YUKON MINING AND EXPLORATION OVERVIEW — 1997

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INTRODUCTION

Mining remained Yukon's number one industry with production from three operating mines and significant expenditures in mine development and mineral exploration. Development expenditures, estimated at $23 million, were incurred at Yukon's three operating mines: the Faro Pb-Zn-Ag Mine, the Brewery Creek Au Mine, and the Mount Nansen Au-Ag Mine. Development also occurred at the Minto Cu-Au-Ag project which will undergo final construction and begin production in 1998, and a number of other projects which are in the final stages of permitting. Exploration expenditures, estimated at $35 million (Fig. 1), were down from the $54 million spent in 1996, but higher than the ten-year average of $32 million. The exploration season was very successful, highlighted by a combination of new discoveries, positive results from several advanced projects, and a significant amount of claim staking as a result of grassroots exploration programs. The number of claims in good standing climbed to a new historical high of 72,723 (Fig. 2), with 9,628 new claims recorded in 1997 (Fig. 3).

Yukon had three producing mines in 1997. The Brewery Creek Mine was opened by Viceroy Resource Corporation in November 1996, and has proven a technical success producing gold utilizing heap leach technology in the extremes of a cold northern climate. Production from Brewery Creek in 1997 is estimated at 2252 kg (72 400 ounces) and 1998 production should surpass 2644 kg (85 000 ounces) of gold. BYG Natural Resources produced 617 kg (19 829 ounces) of gold and 3068 kg (98 654 ounces) silver to the end of September from its Mount Nansen Mine which also opened in November, 1996. Milling operations at the shear zone hosted vein deposit were temporarily shut down in November 1997, to increase water treatment capacity and rectify water balance problems in the tailings pond. Anvil Range Mining Corporation, shut down in December 1996, resumed production from the Grum Pb-Zn-Ag orebody near Faro and began shipping lead and zinc concentrates in November, 1997. The Grum sedimentary-exhalitive deposit is one of several known orebodies distributed in an arcuate belt along the south flank of the Anvil Range batholith in central Yukon.

RÉSUMÉ

L'exploitation minière reste la principale industrie du Yukon. Trois mines sont en exploitation, la mine de Pb-Zn-Ag de Faro, de l'Anvil Range Mining Corporation; la mine d'or de Brewery Creek, de la Viceroy Resource Corporation; et la mine d'or-argent de Mount Nansen, de la société BYG Resources. Le territoire a en outre engagé des dépenses importantes pour des travaux préparatoires et pour l'exploration minérale. L'exploration dans le territoire a été extrêmement fructueuse. Elle a en effet débouché sur de nouvelles découvertes, notamment celle, par la société Atna Resources, du gisement de Pb-Zn-Ag Wolf dans des sulfures massifs inclus dans des roches volcaniques, au sein de roches de la plate-forme de Cassiar; celle, au projet de Wolverine, d'un nouveau corps de sulfures massifs à l'ouest du gisement de Wolverine-Lynx, propriété des sociétés Mines Westmin Ltée et Atna Resources; et celle d'un horizon stratoïde à Ni-Zn, à la suite de forages par les sociétés Blackstone Resources et Glenhaven Resources, dans le nord du Yukon. De nombreux projets ont fourni des résultats d'exploration positifs sur tout le territoire, et l'on espère que les nombreux programmes de reconnaissance se traduiront par de futures découvertes. En termes économiques, les dépenses de mise en valeur et pour l'exploration ont diminué par rapport au chiffre imposant de 108 millions de dollars enregistré en 1996. Les dépenses pour des travaux préparatoires, qui ont atteint en 1996 un sommet, en raison surtout de la mise en valeur de la mine de Brewery Creek de la Viceroy Resource Corporation, ont accusé la plus forte diminution; elles ont néanmoins apporté à l'économie du Yukon un montant estimé à 23 millions de dollars. On assistera en 1998 à une augmentation des dépenses de mise en valeur consécutivement à l'aménagement de la mine de Cu-Au-Ag de Minto et à la réouverture possible de la mine de Pb-Zn-Ag de Sa Dena Hes. Les dépenses pour l'exploration sont évaluées à 35 millions de dollars, chiffre inférieur aux 54 millions de dollars dépensés en 1996 mais supérieur à la valeur décennale moyenne de 32 millions de dollars.

Base-metal exploration highlights include the discovery by Atna Resources of volcanic-hosted massive sulphides (VMS) in Mississippian pyritized felsic tuffs of Pelly-Cassiar Platform at the Wolf property. The discovery hole intersected 6.9% Zn, 2.8% Pb and 138.6 g/t Ag over 25.2 metres and resulted in an immediate increase in exploration activity in this belt of rocks. Continuing evaluation of massive sulphide deposits of Yukon-Tanana Terrane in the Finlayson district at the Wolverine project jointly owned by Westmin and Atna Resources, and Columbia Gold's Fyre Lake deposit were successful in expanding reserves. At Wolverine a new massive sulphide body in the Sable zone, approximately 2 km southwest of the Wolverine-Lynx deposit, was intersected by exploratory drilling. Similarly the Ice occurrence owned by Expatriate Resources in the Campbell Range Belt was further delineated by drilling. In northern Yukon, Blackstone and Glenhaven Resources made a significant discovery of stratabound nickel-zinc at the Taiga Project. There the Devono-Mississippian Earn Group argillites and shales host stratabound mineralization which yielded a 5.3 metre drill intersection grading 1.42% Ni and 0.70% Zn.

Gold exploration was conducted mainly in the mid-Cretaceous Tombstone Suite intrusive belt that spans central Yukon from Dawson in the west to MacMillan Pass in the east. Tombstone Suite intrusive rocks host the Fort Knox deposit in Alaska, the Brewery Creek Mine near Dawson and the Dublin Gulch deposit north of Mayo. Focused exploration programs in the belt were included the Brewery Creek minesite, the 66 000-hectare Oki Doki Project of International Kodiak Resources north and east of the Brewery Creek Mine, and the Scheelite Dome project of Kennecott subsequently optioned by La Teko Resources. Several reconnaissance programs also took place in the belt in 1997 and the largest resulted in more than 1100 claims staked by Viceroy Resource Corporation. The largest gold exploration program in the Yukon was conducted on the Goddell Shear property in the Mt.

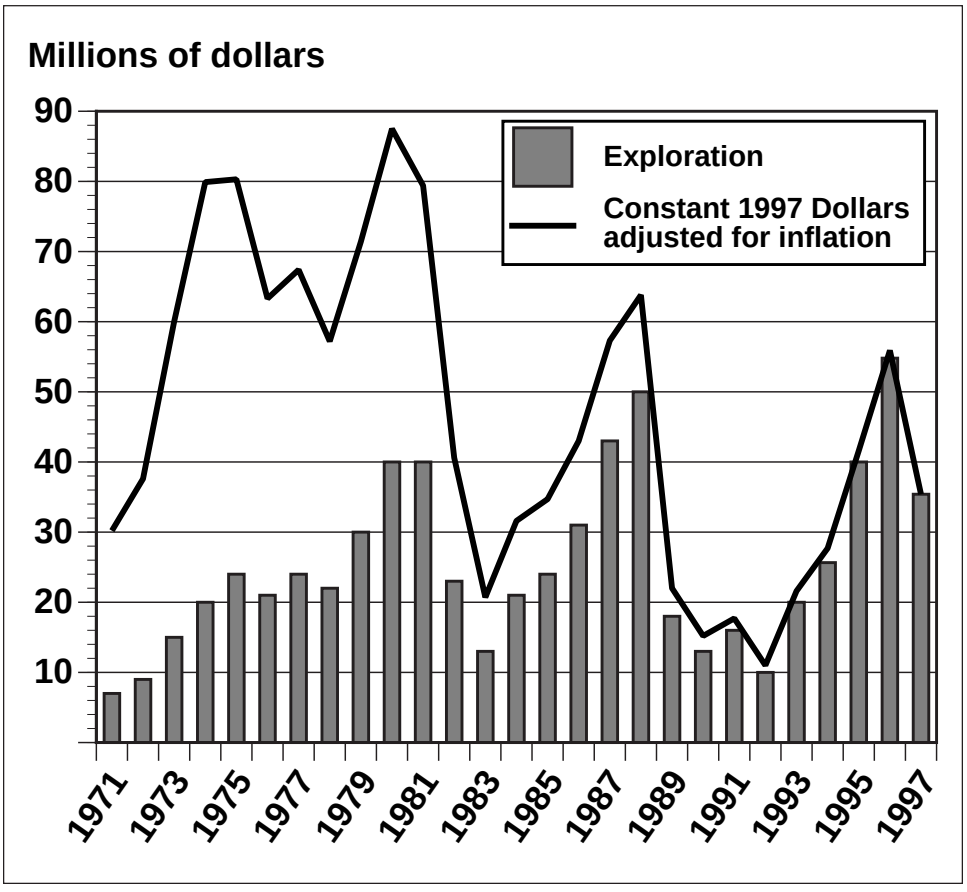


Figure 1. *Exploration expenditures: 1971-1997*

Skukum area, 85 kilometres south of Whitehorse. Omni and Trumpeter Yukon Gold Inc. each hold a 35% interest in the property and Arkona Resources holds 30%. Exploration on the Goddell shear zone, in the mid-Cretaceous Carbon Hill granite, was investigated by extending of the undergound adit 182 metres and by more than 8500 metres of underground drilling in 37 holes. An indicated reserve of 824 594 tonnes grading 7.15 g/t Au was calculated from drill results. These exploration highlights show that continued confidence in the mineral potential in the Yukon, and illustrate that much of the territory remains under-explored (Fig. 4).

