



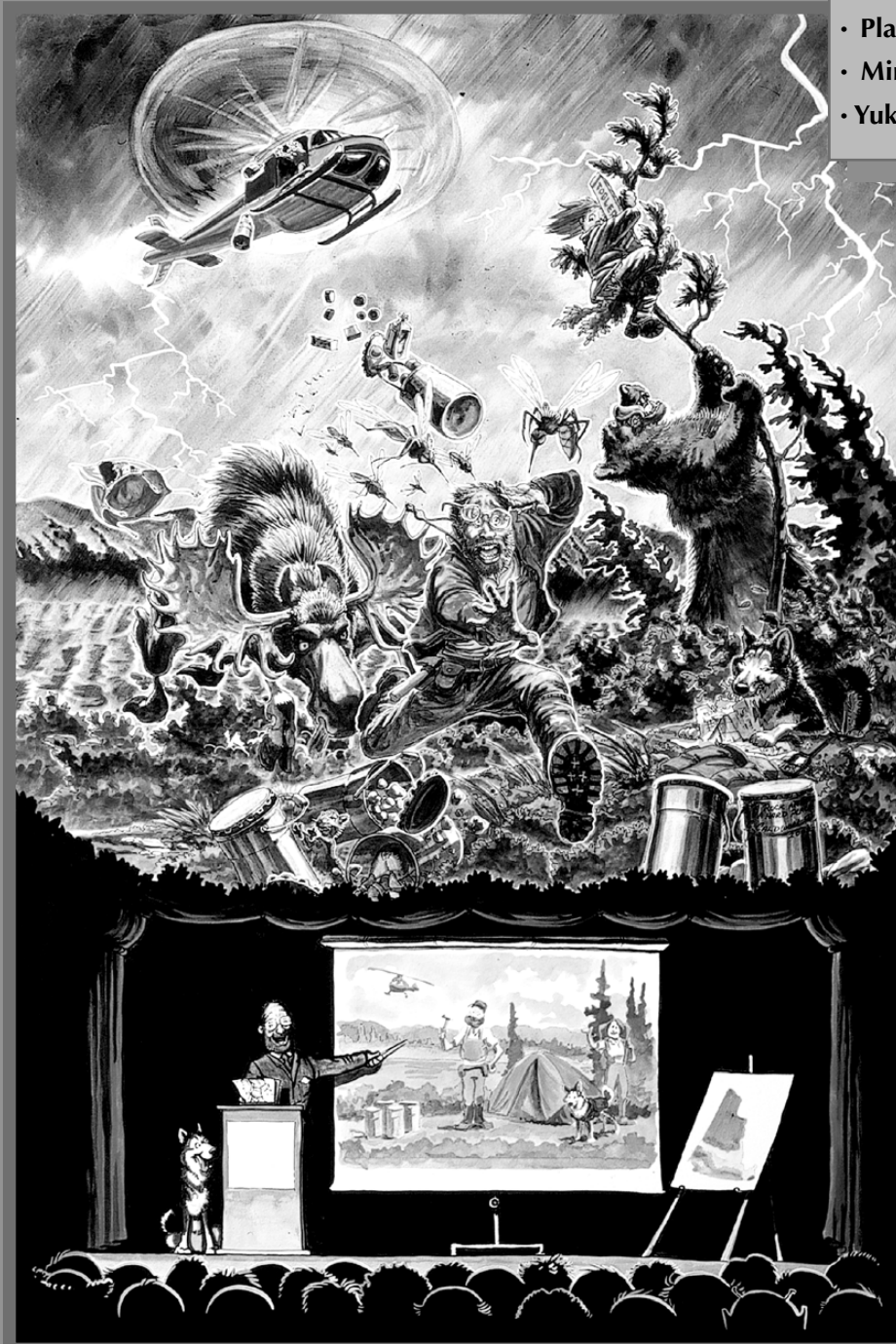
Indian and Northern Affairs Canada  
Affaires indiennes et du Nord Canada

Exploration and Geological Services Division, Yukon Region

# YUKON EXPLORATION & GEOLOGY

## 2002

- Mining, Development & Exploration Overview
- Placer Mining Overview
- Mining Incentives Program
- Yukon Geology Program



**Yukon**  
Government

CELEBRATING 10 YEARS!  
**YUKON**  
GEOLOGY PROGRAM

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**YUKON**  
**EXPLORATION**  
**& GEOLOGY**  
**2002**

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#### **Front cover photo**

This artwork, comically depicting many real geology stories, was commissioned by the Yukon  
Geology Program to celebrate of ten years of service. Original painting by Chris Caldwell.

#### **Back cover photo**

Photo of Tombstone Mountain, located in the Tombstone Park, Yukon. Archer, Cathro & Associates  
(1981) Limited, 2002 inductee to the "Prospector's Honour Roll" has been a leading explorer in  
Yukon for more than 37 years. Partners and key employees of the firm have included Al Archer,  
Bob Cathro, Rob Carne, Doug Eaton, Sandy Main, Bill Wengzynowski, Mike Phillips and  
Joan Mariacher. The company, along with Jim Stephen, donated its mineral claims in the Tombstone  
Mountain area to facilitate creation of Tombstone Park. Photo by Government of Yukon.



# Yukon Mining, Development and Exploration Overview, 2002

**Mike Burke**

*Yukon Geology Program*

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## Yukon Geology Program

**Grant Abbott and staff**

*Yukon Geology Program*

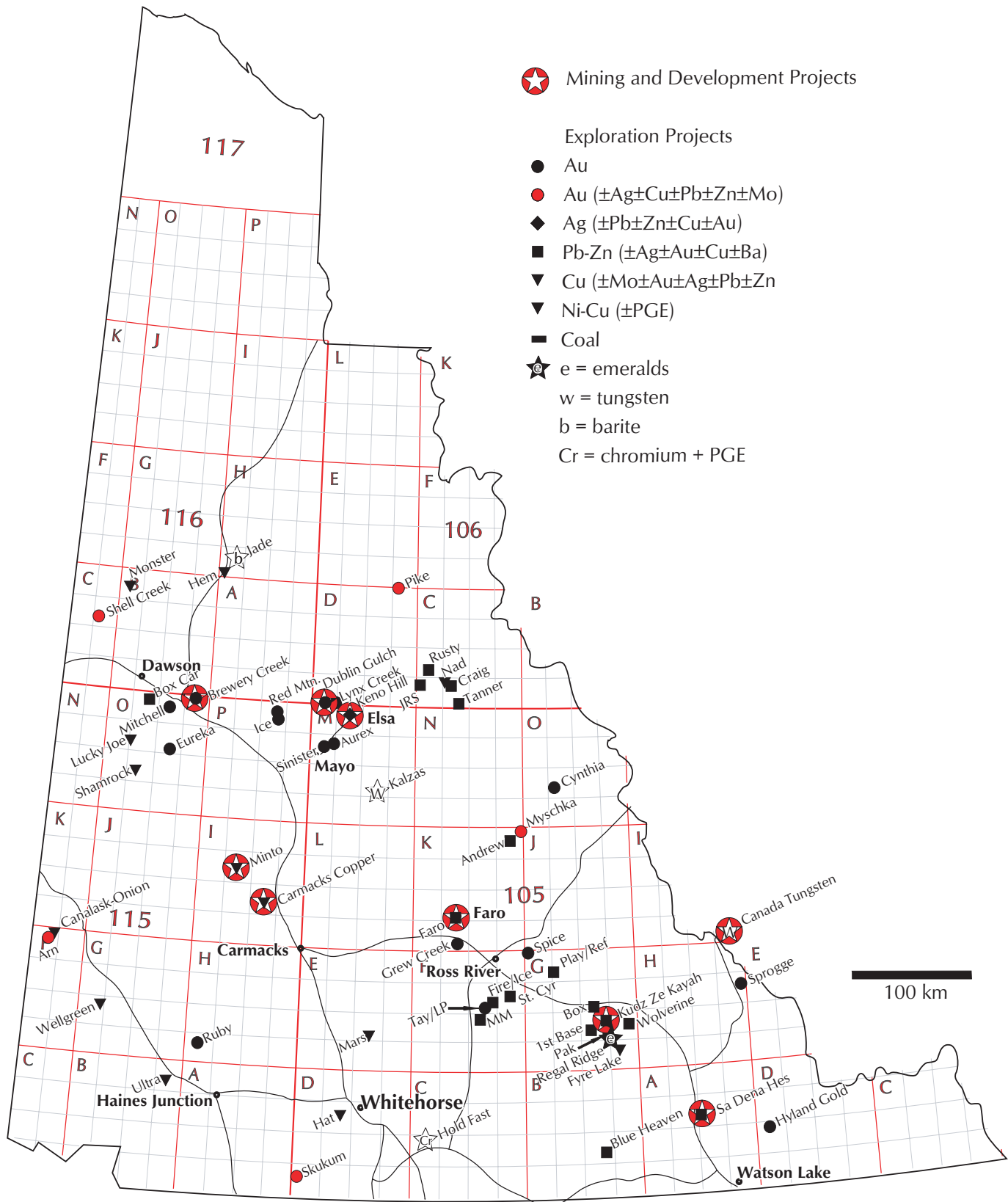
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**Maurice Colpron et Grant Abbott**

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**Figure 1.** Location of Yukon mines, development projects (permitted or undergoing permitting), and exploration projects in 2002. Not all projects are shown on the map. Background of the map shows the National Topographic System (NTS) grid.

# Yukon Mining, Development and Exploration Overview, 2002

*Mike Burke<sup>1</sup>*

*Yukon Geology Program*

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## ABSTRACT

Mineral exploration continues to suffer from the effects of low commodity prices and the extreme difficulty of companies to raise venture capital on the stock markets. Despite these adverse conditions many companies continued to explore Yukon for a wide range of deposit types and commodities. Several new discoveries of significant gold and base metal occurrences were made in 2002. The number and size of drilling programs decreased slightly from 2001. This is reflected in the \$6.9 million estimate of exploration expenditures for 2002, a small decrease from the \$7.2 million spent in 2001. Claim staking has been robust in 2002 with 4080 claims staked to the end of December, a significant increase over the 1702 claims staked in 2001. The number of claims was bolstered by the late season staking of prospective emerald targets in the Finlayson Lake area near the Regal Ridge emerald discovery, and geophysical targets similar to the Lucky Joe copper-gold occurrence near Dawson City.

Yukon, unfortunately, had no operating hard rock mines in 2002. The Brewery Creek mine did recover some gold during rinsing of the heap leach pad, however, Viceroy Resources' efforts were directed at the reclamation of the mine site. The company received the 2002 Robert E. Leckie Award for their outstanding reclamation practices. Mine development at the Minto copper-gold-silver project is currently on hold due to low copper prices while A.M.T. Canada continues to maintain the Keno Hill and Elsa silver mines, with a goal of resuming production in 2003.

## RÉSUMÉ

L'exploration minière continue de subir les contrecoups de la faiblesse des prix des minéraux et la très grande difficulté des sociétés de réunir des capitaux de risque sur les marchés boursiers. Malgré les conditions défavorables, de nombreuses sociétés ont poursuivi leurs activités d'exploration au Yukon à la recherche de gisements et de minéraux très variés. En 2002 on a découvert plusieurs occurrences importantes d'or et de métaux communs. Par rapport à 2001, les programmes de forage ont légèrement fléchi en nombre et en importance. Les dépenses d'exploration ont en effet diminué, passant de 7,2 millions de dollars en 2001 à 6,9 millions de dollars en 2002. Les jalonnements ont été nombreux en 2002, atteignant 4080 à la fin de décembre, une hausse marquée par rapport à 2001 alors que le nombre de claims n'a pas dépassé 1702. Le nombre de jalonnement de claims a été augmenté par les jalonnements de fin de saison effectués sur des cibles susceptibles de receler des émeraudes aux environs du gîte d'émeraudes de Regal Ridge dans la région de Finlayson Lake et sur des cibles offrant des caractéristiques géophysiques semblables à celles de l'occurrence de cuivre-or de Lucky Joe près de Dawson City.

En 2002, il n'y avait malheureusement aucune mine en production au Yukon. Même si on a récupéré de l'or par rinçage de la base de lixiviation en tas, la Viceroy Resources a axé ses efforts sur la restauration du site minier à Brewery Creek. Elle a d'ailleurs reçu en 2002 le prix Robert E. Leckie pour la qualité de ses méthodes de restauration. Les travaux de mise en valeur de la mine de cuivre-or-argent Minto ont été interrompus à cause de la faiblesse des prix du cuivre. La société A.M.T Canada, pour sa part, prévoit reprendre la production en 2003 à ses mines d'argent de Keno Hill et Elsa.

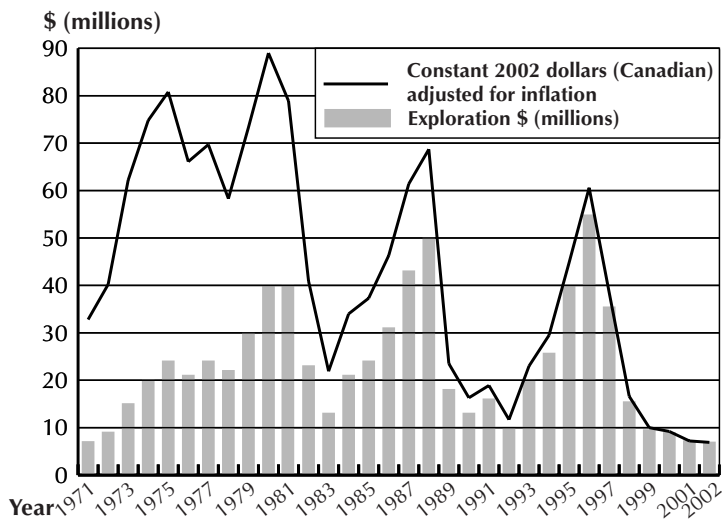
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## INTRODUCTION

Exploration continued in 2002 for many different commodities and deposit types within the Yukon (Fig. 1). Gold was the main target of explorationists in Yukon, with 60% of exploration dollars directed towards the precious yellow metal. Although preliminary estimates indicate a drop in exploration spending to \$6.9 million (Fig. 2), the increase in claim staking and the high number of significant new discoveries made in 2002 bode well for the coming exploration season. New gold discoveries include an intrusive-hosted gold system intersected by drilling at ASC Industries' Ice property; sediment-hosted intrusive-related gold mineralization in drill core not previously analysed for gold at Expatriate Resources' Lynx Creek project; Klad Enterprises' extensive new intrusive-related gold systems on the Cynthia and Myschka claims (Soloviev et al., this volume); Atac Resources' high-grade gold-copper skarn intersected in drilling on their Arn property; and an extensive gold- and copper-mineralized quartz-carbonate vein associated with an Algoma-type iron formation on Shawn Ryans' Shell Creek property. Base metal discoveries include a regionally extensive copper-gold-mineralized horizon on the Lucky Joe property of Copper Ridge Exploration; high-grade zinc-lead in a carbonate-quartz breccia drilled by Noranda on the Andrew property of Ron Berdahl; a new sedimentary-exhalative system intersected in drilling on Manson Creek Resources' Tanner project and volcanogenic massive sulphide (VMS) mineralization on their JRS claims; and a new VMS occurrence on the Box claims of Expatriate Resources in the Finlayson Lake district. True North Gems announced the discovery of additional areas of emerald mineralization on their Regal Ridge property.

The Yukon government continued to support and encourage the mining industry in Yukon by increasing funding of the Yukon Mining Incentive Program to \$850 000. The function of the program is to provide a portion of the risk capital required to locate and explore for mineral deposits in Yukon. The Yukon government also supports the industry through the Yukon Mineral Exploration Tax Credit, which provides a 25% tax refund on eligible exploration expenditures until March 31, 2003. Eight of fourteen Yukon First Nations have settled their land claims; four of the remaining six First Nations have a Memorandum of Understanding with the Government of Canada and Yukon that negotiations are complete. After a legal and technical review these First Nations are anticipated to ratify their claims by April 1, 2003.

**Figure 2.** Yukon exploration expenditures: 1971-2002.



Mine development expenditures were incurred at both the Minto copper deposit and the Keno Hill silver mine. Minto Explorations conducted only a minor amount of work at the Minto site, as the project is currently on hold due to low copper prices. A.M.T. Canada Inc. purchased the historic Keno Hill silver mine in central Yukon in October of 2001. The company is currently maintaining the site and, pending permitting of the project, plans to begin reprocessing tailings in 2003.

