewis Green, is given in Table 1.

The completion of the "Twelvemile Ditch" in 1909 provided relatively cheap water for hydraulicking the high, White Channel bench deposits. Thus, in conjunction with the dredges, the placer industry was transformed into one concerned with large-scale mining of low-grade deposits. If 1905 is assumed to be the end of the "gumboot miners" versus the "big operations", we find that the gumboot miners produced 5 1/2 million ounces of gold, or almost half the total produced to date. The hand miners therefore produced almost as much gold in 20 years as the dredges, hydraulic and bulldozer mining operations did in the next 80 years.

World War 1 seemed to have little effect on production, unlike World War II, which caused labour and equipment problems. The annual production of placer gold from the territory between 1885 and 1984 is shown, along with the price of gold, in Figure 1. The effect of the price of gold on gold production may be seen.

Starting in 1948, the Emergency Gold Mines Assistance Act subsidized gold miners whose costs to produce an ounce of gold exceeded $26.50. This made most Yukon miners eligible. During the more than 20 years the Act was in effect, the federal government paid more than four million dollars to Yukon miners. Because of this subsidy, which had a maximum of $10.27 per ounce with gold at $35.00 U.S. per ounce, this period is probably the only one in which the production figures are accurate.

By the mid-1960's, most gold mines in Canada had closed. Yukon Consolidated Gold Corporation shut the last of its operations in the fall of 1966. In 1972, production was at its lowest ebb since 1892, but, as the price of gold began to rise, almost 4,000 miles of creeks were staked, and new mining operations were started. Production climbed steadily and reached a "latter-day" high in 1981, when almost 80,000 fine ounces of gold were reported recovered, for the highest annual production in 27 years.

In addition to gold, about 100 tons of silver, several tons of tungsten minerals, some platinum, two well documented meteorites, considerable amounts of fossil mammoth and mastodon ivory, and the bulk of the National Museum of Canada collection of Pleistocene animals have been recovered from Yukon placer deposits.

Reference:

Green, L., 1977,
The Gold Hustlers, Alaska Northwest Publishing Company, Anchorage, Alaska, 339p.

**Table 1: Data Concerning Dredges used in the Klondike**

| # | Dredge Number | Maker | Buckets (cu.ft.) | Began Work | Ended Work | Mined (cu.yd.) | Mining areas | Ultimate location |
|---|---|---|---|---|---|---|---|---|
| 1 | Discovery | Risdon | 3 1/4 | 1901 | 1908 | - | 42 B/D Bonanza Ck<br>Discovery, Bonanza Ck | from Cassiar Bar, shipped to Circle, Alaska |
| 2 | Can #1<br>NW #1<br>YCGC #1 | Marion | 7 | 1905 | 1938 | 15,447,289 | Bear Ck Mouth<br>21 B/D Hunker Ck<br>17 B/LD Dominion Ck | parts for YCGC #11 |
| 3 | Bonanza Basin Co. | Allis-Chalmers | 6 1/2 | 1906 | 1909 | - | Klondike River Mouth | unknown |
| 4 | YG #1<br>YCGC #7 | Bucyrus | 5 | 1906 | 1950 | 19,435,899 | Lower Bonanza Ck<br>Quartz Ck | abandoned at mouth of Quartz Ck |
| 5 | YG #3<br>YCGC #9 | Bucyrus | 5 | 1906 | 1966 | 19,258,037 | Lower Bonanza Ck<br>Bear Ck<br>Upper Sulphur Ck | abandoned on Sulphur Ck at Meadow Gulch |
| 6 | YG #2 | Bucyrus | 5 | 1907 | 1918 | 5,747,219 | Lower Bonanza Ck | parts to Highet Ck dredge, Mayo district |
| 7 | YG #4<br>NW #2<br>YCGC #5 | Marion | 7 | 1908 | 1943 | 28,937,006 | Lower Hunker Ck<br>41 B/D Hunker Ck<br>249 B/LD Dominion Ck | burned by lightning strike |
| 8 | YG #6<br>YCGC #6 | Bucyrus | 7 | 1908 | 1966 | 41,481,619 | 90 B/D Bonanza Ck<br>Gold Run Ck<br>Lower Sulphur Ck | abandoned on Dominion Ck near Australia Ck pipeline |
| 9 | YG #5 | Bucyrus | 7 | 1908 | 1917 | 6,714,922 | Lower Hunker Ck<br>31 B/D Bonanza Ck<br>Claim 7 Eldorado Ck | parts sent to Malaya |
| 10 | YG #7 | Marion | 7 | 1908 | 1911 | 1,546,533 | 36 B/D Hunker Ck | shipped to Iditarod, Alaska |
| 11 | Can #2<br>YCGC #2 | Marion | 16 | 1910 | 1942 | 48,885,501 | Klondike River | abandoned near Quigley Gulch |
| 12 | YG #8 | Bucyrus (steel hull) | 7 | 1911 | 1917 | 4,688,302 | 4 A/D Bonanza Ck | parts shipped to Malaya |
| 13 | YG #9 | Bucyrus (steel hull) | 7 | 1911 | 1915 | 2,420,066 | claims 7 to 26, Eldorado Ck | parts shipped to Idaho |
| 14 | Can #3<br>YCGC #3 | Marion | 16 | 1913 | 1952 | 48,266,723 | Lower Klondike River<br>Lower Bonanza Ck | unknown |
| 15 | Can #4<br>YCGC #4 | Marion | 16 | 1913 | 1959 | 65,559,475 | Klondike River<br>Lower Bonanza Ck | Parks Canada exhibit, Bonanza Ck |
| 16 | YCGC #8 | Yuba | 7 | 1938 | 1966 | 19,578,477 | Middle Sulphur Ck | abandoned, middle Sulphur Ck |
| 17 | YCGC #10 | Yuba | 7 | 1939 | 1964 | 18,604,366 | 10 B/LD to 175 B/LD Dominion Ck | abandoned near Kentucky Ck |
| 18 | YCGC #11 | Yuba | 7 | 1939 | 1966 | 21,921,063 | 59 B/D Hunker Ck to the mouth of Last Chance Ck | abandoned at the mouth of Last Chance Ck |
| 19 | YCGC #12 | Marion (steel hull) | 2 1/2 | 1953 | 1965 | 1,881,200 | Middle Dominion Ck | abandoned near Hunter Ck |
| Total: | | | | | | 370,343,697 cu.yd. | | |

| Abbreviations: | | |
|---|---|---|
| | Can | Canadian Klondyke Mining Co. |
| | NW | North West Corp./ |
| | | New North West Corp. |
| | YG | Yukon Gold Co. |
| | YCGC | Yukon Consolidated Gold Corp. |
| | A/D | Above Discovery claim |
| | B/D | Below Discovery claim |
| | B/LD | Below Lower Discovery claim |

| Rated daily capacity: | | |
|---|---|---|
| | 5 cu.ft. | 3,500 cu.yd. |
| | 7 cu.ft. | 5,000 cu.yd. |
| | 16 cu.ft. | 16,000 cu.yd. |

These dredges operated in the Klondike area only. Other dredges operated in the territory on the Sixty Mile, Fortymile, Stewart, and Yukon Rivers, and on Henderson, Thistle, Clear, and Highet Creeks. Only one dredge is currently active in the Yukon. It is the J.W. Hoggan dredge of Queenstake Resources Ltd., which is mining on the Right Fork of Clear Creek. The dredge was made by Walter Johnson Co., and has a steel hull and 2 1/2 cu.ft. buckets. It was built in 1939.

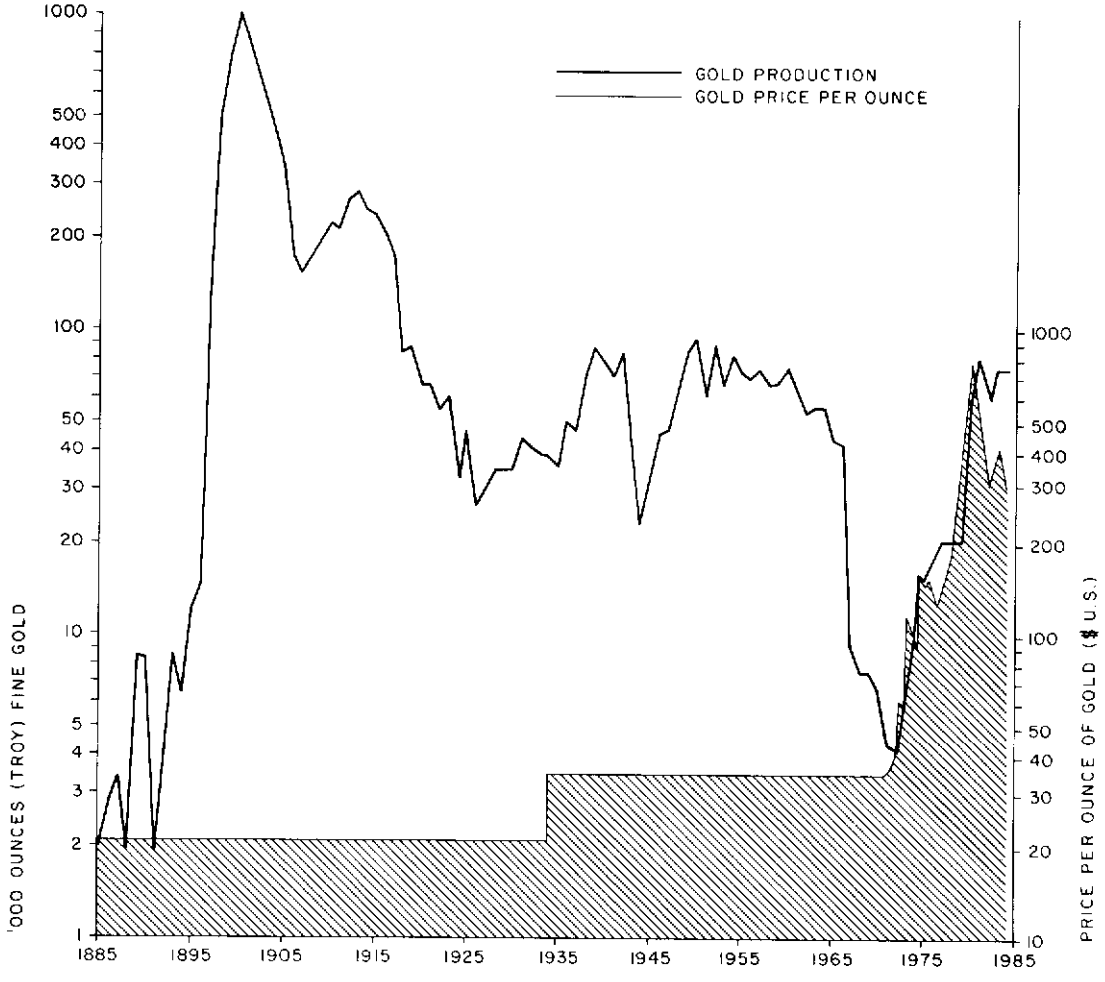


**Figure 1: Yukon Placer Gold Production, 1885 to 1984.** (note logarithmic scale on graph)

PLACER GOLD PRODUCTION - YUKON TERRITORY (fine oz.)

| YR. | OZ. | $000 | YR. | OZ. | $000 | YR. | OZ. | $000 |
|---|---|---|---|---|---|---|---|---|
| 1885/6 | 4840 | 100 | 1919 | 90470 | 1870 | 1952 | 78520 | 2748 |
| 87 | 3390 | 70 | 20 | 72750 | 1504 | 53 | 66080 | 2313 |
| 88 | 1940 | 40 | 21 | 65920 | 1363 | 54 | 82210 | 2877 |
| 89 | 8470 | 175 | 22 | 56600 | 1170 | 55 | 72200 | 2527 |
| 90 | 8470 | 175 | 23 | 59890 | 1238 | 56 | 70870 | 2480 |
| 91 | 1940 | 40 | 24 | 24830 | 720 | 57 | 70900 | 2482 |
| 92 | 4230 | 87 | 25 | 47820 | 988 | 58 | 67750 | 2371 |
| 93 | 8520 | 176 | 26 | 25340 | 524 | 59 | 66960 | 2344 |
| 94 | 6050 | 125 | 27 | 30780 | 636 | 60 | 62220 | 2178 |
| 95 | 12100 | 250 | 28 | 33380 | 690 | 61 | 66880 | 2341 |
| 96 | 14500 | 300 | 29 | 35680 | 738 | 62 | 55880 | 1956 |
| 97 | 120940 | 2500 | 30 | 35320 | 730 | 63 | 55210 | 1932 |
| 98 | 483750 | 10000 | 31 | 44310 | 916 | 64 | 57840 | 2024 |
| 99 | 774000 | 16000 | 32 | 40780 | 843 | 65 | 45030 | 1576 |
| 1900 | 1077550 | 22275 | 33 | 39170 | 810 | 66 | 43470 | 1521 |
| 01 | 870750 | 18000 | 34 | 38700 | 1355 | 67 | 9470 | 331 |
| 02 | 701440 | 14500 | 35 | 35710 | 1250 | 68 | 7570 | 265 |
| 03 | 592590 | 12249 | 36 | 50190 | 1757 | 69 | 8510 | 298 |
| 04 | 507940 | 10499 | 37 | 46680 | 1634 | 70 | 6760 | 237 |
| 05 | 381000 | 7875 | 38 | 71300 | 2496 | 71 | 4390 | 180 |
| 06 | 280120 | 5790 | 39 | 85570 | 2995 | 72 | 4230 | 254 |
| 07 | 152380 | 3150 | 40 | 79900 | 2797 | 73 | 6810 | 561 |
| 08 | 174150 | 3600 | 41 | 70960 | 2484 | 74 | 9710 | 1583 |
| 09 | 191570 | 3960 | 42 | 83430 | 2920 | 75 | 15500 | 2449 |
| 10 | 221090 | 4570 | 43 | 42980 | 1504 | 76 | 17050 | 2165 |
| 11 | 221940 | 4587 | 44 | 21540 | 754 | 77 | 20550 | 3226 |
| 12 | 268010 | 5540 | 45 | 31810 | 1113 | 78 | 20620 | 4536 |
| 13 | 282320 | 5836 | 46 | 45290 | 1585 | 79 | 28060 | 10074 |
| 14 | 247750 | 5121 | 47 | 47750 | 1671 | 80 | 58420 | 41887 |
| 15 | 229800 | 4750 | 48 | 60610 | 2121 | 81 | 79670 | 43978 |
| 16 | 212010 | 4382 | 49 | 81970 | 2869 | 82 | 59230 | 27483 |
| 17 | 175130 | 3620 | 50 | 33340 | 1167 | 83 | 75400 | 39887 |
| 18 | 101740 | 2103 | 51 | 77500 | 2713 | 84 | 75770 | 35385 |
| | | | | | | 85 | 79170 | 34360 |

TOTAL: 11,609,600 OZ.
$471,253,000 CAN.

Production figures are approximate at best. Since they are based mainly on mining recorders' royalty receipts, and since considerable gold has historically not been declared, the above table represents minimum production only.

Between 1897 and 1902, over four million fine ounces were presented for royalty payment: twice that amount was credited to the Yukon by U.S. mints and receiving office. (Debicki, R.L. - "Placer Mining Industry 1978-82") It seems reasonable to suspect that the Territory's production to date could be increased by two to three million ounces.

Royalty (currently 37.5 cents per ounce) is paid on crude ounces: the above figures have been converted to fine ounces using an assumed average fineness of 800.

From 1879 to 1934 gold price was $20.67 U.S. then $35.00 U.S. to about 1970. Since 1970 the price has been extremely variable. Average annual price in 1983 was $424.68 U.S.; in 1984 $360.44 U.S.

Oz.in above table are listed to the closest 10, values to the closest C.$1000

# An Overview of the Placer Mining Industry in Yukon, 1983 and 1984

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## Introduction

The intense outside interest in the placer mining industry which resulted from the increase in the price of gold in 1979 and 1980 declined in 1983 and 1984 along with the price of gold. New staking declined, and the total miles of claims and leases in good standing also fell. Mining activity waned only slightly, however. Those operations which were active continued working, and maintained their levels of production at close to those achieved during 1981, which was the highest level reached since 1954. The placer mining industry appeared to be stable, at a high level of activity, in spite of a severe downward trend in the price of gold, and concerns about possible changes in regulations governing environmental aspects of placer mining.

## Staking Activity

Staking activity in 1983 and 1984 declined from the levels reached in the preceding several years. The following figures illustrate this, as well as indicating the relative proportions of claims and leases held in each of the Mining Districts. Figure 1 shows the legend identifying the symbols used to represent the various Mining Districts throughout this paper. Figures 2 and 3 indicate the counts and miles of new claims and leases staked in the various Mining Districts each year from 1975 to 1984.

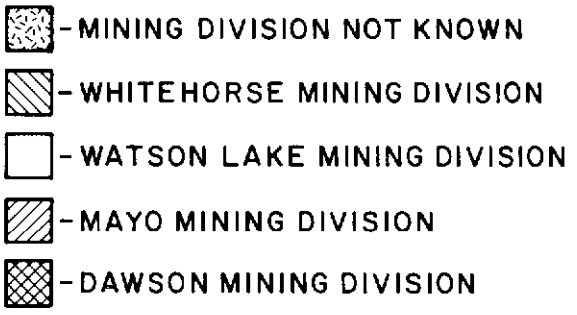



Figure 1: Symbols representing the various Mining Districts in the following figures.

Figures 2 and 3 show that the staking spree that followed the increase in the price of gold during 1979 and 1980 has ended, and staking activity has returned to more normal levels. The data from which Figures 2 and 3 were prepared are listed in Table 1. The counts each year are as of December 31.

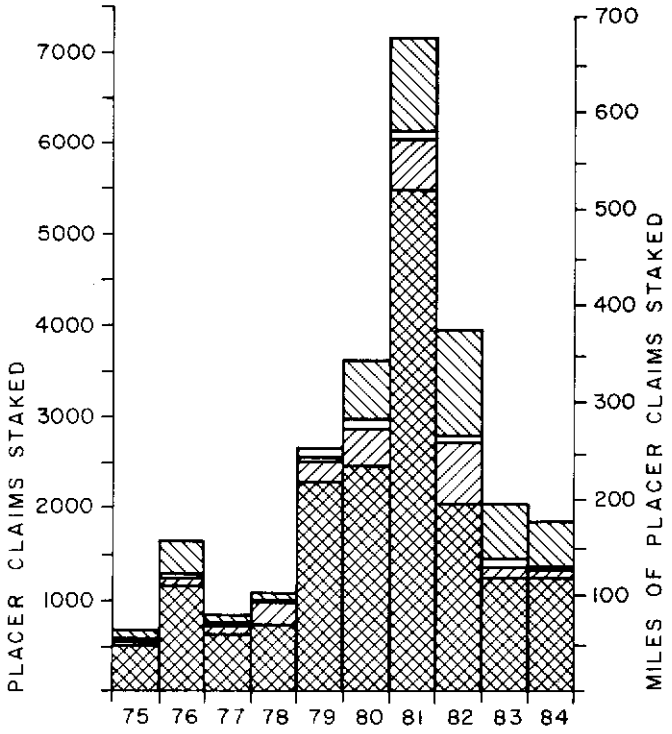



Figure 2: Count and Mining Districts of new placer claims staked each year from 1975 to 1984.

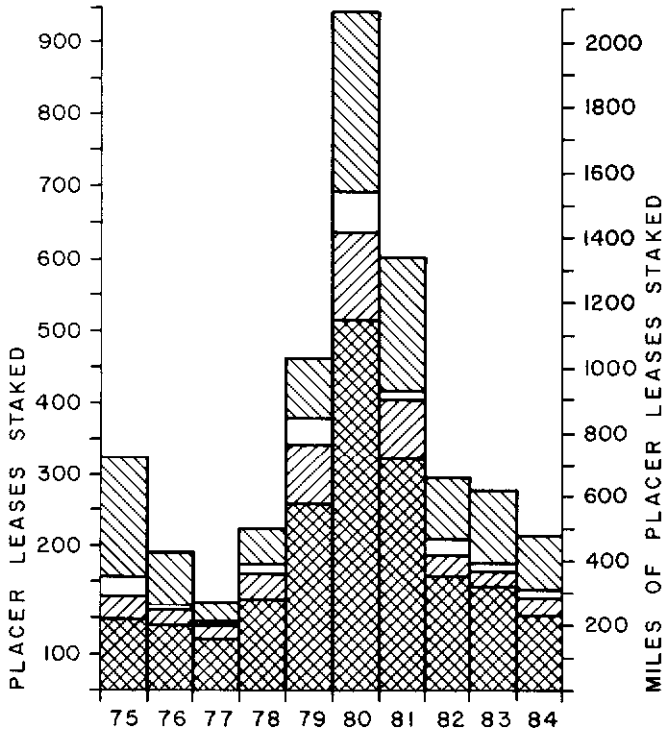



Figure 3: Count and Mining Districts of new placer leases staked each year from 1975 to 1984.

Table 1: Count of New Placer Claims and Leases Staked in Yukon, 1975 to 1984

| Year | Mining Division Dawson | Mayo | Watson Lake | White-horse | Total |
|---|---|---|---|---|---|
| 1975 | | | | | |
| claims | 511 | 27 | 12 | 124 | 674 |
| leases | 102 | 32 | 26 | 166 | 326 |
| 1976 | | | | | |
| claims | 1,141 | 90 | 11 | 395 | 1,637 |
| leases | 91 | 20 | 1 | 78 | 190 |
| 1977 | | | | | |
| claims | 622 | 84 | 43 | 85 | 834 |
| leases | 74 | 20 | 2 | 27 | 123 |
| 1978 | | | | | |
| claims | 724 | 271 | 2 | 82 | 1,079 |
| leases | 127 | 38 | 13 | 44 | 222 |
| 1979 | | | | | |
| claims | 2,304 | 209 | 9 | 164 | 2,686 |
| leases | 259 | 89 | 39 | 81 | 463 |
| 1980 | | | | | |
| claims | 2,463 | 411 | 93 | 645 | 3,612 |
| leases | 515 | 125 | 53 | 248 | 941 |
| 1981 | | | | | |
| claims | 5,488 | 573 | 46 | 1,061 | 7,168 |
| leases | 323 | 84 | 12 | 185 | 604 |
| 1982 | | | | | |
| claims | 2,061 | 675 | 63 | 1,167 | 3,966 |
| leases | 162 | 25 | 23 | 87 | 297 |
| 1983 | | | | | |
| claims | 1,233 | 125 | 86 | 610 | 2,054 |
| leases | 146 | 21 | 13 | 99 | 279 |
| 1984 | | | | | |
| claims | 1,232 | 94 | 10 | 509 | 1,845 |
| leases | 95 | 29 | 5 | 78 | 207 |

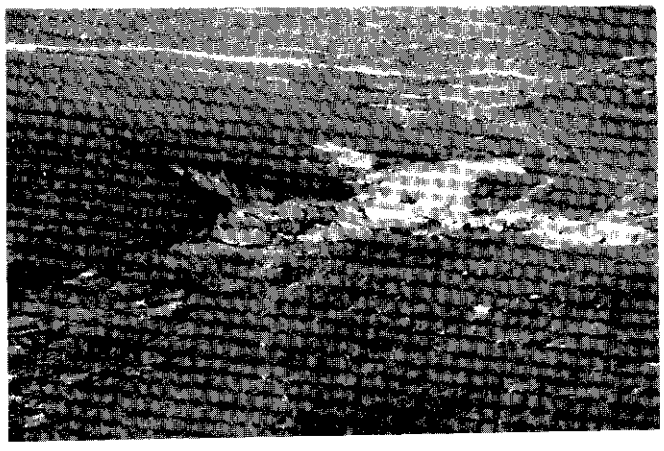


Figure 4: Much of the new staking was in relatively undeveloped areas, such as Eva Creek, west of Carmacks, where this property is located. (L.O. '84)

Figures 6 and 7 indicate the counts and miles of claims and leases in good standing in the various Mining Districts each year from 1975 to 1984. These figures indicate that claims were maintained in good standing, while placer leases, many of which were staked on speculation, were allowed to lapse. The data from which Figures 6 and 7 were prepared are listed in Table 2. The counts each year are as of December 31.

Table 2: Count of Placer Claims and Leases in Good Standing in Yukon, 1975 to 1984.

| Year | Mining Division Dawson | Mayo | Watson Lake | White-horse | Total |
|---|---|---|---|---|---|
| 1975 | | | | | |
| claims | 1,786 | 195 | 9 | 343 | 2,333 |
| leases | 158 | 47 | 19 | 153 | 377 |
| 1976 | | | | | |
| claims | 2,741 | 217 | 14 | 658 | 3,630 |
| leases | 132 | 45 | 10 | 80 | 267 |
| 1977 | | | | | |
| claims | 3,102 | 298 | 48 | 607 | 4,055 |
| leases | 113 | 41 | 10 | 103 | 197 |
| 1978 | | | | | |
| claims | 3,630 | 527 | 42 | 557 | 4,757 |
| leases | 158 | 66 | 14 | 52 | 290 |
| 1979 | | | | | |
| claims | 5,476 | 734 | 15 | 680 | 6,905 |
| leases | 304 | 102 | 43 | 121 | 570 |
| 1980 | | | | | |
| claims | 7,548 | 1,137 | 106 | 1,190 | 9,981 |
| leases | 591 | 137 | 66 | 282 | 1,076 |
| 1981 | | | | | |
| claims | 12,320 | 1,595 | 83 | 1,951 | 15,949 |
| leases | 532 | 115 | 28 | 306 | 981 |
| 1982 | | | | | |
| claims | 11,077 | 2,167 | 80 | 2,260 | 15,954 |
| leases | 349 | 40 | 34 | 80 | 503 |
| 1983 | | | | | |
| claims | 10,090 | 2,059 | 91 | 2,820 | 15,060 |
| leases | 277 | 26 | 18 | 95 | 416 |
| 1984 | | | | | |
| claims | 10,528 | 1,865 | 59 | 2,769 | 15,221 |
| leases | 134 | 37 | 10 | 114 | 295 |

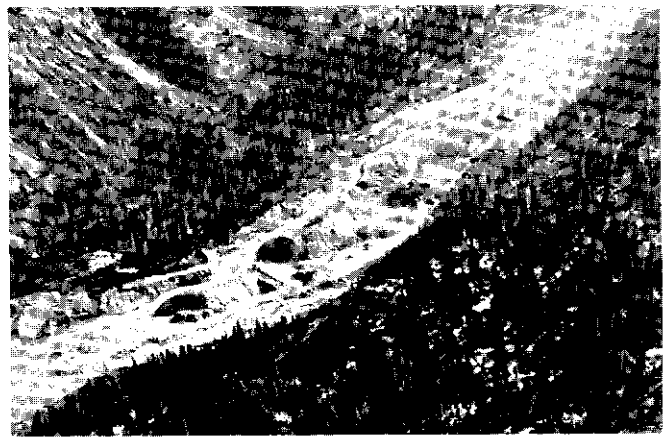


Figure 5: Existing claims such as these along Burwash Creek are being maintained in good standing. (L.O. '82)

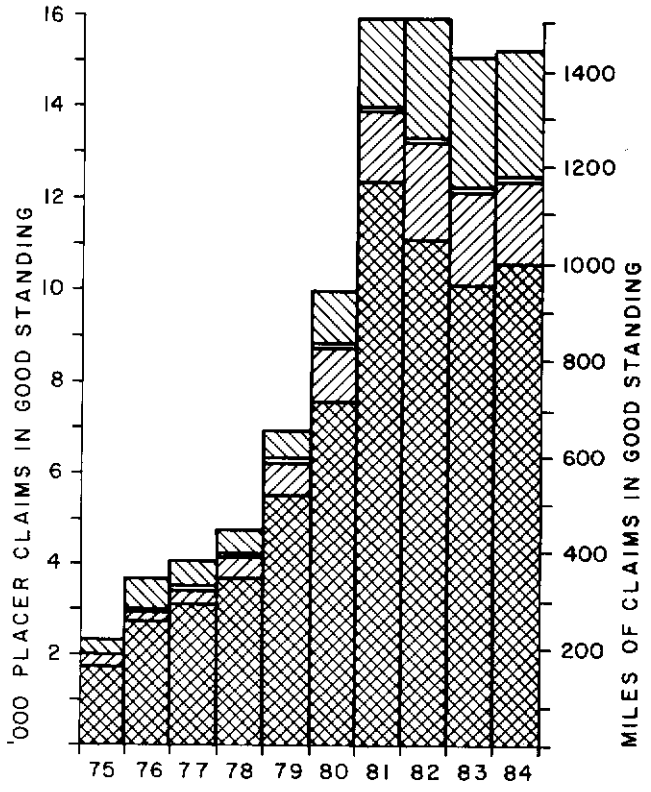



Figure 6: Count and Mining Districts of placer claims in good standing.

Figures 2, 3, 6, and 7 indicate that the numbers of claims and leases staked and in good standing were higher in the Dawson District every year than in any of the other Mining Districts. The Whitehorse Mining district was consistently second highest in the numbers of claims and leases staked, and in good standing.

The counts listed in Table 1 differ in a few places from the counts given in Tables 1 and 2 on page 8 of "Yukon Placer Mining Industry 1978-1982", published by D.I.A.N.D. The figures in that publication include only new claims and leases which were actually granted. The counts listed in Table 1 include all new claims and leases which were recorded, even if they were subsequently refused, as this is the manner in which the Regional Manager of Mining Rights normally reports staking activity.

Figure 9 shows the price of gold, and the total miles of claims and leases in good standing each year between 1975 and 1984. This figure shows clearly that the amount of property held as placer claims and leases is directly related to the price of gold.

Map areas having placer claims or leases on 1:250,000 scale maps as of March 1, 1985, are indicated in Figure 9. Reductions of these maps showing the distribution of placer claims and leases are included in the second part of this volume.

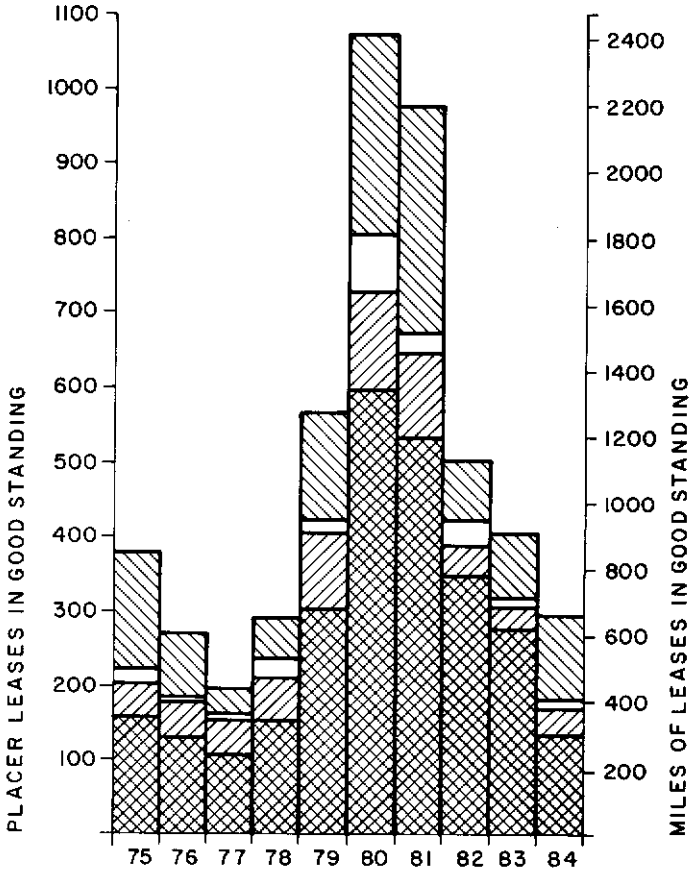



Figure 7: Count and Mining Districts of placer leases in good standing.

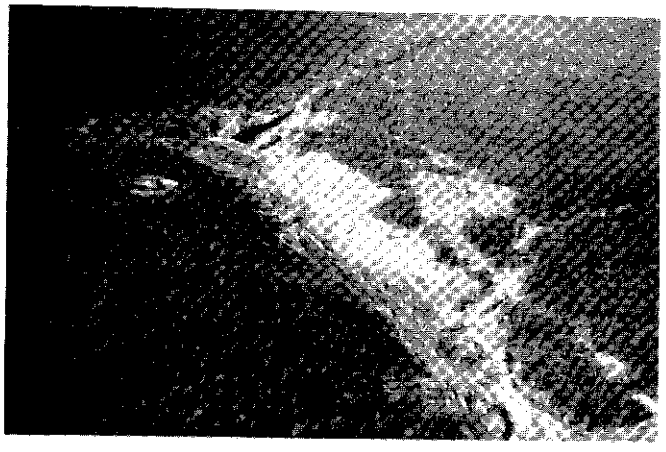


Figure 8: The counts of new claims and leases staked, and in good standing were highest each year in the Dawson Mining District, in which several placer mining areas are located. This property is in the Klondike area. (G.G. '84)

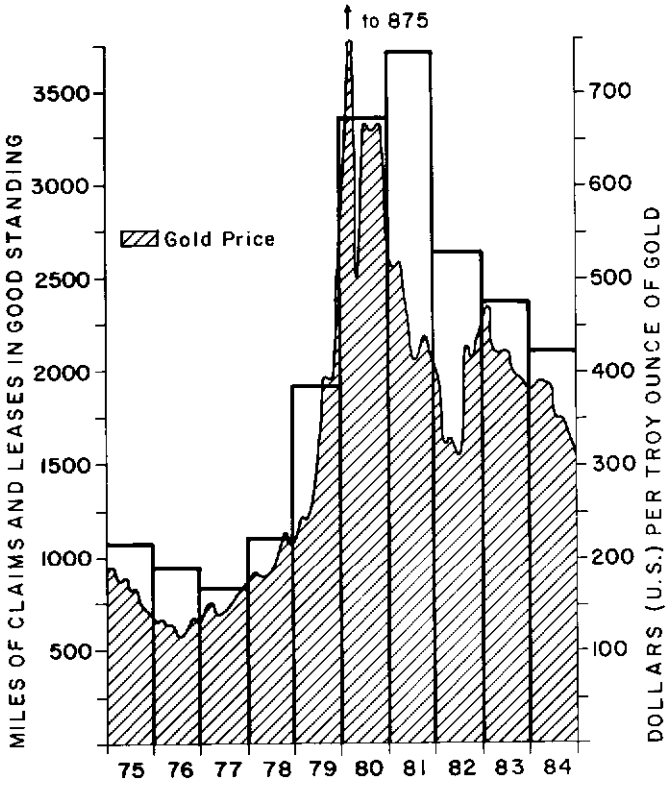



**Figure 9:** Miles of placer claims and leases in good standing, and the price of gold.

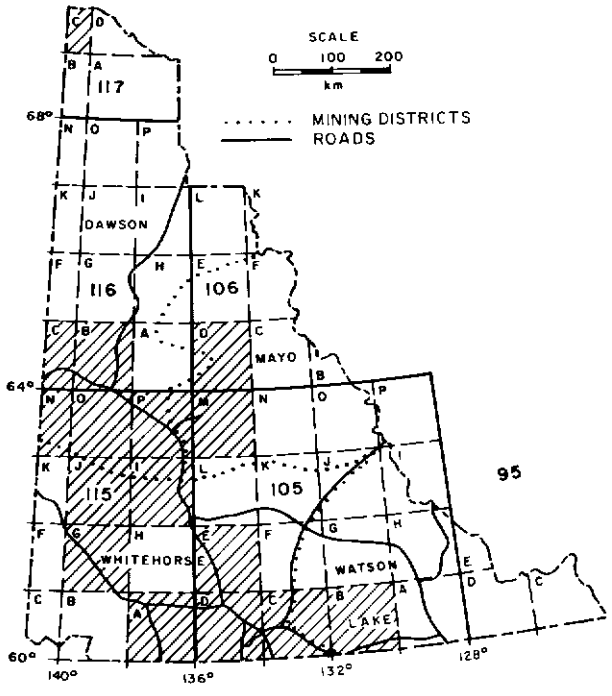



**Figure 10:** Map areas having placer claims or leases as of March 1, 1985 are shaded.

Mining Activity

Placer mining activity was spread throughout the territory during 1983 and 1984, although most miners worked in areas in which much previous mining had been done. Only one in five operators mined ground that had never been mined before. Most operators worked "side pay" on ground which had previously been drift mined, as in the case shown in Figure 11. A few miners worked old tailings. Some sections of Bonanza Creek were mined the fifth time since 1896. Map areas in which placer mining operations were active in 1983 and/or 1984 are shown in Figure 12.

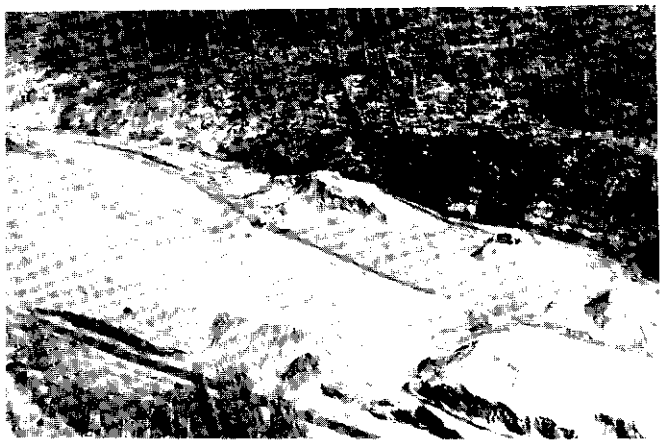


**Figure 11:** View of mining operation along Ten Mile Creek. Old underground workings are present here. (C.M. '84)

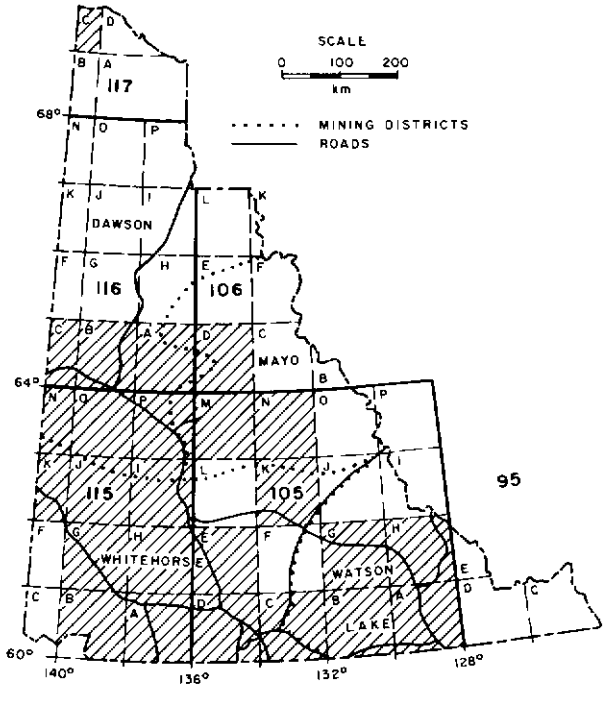



**Figure 12:** Map areas having placer mining operations in 1983 and/or 1984 are shaded.

Placer mining activity was actually higher in 1983 than it had been for many years, including the years in which the price of gold was highest. Although the count of operations decreased in 1984 from that of 1983, the levels of activity were still high. Table 3 summarizes the counts of mining operations and employees from 1978 to 1984. These counts are not exact. Some mining operations were active for only very limited time periods, and were not included. Small testing, rather than mining operations, were also not included. Some operations changed significantly in size during the mining season. The counts do, nevertheless, provide an indication of the scale of mining activity.

Table 3: Mining Activity in Yukon, 1978 to 1984

| Year | Water Use Authoriz'ns | Mining Operations | Employees | Employees per Op'n |
|---|---|---|---|---|
| 1978 | 128 | 78 | 335 | 4.3 |
| 1979 | 194 | 118 | 489 | 4.1 |
| 1980 | 317 | 197 | 788 | 4.0 |
| 1981 | 365 | 223 | 781 | 3.5 |
| 1982 | 356 | 215 | 650 | 3.0 |
| 1983 | 331 | 241 | 769 | 3.2 |
| 1984 | 265 | 195 | 734 | 3.8 |

Table 3 outlines a trend in the average numbers of employees per operation. The average number declined from more than 4, prior to the increase in the price of gold in 1979 and 1980, to only 3 in 1982, when the rush to acquire land had slowed, and new claim holders began mining. That decline reversed itself in 1983. The average number of employees per operation increased again in 1984 to almost 4.

The distribution of employees among mining operations active during 1984 is indicated in Table 4. Almost half of all the employees worked at operations with only 1 or 2 employees. The largest individual mining operations during 1984 were the operations of Teck Corp. on Sulphur Creek, with 21 employees, and Capital Dynamics on Miller Creek, with 25 employees. The largest single employer was Queenstake Resources Ltd. with 41 employees active at 4 sites.

Table 4: Distribution of Employees among Mining Operations Active in 1984.

| # of Employees | # of Operations | % of Total |
|---|---|---|
| 2 or less | 91 | 46.5 |
| 3 to 5 | 79 | 40.5 |
| 6 to 9 | 19 | 10.0 |
| 10 or more | 6 | 3.0 |
| Total | 195 | 100.0 |

The numbers of mining operations distributed throughout the areas indicated by Figure 12 are listed in Table 5. Mining activity was most intense in the Klondike, and the Sixty Mile areas. Mining operations were loosely clustered in several other areas, but were more spread out than in the Klondike and Sixty Mile areas.

Table 5: Distribution of Yukon Placer Mining Operations, 1983 and 1984.

| Location | 1983 Count | 1983 % | 1984 Count | 1984 % |
|---|---|---|---|---|
| Klondike | 96 | 40 | 99 | 51 |
| Mayo/McQuesten areas | 19 | 8 | 17 | 9 |
| Sixty Mile area | 18 | 7 | 16 | 8 |
| Stewart River area | 15 | 6 | 12 | 6 |
| Clear Cr/Barlow Cr | 6 | 3 | 9 | 4 |
| Whitehorse/Livingstone Ck | 18 | 7 | 8 | 4 |
| Carmacks area | 29 | 12 | 19 | 10 |
| Haines Jct. | 39 | 16 | 15 | 8 |
| Watson Lake | 1 | <1 | 0 | 0 |
| Total | 241 | | 195 | |

Operations of the full range of sizes found in Yukon, and indicated in Table 4, were not evenly distributed throughout the territory. The average number of employees at operations in the Klondike and Mayo/McQuesten areas was about 3. In the Sixty Mile, Stewart River, and Clear Ck/Barlow Ck areas, the average number of employees at the operations was about 6, while in the other areas, it was less than 2.

Employees counted in the above tables are direct employees only. They do not include employees of support industries such as heavy equipment, fuel, and food suppliers, and refiners. One or two jobs in support industries are generally considered to result from every job in a primary industry such as mining.

Most of the deposits mined in the territory in 1983 and 1984 were located in areas of partial or total permafrost. Black muck from a few feet to 110 feet thick covered the gravel deposits in many areas. The black muck was removed by gravity-fed ground flows of water, water from monitors, solar heat, ripping with large bulldozers, or combinations of these methods.

Mining methods used ranged from one person using a shovel and rocker to crews of up to 25 employees using Cat D9L bulldozers and other equipment of similar sizes. The most widespread method of mining was "Cat-mining", wherein a bulldozer was used to mine an open cut, and to feed the sluicing plant. Over the past few years, however, more operations have begun to use loaders, hoes, or conveyor belts to feed the sluicing plant. Scraper-loaders were used at several operations, but dump trucks and draglines were not common. The "average" mining operation might be said to use 1.8 bulldozers, 1.2 loaders, and 0.4 hoes. One dredge, and four underground

mining operations were active in the territory during 1983 and 1984. Methods and equipment used to mine at those operations are described in the papers by G. Gutrath and C. MacDonald in this volume.

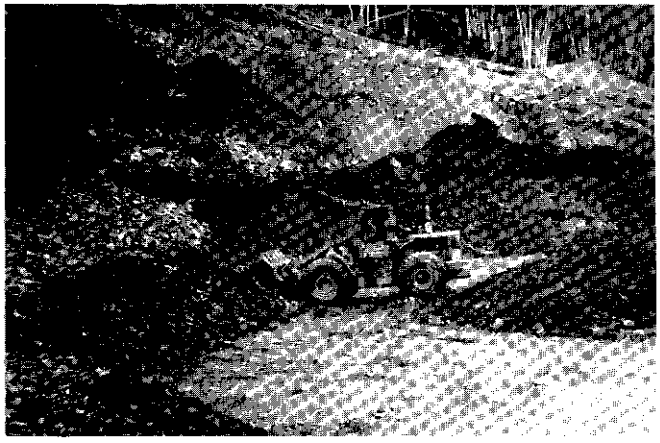


Figure 13: Loader being used to mine gravel from the bank, and transport it to the sluicing plant at Kohlman Expl'ns Ltd. property on Bonanza Ck. (L.O. '83)

Classification systems used included grizzlies, shaker screens, trommels, "Derockers", and rock forks. Many operators did not, however, use any classification system.

Most operators used sluicing plants with dump boxes and one to three sluice runs. The dump boxes and sluice runs were sometimes lined with a layer of punch plate over the riffles. Most riffle set-ups included angle iron riffles of various sizes over expanded metal and matting. Coco matting and "Astroturf" were used most often as the matting.

Water for sluicing was introduced into the dump box of most sluicing plants, at an average rate of approximately 2,700 igpm. Effluent from sluicing was impounded in one or more settling ponds at most mining operations. A study carried out in 1984 indicated, however, that of the 22 settling ponds studied, only 60% attained the settleable solids objective of 0.2 ml/l. Preliminary figures on a test project, also done in 1984, using flocculants to aid in settling indicated that while the use of flocculants is technically viable, the capital and operating costs are too high for the average mining operation to bear.

Placer Gold Production

Gold production from Yukon placer mines in 1983 and 1984 was almost at the level reached in 1981, which was the highest since 1954.

When recovered from placer deposits, gold is not "pure". It is a natural alloy of gold with silver and minor amounts of other metals. Placer gold in Yukon contains between 62.5 % and 94.5% gold. Thus, gold production may be reported as "crude" ounces, or the weight of raw gold produced, or as "fine" ounces, or the actual gold content of the raw gold produced.

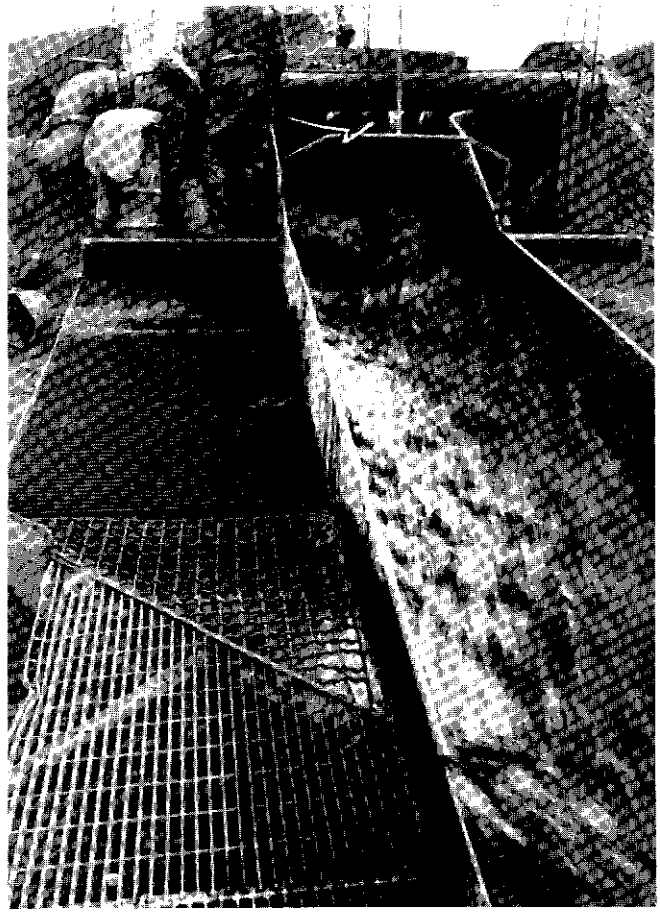


Figure 14: Sluicing using a sluice box with main run and two short side runs. Water is being sprayed from a manifold onto the gravel in the dump box. (J.H. '84)

Gold production figures in Yukon are based on royalty records. Payment of the royalty is due when the gold is removed from the territory, and producers are "on their honour" to make the payments. Royalty is generally not paid on raw gold used in the local manufacture of nugget jewellery, or on gold which is not taken out of the territory. The royalty records thus provide only a minimum production figure.

The royalty records were used to prepare Figure 15, which shows the gold production from 1975 to 1984 in both crude and fine ounces. An average fineness of 800 was used in the preparation of this figure. The data from which Figure 15 was prepared are listed in Table 6.

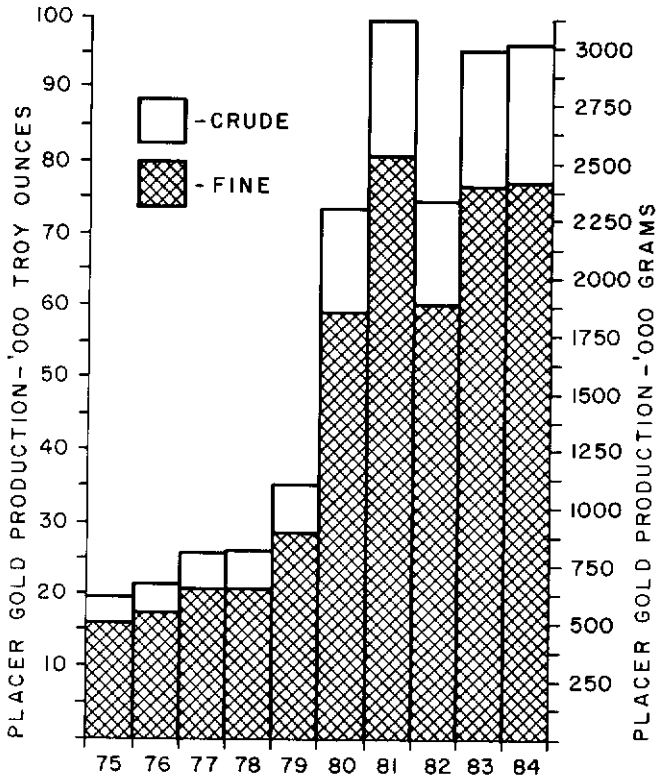



Figure 15: Placer gold production in Yukon, 1975 to 1984.

Table 6: Gold Royalties Paid in the Mining Districts, 1975 to 1984 (crude oz).

| | Mining Districts | | | | |
|---|---|---|---|---|---|
| Year | Dawson | Mayo | W.Lake | Whitehorse | Total |
| 1975 | 14,642 | 513 | 20 | 4,203 | 19,378 |
| 1976 | 13,733 | 1,238 | - | 6,341 | 21,312 |
| 1977 | 14,739 | 1,559 | - | 9,394 | 25,692 |
| 1978 | 15,799 | 468 | - | 9,521 | 25,788 |
| 1979 | 25,287 | 739 | - | 9,074 | 35,100 |
| 1980 | 54,445 | 886 | 76 | 17,751 | 73,158 |
| 1981 | 74,375 | 497 | 131 | 24,663 | 99,666 |
| 1982 | 47,462 | 708 | - | 25,872 | 74,042 |
| 1983 | 65,041 | 680 | - | 28,535 | 94,256 |
| 1984 | 61,746 | 499 | - | 32,461 | 94,706 |
| Total | 387,269 | 7,787 | 227 | 167,815 | 563,098 |

The data in Table 6 were also used to prepare Figure 16, which shows the royalty paid according the Mining Districts. The impression given by this figure is misleading, in that production from the Whitehorse Mining District appears more, and production from the Mayo Mining Distrct appears less than they actually are. This results from royalty being paid in Whitehorse on gold recovered from other Mining Districts by miners leaving the territory.

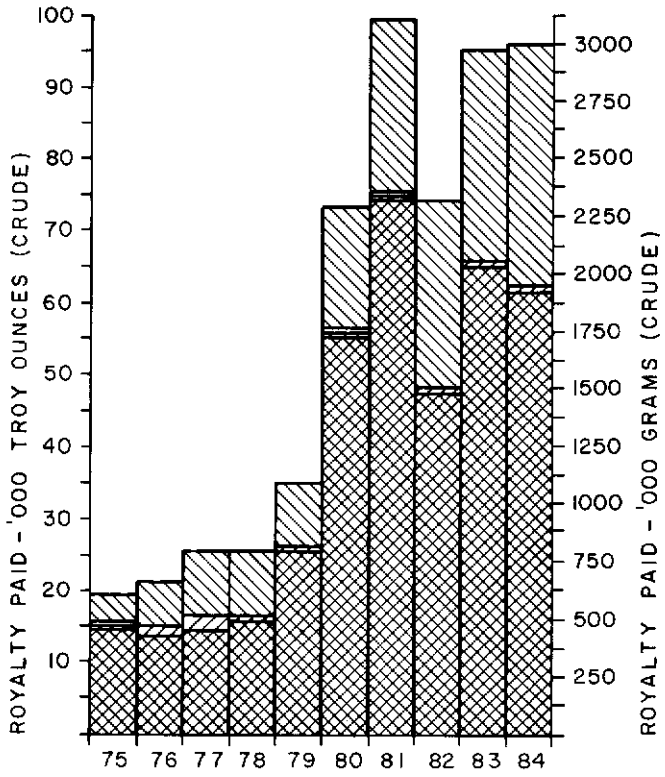



Figure 16: Royalty paid in Mining Districts, 1975 to 1984.

Data listing the Mining Districts in which gold was actually produced are available for 1978 to 1984, and are listed in Table 7. They were used to prepare Figure 18 which shows that, discounting gold from unknown sources, most of the gold produced between 1978 and 1984 came from the Dawson District.

Table 7: Gold Produced in the Mining Districts, 1978 to 1984 (crude oz).

| | Mining Districts | | | | | |
|---|---|---|---|---|---|---|
| Year | Dawson | Mayo | W.L. | Whse | Unknown | Total |
| 1978 | 13,769 | 1,741 | - | 4,815 | 5,463 | 25,788 |
| 1979 | 17,512 | 1,638 | - | 2,727 | 13,223 | 35,100 |
| 1980 | 46,017 | 1,584 | - | 2,583 | 22,974 | 73,158 |
| 1981 | 79,430 | 2,616 | 3 | 6,322 | 11,295 | 99,666 |
| 1982 | 59,512 | 2,717 | - | 7,328 | 4,485 | 74,042 |
| 1983 | 82,200 | 3,887 | - | 6,784 | 1,385 | 94,256 |
| 1984 | 79,472 | 7,119 | - | 4,879 | 3,236 | 94,706 |
| Total | 377,912 | 21,302 | 3 | 35,438 | 62,061 | 496,716 |

During the 7 years covered by Table 7 and Figure 18, gold production was recorded from 98 creeks. Of that production, however, 90 % came from just 20 creeks. The most productive creeks are listed in order, along with their total reported gold production, in Table 8. All 98 creeks with reported gold production are listed alphabetically, along with

their annual production, in Table 9. Most of the production was from unglaciated areas.

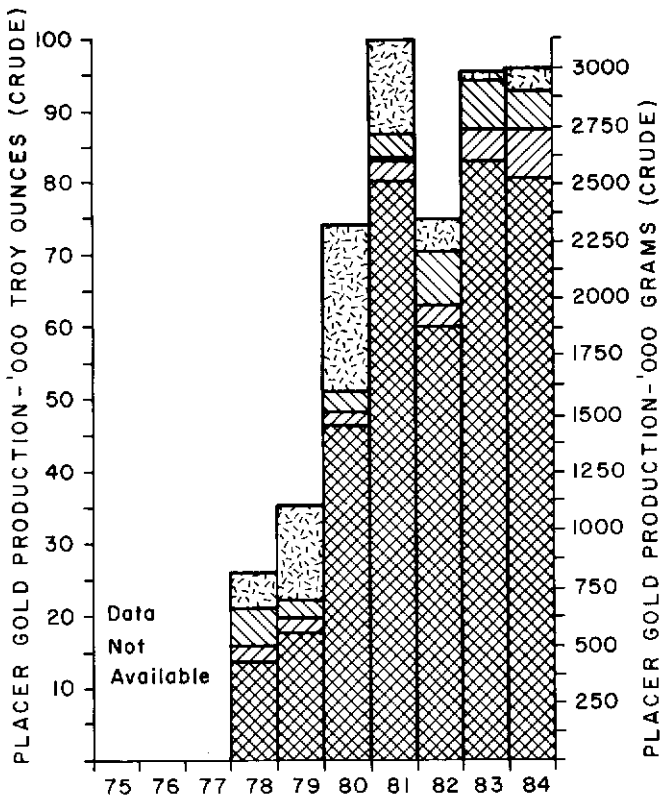



Figure 18: Gold production from Mining Districts, 1978 to 1984.

Table 8: Most Productive Creeks, 1978 to 1984.

| Rank | Creek Name | Production |
|---|---|---|
| 1. | Hunker Ck. (with Gold Bottom and Last Chance Creeks, and 80 Pup) | 39,989 |
| 2. | Sulphur Ck. | 39,464 |
| 3. | Dominion Ck. (with Caribou Ck.) | 39,159 |
| 4. | Bonanza Ck. | 37,199 |
| 5. | Sixtymile R. | 27,622 |
| 6. | Eureka Ck. | 26,930 |
| 7. | Black Hills Ck. | 21,348 |
| 8. | Miller Ck. | 20,061 |
| 9. | Quartz Ck. | 17,854 |
| 10. | Moosehorn Range | 17,604 |
| 11. | Eldorado Ck. (with Gay Gulch) | 16,796 |
| 12. | Clear Ck. | 16,395 |
| 13. | Henderson Ck. | 15,717 |
| 14. | Tenmile Ck. | 12,916 |
| 15. | Bear Ck. (Dawson Mining Div.) | 10,582 |
| 16. | Matson Ck. | 7,221 |
| 17. | Haggart Ck. (with Dublin Gulch) | 6,427 |
| 18. | Fourth of July Ck. | 6,210 |
| 19. | Highet Ck. | 5,162 |
| 20. | Scroggie Ck. | 3,965 |
| Total (crude oz) | | 388,621 |

The placer gold production from 1975 to 1984 is shown along with its value in Figure 19. The value of gold produced in 1984 was lower than that of gold produced in 1983 as a result of the lower price of gold. The value of gold produced in both years was, however, higher than the value of all the minerals produced by the remaining "hard rock" mines active in the territory. According to the Yukon Department of Tourism, placer mining was the second most important industry in the territory in 1983 and 1984, ranking behind tourism.

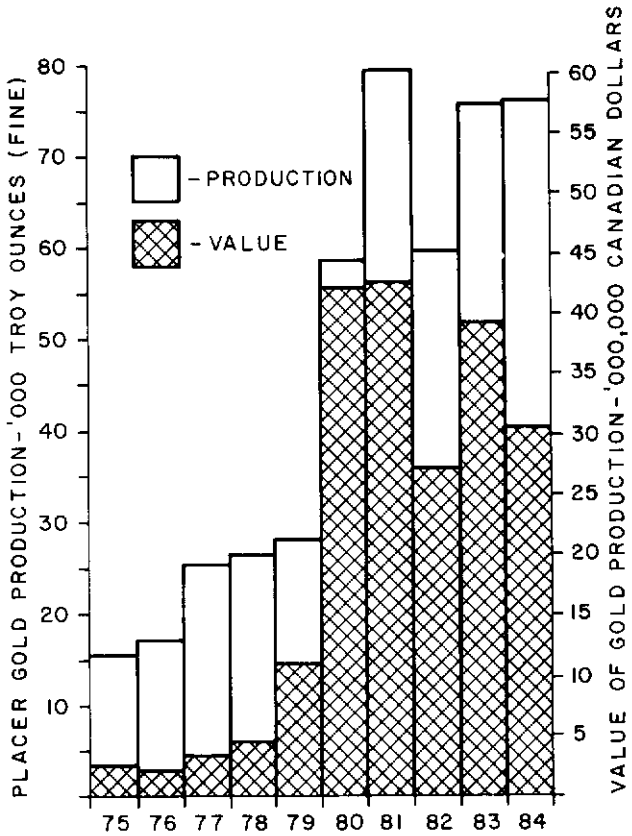



Figure 19: Placer gold production and value of gold produced in Yukon, 1975 to 1984.

During the period 1981 to 1983, total Canadian gold production rose significantly with the opening of a number of new "hard rock" mines, and an increase in production at others. This increase in production is shown in Figure 20. It has resulted in a decrease in the Yukon contribution to total Canadian gold production from the high of almost 4 % reached in 1981 to slightly less than 3 % in 1983 and 1984, as shown in Figure 21. Yukon is fifth in gold production in Canada, behind Ontario, Quebec, British Columbia, and Northwest Territories.

The seasonal production for 1983 and 1984 at Yukon placer mining operations averaged approximately 100 fine ounces of gold per employee.

Table 9: Recorded Gold Production from Yukon Creeks, 1978 to 1984

| Creek Name | Tributary to | Mining Division | Year '78 | '79 | '80 | '81 | '82 | '83 | '84 | '78-'84 |
|---|---|---|---|---|---|---|---|---|---|---|
| Allgold Ck. | Klondike R. | Daw. | 144 | 218 | 70 | 206 | 382 | 260 | 24 | 1,304 |
| Anderson Ck. | Mayo L. | Mayo | - | - | 12 | 6 | - | - | - | 18 |
| Arch Ck. | Donjek R. | Whse | - | - | 3 | - | - | - | 62 | 65 |
| Back Ck. | Victoria Ck. | Whse | - | - | - | - | - | - | 87 | 87 |
| Ballarat Ck. | Yukon R. | Daw. | - | - | - | 263 | 791 | 208 | 874 | 2,136 |
| Barker Ck. | Stewart R. | Daw. | - | - | 25 | 80 | 162 | 11 | 6 | 284 |
| Barlow Ck. | Clear Ck. | Daw. | - | - | - | - | 41 | - | 8 | 49 |
| Bear Ck. | Klondike R. | Daw. | 761 | 146 | 2,830 | 5,227 | 1,096 | 522 | - | 10,582 |
| Bear Ck. | Moose Ck. | Mayo | - | - | - | 130 | 4 | 26 | - | 160 |
| Bedrock Ck. | Sixtymile R. | Daw. | 27 | 15 | 100 | - | 134 | 117 | 198 | 591 |
| Big Gold Ck. | Sixtymile R. | Daw. | - | - | 34 | - | 677 | 942 | - | 1,653 |
| Black Hills Ck. | Sixtymile R. | Daw. | 2,234 | 1,732 | 3,181 | 3,068 | 29 | 4,530 | 6,574 | 21,348 |
| Bonanza Ck. | Klondike R. | Daw. | 579 | 1,637 | 3,037 | 4,785 | 8,979 | 12,802 | 5,380 | 37,199 |
| Burwash Ck. | Kluane R. | Whse | - | 131 | 189 | 660 | 241 | 109 | 283 | 1,613 |
| California Ck. | Sixtymile R. | Daw. | - | - | - | - | - | - | 3 | 3 |
| Canadian Ck. | Britannia Ck. | Whse | 10 | 1 | - | 191 | 484 | 554 | - | 1,240 |
| Caribou Ck. | Dominion Ck. | Daw. | 33 | 228 | 694 | 379 | 879 | 584 | 507 | 3,304 |
| Carlson Ck. | Minto Ck. | Mayo | - | - | 49 | - | 18 | 38 | - | 105 |
| Casino Ck. | Dip Ck. | Whse | - | - | - | - | - | 59 | - | 59 |
| Clear Ck. | Stewart R. | Daw. | 385 | 620 | 938 | 2,400 | 2,689 | 6,372 | 2,991 | 16,395 |
| Cottoneva Ck. | S. Big Salmon R. | Whse | - | - | 9 | - | - | - | - | 9 |
| Davidson Ck. | Mayo R. | Mayo | - | 128 | 2 | 128 | - | - | - | 258 |
| Dawn Gulch | Mayo L. | Mayo | - | 4 | - | 11 | - | - | - | 15 |
| Dominion Ck. | Indian R. | Daw. | 177 | 552 | 2,884 | 11,792 | 4,510 | 6,266 | 9,674 | 35,855 |
| Dollis (Squaw) Ck. | Tatshenshini R. | Whse | - | - | - | - | - | 76 | 53 | 129 |
| Donjek Trib. near Arch Ck. | Donjek R. | Whse | - | - | 24 | - | - | - | - | 24 |
| Dublin Gulch | Haggart Ck. | Mayo | 777 | 463 | 410 | - | - | 230 | 3,561 | 5,441 |
| Duncan Ck. | Mayo R. | Mayo | 595 | 430 | 507 | 269 | 943 | 1,060 | 754 | 4,558 |
| Eldorado Ck. | Bonanza Ck. | Daw. | 737 | 1,042 | 1,783 | 2,075 | 3,244 | 3,095 | 3,320 | 15,296 |
| Eureka Ck. | Indian R. | Daw. | 351 | 2,724 | 3,568 | 8,054 | 8,483 | 2,028 | 1,722 | 26,930 |
| Excelsior Ck. | Yukon R. | Daw. | 5 | - | 3 | - | - | - | - | 8 |
| Fortymile R. | Yukon R. | Daw. | - | - | - | 3 | 191 | 163 | 161 | 518 |
| Foster Gulch | Klondike R. | Daw. | - | - | - | - | - | 42 | - | 42 |
| Fourth of July Ck. | Jarvis R. | Whse | - | - | - | 1,877 | 1,724 | 2,092 | 517 | 6,210 |
| Gay Gulch | Eldorado Ck. | Daw. | - | - | - | 215 | 520 | 667 | 98 | 1,500 |
| Gem Ck. | Sprague Ck. | Mayo | - | - | - | - | 5 | 34 | 86 | 125 |
| Glacier Ck. | Sixtymile R. | Daw. | 219 | 411 | 251 | 497 | 41 | 567 | 481 | 2,467 |
| Gold Bottom Ck. | Hunker Ck. | Daw. | 379 | 24 | 1,367 | 1,332 | 984 | 473 | 626 | 5,185 |
| Gold Run Ck. | Dominion Ck. | Daw. | - | - | 21 | - | 126 | 550 | 944 | 1,641 |
| Haggart Ck. | McQuesten R. | Mayo | 14 | 115 | - | 4 | 223 | 411 | 219 | 986 |
| Happy Ck. | Big Ck. | Whse | - | - | - | - | 8 | 70 | - | 78 |
| Hayes Ck. | Selwyn Ck. | Whse | 32 | 5 | 1 | 44 | 4 | 16 | - | 102 |
| Henderson Ck. | Stewart R. | Daw. | 2,874 | 900 | 3,265 | 2,759 | 32 | 2,969 | 2,918 | 15,717 |
| Highet Ck. | Minto Ck. | Mayo | 144 | 245 | 143 | 728 | 1,249 | 1,568 | 1,085 | 5,162 |
| Hobo Ck. | S. Klondike R. | Daw. | 10 | 8 | - | - | - | - | - | 18 |
| Hope Gulch | Lightning Ck. | Mayo | - | 8 | - | - | - | - | - | 8 |
| Hunker Ck. | Klondike R. | Daw. | 1,246 | 2,164 | 2,393 | 4,731 | 2,861 | 7,844 | 10,303 | 31,542 |
| Indian R. | Yukon R. | Daw. | - | - | - | - | - | 242 | 433 | 675 |
| Johnson Ck. | McQuesten R. | Mayo | - | 205 | 231 | 899 | 269 | 483 | 210 | 2,297 |
| Josephine Ck. | Yukon R. | Daw. | - | - | 17 | 12 | - | - | - | 29 |
| Kimberly Ck. | Jarvis R. | Whse | - | - | - | 5 | 362 | 126 | 10 | 503 |
| Lake Ck. | S. Big Salmon R. | Whse | - | 2 | - | - | - | - | 11 | 13 |
| Last Chance Ck. | Yukon R. | Daw. | 75 | 18 | 137 | 131 | 1,528 | 71 | 149 | 2,109 |
| Ledge Ck. | Mayo L. | Mayo | - | 4 | - | - | 6 | 37 | 854 | 901 |
| Liard R. | Mackenzie R. | W.L. | - | - | - | 3 | - | - | - | 3 |
| Lightning Ck. | Duncan Ck. | Mayo | 150 | - | 4 | - | - | - | - | 154 |
| Little Gold Ck. | Sixtymile R. | Daw. | - | - | 724 | 754 | 512 | 686 | 1,018 | 3,694 |
| Livingstone Ck. | S. Big Salmon R. | Whse | 4 | 48 | 112 | 207 | 43 | - | 188 | 602 |
| Lousetown Bench | Yukon R. | Daw. | - | - | - | 162 | 342 | 250 | 183 | 937 |
| Maisy May Ck. | Stewart R. | Daw. | - | - | 538 | 1,815 | 645 | 557 | 368 | 3,923 |
| Martin Ck. | S. Big Salmon R. | Whse | - | - | - | - | 34 | - | - | 34 |
| Matson Ck. | Sixtymile R. | Daw. | 315 | 1,745 | 2,416 | 1,670 | 32 | 71 | 972 | 7,221 |

| Creek Name | Tributary to | Mining Division | Year '78 | '79 | '80 | '81 | '82 | '83 | '84 | '78-'84 |
|---|---|---|---|---|---|---|---|---|---|---|
| McQuesten R. | Stewart R. | Mayo | - | - | 8 | 13 | - | - | - | 21 |
| Mechanic Ck. | Big Ck. | Whse | 21 | - | - | - | 55 | 142 | - | 218 |
| Miller Ck. | Sixtymile R. | Daw. | 64 | - | 1,188 | 2,785 | 4,617 | 5,600 | 5,807 | 20,061 |
| Minto Ck. | Mayo R. | Mayo | 42 | - | 190 | 215 | - | - | - | 447 |
| Moose Ck. | Fortymile R. | Daw. | - | 254 | 23 | 100 | 63 | - | - | 440 |
| Moose Ck. | Lubbock R. | Whse | - | - | - | - | - | 30 | - | 30 |
| Moosehorn Range | Tanana R. | Whse | 4,527 | 2,201 | 1,233 | 2,056 | 3,323 | 2,390 | 1,874 | 17,604 |
| Nansen Ck. | Nisling R. | Whse | - | - | 28 | 54 | - | 46 | 118 | 246 |
| Parent Ck. | Duncan Ck. | Mayo | - | - | - | 11 | - | - | - | 11 |
| Poker Ck. | Fortymile R. | Daw. | - | - | - | - | - | - | 10 | 10 |
| Quartz Ck. | Indian R. | Daw. | 1,195 | 358 | 2,780 | 2,362 | 4,237 | 3,254 | 3,668 | 17,854 |
| Quill Ck. | Kluane R. | Whse | - | - | - | - | - | 100 | - | 100 |
| Reed Ck. | Donjek R. | Whse | - | - | - | - | - | 7 | 200 | 207 |
| Revenue Ck. | Big Ck. | Whse | 221 | 321 | 261 | 887 | 799 | 500 | 900 | 3,889 |
| Rude Ck. | Dip Ck. | Whse | - | - | 618 | 104 | - | - | - | 722 |
| Scroggie Ck. | Stewart R. | Daw. | - | - | 33 | 1,591 | - | - | 2,341 | 3,965 |
| Seattle Ck. | McQuesten R. | Mayo | - | - | - | 198 | - | - | - | 198 |
| Sestak Ck. | Yukon R. | Daw. | - | - | - | 2 | - | - | - | 2 |
| Seymour Ck. | Big Ck. | Whse | - | - | - | - | - | 134 | 314 | 448 |
| Sheep Ck. | Yukon R. | Daw. | - | 59 | 198 | 80 | - | 185 | 212 | 734 |
| Sixtymile R. | Yukon R. | Daw. | 1,131 | 2,070 | 3,214 | 5,475 | 5,011 | 4,795 | 5,926 | 27,622 |
| S. Big Salmon R. | Big Salmon R. | Whse | - | 10 | - | - | 23 | - | - | 33 |
| Squirrel Ck. | Duke R. | Whse | - | 8 | 91 | 233 | 152 | 283 | 236 | 1,003 |
| Steep Ck. | Mayo L. | Mayo | - | 14 | - | - | - | - | - | 14 |
| Stewart R. | Yukon R. | Daw. | - | - | - | - | - | - | 8 | 8 |
| Stewart R. | Yukon R. | Mayo | 19 | 22 | 18 | 4 | - | - | - | 63 |
| Sulphur Ck. | Dominion Ck. | Daw. | - | 36 | 6,904 | 11,147 | 2,189 | 12,094 | 7,094 | 39,464 |
| Summit Ck. | S. Big Salmon R. | Whse | - | - | - | 4 | 76 | - | 26 | 106 |
| Tenmile Ck. | Sixtymile R. | Daw. | 828 | 551 | - | 1,190 | 3,353 | 2,717 | 4,277 | 12,916 |
| Thistle Ck. | Yukon R. | Daw. | - | - | 1,401 | 1,201 | 34 | 606 | 14 | 3,256 |
| Thomas Gulch | Klondike R. | Daw. | - | - | - | - | 52 | 60 | 122 | 234 |
| Thunder Gulch | Lightning Ck. | Mayo | - | - | 10 | - | - | - | 350 | 360 |
| Wheaton R. | Bennett L. | Whse | - | - | 14 | - | - | - | - | 14 |
| Yukon Trib. (Mi.894) | Yukon R. | Whse | - | - | - | - | - | 50 | - | 50 |
| Zinc Ck. | Barlow Ck. | Daw. | - | - | - | - | - | - | 38 | 38 |
| 80 Pup | Hunker Ck. | Daw. | - | - | - | 1,087 | 46 | - | 20 | 1,153 |
| "Various Creeks" | | | 5,463 | 13,223 | 22,974 | 11,295 | 4,485 | 1,385 | 3,236 | 62,061 |
| Total | | | 25,788 | 35,100 | 73,158 | 99,666 | 74,042 | 94,256 | 94,706 | 496,716 |

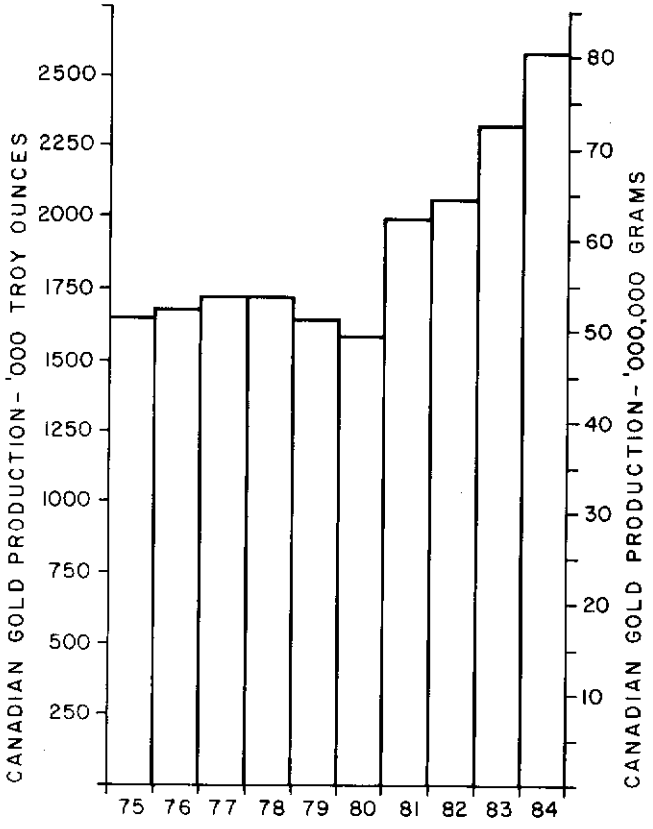



Figure 20: Total Canadian Gold Production, 1975 to 1984.

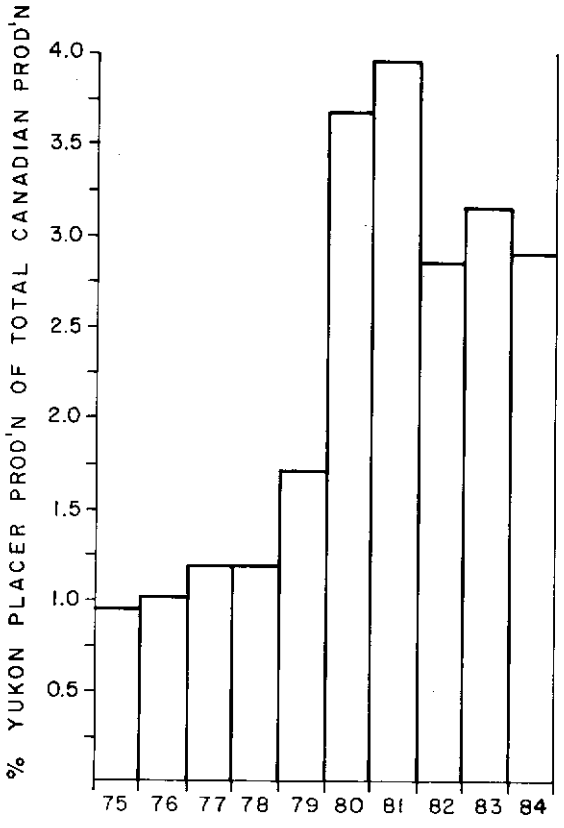



Figure 21: Yukon placer gold production as a percentage of Canadian gold production, 1975 to 1984.

# Water Licencing for Placer Mining in Yukon

by
R.L. Debicki
Geological Consultant,
Richmond,B.C.

The granting of rights to water for placer mining in Yukon underwent a major change in 1984. Since 1972, authorizations to use water have been granted by the Water Resources Section of the federal Department of Indian Affairs and Northern Development (D.I.A.N.D.). This function was turned over to the Yukon Territory Water Board in 1984.

The Yukon Territory Water Board consists of a nine member appointed body. Three members of the board are nominated by the Minister of Indian Affairs and Northern Development. One of these members is the Chairman, who is appointed for a period of 1 to 3 years. Three more members are nominated by the Yukon Territorial government. One member of the board is appointed by each of the federal Departments of Environment, Indian Affairs and Northern Development, and Health. These last three members are usually, but not necessarily, government employees.

The administrative staff of the Yukon Territory Water Board are employed by the Renewable Resources Branch of D.I.A.N.D. Their job is to supply the technical and administrative data on which the Water Board bases its decisions.

All applications for licenses to use water in the territory for placer mining, or any other purpose, are treated in the same manner. Applications may be made for licenses covering 1, 2, or 3 year periods. To obtain the right to use water for placer mining, the applicant must complete a Schedule II "Application for Licence, Amendment of Licence, or Renewal of Licence". In addition to this short form, the applicant must complete the longer "Placer Mining Information Sheet" which lists site specific environmental and operational information. The applicant must also file a declaration affirming his right to mine at the location for which the application to use water is being made.

Because of provisions in the Northern Inland Waters Act, public hearings must be set up for every licence application. If there are no intervenors, the public hearing may be cancelled provided that the applicant has filed a declaration to dispose of the public hearing in case there are no intervenors.

To expedite processing the licence applications, members of the administrative staff at the Yukon Water Board routinely provide information concerning applications for water licences to D.I.A.N.D., the Yukon Territorial Government Economic Development Branch, the Yukon Chamber of Mines, the Council for Yukon Indians, the Yukon Conservation Society, and the federal Department of Fisheries. The amount of information supplied to each of the groups differs according to the preference of the group. Any of these groups, or any other group or person may intervene on any application. Written comments regarding applications for water licences may also be submitted by any person or group, whether or not a hearing is held.

Each application is considered by the Yukon Territory Water Board as an individual case, using the input from the various interest groups. Such input may include suggestions from D.I.A.N.D. that all the necessary technical information has not been included, or from Department of Fisheries that the watercourse has some special significance as a fish habitat.

Conditions of operation are attached to the water licences when granted. Almost all licences require settling facilities. An objective of 0.2 ml/l of settleable solids in effluent has been set. In-stream structures such as dams, settling ponds, and berms are expected to be able to withstand a one-in-two year flood, or the highest water levels in an average 2 year period. Constraints are most severe in the case of salmon spawning and rearing streams.

There are no time restrictions under the Yukon Inland Waters Act concerning how quickly applications for water licences must be processed. The Yukon Territory Water Board has established methods to process the applications as quickly as possible, but because of provisions of the act, the time required averages 60 days. A report entitled "Reasons for Decision" is published for every licence issued.