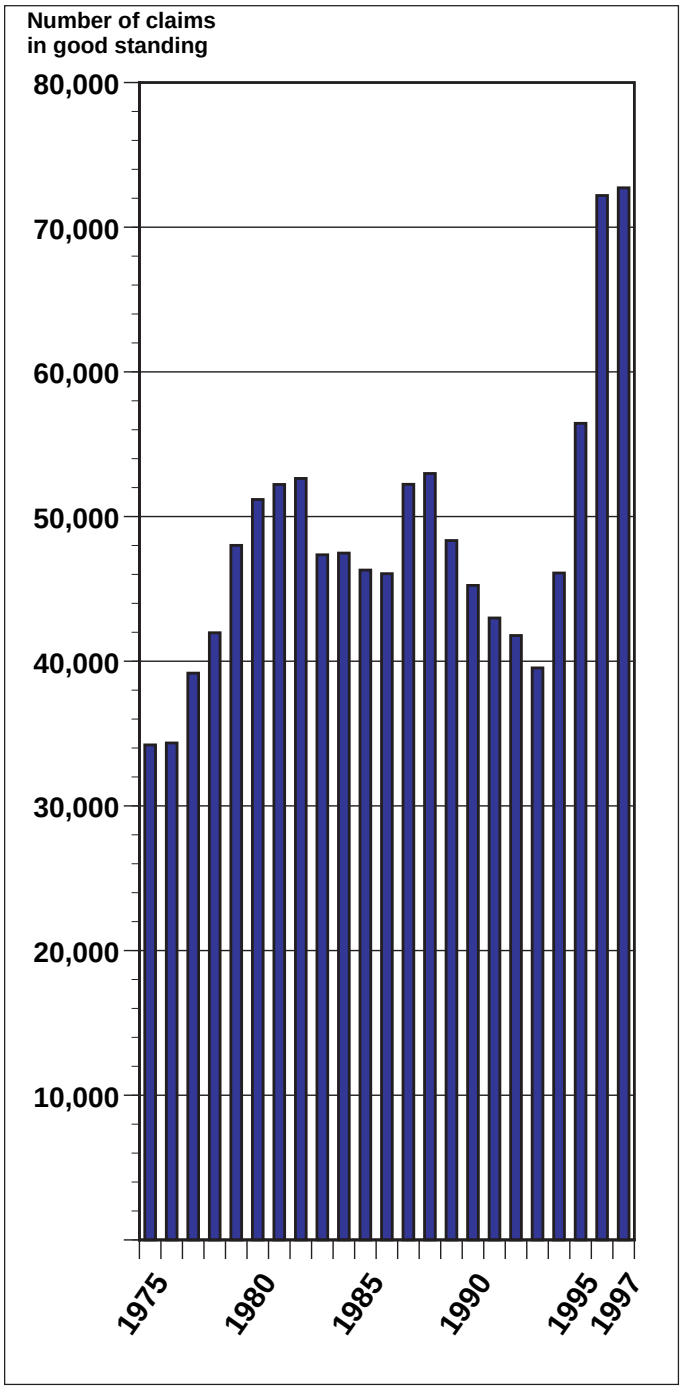


Figure 2. *Quartz claims in good standing: 1975-1997*

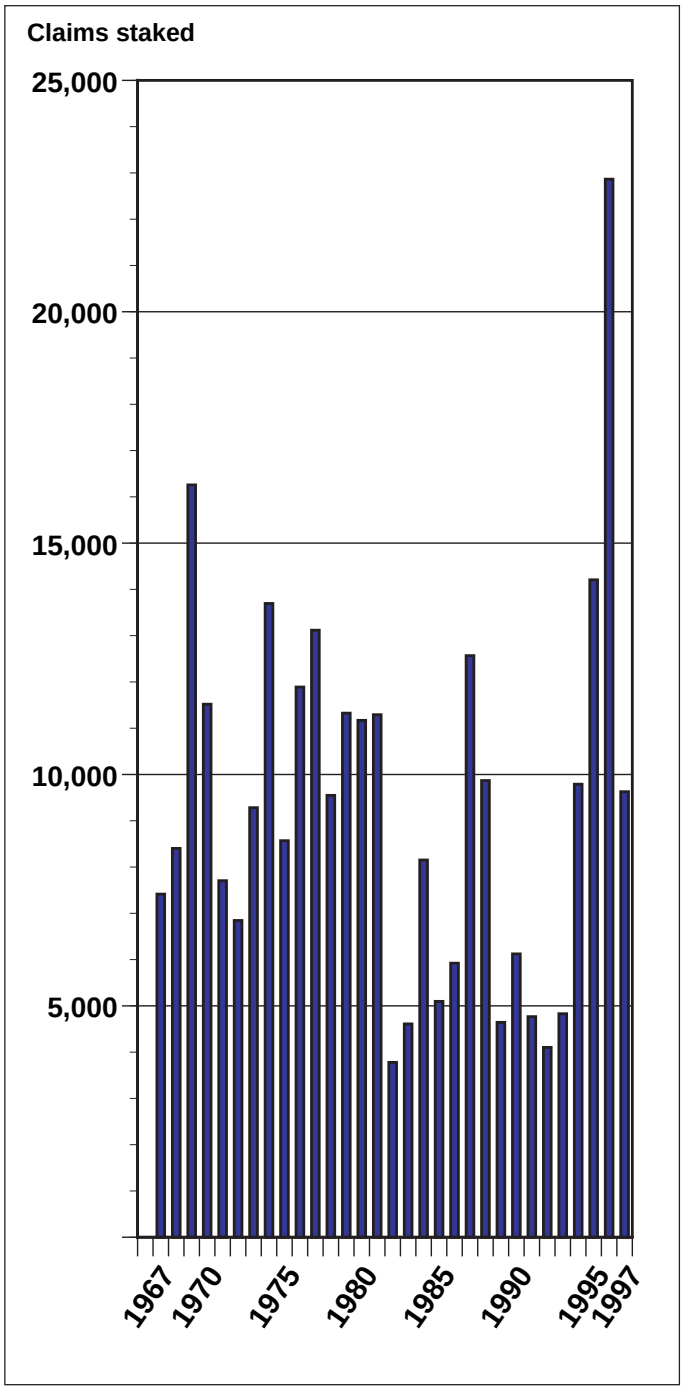


Figure 3. *Quartz claims staked: 1967-1997*

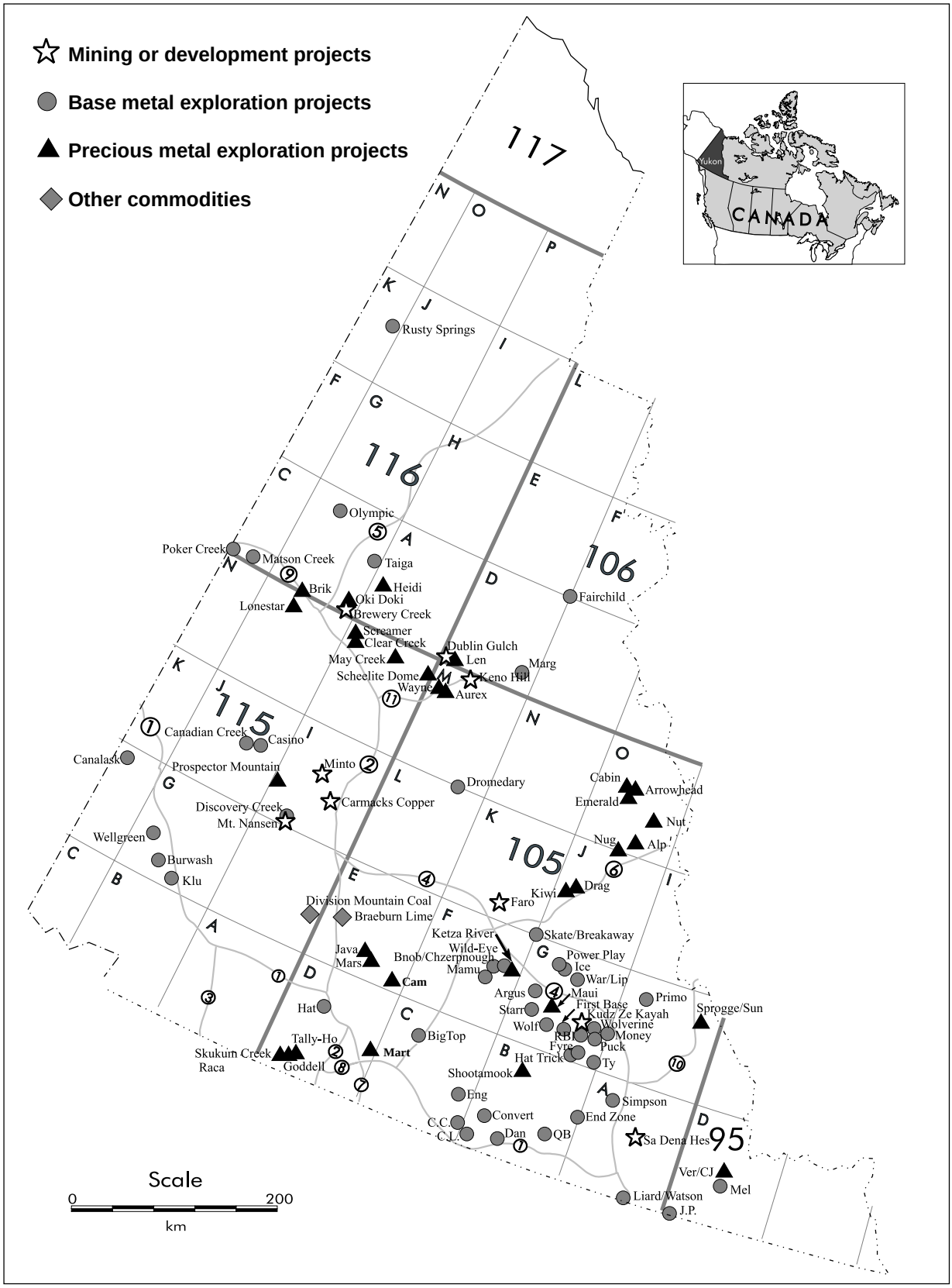


Figure 4. *Location of active Yukon mines and exploration projects in 1997. Not all exploration (particularly reconnaissance) can be shown on the map.*

LODE MINING AND MINE DEVELOPMENT

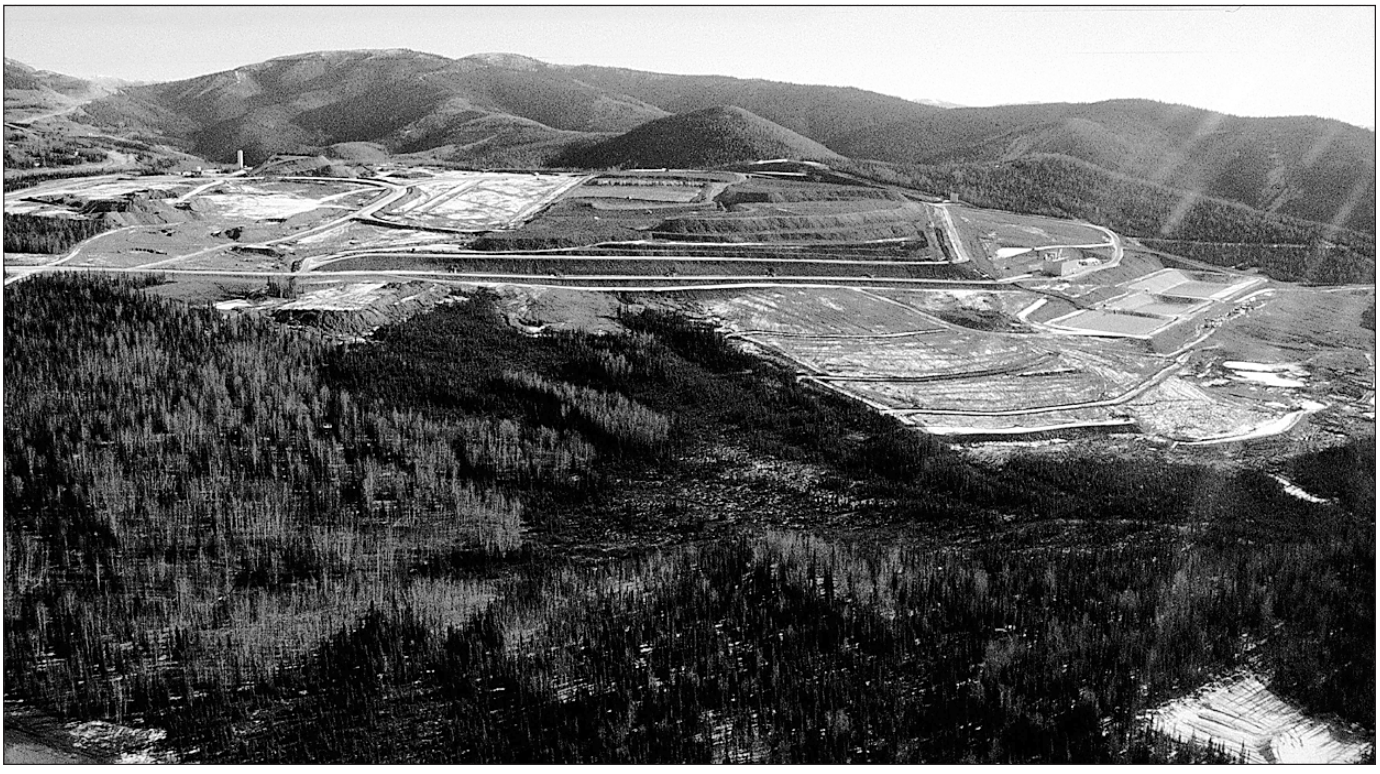
Mining resumed at the **Faro Pb-Zn-Ag Mine** (Yukon Minfile 105K 056) of Anvil Range Mining Corp. after a temporary shutdown. Mining of the Grum sedimentary-exhalative orebody was suspended in December, 1996 due to low metal prices and a number of operational factors, although milling of low-grade stockpiles continued until the end of March, 1997. In August, 1997 Anvil Range started a $15 million stripping program at the Grum deposit which contained open-pit mineable reserves of 16.9 million tonnes (Fig. 5) grading 3.0% Pb, 4.9% Zn, 47 g/t Ag and 0.7 g/t Au prior to mining which began in 1995. Funding for the current stripping program was provided in the form of a $15 million loan at 8.5% interest by Cominco Ltd., Anvil Range's largest shareholder at 27.7%. The loan is fully secured by all of Anvil Range's assets. Cominco has received five million warrants exercisable at $3 per share in conjunction with the loan. Cominco has also provided Anvil Range with sufficient working capital to continue operations until March, 1998 and the Glencore Group has entered into an agreement as the exclusive buyer of lead and zinc concentrates from the mine. Trucking concentrates to Skagway, Alaska (535 km) resumed in November, 1997. When in full operation the Faro Mine is one of the world's largest zinc-lead producers with an annual production of 480 000 tonnes of zinc and lead concentrates. Anvil Range conducted diamond drilling on the northwest side of the Grum pit, proving a model which would expand the pit limits in this direction. The mine is the Yukon's largest private-sector employer with nearly 500 direct employees plus related contractors.

Figure 5. *Production resumed from the Grum open pit at the Faro Mine in December, 1997. Stripping, shown here, began in August.*

Viceroy Resource Corporation successfully produced gold during its first winter of operation at the **Brewery Creek Mine** (Yukon Minfile 116B 160). Previously it was not known how successful heap leach technology would be in a northern climate (Fig. 6). Gold production during the first two months of operation, November and December 1996, totaled 316 kg (10 175 ounces) at a cash operating cost of US$239/oz. 1997 production is estimated at 2252 kg (72 400 ounces) of gold at a cash cost of US$190 per ounce. The ore at Brewery Creek consists of eight low-grade oxide gold deposits. The deposits are hosted by Cretaceous Tombstone Suite quartz-monzonite sills and underlying Devono-Mississippian greywacke of the Earn Group which occur over a linear trend 7 kilometres long. The orebodies will be extracted over an initial eight-year mine life. The unique configuration of the orebodies and the mine plan allows the backfilling and reclamation of the open pits shortly after extraction is completed. Reclamation of the mine therefore began in the first year of full production with the backfilling and reclamation of the Canadian Pit. Open-pit mineable reserves at the onset of production stood at 17.1 million tonnes grading 1.45 g/t Au. The strip ratio is 1.5:1 and gold recovery is 78%. Development in 1997 at the Brewery Creek Gold Mine included expanding the heap leach pad and construction of haulage roads. Two more cells were added to the existing 158 000 m^2 heap leach pad and haulage roads were constructed to orebodies slated for future production. Reserves are being updated and initial analysis indicates a decrease in tonnage and an increase in grade. The mine employs approximately 150 people during active mining in the summer months and 45 during the winter.

Viceroy conducted a $2 million exploration program to expand reserves beyond the main trend. The program covered nine kilometres of untested soil anomalies, using excavator trenching followed by reverse circulation drilling of several targets. In conjunction with the Geological Survey of Canada, an airborne geophysical survey was carried out over the mine property, as well as on adjacent Tr'on dek Hwech'in land claims, adjoining quartz claims and open ground on mapsheets 116B-1 and 115P-13. Within the minesite, trenching and drilling on the Moosehead, Big Rock, Bohemian, Lucky, Schooner, Sleemans zones, as well as the West grids have returned additional ore-grade intersections over mineable widths. The

Figure 6. *Gold-bearing ore, the Adsorption-Desorption Recovery plant and processing ponds can be seen in this photo of the heap leach pad area at Viceroy Gold's Brewery Creek Mine. The mine successfully produced gold during its first winter of operation, proving that heap leach technology can be used successfully in northern climates.*



highlight was the Lucky zone, where infill drilling returned numerous intersections up to 2.54 g/t Au over 22 metres. Drilling to the southwest of the current pit design returned intersections including 14.11 g/t Au over 10 metres, 8.67 g/t Au over 12 metres, 4.82 g/t Au over 16 metres and 7.94 g/t Au over 12 metres. These results illustrate the potential for significant expansion of reserves in and around the deposits in the current mine plan.

Central to the Brewery Creek Mine is the Classic zone, a Fort Knox-style target in potassic-altered syenite and biotite monzonite stocks south of the main reserve trend. Trenching at the Classic has exposed a zone of strong clay, sericite and limonite alteration over a length of one kilometre within a five-kilometre long Au-As geochemical anomaly. Assays from the Classic zone returned up to 1.88 g/t Au over 5.4 metres and 0.7 g/t Au over 20 m. Drilling on the North Slope zone intersected sediment-hosted ore-grade mineralization over a 500 m strike length. Assays include 13.15 g/t Au over 4 metres and 2.56 g/t Au over 16 m but typically range from 1 to 3 grams over thicknesses of 4 to 6 metres. The North Slope zone contains alteration and mineralization similar to Carlin-type deposits. Sulphide zones below the oxide reserves were also tested with drilling in 1997. Results suggest the grade of sulphide mineralization is similar to oxide mineralization. Preliminary metallurgical test work has indicates that bio-oxidation can attain recoveries from the refractory sulphides of up to 90%. Continued exploration on the mine property will add to the reserve base and likely extend the mine life beyond the projected eight years.

BYG Natural Resources Inc. continued production in 1997 from the Brown-McDade open pit (Fig. 7) at the **Mt. Nansen Au-Ag Mine** (Yukon Minfile 115I 064, 065). The Brown-McDade is a vein-fault up to 30 metres wide cutting Lower Cretaceous granodiorite and feldspar porphyry of the Mount Nansen Group. The fault contains lenses of quartz with sulphides. Mining is currently directed at the upper oxidized portion of the vein. A high clay content in the ore created lower production from the crushing and screening circuit of the mill resulting in lower throughputs for the first six months of 1997. A SAG mill was installed and commissioned in late August to replace the crushing and screening circuit. Production for 1997 totaled 617 kg (19 829 ounces) of gold and 3068 kg (98 654 ounces) silver. The

Figure 7. *Brown-McDade open pit at BYG Natural Resources, Mt. Nansen Mine. The upper oxidized portion of the vein system is currently being mined.*

mine shut down on November 12 to upgrade the water treatment system and was slated to resume full production by year-end, meeting water discharge requirements. The mine employs approximately 70 people.

The **Flex zone** (Fig. 8), which hosts possible reserves of 115 000 tonnes grading 7.5 g/t Au and 200 g/t Ag, will supply feed for the Mount Nansen mill after depletion of the Brown-McDade. The Flex zone, a shear zone hosted vein system similar to the Brown-McDade was stripped and trenched for detailed mine planning. The Flex zone contains two parallel veins, the Main and Footwall, that were exposed over a 350 metre strike length. Samples from the Main vein returned values of 7.1 g/t Au, 350.8 g/t Ag over 3.0 metres at the north end and 2.0 metres grading 14.6 g/t Au and 350.4 g/t Ag at the south end of the stripped area. The Footwall vein returned values of 3.0 metres of 9.4 g/t Au and 486.7 g/t Ag at the north end and 2.0 metres of 16.8 g/t Au and 221.2 g/t Ag at the south end of the stripping. B.Y.G also conducted a drilling program on the Eliza Extension vein to the northwest of the minesite on the **Discovery Creek** property. Drilling on the quartz-sulphide vein returned values up to 2.4 g/t Au and 25.7 g/t Ag over 3.8 metres in Hole 97-4 and 1.9 metres grading 4.29 g/t Au and 5.8 g/t Ag in Hole 97-3.