## MINING AND DEVELOPMENT

Production from the **Brewery Creek** gold mine (Yukon MINFILE 2002, 116B 160) declined significantly, triggering the company to begin their detoxification and heap stabilization program in the second quarter of 2002. The company also continued with significant reclamation and revegetation of pits, dumps and mine site roads (Fig. 3). In recognition of their work, they received the 2002 Robert E. Leckie Award for outstanding reclamation practices. Approximately 2 million tonnes of capacity remain on the heap leach pad, and Viceroy has been actively evaluating areas near the mine for additional reserves. Remaining resources at the mine site could also be placed on the pad, with a sufficient rise in the price of gold.

Mine development expenditures were incurred at the **Minto** copper-gold-silver deposit (Yukon MINFILE 2002, 115I 021, 022) of Minto Exploration and by A.M.T. Canada at the **Keno Hill** silver mine (Yukon MINFILE, 2002, 105M 001).

The Minto project is currently on hold due to low copper prices. The project, located 240 km northwest of Whitehorse, is being developed as a conventional open pit mine and milling operation. The in-situ geological reserve for the deposit, above a cut-off grade of 0.50% Cu, is 8.818 million tonnes with grades of 1.73% Cu, 0.48 g/t Au (0.014 oz/ton) and 7.5 g/t Ag (0.22 oz/ton). This reserve contains 179 million kg (336 million lbs) of copper, 4.37 million grams (140,500 ounces) of gold and 67.68 million grams (2.176 million ounces) of silver. The ore that will be mined as per the current mine design is 6.51 million tonnes with grades of 2.13% Cu, 0.62 g/t Au (0.018 oz/ton) and 9.3 g/t Ag (0.27 oz/ton) with an overall stripping ratio of 4.9:1.0. Minto Exploration incurred minor expenditures in road and site maintenance at the project in 2002 and conducted geological mapping and sampling outside the deposit area.

A.M.T. Canada Inc. continued to maintain the historic **Elsa** properties (Yukon MINFILE 2002, 105M 001) at the Keno Hill silver mine in central Yukon. The company is planning on using proprietary technology to reprocess tailings at the mine site. The mine has produced over 200 million ounces of silver at a historic camp grade of 1370 g/t Ag (40 oz/ton Ag) from vein deposits within the Mississippian Keno Hill Quartzite.

A.M.T. Canada also proposes to restart underground mining. Proven and probable underground reserves at the property are 415 000 tonnes grading 1145 g/t Ag, 7.5% Pb and 5.6% Zn.

The **Cantung** mine of North American Tungsten Corporation entered into commercial production in 2002. Yukon companies supply the bulk of the supplies and services to the mine, which is accessed through Yukon but is located in the Northwest Territories. The mine also provides high-quality employment for many Yukoners.

*Figure 3. Recontoured open pits at the Brewery Creek minesite. Photo from Karen Pelletier.*



## EXPLORATION

Exploration in Yukon is typically divided equally between the search for base and precious metals, with slight variations from year to year. Approximately 60% of the \$6.9 million spent on exploration in 2002 was directed towards the search for precious metals, mainly gold (Appendix 1). The bulk of exploration was conducted by junior mining companies and prospectors, which accounted for 90% of total Yukon exploration expenditures. Companies continued to be faced with the inability to quickly raise funds to achieve exploration success. A return to healthy exploration levels in Yukon will continue to be hampered by the lack of investment in the junior mining sector. Despite this, several significant discoveries were made in 2002, mainly by prospecting, but more significantly in drill holes. A change may be in the air, as True North Gems had no difficulty in raising funds for continued exploration on the Regal Ridge emerald property in the Finlayson Lake area. The company successfully completed their Initial Public Offering in late November to raise \$1.23 million and captured the attention of the market and other junior mining companies.

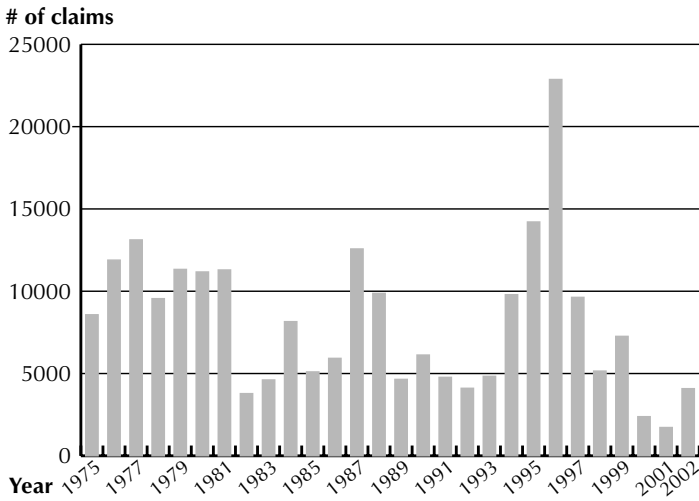


Figure 4. Quartz claims staked: 1975-2002.

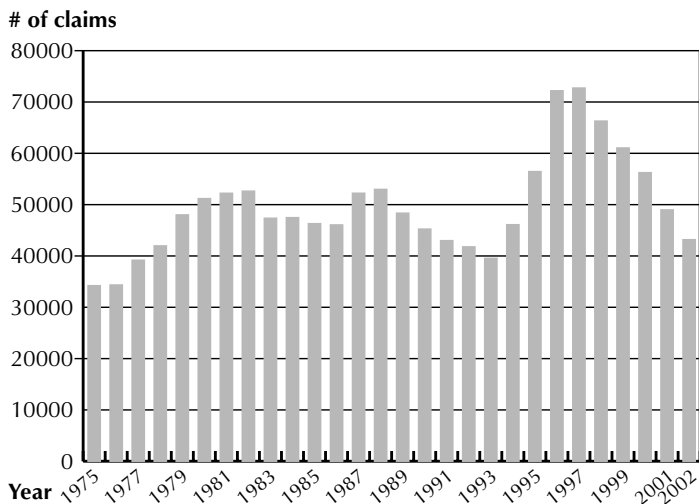


Figure 5. Quartz claims in good standing: 1975-2002.

Claim staking has mounted a significant comeback with a total of 4080 (Fig. 4,5) claims recorded in 2002, more than doubling the 1702 claims staked the previous year. Although the number of drilling programs remained the same as in 2001, the total footage drilled decreased to 11 205 (3415.3 m), a decrease of 13% from 2001 (Appendix 2). The total number of exploration projects has increased over 2001, buffering the decrease in exploration expenditures despite the decline in drilling.

This overview highlights a number of exploration projects conducted in Yukon during the 2002 field season and is by no means a comprehensive review of all exploration conducted. Several projects have not been included because of restrictions on disclosure for publicly traded companies, and for competitive reasons, when companies and individuals choose to not openly share exploration results.

## PRECIOUS METALS

Regent Ventures performed a program of induced polarization geophysics, geochemistry and detailed geological mapping followed by 949 m of diamond drilling in six holes on their **Red Mountain** property (Yukon MINFILE 2002, 115P 006). In conjunction with the geological work, a compilation of all available exploration data since 1993 was performed (Fig. 6). Gold mineralization in the Saddle zone, where most of the work has concentrated, is hosted within a swarm of Cretaceous Tombstone Suite biotite-quartz monzonite dykes cutting adjacent sandstones of the Neoproterozoic to Lower Cambrian Hyland Group,

and in flat-lying quartz-tourmaline and quartz-tourmaline-sulphide mineral breccias. The dykes are truncated by a shallowly dipping structure, but the drilling (i.e., DD02-35) demonstrated that gold mineralization continues into the sedimentary rocks and breccia zones below the structure. Diamond drill hole DD02-35 intersected 13.24 g/t Au over 2.0 m in a quartz-tourmaline breccia. The compilation work demonstrated that the Saddle zone is a large low-grade mineralized system with many drilling intervals in the 500- to 1000-ppm-Au range over tens of metres. Higher grade intersections of up to 46.1 g/t Au over 1.0 m (DD01-28) occur within the low-grade zones. Further work, including down-hole surveying of historical drilling, will be done to refine the geological model of the zone and direct future drilling. Several other targets have also been identified on the property, including the 50/50 zone, which is a prominent fault zone visible on surface. The zone exhibits the highest multi-element geochemical response on the claims. Historical drilling has targeted the 50/50 zone, but all holes were abandoned before successfully penetrating the structure.

ASC Industries Ltd. explored the **Ice** property, which adjoins Regent Ventures' claims to the north. They conducted a program of geophysics (induced polarization and magnetic surveys), geochemical sampling and geological mapping, followed by diamond (Fig. 7) and reverse circulation drilling. Reverse circulation drilling successfully intersected the Red Mountain stock, which was shown to be a sill-like body with the following selected assays: RC02-04 returned 4.6 m grading 0.85 g/t Au and 4.6 m grading 0.84 g/t Au; RC02-05 intersected 5.1 m of 1.07 g/t Au and 1.53 m of 4.35 g/t Au at the bottom of the hole; RC02-06 intersected 12.19 m grading 1.47 g/t Au, including 2.35 g/t Au over 6.1 m; RC02-09 assayed 0.91 g/t Au over 15.24 m, including 3.83 and 3.12 g/t Au over 1.53 m, respectively. All holes intersected zones of anomalous gold within the intrusive rock. Diamond drilling targeted the higher



**Figure 6.** Anna Fonseca, geologist, examining drill core at Regent Ventures' Red Mountain project.



**Figure 7.** Diamond drilling on the Ice property of ASC Industries.

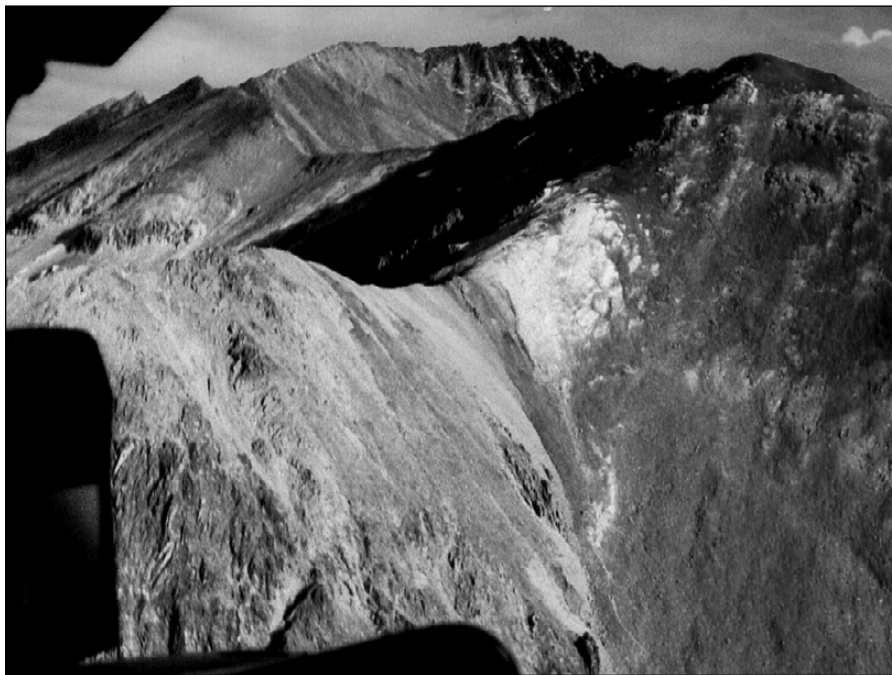


grade Treadwell vein where surface samples assayed up to 14.2 g/t Au. Drilling intersected anomalous gold values associated with quartz-sulphide mineral veins.

Expatriate acquired the **Len** claims (Yukon MINFILE 2002, 106D 020) located 8 km east of the Dublin Gulch deposit and expanded the property, now renamed Lynx Creek. The claims were previously explored for gold mineralization hosted in a quartz-sulphide mineral vein system within a small Cretaceous Tombstone Plutonic Suite granodiorite intrusion. Drilling in 1997 outlined a quartz-sulphide mineral vein over a 300-m strike length with intersections including hole 97-1 in a narrow high-grade zone grading 15.5 g/t Au over 1.83 m, and a wider zone of 4.23 g/t Au over 6.1 m in hole 97-3. Hole 97-6 was drilled 100 m along strike of the vein system and intersected pyrite-arsenopyrite veinlets in quartzite proximal to the intrusion. Unsplit core in hole 97-6 was sampled by Expatriate and assayed 0.79 g/t Au over its entire 59.1-m length, including 1.23 g/t Au over 27.1 m. Soil sampling, using a power auger, was completed to better define soil anomalies located proximal to the granodiorite.

Klad Enterprises Ltd. conducted detailed geological and structural mapping, and rock and soil sampling on a number of properties north of Ross River in the eastern portion of the Cretaceous Tombstone Plutonic Suite. The **Myschka** property (Yukon MINFILE 2002, 105K 090) is underlain by a quartz diorite stock that intrudes Road River cherts and minor shale. Extensional faulting has resulted in at least four east-trending breccia and alteration zones that crosscut and surround the quartz diorite stock (Soloviev et al., this volume). The breccia zones are extensively leached and altered. Leached material returned anomalous gold values in the 100 to 200 ppb range; sulphide samples returned values up to 550 ppb Au, 57.2 g/t Ag and 6.9% Pb. A detailed description of the property is contained in Soloviev et al. (2003a, this volume).

The **Cynthia** property (Yukon MINFILE 2002, 105O 007) of Klad Enterprises Ltd. is characterized by two large Cretaceous Tombstone Suite quartz-monzonite stocks that cut Cambro-Ordovician Road River Group chert, shale and minor limestone.



Three structurally controlled zones – Ted, Garry and Intersection – were explored in the 2002 program. The gold grades within the mineralized structures are commonly in the range of 200 ppb to 2.0-3.0 g/t, with higher (up to 16 g/t Au) values attributed to the fault intersection area (Fig. 8). A detailed description of the property geology and exploration results is presented in Soloviev et al. (2003b, this volume).

**Figure 8.** Aerial view of the Intersection zone on Klad Enterprises' Cynthia property. The zone is the area of white alteration in the foreground. Photo by Klad Enterprises.



Southeastern Yukon contains a number of intrusive-related gold occurrences associated with the mid-Cretaceous Selwyn Plutonic Suite. Properties include the **Hit** claims (Yukon MINFILE 2002, 105H 036) of Hudson Bay Exploration and Development Ltd.; the **Fer** claims (Yukon MINFILE 2002, 105H 102) of Rimfire Minerals Corporation/Boliden Ltd.; the **Hy** claims (Yukon MINFILE 2002, 105H 102) optioned by Athlone Minerals Ltd. from Phelps Dodge; the **Justin** claims (Yukon MINFILE 2002, 105H 035) of Eagle Plains Resources; and NovaGold Resources' **Sprogge** claims (Yukon MINFILE 2002, 105H 035). The various properties occupy a northwest-trending structural corridor, which hosts various styles of distal and proximal intrusive-related gold mineralization in Neoproterozoic to Lower Cambrian Hyland Group sedimentary rocks of the Selwyn Basin. The belt has been subjected to mostly reconnaissance-type exploration with only minor drilling conducted on the Hit property in 1999 and on the Sprogge claims in 2000. Eagle Plains was the only company to conduct any activity on their claims in 2002. They conducted a small program of geological mapping, geochemistry and detailed sampling in the area of the Confluence zone (Fig. 9), which hosts chalcidonic veining within coarse clastic rocks. Previous continuous chip-sampling in Confluence zone trenches returned 4.24 g/t Au over 4.5 metres; individual veins within this interval returned geochemical analyses of up to 59 250 ppb (approximately 59 g/t) Au. At the Discovery zone, gold-bearing pyritic mineralization occurs within a quartz monzonite dyke and adjacent calcareous siltstone. Chip sampling across this zone has returned 2.38 g/t Au over 22.5 m. Results of the 2002 program have not been released.