The annual fees payable by the holders of water licences are as follows:

- $10.00 application fee
- $1.00 for each 10,000 gallons per day up to 500,000 gallons per day authorized by the licence
- $0.50 for each 10,000 gallons per day from 500,000 up to 1,000,000 gallons per day authorized by the licence
- $0.10 for each 10,000 gallons per day over 1,000,000 gallons per day authorized by the licence

A medium sized mining operation would be required to pay about $125. per year in water use fees.

The office of the Yukon Territory Water Board is located at:

Suite 200,
4114 Fourth Ave.,
Whitehorse, Yukon
Y1A 4N7

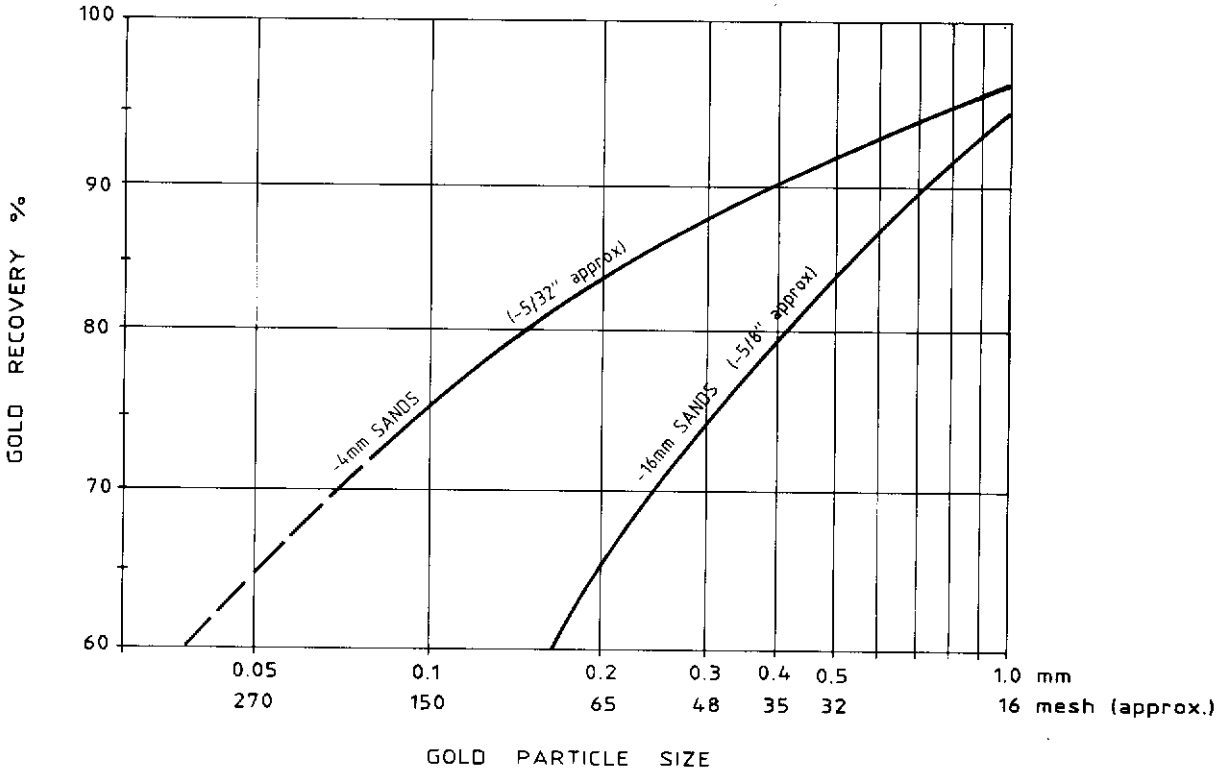
(403) 668-4884

Further information and application forms may be obtained from this office during business hours, Monday to Friday.

SLUICE PERFORMANCE VS SIZE OF FEED (U.S.S.R.)

For-5/8" sand-- Water: solids = 20 to 24: 1 (by volume)
-- Loading = 0.8 -1.0 $yds^3$/hr/ft of sluice width

For-5/32" sand--Water: solids = 8 to 12: 1 (by volume)
--Loading = 1.2 - 1.4$yd^3$/hr/ft of sluice width




U.S.S.R. research - re sluice water

Studies of process water gave the following results:
Konyukova - no recovery loss up to 30,000 mg/l suspended solids.
Melik-Stepanov - jigs cease to operate efficiently above 80,000 mg/l S.S.
Egupov - sluice water cannot exceed 160,000 mg/l S.S.
Egupov - @ 160,000 mg/l smallest gold grain size recoverable = 150 mesh
Egupov - @ 70,000 mg/l smallest gold grain size recoverable = 200 mesh

These figures are qualified by the authors: "The question of the permissible degree of contamination of process water has not yet been sufficiently studied".

# SLUICING IN THE YUKON TERRITORY - 1984

by
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and Mineral Process Engineering,
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Presented at the RMS - Ross Seminar
Westin-Bayshore Hotel, Vancouver, B.C.
February 4-7, 1985

This paper was originally presented at the RMS-Ross Seminar held Feb 4-7, 1985 at the Westin-Bayshore Hotel, Vancouver, B.C., where it was entitled "Primary Concentrators Employed in the Yukon Territory, 1984". The concentrators described were sluices, since they were, with one or two exceptions, the only device used for primary concentration of gold from alluvial deposits. In the Yukon the relatively low initial cost, high concentrating ratio, durability, high throughput, ease of use, and acceptable recovery rates are reasons the sluice, in its many forms, has remained the favorite since the turn of the century.

Data for this report were gathered by the author from visits to approximately 40 mine sites during the summer of 1984 while employed as a consultant for Mining Engineering Division, D.I.A.N.D., Whitehorse, and from field notes compiled in 1983 and 1984 by claim inspectors and placer technicians Bob Whittingham and Lee Olynyk. These sources plus comments from Bob, Lee, and George Gilbert, Head, Placer Mining Section and Inspector of Mining, combined to form a fairly complete picture of the placer industry. A total of 131 operations, representing over 90% of the operations that processed more than 10 cu.yd. of material per hour when sluicing, and operated for a significant period during 1984, are encompassed by this survey. The very small mining operations were not included in this survey.

## Mining Environment

Before proceeding, a brief description of the mining environoment in the Yukon Territory as it relates to this report is necessary. A number of publications describe the geology and geomorphology of the placer gold regions of the Yukon Territory. One is in "Yukon Placer Mining Industry, 1978-1982", and more are listed in the bibliography of the same volume. From a primary concentration viewpoint, the most important features of a placer deposit are:

1. Size of deposit
2. Grain size distribution of the placer gravel
3. Type and amount of gold contained.

1. The size of a deposit influences the selection of the sluice capacity. To exploit the potential advantages of a high capacity sluice, such as lower operating costs per cubic yard sluiced, and higher gold production, a fairly large deposit that is readily mineable in large tracts is usually required. Small deposits do not justify large expenditures for equipment, and consequently are usually worked by small, low cost, low throughput operations. Small deposits are typically remnants of larger deposits disturbed by man, nature, or both, or are tightly confined by surrounding land forms.

2. The grain size distribution of the placer gravel has a large influence on both the mining method used and the configuration of the concentrator. The presence of large boulders and excessive amounts of fines are two of the most important considerations here. Large boulders make mining much more difficult and expensive, and frequently require the use of a grizzly or high water flow in the oversize watercourse. Excessive fines reduce the capacity of the concentrator by causing overloading of the riffles and loss of fine-grained gold, especially in the side run or undercurrent areas.

3. The type of gold usually describes whether it is predominantly coarse or fine, and its shape in general. The type of sluice and its exact configuration are usually the result of trial and error efforts to maximize recovery during actual operation. The amount of recoverable gold present obviously affects the profitability of the mining operation.

## Mining Areas

The placer areas of the Yukon are:

1. Klondike
2. South Klondike, around the Yukon and Stewart Rivers
3. Sixty Mile River
4. Clear Creek
5. Mayo
6. Burwash
7. Big Creek - Mount Nansen
8. Miscellaneous areas

1, 2. Klondike and South Klondike

The primary feature of the Klondike and South Klondike areas is the absence of glaciation. This has enabled the rich placers of the White Channel gravels and the younger valley placers to remain undisturbed. These areas account for the majority of placer production, both past and present. Well rounded gravels, without large boulders make this type of deposit relatively easy to mine, when stripped of black muck and thawed. The character of the bedrock, which has undergone varying degrees of decomposition, affects mining practices. Deposits in the Klondike and South Klondike areas are fairly large and may or may not have well defined paystreaks, except where they occur in headwaters, in narrow valleys, or as remnants.

3. Sixty Mile River

Discovered before the Klondike, the Sixty Mile River area was also not glaciated. The valley of the Sixty Mile River is wide and the river gravels and gravels on nearby benches have been worked extensively near the confluences of Miller and Glacier Creeks. The valley and bench gravels of tributary creeks Big Gold, Little Gold, Glacier, Miller, and Bedrock have also produced gold. The tributary creeks have

reasonably steep gradients, and are contained in relatively narrow V-shaped valleys. As with the Klondike and South Klondike areas, there are few large boulders in the gravel. The gravel is covered by black muck, except in the Sixty Mile River valley. The tributary valleys are more narrow than in the Klondike and South Klondike areas due to their relatively immature nature, and the deposits are smaller. They are, however, still large deposits by placer standards.

4. Clear Creek
The Clear Creek area currently supports the only dredge operation in the Yukon. Deposits in the area typically consist of shallow gravels overlain by a thin covering of black muck. The area was not extensively glaciated during recent times, but large boulders are common.

5, 6, 7, 8. Mayo, Burwash, Big Creek-Mount Nansen, and Miscellaneous
The remaining placer areas have all been subject to varying degrees of glaciaton. As a result, placer deposits in these areas are either remnants, consist of reworked glacial debris, or were protected from the scouring effects of glaciation. Most of the pre-glacial gravels that survived were in narrow valleys or gorges. They remain due to their orientation to the ice flow or their restricted geometry. The Mayo and Burwash areas were heavily glaciated. Deposits in those areas are usually relatively small, and occur in narrow tributary valleys. They contain large boulders, and the gravels are typically poorly sorted. The Big Creek-Mount Nansen area was on the fringe of the glacial advance. Some of the gold bearing gravels in that area are buried under barren post glacial gravels. They are generally present in small tributary creeks to larger debris choked valleys.

The placer mining environment in the Yukon is therefore seen to be quite variable, depending on the area being mined.

Sluices

The term "sluice box" is a broad generic term that encompasses just about any device that confines a slurry of water and gravel to a fixed, usually rectangular cross section at a constant gradient. The great variety of sluicing systems makes any attempt to categorize them difficult.

Some of the descriptive terms used in relation to sluice boxes are:

Single run sluice box
a sluice box where all of the material is processed in one flume.

Undercurrent
where punch plate is suspended 2 to 6 inches above the bottom of a sluice run in which material coarser than one inch in diameter is being processed. The punch plate serves to classify the feed to the riffles on the sluice bottom, and to protect them from highly turbulent flow. The smaller grain size of material fed to the riffles, and the less turbulent flow under the punch plate allow for recovery of finer gold than would be recovered by coarse gold riffles alone.

Side runs
where feed is classified, usually by punch plate, and the underflow is treated in a separate sluice run from the coarser grained overflow. The underflow sluice is referred to as a side run.

Classifier
The term "classifier" as used in this report should more properly be described as a "screen". Punch plate, though technically a screen, is greatly affected by the volume and velocity of water accompanying the gravels. The term "classifier" will be used throughout to describe a mechanism that performs either a screening or classifying function.

The most common method for classifying alluvial gravels is the use of punch plate. With few exceptions, the large sluice boxes use punch plate as the classifier to direct the fine material through the side run or undercurrent areas. Circular or oval punch patterns are used most commonly, but a few operators use slotted plate. The size of the holes varies between 1/2" and 1" in the small dimension. The upper size of material that will drop through these plates is dependent on the velocity of the slurry over the punch plate. A higher velocity will reduce the upper size limit of the underflow and will increase carry over of fines into the coarse particle stream. There was no hard and fast rule to dictate the aperture size used. It appeared that most operators preferred their side runs to treat -1/4" material.

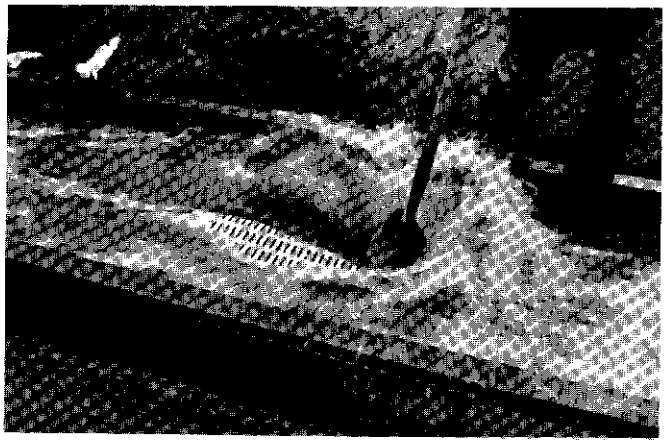

Figure 1: Slotted punch plate over riffles in a single run sluice box. (J.H. '84)

The other methods of classification observed were grizzlies, trommels, "Derockers", and screen decks. The use of grizzlies to scalp off the very large rocks is common in the glaciated areas but was comparatively rare in the Klondike, South Klondike, and Sixty Mile. Trommels and screen decks are not common in the

Yukon. The higher capital and operating costs and more complex operation restricted the use of these methods to a small number of operations. Approximately half a dozen of each type were noted in operation this year. The advantages to these methods were more efficient size separation than punch plate and the reduction of water required since a large part of the process water in a conventional sluice is used to move large rock. Segregation in this manner usually complicated tailings disposal but those operators using these methods felt that the advantages outweighed the disadvantages.

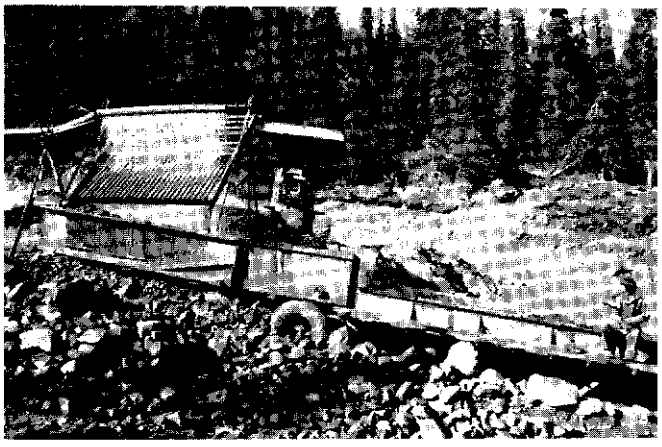

Figure 2: Single run sluice box with grizzly typical of those used in glaciated areas. (J.H. '84)

"Derockers" were employed on approximately a dozen operations. The underflow upper size varied from 1" to 2". Some operators then used punch plate to further classify the slurry while others sluiced the "Derocker" underflow in a single run with no further classification. The "Derocker" was most effective for bulldozer mining in areas with large angular boulders.

For the purposes of this report, the operations surveyed were included in one of the following six categories.

1. Single run sluice box with undercurrent

2. Single run sluice box without undercurrent

3. "Ross" Box
   three run sluice box using punch plate to classify the slurry stream. Punch plate is used in the throat area of the dump box, and over the upper 4 feet of the centre run. The oversize is treated in the centre run, and the undersize is treated in the two side runs and the centre run undercurrent. All three runs are fixed at the same gradient.

4. "Rock" Box and copies of the "Rock" Box
   three run sluice box similar to the "Ross" box except that the side runs have adjustable gradients, and there is no undercurrent in the centre run.

5. Other Multiple Run Sluices
   those sluice boxes that didn't fall into the "Ross" or "Rock" box categories, but have one or more of the following characteristics:
   a. sluices with side runs
   b. sluices with undercurrents wider than the main run
   c. sluices with runs fed different sized material from a classifier

Figure 3: View of a typical "Ross" sluice box. Note the undercurrent discharge under the end of the centre run. (J.H. '84)

6. Other concentrators
   A survey of operations is summarized in Table 1. Though there are a significant number of the more elaborate, multiple run type sluices, the most predominant type of concentrator is the simpler single run type sluice. The use of undercurrents in these single run boxes is gaining popularity as shown by the fact that 50% of single run operators use some form of undercurrent. The inclusion of undercurrents is a relatively recent trend that probably reflects the influence of the larger multiple run

boxes that appeared in the mid 1970's.

Table 1: Numbers of sluices of various types in use at operations surveyed

| Type of sluice | Number of operations using sluice | Number with capacity >100 yd/hr |
|---|---|---|
| 1. Sluice run with undercurrent | 41 | 5 |
| 2. Sluice run without undercurrent | 43 | 3 |
| 3. "Ross" box | 13 | 13 |
| 4. "Rock" box and "Rock" Box copies | 7 | 7 |
| 5. Other multi-run boxes | 24 | 11 |
| 6. Other concentrators | 7[1] | |

Note 1: three of the other concentrators are used in series with a conventional sluice box.

It should be emphasized here that these are not intended to be rigid classifications but merely indications of operational preferences. Some of the boxes listed as "Other multiple run sluices" are close copies of either "Ross" or "Rock" sluice box designs. In some cases the boxes may have been difficult to identify as an original design or copy. The point to note is the large number of these multiple run boxes being employed. Table 1 shows the operations capable of operating in excess of 100 yds/hr. This indicates that as the capacity increases the tendency is to go to these more expensive feed classified sluices.

Table 2: Distribution of sluice boxes of various types in the placer areas of Yukon

| Area | Type of Sluice Box[1] 1 | 2 | 3 | 4 | 5 | 6 | Tot |
|---|---|---|---|---|---|---|---|
| 1. Klondike | 27 | 14 | 3 | 4 | 13 | 4 | 65 |
| 2. S. Klondike | 3 | 0 | 4 | 1 | 4 | 1 | 13 |
| 3. Sixty Mile | 4 | 1 | 4 | 2 | 2 | 1 | 14 |
| 4. Clear Creek | 2 | 2 | 0 | 0 | 1 | 0 | 5 |
| 5. Mayo | 2 | 8 | 1 | 0 | 1 | 1 | 13 |
| 6. Burwash | 1 | 7 | 1 | 0 | 2 | 0 | 11 |
| 7. Big Creek-Mt. Nansen | 2 | 6 | 0 | 0 | 1 | 0 | 9 |
| 8. Misc. Areas | 0 | 5 | 0 | 0 | 0 | 0 | 5 |

Note 1: type of sluice box is as listed in Table 1.

The smaller operations have tended to stay with the smaller and less expensive single run sluice box and add punch plate to form a relatively protected undercurrent area. This is usually done at the head of the sluice and/or the throat of the dump box if used. Another technique is to employ punch plate, either circular or slotted, at the end of the sluice which then feeds a small side run. Most operators using the undercurrent felt it had improved their recovery of fine gold. The effectiveness of the undercurrents for treatment of slurries of fine grained material appeared to vary widely. Since the undercurrent itself couldn't be examined in operation it was hard to say how much of the fine grained material was actually entering the undercurrent stream and what the flow conditions were. Most undercurrent and side run applications ran with the solid and water mixture that dropped through the classifying area. Some operators used additional water at the head of the undercurrent or side run to help carry the solids or direct the slurry stream.

A survey of classifications by area is shown in Table 2. As can be seen, the Klondike accounts for half of the operations included in this survey. The majority of the more sophisticated sluice boxes were operating in the Klondike, South Klondike, and Sixty Mile areas, where larger deposits are more common.

**Riffles**

Riffles comprise any device which creates an obstruction to flow in a slurry stream for the purpose of concentrating heavy minerals. This interpretation is compatible with that used in Peele's classic publication "Mining Engineers' Handbook" (1918), although some miners in Yukon use the term to refer only to angle iron placed across the bottom of the sluice run. The gold saving devices used in Yukon were almost always angle iron and expanded metal.

Coarse gold riffles

In sluicing environments where large rock was being processed 2"to 4" angle iron was the most popular choice of riffle. These sluice runs were the non-undercurrent section of single run sluices or the main run of the larger multi-run boxes. The riffles were generally chosen for their ability to withstand the abuse of the particular gravels being sluiced. The tendency was to use as small a riffle as could be expected to last and gave a good bedding pattern which was not choked or scoured. The larger riffles, while more durable, retained considerably more concentrate requiring more time for cleanup and subsequent secondary extraction. The riffles were overlying either expanded metal over some type of matting or just matting. It is estimated that approximately 75% of miners put expanded metal over matting under large angle iron riffles. The amount of water used per foot of sluice width varied considerably for all riffle types observed but especially for the large angle iron riffles. The dominant consideration was the amount of water required to move the large rocks through the sluice. The slope of the sluice and the water flow were normally adjusted to minimize "rock-picking" where this was a factor. The amount and velocity of water used to move large rocks could, and usually did, produce excessive turbulence in the main sluice run and classification areas. This would reduce the fine gold recovery in both single run and multiple run boxes. In single run boxes the high velocity water flows serve to carry the fine gold through the box and in multiple run boxes the turbulence in the classification areas will cause some fine material, with the accompanying gold, to be carried with the coarse rock material into the highly turbulent main runs with their coarse gold riffles. The use of

grizzlies or a screen decks to scalp off the larger rocks were some of the methods employed to overcome this problem. This was especially prevalent in the glaciated areas where large rocks were common. In areas where large rocks were not a problem the water was usually regulated so as to move the required yardage and maintain "acceptable" recovery.

Side run riffles

The operations that employ the use of side runs to treat fine material used expanded metal or small angle iron riffles. Where angle iron was used in side runs it was usually 1" to 1 1/2". It was common to see both angle iron and expanded metal in the side runs. Approximately 80% of these operations used angle iron riffles in their side runs somewhere, the remainder using solely expanded metal.

The use of expanded metal as a riffle is common but the types of expanded metal used varied considerably. It was not uncommon to see two or three types of expanded metal in use in a single sluice box. The practice of using two or more layers of expanded is also quite common. There is no one type of expanded metal that is most preferred. It would appear that as a general rule where expanded metal is used by itself as a riffle it tends to be made from relatively thick gauge steel. Where expanded metal is used under angle iron or thick gauge expanded metal it is usually of light gauge metal.

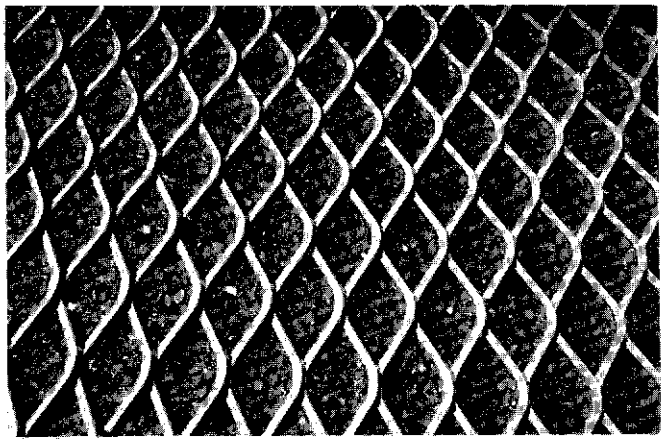

Figure 4: Thick guage expanded metal overlying indoor-outdoor carpet. Heavy minerals trapped by the riffles can be seen.

As was mentioned previously, the use of undercurrents is increasing. The riffles employed in undercurrents are usually expanded metal but angle iron is also used. As with the other types of sluice run the individual combinations are many and varied. As it usually is not possible to observe undercurrent type riffles in operation, the selection of riffles is usually based on the bedding pattern and gold location observed during cleanup. Certainly the amount of material being treated by the undercurrent and the amount of water that accompanies the fines, together with the manner in which they enter the undercurrent area have a large effect on the behaviour of whatever riffle is used. It would appear that in undercurrents not subject to high water and solid flows that expanded metal is preferred over angle iron due to better fine gold recovery and less concentrate. The use of undercurrents in dump boxes is common, as this type of undercurrent is easy to install without modifying the box. The riffles used are usually one or two layers of expanded metal with a few operators using small angle iron.

In the Mayo area a small number of operators use grader blades as part or all of their riffles in their single run sluice boxes. The blades were overlapped in such a manner as to create sufficient eddying and also provide pockets for coarse gold to be caught. In some operations, punch plate laid directly on top of matting served as fine gold riffles. The gold was trapped in the holes in the plate. One operation used small pieces of angle iron welded vertically, with the 90° corner facing upstream, to traditional angle iron riffles. This was claimed to improve the fine gold recovery of the system. A few other operators used angle iron riffles with holes along the top.

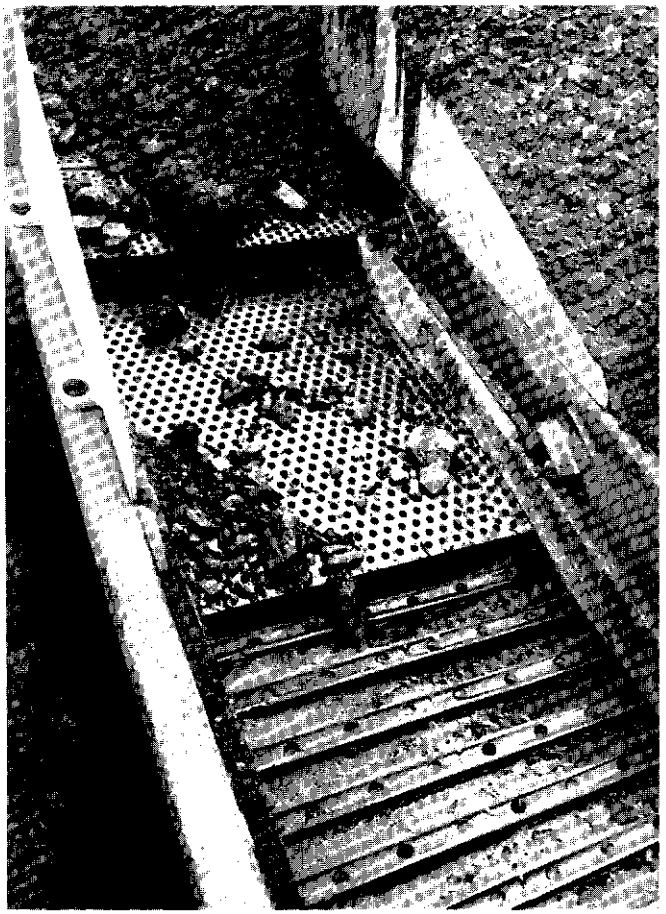

Figure 5: Punch plate over angle iron riffles with holes along the top. (J.H. '84)

The depth of water and its velocity in the main sluice run are functions of the slope of the sluice, amount and size of the solids carried, water flow rate, and type of riffles employed. The variety of combinations employed by Yukon placer miners result in a wide spectrum of flow conditions. In this respect it's easy to see why, as many miners point out, that no two sluice boxes operate exactly the same. Indeed, depending on the combination of variables previously mentioned two identical sluice boxes with identical flow rates can have very different flow conditions.

A general guide to the amount of water used per minute in a sluice run is given in Figure 6. The graph indicates only the amount of water flowing in the sluice box. The depth of flow due to gravel in the sluice box is not included. The graph was modified by G. Gilbert from a diagram prepared by R & M Consultants, Inc., Fairbanks, Alaska, and published in "Placer Mining Settling Pond Design Handbook" by Alaska Department of Environmental Conservation.

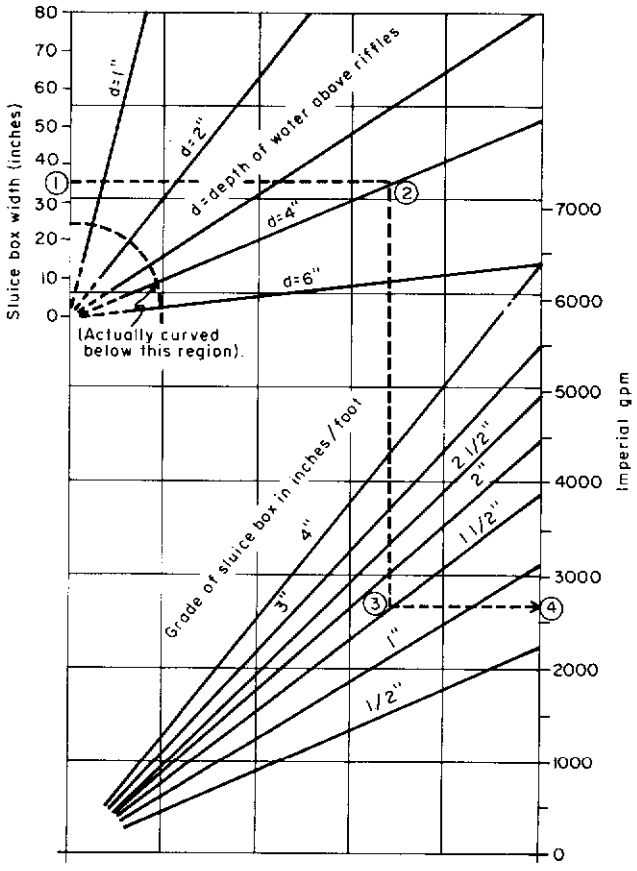


Figure 6: General guide to the amount of water used per minute in a sluice box.

A line drawn out across the top part of the graph from a selected sluice run width (1) intersects a series of lines representing water depths in the run (2, for a water depth of 4 inches). A line drawn down from the intersection of sluice width and water depth lines intersects a second series of lines representing various sluice run gradients (3, for a gradient of 1 1/2 inches per foot). The gradient line is intersected opposite to a scale at the right side of the figure (4). The scale indicates the number of Imperial gallons of water per minute required to provide a sluice run of a given width, with a certain depth of water for sluicing when set at a particular gradient. In the example shown by 1, 2, 3, 4 on Figure z, a sluice run 36 inches wide with water 4 inches deep and a gradient of 1 1/2 inches to the foot, requires 2,700 igpm of water.

## Conclusion

Their preference for the sluice box indicates that Yukon placer miners still regard it as the most cost effective method of treating placer gold deposits. Though simple to construct and operate, the behaviour of a sluice box is really quite complex. This is part of the reason that it has not been extensively researched. There are a number of variables that affect the behaviour of a sluice box. The most important variables, from a gold concentrating point of view, are:

1. sluice width
2. feed rate of solids - the true instantaneous feed rate can vary greatly about the average or nominal feed rate
3. flow rate of water
4. geometry of solid and water feed
5. riffle configuration
6. upper feed size
7. feed gravel composition
8. sluice length
9. sluice gradient
10. gold size distribution and shape description
11. externally supplied motion to the sluice box
12. composition of active area in sluice bed (%heavy minerals)
13. water viscosity

The feed rate of water or gravel per foot of sluice width, riffle configuration, and feed geometry vary considerably throughout the Yukon. Certainly, natural variations in gravel composition, types of gold (coarse- and fine-grained, nuggets or flakes), and percentage of heavy minerals including magnetite, pyrite, garnets, scheelite, and cassiterite necessitate some differences in configuration and operation. The great variety of operating practices observed has, however, always intrigued the author because they seem to be far in excess of that required even with the preceeding considerations. In this respect, the Yukon is no different from the rest of the North American placer mining industry. The lack of concensus among placer miners indicates the need for a more fundamental understanding of the sluice box.

## Acknowledgements

The author wishes to express his thanks to Colin MacDonald, D.I.A.N.D. for the opportunity of observe the placer operations in the Yukon during the 1984 season. Bob Whittingham, Lee Olynyk, and George Gilbert spent many hours answering questions and providing valuable insights regarding the placer mining industry in the Yukon. Thanks are also due to Ruth Debicki for her helpful comments regarding the editing and final preparation of this report.

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## "FINE GOLD" (particle size)

"Fine gold" is a relative term which seems to depend more on geographical location than on any scientific rationale.

A few examples of what is considered "fine gold" are given below.
(Tyler mesh size refers to screens in common use throughout the world and especially in North America. For example, one square inch of #10 mesh has 10 wires intersected at right angles by 10 other wires, i.e. - the aperture is 1/10 inch minus the wire diameter. Gold particles which will pass through 10 mesh but remain on 40 mesh are designated " -10 + 40 mesh")

| | | diam.(mm) | Tyler mesh" |
|---|---|---|---|
| B.C. | "fine" | -1.5 + 0.35 | -10 + 40 |
| | "flour" | -0.35 | -40 |
| Calif. | "fine" | -0.84 +0.35 | -20 + 40 |
| U.S.S.R. | "fine" | -0.315+0.10 | -48 + 150 |
| | "minute" | -0.10 +0.037 | -150+ 400 |
| | "dispersible" | -0.037 | |
| Wang Wenqian/G.W. Poling (suggested) | | | |
| | "fine" | -0.074 | -200 |
| Lindgren W. (circa 1920) | | | |
| | "fine" | (12000 colors/oz.) | |
| | "flour" | (40000 colors/oz.) | |

Can. Dept. of Mines (circa 1918)
"A flat particle of gold weighing one-billionth of an ounce can be seen with the naked eye".

G.W. Gilbert.

# Review of Queenstake's Placer Mining Operations, Yukon Territory

by
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Presented at the Seventh Annual Conference
on Alaskan Placer Mining,
University of Alaska, Fairbanks,
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## Introduction

Queenstake Resources Ltd. is a publicly owned resource company that was founded in 1977 on hardrock and placer properties located in the Dublin Gulch area of the Mayo Mining District. Since 1977, Queenstake has invested approximately $10 million in the Yukon, primarily in placer gold exploration and development, and hardrock exploration. The company has four placer gold mining operations in the Dawson Mining District. There is a bucketline dredge operation at Clear Creek, as well as three bulldozer-sluice box operations on Black Hills, Maisy May, and Little Gold Creeks.

This review is of activities at the Black Hills Creek and the Clear Creek operations during 1983 and 1984. Since the capacity of the Black Hills Creek operation was almost doubled in 1984, comparison of 1983 and 1984 operating statistics for it allows a comparison of mining operations of different scales, working under virtually identical conditions. The capacity of the Clear Creek operation was less than that at Black Hills Creek in either 1983 or 1984. A comparison of 1983 and 1984 operating statistics at Clear Creek with those at Black Hills Creeks allows a further comparison of mining operations of different scales, as well as comparisons of mining operations working under different conditions, and using different methods.

## Black Hills Creek

### Property

The property is located along the upper reaches of Black Hills Creek, 80 miles southeast of Dawson City. It can be reached from Dawson City by way of 10 miles of Klondike Highway and 70 miles of secondary gravel road.

The Black Hills Creek property covers 7 miles of a northerly trending, meandering stream valley bordered by steep valley walls on the west and by low lying, irregular flat benches and gentle slopes on the east. The property starts 8 miles upstream from the mouth of Black Hills Creek at an elevation of 1,550 feet, and continues upstream 8 miles to an elevation of 2,000 feet. The valley bottom in the mine area is flat and varies from 400 to 600 feet in width. The property is located in N.T.S. area 115 O 7, and is shown as location 4 on map 115 O/N in the second part of this volume. The Black Hills property has a drainage basin of 120 square miles. Summer flow rate of southerly-flowing Black Hills Creek is estimated to be 30 cubic feet per second or 11,250 igpm.

The annual precipitation is 12 inches, with cumulative snowfall of 2 feet. The mean summer temperature is 48° F. Vegetation present consists of muskeg with stunted black spruce. The property is underlain by highly metamorphosed sedimentary rocks. It was not glaciated.

### Placer Deposits

Deposits at the Black Hills Creek property consist of 11 feet of gravel overlain by 6 to 15 feet of silty frozen black muck with a water/ice content of 20 to 40%. The gravel is classified as boulder cobble gravel. Boulders from 1 to 2 feet across generally comprise 2 to 5% of the deposit, but in some areas of blocky bedrock, subrounded boulders range up to 4 feet across, and boulders from 1 to 2 feet across make up 5 to 10% of the material. Clay is seldom found on the gravel-bedrock interface, where the gold is concentrated.

The fineness of the gold averages 750. Less than 2% of the gold recovered is coarser than 10 mesh (1/15 inch in diameter). The majority of it is between 70 and 10 mesh in size (1/135 and 1/15 inch in diameter).

Reserves at the property were outlined by a drilling program of 327 churn drill holes carried out by Yukon Consolidated Gold Corp. between 1936 and 1938. Reserves total 4.6 million cubic yards of gravel averaging 0.009 ounces of gold per cubic yard. Included in the 4.6 million cubic yards is 1.1 million cubic yards averaging 0.014 ounces of gold per cubic yard.

### Mining Operations

Mining operations at Black Hills Creek were carried out with 9 employees in 1983, and 12 employees during 1984. During both 1983 and 1984, stripping using a Cat D9H or D9L bulldozer was started in the spring prior to mining, and continued through the summer season until two to three weeks after mining and sluicing were completed. During both years, mining and sluicing were carried out on one twelve to fourteen hour day shift, and stripping was done on one twelve hour night shift. There were two bulldozer operators, a loader operator, and a monitor operator-rock puller on the sluice during the day shift, and one bulldozer operator during the night shift during 1983. Crews used were the same during 1984, with the addition of one loader operator on the day shift, and two general labourers.

A listing of positions held by employees at the Black Hills Creek operation during 1983 and 1984 is given in Table 1.

Mining equipment used during 1984 had a higher capacity than the equipment used in 1983. The major pieces of equipment used during the two seasons are listed in Table 2.

The D9H bulldozer was used in 1983, and the D9L bulldozer was used in 1984 to feed the sluice box. Tailings were stacked during both years by a rubber tired loader. The increase in production achieved

in 1984 by the increased staff using equipment of higher capacity than in 1983 is outlined by Table 3.

Table 1: Black Hills Creek Employees

| Position | 1983 | 1984 |
|---|---|---|
| Manager | 1 | 1 |
| Bulldozer Operator | 3 | 3 |
| Loader Operator | 1 | 2 |
| Master Mechanic | 1 | 1 |
| Sluice Tender | 1 | 1 |
| General Labour | 0 | 2 |
| Gold Cleanup | 1 | 1 |
| Cook | 1 | 1 |
| Total[1] | 9 | 12 |

Note 1: Black Hills Creek operations shared an expeditor with other Queenstake Resources Ltd. operations.

Table 2: Black Hills Creek Equipment[1]

| Equipment | 1983 | 1984 |
|---|---|---|
| D8K bulldozer (300 hp.)[2] | 1 | 0 |
| D9H bulldozer (410 hp.)[2,3] | 1 | 1 |
| D9L bulldozer (460 hp.)[3] | 0 | 1 |
| 980C loader (200 hp.) | 1 | 2 |
| 3208 10x12 pump (250 hp., 3,500 igpm) | 1 | 0 |
| 3406 10x12 pump (325 hp., 5,000 igpm) | 0 | 1 |

Note 1: All equipment was made by Caterpillar.
Note 2: Both bulldozers used in 1983 were equipped with rippers and U blades.
Note 3: Both bulldozers used in 1984 were equipped with multishank rippers and U blades.

Table 3: Black Hills Creek Production

| | 1983 | 1984 | Change |
|---|---|---|---|
| Operating Season | May 22 to Sept 29 | May 20 to Sept 28 | - |
| Days of Operation | 111 | 121 | +9% |
| Hours of Operation | 1,221 | 1,334 | +9% |
| Operating Hours per day | 11 | 11 | +/- 0% |
| Cu.yd. per hour | 150 | 285 | +90% |
| Cu.yd. per day | 1,649 | 3,140 | +90% |
| Cu.yd. per season | 183,000 | 380,000 | +107% |

The sluice used in 1984 also had a larger capacity than the one used in 1983. A comparison of the two units is given in Table 4.

A maximum of 5,000 igpm of water was used for sluicing, of which 50 to 75% was recirculated.

The mining plan used in 1983 differed somewhat from the one used in 1984. During 1983, mining was done selectively. Only the pay channel was taken, and ground containing less than 0.01 oz. of gold per cu.yd. was not mined. During 1984, the lower grade ground surrounding the pay channel was mined along with the pay channel, giving a lower average grade for the material mined, but increasing the mineable reserves. The differences in production, average grade, and gold recovery in 1983 and 1984 are listed in Table 5.

Table 4: Black Hills Creek Sluice Units

| Sluice Part | 1983 | 1984 |
|---|---|---|
| Dump box length | - | 20 ft |
| Dump box width at end | 20 ft | 25 ft |
| Dump box width at throat | 4 ft | 5 ft |
| Number of sluice runs | 1 | 1 |
| Width of sluice run | 4 ft | 5 ft |
| Length of sluice run | 50 ft | 30 ft |
| Dump box riffle area[1] | 80 sq ft | 132 sq ft |
| Dump box riffle type[2] | Hungarian[3] | Hungarian[3] |
| Sluice run riffle area | 200 sq ft | 150 sq ft |
| Sluice run riffle type | Hungarian[4] | Hungarian[4] |
| Total riffle area | 280 sq ft | 282 sq ft |
| Capacity per hour | 150 cu yd | 285 cu yd |

Note 1: Riffles were set only in the lower portion of the dump boxes; the upper portion was slick plate.
Note 2: All riffles were set over expanded metal and coco matting.
Note 3: Punch plate with 3/4 inch holes was used over the riffles in the dump boxes in 1983 and 1984.
Note 4: Punch plate with 5/8 inch holes was used over the riffles in the first five feet, and punch plate with 1/2 inch holes was used over the riffles in the second five feet of the sluice used in 1984.

Figure 1: View upstream along Black Hills Creek showing two bulldozers pushing gravel to the sluice. Tailings and settling ponds are downstream from the sluice. (L.O. '83)

Operating Costs

Operating costs as outlined in Table 6 are the costs of annual operation, and include the cost of opening inventory plus direct operating costs, less the value of closing inventory and development work. Costs of property acquisition, equipment

purchase, and financing are not included.

Table 5: Black Hills Creek Gold Recovery

| | 1983 | 1984 | Change |
|---|---|---|---|
| Production, cu yd | 183,000 | 380,000 | +107% |
| Recovered gold (crude oz) | 3,797 | 4,653 | +23% |
| Gold fineness | 760 | 754 | -1% |
| Recovered gold (fine oz) | 2,886 | 3,508 | +22% |
| Grade (fine oz per cu yd) | .0158 | .0092 | -42% |

Table 6: Black Hills Creek Operating Costs

| | 1983 | | 1984 | | |
|---|---|---|---|---|---|
| | $/cu yd | % | $/cu yd | % | Change |
| Opening inventory | - | 0 | .13 | 4 | - |
| Personnel | 1.68 | 40 | 1.20 | 41 | -25% |
| Camp costs | .26 | 6 | .23 | 8 | -15% |
| Communications | .04 | <1 | .02 | <1 | -52% |
| Gold refining | .03 | <1 | .02 | <1 | -33% |
| Office | .04 | <1 | .03 | 1 | -25% |
| Property | .01 | <1 | - | - | - |
| Fuel | 1.22 | 29 | .83 | 28 | -32% |
| Travel | .08 | 2 | .03 | 1 | -63% |
| Equipment cost | 1.22 | 29 | .78 | 27 | -36% |
| Vehicle | .04 | <1 | .03 | 1 | +/-0% |
| Sub total | 4.62 | 109 | 3.31 | 113 | -26% |
| less: | | | | | |
| Closing inventory | .27 | (6) | .39 | (13) | |
| Capitalization | .14 | (3) | - | - | |
| Total cost | 4.21 | 100 | 2.92 | 100 | -31% |

The cost per cubic yard of material mined is listed again in Table 7, along with the cost per fine ounce of gold recovered. The figures for each year are listed in both Canadian and U.S. dollars.

Table 7: Black Hills Creek Cost Comparisons

| | 1983 | 1984 | Change |
|---|---|---|---|
| Operating costs | $770,460.00 | 1,108,346.00 | +44% |
| Cost/cu yd (Cdn) | 4.21 | 2.92 | -31% |
| (U.S.) | 3.42[1] | 2.25[2] | -34% |
| Cost/fine oz (Cdn) | 267.00 | 316.00 | +18% |
| (U.S.) | 216.00 | 243.00 | +12% |

Note 1: The 1983 exchange rate used was $1.00 Cdn to $.81 U.S.
Note 2: The 1984 exchange rate used was $1.00 Cdn to $.77 U.S.

Comparison of 1983 and 1984 Operations

A comparison of the 1983 and 1984 operations at Black Hills Creek affords a comparison between two operations of different sizes using the same methods to mine under virtually identical conditions. In 1984, there was an increase of 107% in the amount of material processed, with a drop in average grade of 42%. Although the cost per cubic yard of material moved was reduced by 31%, it cost 18% more to produce an ounce of gold in 1984 than it did in 1983. This increase in the cost per counce of gold was, however, more than offset by a 22% increase in gold production. The break-even grade was reduced from 0.0105 ounces per cubic yard in 1983 to 0.0073 ounces per cubic yard in 1984, assuming a gold price of $400.00 Cdn (or $300.00 U.S.) per ounce. Mineable reserves were thus significantly increased.

## Clear Creek

### Property

The property is located along the Right Fork of Clear Creek, 69 miles east-southeast of Dawson City. It can be reached from Dawson City by way of 60 miles of Klondike Highway and 24 miles of secondary gravel road.

The Clear Creek property covers 11 miles of the easterly trending Right Fork of Clear Creek, which is bordered by gentle to steep rounded slopes. The property starts 23 miles from the mouth of Clear Creek at an elevation of 2,480 feet, and the dredgeable portion of the valley extends upstream 7 miles to an elevation of 3,250 feet. The valley bottom is flat, and varies from 150 to 500 feet in width. The property is located in N.T.S. area 115 P 14, and is shown as location 7 on map 115 P in the second part of this volume. The Clear Creek property has a drainage basin of 26.4 square miles. Summer flow rate of the westerly-flowing Right Fork of Clear Creek is estimated to be 24 cubic feet per second or 9,000 igpm.

The annual precipitation is 15 inches, with cumulative snowfall of 2 feet. The mean summer temperature is 47° F. Vegetation present consists of muskeg with stunted black spruce. The property is underlain by highly metamorphosed sedimentary rocks. It was glaciated by a pre-Reid glacial event, and was on the margin of areas affected by the younger Reid and McConnell glacial events.

### Placer Deposits

Deposits at the Clear Creek property consist of 8 to 14 feet of gravel overlain by 2 to 4 feet of silty frozen black muck with a water/ice content of 20 to 40%. The gravel depth occasionally reaches 20 feet. Few large boulders are present in the deposits, which are classified as cobble gravel. A high percentage of clay is mixed with the gravel at the gravel-bedrock interface, which is where the gold is concentrated.

The fineness of the gold averages 800. Less than 10% of the total gold recovered is coarser than 10 mesh (1/15 inch in diameter). Ninety per cent of the gold is between 70 and 10 mesh in size (1/135 and 1/15 inch in diameter).

Reserves at the property were outlined by a sampling program of 162 backhoe pits and a drilling program of 25 rotary drill holes carried out by Queenstake Resources Ltd. between 1979 and 1984. Reserves remaining total 900,000 cubic yards of gravel averaging 0.011 ounces of gold per cubic yard.

**Mining Operations**

Mining operations at Clear Creek were carried out with 10 employees in 1983 and 1984. Ground was stripped ahead of the dredge by a D9H bulldozer working 6 hours each day. Mining and sluicing were done by a Walter Johnson 3.5 cubic foot bucketline dredge working 22 hours per day. Mining was done on three ten-hour shifts per day. A winchman and oiler were required on each shift to operate the dredge. The day shifts overlapped by 6 hours, during which period one winchman and oiler used the D9H bulldozer to do stripping, or carried out other miscellaneous work on the dredge or at the shop. The dredge was shut down for two hours daily for maintenance.

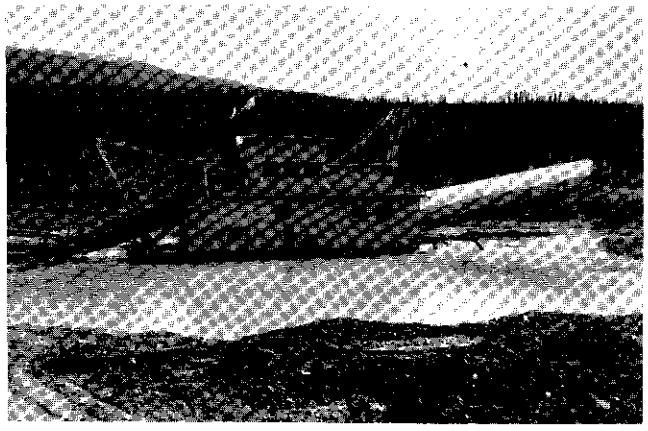

Figure 2: View of the bucketline dredge at Clear Creek. The bucketline is at left. The tailings leave the dredge at the end of the sluices, and by way of the conveyor or stacker at right. (G.G. '83)

A listing of positions held by employees at the Clear Creek operation during 1983 and 1984 is given in Table 8.

Table 8: Clear Creek Employees

| Position | 1983 | 1984 |
|---|---|---|
| Manager | 1 | 1 |
| Winchman | 3 | 3 |
| Oiler | 3 | 3 |
| Master Mechanic | 1 | 1 |
| Gold Cleanup | 1 | 1 |
| Cook | 1 | 1 |
| Total | 10[1] | 10[1] |

Note 1: Clear Creek operations shared an expeditor with other Queenstake Resources Ltd. operations.

Major pieces of equipment used during 1983 and 1984 consisted of the 410 hp. Caterpillar D9H bulldozer equipped with U blade and ripper, which was used for stripping, and the dredge. The dredge was powered by a 300 Kw, 420 hp. diesel electric generator. It had a capacity of 75 to 100 cubic yards per hour, with a maximum digging depth of 20 feet. Material was mined and fed to the trommel by the bucketline. Undersize from the trommel was divided between a number of sluice runs totalling 760 square feet. All sluice runs were lined with angle iron Hungarian riffles set over expanded metal and coco matting. Fine tailings from the sluice runs were released into the dredge pond behind the dredge, and were ultimately covered by coarse tailings from the trommel fed to the tailings piles by conveyor belt. Up to 5,500 igpm of water was used for sluicing, with 50 to 75% of it being recirculated. Production rates for the mining seasons of 1982, 1983, and 1984 are listed in Table 9.

Table 9: Clear Creek Production

| | 1982 | 1983 | 1984 |
|---|---|---|---|
| Operating season | June 23 to Oct 22 | June 2 to Oct17 | May 30 to Oct 18 |
| Days of operation | 122 | 138 | 128 |
| Hours of operation | 2,621 | 2,998 | 2,904 |
| Operating hours per day | 21.4 | 21.7 | 22 |
| Cu yd per hour | 71 | 72 | 66 |
| Cu yd per day | 1,512 | 1,562 | 1,468 |
| Cu yd per season | 184,450 | 215,600 | 193,880 |

During 1983, the ground had an unusually high grade. In addition, the fineness of the gold recovered that year was slightly higher than that of gold recovered during 1982 and 1984. The differences in gold recovery in 1982, 1983, and 1984, and the differences in grade and gold fineness of the material mined, are outlined in Table 10.

Table 10: Clear Creek Gold Recovery

| | 1982 | 1983 | 1984 |
|---|---|---|---|
| Production, cu yd | 184,450 | 215,600 | 193,880 |
| Recovered gold, crude ounces | 2,020 | 5,252 | 2,023 |
| Gold fineness | 801 | 806 | 784 |
| Recovered gold, fine ounces | 1,619 | 4,232 | 1,586 |
| Grade, fine ounces per cubic yard | 0.0088 | 0.0196 | 0.0082 |

**Operating Costs**

Operating costs as outlined in Table 11 are the costs of annual operation, and include the cost of opening inventory plus direct operating costs, less the value of closing inventory. Costs of property acquisition, equipment purchase, and financing are not included.

The cost per cubic yard of material mined in 1982, 1983, and 1984 is listed again in Table 12, along with the cost per fine ounce of gold recovered. The figures for each year are listed in both Canadian and U.S. dollars.

Table 11: Clear Creek Operating Costs

| | 1983 | | 1984 | | |
|---|---|---|---|---|---|
| | $/cu yd | % | $/cu yd | % | Change |
| Opening inventory | .46 | 14 | .51 | 13 | +10% |
| Personnel | 1.48 | 46 | 1.68 | 44 | +14% |
| Camp costs | .29 | 9 | .30 | 8 | +3% |
| Communications | .02 | <1 | .02 | <1 | +/-0% |
| Gold refining | .02 | <1 | .02 | <1 | +/-0% |
| Office | .08 | 3 | .12 | 3 | +50% |
| Property | .02 | <1 | - | - | - |
| Fuel | .52 | 16 | .62 | 16 | +19% |
| Travel | .02 | <1 | .02 | <1 | +/-0% |
| Equipment cost | .74 | 23 | .77 | 20 | +4% |
| Vehicle | .04 | 1 | .03 | <1 | -25% |
| Sub total | 3.69 | 114 | 4.10 | 107 | |
| Less: | | | | | |
| Closing inventory | .46 | (14) | .26 | (7) | |
| Total cost | 3.23 | 100 | 3.84 | 100 | +19% |

Table 12: Clear Creek Cost Comparisons

| | 1982 | 1983 | 1984 |
|---|---|---|---|
| Operating costs | 789,605.00 | 696,619.00 | 744,345.00 |
| Cost/cu yd (Cdn) | 4.28 | 3.23 | 3.84 |
| (U.S.) | 3.44[1] | 2.62[2] | 2.95[3] |
| Cost/fine oz (Cdn) | 391.00 | 164.00 | 469.00 |
| (U.S.) | 314.00 | 134.00 | 361.00 |

Note 1: The 1982 exchange rate used was $1.00 Cdn to $.80 U.S.
Note 2: The 1983 exchange rate used was $1.00 Cdn to $.81 U.S.
Note 3: The 1984 exchange rate used was $1.00 Cdn to $.77 U.S.

### Comparison of 1982, 1983, and 1984 Operations

Operations carried out during 1982, 1983, and 1984 used the same equipment and the same number of employees. The amount of material mined each season was within 20% of the amount of material mined during the other two seasons. Costs per cubic yard of material moved were within 25% of costs during the other two seasons. Costs per fine ounce of gold recovered differed, however, by up to almost 200% as a result of the large difference in the grade of the material mined during the three years.

### Comparison of Black Hills Creek and Clear Creek

Both properties have good road access from Dawson City, the supply centre. Clear Creek is 5 miles further than Black Hills Creek but has 46 miles less secondary gravel road.

Clear Creek lies in an east-west trending valley which is somewhat narrower than the north-south valley of Black Hills Creek. Clear Creek consequently receives less sunshine during the warmest part of the day, with the result that the gravel thaws more slowly there than at Black Hills Creek. Clear Creek is also approximately 1,000 feet higher in elevation than Black Hills Creek, resulting in shorter mining seasons at Clear Creek. The use of the dredge at Clear Creek allows longer mining seasons than would be possible with bulldozers.

Glaciation and related factors at Clear Creek destroyed any original gold-bearing channel, and redistributed the gold in a number of irregular, discontinuous channels, making grade control difficult.

The area of the watershed of Clear Creek is one-fourth the area of that of Black Hills Creek, resulting in a minimum of available water during dry periods at Clear Creek.

Clear Creek has less overburden than does Black Hills Creek. Stripping ratios at the properties are 0.3 to 1, and 1 to 1 respectively. The gravel at Clear Creek is cobble gravel with few large boulders. Mining and washing is easy, except at the gravel-bedrock interface where the gold is concentrated, and where a high concentration of clay and silt results in slow, difficult washing. At Black Hills Creek, the gravel and decomposed bedrock are easily washed, but in place large boulders result in slow mining and cost increases.

Although the overall mining plan is similar at the two properties, they are mined by different mining equipment. The choice of equipment was dictated by availability more than by foresight, but the equipment used is appropriate for each site.

Variations in costs at the operations during 1983 and 1984 resulted from physical differences in the properties as well as the equipment used to mine. The length of the mining season, and transportation, stripping, mining, and sluicing costs were affected by the physical characteristics of the two properties. Mining costs were also affected by the capacity and fuel consumption rates of equipment used to work them. Costs per ounce of gold recovered were affected by all the factors already listed, as well as by the grade of the gravel, and the fineness and recoverability of the gold contained in it.

### Conclusion

This comparison of Queenstake Resources Ltd.'s placer mining operations describes the activities of a relatively small mining company by international standards, although large by Yukon placer mining ones. The company is attempting to develop mining methods to economically mine low grade placer deposits in a high cost area. Mining plans will continue to be modified to meet current conditions. Modifications will include systematic sampling to improve grade control and to minimize dilution, and optimization of equipment use to reduce crew size and lower overall operating costs. In order for a company like Queenstake Resources Ltd. to survive the variable, and unfortunately present downward trending gold price, it must continue to modify mining plans and to improve operating efficiency.

### Acknowledgements

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# Underground Placer Mining in Yukon

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## History

The past history of gold mining in the Klondike area has always been very much concerned with permafrost. In reports of the Geological Survey of Canada for 1898, just 2 years after discovery of gold in the Klondike, and in 1903, reference is made to the mining methods used in frozen ground.

The first account describes shaft sinking by lighting fires on the ground, after some time removing a few inches or more of thawed ground, and then repeating the process until bedrock was reached. The sides of the shaft remained firm without timber. If the gravel at bedrock was rich enough, the ground was chambered out from the bottom of the shaft.

The 1903 report indicates that by that time the thawing was being done by steam points or cold water under pressure, rather than by fire. Again shafts were sunk to bedrock, and drifts were driven to the edge of the claim or the limit of the pay gravel. The pay streak was mined by a retreat system, in which a series of drifts were extended out from the base of the shaft or shafts to the edge of the claim or the edge of the pay gravel, the drifts were connected by crosscuts, and the gravel was mined out beginning with the blocks of ground farthest from the shaft. The report also refers to the stability of the frozen backs, or hangingwalls, and describes how chambers without any support were established up to the incredible size of 140 feet by 230 feet.

Somewhat later, practically all the mining was done by surface methods. For both hydraulic mining and dredging, the permafrost was a severe impediment to efficient and economic mining. Actual cost figures are scarce, but some figures for dredging in 1930 indicate that almost 25% of the total mining cost was the cost of thawing ground.

In recent years in the Dawson and Sixty Mile River areas, miners are once more mining underground at the bedrock-gravel interface, only this time the mining method used employs jumbo drill rigs, explosives for blasting, and modern diesel-powered trackless equipment for muck handling. Underground mining of frozen placer deposits has come a long way from steam points, hand shovels, wheelbarrows and windlasses!

## The New Era

In the summer of 1981, development work was started at two different locations. The work was designed to bring into production ground considered too deep or too difficult for surface mining.

One of these programs was on Dago Hill, on the left limit of Hunker Creek, where White Channel Underground Mining Ltd. began mining an area of White Channel gravel which had drill indicated reserves at bedrock. The layer of gold-bearing gravel was about 8 feet thick, and carried somewhat better than 0.08 ounces of gold per cubic yard. The gold-bearing gravel was overlain by approximately 100 feet of frozen gravel. A tunnel was collared close to bedrock on a north facing slope, and driven towards the pay zone. The first 80 feet were timbered to where the heading was well into permafrost ground. The plan for the project was to drive dual parallel headings 20 feet wide and separated by an 80 foot pillar in the pay zone, from the end of the timber.

To maintain the underground temperature below freezing, all the equipment employed was pneumatic, and the ventilation air was refrigerated. In the Klondike, the permafrost is only a very few degrees below freezing, while in summer the ambient outside temperature is often around plus 20° C 24 hours a day. The refrigeration unit used was, unfortunately, too small to keep the temperature of the underground workings below freezing. The result of this was that the drift backs loosened or sloughed, so the project was stopped for safety reasons.

Also during the summer of 1981, another underground project was initiated by Chumar Placers Ltd. at Miller Creek, a tributary of the Sixty Mile River, about 100 miles west of Dawson. At the Miller Creek mine, a buried channel was identified by earlier work. It lies parallel to the present Miller Creek and about 800 feet from it, and is separated from the newer channel by a ridge of bedrock about 300 feet wide. The pay streak was again on bedrock at this location, and was again approximately 8 feet thick. It was overlain by 60 to 80 feet of gravel and black muck, both of which were permafrost. The mining plan at Miller Creek was somewhat different from the one at Dago Hill. An adit was collared near the present creek, and advanced through the solid rim rock in the direction of the pay gravel. This cross-cut was advanced 310 feet through bedrock, requiring timber. When the heading reached the frozen gravel, work was suspended to await the onset of cold winter weather which would allow work to proceed using the refrigeration that the good Lord would provide in abundance.

## Winter Mining Operations

In the fall of 1981, the camp of Chumar Placers Limited on Miller Creek was winterized. With the onset of winter weather in early October, underground work was resumed. This operation used diesel equipment for muck hauling. Because diesel equipment was used, the company was required by the Mining Regulations to supply the underground workings with ventilation by mechanical means at a minimum rate of 75 cubic feet of air per minute per

engine horsepower. The air requirement was supplied by an electric fan and plastic ventilation tubing. This amount of cold air proved sufficient to dilute the engine exhaust fumes and also to keep the mine air temperature well below freezing. Development work continued, following the bedrock surface down a gentle slope until it flattened off at the base of the buried channel. Work continued throughout the winter until warmer weather caused a shut down in early May. The portal was well sealed to prevent air circulation to the workings, with the result that very little deterioration of the backs took place during the summer. Since the winter of 1981-1982, work has been done each winter at the Miller Creek Mine by Chumar Placers, Klondike Sand and Gravel Co. Ltd., and in 1984-195, by Klondike Underground Mining Ltd.

Perhaps influenced in part by the successful operation at Miller Creek during the winter of 1981-1982, two more underground operations started during the fall of 1982. On Dago Hill where the underground work of White Channel Underground Mining Ltd. had been suspended during the summer of 1981, a new joint venture was formed between Miben Mining Company, the claim holders, and a local underground development contractor called Mainstreet Mining. Mining methods used were similar to those used at Miller Creek Mine. A Gardner Denver air track supplied with air from an air compressor located outside was used for drilling, and an Eimco diesel load-haul-dump unit was used for mucking. Ventilation air was supplied by a 24 inch high capacity electric fan, and plastic ventilation tubing. Mainstreet Mining continued work at Dago Hill during the 1982-1983, and 1983-1984 mining seasons.

Jackson Hill Ventures also started underground work during the fall of 1982. The company mined White Channel gravel deposits on Jackson Hill, on the south side of the Klondike River east of the mouth of Bonanza Creek. The deposits there were again frozen, and consisted of an 8 foot thick pay streak at the bedrock-gravel interface overlain by 150 to 250 feet of gravel. This operation started at the beginning of December, 1982, by collaring a heading on a previously established nearly vertical face of gravel. The level of the drive was close to the elevation of bedrock. Work at this property was continued in 1984-1985 by White Channel Underground Mining Ltd.

A new underground mining operation was begun during 1985 by King Solomon Mines Ltd. at King Solomon Hill, along the left limit of Bonanza Creek.

### Mining Method and Equipment Used

The mining method used could perhaps best be described as a combination of room and pillar mining, and gopher holing. In most cases, information on the limits of the pay ground is lacking, and the mining is in part development work to prove up production ground. The mining program is thus not as systematic as it might be if the limits of the pay ground were outlined first, and the pay ground then mined on a retreating room and pillar system.

The general approach to the mining program is to establish the start of pay ground, and then advance along the channel with a heading 15 to 20 feet wide and 12 to 18 feet high. At intervals, cross-cuts are driven into the sides of these headings to establish the edges of the pay zone. The cross-cuts may also be opened up, and pillars left between the openings. The size of the headings depends upon the type of equipment being used.

The headings are driven by drilling, blasting, and mucking. The lifters in the blast are placed about 3 feet below the bedrock-gravel interface, as the first foot or two of bedrock is usually gold-bearing. No universal drill pattern is used, although some trends were noted between 1981 and 1984. Chumar Placers Ltd. started with a fairly conventional drill pattern with about 25 holes, including a 4 or 5 hole cut, during 1981. The holes were 1 1/2 inches in diameter by 11 feet long, and were charged with Amex, the ammonium nitrate-fuel oil blasting agent. Dynamite stick powder was used in the cut holes and one priming stick of dynamite was used in each of the other holes. More recent operations have gone to larger diameter holes. A typical drill pattern in 1984 was around 15 holes 2 1/2 or 3 inches in diameter by 11 feet long, with a 2 or 3 hole cut. From 4 to 5 bags of Amex (200 to 250 pounds) are required to blast a round. The ground is generally very easy to break, so advance is good. Table 1 summarizes the drilling and blasting data for several oprations.

Table 1: Drilling and Blasting Data

| Operation | Drill Type | Drill Hole[1] Diam. | Length | Amex Lbs.[2] |
|---|---|---|---|---|
| Chumar Placers (Miller Creek) | GD Jumbo | 2 1/2" | 11' | 225 |
| Mainstreet Mining (Dago Hill, Hunker Creek) | GD Air Track | 2 1/2" | 12' | 250 |
| Jackson Hill Ventures (Jackson Hill, Klondike River) | GD Air Track 3100/123 | 2 1/2" | 12' | 225 |
| White Channel Underground (Jackson Hill, Klondike River) | Copco Tank Drill[3] Copco R-100 | 3" | 11' | 250 |
| King Solomon Mines (King Solomon Hill, Bonanza Creek) | Copco Tank Drill Copco R-100 | 2 1/2" | 11' | 225 |

Note 1: Button bits are used with the Copco drill. The other drills use 4 wing carbide bits.

Note 2: The pounds given are the pounds of Amex used per round of blasting.

Note 3: The Copco tank drill is a self-contained unit consisting of a tracked Bren Gun Carrier chassis equipped with a Copco 400 c.f.m. compressor and Copco R-100 drill.

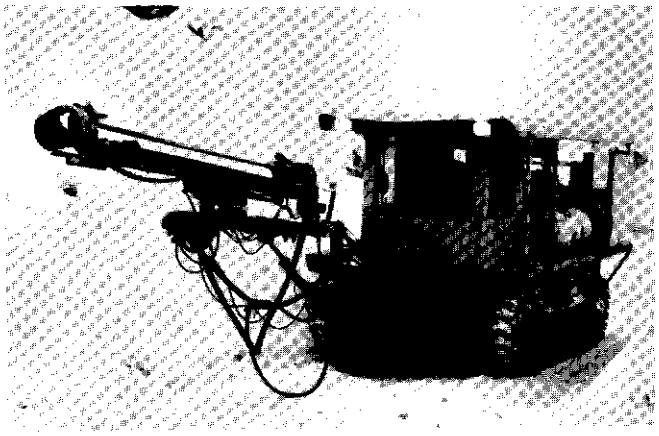

Figure 1: Copco R-100 tank drill used by White Channel Underground Mining Ltd. at Jackson Hill. (C.M. '84)

In all of the mining operations, muck transport is done by various pieces of diesel equipment. As mentioned earlier, the Mining Regulations require a minimum of 75 cubic feet of air per minute per horsepower be supplied by mechanical ventilation to the area underground where the equipment is operating. The fresh air is supplied by some type of electric fan, ranging from one 12 inches in diameter initially used at Miller Creek Mine by Chumar Placers Ltd. to one 36 inches in diameter used at Jackson Hill. To date, the fans have provided sufficient air to maintain the workings well below the freezing point when the outside termperature is lower than minus 10° C. When the outside temperature approaches 0° C, operations are usually suspended as it gets too warm where the equipment is operating, and the drift backs start to thaw. Mucking and hauling equipment in use at some of the operations is summarized in Table 2.

Figure 2: Loading rounds for blasting at Jackson Hill mine of White Channel Underground Mining Ltd. (C.M. '84)

Table 2: Mucking and Hauling Equipment

| Operation | Type of Equipment | Capacity (cu.yd.) | Monthly Prod'n (cu.yd.) |
|---|---|---|---|
| Chumar Placers (Miller Creek) | Wagner S.T.2 LHD[1] unit | 2 | 5,000 |
| | Eimco 915 LHD unit | 5 | |
| Whitehorse Sand and Gravel (Miller Creek) | Eimco 915 LHD unit | 5 | 6,500 |
| | Eimco D-10 truck | 10 | |
| Mainstreet Mining (Dago Hill, Hunker Creek) | Eimco 912 LHD unit | 2 | 4,000 |
| Jackson Hill Ventures, (Jackson Hill, Klondike River) | Caterpillar 966C loader | 3 | 7,000 |

Note 1: An LHD unit is a load-haul-dump unit.

The range of equipment types in use at these operations reflects what was available from other contracts, or from summer operations.

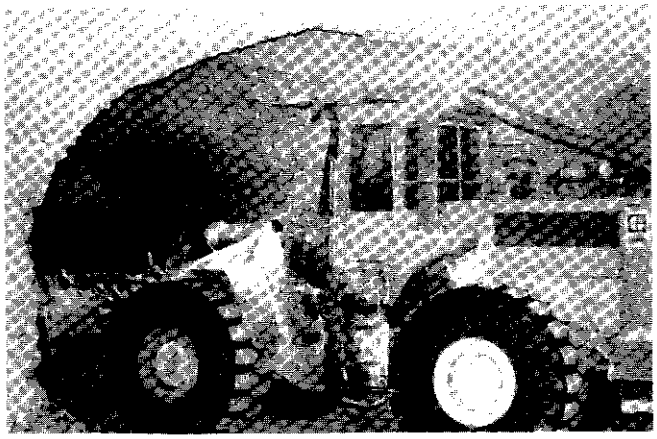

Figure 3: Cat loader mucking out gravel at Jackson Hill Mine of White Channel Underground Mining Ltd. (C.M. '84)

Production Rates

Muck removed from underground placer mines is stored in stockpiles close to where the stockpiles will be sluiced during the summer. Sluicing is usually started in late May or June, depending on the rate of thawing. Production figures for each of the underground operations active during the three complete operating seasons between 1981 and 1984 are listed in Table 3. Monthly production was from 4,000 to 10,000 cu.yd., while the highest production for an entire winter season between 1981 and 1984 was 28,500 cu.yd. Production figures for 1984-1985 are shown in Table 4.

Table 3: Production Figures, 1981 to 1984

| Company | 1981-1982 Cu.yd. | Hrs. | 1982-1983 Cu.yd. | Hrs. | 1983-1984 Cu.yd. | Hrs. |
|---|---|---|---|---|---|---|
| Chumar Placers Miller Creek | 6,000 | 7,300 | 23,000 | 9,500 | - | - |
| Whitehorse Sand and Gravel Miller Creek | - | - | - | - | 28,500 | 11,200 |
| Mainstreet Mining Dago Hill | - | - | 28,000 | 5,200 | 14,000 | 3,500 |
| Jackson Hill Ventures Jackson Hill | - | - | 17,000 | 2,008 | - | - |
| White Channel Underground Dago Hill | 1,000 | 1,000 | - | - | - | - |

Table 4: Production Figures, 1984-1985

| Company | Location | Number of Employees | Season | Production (cu.yd.) |
|---|---|---|---|---|
| Klondike Underground Mining Ltd. | Miller Creek | 8 | Oct '84- Mar "85 | 18,000 |
| White Channel Underground Mining Ltd. | Jackson Hill | 8 | Nov '84- Feb '85 | 39,000 |
| King Solomon Mines Ltd. | King Solomon | 4 | Jan '85- Mar '85 | 13,000 |

Advantages of Underground Placer Mining

This method of mining has been employed profitably in a few locations where an excessive depth of barren or low grade gravel overlies a relatively shallow depth of pay gravel on bedrock. In these cases it was considered that mining all the gravel above bedrock by surface means would have been uneconomic.

This method of mining has also proven economic in the case of Miller Creek, where the old buried channel lies at some distance from the existing channel and is separated from it by a ridge of bedrock.

There is some attraction for this method from an environmental point of view, as the surface remains undisturbed, and the quantity of tailings from the operation is only about 5% of the tailings that would be produced by mining all the ground.

There are also sociological advantages to this method in placer areas such as Dawson City, in providing some winter mining activity and purchasing power from an industry that otherwise only contributes to the economy during the summer. Also, some of the equipment available in winter would otherwise be lying idle all winter.

Disadvantages of Underground Placer Mining

In most cases, the pay streak is not sufficiently well delineated before mining is started. If the pay streak could be accurately laid out in advance, a much more efficient mining plan, such as a true room and pillar system, could be developed. Such a system would provide better control of the grade of the material mined, and would allow recovery of well over 80% of the pay streak.

In deeper ground, it appears that the lower limit of the permafrost is at a depth of about 175 feet. In several cases, mining plans had to be changed radically when thawed ground was encountered.

Drilling has presented a problem with air quality underground. With the underground workings being maintained well below freezing, it would be costly, if not impossible, to utilize wet drilling methods such as would be mandatory in a hard rock mine. The Mining Safety Inspection office has so far been of the opinion that the health of the workers can be protected by keeping a large supply of fresh air close to the site of drilling to dilute any dust from drilling, and by requiring that the drillers always wear approved dust masks. In the case of mucking, the dust problem is not so severe, as it seems the small amount of moisture in the gravel thaws in the blasting process, and lays the dust.

Figure 4: A slab of frozen gravel which has fallen from the roof of the area mined is lying on the floor of this room at the Whitehorse Sand and Gravel Co. Ltd. mine at Miller Creek. (C.M. '84)

The frozen gravel has an impressive tendency to hold up well over relatively wide spans. However, the mining has encountered in all cases fine sand

horizons in the gravel, which are generally nearly parallel to the bedrock, and which form partings and allow the underlying frozen gravel to sag. This results in poor back conditions that require close watching.

The mining operation is controlled to a large extent by the weather. For example, the mean minimum temperature for the months December, January and February from 1940 to 1970 was minus 30° C. For the same 3 months during the winter of 1984-1985, the mean minimum temperature was minus 18° C, and the average temperature for January was an incredibly warm minus 4.7° C!

The time between the relatively high expenditure for mining, and the return on investment when summer allows sluicing and recovery of gold, results in a cost burden. The high interest rates at present increase that burden.

The muck piles of pay gravel, being built up in sub-zero conditions, become solidly frozen. Great care must be exercised when sluicing starts, or all the profits pass through the sluice box in the form of frozen lumps.

## Conclusions

In spite of some false starts and initial problems, underground mining in unsupported frozen gravel has been demonstrated to be a viable mining method. Unfortunately, the fact that so much of the Klondike area has been worked by the old timers makes the work of preparing advanced development plans difficult. If some of the bench ground of Bonanza and Hunker Creeks were still in virgin condition, the gold could be mined out now far more efficiently than by open-cut methods, and the surface would be virtually untouched.

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# AN OVERVIEW OF PLACER DEPOSIT SETTINGS IN YUKON TERRITORY

by
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## INTRODUCTION

Yukon Territory is unique in the Canadian Cordillera as the terrain ranges from unglaciated west-central and northern regions to recently glaciated southern regions (Figure 1). As a result, placer deposits in Yukon occur in five generalized stratigraphic settings. This technical note briefly outlines each of these settings and gives examples in Yukon.

## YUKON GLACIAL HISTORY

During the Pleistocene time period, which began approximately 2 million years ago, 4 Cordilleran ice sheets scoured parts of Yukon Territory (Figure 1). These glacial advances, termed Nansen (oldest), Klaza, Reid and McConnell (youngest) (Bostock, 1966), have limits which are recognizable from features such as moraines, meltwater channels, and elevations of glacial erratics (Hughes et al., 1969). Geomorphic features attributed to Nansen and Klaza glaciations are very subdued and limits are delineated by elevations of glacial erratics (Bostock, 1966). Thus, glacial deposits beyond the Reid limit (i.e. Klaza and Nansen advances) are collectively called pre-Reid (Figure 1). Cordilleran ice sheets in Yukon Territory moved northwesterly and westerly from source areas such as the Cassiar and Selwyn Mountains (Hughes et al., 1969). Each consecutive glaciation (from oldest to youngest) advanced to a lesser extent in central Yukon (Figure 1). Montane or local glaciations also originated from the St. Elias and Ogilvie Mountains during similar time periods as the regional Cordilleran glacial advances (Hughes et al., 1969; Hughes et al., 1983; Tarnocai et al., 1985).

## STRATIGRAPHIC SETTINGS AND GENERAL CHARACTERISTICS OF PLACER GOLD DEPOSITS IN YUKON

Unconsolidated placer deposits in Yukon were formed during five generalized stratigraphic time periods (Table 1). The following discussion reviews each of these periods of gravelly sedimentation with emphasis on general sediment characteristics, gold distribution and mining and exploration implications.

### Pliocene to early Pleistocene placer deposits

Pliocene to early Pleistocene placer alluvium is found as high level terraces, and is usually buried beneath overburden such as glacial drift or nonauriferous alluvium. Examples include terraces close to the upper limit of glaciation in Clear Creek drainage basin and White Channel deposits in the Klondike area (Morison, 1985 a,b).

In the Clear Creek area (Figure 1) buried placer alluvium or buried channels are found below high level terraces or benches of pre-Reid glacial drift. Pre-glacial alluvial deposits close in elevation to the upper limit of pre-Reid glaciation (approximately 945 metres or 3100 feet) were preserved during burial as a result of decreased glacial scour and topographic protection from the advancing ice sheet (Morison, 1985b). Thus, pre-Reid glacial terraces at elevations near limits of glaciation in central Yukon are important areas for the exploration of buried channels.

High level terraces in the Klondike area (Figure 1) contain White Channel placer alluvium which ranges in thickness from a few metres to over 35 metres. White Channel alluvium is stratigraphically below nonauriferous sequences of either glaciofluvial Klondike gravel or younger stream gravel (Hughes et al., 1972; Morison 1985b). The White Channel sequence is characterized by 14 sediment types which range from laminated silt and clay to massive and disorganized boulder gravel (Morison, 1985b). These sediment types were deposited in a braided river environment which included tributary alluvial fan and debris flow sedimentation at the valley sides (Morison, 1985b). Some White Channel terraces and underlying bedrock in the Klondike area have been hydrothermally altered (Dufresne et al., in press). Alteration in White Channel alluvium was first recognized by Tempelman-Kluit (1982) and is characterized by a dramatic increase in clay minerals. Clasts in altered gravel are soft and crumbly, and sedimentary structures are either destroyed or masked by the addition of clay minerals.

Gold concentration in White Channel alluvium increases down-section and is reported to be economic in the lower 1 to 2 metres above the bedrock surface (McConnell, 1907; Gleeson, 1970). However, sorting and placer concentrating mechanisms improve up-section in the White Channel sequence (Morison, 1985b). This indicates that gold concentration should be higher in upper parts of the White Channel deposit, assuming a constant lode source during aggradation. Thus, economic concentrations of gold above the bedrock surface indicates lode sources were available during the early stages of White Channel sedimentation and were depleted during aggradation. It is also important to note that in unaltered White Channel alluvium, gold content is related to the type and distribution of gravelly sediments (Morison, 1985b). Economic concentrations of gold in altered White Channel alluvium is not restricted to the lower few metres above bedrock, and gold distribution does not appear to be related to the type of gravelly sediment. McConnell (1907) showed that gold values for altered hills such as Dago and Paradise were not restricted to the lower few metres above bedrock, and enrichment zones occur up to 20 metres above bedrock. Tempelman-Kluit (1982) was the first to suggest that alteration processes may be responsible for gold mineralization in White Channel alluvium. Thus, in altered White Channel alluvium there may be a hydrothermal style of gold mineralization in addition to gold which was initially deposited in a placer environment. Differentiation of the type of

White Channel alluvium is important when planning a mining or testing program as characteristics such as clay content and gold mineralization change with each setting.

Pleistocene nonglacial placer deposits

During the Pleistocene, stream gravels were continuously deposited in unglaciated areas, and are preserved as low to high terraces and valley bottom fill in placer areas such as the Sixty-Mile and Klondike drainage basins (Figure 1). This type of placer alluvium is characterized by locally derived gravel with a wide range of sorting and sedimentary structures. Pay zones range from continuous streaks on bedrock surfaces to discontinuous concentrations throughout gravelly sequences.