Development occurred at a number of Yukon projects which are in various stages of mine permitting and may see production in the near future. Minto Explorations received a positive Screening Report from the Regional Environmental Review Committee in April 1997 for the **Minto Cu-Au-Ag project** (Yukon Minfile 115I-021, 022), and signed a cooperation agreement with the Selkirk First Nation. A Yukon Water Board Hearing was held in June and the Board is in the process of drafting the water license. The porphyry deposit hosts open-pit-mineable reserves of 6.51 million tonnes grading 2.13% Cu, 0.62 g/t Au and 9.3 g/t Ag at a stripping ratio of 4.9:1. The mill is designed for a throughput of 525 000 tonnes of ore giving the mine an initial 13 year life. The estimated average cash operating cost per pound of copper, including freight, smelting, and refining charges and after gold and silver credits, is US$0.52 for the first five years of production. In anticipation of receiving their license Minto began site construction. The remaining 12.8 kilometres of access road were upgraded, the camp and mill sites excavated, peripheral access roads constructed, and two grinding mills moved to the site. Concrete for the mill footings may be poured as early as March, 1998 and production at the mine could begin as early as November, 1998. Asarco Inc. will acquire a

Figure 8. *Oxide material exposed by stripping of the Flex zone at the Mt. Nansen Mine. Detailed work for mine planning began on the Flex which is slated for production when the ore from the Brown-McDade pit is depleted.*

70% interest in the property by funding development costs up to US$25 million with Minto Explorations remaining the operator with a 30% interest.

Western Copper Holdings Limited continued engineering studies on the **Carmacks Copper Project** (Yukon Minfile 115I 008). The project hosts an open-pittable 14.1 million tonne oxidized porphyry Cu-Au deposit grading 1.01% Cu and 0.51 g/t Au. The project, which is being reviewed under the Environmental Assessment and Review Process, is slated to recover copper using solvent extraction-electrowinning technology. Western cleared and grubbed the access road, leach pad site, and plant site in 1997 (Fig. 9). A bulk sample was also extracted to conduct column tests on run of mine ore which may allow the elimination of a crusher in the mine plan resulting in substantial capital and operating cost reduction.

Cominco Ltd, announced in August that the **Sa Dena Hes Zn-Pb Mine** (Yukon Minfile 105A 012, 013) may reopen by mid-1998 however by mid-December they announced that the current market conditions did not support a reopening of the mine. Preparations for possible start-up included upgrading the haul road, camp renovations, recommissioning of power plants and rehabilatation of mine openings. The mine, formerly operated by Curragh Resources, ceased operation in December 1992 (Fig. 10). At Sa Dena Hes, several high-grade zinc-lead-silver skarn zones occur along contacts between Early Cambrian limestone and phyllite. The former operator mined mainly from Jewelbox Hill while future production will come from reserves in the Burnick Zone. The Sa Dena Hes mine is owned jointly by Cominco Ltd. (25%), Teck Corporation (25%) and Korea Zinc Co., Ltd., (50%), with Cominco the operator of the project.

The **Kudz Ze Kayah project** (Yukon Minfile 105G 117) of Cominco received a positive screening report under the Canadian Environmental Assessment Act in mid-December, 1997. No production decision has been made. The ABM volcanic massive sulphide deposit, the first major discovery in the Finlayson Lake district, hosts open-pit mineable reserves of 11 million tonnes grading 5.9% Zn, 0.9% Cu, 1.5% Pb, 130 g/t Ag and 1.3 g/t Au. Cominco conducted UTEM and magnetic geophysical surveys on the Kudz Ze Kayah property and drilled 17 holes totaling 5360 metres. A regional program consisting of soil sampling, horizontal-loop electromagnetics, magnetics and gravity surveys was also conducted by

Figure 9. *Western Copper Holdings stripped the pad site for the Carmacks Copper Project in 1997. Production of copper from the oxide deposit, using solvent extraction-electrowinning technology, will come from the No.1 zone, marked by trenches at the top right of the cleared pad site.*

Cominco on their numerous properties in the Finlayson Lake district. Six of these were tested with 1050 metres of drilling in seven holes.

The former producing mines of **United Keno Hill Mines** (Yukon Minfile 105M 001) Limited were placed on care-and-maintenance during 1997 while the company focused on renewing their water licence and obtaining financing to reopen. The 30 veins in the Keno and Galena hills have produced over 200 million ounces of silver in the past 70 years. Underground mineable reserves, mostly in the Bellekeno and Silver King veins, stand at 415 000 tonnes grading 1145 g/t Ag, 7.5% Pb, and 5.6% Zn; geological reserves are 944 000 tonnes grading 930 g/t Ag, 4.8% Pb and 3.9% Zn. The veins are hosted in the Mississippian Keno Hill quartzite and Triassic metadiorite intrusions. The Bellekeno vein contains massive sideritic galena-sphalerite while the Silver King ore-body consists of high grade veins with native silver, ruby silver and galena.

Late in 1997, United Keno Hill and NDU Resources announced a binding merger agreement between the two companies. NDU brings two substantial mineral deposits, the Marg (Yukon Minfile 106D 009) and the Blende (Yukon Minfile 106D 064), while Keno Hill brings the mineral deposits outlined above and the mine infrastructure at Elsa. The **Blende**, a large Mississippi Valley-type Zn-Pb-Ag deposit approximately 65 kilometres northeast of Elsa, is hosted by Middle Proterozoic Gillespie Group dolomite. It contains a drill-indicated resource of 19.4 million tonnes grading 2.81% Pb, 3.04% Zn and 55.9 g/t Ag mineable by open pit methods. The deposit was drilled between 1988 and 1994 with the latest results indicating an expansion in the West Zone. Hole 94-81 returned 14.86 m of mineralization which assayed 9.71% Pb, 5.48% Zn, 0.78% Cu and 228.4 g/t Ag. The **Marg** deposit is a polymetallic VMS deposit hosted in Early Mississippian meta-chert and quartz and muscovite schist (coeval with Yukon-Tanana stratigraphy) in the north-central Selwyn Basin approximately 60 kilometres east of Elsa. NDU has drilled the Marg deposit for the last couple of summers and drill-indicated reserves at the end of the 1996 were 5 527 000 tonnes at a grade of 1.76% Cu, 2.46% Pb, 4.6% Zn, 62.7 g/t Ag and 1.0 g/t Au. The 1997 program consisted of seven diamond drill holes outside the existing reserve blocks. Drilling was suspended until access for underground drilling can be established. A winter road to the Marg site was completed in 1997 across Class A (surface and subsurface rights) settlement lands of the Nacho Nyak Dun First Nation to facilitate development of the project.

Figure 10. *The Sa Dena Hes Mine underwent preparations for a possible reopening. With the right conditions in the zinc market the mine could resume production with short notice.*

New Millenium Mining Ltd, whose principal asset is the **Dublin Gulch deposit** (Yukon Minfile 106D 021-029) 51 km north of Mayo announced positive results from a feasibility study on this Fort-Knox style (intrusive-hosted) deposit which hosts open-pit mineable reserves of 50.4 million tonnes grading 0.93 g/t Au. The feasibility study indicates a gold recovery of 78%, a stripping ratio of 0.8:1, with forecast production of 135 000 ounces of gold per year at a capital cost of US$106.7 million and an operation cost of US$230 per ounce. In 1997 the company completed the feasibility study, continued environmental monitoring, baseline studies and underwent a comprehensive review of the project for permitting under the Canadian Environmental Assessment Act (CEAA).

PLACER MINING

William LeBarge, Yukon Geology Program

Yukon's placer mining industry continued to be an important part of the Yukon's economy in 1997. A total of 183 operations, directly employing 700 people, mined in ten major placer mining areas. The unglaciated Klondike (Fig. 11), Indian River, West Yukon (Fortymile, Sixtymile, and Moosehorn Range) and the Lower Stewart River tributaries produced approximately 80% of the total, with the remainder produced from the variously glaciated Clear Creek, Mayo, Dawson Range, Kluane and Livingstone areas.

Figure 11. *Ross Mining (foreground) on Dominion Creek and Teck Corporation (background-across road) on Gold Run Creek are two of the largest producing placer gold mines in the Yukon in recent years.*

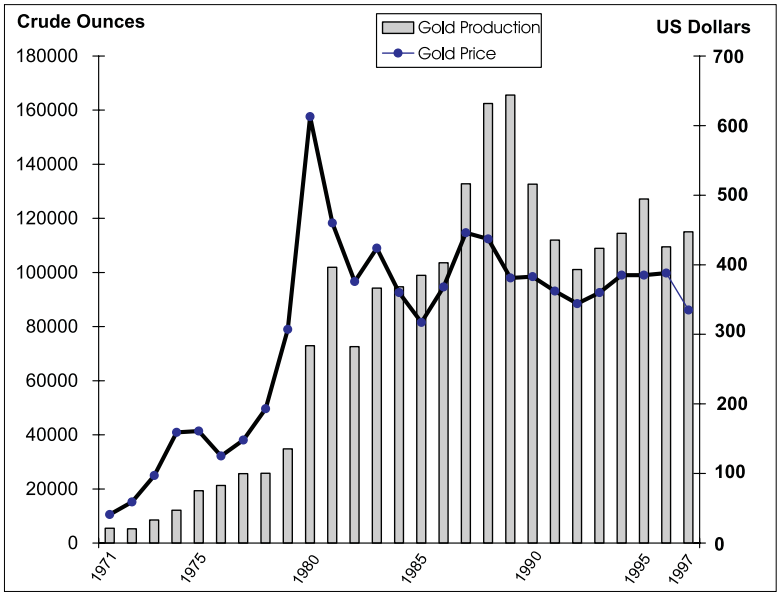
The 1997 Yukon placer gold production total of over 116 000 crude ounces of gold was up approximately 6% over 1996 (Fig.12), however due to the drastic drop in world market gold price, the total value of this gold was just over $42 million compared to nearly $46 million for 1996. The reason for this may be that some producers were forced to sell stockpiles of placer gold to offset its lesser value in order to pay production costs.

The number of placer mining operations in outlying (non-traditional) areas has increased in recent years, with renewed mining on Henderson Creek, Canadian Creek and in other parts of the Dawson Range.

Teck Corporation, which operated on Gold Run Creek in the Klondike, was one of the largest placer mines in the Yukon until it ceased production in September after 10 years of mining. Over 90 000 ounces were credited to this mine over its ten-year production life.

Other recent developments in the industry include the introduction of Mining Land Use regulations on placer claims, which are scheduled to take effect in the 1999 mining season.

Figure 12. *Yukon placer gold production and average US gold price, 1971 to 1997.*



EXPLORATION — BASE METALS

Continued exploratory drilling on volcanic-associated massive sulphide (VMS) deposits in the Finlayson Lake district and the search for additional deposits, dominated the 1997 exploration season. Cominco's initial discovery, in 1994, of the ABM deposit at the Kudz Ze Kayah project hosted in Mississippian felsic meta-volcanic rocks of Yukon-Tanana Terrane, spurred a staking rush and subsequent intensive exploration, resulting in the discovery of the Wolverine deposit jointly owned by Westmin and Atna Resources, the Fyre Lake deposit of Columbia Gold Mines, and the Ice deposit of Expatriate Resources. In 1997, Atna Resources discovered a new massive sulphide body on the Wolf claims 45 kilometres west of Kudz Ze Kayah.

Columbia Gold Mines spent approximately $4 million on a 44-hole, 13 500 metre drill program (Fig. 13) at the **Fyre Lake project** (Yukon Minfile 105G 034) 53 km south of Finlayson Lake and 30 kilometres southwest of Wolverine deposit. The Fyre Lake deposit is located stratigraphically below the ABM and Wolverine deposits at the contact of carbonaceous phyllites and chlorite schist of the Yukon-Tanana Terrane. The extensive exploration program followed up on positive results from 1996, and included detailed mapping around the Kona deposit, reconnaissance-scale mapping at the Lake zone, grid extensions, ground magnetometer and electromagnetic surveys and downhole geophysics (UTEM). The Kona deposit contains two parallel trends of copper-cobalt-gold mineralization: Kona East and Kona West. The east zone has a strike length in excess of 900 metres and consists of upper and lower horizons with an average thickness of 8 to 12 metres and average widths of 100 to 125 metres. The Kona West zone, which has a strike length of at least 1450 metres, a minimum width of 125 metres and varies in thickness from 9 to 40 metres, was the main focus of the 1997 drilling. The strike length of the Kona West zone was increased to approximately 1450 metres with the intersection of 16.3 metres of massive sulphides grading 1.28% Cu, 0.61 g/t Au, and 0.11% Co in the last hole of the season, a 450 metre southeasterly step-out. The entire Kona deposit is estimated to average 1.5 to 2.0% Cu, 0.1 to 0.14% Co and 0.5 to 1.0 g/t Au based on reported drill intercepts. Metallurgical testwork has indicated that copper recoveries of 90% and cobalt and gold recoveries of 70% can be achieved.

Westmin and Atna Resources conducted a large exploration program in and around the **Wolverine deposit** (Yukon Minfile 105G 032) located approximately 25 km east of Kudz Ze Kayah and 35 km southeast of Finlayson Lake. The Wolverine is hosted in Devono-Mississippian carbonaceous meta-sedimentary and meta-volcanic rocks of Yukon-Tanana Terrane. The deposit was first intersected by drilling in 1995 after an initial geological program identified favourable host rocks and coincident barium-lead-copper-zinc-gold-silver geochemistry. A large program in 1996 outlined a geological inventory of 5.3 million tonnes grading 1.8 g/t Au, 359 g/t Ag, 1.4% Cu, 1.5% Pb, and 13% Zn based on 49 drill intersections. In 1997, Westmin drilled 22 holes with 19 intersecting mineralization outside of the 1996 block model. The program was successful in expanding the Wolverine-Lynx zone deposit in the up-dip direction, and to the east and west along strike. The deposit

Figure 13. *John Dayton (L) and Ian Foreman (centre) of Columbia Gold Mines review core with Julie Hunt (Yukon Geology Program) who is conducting a study of VMS deposits in the Yukon.*

remains open in the downdip direction which extends across the claim boundary onto ground held by Cominco. Westmin revealed that the deposit contains unusually high levels of selenium which is a metallurgical concern.

Westmin also drilled an additional 20 stratigraphic holes on targets believed to be underlain by stratigraphy similar to that hosting the Wolverine deposit. Favourable stratigraphy extends approximately14 kilometres on their claims. The stratigraphic drilling program intersected numerous areas with alteration and uneconomic mineralization, some of which will require a significant follow-up. Late in the season, massive sulphides in the Sable zone were discovered by a drill intersection 1.6 kilometres east of the Wolverine deposit. Hole WV97-106 (Fig. 14) returned 2.6 g/t Au, 183 g/t Ag, 0.65% Cu, 0.62 Pb and 15.7% Zn over a true thickness of 0.6 metres. The Puck claims, optioned by Westmin from Expatriate Resources, adjoin the Wolverine property to the southeast in the vicinity of the Sable zone. Westmin drilled 10 widely spaced stratigraphic holes on the Puck claims which were successful in intersecting the favourable Wolverine horizon, magnetite horizon, stockwork mineralization and strong alteration, however no economic mineralization was reported.