Ross River Minerals Inc. conducted a program of geologic mapping, prospecting, excavator trenching and diamond drilling on their **Tay-LP** property (Yukon MINFILE 2002, 105F 121) in south-central Yukon. The claims cover the western portion of the Ketz-a-Seagull Arch, a domal uplift created by the intrusion of one or more buried Cretaceous intrusions (Abbott, 1986). Small plugs of biotite-quartz monzonite have been mapped on the property and are interpreted from geophysics to form larger bodies at depth. The quartz monzonites intrude folded and faulted Lower Cambrian to Devonian metamorphosed calcareous sedimentary rocks. Semi-massive to massive sulphide mineralization consists of replacement-type pyrrhotite ± pyrite, arsenopyrite and chalcopyrite in calcareous metasedimentary rocks; and similarly mineralized quartz-sulphide mineral vein float is found over much of the 20-km length of the



**Figure 9.** Bernie Krest, prospector, on the Justin claims optioned by Eagle Plains Resources. Photo by Eagle Plains Resources.



**Figure 10.** Robin Tolbert (right) examining drill core with Lee Pigage of the Yukon Geology Program on the Tay-LP property of Ross River Minerals.

claims. Outcrop on the property is sparse due to widespread glacially deposited material. Ross River Minerals completed seven diamond drill holes totalling 568 m on the Tay-LP claims (Fig. 10) and an additional four holes totalling 343 m on the adjacent Ram claims optioned from Almaden Minerals. Drilling intersected significant mineralization in four of the holes drilled on the Tay-LP claims. Hole TLP02-03 intersected 3.00 m grading 2.24 g/t Au, TLP02-04 intersected 1.57 m grading 2.73 g/t Au, TLP02-06

intersected 1.45 m grading 1.45 g/t Au, and TLP02-07 intersected 31.81 m grading 1.35 g/t Au, including 14.06 m of 2.58 g/t Au and 3.56 m of 8.99 g/t Au. The higher grade intersection in hole TLP02-07 consisted of a massive quartz-pyrrhotite vein crosscutting a thick zone of pyrrhotite replacement in calcareous metasedimentary rocks. Drilling by previous operators intersected mineralization with >1 g/t Au in drill holes over a 7.5 km length of the property, outlining a mineralized system of significant size. Ross River Minerals' program in 2002 continued to define the controls on the gold-bearing phase of mineralization within the extensive sulphide mineralized system.

Tagish Lake Gold Corp. continued to advance the **Skukum** gold-silver property towards their goal of resuming production. The property consists of a land package of greater than 1000 claims which encompasses three known gold-silver mineral deposits: **Skukum Creek** (Yukon MINFILE 2002, 105D 022), **Mt. Skukum** mine (Yukon MINFILE 2002, 105D 158) and **Goddell gully** (Yukon MINFILE 2002, 105D 025), as well as numerous exploration targets. The Skukum Creek deposit is a polymetallic, shear-hosted gold-silver vein within mid-Cretaceous granodiorite of the Coast Plutonic Complex and is the main exploration target of Tagish Lake Gold. Mt. Skukum mine consists of epithermal gold-silver veins and breccias hosted in the Eocene Mt. Skukum Volcanic Complex. The Mt. Skukum mine was in production from 1986 to 1988 and produced 2419 kg (77 790 troy ounces) of gold from 233 400 tonnes of ore. Goddell gully consists of gold-bearing polymetallic veins hosted in the Goddell shear zone within mid-Cretaceous granite of the Coast Plutonic Complex. Prior to the 2002 drilling, the three gold-silver mineral deposits on the Skukum property had estimated geological resources of 1 072 000 tonnes grading 9.63 g/t Au and 175.21 g/t Ag, or 10 323 kg (332 000 ounces) of gold and 187 834 kg (6 039 000 ounces) of silver. Tagish Lake Gold acquired the properties by amalgamating Omni Resources and Trumpeter Yukon Gold, resulting in the consolidation of all three deposits under a single company.



**Figure 11.** Underground drill at the Skukum Creek deposit.

In 2002, Tagish Lake Gold rehabilitated the underground workings at Skukum Creek and conducted a 15-hole underground diamond-drilling program (Fig. 11), totalling 2502 m, to test the deposit at depth. The program proved that the deposit continues at depth, with similar grades to that encountered in previous drilling (Table 1).

A detailed field and petrographic examination of structure and alteration at Skukum Creek was also conducted and is summarized in Lang et al. (this volume). The company has announced its intentions to begin the next phase of exploration early in the new year, which will consist of deepening the underground workings to allow continued drilling of the Rainbow zone extension. Drilling of the Ridge zone, which was intersected by surface drilling in 2001, will also be feasible from the underground extension.

Viceroy Resources Corporation optioned the **Eureka** claims (Yukon MINFILE 2002, 115O 057) from Expatriate Resources and Strategic Metals. The Eureka claims are located in the southern portion of the Klondike goldfields at the headwaters of Eureka Creek. Intensely oxidized, altered and silicified quartzite of the Devonian

**Table 1.** Skukum Creek drill results.

Hole #	From (m)	To (m)	Interval (m)	Au (g/t)	Ag (g/t)
<b>Rainbow Zone</b>					
SC02-05	143.06	143.75	0.69	4.65	125.1
SC02-06	185.01	187.82	2.81	4.68	167.3
including	186.92	187.36	0.44	10.08	423.9
SC02-07	81.35	88.45	7.10	10.04	504.7
including	81.35	84.16	2.81	19.57	778.0
SC02-08	65.80	66.40	0.60	4.80	125.1
SC02-09	102.50	103.80	1.30	4.96	173.9
SC02-10	161.40	162.59	1.19	8.78	267.6
and	166.03	175.77	9.74	3.61	246.4
including	166.03	167.67	1.64	14.72	1226.6
SC02-11	98.35	104.03	5.68	7.76	129.7
including	102.37	103.52	1.15	30.84	550.7
and	113.29	116.43	3.14	3.02	53.2
including	115.21	116.43	1.22	6.07	90.9
and	119.62	123.20	3.58	4.72	579.7
including	119.62	120.82	1.20	10.61	1626.5
SC02-12	179.30	191.34	12.04	6.52	164.6
including	180.32	185.44	5.12	10.46	260.7
SC02-13	104.24	104.84	0.60	3.92	260.8
and	182.87	183.02	0.15	5.55	307.4
and	191.67	191.85	0.18	10.94	163.3
and	195.05	196.96	1.91	3.11	65.9
SC02-14	141.39	155.02	13.63	6.85	78.5
including	146.86	149.14	2.28	19.82	112.7
and	159.81	162.21	2.40	33.48	265.0
SC02-15	116.75	121.20	4.45	3.95	62.3
including	116.75	118.35	1.60	7.54	86.9
and	124.48	125.50	1.02	4.56	54.8
and	127.30	128.56	1.26	16.23	240.8
SC02-17	122.91	125.15	2.73	8.79	109.1
SC02-18	118.50	121.49	2.99	13.45	144.2
<b>Sterling Zone</b>					
SC02-16	131.43	132.74	1.31	1.53	11.4
<b>Kuhn Zone</b>					
SC02-16	204.05	206.96	2.91	8.32	69.2
SC02-19	168.35	168.70	0.35	1.78	38.5



**Figure 12.** Rick Diment with Viceroy Resources examining a rock chip from reverse circulation drilling on the Eureka property.

to Mississippian Nasina Assemblage of the Yukon-Tanana Terrane have returned values up to 15 g/t Au from surface trenching. Viceroy conducted additional surface excavator trenching, and drilled four reverse circulation holes for a total of 390 m (Fig. 12). No results have been released from the program.

In the southwestern Yukon, Atac Resources explored the **Arn** property (Yukon MINFILE 2002, 115F 048) with geological mapping, prospecting and drilling (Fig. 13) of the first four diamond drill holes ever drilled on the claims. The property is located within 6 km of the Alaska Highway. Garnet-epidote skarn and magnetite skarn with pyrrhotite, pyrite and chalcopyrite formed in the Triassic Nikolai Greenstone, which consists of mainly volcanic rocks with minor limestone

beds that have been intruded by Cretaceous diorite dykes. Bedrock exposure on the claims is very poor. Previous work identified three skarn horizons with high-grade gold and copper mineralization in hand trenches and float boulders. Drilling was conducted to gain a better understanding of the poorly exposed geology and test the high-grade gold mineralization. The drilling successfully intersected high-grade gold skarn mineralization associated with a steeply dipping structural zone containing three faults. Hole Arn-3 intersected 1.01 m of 11.29 g/t Au and 0.02% Cu; hole Arn-4 intersected 12.67 m grading 11.92 g/t Au and 0.22% Cu, which includes 1.98 m averaging 64.42 g/t Au with 1.16% Cu and 5.95 m grading 1.05 g/t

Au and 0.43% Cu. Additional prospecting conducted along the trend of the structural zone identified a new zone 3 km from the discovery drill holes. Assays up to 14.7 g/t Au were collected from skarn and vein mineralization, mainly in float boulders in a recessive weathering zone over a 1400 by 300 m area along the fault trace. The drill remains on site to continue testing this exciting new discovery in 2003.

Al Carlos of Whitehorse drilled six holes totalling 415 m on his **Grew Creek** (Yukon MINFILE 2002,



**Figure 13.** A helicopter gently moving the drill into place on the Arn claims. Note the small area affected by this method of drilling. Photo by Atac Resources.

105K 009) property, an Eocene epithermal gold-silver deposit near Faro. The deposit hosts a drill-indicated geological resource of 773 012 tonnes grading 8.9 g/t Au and 33.6 g/t Ag (Christie, 1992). AI has been conducting extensive compilation work on the property, and in 2000 conducted a geochemical survey utilizing the Enzyme Leach process on targets outside of the main Grew Creek deposit. Several anomalies were outlined with the survey and supported by historical airborne and ground geophysical data, conventional geochemistry and prospecting. Carlos drilled 191 m in four holes in 2001, and conducted this year's exploration program on one of these anomalies. Results for the 2002 drilling have not been released.

The **Spice** claims (NTS 105G/13), optioned by Atac Resources from Tanana Exploration Inc., were subjected to a small geological mapping and auger sampling program. The claims were initially staked as a follow-up to a highly anomalous till geochemical sample released by Jeff Bond (Bond, 2001) of the Yukon Geology Program. The analyses of the till show a well developed, down-ice dispersion train with anomalous values for gold (50 to 4460 ppb), arsenic (100 to 546 ppm) and mercury (5 to 52 ppm). The anomalous sample sites are commonly associated with cherty rhyolite or porphyritic rhyolite rock fragments. The anomalous area has only been partially outlined but appears to truncate up-ice along a prominent, northerly trending lineament. The geochemical response of the occurrence is similar to that of the Grew Creek epithermal gold-silver deposit located approximately 50 km to the west.

Exploration on the **Ruby Range** property (Yukon MINFILE 2002, 115H 047; Fig. 14) by Cash Minerals examined several areas of greater than 30 g/t Au related to an extensive system of mesothermal gold-bearing quartz-carbonate veins occurring in biotite and muscovite schist of the Kluane Metamorphic Assemblage, which is intruded by the Eocene Ruby Range Plutonic Suite. A program of prospecting and hand trenching traced one of the main vein systems (Rikus) over a total distance of 800 m. Earlier work on this target included surface chip sampling of two parallel veins and adjacent wall rock over a strike length of 60 m that yielded weighted average grades of 4.30 and 3.94 g/t Au across 3.20 and 3.65 m, respectively. Float occurrences elsewhere on the property have returned numerous high gold assays including 193, 122 and 102 g/t from three areas located approximately 1500 m apart along linear structures similar to the Rikus vein. Work in 2002 defined a number of promising targets at or near the junctions of veins, or where the veins are cut by cross-faults.

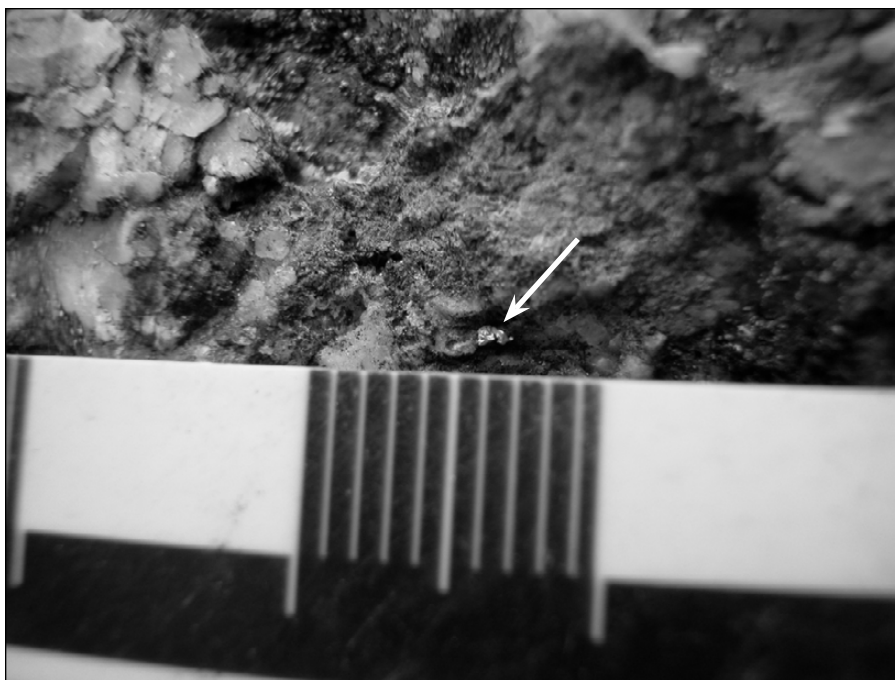


**Figure 14.** Hot coffee on a wet day at Cash Minerals' Ruby project.

The **Pike** claims (Yukon MINFILE 2002, 106E 040) optioned by War Eagle Mining from Strategic Metals Ltd. cover a Proterozoic Wernecke Breccia body containing iron oxide, copper, gold and uranium mineralization. Exploration targets include (a) an area in the breccia body with a 960 by 300 m gold-in-soil anomaly ranging from 25 ppb to 950 ppb with a partially coincident 700 by 300 m copper-in-soil anomaly ranging from 200 ppm to 7800 ppm, and (b) two parallel float trains of gold mineralization on a steep talus-covered slope downhill from the breccia body. The gold float trains are 65 m apart, 5- to 20-m-wide and each about 100 m long. Gold in the float trains consists of scattered fist- to fingertip-size fragments containing native gold in flakes, wires and rosettes in brecciated, hematite-stained, quartz-bearing rock, commonly within or adjacent to pitchblende or brannerite. Assays have ranged from less than 30 g/t Au (1 oz/ton) up to 64 652 g/t Au (2078.6 oz/ton).

Shawn Ryan staked the **Simba** claims to cover a known Algoma-type banded iron formation (Yukon MINFILE 2002, 116C 029) located on Shell Creek approximately 70 km northwest of Dawson City. The iron-formation is composed of two principal types of material, a black magnetite-grey chert facies and a thin-banded grey chert containing pyrite and pyrrhotite. The iron formation is intimately associated with epidote-altered volcanic tuffs and breccias, reportedly of the Cambrian to Silurian Marmot Formation. It forms part of a tightly folded group of rocks composed of various schists, argillite, slate, buff-brown gritty quartzite, and black maroon and green shales, all of Precambrian and/or Cambrian age. Ryan was investigating the possibility of gold associated with the iron formation based on anomalous regional geochemical surveys, geological modeling and anecdotal reports of placer gold in Shell Creek. Prospecting discovered a sporadically exposed quartz-carbonate vein(s) hosted within the volcanic rocks approximately 30 m stratigraphically above the magnetite iron formation. The vein(s) has(have) been traced intermittently by outcrop and float boulders over a 7-km strike length. The width of the vein is undetermined but some of the float boulders examined were approximately 2 m

**Figure 15.** A flake of visible gold approximately 1 mm across associated with malachite from the Shell Creek property.



wide. The quartz-carbonate veins are weakly mineralized with malachite and chalcocite (?), and rarely with galena; and visible gold (Fig. 15) has been found in three locations over approximately 2 km. Ryan completed reconnaissance and grid soil and rock sampling, and geophysical surveys (magnetics) on the claims this season.