Pleistocene interglacial placer deposits

Between glacial advances stream sedimentation concentrated gold from bedrock and glacial drift and formed alluvial valley bottom fill and low terraces in drainage basins which have not been scoured by subsequent glacial advances. Interglacial placer gravel is very similar to nonglacial placer alluvium, with the exception that gravel clasts are both locally and regionally derived. Examples are not well documented, and areas such as Livingstone Creek are reported to interglacial placer alluvium below glacial drift (Bostock and Lees, 1960). Also, placer alluvium was deposited and preserved as valley bottom fill in areas of pre-Reid terrain such as Big Creek (Figure 1), where subsequent Reid and McConnell glaciations did not advance.

Glacial placer deposits

During glacial intervals, ice-related depositional processes can incorporate placer gold from regional bedrock or paleoplacer sources in terraces of glacio-fluvial or ice contact gravel, terminal and recessional valley moraines, and some stratified till deposits. Examples are common in areas of pre-Reid terrain where early glaciations eroded regional bedrock and paleoplacer sources. For example, in Clear Creek drainage basin (Figure 1) gold is present in glaciofluvial sediments which were deposited during the pre-Reid glacial interval (Morison, 1985a). Reid and McConnell glacial drift does not usually contain placer gold as bedrock and paleoplacer source areas were mantled by pre-Reid drift during these glacial intervals. The grade is lower than for alluvial placers due to the large volume and poor sorting which characterizes these deposits.

Recent placer deposits

After the McConnell glacial advance gold was concentrated in colluvium or slope deposits, and valley bottom alluvial blankets in gulches and streams, and bar deposits in major rivers. Gulch and stream placer deposits are found in narrow valleys with weathered and colluviated slopes. The deposits are generally thin (less than 5 metres), and gravelly sediments are poorly sorted, angular and locally derived. Bar placer deposits are associated with fluvial environments such as braided and meandering streams in wide glaciated valleys. Gold distribution in recent alluvium varies from discrete concentrations to continuous pay streaks above the bedrock surface. Examples of gulch and stream placer deposits are found in Clear Creek drainage basin (Morison, 1985a), and bar deposits have been mined on the Stewart River (Gilbert, 1983). Variable grade and low volume of economic placer gravel typify this type of deposit.

Colluvial placer deposits are best developed where active downslope movement of surface materials is occurring, generally over a weathered bedrock surface, and commonly associated with local primary lode sources. The concentration process involves winnowing and sorting associated with migration of large coarse fragments and heavy minerals during downslope movement. Factors such as slope angle, thickness and type of slope material, size and specific gravity of heavy minerals, coefficient of friction, and seasonal frost all affect the extent and grade of colluvial placer deposits (Boyle, 1979). Both grain size and fineness of gold decreases with distance from the source area (Boyle, 1979). Near the Mayo placer area (Dublin Gulch) small colluvial placers have developed from local bedrock sources (Boyle, 1979). Although there are no economic colluvial placers in Yukon, they are important exploration tools for tracing lode sources in unglaciated terrain.

SUMMARY

Preglacial placer deposits were formed during Pliocene to early Pleistocene stream sedimentation as high level benches or terraces and are usually buried beneath overburden such as glacial drift and nonauriferous alluvium. Throughout the Pleistocene, beyond the pre-Reid glacial limit repeated cycles of downcutting and stream sedimentation concentrated placer gold in thick valley bottom alluvial fill and low to high level terraces. In glaciated areas, drainage basins which were not completely scoured during subsequent Cordilleran ice advances concentrated placer gold through interglacial stream sedimentation. Glacial placer deposits are found in pre-Reid terrain as glaciofluvial terraces. Recent slope and alluvial sedimentation processes have concentrated placer gold in thin colluvial veneers and valley bottom fill in gulches and streams, and bars in major rivers.

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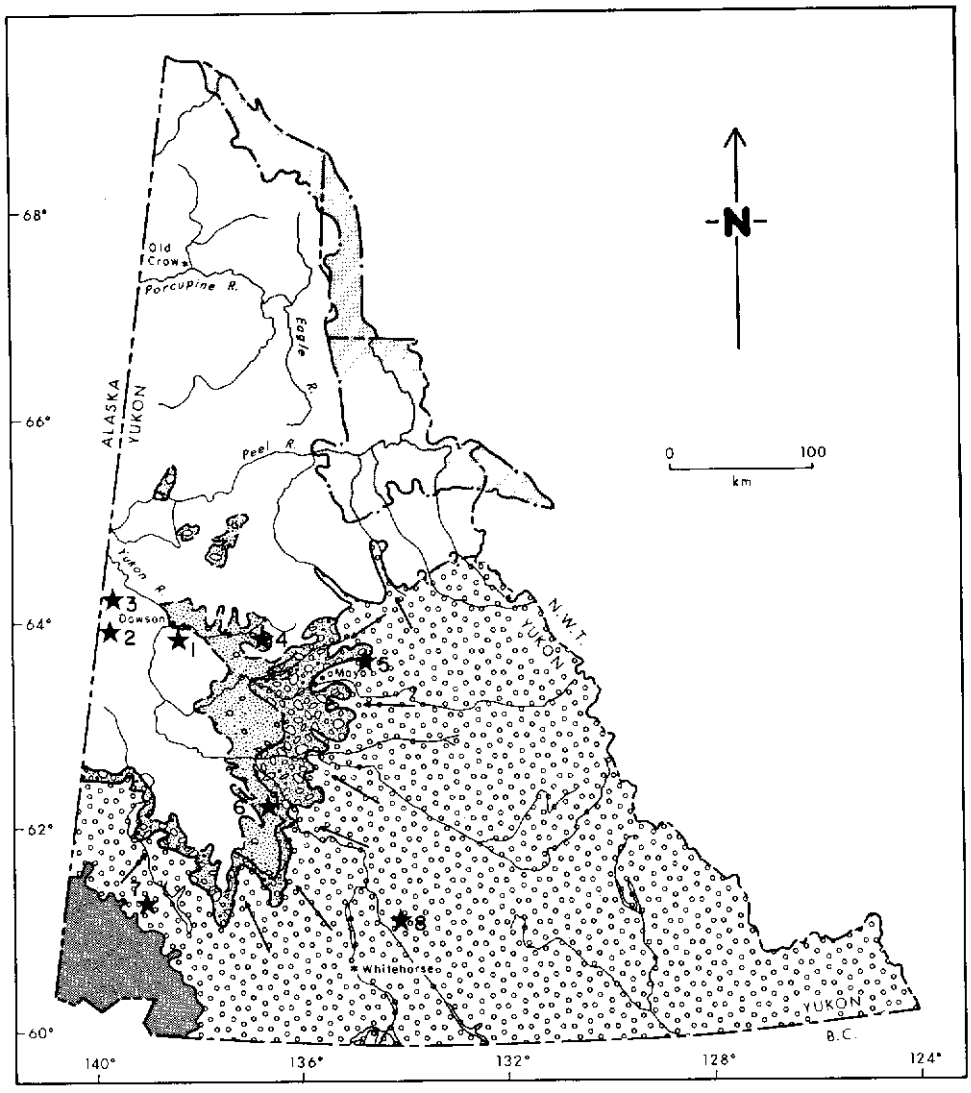
| TIME PERIOD | Tertiary | Quaternary | | | |
|---|---|---|---|---|---|
| | Pliocene | Pleistocene | | | Recent |
| PLACER ENVIRONMENT & GEOMORPHIC LOCATION | Buried alluvial sediments in benches above valley floors | Preglacial or Nonglacial Buried alluvial sediments in benches above valley floors; valley fill alluvial sediments; alluvial terraces | Interglacial Valley fill alluvial sediments; alluvial terraces | Glacial Benches of proglacial and ice contact deposits; terminal valley moraines and alpine drift | Valley bottom alluvial plains and terraces; colluvium and slope deposits; beach and nearshore marine deposits |
| GENERAL SEDIMENT CHARACTERISTICS | Mature sediments; well sorted alluvium with a diverse assemblage of sediment types | Locally derived gravel lithology; moderately to well sorted alluvium which is crudely to distinctly stratified | Mixed gravel lithology; moderately to well sorted alluvium which is crudely to distinctly stratified | Regionally derived gravel lithology; variable sorting and stratification depending upon type of glacial drift | Mixed gravel lithology; moderately to well sorted alluvium which is crudely to distinctly stratified; poorly sorted, massive slope deposits; well sorted beach sand |
| GOLD DISTRIBUTION | Greater concentration with depth | Discrete concentrations throughout to pay streaks at base of alluvium | Discrete concentrations throughout to pay streaks at base of alluvium | Dispersed throughout | Discrete concentrations throughout to pay streaks at base of alluvium; pay streaks follow slope morphology and strandline trend |
| MINING PROBLEMS | Thick overburden | Thick overburden; variable grade | Variable grade | Low grade and large volume of material | Variable grade and low volume of auriferous sediment |
| EXAMPLES | "White Channel Gravel" of the Klondike area, Yukon Territory | Preglacial fluvial gravels, Clear Creek drainage basin and unglaciated terrain | Interglacial stream gravels in Atlin and Cariboo | Glaciofluvial gravel in Clear Creek drainage basin, Yukon | Valley bottom creek and gulch placers in Clear Creek drainage basin, Yukon Territory; |

TABLE 1-Stratigraphy and general characteristics of placer gold deposits in Canada (from Morison, in press)




LEGEND

Glacial Limits

Cordilleran ice sheet

——— Limit of McConnell glaciation (Late Wisconsinan)

—— — Limit of Reid glaciation (Illinoian?)

— — — Limit of pre-Reid glaciation(s)

Laurentide ice sheet

—·— Limit of Hungry Creek (Buckland) glaciation (Late Wisconsinan?); and also the maximum Laurentide limit

——→ General direction of ice movement

Unglaciated Terrain

Undifferentiated nonglacial deposits

Glaciated Terrain

McConnell glacial deposits

Reid glacial deposits

pre-Reid glacial deposits

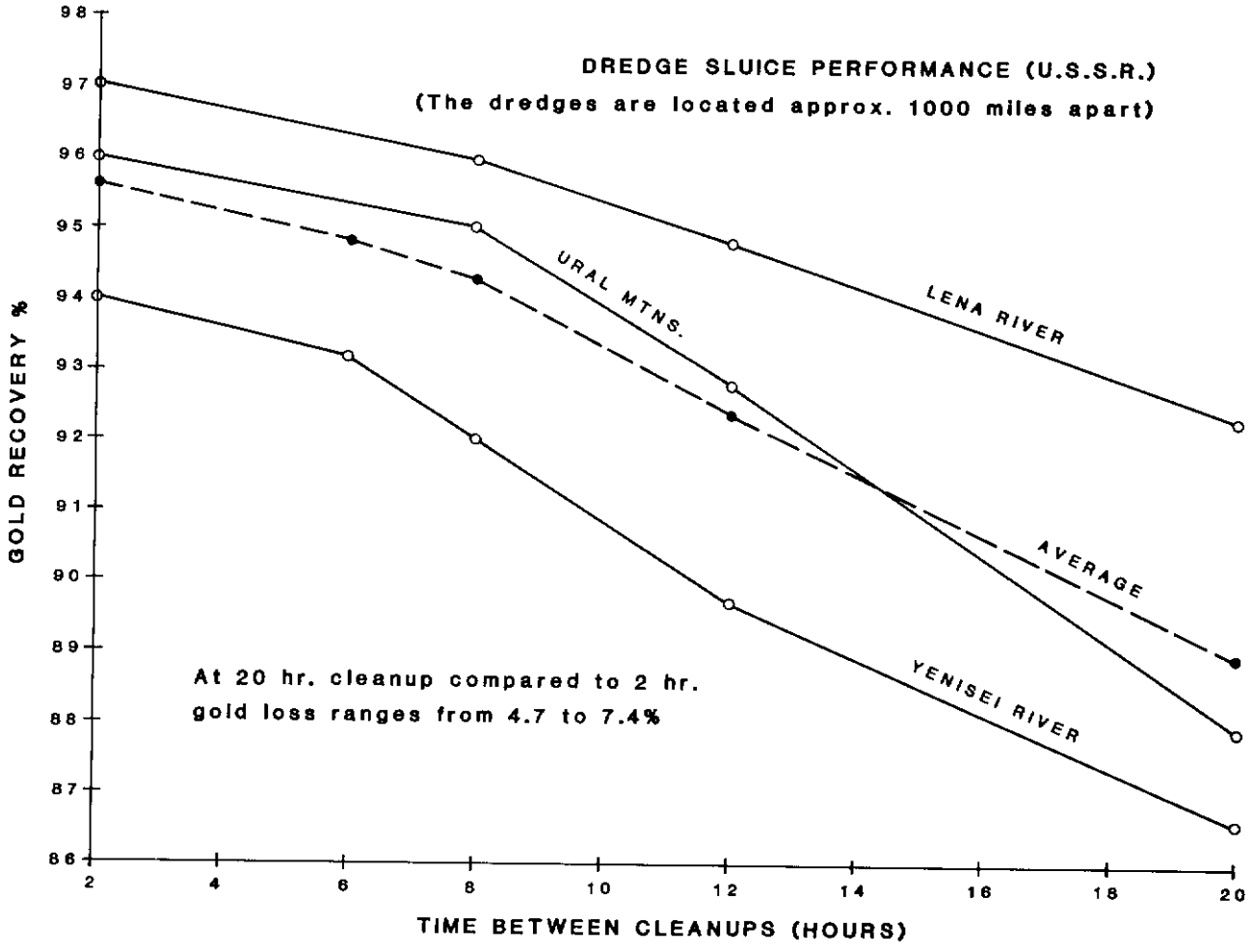
Hungry Creek or Buckland glacial deposits

Icefields, glaciers

MAJOR PLACER MINING AREAS ★

1-Klondike 2-Sixty-mile 3-Forty-mile 4-Clear Creek 5-Mayo 6-Big Creek 7-Burwash Creek 8-Livingston Creek

FIGURE 1- Glacial limits in Yukon Territory (modified from Hughes et al., 1983, and Tarnocai, in prep).




NOTE:

Many miners in the Cariboo District, B.C. have reportedly increased gold recovery by cleaning the first few feet of riffles several times a day. This is rapidly accomplished by stopping the feed for a few minutes & using a suction dredge or a wet-dry vacuum cleaner.
(Pers. comm. - Brendan Gordon B.C.D.M.)

## Placer Claims and Leases in Good Standing

## as of March 1, 1985

## and

## Descriptions of Placer Mining Operations

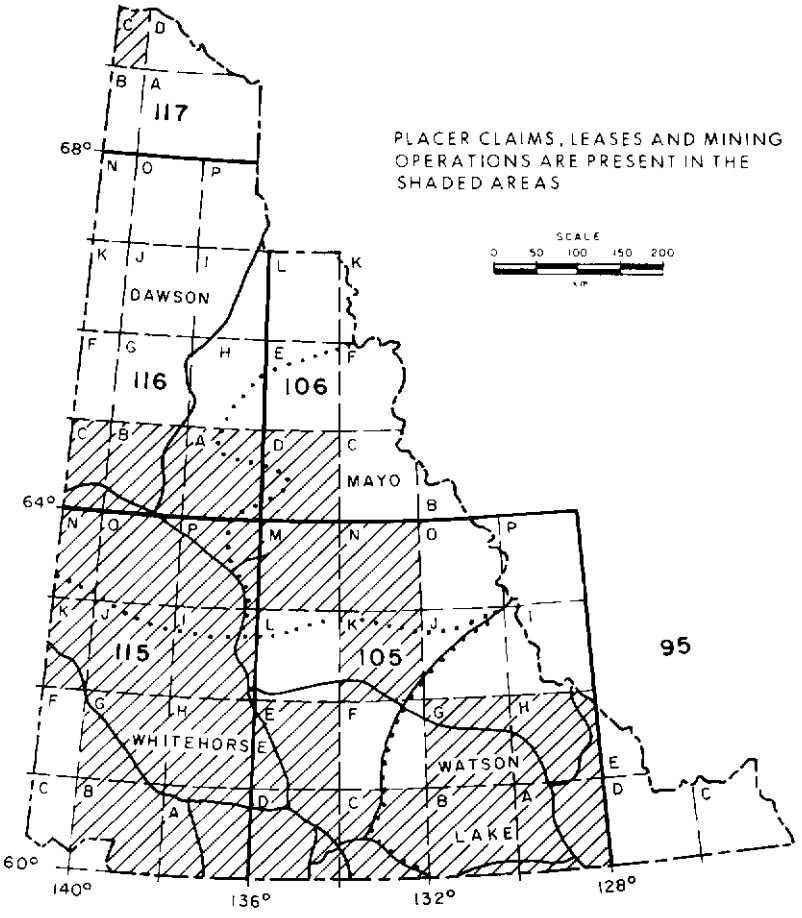
## Active in 1983 and/or 1984

Reports in this section describe placer mining operations which were active in 1983 and/or 1984. Information in the reports was compiled from the field investigations of L. Olynyk and R. Whittingham of Mining Engineering Division, D.I.A.N.D., in Whitehorse and Dawson. Some information was also compiled from applications for Water Authorizations and Licenses, on file at D.I.A.N.D. in Whitehorse.

Each report is keyed to a set of maps which are reductions of the 1:250,000 scale topographic maps. The maps show the distribution of placer claims and leases in good standing as of March 1, 1985, as well as the locations of the mining operations. Not every map area with claims and leases in good standing also had active mining operations. The map areas with claims and/or leases in good standing are shaded on the index map. Due to the density of mining operations in the Klondike area, a separate map, with less reduction than the others, was prepared to show the locations of mining operations in that area. The claim and lease information on the maps was compiled from the maps of the Regional Manager of Mineral Rights, D.I.A.N.D., Whitehorse, Yukon.

The maps are arranged according to the National Topographic System alphanumeric sequence. Map areas which are not shaded on the index map had no placer claims and/or leases in good standing as of March 1, 1985, and did not have active placer mining operations during 1983 or 1984. Accordingly, they are not included in this volume. Each of the maps precedes a section describing placer mining activity within that area. Each report on a property includes a heading with a number keying it to its location on the map, the National Topographic System number of the 1:50,000 scale map area in which it lies, and its latitude and longitude. The name or names in the heading are those of operators at the site during the time covered by the report, while the years indicate in which of 1983 and 1984 there was work done. There are a few omissions. Some operations where the work done was exploratory or preparatory were omitted on purpose. Other operations where the work done was also exploratory or preparatory were included because of the large scale of the operation, or because of the type of work carried out. Data were unavailable for some mining operations, and incomplete for others.

# INDEX of N.T.S. MAP AREAS in REPORT



Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

WATSON LAKE.

Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

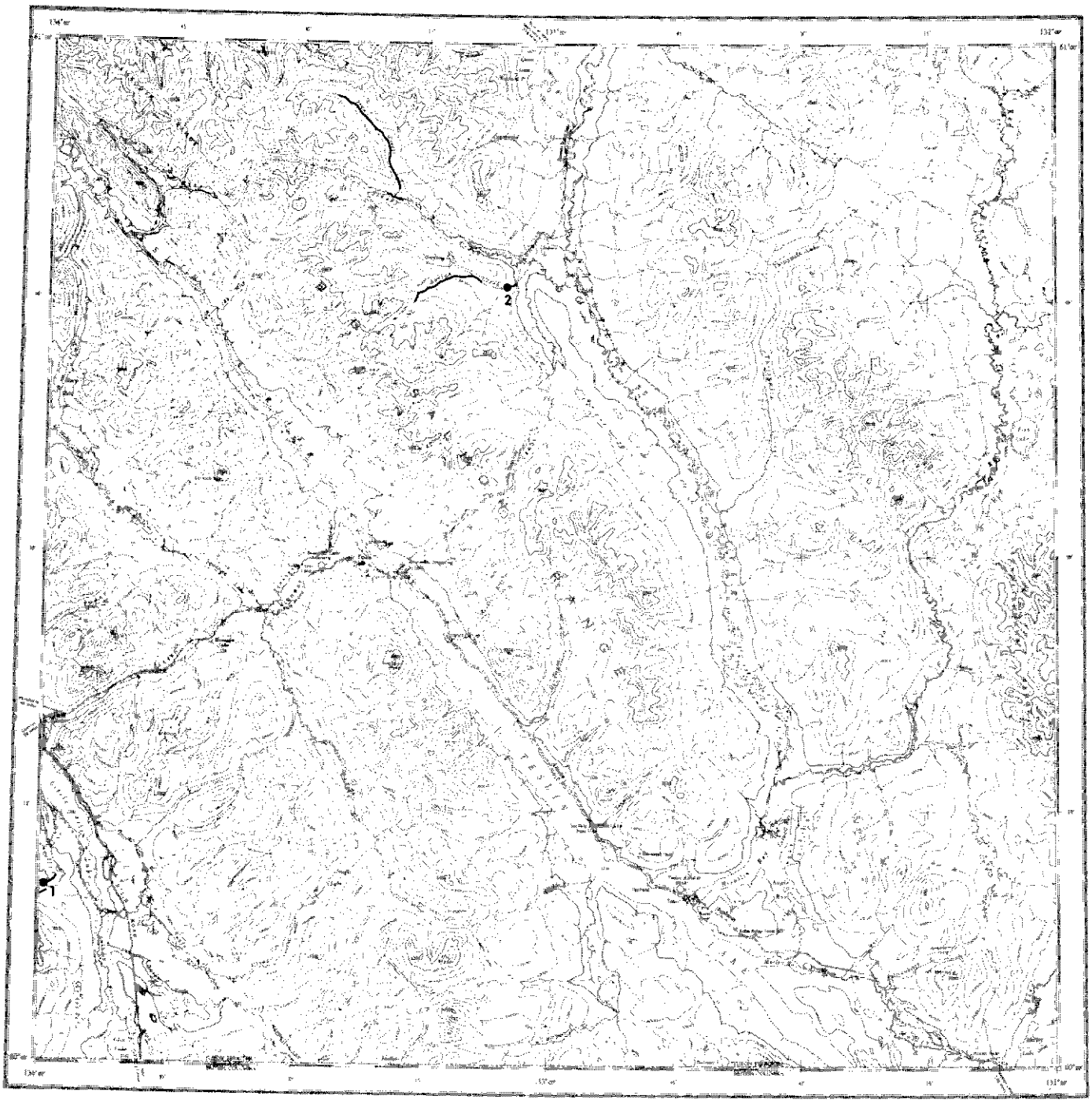
WOLF LAKE

Karat Mines Ltd. (1)
Sayyea Creek 105 B 9
1983 60°45'N 130°25'W

This property is located on Sayyea Creek, approximately 2 1/2 miles upstream from its confluence with Liard River, and just upstream from the head of the canyon. It was on this creek that coarse placer gold was discovered for the first time in the Yukon Territory during 1874. Open cut and underground mining have been done on Sayyea Creek by early hand miners.

Test mining was carried out at several locations along approximately 1 mile of Sayyea Creek by Karat Mines Ltd. during 1983. A crew of 4 worked on a single shift using a Komatsu bulldozer for trenching and a Komatsu 55 loader with 2 1/2 cu.yd. bucket to dig test pits, and feed material to the sluicing plant. The sluicing plant consisted of a dump box and single sluice run 14 inches wide and 12 feet long. Water for sluicing was pumped from Sayyea Creek at a rate of approximately 240 igpm by a 3 inch pump.

Gold from this property is reported to be both fine and coarse grained.




Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

TESLIN

T. Kabanak (1)
Moose Creek 105 C 4
1983 60°10'N 134°00'W

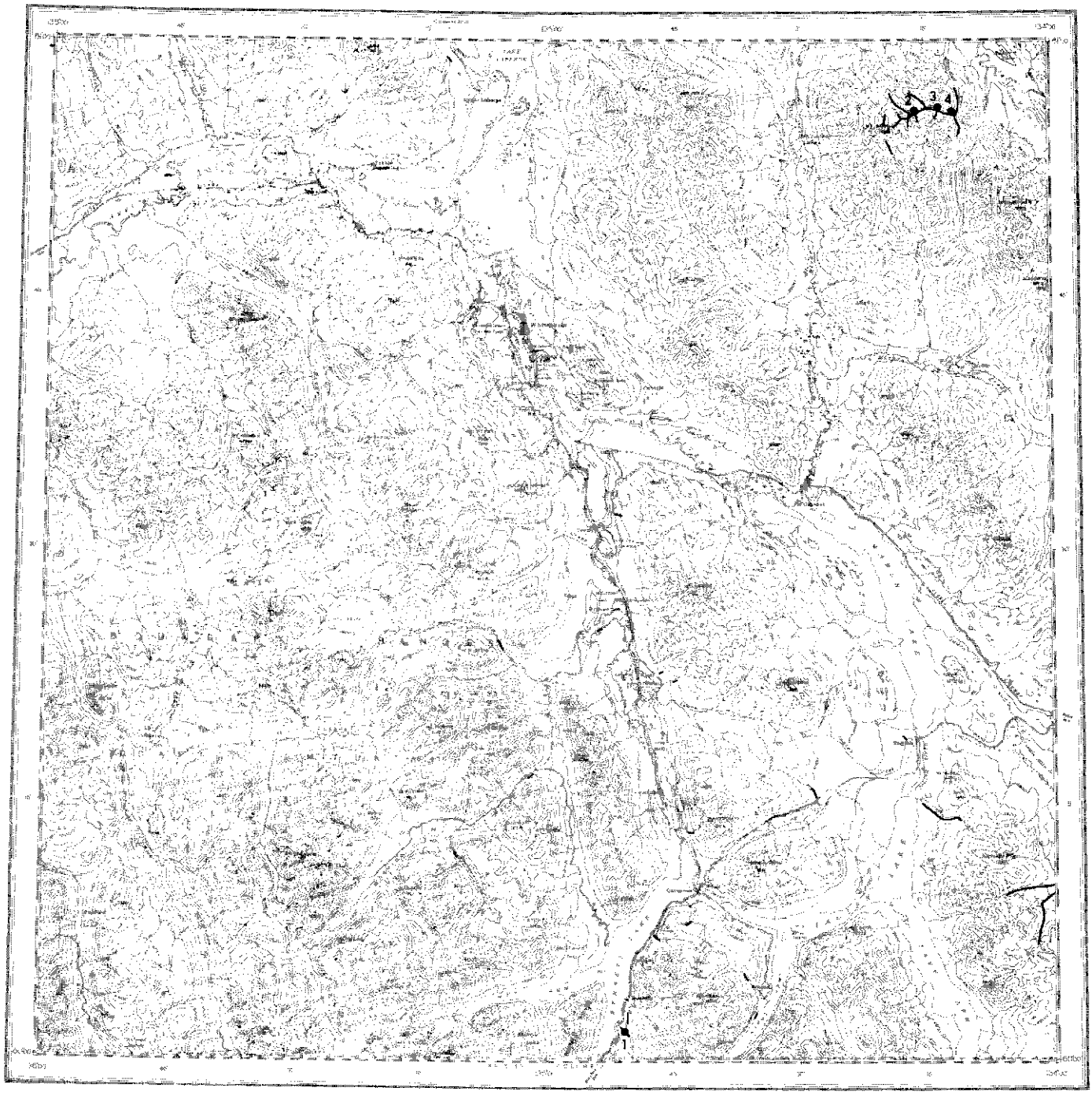
This property is located on Moose Creek. The deposits at the site are 40'thick on the right limit of the valley, and 25 feet thick on the left limit of the valley. They consist primarily of silt, with a band approximately 15 feet thick in the middle of the section of sand, and pebbly to bouldery gravel. Some boulders are up to 3 feet across.

Work was done at the property during 1983. Gravel and several feet of bedrock were mined from a cut 100 feet wide and 350 feet long. Stripping upstream from the cut was also done. Water for sluicing was provided from a holding pond 100 feet in diameter, and effluent was settled in a settling pond 200 feet wide and 300 feet long.

Blue Chip Resources Ltd. (2)
Evelyn Creek 105 C 14
1984 60°46'N 133°06'W

This property is located along the lower reaches of Evelyn Creek, approximately 1 mile upstream from the South Canol Road crossing, and 3 miles upstream from its confluence with Sidney Creek. The Evelyn Creek valley is wide, and the creek has a shallow gradient. Deposits present consist of silt, sand, and bouldery gravel. Some of the gravel is stained red by iron.

Work on the property was done by one or two miners during 1984. A 4 cylinder Case wheeled tractor, model TR 545, equipped with a 1 cu.yd. bucket and 1/2 cu.yd. backhoe attachment was used for all work. An area approximately 300 feet wide and 500 feet long was stripped. Within this area, 2 pits approximately 50 feet wide and 100 feet long were dug to a depth of 5 feet. The material mined was washed in a sluicing plant set up between the two pits. The sluicing plant consisted of a dump box, and single sluice run set at 90° to the dump box. As the washed material left the dump box, it was screened to approximately 3 inches in diameter before going into the sluice run. The sluice run was approximately 24 inches wide and 24 feet long. Both pits were flooded with seepage water. Water for sluicing was pumped from the lower pit by way of a 6 inch diameter pipeline, and effluent discharged back into the lower pit.




Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

WHITEHORSE

D. Wookey (1)
Unnamed Tributary 105 D 2
to Bennett Lake 60°02'N 134°51'W
1983, 1984

This property is situated along an unnamed creek on the east side of Bennett Lake. The deposits present are 12 feet deep, and are not frozen. They consist of sand, clay, and gravel.

Test work was done at this site during 1983 by D. Wookey with one helper. They used a John Deere 544 rubber tired loader to mine approximately 2,000 cu.yd. of material from a cut along the right limit of the creek. All the material mined was sluiced in a sluicing plant consisting of grizzly and wooden single run sluice box 36 inches wide and 40 feet long. Water for sluicing was gravity fed by way of a 16 inch diameter pipeline 30 to 100 feet long. Effluent from sluicing was settled in a series of 3 settling ponds, each 35 feet wide and 100 feet long, located along an abandoned channel of the creek downstream from the sluice box. Work at the property continued during 1984 using the same equipment and mining methods as were used in 1983. Sluicing was done for 60 hours during June.

Orion Construction (2)
Sheldon Creek 105 D 16
1984 60°56'N 134°16'W

This property is located along the Right Fork of Sheldon Creek, approximately 3 miles upstream from the forks, and 11 1/2 miles upstream from the confluence of Sheldon Creek with the Teslin River.

A major trenching program was carried out at this property during 1984 by Orion Construction. Orion Construction had 12 miners and 4 support crew members active at this, and two other sites along Sheldon Creek during 1984. At this site, they used a John Deere 690 backhoe equipped with a 3/4 cu.yd. bucket to dig the trenches.

Orion Construction (3)
Sheldon Creek 105 D 16
1984 60°56'N 134°13'W

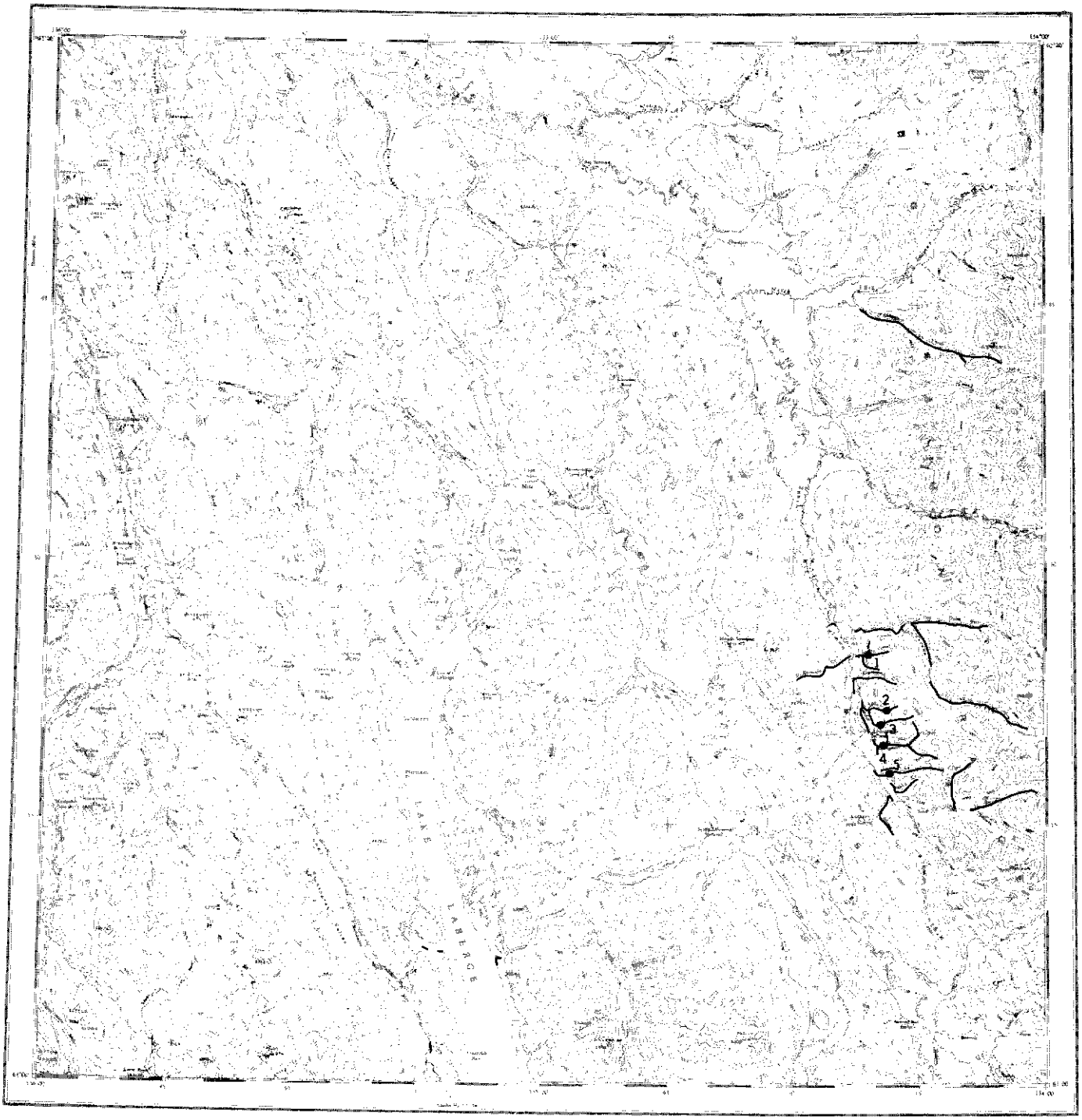
This property is located along the Right Fork of Sheldon Creek, approximately 1 1/2 miles upstream from the forks, and 10 miles upstream from the confluence of Sheldon Creek with the Teslin River. Deposits present are 30 to 40 feet deep, and consist of an erratic section of sand, gravel, rock, and blue clay.

Work at this site was done during 1984 by members of the Orion Construction crew of 12 miners and 4 support staff working at three properties along Sheldon Creek. Work was done on two 8 hour shifts during most of the season, but after August 12, the size of the crew was reduced to approximately 5, and only a single shift was worked. They used a Cat D8H bulldozer to do stripping, dig a drain, and to work the cut. The cut was 20 feet wide, 250 feet long, and 30 feet deep. Machinery and fuel for this work were brought to the property during the fall of 1983 as swampy areas along the access route, which runs from Mile 898 of the Alaska Highway, up the Michie and Byng Creek valleys, and over the ridge crest to Sheldon Creek, restrict travel to the parts of the year during which the ground is frozen.

Orion Construction (4)
Sheldon Creek 105 D 16
1984 60°56'N 134°12'W

This property is located along the lower end of the Right Fork of Sheldon Creek, approximately 9 miles upstream from the confluence of Sheldon Creek with the Teslin River.

Work at this site was done during 1984 by members of the Orion Construction crew of 12 miners and 4 support staff which worked at three properties on Sheldon Creek. Work was done on two 8 hour shifts during most of the season, but after August 12, the size of the crew was reduced to approximately 5, and only a single shift was worked. A Cat D8H bulldozer was used to mine a long, narrow cut at this site. The cut acted as its own drain. Approximately 3,000 cu.yd. of material was fed to the sluicing plant by a Cat 966 C loader equipped with a 3 cu.yd. bucket. The sluicing plant consisted of a dump box with wet grizzly, and 3 channel sluice box. The dump box and grizzly measured 12 feet wide and 16 feet long, and screened material to less than 3 1/2 inches in diameter. Two spray bars washed the material during the screening process. Material less than 3 1/2 inches in diameter passed into the main run of the sluice box, which was 48 inches wide and 30 feet long. The sluice run was lined with 2 1/2 inch heavy screen and matting for the first 18 feet of its length. Below that, the material was further screened, and the undersize entered two side runs 24 inches wide and 12 feet long. Water for sluicing was provided by 2 simultaneously run 6 inch Monarch pumps powered by 4 cylinder Ford diesel engines. Tailings were removed by a Cat D6C bulldozer. Effluent from sluicing was settled immediately downstream from the operation in a large abandoned beaver pond. Other equipment on the property included a John Deere 690 backhoe with 3/4 cu.yd., bucket, a John Deere 350 bulldozer with winch, used for light duty work, and a Case 750 bulldozer with winch, also used for light duty work. Bedrock was not found in the valley bottom at this, or the other sites tested, although it was located along the valley side walls. The results of seismic work completed earlier in 1984 were deceptive.

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Numbers beside the dots relate to the text.

KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

LABERGE

Golden Violet Mining Ltd. (1)
Little Violet Creek 105 E 8
1983, 1984 61°25'N 134°22'W

This property is located on the lower reaches of Little Violet Creek, approximately 4,000 feet upstream from its point of entry into the South Big Salmon River valley. Deposits present are 50 feet deep in the centre of the valley, and 70 feet deep along the margins of the valley. They consist of sandy gravel, and have fewer boulders than do the other creeks in the Livingstone Creek area. The boulders that are present are also smaller than boulders found in other creeks in the Livingstone Creek area. They usually do not exceed 2 to 3 cubic feet in size. The valley bottom is only 50 to 60 feet wide, and has gently sloping side walls. The gradient of the creek is steep.

Work on this property was done by a crew of 3 during 1983. They used a Cat 931 loader with backhoe attachment, and a Cat 977 Traxcavator loader. Material was mined from a cut 40 feet in diameter, slightly to the right of the centre of the valley. It was fed at a rate of 15 cu.yd. per hour to a sluicing plant consisting of a grizzly, dump box, and single run sluice box. The material was washed on the grizzly by water which was fed by gravity by way of a 4 inch diameter pipeline. Undersize from the grizzly was less than 4 inches in diameter. It fell into the dump box, which was 6 feet wide and 10 feet long. The sluice run was 30 inches wide and 24 feet long. It was divided into three 8 foot long sections, with a 4 inch drop between each section. The upper and lower sections were lined with 3 inch riffles, while the middle section was lined with expanded metal. Water for sluicing was recirculated from a 40 foot diameter pond immediately downstream from the sluicing plant by a 6 inch pump powered by a 4 cylinder industrial gasoline engine. The water was delivered to the dump box at a rate of approximately 1,000 igpm by way of three 6 inch hoses feeding a spray manifold. Effluent from sluicing was settled in two ponds before entering the South Big Salmon River. Work on the property was continued by a crew of 3 during 1984. They used the same methods and equipment as were used in 1983.

E. Kosmenko (2)
Lake Creek 105 E 8
1983, 1984 61°22'N 134°19'W

This property is located along Lake Creek above the canyon, and approximately 1 mile upstream from the lake. Deposits in the valley bottom are approximately 28 feet thick. Large boulders occur only in the upper layers of the deposits. Intermittent frozen patches are present in the deposits along the side walls of the valley.

Mr. Kosmenko worked alone at the property during 1983, using an International TD-15 loader with hoe attachment with 1/3 cu.yd. bucket, and 3 cu.yd. loader bucket. He continued work alone using the same equipment during the first part of 1984, but was later joined by one other miner who brought with him a Cat D4-7U bulldozer equipped with a winch, and a Scoopmobile LD-358 wheeled loader. A single narrow cut approximately 30 feet deep was mined in 1984. The lowermost 4 feet of gravel, and 2 feet of bedrock were sluiced. A total of 3,700 cu.yd. of material was stripped, and an additional 1,000 cu.yd. of material were sluiced in a washing plant which had a capacity of 4 to 12 cu.yd. per hour. It consisted of a wooden sluice box 20 inches wide and 20 feet long, to which a grizzly was added in 1984. Milled 2 by 4 inch boards placed on edge, and tilted forward, with the upper surface shielded by 1 1/2 inch angle iron, were used as riffles. Water for sluicing was gravity fed from a small reservoir in Lake Creek. The availability of water was a major factor in controlling the rate of sluicing. Effluent from sluicing was settled in the small lake downstream.

Gold from this property was reported to be coarse grained, and to have a fineness of 895.

R. Asuchak (3)
Summit Creek 105 E 8
1983, 1984 61°22'N 134°21'W

This property is located near the downstream end of the east-west trending portion of Summit Creek, at the upstream end of the canyon. Deposits present are frozen. A face exposed along the left limit of the creek in 1984 was estimated to be more than 100 feet high.

Mr. Asuchak worked alone at the property during 1983 using a Cat D4-7U bulldozer with winch attachment. Material was washed down from the face using a monitor with water at a considerable head fed by way of several hundred feet of pipeline from a reservoir upstream along Summit Creek. The lower part of the section was washed in a sluicing plant which consisted of dump box and single sluice run 24 inches wide and 26 feet long. The sluicing plant was fed at a rate of 30 cu.yd. per hour. Water for sluicing was recirculated by a 6 inch pump from a small pond at a rate of 500 igpm. Effluent from sluicing was settled in a small lake approximatley 2 miles downstream from the operation. Mr. Asuchak continued work intermittently at the property during 1984. He used the bulldozer used in 1983, as well as a Scoopmobile LD-358 wheeled loader.

Gold recovered from this property is reported to be coarse grained.

Livingstone Placers (4)
Livingstone Creek 105 E 8
1983, 1984 61°20'N 134°20'W

This property is located along Livingstone Creek slightly downstream from the head of the canyon, and approximately 400 feet downstream from the bench on the left limit of the canyon. Deposits present are approximately 100 feet thick, and consist of a mixed section of sand, clay, gravel, and till. Some boulders up to 3 feet across occur in the gravel and till. The material is all frozen, except the layer of gravel immediately overlying bedrock. The gradient of the creek is very steep. Local flash floods are known to occur.

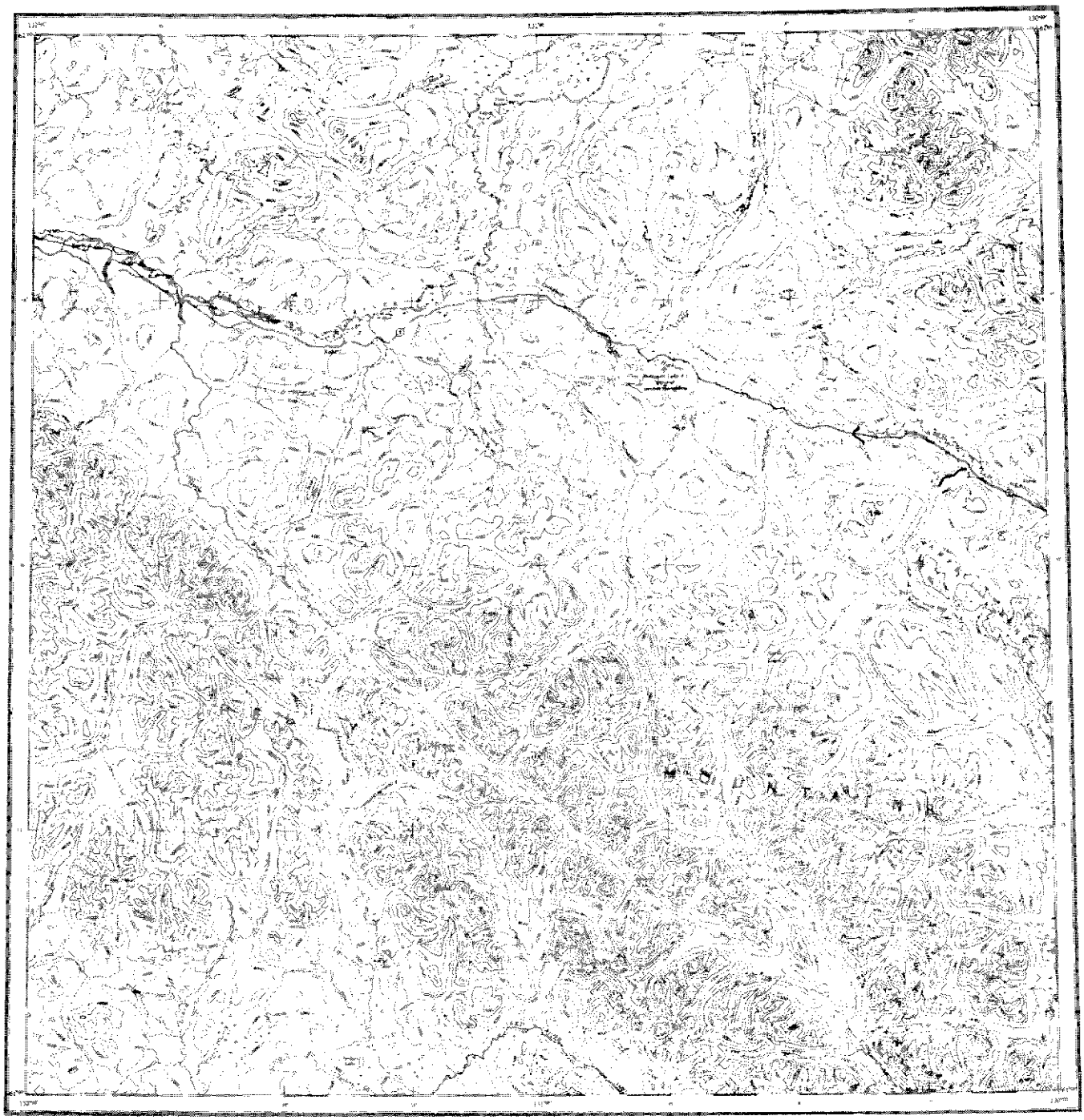
Work at the property in 1983 was begun by a crew of 5, using a Cat D7F bulldozer, a Cat D7G bulldozer, a Cat 950 loader, a Terex 82-30 bulldozer, and a Terex 72-51 loader. The crew was cut to 2 workers, after 3 weeks, however. They used the Terex machines to mine. The bulldozer was used to work the cut, to feed the loader, and to push tailings. The loader was used mainly to feed the sluicing plant. Work was also done on the left limit bench, where deposits were monitored with gravity fed ditch water and water pumped from the creek. The sluicing plant consisted of a wet grizzly, dump box, and single run sluice box. It was fed at a rate of approximately 25 cu.yd. per hour. Material fed to the grizzly, which was made of 2 1/2 inch steel bars, was washed by water from 2 spray bars fed by a 4 inch diameter hose. Undersize was 5 inches in diameter and less. It passed through the grizzly into the dump box, which was semi-circular in section, 5 feet across, and 15 feet long, and went on into the sluice box. The sluice box was 26 inches wide and 30 feet long, and was lined with 3 inch angle iron riffles spaced 6 inches apart over expanded metal and matting. Water was delivered directly to the sluice box by two 4 inch diameter hoses. It was pumped from Livingstone Creek at a rate of 1,500 igpm by a Cornell 6 by 8 inch pump run by a 671 Jimmy diesel engine. The water was not recycled. Effluent from sluicing was settled in a pond in the South Big Salmon River valley, approximately 4 1/2 miles downstream. Work at the property continued during 1984. The crew of 2 was joined by a third worker at the end of the season. They used the Terex equipment used in 1983 to mine several cuts, and sluiced 12,000 cu.yd. of material. A 60 foot high pile of tailings left by early workers was sluiced, as was the old road on the left limit of the valley. A cut 20 feet wide and 400 feet long in shallow ground against the right limit canyon wall was also mined.

Gold from this property is reported to have a fineness of 880, with a high percentage of it being coarse grained. Historical reports indicate that 20 ounce nuggets have been recovered from Livingstone Creek.

D. Gonder (5)
Martin Creek 105 E 8
1983, 1984 61°18'N 134°19'W

This property is located on Martin Creek, approximately 2,000 feet upstream from its entry into the South Big Salmon River valley. The gradient of the creek is steep. Deposits present are approximately 80 feet thick.

Work at this property was done by 2 miners using one bulldozer during 1983. The work done included stripping, mining, and sluicing. Work was continued by two miners in 1984, but only stripping was done. Water from a monitor positioned on the left limit of the Martin Creek valley was used to wash down a high gravel face on the right limit of the valley. The water was impounded in two large reservoirs several hundred feet upstream from the operation. From the reservoirs, it was delivered to the monitor at a considerable head by way of a gravity fed pipeline. Material washed down from the face was pushed to the centre of the creek channel by the bulldozer, to be carried downstream to a settling pond in a swampy area along the right limit of the South Big Salmon River valley.



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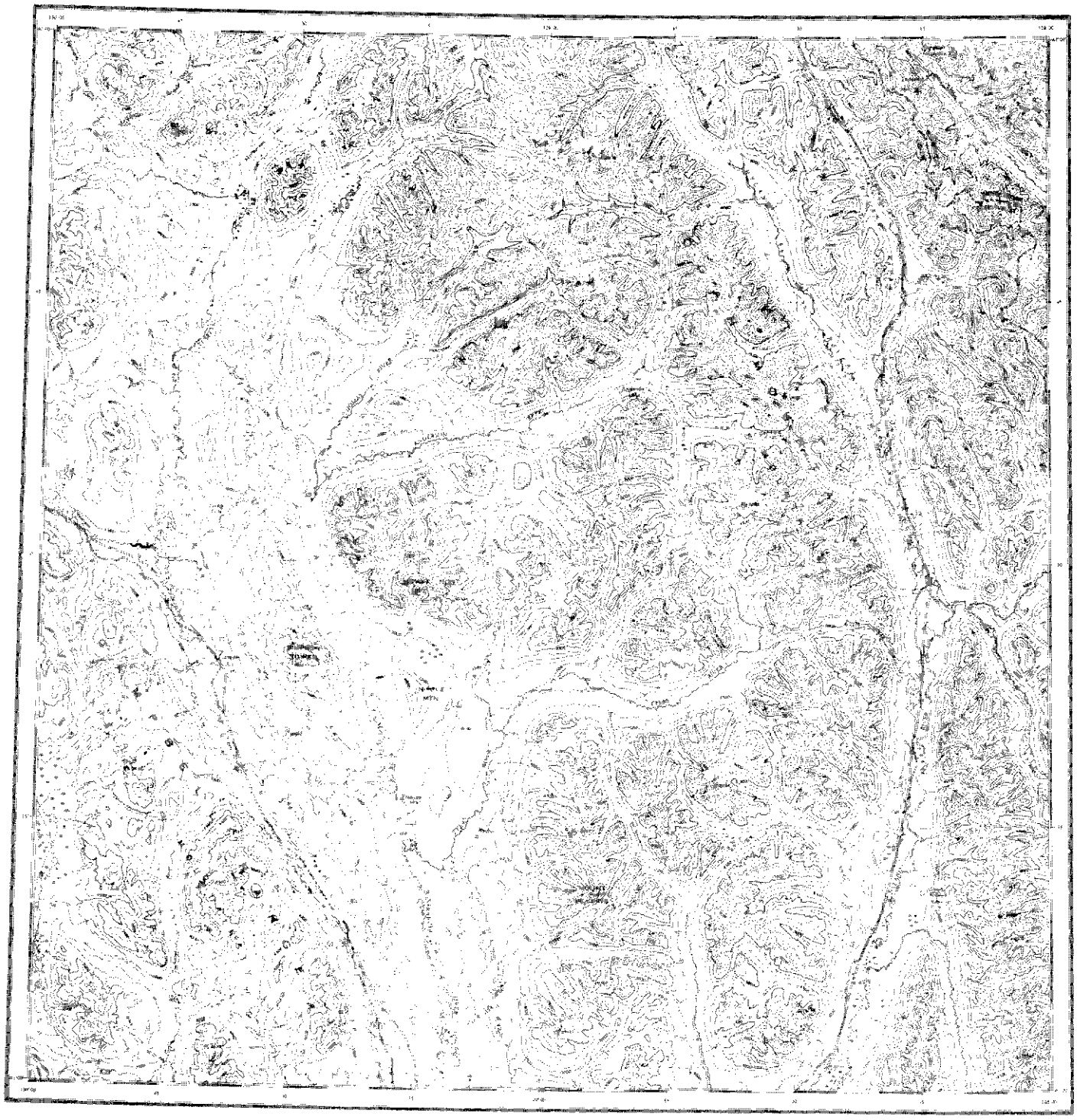
KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

FINLAYSON LAKE



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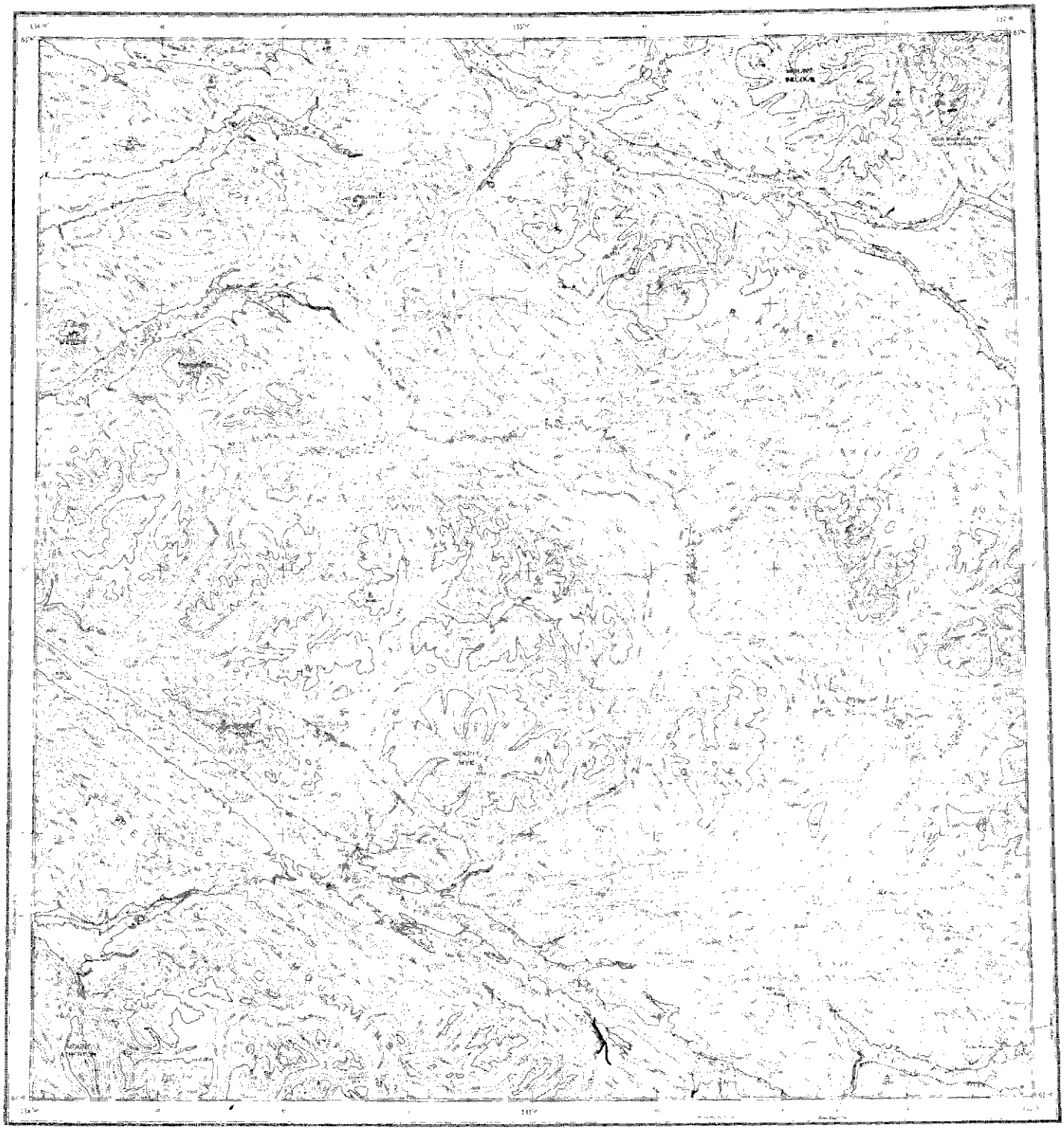
KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

FRANCES LAKE



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KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

TAY RIVER


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KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

MAYO

4306 Yukon Ltd. (1)
Ledge Creek 105 M 10
1983, 1984 63°41'N 134°52'W

This property is located near the mouth of Ledge Creek, midway along the northern shore of the south arm of Mayo Lake. Deposits at the site consist of post-glacial muck, silt, clay, and gravel at the apex of the Ledge Creek delta. The deposits are 40 to 50 feet thick, and are not frozen. Bedrock is soft schist with some quartz stringers.

Work on the property was carried out during 1983 by a crew of 5. Approximately 3,000 cu.yd. of material were sluiced during the few weeks the operation was active. A crew of 5 workers was also active in 1984. They worked from June to October, using a Cat D8K bulldozer to mine and stockpile gravel near a Cat 235 hoe. The hoe was used to feed the sluicing plant. The entire section of material was sluiced. Approximately 65,000 cu.yd. of material were sluiced at a rate of 90 to 100 cu.yd. per hour. The sluicing plant consisted of a "Derocker" screening unit, and custom built 3 run sluice box. Water for sluicing was recycled at a rate of 1,800 igpm by a Flygt 10 inch pump. Tailings were removed by a John Deere 840 loader. Effluent from sluicing went to a settling pond. Overflow from the settling pond went to the recycling pond to be returned for sluicing.

Gold recovered from this property is reported to be 10% coarse grained, and 90% fine grained. Gold with some quartz attached was reported to be common.

M. Wozniak (2)
Anderson Creek 105 M 11
1983, 1984 63°43'N 135°02'W

This property is located along Anderson Creek, approximately 1,300 feet upstream from its mouth at Mayo Lake. It is at the suspected upper limit of glacial debris on the creek. Deposits present consist of approximately 12 feet of bouldery gravel overlying quartz-sericite schist bedrock.

Mr. Wozniak mined at this property on a small scale during 1983 and 1984, using a Cat D4 bulldozer for all work. The total flow of Anderson Creek was used for sluicing. It was directed through a control gate, and gravity fed to the sluice box.

F. Taylor (3)
Duncan Creek 105 M 14
1983, 1984 63°49'N 135°28'W

This property is located on Duncan Creek, approximately 3 1/2 miles upstream from its confluence with Mayo River. Deposits present along the left limit of the valley consist of 3 to 4 feet of muck overlying up to 30 feet of washed gravel, most of which is of glacial origin. Boulders up to 3 feet in diameter are common. Bedrock is decomposed Keno Hill quartzite.

Mining at the property was done during 1983 by a crew of 5 using a Cat D8K bulldozer for stripping, a Cat 988B loader to mine and feed the sluicing plant,

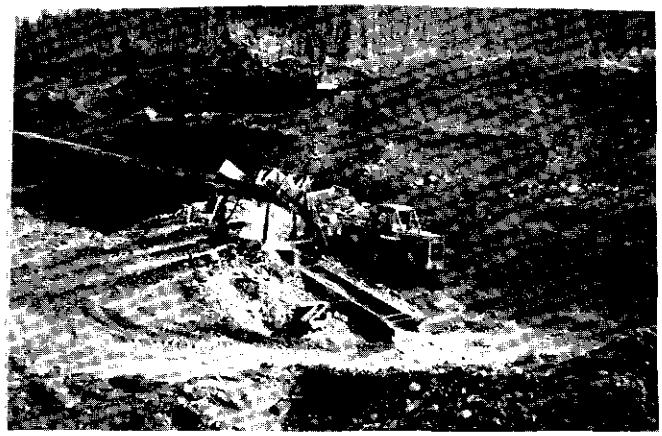


Figure 1: Loader removing oversize tailings from below grizzly at F. Taylor operation on Duncan Creek. (R.W. ''83)

and a Michigan 125B loader to remove tailings and pile them in a large berm between the tail race from the sluicing plant, and the drain from the pit. The berm was then levelled to form the access road from camp to the pit. The sluicing plant consisted of a wet grizzly, dump box 8 feet wide and 16 feet long, and single run sluice box 4 feet wide and 20 feet long. Material for sluicing was dumped over the grizzly, and washed by water provided to the spray bar by a small pump. Material less than 6 inches in diameter fell into the dump box, which was lined with punch plate over expanded metal, and was washed into the single run sluice box which was lined with riffles, expanded metal, and mats. The sluice box was set at a gradient of 1 3/4 inches to the foot. Water for sluicing was diverted through a ditch from Duncan Creek, and gravity fed to the sluice box. Effluent was settled in a series of settling ponds approximately 2,500 feet downstream from the sluice box. Work at the property continued during 1984, but some equipment, and the mining methods used were different than in 1983. The Cat D8K bulldozer was again used to strip the cut, but a UH-30 hoe with 3 1/2 cu.yd bucket was used to feed the new sluicing plant, which was originally designed by Nugget Drilling. The sluicing plant consisted of a high dump box with wire cable grizzly, and twin sluice runs. The grizzly diverted material coarser than 3 inches in diameter to the sides of the sluice box. Water from a spray bar washed the material as it passed over the grizzly. Material less than 3 inches in diameter went into the sluice runs, which were each 3 feet wide and 40 feet long. All but the last 6 feet of the runs was lined with 1 1/2 or 2 inch angle iron riffles over expanded metal and matting. The last 6 feet were lined with punch plate with 1/4 inch holes over a set of hydraulically run pulsating riffles. A hydraulic system run by a 111 hp diesel engine provided power for the pulsating riffles, and for a 10 by 12 inch pump. The mobility provided by the easily moved sluicing plant caused a basic change in the operating method from that used in 1983. The sluicing plant was moved back and forth across the face of the cut, taking the face back about 30 feet with each pass. The sluice was picked up at each end of the cut with the loader and hoe,

and moved with all hydraulic hose lines in place. The distance moved was rarely more than 50 feet. The hoe was able to feed the box from either side at a rate of 100 to 120 cu.yd. per hour. Tailings were stacked with the Cat 988B loader. Effluent from sluicing was settled in a large new settling pond downstream of the old ponds, which had filled up.

Gold recovered from this property is reported to be fine grained, and to be flattened or rolled.

N. Bunka, C. Deeks, E. Jarvis (4)
Duncan Creek 105 M 14
1983 63°54'N 135°20'W

This property is located on Duncan Creek, immediately upstream from the mouth of Lightning Creek. The valley is approximately 200 feet wide at the property, but narrows rapidly upstream to the mouth of a canyon. The deposits present are frozen in places. They are approximately 12 feet deep, and consist of gravel from top to bottom. Boulders up to 2 feet in diameter are common. Bedrock is Keno Hill quartzite.

Work was carried out by 3 people during 1983. They used a Cat D6C bulldozer to mine, push material to a stockpile near the sluicing plant, and stack tailings. A Hyhoe with 3/4 cu.yd. bucket was used to feed the sluicing plant with material from the stockpile. The sluicing plant consisted of grizzly, dump box, and single run sluice box. Material was washed on the grizzly by water supplied by 2 Honda pumps. Pieces of material less than 4 inches in diameter fell through into the dump box, and were washed on into the sluice run. The sluice run was 4 feet wide and 40 feet long. Gravity fed water was supplemented by water pumped by a small diesel pump. Effluent from sluicing was settled in a pond immediately downstream from the sluicing plant.

D. Flick (5)
G. Gervais 105 M 14
Duncan Creek 63°53'N 135°19'W
1983

This property is located along Duncan Creek, approximately 4,000 feet upstream from the mouth of Lightning Creek. The valley bottom is very narrow, and has a steep gradient. The deposits present were left on a bench when the creek cut down into the canyon through which it now flows. They are approximately 25 feet thick, and consist of a few feet of black muck overlying 20 feet of glacial gravel. Bedrock is black siliceous schist.

Work on this property was done during 1983 by 2 miners. They used a Cat 977 tracked loader to dig material from a working face up to 20 feet high, and transport it to the sluicing plant. The sluicing plant consisted of a dump box 10 feet wide and 12 feet long, and a single run sluice box 4 feet wide and 16 feet long. The sluice box was lined with punch plate over riffles and grader blade on expanded metal and matting. It was set at a gradient of 1 1/2 inches to the foot. A Cat D7D bulldozer was used to push tailings over previously mined ground. Water for sluicing was diverted from Duncan Creek above the operation into a reservoir, from which it was pumped at a rate of 3,000 igpm. Effluent from sluicing was settled in a series of three settling ponds downstream from the sluice box.

D. Flick (6)
Duncan Creek 105 M 14
1984 63°53'N 135°18'W

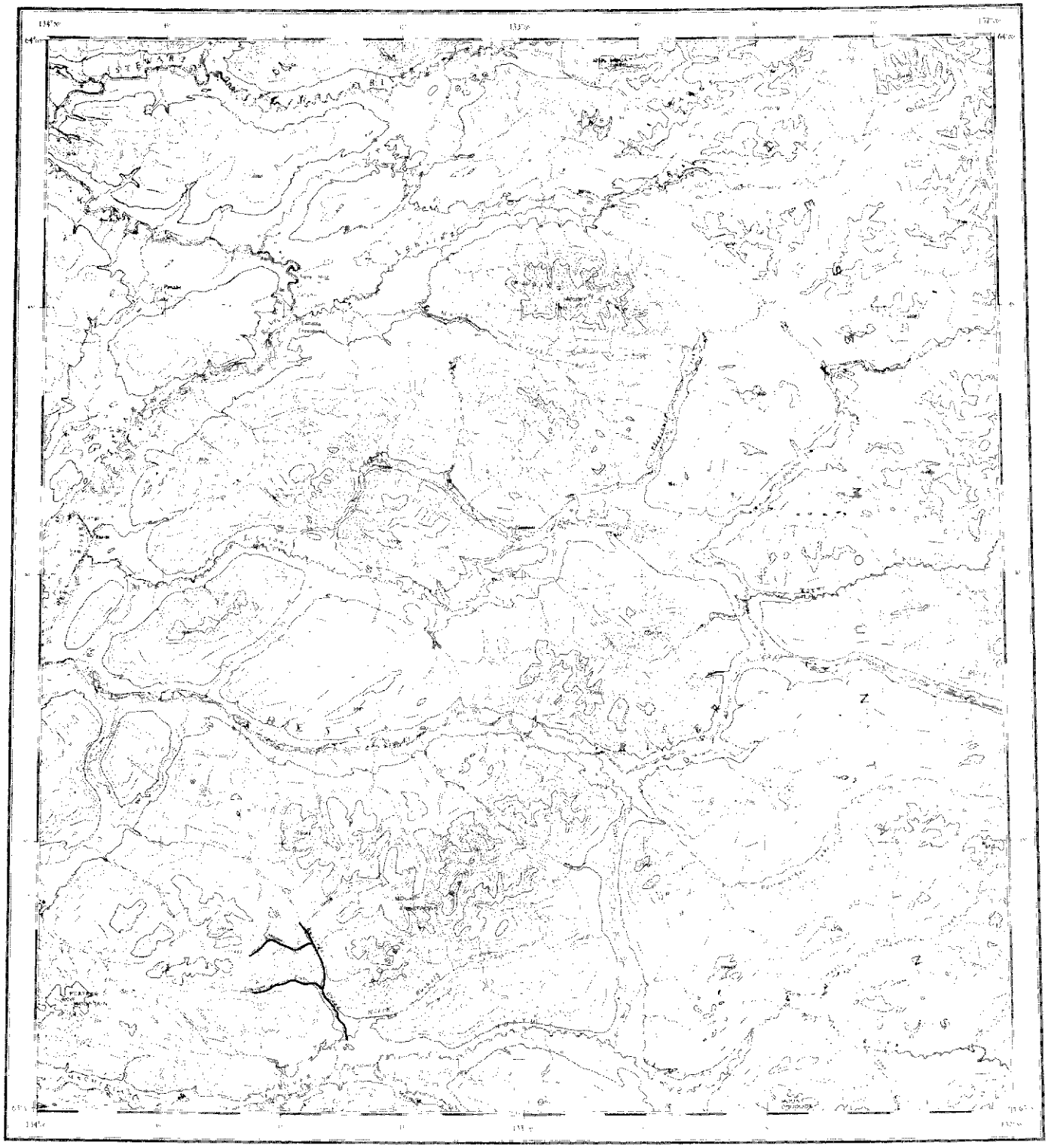
This property is located along Duncan Creek, approximately 6,500 feet upstream from the mouth of Lightning Creek. Deposits present along the right limit of the creek are 30 feet thick, and consist of a mixed section of glacial gravel, frozen black muck, and ice lenses.

Three people mined at this property on a single shift during 1984, using a Cat 977 tracked loader and a Cat 966 loader. The tracked loader was used to dig out and transport material, and to feed the sluicing plant. The sluicing plant consisted of a dump box 10 feet wide and 12 feet long, and a single run sluice box 4 feet wide and 16 feet long. The sluice box was lined with punch plate set over riffles and grader blade on expanded metal and matting. Water for sluicing was fed to a reservoir by a small ditch from Duncan Creek, and pumped to the sluice box by a 10 by 12 inch pump powered by a Cat 3306 diesel engine. Tailings were removed by the Cat 966 loader. Effluent from sluicing was settled in a series of settling ponds downstream from the sluicing plant.

Bardusan Placers Ltd. (7)
Thunder Gulch 105 M 14
1984 63°54'N 135°15'W

This property is located along Thunder Gulch, approximately 500 feet downstream from the first fork on the creek, and 5,000 feet upstream from the confluence of Thunder Gulch with Lightning Creek. The Thunder Gulch valley is narrow, and has a very steep gradient. Deposits present are up to 80 feet deep, and consist entirely of glacial gravel. Boulders 4 feet in diameter are common, and boulders up to 10 feet in diameter are present.

Work at this property was done in 1984 by a crew of 3 using a Cat D7E bulldozer, a Cat 980C loader, and a Trojan loader with 3 cu.yd. bucket. The loaders were used to mine, feed the sluicing plant and remove tailings. All the material mined was sluiced. One pass 40 feet deep was made through the cut. According to the operators, a second pass was required as an additional 40 feet of gravel remained above bedrock. The sluicing plant consisted of a "Derocker" screening unit, dump box, and single run sluice box 3 feet wide and 30 feet long. It was fed at a rate of approximately 120 cu.yd. of material per hour. Water for sluicing was gravity fed at a rate of 1,500 igpm to the "Derocker". Tailings were transported by loader up a long ramp, and were stacked on the hillside downstream of the cut. Effluent from sluicing was settled in a series of settling ponds in the Lightning Creek valley.



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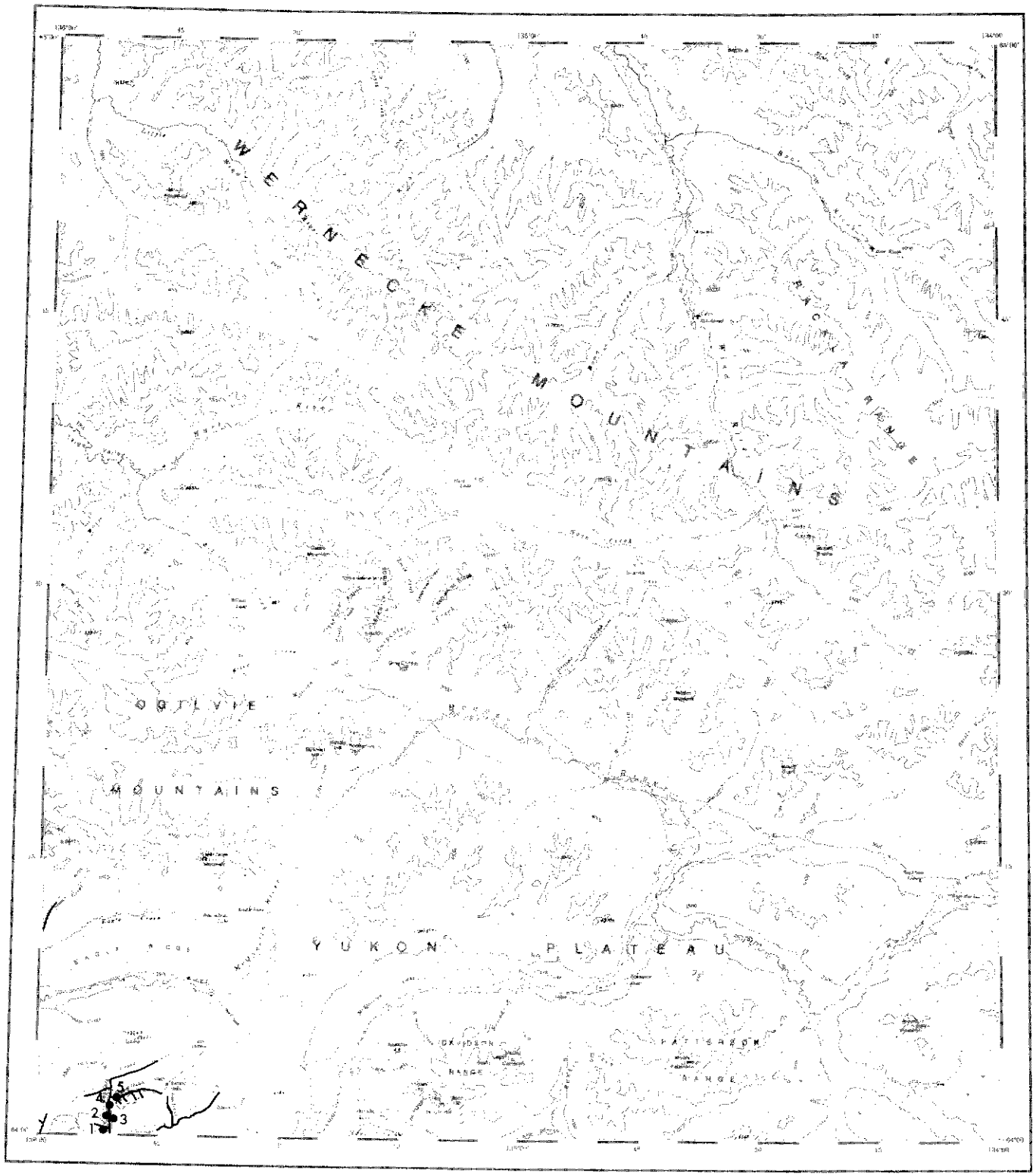
KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

LANSING

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KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

NASH CREEK

# PLACER MINING OPERATIONS IN THE NASH CREEK MAP AREA, NTS 106 D

A. Ritter (1)
F. Schomig 106 D 4
Fifteen Pup 64°00'N 135°51'W
1983, 1984

This property is located along Fifteen Pup, 1,000 feet upstream from its confluence with Haggart Creek. Deposits present are on a "bench" approximately 80 feet above the present level of Haggart Creek, and are at least 40 feet thick. They consist of colluvium and pebbly sand over parallel and cross laminated sand. Paleoflow indicators suggest that the laminated sand is a result of post-glacial deposition in a deep and wide stream in the Haggart Creek valley. Fine grained flaky gold was reported to occur throughout the section.

Work during 1983 was done by a crew of 2 using a Cat D8K bulldozer and a Cat 930 loader. All material mined was sluiced in a sluicing plant with dry grizzly, dump box, and single sluice run. The material was fed by the loader to the grizzly, which had a 6 inch spacing. Material less than 6 inches in diameter fell into the dump box, which was 6 feet wide and 10 feet long, and was washed by water entering the dump box through a large pipe, and a small pipe set up like a monitor. The sluice run was 24 inches wide and 16 feet long, and was lined with riffles over expanded metal and mats. The gradient on the sluice box was 3 inches per foot. Water for sluicing was gravity fed through a combination of pipes and ditches from a reservoir upstream along Fifteen Pup. Effluent from sluicing was impounded in a settling pond before flowing into Haggart Creek. Work on the property continued during 1984, using the same methods and equipment as in 1983. Approximately 80 cu.yd. per hour of material were sluiced, using 400 igpm of water. Clay and silt lenses in the section caused some problemns during sluicing. The cut reached 40 feet in depth, but bedrock was not found.

Figure 1: Sluicing plant at A. Ritter and F. Schomig operation on Fifteen Pup. Grizzly is visible at upper left above dump box. (R.W. '83)

Gold from this property is fine grained, flaky, and shiny, and is reported to have a fineness of 890.

T. Takus (2)
E. Kotiuk 106 D 4
Haggart Creek 64°01'N 135°51'W
1983

This property is located along the extreme right limit of Haggart Creek, approximately 5,000 feet upstream from the mouth of Fifteen Pup. Deposits present are approximately 40 feet thick, and are situated on a series of stepped 12 to 15 foot high benches. The depth of overburden increases rapidly as the cut moves into the valley wall.

Two miners worked at this property during 1983, using a Cat 977 loader and JCB backhoe/loader. Material was mined by the loader and brought to a stockpile beside the sluicing plant. The sluicing plant, which consisted of a dump box and single sluice run, was fed by the small backhoe. The dump box was 5 feet wide and 12 feet long, and the sluice box was 12 inches wide and 20 feet long. It was lined with riffles over expanded metal and coco matting, and was set at a gradient of 2 inches per foot. Tailings were removed by the loader. Water for sluicing was pumped by way of a short pipe line at a rate of about 1,000 igpm from a small pond immediately adjacent to Haggart Creek. Effluent from sluicing was settled in one settling pond, and returned to Haggart creek by filtering through old tailings.

Gold from this property is reported to be worn, fine grained, and flaky.

W. Malicky (3)
Haggart Creek 106 D 4
1983, 1984 64°01'N 135°51'W

This property is located along the left limit of Haggart Creek, approximately 5,000 feet upstream from the mouth of Fifteen Pup. Deposits present are approximately 20 feet thick, and consist of 8 feet of clayey gravel and mucky silt, over 12 feet of rusty orange gravel.

Mr. Malicky worked at this property during 1983 using a Cat D8-2U bulldozer, a Cat 977 Traxcavator, and a Michigan rubber tired loader. Small cuts were mined along the edge of the creek. Work was done during 1984 by a crew of 3 using the same equipment as in 1983, plus a Komatsu D85A bulldozer. The Komatsu bulldozer was used to strip the cut. Material was mined and fed to the sluicing plant by the loader at a rate of 50 cu.yd. per hour. The sluicing plant consisted of a dry grizzly, dump box, and single run sluice box. Material greater than 6 inches in diameter was removed by the grizzly. Finer grained material fell into the dump box, which was 8 feet wide and 10 feet long. The material was washed through an 8 foot long yoke, which narrowed to 24 inches in width, and into the sluice run. The sluice run was 24 inches wide and 20 feet long, and was lined with 1 1/2 and 2 inch angle iron riffles over expanded metal and Astro turf. Tailings were removed by the Cat bulldozer. Water for sluicing was pumped from a widened and deepened portion of the drain from the cut. Recycling took place, depending on how much seepage was coming from the

cut. Effluent was impounded in a settling pond downstream from the sluicing plant, and from there returned to Haggart Creek by seeping through old tailings.

T. Takus (4)
Haggart Creek 106 D 4
1984 64°02'N 135°51'W

This property is located along the right limit of Haggart Creek, approximately 2,500 feet downstream from the mouth of Dublin Gulch.

Figure 2: Gold saver in position at end of sluice box at T. Takus operation on Haggart Creek. Note hose supplying water to gold saver. (R.W. '84)

Mr. Takus mined with the help of family members during 1984, using a Cat 977 loader and JCB backhoe-loader. The backhoe was used to prospect for small pockets of gold bearing gravel, which, when located, were then mined. The material was mined by the loader and brought to a stockpile beside the sluicing plant. The sluicing plant was fed by the small backhoe at a rate of about 10 cu.yd. per hour. The sluicing plant consisted of a dry grizzly, which screened material more than 6 inches in diameter, a dump box, and single sluice run. The dump box was 5 feet wide and 12 feet long, and the sluice box was 12 inches wide and 20 feet long. The sluice box was lined with riffles over expanded metal and coco matting, and a small jig-like gold saver was added to the end. The operation of the gold saver was simple. A piece of punch plate with 1/2 inch holes allowed material smaller than 1/2 inch in diameter to fall into the unit. Water injected into the bottom of the unit blew light grains out of the gold saver, while allowing the heavy grains to remain. Water for sluicing was provided by a 5 by 6 inch pump powered by a 4 cylinder gas motor. A small Honda pump provided water for the gold saver. Water was pumped directly from Haggart Creek, with screens used on the hose inlets. Effluent from sluicing was impounded in a settling pond before being returned to Haggart Creek.