Figure 14. *Massive sulphides from the Sable zone intersected in Hole WV97-106 at the Wolverine Project. This interval assayed 2.26 g/t Au, 183 g/t Ag, 0.65% Cu, 0.62% Pb and 15.70% Zn over 0.6 metres.*

Expatriate Resources conducted a 7880 metre diamond drilling program (Fig. 15) on the **Ice property** (Yukon Minfile 105G new) 70 kilometres northwest of the ABM deposit and 35 km northwest of Finlayson Lake. The deposit is hosted in basalts of the Campbell Range Belt. Cyprus-type massive sulphide mineralization was intersected on the Ice property in the final

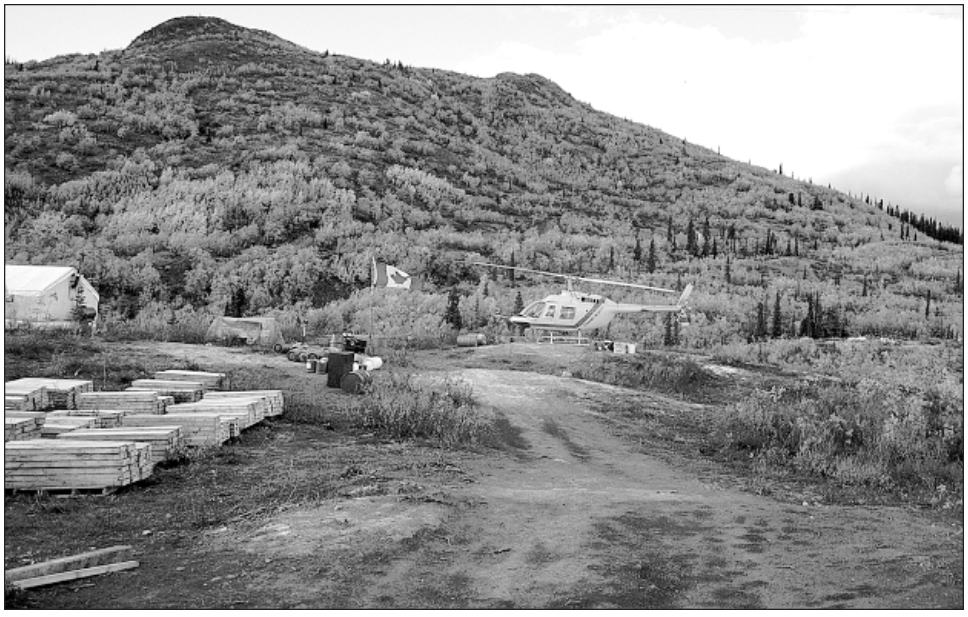


Figure 15. *The Ice deposit of Expatriate Resources lies underneath the hillside behind the helicopter. Over 100 drill holes at 25- and 50-metre spacings have intersected the deposit in the area of this photo.*

Figure 16. *Bright red hematitic chert (grey in this photo) at the upper contact of a massive sulphide intersection (black) on Expatriate Resources' Ice Property in the Finlayson Lake area.*

hole of the 1996 exploration program. Drilling in 1997 intersected sulphides in two horizons, an upper massive sulphide horizon (Fig. 16) and a lower stockwork sulphide horizon which contains lenses of massive to semi-massive sulphides. Mid-way through the program the best intersection was Hole ID97-13 which returned 6.83% Cu, 1.02% Zn, 0.12% Co, 0.56 g/t Au and 24.2 g/t Ag over 10.98 metres. A feeder zone directly underlying the massive sulphides contained an additional 1.53% Cu over 17.57 metres. Expatriate's drilling program outlined a higher grade core to the deposit over a 350 by 50 metre area within a larger 600 by 400 metre area. Copper intersections from the core included, 5.20% over 20.56 metres, 8.56% Cu over 5.92 metres, 3.57% Cu over 28.55 metres and 4.31% Cu over 19.75 metres. Thicker lower grade mineralization surrounding the high-grade core, contains 1.5% to 3.0% Cu and the feeder zone assays in the 0.2% to 1.5% Cu range.

Expatriate also conducted several programs, including mapping, prospecting, geochemistry and hand trenching, on their extensive land package (>100 000 ha) in the Finlayson Lake district. Several areas of new mineralization and favourable stratigraphy for hosting VMS deposits were identified. On the **Goal-Net** property, Pb-Zn mineralization is associated with several intense multi-element geochemical anomalies and felsic metavolcanic rocks. An extensive magnetite horizon has also been identified. Regional mapping by the company indicates that it lies at approximately the same stratigraphic horizon as the magnetite horizon which forms a marker in the hanging wall of the Wolverine deposit. Helicopter-supported diamond drilling was performed on the **Power Play, Skate, Breakaway and Arn** (Yukon Minfile 105G new, 105K 098, 103, 105G 112) (Fig. 17) claims, following up on geochemical anomalies; however, no significant mineralization was encountered.

Nordac Resources conducted drilling programs on the **Convert, Simpson and End Zone** (Yukon Minfile 105B new, 105G new, 105B 101) properties south of Finlayson Lake. Drilling at Convert and Simpson intersected felsic metavolcanic rocks, baritic horizons, and pyrite with minor sphalerite and rare galena and chalcopyrite. At the Simpson property, where previous work had located strataform copper-lead-zinc grading up to 2.17% Cu, 10.5% Pb, 2.26% Zn and 128.6 g/t Ag, a chloritic magnetite horizon was intersected. Drilling at the End Zone failed to intersect stratiform mineralization, exposed in a creek bank, which returned up to 4.67% Zn, 3.17% Pb and 46 g/t Ag over 0.7 metres. Drilling was conducted across the creek from the exposed mineralization. Folding or faulting, indicated in drill core, has probably disrupted the continuity of the mineralization.

Elsewhere in the Finlayson Lake area many other programs were performed. Westmin conducted max-min and magnetometer surveys, soil sampling and geological mapping on the **Ty property** (Yukon Minfile 105G 083) optioned from Pacific Bay Minerals Ltd. The

Figure 17. *Bill Wengzynowski (left) of Archer, Cathro and Associates with his crew of assistants clearing a drill pad on the Arn property in the Finlayson Lake district. Hand trenches by this crew on other Finlayson area properties bear a striking similarity to trenches dug by a Caterpillar 225 excavator.*

program outlined a multi-element geochemical anomaly and coincident EM conductor in volcanic schists that is planned for drill testing in 1998. Pacific Bay conducted a program of geological mapping, grid soil sampling, prospecting and lithogeochemistry on 13 of 19 properties optioned from Cominco in the Finlayson region. Demand Gold Ltd. drilled two holes on the **RBI** (Yukon Minfile 105G new) claims, located three kilometres south of Cominco's ABM deposit, to test EM conductors associated with a weak magnetic anomaly and slightly anomalous soil geochemistry. The drilling encountered highly faulted structures but no economic mineralization. KRL Resources drilled five holes on the **Watson** (Yukon Minfile 105A new) property located at the southern end of the Finlayson Lake district on the BC-Yukon border. The best intersection from the program was 2.67% Zn over 0.9 metres. Arcturus Resouces Ltd, conducted a 3-hole drill program on the **First Base** (Yukon Minfile 105G 031) (Fig. 18) property located 17 kilometres southwest of Cominco's Kudz Ze Kayah Project in early October to investigate an electromagnetic and magnetic anomaly coincident with a lead-copper-zinc soil anomaly. Results of the program are pending. Atna Resources conducted drill programs on the **Money and Argus** (Yukon Minfile 105H 078, 105G 013) properties following up on mineralization intersected in 1996 drilling. Atna also conducted an E-scan (3-D conductivity and resistivity) survey on the Money property (Fig. 19).

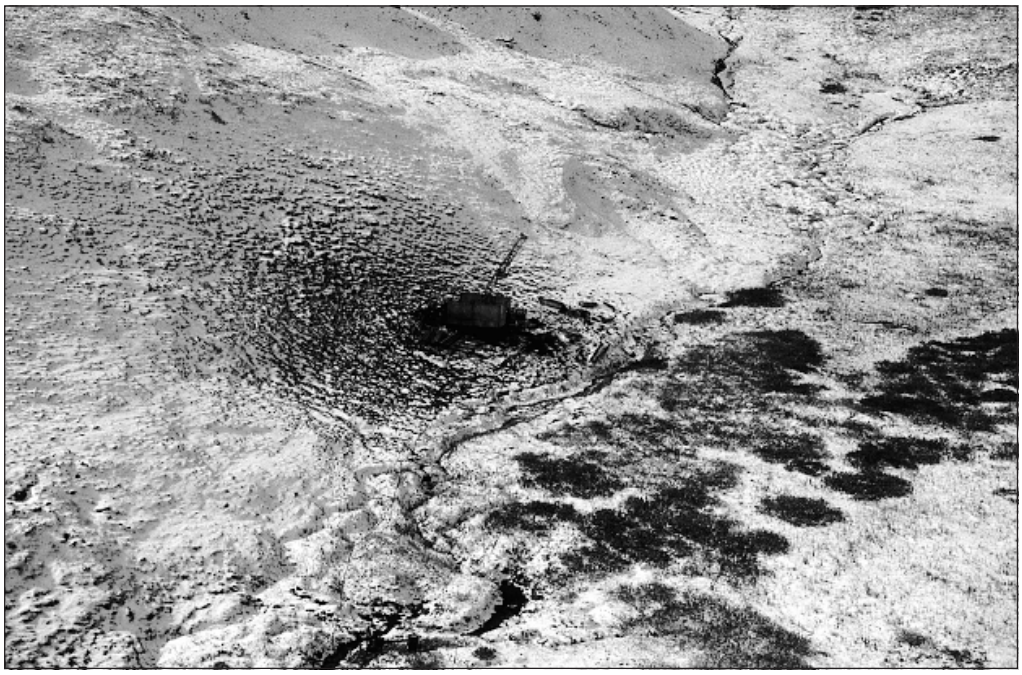


Figure 18. *Arcurus Resources conducted a 3-hole diamond drilling program on the First Base property located 17 kilometres southwest of Cominco's Kudz Ze Kayah Project. Drilling conducted in October targeted coincident electromagnetic, magnetic and Pb-Cu-Zn soil anomalies. The drill is visible in the centre of the photograph..*

Figure 19. *Wayne Pickett of Atna Resources examines 1996 core on the Money property. Atna continued drilling the property in 1997.*

Exploration continued in 1997 for VMS deposits outside the Finlayson Lake district. Exploration in volcanic rocks of Pelly-Cassiar Platform west of the Finlayson Lake area resulted in the discovery of a new massive sulphide body on the Wolf property of Atna and YGC Resources. Prospective occurrences in Yukon-Tanana Terrane north of Teslin and in the Dawson area were the focus of several focused programs and some grassroots exploration programs. The Marg deposit, hosted in Devono-Mississippian felsic volcanic rocks of the Selwyn Basin was explored with a moderate drill program.

The most significant program outside the Finlayson area was operated by Atna Resources on the **Wolf** (Yukon Minfile 105G 008) property. The Wolf property, 45 kilometres west of Kudz Ze Kayah, is on the west side of the Tintina Fault in Pelly-Cassiar Platform strata coeval, and possibly correlative with, Yukon-Tanana Terrane rocks in the Finlayson Lake district. The intermediate to felsic volcanic rocks hosting the mineralization discovered on the Wolf property define a belt approximately 80 kilometres long and up to 25 kilometres wide. Massive sulphide mineralization is hosted by pyritized felsic tuffs and was intersected by all nine drill holes of the program (Fig. 20) over a 500 metre strike length and 250 metres downdip. The property has been drilled by previous operators who intersected narrow sub-economic mineralization. Based on geologic interpretation of previous work and from their 1996 program Atna drilled deeper in the target horizon and intersected mineralization in the first hole of the program. The highest grade intersection, in WF97-07, was 25.2 metres grading 6.94% Zn 2.78% Pb and 138.6 g/t Ag. Atna will be conducting a major drill program in 1998 on the Wolf property.

Subsequent to the Wolf discovery, Atna Resources optioned several properties, including the **Mamu** (Yukon Minfile 105F 013) property of Oro Bravo Resources, and the **Bnob (Ice) and Chzerpnough (Fire)** (Yukon Minfile 105F 071, 073) properties of Eagle Plains and Miner River Resources. These three occurrences hosted in the same 80 by 25 kilometre belt of intermediate to felsic volcanic rocks as the Wolf. Oro Bravo completed a 12 kilometre access road (Fig. 21) to the Mamu property and conducted prospecting, additional claim staking and a 3-hole, 350 metre drill program. Mineralization at Mamu consists of disseminated pyrite in exhalite horizons, massive bedded pyrite, quartz veins and quartz breccias with pyrite +/- sphalerite, tetrahedrite, galena and chalcopyrite. On the **Bnob** and **Chzerpnough** properties, Eagle Plains and Miner River conducted geochemistry, mapping and prospecting. The Bnob hosts two layered barite horizons containing disseminated pyrite, and banded galena and sphalerite (Fig. 22). Select grab samples of the mineralized barite returned up to 12.7% Pb,

Figure 20. *Atna and YGC Resources geologists examine core at the Wolf massive sulphide discovery.*

Figure 21. *Oro Bravo Resources completed a 12-kilometre access road to the Mamu property. Three diamond drill holes were completed on the project in 1997.*

4.7% Zn and 55 g/t Ag. The Chzerpnough is host to disseminated sphalerite and galena mineralization hosted by lapilli tuff with a carbonate matrix. Peak values of 2.5% Pb, 11.7% Zn, 72.9 g/t Ag, and 1.06 g/t Au have been obtained on the property.

Artemis Ventures Inc, explored the **Wild-Eve** claims (Yukon Minfile 105F 020) with trenching and soil sampling. The claims are located approximately three kilometres south of the Chzerpnough occurrence. Trenching encountered a pale grey, pyritic horizon in Devono-Mississippian shales. The property is also underlain by felsic volcanics. Values up to 10.3 ppm Ag and 1853 ppm Pb were obtained from trenches and soil samples up to 44.1 ppm Ag, 2418 ppm Pb and 5564 ppm Zn were obtained.

Figure 22. *Tim Termuende, President of Miner River Resources examines banded galena and sphalerite in a barite horizon on the Bnob (Ice claims) occurrence.*

Pathfinder Resources staked approximately 450 **Starr** (Yukon Minfile 105G new) claims northeast from the Wolf discovery on open ground between the Wolf and the Bnob-Chzerpnough-Mamu properties. The property covers favourable volcanic stratigraphy which, with the recent discovery on the Wolf, has increased significantly in its mineral potential. Pathfinder conducted an airborne electromagnetics and magnetics survey over the claims and plans on conducting extensive exploration in 1998.

In the Teslin area the **BigTop** (Yukon Minfile 105C 021) property was explored by a privately funded Yukon exploration company with an airborne electromagnetic (EM) and magnetic survey, grid geochemistry, mapping, and excavator trenching (Fig. 23). Multi-element geochemical anomalies with up to 8.9 ppm Ag, 351 ppm Cu, 669 ppm Pb, and 3361 ppm Zn with coincident EM and magnetic anomalies were trenched, exposing a package of interlayered carbonaceous shales, argillites, pyritic felsic volcanics and tuffaceous units. Thinly laminated argillite with disseminated sphalerite returned assays of 0.75% Zn from outcrop and 1.2% Zn from float. Results of detailed sampling, whole rock analyses, thin section and polished sections are pending.

Fairfield Minerals Ltd. explored the **Cabin Lake** and **Caribou Creek** properties in the Teslin and Wolf Lake areas with prospecting, mapping, geochemistry and airborne geophysics. The properties were both staked on regional multi-element geochemical anomalies from a 1980's survey. On the Cabin Lake property a 250 ppm copper anomaly 800 metres long and 400 metres wide, with peak values up to 3000 ppm copper with some coincident silver, lead and zinc anomalies was identified. Grab samples up to 6087 ppm copper in quartz sericite schists were obtained from the Caribou Creek property.

Birch Mountain Resources Ltd. explored the **Swift River** (Yukon Minfile 105B 027) property located midway between Teslin and Watson Lake in Yukon-Tanana Terrane. Birch Mountain conducted a horizontal-loop electromagnetic survey in the spring followed by prospecting, trenching, detailed mapping and diamond drilling. Mineralization is associated with limy bands and metavolcanic rocks of the Anvil Allochthon. Detailed mapping of the mineralized showings on the property and subsequent petrographic work identified interlayered tuffaceous volcanics and calcareous sedimentary rocks. Mineralization consisting of massive to semi-massive pyrrhotite and magnetite was drilled at the Dan (Fig. 24) and Lower Crescent Lake showings. At the Dan, values of 14.57% Zn over 1.2 metres and 6.55% Zn over 1.88 metres were obtained. At the Lower Crescent, an intersection of 3.52% Zn over 1.1 metres was obtained. At the Upper Crescent showing, four horizons of interlayered magnetite and sphalerite returned values up to 6.29% Zn over 0.88 metres and 4.67% Zn over 4.85 metres.