Uravan Minerals Inc. drilled two holes totaling 495 m (Fig. 16) on the **Canalask/Onion** property (Yukon MINFILE 2002, 115K 077). The property covers the Triassic White River Intrusive Complex, the second largest mafic-ultramafic body located in the Klauene Mafic-Ultramafic Belt (Hulbert, 1997). Uravan targeted Ni-Cu-platinum group element (PGE) mineralization in marginal gabbros in



the basal section of the Discovery-Onion and Sax-Cessna areas. Geophysics identified two strong horizontal-loop electromagnetic (HLEM) anomalies with coincident induced polarization (IP) chargeability-resistivity anomalies that were the targets of this year's drilling. Very broad areas of highly anomalous Ni-PGE mineralization were found hosted in the White River ultramafic sill, and broad areas of anomalous gold and copper mineralization were discovered in the footwall quartz-carbonate alteration zone and underlying sedimentary and volcanic rocks. Preliminary assay results indicate no economic mineralization was intersected in either hole. The broad areas of Ni-PGE mineralization hosted in ultramafic rocks (clinopyroxenite) occurred in zones of net-textured and disseminated magnetite plus ferro-chromite and sulphide minerals. Intersections ranged in grade from about 1100 ppm to 3100 ppm Ni, and 90 ppb to 634 ppb Pt, plus Pd over intervals greater than 20 m wide in both drill holes.

Prospector Gord McLeod of Whitehorse restaked a chromite occurrence located approximately 50 km south of Whitehorse as the **HFA claims** (Yukon MINFILE 2002, 105C 012). The chromite (Fig. 17) has a layered appearance, but exhibits textures that indicate it was formed during a late mineralizing event. The host dunite is part of a larger layered ultramafic sequence. The showing is poorly exposed and the relationship of the dunite with the layered ultramafic rock is unclear. Additional mapping is required to determine if it is part of the layered sequence or a later dyke. McLeod conducted sulphide fusion assays on the chromite, which returned values of up to 159 ppb Pt, 5 ppb Pd, 417 ppb Ir, 406 ppb Os, 70 ppb Rh and 683 ppb Ru.

**Figure 17.** Chromite (dark) in dunite at the Hold Fast property of Gordon McLeod.



**Figure 16.** Larry Lahusen of UraVan Minerals examining core from the Canalask/Onion property.



## BASE METALS

Iron-oxide-associated copper-gold occurrences in Proterozoic 'Wernecke Breccia' continue to be an attractive exploration target in Yukon. Copper Ridge Exploration optioned the **Hem** claims (Yukon MINFILE 2002, 116G 082) from Shawn Ryan and explored the breccia occurrence with ground-based magnetometer and gravity surveys. The Hem claims cover a hematitic Wernecke Breccia cut by intermediate (Fig. 18) dykes exposed in a small window of Proterozoic clastic rocks. The Hem claims and the breccia body are bisected by the Dempster Highway where the road-cut provides a nice exposure of the breccia, mineralized with disseminated chalcopyrite. The property has since been renamed the Yukon Olympic. The hematitic breccia can be found in a continuous exposure along a creek on the east side of the Blackstone River for over 1.5 km. The geophysical surveys outlined a +4.5 mGal gravity anomaly 8 km long and 1 km wide with three distinct peaks that lie below the Paleozoic sedimentary rocks, which unconformably overlie the Proterozoic clastic rocks. The magnetometer survey outlined a magnetic anomaly, which is slightly offset from two of the gravity anomaly peaks. Late in the season, Copper Ridge optioned the property to Canadian Empire Exploration who conducted a two-hole diamond drilling program in November. The first hole was collared on the westernmost gravity anomaly, which was the lowest priority target but offered easy access from the Dempster Highway. The hole YO-1 was drilled to 563 m depth before being abandoned, however, the casing was left in the hole. The hole is reported to have intersected some breccia and minor sulphide mineralization, and results are pending. The second hole was drilled alongside the Dempster Highway on the road-cut showing, and results from that hole are also pending. Drill testing of the higher priority gravity targets are scheduled for 2003.

**Figure 18.** Chalcopyrite and bornite mineralization in an intermediate dyke on the Yukon Olympic (Hem) property.



Monster Copper Resources optioned the **Monster** property (Yukon MINFILE 2002, 116B 103) to Orezone Resources Inc. The Monster property covers a number of occurrences of 'Wernecke Breccia' with copper and gold mineralization within the

Coal Creek Inlier, an oval-shaped east-trending window of Middle and Late Proterozoic clastic rocks. Drilling has not adequately tested any of the occurrences in the Inlier. A program of ground geophysics, geological mapping and prospecting was conducted in 2002.

Commander Resources also has significant claim holdings in the Coal Creek Inlier covering the **Rob** and **Lala** breccia occurrences (Yukon MINFILE 2002, 116B 099,113). The claims were last explored during the 1996 and 1997 field seasons with helicopter-borne magnetic and radiometric, ground-based magnetic and gradient induced polarization



surveys, and geological mapping and sampling, followed by diamond drilling of 2672 m in 11 holes.

The **Lucky Joe** copper-gold occurrence (Yukon MINFILE 2002, 115 051) is located 50 km south of Dawson City in west-central Yukon. The property was staked by prospector Shawn Ryan in 2001 after the release of the Stewart River Multisensor Airborne Geophysical Survey flown by the Yukon Geology Program and Geological Survey of Canada as part of the Targeted Geoscience Initiative. Geological mapping based on the airborne geophysics is ongoing as part of the Stewart River component of the Ancient Pacific Margin NATMAP project. Shawn recognized a distinct, regionally significant geophysical signature in the airborne magnetic survey that was associated with the Lucky Joe occurrence. Reconnaissance soil surveying by Ryan demonstrated the Cu-Au-Mo metal signature associated with the Lucky Joe was also associated with the geophysical target. Copper Ridge Exploration optioned the property in 2002 and conducted additional claim staking, ground magnetic surveys, grid and reconnaissance soil sampling, and hand trenching. The claims are underlain by metamorphic rocks of the Paleozoic Yukon-Tanana Terrane. Magnetite-bearing amphibolite is underlain by quartz-muscovite and biotite-muscovite schist, quartzite and orthogneiss. Copper-gold-molybdenum mineralization is found in the upper 50 m of a blanket-like pyritic layer up to 300 m thick in schist and orthogneiss immediately below the amphibolite unit. Drilling on the Lucky Joe occurrence (Fig. 19) in the mid-1970s intersected broad zones of mineralization with values up to 0.95% Cu over 5.2 m. The work in 2002 outlined two areas of anomalous soil response approximately 7.5 km apart. The Bear Cub anomaly is an area 1500 m by 1000 m that returned greater than 250 ppm Cu and 10 ppm Mo, with peak values to 4300 ppm Cu, 76 ppm Mo and 573 ppb Au. The Ryan's Creek anomaly is over 3500 m long, up to 500 m wide and returned greater than 60 ppm Cu. The work clearly demonstrated the regional extent and significance of the mineralization in this area. Copper Ridge acquired the Shamrock



**Figure 19.** Prospector Shawn Ryan (left) and Ken Galambos, Mineral Development geologist with the Yukon Geology Program, examine old drill core on the Lucky Joe property.



**Figure 20.** Leached and gossanous kill zone on the newly staked Box claims of Expatriate Resources. Photo by Expatriate Resources.

**Figure 21.** Eagle Plains Resources staking the MM occurrence in the Pelly Mountain volcanic belt. Photo by Eagle Plains Resources.



property, consisting of 338 claims immediately south of Lucky Joe, based on a similar geophysical and geochemical signature.

Shawn Ryan conducted grid geochemistry, magnetic and very low frequency (VLF) geophysical surveys on his **Box Car** property (Yukon MINFILE 2002, 1150 071) in the Dawson area. The property is underlain by pale green-to tan-weathering quartz-muscovite-chlorite schist of the Permian Klondike Schist of the Yukon-Tanana Terrane. Soil sampling returned anomalous values up to 9 ppm Mo, 3000 ppm Pb, 700 ppm Zn, 250 ppm Cu and 65 ppb Au. The property is host to a known

copper-lead-zinc-silver-gold vein, but Shawn is evaluating the claims for their volcanogenic massive sulphide (VMS) potential.

In the Finlayson Lake district, Expatriate Resources conducted regional reconnaissance work on some of their many properties in the area. Expatriate also staked additional claims based on recent mapping as part of the Finlayson Lake Targeted Geoscience Initiative, which identified a new belt of Kudz Ze Kayah-equivalent felsic volcanic rocks. The **Box** claims (NTS 105G/10; Fig. 20) cover a prominent leached and gossanous zone, where previous sampling in 1996 by Expatriate had identified anomalous multi-element soil geochemistry. Expatriate's field work, based on the geologic framework provided by recent government mapping, has identified new target areas in favourable Kudz Ze Kayah stratigraphy on the Pak (Yukon MINFILE 2002, 105G 032), Play and Ref (Yukon MINFILE 2002, 105G 051) claims.

Eagle Plains Resources performed regional reconnaissance in the vicinity of their large claim holdings in the Pelly Mountain volcanic belt (Hunt, 2002). Eagle Plains staked additional claims based on their program of detailed regional stream sediment sampling, prospecting and geological mapping. They also acquired, by staking (Fig. 21), the **MM** deposit (Yukon MINFILE 2002, 105F 012). Mineralization on the MM consists of stratiform lenses of barite-pyrite with associated silver, copper, lead and zinc sulphides that appear to be restricted to approximately the same stratigraphic horizon, and occur over a strike length of at least 3750 m. Modally, the lenses range from nearly pure barite to nearly pure pyrite.



**Figure 22.** Bedded pyrite in black shales from the Tanner property of Manson Creek Resources.

Mineralized drill intersections range from 0.9 m to 15.7 m in width, with grades of up to 5.9% Zn, 3.0% Pb and 55 g/t Ag (1.6 oz/t) over 7.2 m reported from hole 76-MM-02; and 13.5% Zn, 7.8% Pb, 1.3% Cu and 110 g/t Ag (3.5 oz/t) over 2.7 m reported from hole 77-MM-03.

Manson Creek Resources conducted three small helicopter-supported diamond drilling programs on the **Tanner**, **JRS** and **Rusty** (NTS 106C/3; 106C/4; 106C/5) properties, in 2002, exploring for sedimentary-exhalative (SEDEX) and VMS deposits. On the Tanner property, recent mapping by Manson Creek has identified prospective Devonian-Mississippian Earn Group stratigraphy. Two holes totalling 306 m were drilled to test a 750-m portion of a 4.4-km airborne conductivity anomaly. Bedded barite and pyrite (Fig. 22), and pyritic syndimentary breccias were intersected. Drilling returned values up to 1370 ppm Zn, 3.8 g/t Ag and 0.15 g/t Au over 1 m, and 20 m of 26.9% BaO. Manson Creek expanded the property to encompass the Tell occurrence (Yukon MINFILE 2002, 106C 091) where previous work returned up to 10% Zn.

Three holes drilled on the JRS property intersected narrow syngenetic pyritic massive sulphide horizons in Devonian-Mississippian Earn Group stratigraphy similar to that hosting the **Marg** deposit (Yukon MINFILE 2002, 106D 009) located 50 km to the east. Mafic volcanic rocks, bedded barite, and chert of possible exhalative origin were intersected by drilling. Assays up to 2600 ppm Zn, 2760 ppm Cu, 27.6 g/t Ag and 0.38 g/t Au were obtained from bedded pyrite. A quartz-barite vein with pyrite and arsenopyrite in black shale was intersected in hole JRS01-02, and returned 0.30 g/t Au over 0.45 m. The mineralization is similar to a showing in another area of the claims discovered last season, which has assayed up to 4.27 g/t Au in grab samples.

On the **Nad** Claims (NTS 106C/3) Manson Creek Resources continued to explore for ultramafic-associated Ni-Cu mineralization in heavily serpentinized ultramafic flows and high-grade gold in associated listwaenites (Jutras, this volume). Grab

**Figure 23.** Sphalerite-galena mineralization in calcite-quartz breccia on Noranda's Andrew property.



samples from a pyrite-chalcopyrite lens in listwaenite assayed up to 20.37 g/t Au, 6.8 g/t Ag, 6.85% Cu, 0.56% Ni and 0.16% Co.

Noranda Exploration drilled eight holes totaling 1800 m on the **Andrew** property (Yukon MINFILE 2002, 105K 089) in central Yukon. Noranda optioned the claims from prospector Ron Berdahl in 2000, and conducted an airborne electromagnetic and magnetic survey in early 2001. This was followed by geologic mapping, prospecting, geochemistry, ground-based magnetic and gravity surveys over selected targets, and a 15-hole 2789-m helicopter-supported diamond drilling program. Drilling on the Andrew showing in 2001 and 2002 targeted an east-striking extensional fault zone within interbedded quartzites, shales and limestones of the Neoproterozoic to Lower Cambrian Hyland Group. Sphalerite-galena mineralization is hosted in a calcite-quartz breccia (Fig. 23). Significant intersections from the 2001 drilling are presented in Table 2.

**Table 2.** Significant results from 2001 Andrew property drilling.

Drill hole	From (m)	To (m)	Interval (m)	% Pb	% Zn	g/t Ag
AN-01-04	96.6	103.4	6.8	0.01	10.78	0.6
	110.10	137.60	27.50	0.12	12.84	1.8
AN-01-11	89.00	107.50	18.50	3.12	14.89	12.6
AN-01-12	151.15	163.15	12.00	0.01	5.25	0.8
	167.00	173.20	6.2	0.01	6.13	0.7
	214.7	255.60	40.9	.090	1.13	2.2
includes and	214.70	221.50	6.80	0.01	2.61	0.5
	251.15	255.60	4.45	6.32	2.40	12.5
AN-01-14	123.35	127.90	4.55	24.52	6.59	64.3
AN-01-15	141.20	143.75	2.55	22.63	3.59	60.9
	153.60	162.00	8.40	18.84	9.52	67.9
	185.85	196.10	10.25	20.16	10.98	45.7

The drill holes intersected mineralization over a 200-m strike length and approximately 150 m down-dip. Results from the 2002 drilling are not yet available and the property has since been returned to the vendor. Mr. Berdahl, the vendor, is awaiting a complete set of exploration data from Noranda, which can be made available for companies interested in optioning this significant new discovery.

## GEMSTONES

True North Gems explored their **Regal Ridge** property (Yukon MINFILE 2002, 105G 147) for emeralds with prospecting, geological mapping, excavator trenching, bulk sampling and diamond drilling in 2002. They were very successful in recovering a large bulk sample of emerald-bearing material, discovering new emerald occurrences, and acquiring a much better understanding of the geological setting of the emerald deposit. Neufeld et al. present a preliminary paper on emerald mineralization at Regal Ridge in this volume. True North conducted a bulk-sampling program that recovered 120.34 tonnes of emerald-bearing material from seven different zones that was processed on site to yield 65 kg of emerald concentrate. The concentrate was transported to the True North laboratory facility in Vancouver, B.C., where the material was further processed. Emerald-bearing material was first sorted into three categories: gem quality, near-gem quality and non-gem quality. In general, the gem quality material is transparent and considered usable for faceting; the near-gem material is translucent and considered usable for cabachons; the non-gem material is opaque and could potentially be used for beads or other products. The various gem classification categories were defined by a consulting gemologist, William Rohtert, G.G. and an experienced faceter, Bernard Gaboury, MSc, PEng, President of True North. Microscopic examination of gem quality material showed it to be medium green with good saturation and transparency with some fractures, and no foreign inclusions. The near-gem quality material is also medium green with good saturation, but contains light to moderate fractures, some pits, and a few inclusions.

Detailed tables showing the gem, near-gem and non-gem yields (in grams) from each zone, plus the yield (in grams) and number of stones based on four size categories obtained using diamond sieves (+4.5, 3.9-4.5, 2.9-3.9, 1.9-2.9 mm), were presented in a December 12, 2002 news release available on the True North website at [www.truenorthgems.com](http://www.truenorthgems.com). The most impressive yield was obtained from Southwest zone (Fig. 24) where a 6.36 t bulk sample yielded 11.59 kg of emerald concentrate. From this, 121.42 g of gem quality and 587.33 g of near-gem quality stones were recovered for a yield of 19.09 g/t gem quality and 92.35 g/t near-gem quality emeralds. The sample produced 1092 gem quality stones with 284 in the +4.5mm size category, and 1903 near-gem quality stones with 714 in the +4.5mm range. The stones are currently being stabilized, cut and polished after which they will be evaluated by an independent qualified gemologist.