Canada Tungsten Mining Corp. Ltd. (5)
Dublin Gulch 106 D 4
1983, 1984 64°02'N 135°50'W

This property is located along Dublin Gulch. Deposits present are up to 50 feet deep, and consist of glaciofluvial gravel, in which large rounded boulders are common, overlying pre-glacial gravel. A layer of black organic material about 20 feet above bedrock separates the gravel layers. Scheelite is the most abundant of the heavy minerals recovered, and has proven difficult to sort. Because of the arsenopyrite content in the concentrate, it can not be simply smelted to separate the metals contained in it.

Work at this property was carried out by a crew of 4 during 1983. Approximately 100,000 cu.yd. of material were stripped from a large cut, but no sluicing was done. The limits of the cut were determined by drill testing done in 1982 and 1983. The stripping was done hydraulically, with the assist of a Cat 931B Traxcavator, and a Cat 627B scraper with a capacity of 21 cu.yd. Dublin Gulch was dammed to make a reservoir from which two electric pumps fed three monitors. Water from the monitors washed a 30 foot thick section of overburden down a drain. The Traxcavator was used to clean the drain to maintain material movement from the face. The scraper was also used to remove tailings which the water flow would not carry. The tailings were stacked downstream from the cut along the left limit of Dublin Gulch. Effluent from stripping was settled in a series of large settling ponds in the Haggart Creek valley. A section of gravel 20 to 25 feet thick was left for mining and processing in 1984. During 1984, a crew of 3 worked at the property. They used a Cat D9H bulldozer to strip 28,500 cu. yd. of material. It was able to move as much material in one week as had been moved in a month by hydraulicking in 1983. The bulldozer was also used to loosen pay gravel for the loader, and stack tailings. A Cat 980C loader was used to transport material from the cut to the sluicing plant. It was also used to stack tailings. The sluicing plant consisted of a "Derocker" screening unit, dump box, and sluice box with side run. It was fed by the loader at a rate of approximately 50 cu.yd. per hour. The "Derocker" was modified by the addition of a steep slick plate around the head. Water seeping across this plate allowed material to be dumped into the "Derocker",

without having it land on the moveable plates. This modification, along with water sprayed under the plates for lubrication, was expected to extend the life of the unit. Material less than 2 inches in diameter passed through the "Derocker" into the sluice box. The main channel of the sluice box was 36 inches wide, and 40 feet long. The top 10 feet were lined with punch plate with 3/4 inch holes. Material less than 3/4 inch in diameter went to a side run which was 24 inches wide, and 18 feet long. Both runs had drops, and both were lined with 1 1/4 inch angle iron riffles over expanded metal and mats. There were 30,500 cu.yd. of material sluiced during 1984, from which about 3,000 ounces of gold were recovered. Water for sluicing was provided at a rate of 2,500 to 3,500 igpm from the same reservoir as was used in 1983. It was pumped by an 8 by 10 inch pump powered by a 60 hp electric motor. Effluent from sluicing was settled in a series of large settling ponds on Haggart Creek.


Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

KLUANE LAKE

**Sikanni Oilfield Construction** (1)
**4th of July Creek** 115 G 1
**1983** 61°11'N 138°04'W

This property is located on 4th of July Creek, approximately 1,000 feet downstream from the mouth of left limit tributary Alie Pup. Deposits exposed in cuts at the site are 20 feet thick, and consist of gravel with both rounded and angular clasts overlying bouldery clay. Only small isolated patches of the deposits are frozen, which is probably why early attempts to sink shafts to bedrock along the creek failed. 4th of July Creek was discovered in 1903 by Dawson Charlie of Carcross, and has been mined intermittently since.

Work was carried out on 2 shifts by a crew of 10 workers during 1983. A Cat 235 backhoe was used to mine gravel from the face of the cut, and feed the sluicing plant. Tailings were removed by a Cat D8H bulldozer. The sluicing plant consisted of a modified "Ross" box. It was equipped with wheels and hydraulic levelling jacks, and sat on the stripped surface at the head of the cut. Material was fed to the dump box by the hoe at a rate of approximately 50 cu.yd. per hour. It was washed, and classified by punch plate with 1/2 inch holes. Oversize continued through the centre sluice run. Instead of being sluiced in the side runs, the undersize was divided between four 18 inch diameter revolving "centrifugals" each 10 feet long, which rotated at a rate of 140 rpm. These tubes contained several sections of riffles parallel to their length, and were reported to improve recovery of fine grained gold. Clean-up of the tubes was done by slowing their rate of revolution to 70 rpm, and using water to flush material contained in them into a container prior to further processing. Water for sluicing was recirculated from a series of 3 settling/recirculation ponds by a 10 inch diesel pump.

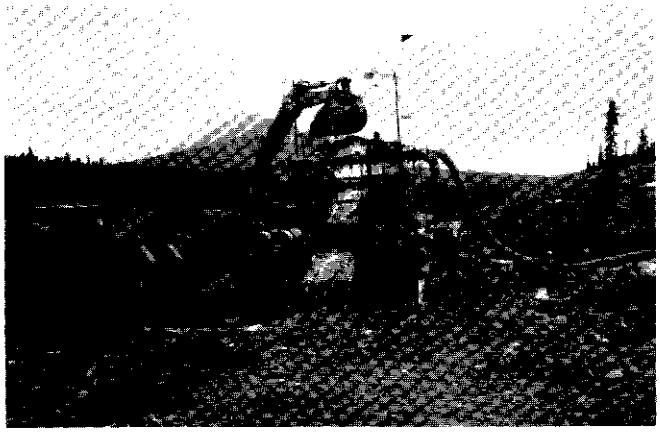


**Figure 1:** Hoe feeding sluicing plant at Sikanni Oilfield Construction operation on 4th of July Creek. (G.G. '83)

Gold from this property was reported to have a fineness of 800. The high garnet content in the heavy mineral concentrates from this site hampers final recovery of the gold.

**A. Ticiniski** (2)
**Squirrel Creek** 115 G 6
**1983, 1984** 61°19'N 139°07'W

This property is located on Squirrel Creek, 2 miles upstream from its confluence with the Duke River. Deposits near the centre of the valley are 5 feet deep. They thicken to 10 feet deep along the right limit valley wall. Deposits in the centre of the valley are thawed, while those along the margins of the valley are frozen. The bedrock surface is wavy.

Mr. Ticiniski mined a cut in the centre of the valley at this site in 1983. He continued work at the property with 3 helpers during the latter part of the 1984 season. Working on a single shift, they mined a cut 60 feet wide and 375 feet long along the right limit of the valley. A Cat D6 bulldozer was used to scrape material from the surface of the cut as it thawed. A layer approximately 6 inches thick was mined each day, and fed to a Case W 24 C loader equipped with a 3 cu.yd. bucket. The loader fed the sluicing plant at a rate of approximately 65 cu.yd. per hour. Tailings were removed by a Cat D8H bulldozer. The sluicing plant consisted of a grizzly, dump box, and single run sluice box. The grizzly was constructed of inverted heavy rail iron, and was set at right angles to the sluice run. The spacing between the rails was 6 inches. Material less than 6 inches in diameter fell through the grizzly into the dump box, which was 6 feet wide and 15 feet long. From there it was washed into the sluice box, which was 24 inches wide and 30 feet long. It was lined with riffles over expanded metal and matting. Riffles in the upper half of the run were of 2 1/2 inch angle iron, while those in the bottom half of the run were of 1 1/2 inch angle iron. Water for sluicing was pumped to a spray bar over the grizzly by a 10 by 10 inch pump powered by a Cummings 335 six cylinder diesel engine.

In addition to gold and other heavy minerals, copper nuggets were recovered from the deposits at this property.

**C. Vickers** (3)
**Burwash Creek** 115 G 6
**1984** 61°24'N 139°14'W

This property is located on a small piece of high bedrock on the left limit of Burwash Creek, approximately 3 1/2 miles upstream from the Alaska Highway. Deposits present are approximately 10 feet thick, and consist of 4 feet of organic material overlying 6 feet of sandy gravel. Bedrock is decomposed schist.

Mr. Vickers worked by hand at this property during 1984. All but the organic material was shovelled onto a grizzly, over which it was washed and raked. Material less than 1 inch in diameter fell into the wooden sluice box, which was 12 inches wide and 30 feet long. The sluice box was lined with expanded metal and matting. Water for sluicing was derived from a left limit pup. It was impounded in a small pond, connected to a second pond by a culvert. Water for sluicing was pumped by a 3 hp

pump from the lower pond to the sluice box by way of a 2 inch hose. Effluent from sluicing returned to the second pond.

O. Brown (4)
Burwash Creek 115 G 6
1984 61°23'N 139°14'W

This property is located on Burwash Creek, about 3 miles downstream from the mouth of Tatamagouche Creek. Deposits present are 10 feet thick, and consist of 2 feet of frozen organic material mixed with volcanic ash overlying 8 feet of grey sand with some gravel. Boulders in the gravel are well rounded, and up to 12 inches in diameter. Bedrock is decomposed schist.

Mr. Brown began work at this site in 1984. He used a John Deere 350 loader with 3/4 cu.yd. bucket and 1/4 cu.yd. backhoe attachment to strip the layer of frozen overburden from a cut of approximately 30,000 square feet at the mouth of a small left limit tributary. A rented Cat D8 bulldozer was also used occasionally for the stripping. This work was done in preparation for mining in 1985. A wooden single run sluice box 12 inches wide and 8 feet long with tin lining, and a dump box 2 feet wide and 5 feet long were constructed. The upper 4 feet of the sluice run were lined with 1 1/4 inch riffles, while the bottom 4 feet were lined with heavy guage expanded metal. Material was mined from a 10 foot high face along the left limit of the creek, and fed to the dump box by the backhoe. Water for sluicing was pumped directly from Burwash Creek by a 3 inch Homelite 316 pump.

G. Jones (5)
Burwash Creek 115 G 6
1983, 1984 61°23'N 139°14'W

This property is located on a left limit bench of Burwash Creek, approximately 4 miles upstream from the Alaska Highway. The deposits present are 12 feet thick, and are frozen. They consist of 2 feet of organic material mixed with volcanic ash, overlying 5 feet of mixed sand and gravel and 5 feet of mixed clay, sand, and gravel. Large boulders and wood fragments are occasionally present throughout the section.

Work at this property was done by a crew of 2 with 2 helpers during 1983 and 1984. Material was mined by hand from the face of the left limit bank alongside the road. All but the organic layer was sluiced in a wooden sluice box 9 1/2 inches wide and 13 feet long, which was lined with expanded metal over coco matting. Material coarser than 1 inch in diameter was screened off prior to sluicing by a section of expanded metal. Water for sluicing was pumped at a rate of 40 to 50 igpm directly from Burwash creek by a 3 inch Honda pump.

D. Miller (6)
Burwash Creek 115 G 6
1983, 1984 61°22'N 139°16'W

This operation is located along the right limit of Burwash Creek, approximately 2 miles downstream from the mouth of Tatamagouche Creek. Deposits present are 8 feet thick, and consist entirely of gravel. The deposits are not frozen. Bedrock is red decomposed schist.

Mr. Miller worked at this property during 1983. He continued work in 1984, using a Bucyrus-Erie 190B Dynahoe with 1/2 cu.yd. bucket to excavate the cut, stockpile material for the loader, and feed the sluicing plant. A Hough 70 payloader equipped with a 2 1/2 cu.yd. bucket was used to feed the hoe while sluicing was going on. One IH TD-7E bulldozer was used for small jobs. The cut was approximately 50 feet wide and 150 feet long. Material was fed at a rate of approximately 25 cu.yd. per hour to the sluicing plant, which consisted of a dry grizzly, dump box, and single sluice run. Material 7 inches across and less fell through the grizzly to be sluiced. The sluice run was 36 inches wide and 30 feet long, and was lined with 2 inch riffles over matting. It was set at a gradient of 1 5/8 inches to the foot. Water for sluicing was diverted from Burwash Creek, and impounded along the right limit of the creek in a pond approximately 60 feet wide and 500 feet long. The water was gravity fed by way of a short 12 inch pipe line, half full, to the dump box. Effluent from sluicing was settled in a large pond along the right limit of Burwash Creek, 500 feet downstream from the sluice box. Tailings were removed by the loader.

Burwash-Cooper Mining Co. Ltd. (7)
Burwash Creek 115 G 6
1984 61°22'N 139°19'W

This property is located along Burwash Creek, approximately 1,000 feet upstream from the mouth of left limit tributary Tatamagouche Creek, and 3,500 feet downstream from the site at which the company mined for most of the 1984 season. Deposits present are 6 to 8 feet thick, and consist of gravel with rounded boulders 6 to 18 inches in diameter.

The Burwash-Cooper Mining Co. Ltd. crew of 8 moved its activities to this property early in September. The road between the properties was widened and smoothed, and the Cat D8H and Cat D9H bulldozers were used in tandem to skid the sluicing plant on its pontoon to this property. Meanwhile, the Cat 245 hoe was used to dig a large pond in which to float the sluicing plant during mining operations. Mining and sluicing at this location continued until the end of the season, using the same equipment and mining methods as were used at the previous mine site.

Burwash-Cooper Mining Co. Ltd. (8)
Burwash Creek 115 G 6
1984 61°22'N 139°20'W

This property is located along Burwash Creek, approximately 4,500 feet upstream from the mouth of left limit tributary Tatamagouche Creek. Deposits present average 14 feet deep, and consist of gravel with numerous boulders 12 inches in diameter and larger.

Work at this site was begun during July, when the sluicing plant was moved onto the property. During set-up of the sluicing plant, called a "Hall dredge" after its designer Bill Hall of Alaska, a crew of 23 worked on 2 shifts. Six low-bed trailer loads were reported necessary to transport the sluicing plant. Once sluicing was begun, the size of the crew was reduced to 8 miners working on 2 shifts. One Cat D8H bulldozer and 1 Cat D9H bulldozer were used to strip and contour ground in preparation for the sluicing plant and the Cat 245 hoe used to feed it. A cut 150 feet wide, 300 feet long, and 14 feet deep was mined. Material was mined from the flooded cut by the hoe, and was fed to the sluicing plant, which floated in the cut, at a rate of approximately 120 cu.yd. of material per hour. The plant was made up of a grizzly, feed hopper, trommel, and 6 sluice runs, all mounted in a zig-zag configuration on a single metal pontoon 36 feet wide and 50 feet long. Material was fed over a high, double winged wet grizzly by the hoe. Material less than 12 inches in diameter fell through the grizzly into the hopper. Material was fed from the hopper into the trommel, which was 6 feet in diameter and 40 feet long, and was set at a gradient of 1 foot to 30 feet. The upper 22 feet of the trommel acted as a scrubber, and the lower 18 feet of it screened the material through 3/8 inch holes. Material less than 3/8 inch in diameter went to the sluice runs, while the oversize spilled over a series of nugget traps prior to being sent to tailings by way of a conveyor belt. Material less than 3/8 inch in diameter was divided between two sluice runs, sloping in the opposite direction than the trommel at a gradient of 1 9/16 inches to the foot. These two runs then fed 4 parallel sluice runs running in the same direction as the trommel at a gradient of 1 3/8 inches to the foot. Slop trays beneath the lower end of each wing of the grizzly also fed material to the lower set of sluice runs. They caught material that had moved too far on the grizzly wings to enter the hopper. This material was screened to less than 1 inch in diameter on the grizzly. The same riffle configuration was used in all six trays. Two inch angle iron riffles spaced 5 3/4 inches apart, were tipped back at an angle of 15 degrees. Welded vertically on the tops of the riffles were 7 inch long sections of 2 inch angle iron, with the angle facing into the flow of material in the run. Two or three of these vanes were used alternately on successive riffles. Three 6 cylinder 80 hp Deutz diesel engines were mounted on the feed end of the pontoon. Two of them drove pumps, which together provided water at a rate of 3,500 igpm for sluicing. The third drove the hydraulic motors which provided power to rotate the trommel and vibrate the sluice trays. The sluice trays were emptied daily into a clean-up truck with a capacity of 2 clean-ups. During clean-up, the riffles and matting, which was attached to the base of the riffles in short overlapping sections, were elevated by a 9 1/2 inch hydraulic ram to facilitate quick easy cleaning of the trays.

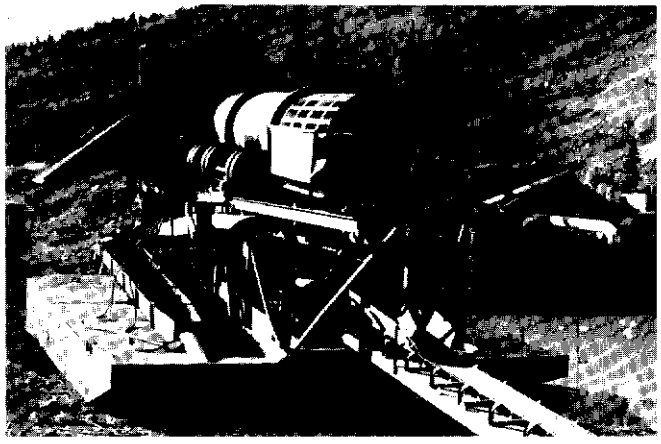


Figure 2: View of "Hall Dredge" sluicing plant used by Burwash-Cooper Mining Co. Ltd. on Burwash Creek. The pontoon hull of the unit is visible. (L.O. '84)

A. Ticiniski (9)
Burwash Creek 115 G 6
1984 61°22'N 139°25'W

This property is located on Burwash Creek, downstream from the mouth of Cooper Creek. The valley bottom is only 30 feet wide. Deposits present are 6 feet deep, and consist of gravel with numerous large boulders. Some boulders are more than 3 feet in diameter.

Work at this property was done during the early and middle part of the 1984 season by a crew of 3. They used a Cat D8H bulldozer to mine two long, narrow cuts, which took in the entire width of the valley bottom, and to stockile material for a Case W 24 C loader. A berm pushed up in the centre of the valley kept the creek out of the cut. The loader was used to feed the sluicing plant and remove tailings. A Cat 955 Traxcavator was used as a back up machine. The sluicing plant consisted of a wet grizzly, dump box, and 3 run sluice box. Material was fed to it at a rate of approximately 60 cu.yd. per hour, and was screened to 9 inches in diameter and less on the grizzly before dropping into the dump box. All 3 sluice runs were 36 inches wide and 16 feet long. The main run was lined with 2 1/2 inch riffles spaced 6 inches apart over 2 layers of expanded metal and Astro turf. The side runs were lined with expanded metal over matting. Water for sluicing was provided to the grizzly spray bars and dump box manifold by a 10 by 10 inch pump powered by a 335 Cummings 6 cylinder diesel engine.

Gold recovered from this site was reported to be entirely fine grained, flat, and very difficult to catch in the sluice box. Heavy quantities of black sand were recovered with the gold.

Figure 3: View upstream along Burwash Creek, at the A. Ticiniski property. (L.O. '84)

Upper Burwash Mining Co. Ltd. (10)
Burwash Creek 115 G 6
1984 61°19'N 139°26'W

This property is located along the headwaters of Burwash Creek, due west of Amphitheatre Mountain. Deposits at the site consist of glacial outwash and three types of clay. The deposits are more than 25 feet deep.

Work at this property was done for the first time during 1984, but the property was abandoned in August. A crew of 3 with 1 helper in camp used a Cat D8H bulldozer to mine a pit 14 feet wide, 300 feet long, and 25 feet deep. A Cat 988 loader was used to feed the material mined to the sluicing plant. The sluicing plant consisted of a 12 by 12 foot hopper, vibrating screening unit, sluice, and centrigual concentrators. Material less than 5 1/2 inches in diameter fell through a screen at the hopper mouth and onto a conveyor belt 30 inches wide to be carried to the vibrating screening unit. The screening unit had 2 decks, of which the top one had 2 sections. The upper half screened to 1 1/4 inches and the lower half screened to 1/2 inch. The bottom deck screened to 3/16 inch. Material between 3/16 and 1 1/4 inches in size was fed to a sluice run with nugget traps at the upper end. The lower 3 feet were lined with 1 inch screen over Astro turf. Material less than 3/16 inch in diameter was split between two 30 inch Knelson centrifugal concentrators. Operations were hampered by the inability of the concentrators to handle clay, which was plentiful. Power for the sluicing plant was supplied by a 250 KVA generator set powered by a 230 hp V8 Detroit diesel engine. Water for sluicing was pumped at a rate of 900 igpm by a 6 by 8 inch Hidustrial slurry pump run by a 50 hp Teco 3 phase induction motor. Water was pumped from a 40 foot diameter pond fed by Burwash Creek by way of approximately 300 feet of diversion ditch.

T. Bradley (11)
B. Bjork 115 G 5
Porcupine Creek 61°29'N 139°42'W
1984

This property is located along Porcupine Creek, a left limit tributary of Arch Creek. Deposits present are approximately 12 feet thick. They are frozen in places, and consist of gravel with layers of sticky clay.

Work on this property during 1984 was done using a Cat D7E bulldozer to stockpile material, and a Cat 944 loader, a Cat 966 loader, and a Cat 977 tracked loader to feed the sluicing plant and remove tailings. Material mined was sluiced in a small sluice box. Water for sluicing was pumped at a rate of 60 igpm from a settling/recirculation pond downstream from the sluice box. Water shortages, and problems with clay, caused problems during sluicing.

H. Fromme (12)
A. Fromme 115 G 5
Arch Creek 61°30'N 139°41'W
1984

This property is located along Arch Creek, immediately downstream from the foot of the lower canyon, and approximately 1 1/4 miles upstream from the Donjek River valley. Deposits present are 20 feet thick, and consist of grey sandy gravel, with boulders from 18 to 36 inches in diameter being common. The deposits are not frozen.

Work on the property during most of the 1984 season was done by a crew of 6 miners working on 2 shifts, with the support of 2 helpers in camp. At the end of the season, work was done by a crew of 3 miners working on a single shift. They used a Cat D7G bulldozer to work a cut along the left limit of the valley, and to feed the backhoe. The P & H backhoe, which was equipped with a 1 1/4 cu.yd. bucket, was used to feed the sluicing plant. A Cat 977 Traxcavator was used to remove tailings. The entire section of gravel was mined and sluiced even though values were found only in the lower levels of the section. This was done because it was the most efficient way to handle the material in the narrow valley, where operating room was a factor. The gravel was washed in the sluicing plant, which consisted of a wet grizzly, dump box, and single run sluice box, at a rate of approximately 60 cu.yd. per hour. Material was screened to less than 6 inches in diameter on the grizzly prior to falling into the dump box. Water for the grizzly was pumped directly from Arch Creek by a 6 inch pump powered by a 4 cylinder Ford engine. Water was also delivered directly to the head of the dump box, which was 10 feet wide and 18 feet long, and lined with slick plate. The water was delivered under gravity by way of two 14 inch pipes. The sluice run was 48 inches wide and 30 feet long. It was lined with 4 inch riffles.

E. Green (13)
R. Moore 115 G 5
Arch Creek 61°29'N 139°38'W
1984

This operation is located 200 feet upstream from the head of the upper canyon on Arch Creek. The deposits present are not frozen. They consist of sandy grey gravel with numerous boulders more than 18 inches in diameter. The valley bottom is approximately 150 feet wide, and the gradient of the creek is steep.

Work at this site was begun in September, 1984. Two miners used a Cat D8H bulldozer to work the cut, and feed a Cat 988 loader. The loader was used to feed the sluicing plant and remove tailings. The sluicing plant consisted of a grizzly, dump box, and single run sluice box. Material was screened to less than 6 inches in diameter by the grizzly prior to falling into the dump box. The dump box was 7 feet wide and 9 feet long, and was lined with expanded metal over coco matting. Heavy rails were used to act as wear plates. The sluice run was 36 inches wide, and 28 feet long, and was lined with 1 inch rail riffles over expanded metal and coco matting. Water for sluicing was gravity fed by way of a 20 inch diameter pipe line.

D. Duensing (14)
R. Holway 115 G 12
Reed Creek 61°32'N 139°38'W
1984

This property is located on Reed Creek, approximately 1,000 feet downstream from the foot of the canyon, and 4 miles upstream from its confluence with the Donjek River. Deposits present are 9 feet deep, and are not frozen. They consist of brown and red sandy gravel overlying competent to highly decomposed bedrock. Old workings are present nearby. Bedrock was cleaned in the canyon by early workers, and the ground downstream from it was mined by open-cut methods. Deeper ground farther downstream was mined by underground methods. Old records report that an 11 ounce nugget was recovered from Reed Creek.

Work on the property during 1984 was done by 3 miners with one helper in camp. They used a Cat D9G bulldozer to work the cut and feed material to the loader, and to remove tailings. The Cat 966C loader was used to feed the sluicing plant. A Cat D8H bulldozer was used as a standby for the D9G. Four cuts were mined, each 150 feet square, and each taking in the entire width of the valley. Up to 4 feet of bedrock was mined and sluiced where it was decomposed. The material mined was fed to the sluicing plant at a rate of 60 cu.yd. per hour. The sluicing plant consisted of a wet grizzly, dump box, single run sluice box, and small side run. The grizzly was 18 feet wide and 10 feet long. It screened material to less than 5 inches in diameter for the first 4 feet of its length, and to less than 3 inches in diameter for the remaining 6 feet of its length. From the grizzly, material fell into the dump box and was washed into the sluice run. The sluice run was 56 inches wide and 30 feet long, and was lined with 3 inch riffles spaced 6 inches apart over Astro and coco matting. Near the end of the run, a short section of punch plate with 3/8 inch holes fed a small side run. The side run was 12 inches wide and 4 feet long, and was lined with 2 layers of expanded metal over matting. When plentiful, water was fed by gravity from a small reservoir to the spray bar of the grizzly by way of a 6 inch diameter pipe, and to the dump box by a partly full 24 inch diameter pipe. When water was not plentiful, it was recirculated at a rate of 1,800 igpm by a 10 by 12 inch PACO pump powered by a Cat 3304 diesel engine. Effluent from sluicing was settled in a series of 4 ponds over the two miles of creek downstream from the mine.

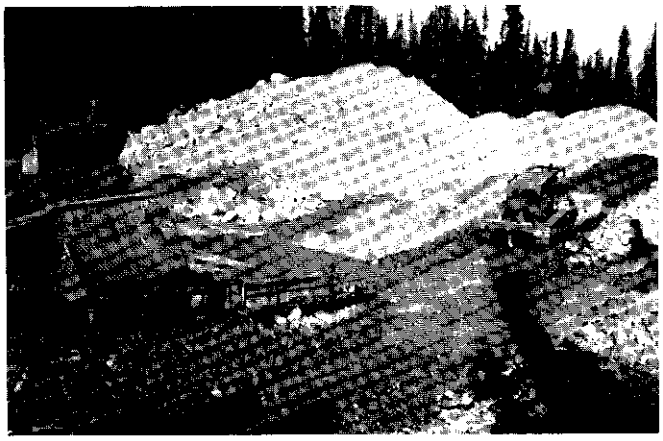


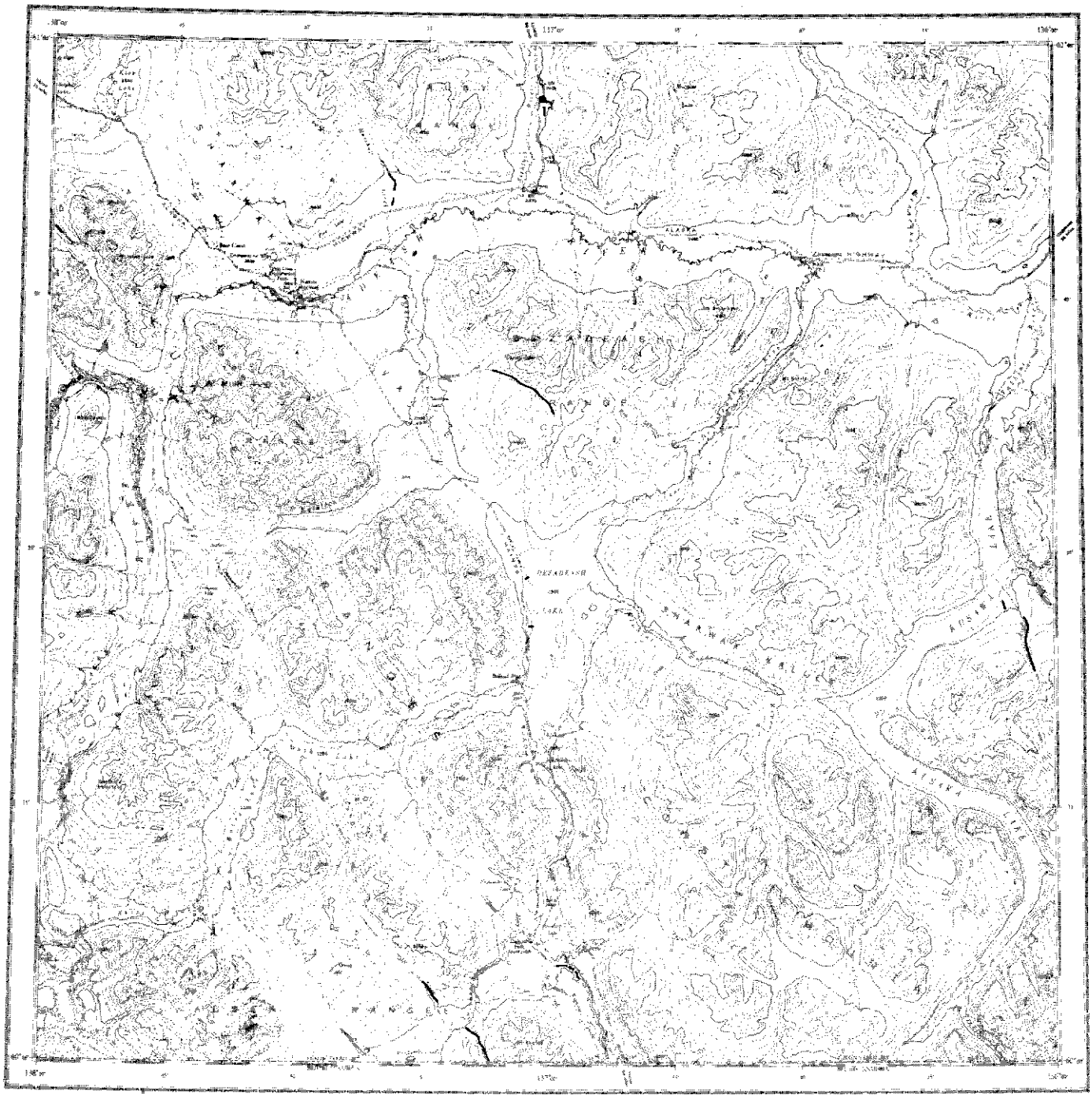
Figure 4: Sluicing at Reed Creek operation of D. Duensing and R. Holway. (L.O. '84)

Gold from this property is reported to be very rough and angular, with a large percentage of it being coarse grained. The fineness of the gold ranges from 889 to 896.

G. Mogenson (15)
J. Willey 115 G 6
Quill Creek 61°29'N 139°25'W
1983, 1984

This property is located along the lower reaches of Quill Creek, approximately 4 miles upstream from the Alaska Highway. Deposits present are 12 feet deep, and consist of mixed layers of silt, sand, and gravel.

G. Mogenson worked at this property during 1983, using a Cat D7E bulldozer, and a Cat 966C loader. During 1984, work was done by J. Willey. He used the Cat D7E bulldozer for stripping the upper half of the section from a cut along the left limit of the creek. The Cat 966C loader was used to feed the lower half of the section to the sluicing plant, and remove tailings. Approximately 7,500 cu.yd. of material were sluiced. The sluicing plant, which was fed at a rate of 40 cu.yd. per hour, consisted of a wet grizzly, dump box, and single run sluice box. Material less than 4 inches in diameter fell through the grizzly to be sluiced. The sluice box was 36 inches wide and 30 feet long, and was lined with 2



Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

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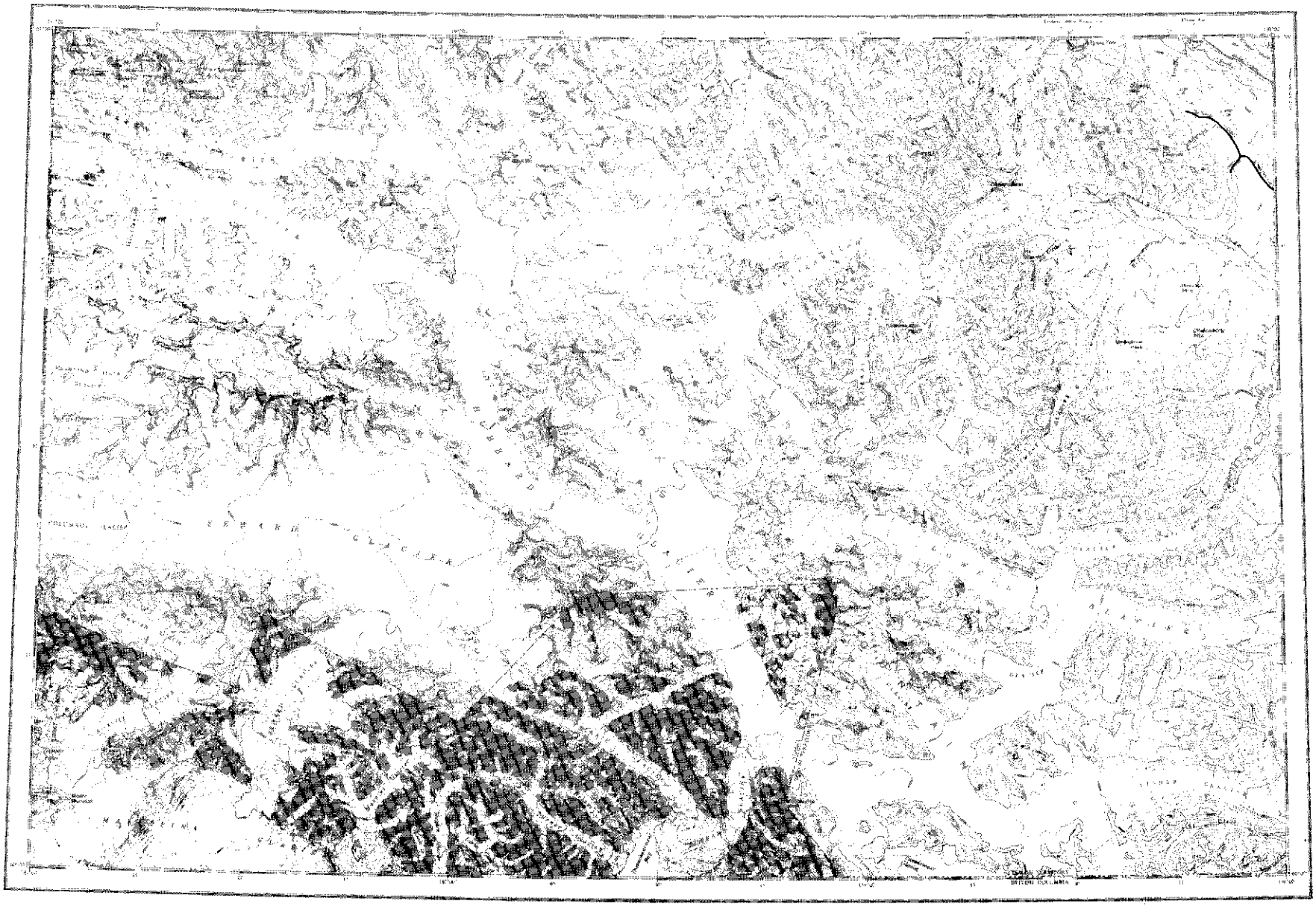
and 3 inch riffles over expanded metal and matting. Water for sluicing was provided at a rate of 1,200 igpm by a 6 inch Milwaukee pump. Effluent was settled in a pond formed where Quill Creek widened to 30 feet for a distance of 200 feet.

G. Washington (1)
Seven Mile Creek 115 A 14
1984 60°57'N 137°01'W

This property is located on Seven Mile Creek, approximately 1,000 feet upstream from the Aishihik Road crossing at mile 7 of the road. The valley bottom is quite wide. Deposits present consist of sandy gravel with well rounded boulders up to 12 inches in diameter.

A limited amount of work was done at this site during 1984. Some stripping was done, and several trenches were dug by a backhoe to obtain material for sluicing.



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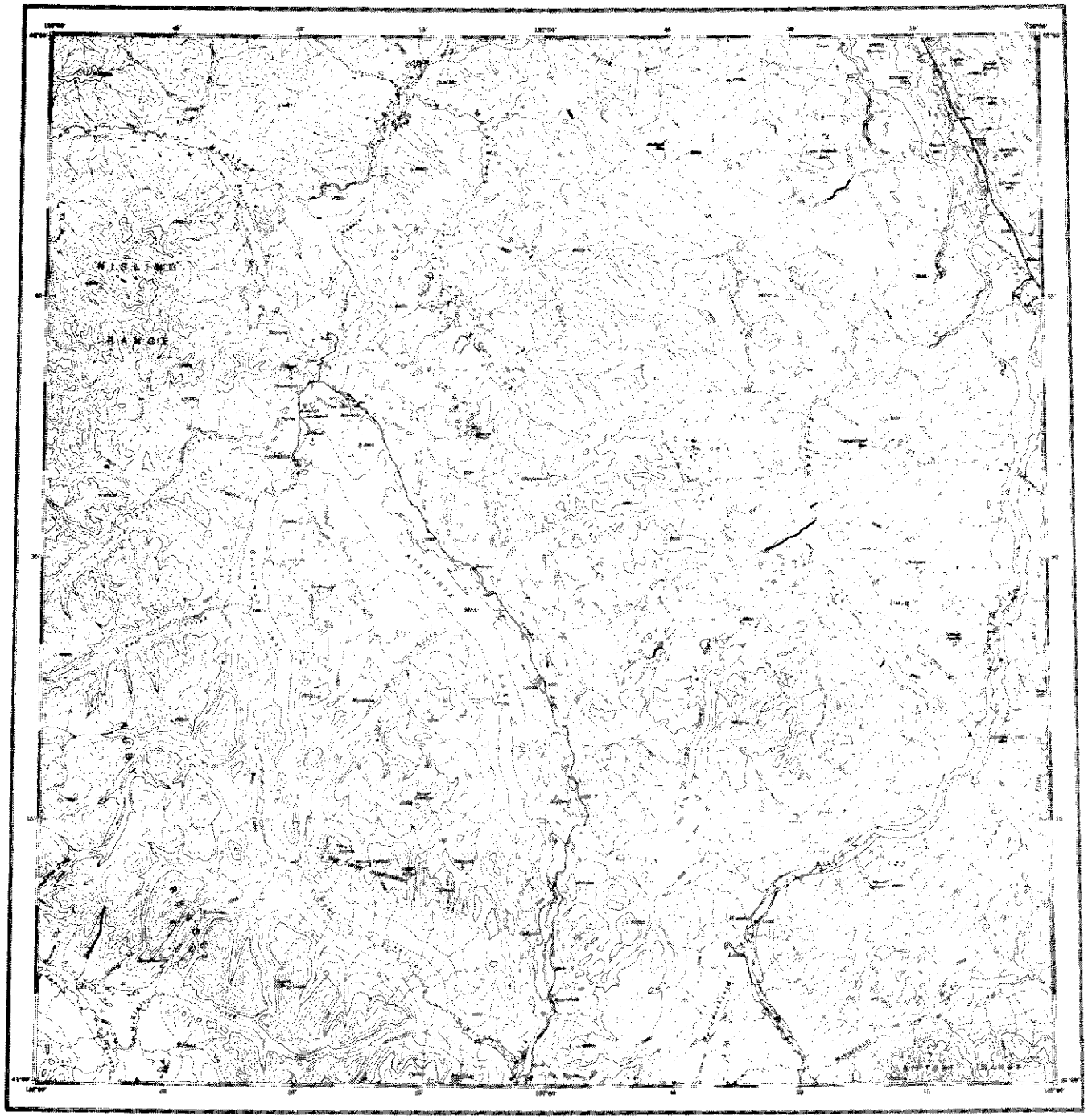


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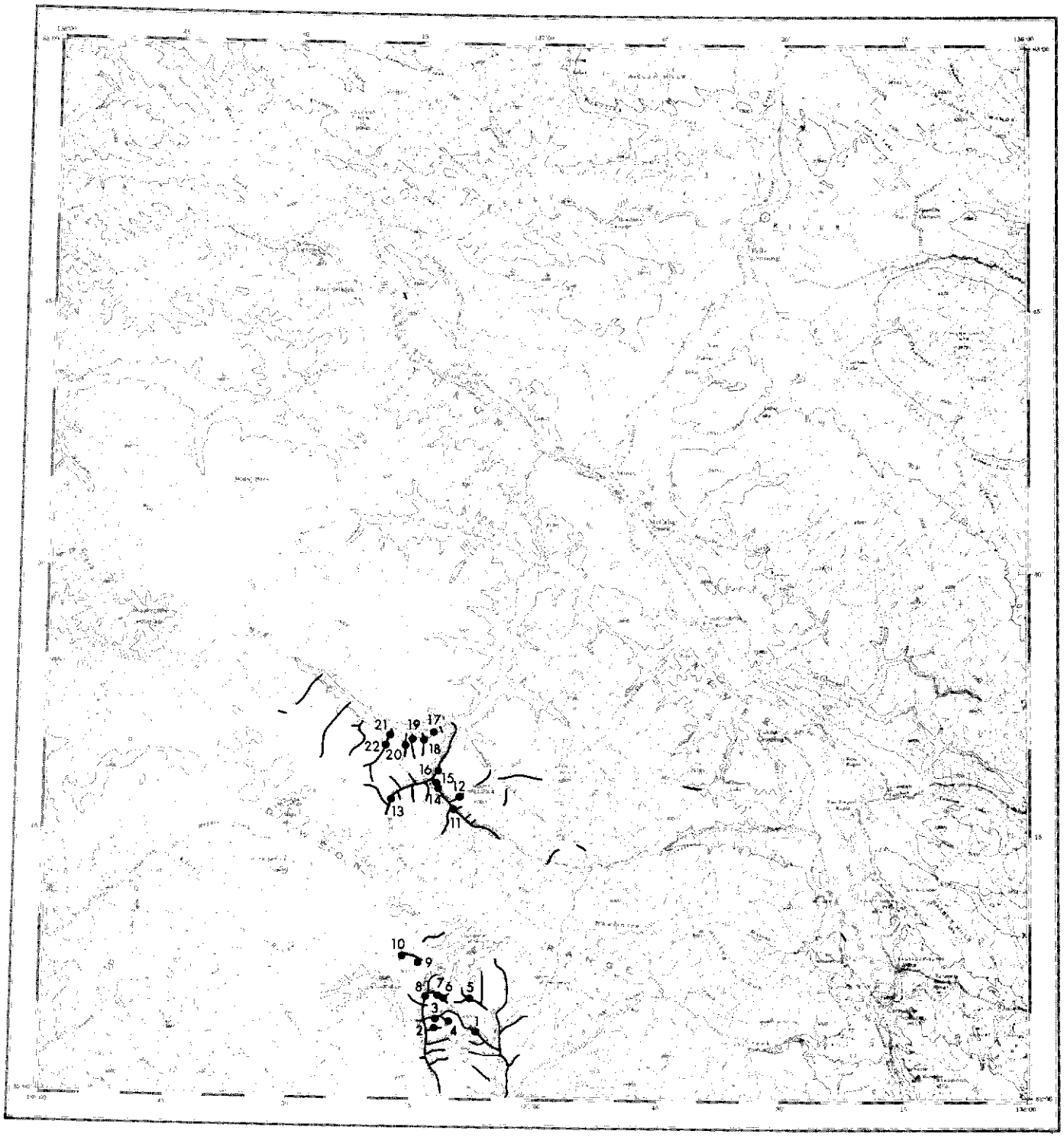


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Numbers beside the dots relate to the text.

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# PLACER MINING OPERATIONS IN THE CARMACKS AREA, NTS 115 I

F. Cochrane (1)
G. Cochrane 115 I 3
Back Creek 61°04'N 137°07'W
1983, 1984

This property is located on Back Creek, approximately 2 miles upstream from its confluence with Victoria Creek. Deposits present are 30 feet deep, and consist of 6 to 8 feet of overburden overlying 22 to 24 feet of post-glacial gravel. The gravel rests on a layer of blue clay. The deposits are frozen.

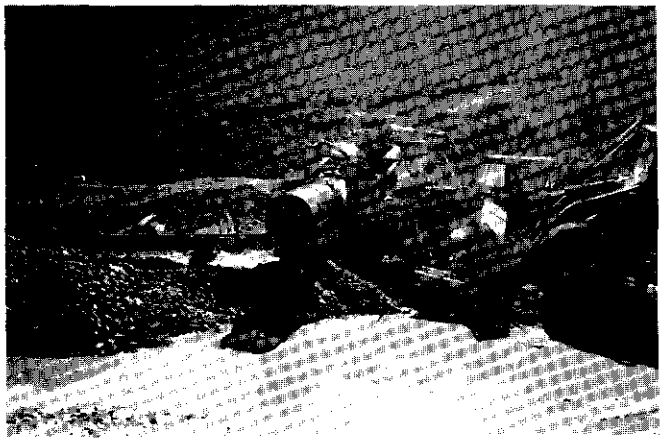


Figure 1: Sluicing plant at Back Creek mining operation of F. and G. Cochrane being fed by backhoe. (L.O. '84)

Work on this property was carried out by F. and G. Cochrane during 1983 and 1984. During 1984, they used a Cat D7-17A bulldozer to strip and mine a cut 75 feet wide and approximately 500 feet long. The material mined was fed to a Hough model 100 loader equipped with a 6 cu.yd. bucket, which was used to feed the sluicing plant and remove tailings. A 5500 Ford wheeled tractor, equipped with a 1 1/8 cu.yd. backhoe attachment was used occasionally in place of the loader. The sluicing plant consisted of a dump box, trommel, and single run sluice box. The dump box was made from the box of a dump truck. It fed material to the trommel at a rate of 20 cu.yd. per hour. The trommel was 40 inches in diameter, and 15 feet long, and was set at a gradient of 1/2 inch per foot. It was equipped with sprocket teeth welded to its circumference, and was chain driven at a rate of 12 rpm by a final drive powered by an International diesel engine. The upper 8 feet of the trommel acted as a scrubber, and the next 4 feet as a screening unit. Material less than 3/4 inch in diameter fell into the sluice run, which was 24 inches wide and 24 feet long. It was set at a gradient of 3/4 inch to the foot. The top end of the sluice run was a nugget trap, while the remaining section was lined with 2 inch angle iron riffles over expanded metal and indoor/outdoor carpet. Water for sluicing was pumped to the dump box at a rate of 600 to 750 igpm by way of a 4 inch diameter pipe line. A 6 inch Jaguar pump powered by a Massey 44 four cylinder diesel engine was used. The water was recirculated from a pond adjacent to the sluicing plant into which the total creek flow of Back Creek was fed. Effluent from sluicing also flowed into the pond, after being partially settled in a tailings area immediately below the sluicing plant. Overflow from the pond was returned to the creek channel by way of a spillway. A second, large settling pond was located downstream from the mine site.

Gold from this property is reported to be 60% coarse grained and 40% fine grained. All is rough edged, and shows no signs of wear.

R. Marchand (2)
Dolly Creek 115 I 3
1984 62°04'N 137°12'W

This property is located along Dolly Creek, a left limit tributary of Nansen Creek, approximatley 2,400 feet from its confluence with Nansen Creek. The creek valley is narrow, with a moderate to steep gradient. The left limit sidewall slopes steeply, and the right limit, south facing sidewall slopes moderately. Deposits exposed in a cut along the right limit are up to 15 feet deep, and consist mainly of sand with occasional pieces of rock mixed in. Only a very few of the pieces of rock show any wear.

Work done on the property during 1984 was mostly in preparation for mining. An area 60 feet wide and approximately 300 feet long was stripped hydraulically. Water for stripping was impounded in a reservoir along Dolly creek about 2,500 feet upstream from the mouth of Dolly Creek. From there, an 8 inch diameter pipe line 110 feet long carried water downstream to the stripped area. The maximum depth of organic material stripped was 5 feet, although the average was less. Immediately upstream from the reservoir, a cut 12 feet wide and 300 feet long was dug. It was 15 feet deep at the downstream end, and sloped to 4 feet deep at the upstream end.

F. Permenter (3)
L. Janson 115 I 3
Discovery Creek 62°05'N 137°12'W
1984

This property is located along Discovery Creek, approximately 1,000 feet upstream from the mouth of left limit tributary Eliza Creek. Deposits present are 12 to 18 feet deep, and consist of overburden and gravel over a 4 foot section of gold bearing sandy gravel, and fractured bedrock. All the gravel is stained red. The deposits are along the margins of the valley, as a centre cut was mined previously by mechanized methods. Bedrock slopes into the valley wall along the right limit of the creek.

Work at this property was carried out in 1984 by two miners with the assistance of two helpers in camp. They used a Cat 980 loader for all work. A cut 75 feet wide and 500 feet long was mined along the right limit of the creek. Up to 5 feet of bedrock was mined along with the 4 foot thick section of gravel. The material mined was fed to a washing plant made up of a dump box, trommel, and 3 sluice runs. Material was fed to the dump box at a rate of 40 to 45 cu.yd. per hour, except when clay was present. In that case, the feed rate was slower. Water

from a spray bar, and a monitor mounted at the head of the dump box, washed the material to the trommel. The trommel was 48 inches in diameter and 24 feet long, and was set at a gradient of 1 inch per foot. It rotated at a rate of 10 to 12 rpm. Power was provided by a 4 cylinder Datsun gasoline engine with reduction gear. The trommel was divided into 4 sections. The upper 11 feet acted as a scrubber. The next 6 feet screened material to less than 1 inch in diameter, while the next 3 feet screened material to less than 1 1/2 inches in diameter. The last 4 feet fed oversize material to tailings. All material less than 1 1/2 inches in diameter fell into a 12 foot long sluice run set parallel to, and directly under the trommel. The tray, which was sloped in the opposite direction as the trommel, was lined with Nomad matting only, and no riffles. Material from this run was split between 2 runs sloped in the same direction as the trommel. These runs were each 22 inches wide and 12 feet long, and were lined with two layers of expanded metal over Nomad matting. All tailings discharged at the foot of the trommel, where they were picked up by the loader and transported to the left limit wall of the valley. Water for sluicing was recirculated from the first of 2 settling ponds at a rate of 1,500 igpm by a 6 by 8 inch Monarch pump. Water from Discovery Creek was diverted to the right limit of the valley upstream from the sluicing plant, and was held at grade until it was past the cut. It was then returned to creek level and mixed with effluent from sluicing prior to entering two settling ponds set in series.

Colt Enterprises (4)
Discovery Creek 115 I 3
1983, 1984 62°04'N 137°11'W

This property is situatd on the South Fork of Discovery Creek, approximately 2,000 feet upstream from the forks. A 1955 legal survey plan regarding the area describes the creek as Courtland. The valley bottom at this site is approximately 300 feet wide, and has moderately sloped sidewalls. Approximately 700 feet upstream from this site, however, the valley bottom is only 150 feet wide. Deposits present are 8 feet thick, and consist of 2 feet of organic material overlying 2 feet of grey gravel and 4 feet of stained red gravel with angular clasts. Bedrock is yellow, decomposed schist.

Work at the property was done during 1983 and 1984 by a crew of 2. They used a Cat D7E bulldozer, and a John Deere 450B tracked loader. The organic material and grey gravel were stripped, and the red gravel and 3 feet of bedrock were mined and washed. Material mined was fed to a sluicing plant consisting of a dump box and 2 run sluice box. The dump box was 6 feet wide and 12 feet long. It was lined for 2 feet in the throat area with punch plate. The main run was 24 inches wide, and 20 feet long, and was lined with 2 inch riffles spaced 4 inches apart, tipped back at an angle of almost 30° from the horizontal. Midway down the run, a 2 foot section of punch plate with 1/4 inch holes fed a small side run 12 inches wide and 8 feet long, which was lined with expanded metal. Water for sluicing was recirculated from the second of two settling ponds in series downstream from the sluicing plant by a 6 inch Monarch pump powered by a 4 cylinder industrial Ford diesel engine. The total flow of the creek, along with the sluicing effluent, were directed into the ponds. Upstream from the cut, water was also impounded in a reservoir, enabling the storage of enough water to refill the lower ponds subsequent to cleaning. Two 10 inch pipes acted as spillways for the creek flow.

H. Knippel, R. Trudeau (5)
R. Smith, M. Parent 115 I 3
Eva Creek 62°06'N 13708'N
1983, 1984

This property is located along the Left Fork of Eva Creek, approximately 1,300 feet upstream from the forks, and 2 1/2 miles upstream from the confluence of Eva Creek with Victoria Creek. Deposits at the downstream end of the workings are approximately 15 feet thick, and consist of 5 feet of organic material with a high silt content overlying 10 feet of rusty sandy gravel. Deposits at the upstream end of the workings, about 1,500 feet away, are approximately 9 feet thick, and consist of 3 feet of organic material over 6 feet of gravel. The gravel layer contains numerous bands of silt and sand, and pieces of angular slide rock. Bedrock is highly fractured, and portions of it are decomposed.

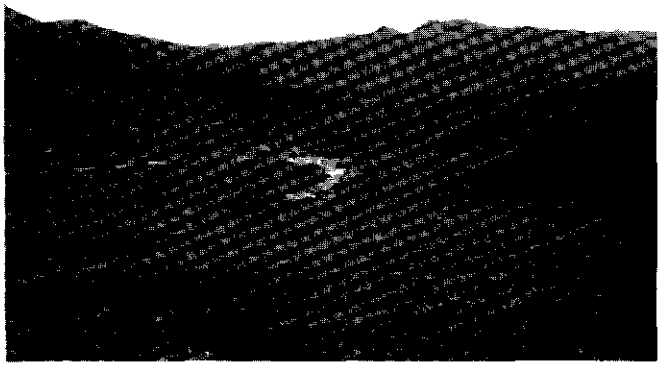


Figure 2: View of property along Eva Creek mined in 1984 by R. Trudeau, and by R. Smith and M. Parent. (L.O. '84)

Work on this property was carried out in 1983 by H. Knippel. He used a loader to strip overburden, and to mine the underlying gravel. The gravel was processed in a sluicing plant with trommel. Work was done during the first half of the 1984 season by R. Trudeau. He mined the shallow deposits at the upstream end of the property using a wheeled loader. The gravel was washed in a sluicing plant consisting of vibrating screening deck, dump box, and sluice box. Three people worked at the property on behalf of R. Smith and M. Parent during the second half of the 1984 season. They began work along the left limit of the creek, using water from a monitor mounted on the small scale sluice box to wash gravel directly into the sluice box. A one cylinder engine coupled with a 3 inch pump was used to recirculate water from a settling/recirculation pond. Later in

the season, a small bulldozer and a Cat D8 bulldozer were used to mine and push material to the sluice box. A series of settling/recirculation ponds were also created.

Gold from this location is reported to be fine grained.

C. Ireland (6)
T. Mickey 115 I 3
East Fork, Nansen Creek 62°06'N 137°12'W
1984

This property is located along the East Fork of Nansen Creek, immediately downstream from the mouth of the South Fork. Deposits present are 9 feet thick, and consist of 3 feet of organic material overlying 6 feet of gravel. The gravel lies on an undulating surface of multicoloured boulder clay. Much work was done in this area by early miners using both underground and open-cut methods. The underground workings were timbered.

Work at this site was done during 1984 by one person, who was joined periodically by two other workers. They used 2 Cat D8 bulldozers to strip and stockpile material, and one Cat 955 Traxcavator to feed the sluicing plant from the stockpile, and remove tailings. A small John Deere 24 loader was used for odd jobs. The sluicing plant consisted of a dump box and single run sluice box. It was fed at a rate of approximately 30 cu.yd. per hour. The dump box was 6 feet wide and 8 feet long, and had a 3 foot section of punch plate at its throat. Material which fell through the punch plate was sluiced over a section of expanded metal and matting immediately below the punch plate. Material leaving the dump box passed over a 2 1/2 foot section with 1 inch "Redi-rod" spaced 4 inches apart. Material less than 4 inches in diameter fell into the sluice run. The sluice run was 18 inches wide and 12 feet long, and was lined with expanded metal on matting. Water for sluicing was pumped from a reservoir downstream from the sluicing plant to two pivoting dump box manifolds at a rate of approximately 1,000 igpm by a 4 inch pump powered by a 6 cylinder gasoline engine. Upstream from the sluicing plant, a dam 130 feet wide created a second large reservoir. The total creek flow was impounded in both reservoirs. Effluent from sluicing was settled in two ponds in series downstream from the sluicing plant. At times of low water, a 3 inch pump powered by a single cylinder gasoline engine was used to pump settled sluice effluent from the lower settling pond to the lower reservoir, to be recycled for sluicing. Water shortages caused probems during the 1984 season.

Gold from this property is reported to be fine grained.

T. Tullis (7)
East Fork, Nansen Creek 115 I 3
1984 62°06'N 137°12'W

This property is located along the East Fork of Nansen Creek, approximately 1,500 feet upstream from its confluence with Nansen Creek. Deposits present are shallow, averaging only 5 feet deep. They consist of 2 to 3 of organic material overlying 2 to 3 feet of gravel. The gravel rests on an irregular surface of boulder clay. It is reported that the gold lies immediately above the clay, rather than being distributed through the gravel.

Figure 3: View of T. Tullis mining operation along the East Fork of Nansen Creek. (L.O. '84)

Work on this property was carried out in 1984 by Mr. Tullis. He worked alone, using a Cat D6-9U bulldozer to prepare a cut 70 feet wide, and 500 feet long, and to stockpile pay material. Parts of the cut had been worked by early hand miners. A Cat 950 loader was used to feed the sluicing plant from the stockpile, and remove tailings. The sluicing plant consisted of a hopper/conveyor fed vibrating screening deck, and two oscillating sluice runs. The sluicing plant was fed at a rate of 20 to 30 cu.yd. of material per hour. The hopper was 6 by 10 feet at the top opening, and 4 feet deep. It was capable of handling material up to 2 feet in diameter. Care was taken to limit material being fed to the hopper to less than 2 feet in diameter, as there was no grizzly over the top of the hopper. Material passed from the bottom of the hopper to the deck of the vibrating screening unit by way of a conveyor belt 30 inches wide and 40 feet long. The screen deck was 36 inches wide and 8 feet long, and consisted of punch plate with 1 inch holes. Material less than 1 inch in diameter was further screened over a 2 1/2 foot section of punch plate with 3/8 inch holes. Material less than 1 inch, but more than 3/8 inch across, was washed in a sluice run lined with riffles over Astro turf. Material less than 3/8 inch in diameter was washed in a sluice run lined with double layers alternating with single layers of expanded metal over Astro turf. Both runs were 24 inches wide. Electric power was provided for the plant by a 50 KW generator set powered by a Cat D3800 4 cylinder diesel engine. The belt feeder and conveyor were each powered by 10 hp electric motors. Individual 2 hp motors drove shafts with counterweights, mounted on the bottom of each sluice run. Being deliberately set off balance, the counterweights gave the runs their oscillating motion. Water for sluicing was pumped at a rate of approximately 1,000 igpm by a 6 inch Gould pump powered by

a 24 hp 3 cylinder Lister diesel engine. The water was partially recycled. Effluent was settled in a series of two ponds, which flowed into the pumping pond. The total creek flow also flowed into the pumping pond. Excess water reentered the creek by way of a spillway.

Gold recovered from this property is mainly fine grained. The coarse gold which was found appears worn, and is rusty.

E. Curley (8)
Nansen Creek 115 I 3
1983, 1984 62°06'N 137°13'W

This property is located along Nansen Creek, approximately 1,500 feet downstream from the mouth of the East Fork. The valley bottom is 1,500 feet wide, and has a moderate gradient. Deposits present are shallow, and consist of 1 to 2 feet of organic material and volcanic ash overlying 3 to 5 feet of sandy gravel. The gravel contains boulders up to 2 feet in diameter, and rests on an undulating surface of boulder clay. Reefs covered by only 1 foot of gravel are common in the boulder clay. Evidence of open-cut mining by early miners was present at the property.

Mr. Curley first worked at this site in 1983. Preparatory work and a limited amount of sluicing were done. Work was continued in 1984, using a Cat 977 Traxcavator equipped with a 2 cu.yd. bucket. A cut approximately 100 feet wide and 700 feet long was stripped, and mining and sluicing were done. The cut was located approximately 500 feet from the left limit of the broad valley. Material mined was washed at a rate of 10 to 12 cu.yd. per hour in a sluicing plant consisting of a dump box and single run sluice box. The units were separate and were positioned at 90° to each other. The dump box was 6 feet wide and 20 feet long, and was lined with slick plate. Washed material leaving the dump box was screened over a grizzly set at a gradient of 3 inches to the foot, and grains less than 1 inch across fell into the sluice run. The sluice run was 24 inches wide and 36 feet long, and was lined with 2 layers of expanded metal over Astro turf. The top layer of expanded metal was of 1 inch size. It was placed directly over the second layer, which was of 1/8 inch size. A 1/4 inch space was left between the bottom layer of expanded metal and the matting. The gradient of the sluice run was 1 inch per foot. Water for sluicing was impounded in a shallow reservoir. Sixty feet of 8 inch diameter plastic pipe coupled with 80 feet of 6 inch diameter plastic pipe delivered water to the box under gravity at one location. A second set-up at a higher elevation necessitated the addition of two 4 inch portable pumps powered by single cylinder gasoline engines. The units had rate maximum pumping capacities of 300 igpm each.

Gold from this property is reported to have a fineness of 820. It is fine to medium grained, and very bright. Some is well worn, and some is not. Large amounts of black sand are present in concentrates from this property.

W. Perry (9)
Unnamed Tributary, 115 I 3
Klaza River 62°08'N 137°14'W
1983

This property is located on a small unnamed left limit tributary near the headwaters of the Klaza River.

Work at this property was begun in 1982, when mining was carried out by hand. In 1983, 3 people worked, using an International wheeled tractor with 1/4 cu.yd. loader bucket and hoe attachment to work the cut, and feed the sluice box. The single run sluice box was 12 inches wide and 8 feet long. A 1 1/2 inch pump provided water for sluicing.

Gold from this property is reported to be fine grained. Some wire gold is present.

W. Perry (10)
Unnamed Tributary, 115 I 3
Klaza River 62°08'N 137°16'W
1984

This property is located on a small unnamed left limit tributary near the headwaters of the Klaza River. It lies 2 1/4 miles 30° northeast of Mount Nansen. The valley is very broad, and has gentle sidewalls. Deposits present are approximately 10 feet deep, and consist of 3 feet of frozen black organic material, overlying 6 to 7 feet of gravel.

Work at this property was begun in 1984. A crew of 3 used an International wheeled tractor, equipped with 1/4 cu.yd. loader bucket and hoe attachment to mine approximately 280 cu.yd. of material, and feed the sluicing plant. The sluicing plant consisted of a small scale dump box, vibrating screening deck, and two sluice runs. The vibrating action of the screening deck was provided by an eccentric mounted on the dump box, and powered by a small electric motor. The single deck of the screening unit was lined with 1 1/2 inch expanded metal, which effectively screened the majority of the material to less than 1/4 inch in size. Screened material entered two 9 by 11 inch traps, 1 inch deep, lined with multiple layers of expanded metal, before entering the sluice runs. The sluice runs were 12 inches wide and 8 feet long, and were lined with 2 layers of 14 guage expanded metal. The sluice runs were set at a gradient of 1 1/2 inches to the foot. Water for sluicing was recirculated from a small pond, immediately below the sluicing plant, at a rate of 180 to 200 igpm by a 3 inch Yamaha pump. To provide additional sluice water, the valley upstream from the operation was stripped for an area of 300 by 1,700 feet. The thaw from the exposed muck provided a continual source of water. Effluent from sluicing was settled in a series of 3 ponds downstream from the sluicing plant. Sluicing water was recirculated from the first of the ponds.

L. Nagy (11)
D. Bruns 115 I 6
Seymour Creek 62°17'N 137°10'W
1984

This property is located along Seymour Creek, approximately 1,300 feet upstream from the mouth of left limit tributary Caribou Creek. Work was done adjacent to the late Fred Guder's cabin, a local landmark. Deposits at the site are frozen.

Three people worked at this property during part of the 1984 season. They used a Cat D6C bulldozer to do stripping, mine test pits, and construct a stream diversion and settling pond. An International tractor with hoe attachment was used to feed the sluicing plant. The sluicing plant consisted of a small trommel, and a pair of sluice runs. It was fed at a rate of 25 cu.yd. per hour.

J. Peel (12)
Cabin Gulch 115 I 6
1984 62°17'N 137°09'W

This operation is located on Cabin Gulch, approximately 1 mile upstream from its confluence with Seymour Creek. The Cabin Gulch valley is only about 50 feet wide, and has a steep gradient. Creek flow is intermittent. Deposits present are 12 to 14 feet deep, and consist of 2 feet of overburden overlying 10 to 12 feet of sandy material. The sandy material is mixed with angular fragments of bedrock.

Work at this property was done by a crew of 2 during 1984. They used a D7 bulldozer to strip ground and work the cut, which was 12 feet wide and 350 feet long. A John Deere 544B loader was used to feed the sluicing plant at a rate of approximately 25 cu.yd. per hour, and to remove tailings. A John Deere 350D bulldozer was used for light work. The sluicing plant consisted of a dry grizzly, hopper, vibrating screening deck, and 4 sluice runs. Prior to entering the hopper the material was fed to a grizzly with 12 inch spacing. Material less than 12 inches in diameter fell through into the hopper, which was 10 feet square at the top, and 4 feet square at the bottom. Material from the hopper was then washed on the vibrating deck, and screened to less than 3/4 inch in diameter. The undersize was split between two sluice runs, each 24 inches wide and 8 feet long, and lined with heavy expanded metal over matting. The sluice runs sloped upstream. Material leaving the first two sluice runs reversed direction, and was further sluiced in two more sluice runs 24 inches wide and 8 feet long, and lined with smaller expanded metal over matting. Water was pumped to the screen deck from a small recirculation pond immediately downstream from the sluicing plant by a 4 inch Monarch model 77-4H pump powered by a 2 cylinder diesel engine. Sluicing water was almost totally recycled, as the total creek flow, which also entered the pond, likely averaged less than 10 igpm. Overflow from the recirculation pond was further settled in a second small pond, approximately 300 feet downstream.

K. Graw (13)
6804 Creek 115 I 6
1983, 1984 62°17'N 137°18'W

This property is located along 6804 Creek, a left limit tributary of Bow Creek, immediately upstream from its confluence with Bow Creek.

Work was done at this property during 1983 using a Fiat-Allis 21C bulldozer, a Northwest 80-D dragline, and a Fiat-Allis 745C loader. Material mined was washed in a sluicing plant with centrifugal tube. A limited amount of work was also carried out in 1984. Problems were encountered with glaciation in the spring, when approximately 12 feet of ice formed in the 1983 cut.

T. Yardley (14)
Seymour Creek 115 I 6
1984 62°18'N 137°12'W

This property is located along Seymour Creek, approximately 2,500 feet upstream from the mouth of Bow Creek. Bedrock consists of porphyry and black schist. The deposits are not frozen in the area mined, but they are frozen further upstream.

Work on this property was carried out in 1984 by 3 to 4 people working on a single shift. They worked immediately upstream from the 1984 operation of K. Yardley and G. Yardley. A Cat D8 bulldozer was used to mine a cut 360 feet wide and 340 feet long, feed a Cat 225 hoe, and remove tailings. The hoe was used to feed the sluicing plant, which consisted of a trommel and centrifugal sluice. The trommel was 48 inches in diameter, and 16 feet long, and was fed by a self-feeding belt. Screened material was washed in a centrifuge 18 inches in diameter and 12 feet long. Water was pumped to the sluicing plant from a backwater inlet channel along Seymour Creek by a 6 inch pump. Effluent from sluicing was impounded in settling facilities downstream, which were also used by the adjacent mining operation. The effluent was settled first in an instream slow water area 60 feet wide and 300 feet long, and then in a pond 60 feet wide and 90 feet long. Recirculation of water for sluicing was not necessary.

H. Fromme (15)
K. Yardley, G. Yardley 115 I 6
Seymour Creek 62°18'N 137°12'W
1983, 1984

This property is located along Seymour Creek, approximately 2,500 feet upstream from the mouth of Bow Creek. Deposits present are 5 feet deep, and are not frozen. Gold values are reported to occur throughout the section, although the highest values are present just above bedrock. Bedrock consists of porphyry.

Work at this property was begun in 1983 by H. Fromme. He mined a small test cut, and sluiced at a rate of 40 cu.yd. of material per day. After Mr. Fromme left the property, K. Yardley and G. Yardley mined for 23 days. They returned to the property in 1984, and mined with a crew totalling 4 or 5 work-

ers. Work was done on two overlapping shifts, and sluicing was done 12 hours daily. A Cat D8 bulldozer was used to do stripping, and a Cat 931 scraper was used to move material from the cut to a stockpile next to the sluicing plant. The cut begun in 1983 was enlarged to 360 feet wide and 1,360 feet long. Material was fed from the stockpile to the sluicing plant at a rate of between 30 and 60 cu.yd. of material per hour by a Cat 225 hoe. A Cat 950 loader was used to remove tailings. The sluicing plant consisted of a trommel and two sluice runs. The trommel was 50 inches in diameter, and 24 feet long. Material less than 3/4 inch in diameter fell through the trommel, and into the two sluice runs, which were 48 inches wide and 16 feet long. Water for sluicing was pumped from a small instream pond. Recirculation was not necessary. Effluent from sluicing was settled downstream from the sluicing plant in an instream slow water area 60 feet wide and 300 feet long, and then in a pond 60 feet wide and 90 feet long.

Figure 4: View looking upstream along Seymour Creek to the mining operation of K. and G. Yardley. (L.O. '84)

Gold from this locality is reported to be fine grained, with 87.5% of the gold recovered in 1984 being 20 mesh (.0331 inches) in diameter or smaller.

G. Lee (16)
Guder Creek 115 I 6
1984 62°19'N 137°12'W

This property is located on Guder Creek, approximately 3,700 feet upstream from its confluence with Seymour Creek. The valley bottom is 120 feet wide, and has a moderate to steep gradient. Deposits present are 22 feet deep, and consist of 2 1/2 feet of organic material and volcanic ash overlying 19 1/2 feet of gravel. Bedrock is decomposed schist.

Exploration, rather than production was done at this site during 1984. A description of the work is included here, however, as it is a good example of testing a property by the underground mining methods used by early miners. A shaft and two cross-cuts were dug in order to determine the depth, and type and value of material present. All work was done in frozen ground. Thawing was done with a wood-fired steam boiler, and accompanying 20 gallon tank for preheating water. Single braided 3/8 inch hydraulic hose was used to convey the steam produced to the steam point. The shaft was cribbed in intervals of 4 to 7 feet of vertical gain, while the cross-cuts were cribbed after each advance, or mucking after thawing. The outside diameter of the shaft was 44 by 48 inches. The average daily vertical gain when sinking the shaft, and setting cribbing, was eight inches. The cross-cuts were 40 inches wide, and 6 feet high. The one running north from the north wall of the shaft was 10 feet long, while the one running south from the south wall of the shaft was 13 feet 4 inches long. A drifting cycle was 4 days long. An average of 2 days of steam thawing preceeded 2 days of mucking, resulting in an advance of 1 foot per day, including cribbing. The material was mucked out with a shovel, 5 gallon cans, and windlass. Material removed from the shaft and drifts was sluiced to determine the grade of the various materials present. It was shovelled from a stockpile onto a wet grizzly with 1/2 inch holes. Water was pumped from Guder Creek with a 1 1/2 by 2 inch pump, powered by a single cylinder Briggs & Stratton engine. Material less than 1/2 inch in diameter fell through the grizzly into a dump box 24 inches wide and 28 inches long, and was washed into a small sluice run 14 1/2 inches wide and 4 feet long. The sluice run had 3 "steps" or "drops", each 1 1/2 inches high.

R. McCauley (17)
Tara Creek 115 I 6
1983, 1984 62°21'N 137°12'W

This property is located along Tara Creek, a right limit tributary of Big Creek.

Mr. McCauley worked intermittently at this property during 1983 and 1984, using a small Case backhoe. Material mined was processed in a sluicing plant consisting of a small trommel, dump box, and sluice box. Water for sluicing was stored in a small reservoir upstream from the sluicing plant. A small pond located downstream from the sluicing plant was used as a settling and recirculation pond. Water shortages were encountered at times.

Three Creek Resources Ltd. (18)
Happy Creek 115 I 6
1984 62°21'N 137°14'W

This property is located along Happy Creek, approximately 1,300 feet upstream from its confluence with Big Creek. The valley bottom is narrow, with a width of only about 40 feet. Deposits at the site are approximately 20 feet deep, and consist of a few feet of organic material overlying gravel and sandy gravel. Much slide rock is present in the gravel section, including angular pieces up to 2 or 3 feet across. Bedrock is decomposed schist.

Work done on the property during 1984 was mainly testing and development work. A crew of 2 used a Cat D8H bulldozer to do stripping, and to mine and stockpile material for sluicing from a cut 40 feet

wide and 150 feet long. The upper half of the section was stripped, and the lower half was mined and sluiced. A Cat 966 loader fed 800 cu.yd. of material from the stockpile to the sluicing plant at a rate of approximately 50 cu.yd. per hour. The sluicing plant consisted of a dump box and single run sluice box with small side run. The dump box was 24 inches wide and 20 feet long, and was lined with 1 1/4 inch riffles. A section of punch plate with 3/4 inch holes lined the bottom 4 feet of the sluice box. Material which fell through this punch plate was washed in a sluice run 48 inches wide and 5 feet long, lined with 1 1/4 inch riffles. The side run was placed at right angles to the main sluice run. Water for sluicing was fed by gravity by way of 340 feet of 10 inch diameter pipeline from a reservoir upstream from the sluice box. Water for sluicing was limited as the reservoir was small, and creek flow was low. Effluent from sluicing was settled in a series of two small settling ponds along the right limit of Happy Creek, at the edge of the Big Creek Valley. Upstream from the reservoir, an area 40 feet wide and 700 feet long was stripped in preparation for future mining.

Figure 5: View upstream along Happy Creek showing the Three Creek Resources Ltd. mining operation. (L.O. '84)

**Three Creek Resources** (19)
**Boliden Creek** 115 I 6
**1983, 1984** 62°21'N 137°15W

This property is located along Boliden Creek, a right limit tributary of Big Creek, approximately 1,500 feet upstream from its confluence with Big Creek. The Boliden Creek valley is narrow, with steep valley walls, particularly upstream of the operation where the valley narrows dramatically to only 20 feet in width. Deposits present in the centre of the valley are at least 30 feet deep, and consist of a thick layer of organic material overlying gravel. Deposits in a cut along the east facing left limit of the creek, which was stripped by hydraulic methods, consist of as much as 60 feet of black muck.

A limited amount of mining and sluicing was done at this site during 1983. Work on the property continued during 1984. A crew of 2 worked using a Cat D9H bulldozer, a Cat D8H bulldozer, a Cat D6D bulldozer, a Cat 966 loader, and a Cat 235 hoe equipped with a frost bucket and ripper tooth. Water pumped to a monitor was used to strip organic material overlying the gravel section. The D9H was used for stripping gravel, and mining and stockpiling gravel from the cut. The D8H was used to construct and maintain settling ponds. The D6D bulldozer was used to feed the sluicing plant, while the 966 loader was used to remove tailings. The 235 hoe was used for testing, stripping, and drain work. Approximately 6,000 cu. yd. of material were processed in a sluicing plant consisting of a "Derocker" screening unit and single run sluice box. Water for sluicing was pumped from Big Creek, from a location several hundred feet downstream from where effluent from sluicing joined the creek. A 10 by 12 inch Paco pump, powered by a 6 cylinder 350 Cummings diesel engine provided water for sluicing by way of 1,500 feet of 12 inch diameter pipeline, along the right limit of the Boliden Creek valley. Effluent from sluicing was settled in 1 of 2 parallel ponds in the Big Creek valley, and then filtered randomly over a swampy area before entering Big Creek. Material to build the settling ponds was brought down from Boliden Creek, as the silty material from the Big Creek valley would not hold to form a settling pond. Effluent from stripping was handled in the same manner as effluent from sluicing.

**K. Djukastein** (20)
**Revenue Creek** 115 I 6
**1983, 1984** 62°20'N 137°16'W

This property is located along Revenue Creek, approximately 4,000 feet upstream from its confluence with Big Creek. Deposits present are 25 to 30 feet deep, and consist of 15 to 20 feet of black muck with occasional thin bands of gravel, overlying gravel.

Work at this property was carried out in 1983 and 1984 by Mr. Djukastein, with one helper. Water from a single monitor with 3 inch diameter tip was used to strip black muck from the cut. A Cat D7E bulldozer was used to finish stripping the ground, and to feed the sluicing plant. Tailings were re-

moved by a Cat 966B loader. During 1984, a single cut 55 feet wide, or the full width of the valley, and 260 feet long was mined. The material mined was processed in a sluicing plant which consisted of a "Derocker" screening unit, and a single run sluice box 48 inches wide and 30 feet long. Material was fed to the "Derocker" at a rate of approximately 80 cu.yd. per hour. An estimated 50% of the material was oversize, or more than 2 inches in diameter. Undersize fell into the sluice run, which was lined by 1 3/4 inch riffles set 4 inches apart and tipped back at an angle of 13°, over expanded metal. No matting was used. Narrow, elongated pieces of iron were also welded vertically to the tops of the riffles to create areas to trap lightweight nuggets with quartz attached. The sluice run was set at a gradient of 1 3/4 inches per foot. Water for sluicing was supplied by a ditch approximately 4,000 feet long, which brought Big Creek water at grade to the mouth of Revenue Creek. From there, the water was pumped to the sluicing plant at a rate of 1,500 igpm. It was pumped by a 6 by 8 inch Pacco centrifugal pump powered by a 471 Jimmy diesel engine, by way of 3,000 feet of 10 inch diameter pipe. Water for stripping was delivered to the cut in the same manner, but a second 6 by 8 inch Pacco centrifugal pump located along the pipe line, and powered by another 471 Jimmy diesel engine was used along with the first pump. Effluent from stripping and sluicing was impounded in a series of two ponds prior to entering Big Creek.

Gold from this property is reported to be almost entirely fine grained. The few "nuggets" which are present are batches of wiry gold attached to quartz pebbles.