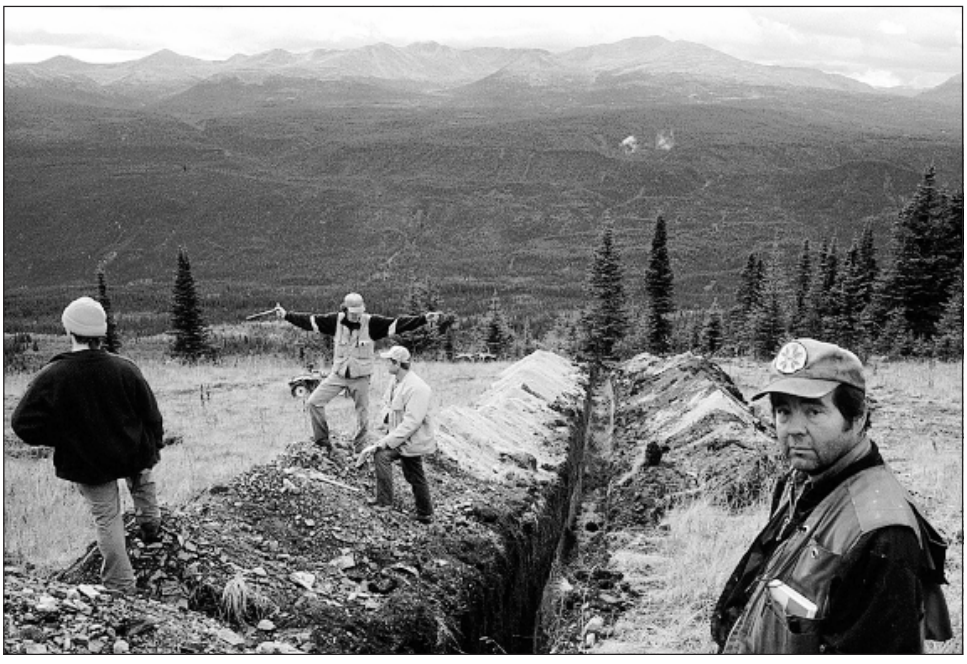


Figure 23. *Interbedded black argillites and light coloured felsic rocks can be seen in trenching on the Bigtop property being explored for its VMS potential by a private Yukon exploration company.*

Also in Yukon-Tanana Terrane Atna Resources explored the **Matson Creek** (Yukon Minfile 115N 100) property west of Dawson with an electromagnetic and UTEM geophysical survey. The property is underlain by meta-sedimentary and meta-volcanic rocks of the mid-Permian Klondike Schist. Boxwork textured limonite occurs on surface within a large soil Cu-Pb-Zn geochemical anomaly, suggesting

the presence of sulphides. Quartz veins with sulphide selvages identified in core from previous drilling may also explain the source of the geochemical anomaly.

Madronna Mining Limited conducted a program of soil geochemistry on the **Poker Creek** (Yukon Minfile 116C 019, 146) prospect located 75 km west of Dawson in Yukon-Tanana Terrane. The property is being explored for its potential to host a VMS deposit. The geochemical survey was completed over magnetic highs identified in a 1996 airborne geophysical survey.

Figure 24. *Geologist Ed Santiago (R) at the Dan showing on Birch Mountain Resources' Swift River Project.*

Exploration for base metals targets other than volcanic-hosted massive sulphides were conducted by several companies. Deposit types explored for included: sedimentary-exhalative Pb-Zn-Ag and sedimentary Ni-Zn in Selwyn Basin strata, Olympic Dam Cu-Co-Au in the Proterozoic rocks of MacKenzie Platform, porphyry Cu-Au in Stikine Terrane northeast of Whitehorse and in the Dawson Range, skarn Cu in the Whitehorse Copper Belt and magmatic Cu-Ni-PGE in Wrangell Terrane of southwest Yukon.

Blackstone Resources and joint-venture partner Glenhaven Resources, conducted a 12-hole helicopter-supported, reconnaissance scale drill program for stratiform Ni-Zn mineralization at the **Taiga** (Yukon Minfile 116B 128) project. The property is located approximately 100 kilometres northeast of Dawson and seven kilometres from the Dempster Highway. Mineralization consists of stratiform vaesite (nickel disulphide) hosted in silty argillites and shale of the Devono-Mississippian Earn Group (Fig. 25). A distinctive limestone ball unit consisting of limestone spheres up to one metre in diameter occurs in the strata immediately below the mineralization. This stratigraphic setting is similar to that found at the Nick occurrence located 150 kilometres to the east. At Taiga, Ni-Zn-PGE mineralization has been discovered in outcrop in two locations in 1994 and 1996, and the 1997 drill program was designed to test the favourable stratigraphy and coincident geochemical anomalies over a ten-kilometre strike length. Drill hole REN97-08 drilled in the vicinity of the TB showing (3.58% Ni over 40 cm on surface) intersected 25.5 metres of 0.51% nickel with 0.41% zinc starting at 29 metres depth. The intersection included a higher grade 5.3 metre intersection

Figure 25. *Dave Caufield (R) of Equity Engineering and John Robins, Director of Blackstone Resources at the TB showing, a stratiform nickel-zinc horizon on the Taiga Project.*

grading 1.42% nickel and 0.70% zinc (Fig. 26). Drill hole REN97-07, drilled 200 metres east of 97-08, intersected 6.1 metres of 0.27% Ni and 0.33% Zn. Late in 1997, Blackstone staked a further 900 claims to cover 34 kilometres of favourable stratigraphy and coincident Ni-Zn soil and silt anomalies in the Taiga Basin. The discovery area and new areas will be further tested with an expanded program in 1998.

Blackstone Resources continued to evaluate the **Dromedary** (Yukon Minfile 105L 031, 051) property, where sedimentary exhalative mineralization, grading up to 8.42% Zn, 2.43% Pb and 29.8 g/t Ag over 2 metres, was intersected by drilling in 1996. The property, 80 km east of Pelly Crossing, is underlain by northwest-trending, south-dipping thrust panels which repeat Devono-Mississippian Earn Group sediments and Cambro-Ordivician Kechika Group sediments. Sedimentary exhalative mineralization consists of massive pyrrhotite, pyrite, sphalerite, galena and minor arsenopyrite hosted in the Earn Group while stratabound pods, bands and disseminations of pyrrhotite, pyrite, galena and sphalerite with cross-cutting quartz-galena-sphalerite veins occur in Kechika Group sediments. The 1997 program consisted of magnetic and gravity geophysical surveys, trenching, mapping, soil and rock sampling. The geophysical program increased the density and expanded a previous geophysical survey performed by Anaconda. The new data was successful in further delineating the coincident gravity and magnetic anomalies which formed the basis of the 1996 drilling. A better understanding of the geophysical signature of the massive sulphide mineralization encountered in the 1996 drilling has generated 13 anomalies which need to be further tested by drilling. Surface exploration led to the discovery of the Gully showing where selected grab samples returned up to 5.83% Zn and 5.5% Pb. The Gully showing is in the Kal-Cave area west of the 1996 drilling where several showings occur over a five-kilometre strike length.

Figure 26. *Drill core from Hole REN 97-08 at the Taiga property which demonstrates the subtle character of nickel-zinc mineralization. This hole returned a 5.3 metre intersection grading 1.42% nickel and 0.70% zinc.*

The Westmin-Newmont joint venture (Fig. 27) conducted a helicopter-supported drill program in the Wernecke Mountains on the **Fairchild** (Yukon Minfile 106C,D,E various) project to test previously outlined geophysical anomalies in search of Cu-Au-Ag-Co mineralization hosted by "Wernecke Breccias." Similarities to the Olympic Dam deposit (over 2 billion tonnes grading 1.6% Cu and 0.6 g/t Au, 3.6 g/t Ag, 0.06 U_2O_3) include: the hematitic breccia host rocks, the Proterozoic age of both host rocks and the deposit, and a similar mineralogy consisting of approximately 85% chalcopyrite and 15% chalcocite-bornite. The joint venture has 27 properties totalling over 1800 claims in the Bonnet Plume River region and has spent approximately $8.0 million on exploration over six years. Eleven of the properties have been drilled with 14 600 metres of diamond drilling in 105 holes. More than half of the drilling has been on the Hoover-Slab occurrence. Selected results from drilling include: 20.5 metres of 2.0% Cu, 0.21% Co, 0.16 g/t Au from Hole 3 at the Gremlin occurrence, 0.25% Cu over 200 metres including 20 metres grading 0.52% Cu in Hole 94-5 at the Hoover and 18 metres of 0.76% Cu in Hole 97-9 at the Slab.

The **Olympic property** (Yukon Minfile 116B 099), within the Ogilvie Mountains, 100 kilometres north of Dawson City was explored by Major General Resources with structural mapping, geophysics and

diamond drilling. The property is underlain by a hematitic breccia complex analagous to those in the Wernecke Mountains being explored by the Westmin-Newmont joint venture and both are similar in age and emplacement style to the Olympic Dam deposit in Australia. The program ended in early October and results are not yet public. Previous work identified several areas of fracture-controlled, breccia-hosted copper mineralization which returned values up to 7.0% Cu over 4 metres. Mineralization in a fractured mafic dyke returned 1.97% Cu over 4 metres.

Figure 27. *The Westmin-Newmont joint venture went to great lengths to have a minimal environmental impact with their exploration program in the Bonnett Plume River area. This included flying garbage out of the area to the town of Mayo.*

An eight-hole, reverse-circulation drilling program was carried out on the **Rusty Springs** property (Yukon Minfile 116K 003) of Eagle Plains Resources during 1997 (Fig. 28). The program was funded by CanAustra Resources who can earn a 60% interest by spending two million dollars in exploration and making cash payments over 4 years. A total of 412 metres were drilled over the course of the program, which tested for stratabound base-metal mineralization beneath Mississippian-aged chert and shales in the lower Earn Formation. Four of the eight holes were abandoned with two holes intersecting the siliceous limonitic stratabound unit identified in the 1996 drilling program. Anomalous copper and zinc were obtained over a 36.6 metre limonitic interval in one hole and anomalous copper, lead, zinc and silver over a 59.9 metre interval of limonite in the other. The target siliceous limonitic unit was first successfully recovered in drilling in 1996 which led to reinterpretation of the property geology and setting of stratabound mineralization. The siliceous limonitic unit is host to both oxide and sulphide mineralization on the property, and has been intersected by drill holes up to five kilometres apart. The horizon is everywhere anomalous in base metals and has returned values in oxides up to 15.3 metres of 517.7 g/t Ag, 3.0% Cu and 1.3% Zn. Sulphide mineralization encountered in the horizon has returned values up to 4.54 metres grading 3873.8 g/t Ag, 13.0% Pb and 2.0% Cu.

Figure 28. *Summit Air's Skyvan provides support for the Rusty Springs project in northern Yukon. Drilling equipment, fuel and vehicles are among the supplies efficiently delivered to the project.*

Placer Dome conducted a program of geological mapping, sampling, geochemistry, airborne magnetics and radiometrics and an IP survey on the **Mars** (Yukon Minfile 105E 002) claims optioned from Camdan Exploration Inc. The property is located approximately 60 km northeast of Whitehorse near the Livingstone Creek winter trail. The Cu-Au porphyry target is hosted by the Middle Jurassic Teslin Crossing Pluton, an alkalic monzonite stock which intrudes Jurrasic Whitehorse strata of Stikine Terrane. Intensive potassic alteration and magnetite occur within the stock and mineralization consists of stockwork quartz +/- chalcopyrite.

Camdan Exploration Inc. conducted a program of prospecting, mapping and geochemistry on the **Java** claims located 3 kilometres northwest of the Mars property. The claims cover Jurassic intrusive rocks and a magnetic signature analogous to the host rocks and magnetic signature on the Mars property. Prospecting located a Cu-Au skarn occurrence which assayed up to 900 ppb Au and 1.5% Cu with anomalous zinc and bismuth. The occurrence is associated with a linear magnetic feature tailing off of the magnetic high coincident with the property.

Wildrose Resources Ltd. and joint venture partner Alexis Resources conducted a program of road-building, drill-pad construction, and prospecting on the **Canadian Creek** property (Yukon Minfile 115J 036) 150 kilometres south of Dawson in central Yukon. The property is located in the Dawson Range appoximately 5 kilometres west of the Casino Cu-Au-Mo porphyry deposit and may contain a similar target. Pyritic stockwork mineralization in intrusive subcrop was exposed during road-building and several gossanous areas were stripped in preparation for trenching.

Inco Limited and Fort Knox Gold Resources Inc. explored the **Klu** (Yukon Minfile 115G 003, 084) and **Burwash** (Yukon Minfile 115G 016) properties near Destruction Bay in western Yukon. Inco initially staked the Klu property in 1994 after discovering Ni-Cu mineralization hosted by Triassic mafic-ultramafic sills. Grab samples assayed up to 2.8% Cu, 3.1% Ni, 0.2% Co, 3.1 g/t Pt, and 1.0 g/t Pd. UTEM and ground magnetic surveys were conducted on the Klu property in 1997 following up on electromagnetic conductors identified in an airborne survey conducted in 1996. On the Burwash property, optioned from Nathan Minerals, two showings grading up to 3.6% Ni and 2.0% Cu are located at the base of the Tatamagouche Ultramafic complex. Ground magnetics and UTEM surveys, geological mapping and sampling were conducted on the Burwash property in 1997.

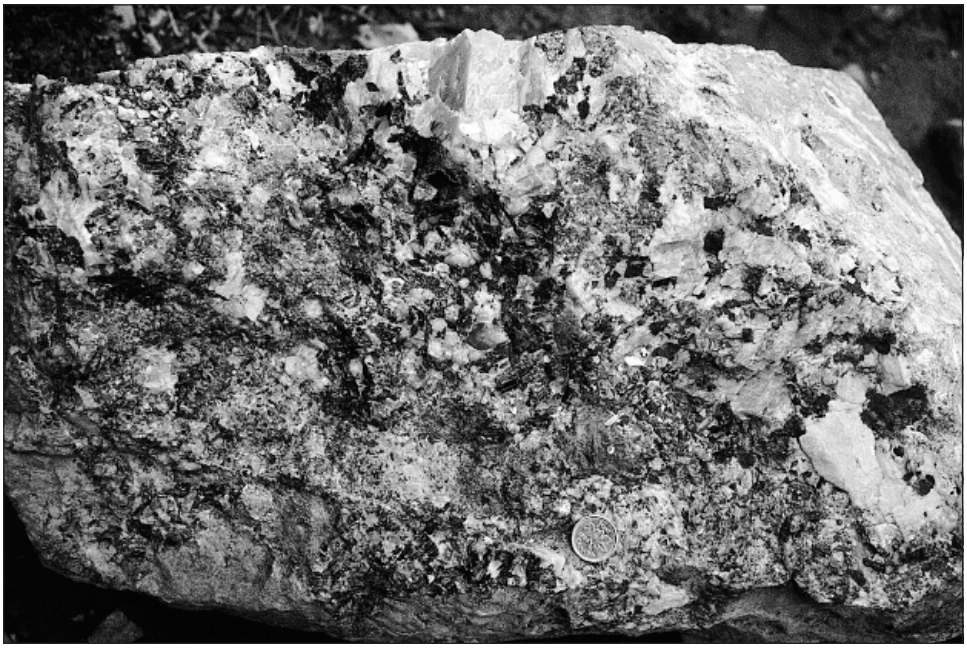


Figure 29. *Chalcopyrite-bearing skarn mineralization from the Hat claims located in the Whitehorse Copper Belt.*

Expatriate Resources drilled the **Canalask** Ni-Cu property (Yukon Minfile 115F 045) with 10 holes totalling 1203 metres. The drilling tested airborne magnetic and electromagnetic anomalies identified in a 1996 survey. The best results from the drilling was 0.35% Ni and 0.12% Cu associated with pyrrhotite concentrations in a gabbro. The geophysical anomalies coincide with fault zones containing pyrrhotite, magnetite and minor native copper.