Recent mapping by the Yukon Geology Program and Geological Survey of Canada as part of the Targeted Geoscience Initiative in the Finlayson Lake area (Murphy, 2001) has provided

**Figure 24.** Emerald concentrate from the Southwest #1 vein at Regal Ridge. Photo by True North Gems.



an excellent geologic framework in the emerald discovery area. This, combined with details of the geologic setting of the emeralds provided by True North Gems, has demonstrated that the Finlayson Lake area has many unique geological characteristics required for emerald formation (W.R. Rohtert and J.H. Montgomery, 2002 field activity report, on website at [www.sedar.com](http://www.sedar.com)). This has resulted in the staking of many new properties that have the potential for emerald mineralization, and the re-evaluation of many existing claims for their emerald potential. Expatriate Resources Ltd. has entered into an agreement with YK Group to explore its extensive claim holdings in the Finlayson Lake district for emeralds. Pacific Ridge Exploration has re-examined their exploration database of geological information in the Fyre Lake area immediately south of Regal Ridge and has identified several emerald targets. Firestone Ventures Inc. is earning an interest in a 118-claim property from True North Gems. Hinterland Metals has optioned the **Gleam** property and International Arimex Resources, the **Glitter** property, both from True North Gems. Claim staking in the area is continuing.

Additionally, the coloured gemstone potential of the Yukon and the northern Cordillera is now being recognized, and exploration for gemstones is expected to increase in the coming years. A one-day seminar on northern gems at the annual Yukon Geoscience Forum attracted over 100 participants. The "Yukon Diamond Rumour Map" that was released at the seminar is available online at [www.emr.gov.yk.ca](http://www.emr.gov.yk.ca).

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## APPENDIX 1: 2002 EXPLORATION PROJECTS

PROPERTY	COMPANY/OWNER	MINING DISTRICT	MINFILE # or (1:50 000 NTS)	WORK TYPE	COMMODITY
<b>1st Base</b>	Arcturus Ventures	Watson Lake	105G-031	G,GC	Cu-Pb-Zn-Ag-Au
<b>Andrew</b>	Noranda Exploration	Whitehorse	105K-089	G,GC, DD	Zn-Pb-Ag
<b>Arn</b>	Atac Resources	Whitehorse	115F-048	G,GC,P,DD	Au-Cu
<b>Brewery Creek</b>	Viceroy Resources	Dawson	116B-160	Reclamation	Au
<b>Blue Heaven</b>	Strategic Metals	Watson Lake	105B-020	G	Ag-Pb-Zn-Cu
<b>Box</b>	Expatriate Resources	Watson Lake	(105G/10)	G,GC	Cu-Pb-Zn-Ag-Au
<b>Box Car</b>	Shawn Ryan	Dawson	115N-071	GC,GP,T	Cu-Pb-Ag-Au
<b>Canalask</b>	Uravan Minerals/ Expatriate Resources	Whitehorse	115K-077	DD	Ni-Cu-PGE
<b>Cynthia</b>	Klad Resources	Mayo	105O-007	G,GC,T	Au
<b>Eureka</b>	Viceroy Resources/ Expatriate Resources	Dawson	115O-057	G,T,RC	Au
<b>Fyre Lake</b>	Rock Resources/ Pacific Ridge Exploration	Watson Lake	105G-034	G	Cu-Co-Au
<b>Grew Creek</b>	Al Carlos	Whitehorse	105K-009	DD	Au-Ag
<b>Hat</b>	Kluane Drilling/ Norwest	Whitehorse	105D-053	G,DD	Cu-Au-Ag
<b>Hem (Canadian Olympic)</b>	Copper Ridge Exploration/ Canadian Empire	Dawson	116G-082	G,GC,GP,DD	Cu-Au
<b>Hold Fast</b>	Gordon McLeod	Whitehorse	105C-012	G,GC	Cr-PGE
<b>Hyland Gold</b>	Expatriate Resources/ Cash Minerals	Watson Lake	95D-011	G,GC	Au
<b>Ice</b>	ASC Industries Ltd.	Mayo	115P-006	G,GC,GP,DD,RC	Au
<b>Kalzas</b>	Copper Ridge Exploration	Mayo	105M-066	G,GC	WO <sub>3</sub>
<b>Keno Hill</b>	A.M.T. Canada	Mayo	105M-001	D	Ag-Pb-Zn
<b>Lucky Joe</b>	Copper Ridge Exploration	Dawson	115O-051	G,GC,T	
<b>Lynx Creek</b>	Expatriate Resources	Mayo	106D-020	G,GC	Au
<b>Mars</b>	Saturn Ventures Inc.	Whitehorse	105E-002	G,GC	Cu-Au
<b>Minto</b>	Minto Resources	Whitehorse	115I-021,022	D	Cu-Ag-Au
<b>Mitchell</b>	JAE Resources	Dawson	115O-068	T	Au
<b>MM</b>	Eagle Plains Resources	Watson Lake	105F-012	G,GC	Cu-Pb-Zn-Ag
<b>Monster</b>	Monster Copper Resources/ Orezone Resources	Dawson	116B-103	G,GC,P,GP	Cu-Au
<b>Myschka</b>	Klad Resources	Mayo	105K-090	G,GC,T	Au
<b>Pak</b>	Expatriate Resources	Watson Lake	105G-032	G,GC	Cu-Pb-Zn-Ag-Au

continued...



## APPENDIX 1 (continued): 2002 EXPLORATION PROJECTS

PROPERTY	COMPANY/OWNER	MINING DISTRICT	MINFILE # or (1:50 000 NTS)	WORK TYPE	COMMODITY
<b>Pelly Mtn Project (Fire/Ice/St. Cyr)</b>	Eagle Plains Resources	Watson Lake	105F-071,073	G,GC	Pb-Zn-Ag
<b>Pike</b>	Strategic Metals War Eagle Mining	Mayo	106E-040	G,GC,T	Au
<b>Play/Ref</b>	Expatriate Resources	Watson Lake	105G-051	G,GC	Cu-Pb-Zn-Ag-Au
<b>Red Mountain</b>	Regent Ventures	Mayo	115P-006	G,GC,GP,DD	Au
<b>Regal Ridge</b>	True North Gems/ Expatriate Resources	Watson Lake	105G-147	G,GC,T,DD,BS	Emeralds
<b>Ruby Range</b>	Cash Minerals Ltd.	Whitehorse	115H-047	G,GC,T	Au
<b>Rusty/JRS/Tanner</b>	Manson Creek Resources	Mayo	(106C/5,C/4,D/3)	G,GC,DD	Zn-Pb-Ag
<b>Shamrock</b>	Copper Ridge Exploration	Dawson	(115O/6)	GC	Cu-Au
<b>Simba (Shell Creek)</b>	Shawn Ryan	Dawson	116C-029	GC,GP	Au, Cu
<b>Skukum</b>	Tagish Lake Gold	Whitehorse	105D-22,25,158	G,GC,DD	Au-Ag
<b>Spice</b>	Atac/Tanana Exploration	Watson Lake	(105G/13)	G,GC,T	Au
<b>Sprogge</b>	Eagle Plains Resources	Watson Lake	105H-035	G,GC	Au
<b>Tay/LP</b>	Ross River Minerals	Whitehorse	105F-121	G,GC,T,DD	Au
<b>Ultra</b>	Tom Morgan	Whitehorse	115B-008	G,GC	Ni-Cu-PGE; Zn-Cu-Au-Ag
<b>Wellgreen</b>	Northern Platinum	Whitehorse	115G-024	G,GC	Ni-Cu-PGE

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

## APPENDIX 2: 2002 DRILLING STATISTICS

PROPERTY	COMPANY	DIAMOND DRILL		RC/PERCUSSION DRILL	
		metres	# holes	metres	# holes
<b>Andrew</b>	Noranda Exploration/ Ron Berdahl	1800	8		
<b>Arn</b>	Atac Resources	182	4		
<b>Canalask/Onion</b>	Uravan Minerals/ Expatriate Resources	495	2		
<b>Eureka</b>	Viceroy Resources/ Expatriate Resources			390	4
<b>Grew Creek</b>	Al Carlos	414	6		
<b>Ice</b>	ASC Industries	422	2	604	10
<b>Ram</b>	Ross River Minerals/Almaden	343	4		
<b>Red Mountain</b>	Regent Ventures	949	6		
<b>Regal Ridge</b>	True North Gems	400	6		
<b>Skukum Creek</b>	Tagish Lake Gold	2502	15		
<b>Tanner/JRS</b>	Manson Creek Resources	791	6		
<b>Tay-LP</b>	Ross River Minerals	568	7		
<b>Whse Cu (Hat)</b>	Coyne and Sons	567	4		
<b>Yukon Olympic</b>	Canadian Empire/Copper Ridge Exploration	773	2		
<b>TOTAL</b>		10 209		994	

# YUKON PLACER MINING OVERVIEW, 2002

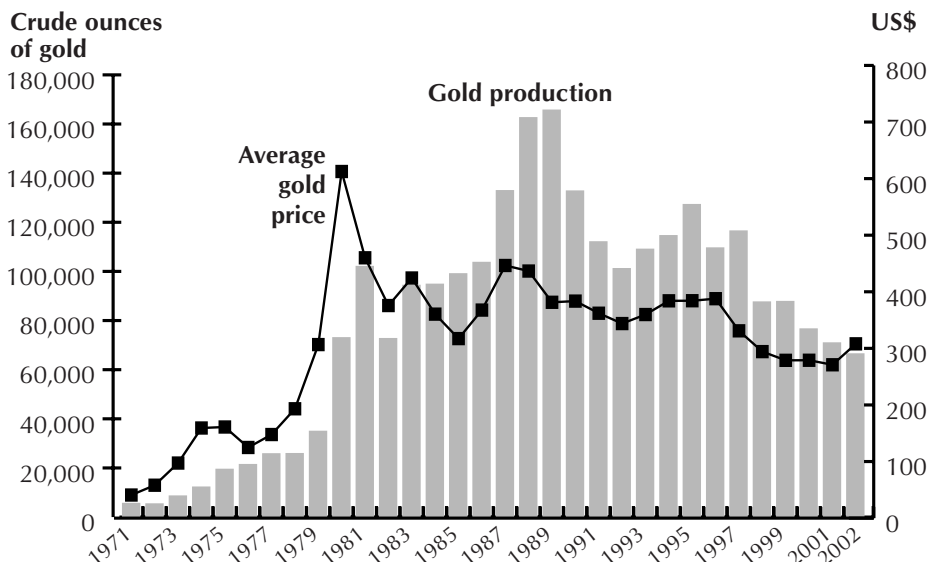
*William LeBarge<sup>1</sup>*  
*Yukon Geology Program*

LeBarge, W., 2003. Yukon Placer Mining Overview, 2002. *In: Yukon Exploration and Geology 2002*, D.S. Emond and L.L. Lewis (eds.), Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 27-29.

Placer mining in the Yukon continued to be an important industry in 2002. A total of 115 mines were operating, with approximately 400 people directly employed in the industry. This represents a 7% decrease in the number of operating mines from the 2001 mining season, and an 18% decrease over the last two years. However, there were an estimated 600 additional jobs generated in 2002 in related service and hospitality industries. The effects of these economic benefits are especially felt in the small communities of Dawson and Mayo. As usual, the majority of active mining operations were in the Dawson Mining District (73) followed by the Whitehorse Mining District (30) and the Mayo Mining District (12).

For 2002, over 90% of the Yukon's placer gold was produced in the Dawson Mining District, which includes the unglaciated drainages of Klondike River, Indian River, west Yukon (Fortymile and Sixtymile rivers, and the Moosehorn Range) and lower Stewart River. The remaining gold came from glaciated regions, including Mayo, the Dawson Range, Kluane and Livingstone Creek.

Relative to 2001, placer gold production from Indian River drainages remained relatively unchanged. Klondike area drainages were higher overall, with less gold produced from Last Chance Creek and more gold produced on Gold Bottom Creek. West Yukon (Sixtymile, Fortymile, and Moosehorn) drainages produced more gold overall due to increases in the Moosehorn Range, but the Sixtymile area saw a decrease. Lower Stewart drainages produced less gold overall, but more was produced on Thistle Creek. No gold was reported from Clear Creek area this year. In the Dawson Range, placer gold production was much lower, due to cessation of mining operations on both Nansen and Canadian creeks. Mayo area drainages had increased gold production with the largest amount coming from Lightning Creek. In the Kluane area, much less gold was produced due to an absence of mining on Burwash Creek and



**Figure 1.** Yearly gold production figures and average US gold price for the Yukon, 1971-2002.

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decreased production from both Fourth of July and Gladstone creeks. In the Livingstone area, reported gold production was higher due to gold royalties reported from Little Violet Creek. In Whitehorse South drainages, no placer gold production has occurred since 1993, but interest in several creeks has continued with small-scale testing occurring on Evelyn, Iron and several other creeks.

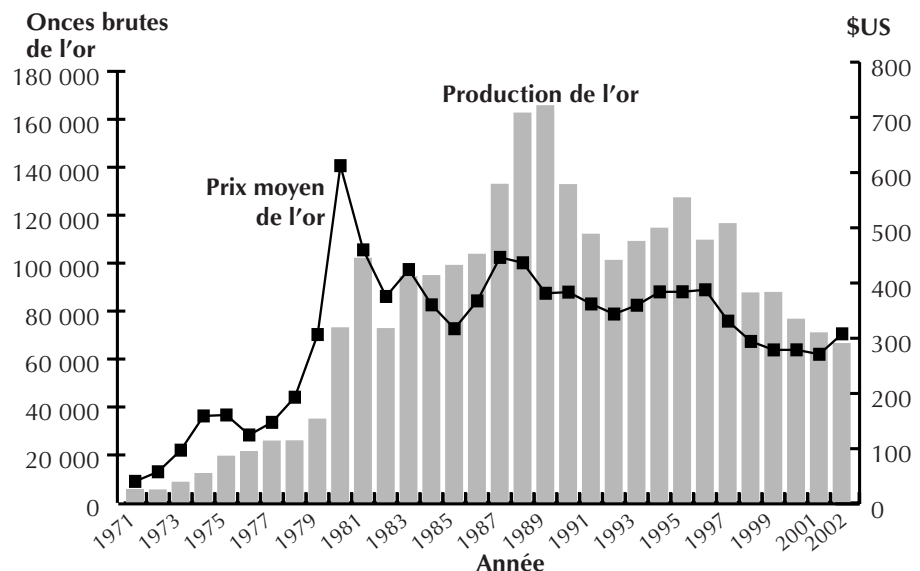
Total placer gold production for 2002 was 66,353 crude ounces (2 063 800 g) worth \$25.8 million (Canadian funds) compared to 70,819 crude ounces (2 202 719 g) in 2001, which represents a 6.1% decrease. Since 1999, placer gold production has dropped 25% to its lowest level since 1979. However, due to a steady rise in the world market price of gold throughout 2002, the drop in gold production was offset considerably by an increase in value. The total dollar value of Yukon placer gold produced in 2002 was approximately \$26 million, up slightly from the \$23 million generated in 2001. This, combined with an overall decrease in fuel prices from 2001, resulted in a somewhat more profitable year for many Yukon placer miners.

**SURVOL DE L'EXPLOITATION DE PLACERS AU YUKON EN 2002**

L'exploitation de placers a continué d'être une importante industrie au Yukon en 2002. Au total, on a exploité 115 mines qui ont donné un emploi direct à environ 400 personnes. Ce chiffre représente une diminution de 7 % pour le nombre de mines exploitées par rapport à l'an 2001 et une régression de 18 % au cours des deux dernières années. Toutefois, on estime à 600 le nombre d'emplois additionnels créés en 2002 dans les industries des services et du tourisme d'accueil. Ce sont les petites agglomérations de Dawson et Mayo qui ont le plus profité de ces avantages. Comme dans le passé, la majorité des exploitations minières étaient situées dans le district minier de Dawson (73), suivi des districts de Whitehorse (30) et de Mayo (12).

En 2002, plus de 90 % de l'or placérien a été extrait dans le district de Dawson, soit dans les réseaux de drainage non englacées de la rivière Klondike, dans l'ouest du

**Figure 1.** Production annuelle d'or et prix moyen américain de l'or au Yukon pour la période de 1971 à 2002.



Yukon (les rivières Fortymile et Sixtymile et le chaînon Moosehorn) et dans le cours inférieur de la rivière Stewart. Le reste de l'or provenait de régions englacées, incluant Mayo, le chaînon Dawson, Kluane et le ruisseau Livingstone.