Guder Mining Exploration Ltd. (21)
Mechanic Creek 115 I 6
1984 62°21'N 137°18'W

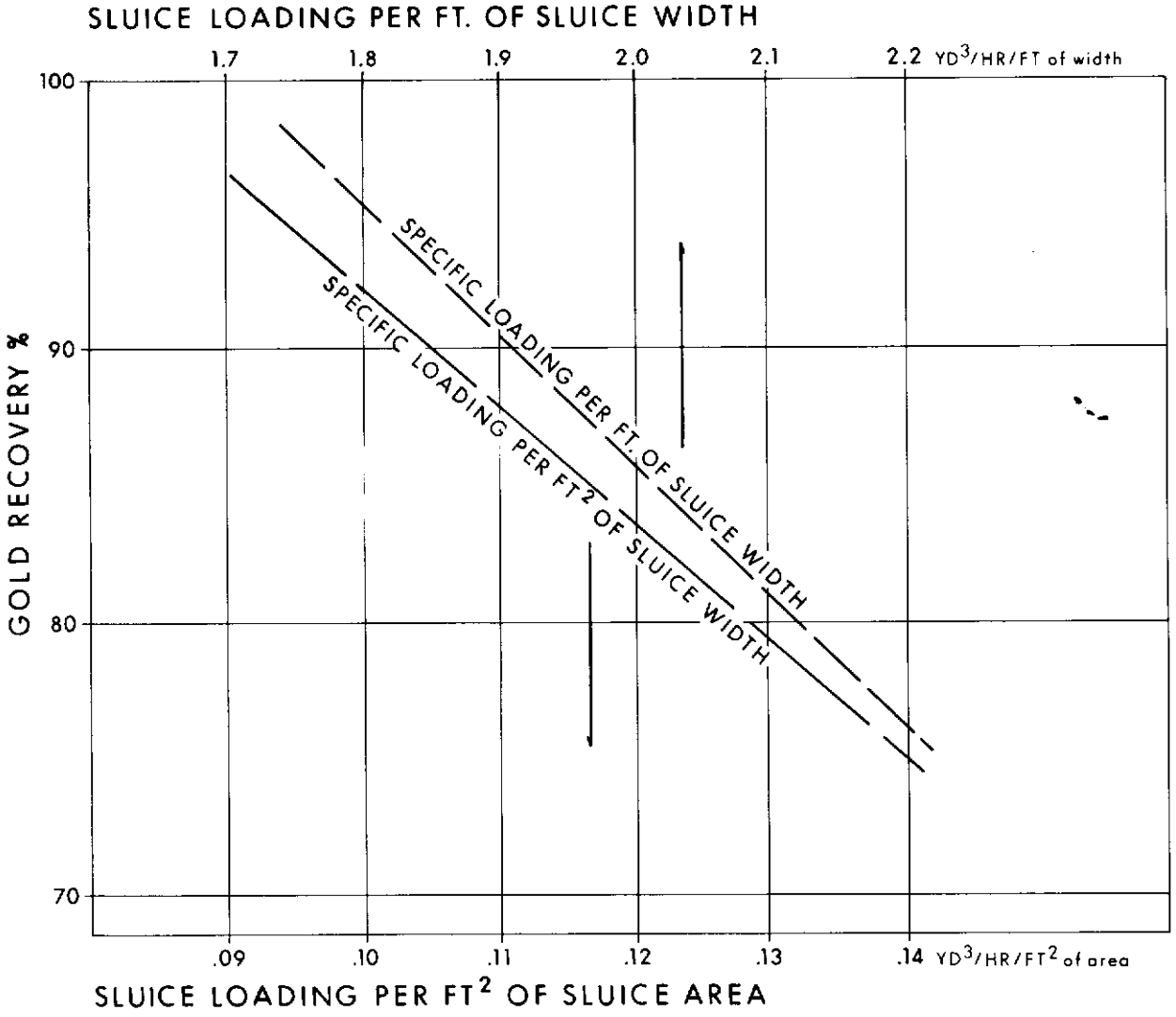
This property is located along Mechanic Creek, a right limit tributary of Big Creek, approximately 1,500 feet upstream from its confluence with Big Creek. Deposits present are at least 6 feet deep, and consist of 3 feet of organic material overlying sandy gravel with boulders up to 18 inches across. Most boulders are angular, and show little wear. The true thickness of the gravel is not known as the bedrock was not exposed.

Work was done at this location in 1984 by E. Wenecke. Much of the work was preparatory, rather than actual mining. A Cat D6-9U bulldozer and a Cat 930 loader were used. An area a few hundred feet long along the valley bottom was stripped, and the creek was diverted to the left limit of the valley and held with a gravel berm. A small cut 50 feet wide, taking in the entire valley bottom, and 80 feet long, was mined. Bedrock was not reached. A sluicing plant consisting of a "Derocker" screening unit and a single run sluice box 30 inches wide and 30 feet long was set up. A small settling/recirculation pond was put in place downstream from the cut, and a 12 by 12 inch Gorman Rupp trash pump powered by a 5 cylinder diesel engine was installed to provide water for sluicing.

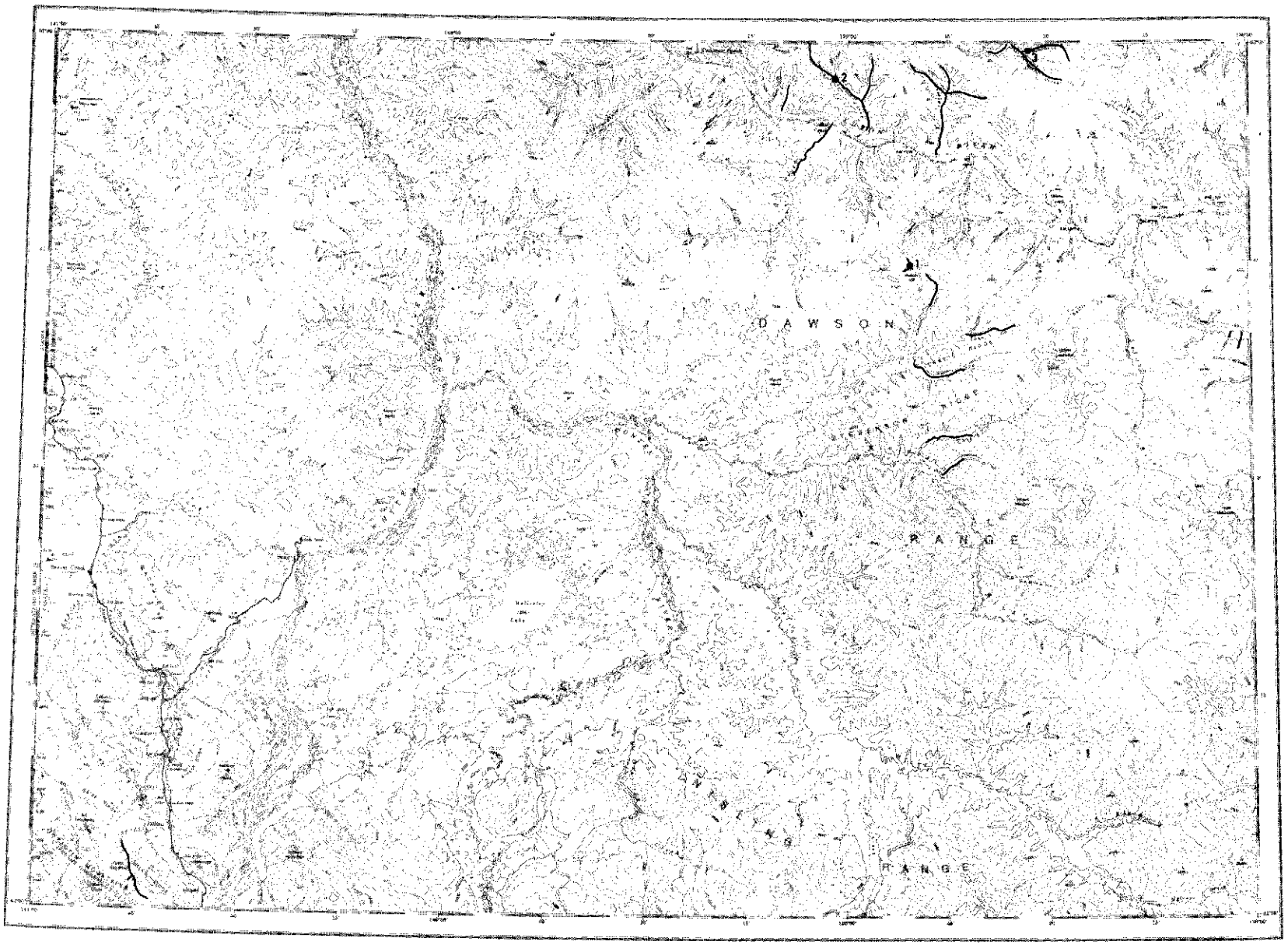
R. Coles (22)
Mechanic Creek 115 I 6
1983, 1984 62°20'N 137°19'W

This property is located along Mechanic Creek, approximately 6,500 feet upstream from its confluence with Big Creek.

Mr. Coles worked part time at this location in 1983 and 1984. He used a Komatsu D65E bulldozer, to do stripping and to mine, and a Cat 930 loader to feed the sluicing plant. Some hydraulic stripping was also done. The sluicing plant consisted of a trommel, and single run sluice box. Water for sluicing was recirculated by a 6 inch pump. Effluent from sluicing was settled in a series of 2 settling ponds downstream from the sluicing plant during 1983. Two additional settling ponds were constructed in 1984.




TYPICAL DETERIORATION IN SLUICE PERFORMANCE
WITH INCREASED LOADING




Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES
5 0 5 10 15 20 25 30
5 0 5 10 15
MILES

SNAG

PJJ Mining (1)
Canadian Creek 115 J 10
1983, 1984 62°45'N 138°51'W

This property is located along the headwaters of Canadian Creek, a left limit tributary of Britannia Creek. The valley bottom is broad, and has a moderate gradient. Deposits present are up to 18 feet deep, but average 5 to 6 feet deep. The deposits are frozen, and consist of 1 to 2 feet of organic material overlying a section of gravel of variable thickness. Clasts in the gravel are rounded, and are generally less than 12 inches in diameter. A few very large boulders are present. Abundant round grains of hematite and magnetite up to 4 inches in diameter are also present. The deposits were tested by drilling and sampling in 1948, and have been mined since 1980.

Mining was carried out at this location in 1983 and 1984. In 1984, a crew of 8 worked using 1 Cat D8H bulldozer to do stripping, and to stockpile gravel for 2 Cat 966C loaders. The loaders were used to feed the sluicing plant, and to remove tailings. Material was mined from a cut along the left of two forks at the headwaters of Canadian Creek, and fed to the sluicing plant at a rate of 20 cu.yd. per hour. The sluicing plant consisted of a wet oscillating screening unit with a single deck which screened material to less than 3/4 inch in diameter, a dump box, and two sluice runs. The dump box was 4 feet wide and 20 feet long, and the sluice run was 48 inches wide, and 32 feet long. The dump box was lined with punch plate with 1/2 inch holes over matting, and the sluice run was lined with 1 1/2 inch angle iron riffles over matting. Water for sluicing was pumped by a 3 1/2 inch electric pump at a rate of 400 igpm from a small reservoir at the confluence of the forks. The pump and screening deck were both run by a 75 KV generator powered by a Cat D-330C 4 cylinder diesel engine. Sluicing effluent was settled in a series of 4 ponds along the right limit of Canadian Creek, downstream from the forks. Stripping of a cut 300 feet wide and 500 feet long was also done along the right fork of the creek, in preparation for mining in 1985.

Gold from this property is reported to be very fine grained.

M. Fuhre (2)
Ballarat Creek 115 J 14
1983, 1984 62°58'N 139°02'W

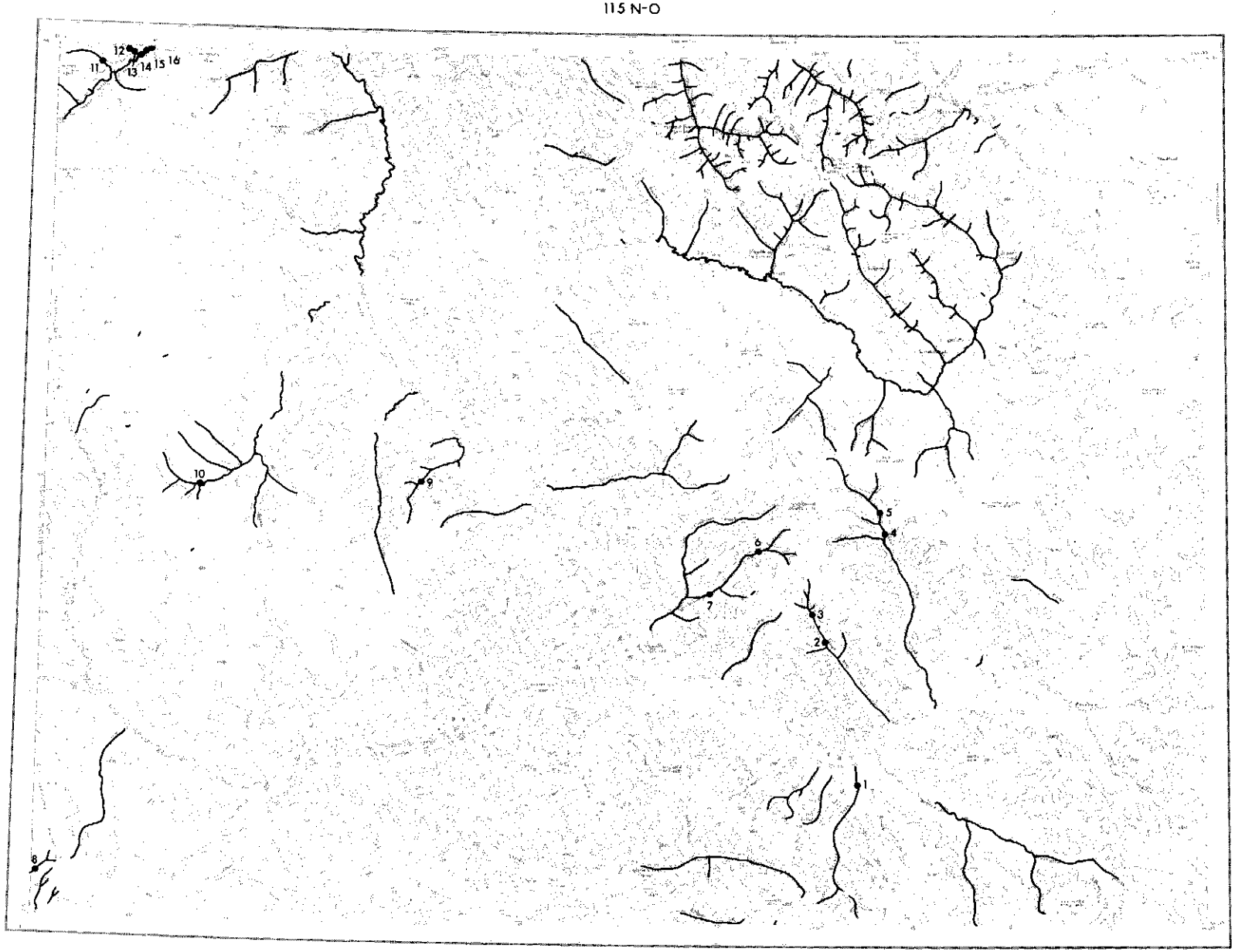
This property is located along Ballarat Creek, approximately 7 miles upstream from its mouth. Deposits present are 16 to 23 feet thick, and consist of 1 to 5 feet of black organic muck overlying 15 to 18 feet of gravel.

Work at this site was begun in 1983. An area 100 feet wide and approximately 1,000 feet long was mined. Work continued in 1984, when an area 100 feet wide, and approximately 2,000 feet long was mined. Nine people worked on two 12 hour shifts, using a D8K bulldozer to strip all but the lowermost 2 to 4 feet of the section, and push the remaining material to a stockpile. A Cat 235 hoe was used to feed the sluicing plant from the stockpile at an average rate of 120 cu.yd. per hour. The D8K bulldozer was used to remove tailings. The sluicing plant consisted of a 3 run Pearson "Rock" box. It was set up so that water for sluicing could be diverted from Ballarat Creek. Approximately 3,000 igpm of water were used. Effluent from sluicing was impounded in two settling ponds, each 100 feet wide and 200 feet long, downstream from the sluicing plant.

Resore Industries (3)
Mariposa Creek 115 J 15
1984 62°59'N 138°33'W

This operation is located on Mariposa Creek, at, and just upstream from its confluence with Scroggie Creek. Deposits present are 9 feet thick, and consist of 4 feet of black muck overlying 5 feet of gravel.

Work at this site by Resore Industries was begun in 1984. A crew of 4 miners, with 1 helper in camp, worked on 2 shifts using a Komatsu D155A bulldozer for stripping, feeding the sluicing plant, and removing tailings. Mining was done in part of a large area stripped by a previous operator at the site. Cuts were taken from rim to rim. Each was approximately 185 feet wide and 300 feet long. Two cuts were mined on Scroggie Creek, and 4 cuts were mined on Mariposa Creek. The material mined was processed in a sluicing plant which consisted of a dump box and 3 sluice runs. It was fed at an average rate of 100 cu.yd. of material per hour. The dump box was lined with punch plate in the throat. Undersize which fell through the punch plate was divided between two side runs lined with angle iron riffles over expanded metal and matting. The main run had a nugget trap at the top. Below the nugget trap, it was lined with punch plate over expanded metal and matting. Mariposa Creek flowed through the cut, and into the pump pond. Water for sluicing was pumped at a rate of approximately 3,500 igpm to a monitor and a manifold mounted on the dump box by a Worlington 10 by 12 inch pump powered by a Cat 3208 diesel engine. Overflow from the pump pond entered the settling ponds, as did effluent from sluicing. A series of settling ponds was present, and as mining progressed, the finished cuts became additional ponds.

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KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

STEWART RIVER

H. Calmegane (1)
Barker Creek 115 O 2
1983, 1984 63°10'N 138°54'W

This property is located on a left limit bench along Barker Creek, opposite the mouth of Preacher Creek. Deposits present are 10 to 25 feet thick, and consist of 5 feet of organic material and silt overlying 5 to 20 feet of gravel. Evidence of old workings is present along the bench.

Mr. Calmegane worked at this property during September, 1983, and for a limited time in 1984. Work was done using a John Deere 450 bulldozer. Material mined was processed in a sluicing plant which consisted of a dump box, and a single sluice run 24 inches wide and 40 feet long. Water for sluicing was pumped from Barker Creek to the sluicing plant at a rate of approximately 250 igpm by way of a 4 inch diameter pipe line. It was also pumped simultaneously from a recirculation pond on the left limit bench to the sluicing plant at a rate of about 1,150 igpm by way of a 6 inch diameter pipe line. All sluice effluent flowed 20 feet from the sluicing plant into the recirculation pond. Overflow from the recirculation pond flowed over the side of the bank, and was settled in 2 ponds along the left limit of Barker Creek before returning to the creek by seepage.

Maisy May Mines (2)
Maisy May Creek 115 O 7
1983 63°20'N 138°58'W

This property is located along Maisy May Creek. The deposits present in the wide valley are 12 to 14 feet thick, and consist of a thin layer of black muck overlying 6 feet of sand and silt, and 6 to 8 feet of gravel. Bedrock is competent, and blocky.

During 1983, a crew of 6 plus help in camp mined 2 cuts using 1 Cat D9G bulldozer to strip overburden, 2 Cat D8K bulldozers to strip overburden, and feed the sluicing plant, and 1 Cat 980 loader to remove tailings. Material mined was washed in a sluicing plant consisting of a "Ross" 300 dump box and 3 run sluice box at a rate of approximately 250 to 300 cu.yd. per hour. The dump box was 16 feet square. The lowermost 3 feet of the dump box were lined with punch plate. Undersize screened in this area was split between the 2 side runs of the sluice box. The main run was 48 inches wide and 17 feet long, and was lined with 2 1/2 inch riffles on coco matting. The side runs were each 48 inches wide and 17 feet long, and were lined with 3/4 inch riffles for the upper 8 feet, and 2 layers of expanded metal for the lower 11 feet. Coco matting was used under the riffles and expanded metal in the side runs. Water for sluicing was pumped at a rate of 2,500 to 3,000 igpm from a recirculation pond by a 10 by 12 inch Morris pump driven by a Cat 3406 diesel engine. The total creek flow entered the pond. Overflow flowed out by way of the water return box where the pump was situated. Effluent was reported to settle rapidly in the pond.

Gold recovered from this property was reported to be 40% coarse grained, and to have rough edges.

Maisy May Mines (3)
Queenstake Resources Ltd. 115 O 6
Maisy May Creek 63°22'N 139°00'W
1983, 1984

This property is located along Maisy May Creek. The valley bottom is moderately wide, with a gentle gradient. The width of the valley narrows, and the gradient of the creek steepens rapidly upstream of this site, however. Deposits present consist of black muck overlying brown gravel. Bedrock is competent, and blocky.

Work at this site was carried out during 1983 by a crew of 6, plus helpers in camp, working on two shifts. They mined 2 cuts, using a Cat D9G bulldozer to strip overburden, 2 Cat D8K bulldozers to strip overburden and feed the sluicing plant, and 1 Cat 980 loader to remove tailings. Material mined was processed in a sluicing plant consisting of a "Ross" 300 dump box and 3 run sluice box at a rate of approximately 250 to 300 cu.yd. per hour. The dump box was 16 feet square. The lowermost 3 feet of the dump box were lined with punch plate. Undersize screened in the dump box was split between the 2 side runs. The main run was 48 inches wide and 17 feet long. It was lined with 2 1/2 inch riffles on coco matting. The side runs were 48 inches wide and 17 feet long, and were lined with 3/4 inch riffles for the upper 8 feet, and 2 layers of expanded metal for the remainder. Both the riffles and expanded metal were placed on coco matting. Water for sluicing was pumped at a rate of 2,500 to 3,000 igpm from a recirculation pond by a 10 by 12 inch Morris pump driven by a Cat 3406 diesel motor. Work at this site in 1984 was done by Queenstake Resources Ltd. Stripping and exploration work were carried out with 1 Cat D9L bulldozer, 1 Cat D8K bulldozer, and a Cat 980C loader. Later, the same equipment was used for mining. A total of 43,000 cu.yd. of material was mined, and processed in a modified "Ross" 200 sluicing plant. Water for sluicing was provided by a 10 by 12 inch pump, run by a Cat 3208 diesel engine. Based on the work done in 1984, the company estimated that with selective mining, there were reserves of 200,000 cu.yd. of gravel with a recoverable grade of 0.012 oz of fine gold per cu.yd. at the property.

Gold from this property is reported to be 40% coarse grained, with rough edges. Several pieces with quartz and black schist embedded in them were found.

Queenstake Resources Ltd. (4)
Black Hills Creek 115 O 7
1983, 1984 63°27'N 138°49'W

This property is located on Black Hills Creek, just upstream of the mouth of Dome Creek. Queenstake acquired the property in 1982 after the former holder, Territorial Gold Placers Ltd., went into receivership. Deposits present are 14 to 16 feet deep, and consist of 4 to 6 feet of organic muck overlying 12 feet of grey gravel. Quartz boulders in the gravel are rare. Bedrock is competent and very blocky, and forms reefs across the valley bottom.

Work was done on the property during 1983 by a crew of 6, plus helpers in camp, working on a single shift. One Cat D9H bulldozer and 1 Cat D8K bulldozer were used to do stripping, to clean the cut, and to feed the sluicing plant. All the black muck, and the top 2 to 4 feet of gravel were stripped. Much of the ground worked by Queenstake had been stripped by Territorial. The rest of the gravel, and up to 5 feet of bedrock were mined and sluiced at an average rate of 150 cu.yd. per hour. Nine cuts were mined. Material sluiced from each of the cuts averaged approximately 20,300 cu.yd., and totalled 183,000 cu.yd. Gold recovery was reported to be 2,886 fine ounces, indicating that the average grade of the material sluiced was 0.0158 oz of gold per cu.yd. Two Cat 980C loaders were used to remove tailings. The sluicing plant consisted of a modified "Ross" 300 unit. The entire dump box was lined with punch plate with 1/2 to 1 1/2 inch holes set over 1 1/2 inch riffles and coco matting. Most of the gold recovered was reportedly caught by the riffles in the dump box. The side runs were closed off, and the centre run, which was 48 inches wide, was lengthened from 16 feet to 34 feet. It was lined with riffles for all but the lowermost 3 feet, which were lined with punch plate with 1/2 inch holes set over expanded metal. Midway along the box, two 6 inch steps or drops were used. A 4 foot long piece of punch plate with 1/2 inch holes was just below each of the steps. The gradient of the sluice run was 3 inches to the foot. Water for sluicing was pumped from a recirculation pond at a rate of 4,500 igpm by a 10 by 12 inch Pacco pump driven by a Cat 3208 diesel engine. Effluent from sluicing was settled in a series of ponds constructed in former cuts. As mining moved upstream, mined out cuts were added to the settling system. Work at the property continued in 1984. A crew of 10 , with 2 helpers in camp, mined on two shifts, using the same equipment as in 1983 plus a Cat D9L bulldozer. The D9 bulldozers were used to prepare the cut, and feed the sluicing plant, and the loaders were used to remove tailings. The D8 bulldozer was used for lighter work. Ten cuts were mined. The first 6 were along the right limit of the creek, while the remaining 4 were along the left limit of the creek. A total of 380,000 cu.yd. of material was sluiced. Gold recovered totalled 3,508 fine oz, indicating the average grade of the material sluiced was 0.0092 oz per cu.yd. The 1983 sluicing plant was replaced by a new one designed by the foreman at the property, M. Hughes. The new sluicing plant had a designed capacity of 600 cu.yd. per hour, but was fed during operation at a rate of 300 cu.yd. per hour. It consisted of a dump box and single run sluice box. The funnel shaped dump box was 30 feet wide across the top, and 5 feet wide across the bottom, and was 20 feet long. The lower 14 feet were lined with punch plate with 3/4 inch holes, set over 1 1/2 inch riffles. The punch plate was hinged to allow easy access to the riffles for frequent cleaning. The sluice run was 60 inches wide and 30 feet long. It had 4 inch drops every 10 feet. Immediately below each of the drops was a 4 foot section of punch plate which acted as a wear plate, and as screening. The drops were intended to tumble the large bedrock slabs, and provide them with a more thorough washing. The sluice run was lined with 2 1/2 inch riffles. Water for sluicing was delivered at a rate of 4,500 igpm to the dump box by way of a monitor with 3 inch diameter tip, mounted at the throat, and 2 spray manifolds. Additional information concerning this property is given in the paper by G. Gutrath in the first part of this volume.

Gold recovered from this property is reported to have a fineness of 755 to 760.

Paydirt Holdings Ltd. (5)
Black Hills Creek 115 O 7
1983, 1984 63°29'N 138°51'W

This property is located on Black Hills Creek, directly across from the mouth of left limit tributary Oil Gulch. Deposits present in the centre of the valley are 12 to 14 feet deep, and consist of 4 to 8 feet of black muck overlying 6 to 8 feet of brown gravel. Up to 20 feet of black muck overlies 8 feet of gravel along the margins of the valley. Bedrock is both decomposed and competent.

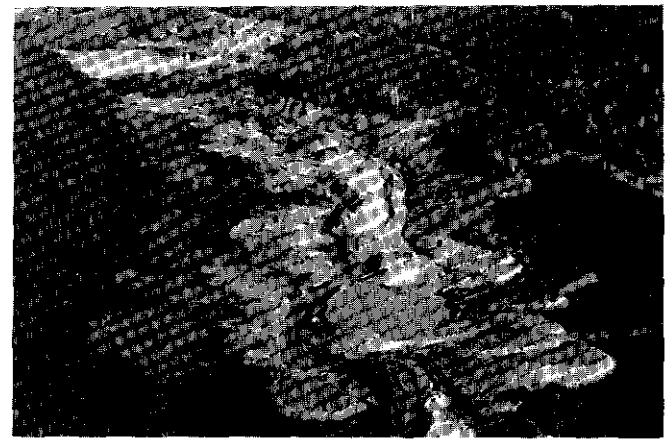


Figure 1: View upstream along Black Hills Creek showing Paydirt Holdings Ltd. mining operation. (L.O. '84)

Work on this property was carried out in 1983 by a crew of 4. They mined using 1 Cat D8K bulldozer, 1 Cat D8H bulldozer, 1 Cat 966 loader, and 1 Cat 366 Bantam hoe. The bulldozers were used for stripping, and to feed the sluicing plant. Only the lowermost 4 feet of gravel were sluiced. The loader was used to remove tailings. The sluicing plant consisted of a dump box and single run sluice box. The dump box was 12 feet wide and 16 feet long. The lower half of it was lined with punch plate over 1 1/4 inch riffles and coco matting. The sluice run was 36 inches wide and 40 feet long, and was lined with 1 1/4 inch riffles over coco matting. All but the last 4 feet of the sluice run had punch plate with 1 inch holes set over the riffles. Water for sluicing was pumped at a rate of 2,000 to 3,000 igpm. Two 6 inch Flyght submersible pumps, powered by a Cummings diesel generator, were used during part of the season. A third pump was used along with the other two during the rest of the season. Water was pumped from Black Hills Creek, and was not recirculated. Effluent from sluicing was settled in a series of 3 settling ponds downstream from the sluicing plant.

Work at the property continued during 1984, using the same equipment and mining methods as in 1983.

| | |
|---|---|
| Surinam-Sutherland Resources | (6) |
| Henderson Creek | 115 O 6 |
| 1983, 1984 | 63°26'N 139°09'W |

This property is located along the upper portion of Henderson Creek, approximately 8 miles upstream from the mouth of North Henderson Creek. Deposits present are approximately 15 feet thick, and consist of 8 feet of black muck overlying 7 feet of brown sandy gravel. Extensive hand mining by early miners was done at this site.

Figure 2: View downstream along Henderson Creek showing the upper sluicing operation of Surinam-Sutherland Resources, and the area stripped in preparation for future mining. (L.O. '83)

Surinam optioned this property in 1983, after the former operator, Territorial Gold Placers Ltd., went into receivership. Work was carried out at this location, and a second site 6 miles downstream, alternately during 1983. This allowed the cuts being worked to partially thaw, thereby eliminating some ripping of frozen ground. The work was done by a crew of 8, including helpers in camp, who worked on a single shift. They used 2 Cat D8K bulldozers, 1 Cat D8H bulldozer, and 1 Cat road grader. An area 275 feet wide and 1,150 feet long was mined in a series of 4 cuts. Black muck was bulldozed into the creek, which carried it downstream to be settled. The entire section of gravel along with 2 feet of bedrock was then mined and processed in a sluicing plant which consisted of a dump box and 3 run sluice box. The dump box was 16 feet square, and the lower half was lined with punch plate with 1/2 inch holes. Undersize fell through the holes, and was divided between the two side runs. The side runs were 48 inches wide and 12 feet long, and they were lined with 1 inch riffles on coco matting. Oversize was sluiced in the main run, which was 48 inches wide and 25 feet long. It was lined with 2 1/2 inch riffles over coco matting. The sluice runs were set at a gradient of 2 3/4 to 3 inches per foot. When bedrock was being sluiced, one or more rock pickers were sometimes necessary at the sluice box to keep it from becoming plugged. Water for sluicing was pumped at a rate of 3,500 to 4,000 igpm by a 10 by 12 inch pump powered by a 671 Jimmy diesel engine. Work at the property continued in 1984, using the same equipment as was used in 1983. A crew of 8 was again active. Six miners worked during the day, and one person did stripping at night. One helper worked in camp. A total of 4 cuts across the full width of the valley bottom, each averaging 200 feet wide and 300 feet long, were mined.

Gold from this property is reported to be coarse grained, and to have rough edges. A size gradation is apparent between gold recovered from this site, and the fine grained gold recovered from the downstream operation of this company.

| | |
|---|---|
| Surinam-Sutherland Resources | (7) |
| Henderson Creek | 115 O 6 |
| 1983, 1984 | 63°23'N 139°16'W |

This property is located along the upper portion of Henderson Creek, approximately 2 miles upstream from the mouth of North Henderson Creek. Deposits present are approximately 11 feet thick, and consist of 6 feet of black muck overlying 5 feet of brown sandy gravel.

Surinam optioned this property in 1983 after the former operator, Territorial Gold Placers Ltd., went into receivership. Work was alternated between this property, and a second one 6 miles upstream, during 1983. This allowed the cuts being worked to thaw partially, thereby eliminating some ripping of frozen ground. Work was done by a crew of 8, including helpers in camp, who worked on a single shift. They used 2 Cat D8K bulldozers, 1 Cat D8H bulldozer, and 1 Cat road grader. An area 200 feet wide and 900 feet long was mined in a series of 3 cuts. Black muck was bulldozed into the creek, which carried it downstream to be settled. The entire section of gravel along with 2 feet of bedrock was then mined and processed in a sluicing plant which consisted of a dump box, and sluice box with 3 runs. The dump box was 16 feet square, and the sluice runs were each 48 inches wide and 25 feet long. The lower half of the dump box was lined with punch plate with 1/2 inch holes. Undersize which fell through the holes was

divided between the two side runs, which were lined with 1 inch riffles on coco matting. Oversize was sluiced in the main run, which was lined with 2 1/2 inch riffles over coco matting. The sluice runs were set at a gradient of 2 3/4 to 3 inches to the foot. Water for sluicing was pumped at a rate of 3,500 to 4,000 igpm by a 10 by 12 inch pump powered by a 671 Jimmy diesel engine. Work continued at the property during 1984, with 8 workers using the same equipment as was used in 1983. Six miners worked during the day, and one person did stripping at night. One helper worked in camp. Five cuts averaging 200 feet wide and 300 feet long, taking in the entire width of the valley, were mined.

Gold from this property is reported to be fine grained. Three different colour varieties occur.

Goldwin Consulting (8)
Kenyon Creek 115 N 2
1983, 1984 63°03'N 140°59'W

This property is located on the southwestern slope of the Moosehorn Range, near the headwaters of Kenyon (Swamp) Creek. The creek valley is narrow and has a steep gradient. Deposits present are approximately 15 feet thick, and consist of 9 feet of black muck overlying 6 feet of gravel. Bedrock is decomposed granitic rock.

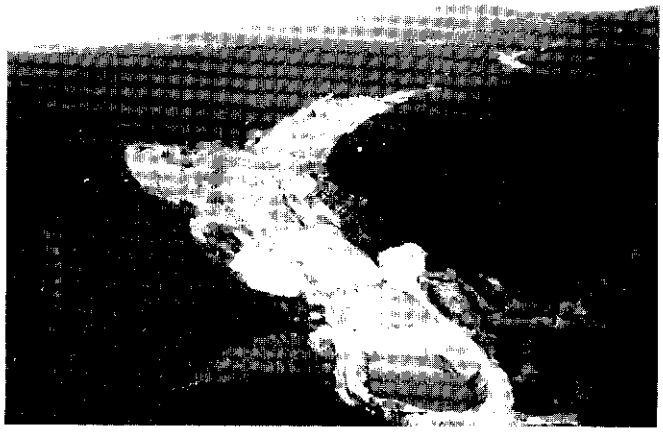


Figure 3: View of the Moosehorn Range property of Goldwin Consulting. (R.W. '84)

Work at this site was carried out during 1983, and continued during 1984. The same equipment and mining methods were used each year. A crew of 8 worked on 2 shifts, using 2 Terex 8240 bulldozers, 1 Cat D9H bulldozer, 1 Cat 980B loader, 1 Cat 966C loader, 1 Cat 245 hoe, and a Linkbelt 989 dragline. The bulldozers did stripping, and pushed material for sluicing to a stockpile. The cuts mined were from 90 to 150 feet wide, and were up to 700 feet long. Approximately 25,000 cu.yd. of material were sluiced each year. Material from the stockpile was fed to the sluicing plant at a rate of approximately 75 cu.yd. per hour by one of the loaders. The other loader was used to stack tailings. The sluicing plant consisted of a "Derocker" grizzly, a screening unit, and a 3 run sluice box. Undersize from the "Derocker" was less than 2 inches in diameter. It was fed to the screening unit. Undersize from the screening unit was less than 3/8 inch across. It was split between three sluice runs, each 48 inches wide and 20 feet long, and each of which was divided into 3 channels 16 inches wide and 20 feet long. The sluice runs were lined with expanded metal over coco matting, and were set at a gradient of 1 1/2 inches to the foot. Water for sluicing was recycled from the second of 3 settling ponds downstream from the sluicing plant. The total flow of the creek, and all the sluicing effluent were directed through the settling ponds. As mining progressed upstream, mined out cuts were converted to settling ponds.

Gold recovered from this property is reported to be fine grained.

Oak Bay Manor Ltd. (9)
Ten Mile Creek 115 O 12
1983, 1984 63°31'N 139°59'W

This property is located along Ten Mile Creek, at the mouth of Valentine Creek. Deposits present are approximately 24 feet thick, and consist mainly of gravel. Bedrock is decomposed schist.

Figure 4: View of Oak Bay Manor Ltd. property looking downstream along Ten Mile Creek to Sixty Mile River. (R.W. '84)

Work at this property was carried out during 1983, using 2 Cat D8K bulldozers to do stripping, and 2 Cat 980C loaders to mine material, feed the sluicing plant, and remove tailings. The cuts mined were taken across the full width of the valley, and were from 400 to 500 feet long. The sluicing plant consisted of a "Derocker" screening unit, and single run sluice box. The sluice box was 48 inches wide and 40 feet long, and was lined with angle iron riffles over expanded metal and coco matting. It was fed at a rate of 200 to 250 cu.yd. per hour. Water for sluicing was pumped from a recirculation pond adjacent to the first of a series of settling ponds by a 10 by 12 inch pump powered by a Cat 3208 diesel engine. Work at the property continued in 1984. A crew of 11 worked on 2 shifts, using the same mining methods and equipment as in 1983, with the addition of a Cat D8L bulldozer.

Goldmark Minerals (10)
Matson Creek 115 N 7
1984 63°30'N 140°36'W

This property is located along Matson Creek, 6 miles upstream from the mouth of Marion Creek. The deposits present along the right limit of the creek are 30 feet deep, and consist of 12 to 15 feet of frozen black muck over gravel.

Work at this property was carried out by a crew of 8 working on 2 shifts during 1984. They used 2 Cat D8K bulldozers to strip the black muck and all but the lowermost 6 feet of gravel, and to stockpile gravel in the cut. One Cat 980C loader was used to transport material from the stockpile to feed the sluicing plant. Tailings were removed by the bulldozers and the loader. The sluicing plant was fed at an average rate of 200 cu.yd. per hour. It consisted of a dump box 8 feet wide and 20 feet long, and single run sluice box 48 inches wide and 40 feet long. The dump box and sluice run were lined with punch plate with 1 1/2 inch holes over angle iron riffles, expanded metal, and matting. Chains were strung across the dump box over the punch plate to break up clay balls before they entered the sluice run. One 5 foot section of riffles in the sluice run had water injected into the riffles from below. Approximately 75% of the water for sluicing was recycled. It was pumped at a rate of 4,000 igpm by a 10 by 12 inch pump powered by a Cat 3208 motor from a recycle pond at the foot of the second of 2 settling ponds in series, and was fed to the sluicing plant by a spray bar at the throat of the dump box. Make-up water was acquired from a small right limit tributary upstream from the settling ponds, rather than from Matson Creek. Overflow flowed out of the second settling pond into Matson Creek.

S. Prohaska (11)
Bedrock Creek 115 N 15
1983, 1984 63°59'N 140°53'W

This property is located along Bedrock Creek, about 4,000 feet upstream from its confluence with Sixty Mile River. Deposits along the left limit of the creek are approximately 16 feet thick, and consist of 6 feet of black muck with some old tailings over 10 feet of gravel. Bedrock is schist.

Work on this property was carried out in 1983 by Mr. Prohaska with 1 or 2 helpers. They worked using a Cat D7E bulldozer, a Cat D8H bulldozer, a Cat 980 loader, and a Drott 50 hoe. Material mined was processed in a sluicing plant with dump box and single run sluice box. A crew of 2 continued work at the property during 1984. The same equipment was used to mine along the left limit of the creek. The bulldozers were used for stripping, and to stockpile pay gravel. The loader was used to transport the gravel to the sluicing plant and to remove tailings. The entire section of gravel was sluiced. The sluicing plant used in 1984 was different from the one used in 1983. It was made up of a hopper, where water was sprayed onto the gravel to produce a slurry, a vibrating screening deck on which water from spray bars washed the material over screens with 1 1/2 and 1 inch holes, and a sluice run 36 inches wide and 16 feet long, lined with expanded metal and Astro turf. A Denver jig was located at the end of the sluice run. The sluicing plant was fed at a rate of 70 to 80 cu.yd. of material per hour. Water for sluicing was pumped from a small pond along Bedrock Creek by a 6 inch Flygt pump powered by a 75 KW generator run by a 440 Lister diesel engine. Sluicing effluent was settled in a small pond immediately downstream from the sluicing plant, and was returned to Bedrock Creek prior to additional settling in a series of ponds farther downstream.

Capital Dynamics (12)
Miller Creek 115 N 15
1983, 1984 64°00'N 140°49'W

This property is located along Miller Creek, upstream from its confluence with Sixty Mile River. Deposits present in a cut 3 miles upstream from the mouth of the creek are approximately 20 feet thick, and consist of 3 to 4 feet of black muck overlying gravel. Bedrock is decomposed schist.

Work was carried out on this property during 1983 and 1984. In 1983, several cuts taking in the entire valley bottom were taken at sites in the 2 miles upstream from the mouth of the creek. Work at the property continued during 1984, when a crew of 22, plus 3 helpers in camp, mined on two shifts. They were active in an area approximately 3 miles upstream from the mouth of the creek, using a Cat D9H bulldozer, 3 Cat D8K bulldozers, a Cat D8H bulldozer, a Cat 980C loader, and a Cat 235 hoe. During the early part of the season, work was done at one cut at a time, but plans were to have two complete operations active simultaneously during the rest of the season. The bulldozers were used for stripping, and to push material from the cuts to the sluicing plant. Each cut was approximately 150 feet wide, taking in the entire valley bottom, and 300 feet long. Tailings were removed by the loader and the hoe. The sluicing plants were modified "Ross" units each made up of a dump box and 3 sluice runs. The sluice runs were set at a gradient of 3 inches to the foot. Each sluicing plant was fed at a rate of approximately 100 cu.yd. of material per hour. Water for sluicing was recirculated from the first of a series of 5 settling ponds situated in mined

out cuts. It was provided by a 10 by 12 inch pump run by a Cat 3406 diesel engine, and an 8 by 12 inch pump run by a Cat 3304 diesel motor. Each sluicing plant used approximately 3,500 igpm of water.

Gold from this property is reported to have a fineness of 810 to 830. A variety of heavy minerals, including scheelite, and cinnabar, is found in the concentrates from this site.

Chumar Placers (13)
Dublin Gulch Mining 115 N 15
Miller Creek 64°00'N 140°48'W
1982-1983, 1983-1984

This property is located along the left limit of Miller Creek, approximately 3,000 feet upstream from its confluence with Sixty Mile River. Deposits at this site occupy an old channel of Miller Creek, on the left limit of the present channel, and separated from it by a ridge of bedrock approximately 350 feet wide. Deposits present consist of up to 100 feet of frozen black muck and gravel.

Figure 5: Small side run at the end of the main sluice run set up by Dublin Gulch Mining to recover fine grained gold at the Chumar Placers property on Miller Creek. (R.W. '84)

Mining at this site was carried out during the winter months. Gravel was mined from the base of the section of deposits in the old channel using the underground room and pillar method. The rooms were up to 9 feet high. The gravel was removed from the mine by way of an adit which was driven 600 feet to the east from the present creek valley, into the buried channel. A description of this, and other underground placer mining operations is given in the paper by C. MacDonald in the first section of this volume. The gravel mined during each winter was stockpiled for sluicing during the summer. In 1983, Chumar Placers mined, and sluiced the material which was stockpiled. A sluicing plant consisting of dump box and single run sluice box was fed by a bulldozer. Tailings were removed by a loader. In 1984, material was mined during the winter months by Chumar Placers. Tailings from the 1983 sluicing efforts, and the material mined during 1984 were sluiced during the summer of 1984 by Dublin Gulch Mining. A crew of 6 plus 3 helpers in camp worked on 2 shifts, using a Cat 980B loader, or alternately, a Trojan 4000 loader, and a Cat 950 loader to feed the sluicing plant and remove tailings. The sluicing plant consisted of a hopper set over a dump box, and single run sluice box with small side run. The side run was set at 90° to the main run, and was fed by material less than 1/4 inch in diameter screened at the end of the main run. The sluicing plant was fed at a rate of 20 to 25 cu.yd. an hour. Water for sluicing was recycled from a settling pond by a 4 inch pump powered by a 4 cylinder gas motor. Miller Creek was diverted around this pond, and was only allowed into the pond to make up lost water.

Brisebois Brothers Construction Ltd. (14)
Sixty Mile River 115 N 15
1983, 1984 63°59'N 140°47'W

This operation is located on a left limit bench along Sixty Mile River, about 1,500 feet downstream from the mouth of Miller Creek. Deposits present are 60 to 80 feet deep, and consist of 15 feet of muck overlying a thick section of gravel. Bedrock is decomposed Eocene volcanic rocks.

Work at this property was carried out in 1983 and 1984 by Brisebois Brothers Construction Ltd. They used a Cat D9G bulldozer, and a Cat 992 loader to strip all but the lowermost 5 to 6 feet of the section, and mine the remaining gravel and a few feet of bedrock. Material was fed to the sluicing plant by the loader at an average rate of 120 cu.yd. per hour. The sluicing plant consisted of a dump box and single sluice run 48 inches wide and 30 feet long. The upper half of the sluice run was lined with punch plate with 3/4 inch holes. Angle iron riffles over expanded metal and matting were used throughout the sluice run. Both the loader and the bulldozer were used to remove tailings. Water for sluicing was pumped to a monitor in the dump box at a rate of approximately 4,000 igpm by a 12 by 14 inch pump powered by a Cat D343 engine. The water was obtained from a pond fed by a diversion from the Sixty Mile River.

M. Brisebois (15)
Sixty Mile River 115 N 15
1983, 1984 64°00'N 140°46'W

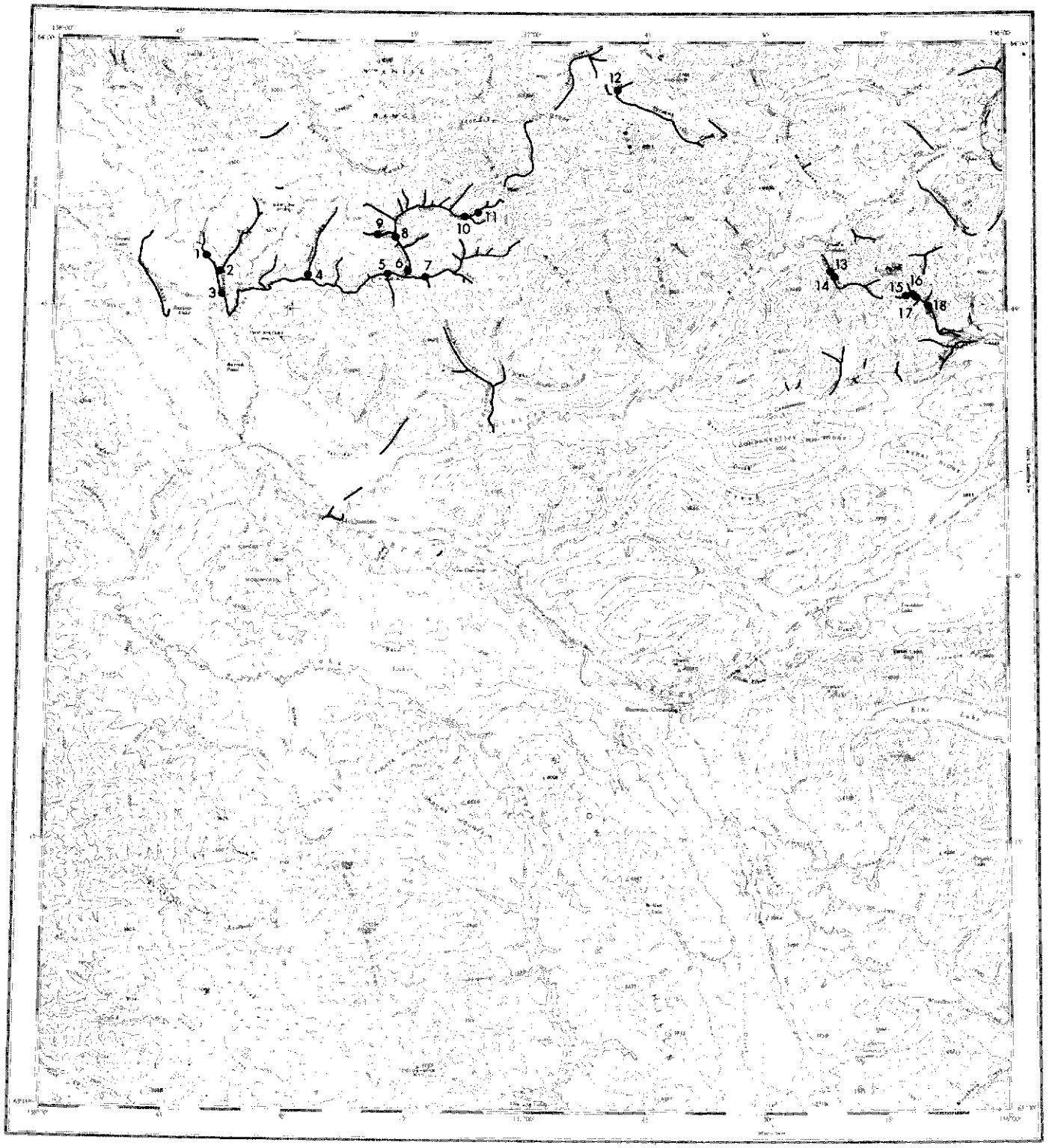
This property is located on a left limit bench along Sixty Mile River, approximately 5,000 feet downstream from the mouth of Miller Creek. Deposits present are 60 feet deep, and consist of 10 to 15 feet of black muck overlying gravel. Bedrock is decomposed Eocene volcanic rock.

Work on the property was carried out during 1983 and 1984 by M. Brisebois with 2 helpers. They used a Cat D9G bulldozer to strip all but the lowermost few feet of gravel, and a Cat 988 loader with 6 cu.yd. bucket to feed the sluicing plant each year. The sluicing plant consisted of a dump box and single run sluice box 36 inches wide and 32 feet long. Water for sluicing was pumped from a small pond fed by a diversion from Sixty Mile River. The diversion split off from the river upstream from the mouth of Miller Creek, and provided water for 5 operations along the left limit of Sixty Mile River. Effluent from sluicing was impounded in a settling pond before being returned to the diversion.

Norlee Placers (16)
Sixty Mile River 115 N 15
1983, 1984 64°00'N 140°47'W

This property is located along the left limit of the main valley of Sixty Mile River, about 2,500 feet downstream from the mouth of Miller Creek. Deposits present are approximately 12 feet deep, and consist entirely of gravel. Parts of the main river valley were dredged between 1929 and 1942, and between 1947 and 1959, but the dredging did not take in the entire valley bottom, and patches of unmined ground were left along the margins of the valley.

Work at this property was done during 1983 by M. Connors, his wife, and 3 other people. They mined a number of cuts approximately 150 feet wide and 300 feet long using 2 Cat D8H bulldozers to push material to a "Ross" 200 sluicing plant. A Cat 966C loader was used to stack tailings. Water for sluicing was pumped at a rate of approximately 3,500 igpm from a small pond fed by a diversion from the Sixty Mile River. Effluent from sluicing was settled in a pond 300 feet wide and 1,000 feet long, located in a mined out cut, before being returned to the diversion. Work at the property was continued in 1984 by a crew of 6 working on 1 shift. Eight cuts approximately 200 feet wide, and 200 to 300 feet long were mined. The same equipment used in 1983, plus a Cat D8K bulldozer were used in 1984. A new "Ross" 200 sluicing plant replaced the one used in 1983. It was fed at a rate of 200 to 250 cu.yd. of material per hour. Water for sluicing was supplied at a rate of 3,500 igpm by a 10 by 12 inch pump powered by a Cat 3208 diesel engine. Effluent was again settled in a settling pond in a mined out cut downstream from the sluicing plant, before being returned to the diversion from Sixty Mile River.




Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES

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5 0 5 10 15

MILES

McQUESTEN

**D. Buerge** (1)
**Zinc Creek** 115 P 13
1983, 1984 63°48'N 137°42'W

This property is located along the right limit of Zinc Creek, approximately 2 miles upstream from its confluence with Barlow Creek. Deposits present lie at the edge of a bench approximately 90 feet above creek level, and consist of 1 to 2 feet of organic material overlying gravel.

Work on the property was done by a crew of 2 in 1983 and 1984. During 1984, 2 Cat D4 bulldozers were used to do stripping, mine the cut, feed the sluicing plant, and push tailings. The sluicing plant consisted of a dump box, a trommel 42 inches across and 16 feet long, and a single run sluice box. Water was pumped from Zinc Creek to the dump box and trommel at an average rate of 100 igpm by a 4 inch Monarch pump, and a 3 inch Honda pump set up in series along a hose line. Effluent from sluicing was settled in 2 settling ponds in series in the present Zinc Creek valley, before being returned to Zinc Creek.

Barlow Creek Mines Ltd., (2)
Barlow Creek 115 P 13
1984 63°47'N 137°40'W

This property is located on the left limit of Barlow Creek, approximately 2,500 feet upstream from the mouth of Zinc Creek. Deposits present consist of 3 feet of organic muck overlying gravel. The deposits are frozen.

Work on this property was begun by Barlow Creek Mines Ltd. during 1984. A crew of 5 used a Cat D8 bulldozer and a Cat D6 bulldozer to do stripping, to mine material from the cut, and to feed the sluicing plant. A diversion was put in place along the right limit of Barlow Creek, and a small dam was built on the diversion to create a holding pond. Water was gravity fed to the sluice box from the holding pond at a rate of approximately 2,000 igpm by way of a 12 inch diameter pipe line. A 4 inch pump also pumped water from the holding pond to the spray bar of the sluicing plant. The sluicing plant was fed at an average rate of 30. cu.yd. per hour. Effluent from sluicing was settled in a series of 2 settling ponds downstream from the sluicing plant. Tailings were removed by the D6 bulldozer.

Barlow Creek Mines Ltd., (3)
Barlow Creek 115 P 13
1983, 1984 63°46'N 137°39'W

This property is located on the left limit of Barlow Creek, approximately 1 1/2 miles upstream from its confluence with Clear Creek, and immediately upstream from the Clear Creek road crossing. The deposits present are frozen, and consist of 3 feet of organic muck overlying gravel.

A limited amount of work was carried out on this property during 1983. Work was continued during the first part of the 1984 season by Barlow Creek Mines Ltd. A crew of 5 worked, using a Cat D8 bulldozer and a Cat D6 bulldozer. Both bulldozers were used to do stripping. Material was pushed to the sluicing plant by the D6 bulldozer, and tailings were removed using the same machine. The sluicing plant consisted of a dump box with spray bar, and single run sluice box. During sluicing, water was pumped from Barlow Creek to the spray bar at a rate of 600 igpm by a 4 inch pump. Effluent from sluicing was settled in a series of 2 ponds downstream from the sluicing plant.

Auriferous Placers (4)
Squaw Creek 115 P 15
1983, 1984 63°47'N 137°28'W

This property is located on Squaw Creek, approximately 3/4 mile upstream from its confluence with Clear Creek. The Squaw Creek valley is narrow, and has a steep gradient. Deposits present are frozen, and consist of 1 to 2 feet of organic material overlying 10 to 12 feet of sandy gravel.

Exploration and development work were done at this site during 1983 by Auriferous Placers. Material mined was sluiced at a rate of approximately 50 cu.yd. per hour in a Terra Magnum LV test sluicing plant, which consisted of a dump box, screening unit, and short sluice runs. Work at the property continued in 1984. The creek was diverted into a channel along the left limit of the valley. A number of cuts were mined along the right limit of the valley, and under the former channel of the creek. A Komatsu 155A bulldozer with a ripper was used to do stripping, and to rip material in the cut. The loosened material was then transported to the sluicing plant by a Clark 175C rubber tired loader with 4 1/2 cu.yd. bucket. The loader was also used to remove tailings. A Liebherr hydraulic excavator with 1 1/8 cu.yd. bucket was used to feed the sluicing plant, and to dewater trenches and ditches. The sluicing plant was a Terra unit consisting of a dump box, screening unit, and several sluice runs. It was fed at a rate of 300 cu.yd. per hour. An 8 inch Flygt submersible pump provided water at a rate of 1,200 igpm from Squaw Creek for sluicing. Effluent from sluicing was impounded in a series of settling ponds situated in mined-out cuts.

4757 Yukon Ltd. (5)
Clear Creek 115 P 14
1984 63°47'N 137°18'N

This property is located along the right limit of Clear Creek, approximately 2 miles downstream from the confluence of the Right and Left Forks of the creek, at the mouth of Smith Gulch. Deposits present are approximately 8 feet deep, and consist of gravel with large boulders. Bedrock is competent schist. Some stripping was done at this site during the 1970's, but the ground was never mined.

A crew of 3 worked at this property in 1984. A Cat D6C bulldozer was used to do stripping, and push material from the cut to the sluicing plant and into the dump box. A Cat 966C loader was used to remove tailings. The sluicing plant consisted of a dump box 8 feet wide and 12 feet long, and a single run

sluice box 36 inches wide and 22 feet long. It was fed at a rate of approximately 50 cu.yd. of material per hour. The dump box was lined with punch plate with 1 inch holes in the throat. The sluice run was lined with angle iron riffles over expanded metal and matting, and was set at a gradient of 1 1/2 inches to the foot. Water for sluicing was pumped from Clear Creek to spray bars in the dump box by a 12 by 14 inch pump powered by a V671 Detroit diesel engine. Effluent from sluicing was settled in a pond 30 feet wide, and 150 feet long, downstream from the sluicing plant.

3641 Yukon Ltd. (6)
Left Fork, Clear Creek 115 P 14
1983 63°47'N 137°16'W

This property is located along the right limit of the Left Fork of Clear Creek, just upstream from its confluence with the Right Fork of the creek.

Work at this site was carried out in 1983. Two cuts totalling 150 feet wide and 400 feet long were mined. Equipment used was taken from the 3641 Yukon Ltd. "fleet" of 1 Cat D9H bulldozer, 1 Cat D9G bulldozer, 1 Cat D8H bulldozer, 1 Cat 988 loader, 1 Cat 966 loader, a Cat 930 loader, and 1 Cat 225 hoe, which was in use in the Left Fork area. Material mined was washed at a rate of 50 to 75 cu.yd. per hour in a sluicing plant consisting of a wet screening unit, and 4 run sluice box.

Queenstake Resources Ltd. (7)
Right Fork, Clear Creek 115 P 14
1983, 1984 63°47'N 137°13'W

This property is located along the Right Fork of Clear Creek, approximately 4 miles upstream from the confluence of the forks of the Creek. Deposits present average 12 to 15 feet deep, although a section 20 feet deep was encountered in the area mined in 1984. There were also 17,000 cu.yd. of tailings from a previous bulldozer mining operation present in the area mined in 1984.

Work on the property was carried out by a crew of 10 during 1983 and 1984. A Heinz-Werner C12B hoe was used to dig test pits. The area to be mined was marked out, and the markings were followed during mining. When mining was begun by the company in 1981, the entire valley bottom was mined. It was found, however, that too much low grade material was being processed, so the programme of testing was begun. A Cat D9H bulldozer, and a Cat D8H bulldozer were used to do stripping in preparation for mining, and to construct settling ponds in mined-out areas. Stripping was done an average of 6 hours per day. A Walter Johnson 3 1/2 cu.ft. bucket line dredge was used to mine and process the gravel. The hoe, and a John Deere 450 tracked loader were used as anchors for the dredge's winch lines. The dredge was operated by two people per shift, working on 3 overlapping 10 hour shifts. Maintenance was carried out each day, so that actual mining was done for about 22 1/2 hours a day. The dredge was powered by electricity provided by a Cat 34012 engine running a generator. All winches and pumps on the dredge were electric. With the side winch lines, the dredge was caused to pivot on its "spud", moving the bucket line back and forth across the valley bottom. The bucket line consisted of 74 buckets with 3 1/2 cu.ft. capacity, which brought material up to the trommel inside the dredge. The material was washed and sorted by the trommel. Pieces larger than 1 inch in diameter were removed by conveyor, and dumped out the back of the dredge. Material less than 1 inch in diameter was divided between a series of sluice runs which were lined with angle iron riffles over expanded metal and matting. Water for sluicing was pumped from the dredge pond by a 10 by 12 and an 8 by 10 inch pump at approximately 5,000 igpm. Sluicing effluent flowed back into the pond behind the dredge, so that total recycling took place. The creek flowed into the dredge pond, but water exited from the pond only by way of seepage. It passed through a large number of settling ponds downstream from the dredging pond before rejoining the creek. The dredge advanced about 30 feet per day. In 1983, the mining season was 146 days long. Sluicing was carried out at a rate of 70 cu.yd. per hour. During 1983, 215,600 cu.yd. of material were mined, from which 4,232 ounces of fine gold were recovered. During 1984, 193,880 cu.yd. of material were mined, from which 1,586 ounces of fine gold were recovered. A more complete description of this property, and the mining methods used at it, is given in the paper by G.C. Gutrath, President of Queenstake Resources Ltd., in the first part of this volume.

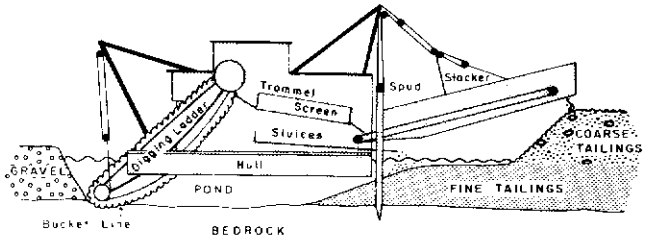



Figure 1: Diagram showing the parts of the Queenstake Resources Ltd. dredge.

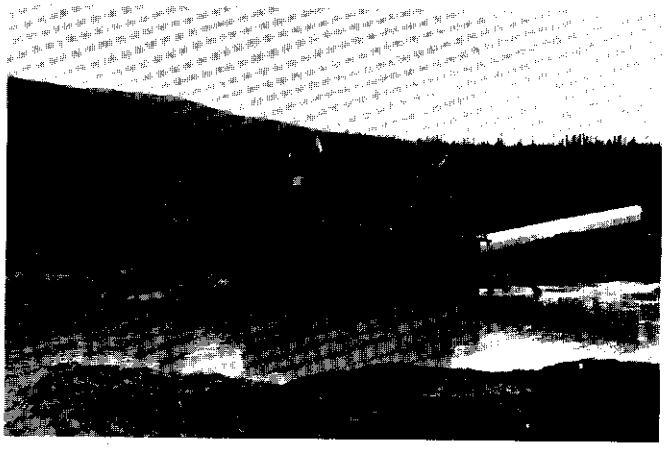


Figure 2: View of the dredge working along the Right Fork of Clear Creek. (G.G. '83)

The fineness of gold recovered by this operation during 1983 was 806, while the fineness of the gold recovered during 1984 was 784.

3641 Yukon Ltd. (8)
Left Fork, Clear Creek 115 P 14
1983, 1984 63°49'N 137°17'W

This operation is located along the Left Fork of Clear Creek at the mouth of right limit tributary 65 Pup.

Work at this property was carried out by a crew of 10 miners working on 2 shifts, with 7 additional workers in camp during 1983. Work was done using a Cat D9G and a Cat D9H bulldozer for stripping, a Cat D8H bulldozer for pushing material from the cut to a stockpile near the sluicing plants, a Cat 225 hoe to feed material from the stockpile to two sluicing plants set up side by side, and a Cat 966 loader to remove tailings. A Cat 988 loader and a Cat 930 loader were used as back up machines. The entire section of gravel was sluiced. The sluicing plants were operated simultaneously, and together washed 100 to 150 cu.yd. of material per hour. One of the sluicing plants consisted of a "Derocker" screening unit, a vibrating screening deck, and 4 run sluice box. Material less than 1 1/2 inches in diameter fell through the Derocker onto the screening deck. Material less than 1/2 inch in diameter fell through the screening deck, and was split between the sluice runs, each of which was 24 inches wide and 16 feet long. The runs were lined with expanded metal over rubber matting, and were set at a gradient of 1 inch per foot. The other sluicing plant consisted of 2 vibrating screening units, and 4 run sluice box. Material was fed to the first vibrating screening unit, which screened out material more than 2 inches across. Undersize was carried by a metal flume to a second, smaller vibrating screening unit, where it was screened to 1 1/4 inches in diameter. Undersize was divided between the sluice runs, each of which was 30 inches wide and 20 feet long. These sluice runs were also lined with expanded metal over rubber matting, and were set at a gradient of 1 inch per foot. Power to operate the sluicing plants was provided by a generator driven by a Cat 4 cylinder diesel engine. Water for sluicing was provided at a rate of approximately 2,500 igpm by way of two 6 inch diameter pipe lines, spliced into a 10 by 12 inch pump driven by an Allis Chalmers 6 cylinder diesel engine. Effluent from sluicing was settled in 2 ponds in series downstream from the sluicing plants. Water was not recirculated. Work continued at this site during 1984, although on a reduced scale. A crew of 4, with 1 helper in camp, worked on one 12 hour shift, using a Cat D9H bulldozer for stripping, and to feed a Cat 980B loader. The loader was used to feed the sluicing plant, and to remove tailings. A Cat 225 hoe was used to maintain the drain for the cut. The cut was approximately 80 feet wide, 400 feet long, and up to 20 feet deep. The bottom 10 feet of the section were washed in a sluicing plant consisting of a "Derocker" screening unit, and a 4 run sluice box. Only the centre 2 runs were used, however. Each of them was 30 inches wide and 20 feet long, and had two 6 inch steps. They were lined with 1 1/4 inch angle iron riffles over expanded metal and matting. The sluicing plant was fed at a rate of approximately 80 cu.yd. of material per hour. Water for sluicing was pumped from the creek, which was diverted to the right limit of the valley away from the cut, drain, and settling ponds. It was pumped at a rate of approximately 2,500 igpm by a 10 by 12 inch pump powered by a 335 Cummins diesel engine. Effluent from sluicing was settled in a series of ponds downstream from the sluicing plant.

J. Scott (9)
65 Pup 115 P 14
1983, 1984 63°49'W 137°19'W

This property is located on 65 Pup, a right limit tributary of the Left Fork of Clear Creek, approximately 1 mile upstream from its confluence with Clear Creek. The valley bottom is 125 feet wide at this site, and deposits present are reported to be shallow. Abundant slabs of slide rock up to 3 feet across are present in the deposits.

A limited amount of work was done at this site by Mr. Scott during 1983. A small cut was mined and sluiced, and an area 100 feet square, approximately 1,000 feet downstream from the cut, was stripped. A John Deere 350 loader, and a Cat 955H Traxcavator were used for all work. The material mined was processed in a sluicing plant which consisted of a dump box, and single run sluice box. The dump box was 5 feet wide and 8 feet long, and was modified from the box of a pick-up truck. The sluice run was 24 inches wide and 30 feet long, and was lined with 1 1/2 inch angle iron riffles over expanded metal and matting. Water for sluicing was gravity fed from a shallow reservoir upstream from the sluicing plant. Work at the property continued in 1984. A new storage pond was constructed 500 feet upstream from the old dam. The old dam was sluiced in preparation for mining the gravel underneath it. A John Deere 1010 tracked loader, and a Cat 955H Traxcavator were used for all work. Material mined was processed in a sluicing plant modified from the one used in 1983. It consisted of a grizzly, dump box, and single run sluice box. Material was fed to the grizzly at a rate of approximately 15 cu.yd. per hour, and was washed by water from a spray bar supplied by a small Honda pump. Material less than 8 inches in diameter fell through the grizzly, and was sluiced. Punch plate with 1/2 inch holes set on expanded metal and coco matting was added to half of the dump box, and was said to be an effective trap for gold. Water for sluicing was gravity fed from the reservoir by a combination of ditch and pipe. Effluent from sluicing was settled in ponds left along the Left Fork of Clear Creek by previous operators in the area.

Blackstone Placer Mining Ltd. (10)
Left Fork, Clear Creek 115 P 14
1983, 1984 63°51'N 137°07'W

This property is situated along the upper part of the Left Fork of Clear Creek, approximately 1 1/2 miles upstream from the mouth of Lewis Gulch. Deposits present along the right limit of the creek are

approximately 30 feet deep, and consist of 2 feet of organic material overlying 28 feet of brown and grey gravel. The deposits follow a channel which is entrenched in bedrock. The bottom of the channel is approximately 15 feet wide. Deposits along the left limit of the creek are 10 to 12 feet deep. The bedrock surface along the left limit of the creek is 15 to 20 feet above the bottom of the channel along the right limit. Bedrock is mainly decomposed, but some competent bedrock occurs as reefs across the valley bottom. Boulders up to 5 feet across are present.

Work at this site was carried out in 1983 by Mr. N. Harper, with the help of 3 family members. They used a Cat D8H bulldozer to strip overburden, and stockpile gravel. Two Hough 90E loaders equipped with 4 cu.yd. buckets were used to feed the sluicing plant, and to remove tailings. A Cat D7 bulldozer was used as a standby machine. Material was mined from a single right limit cut 200 feet wide and 300 feet long during 1983. The entire section of material mined was processed in a sluicing plant which consisted of a grizzly, dump box, and single channel sluice box. The grizzly screened material to less than 12 inches in diameter. Undersize fell into the dump box, which was 7 feet wide, and 16 feet long. It was lined throughout with punch plate over expanded metal and matting. One inch riffles were used in place of expanded metal at the throat of the dump box. The sluice run was 36 inches wide, and 30 feet long, and was lined with 2 inch riffles over expanded metal and Nomad matting. The sluice run was set at a gradient of 1 3/4 inches to the foot. Water for sluicing was gravity fed from a holding pond by way of 200 feet of 11 inch diameter pipe. A 4 inch pump driven by a Hatts 2 cylinder air cooled engine was hooked in line to the pipe near the sluicing plant. It delivered water to 2 spray bars over the grizzly when oversize was being fed to the sluicing plant. Work at the property continued in 1984, when a cut 10 to 12 feet deep was mined along the left limit of the creek. Approximately 29,000 cu.yd. of material were washed at an average rate of 50 cu.yd. per hour. Some stripping was also done, upstream from the mining operation.

Both fine and coarse grained gold are reported to occur at this property. The coarse grained gold has rough edges. The fineness of the gold is reported to be 800.

T. Bazylinski (11)
Left Fork, Clear Creek 115 P 14
1983 6351'N 137°06'W

This property is located along the headwaters of the Left Fork of Clear Creek, approximately 2 1/2 miles upstream from the mouth of Lewis Gulch. The valley bottom is relatively wide, and has a shallow gradient. Deposits present are 6 to 15 feet thick, and consist of 2 to 5 feet of organic rich material overlying 4 to 10 feet of gravel.

Work at this property was carried out during 1983 by T. Bazylinski, and 2 helpers. The work was done using 1 Cat D9H bulldozer for stripping, and stockpiling material, and a Cat 988 loader, for feeding the sluicing plant, and removing tailings. The sluicing plant consisted of a vibrating screening unit, and 2 sluice runs. Material 1 1/4 inches in diameter and less passed through the wet screening unit, and was divided between two sluice runs 30 inches wide and 20 feet long, lined with expanded metal and matting. Water for sluicing was gravity fed from a large holding pond by way of a 6 inch diameter pipe. Effluent from sluicing was settled in two large ponds constructed from coarse tailings, downstream from the sluicing plant. Water filtered through the tailings from which the ponds were built before returning to the creek.

Tamandara Resources Ltd. (12)
Gem Creek 115 P 15
1983, 1984 63°58'N 136°49'W

This property is situated on Gem Creek, approximately 2,000 feet upstream from its confluence with Sprague Creek. Deposits at this site are 9 to 12 feet thick, and consist of 1 to 4 feet of organic rich material and soil over 8 to 10 feet of gravel. Evidence of mining by early hand miners is present.

Work on the property was done during 1983 and 1984 by E. Wiez with one helper. They mined using a Komatsu D60E bulldozer to strip waste, and excavate material in the cut. A Trojan 2000 loader was used to transport material from the cut to the sluicing plant, and to remove tailings. Approximately 8,000 cu.yd. of material were sluiced each year. The sluicing plant consisted of a dry grizzly, with bars spaced 3 inches apart, a dump box, and a single run sluice box. It was fed at a rate of approximately 25 cu.yd. of material per hour. The dump box was 6 feet wide and 12 feet long, and was lined with train rail oriented parallel to the flow. The sluice run was 24 inches wide and 30 feet long, and was lined with angle iron riffles decreasing in size from 4 inches at the top to 1 1/2 inches in the middle, and 1 inch at the end. The last 3 feet of the run were lined with punch plate with 1/4 inch holes. All the riffles and punch plate were set over expanded metal and matting. Water for sluicing was gravity fed from Gem Creek by way of a ditch. At times of low water, the total creek flow was required. Effluent from sluicing was settled in 3 ponds in series. Gem Creek also flowed through the ponds.

Gold recovered from this property is reported to be fine grained, and to have a fineness of 880 to 890. It usually has a rusty or black stain. Very little black sand is recovered with the gold in the concentrates, but barite, scheelite, and cassiterite are found.

Bardusan Placers Ltd. (13)
Johnson Creek 115 P 16
1983 63°47'N 136°22'W

This property is located along the right limit of Johnson Creek, approximately 1 1/4 miles downstream from the mouth of Sabbath Creek. Deposits present are 14 feet deep, and consist of a few feet of black muck overlying gravel. Bedrock in the area is competent, and blocky weathering.

Work at this property was done by H. Barchan and 3 family members during 1983. They used a Cat D7E bulldozer, and a Trojan loader with 3 cu.yd. bucket to mine along the right limit of the creek, adjacent to previously mined centre cuts. The material mined was processed at a rate of approximately 90 cu.yd. per hour in a sluicing plant which consisted of a "Derocker" screening unit, and a single run sluice box. The "Derocker" screened out pieces larger than 2 inches in size. Pieces less than 2 inches across fell into the sluice run, which was 36 inches wide and 30 feet long. It was lined with riffles over expanded metal and matting. Water for sluicing was gravity fed from Johnson Creek to a spray bar above the "Derocker", with enough pressure to provide a good wash of the material on the screening deck, and enough volume to carry it through the sluice run. Effluent from sluicing flowed down a drain approximately 2,000 feet long to 2 large settling ponds in series. A third pond was added in 1983.

Gold recovered from this property is reported to be fine grained and flat. Minerals found with the gold in the concentrate include scheelite, cassiterite, and magnetite.

**C & I Construction Ltd.** (14)
**Johnson Creek** 115 P 16
**1983, 1984** 63°47'N 136°21'W

This property is located along Johnson Creek, approximately 1 mile downstream from the mouth of Sabbath Creek. Deposits present in a cut along the right limit of the creek are up to 35 feet thick, and consist of a thick layer of black muck and colluvium overlying gravel. Only the bottom part of the gravel is gold bearing. The deposits are frozen.

Work was carried out on this property by C & I Construction Ltd. during 1983 and 1984. Work was done using an International TD-25B bulldozer, a Trojan 4000 loader, and a Michigan loader with 7 cu.yd. bucket. Mining was done in a cut along the right limit of the creek, in an area covered by material which had slumped down from the adjacent hillside. Material was mined from the face by the loaders, and transported to the sluicing plant which consisted of a dry grizzly, dump box, and single run sluice box. Material more than 6 inches in diameter was screened out by the grizzly. Undersize dropped into the dump box, which was 4 feet wide and 15 feet long, and was washed through the sluice run. The sluice run was 36 inches wide and 20 feet long. It was lined with punch plate with 1 inch holes, over riffles and mats throughout. Water for sluicing was gravity fed from Johnson Creek by way of a ditch. Sluicing effluent flowed down a drain and into a series of small settling ponds.

Gold recovered from this property is reported to be flat, and fine grained.

**Erl Enterprises** (15)
**Highet Creek** 115 P 16
**1983, 1984** 63°46'N 136°13'W

This property is located along the upper reaches of Highet Creek, just upstream from the mouth of left limit tributary Rudolph Pup. The valley bottom in this area is narrow, and the gradient is steep. Deposits present along the left limit of the creek are 30 to 35 feet thick, and consist of 24 to 27 feet of colluvium overlying 6 to 8 feet of gravel. Timber from old drift mining operations is evident in the cut.

Work at this site was carried out by Mr. F. Erl during 1983 and 1984, using a Cat D8 bulldozer, and a Cat 941 Traxcavator. The Traxcavator was used for most work, including digging material from the face, and transporting it to the sluicing plant. Approximately 2,000 cu.yd. of material were sluiced each year. The loader was also used to remove tailings. The sluicing plant consisted of a wet grizzly, dump box, and single run sluice box. Water was supplied to the sluicing plant by two methods, simultaneously. Water from Highet Creek was diverted through a pipe line made from 45 gallon drums, and gravity fed to the end of the dump box. The total creek flow was directed through the sluice box in dry periods. At the same time, a ditch along the right limit of the creek supplied water from farther upstream to a 6 inch diameter pipeline at a 70 foot head. This water was fed to spray bars above the grizzly. The water washed material being screened by the grizzly, and then dropped into the dump box. Effluent from sluicing was settled downstream from the operation, where the Highet Creek valley widened.

Both flat, flaky, worn gold, and angular, wiry gold are reported to be present at this property.

**W. Gordon** (16)
**Highet Creek** 115 P 16
**Rudolph Pup** 63°46'N 136°11'W
**1983, 1984**

This property is located along Highet Creek, at the mouth of Rudolph Pup. Deposits present represent several depositional environments. Some of the deposits lie on a low bench along the right limit of Highet Creek. Others are present in the valleys of Highet Creek and Rudolph Pup. The deposits include pre-glacial gravel, glaciofluvial sand and gravel, and post-glacial gravel.

Work on this property was done during 1983 and 1984 by Mr. W. Gordon. During 1983, mining was done alternately on the right limit bench along Highet Creek, and in the valley of Rudolph Pup. Material was mined from each cut as it thawed. A Michigan 35 loader and a Michigan 45 loader were used for all work. The material mined was processed in sluicing plants, each of which consisted of a dump box and single run sluice box, set up at each site. Both sluice boxes were lined with grader blade and angle iron riffles over expanded metal and matting. On the right limit bench, waste was stripped, and pay gravel transported approximately 250 feet to the sluicing plant. Water for sluicing was gravity fed

from a reservoir along Highet Creek by way of a pipe line made from 45 gallon drums. On Rudolph Pup, material was dug from the face of a narrow cut 8 to 10 feet deep. All material mined was sluiced. Water for sluicing was brought by way of pipe from Rudolph Pup. Effluent from both sites was settled in a series of small ponds along Highet Creek. Work at the property continued during 1984. Mr. Gordon mined along the right limit bench using the same methods and equipment as he used during 1983. Because of low water levels in Highet Creek, water from Rudolph pup was added to the supply from Highet Creek to provide enough water for sluicing.

Both wire gold, and well worn, flat, flaky gold are reported to be present at this property.

W. Tuck (17)
Highet Creek 115 P 16
1983, 1984 63°46'N 136°11'W

This property is located on Highet Creek, just downstream from the mouth of Rudolph Pup. Deposits are present in the Highet Creek valley, and on a low bench along the right limit of the creek. The deposits include pre-glacial gravel, glaciofluvial sand and gravel, and post-glacial gravel.

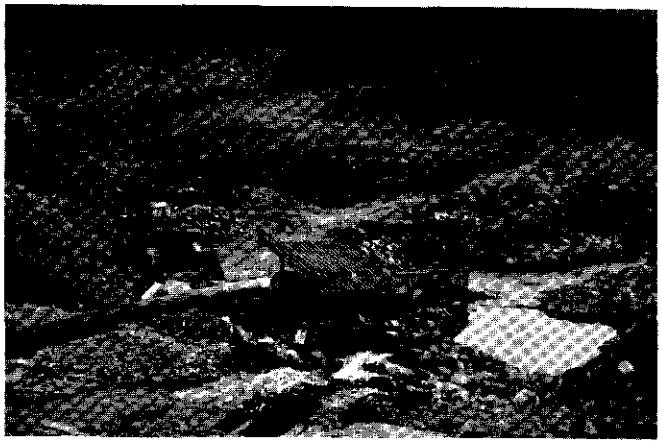


Figure 3: View of cut and sluicing plant at W. Tuck mining operation along the left limit of Highet Creek. (R.W. '83)

Work was carried out at this site by Mr. Tuck with one helper during 1983. They used a Cat D8H bulldozer to strip overburden from a cut along the left limit of the creek. Gravel from a narrow gold-bearing layer 2 feet deep was mined and carried to the sluicing plant by a Clark 75B loader. The loader was also used to remove tailings. The sluicing plant was made up of a dry grizzly, dump box, and a single run sluice box. Material less than 10 inches across fell through the grizzly into the dump box, to be washed. The sluice run was lined with grader blade and angle iron riffles over expanded metal and matting. Water was gravity fed to the dump box from a reservoir on Highet Creek. In dry periods the total creek flow was needed for sluicing. Effluent was impounded along with the flow from Highet Creek in a large settling pond. Work at the property continued during 1984. A Cat D8K bulldozer was used to mine a cut along the right limit bench. Material mined was processed in the same sluicing plant as was used during 1983 at a rate of 70 to 100 cu.yd. per hour. Water for sluicing was gravity fed from Highet Creek, with additional water recirculated by a 6 inch pump run by a small gas motor. From 600 to 1,000 igpm were used. Effluent from sluicing was impounded in a small new settling pond before flowing into the pond used in 1983.

Bleiler Placers Ltd. (18)
Highet Creek 115 P 16
1983, 1984 63°45'N 136°10'W

This property is located on Highet Creek, approximately 3 1/2 miles upstream from its confluence with Minto Creek, at the mouth of Hayden (Dredge) Creek. Deposits present are 30 to 40 feet thick. Boulders up to 12 inches across are common in the gravel, and larger boulders do occur.