Northern Platinum Ltd. continued work on the **Wellgreen** (Yukon Minfile 115G 024) deposit which contains reserves of 50 million tonnes of 0.35% Cu, 0.36% Ni, 0.51 g/t Pt and 0.34 g/t Pd in a Triassic layered mafic-ultramafic sill 600

metres thick. The deposit was in production in 1972 and 1973 and a portion of the underground workings were rehabilitated and resampled in the 1997 program. Adjoining are the Linda claims where Northern Platinum sampled a zone of massive to semi-massive sulphides which averaged 4.12% Ni, 0.89% Cu, 1.88 g/t Pt and 1.35 g/t Pd over 1.3 metres.

Local prospector Rob Hamel explored the **Hat** (Yukon Minfile 105D 053) claims located one kilometre north of the former War Eagle Open Pit near the garbage disposal area for the City of Whitehorse. Excavator trenching (Fig. 29) uncovered calc-silicate skarn consisting of garnet, diopside and wollastonite with chalcopyrite and bornite typical of the Whitehorse Copper Belt over a strike length of approximately 200 metres. Several extremely high grade areas of bornite and chalcopyrite mineralization were noted during a property visit. Production in 1970 and 1971 from the War Eagle deposit totaled 900 000 tonnes grading 1.25% Cu, 0.22 g/t Au, 8.57 g/t Ag and 0.038% Mo. Further to the north, in an area slated for expansion of the garbage dump, Hamel conducted limited cat-trenching to expose more porphyry-style mineralization.

EXPLORATION — GOLD

Exploration for precious metals, mainly gold, was active throughout Yukon with the main interest along the Cretaceous Tombstone Suite intrusive belt which stretches across the Yukon from north of Dawson in the west to MacMillan Pass in the east. Several reconnaissance programs were conducted in this belt of rocks, which hosts the deposits at Brewery Creek and Dublin Gulch in the Yukon, and Fort Knox in Alaska. The largest gold exploration program elsewhere in the Yukon was conducted in the Wheaton River district southwest of Whitehorse. In the Wheaton, Omni Resources with joint venture partners Arkona Resources and Trumpeter Yukon Gold continued a successful advanced exploration program on the Goddell and Skukum Creek deposits.

Omni Resources and Trumpeter Yukon Gold Inc, each hold a 35% interest in the **Goddell Shear** (Yukon Minfile 105D 025) property 85 kilometres south of Whitehorse; Arkona Resources holds the remaining 30%. In 1997, the undergound adit was extended 182 metres and over 8500 metres of underground drilling completed in 37 holes (Fig. 30). Based on this drilling an indicated reserve of 824 594 tonnes grading 7.15 g/t Au has been calculated. The shear zone cutting the mid-Cretaceous Carbon Hill granite contains gold and silver with disseminated stibnite, galena, sphalerite and arsenopyrite. Omni also conducted surface drilling near its **Skukum Creek** (Yukon Minfile 105D 022) deposit located 5 kilometres away. The deposit hosts a drill-indicated and inferred reserve of 800 150 tonnes grading 7.6 g/t Au and 275 g/t Ag. Drilling approximately 300 metres west of Skukum Creek intersected 7.66 g/t Au, 234.9 g/t Ag, 0.24% Cu, 5.88% Zn and 2.06% Pb over 11.6 metres in a quartz breccia containing galena-sphalerite-chalcopyrite-arsenopyrite-pyrite mineralization. Access to this new area, called the Ridge zone, can be gained by extending the 1300 level drift at Skukum Creek. Drilling also began on the **Raca** (Yukon Minfile

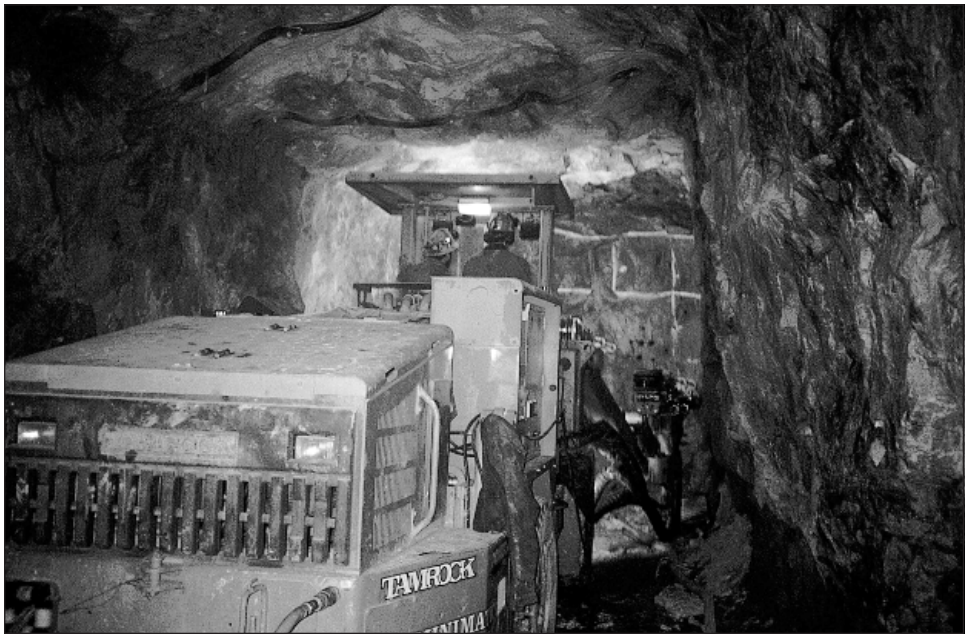


Figure 30. *Omni Resources extended the underground workings at the Goddell project to facilitate underground drilling of the deposit.*

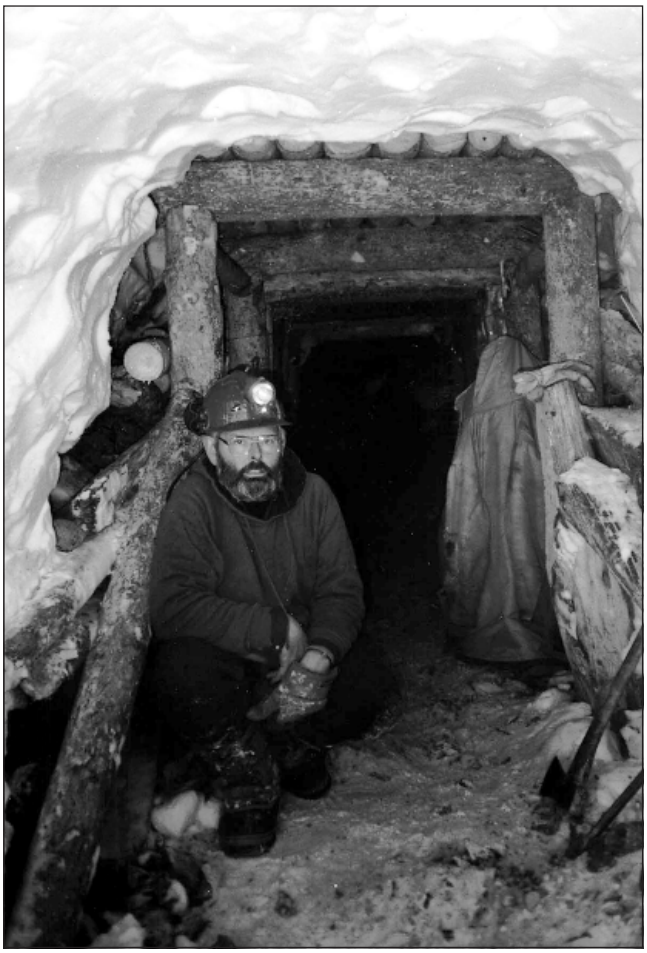


Figure 31. *Gary Lee in the rehabilitated underground workings on the Tally-Ho property in the Wheaton River District.*

105D 023) claims on strike to the northeast from the Skukum Creek deposit. A mineralized zone was reported in the first hole drilled in October but assay results are not yet available. Several other areas of high-grade mineralization were discovered in the vicinity of the Skukum Creek deposit during the summer.

Gary Lee and Mike Power continued work on the **Tally Ho** (Yukon Minfile 105D 032) property in the Wheaton River District which they have explored since 1994. The property straddles the Tally Ho shear zone between Dickson Hill and the Wheaton River. The pair have conducted extensive geophysical surveys, excavator trenching on 6 showings and rehabilitation of the underground workings on Mt. Stevens (Fig. 31). This work has delineated a series of E-W and NW-SE striking, epithermal quartz-calcite veins which appear to be splays of the Llewellyn Fault. Mineralization consists of pyrite-galena shoots up to 30 metres long over narrow widths returning grades of 6 to 93 g/t in both gold and silver.

Viceroy Resource Corporation conducted an extensive regional exploration program throughout the Yukon, looking for Brewery Creek-type and Carlin-style deposits. This was the largest reconnaissance program conducted in the Yukon in many years; over 80 targets were selected by extensive research and field checked during the summer. Viceroy staked eight new claim groups totalling more than 1100 claims and optioned several properties including two Tr'ondek Hwech'in land claims blocks. In addition the **Sun** and **Sprogge** (Yukon Minfile 105H 034) claim groups in southwestern Yukon were optioned by Viceroy from Battle Mountain Canada and explored with detailed mapping, sampling and hand trenching. Mineralization on these claims consists of skarns and quartz-arsenopyrite vein breccias assaying up to 6.9 g/t Au. Viceroy plans extensive exploration programs in 1998 on their many Yukon claim holdings.

Figure 32. *International Kodiak Resources conducted a large stream sediment sampling program on the 66 000 ha Oki-Doki property adjacent to the Brewery Creek Mine. Preliminary results from the program have identified numerous Au-As-Hg-Sb geochemical anomalies.*

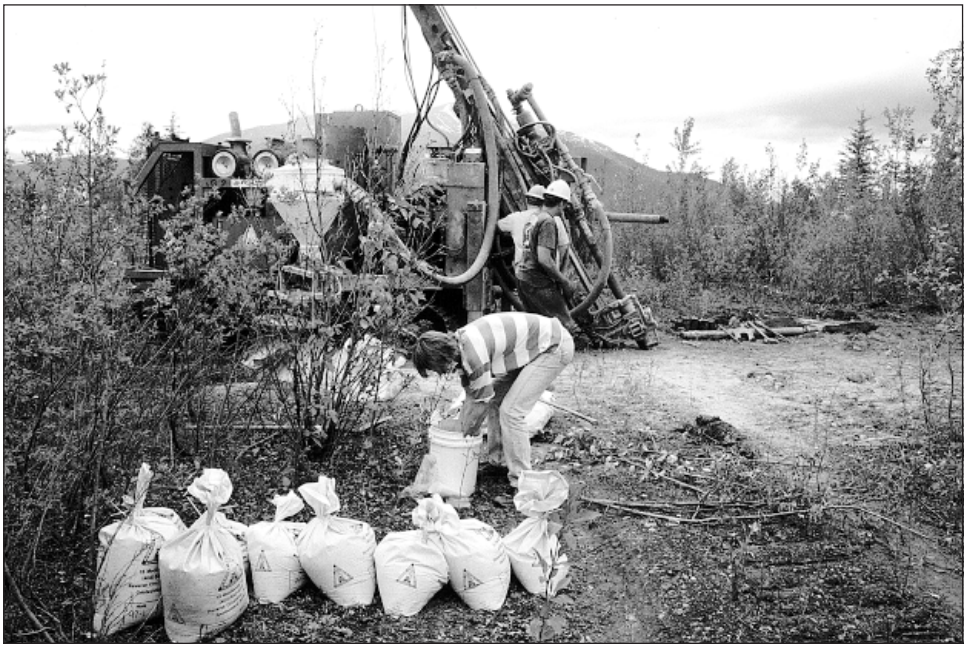
International Kodiak Resources Inc, conducted a substantial exploration program on the **Oki-Doki** (Yukon Minfile 116B new) Project which consists of over 3300 claims (66 000 ha) at the northern and eastern boundary of the Brewery Creek Mine northeast of Dawson. The property is underlain by rocks of the Ordivician-Silurian Road River Group, the Devonian-Mississippian Earn Group and intrusive rocks of the Cretaceous Tombstone suite. The property contains very little outcrop and an airborne geophysics survey in conjunction with the Geological Survey of Canada, as well as detailed stream-silt geochemical sampling, (Fig. 32) were conducted in the fall of 1997. Nearly 10 000 silt samples were collected at 50-metre spacing on all primary and secondary drainages of the property. In October, with less than one third of the analyses received, 11 multi-element (Au, As, Hg, Sb) anomalies and 25 gold-only anomalies had been identified. Prospecting, mapping, detailed grid- and contour-soil sampling of anomalous areas, followed by trenching and drilling is planned for 1998.

Kennecott Canada conducted mapping, prospecting, excavator trenching (Fig. 33) and a reverse-circulation drill program consisting of 13 holes totaling 1000 metres on the **Scheelite Dome** (Yukon Minfile 115P 033) property located 120 kilometres east of Brewery Creek and 25 km northwest of Mayo. The property was optioned by La Teko Resources after the 1997 program. La Teko's main asset is the True North deposit in the Fairbanks district in Alaska which is optioned to Newmont. Scheelite Dome is underlain by a Cretaceous Tombstone suite granodiorite which intrudes Late Proterozoic Hyland Group metasediments. Several styles of gold mineralization hosted mainly in the metasediments have been identified on the property. Mineralization is more abundant in the competent quartzite units and consists of quartz-arsenopyrite +/- stibnite, galena and pyrite in veinlets and arsenopyrite as disseminations. Previous work by Kennecott defined a gold-in-soil geochemical anomaly which extends over three kilometres along strike and is one kilometre in width. Soils within the anomaly average severel hundred parts per billion, with a peak value of 1640 ppb Au. Trenching within the anomaly has returned values to 84.3 g/t Au over 4 metres and 20.5 g/t Au over 4.5 metres. One trench returned 0.33 g/t Au over its 744 metre length. The 1997 drilling tested two areas within the large geochemical anomaly and intersected

Figure 33. *Kennecott Canada conducted an extensive exploration program on the Scheelite Dome property. Trenches excavated during the program were backfilled at the end of the year. La Teko Resources has recently optioned the property and plans more work for 1998.*

Figure 34. *Mike Glynn (L) explains the finer points of exploration work to Brenton Keyser (geologist-in-training) at the Len property in central Yukon. Drilling at the Len intersected a consistent gold-bearing quartz-arsenopyrite vein over a 500 metre strike length.*

Figure 35. *Midnight Sun Drilling of Whitehorse performed reverse-circulation drilling on the Wayne property of Eagle Plains and Miner River Resources. Viceroy Resource Corporation optioned the property and conducted trenching late in 1997 and plans on further drilling in 1998.*



mineralization in every hole. Selected results include 0.48 g/t Au over 29 metres in Hole 97-4 which was abandoned at a depth of 29 metres and Hole 97-11 which assayed 0.415 g/t Au over its entire 60.1 metre length.

Panamex Resources Inc. completed a six-hole diamond drilling program on the **Len** (Yukon Minfile 106D 020) property located 10 kilometres east of the Dublin Gulch deposit (Fig. 34). Quartz-sulphide veins are hosted by an east-west fracture system in a granodiorite stock, probably of the Tombstone Suite. Six holes were drilled at 100 metre spacings and all intersected quartz-arsenopyrite-pyrite mineralization with grades from 1.1 to 28.5 g/t Au. Intersections included 18.6 metres grading 2.1 g/t Au (including 15.3 g/t Au over 1.83 metres) in Hole 97-1, 4.2 g/t Au over 0.61 metres in Hole 97-5 and 3.1 g/t Au over 6.1 metres in Hole 97-6.