Par rapport à 2001, la production d'or placérien dans le réseau de drainage de la rivière Indian est demeurée relativement au même niveau. Les gîtes du réseau de drainage de Klondike ont été plus productifs dans l'ensemble; la production a été moins élevée au ruisseau Last Chance et plus élevée au ruisseau Gold Bottom. Dans l'ouest du Yukon (Sixtymile, Fortymile et Moosehorn), la production d'or a été plus élevée dans l'ensemble grâce aux augmentations enregistrées dans le chaînon Moosehorn même si la région de Sixtymile a connu un recul. La partie aval du réseau de drainage de la rivière Stewart a, pour sa part, produit moins d'or dans l'ensemble bien que le ruisseau Thistle en a produit plus. Le ruisseau Clear n'a pas produit cette année. Dans le chaînon Dawson, la production d'or placérien a beaucoup fléchi, et ce, à cause de l'interruption de l'exploitation sur les ruisseaux Nansen et Canadian. La région de Mayo a enregistré un accroissement de la production d'or, la grande partie provenant du ruisseau Lightning. Dans la région de Kluane, la baisse de la production est principalement due à une interruption de l'exploitation dans le ruisseau Burwash et à une diminution de la production dans les ruisseaux Fourth of July et Gladstone. Dans la région de Livingstone, la production d'or a été plus élevée si l'on base sur les redevances enregistrées au ruisseau Little Violet. Dans le réseau de drainage de Whitehorse Sud, il n'y a pas eu de production d'or placérien depuis 1993, mais plusieurs ruisseaux ont continué de susciter de l'intérêt si l'on se fonde sur les essais à petite échelle réalisés sur plusieurs d'entre eux, dont les ruisseaux Evelyn et Iron.

La production d'or placérien pour l'année 2002 a totalisé 66 353 d'onces brutes (2 063 800 g) qui vaut \$25,8 million (en argent canadien), comparativement à 70 819 onces brutes (2 202 719 g) en 2001, une chute de 6,1 %. Depuis 1999, la production d'or placérien a dégringolé de 26 %, pour s'établir à son plus bas niveau depuis 1979. Cependant, la hausse constante des prix mondiaux de l'or tout au long de 2002 a contrebalancé le fléchissement de la production. En 2002, la valeur monétaire totale de l'or placérien produit au Yukon a atteint quelque 26 millions de dollars, comparativement à 23 millions de dollars en 2001. Si l'on combine ces résultats à la baisse globale des prix des carburants en 2001, l'année a été un peu plus profitable pour de nombreux exploitants de placers au Yukon.



# Yukon Mining Incentives Program, 2002

**Ken Galambos<sup>1</sup>**

*Mineral Resources Branch, Yukon Government*

Galambos, K., 2003. Yukon Mining Incentives Program, 2002. *In: Yukon Exploration and Geology 2002*, D.S. Emond and L.L. Lewis (eds.), Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 31-38.

The Yukon Mining Incentives Program (YMIP) received 99 applications by this year's deadline of March 1, 2002. A total of \$982,000 was offered to 62 successful applicants. From these programs, 9 were approved under the Grassroots Prospecting and Grubstake modules, 36 proposals were part of the Target Evaluation module and 17 applicants were approved under the newly added Focused Regional module. Precious metal exploration under the program was down from last year with approximately 41% of applicants searching for gold and platinum group elements. Base metal exploration accounted for 45% of approved programs; the remaining 14% of programs involved exploration for gem stones and other commodities. Exploration programs were proposed for all four mining districts and were fairly evenly dispersed over the entire Territory. Although total exploration spending is down from last year, the number of property options by prospectors is up significantly. To date there have been nine options signed for properties that have been explored under YMIP.

Highlights for the year, for both placer and hard rock exploration programs, include the discovery of significant gold and pathfinder anomalies in both soils and rock, and the extension of known



**Figure 1.** Erwin Kreft is seen here processing some of the pay gravels excavated on Little Blanche Creek located in the Klondike goldfields. Photo by Exilda Driscoll.

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showings through prospecting and geophysics. A number of significant exploration targets were found with the new Focused Regional module.

The following sections detail exploration highlights for selected YMIP projects.

**LITTLE BLANCHE CREEK (TARGET MODULE)**

Erwin Kreft (Fig. 1) had a successful season following up on previous auger drilling results on placer claims located on Little Blanche Creek, south of Dawson City. Previous drill programs outlined a pay streak averaging 6 ft (1.8 m) thick and 30 to 36 ft (9 to 11 m) wide. The best result from drilling was 5 ft (1.5 m) averaging 0.081 oz (2.5 g) of gold per bank yard from Auger Hole 2000-6. Test pitting of anomalous drill holes confirmed and enhanced results where target depths were reached. Hole #1, dug at the collar of drill hole 2000-6, returned 0.097 oz (3 g) of gold per bank yard or C\$47/yd<sup>3</sup> at \$308/oz. Hole #2 encountered abundant ground water and failed to reach bedrock. Hole #3, excavated at the collar of Auger Hole 2001-2 (0.06 oz/yd<sup>3</sup> over a 6-foot (1.8 m) interval), returned 0.109 oz (3.39 g) of gold per bank yard or C\$52.80/yd<sup>3</sup>. Little Blanche Creek placer gold has a purity of approximately 65%, so the number of crude ounces per bank yard is substantially more than reported.

**IRON-OXIDE-COPPER-GOLD (FOCUSED-REGIONAL MODULE)**

Prospector Bernie Kreft (Fig. 2) conducted a regional exploration project for Olympic Dam-type, iron-oxide-



**Figure 2.** Bernie Kreft is seen in the background of a large talus field that is 60-80% mineralized with pyrite, chalcopyrite and malachite. This is one of the new showings discovered this year during his program looking for IOCG targets.

copper-gold (IOCG) targets north of Mayo this season. Three new areas of mineralization were discovered with values up to 2.65 g/t Au, 2% Cu and 0.25% Co. These values were returned from brecciated intrusive and sedimentary rocks as well as quartz-siderite and ankerite veins (Fig. 3). Brick red alteration and specular hematite are common to all brecciated occurrences. Exploration indicates large anomalous areas coincident with the new showings.

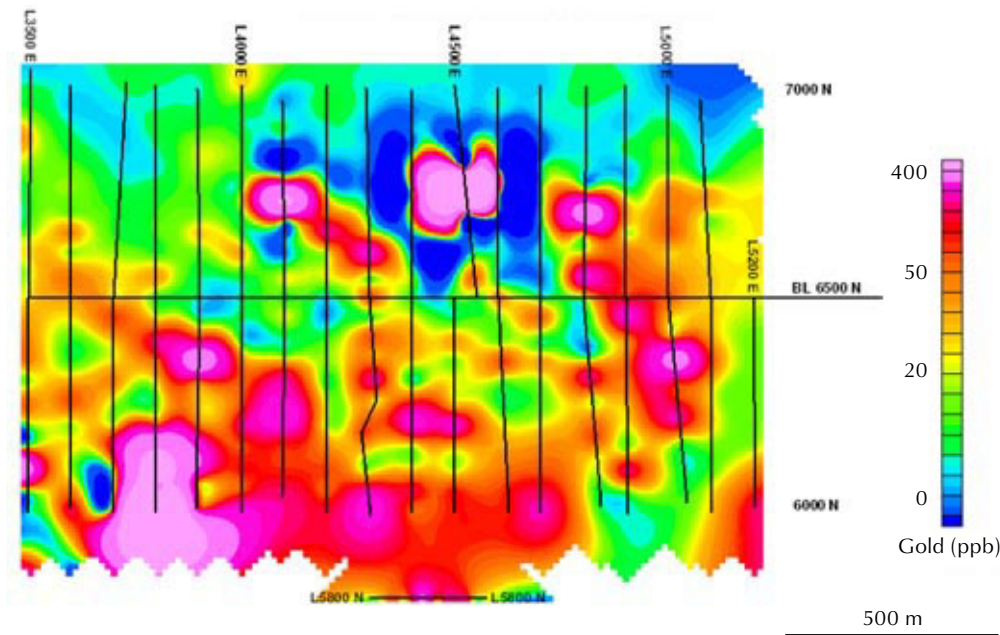
**SEVERANCE PROPERTY (TARGET EVALUATION MODULE)**

The Severance property was explored by 4763 NWT Ltd. and is located north of the Klotassin River, 260 km northwest of Carmacks on NTS sheet 115J/7. The property is underlain by granodiorite of the Cretaceous Dawson Range Batholith, which is intruded by Tertiary quartz-



**Figure 3.** This sample of weakly brecciated pink to beige chert with disseminated and fracture-controlled chalcopyrite assayed 1.92% Cu.





**Figure 4.** Gold-in-soil plot showing what appears to be a number of mineralized structures on the Severance property. Geochemical plot by Aurora Geosciences Ltd.

feldspar porphyry dykes. The area had been previously explored by Kennecott Canada Ltd. with reconnaissance stream sediment and soil sampling as a follow-up of an NGR (National Geochemical Reconnaissance) stream sediment anomaly of 280 ppb Au on a tributary of Somme Creek. Kennecott's program returned a number of samples anomalous in gold, bismuth and arsenic. In January 2002, 4763 NWT Ltd. staked the Severance property, covering the area of anomalous soils. This summer the company conducted an exploration program consisting of geological mapping, prospecting and soil sampling. A grid was established to cover an area measuring 1.7 by 1 km, and soil samples were collected at 50-m stations on lines spaced 100 m apart. The soil program returned some significantly anomalous values (Fig. 4) with 31 of 344 samples being greater than 100 ppb Au, including four samples with 600, 738, 1965 and 2680 ppb Au. Coincident with the gold are copper, molybdenum and arsenic anomalies. Rock sample results included a grab sample of silicified and quartz-veined granodiorite with 7% disseminated pyrite which assayed 1.2 g/t Au and 0.35% Cu.

#### **YUKON OLYMPIC PROPERTY (TARGET EVALUATION/FOCUSED REGIONAL MODULES)**

Shawn Ryan had a very successful year of exploration in the Dawson district. While prospecting by snow machine

in early April, he discovered a new showing off of his Hem property, located near Windy Pass on the Dempster Highway. The showing consists of a mineralized diorite dyke intruding an outcrop of hematite breccia immediately below a major unconformity (Fig. 5). Copper mineralization occurs as disseminated mineralization in the intrusive rock, as fracture fillings, with quartz-carbonate vein material, and as chalcopyrite-filled vesicles. In May, he was successful in optioning the Hem claims to Copper Ridge Explorations Inc. With assistance from the company, Shawn completed a large geophysical survey, including magnetics and gravity, over the claim block and

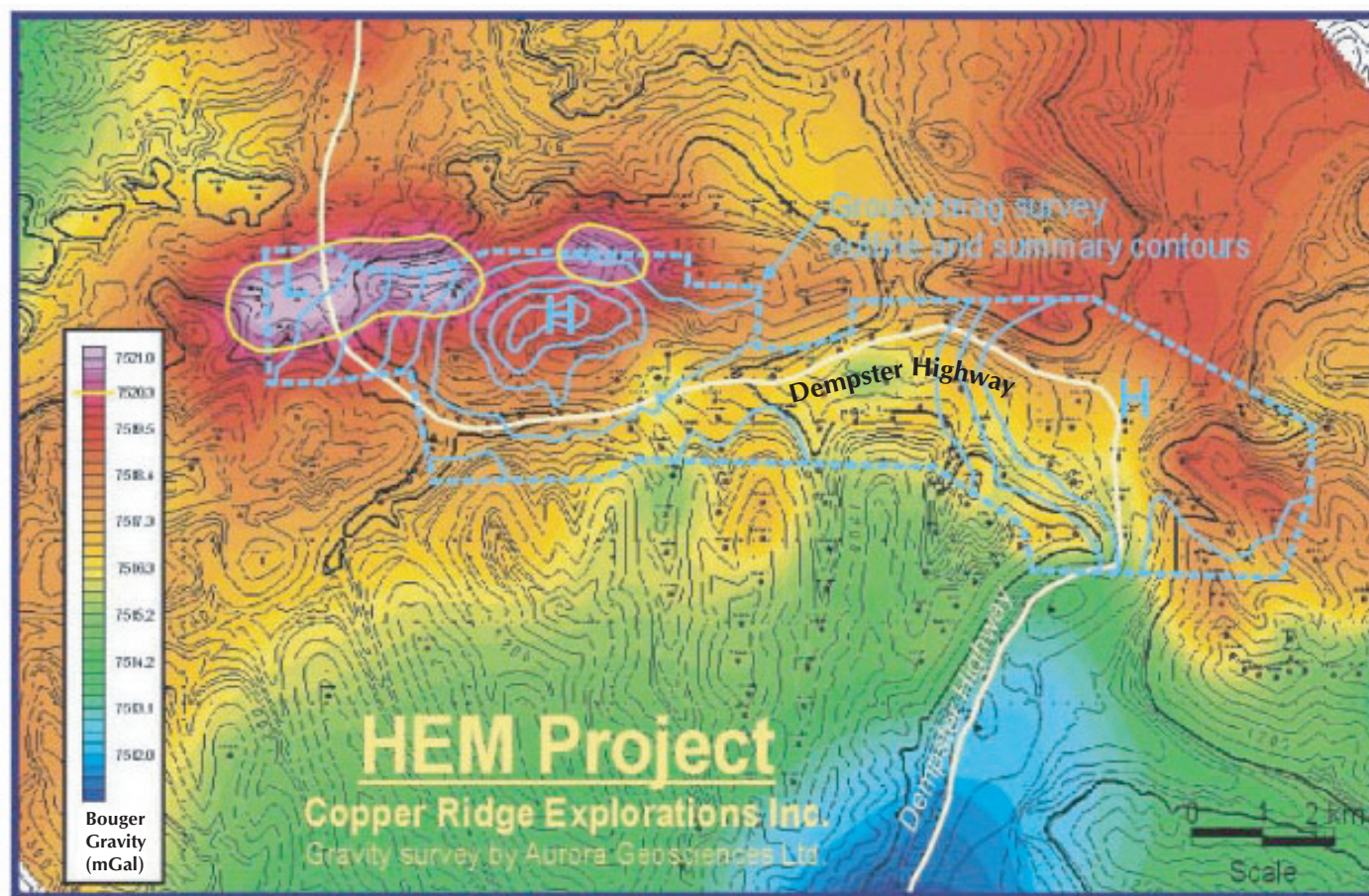


**Figure 5.** Shawn Ryan at his new copper showing on the Yukon Olympic property.

surrounding area. The survey revealed a very large and intense gravity anomaly to the north of the claims (Fig. 6). The gravity has a maximum amplitude of 6 milligals above background, a strike length of 8.2 km and a half amplitude width of 2.4 km. As with the Olympic Dam property in Australia, the gravity anomaly is related to, but not coincident with, a regional-scale magnetic anomaly. Additional staking to cover these targets has expanded the Yukon Olympic property to 377 claims. Copper Ridge subsequently optioned the property to Canadian Empire Exploration Corp. in September, 2002. Canadian Empire conducted a two-hole diamond drilling program in October and November, 2002. Results of the drill program are pending.

### LUCKY JOE PROPERTY (GRASSROOTS PROSPECTING MODULE)

With the release of the initial Stewart River Multisensor Airborne Geophysical Surveys in 2001 (Shives et al., 2001), Mr. Ryan recognized a possible geophysical signature for the historic Lucky Joe copper-molybdenum property. He also realized that the size of this signature was very large and that the known mineralization was situated on the very edge of this anomaly. During the 2001 field season Shawn set out to test his theory with reconnaissance magnetic and soil surveys. Continued exploration during 2002 included test-pitting on some of the better geochemical anomalies, claim staking and expanded soil surveys. The property was optioned to Copper Ridge Explorations Inc. in June of 2002 and further staking and soil sampling ensued. The expanded property now covers much of the 6-km-wide and 16-km-long copper-in-soils anomaly that has been identified. A



**Figure 6.** The large gravity anomaly found on the Yukon Olympic property is thought to comprise three discrete bodies, each with a density of 4. Modeling suggests that the two masses closest to the highway measure roughly 1 billion tonnes each; the eastern body is thought to be in the 5 to 6 billion tonne range, but situated slightly deeper. Geophysical plot by Aurora Geosciences Ltd. and taken from Copper Ridge's website at [www.copper-ridge.com](http://www.copper-ridge.com).