Work at this site was carried out during 1983 by a crew of 4. They mined using a Cat D8K bulldozer, a Cat 988B loader, and a Cat 955 Traxcavator. The bulldozer was used to push material from the cut up a ramp and into the sluicing plant. Two cuts were mined side by side, across the entire valley bottom, for each set up of the sluicing plant, which consisted of a "Ross" 200 unit. The complete section of gravel was processed at a rate of approximately 120 cu.yd. per hour. Water for sluicing was gravity fed at a head of about 10 feet by way of a pipe line from a reservoir on Highet creek. Tailings were removed by the loader. Effluent was impounded in a series of large settling ponds approximately 1 1/2 miles downstream from the operation. Work at this site continued in 1984. One cut of approximately 85,000 cu.yd. was mined and processed. The sluicing plant was the same as the one used during 1983, but the feed system for it was changed. A wet grizzly was set up with a shallow dump box. Two 3 inch jets of water initially wetted the gravel, and allowed it to slide over the grizzly and be washed by the spray from a water manifold. Water for the water jets and the manifold was gravity fed. The grizzly was built from heavy T-bar, with the space between the bars tapering from bottom to top, to limit stuck rocks. A UH-20 hoe was added to feed the sluicing plant. The capacity of the sluicing plant was increased to approximately 180 cu.yd. per hour by these changes.

Both coarse, wiry gold, and fine grained, flat, worn, flaky gold are reported to be present at this property. Other minerals reported to occur in the concentrate include scheelite, pyrite, stibnite, and arsenopyrite.

C.Y. Kin (19)
Swede Creek 115 P 16
1984 63°59'N 136°01'W

This property is located along Swede Creek, just upstream from its confluence with Secret Creek.

Work at this property was begun by C.Y. Kin with the help of family members during 1984. They used a

John Deere 555 tracked loader with back hoe attachment to mine test cuts along the left limit of Swede Creek. Material mined was fed by the back hoe at a rate of 15 to 20 cu.yd. per hour to a sluicing plant consisting of a dump box and small single run sluice box lined with angle iron riffles. Water for sluicing was supplied by a 2 inch pump driven by a 3 cylinder Lister diesel engine.

U.S.S.R. RESEARCH

U.S.S.R. Research - re clay

"A distinctive feature of ---clay--- is its capacity for strengthening when it is rapidly mixed (in water), which impairs disintegration in trommels, etc. Highly plastic clays having a moisture content above the maximum molecular moisture capacity break down in water either only slightly or not at all. The moisture content affects the strength of the clay: when the moisture content increases, the strength at first increases to the maximum & then decreases." (At which point it may be already through the sluice - G.W.G.)

S.P. Dukhnin studied dredging operations in the Ural Mtns. where old tailings were being re-mined. The high clay content, difficult-to-wash original gravels had lain for many years subjected to breakdown by atmospheric forces. When the tailings were re-dredged, using the same equipment, gold recovery ranged from 30 to 60% of the original amount.

Researchers testing the action of thin, high-pressure nozzles (1/16" to 3/16" diameter) on highly plastic clays found that when the pressure was increased from 200 psi to 300 psi (approx), the disintegration efficiency almost doubled.


Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

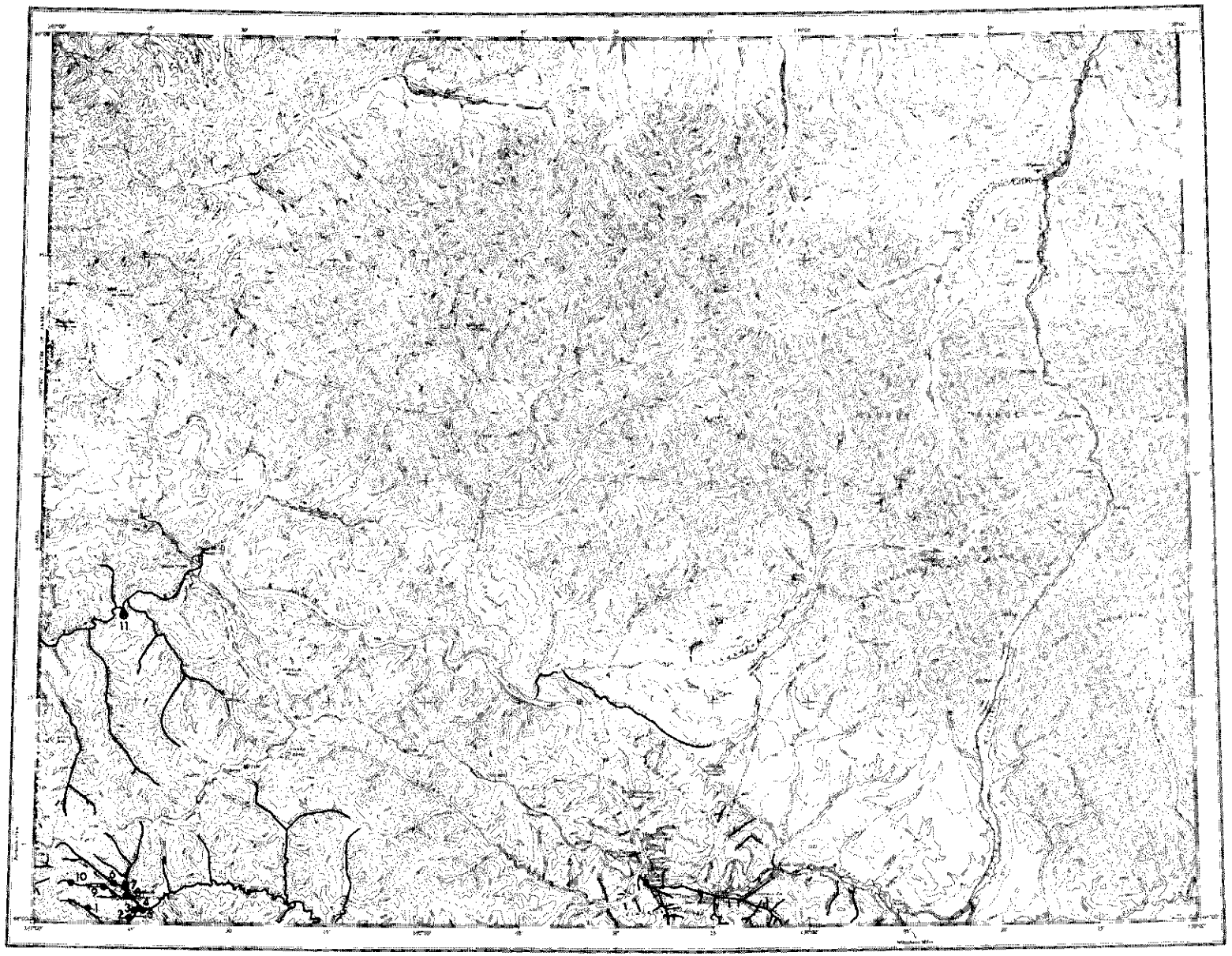
KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

LARSEN CREEK




Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984.
Numbers beside the dots relate to the text.

KILOMETRES

5 0 5 10 15 20 25 30

5 0 5 10 15

MILES

DAWSON

Capital Dynamics (1)
Miller Creek 116 C 2
1983 64°01'N 140°52'W

This property is located along the middle part of Miller Creek, approximately 3 3/4 miles upstream from its confluence with Sixty Mile River.

Work was carried out at this site during 1983, when a cut 50 to 100 feet wide, and approximately 300 feet long, taking in the entire valley bottom, was mined. Three Cat D8 bulldozers were used to do stripping, and to push material from the cut to the sluicing plant. The sluicing plant consisted of a modified "Ross" unit made up of a dump box and 3 sluice runs, which were set at a gradient of 3 inches to the foot. Material was processed at a rate of about 100 cu.yd. per hour. Water for sluicing was provided by a 10 by 12 inch pump driven by a Cat diesel engine at a rate of approximately 3,500 igpm.

L. Haner (2)
Sixty Mile River 116 C 2
1983, 1984 64°00'N 140°45'W

This operation is located along the left limit of the Sixty Mile River valley. Deposits are found on a low left limit bench along the valley margin, as well as in the valley itself. Deposits on the bench are up to 60 feet thick, and consist of up to 40 feet of black muck and gravel overlying a mixed section of gravel, silt, and organic debris. The bottom 4 to 6 feet of gravel is gold bearing. Deposits in the Sixty Mile River valley are approximately 12 feet deep, and consist of a thin layer of organic material overlying gravel.

Work on the property was done during 1983 by a crew of 5. They mined using a Cat D9G bulldozer, a Cat 966C loader, and an Ensley H3500 hoe. During the first half of the season, they mined on the low left limit bench. Mid-way through the season, they moved to the floor of the valley, and mined 2 cuts 100 feet wide, and totalling 300 feet long. Material was stockpiled with the hoe and bulldozer, and was fed to the sluicing plant by the loader. The sluicing plant consisted of an elevated dump box, grizzly, and 3 run sluice box. A monitor was used to wash material from the dump box across a grizzly with a series of different size grates. Pieces of feed material less than 3 inches across fell through the grizzly into the sluice box. Punch plate in the main run of the sluice box acted to further classify the material, and supplied fine grained material to the adjustable side runs. Tailings were removed by the loader and the bulldozer. Water for sluicing was pumped by way of a pipe line from the Sixty Mile River diversion, which supplied water to a number of operations along the left limit of the valley. Effluent was impounded in a settling pond before being returned to the diversion. Work continued at the property during 1984. Three cuts in the Sixty Mile River valley were mined, using the same equipment and methods as were used in 1983. Some hydraulic stripping of black muck present along the bench was also done. Water for sluicing and stripping was supplied by two 8 by 10 inch pumps powered by Cat diesel engines. Approximately 2,000 igpm of water were used for sluicing, and 3,500 igpm of water were used for stripping.

Figure 1: View of loader feeding sluicing plant at L. Haner operation on the bench along the left limit of the Sixty Mile River. (R.W. '83)

C. McDougall (3)
Sixty Mile River 116 C 2
1983, 1984 64°01'N 140°44'W

This property is located on the bench along the left limit of the Sixty Mile River, approximately 1 mile upstream from the mouth of Big Gold Creek. Deposits present consist of 15 to 40 feet of frozen black muck overlying 4 to 8 feet of gravel. Some large boulders of volcanic rock occur at the foot of the black muck section.

Mr. C. McDougall and two helpers worked at this site during 1983 and 1984. They used water from 2 monitors to thaw and strip the black muck. A Cat D8H bulldozer was used to assist with stripping, and to mine material from the cut, feed the sluicing plant, and remove tailings. The sluicing plant was fed at a rate of about 100 cu.yd. of material per hour. It consisted of a dump box with spray bars on the side, and a single run sluice box. Punch plate was used to sort material in the sluice run. Undersize material was split between two short side runs at the bottom end of the main run. Water for both stripping and sluicing was supplied from the Sixty Mile River diversion by an 8 inch pump. Effluent from stripping and sluicing was settled separately in 2 small ponds, which fed a large pond. Some water was recirculated from the large pond.

Fell-Hawk Placers (4)
Big Gold Creek 116 C 2
1983, 1984 64°01'N 140°44'W

This property is located on the right limit of Big Gold Creek near its confluence with Sixty Mile River. Deposits present consist of up to 35 feet of frozen black muck overlying a thin layer of gravel. Bedrock is decomposed andesite.

Work at this property was carried out in 1983 by a crew of 4. They mined using a Cat D9H bulldozer, 2 Cat D8H bulldozers, and a Cat 966C loader. Material mined was washed in a sluicing plant consisting of a dump box 25 feet long, and a single run sluice box, also 25 feet long. Sluicing water was pumped to a monitor mounted on the dump box. Work at this site continued during 1984, when approximately 87,000 cu.yd. of material were stripped, and 48,000 cu.yd. of material were sluiced.

Cogasa Mining Corp. (5)
Sixty Mile River 116 C 2
1983 64°01'N 140°43'W

This property is located in the Sixty Mile River valley at the mouth of Big Gold Creek. Deposits present consist of tailings from dredge mining operations in the area from 1929 to 1941, and from 1947 to 1959, and undisturbed deposits 10 to 15 feet deep consisting of 2 to 4 feet of organic material over 8 to 11 feet of silty gravel.

Work at this site was carried out in 1983 by a crew of 12. They used 2 Cat D9G bulldozers to excavate material in the cut. The material was then picked up, and transported to the sluicing plant by a Cat 641 scraper. The sluicing plant consisted of a conveyor, fed with a Cat 225 backhoe, a vibrating screening unit, and a set of 7 vibrating sluice runs. The conveyor transported the gravel to the screening unit, which screened material to 1 inch in diameter and less. Undersize was split between the sluice runs. Tailings were removed by the scraper.

Queenstake Resources Ltd. (6)
Little Gold Creek 116 C 2
1983, 1984 64°03'N 140°48'W

This property is located on Little Gold Creek, approximately 1 1/2 miles upstream from its confluence with Big Gold Creek. Deposits present average 15 feet deep, and consist of 7 feet of black muck overlying 8 feet of gravel.

Work at this property was carried out in 1983 by a crew of 7 miners working on 2 shifts, with the aid of 4 other workers in camp. The creek was diverted to the right limit of the valley, and 5 cuts, each 200 feet wide and 350 feet long, taking in the full width of the valley bottom, were mined. A Cat D9H bulldozer, and a Komatsu 355A bulldozer ripped the material, and pushed it to a stockpile at the ramp of the sluicing plant. An International Hough 100C loader was used to push the material into the sluicing plant at a rate of approximately 160 cu.yd. per hour, and to remove tailings. The sluicing plant consisted of a Pearson "Rock" box. Water for sluicing was recycled from a series of settling ponds located in mined out cuts. Each old cut was converted into a set of two ponds. Work at this property continued in 1984. Four cuts were mined between June 13 and July 19, using the same mining equipment and methods as were used in 1983. Production totalled approximately 42,000 cu.yd.

Queenstake Resources Ltd. (7)
Little Gold Creek 116 C 2
1983, 1984 64°02'N 140°46'W

This property is located on Little Gold Creek, at its confluence with Big Gold Creek. Deposits present are more than 18 feet deep, and consist of at least 10 feet of black muck overlying 8 feet of gravel.

Work at this site was begun in 1983. Members of a crew of 11 who worked on another Queenstake Resources Ltd. property on Little Gold Creek stripped 10 feet of black muck from a large area at the mouth of Little Gold Creek. A Cat D9H bulldozer and a Komatsu 355A bulldozer were used. Work at the property continued in 1984. Further stripping was done, and 2 cuts containing 38,000 cu.yd. of material were mined and processed between July 24 and August 11.

Ardill Construction Ltd. (8)
Kluane Enterprises Ltd. 116 C 2
Glacier Creek 64°02'N 140°46'W
1983, 1984

This property is located along Glacier Creek, approximately 1/2 mile upstream from its confluence with Big Gold Creek. Deposits in a cut along the left limit of the creek are approximately 45 feet deep, and consist of 40 feet of barren gravel overlying 5 feet of gold bearing gravel.

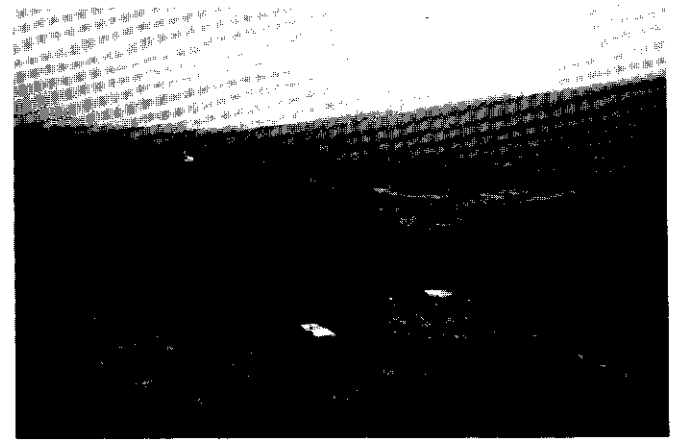


Figure 2: View of the Ardill Construction Ltd. property on Glacier Creek. Barren gravel is being stripped, and pushed into a mined out cut. (R.W. '83)

Work on this property was carried out in 1983 by Ardill Construction Ltd. A crew of 7 with 1 helper in camp worked on 2 shifts. They used a Cat D9H bulldozer and a Cat D7 bulldozer to strip the barren gravel and stockpile the gold bearing gravel and a few feet of bedrock. A Cat 980B loader was used to feed the sluicing plant from the stockpile at a rate of about 100 cu.yd. per hour. The loader was also used to remove tailings. Water was pumped from Big Gold Creek to a pond on the hill top between Big Gold and Glacier Creeks, and from there was gravity fed under pressure for sluicing. The sluicing plant

consisted of a Pearson "Rock" box, to which a dump box with side spray bars was added. Effluent was directed into a settling pond set up with 2 baffles. The flow from Glacier Creek also flowed through this pond, after passing through 2 other small ponds immediately upstream from it. Work on the property was continued on a reduced scale in 1984 by Kluane Enterprises Ltd. There were 4,200 cu.yd. of material stripped, and 4,000 cu.yd. of material sluiced.

Gold from this property is reported to be fine grained.

Queenstake Resources Ltd. (9)
Big Gold Creek 116 C 2
1984 64°01'N 140°43'W

This property is located on Big Gold Creek, just upstream from its confluence with Sixty Mile River. Deposits present lie on a low bench along the left limit of Big Gold Creek, at the edge of the Sixty Mile River valley.

Work at this site was begun in 1984. Members of a crew active at the Queenstake Resources Ltd. properties on Little Gold Creek drilled and bulk sampled the deposits at this site. The area was stripped, and the company's sluicing operation was moved from Little Gold Creek to this property in mid August. Between August 29 and September 29, 45,000 cu.yd. of material were mined and sluiced. Water for sluicing was pumped from a reservoir along Big Gold Creek. Effluent was settled in series of 3 large ponds in the Sixty Mile River valley, before flowing into Sixty Mile River.

Glacier Creek Gold Co. Ltd. (10)
Glacier Creek 116 C 2
1983, 1984 64°02'N 140°49'W

This property is located on Glacier Creek, about 2 miles upstream from its confluence with Big Gold Creek. Deposits present on a right limit bench, 10 feet above the present creek level, consist of black muck overlying 4 to 5 feet of gravel. Work at this site was done using hand mining methods between 1894 and 1945, and bulldozers between 1949 and 1960.

Mr. J. Lynch mined on the bench along the right limit of the creek at this property during 1983 and 1984. He used a Cat D7E bulldozer to rip gravel in the cut, and push it to a stockpile. The gravel was then washed with water from a monitor, before being transported to the sluicing plant by a Cat 966 loader. Water was supplied to the monitor at a rate of 2,500 igpm by a Bingham pump powered by a GM engine. The material was then processed in a sluicing plant made up of a dump box 8 feet wide and 20 feet long, and a single sluice run 33 inches wide and 30 feet long. Tailings were removed by the loader. Water for sluicing was gravity fed from a large reservoir by way of a ditch, and was let into the upper end of the dump box by two pipes. Effluent was settled in one pond 1,000 feet downstream from the sluicing plant, and a second pond farther downstream, before being returned to the creek.

Figure 3: View looking downstream along Glacier Creek past Glacier Creek Gold Co. Ltd. property to Sixty Mile River. Little Gold Creek is at left. (R.W. '83)

Gold recovered from this property is reported to be fine grained.

G. Hagen (11)
Glacier Creek 116 C 2
1983, 1984 64°03'N 140°54'W

This property is located along the upper reaches of Glacier Creek, approximately 5 miles upstream from its confluence with Big Gold Creek. The valley bottom is 30 to 50 feet wide, and has a moderate gradient. Deposits present are 4 to 12 feet deep, and consist of a thin layer of organic material overlying gravel with some silt layers.

Work at this site was carried out by Mr. Hagen and one helper in 1983 and 1984. During 1983, test work was done using a backhoe with 1/4 cu.yd. bucket and small sluice box. During 1984, 1 Cat 931 Traxcavator with 1 cu.yd. bucket was used along with 1 International tracked loader with 1 cu.yd. bucket to mine 5,000 cu.yd. of material from a cut along the left limit of the creek, feed the sluicing plant, and remove tailings. The sluicing plant consisted of a hopper, a vibrating screening unit which screened out material larger than 1 1/2 inches in diameter, and a single sluice run. Water for sluicing was pumped from a small reservoir along Glacier Creek at a rate of 300 igpm by a 4 inch submersible pump. The creek was diverted around the cut, and held in place by a berm. Effluent was impounded in 2 settling ponds in series downstream from the sluicing plant, before being returned to the creek.

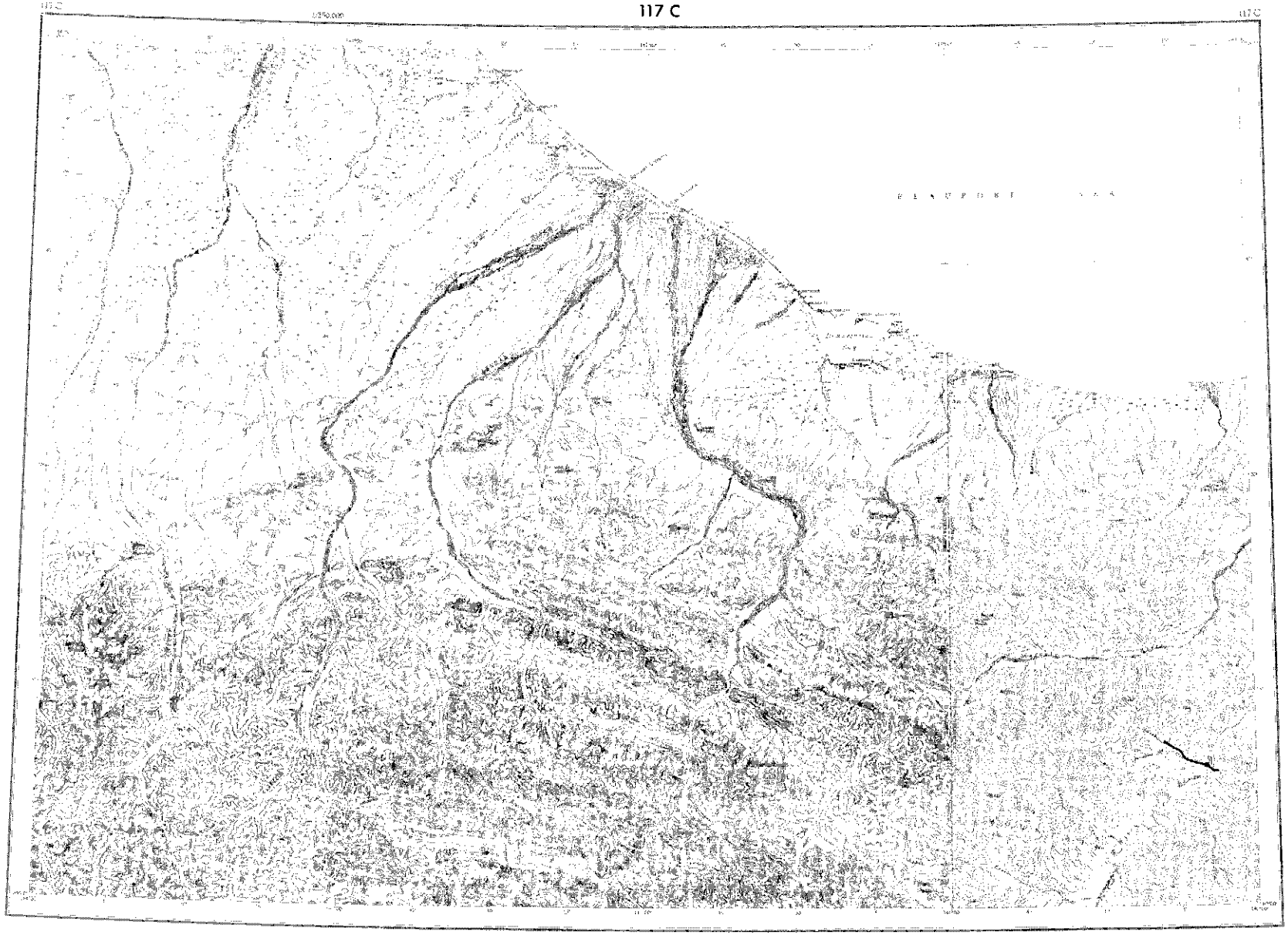
Sikanni Oilfield Construction Ltd. (12)
B. Claxton 116 C 7
Forty Mile River 64°21'N 140°47'W
1983, 1984

This property is located on a high bench along the left limit of the Forty Mile River, in an area enclosed by a large meander. It is just downstream from the mouth of Marten Creek. Deposits present

average 10 feet deep, and consist of gravel with some large rocks.

Work on this property was carried out in 1983 by Sikanni Oilfield Construction Ltd. Mining was done using bulldozers to push material from the pit to the sluicing plant, and a loader to remove tailings. Work was carried out during 1984 by Mr. B. Claxton, with the aid of 2 helpers. They mined using a Cat 941 Traxcavator to dig material from the face of the cut, to transport it, and to feed the sluicing plant. The sluicing plant consisted of a hopper over a dry grizzly, a vibrating screening unit, and a single sluice run. A moving plate in the hopper provided a steady feed to the grizzly and screening unit. The grizzly had 10 inch spacings, while the screening unit had 2 decks with 1 inch and 1/4 inch spacings. Material on the screen decks was washed with water from spray bars. Undersize fell into in the sluice run, which was lined with expanded metal over Astro turf. Water for sluicing was pumped from the Forty Mile River at a rate of 60 igpm by two Honda pumps. The pumps were used in stages, as the sluicing plant was located about 100 feet above the river. The limited supply of water made classification of the material being sluiced very important. Tailings were dumped over the edge of the bench.

Gold from this property is reported to be very fine grained.



Heavy lines indicate placer claims and leases in good standing as of March 1, 1985.
Dots indicate placer mining operations active during 1983 and/or 1984

Numbers beside the dots relate to the text.

MILES
5 0 5 10 15 20
5 0 5 10 15 20 25 30
KILOMETRES

DEMARCATION POINT

R. Parkes (1)
Sheep Creek 117 C 1
1983, 1984 69°10'N 140°09'W

This property is located along the lower reaches of Sheep Creek, approximately 1/2 mile upstream from its confluence with Firth River. Deposits present along the left limit of the creek are approximately 8 feet thick, and consist of 2 feet of muck overlying 6 feet of gravel. The deposits along the creek are not frozen, although bench deposits are frozen.

R. Parkes worked at this property with the help of family members during 1983 and 1984. They worked along the left limit of the creek, mining an area 250 feet wide progressively upstream. In 1984, operations were moved upstream approximately 2,000 feet to the upstream end of a canyon. A deep trench was dug in frozen bench gravel along the right limit of the creek, but bedrock was not reached. A Cat D8F-17A bulldozer and a Cat 950 loader with hoe attachment were used for all work. Material mined was washed in a sluicing plant which consisted of a dump box 8 feet wide and 20 feet long, and single sluice run 39 inches wide and 44 feet long. Water for sluicing was gravity fed. Effluent was settled in Sheep Creek before entering the Firth River.

This property lies within the boundaries of the new "Northern Yukon National Park". Its future as a mining property is uncertain.

OUNCES, PENNYWEIGHTS & GRAINS

About 350 B.C. the King of Rome decided to mint his first coin patterned from the Greek coins which had been in circulation for 150 years. Since the medium of exchange until that time had been cows, donkeys etc., he decreed that the coin would be equivalent to the value of one donkey. This coin was therefore called an "ass". It was made of bronze and weighed about one pound: it was only marginally handier than the original donkey. This unit of currency was much too large for most purchases so the coin was later designed so it could be broken into various segments: halves, quarters, etc. The name of the coin was changed to "libra" (pound) and its twelfth part known as an "uncia" (ounce today).

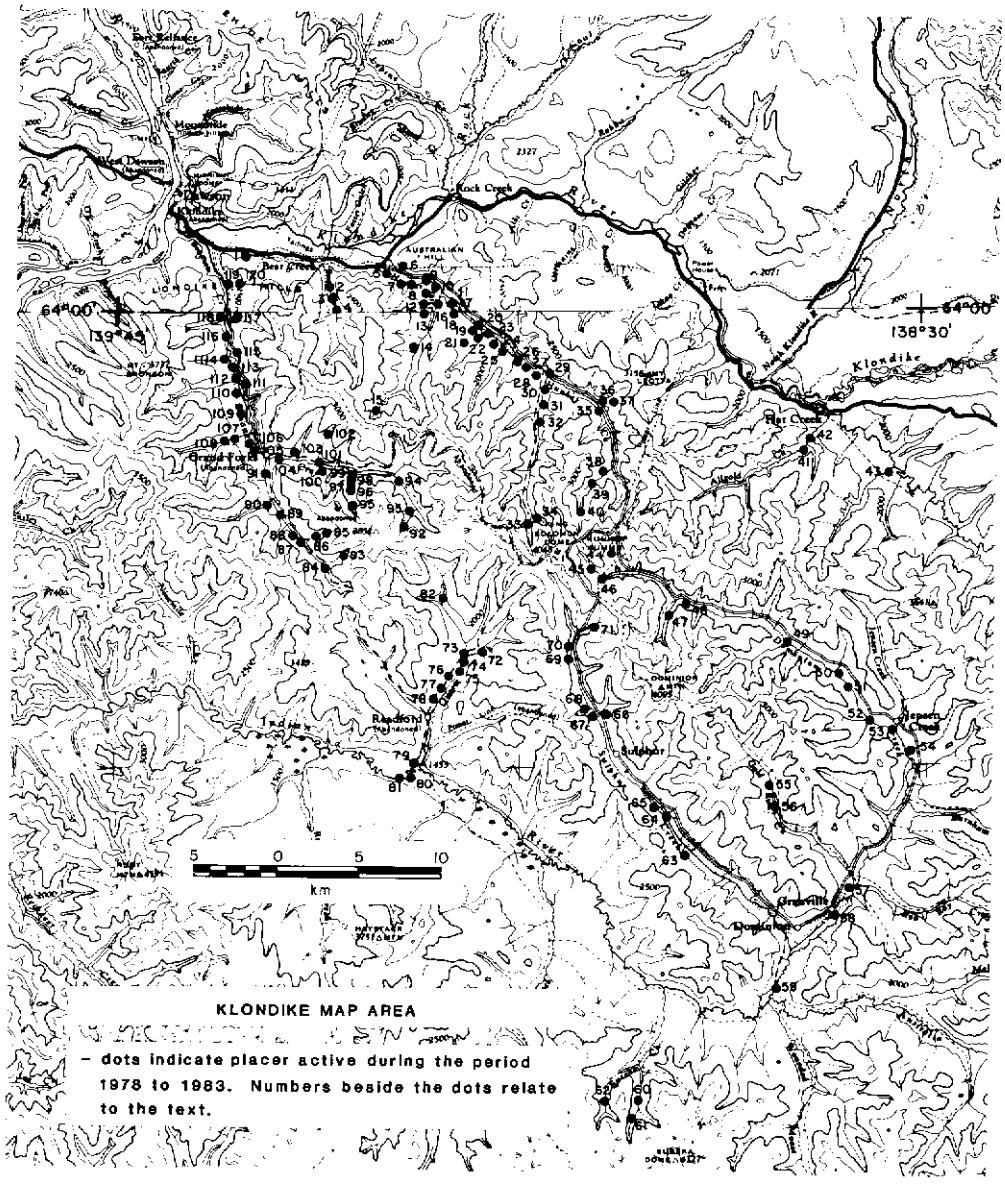
It was not until about 800 A.D. that Charlemange instigated an attempt at standardization of the different weights of coins throughout Europe. He instructed his mint at Troyes, France to cut 240 pennies from one pound (libra) of silver, i.e. - twenty per "uncia". This measure, the "pennyweight", became a standard for weighing things besides coins.

Another small weight had been in existence since antiquity: the "grain." This was defined as "the weight of a grain of wheat". Obviously climate, soil, etc. caused wide variations in this unit of measurement. Charlemagne defined the grain as 1/24th of a pennyweight.

This system "Troy weight" (from Troyes) is still used 1200 years later.

G.W. Gilbert

PLACER MINING OPERATIONS IN THE KLONDIKE MAP AREA,
PARTS OF NTS 115 O/N AND NTS 116 B/C




KLONDIKE MAP AREA

– dots indicate placer active during the period 1978 to 1983. Numbers beside the dots relate to the text.

R. Engdahl (1)
T. Semple 116 B 3
Jackson Gulch (Klondike)
1984 64°02'N 139°16'W

This property is located on a left limit bench of Jackson Gulch. The deposits consist of White Channel gravels almost 200 feet above the level of the Gulch, and approximately 800 feet from the creek baseline. The gravel deposits at this point thicken rapidly away from the edge of the bank. Mining is not planned to continue after the depth of the gravels reaches 40 feet.

Two people worked at this location in 1984 using a D7E bulldozer to strip and loosen material in the cut, and a Case 350 bulldozer to push the gravel into the sluice. The sluice consisted of a dump box 4 feet wide and 10 feet long, and a single sluice run 2 feet wide and 54 feet long. The first eight feet were lined with punch plate, while the rest of the run was lined with Hungarian riffles. The slope of the box was 2 1/2 inches per foot. A 10 by 12 pump run with a Massey Ferguson 6 cylinder diesel engine provided 1000 igpm of water to a monitor mounted in the sluice. About 25 to 30 cubic yards of material were sluiced per hour. Tailings were deposited as a fan down the hillside into Jackson Gulch, where a dam created a settling and pumping pond. Total recirculation of water took place.

J. Malfair (2)
Bear Creek 116 B 3
1983 Klondike
64°01'N 139°15'W

This property is situated approximately 1 mile upstream from the mouth of Bear Creek.

During 1983, Mr. Malfair began work along the left limit of Bear creek in a cut 50 feet wide and 150 feet long, using an early model D7 bulldozer. A sluice box with dump box 5 feet wide and 10 feet long, and a single run 29 inches wide and 16 feet long lined by expanded metal and punch plate were used for sluicing. Water for sluicing was pumped from Bear Creek using a gas powered 4 by 6 pump. No work was done on the property in 1984.

Sigma Properties Ltd. (3)
Bear Creek 116 B 3
1983 (Klondike)
64°00'N 139°14'W

Deposits at this property lie in a narrow, steep-sided valley, just upstream from the upper limit of old dredge workings, and about 2 miles upstream from the mouth of Bear Creek. Depth to bedrock in the centre of the valley was 18 to 22 feet. Those deposits were mined between 1979 and 1981 by other operators. Remaining deposits consisted of coarse gravel with muck layers interspersed along the right limit, and of gravel overlain by a thick layer of black muck along the left limit.

During 1983, Sigma mined narrow cuts along both margins of the earlier workings. A cut 40 feet wide and 1000 feet long was taken along the right limit, and a cut 40 feet wide and 500 feet long was taken along the left limit. Equipment used included one Cat 637 scraper, used to strip overburden and stockpile gravel for sluicing, one Cat D9H bulldozer, used to push feed to the scraper, and one Cat 988 loader, used to feed the sluice and remove tailings. The lower 4 feet of the gravel section, and the upper 2 feet of bedrock were sluiced at a rate of 150 cu.yd. per hour, using a Derocker to remove material coarser than 2 inches, and a standard sluice. Water was recirculated at a rate of 2800 igpm with a 10 by 12 pump driven by a Cat 3406 diesel engine.

L. Steigenberger (4)
Bear Creek 116 B 3
1983 (Klondike)
64°00'N 139°14'W

This property is situated on Bear Creek, immediately downstream from the mouth of Discovery Pup.

L. Steigenberger worked at this location in 1983, sluicing a stockpile of gravel mined from cuts along the margin of the Bear Creek valley by previous workers. Approximately 3000 cu.yd. of gravel were pushed to a Derocker, which separated material less than 2 inches in diameter for sluicing. A pump driven by a 3208 Cat diesel pumped sluice water from a large holding pond. Effluent was settled in tailings downstream from the sluicing operation.

Colin Mayes (5)
Hunker Creek 116 B 3
1983, 1984 (Klondike)
64°01'N 139°10'W

This property is situated along the left limit of Hunker Creek, 2 to 3 claim lengths downstream from the mouth of left limit tributary Henry Gulch. Deposits being mined lie along the margin of tailings from early dredging operations, and consist of black muck overlying 8 feet of gravel. Up to 40 feet of black muck were present in the area mined in 1983, and as much as 100 feet of black muck were present in the area mined in 1984. Intermittent silt layers and ice lenses were present in the black muck. The gravel section thickened, and the level of bedrock sloped down as mining advanced into the hillside away from Hunker Creek. Shafts and drifts left by early underground miners were exposed by the 1983 and 1984 work.

The mining operation is a family one. C. Mayes and his brother provided most of the labour, but were assisted by other family members when necessary. The operation averaged 3 workers on a single shift basis. Mining equipment used in 1983 consisted of one Cat D8K bulldozer, used for stripping and for pushing tailings, and one Cat 980 loader used to clean the drain and to remove gravel for sluicing from poorly drained sections of the cut. Equipment used in 1984 was the same as in 1983, with the addition of a Cat D9 bulldozer used for stripping. Hydraulic methods were also used for stripping. During

the early parts of both the 1983 and 1984 seasons, bulldozers ripped the frozen black muck and fed it to streams of water from two monitors equipped with 3 1/2 inch tips. Through the remainder of the 1983 season, stripping to remove the black muck was done hydraulically without bulldozer assist. In 1984, 4 months and 2,200 hours of D9 work were devoted to stripping the cut. While this work was going on, two 10 hour shifts were worked. The stripping water was settled in the Klondike valley in areas of old dredge tailings during parts of each season. After the black muck was removed, the gravel section was sluiced along with 3 to 6 feet of bedrock. Cuts mined each year were 700 to 800 feet long, and advanced 100 feet into the hillside. At the end of 1984, the bedrock surface in the pit was 6 feet below the level of the drain from the pit, and a 4 inch Lombardi 120 pump with 2 cylinder diesel along with a 6 inch Gorman Rupp pump ran 24 hours daily in an attempt to remove seepage water. The material sluiced was washed in a single run sluice with dump box. The dump box was 10 by 24 feet, and readily accommodated a D8K blade load of pay material from the side. A spray manifold the full length of the dump equipped with seventeen 2 inch diameter jets efficiently washed the material. The dump box was lined by slick plate throughout, except for a 4 foot square section of punch plate with 3/4 inch holes positioned in the throat area. In order to keep this area from filling and packing, a small spray bar with nine 1/2 inch nozzles was used beneath the plate, at its upper end. The jets apparently washed lighter material down the sluice run, leaving behind primarily gold and other heavy minerals. The largest percentages of gold recovered at clean-up times were removed from this area of the dump box. The sluice run was 42 inches wide and 42 feet long, and was outfitted with rail-iron riffles and coco matting throughout. Holes in the tops of the riffles were said to create more undercurrent action, and to prevent packing of the riffles. The upper 6 feet of the run were overlain by punch plate with 3/4 inch holes. The dump box was set at a gradient of 2 inches to the foot, while the sluice run was set at 2 3/4 inches to the foot. A Peerless pump powered by a V8 Jimmy diesel was used to supply 2,500 to 3,000 igpm of water for sluicing from a large pond at the upstream end of the operation.

Gold recovered from this site is reported to be of two distinct types. In earlier seasons, the gold recovered was fairly bright, and had a fineness of 820. In 1983, however, dull gold with a fineness of 620 began to be recovered along with the bright gold, bringing the average fineness of gold recovered down to 780. The dull gold is thought to have come from Henry Gulch.

J. Reid (6)
Hunker Creek 116 B 3
1983 (Klondike)
64°02'N 139°09'W

Deposits worked at this property were on a low bench along the right limit of Hunker Creek, opposite the mouth of Henry Gulch. They were quite variable in character, and changed abruptly in a manner suggestive of cross-cutting channels. The deposits present included sandy gravel, sand, and laminated clay. The bedrock surface was also very irregular. Several rooms up to 45 by 100 feet left by early underground miners were uncovered during the 1983 work.

A single shift was worked by two persons at this property in 1983. They mined a cut 100 feet wide by 800 feet along the length of the valley. The bedrock surface was very irregular, and the depth of the cut at the upstream end was 50 feet, while at the downstream end it was 16 feet. Mining was done using a 16 yard capacity pull-scraper pulled by a D8H bulldozer to strip ground, and a John Deere 644 loader equipped with a 3 yard bucket to feed the washing plant and remove tailings. The washing plant had a capacity of 60 cu.yd. per hour, and used 400 igpm of water supplied by a 4 inch pump. It consisted of a vibrating screening deck and a single sluice run equipped with pulsating riffles.

Three distinct types of gold were recovered. Dendritic gold was evidently recovered from the tops of bedrock reefs. Dull gold similar to that recovered from Henry Gulch, and gold stained with a black tarnish were also recovered.

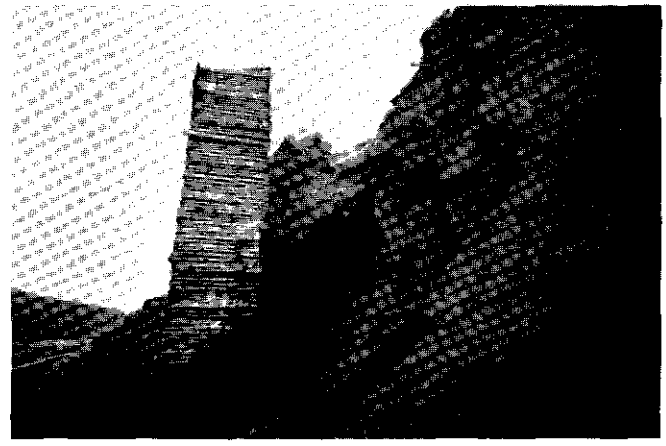


Figure 1: Timbered shaft left at C. Mayes' property by early underground miners, and exposed by hydraulic stripping. (L.O. '83)

J. Alton (7)
Henry Gulch 116 B 3
1983, 1984 (Klondike)
64°01'N 139°09'W

This property is situated at the mouth of Henry Gulch, a left limit tributary of Hunker Creek. There is evidence of much underground work by early miners. Deposits present include 11 to 22 feet of alternating gravel and black muck overlying 5 feet of gravel.

Mr. Alton and one helper did exploration work by hand at this location before starting a mining program. During the winter of 1982-1983, they dug 3 shafts. Depth to bedrock was 12, 22, and 37 feet, with the deepest shaft in frozen ground. Timbering

proved unnecessary in all the shafts. A single drift, measuring 37 by 6 by 6 feet, took the two men 6 weeks to complete. The ground was thawed, and required timbering. Open cut mining was begun in September, 1983, when Mr. Alton worked with a partner in the cut, and one helper in camp. They hydraulically stripped black muck from a small cut on the left limit at the mouth of Henry Gulch. Effluent was settled downstream in a 100 by 200 foot pond. Heavy equipment present included two Cat D7E bulldozers, one early model loader, and one 12 yard pull scraper, for future use. Work continued in 1984, when 4 people were present at the site. They used two early model 12 yard pull scrapers to strip approximately 50,000 cu.yd. of material. During stripping, one D7 was used to pull the scraper constantly, and the second D7 assisted by pushing the scraper while it was being loaded. Two cuts were mined. One, 125 wide, 300 feet long, and 18 feet deep was taken along the left limit of Henry Gulch. The other, 100 feet wide, 150 feet long, and 30 feet deep was taken along the left limit of Hunker Creek at the mouth of Henry Gulch. The 5 foot section of gravel and two feet of bedrock were sluiced at a rate of 60 to 80 cu.yd. per hour. A total of 24,000 cu.yd. of material was sluiced in the sluicing plant, which consisted of a 10 by 22 foot dump box, and a 32 foot long sluice run 34 inches wide. The bottom 8 feet of the dump box and the upper 12 feet of the sluice run had punch plate with 3/4 inch holes. Riffles and expanded metal lined the bottom of the sluice run. The dump box was set at a gradient of 2 inches to the foot, and the sluice run was set at 2 1/4 inches to the foot. When sluicing, one D7 fed gravel to the box, while the other removed tailings. Sluice water was taken from a small reservoir at the mouth of Henry Gulch fed by water from Henry Gulch and Hunker Creek. An 8 by 10 Fairbanks Morse turbine pump coupled with a 371 Jimmy diesel engine delivered water to the dump box, while a 5 by 6 Fairbanks Morse pump coupled with a Chevrolet 327 gasoline engine delivered water to a monitor at the throat of the dump box.

Gold from this property is reported to have a fineness of 646. Some is dendritic in shape.

J. Hanulik (8)
Hunker Creek 116 B 3
1983, 1984 (Klondike)
64°01'N 139°08'W

This operation is situated on a low bedrock terrace on the left limit of Hunker Creek valley, just downstream from the mouth of Dago Gulch. Deposits present consist of 7 feet of hydraulic tailings from Dago Hill overlying 38 feet of black muck with occasional sandy lenses and slide rock, and 3 to 4 feet of gravel. Shafts and drifts left by old underground miners were found in the current workings.

Mr. Hanulik worked alone in 1983 and 1984 using one Cat D9 bulldozer to rip frozen material and strip the cut, one model CT scraper with 12 to 14 cu.yd. capacity pulled by a Cat D7E bulldozer to strip the cut, and the D7E bulldozer to feed the sluice box and ramp tailings. In 1983, a single cut 150 feet long and 100 feet wide was mined. In 1984, a single cut of irregular shape, averaging 200 feet long and 90 feet wide was mined immediately upstream of the 1983 cut. The gravel, and up to 2 feet of bedrock were sluiced in a sluice plant with a dump box of 12 by 30 feet, and one sluice run 30 feet long and 42 inches wide. The bottom 10 feet of the dump box were lined with punch plate, under which 50 to 60 % of the gold recovered was found. The sluice run had scarifier plate with 3/4 by 1 inch holes cut in it to screen material to minus 3/4 inch. Two inch riffles over coco matting were under the scarifier plate. Between 50 and 80 cu.yd. per hour were processed using 3,000 to 3,500 igpm of water. Water for sluicing was pumped up from Miben's large recirculation pond on the far right limit of Hunker Creek, and sluicewater was settled in a pond downstream of the sluice plant. A 12 by 12 pump driven by a 671 Jimmy diesel engine delivered the water by way of a 12 and 10 inch pipeline.

Gold recovered from the property was reported to be fine-grained, with a fineness of 750 to 790.

M. Church (9)
Preido Mines Ltd. 116 B 3
Hunker Creek (Klondike)
1983, 1984 64°01'N 139°07'W

This property is located at the downstream end of Dago Hill, a high left limit bench of Hunker Creek just upstream from Dago Gulch. Deposits present consist of typical White Channel gravel, which comprises most of the section, overlain by brown gravel. The average depth of the deposits is approximately 68 feet, with some sections up to 100 feet thick near the centre of the hill. Previous mining on the property has been done by underground and hydraulic methods.

Mining at this location was done in 1983 and 1984 using two Cat 637D scrapers with a capacity of 31 cu.yd. for stripping and for moving material to be sluiced to the area of the sluicing plant, one Cat D9H Cat bulldozer to push the gravel for sluicing from the scraper dump-off area to the sluicing plant, one Cat 235 hoe for feeding the sluicing plant, and one Cat 980 loader for removing tailings. During mining, a large enough area was worked at any time to allow natural thawing of the gravel to take place as fast as it was removed by the scrapers. During sluicing, the material was fed into a hopper with top surface dimensions of 12 by 16 feet. The hopper was equipped with a hydraulic ram to tilt the hopper deck for the occasional cleaning off of oversize, which was 1 1/2 feet in diameter or larger. After passing through the bottom of the hopper, the material fell onto a short section of "live feeding" belt which uniformly fed a conveyor belt 36 inches wide and approximately 32 feet long. From the conveyor belt, the material fell onto the top deck of a wet vibrating screening unit of the type used in the aggregate industry, and, while vibrating, received its first wash under high pressure manifold nozzles. All material coarser than 1/2 inch in diameter was screened off on this deck. Finer grained material fell through the rubber surfaced screen to the second vibrating deck, where material coarser than 1/4 inch in diameter was screened off. All material

between 1/4 and 1/2 inch in diameter was fed to a small single run sluice box designed to catch nuggets in that size range. Material finer than 1/4 inch in diameter was divided between 6 sluice runs 48 inches wide and 20 feet long. The sluice runs were suspended from cables, and were believed to have an oscillating action when driven by an electric eccentric movement. The six sluice runs were lined by expanded metal and matting. They emptied into one last sluice run 36 inches wide and 28 feet long lined by inch riffles and matting. Electric motors providing the "live action" were powered by a KATO 62.5 KVA generator driven by a diesel 4 cylinder Cat engine. Tailings were removed from the sluicing plant by either the scraper or the bulldozer. Tailings were directed over the edge of Dago Hill, and effluent from sluicing settled downstream in Miben's large recirculation pond. Water for sluicing was pumped from a small pond on Hunker Creek, just downstream from Miben's pond, at a rate of 3,500 igpm. Eight people worked at the operation during 1983. Eight people also worked at the operation during 1984, when a total of 1,400 hours of sluicing was done between May 24 and Sept. 30. The 1984 operation was similar to that of 1983.

Figure 2: View to southeast along Dago Hill, showing the operation of Preido Mines Ltd. (L.O. '84)

Mainstreet Mining (10)
Hunker Creek 116 B 3
1984 (Klondike)
64°01'N 139°06'W

This property is located at the base of the northeast side of Dago Hill, along the left limit of Hunker Creek. Deposits consist of tailings from sluicing operations on Dago Hill.

Mainstreet Mining worked underground during the winters of 1982-1983 and 1983-1984 on Dago Hill. The material mined was stockpiled during the winter, and sluiced during the summers. A description of the winter mining operations is given in the paper by C. MacDonald in the first part of this volume. During the summer of 1984, the operators determined that some values were lost in their sluicing operations. They moved to the foot of their tailings on the large tailings pile at the base of Dago hill, and pushed additional tailings out of the narrow drain using a D7 bulldozer. The tailings were then fed to a washing plant by a Cat 920 loader. The washing plant consisted of a screening plant and centrifugal concentrators with a capacity of 25 cu.yd. per hour. Water for sluicing was recirculated from Miben's recirculation pond, after tailings settled out farther down the tailings fan on which the resluicing operation was situated.

Miben Mining Co. (11)
Hunker Creek 116 B 3
1983, 1984 (Klondike)
64°01'N 139°07'W

This operation is located on the upstream end of Dago Hill, immediately downstream from left limit tributary Last Chance Creek. Deposits on the property are up to 100 feet thick, and average 68 feet thick. The deposits consist of matrix supported White Channel gravel with cobbles up to 6 inches in diameter. The gravel is believed to have been derived mainly from Hunker Creek, but with some input from Last Chance Creek. Underground mining, and some small scale hydraulic mining was done at this location by early miners.

Mining was done by 5 people in 1983 using a Cat D9G bulldozer for stripping barren gravel, and for pushing gravel for sluicing to a Cat D8K bulldozer, which was used to feed the washing plant. A Cat 992 with a 12 to 15 cu.yd. capacity bucket was used to distribute tailings after they left the conveyor system used to remove them from the area of the washing plant. Other equipment present, but which received less use, included a Cat D6 bulldozer and a Cat 824B rubber tired bulldozer. Mining in 1984 was done in much the same manner as in 1983, except that the stripping was contracted out to Preido Hill Mines Ltd., which used two Cat 637D scrapers with 31 cu.yd. capacity, instead of the D9G, for stripping. The single cut mined in 1984 was 250 by 300 feet. An average of 26 feet of gravel and silt were stripped, and 14 feet of gravel were sluiced. The sluicing was done in a washing plant made mainly from parts recovered from old dredges. Ahead of a trommel a large scale hopper capable of taking a full blade load of the D8K was positioned. A monitor with a 4 inch opening was mounted on the hopper. It provided the first washing of the material prior to its entering the trommel, thus allowing more yardage to be processed, and controlled the rate of feed to the trommel by holding material back in the hopper, thus allowing better recovery of gold in the sluice runs. The trommel was set at a grade of 1 1/4 inches to the foot, and turned at a rate of 9 r.p.m. The electric motor driving the trommel was run by a Murphy 250 KW generator. High pressure spray jets inside the trommel washed the material thoroughly, and grains smaller than 1 inch in diameter were carried with water through the punch plate holes into the series of sluice runs below. Each run was 36 inches wide, with riffles over expanded metal and matting. Oversize from the trommel fell onto a conveyor belt 30 inches wide and 500 feet long, and was carried to a tailings disposal area near the margin of the Last Chance Creek valley.

Sluice water was fed to the sluice runs from the trommel spray bar. It was pumped from a large pond located slightly upstream of the mouth of Dago Gulch on Hunker Creek. The pipeline ran up Dago Gulch to the top of the hill, and then followed the rim of Hunker Creek valley to the washing plant. Pipe size of the pipeline, which was more than a mile long, was 22 inches at the pump, necked down to 18 inches midway along the line, and necked down again to 12 inches just short of the washing plant. Two pumps in line were used. The pump in the valley was powered by a Cummings diesel, rated at 580 hp at 2,100 rpm. A booster pump powered by a 6 cylinder Murphy diesel engine was used at the top of the hill. The monitor in the hopper received its water from an electric powered Flygt submersible pump in a sump below the trommel. It recirculated sluice effluent at a rate of 600 igpm. Most sluice effluent entered a bedrock drain, and flowed back to the Hunker Creek valley. As this water entered the valley above Miben's pump pond, it was thereby totally recirculated. In 1984, a 36 inch diameter sand screw run by a 30 hp Lincoln electric motor was added to the sluicing plant. Tailings from one of the sluice runs were directed to it, where they were dewatered and fed to the tailings conveyor belt. Water from the unit emptied into the sump below the trommel for recirculation to the monitor.

H. Hanulik (12)
Last Chance Creek 116 B 3
1983, 1984 (Klondike)
64°00'N 139°07'W

Deposits at this property, which is situated on Dago Hill along the left limit of Last Chance Creek, consist of 30 to 50 feet of White Channel gravel with boulders up to 15 inches in diameter. Clasts in the gravel near bedrock are decomposed, as is the underlying bedrock.

Mr. Hanulik worked at this site during 1983 and 1984. Some stripping was done with a rented Cat D9 bulldozer during 1983. During 1983 and 1984, a Cat 955 loader was used to mine,and a 30foot long single run sluice box modified to 12 to 14 inches wide was used to wash the gravel. Water for sluicing was pumped by a Lister 4 inch pump at a rate of 1,500 igpm from a holding pond on the bench. The pond was fed by runoff during spring thaw and times of heavy rainfall, and occasionally by water from the Miben operation pipeline when pumps feeding that pipeline were started. All water was recirculated. Approximately 2,500 cu.yd. of material was sluiced each year.

I. Bremner (13)
Last Chance Creek 115 O 14
1983, 1984 (Klondike)
64°00'N 139°07'W

This operation is located on the downstream side of Discovery Hill, on the left limit of Last Chance Creek approximately 1 mile from its mouth. Deposits are up to 35 feet thick and consist of White Channel gravel with boulders up to 12 inches in diameter, overlain by a thin layer of yellow-brown gravel. The property was first worked by hand miners at the turn of the century, and was later worked by hydraulic miners including Canadian Klondike Mining Co.

Mr. Bremner worked alone, with some help from one person employed to carry out ditch repairs. His operation was the same in 1983 as in 1984, except for differences caused by shortages of rain water in 1984. Equipment used consisted of a small tracked loader used to clean bedrock and stack it along with pay gravels near the mouth of the sluice dump box. Otherwise, the operation was entirely hydraulic. Spring run-off water, which entered a ditch extending approximately 5 miles upstream to the forks of Last Chance Creek, was used by a monitor mounted in the pit to hydraulic the face of the cut. A pipeline carried the water from a holding pond to the monitor with a head of approximately 35 to 40 feet. After spring water run-off ceased, rain water was collected and used for sluicing when available. Material was washed through a long wooden sluice box, with effluent entering the Last Chance Creek valley at 8 Below Discovery Pup. During 1983, some settling occurred as the effluent passed over the large tailings fan left by previous mining operations. In 1984, tailings in 8 Below Discovery Pup were diked to create a settling pond.

R. Berglund (14)
Last Chance Creek 115 O 14
1983 (Klondike)
63°59'N 139°08'W

This property is located on Treasure Hill, a high level bench along the left limit of Last Chance Creek. The workings are at the upstream end of the hill, immediately downstream of 15 Above Discovery Pup, and about 2 3/4 miles upstream from the mouth of Last Chance Creek. Deposits present consist of brown gravel with large quartz boulders prevalent on the bedrock surface. Bedrock is carbonaceous schist. Previous work includes early hand mining, and hydraulic mining by Canadian Klondike Mining Co. The cut taken by hydraulic miners on Treasure Hill differs from the cuts taken on all the other Last Chance Creek hills, in that it was not taken from the rim back into the face, but instead was started from each end and mined as a slot along the middle of the hill, parallel to the creek.

Two people worked at this location during the early part of the 1983 season in an effort to make use of spring run-off water as much as possible. An early model Cat D6 bulldozer was used along with a single run sluice box 24 inches wide and 30 feet long. A four foot long section of punch plate at the throat of the dump box was underlain by 2 inch riffles. Two inch riffles were also used directly over coco matting in the sluice run. The coco matting was of a new variety, with a small percentage of synthetic fibre woven into it to give better wear. Both the dump box and the main run were set at the shallow gradient of 1 1/4 inches to the foot. Water for sluicing was taken from a ditch bringing water from 15 Above Discovery Pup. A small holding pond was used to store water, giving a maximum sluicing time of two hours when the ditch was full. At the end of the sluice run, a section of wooden flume

lined with tin was installed to carry tailings over a conveyance ditch providing a downstream operation with water. Tailings entered the 15 Above Discovery Pup valley under gravity off the end of the flume. Effluent was settled in a small retaining pond in old hydraulic tailings.

Gold recovered from this property was predominantly fine-grained. Much of it was reported to be dendritic.

W. McIntyre (15)
Epoch Holdings 115 O 14
Last Chance Creek (Klondike)
1983, 1984 63°51'N 139°10'W

This property is located along the upper reaches of the right fork of Last Chance Creek. Access to the property is by way of a road leaving the Bear Creek Road just upstream from Discovery Pup. The road was constructed during the fall of 1982 to provide access to the property. Deposits at the site consist of 10 feet of sand, slide rock, and muck overlying 8 feet of red-stained gravel. Quartz boulders up to 2 feet in diameter occur in the gravel. Bedrock is blocky weathering schist and black carbonaceous schist. Many old shafts with sluice piles adjacent are present along the left limit of the valley in the part of the Last Chance Creek valley running downstream from the property.

No sluicing was done during 1983, but an area approximately 100 feet wide and 200 feet long was stripped along the left limit of the creek by W. McIntyre in preparation for mining in 1984. Epoch Holdings worked the property in 1984. Two to three people mined on a single shift using one Cat D8H bulldozer to strip ground, and one Cat 966A loader to feed the sluice plant and remove tailings. One cut, 20 feet wide and 30 feet long, was mined at the mouth of a small right limit tributary. Stripping of the lowermost 400 feet of the tributary was also done. The sluice plant consisted of a dump box, and single sluice run 24 inches wide and 24 feet long. The sluice run was lined by a variety of materials. The uppermost 3 feet were lined with punch plate with 3/8 inch holes, over expanded metal and coco matting. At three feet, there was an 18 inch drop. Between 3 and 6 feet, the run was lined with 1/2 inch punch plate over expanded metal and matting, and between 6 and 16 feet it was lined with 2 1/2 inch angle iron over matting. Between 16 and 22 feet, it was lined with 1/2 and 5/8 inch punch plate over expanded metal and matting, and the last two feet of the box were lined with 2 inch angle iron riffles over matting. The sluice plant was fed at a rate of 30 cu.yd. per hour, using 1,600 to 2,000 igpm of water. Water for sluicing was impounded in a horseshoe shaped reservoir immediately upstream of the operation. An 8 by 10 Pacific pump powered by a 6 cylinder Buddah diesel engine delivered water to the dump box by way of a 6 inch pipeline.

Gold recovered from this property was reported to be very bright. Some was apparently crystalline in nature.

G.B.L. Resources Ltd. (16)
Last Chance Creek 116 B 3
1984 (Klondike)
64°00'N 139°06'W

This property is situated on Preido Hill, a high level bench along the right limit of Last Chance Creek, approximately 3,000 feet upstream from the mouth of the Creek. Deposits consisted of up to 70 feet of White Channel gravel which were almost all thawed. Bedrock, and some clasts near bedrock in the gravel were decomposed. The hill was worked by Preido Mines Ltd. during 1981 and the early part of the 1982 season. No work was done during 1983.

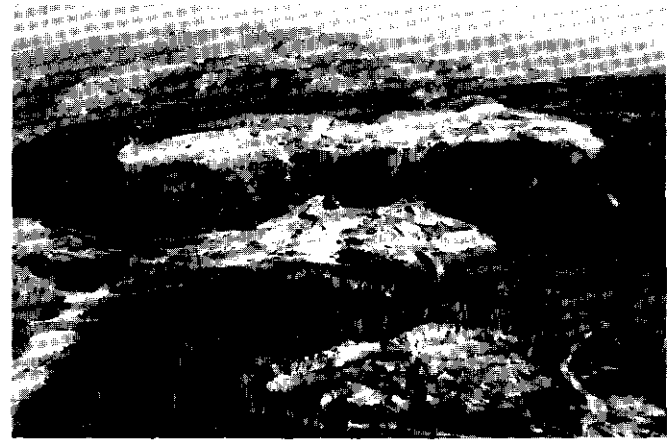


Figure 3: View to east across Last Chance Creek, showing Discovery Hill in the foreground, and Preido Hill in the middle distance. (L.O. '84)

Two people worked on each of two shifts at the property during 1984. One Cat D9H bulldozer was used to mine four cuts totalling approximately 110,000 bedrock square feet. Gravel depths ranged between 30 and 70 feet. The upper layers of gravel were stripped from each cut, and the lower 15 feet were sluiced. One Cat 980C loader was used to feed the sluice plant and to remove tailings. The sluice plant consisted of a Derocker screening unit modified to allow only material less than 1 inch in diameter to pass, and a single run sluice box. Late in the season, two four foot square sections of punch plate with 3/8 inch holes over expanded metal and matting were placed on the floor of the "Derocker" unit. The sluice run was 48 inches wide and 30 feet long, and was lined with 2 inch angle iron riffles spaced 4 1/2 inches apart over matting for the upper half of its length. The lower half was lined with a double layer of expanded metal over matting. Above the riffles, the total length of the box was lined with punch plate with holes varying from 3/8 to 3/4 inches. The grade of the sluice run was set at 1 1/2 inches to the foot. The sluice plant was operated at a rate of 80 cu.yd. per hour of material with 1,800 igpm of water. Water for sluicing was pumped from a reservoir approximately 200 feet wide and 400 feet long in the Last Chance Creek valley. A 6 by 8 Cornell pump powered by a 3406 Cat diesel engine was used to pump the water. During times of normal to high creek flows, water was not recirculated. When

recirculation was necessary, sluicing effluent was directed across the old hydraulic tailings fan at the edge of Preido Hill, and into an 80 foot diameter pond to settle. The pond was immediately above the reservoir, so that settled effluent from the pond entered the reservoir ready for recirculation.

E. Ragauth (17)
Tamarack Inc. 116 B 3
80 Pup (Klondike)
1983, 1984 64°00'N 139°05'W

This property is located on 80 Pup, a left limit tributary of Hunker Creek, approximately 1,500 feet upstream from its confluence with Hunker Creek. The valley is narrow, and has fairly steep slopes. Deposits present are frozen, and up to 60 feet deep. The total section, excluding 2 feet of gravel immediately overlying bedrock, is organic-rich black muck. The gravel is believed to have been reconcentrated from White Channel gravel on high level benches bordering the creek. Bedrock ranges from decomposed and clayey to competent. Evidence of substantial underground work by early miners is present at this site.

Four person including E. Ragauth worked on one shift at the property during 1983. They used a Terex 8240 bulldozer for stripping the upper layers of black muck, including roots and other debris which resisted stripping by water, a variety of monitors with 2, 3, and 4 inch nozzles for hydraulic stripping of most of the black muck, a Cat 977 Traxcavator for doing miscellaneous work, and a Cat 988 loader for feeding the sluice plant. The monitors were used one at a time depending on the load of muck and the distance from the area being stripped. Water was supplied to them by a 12 inch pipeline running 700 feet from a pump on the left limit of the Hunker valley, followed by a 10 inch pipeline running a further 600 feet. Several pumps were used during the season. They were powered by a Cummings 6 cylinder diesel engine. Effluent from the hydraulic stripping was settled in a number of settling ponds in dredge tailings upstream from the mouth of 80 Pup. The sluice plant consisted of a dump box lined by punch plate, and three sluice runs. Material was dumped into the dump box by the loader, where it was washed by water from a high pressure manifold. Material small enough in size fell through the punch plate in the dump box, and was divided between the side runs. All other material was sluiced in the centre run. All three runs were 36 inches wide, and 20 feet long, and were lined with riffles, expanded metal and matting. The gradient on the main run was 3 inches to the foot, while the gradient on the adjustable side runs was 1 inch to the foot. Concentrate from the sluice runs was further processed on a "Wilfley" vibrating table. Work at this property in 1984 was done by Tamarack Inc. The cut, taking the entire valley bottom, was 100 feet wide and 430 feet long, with an average depth of 35 feet. Equipment used to mine the cut included 1 Cat D9H bulldozer, used to strip the cut and feed the loader, 1 Cat 966 loader with 4 cu.yd. bucket used to feed the sluice plant and remove tailings, 1 Hough 100 loader with 5 1/2 cu.yd. bucket used at times instead of the 966 loader, and 1 Cat D7E bulldozer used to trim ridges in the cut, and to dress down the slopes. Hydraulic methods were used along with the D9H to strip the cut. The operators found that ripping with a double shank on the bulldozer was preferable to ripping with a single shank, as the resulting blocks of muck were smaller, and allowed quicker thawing. Thawed muck was carried by water to Hunker Creek, where it was settled. For monitoring, 3,500 igpm of water were used at a 115 foot head, while for sluicing, 2,000 igpm of water were used. An 8 by 10 Morris trash pump, powered by a Cat 3306 diesel engine, was used to provide water for both jobs. The sluice plant was the one used in 1983, and was operated at a rate of 70 cu.yd. per hour of material.

F. Peschke (18)
80 Pup 116 B 3
1983, 1984 (Klondike)
64°00'N 139°05'W

This property is located at the site of an old hydraulic cut along a high level right limit bench of 80 Pup directly opposite from the mouth of Dutton Pup. It is approximately 3,000 feet upstream from the confluence of 80 Pup with Hunker Creek. The deposits range from 0 feet deep at the edge of the bench to more than 50 feet thick at the back of the cut. They consist of typical White Channel gravel, and brown gravel. Bedrock is partly decomposed, and was reported to "ball up" during sluicing.

Two people worked at this site during 1983 using one Cat D6C bulldozer for all work. A rented Cat 988 loader was used briefly during the setting up stage of work. The sluice plant consisted of a dump box equipped with a wet grizzly and a "multi-directional" single run sluice. The dump box measured 39 inches wide and 24 feet long, and was lined by slick plate throughout, with no gold saving devices. A spray manifold with two 2 inch nozzles was mounted at the lower end of the dump box. Washed material more than 3 inches in diameter was screened off by a "pronged" grizzly. The sluice run was 24 inches wide, with a total length of 27 feet, and was lined by a combination of punch plate, 2 inch riffles, and expanded metal over coco matting. The sluice run changed direction 3 times. Water for sluicing was pumped from a pump station in the Hunker Creek valley, by way of a pipeline already in place as a result of earlier mining operations on nearby Savoya Hill. A small spur line was added to the existing line. The pipeline was 16 inches in diameter at Hunker Creek, and was necked down to 10 inches and then to 6 inches before reaching the sluice plant. The total length of the pipeline was almost one mile. Effluent from sluicing was directed into an old bedrock drain, and flowed into 80 Pup where it was settled in ponds constructed in old hydraulic tailings. Work continued at the site at the same scale during 1984. One change was the 6 inch pump powered by a 6 cylinder Detroit diesel engine which was installed at Hunker Creek.

F. Oblak (19)
D. Sandberg 115 O 14
Hunker Creek (Klondike)
1983, 1984 63°59'N 139°03'W

This property is located on Paradise Hill, a high level left limit bench of Hunker Creek just downstream from the mouth of Hester Creek. Deposits present consist of up to 15 feet of yellow-brown gravel overlying 15 feet of White Channel gravel with quartz boulders up to 18 inches in diameter. Much of the gravel is thawed due to stripping done previously by Yukon Consolidated Gold Corporation. Once outside of the area stripped by the company, the gravel is frozen.

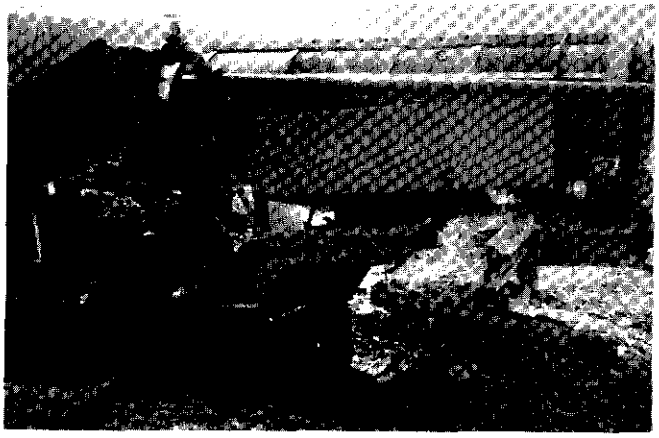


Figure 4: Sluicing plant used by D. Sandberg at the base of Paradise Hill. (L.O. '83)

F. Oblak did a limited amount of hand mining at this site during 1983, as he did in previous years. Mid-way through the 1983 season, however, a mechanized operation was active for several weeks. D. Sandberg was assisted by five others working a single shift. Because there was not enough room on the property for large scale sluicing facilities to be set up, gravel was transported approximately 1 mile into the Hunker Creek valley for sluicing. One Cat D8H bulldozer was used for stripping overburden and barren gravel. One Cat 966 loader was used to load two dump trucks having a reported carrying capacity of 16 loose cu.yd. each with material from the lowermost 12 feet of the section. A Cat road grader was used to keep the haul road to the sluice plant in good condition. Including loading, a return trip took 15 minutes. The transportation of the gravel was contracted to Klondike Transport. One Cat 988 loader was used for feeding the sluice plant, and removing tailings. Once at the sluice plant, the gravel was fed into a vibrating hopper with dry grizzly. From the hopper, it fell onto a reciprocating feeder which fed a conveyor belt at a rate of 20 plates per minute. From the conveyor, it was fed to a trommel 4 feet in diameter and 16 feet long, and passed through a section of scrubber before reaching punch plate with 3/8 inch holes. Material less than 3/8 inches in diameter was then sluiced in sluice runs set at a low gradient. Material between 3/8 and 3/4 inches in diameter passed through a short section of punch plate at the end of the trommel and entered a separate sluice run with coarse riffles. Material coarser than 3/4 inch in diameter went to the tailings pile. High pressure water jets washed the material throughout the entire length of the trommel. Water for sluicing was taken from a small pond near the sluice plant, supplied both directly from Hunker Creek and through seepage. A 6 inch pump powered by a 4 cylinder diesel delivered the water through 60 feet of 6 inch aluminum pipe. Mr. Oblak continued to mine by hand at the property during 1984. He transported the gravel into the Hunker Creek valley for sluicing, after a ditch which had previously provided water for sluicing to a small recirculation pond on Paradise Hill was filled in by a neighbouring operation. He used a 2 inch pump to pump sluicing water from a pond in dredge tailings at a rate of 130 igpm.

Tamarack Inc. (20)
Hunker Creek 115 O 14
1983, 1984 (Klondike)
63°59'N 139°03'W

This property is situated along the left limit of Hunker Creek, at the foot of Paradise Hill. The deposits present are 37 feet thick, and consist of 17 feet of tailings from hydraulic workings on Paradise Hill overlying 14 feet of black muck and 6 feet of gravel. Bedrock is decomposed. The black muck under the hydraulic tailings was thawed.

Work was begun in 1983, when a cut 120 feet long along the Hunker Creek valley and 350 feet wide was stripped. During 1984, one Cat D9H bulldozer was used to strip the cut along with one Cat 627 scraper with a capacity of 21 cu.yd. The scraper was also used to feed material to a hopper for the sluicing plant, and to remove tailings. A dragline was used to dig a drainage sump to handle seepage in the cut. Gravel and as much as 15 feet of bedrock were washed in a three run Pearson "Rock" box, which used 3,500 igpm of water. The water was pumped from Hunker Creek with an 8 by 10 Morris pump powered by a Cat 3306 diesel engine.

M. Brown, L. Knols (21)
Sigma Properties Ltd. 115 O 14
J. Brown (Klondike)
Hester Creek 63°59'N 139°04'W
1983, 1984

This property is located on a high left limit bench along a small left limit tributary of Hester Creek. The tributary flows into Hester Creek approximately 5,000 feet upstream of its confluence with Hunker Creek. Deposits at the site, which is commonly referred to as the "back side of Paradise Hill", consist of 1 to 30 feet of interstratified layers of yellow-brown Klondike gravel, laminated silt, and White Channel gravel. The bedrock surface is rough. Bedrock is badly decomposed carbonaceous schist.

A crew of 8 worked at the property on a single shift for M. Brown and L. Knols at the start of the 1983 season. They used one Cat D9G bulldozer to strip overburden and push gravel near to the sluice plant, one Cat 988 loader to feed the plant, and a

large dragline to clean the recirculation ponds and feed the plant when the loader was not operating. Material for sluicing was fed into a standard sluice box equipped with a large dump box and two sluice runs 40 feet long. The runs were set at a grade of 2 1/2 inches to the foot, and were lined with 2 inch riffles. After leaving the sluice runs, the material fell onto a vibrating screening unit equipped with two decks. The decks measured 6 by 14 feet, and were set at a slope of 20°. Screens were 3/4 and 3/8 inch. Material less than 3/8 inch in diameter was divided between a series of six sluice runs 48 inches across and 20 feet long which were lined with riffles, expanded metal and matting. The riffles pulsated at 70 movements per minute. The designer of the sluicing plant, K. Bennett, indicated that he intended to slow the movements down to 30 pulses per minute. A gradient of 1 1/4 inches to the foot was used on the six sluice runs. The full section of gravel was fed to the sluice plant at a rate of 140 cu.yd. per hour. Sluicing water was totally recycled from two settling ponds and a ditch set up in series. Make-up water, originally from Hunker Creek, was pumped from one of Tamarack's ponds on Paradise Hill. During the middle of the 1983 season, Sigma Properties Ltd. took over mining activities at this location. They used two Cat 637 scrapers with 31 cu.yd. capacity to mine gravel and transport it approximately 200 feet from the cut to a stockpile near the sluice plant. One D9G bulldozer assisted loading the scrapers. A second D9G bulldozer pushed the gravel from the stockpile 150 feet to within 50 feet of the sluice plant. One Cat 966 loader carried the gravel the remaining distance and fed the sluice plant. One Cat 988 loader was used to take away coarse tailings. The sluice plant was modified, and a trommel added in place of the vibrating screening unit. Water for sluicing was pumped directly from Hunker Creek at a rate of 4,000 igpm by way of a 12 inch diameter pipeline 5,700 feet long, with a Johnson 7 stage turbine pump powered by a V12 Jimmy diesel engine. Only a small amount of work was done at this site during 1984. J. Brown mined tailings left by the 1983 operations by hand. He used a small Briggs & Stratton pump to provide water for sluicing in a long tom 12 inches wide and 8 feet long. Water was recirculated from a large reservoir left by the previous workers.

Gold from this property was reported to be almost entirely fine grained.

Tamarack Inc. (22)
Hunker Creek 115 0 14
1983, 1984 (Klondike)
63°59'N 139°03'W

This property is situated on Paradise Hill, a high level bench on the left limit of Hunker Creek, just downstream from Hester Creek. Deposits on Paradise Hill cover a wide area, but this operation is near both the rims of the Hunker and Hester Creek valleys. Deposits on the hill are approximately 42 feet thick, and consist of approximately 4 feet of organic soil overlying 30 feet of silt and 8 feet of reddish brown gravel. A discontinuous layer 2 feet thick of blue clay is present in places between the silt and the gravel. The gravel and the uppermost 2 feet of bedrock were sluiced in 1983. Gold values were apparently higher in the upper half of the gravel section than in the section immediately overlying bedrock. The deposits are not frozen. Hydraulic mining has been done at this site previously. The results of drilling and shafting test work done by Yukon Consolidated Gold Corporation were used by the operators as guides to mining in 1983 and 1984.

Figure 5: View of Cat D9H bulldozer pushing Cat 627 scraper while loading at Tamarack Mining Co. property on Paradise Hill. (L.O. '83)

Six people worked at this location on a single shift in 1983. They used one Cat D9H bulldozer to strip waste and push a scraper while it was loading, one Cat 627 scraper with 21 cu.yd. capacity to transport waste and gravel for sluicing, and one Cat 966 loader equipped with a 4 cu.yd. bucket to feed the washing plant and remove tailings. Two cuts, each of approximately 24,000 square feet were mined. The same equipment was used in 1984 to mine an area of approximately 45,000 square feet to an average depth of 60 feet. Much of the material mined in 1984 consisted of highly decomposed red-stained schist bedrock. The washing plant used both years consisted of a vibrating screening unit made up of a hopper, conveyor belt, and screening deck, and two sluice runs. The hopper, which was 12 feet square at the top and funnelled down to 5 by 2 feet, sat on track rollers and was capable of shunting towards the conveyor belt under the power of a hydraulic ram. From the hopper the material was fed onto a wet conveyor belt 34 inches wide and 30 feet long which in turn fed the decks of the screening unit. The unit was equipped to handle two screening trays, although only one screen was used. Oversized material went off the screening deck to tailings. Material less than 1 inch in diameter was divided between two sluice runs. The sluice runs were 36 inches wide and 30 feet long, and were set up with a variety of gold saving devices. The first 3 feet were lined with 1 1/4 inch Hungarian riffles and astro-turf, and were followed by 12 feet lined with 1 1/4 inch pulsating riffles. The next 4 feet were lined with widely spaced 1 1/4 inch riffles, while the last 10 feet were lined with expanded metal over matting. A sand screw was added in 1984. After screening and sluicing, the material entered the screw, where it

was dewatered and fed to another single sluice run. That sluice run was 36 inches wide and 40 feet long, and was lined with 1 inch riffles over expanded metal and Nomad matting. It was set at a gradient of 1 1/2 inches to the foot. Electric power was supplied to the plant by a generator driven by a Cat 3306 4 cylinder diesel engine. The plant was capable of processing 100 cu.yd. per hour of material. Approximately 1,000 igpm of water were pumped to the screening unit, and an additional 500 igpm were pumped to the sluice run added in 1984. Sluicewater was totally recirculated on the bench level from a horseshoe shaped pond 100 feet wide and 400 feet long. The pump sat at one end, while the effluent entered the other. A new pond was built for the 1984 season. As the ponds built up with silt they were enlarged rather than cleaned. The recirculation pump used in 1983 was a 6 inch Barnes trash pump driven by a Lister 4 cylinder diesel engine. In 1984, a 5 by 8 Cornell & Deutz diesel pump was used. "Make-up" water was pumped from Hunker Creek by a 14 by 16 Dominion pump powered by a Cat D398 V12 diesel engine.

Gold recovered from this property was reported to be quite angular. The majority of it was less than 1/60 inch (40 mesh) in diameter.

A. Kosuta (23)
Hester Creek 115 O 14
1983, 1984 (Klondike)
63°59'N 139°02'W

This operation is located along Hester Creek, at the mouth of the Hester Creek valley. Deposits present consist of an irregular layer of tailings from old hydraulic mining operations on adjacent Paradise Hill overlying 5 to 20 feet of silty black muck with thin bands of gravel and 3 to 6 feet of gravel with quartz boulders up to 12 inches in diameter. Shafts and drift timbers left by old underground mining operations were present.