Miner River and Eagle Plains Resources acquired the **McQuesten** (Yukon Minfile 105M 029, Wayne) property in central Yukon, 17 kilometres south of Dublin Gulch. Mineralization at the Wayne consists of gold-bearing calc-silicate skarn in Proterozoic Hyland Group metasediments. Drilling in the 1980s intersected wide gold-bearing intervals including 0.72 g/t Au over 95.7 metres and 1.4 g/t Au over

40.1 metres. In 1997, a 6-hole reverse-circulation drill program (Fig. 35) tested the mineralized horizon over a strike length of 750 metres. Results included 3.23 g/t Au over 21.3 metres, 1.77 g/t Au over 35.3 metres and 0.92 g/t Au over 45.7 metres. Subsequent to the drilling program, Viceroy Resources optioned the property and began a program of trenching and detailed sampling. Viceroy's trenching program returned values up to 2.23 g/t Au over 22 metres, 1.59 g/t Au over 25 metres and 1.45 g/t Au over 10 metres. Preliminary metallurgical tests indicate that gold occurs as free particles resulting in material that is amenable to low-cost cyanide processing. Viceroy is planning a major drill program for the property in early 1998.

Pacific Galleon Mining Corp. explored the **Screamer** (Yukon Minfile 115P 040) property midway between Dawson and Mayo with prospecting, mapping and geochemistry. The claims cover the sheared contact between a syenite intrusive and metasediments. Sampling of the sheared contact in 1996 returned values up to 2.53 g/t Au from the zone which contains quartz with disseminated and banded pyrite, arsenopyrite, galena, antimony and trace chalcopyrite. The zone is up to 75 metres wide and can be traced over a one-kilometre strike length.

Miner River and Eagle Plains conducted mapping, prospecting (Fig. 36) and detailed sampling on several gold properties in the Tombstone Suite intrusive belt between Mayo and MacMillan Pass. The **Dragon Lake property** (Yukon Minfile 105J 007) located 85 km northeast of Ross River, 10 km west of the North Canol Road, hosts calc-silicate mineralization in Hyland Group metasediments and bears many similarities to the Wayne property located approximately 250 kilometres to the northwest. A program of prospecting and hand trenching at Dragon Lake uncovered several mineralized areas in a 300 by 600 metre area. Chip samples returned values up to 1.87 g/t Au over 9 metres and 1.21 g/t Au over 15.3 metres. The companies also conducted a small program involving prospecting and sampling on the **Nug** (Yukon Minfile 105O 048) property southwest of MacMillan Pass. A weakly silicified and clay-altered granitic stock containing a quartz stockwork returned values up to 1.55 g/t Au. On the **May Creek** (Yukon Minfile 115P 056) property west of Scheelite Dome in the Mayo area, grab samples returned up to 5.7 g/t Au from a granitic intrusion hosting narrow arsenopyrite veins. Actinolite skarn located peripheral to the granitic stock

Figure 36. *Bernie Kreft examines an outcrop of gold-bearing calc-silicate mineralization on the Drag Property. The property bears many similarities to the Wayne property.*

returned gold values up to 6.6 g/t Au. The company also staked the **Nut** (Yukon Minfile 105O 044) claims northwest of MacMillan Pass to cover skarn mineralization identified by Amax in the early 1980s. The property is underlain by Proterozoic Hyland Group metasediments intruded by a Tombstone-age intrusion.

Near MacMillan Pass, at the eastern end of the Tombstone Suite intrusive belt, Cyprus Canada Inc. conducted a program of general prospecting, sampling and additional staking on the **Hess River** (Yukon Minfile 105O 009, etc) project, optioned from Alliance Pacific Gold Corp. The option applies to several blocks of claims staked and drilled by Alliance Pacific (formerly Yukon Gold Corp.) in 1995 and 1996, but excludes the Plata Mine property. Mineralization, similar to that at the Fort Knox mine operated by Cyprus in Alaska, has been identified on several of the claim blocks.

YGC Resources (no affiliation with Yukon Gold Corp.) continued to explore the **Ketza River** (Yukon Minfile 105F 019) Mine property south of Ross River. Diamond drilling in the area of the McGiver, Nu, and B-mag zones (Fig. 37) was directed towards demonstrating continuity between the zones. Drill hole KR-97-587 suggested a connecting mineralization between the Nu zone and McGiver, with an intersection of 6.1 metres grading 16.3 g/t Au in oxide mineralization. Drilling also intersected a new zone of oxide mineralization named the McDood. Two intersections 100 metres apart returned assays of 6.7 g/t Au over 4.7 metres and 4.6 g/t Au over 5.8 metres. The 1997 program was aimed at increasing oxide reserves on the former producing mine property in preparation for possible production in 1998. Ore from Ketza River would be trucked 300 km to the Mt. Nansen mill owned by YGC's joint venture partner and major shareholder BYG Natural Resources. YGC also conducted geological work on the Shamrock Zone, a bulk-tonnage low-grade gold target. The Shamrock Zone was tested with widely spaced drilling in 1996 which returned numerous intersections. The 1997 work included detailed mapping, sampling and re-logging of all core drilled by previous operaters.

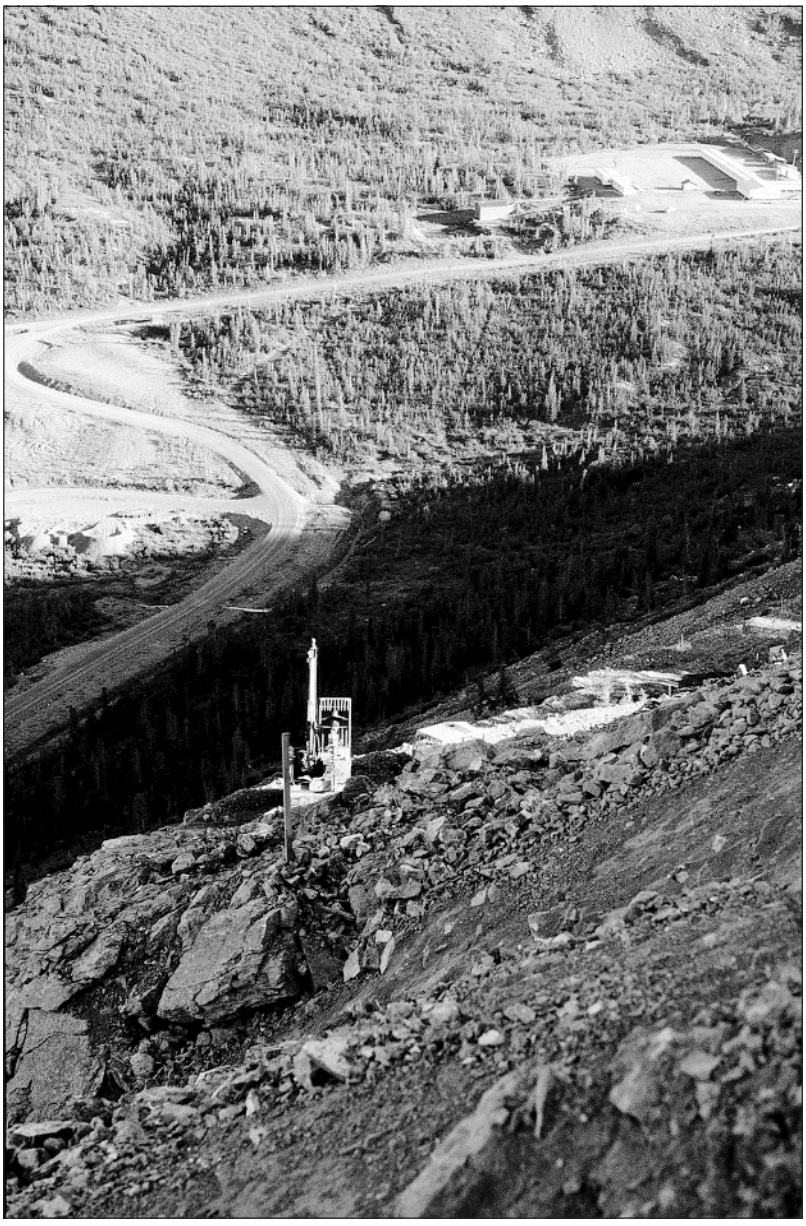


Figure 37. *YGC Resouces drilled for more oxide reserves at the Ketza River property. The access road and campsite of the former producing mine are visible in the background.*

Brett Resources conducted preliminary work on the **Maui** (Yukon Minfile 105G new) claims, approximately 80 kilometres southeast of Ross River. The claims are underlain by Proterozoic metasediments and a Cretaceous intrusion immediately north of the Tintina Fault. Newly discovered mineralization on the property consists of silicification with pyrite, arsenopyrite, sphalerite and bismuthinite. Grab samples graded up to 5.9 g/t Au and 718 g/t Ag and nearly all samples assayed >1g/t Au.

Troymin Resources Ltd. optioned the **Prospector Mountain** (Yukon Minfile 115I 034, 036) from Almaden Resources Ltd. and explored the property with geological mapping, prospecting and trenching. The property, 100 kilometres west of Carmacks, is underlain by schists and gneiss intruded by Early Cretaceous Mt. Nansen volcanics and a subvolcanic syenite intrusive. Grab samples

from veining within the intrusive returned values up to 56.0 g/t Au, 52.2 g/t Ag and 0.25% Cu. Anomalous values of mercury, arsenic and antimony were also obtained. The property was expanded and the new areas of mineralization will be investigated in 1998.

Yukon Yellow Metal Exploration Ltd, a privately funded Yukon exploration company, explored the Winnie showing on **Shootamook Creek** (Yukon Minfile 105B 045) in southern Yukon with excavator trenching and sampling. The Winnie showing was excavated and sampled in three successive phases during 1997. Each phase was excavated to a deeper level in the same area and sampled. Gold mineralization occurs within a silicified shear zone cutting a small granitic intrusion, in quartz stockworks extending from the shear host granite, and in adjacent silicified graphitic schist (Fig. 38). Mineralization consists of immiscible sulphide (pyrite) blebs, arsenopyrite on fractures and minor malachite and scorodite staining within the intrusive. Limonite staining occurs within the intrusive and surrounding metasediments. The last and deepest phase of excavation returned a general increase in anomalous values of silver, copper, lead, zinc, arsenic, antimony and cadmium. Select samples from quartz stockworks within the intrusive, in the hanging wall of the shear, returned gold values up to 3.6 g/t in the first phase, 6.91 g/t in the second and 5.18 g/t in the third. Sampling showed typical nugget effect with some samples returning below detection but 33% of the 55 samples assaying >1 g/t Au. Anomalous Cu (up to 618 ppm), Pb (up to 1292 ppm), Zn (4821 ppm), As (up to 1.7%) Sb (up to 359 ppm), Ag (up to 84.7 g/t) and Cd (up to 13.9 ppm) were also obtained, with the values showing a general increase in value from deeper excavations. Chip sampling by Mike Burke of the Yukon Geology Program returned values up to 0.618 g/t Au over 1.5 metres from altered and stockworked granite in the immediate hanging wall of the shear. A chip sample by independant geologist Larry Carlyle from highly silicified, limonitically altered, thin bedded black graphitic schist with trace pyrite, also in the hanging wall of the shear, returned 1.86 g/t Au, 1.4 g/t Ag and 1.1% As over 1.2 metres.

Figure 38. *Excavator trenching on the Winnie showing at Shootamook Creek. Gold values were obtained from the light-coloured felsic intrusive in the centre of the photo and from graphitic schist in the lower left.*

Whitehorse geologist Larry Carlyle and placer miner Max Fuerstner staked 142 **Cam** claims (Yukon Minfile 105E 001, etc.) in the Livingstone placer mining camp. Historical production from Livingstone Creek and tributaries is estimated at 70 000 crude ounces with nuggets up to 39 ounces. Carlyle conducted geochemical and ground VLF-EM surveys on the claims. Bull-quartz veins with widths up to 1 metre occupy several faults which strike 320°, parallel to the Big Salmon Fault, on the western edge of the claims and perpendicular to placer creeks. The property is underlain by Paleozoic biotite schists which contain sericite and chlorite alteration in proximity to faulting. Placer gold is reported to be concentrated near faults encountered during mining. Soil samples up to 898 ppb were collected in the program and one rock sample from a quartz veinlet returned 1.4 g/t Au. Carlyle has proposed the property has

Figure 39. *Harman Keyser, of Radius Exploration examines a trench in altered ultramafic rocks on the Brik property near Dawson.*

many similarities to the Macraes Mine in New Zealand and will be exploring the property based on this model in 1998.

Radius Exploration conducted an exploration program consisting of a grid establishment, geophysics survey and excavator trenching (Fig. 39) on the **Brik** (Yukon Minfile 116B 004) property. Previous work by Noranda on the property, which is close to the Klondike Highway 15 kilometres south of Dawson, identified soil anomalies with up to 300 ppb Au and 3000 ppm As associated with a vegetative kill zone. The property straddles the Tintina Fault and contains an outcrop of Eocene felsic volcanics similar to those hosting the Grew Creek Gold deposit. Trenching in the area of the soil anomaly exposed ultramafic rock with a stockworks of chalcedony veinlets and listwaenite alteration.

COAL AND INDUSTRIAL MINERALS

Exploration for commodities other than base metals and gold was also active in the Yukon in 1997. Coal and lime resources could supply both local demand and potential export. Coal offers an alternative local fuel source for the Yukon, which relies upon diesel fuel to supplement the decreased hydoelectric generation in the winter months. Coal resources are also of a sufficient quality to export to the Orient if a large enough reserve is proven. Lime, currently imported for the Yukon's operating mines, could be supplied from a local source, which would drastically cut transportation costs.

Figure 40. *Coal can be seen in this trench excavated by Cash Resources on the Carmacks Coal Project. Cash also conducted a successful program aimed at expanding reserves at the Division Mountain Coal Project 70 kilometres to the south.*

Cash Resources advanced the **Division Mountain Coal** (Yukon Minfile 105H 013) project with a program of excavator trenching and diamond drilling. The property is located 90 kilometres northwest of Whitehorse near Braeburn and is 18 kilometres southwest of the main power transmission line to Carmacks and Faro. Before the 1997 program began, the property contained drill-

indicated, open-pittable reserves of 31.7 million tonnes of high-volitile bituminous B coal. Washability tests indicate that a product averaging 1.9% moisture, 14.6% ash, 29.8% volitile matter, 55.6% fixed carbon and 0.5% sulphur with a calorific value of 6583 kcal/kg (11 756 btu/lb) can be readily produced. Exploration on the South Zone, approximately 1.5 kilometres south of the previous reserve, included drilling 10 large-diameter holes totaling 1667 metres. The drilling outlined coal in a continuous seam up to 21 metres thick with as many as five narrower hanging wall seams, over a 2.5-kilometre strike length. The seam is projected to wrap around the nose of a north-plunging syncline 1.5 kilometres to the southeast. This area has high potential for a dramatic increase in low-strip-ratio coal reserves. Cash Resources estimates drill-indicated raw coal reserves at 54.7 million tonnes. Exploration on other areas of the property identified economic thicknesses of coal in three areas within 10 kilometres of the main area of excavation. Cash Resourcesalso explored for coal on other concessions in the Yukon. Trenching on the Carmacks concession (Fig. 40), 70 kilometres north of Division Mountain, and about 10 kilometres south of Carmacks, exposed five zones of bituminous coal with an aggregate thickness of up to 10 metres.

Figure 41. *Al Doherty of Aurum Geological Consultants in Whitehorse samples high purity limestone in a blast pit on the Braeburn Lime Project.*

A private Yukon exploration company conducted a blast trenching, sampling and reverse circulation drill program (Fig. 41) on the **Braeburn Lime** (Yukon Minfile 105E new) Project. The property is road-accessible, close to the Klondike Highway at Braeburn, which is midway between Whitehorse and Carmacks. Triassic Lewes River Group limestone from the North and South zones was tested and contains approximately 95% $CaCO_3$. The objective of the project is to produce a quality lime product for the domestic market.