**Figure 7.** Shawn Ryan is seen here in a pit located on the Ryan Creek anomaly where C horizon soils returned values of up to 1.19% Cu.



**Figure 8.** Folded iron formation located on Shawn Ryan's Simba claims, located at the headwaters of Shell Creek, approximately 70 km northwest of Dawson City.

total of 1430 soil samples were collected from approximately 70 km of line and resulted in the discovery of two anomalous areas. The Bear Cub anomaly is 1750 m long, up to 1500 m wide and open in two directions. The core of the anomaly, 1500 m by 1000 m, averages greater than 225 ppm Cu and 10 ppm Mo, with many values in the 1000 to 4300 ppm Cu range. The Ryan Creek anomaly has a strike length of 3500 m, and an average width of 500 m using a threshold value of 60 ppm Cu, and is also open in two directions. Pits dug to date on the Ryan Creek grid revealed mineralization assaying up to 1.19% Cu in C-horizon soils (Fig. 7).

### **SHELL CREEK PROPERTY (TARGET EVALUATION/ FOCUSED REGIONAL MODULES)**

The Simba claims were staked to cover the nose of a large banded iron formation unit situated just north of the Yukon River on Shell Creek, approximately 70 km northwest of Dawson City. The claims also cover a very small part of coincident regional-scale magnetic and gravity anomalies. Shawn Ryan conducted prospecting, and geophysical and geochemical surveys on the property this season looking for an Algoma-style banded iron formation gold target (Fig. 8). While prospecting an area to the northwest of the claims, a very large quartz-carbonate vein was found that parallels iron formation within what is believed to be Cambrian to Silurian Marmot Formation volcanic rocks. This vein was found to contain coarse visible gold for a strike length of over 2 km (Fig. 9). A number of copper showings have been found on the property, some of which are associated with visible gold.

### **CANYON GOLD GREW CREEK PROJECT (TARGET EVALUATION MODULE)**

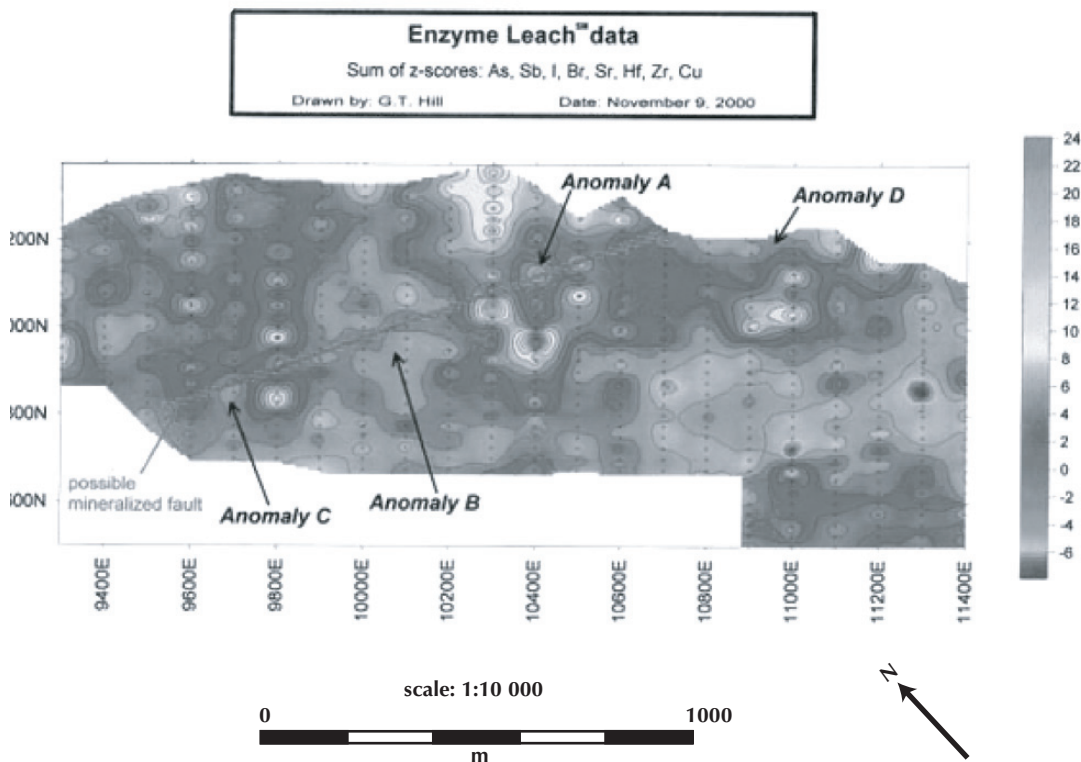
Al Carlos continued to explore his Canyon claims near the Eocene-aged Grew Creek deposit (geological resource of 773 012 tonnes grading 8.9 g/t Au and 33 g/t Ag). In 2000, Mr. Carlos conducted a 558-sample Enzyme Leach survey over the till-covered area approximately 1 km east of the deposit and over his Dozer claims to the west. Interpretation of the data was completed by Gregory T. Hill of Enzyme Laboratories, Inc. in Reno, Nevada. The Grew Creek survey revealed five anomalies. Anomalies A-D are oxidation anomalies aligned along what is thought to be a mineralized structure (Fig. 10). "Oxidation anomaly patterns tend to be characterized by oxidation halos where reduced material in the subsurface is undergoing very subtle oxidation. These halos flank the



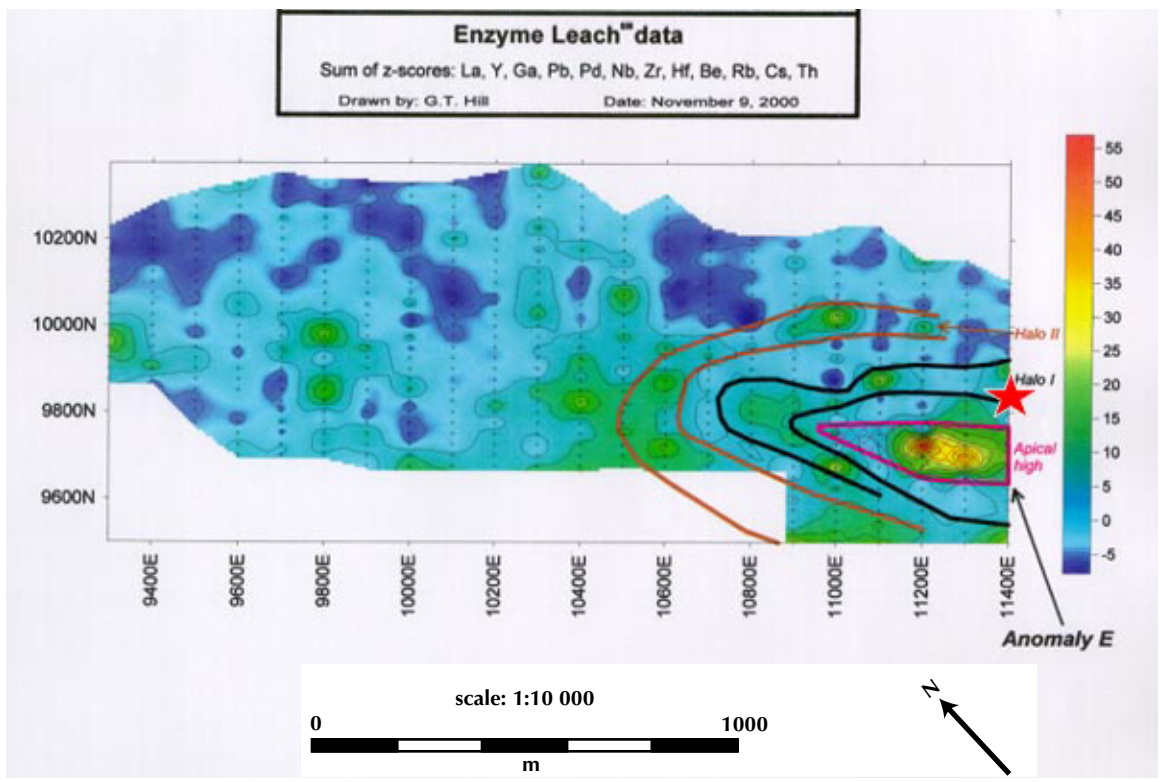
**Figure 9.** Visible gold is found in large quartz-carbonate veins at Shell Creek. This flake of gold measures almost 1 mm in length. Photo by Mike Burke.

reduced body, and a “central low” is found over a “reduced chimney” located between the reduced body and the surface. The elements in these halos characteristically include at least part of the oxidation suite: Cl, Br, I, Mo, As, Sb, W, Re, V, Se, Te, U, Th”

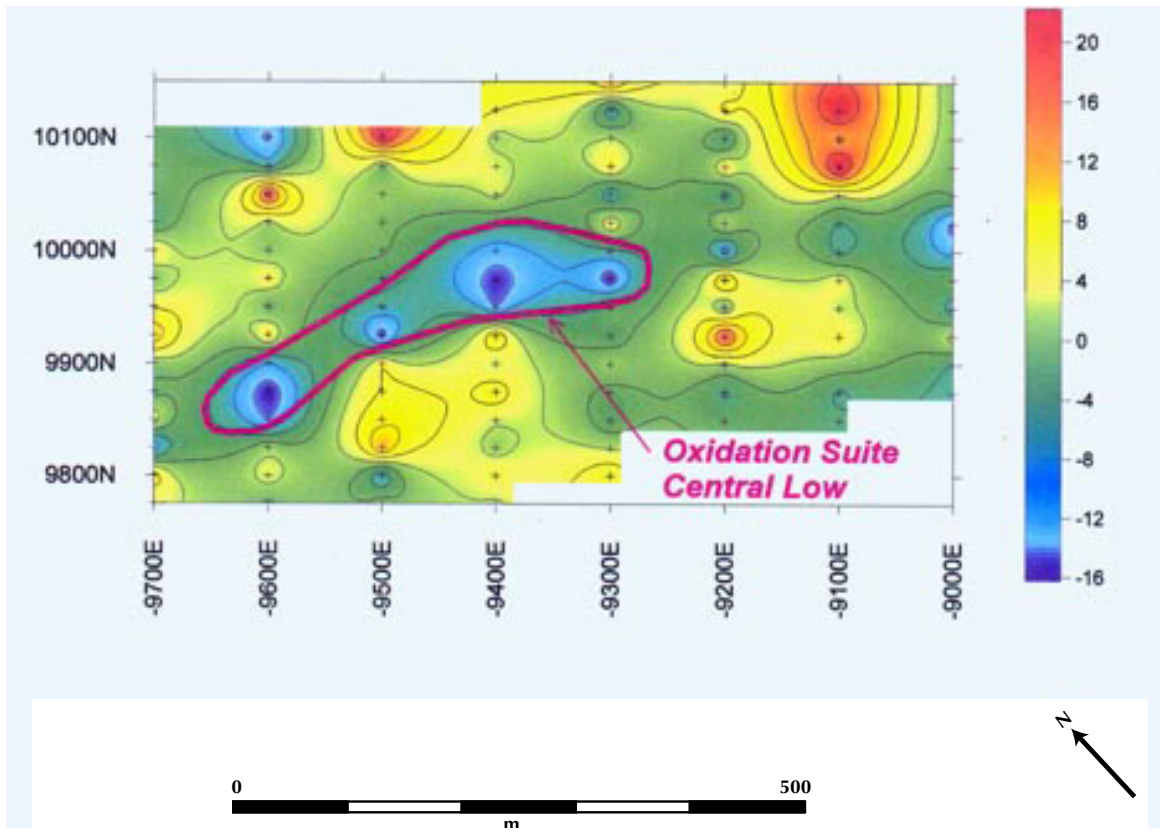
(G.T. Hill, pers. comm., 2000). Anomaly B is unique in that bismuth was detected in the oxidation halo suggesting a buried intrusion or rhyolite flow dome complex. Anomaly E is a combination anomaly with a high-contrast apical anomaly surrounded by a well developed nested halo set (Fig. 11). “Apical anomaly patterns tend to form highs directly over the source of the anomaly rather than forming a halo around the source. The source of the anomaly can be a mineral body or it can be a fault, unconformity or other feature that facilitates the movement of the trace elements to the surface. Combination anomalies contain an apical anomaly at the center which is surrounded by a halo or set of nested halos” (G.T. Hill, pers. comm., 2000). Anomaly E shares nearly the same geochemical signature as a nearby mineralized outcropping of conglomerate. Results from a 2001 drilling program on anomaly E – 191 m in four holes – were inconclusive, so Mr. Carlos completed a further 415 m in six holes this past season to further test this target. Hydrothermal breccias were intersected in a number of the holes and results are pending. Anomalies A-D and the classic oxidation anomaly located on the Dozer claims (Fig. 12) remain untested and are excellent drill targets.



**Figure 10.** Oxidation anomalies A-D aligned on a possible mineralized fault on the Canyon claims of Al Carlos. Geochemical plot by Enzyme Laboratories Ltd.



**Figure 11.** Apical anomaly E on the Canyon claims is shown in relation to the location of a mineralized outcrop of conglomerate. The outcrop assayed up to 2200 ppb Au in grab samples. Geochemical plot by Enzyme Laboratories Ltd.



**Figure 12.** Data from the Dozer claims suggest that the most intense alteration and potential mineralization coincides with an inflection in the northwest-trending structure. Geochemical plot by Enzyme Laboratories Ltd.

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# Yukon Geology Program

*Grant Abbott<sup>1</sup> and staff*  
*Yukon Geology Program*

Abbott, J.G., 2003. Yukon Geology Program. *In: Yukon Exploration and Geology 2002*, D.S. Emond and L.L. Lewis (eds.), Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 39-46.

## OVERVIEW

Ten years ago, the Canada-Yukon Geoscience Office opened its doors and marked the beginning of a *de facto* Yukon Geological Survey. Seven years ago, when the Canada-Yukon Mineral Development Agreements ended, the name changed to the Yukon Geology Program (YGP). The YGP (Fig. 1) includes two integrated and jointly managed offices with different administrative structures (Fig. 2). Federal funding is provided through the Exploration and Geological Services Division (EGSD), Yukon Region of the Department of Indian Affairs and Northern Development (DIAND), while Yukon Territorial Government (YTG) and cost-shared (YTG/DIAND) funding comes through the Mineral Planning and Development Branch of the Department of Energy, Mines and Resources (YTG). YTG independently manages and funds the Mineral Assessment Group and the Yukon Mining Incentives Program (YMIP). These are described separately. The Geological Survey of Canada (GSC) also maintains an office with the Program.

The past year has been a time of transition. In preparation for devolution of responsibility for administration of Yukon's land and resources from the Department of Indian Affairs and Northern Development, the Government of Yukon embarked upon a Renewal Process that examined how the government was organized and served the public. Out of that process, the Department of Energy,



**Figure 1.** Yukon Geology Program staff from left to right: Jesse Duke, Don Murphy, Rod Hill, Grant Abbott, Jeff Bond, Bill LeBarge, Lee Pigage, Roger Hulstein, Ali Wagner, Karen Pelletier, Lara Lewis, Ken Galambos, Mike Burke, Amy Stuart, Maurice Colpron, Craig Hart, Derek Thorkelson, Jo-Anne vanRanden, Robert Deklerk, Julie Hunt, Charlie Roots, Diane Emond, Panya Lipovsky, Monique Raitchey, Grant Lowey and Steve Traynor. Missing: Robert Stroshein.

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Mines and Resources was formed to assume responsibility for minerals, oil and gas, forestry, agriculture and lands. On April 1, 2003 the Geology Program will finally become one organization within the Mineral Development Branch (Fig. 2) of the Oil, Gas and Mineral Resources Division. The Geology Program will continue to be co-managed by Grant Abbott and Rod Hill. Jesse Duke will assume responsibility for the Geology Program as Director of the branch.

The Program has been fortunate to have had little staff turnover over the past year. We were sad to see Anna Fonseca leave the Mineral Assessment Group for the private sector, and Gary Stronghill leave the GIS Group for Ontario. Both positions have yet to be filled full-time.