During 1983, four members of the Kosuta family mined using one Cat D5B and one Cat D6 bulldozer to do stripping and ramp tailings, and one Cat 941 Traxcavator equipped with a 1 1/2 cu.yd. bucket to dig and transport material from a cut 40 feet wide and 125 feet long to the sluice plant. The entire section of gravel was sluiced along with up to 3 feet of bedrock. Because the cut became too deep to be drained properly, a sump pump was used to keep it as dry as possible, and a rubber tired loader was used in place of the Traxcavator late in the season. The sluice plant consisted of a dump box and single sluice run, and was fed at a rate of approximately 50 cu.yd. per hour. The sluice run was 28 inches wide, and 38 feet long. The upper 18 feet were lined with punch plate over expanded metal and coco matting. The punch plate was stepped with 2 1/2 inch drops to provide maximum agitation of the material being washed. The lower 20 feet of the run were lined with heavy railway iron riffles over expanded metal and coco matting. The riffles had 3/4 by 1 inch oblong holes in the top to cause more undercurrent action, and to keep the riffles from packing. The gradient of the sluice run was 1 1/16 inches per foot, although a steeper gradient would have been used if possible. Because water for sluicing was gravity fed, the head of the dump box could not be elevated, while if the end of the sluice was lowered, a deep drain would have been necessary. Water for sluicing was obtained from two sources, used together. A 6 by 8 pump powered by a Cat 6 cylinder diesel engine provided water from a dredge pond in the middle of Hunker Creek valley by way of a 6 inch diameter pipeline. An 8 inch diameter pipeline fed water by gravity from a small holding pond on Hester Creek. Three hours of sluicing time were available when the holding pond was full. Effluent from sluicing was directed through a wide drain to Hunker Creek. Mr. Kosuta did some underground work during the winter of 1983-1984 to test gold values in the deposits at this location. Mining operations using the same equipment and workers as in 1983 continued during 1984.

Figure 6: Mr. A. Kosuta testing gravel at base of cut at the mouth of Hester Creek. (R.W. '84)

J. Gould (24)
R. Gould, P. Gould 115 O 14
Hunker Creek (Klondike)
1983, 1984 63°59'N 139°02'W

This property is situated at the upstream end of

Nugget Hill, a high level left limit bench of Hunker Creek, approximately 400 feet downstream from the rim of the Independence Creek valley. The claims have been in the Gould family since 1903. Deposits present consist of 2 feet of gummy clay overlying 18 feet of White Channel gravel with quartz boulders near bedrock up to 3 feet in diameter. Gold values reported in the gravel were as high as 12 feet above bedrock. Bedrock consists of competent carbonaceous schist. The bedrock surface is irregular.

J. and R. Gould worked at this site during 1983, using a Cat D4 bulldozer to strip overburden and a John Deere 350B tracked loader to feed the sluice plant and remove tailings. A monitor with a 4 inch diameter nozzle with water under a head of approximately 50 feet was used to wash down the gravel face. After the material was washed down, the monitor was used to wash it thoroughly at the foot of the face. The loader then picked up the large boulders and stacked them on the waste pile before transporting the remaining gravel to the sluice plant. The sluice plant had a capacity of 30 cu.yd. per hour. It consisted of a dump box 10 feet wide and 18 feet long with slick plate throughout, and a single sluice run. The sluice run was 24 inches wide and 20 feet long, and was lined with riffles, expanded metal, and coco matting. It was set at a gradient of 1 to 1 1/2 inches to the foot. Water for the monitor and for sluicing was supplied from a reservoir directly above the mine face. The reservoir was fed by a ditch tapping Independence Creek two miles upstream. Most work was done in the spring when run-off water was available. Effluent was directed over the edge of Nugget Hill by a bedrock drain, and partially settled in the tailings fan below before entering Hunker Creek. Work continued at the property in 1984. J. and P. Gould used a TD 25C bulldozer to strip ground prior to monitoring, and used the John Deere 350B tracked loader and a Cat 930 rubber tired loader to remove boulders and feed the sluice plant. The monitor used in 1983 was used, along with a second monitor supplied by water pumped from Hunker Creek. An initial settling pond conserved some water on Nugget Hill, while the rest went off the hill and was diverted back toward the pump inlet.

Gold recovered at this site was reported to be fine-grained, and flat, while gold recovered from Nugget Hill next to the rim of Independence Creek valley was reported to be coarser and angular.

D. Laurenson (25)
Independence Creek 115 O 14
1983 (Klondike)
63°59'N 139°01'W

This property is located on Independence Creek approximately 1,500 feet upstream from its confluence with Hunker Creek. Deposits present were likely derived from Independence Creek rather than Hunker Creek, and consist of grey sandy gravel with many small, angular pebbles. Bedrock is slabby schist.

D. Laurenson worked alone at this location for part of the season in 1983, using a Cat D8 bulldozer. He mined a cut 60 feet wide, 300 feet long, and 18 feet deep. Effluent from sluicing drained toward Hunker Creek along the extreme right limit of the Independence Creek valley.

D. Gould (26)
Daval Mining 115 O 14
Hunker Creek (Klondike)
1983, 1984 63°59'N 139°00'W

This property is situated at claim "40 Below Discovery" on Hunker Creek, between left limit tributaries Colorado Creek and Not Much Gold Creek. The deposits present are of two types. They consist of tailings from 1916 or 1917 dredging operations in the valley bottom, and, on a bench 30 feet above creek level along the left limit of the creek, 22 feet of black muck containing discontinuous layers of sand and colluvium over 6 to 8 feet of gravel and slabby bedrock. Numerous shafts and drifts left by early underground miners were found on the bench.

D. Gould assisted by two others worked at this property during 1983 using one Cat D3 bulldozer with straight blade and ripper, and one Cat 950 loader. Dredge tailings were mined during the first part of the season. Operations then moved to the bench, where the black muck was stripped before the gravel was mined and sluiced. The sluice plant consisted of a 7 by 12 foot dump box, most of which was lined with punch plate, and a single sluice run. The sluice run was 24 inches wide and 30 feet long. The upper 8 feet of the sluice run were lined with punch plate over expanded metal and coco matting. The remainder was lined with 1 1/2 inch riffles directly over coco matting. Water for sluicing was pumped directly from Hunker Creek by a 6 by 6 Gorman Rupp pump powered by a Deutz 4 cylinder engine. Effluent was settled in old workings downstream along the bench. Work at the property continued in 1984, when D. and A. Gould with the help of one other person mined a single cut along the left limit bench. The cut was 90 feet wide and 300 feet long, and averaged 30 feet deep. One Cat D8K and one Cat D9 bulldozer were used during the early part of the season to rip the black muck and strip the cut. Two 3 inch Honda pumps were used 3 hours per day to handle seepage. The Cat 950 loader mined the gravel and moved it to a stockpile near the sluice plant. The sluice plant was the same one used in 1983. It was fed from the stockpile by the Cat D3 bulldozer. Approximately 1,000 igpm of water were used to sluice 15 to 20 cu.yd. of material per hour.

Gold from the bench workings was reported to be fine-grained, and to occur almost entirely in the bedrock.

P. Gould (27)
R. Gould 115 O 14
Hunker Creek (Klondike)
1983, 1984 63°59'N 139°00'W

This property is located on the right limit of Hunker Creek at claims "39 and 40 Below Discovery". It is between left limit tributaries Colorado Creek and Not Much Gold Creek. Deposits present consist

of tailings left by 1916 or 1917 dredging mining operations.

P. Gould and one helper mined during 1983 using a Cat 930 loader for all work. The top 8 to 10 feet of tailings were sluiced. They consisted of coarse material including large balls of gumbo bedrock embedded with quartz pebbles. Below that was fine material which apparently does not contain gold. The sluice plant, which consisted of a dump box, 8 feet wide and 18 feet long, and a single sluice run 22 inches wide and 35 feet long, processed 40 to 50 cu.yd. per hour of material. The dump box was lined throughout with slick plate. It was fed from the side, and material was washed with water from a manifold equipped with low pressure nozzles. The upper 8 feet of the sluice run were lined with punch plate over expanded metal and coco matting. A 2 inch drop at the 8 foot mark of the box was followed by 27 feet of sluice run lined with 1 1/2 inch riffles over coco matting. Water for sluicing was pumped from Hunker Creek by a 6 inch Gardner-Denver pump powered by a Cat 4 cylinder diesel engine. Effluent from sluicing entered Hunker Creek unsettled. The quality of the effluent was, however, fairly good due to the washed condition of the dredge tailings being sluiced. Mining at the site continued during 1984, with R. Gould using the same equipment and sluice plant as was used by P. Gould in 1983.

J. Fraser (28)
A. Close 115 O 15
Hunker Creek (Klondike)
1983, 1984 63°58'N 138°59'W

This property is located on a low left limit bench along Hunker Creek at the foot of Temperance Hill, midway between left limit tributaries Gold Bottom Creek and Not Much Gold Creek. Deposits present consist of 25 to 65 feet of frozen black muck with ice lenses, overlying 5 feet of brown gravel and decomposed quartz-sericite schist bedrock. Numerous shafts and drifts left by early underground miners were found on the property. A band of tailings from past hydraulic mining on Temperance Hill covers a small portion of the section.

A crew of four worked a single shift at this property during 1983. All stripping was done hydraulically. In 1983, one monitor was set up at the base of the hill. The operators found that the set-up they had used in prior years, with monitors at the top of the hill, was more effective. A sluice run set up at bedrock level was located immediately downstream of the hydraulicking, so that all effluent from the stripping passed through it before leaving the bench. Water for stripping was pumped from a small pond by a 6 inch pump powered by a 4 cylinder GM 4031C diesel engine. One Cat D6C bulldozer was used to push the material in the cut to a stockpile near the sluice plant, and a Cat D4 bulldozer was used to feed the material to the sluice plant. The sluice plant was fed at a rate of 30 cu.yd. per hour of material. It consisted of a dump box 12 feet wide and 18 feet long, and a single sluice run 24 inches wide and 30 feet long. The sluice run was lined with punch plate, expanded metal and matting, and set at a gradient of 1 1/2 inches to the foot. Water for sluicing was provided at a rate of 800 to 1,000 igpm by a 4 by 5 inch pump powered by a 6 cylinder diesel engine. Work continued at the property during 1984. Two monitors using approximately 1,100 igpm of water were set up at the base of the hill to do stripping. The same heavy equipment as in 1983 was used to mine, while the sluice run was changed to one 48 inches wide and 24 feet long. It used approximately 1,300 igpm of water.

Figure 7: View looking upstream of J. Fraser and A. Close mining operation at the base of Temperence Hill. (L.O. '83)

Millar Bros. (29)
Mogul Gold Placers Ltd. 115 O 15
Hunker Creek (Klondike)
1983, 1984 63°58'N 138°58'W

This property is located in a very narrow part of the Hunker Creek valley, immediately downstream from the mouth of Gold Bottom Creek, and along the downstream end of Gold Bottom Creek. Deposits at this site consist of tailings from previous mining operations.

Two people mined on the Hunker Creek portion of the property for part of the season during 1983, using a Cat D8 bulldozer and a three channel "Ross" sluicing plant. They continued work on the Gold Bottom Creek portion of the property during 1984, using a Cat D6 bulldozer to feed a single run sluice box and remove tailings. The sluice box used in 1984 had one run 30 inches wide and 30 feet long, and was lined with 2 1/2 inch angle iron riffles. Approximately 9,000 cu.yd. of material were sluiced. Water for sluicing was pumped from holding ponds fed by Gold Bottom Creek by a Gorman-Rupp trash pump at a rate of 1,500 igpm.

Gold Bottom Placers (30)
Gold Bottom Creek 115 O 15
1983, 1984 (Klondike)
63°58'N 138°58'W

This property is located on Gold Bottom Creek, immediately upstream from its confluence with Hunker

Creek. Deposits present consist of 6 to 8 feet of muck, sand, and earth, much of which appears to have slumped in from the steep valley slopes, overlying 15 feet of brown gravel. The upper surface of the gravel section is very irregular. Bedrock varies from competent to decomposed. The deposits are almost completely thawed, possibly due to stripping done by earlier workers who did not mine.

Two to four workers mined during 1983, using two Cat D8H bulldozers to strip ground and push tailings, and one Koehring 666 backhoe equipped with a 1 3/4 cu.yd. bucket was used to feed the sluice plant. One Cat D7-17A and one Cat D8-24 bulldozer were also used if necessary. The cut was kept well drained by means of a ditch along its perimeter and a 6 inch Gorman Rupp trash pump sitting in a sump at the downstream end of the ditch. The trash pump worked 24 hours per day. Gold Bottom Creek flowed past the cut in an elevated channel along the left limit of the valley. When sluicing, one bulldozer pushed material to within reach of the hoe, which fed the sluice plant situated outside of the cut. The sluice plant was fed at a rate of 100 cu.yd. per hour of loose material when that material was dry, but as little as 60 cu.yd. per hour of loose material was fed when it was wet. The sluicing plant consisted of a dump box and single sluice run. The dump box was of the side-feed type, and had a spray manifold opposite. Hungarian riffles over expanded metal and matting were used from the top of the dump box to almost the bottom of the sluice run. A section of punch plate over expanded metal and matting was located at the end of the sluice run to catch fine-grained gold which might otherwise have been lost. Tailings were pushed away by another bulldozer. Water for sluicing was pumped at a rate of 2,500 igpm from Gold Bottom Creek. It was not recirculated. Work continued during 1984 using the same equipment and mining methods as in 1983, until the last of the valley bottom ground on the property was mined out.

G. Shaw (31)
Gold Bottom Creek 115 O 15
1984 (Klondike)
63°57'N 138°59'W

This property is located on Gold Bottom Creek, approximately 3,500 feet upstream from its confluence with Hunker Creek. Deposits present consist of tailings from previous mining operations.

Mr. Shaw mined for part of the 1984 season, using a Case 350 bulldozer and a Hough loader with 1 1/4 cu.yd. bucket. Material mined was sluiced in a sluicing plant with dump box and one sluice run 24 inches wide and 8 feet long. The sluice run was lined with riffles over expanded metal and matting.

O. Lunde (32)
Gold Bottom Creek 115 O 15
1983, 1984 (Klondike)
63°57'N 138°59'W

This property is located at claim "15 Above" the mouth of Gold Bottom Creek, approximately 500 feet upstream from the mouth of left limit tributary Soda Pup. Deposits at the site are 11 feet deep, and are thawed. They consist of brown gravel, and differ from deposits encountered in mining operations downstream in that large quartz boulders are rare. The deposits were apparently originally 16 feet deep and frozen, but the top 5 feet of overburden were stripped years ago by Mr. Lunde using gravity water boomed from an automatic gate, and the ground has thawed since then. Heavy drifting was done by early underground miners along the left limit of the creek in this area.

Mr. Lunde mined using a Cat D7F bulldozer and a Cat 950 loader equipped with a 3 cu.yd. bucket in 1983. During much of the season he worked alone, but did have one helper at times. Two cuts side by side, which took in the entire valley bottom and totalled approximately 50,000 square feet, were mined. The material mined was washed in a sluice plant with dump box 8 feet wide and 24 feet long, and a single sluice run 24 inches wide and 20 feet long. The dump box was lined throughout with punch plate with 5/8 inch holes. The punch plate was over expanded metal and "Nomad" plastic matting. The sluice run was lined with 2 1/2 inch riffles slanted back 15° to 20° set over astroturf. Water for sluicing was trapped in a holding pond upstream along Gold Bottom Creek, and delivered to the sluice plant by gravity at an estimated head of 30 feet by way of an 8 inch pipeline. Mining continued at the site during 1984. Mr. Lunde and one helper working full time used the same equipment and sluice plant as in 1983 to again mine two cuts totalling approximately 50,000 square feet. The bulldozer was used to strip the cut, feed the sluice plant, and remove tailings, while the loader was seldom used. Three feet of gravel, and two feet of bedrock were washed. In 1984, water for sluicing was pumped from the reservoir by an 8 by 8 pump powered by a 6 cylinder Deutz diesel engine. Approximately 1,800 igpm were used to wash 80 to 120 cu.yd. of material per hour.

Gold recovered from the left limit side of the Gold Bottom Creek valley was reported to be coarser grained than that recovered from the right limit side of the valley.

P. Erickson (33)
Soap Creek 115 O 15
1984 (Klondike)
63°53'N 138°59'W

This property is located on the portion of Soap Creek just upstream from its confluence with Gold Bottom Creek. Deposits present consist of 7 to 10 feet of black muck overlying 4 to 6 feet of reddish brown gravel.

Mr. Erickson mined alone on this property using one Cat D6C and one Cat D7 bullodozer. Some stripping and ripping of bedrock was contracted out, and was done with a Cat D9 bulldozer. Four narrow cuts totalling 1,000 feet in length were mined along the right limit of the narrow valley. The entire section of gravel and 2 feet of bedrock were processed in a sluice plant consisting of a dump box 7 feet wide and 20 feet long, and a single sluice run 28

inches wide and 20 feet long. The sluice run was set at a gradient of 2 inches to the foot. Approximately 1,500 igpm of water were used to wash 30 cu.yd. per hour of material. Effluent was settled in two ponds downstream along Gold Bottom Creek. Water was not recirculated.

Gold recovered from this property was reported to have a fineness of 763 to 766.

B. Rouleau (34)
Gold Bottom Creek 115 O 15
1983, 1984 (Klondike)
63°53'N 138°59'W

This property is located on the left fork of Gold Bottom Creek, approximately 500 feet upstream from its confluence with Soap Creek. Deposits present in the narrow valley consist of 2 feet of black muck overlying 13 feet of brown gravel with sandy layers interstratified. Bedrock is green and yellow decomposed schist. The deposits are frozen, unlike the deposits of Gold Bottom Creek downstream from the forks, from which the layer of black muck was removed hydraulically by earlier workers using an automatic gate. Evidence of extensive drifting by early hand miners was also present.

Figure 8: View upstream along the upper part of Gold Bottom Creek at the mouth of Soap Creek. (L.O. '83)

Two people worked a single shift at this property during 1983, using a Cat D7-17A bulldozer and an International TD 15 bulldozer for stripping and stacking tailings. A Cat 977 Traxcavator equipped with a 2 1/2 cu.yd. bucket was used for feeding the sluice plant. The sluice plant consisted of a dump box 6 feet wide and 12 feet long with spray manifold attached. It was lined with punch plate with 3/8 and 1/2 inch holes, and was set at a gradient of 2 1/2 inches to the foot. The sluice run was 30 inches wide and 20 feet long, and was lined with 1 1/4 inch riffles. The entire section of gravel was sluiced. Water for sluicing was fed by gravity from a reservoir at the mouth of Soap Creek. Water was diverted from the left fork of Gold Bottom Creek, at grade, along a ditch to the reservoir where it was stored along with water diverted from Soap Creek. The water was then directed to the sluice plant by way of an 8 inch pipeline when needed for sluicing. Effluent from sluicing was settled in a pond downstream from the forks. Work continued at this site during 1984, but moved just downstream of the forks. A side cut 60 feet wide and 400 feet long was taken out along the edge of a centre cut mined earlier by Mr. Rouleau. Approximately 8,000 cu.yd. of material were stripped, and 2,000 cu.yd. of material were sluiced. Water for sluicing was gravity fed.

Gold from this property was reported to be entirely within the gravel layer. Little or none was in the bedrock.

J. Erickson (35)
H. Liedtke 115 O 15
Hunker Creek (Klondike)
1984 63°57'N 138°54'W

This property is located along the right limit of Hunker Creek, immediately downstream from the mouth of Rogers Gulch. Deposits present consist of 37 feet of black muck overlying 3 feet of brown gravel. Bedrock is blocky weathering schist.

J. Erickson and H. Liedtke mined at this site during the first part of the 1984 season, along the margin of earlier workings. They used one Cat D8H bulldozer to strip the cut and move material for sluicing to a stockpile, and a Volvo LM 1240 loader to feed material from the stockpile to the sluice plant. One Cat 977 Traxcavator was used as a standby for the Volvo loader. The entire 3 foot thick section of gravel, and 2 feet of bedrock from a cut of 25,000 square feet were processed in the sluice plant. The sluice plant consisted of a dump box and a single run sluice box, and was fed at a rate of 80 cu.yd. per hour of material. Water for sluicing was provided at a rate of 1,500 igpm by a 10 by 12 Morris pump.

G. Shaw (36)
Rogers Gulch 115 O 15
1983 (Klondike)
63°57'N 138°53'W

This property is located along Rogers Gulch, a right limit tributary of Hunker Creek, approximately 700 feet upstream from its mouth. The creek, which is immediately upstream from Whiskey Hill, is narrow and has steep valley walls. It is also known as 6 Below Pup. Deposits present consist of 15 to 20 feet of black muck overlying up to 5 feet of sandy brown gravel. Bedrock is slabby schist.

Mr. Shaw worked alone at this site during 1983. He used a monitor with 3 inch diameter nozzle supplied with gravity fed water from a small reservoir upstream along Rogers Gulch to strip the black muck and carry it away. A Case 450C bulldozer was used to move material for sluicing to the sluice plant, to feed the sluice plant, and to remove tailings. The sluice plant consisted of a dump box and single sluice run 24 inches wide and 8 feet long. Work at this site was completed in 1983. Part of Mr. Shaw's pit was buried during 1984 by tailings from the

operations of J. Erickson and H. Liedke on Ensel Hill.

J. Erickson (37)
H. Liedtke 115 O 15
Hunker Creek (Klondike)
1984 63°57'N 138°53'W

This property is located on the high level right limit bench along Hunker Creek immediately upstream from Rogers Gulch. The hill is referred to by old reports as Ensel Hill. Deposits present consist of 1 foot of sandy muck overlying 11 feet of reddish brown sandy gravel. Channel structures are present in the gravel. Bedrock is blocky muscovite-feldspar-quartz schist, which is decomposed in places to sand. The property was extensively worked by early hand miners.

J. Erickson and H. Liedke worked with two helpers at this property during the latter part of the 1984 season. They used one Cat D8H bulldozer to strip the cut and feed the loader. One Volvo LM 1240 loader was used to feed the sluice plant, and one Cat 977 traxcavator was used as a standby for the loader. The sluice plant, which was fed at a rate of 80 cu.yd. of material per hour, consisted of a dump box 30 feet long, and a single sluice run. The lower half of the dump box was lined with punch plate with 3/8 inch holes, set over 1 inch angle iron riffles and a double layer of expanded metal. The sluice run was lined with riffles of several sizes, and some areas also had punch plate. The sluice run was set at a gradient of 1 1/2 inches to the foot. Water for sluicing was provided at a rate of 1,500 igpm by a 10 by 12 Morris pump powered by a Cat 3406 engine. Water was pumped from Hunker Creek by way of a 10 inch diameter pipeline 1,200 feet long. Effluent from sluicing was discharged over the end of Ensel Hill into Rogers Gulch, and was partially settled in a reservoir in the valley before crossing under Hunker Road and entering Hunker Creek.

Gold from this property was reported to have a fineness of 835. Nuggets were flat on one side, and rough on the other, and many had quartz adhering. They were not badly worn.

G. Ahnert (38)
25 Pup 115 O 15
1983, 1984 (Klondike)
63°55'N 138°54'W

This property is located along 25 Pup, approximately 2,500 feet upstream from its mouth. The creek is a small, narrow, left limit tributary of the right fork of Hunker Creek, and flows into the right fork approximately 2,000 feet upstream from the confluence of the right and left forks of Hunker Creek. Deposits at the site consist of 16 feet of black muck rich in organic matter including tree roots and bones overlying up to 2 feet of gravel. Shafts and drifts left by early underground miners are present.

Mr. and Mrs. Ahnert worked at this property by hand during 1983 and 1984. During 1983, material for sluicing was loaded by hand into a small wooden rail car, and was winched out of the pit along 100 feet of 22 inch gauge spruce rail line to a sluice set up outside the pit, and 18 feet above it. Water for sluicing was fed by gravity from a 1,500 gallon reservoir upstream along the creek. Mining continued in 1984. Some stripping was done with a monitor equipped with a 5/8 inch diameter nozzle using gravity fed water. Material for sluicing was shovelled into the box, which was set up in the pit along the right limit of the cut. The sluice run was 12 inches wide and 8 feet long, and was lined by 1 1/2 inch angle iron, expanded metal and coco matting. Water at a head of approximately 15 feet was gravity fed to the head of the box by a 3 1/2 inch diameter hose. Flow rate was controlled with a valve at the sluice. The sluice was set at a steep gradient. Mining rates were reported to be 1 cu.yd. per day.

Chris Mayes (39)
Hunker Creek 115 O 15
1984 (Klondike)
63°54'N 138°55'W

This property is located on the right fork of Hunker Creek, approximately 6,000 feet upstream from the confluence of the right and left forks of Hunker Creek. Deposits at this site have been heavily worked by earlier miners. The shallow valley centre has been open-cut mined by early hand miners. The side limits have been mined by underground methods. In addition, parts of the area have also been mined by mechanized methods. Deposits present consist of 2 feet of overburden overlying 6 feet of gravel. Bedrock is slabby chlorite schist and quartz schist.

Chris Mayes and his wife worked at this property for the first time in 1984, after Chris mined during previous years with his brother Colin along the left limit near the mouth of Hunker Creek. A Cat D7E bulldozer was used for all work. Two cuts totalling 25,000 square feet were mined. Gravel was processed in a sluice plant at a rate of 50 to 75 cu.yd. per hour. It consisted of a dump box 8 feet wide and 22 feet long lined with slick plate, and a single run sluice box 42 inches wide and 24 feet long lined with 2 1/2 inch riffles over matting. The riffles in the upper 8 feet of the sluice run were under punch plate. The sluice run was set at a gradient of 2 1/2 inches to the foot. Water for sluicing was delivered under gravity by way of a pipeline from a reservoir to the head of the dump box at a rate of 1,200 to 1,500 igpm. Effluent from sluicing was settled in two small ponds immediately downstream from the sluice plant, which were cleaned daily, and a larger pond several hundred feet downstream.

The gold recovered was reported to be fine grained, and much of it was coated with mercury.

P. Erickson (40)
Hunker Creek 115 O 15
1983 (Klondike)
63°54'N 138°56'W

This property is situated at the headwaters of

the right fork of Hunker Creek. Deposits present consist of 4 to 5 feet of black muck, and 6 to 7 feet of rusty brown sandy gravel.

Mr. Erickson worked alone using one Cat D6C bulldozer for most work and one Cat D7 bulldozer on a standby basis. Gravel was processed in a sluicing plant at a rate of 75 cu.yd. of material per hour. The sluice plant consisted of a dump box 7 feet wide and 21 feet long lined with slick plate, and a single sluice run 28 inches wide and 20 feet long. The sluice run was set at a gradient of 2 inches to the foot. Water for sluicing was recycled from a pond in line with the creek by an 8 by 8 trash pump powered by a 6 cylinder gasoline engine. The pond was cleaned daily after 4 to 6 hours of sluicing. Effluent was settled further in two ponds in series, one mile downstream from the operation.

W. Lengerke (41)
Allgold Creek 115 O 15
1984 (Klondike)
63°56'N 138°38'W

This operation is located on a low bench along the left limit of Allgold Creek, approximately 8,000 feet upstream from the mouth of the creek. Deposits present consist of up to 6 feet of frozen black muck over 16 feet of gravel.

Mr. Lengerke worked at this site for the first time during 1984. He worked alone for most of the season, but did have one helper at times. They used a Terex 82-30 bulldozer to strip and to feed the sluice plant, and a Hough 120 loader to remove tailings. The sluice plant had a capacity of 50 to 75 cu.yd. of material per hour. It consisted of a dump box 8 feet wide and 20 feet long and a single sluice run. The lower 3 feet of the dump box and the upper 3 feet of the sluice run had punch plate lining, and the rest of the sluice run was lined with riffles over expanded metal and matting. The sluice run was set at a gradient of 2 1/2 inches per foot. Water for sluicing was pumped at a rate of 2,400 igpm to a manifold in the dump box. It was pumped from a small storage pond on Allgold Creek by a 10 by 12 inch pump powered by a Chrysler 8 cylinder gas engine. Effluent from sluicing was settled in two ponds downstream from the operation which were also used by the other operator on the creek.

J. Alton (42)
D. Laurenson 115 O 15
Allgold Creek (Klondike)
1983, 1984 63°56'N 138°38'W

This property is located on Allgold Creek approximately 5,000 feet upstream from the mouth of the creek. Deposits along the left limit of the valley bottom consist of 10 feet of colluvium with slide rock overlying 5 feet of frozen black muck, and 5 feet of gravel. Bedrock is decomposed schist.

J. Alton mined at this location during the early part of the 1983 season using two Cat D7 bulldozers. Water for sluicing was fed by gravity from a small reservoir. D. Laurenson moved to the property late in the 1983 season and did a limited amount of work. He continued work with one helper during 1984, using a Cat D8H bulldozer for all work. Several cuts were mined in the center of the valley and along the left limit of the creek bottom. The colluvium and black muck were stripped, and the entire section of gravel and 2 feet of bedrock were processed. The sluice plant consisted of a dump box 8 feet wide and 14 feet long lined with slick plate, and three sluice runs, and was capable of processing approximately 70 cu.yd. per hour of material. The centre sluice run was 3 feet wide and 12 feet long, and was lined with Hungarian riffles. It had a 3 foot long section of rebar with 1/8 inch spacings near the top to supply material less than 1/8 inch in diameter to the two side runs. The side runs were 1 foot wide and 8 feet long, and were lined with expanded metal over astroturf. Water from sluicing was pumped from a small pond to the sluice plant at a rate of 1,500 igpm. Effluent from sluicing was settled in two ponds located approximately 2,000 feet downstream from the mining operation.

Gold recovered from this site was reported to be fine-grained and flaky, and to have a fineness of 854.

J. Wheelton (43)
Minnie Bell Creek 115 O 15
1983 (Klondike)
63°55'N 138°33'W

This property is located along Minnie Bell Creek, approximately 1,000 feet upstream from the mouth of the creek. Deposits present consist of at least 15 feet of silty material. Very little gravel was exposed. Bedrock was not reached in the cut.

Work done during 1983 or earlier consisted mainly of preparations for mining. A drain approximately 1,000 feet long and 15 feet deep at the upstream end was dug from the cut to the Flat Creek valley. A cut 400 feet square was stripped to a depth of 15 to 20 feet. Additional stripping was done upstream of the cut, and a water reservoir was prepared.

L. Arsenault (44)
Lombard Pup 115 O 15
1984 (Klondike)
63°52'N 138°53'W

This property is located along the headwaters of Lombard Pup, a left limit tributary of the upper part of Dominion Creek. Deposits present consist of 15 feet of black muck, and sand, silt, and gravel. The property was hand mined during the 1930's.

L. Arsenault began work at this location during the middle of the 1984 season. He used a D8H bulldozer to strip organic material and black muck from a cut in the centre of the valley, and to mine a small amount of gravel. A 6 inch trash pump was used to pump water for sluicing.

K. Adams (45)
Dominion Creek 115 O 15
1983, 1984 (Klondike)
63°52'N 138°55'W

This property is located along the headwaters of Dominion Creek. The creek valley is narrow, and has steep slopes. Deposits are from 15 to 20 feet deep, and consist of 5 to 10 feet of layered black muck, silt and slide rock overlying 5 feet of silt and sand with gravel lenses, and 5 feet of sandy gravel. Bedrock is blocky weathering schist. The property was worked by hand using steam thawing between 1902 and 1908, and by steam powered dragline with steam thawing between 1933 and 1940.

K. Adams mined at this property during 1983 and 1984. He used two Cat 977 Traxcavators and a Bantam C450 backhoe with 3/4 cu.yd. bucket to mine, and a sluice plant with dump box and single sluice run 27 inches wide and 24 feet long to process the gravel. A Dominion 120 dragline with 1 1/4 cu.yd. bucket was used for stripping, and for cleaning the water reservoir and settling pond. Water for sluicing was impounded upstream from the mining operation, and was recirculated by a Gardner Denver 75 pump at a rate of 1,500 igpm. from settling ponds downstream from the sluice plant. Approximately 1,200 cu.yd. of material were stripped, and 2,500 cu.yd. of material were sluiced each year.

I. Hamilton (46)
Dominion Creek 115 O 15
1983, 1984 (Klondike)
63°51'N 138°54'W

This property is located along the headwaters of Dominion Creek, approximately 350 feet upstream from the mouth of Little Dominion Creek. It is located immediately upstream of the upstream limit of dredging. The valley is narrow, and has steep slopes. Deposits exposed along the right limit of the valley consist of 10 feet of black muck overlying 15 feet of sandy gravel with silt and sand layers. Old drift timbers in the cut provide evidence of early underground mining at this location.

Work at this location was done in 1983 by I. Hamilton assisted by one helper. They mined using one Cat D7E for stripping, and for pushing gravel and tailings. The area mined was 110 feet wide across the valley, and 180 feet long along the valley. Bedrock on the left limit was climbing rapidly, while on the right limit it was still dipping into the bank. A Bantam C 475 hoe equipped with a 1 1/2 cu.yd. bucket was used to feed the sluicing plant. The sluice plant consisted of a dump box 7 feet wide and 16 feet long constructed of laminated plywood reinforced along the edges and corners with angle iron, and three wooden sluice runs. The dump box was lined with 3/4 inch diameter redi-rod placed lengthwise, and spaced an average of 1/2 inch apart. The rods screened the material, with undersize being directed to the side runs for sluicing. The main run was constructed from two layers of 3/4 inch plywood, and was 38 inches wide and 12 feet long. It was lined with perforated 3 inch riffles. The side runs were constructed with 2 by 8 inch board sides and plywood bottoms, and were 16 inches wide and 12 feet long. Water for sluicing was pumped from a large recirculation-settling pond at the confluence of Dominion and Little Dominion Creeks, which impounded water from both creeks. A 10 by 10 inch pump powered by a 3 cylinder Jimmy diesel engine was used to pump the water to a monitor with 6 inch nozzle at the throat of the dump box. Additional water was stored in a pond on Dominion Creek, approximately 100 feet upstream from the cut. Work continued at the site during 1984. Two Cat D7 bulldozers, and the Bantam 475 hoe were used.

Allgold Placers (47)
Caribou Creek 115 O 15
1983, 1984 (Klondike)
63°50'N 138°49'W

This property is located along Caribou Creek, a right limit tributary of Dominion Creek, approximately 3,500 feet upstream from its confluence with Dominion Creek. Deposits present consist of 9 to 14 feet of black muck overlying 6 feet of sandy gravel. Only a little hand mining was done along the creek by early hand miners, with the majority of it being located between 3,000 and 5,000 feet upstream from the mouth of the creek.

J. and K. Stuart worked at the property during 1983 using one Cat D8H and one Cat D8K bulldozer to strip and to mine an area of approximately 140,000 square feet extending across the valley bottom and including a low left limit bench. A Hein Werner C-14A hoe equipped with a 1 1/2 cu.yd. bucket was used to feed the sluicing plant. The lowermost 2 to 3 feet of gravel and 1 1/2 feet of bedrock were sluiced. The sluicing plant consisted of a dump box 8 feet wide and 22 feet long and a single sluice run 36 inches wide and 24 feet long. It had a capacity of 80 cu.yd. per hour. The dump box was lined with punch plate and gold saving devices, and the sluice run was lined with 2 inch riffles, expanded metal and astroturf. Work continued at the site during 1984. J. and K. Stuart and one helper used one Cat D8 bulldozer and one Cat D9G bullldozer to mine an area of approximately 120,000 square feet. Water for sluicing was supplied at a rate of 2,500 igpm by an 8 by 10 inch pump powered by a 6 cylinder Volvo engine. A settling-recycling pond was located about 800 feet downstream of the sluice plant. A second settling pond was located farther downstream.

Gold recovered from the property during 1983 was reported to be mostly fine-grained, and to have a fineness of 850.

P. Favron (48)
Dominion Creek 115 O 15
1983, 1984 (Klondike)
63°50'N 138°48'W

This property is situated on Dominion Creek, approximately 2,000 feet downstream from right limit tributary Caribou Creek. The Dominion Creek valley is wide at this point. Cuts opposite each other on the right and left limits of the creek were 1,000 feet apart. Deposits on the low left limit terrace

consist of 17 feet of silt and clay overlying 3 1/2 feet of reddish brown gravel. Deposits on the right limit consist of 50 to 60 feet of black muck overlying a thin layer of gravel. The left limit terrace was previously open-cut mined by early hand miners. The property was also worked by Ballarat-Tatlow Joint Venture between 1978 and 1982.

Mr. Favron used one Terex 8230 bulldozer to mine during 1983. He took a cut 90 feet wide, 200 feet long, and up to 20 feet deep from the left limit bench, and a cut 30 feet wide, 400 feet long, and up to 60 feet deep from the right limit of the valley. Black muck was stripped hydraulically from the cut along the right limit by water from a monitor. All the gravel, and 1 1/2 feet of bedrock were processed at both sites at a rate of 60 cu.yd. per hour of material in a sluicing plant which consisted of a dump box and three sluice runs. The dump box was 8 feet wide and 13 feet long, and was lined throughout with punch plate with 3/8 inch holes. Material less than 3/8 inch in diameter fell through the holes and was directed to the two side runs. The side runs were 42 inches wide and 16 feet long, and were lined alternately with expanded metal and 1 inch riffles. Both were set over astroturf. The centre run was 36 inches wide and 16 feet long, and was lined with punch plate with 1/2 inch holes. Material less than 1/2 inch in diameter fell through the holes and was washed over 2 inch riffles in the upper 4 feet of the box and over expanded metal in the lower 12 feet of the box. Astroturf was used throughout the centre run. All three runs were set at a gradient of 1 1/2 inches per foot. Water for sluicing was pumped from a large seepage pond in the middle of the Dominion Creek valley at a rate of 2,000 to 2,500 igpm by a 10 by 12 inch Bingham pump powered by a 671 Jimmy diesel. It was fed to the dump box by way of a manifold, and a monitor with 4 1/2 inch nozzle. Effluent from stripping and sluicing was settled in ponds on the right and left limits immediately downstream from the cuts. Work continued at the site along the right limit of the creek during 1984. Mr. Favron had two Terex 8230 bulldozers, but used only one. Natural thawing, and hydraulic work using a monitor were used to strip the black muck from the cut. A small pump was used in the cut to drain seepage and thaw water, and the tail race from sluicing and the settling pond were diked off from the cut as the pond level was higher than the bedrock level of the cut. The pump used in 1983 was replaced by another 10 by 12 inch pump powered by a Cat D13000 series motor.

Gold recovered from the property during 1983 was reported to be almost all fine-grained, and very flat. Concentrations were reported to be higher along the left limit of the creek than along the right. Heavy concentrations of magnetite were also present in the cut along the left limit, making frequent clean-ups when working there necessary.

J. Taylor (49)
Dominion Creek 115 O 15
1983, 1984 (Klondike)
63°49'N 138°41'W

This property is located on a low bench along the left limit of Dominion Creek, opposite the mouth of Portland Creek. Two cuts approximately 300 feet apart were worked. Deposits at one consisted of 3 feet of black muck overlying 3 feet of gravel, while deposits at the other consisted of 15 feet of black muck overlying 4 feet of gravel.

Mr. Taylor and his daughter worked at this property during 1983 using a Cat D8-14A bulldozer to strip ground, a JD 450 loader with 2 cu.yd. bucket and hoe to feed the sluice plant and remove tailings, and a Bobcat 720 loader for light duties. Two small cuts were mined. The material mined was processed in a sluicing plant consisting of a dump box and single sluice run. The dump box was 4 feet wide and 8 feet long, and was lined with slick plate. The sluice run was 24 inches wide and 12 feet long, and was lined with expanded metal and matting. The sluice run was set at a gradient of 1 3/4 inches to the foot. Water for sluicing at the upstream cut was pumped from a 300 foot long diversion ditch from Dominion Creek by two 3 inch Honda pumps. Effluent from sluicing was settled in dredge tailings. Water for sluicing at the lower cut was pumped from a spring by the two 3 inch Honda pumps, and was recirculated. Mining on the left limit bench continued during 1984. In addition, some stripping was done along Portland Creek at its mouth.

Gold from this property was reported to be all less than 1/15 inch in diameter (12 mesh), and to have a fineness of 820

Lexicon Ventures (50)
J. Lerner 115 O 15
Nevada Creek (Klondike)
1984 63°49'N 138°36'W

This property is situated along the left limit of Dominion Creek, at the mouth of Nevada Creek. Deposits present consist of tailings left by early bulldozer mining operations.

Mr. Lerner worked at this property during 1984 using a Cat 966 loader to do all work. He mined old tailings, and processed them at a rate of approximately 50 cu.yd. per hour in a modified "Ross" 3 channel sluice box.

Ace Placer Mines (51)
A. Sailor 115 O 15
Dominion Creek (Klondike)
1983, 1984 63°48'N 138°36'W

This property is located on a low level left limit bench along Dominion Creek, about 5,000 feet downstream from the mouth of Nevada Creek. Deposits consist of 10 to 15 feet of silty colluvium and slide rock, overlying 8 feet of organic rich silt and black muck, and 6 to 16 feet of sandy gravel. Cobbles in the gravel are up to 8 inches in diameter, but most are less than 4 inches in diameter.

A. and N. Sailor with two helpers worked at 3 locations on the property during 1983 using two bulldozers to strip overburden and stockpile pay gravel, and a loader to feed the sluicing plant and stack

tailings. The sluice plant consisted of a dump box with punch plate in the throat, and three sluice runs. The material which passed through the holes in the punch plate lining the throat of the dump box was divided between two side runs lined with angle iron riffles. The main run was also lined with punch plate, which had steps at intervals to help wash the gravel. Material which passed through the punch plate in the centre run was also washed over angle iron riffles. Water for sluicing was pumped at a rate of 2,800 igpm, and fed to the sluice plant through a manifold and monitor at the throat of the dump box. The gradient of the centre run was slightly steeper than that of the side runs. Mining at this site continued during 1984, when some stripping was done by hydraulic methods. Part of the water for stripping was diverted from Dominion Creek and pumped from a holding pond by a 10 by 12 inch pump, and part was gravity fed by way of a ditch from Nevada Creek. During both 1983 and 1984, approximately 40,000 cu.yd. of material were stripped and 10,000 cu.yd. of material were sluiced.

Figure 9: View of Ace Placer Mines operation along the left limit of Dominion Creek. Tailings from former dredge and bulldozer mining operations are in the foreground. (L.O. '84)

L. Gatenby (52)
G. Gatenby 115 O 15
Dominion Creek (Klondike)
1983, 1984 63°47'N 138°34'W

This property is located on a low level left limit bench along Dominion Creek, approximately 3,500 feet upstream from the mouth of Jensen Creek. Deposits at the site consist of up to 25 feet of frozen black muck with silt and colluvium lenses overlying 5 to 7 feet of sandy gravel. Bedrock consists of slabby schist. The bedrock surface is very irregular. Some shafts and drifts left by early underground miners are present.

L. and G. Gatenby worked at this site with two helpers during 1983, using a Cat D9H bulldozer to strip and stockpile material for sluicing, and a Cat 966 loader to feed the sluice plant and remove tailings. The sluice plant consisted of a dump box and single sluice run 3 feet wide and 30 feet long, and had a capacity of approximately 30 cu.yd. per hour. Five people continued work at the property during 1984, using a newer Cat D9H bulldozer, and the Cat 966 loader. Approximately 130,000 cu.yd. of material were stripped, and an additional 40,000 cu.yd. of material were sluiced. Punch plate was added to the throat of the dump box to separate material less than 1/2 inch in diameter, which was directed to a new side run 2 feet wide and 30 feet long. The main run was set at a gradient of 2 inches to the foot, while the side run was set at 1 1/2 inches to the foot. Water for sluicing was pumped from a small pond on Dominion Creek by a 10 by 10 inch pump run by a 471 Jimmy engine during part of the season, and by an 8 by 10 inch Cornell pump powered by a newer engine during the balance of the season. Approximately 3,000 igpm of water were used. It was fed into the dump box by way of a manifold and a monitor with 4 inch diameter nozzle. Effluent from sluicing flowed upstream along the Dominion Creek valley into an old pond in dredge tailings, to be settled.

Figure 10: View of L. and G. Gatenby operation on low bench along the left limit of Dominion Creek. (L.O. '84)

Yukon Jack Mines (53)
J. Coghlin 115 O 15
Dominion Creek (Klondike)
1984 63°46'N 138°33'W

This property is located along the left limit of Dominion Creek.

Mr. Coghlin began work at this site in 1984, using one Cat D8 bulldozer, and a rubber tired loader to do stripping, and to mine, feed the sluice box, and remove tailings. The material mined was washed in a double run sluice box, at a rate of approximately 170 cubic yards per hour. Water for sluicing was pumped at a rate of approximately 3,000 igpm from a reservoir fed by Dominion Creek.

Rainbow Placers Ltd. (54)
P. McWalters 115 O 15
Dominion Creek (Klondike)
1984 63°46'N 138°31'W

This property is located along the left limit of Dominion Creek.

Mr. McWalters began work at this site in 1984. He used a D7 bulldozer to mine, feed the sluice box, and stack tailings.

W. Hakonson (55)
S. Mynott 115 O 10
Gold Run Creek (Klondike)
1983, 1984 63°45'N 138°42'W

This property is situated on Gold Run Creek, approximately 5,000 feet upstream from the mouth of Laskey Pup. Deposits at the site consist of up to 25 feet of frozen black muck overlying 6 feet of gravel and decomposed schist bedrock. The valley floor widens to about 800 feet in this area.

Work was done at this site in 1983 and 1984. In 1983, three miners and one camp person worked using two Cat D9G bulldozers. They mined one cut 500 feet long and 100 feet wide, and began stripping an area 1,000 feet long and 200 feet wide. Pay gravel was washed at a rate of approximately 150 cu.yd. per hour in a sluice plant with a dump box and single sluice run. The dump box was 10 feet wide and 36 feet long, and was lined with punch plate, coco matting, and expanded metal. The sluice run was 30 inches wide and 20 feet long, and was lined with riffles and coco matting. Water for sluicing was provided by a 10 by 12 inch PACO pump powered by a 471 Jimmy diesel engine. The water was not recirculated. Work continued at the site in 1984. One of the Cat D9G bulldozers was replaced by a D9H bulldozer, but otherwise work proceeded in 1984 as it had done in 1983. An additional 100,000 cu.yd. of material were stripped in two cuts from the 1,000 by 200 foot area, and 25,000 cu.yd. of material were mined and sluiced. Water for sluicing was pumped at a rate of 2,500 igpm, and was recirculated from a single settling pond.

W. Hakonson (56)
S. Mynott 115 O 10
Gold Run Creek Klondike
1983 63°44'N 138°41'W

This property is located along Gold Run Creek, approximately 1,000 feet upstream from the mouth of Laskey Pup.

Work on the property was done in 1983 by 3 miners and one camp person using two Cat D9G bulldozers. They mined one cut 500 feet long and 300 feet wide. The material mined was processed in a single run sluice box. Water for sluicing was pumped at a rate of 2,500 igpm by a 10 by 12 inch PACO pump powered by a 471 Jimmy diesel engine.The cut was later used as a settling pond for mining operations carried out upstream of this site by the same operators.

Ross Mining Services Ltd. (57)
Dominion Creek 115 O 10
1983, 1984 (Klondike)
63°41'N 138°37'W

This property is located along the right limit of Dominion Creek, just downstream from the mouth of Gold Run Creek, and near the edge of the wide Dominion Creek valley. Deposits present consist of 10 to 20 feet of peat moss and frozen muck, silt, and fine gravel. Previous work on the property includes underground mining between 1898 and 1905, dredging between 1926 and 1936, and bulldozer mining between 1978 and 1981.

Ross Mining Services Ltd. mined at this location in 1983 and 1984. They used a Cat D8 bulldozer and a Cat 988 loader to do stripping and mining, and to feed the sluice box. The loader was used to remove tailings. A rented Cat 637 scraper-loader was also used as required to do stripping. Approximately 200,000 cu.yd.of material were stripped and 100,000 cu.yd. of material were sluiced in 1984. A model 500 Ross sluice box was used for sluicing. Water for sluicing was pumped at a rate of 6,000 igpm from a holding pond fed by a diversion ditch from Dominion Creek.

Consolidated Mines (Yukon) Ltd., (58)
Dominion Creek 115 O 10
1983, 1984 (Klondike)
63°41'N 138°37'W

This property is located along Dominion Creek, approximately 6,000 feet downstream from the mouth of Gold Run Creek. Deposits present consist of 10 to 25 feet of peat moss, and frozen clay, sand, and fine gravel. Previous work on the property includes drift mining between 1898 and 1905, dredging between 1923 and 1936, and drill-testing and open-cut mining between 1942 and 1982.

Open-cut mining continued at this property during 1983 and 1984. During 1984, six people worked using a Cat 637D scraper-loader with 31 cu.yd. capacity, and D8L, D8K, and D8H bulldozers to strip approximately 300,000 cubic yards of material. Two bulldozers and the scraper were used to move the material to the sluice plant, and to feed the sluice plant. Tailings were stockpiled by the bulldozers, and later removed from the area of the sluice plant by the scraper. Approximately 200,000 cu.yd. of material were sluiced in a Ross sluice system using 6,000 igpm of water provided by a 12 by 14 inch Peerless 450 hp. pump. A Lorain dragline with 2 cu.yd. bucket was used for miscellaneous work on the property.

Airgold Ltd. (59)
J. Brown 115 O 10
Dominion Creek (Klondike)
1983, 1984 63°38'N 138°41'W

This property is located along the lower portion of Dominion Creek, approximately 6,500 feet downstream from the mouth of Sulphur Creek. Deposits present at the site consist of 6 feet of black muck

overlying 4 feet of sand and gravel, and 8 feet of dark grey gravel. The deposits are thawed. Bedrock is variable, and ranges from blocky to highly fragmented.

Work in 1983 was done on a single shift, with a crew of 4 mining, and 2 working in camp. A Cat D8H and a Cat D8K bulldozer were used for stripping and mining. Three cuts, on which stripping was begun in 1982, were mined. The dark grey gravel and three to four feet of gravel were sluiced. When sluicing, one bulldozer fed one of two Cat 966 loaders, which in turn fed the sluicing plant. For long pushes, one bulldozer fed the next, which then fed the loader. A Cat 463E pull scraper, with a capacity of 16 to 24 cu.yd. was also used to move pay gravel in long haul situations. The sluicing plant consisted of a 12 by 12 foot vibrating screening deck and single run sluice. The deck, which screened to minus 3/4 inch, was powered by a modified 6 cylinder Ford truck sitting adjacent to the plant. Power passed through the standard 3 speed transmission, in high gear, through the drive shaft, and to the screening deck. The sluice run was 48 inches wide and 40 feet long, and was lined alternately with Hungarian riffles and punch plate over expanded metal. Astro turf was used under the expanded metal throughout the sluice run. Approximately 100 cu.yd. of material were processed per hour. Water for sluicing was provided at a rate of 2,500 igpm from a large seepage pond upstream of the operation by a 10 by 10 inch Gorman-Rupp trash pump. Tailings were removed from the area of the sluicing plant by the second Cat 966 loader. A Northwest dragline with 2.5 cu.yd. bucket was used for miscellaneous work on the property. Work continued at the property in 1984. One person was added to the crew, and work was carried out on two 8 hour shifts. Problems with drainage in the cut were encountered because the valley was very broad, with a shallow gradient in the area of the mine, and the deposits were not frozen. Groundwater seeped into the pit, and would not drain away. A pump was used to remove the excess water at a rate of 875 igpm.

Gold from this property is reported to be fine-grained and flat, and to have a fineness of 841. It appears well travelled.

R. Allen (60)
Consolidated Mines (Yukon) Ltd. 115 O 10
Eureka Creek (Klondike)
1983, 1984 63°34'N 138°51'W

This Consolidated Mines (Yukon) Ltd. property is located along the middle part of the Right Fork of Eureka Creek. Deposits present consist of 11 feet of frozen black muck with silt and sand layers overlying 4 to 8 feet of gravel and decomposed chlorite schist bedrock. The property was hand mined between 1898 and 1920, and was mined by machinery between 1959 and 1982.

R. Allen and J. Allen began work at this site in July, 1983. They used a Cat D8-46A bulldozer to do all work. They began by mining tailings from the earlier bulldozer mining operations, and then mined one cut 14 feet wide and approximately 1,000 feet long along the right limit of the creek. The entire section of gravel and 1 to 4 feet of bedrock were sluiced in a 3 channel modified model 200 Ross sluice box at a rate of 150 to 200 cu.yd. per hour. The dump box was lined with punch plate, screening material to approximately 1/2 inch before delivery to the side runs for sluicing. The side runs were 48 inches wide and 30 feet long, and were lined with 1 1/4 inch riffles. Of the gold recovered, 85% was recovered in the side runs. The main run, which measured 32 inches wide and 30 feet long, was lined with 3 inch riffles throughout. A small section of punch plate was placed over the riffles at the upper end of the main sluice run. Long bristle, wiry Monsato turf was used under the riffles in all the runs. The gradient of the three runs was 3 inches to the foot. Water for sluicing was pumped at a rate of 3,000 igpm from a recirulation/settling pond by a 10 by 10 inch Pierce pump powered by a 6 cylinder diesel Cummings engine. Work continued at the property in 1984, when a cut 50 feet wide and 500 feet long was mined in old tailings.

Gold recovered from this property is reported to be of fine to medium size, and to have a fineness of 680 to 730.

Tundra Contracting (61)
Eureka Creek 115 O 10
1983, 1984 (Klondike)
63°34'N 138° 52'W

This property is located along the middle part of the Left Fork of Eureka Creek. Deposits present consist of approximately 20 feet of frozen black muck overlying 4 feet of brown gravel. Bedrock is schist. Extensive work was done on the property by early underground miners. There is an average of three shafts per claim length on the property. Up to 60% of the gravel present was mined out of the drifts by the early workers.

Work on the property during 1983 was done using a Cat D8K bulldozer to strip ground, and a Cat 980 loader to feed the sluicing plant. A cut 75 feet wide and 500 feet long was mined. An effort was made to follow the old underground workings when mining with the cut. The entire section of gravel and 4 feet of bedrock were sluiced. The sluicing plant consisted of 2 vibrating screening decks, with 1 inch and 1/2 inch holes. Power was provided to the screen decks by a portable Cat 50 KVA generator. Oversize and undersize from the 1/2 inch screen deck were sluiced separately in two sluice runs measuring 48 inches wide and 20 feet long each. Water for sluicing was recirculated from a downstream recycle-settling pond by a 6 by 10 inch Cornell pump at a rate of 2,200 igpm. The plant was reported to have a processing capacity of 200 cu.yd. per hour. Tailings were removed by the D8K bulldozer. Work at the site continued during 1984.

It was reported that 40 per cent of the gold recovered from this site was 12 mesh (.065 inches in diameter) or coarser.

Hakkon Placers (62)
Eureka Creek 115 O 10
1983, 1984 (Klondike)
63°34'N 138°54'W

This property is located along the central part of the Right Fork of Eureka Creek, immediately downstream from a major right limit tributary. The valley bottom is approximately 150 feet wide, and the valley sidewalls are relatively steep. Deposits present in the centre of the valley are approximately 20 to 24 feet deep, and consist of 4 to 8 feet of frozen black muck overlying 12 to 16 feet of sandy gravel. The deposits thicken towards the valley walls. Bedrock is blocky-weathering schist. Underground workings left by early miners, including rooms 10 feet square, are common on the property.

Work in 1983 was done on a single shift, with four people mining, and one working in camp. They used a Cat D9H bulldozer for stripping and stacking the black muck while frozen, and for feeding gravel for sluicing to two Cat D8H bulldozers. The D8H bulldozers fed the sluicing plant at a rate of 125 cu.yd. per hour. The sluicing plant consisted of a dump box 27 feet long and a single sluice run 28 feet long. The dump box was lined with expanded metal and coco matting, and the sluice run was lined with 2 inch riffles and coco matting. Punch plate was set over the riffles in the top 8 feet of the sluice run. The gradient on the sluice run was 2 1/2 inches to the foot. Eighty per cent of the gold recovered was reportedly recovered in the dump box. Water for sluicing was provided at a rate of 2,500 igpm by a 10 by 12 inch pump powered by a Cat 3208 diesel engine. Effluent was settled in two large in-stream ponds spanning the valley width below the mining operation. Tailings were ramped by the D9H bulldozer on both sidewalls of the valley. A cut 150 to 175 feet wide, encompassing the entire valley bottom, and 700 feet long was mined. All the gravel and 3 feet of bedrock were sluiced. At the end of the season, stripping of the 1984 cut was begun. Work continued at the property during 1984 in a cut 1,000 feet long. Approximately 50,000 cu.yd. of material were stripped, and an additional 50,000 cu.yd. of material were sluiced.

Gold from this property is reported to be almost entirely fine grained, and to have a fineness of 660. Gold recovered downstream from the current operation had a fineness of 690. Some crystalline gold is present.

H. Kruger (63)
Sulphur Creek 115 O 10
1983, 1984 (Klondike)
63°42'N 138°47'W

This property is located along the right limit of Sulphur Creek, approximately 5.5 miles upstream from its confluence with Dominion Creek. Deposits present are 30 to 32 feet thick, and consist of 10 to 16 feet of frozen black muck with abundant tree remains overlying 4 to 10 feet of sand and bouldery sand, 4 feet of brown gravel, and 8 feet of quartz-rich gravel. The deposits lie along the margin of tailings from earlier dredging operations.

Mr. Kruger mined at this property in 1983 and 1984 using a Hough 120 loader equipped with a 6 cu.yd. bucket, a Cat D7E bulldozer, a Cat 955 Traxcavator, and a 605 dragline. He used the loader and the bulldozer to strip overburden. The 605 dragline was used to do ditching work, and to mine and stockpile pay gravel. Only the quartz-rich gravel was considered to be pay gravel. The Traxcavator was used to feed the sluicing plant, which consisted of a dump box and 3 run sluice box. The main sluice run was 36 inches wide and 36 feet long, and was lined with 3 inch riffles and coco matting. The side runs were 48 inches wide and 20 feet long, and were lined with expanded metal and coco matting. Material was processed at a rate of 30 to 50 cu.yd. per hour. Tailings were stacked by the loader. Water used for sluicing in 1983 consisted only of seepage water pumped from the cut by a 6 inch pump powered by a Ford industrial gas engine. A shortage of water was reported to be common. In 1984, additional water for sluicing was pumped from Sulphur Creek by a 6 by 6 inch Monarch pump run by a 240 Ford engine. Sluice water was returned by a ditch upstream and by seepage to the pump for recirculation. A cut 50 feet wide and 140 feet long, and up to 32 feet deep was worked each year. The cuts were worked without a drain.

Teck Corp. (64)
Sulphur Creek 115 O 10
1983, 1984 (Klondike)
63°44'N 138°50'W

This property is located immediately downstream from the mouth of Brimstone Gulch, along the middle portion of Sulphur Creek. Deposits present consist of up to 30 feet of frozen black muck overlying 6 feet of gravel and decomposed to blocky schist bedrock.

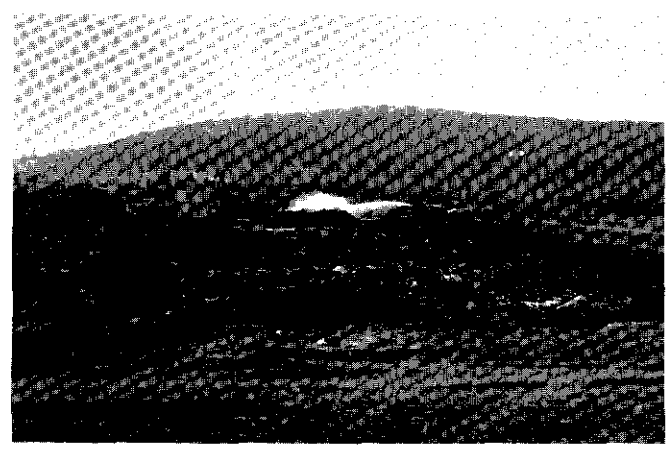


Figure 11: Stripping at the Teck Corp. property on Sulphur Creek. The bulldozer rips the muck, which is then washed away by water from the monitor. (J.H. '84)

Mining operations carried out in 1983 and 1984 were on a large scale. During 1984, 21 people worked at the property on two shifts, using 3 Cat D8K bulldozers, 4 Cat 627B scraper-loaders with 21

cu.yd. capacity, 1 Cat 235 hoe, 1 Cat 966 loader, 1 Cat 40G grader, and several 6 inch monitors to strip and mine the cut. They did stripping on two shifts, using the monitors and bulldozers. Mining was done on one shift, using the scrapers, bulldozers, and hoe. The entire section of gravel along with a few feet of bedrock was brought to the sluicing plant area by the scrapers, and stacked by bulldozer so the loader could feed the sluicing plant. Sluicing was done at a rate of 125 to 140 cu.yd. per hour by the sluicing plant, which consisted of a hopper with level conveyor feed to a vibrating screen deck, and modified model 300 Ross three run sluice box. Material less than 1 inch in diameter passed through the vibrating screen into the dump box, while the oversize was carried away by a conveyor to a stockpile for removal. Punch plate with 3/4 and 5/8 inch holes was used in the dump box to separate material for the side runs. Punch plate with half inch holes was used in the main run, and punch plate with 1/4 inch holes was used at the lower ends of the side runs. Water for sluicing and stripping was kept separate. Stripping water was pumped from a pond filled by water from Brimstone Gulch, and drained through a channel around the cut. Sulphur Creek also flowed through the channel. Effluent flowed downstream to a series of large settling ponds, some of which were up to 1,000 feet long. Water returned to the Sulphur Creek channel by seepage through dredge tailings. Water for sluicing was recycled at a rate of 3,500 igpm from a pair of settling and recirculation ponds. Make-up water was added by pumping seepage from the cut. Two 10 by 12 inch Morris slurry pumps powered by Cat 3406 engines, and one 8 by 10 inch Morris pump powered by a Cat 3206 engine were used to pump the water. Tailings were removed by the scrapers and bulldozers, and were used to build berms and dikes defining settling ponds for future use. In 1983, approximately 400,000 cu.yd. of black muck were stripped, and 230,000 cu.yd. of material were sluiced. In 1984, there were 323,330 cu.yd. of material stripped, and 125,567 cu.yd. of material sluiced.

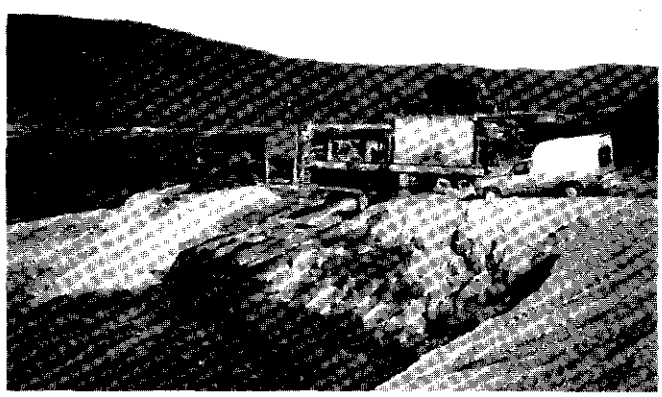


Figure 12: Sluicing plant being fed by loader at Teck Corp. mining operation on Sulphur Creek. (R.W. '84)

R. Gibson (65)
Lucky Lady Placers 115 O 10
Sulphur Creek (Klondike)
1983, 1984 63°44'N 138°51'W

This property is located along the right limit of Sulphur Creek, approximately 1,500 feet upstream from the mouth of Brimstone Gulch. Deposits present consist of up to 20 feet of frozen black muck overlying 7 to 8 feet of gravel.

Mining on the property during 1983 and 1984 was done by a crew of three. They worked using a Cat D9G bulldozer to strip and stack the black muck, and a Cat 977 Traxcavator to mine the pay gravel and transport it the the sluice box. The sluice box consisted of a single sluice run with two small side runs near the bottom. The main sluice run was lined with Hungarian riffles, and one small section had 1/2 inch punch plate over the riffles. It was set at a gradient of 2 inches to the foot. The side runs were lined with expanded metal and matting. They were set at a gradient of 1 inch to the foot. A monitor operated by a box tender was used to wash the gravel into the sluice box. Water for sluicing was provided at a rate of about 1,300 igpm by a 5 by 6 inch pump powered by a 471 Jimmy engine. Effluent from sluicing was directed upstream along the creek valley to a small, deep settling/recycling pond just upstream from the sluice box.

Abundant pyrite present in the deposits at this location was reported to cause problems with packing of the riffles in the sluice.

D. Gritzka (66)
Sulphur Creek 115 O 15
1983, 1984 (Klondike)
63°47'N 138°54'W

This operation is located on the left limit of Sulphur Creek, immediately downstream from the mouth of Friday Gulch. As mining has gone on at this site over the years, the cut has progressed farther into the bank, and away from the creek. Deposits being mined in 1983 and 1984 were up to 30 feet thick, and consisted of up to 20 feet of mixed black muck and silt with gravel lenses, overlying 10 feet of brown gravel and blocky weathering bedrock.

Mining was carried out in 1983 and 1984 by Mr. Gritzka and several partners using a Komatsu D65E bulldozer, a Cat D8H bulldozer, and a monitor. The upper part of the black muck layer was stripped hydraulically using water pumped through the monitor at a rate of 1,500 igpm. The remainder was stripped by bulldozer. The entire section of brown gravel was mined by bulldozer, and sluiced in a sluicing plant with dump box and three run sluice box. Sluicing was done at a rate of 80 to 100 cu.yd. per hour. The main sluice run was 24 feet long and 24 inches wide, and each side run was 14 feet long and 18 inches wide. The main run was lined with punch plate of various sizes and configurations set over riffles, expanded metal, and coco matting. The side runs, which received material less than 3/8 inch in diameter, were lined with expanded metal over coco matting. Sluicing water was pumped from a settling-

recirculation pond and introduced into the dump box with a monitor. During 1984, approximately 133,000 cu.yd. of material were stripped, and 22,200 cu.yd. of material were sluiced.

Gold recovered from this property was reported to be fine-grained.

R. Brisebois (67)
Sulphur Creek 115 O 15
1984 (Klondike)
63°47'N 138°49'W

This operation is located on the left limit of Sulphur Creek, just upstream from the mouth of Friday Gulch. Deposits present consist of patches of material left behind by Sulphur Gold Mines in the area of their 1983 cut.

Work on the property was begun in 1984. Early in the season, Mr. Brisebois worked alone. He mined by hand, and washed the material mined in a single run sluice box 12 feet long and 14 inches wide. Water for sluicing was recycled from a small pond by a 2 inch pump. Part way through the 1984 season, a second person joined Mr. Brisebois on the property. The second person brought with him a 1954 Ford tractor with backhoe attachment. Mining continued using the backhoe. Material mined was processed in the sluice box, to which a 12 inch pulsating jig was added at the end. A 1 1/2 inch pump provided water for the jig. Material was processed by the sluice and jig setup at a rate of approximately 10 cu.yd. per hour.

Sulphur Gold Mines (68)
B. Pierson 115 O 15
Sulphur Creek (Klondike)
1983, 1984 63°47'N 130°50'N

This property is located along the left limit of Sulphur Creek, approximately 1,500 feet upstream from the mouth of Friday Gulch. The deposits being worked are part of the left limit bank, and consist of up to 25 feet of black muck overlying up to 15 feet of gravel. Bedrock is blocky-weathering to decomposed schist. Evidence of old underground mining is present.

During 1983 and 1984, four people worked using a D9G bulldozer to strip material, feed the sluice box, and stack tailings. All but the lowermost 12 feet of material were stripped. The sluice box consisted of a single run, and was used with a dump box and no grizzly. Water for sluicing was provided at a rate of 1,500 igpm by a 6 by 8 inch pump powered by a Cummins 220 engine. The water was introduced into the dump box with a monitor.

M. Crockett (69)
Sulphur Creek 115 O 15
1983, 1984 (Klondike)
63°48'N 138°56'W

This property is located along Sulphur Creek, approximately 3,000 feet upstream from the mouth of Meadow Gulch. The Sulphur Creek valley is approximately 350 feet wide, and has moderate to steep slopes. Deposits present are variable. In the area mined in 1983, deposits along the left limit were predominently of black muck, while those along the right limit were 18 feet thick, and consisted of 2 feet of earth over 8 feet of fine gravel with quartz cobbles up to 2 inches in diameter, 4 feet of silt with some sand, and 4 feet of sand and fine grey-brown gravel. Bedrock was blocky weathering chlorite schist.

Mining in 1983 was done by three miners using two Cat D8 bulldozers, and one Cat D9H bulldozer. Two cuts totalling 340 feet wide and 340 feet long were taken side by side across the entire width of the valley bottom. Black muck overburden from along the left limit was removed hydraulically, while silt, sand, and gravel overburden from along the right limit was stripped using the bulldozers. At least part of the stripping was completed in 1982. Material mined was processed in a washing plant consisting of a side-fed dump box 20 feet long and 11 feet wide, and a three channel sluice box. The lower 10 feet of the dump box were lined with punch plate with 1/2 and 3/4 inch holes, over expanded metal and coco matting. A monitor with a 6 inch tip was mounted at the throat of the dump box. The main run of the sluice was 40 inches wide and 30 feet long. It was lined with perforated riffles over coco matting. The side runs were 24 inches wide and 12 feet long, and adjoined the lower end of the main run of the sluice box. They were lined with expanded metal and coco matting. Water for hydraulicking and sluicing was provided by two 10 by 12 inch pumps powered by Jimmy 471 and 671 engines. Hydraulic and mechanical stripping of an area of approximately the same size as the 1983 cuts was done in preparation for the 1984 mining season. Mining in 1984 was done in the same manner as in 1983, although a new washing plant was used to process the material mined. The new unit consisted of a dump box lined with punch plate with 1/2 inch holes, and a three run sluice box similar to a Pearson "Rock" box, although with shorter sluice runs. The main run was lined with 2 inch Hungarian riffles over expanded metal and matting. The riffles had holes drilled in the tops. The side runs were lined with expanded metal over matting. The tail race and the settling pond were bailed out by a dragline. Hydraulic and bulldozer stripping were done in preparation for the 1985 season.

Meadow Gold Placers Ltd. (70)
Sulphur Creek 115 O 15
1983, 1984 (Klondike)
63°49'N 138°56'W

This property is located along the upper reaches of Sulphur Creek, approximately 5,000 feet upstream from the mouth of Meadow Gulch. Deposits present consist of 30 to 40 feet of frozen black muck overlying 5 to 8 feet of grey gravel. Bedrock is slabby to platy weathering chlorite schist and muscovite-quartz schist.

Work in 1983 was carried out by three people working in the cut, with one or two helpers in camp.

They mined using two early model Cat D8 bulldozers, a Cat D6C bulldozer, and a dragline with .5 cu.yd. capacity bucket. The D8 bulldozers were used for most work. During stripping, the frozen muck was ripped, and pushed into the previous cut. During mining, the material to be sluiced was pushed by one machine from the back of the cut to within reach of the second machine, which fed the sluice. Two cuts were mined in 1983. The first was 70 feet wide and 400 feet long, while the second was 100 feet wide and 300 feet long. All the gravel and 5 feet of bedrock were sluiced at a rate of approximately 150 cu.yd. per hour in a sluicing plant which consisted of a side-fed dump box 8 feet wide and 30 feet long, and two sluice runs. The dump box was lined with punch plate over expanded metal and coco matting. Material screened by the dump box punch plate was sluiced in the dump box, and then entered the side run. The side run was 30 inches wide for its upper 10 feet, and 18 inches wide for its lower 10 feet. It was lined with expanded metal and coco matting in some sections, while other sections were lined with 1/4 and 1/2 inch square mesh over coco matting. The operators stated a preference for the mesh for its ability to hold fine-grained gold. Coarse material was washed in the main run, which was 36 inches wide and 20 feet long, and was lined with riffles ranging between 2 1/4 and 3 inches in size over expanded metal and coco matting. Both the main run and side run were set at slopes of 3 inches to the foot. Water for sluicing was gravity-fed by way of a series of ponds and ditches. Final delivery was via two large diameter pipes, flattened at the end to provide a nozzle effect. Operations in 1984 were similar to those in 1983, except that a 10 by 12 inch pump powered by a UD18 motor was used to supply water to the sluice box at a rate of approximately 3,000 igpm by way of a 6 inch monitor mounted below the dump box. Late in the season, recirculation of sluicing water was begun. Material to be sluiced was pushed into the dump box at a slight angle to allow a buildup of material at the head of the dump box. This gave the monitor operator enough material to wash until the next bladeful was delivered. The rate of sluicing was slowed to about 50 cu.yd. per hour to allow for a more consistent wash in the dump box.

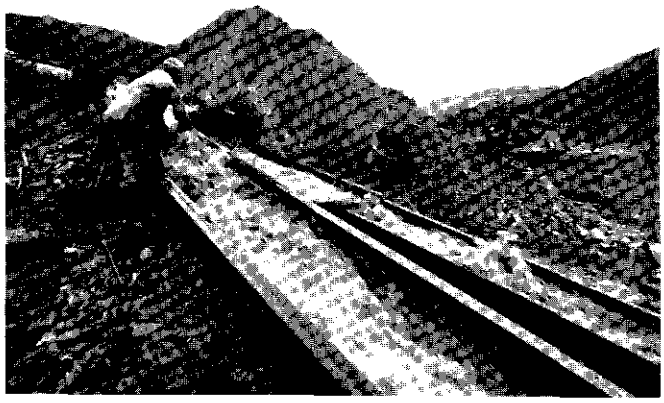


Figure 13: Sluicing at Meadow Gold Placers Ltd. property on Sulphur Creek. (L.O. '83)

D. Morgan (71)
Green Gulch 115 O 15
1983, 1984 (Klondike)
63°50'N 138°55'W

This property is located along Green Gulch, approximately 2,600 feet upstream from its confluence with Sulphur Creek. The valley bottom in the area is 200 feet wide, and has moderately sloping sidewalls. Deposits present are 20 to 25 feet deep, and consist of black muck, and silt with a few gravel lenses overlying a few feet of gravel.

Two people worked in the cut during 1983, with a third person active in camp. They mined an area of approximately 9,000 square feet, using a Cat D8H bulldozer to strip overburden and stockpile pay material, and a Terex loader with 2.5 cu.yd. bucket to feed the sluice box. A Cat D4-7U bulldozer was used to feed the sluice box when the loader was inoperative. The sluicing plant consisted of a dump box 6 feet wide and 16 feet long, and a single sluice run 20 inches wide and 20 feet long. The sluice run was lined with 1 1/4 inch riffles over coco matting. Water for sluicing was pumped to the sluice box at a rate of 1,000 igpm from a settling/recirculation pond 1,000 feet downstream from the sluicing plant by a 5 by 6 inch pump powered by a Cat engine. The water entered the dump box directly from the end of a 6 inch diameter pipe. No manifold was used. Make-up water was stored in a small reservoir fed by both forks of Green Gulch, approximately 1,000 feet upstream from the cut. A Cat D7-17A bulldozer was used to remove tailings. Because of insufficient drainage, the cut was worked wet. A very sticky type of gravel which was present proved difficult to wash because of the wetness. Work continued during 1984, when a drain was dug for the cut, and also to act as a tail race for sluice box effluent. The same sluice box was used as in 1983, but a monitor was added to direct water into the dump box.

Ballarat/Tatlow Joint Venture (72)
Quartz Creek 115 O 14
1983, 1984 (Klondike)
63°49'N 139°03'W

This property is located along the upper reaches of Quartz Creek, at the mouth of Mack Fork.

Work on this property was begun in 1983 by 4 to 6 members of the Ballarat/Tatlow Joint Venture crew of miners who worked with the aid of other workers in camp. They worked using a Cat D9L bulldozer. In 1984, a crew of 9 people working on two twelve hour shifts used the D9L bulldozer to mine a cut of about 200,000 square feet proceeding upstream from the mouth of Mack Fork, and to do stripping upstream from the cut in preparation for future mining. The material mined was washed at a rate of approximately 250 cu.yd. per hour in a sluicing plant consisting of a dump box, and three run sluice box. The dump box, which was 14 feet wide and 24 feet long, was side fed by the bulldozer. Material fed to the dump box was washed by a monitor with 4 inch tip, and spray monitor with fourteen high pressure 2 inch jets. The material was classified by punch plate near the throat of the dump box. Material less than

1/2 inch in diameter was sluiced in the side runs, while material more than 1/2 inch in diameter was sluiced in the main run. The side runs were 48 inches wide and 24 feet long. The top 2 feet of the side runs were lined with several layers of expanded metal, facing different directions. Smaller sizes of metal were used near the bottom of the stack. The next 6 feet were lined with 1 inch riffles alternately spaced 1 or 2 inches apart. The lower 16 feet of the runs were lined with either a single or double layer of expanded metal. Coco matting was used the entire length of the side runs. The main run was 40 inches wide and 24 feet long, and was lined with 3 inch riffles angled back, with coco matting underneath. The side runs were set at a gradient of 1 1/2 inches to the foot, while the main run was set at a gradient of 3 inches to the foot. Approximately 4,000 igpm of water per minute were provided for sluicing by a 12 by 14 inch Morris pump powered by a 6 cylinder Cat 3406 diesel engine. Water from sluicing was settled in a pond approximately 500 feet wide and 1,500 feet long located more than 2 miles downstream from the cut.

W. Rasmussen (73)
Little Blanche Creek 115 O 14
1983 (Klondike)
63°49'N 139°04'W

This property is located along the right limit of Little Blanche Creek at its confluence with Quartz Creek. Deposits present consist of silt and black muck overlying gravel. Bedrock is blocky weathering schist.

A cut 40,000 square feet in size was begun at this location by Mr. Rasmussen in 1983, but mining efforts were abandoned due to uneconomic grade after only a small amount of material was mined. Water, and a Bucyrus-Erie dragline with 1.75 cu.yd. bucket were used to do stripping. Mr. Rasmussen did not mine on the property during 1984.

Ballarat/Tatlow Joint Venture (74)
Quartz Creek 115 O 14
1983, 1984 (Klondike)
63°49'N 139°04'W

This property is located along the right limit of Quartz Creek, immediately downstream from the mouth of Little Blanche Creek.

Work on this property was done during the spring of 1983, when one cut was mined. Work was continued in 1984 by a few members of the Ballarat/Tatlow Joint Venture crew. They used a Cat D9L bulldozer to strip a 12 foot thickness of gravel from a cut 125 feet wide and 500 feet long.

Ballarat/Tatlow Joint Venture (75)
Quartz Creek 115 O 14
1984 (Klondike)
63°48'N 139°04'W

This property is located along the middle part of Quartz Creek at the mouth of Claffey Pup.

Work at this location was done during 1984 by members of a crew of 9 who worked on two shifts. They used a D9L bulldozer to mine a cut 130 feet wide and 600 feet long. A ten foot thick section of gravel, and two feet of bedrock were washed at a rate of approximately 250 cu.yd. per hour in the same sluicing plant as was used at the cut on Quartz Creek at the mouth of Mack Fork. Water from sluicing was settled in a pond approximately 500 feet wide and 1,500 feet long located downstream from the mouth of 19 Pup. Fifteen feet of gravel were also stripped from two cuts on the right limit bench along Quartz Creek, at the mouth of Claffey Pup. Each cut was 125 feet wide and 500 feet long. They were along the edges of a cut mined by a previous operator in the area

Ballarat/Tatlow Joint Venture (76)
Quartz Creek 115 O 14
1984 (Klondike)
63°48'N 139°05'W

This property is located along the right limit of Quartz Creek, between Claffey and 19 Pups. Deposits present lie on a bench 40 feet above the present creek level, and are up to 80 feet thick. They consist of a thin layer of organic material and soil, overlying brown gravel and quartz rich white gravel similar to the White Channel gravel of Hunker and Bonanza Creeks. Scour features, and a discontinuous layer of organic material are present at the interface between the brown and white gravel units. The lowermost 8 to 14 feet of the quartz-rich white gravel are gold bearing. Bedrock is blocky-weathering schist.