GEMSTONES

While (unfortunately) not in the Yukon, a new gemstone occurrence was discovered by Yukon prospector, Ron Berdahl. Translucent to transparent, pale emerald-green and green beryl crystals, up to 2 cm long and 0.5 mm thick, was found in phlogopite schist developed along the contact zone between a Cretaceous rare-element pegmatite (Fig. 42) and

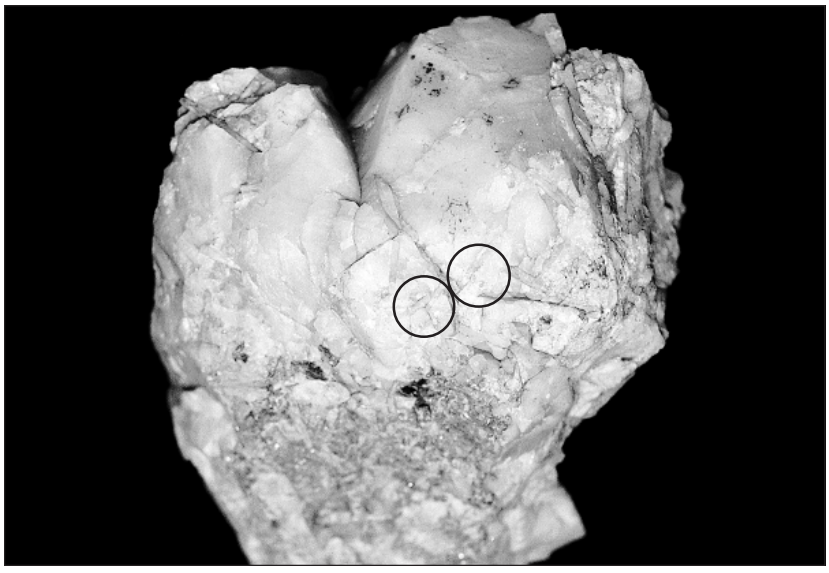


Figure 42. *Translucent to transparent, pale emerald-green and green beryl crystals can be seen in this specimen from Ron Berdahl's property in the N.W.T.*

Devonian-Mississippian carbonaceous black shales near the Yukon-N.W.T border. This locality is of extremely rare North American emerald-green beryl and needs to be evaluated for gemstone potential.

ACKNOWLEDGMENTS

This report is based on public information gathered from many sources. It includes information provided by companies through press releases, property summaries provided to the department and from property visits conducted in the 1997 field season. The cooperation of companies in providing information and their hospitality during field tours are gratefully acknowledged. Editing by Charlie Roots is appreciated.

Companies and individuals exploring in the Yukon and wishing to be included in future reports are encouraged to contact the authors.

APPENDIX 1: 1997 EXPLORATION PROJECTS

BS-Bulk Sample
D-Development
DD-Diamond Drilling
ES-Environmental Studies
F-Feasibility
G-Geology
GC-Geochemistry
GP-Geophysics
M-Mining
PD-Percussion Drilling
PF-Prefeasibility
R-Reconnaissance
T-Trenching
U/GD-Underground Development

PROPERTY	COMPANY	MINING DISTRICT	YUKON MINFILE (prefix is NTS map #)	WORK TYPE	COMMODITY
Alp/Nug/Rog/Old/Nut	Eagle Plains Resources Miner River Resources	Mayo	105O 04, 048, 055, 039, 044	G, GC, P	Au
Argus	Atna Resources/YGC	Watson Lake	105G 013	G, GC, DD	Pb, Zn, Ag
Arn	Expatriate Resources	Watson Lake	105G 112	G, GC, P, T, DD	Zn, Pb, Cu
Aurex	Yukon Revenue	Mayo	105M 060	G, T	Au
BigTop	15053 Yukon Inc.	Whitehorse	105C 021	G, GC, GP, T	Pb, Zn, Cu, Au
Bnob/Chzerpnough	Eagle Plains Resources Miner River Resources	Whitehorse	105F 071, 073	G, GC, P	Cu, Zn, Pb, Au, Ag
Braeburn Lime	Private	Whitehorse	(105E/5)	G, GC, PD	Lime
Brewery Ck	Viceroy Resource Corporation	Dawson	116B 160	M, PD, T, G GC	Au
Breakaway	Expatriate Resources	Watson Lake	105G 93	G, P, DD	Zn, Pb, Ag
Brik	Radius Exploration	Dawson	116B 004	G, GC, P, T	Au
Cabin Lake (C.L.)/ Caribou Creek (C.C.)	Fairfield Minerals Ltd.	Whitehorse	(105B/4) (105C/8)	G, GC, P, T, GP	Cu, Pb, Zn, Ag
Cam	Larry Carlyle	Whitehorse	105E 001	G, GC, GP	Au
Canadian Creek	Alexis/Wildrose Resources	Whitehorse	115J 036	G, GC, T	Cu, Au
Canalask	Expatriate Resources	Whitehorse	115F 045	DD, G	Ni, Cu
Carmacks Copper	Carmacks Copper Limited	Whitehorse	115I 008	ES, D	Cu, Au
Casino	Pacific Sentinel Resources	Whitehorse	115I 028	ES	Cu, Mo, Au
Clear Creek	New Millennium Mining	Dawson	115P 011	G, GC	Au
Convert	Nordac Resources	Watson Lake	(105B/5)	G, GC, P, DD	Pb, Zn, Ag
Discovery Ck	BYG Natural Res.	Whitehorse	115I 093	G, GC.DD	Au, Ag, Cu, Mo, Pb, Zn
Division	Cash Resources Ltd.	Whitehorse	115H 013	DD, T, G, ES	Coal
Drag	Eagle Plains Resources Miner River Resources	Whitehorse	105J 007	G, GC, P, T	Au
Dromedary	Blackstone Resources	Whitehorse	105L 031, 051	G, GC	Pb, Zn, Ag
Dublin Gulch	New Millennium Mining	Mayo	106D 021-29	F, ES	Au
End Zone	Nordac Resources	Watson Lake	105B 101	G, P, DD	Pb, Zn, Ag
ENG (Bar)	Cominco	Whitehorse	105C 003	G, DD	Pb, Zn, Ag
Fairchild	Newmont/Westmin	Mayo	(106/C, D, E)	G, DD	Cu, Au, Ag, Co

PROPERTY	COMPANY	MINING DISTRICT	YUKON MINFILE (prefix is NTS map #)	WORK TYPE	COMMODITY
Faro (Grum)	Anvil Range Mining Corporation	Whitehorse	105K 056	DD, D, M	Pb, Zn, Ag, Au
Finlyson Project	Expatriate	Watson Lake		G, GC, GP, DD	Cu, Zn, Pb, Au, Ag
First Base	Arcturus Resources	Watson Lake	105G 031	G, GC, P, DD	Cu, Pb, Zn
Fret/Dot etc.	Pacific Bay Minerals Ltd.	Watson Lake	(105G)	G, GC	Cu, Pb, Zn, Ag, Au
Fyre Lake	Columbia Gold Mines	Watson Lake	105G 034	G, GC, GP, DD	Cu, Co, Au
Goal/Net	Expatriate Resources	Watson Lake	(105G/7)	G, GC, P	Pb, Zn, Ag
Goddell	Omni/Arkona	Whitehorse	105D 025	DD, U/GD	Au
Hat	Rob Hamel	Whitehorse	105D 053	G, T	Cu, Au
Hess River	Cyprus Canada	Watson Lake	105O 009, etc.	G, GC, R	Au
Ice	Expatriate Resources	Watson Lake	(105G/14)	G, GP, GC, DD	Cu, Co, Au
Java	Camdan Exploration	Whitehorse	(105E/7)	G, GC, P	Cu, Au
JP/Border	KRL Resources	Watson Lake	(95D-4)	G, GP	Pb, Zn, Ag
Keno Hill	United Keno Hill Mines	Mayo	105M 001	ES	Pb, Zn, Ag
Ketza	YGC Resources	Watson Lake	105F 019	DD, G	Au
Kiwi	Teck Exploration	Whitehorse	(105J/12)	G, P	Au
Klu/Burwash	Fort Knox Resources/Inco	Whitehorse	115G 003, 084, 016	G, GP	Cu, Ni, PGE
Kudz Ze Kayah	Cominco Ltd.	Watson Lake	105G 117	ES, F, DD, G	Cu, Zn, Pb, Ag, Au
Len	Panamex Resources	Mayo	106D 020	G, GC, DD	Au
Liard/Watson	KRL Resouces	Watson Lake	(105A/2)	G, GP	Au
Lonestar/Buckland	Klondike Gold	Dawson	115O 72, 077	G, T	Au
Mamu	Oro Bravo	Whitehorse	105F 013	G, GC, GP, DD	Cu, Pb, Zn, Ag
Marg	NDU Resources	Mayo	106D 004	G, GC, DD	Cu, Pb, Zn, Ag, Au
Mars	Placer Dome	Whitehorse	105E 002	G, GC, GP	Cu, Au
Mart	Private	Whitehorse	105D 178	G, GP, T	Au
Matson Creek	Atna Resources/YGC	Dawson	115N 100	G, GP	Cu, Pb, Zn
Maui	Brett Resources	Watson Lake	(105G/11)	G, GC	Au
May Creek	Eagle Plains/Miner River	Mayo	115P 056	G, P	Au
Mel	Cominco	Watson Lake	95D 005	G, GC, DD	Pb, Zn, Ag
Minto/DEF	Minto Explorations	Whitehorse	115I 021, 022	D, ES	Cu, Au, Ag
Money	Atna/YGC	Watson Lake	105H 078	G, GP, DD	Cu, Zn, Pb, Au, Ag
Mt. Nansen	BYG Natural Resources	Whitehorse	115I 064, 065	M, T, G	Au, Ag
Oki-Doki	International Kodiak	Dawson	(116B/1)	G, GC, GP	Au
Olympic	Major General	Dawson	116B 099	G, GP	Cu, U, Co, Au, Ag
Poker Creek	Madronna Mining	Dawson	116C 019, 146	GC	Cu, Pb, Zn

PROPERTY	COMPANY	MINING DISTRICT	YUKON MINFILE (prefix is NTS map #)	WORK TYPE	COMMODITY
Power Play	Expatriate Resources	Watson Lake	(105G/12)	G, GC, P, DD	Cu, Co, Au
Primo	Klondike Gold	Watson Lake	105H 096	G, GC	Cu, Zn, Au, Ag
Prospector Mtn.	Troymin Resources	Whitehorse	115I 034, 036	G, P, T	Au, Ag
Puck	Westmin/Expatriate	Watson Lake	105G 072	G, DD	Cu, Zn, Pb, Ag, Au
RBI	Demand Gold	Watson Lake	105G 117	G, GC, DD	Cu, Zn, Pb
Rusty Springs	Eagle Plains Resourses	Dawson	116K 003	G, GC, T, PD	Ag, Cu, Zn, Pb
Sa Dena Hes	Cominco Ltd.	Watson Lake	105A 012, 013	D	Zn, Pb, Ag
Scheelite Dome	Kennecott Canada	Mayo	115P 033	G, GC, P, T, PD	Au
Screamer	Pacific Galleon	Dawson	115P 040	G, GC, P	Au
Shootamook	Yukon Yellow Metal	Watson Lake	105B 045	GC, T	Au
Simpson	Nordac Resources	Watson Lake	(105G/13)	G, GC, P, DD	Pb, Zn, Ag, Cu
Skate	Expatriate Resources	Watson Lake	105K 098	G, GC, P, DD	Pb, Zn, Ag, Cu
Skukum Creek/Raca	Omni Resources/Arkona	Whitehorse	105D 022, 023	G, GC, P, DD	Au
Starr	Pathfinder Resources	Watson Lake	(105G/5)	G, GP	Pb, Zn, Ag
Sun/Sprogge	Viceroy Resouce Corp.	Watson Lake	105H 034	G, GC, T	Au
Swift River	Birch Mountain Resources	Watson Lake	105B 027	G, GC, GP, DD	Zn, Cu, Pb
Taiga	Blackstone Resources	Dawson	116B 128	G, GC, P, DD	Ni, Mo, Zn, Au, Pt
Tally-Ho	Gary Lee/Mike Power	Whitehorse	105D 032	G, GC	Au
Touchdown etc.	Nordac Resources	Watson Lake	(105A, B)	G, GC, GP, T	Cu, Pb, Zn, Ag, Au
TY	Westmin Pacific Bay Minerals	Watson Lake	105G 083	G, GC, GP	Cu, Zn, Pb, Au, Ag
Ver/CJ	Westmin	Watson Lake	95D 011	G, GC	Au
War/Lip	Expatriate	Watson Lake	105G 070	G, GC, GP	Cu, Pb, Zn, Ag, Au
Watson	KRL Resources	Watson Lake	(105A/2)	G, DD	Pb, Zn, Ag
Wayne (McQueston)	Eagle Plains/Miner River	Mayo	105M 029	G, T, PD	Au
Wellgreen	Northern Platinum	Whitehorse	115G 024	G, U/GD	Cu, Ni, PGE
Wild/Eve	Artemis Ventures Inc.	Watson Lake	105F 020	P, T	Cu, Pb, Zn
Wolf	Atna/YGC	Watson Lake	105G 008	G, GC, DD	Pb, Zn, Ag
Wolverine	Westmin/Atna	Watson Lake	105G 072	G, GC, GP, DD	Au, Ag, Cu, Zn, Pb

APPENDIX 2: 1997 DRILLING STATISTICS

PROPERTY	COMPANY	DIAMOND DRILL		RC/PERCUSSION DRILL	
		METRES	# HOLES	METRES	# HOLES
Arm	Expatriate Resources	462	4		
Argus	Atna Resources	610	6		
Breakaway	Expatriate Resources	92	1		
Brewery Ck	Loki Gold			2914	33
Canalask	Expatriate Resources	1228	10		
Convert	Nordac Resources	993	6		
Division Mountain Coal	Cash Resources	1667	10		
Eliza Extension	BYG Resources	1560	10		
End Zone	Nordac Resources	100	2		
ENG (Bar)	Cominco	536	4		
Fairchild	Newmont	4000	33		
Faro Mine	Anvil Range Mining	2700	13		
Finlayson Regional	Cominco	1050	7		
First Base	Arcturus Resources	366	3		
Fyre Lake	Columbia Gold	13 500	44		
Goddell Gold	Omni Resources/Arkona/Trumpeter	8521	37		
Ice	Expatriate Resources	7880	87		
Ketza	YGC Resources	1217	11		
Kudz Ze Kayah	Cominco	5360	17		
Mamu	Oror Bravo	350	3		
Marg	NDU Resources	1830	7		
MEL	Cominco	361	2		
Money	Atna Resources	610	4		
Mt. Nansen	BYG Resources				
Olympic	Major General Resources	2672	11		
Power Play	Expatriate Resources	1895	6		
QB	Nordac Resources	995	8		
RBI	Pacific Bay Resources	480	2		
Ridge/Raca	Omni/Arkona/Trumpeter	2215	7		
Rusty Springs	Eagle Plains Resources Ltd.			412	8
Scheelite Dome	Kennecott Canada	1000	13		
Simpson	Nordac Resources	980	6		
Skate	Expatriate Resources	556	3		
Swift River	Birch Mountain Resources	985	9		
Taiga	Blackstone/Glenhaven	616	12		
Watson	KRL Resources	750	5		
Wayne (McQueston)	Eagles Plains Miner River			500	6
Wellgreen	Northern Platinum			60	3
Wolf	Atna Resources	2956	9		
Wolverine/Puck/Regional	Westmin Resources/Atna	15 330	53		
TOTAL		**85 489**		**3886**	