Work was carried out at this location during 1984 by members of a crew of 9 miners working on two shifts. They used a Cat D9L bulldozer and a second bulldozer to mine a cut 100 feet wide, 240 feet long, and averaging 80 feet deep. The lowermost 8 feet of gravel and 2 feet of bedrock, or approximately 9,000 cu.yd. of material, were sluiced in the same sluice plant as was used at the cut on Quartz Creek at the mouth of Mack Fork. Water from sluicing was settled in a pond approximately 500 feet wide and 1,500 feet long located downstream from the mouth of 19 Pup. Stripping was done on a second cut at this location in preparation for sluicing in 1985. A layer of gravel approximately 70 feet thick was stripped from a cut 165 feet wide, and 1,300 feet long.

Ballarat/Tatlow Joint Venture (77)
Quartz Creek 115 O 14
1983 (Klondike)
63°49'N 139°04'W

This property is located on a right limit bench along Quartz Creek at the mouth of 19 Pup.

Work was done at this location during the fall of 1983 by members of a crew of 4 to 6 miners working on two shifts, with the aid of helpers in camp. They mined a cut 200 feet wide and 300 feet long using a D9L bulldozer. Material mined was sluiced in the same sluice plant as was used at the cut on

Quartz Creek at the mouth of Mack Fork. Water from sluicing was settled in a pond approximately 500 feet wide and 1,500 feet long located downstream from the mouth of 19 Pup.

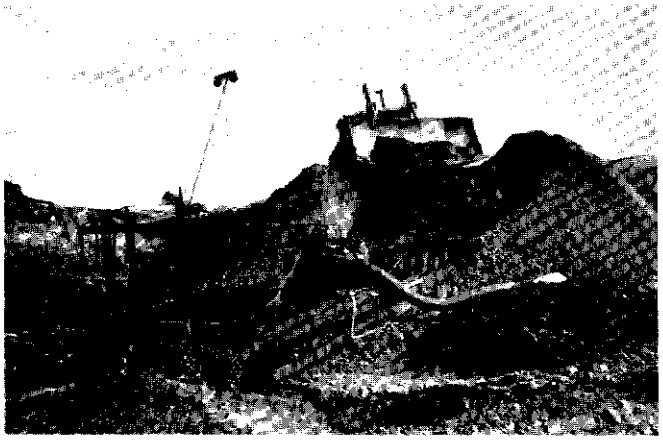


**Figure 14:** Sluicing plant at the Ballarat/Tatlow Joint Venture property at the mouth of 19 Pup. (L.O. '83)

**Ballarat/Tatlow Joint Venture** (78)
**Quartz Creek** 115 O 14
**1983** (Klondike)
63°48'N 139°07'W

This property is located on a right limit bench along the lower reaches of Quartz Creek, approximately 2,500 feet downstream from the mouth of 19 Pup. Deposits present consist of 30 to 40 feet of barren gravel, which were stripped by a previous operator, overlying 10 feet of gold-bearing gravel similar to the White Channel gravel of Hunker and Bonanza Creeks.

Work at this site was done in 1983 by 2 to 3 miners working on each of 2 shifts, with the aid of other workers in camp. They used a Cat D9L bulldozer to mine the remaining 10 feet of gravel and 2 feet of bedrock. The material mined was sluiced in the same sluice plant as was used at the cut on Quartz Creek at the mouth of Mack Fork. Water for sluicing was provided by a 12 by 14 inch Morris pump powered by a 6 cylinder Cat 3406 diesel engine, and was delivered to the plant by way of 1,000 feet of 10 and 12 inch pipeline. The water was taken from a small pond in the middle of the Quartz Creek valley tapping Quartz Creek directly. It was not recirculated, but was settled in a large pond along Quartz Creek downstream from the mouth of 19 Pup.

**Ruth-Ris Holdings** (79)
**Indian River** 115 O 14
**1983** (Klondike)
63°45'N 139°08'W

This property is located along the right limit of Indian River just downstream from the mouth of Quartz Creek. It is located in the flat valley bottom, and not on a bench. Deposits present consist of 1 to 3 feet of black muck and vegetation overlying approximately 12 feet of gravel. The gravel is a cobble gravel with few clasts larger than 6 inches in diameter.

Some mining was done at this location early in the 1983 season by P. Risby. He worked with one helper in the pit and one helper in camp, using a Cat D8H bulldozer to mine, and one Fiat Allis 945 loader with 7.5 cu.yd. bucket to feed the sluicing plant. Mr. Risby moved his operation to a location approximately 4,000 feet downstream from this site part way through the 1983 season.

Ruth-Ris Holdings (80)
Indian River 115 O 11
1983, 1984 (Klondike)
63°45'N 139°08'W

This property is located along the left limit of the Indian River, approximately 4,200 feet downstream from the mouth of Quartz Creek. Although on the left limit of the river, the operation is still along the right side of the very broad Indian River valley. It is situated in a cutoff meander, or abandoned oxbow channel. Deposits present are 12 feet deep, and consist of 6 feet of barren silt overlying 6 feet of gold-bearing reddish gravel. Permafrost is discontinuous. Bedrock consists of lower Cretaceous quartz-pebble conglomerate with thin coal seams.

Work on the property during 1983 was done by 3 people, with two working in the pit and one in the camp. They used a Cat D8H bulldozer equipped with a straight blade to do stripping and push tailings, and a Fiat Allis 945 loader equipped with a 7.5 cu.yd. bucket to feed the sluicing plant at a rate of approximately 50 cu.yd. per hour. The entire section of gravel was sluiced. The sluicing plant consisted of 2 sluice boxes set up in series. The gravel was fed into a dump box 10 feet wide and 12 feet long lined with slick plate, and washed by water from a manifold into a single sluice run 32 inches wide and 20 feet long. The sluice run was lined for its entire length with punch plate with 3/8 inch holes suspended 2 inches above 6 layers of expanded metal set on coco matting. The expanded metal was used instead of riffles to avoid problems with packing of the riffles. Material discharged from the end of the first sluice box into the dump box of the second. No extra water was added. The dump box of the second sluice box was 15 feet wide and 15 feet long, and was lined with punch plate with 1/2 inch holes. Undersize material was divided between two side runs 48 inches wide and 17 feet long for sluicing. Oversize material was sluiced in the main run, which was 36 inches wide and 28 feet long. The upper 6 feet of the main run were lined with punch plate. Water for sluicing was pumped approximately 300 feet from Indian River by a 10 by 12 inch pump powered by a Cat 4 cylinder 3304 diesel engine. Effluent was directed into a low swamp, where it settled. As the cut had no drain, an 8 by 10 inch pump powered by a 6 cylinder Cummings diesel engine was used to pump it out when it flooded. Work continued at the property during 1984, using the same equipment as in 1983 plus a Cat D8-14A

bulldozer and a Hough 120 loader. The bulldozers were used to do stripping, and loosen the pay gravel. The loaders were used to feed the sluice plant, and remove tailings. Only the three channel sluice box was used in 1984. The dump box was extended to 12 feet wide and 24 feet long, and a gold trap was added to it. As the work progressed, the old cuts were made into settling/recirculation ponds so that water was no longer pumped dirctly from Indian River. One person worked with a 4 inch suction dredge in the cut during 1984, where a pond had been scooped out to float it. Material for sluicing was transported to the dredge by loader.

Gold from this property was reported to be chunky, and to have a fineness of 760 to 796.

V. Trainer (81)
Alcar Construction Ltd. 115 O 11
Indian River (Klondike)
1983, 1984 63°45'N 139°09'W

This property is located along the right limit of Indian River, approximately 4,500 feet downstream from the mouth of Quartz Creek. Deposits present are approximately 18 feet deep, and consist of vegetation and black muck over silt and gravel.

Work on the property was done in 1983 by Mr. Trainer with one helper. They used a Cat D8H and a Cat D8K bulldozer to do stripping, and a John Deere 644B loader to mine and feed the sluice box. The gravel was processed in a "Ross" type sluice box with three runs 36 inches wide and 20 feet long. This operation was active for only a few weeks. Midway through the 1984 season, Alcar Construction Ltd. began work at this location. Three people used a Cat model 19A-D9 bulldozer with cable blade to strip the muck, and a Cat 988 loader to mine the gravel, feed the sluice plant, and stack tailings. Ground water seeping into the pit was a problem. The sluice plant consisted of a dump hopper with conveyor feed to an elevated vibrating screen deck where washing began. Oversize material was sent to the tailings, and undersize was sluiced. The sluice run was basically a single run, but it was set up in an over-and-under switch-back configuration. The final sluice section was 48 inches wide and 16 feet long, and had hydraulically driven pulsating riffles. Water for sluicing was pumped from a diversion of the Indian River by a 4 inch pump run by a gas engine. All sluicing water was introduced at the screen deck, but little water was needed to run the plant. The effluent was settled in P. Risby's old cut, which had filled with water. Water returned to the Indian River by seepage.

A. Heikilla (82)
Little Blanche Creek 115 O 14
1983, 1984 (Klondike)
63°51'N 139°05'W

This property is located along the Right Fork of Little Blanche Creek approximately 500 feet upstream from its confluence with the Left Fork. It is situated on a left limit bench approximately 40 feet above the current creek, and about 200 feet from it. Deposits present are 12 to 16 feet deep, and consist of 2 feet of vegetation, earth, and black muck overlying brown gravel. Tailings from old hand workings are present along the left limit bench, and in the creek valley.

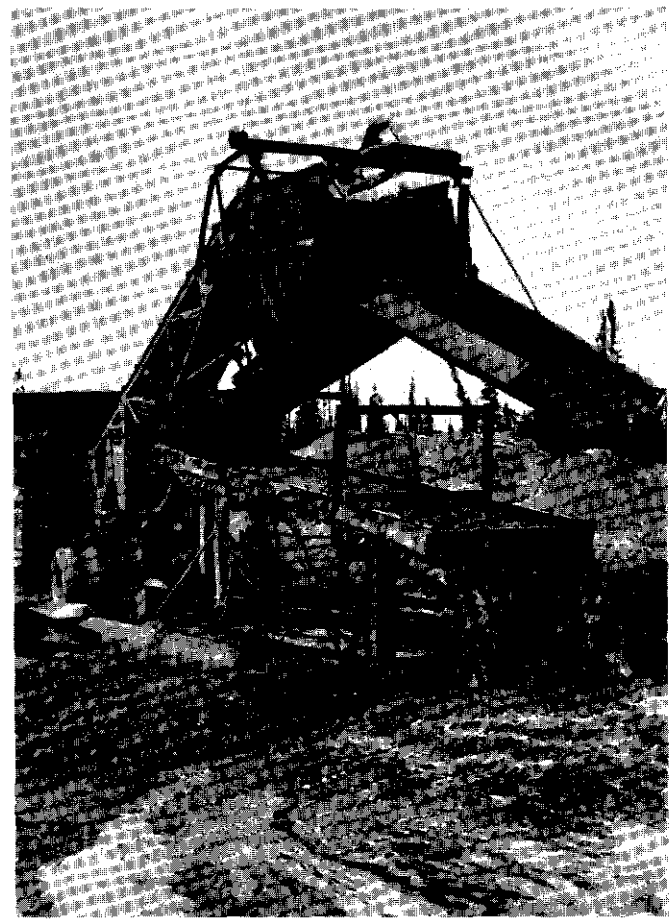


Figure 15: "Over-and-under" sluicing plant used along the right limit of Indian River by Alcar Construction Ltd. (R.W. '84)

Work at this property at the start of the 1983 season was done by H. Algotsson and A. Heikilla using two Cat D6-9U bulldozers. Part way through the season, Mr. Algotsson was replaced by R. Berglund. They were later joined by H. Leidtke and J. Erickson, who brought with them a Cat D8H bulldozer and a Cat 966 loader equipped with a 3.5 cu.yd. bucket. A cut 60 feet wide, 160 feet long and 12 feet deep was mined. Sluicing was done in a unit with side feed dump box and single sluice run. The dump box was 11 feet wide and 23 feet long, and was lined with punch plate with 3/8 inch slotted holes over coco matting. The sluice run was 40 inches wide and 40 feet long. The top half was lined with 2 inch riffles, while the bottom half was lined with 1 1/2 inch riffles. The box was set at a gradient of 2 1/4 inches to the foot. Water for sluicing was provided by a 10 by 12 inch pump powered by a Cat D8-14A 6 cylinder diesel engine. It was recycled from a settling/recirculation pond downstream from

the sluice box. Stripping in preparation for later mining was also done. Work at the site continued in 1984. Mr. Heikilla worked with H. Liedtke and J. Erickson at the start of the season, and with other helpers individually during the rest of the season. Equipment used at the start of the season was as in 1983, but at the end of the season, a Cat D6C bulldozer was used to mine, and a 6 inch pump powered by a gasoline engine was used to provide water for sluicing. Sluicing water was recirculated from a small settling pond immediately downstream from the sluicing plant. Overflow from the small pond was further settled in a pond 150 feet wide and 1,000 feet long, located several claim lengths downstream from the mining operation. Three cuts totalling approximately 100,000 square feet were mined in 1984, and 3 to 5 feet of gravel and 1 foot of bedrock from each were sluiced.

**Figure 16:** View looking downstream along Little Blanche Creek over A. Heikilla property to Quartz Creek. (L.O. '83)

**Eldorado Placers** (83)
**D. Langtree** 115 0 14
**Eldorado Creek** (Klondike)
**1983, 1984** 63°52'N 139°14'W

This property is located along the upper reaches of Eldorado Creek, approximately 2,500 feet upstream from the mouth of Chief Gulch. Deposits along the creek are 14 to 24 feet thick, and consist of 7 to 20 feet of black muck with silt, slide rock, and organic debris, overlying 4 to 7 feet of sandy gravel with angular clasts, and decomposed fragmented schist bedrock. Remnants of shafts and drifts left by early underground miners are common. The valley is narrow, and has moderately steep side walls. The section of muck and gravel thins out upstream.

Work at this property was done in 1983 by Eldorado Placers. Two people worked in the cut with the aid of a third person in camp. They used two Cat D8H bulldozers for all work. Two cuts in series were mined during the season. The second cut was 60 feet wide and 280 feet long. Black muck was removed using water. The gravel was then ripped to bedrock, and thawed with the monitor. After thawing, it was stacked to dry before sluicing. Two feet of bedrock were sluiced along with the gravel. The sluicing plant consisted of a dump box 8 feet wide and 24 feet long, and a single sluice run 30 inches wide and 25 feet long. The dump box was lined throughout with punch plate set over expanded metal or square screen on matting, and the sluice run was lined with 3 inch riffles over matting. The gradient of the sluice run was 2 1/2 to 2 3/4 inches to the foot. Water for sluicing was provided by a 10 by 12 inch Peerless pump powered by a Cat 3306 6 cylinder diesel engine, and was recirculated from a recirculation pond below three large settling ponds. In addition to mining two cuts, Eldorado placers did stripping in preparation for 1984 mining activities at this site. Eldorado Placers was also active on Chief Gulch during the 1983 season. D. Langtree and one helper worked at this property during 1984 using a Cat D7 bulldozer. Black muck was stripped from the cut with water, after which 3 to 4 feet of gravel were pushed to the side limits of the valley by the bulldozer. Three cuts each 75 feet wide, totalling 750 feet long were mined. The lowermost 3 feet of gravel, and 3 feet of bedrock were sluiced. The sluicing plant consisted of a side fed dump box lined with punch plate with 3/4 inch holes set over riffles, expanded metal and matting, and a single sluice run 24 inches wide and 30 feet long, also lined with punch plate, riffles, expanded metal and matting. Material was processed at a rate of 75 to 100 cu.yd. per hour with 2,000 igpm of water. The water was recirculated with a 10 by 12 inch pump powered by a 671 Jimmy diesel engine. Prior to the recirculation pond, sluice effluent was settled in 3 ponds in series. Together, the four ponds covered approximately 0.7 acres. Eldorado Placers also mined at least one cut at this location during 1984. Approximately 20 feet of black muck, silt, slide rock, and organic debris was stripped, and 4 feet of gravel and 2 feet of bedrock were sluiced.

**Eldorado Placers** (84)
**Eldorado Creek** 115 0 14
**Chief Gulch** (Klondike)
**1983, 1984** 63°52'N 139°14'W

This property is situated along Chief Gulch, and runs upstream from the confluence with Eldorado Creek. Deposits at the mouth of Chief Gulch are 44 feet thick, and consist of 40 feet of black muck overlying 4 feet of gravel.

Work at this property was done in 1983 by two people working in the cut with the aid of a third person in camp. They used two Cat D8H bulldozers for all work. Two cuts were mined. One was at the mouth of Chief Gulch, and the other was along Eldorado Creek just below the mouth of Chief Gulch. Black muck was removed using water. Two feet of bedrock were sluiced along with 4 feet of gravel. The sluicing plant consisted of a dump box 8 feet wide and 24 feet long, and a single sluice run 30 inches wide and 25 feet long. The dump box was lined throughout with punch plate set over expanded metal or square screen on matting, and the sluice run was lined with 3 inch riffles over matting. The gradient of the sluice run was 2 1/2 to 2 3/4 inches to the foot. Water for sluicing was provided by a 10 by 12 inch Peerless pump powered by a Cat 3306 6

cylinder diesel engine. Three workers continued mining for Eldorado Placers along Chief Gulch during 1984. They mined two cuts 70 feet wide totalling 800 feet long, using a Cat D9L bulldozer to strip 40 feet of black muck, and the two D8H bulldozers to feed the sluicing plant and remove tailings. Four feet of gravel and 2 feet of bedrock were processed at a rate of 160 cu.yd. per hour, using 3,000 igpm of water.

J. Simpson (85)
Gay Gulch 115 O 14
1983, 1984 (Klondike)
63°53'N 139°15'W

This property is located along Gay Gulch, approximately 2,500 feet upstream from its confluence with Eldorado Creek. Deposits present are approximately 22 feet thick, and consist of 1 or 2 feet of organic material overlying a mixed section of silt, clay, and gravel.

Work was done at this location in 1983 by 2 to 3 people, including one helper in camp. They used a Case 450 bulldozer to do stripping, and a Komatsu loader equipped with 1 cu.yd. bucket to feed the sluicing plant and remove tailings. The sluicing plant consisted of a vibrating screening deck and single sluice run. Material was screened to less than 2 inches in diameter on the 3 by 5 foot screen, and undersize was washed in the 12 inch wide sluice run. The same equipment was used to continue work during 1984. The gravel section was condensed by monitoring prior to being mined and sluiced. All effluent was settled in settling ponds at the downstream mining operation of Beron Placers.

Beron Placers Co. Ltd. (86)
Gay Gulch 115 O 14
1983, 1984 (Klondike)
63°53'N 139°15'W

This property is located along Gay Gulch, 2,000 feet upstream from its confluence with Eldorado Creek. The Gay Gulch valley is only about 60 feet wide, and has steep walls, and a steep gradient. Deposits present along the left limit of the valley are approximately 18 feet deep, and are frozen. The deposits are varied, and sections include black muck directly over bedrock, vegetation and soil directly over gravel, and mixed layers of black muck, soil, silt, and gravel. Gold-bearing gravel is reported to occur in irregular horizons at different levels in the section. Numerous shafts and drifts were dug along the left limit of the creek by early underground miners. Deposits present along the south facing right limit are thawed, and are reported to be nearly barren.

Work on the property was done by two miners in 1983. They used an 8 by 10 inch pump driven by a GM 871 8 cylinder diesel engine to provide water for monitoring, to condense the mixed section of gravel prior to mining and sluicing. A Cat D6C bulldozer was used to blade the cut, and a Cat 950 loader with a 3 cu.yd. bucket was used to feed the processing plant and to remove tailings. A Cat D4 bulldozer was used for miscellaneous work. An area approximately 500 feet long was mined along the left limit during 1983. The material mined was processed in a sluicing plant consisting of a Hewitt-Robins vibrating grizzly feeder and a single run sluice box with undercurrent. The feeder had a rated capacity of 300 cu.yd. per hour, but was used at a maximum rate of 95 cu.yd. per hour. Four spray manifolds washed the material, using 1,500 igpm of water provided by way of 2,000 feet of 10 inch aluminum pipe by a 6 by 8 inch Monarch centrifugal pump driven by a GM 471 4 cylinder diesel engine . The first two manifolds were equipped with 1 1/2 inch nozzles. The second two had high pressure 1/4 inch openings. The feeder was run by electrically driven hydraulic motors powered by a 25 HP 85 Kw generator driven by a Cat 3304 4 cylinder diesel engine. Material less than 2 1/2 inches in diameter passed through the grizzly, and into the 40 foot long sluice box. The first 25 feet were 24 inches wide, and were lined with 2 1/2 inch riffles over Nomad matting. The next 5 feet were lined with punch plate with 1/2 inch holes, and the next 10 feet were lined with slick plate. Material which passed through the punch plate fell into an undercurrent 6 feet wide and 15 feet long, which was lined with expanded metal and matting. Sluice water was recirculated. Effluent was settled in a series of 3 ponds on Gay Gulch before it reached Eldorado Creek. Once there, it was held in a small pond with 2 overflows. One led to Eldorado Creek, and the other led to the pump pond. A third pond impounding Eldorado Creek water also had two overflows. One led back to the creek, and the other led to the pump pond. The system was designed so that the pump pond did not silt in and require cleaning. Mining at the property continued in 1984. The same equipment and mining methods as were used in 1983 were used to mine an area approximately 500 feet long along the left limit of the creek.

Gold from this property is reported to be fine grained, and to have a fineness of 780. Gold with quartz adhering is common.

D. Johnson (87)
Eldorado Creek 115 O 14
1983, 1984 (Klondike)
63°52'N 139°16'W

This property is located along the middle part of Eldorado Creek, upstream and downstream from the mouth of Gay Gulch. Deposits present are up to 30 feet deep, and consist of 20 feet of black muck overlying 5 to 10 feet of gravel and blocky weathering bedrock. Tailings from previous bulldozer mining operations are also present. Some parts of the property have been mined previously using bulldozers as many as 4 times.

Work in 1983 was done by 4 miners with the help of one person in camp. Two cuts were mined along the sides of the valley downstream from the mouth of Gay Gulch. Water was used to strip the black muck. Two D8K bulldozers were used to mine the underlying 5 to 10 feet of gravel. All the gravel was sluiced along with 5 to 12 feet of bedrock. The material sluiced totalled 37,000 cu.yd. Sluicing was done in a Pearson "Rock" box at a rate of 100 to 110 cu.yd.

per hour. Water was provided at a rate of 3,500 igpm by a 10 by 12 inch Morris slurry pump driven by a Cat 3306 6 cylinder diesel engine. Mining was also done upstream from the mouth of Gay Gulch in 1983. Tailings from a cut 200 feet square which had been previously mined by bulldozer were mined and sluiced. Additional bedrock was taken, along with previously unworked material from along the sides of the old cut. Approximately 10,000 cu.yd. of material were sluiced. The same equipment was used to continue work at the site upstream from the mouth of Gay Gulch during May, June, and July, 1984. Approximately 36,000 cu.yd. of material were sluiced.

Gold from this location was reported to be coarse, and to have rough edges. Pieces with quartz adhering were common.

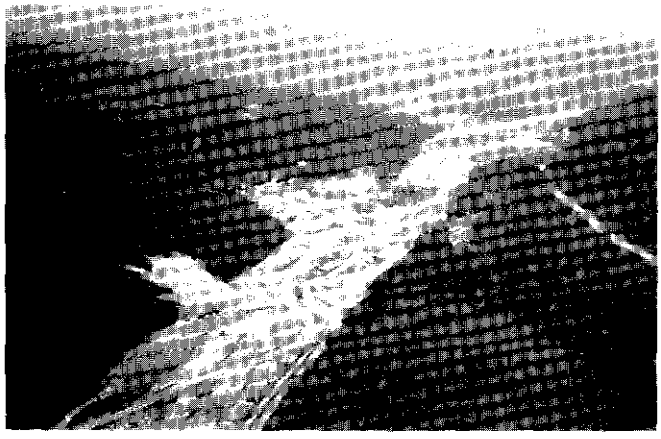


Figure 17: View upstream along Eldorado Creek to the mouth of Gay Gulch, showing the D. Johnson property, and the settling facilities of Beron Placers Co. Ltd. (R.W. '84)

D. Johnson (88)
Eldorado Creek 115 O 14
1984 (Klondike)
63°54'N 139°18'W

This property is located along the middle part of Eldorado Creek, between Little Eldorado Gulch and French Gulch. Deposits present at the mouth of Little Eldorado Gulch consist of tailings from previous dredge mining operations. Deposits along the margin of the valley just upstream from the mouth of French Gulch consist of a thick layer of frozen black muck overlying gravel.

Four people mined with the aid of one helper in camp during August and September, 1984. They used two D8K bulldozers to mine 35,000 cu.yd. of dredge tailings from an area just downstream from the mouth of Little Eldorado Gulch. The tailings were sluiced in a Pearson "Rock" box at a rate of approximately 200 cu.yd. per hour. Water for sluicing was provided at a rate of 3,500 igpm, of which 2,000 igpm was recycled, by a 10 by 12 inch Morris slurry pump driven by a Cat 3306 6 cylinder diesel engine. Work was also done in a large cut along the left limit of Eldorado Creek, just upstream from the mouth of French Gulch. The cut was stripped of black muck, and a test pit was dug to bedrock.

J. Hua (89)
Eldorado Creek 115 O 14
1983 (Klondike)
63°53'N 139°17'W

This operation is situated along the middle part of Eldorado Creek, between Gay Gulch and Nugget Gulch. The valley bottom is approximately 200 feet wide, and covered in tailings from previous bulldozer mining operations. The face along the left limit of the creek is 20 to 30 feet high, and the section there consists of 14 to 24 feet of black muck overlying 6 feet of rusty gravel. Old shaft cribbing and ladders left by early underground miners stick out from the left limit bank.

Work at this property was carried out in 1983 by two miners working on behalf of Mr. J. Hua. They used one I.H. TD-15 bulldozer, and a Cat 930 loader to mine part of a stockpile of material left on the property by a former owner. The material mined was processed in a sluicing plant consisting of a trommel with a capacity of 20 cu.yd. per hour, and three sluice runs. Undersize from the trommel was 2 inches in diameter and less. It entered a sluice run 24 inches wide and 16 feet long, and from there went into two small sluice runs with pulsating riffles for final sluicing. Water used for sluicing was seepage water which was impounded in a small right limit pond. Effluent was settled in a series of 2 small settling ponds, and was recirculated. In addition to sluicing the stockpile, efforts were made to strip the frozen black muck from along the left limit valley wall. A slurry pump was used to pump water from Eldorado Creek to a monitor, but little stripping was accomplished.

Archibald Bros. (90)
Eldorado Creek 115 O 14
French Gulch (Klondike)
1983, 1984 63°54'N 139°19'W

This property is located along the left limit of Eldorado Creek, at the mouth of French Gulch. Deposits present consist of frozen tailings up to 33 feet thick from 1927 dredging operations, and unworked ground along the left limit of the creek. Tailings from hydraulic mining operations on French Hill cover part of the unworked ground. Previously unworked ground is also present along French Gulch. Bedrock includes muscovite-quartz schist, and black pyritic carbonaceous schist.

Three miners worked at this property during 1983, using one Cat D6B bulldozer, one Cat D6C bulldozer, and one Cat 980B loader with 5 cu.yd. bucket. Material mined included dredge tailings, along with an additional foot of bedrock, and some frozen ground from outside the limit of dredging. The material mined was sluiced in a single run sluice box 36 inches wide and 24 feet long without classification system. Water for sluicing was pumped from a pond 60 feet wide and 200 feet long

fed by French Gulch. Effluent from sluicing was directed into Eldorado Creek, which at this point was already laden with silt. Work at the property continued in 1984, using the same equipment and methods as were used in 1983. Approximately 15,000 cu.yd. of material were stripped, and 30,000 cu.yd. of material were sluiced.

E. Giese (91)
Eldorado Creek 115 O 14
1983, 1984 (Klondike)
63°55'N 139°19'W

This property is located along the right limit of Eldorado Creek, approximately 1,500 feet upstream from its confluence with Bonanza Creek. Deposits present along the steep right limit bank consist of 10 feet of black muck overlying 4 to 5 feet of brown gravel mixed with fragments of bedrock.

Mr. Giese mined by hand at this property during 1983. He shovelled the material mined into a dump box 12 inches wide and 24 inches long, set at a gradient of 4 inches per foot. The dump box was lined with 1/2 and 1/8 inch screening. Material less than 1/8 inch in diameter was sluiced in a sluice run 6 inches wide and 4 feet long lined with expanded metal and coco matting. The sluice run was set at a gradient of 2 1/2 inches to the foot. A 1 1/2 inch Monarch "fire pump" was used to pump water for sluicing from a shallow settling/recirculation pond approximately 10 feet wide and 40 feet long. Mr. Giese continued mining in the same manner at the property during 1984.

F. Zlatko (92)
Ready Bullion Gulch 115 O 14
1984 (Klondike)
63°53'N 139°09'W

This operation is located along the upper part of Ready Bullion Gulch, a left limit tributary of Upper Bonanza Creek near its headwaters. The valley walls, and the gradient of the creek are both steep at this location.

Work at this property was begun by Mr. Zlatko in 1984. He used a Cat D8 bulldozer to do stripping and to mine. The material mined was processed in a small sluice box at a rate of 10 cu.yd. per hour. Water for sluicing was provided at a rate of 500 igpm by a pump powered by a Ford engine. The water was recirculated.

D. Coomes (93)
Ready Bullion Gulch 115 O 14
1983, 1984 (Klondike)
63°53'N 139°08'W

This property is situated along Ready Bullion Gulch, immediately upstream from its confluence with Upper Bonanza Creek. Deposits along the left limit of Ready Bullion Gulch, approximately 400 feet upstream from its mouth are 12 to 14 feet thick. They consist of a thin layer of soil over brown gravel with layers of black muck averaging 16 inches thick interspersed at intervals through the gravel. Six bands of black muck were present in the section in one cut. Gold values reportedly can be found in all layers of the black muck and gravel from the top to the bottom of the section. Both black muck and gravel can be found lying on the decomposed schist bedrock. The bedrock surface is irregular, with prominent reefs and hollows, and slopes into the valley wall along the left limit of the creek.

Mr. Coomes worked at the property during 1983 using a Cat 966 loader to mine, and to feed the sluicing plant. The sluicing plant consisted of a dump box lined with slick plate, and a single sluice run 48 inches wide and 26 1/2 feet long. The top 8 feet of the sluice run were lined with punch plate with 5/8 inch holes over 2 layers of expanded metal on coco matting. The bottom 4 feet of the box were lined with the same materials. The middle 14 1/2 feet of the sluice run were lined with 2 inch riffles over coco matting. The sluicing plant was set up in the centre of the Bonanza Creek valley. Water for sluicing was gravity fed from two ponds. A small storage pond on Ready Bullion Gulch fed a larger pond on Bonanza Creek, which in turn fed the sluice box via three 6 inch pipelines. Effluent was settled in a large pond downstream from the sluicing plant. All but the top 3 feet of the section was sluiced during 1983, although in other years, the entire section was sluiced. Material was sluiced at a rate of 50 cu.yd. per hour. It was transported to the sluicing plant by the loader when mined from cuts up to 400 feet away, but when mined from cuts farther than that from the sluicing plant, it was transported by dump truck. The loader then moved from the cut to the sluicing plant to feed the sluicing plant. A Cat D6-9U bulldozer was added to the operation at the end of the 1983 season. Mr. Coomes continued mining on Ready Bullion Gulch during 1984, using the bulldozer and loader. Material mined was trucked from the cut or hauled by the loader to the sluicing plant, where it was processed at a rate of 60 cu.yd. per hour. Four cuts were mined. The entire section of gravel was sluiced along with 4 to 6 feet of bedrock. Stripping of an area 40 feet wide, 100 feet long, and 12 feet deep along the right limit of Ready Bullion Gulch, approximately 1,000 feet upstream from its confluence with Upper Bonanza Creek was also done. The bulldozer and a monitor equipped with a 2 1/2 inch nozzle were used. Water was provided to the monitor by a 6 by 6 inch Marlo pump powered by a 4 cylinder Ford diesel engine. A limited amount of material was sluiced on location in Ready Bullion Gulch. Water for sluicing was provided by the Marlo pump. Effluent from this sluicing was diverted past the reservoirs used to hold sluicewater at the mouth of the creek, and into the settling pond along Bonanza creek. Only Upper Bonanza Creek water was used for sluicing during 1984.

Gold recovered from this locality was reported to be medium to coarse grained, with much of it being rounded and flattened.

J. Bryde (94)
Bonanza Creek 115 O 14
1983, 1984 (Klondike)
63°55'N 139°09'W

This property is located along Upper Bonanza Creek, approximately 700 feet upstream from the mouth of Carmacks Fork. The valley bottom is 200 feet wide. The valley wall along the right limit has a gentle slope, and the valley wall along the left limit has a steep slope. Deposits along the right limit are 6 to 10 feet deep, and consist of 3 feet of black muck and brown earth over 3 to 7 feet of brown gravel. They thin to 3 feet thick near the edge of the valley. Deposits along the left limit are thought to be deeper, as bedrock slopes toward the left limit. Bedrock is slabby schist. Two drifts left by early underground miners are present on the property.

Mr. Bryde worked at this location during 1983. He sank two exploratory shafts, averaging 10 feet deep, to bedrock during the spring to evaluate the deposits. He then rented a Cat D9 bulldozer for one hour to stockpile material from a cut 25 feet across and 18 feet deep, and including 9 feet of fractured bedrock. The material mined was sluiced in a hand fed single run sluicing plant with dump box 4 feet wide and 5 feet long, and sluice run 10 inches wide and 9 feet long. The dump box was lined with slick plate, and the run was lined with 1 inch expanded metal over 1/2 inch expanded metal over Nomad matting. Mr. Bryde continued work using an Insley dragline equipped with a 1/2 cu.yd. bucket to mine a cut 60 feet long, 5 feet wide, and 4 feet deep. The material mined was stockpiled adjacent to the sluicing plant in preparation for sluicing. Water for sluicing was gravity fed. Effluent was settled out in a pond 25 feet wide, 100 feet long, and 20 feet deep located downstream from the sluice box. Mr. Bryde continued work at this site during the winter of 1983-1984, digging three test shafts and one drift. The shafts were 7, 12, and 22 feet deep. The drift went in 5 feet from the shaft along the bedrock surface. Steam from a boiler fueled with wood was used for thawing the gravel. Timbering was not necessary. During the 1984 mining season, Mr. Bryde mined a cut 30 feet wide and 120 feet long. He used a JSW backhoe equipped with a 1 1/2 cu.yd. bucket to feed a test box a bulk sample of 80 cu.yd. and to remove the tailings. A Cat D8 bulldozer was used for a short time to strip the cut and stockpile pay. A Michigan loader equipped with 2 cu.yd. bucket was used for most of the mining work, and fed the sluicing plant at a rate of 12 cu.yd. per hour. A Cat D6-9U bulldozer was used as a standby machine. The sluicing plant consisted of a hopper with 5 cu.yd. capacity and spray bar over a vibrating screen deck which screened to 3/4 inch, and a single sluice run 36 inches wide and 24 feet long. The sluice run was lined with one layer of expanded metal over Nomad matting. The silt and upper 2 feet of gravel were stripped, and 3 feet of gravel and 3 feet of bedrock were sluiced. Sluicing water was pumped from Upper Bonanza Creek by a 4 inch Gorman-Rupp pump powered by a Lombardi 4 cylinder diesel engine.

Gold recovered from this property is reported to be of different types. Some is worn, and some is rough. Large amounts of magnetite are present in the sluice box concentrates.

J. Adam (95)
Victoria Gulch 115 O 14
1984 (Klondike)
63°54'N 139°12'W

This property is located along the upper reaches of Victoria Gulch, just upstream from the mouth of 11 Pup. The valley walls and gradient of Victoria Gulch, a left limit tributary of Upper Bonanza Creek, are steep in this area.

Work at this site was begun in 1984. Mr. Adam used a Cat D8 bulldozer for stripping and stockpiling material. An International 90 Traxcavator with 1 cu.yd. bucket was used to feed the sluice box, and to remove tailings. The material mined was sluiced in a sluicing plant with dump box and single sluice run 18 inches wide.

D. Lohse (96)
Victoria Gulch 115 O 14
1983, 1984 (Klondike)
63°54'N 139°12'W

This property is located along Victoria Gulch, approximately 500 feet upstream from the mouth of left limit tributary 7 Pup. The valley walls and gradient of Victoria Creek are steep in this area, and deposits present range from 4 to 30 feet thick.

Mr. Lohse worked at this property during 1983 and 1984 using a Case 680C loader with backhoe to do all work. Approximately 500 cu.yd. of material were stripped each year, and an additional 500 cu.yd. of material were sluiced in a sluicing plant consisting of a dump box and single sluice run 12 inches wide and 20 feet long. Water for sluicing was gravity fed by way of a 6 inch diameter pipeline.

V. Trainer (97)
Victoria Gulch 115 O 14
1983, 1984 (Klondike)
63°54'N 139°12'W

This property is located along Victoria Gulch, at the mouth of 7 Pup. Deposits present in a cut along the left limit are 30 feet thick, and consist of a mixed sequence of silt, organic debris, icy black muck, slide rock, and gravel. Large unworn boulders up to 6 by 3 by 3 feet are present in the gravel. Remnants of old underground workings left by early miners are common.

Mr. Trainer began work at this site in September 1983, after leaving his Indian River property. He continued work in 1984, with the help of 3 other people in the pit and in camp. They worked on one shift, using one Cat D8H bulldozer to strip the cut, to feed material for sluicing to a J.C.B. backhoe, and to remove tailings. A cut 800 feet long, and averaging 90 feet wide was mined in 1984. The lowermost 8 feet of the gravel section was sluiced along with 2 feet of bedrock. The J.C.B. backhoe was used

primarily to feed the sluicing plant, which consisted of a dump box with grizzly, and single sluice run. Material was fed to the grizzly at a rate of 80 cu.yd. per hour. Material less than 1 inch in diameter passed into the 8 by 16 foot dump box, and on into the sluice run, which was 24 inches wide and 20 feet long. It was lined with angle iron riffles over Astro turf, and was set at a gradient of 2 1/2 inches to the foot. Water for sluicing was provided at a rate of 1,500 igpm to the sluice manifold and monitor mounted on the dump box, by a 6 by 6 inch pump powered by a Perkins 6 cylinder diesel engine. Sluicing water was recirculated from a horseshoe shaped pond located approximiately 500 feet downstream from the sluicing plant.

Gold from this property is reported to be very rough, but to have little quartz attached to it.

E. Tritscher (98)
Victoria Gulch 115 O 14
1984 (Klondike)
63°54'N 139°12'W

This property is located along Victoria Gulch, approximately 1,500 feet upstream from its confluence with Upper Bonanza Creek.

Mr. Tritscher mined on a small scale at this property during the early part of the 1984 mining season.

J. Langevin (99)
Victoria Gulch 115 O 14
1983, 1984 (Klondike)
63°55'N 139°13'W

This operation is located approximately 1,200 feet upstream along Victoria Gulch from its confluence with Upper Bonanza Creek. The Victoria Gulch valley is narrow, and has steep side walls. Deposits exposed in a face along the right limit of the creek are 30 feet thick, and consist of black muck and ice. Deposits along the left limit are 25 feet thick and consist of 10 feet of old tailings overlying up to 15 feet of gravel.

Mr. Langevin worked at this property during 1983 and 1984 using a John Deere Model 1010 bulldozer, and a Massey Ferguson Model 30 loader/backhoe tractor. Sluicing was done in a sluicing plant with grizzly, dump box, and single sluice run. During 1983, material was screened wet on the grizzly, and particles less than 12 inches in diameter fell through into the dump box and were washed on through the sluice run. The dump box was 5 feet wide and 10 feet long, and the sluice run was 12 inches wide and 12 feet long. Approximately 800 cu.yd. of material were sluiced at a rate of 20 cu.yd. per hour during 1983. During 1984, a new vibrating grizzly was added to the old dump box and sluice run. The new vibrating grizzly screened material to less than 3/4 inch in diameter. Approximately 1,500 cu.yd. of material was mined from a cut along the left limit. The entire section of gravel was sluiced at a rate of 25 to 30 cu.yd. per hour. Water for sluicing was provided at a rate of 400 to 500 igpm by a 4 by 4 inch pump with Allis Chalmers motor drive, and was recirculated from a small pond just downstream from the the sluicing plant.

Prince Albert Mines (100)
Bonanza Creek 115 O 14
1983 (Klondike)
63°55'N 139°15'W

This property is located along Upper Bonanza Creek between right limit tributaries Homestake and McKay Gulches. Deposits present consist of tailings from old dredge mining operations in the centre of the valley, and previously unmined ground along the valley margins.

Work was done at this site in 1983 by 12 to 15 miners working for Prince Albert Mines. They used two Cat D9 bulldozers, two large back hoes, two Cat 966 loaders, and one Cat 980 loader. The bulldozers were used to mine a cut approximately 400 feet wide across the entire valley bottom, and 800 feet long. Old dredge tailings, and narrow bands of previously unmined ground along the valley margins were mined. The material mined was brought to the sluicing plant by the loaders. The sluicing plant consisted of a large trommel and sluice box, and was fed at a rate of approximately 250 cu.yd. per hour. Tailings were removed by the loaders. The sluicing plant was not moved during the course of mining.

L. Beyer (101)
Bonanza Creek 115 O 14
1983 (Klondike)
63°55'N 139°15'W

This property is located along Upper Bonanza Creek, immediately upstream from the mouth of Homestake Gulch. Deposits present consist of tailings from former dredge mining operations.

Mr. Beyer worked at this location during part of the 1983 mining season. Material mined was sluiced in a single run sluice box, with gravity fed water supplied by a 1,500 foot long 6 inch diameter pipeline from a holding pond on Homestake Gulch.

A. Roberts (102)
L. Beyer 115 O 14
Homestake Gulch (Klondike)
1983, 1984 63°56'N 139°14'W

This operation is located along the headwaters of Homestake Gulch, 8,000 feet upstream from its confluence with Upper Bonanza Creek. The creek valley is almost 200 feet wide, and has moderately sloping sidewalls, and a steep gradient. Deposits present in one cut were 10 to 12 feet thick, and consisted of 2 feet of brown organic muck with slide rock overlying 8 to 10 feet of fine, sandy gravel. Some of the gravel had bands of reddish stain. The deposits were thicker elsewhere. Tailings from early hand mining operations are present.

Mr. Roberts worked at this property during 1983 using an International 125C tracked loader to do all

work. An area 80 feet wide and 225 feet long was stripped. A pit was dug in the downstream end of the stripped area, and reached bedrock at a depth of 33 feet. Material mined was stockpiled, and the pit allowed to flood. Water in the pit was then pumped out by a 2 inch gasoline driven pump, and used for sluicing. The sluicing plant consisted of a dump box 4 1/2 feet wide and 7 feet long, and a single sluice run 12 inches wide and 12 feet long. Material was fed to the dump box from the stockpile by the loader. Work was done to construct a 4 inch diameter pipeline to supply water from a holding pond 1,500 feet upstream from the cut. Mr. Roberts continued work at the property during 1984 with the aid of L. Beyer. Water was used to strip approximately 1,800 cu.yd. of material. An additional 1,600 cu.yd. of material was mined and sluiced at a rate of 30 cu.yd. per hour.

Mac-Bry Mines (103)
Upper Bonanza Creek 115 O 14
1983 (Klondike)
63°55'N 139°17'W

This property is located on a high-level bench known as Bunker Hill, along the right limit of Upper Bonanza Creek and immediately downstream from Gauvin Gulch. Drill testing done during 1982 and 1983 indicated that deposits on the property are up to 90 feet thick at the 1,200 foot long face of an old hydraulic cut, and 72 feet thick 400 feet back from the face. The 72 foot thick section consists of 22 feet of silty overburden over 50 feet of quartz-rich White Channel gravel.

A crew of eight worked on two shifts at the property during 1983. They used one Cat D8K bulldozer to strip ground, stockpile gravel, and push tailings, and one Cat 980C loader to feed the sluicing plant. The silt and overburden were stripped along with the upper portion of the gravel section, and the lowermost 35 feet of the gravel were sluiced. The ground was frozen, although a large enough area was worked to allow thawing to keep up with mining activity. The sluicing plant consisted of a hopper with 7 cu.yd. capacity, an "RMS Ross twister" trommel, and 5 sluice trays. Material was fed first to the hopper where it was washed by water from a monitor with 4 inch tip. The gradient of the hopper was 3 inches to the foot. The monitor operator at the hopper controlled the rate of feed to the trommel, according to the level of material in the sluice trays. The trommel was 6 feet in diameter and 36 feet long, and had a washing capacity of 200 cu.yd. per hour at 9 3/4 rpm. It was set at a gradient of 1 1/4 inches per foot. The first 15 feet of the trommel provided a scrubbing action, followed by 12 feet of rubber lined punch plate which screened to 5/8 inch. The following 3 feet was lined with rubber lined punch plate with 2 inch holes. The final 4 feet carried oversize material to a discharge skid plate. A spray bar equipped with 36 3/4 inch and 6 1 1/3 inch nozzles ran the full length of the trommel, providing a secondary wash. A life expectancy of 8,000 hours, or twice that of manganese plates, was reported for the rubber lined plates. The trommel was driven by 2 bogie wheels driven by individual 110 volt electric motors. All material screened by the punch plate to less than 5/8 inch in diameter went into a single sluice run 48 inches wide and 8 feet long equipped with 2 inch pulsating riffles spaced 6 inches apart, to handle volume. To prevent packing, the riffles had slotted holes 1/3 by 1 inch spaced every 4 inches along the top. From the first sluice run, the material entered a splitter where it was equally divided between 4 sluice trays. The trays measured 48 inches wide and 8 feet long, and were set at a gradient of 1 1/4 inches to the foot. They were likewise equipped with pulsating riffles. Each sluice tray was equipped with a separate 1 HP electric motor which drove the 5 individual pulsating riffle mechanisms at a rate of 60 pulses per minute. These motors and those driving the trommel were powered by a PL 30 Perkins 30 KW gen-set. The capacity of the sluicing trays was 100 cu.yd. per hour. Material screened by the punch plate to between 5/8 and 2 inches in diameter was washed in a nugget trap. The sluicing plant was shut down daily for 2 hours for servicing, and the top sluice was cleaned. The bottom sluices were cleaned once every 3 days. A high concentration of black sand forced the operator to clean up more frequently than otherwise would be required. Sluicing water was recirculated from Upper Bonanza Creek by way of a 1,040 foot long 12 inch diameter pipeline at a rate of 4,000 igpm by a 10 by 12 inch Morris pump driven by a Cat 3406 6 cylinder diesel engine. Effluent from sluicing was ditched upstream along the wall of Gauvin Gulch and into the Gauvin Gulch valley. From there, it travelled 1,400 feet downstream to Bonanza Creek to a large settling pond. From the settling pond, the water seeped through coarse tailings into Upper Bonanza Creek, and travelled downstream to the recirculation pond. Mining was not done at this location during 1984.

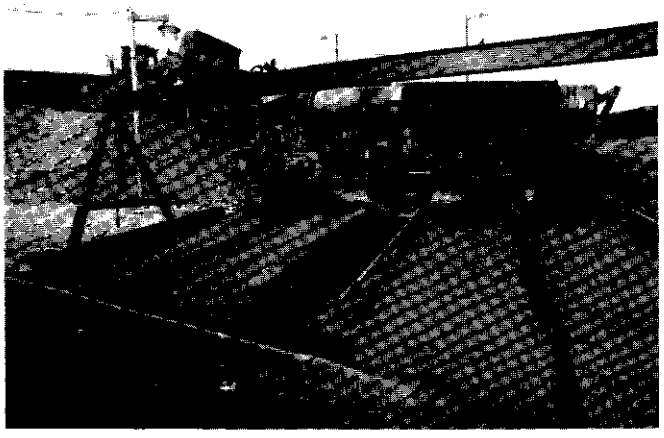


Figure 18: Sluicing plant with vibrating sluice runs at Mac-Bry Mines property. The loader is feeding a hopper at the head of the trommel. (L.O.'83)

W. Hinnek (104)
Bonanza Creek 115 ) 14
1983, 1984 (Klondike)
63°55'N 139°18'W

This property is situated along Upper Bonanza

Creek, just upstream from its confluence with Eldorado Creek. The creek valley is fairly wide, and has a moderate gradient. The major part of the valley has been dredged. Deposits being worked are along the margins of the dredged area. Dredge tailings are 15 feet deep, and consist of coarse material on slickings. Previously unworked deposits along the margins of the dredged area are up to 30 feet thick, and consist of black muck and slide rock over 10 to 14 feet of gravel.

Figure 19: Dragline feeding sluicing plant at W. Hinnek mining operation on Bonanza Creek. (R.W. '84)

Mr. Hinnek and 3 helpers mined along the right limit of the valley at this site during 1983. They used a Cat D8H bulldozer, and Dominion dragline with 2 cu.yd. bucket. The bulldozer was used to push wet material to within reach of the dragline, which was perched on high ground outside of the cut. The dragline fed the sluicing plant, which was also outside of the cut, at a rate of 50 to 55 cu.yd. per hour. The sluicing plant consisted of a dump box and two run sluice box. Coarse material was processed in the centre run, which was 30 inches wide, and lined with riffles, and fine material was processed in the side run, which was 30 inches wide and lined with two layers of expanded metal. Sluicing water was pumped by way of a 12 inch pipeline at a rate of 2,000 to 2,500 igpm. The pump was powered by a cab-over tractor unit modified so that the 671 Jimmy engine ran the pump instead of rear wheels. Tailings were ramped by the bulldozer. A slurry pump was used to pump out the downstream end of the cut, which was 30 feet deep. Effluent from sluicing was settled in a pond 100 feet wide and 300 feet long. A crew of 4 miners continued work at the property during 1984, using the same equipment as in 1983, plus another Cat D8 bulldozer. Approximately 20,000 cu.yd. of material were stripped, and an additional 11,000 cu.yd. of material were mined and sluiced. A second settling pond was added downstream from the first.

K. Daunt (105)
Bonanza Creek 115 O 14
Skookum Gulch (Klondike)
1983, 1984 63°55'N 139°20'W

This property is located along the left limit of Bonanza Creek, at the mouth of Skookum Gulch. Deposits are present on a bench along the left limit of Skookum Gulch at its mouth, and approximately 40 feet above the current level of the creek. They consist of 5 feet of soil and silt overlying 15 feet of layered gravel. Deposits exposed in a cut in the middle of the Skookum Gulch valley consist of 6 feet of tailings from recent bulldozer mining operations, 6 feet of tailings from hydraulic mining operations on adjacent Gold Hill, and 4 feet of gravel. Bedrock was not exposed, although the level of the cut was 6 to 8 feet below the bedrock level of the bench.

K. Daunt worked on the bench at the mouth of Skookum Gulch during 1983, using a Cat D2 bulldozer, and an International TD-15 bulldozer. Water for sluicing was pumped from Bonanza Creek by way of a 6 inch diameter pipeline approximately 500 feet long. A 6 inch Gorman-Rupp trash pump driven by a 3 cylinder Detroit diesel engine pumped the water. Work at the property continued in 1984, when a cut was taken out in the middle of Skookum Gulch. The tailings from hydraulic mining operations on Gold Hill, and the underlying gravel were sluiced at a rate of 80 cu.yd. per hour. An 8 by 10 inch pump run by a V-6 motor was used to supply approximately 2,000 igpm of water for sluicing.

King Solomon Mines (106)
Bonanza Creek 115 O 14
1983 (Klondike)
63°56'N 139°20'W

This property is located on Cheechako Hill, a high level bench along the left limit of Bonanza Creek. Hydraulic mining operations were done by early miners at this site. Deposits present consist of gravel left along the rim of the hill by the early miners, and bedrock which could not be mined economically by the early mining methods.

Mining was done by a crew of 4 using one Cat D8H bulldozer, one Cat D9H bulldozer, and one Cat 980 loader. The material mined was washed in a sluicing plant with dump box 8 feet wide and 16 feet long,

and single sluice run 32 inches wide and 32 feet long. The dump box was lined with punch plate over angle iron riffles, and the sluice run was lined with riffles only. No matting was used beneath the riffles. The sluice run was set at a gradient of 1 3/4 to 2 inches to the foot.

H. Yoder (107)
Adams Creek 115 O 14
1983 (Klondike)
63°56'N 139°27'W

This property is located approximately 5,000 feet upstream along Adams Creek from its confluence with Bonanza Creek. The valley bottom is 150 to 200 feet wide. The valley side walls are fairly steep, and the stream has a moderate gradient. Deposits present along the left limit of the creek are approximately 8 feet deep, and consist of a mixed section of gravel, silt, slide rock, and organic material.

Mr. Yoder worked at the property during 1983. Material mined was processed in a sluicing plant consisting of a wet grizzly set at right angles to a single sluice run. The grizzly deck was 18 feet wide and 7 feet long, not including the overhanging portions. The top 4 feet of it were slick plate, followed by 16 feet of punch plate with 1 inch holes, and 4 feet of rail iron screening to approximately 6 inches. The deck was set at a slope of about 40°. Water was pumped to the grizzly. The sluice run was 36 inches wide and 32 feet long, and was lined with 3 1/2 inch riffles. Water for sluicing was gravity fed to the head of the sluice run by way of 100 feet of 12 inch diameter pipeline from a holding pond upstream.

G. Caley (108)
Adams Creek 115 O 14
1983, 1984 (Klondike)
63°56'N 139°22'W

This property is located along Adams Creek, just downstream from the mouth of Stampede Gulch. The valley bottom is approximately 200 feet wide, and has a moderate gradient. The valley walls are steep. Deposits present in a cut along the right limit consist of 1 foot of black muck over 15 feet of brown gravel. Bedrock is slabby weathering chlorite schist.

Mr. Caley mined in a cut along the right limit of the valley during 1983, using a Cat D7 bulldozer to do stripping, and a Cat 950 loader to feed the sluicing plant. The cut was 45 feet wide, 150 feet long, and 15 feet deep. Work continued during 1984. Mr. Caley used the same equipment to mine 4 cuts, with 2 along each side of the valley. The centre of the creek had been mined previously. Approximately 50,000 cu.yd. of material were stripped, and 10,000 cu.yd. of gravel and bedrock were sluiced in a single run sluice box 30 feet long. Water for sluicing was provided at a rate of 1,500 igpm by a 10 by 12 inch pump.

King Solomon Mines (109)
Bonanza Creek 115 O 14
1983 (Klondike)
63°56'N 139°20'W

This property is located on American Hill, a high level bench between Magnet Gulch and American Gulch. Hydraulic mining operations were done by early miners at this site. Deposits present consist of gravel left along the rim of the hill by the early miners, and bedrock which could not be mined economically by the early mining methods.

Work at this location was done in 1983 by 4 miners working on a single shift. They mined using a Cat D9H bulldozer to push the remaining gravel and 1 1/2 feet of bedrock into Magnet Gulch, where it was picked up by a Cat 980 loader, and fed to the sluicing plant. In addition, a Cat D8H bulldozer pushed gravel from the rim of the hill directly to the sluicing plant. The sluicing plant consisted of a dump box 8 feet wide and 16 feet long, and a single sluice run 32 inches wide and 32 feet long set at a gradient of 1 3/4 to 2 inches to the foot. The dump box was lined with punch plate over angle iron riffles, and the sluice run was lined with riffles only. No matting was used beneath the riffles. Material was fed to the sluicing plant at a rate of less than 100 cu.yd. per hour. The tailings were removed by the loader. Sluicing water was recirculated from a pond along Bonanza Creek, approximately 2,000 feet downstream from the confluence of Magnet Gulch and Bonanza Creek. The water was pumped by a 6 by 8 inch GM 671 pump, and delivered at a rate of 1,500 igpm by way of 3,000 feet of 8 inch diameter pipe. Sluice effluent flowed down Magnet Gulch to Bonanza Creek valley, where it was diked along the side of the valley in old hydraulic tailings for 600 feet downstream until it reached a culvert under the Bonanza Road. Once under the road, the effluent was diked upstream 200 feet to a pond constructed by berming dredge tailings.

Hawk Mining (110)
King Solomon Mines 115 O 14
Bonanza Creek (Klondike)
1983, 1984 63°57'N 139°20'W

This property is located on Oro Fino and Monte Cristo Hills, which are high level benches along the left limit of Bonanza Creek, immediately upstream and downstream respectively from the small left limit tributary Fox Gulch. Deposits present consist of remnants of White Channel gravel left along the edges of the hills by early miners involved in hydraulic mining operations.

Work at this location was done in 1983 by Hawk Mining by two miners with two helpers. They used a Cat D8 bulldozer to push gravel into the Bonanza Creek and Fox Gulch valleys, where the gravel was picked up by a Cat 950 loader and carried across the Bonanza Road to the sluicing plant. The sluicing plant consisted of a dump box and single sluice run, and was fed at a rate of 80 to 90 cu.yd. per hour. Tailings were ramped up over dredge tailings in the centre of the Bonanza Creek valley by the loader. Work nearby on the same hills was carried out in

1984 by King Solomon Mines. An average of 8 people working on two shifts used Two Cat D8 bulldozers, one Cat D9H bulldozer, one Cat 966 loader, and one Cat 980 loader to mine. A Cat D7-4T bulldozer was used as a standby machine. Work at the south end of Oro Fino Hill was done during May to utilize spring run-off for sluicing. Water was recirculated from a reservoir on American Gulch with a 5 by 6 inch Rupp pump. Water was recirculated until too muddy, at which time the reservoir was emptied, and refilled with additional run-off water. Work was also done from May to September on Monte Cristo Hill, using the same crew and mining equipment. The material mined was processed at a rate of approximately 60 cu.yd. per hour in a sluicinig plant wich consisted of a dump box, single channel sluice box, and final sluice tray. The sluice run was 36 inches wide and 36 feet long, and was lined for the first 8 feet with punch plate over angle iron riffles, for the next 20 feet with just angle iron riffles, and for the last 8 feet with punch plate screening to 1/2 inch. Material less than 1/2 inch in diameter fell into a sluice tray 48 inches wide and 20 feet long, which was oriented at 90° to the main run. The final sluice tray was lined with expanded metal, and was set at a gradient of 1 1/2 inches to the foot.

King Solomon Mines (111)
Bonanza Creek 115 O 14
1984 (Klondike)
63°58'N 139°20'W

This property is located along the right limit of Bonanza Creek, between right limit tributaries Queen and Mosquito Gulches. Deposits present are located on a high section of bedrock which juts out into the centre of the Bonanza Creek valley. Work at this site was done by early underground miners, but the deposits were not dredged.

Members of the King Solomon Mines crew of 8 worked at this property during 1984 using a Cat 966 loader and a Cat 980 loader. The cut was mined back as it thawed. The material mined was processed at a rate of 90 to 100 cu.yd. per hour by a "Derocker" screening unit, and three channel sluice box. Water for sluicing was pumped directly from Bonanza Creek.

Hawk Mining (112)
King Solomon Mines 115 O 14
Bonanza Creek (Klondike)
1983, 1984 63°58'N 139°20'W

This property is located along King Solomon Hill, a high level bench approximately 160 feet above the level of Bonanza Creek between left limit tributaries Monte Cristo Gulch and Boulder Creek. Deposits present consist of remnants of White Channel gravel left along the edges of the hill by early miners involved in hydraulic mining operations.

Work at the north end of King Solomon Hill was done during 1983 by Hawk Mining. Two miners with two helpers used one Cat D8K bulldozer to push remnants of gravel, along with bedrock to the edge of the hill along Bonanza Creek. From there, a Cat 950 loader equipped with a 3 cu.yd. bucket fed a sluicing plant with dump box 7 1/2 feet wide and 30 feet long, and single run sluice box 36 inches wide and 40 feet long. The sluicing plant was fed at a rate of 80 to 90 cu.yd. per hour. Water for sluicing was seepage water which was pumped at a rate of 3,000 igpm from a dredge pond on the left limit of Bonanza Creek. It was pumped by way of a 10 inch diameter pipeline 1,000 feet long by a Morris slurry pump. Effluent from sluicing discharged directly over the edge of the hill into the Bonanza Creek valley, and formed a fan of tailings. Water was trapped immediately below the fan in an old dredge pond approximately 200 feet wide and 300 feet long. Hawk Mining continued work at this site during 1984 using the same equipment and methods as in 1983. King Solomon Mines also worked at the north end of King Solomon Hill during 1984. Members of their crew of 8 workers used two Cat D8 bulldozers, one Cat D9H bulldozer, one Cat 966 loader, and one Cat 980 loader to mine gravel and bedrock from the rim of the hill along Boulder Creek, and to transport it to the sluicing plant. Water for sluicing was seepage water, which was pumped from a pond in dredge tailings on Bonanza Creek. Effluent from sluicing was settled along Boulder Creek. Members of the King Solomon Mines crew also used the same equipment to work at the south end of King Solomon Hill during 1984. Water for sluicing at that site was pumped from a holding pond on King Solomon Hill. The holding pond was filled by water from a branch pipe line off the pipe line which provided water for sluicing at the north end of King Solomon Hill. While water was being pumped for sluicing at that site, some was diverted to the holding pond. Crew members and equipment then moved periodically to the south end of the hill, and mined and sluiced there.

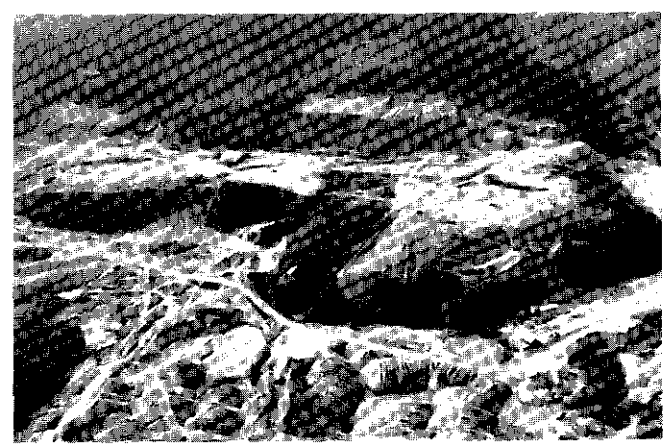


Figure 20: View of King Solomon Hill. Hawk Mining worked at the front right edge of the bench, while King Solomon Mines worked at the rear of the bench at right and left. (L.O. '84)

R. Troberg (113)
Bonanza Creek 115 O 14
1983, 1984 (Klondike)
63°58'N 139°22'W

This property is located on the left limit of

the Bonanza Creek valley, midway between left limit tributaries 49 Gulch and Boulder Creek, and along the downstream wall of a large embayment area left by an old meander of Bonanza Creek. The deposits present are located on a low terrace, reported to be 14 feet higher than the present creek level. They consist of 20 feet of tailings from early hydraulic mining operations on the upstream end of 49 Hill, overlying 25 feet of interlayered silt, gravel, and black muck. The bedrock surface is irregular.

Work on the property during 1983 was done by a crew of 3 using one Cat D8H bulldozer to strip, and to push gravel to a stockpile for the loader, and one John Deere 644 B loader equipped with a 2 cu.yd. bucket to feed the sluicing plant and remove tailings. A monitor was also used to wash material down from the face. The sluicing plant consisted of a dump box and a single sluice run, and was fed at a rate of approximately 25 cu.yd. per hour. The dump box was 8 feet wide and 16 feet long, and was lined with slick plate. The sluice run was 28 feet long. The first 8 feet of the sluice run were 36 inches wide, and were lined with slotted punch plate over expanded metal and coco matting. The remaining 20 feet were 24 inches wide, and were lined with riffles and coco matting. The sluice run was set at a gradient of 2 1/2 inches to the foot. Water for sluicing was carried to a pump by way of a long diversion channel in the centre of the valley, separate from Bonanza Creek, and pumped at a rate of approximately 2,000 igpm. Effluent from sluicing travelled upstream along the left limit of the valley, and settled in coarse dredge tailings before entering Bonanza Creek. A crew of 3 continued work at the property during 1984. Deposits being worked became deeper as the cut progressed into the hillside along the old meander embayment. A 10 by 12 inch pump run by a Cat 4600 series engine capable of providing 2,500 igpm of water for sluicing, was added to the operation. The pump pond was relocated downstream from the tail race and settling pond, to allow for recirculation of water when needed.

LRL Mining (114)
49 Pup 115 0 14
Bonanza Creek (Klondike)
1983, 1984 63°58'N 139°22'W

This property is located at the confluence of Bonanza Creek and left limit tributary 49 Pup. The deposits present are in the valley of 49 Pup, as well as on 49 (Jew) Hill, a high level terrace along the left limit of Bonanza Creek immediately upstream from 49 Pup. Deposits in the centre of the 49 Pup valley are 12 to 27 feet deep, and consist of 0 to 15 feet of hydraulic tailings from mining operations on 49 Hill overlying 7 feet of organic material and 5 feet of mixed brown gravel. Deposits along the right limit of 49 Pup are covered by frozen black muck, and may be more than 50 feet thick. Deposits on 49 Hill consist of remnants of White Channel gravel left along the edges of the hill by miners involved in the hydraulic mining operations.

A crew of 4 with helpers in camp worked at this property during 1983. They used one Cat D8K bulldozer to rip frozen ground, do stripping, and push pay material to within reach of the Cat 235 backhoe equipped with a 1 1/2 cu.yd. bucket which was used to feed the sluicing plant. A Cat 977 Traxcavator was used to haul tailings. The material mined was processed at a rate of 180 cu.yd. per hour in a sluicing plant consisting of a "Derocker" screening unit and single sluice run. Water for sluicing was pumped by an 8 by 10 inch pump powered by a 6 cylinder diesel engine from a dredge pond in the centre of Bonanza Creek valley across from the mouth of 49 Pup. It was delivered by way of an 8 inch diameter pipeline. Effluent was directed approximately 150 feet downstream from the mouth of 49 Pup along the left limit of Bonanza Creek, before entering the creek. Mining was done in the 49 Pup valley for most of the summer, and the when "pay" material was mined out, the operation moved to 49 Hill. On 49 Hill, the floor of the old hydraulic cut was mined for the rest of the season. It was processed in the same way as the material mined in the gulch. Effluent was settled in hydraulic tailings along the edge of the Bonanza Creek valley before it entered the creek. Work continued on 49 Hill during 1984. The Cat D8K bulldozer was used along with a Cat 980C loader to do mining and to feed the sluicing plant. The sluicing plant was the same as was used in 1983, but a "cutter" was used at the end of the main run to divert oversize material and allow fines to continue across a wide section of sluice set at a shallow gradient. A Cornell 5 by 8 inch high pressure pump was used to provide approximately 1,500 igpm of water for sluicing. A settling pond was constructed in the Bonanza Creek valley upstream from the mouth of 49 Pup. Water was recycled to the hill from this pond. Approximately 20,000 cu.yd. of material were mined and sluiced on 49 Hill during the 1983 and 1984 operations. At the end of the 1984 season, the work site was moved approximately 2,000 feet downstream along Bonanza Creek to a low bench along the right limit of the creek. A crew of 2 worked at this location.

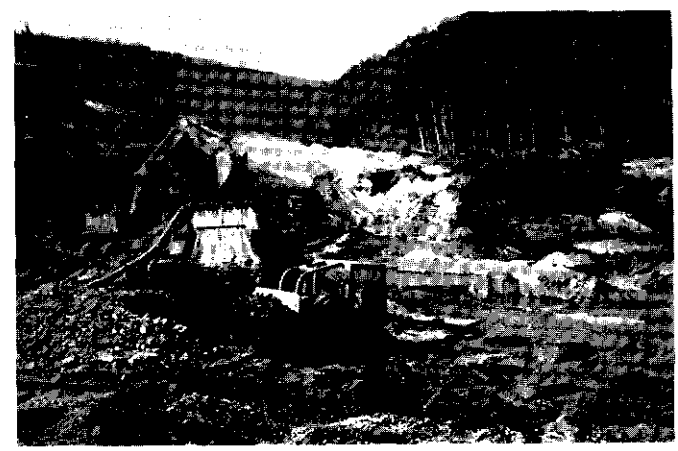


Figure 21: Sluicing plant at LRL Mining being fed by the Cat 235 hoe. Tailings are being removed from the foot of the "Derocker" screening unit by the Traxcavator. (L.O. '83)

KMA Mines (115)
Bonanza Creek 115 O 14
1983, 1984 (Klondike)
63°59'N 139°21'W

This property is situated along the right limit of Bonanza Creek, approximately 500 feet upstream from the mouth of right limit tributary Leamon Gulch. Deposits present are on a low terrace with "stepped" bedrock surface. They are approximately 50 to 60 feet thick, and consist of mixed layers of black muck, silt, sand, clay, and gravel. Underground workings left by early miners apparently followed the lower bedrock terrace, but stopped when the first "step" was reached.

Work at this operation was done during 1983 by a crew of 3 working on a single shift. A monitor with 1 3/4 inch nozzle was used to wash down the face and condense the section. Thawed black muck drained to the tailings area. A Cat D8H bulldozer was used to push material to be sluiced to a stockpile within reach of an International 3984 hoe equipped with a 1 cu.yd. bucket, which was used to feed the sluicing plant. Tailings were removed by the bulldozer. The sluicing plant consisted of an elevated dump box, vibrating screening deck, and single run sluice. Material was washed and classified on the vibrating screening deck under a series of high pressure water jets. A 5 hp electric motor attached to an eccentric provided the table with its shunting movement. All material less than 1 1/4 inch in diameter went into the sluice run. The sluice run was 32 inches wide and 30 feet long, and was lined with riffles and coco matting. Water for sluicing was pumped at a rate of 2,000 igpm by a 6 by 8 inch pump powered by a 6 cylinder Deutz diesel engine. It was pumped from a tailings pond fed by seepage from Bonanza Creek. Effluent drained downstream along the right limit of the valley for approximately 1,000 feet before entering a settling pond. A crew of 3 continued work at the property during 1984. A D8H bulldozer was used to push material washed down from the face to the sluicing plant, and a Cat 950 loader was used to feed the sluicing plant. Tailings were removed by the bulldozer. Approximately 10,000 cu.yd. of material were stripped, and 20,000 cu.yd. of material were sluiced.

Kohlman Explorations Ltd. (116)
Bonanza Creek 115 O 14
1983, 1984 (Klondike)
63°59'N 139°22'W

This operation is located along the left limit terrace of Bonanza Creek, on a terrace 50 feet above the creek level. It is approximately 2,500 feet upstream from the mouth of Sourdough Gulch. Deposits present are 35 feet thick, and consist of 16 feet of mixed gravel and organic matter with organic debris including sticks, overlying 5 feet of gravel, silt, and sand, 2 feet of silt, and 10 feet of brown sandy gravel. Pieces of slide bedrock are also present through the section.

Work at this property was carried out during 1983 by a crew of 4 or 5 working on a single shift. A monitor with water supplied at a rate of about 2,700 igpm by an 8 by 10 inch pump powered by a 6 cylinder Deutz diesel engine was used to wash the face down and condense the section. A Cat D9G bulldozer was then used to push material from the face to within easy reach of the Cat 980 loader used to feed the sluicing plant. A second Cat 980 loader was used to remove tailings. Both loaders were equipped with 5 1/2 cu.yd. buckets. The sluicing plant had a capacity of 200 cu.yd. per hour. It consisted of a "Derocker" screening deck powered by a Lister 3 cylinder diesel engine, and a single run sluice box. Material on the screening deck was washed by 2,100 igpm of water pumped by an 8 by 10 inch pump driven by a Cat 4 cylinder diesel engine. The screening deck was set at a gradient of 1 1/2 inches to the foot. Pieces less than 2 inches in diameter passed through the deck and into the sluice box. The sluice box was 34 feet long, and was set at a gradient of 2 1/4 inches to the foot. The top 4 feet of the box were lined with 2 inch riffles, the next 10 feet were lined with punch plate with 3/4 inch holes set over expanded metal, and the last 20 feet were lined with riffles. A "shag" type of matting was used the full length of the box under the riffles and expanded metal. Effluent from sluicing was settled in a pond slightly below the level of the terrace in an elevated pond along the extreme left limit of the Bonanza Creek valley. Mining at the property continued in 1984, using the same methods and types of equipment as in 1983. A section of punch plate was added to the end of the sluice run, and the undersize was divided between two short, wide side runs for further sluicing. Near the end of the season in 1984, the operation moved approximately 500 feet upstream along the left limit of Bonanza Creek, and a new cut was begun.

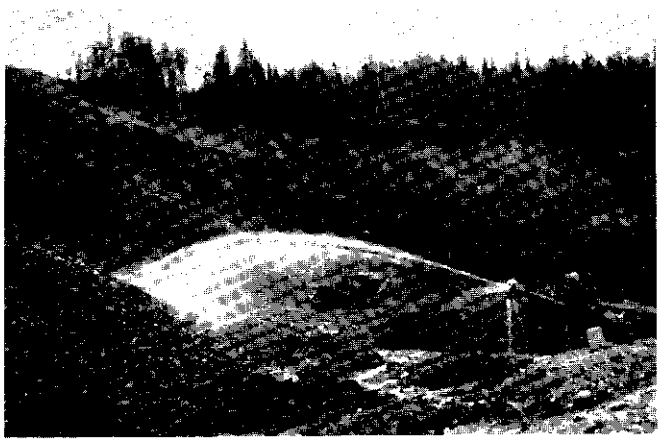


Figure 22: Water from monitor being used by Kohlman Expln's Ltd. to condense section prior to sluicing. (L.O. '83)

Gold from this property is reported to have a fineness of approximately 780.

C. Nicholson (117)
Bonanza Creek 115 O 14
1983, 1984 (Klondike)
64°00'N 139°21'W

This property is located on Ophir Hill, a high level bench along the right limit of Bonanza Creek, just downstream from the mouth of Pure Gold Gulch. Deposits at the site are 26 to 30 feet thick, and consist of 15 to 19 feet of gravel with silty to earthy matrix, and only 15% clasts, overlying 5 feet of silt, clay and sand, and 6 feet of sandy brown gravel. The deposits are unlike the White Channel deposits found on nearby benches, and occur at an elevation slightly higher than that at which the White Channel deposits occur.

Mr. Nicholson and one helper worked at his property during 1983. They used a Cat D6-9U bulldozer to strip the ground, and a Cat 920 loader to feed the sluicing plant. The sluicing plant consisted of a dry grizzly, and single run sluice box. Water for sluicing was gravity fed at a rate of 2,000 igpm by way of an 8 inch diameter pipeline from a large holding pond located approximately 300 feet in elevation above the sluice box, and 2,000 feet northeast of the cut. The pond was fed by a lengthy ditch bringing water from the head of Pure Gold Gulch. Sluicing effluent was directed over the edge of Ophir Hill, and settled in a settling pond in dredge tailings at the base of the tailings fan along the right limit of the Bonanza Creek valley. Work at the property was continued during 1984 using the same methods and equipment as in 1983. Mr. Nicholson also mined on Sourdough Hill, immediately across the Bonanza Creek valley from Ophir Hill during 1983 and 1984.

C. Nicholson (118)
Bonanza Creek 115 O 14
1983, 1984 (Klondike)
64°00'N 139°22'

This property is located on Sourdough Hill, a high level bench along the left limit of Bonanza Creek, immediately downstream from the mouth of Sourdough Gulch. Deposits present at the property are up to 40 feet thick, and consist of sandy White Channel gravel.

Mr. Nicholson worked with one helper at this site during 1983. They used a Cat D6-9U bulldozer to strip the ground, and a Cat 920 loader to feed the sluicing plant. Water for sluicing was fed from Sourdough Gulch by a ditch, and 15 inch diameter pipeline 1,500 feet long to a holding pond on Sourdough Hill. From the holding pond, it reached the single run sluice box by way of 400 feet of 6 inch diameter pipeline. Tailings from sluicing were directed over the edge of Sourdough Hill. Effluent settled in a series of 2 settling ponds at the base of the tailings fan along the left limit margin of the Bonanza Creek valley. Mr. Nicholson also mined on Ophir Hill, immediately across the Bonanza Creek valley from Sourdough Hill during 1983 and 1984.

B.Howie (119)
B. Callison 116 B 3
Trail Gulch (Klondike)
1983 64°01'N 139°22'W

This property is located on the right limit of Trail Gulch, a right limit tributary of Bonanza Creek, at the upstream end of Trail Hill. Deposits present consist of 12 to 15 feet of gravel left along the rim of the hill by workers involved in early hydraulic mining operations.

Work at this location was carried out in 1983 by a crew of 3 to 4 using a Cat D9G bulldozer, which was later replaced by a Cat D8 bulldozer, and a Volvo loader. The bulldozer was used to push rim gravel and bedrock exposed by the hydraulic mining operations to within easy reach of the loader. The loader was used to feed the sluicing plant at a rate of approximately 125 cu.yd. per hour. The sluicing plant consisted of a "Derocker" screening unit and single sluice run. The "Derocker" was modified by welding lips on the screening plates, so that undersize was 1 inch in diameter instead of 2 inches in diameter. This also allowed sluicing to be done with less water. The sluice box was 48 inches wide and 30 feet long, and was set at a gradient of 2 1/2 inches to the foot. It was lined with 2 inch Hungarian riffles set back at an angle of 10°, over expanded metal and Nomad wiry rubber matting. Water for sluicing was pumped from a large pond in dredge tailings on the right limit of the Bonanza Creek valley, by a 6 by 8 inch Corneli high lift pump run by a Cat 3406 diesel engine. At first the water was supplied at a rate of 1,200 igpm by way of a 6 inch diameter pipeline 2,000 feet long, but the pipeline was later changed to 8 inches in diameter. Water was then supplied at a rate of 1,600 igpm. Effluent from sluicing flowed down Trail Gulch and settled in hydraulic tailings along the Bonanza Road.

P. Foth (120)
Trail Gulch 116 B 3
Bonanza Creek (Klondike)
1983, 1984 64°01'N 139°21'W

This property is located at the upstream end of Trail Hill, and the downstream end of Cripple Hill, which are high level benches along the right limit of Bonanza Creek on either side of Trail Gulch. Deposits present on Trail Hill consist of 3 feet of organic material over 2 to 9 feet of White Channel gravel with clasts up to 12 inches in diameter. On Cripple Hill they consist of 8 to 12 feet of frozen black muck over gravel. Bedrock is carbonaceous schist.

Mr. Foth worked alone on Trail Hill during 1983, using a John Deere 450 bulldozer to do stripping. Mining was done hydraulically, using one monitor with a choice of 1 1/2 inch, 2 1/4 inch, or 3 inch tips. Material was dislodged from the face, and then directed into the dump box with water from the monitor. The dump box was 4 feet wide at the head, and 8 feet long, and narrowed toward the lower end. Material passed from the dump box into a single run sluice box 20 inches wide and 26 feet long, The first 3 feet of the box were lined with punch plate

with 1/2 inch holes over 1 1/2 inch riffles. The next 5 feet of the box were lined with 1 1/2 inch riffles, and the rest of the box was lined with 1 1/4 inch riffles. Coco matting was used under the riffles throughout. The water was gravity fed from a large holding pond on Trail Gulch. Water flowed out of the pond at an estimated head of 30 feet, through a series of pipelines 16 inches, 12 inches, and 6 inches in diameter before reaching the monitor. Sluicing went on continuously when the face was being washed, as all material washed down from the face was caught between the wing-walls of the dump box. Water for this work was very limited. Most work was done during May when run-off water was available, or during rainy weather during the fall. Effluent from sluicing was settled below Trail Hill in hydraulic tailings. During 1983, Mr. Foth restored a ditch bringing Cripple Creek water to the upstream end of Cripple Hill, and layed 1,400 feet of 6 inch diameter pipeline along the hill to Trail Gulch. He continued work on Trail Hill during 1984 in the same manner as in 1983, but he used the John Deere 450 bulldozer to push the gravel to the mouth of the dump box before washing it in with water from the monitor. He also worked on Cripple Hill. The bulldozer was used to begin stripping an area 50 feet wide and 100 feet long. The work was continued hydraulically using water brought from Cripple Gulch by way of 1,000 feet of 6 inch diameter pipeline and 500 feet of ditch to a reservoir on Cripple Hill. From there, the water was carried at a head of 30 feet to a 3 inch monitor tip at the face by way of 300 feet of 16 inch, 10 inch, and 8 inch diameter pipe. The material mined was washed in a sluicing plant with dump box 40 inches wide and 12 feet long, and single sluice run 18 inches wide and 12 feet long. The dump box was lined with riffles over indoor/outdoor carpet. The sluice run was lined with aluminum punch plate with 3/4 inch holes over expanded metal and green long wire matting. Sluicing effluent was settled in an abandoned settling pond along Trail Gulch.

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