This year being the tenth anniversary, staff have embarked on a number of commemorative activities. Local artist Chris Caldwell was commissioned to paint the poster shown on the cover. An open house was held for schools and the public to raise knowledge of the Program, Yukon geology and the mineral industry. Accomplishments of the Program were presented in a talk by Grant Abbott at the Geoscience Forum. Highlights include a quantum leap in the quality and quantity of the Yukon Geoscience database; significant measurable stimulation of mineral exploration; identification of significant, but under-explored mineral potential; and better information management. Some examples include doubling of detailed bedrock mapping coverage; generation of at least \$50 million in exploration spending on YGP-defined

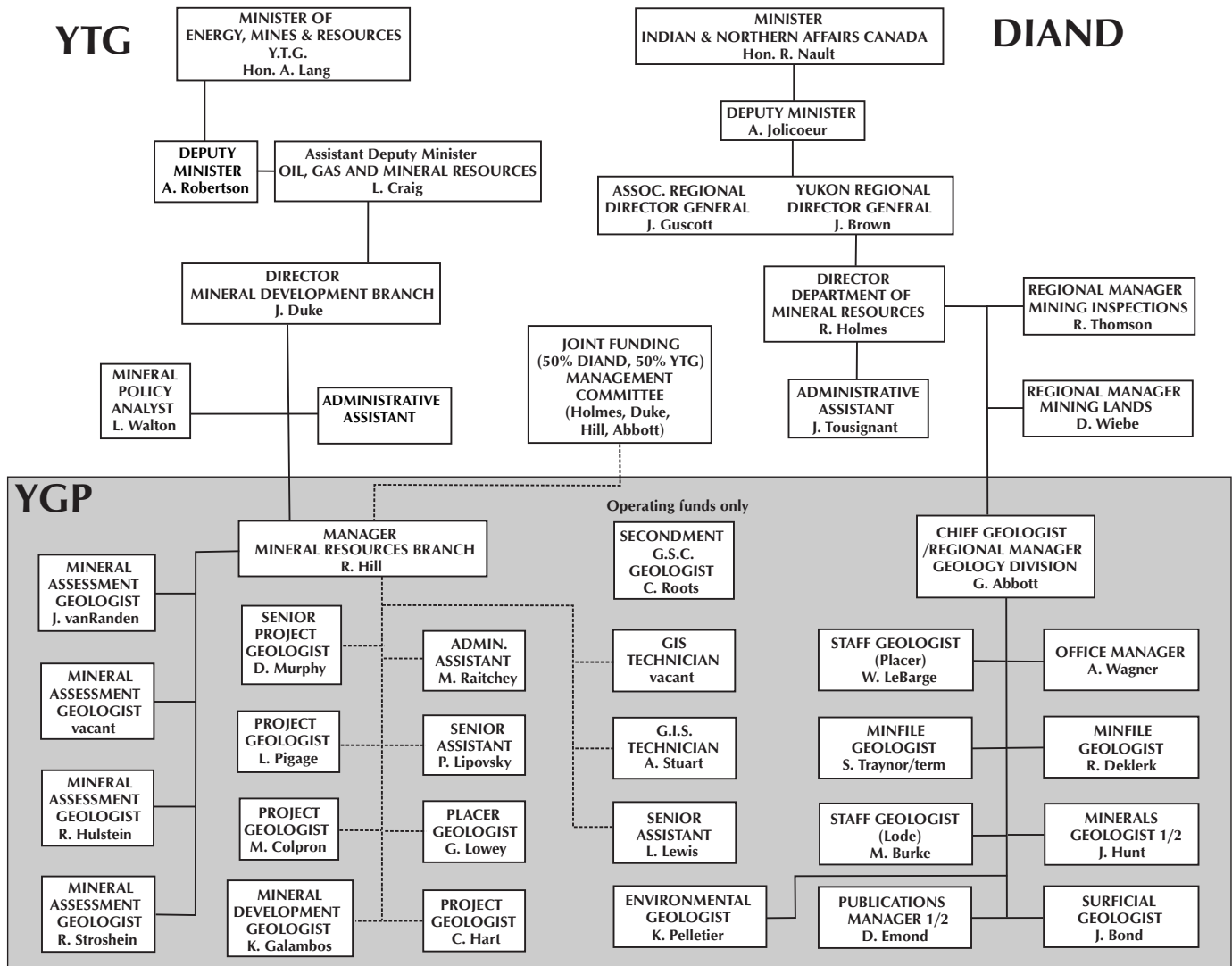


Figure 2. Yukon Mineral Resources organization chart.



geochemical, geophysical and geological targets; identification of untested geological, geochemical and geophysical targets in several parts of the Yukon-Tanana Terrane; and development of key databases and Internet distribution of all YGP Geoscience publications and data.

## PROGRAM HIGHLIGHTS FOR 2002

### FIELDWORK

The Yukon Geology Program is committed to providing a balanced complement of field projects, which not only quickly stimulate the mining and exploration industry, but also take the longer term view towards developing an

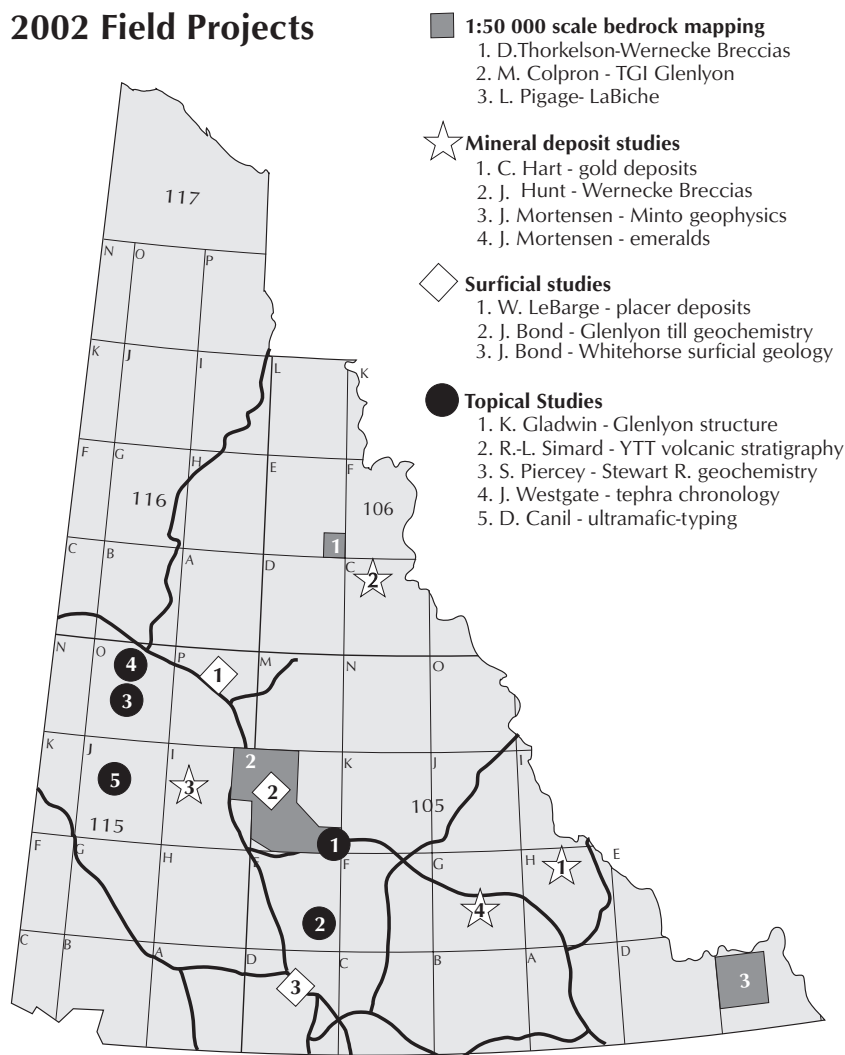
understanding of the Yukon regional geological framework, and building the Yukon geoscience database. Field projects carried out in 2002 are shown in Figure 3, and the present state and location of geological, geochemical and geophysical surveys are shown in Figure 4.

The Yukon Geology Program continued to commit substantial resources to a joint Geological Survey of Canada-British Columbia Geological Survey Branch-Yukon Geology Program initiative, the Ancient Pacific Margin NATMAP (National Mapping Program) Project. This project is a multidisciplinary effort to better understand Yukon-Tanana and Kootenay terranes, arguably the least understood parts of the North

American Cordillera. In Yukon, mapping projects include Finlayson Lake map area (Don Murphy), Glenlyon (Maurice Colpron), Stewart River (Steve Gordey, Jim Ryan/ GSC), and Wolf Lake (Charlie Roots/GSC). In southern B.C., the Project also includes regional mapping by Bob Thompson of the GSC, and in east-central Alaska, mapping by David Szumigala of the Alaska State Geological Survey, and mineral deposit studies by Cynthia Dusel-Bacon of the U.S. Geological Survey. Participation by numerous university researchers, graduate students and other specialists has greatly added to the depth and complexity of the Project. In Yukon, these include litho-geochemical studies in the Stewart River area by Steve Piercey of Laurentian University and mineral deposit studies by Jan Peter of the GSC. Regular workshops and field trips are one of the main benefits of such a large and diverse project. In November, 2002, the last NATMAP workshop was held in Sidney, B.C. and the project has now entered its synthesis phase, which is expected to be completed in 2004.

In 2002, the Yukon portion of the project has once again received a substantial boost from funds obtained through Natural Resources Canada's

### 2002 Field Projects



**Figure 3.** Field projects carried out or sponsored by the Yukon Geology Program in 2002.

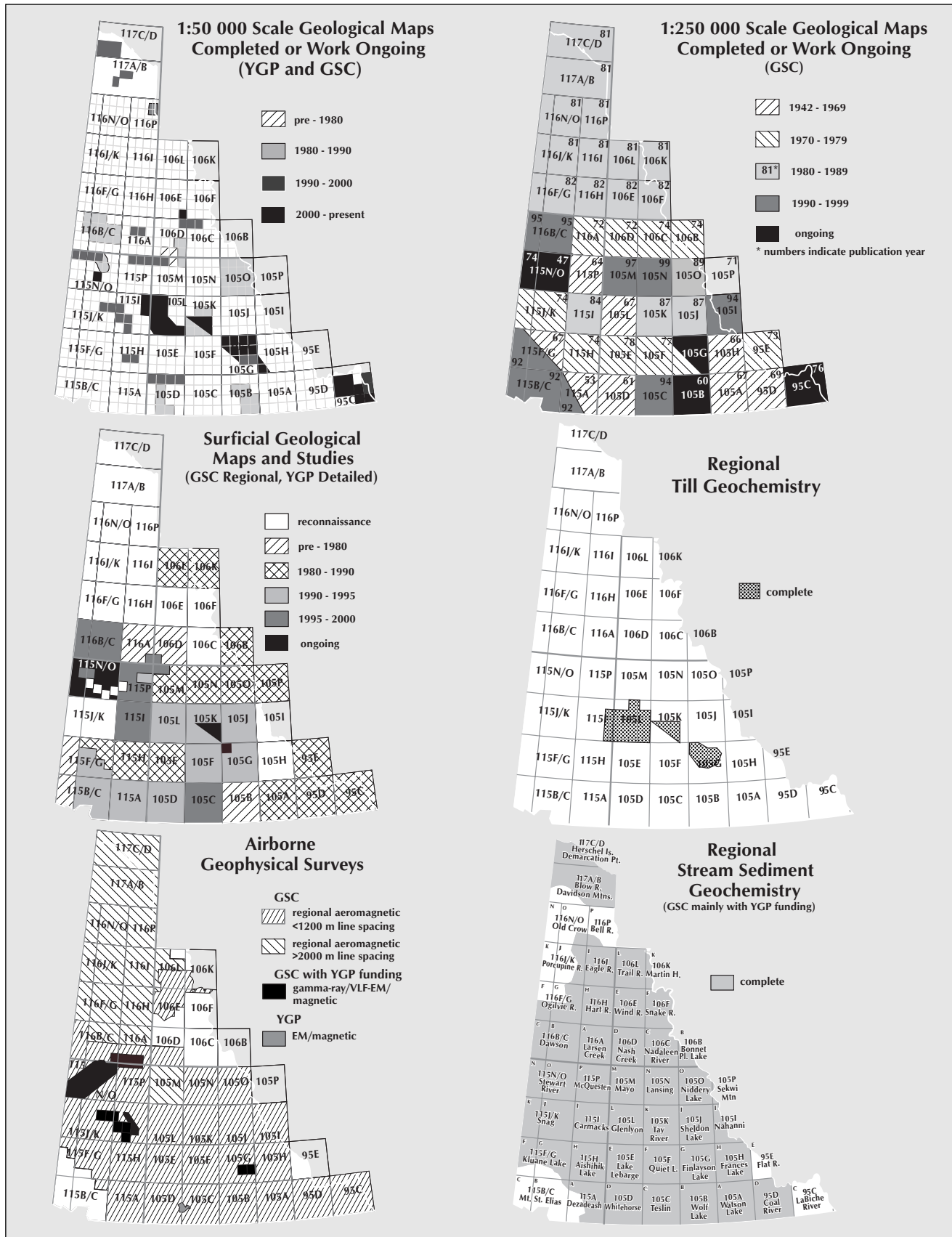


Figure 4. Summary of available geological maps, and regional geochemical and geophysical surveys in the Yukon.

Targeted Geoscience Initiative. In the Glenlyon map area, the extra funding enabled a program of accelerated regional bedrock mapping and till geochemistry. By using a contract helicopter for five weeks, five expert NATMAP participants (M. Colpron, D. Murphy, S. Gordey, J. Nelson and C. Roots) were able to map over half of the map sheet at 1:125 000 scale. As well, J. Bond, A. Plouffe and two assistants successfully carried out a regional till geochemical sampling program across the extensive overburden-covered parts of the area. Promising geological and geochemical targets were defined as a result.

Elsewhere, Don Murphy and Charlie Roots began the final compilation map and bulletin of Finlayson Lake and Wolf Lake – Jennings River map areas, respectively. In the Stewart River area, work included GSC bedrock mapping by Gordey and Ryan, and surficial mapping by Lionel Jackson for the GSC. Grant Lowey began the final compilation map and bulletin of his placer deposit studies.

Fieldwork was completed this year on the Central Forelands NATMAP Project, in which the Yukon Geology Program is a partner with GSC Calgary staff and university researchers. The Central Forelands Project is primarily focused on hydrocarbon-related geoscience, and includes regional mapping and topical studies in two separate areas: Trutch (94G) and Toad River (94N) in northern British Columbia, and Fort Liard (95B) and La Biche (95C) in Yukon and Northwest Territories. Tammy Allen and Lee Pigage joined the project in La Biche map area in southeast Yukon. The project has more clearly defined the geologic framework of the area with the highest hydrocarbon potential in all of Yukon. Mapping in the eastern part of the La Biche area has resulted in new structural interpretations that are key to hydrocarbon exploration. Work by Lee and Tammy in the western part of the map area has resulted in significant reinterpretation of both structure and stratigraphy.

Another major effort by the Yukon Geology Program has been to synthesize and enhance the geological database of the Anvil district. The Faro mine remains closed for the foreseeable future, but the possibility remains for renewed exploration and mining at some point. Lee Pigage has completed bedrock mapping, and has released a complete set of 11 geological maps of the district at 1:25 000 scale, and a compilation at 1:100 000 scale. A final report (bulletin) will be released in the spring of 2003. Jeff Bond completed surficial mapping and a till geochemical survey, and released 11 final maps and a bulletin in the spring of 2001.

Derek Thorkelson joined the YGP for six months while on sabbatical from Simon Fraser University. He has completed a 1:50 000-scale map sheet in the Wind River area (106E/1) of the Wernecke Mountains. The map area is an extension of Derek's previous project and includes extensive areas of Wernecke Breccia and many of the best-known Cu-U-Au occurrences associated with those rocks.

Craig Hart has completed a year's leave to undertake a PhD program at the University of Western Australia. Most of the requirements for the degree will entail writing papers on his previous field studies of the Tintina Gold Belt and other Yukon gold occurrences. Many of the students who received support from the YGP and assistance from Craig to study various aspects of Yukon gold deposits finished their studies this year. These included Mark Lindsay and Julian Stephens, under the supervision of Tim Baker at James Cook University; John Mair at University of Western Australia; and Erin Marsh and Seth Mueller under the supervision of Rich Goldfarb at the U.S. Geological Survey. This year, Craig carried out a preliminary investigation of intrusive-related mineral occurrences in northern Frances Lake map area with Lara Lewis.

Bill LeBarge and Mark Nowasad completed their studies of the relationship between sedimentology, grain size distribution and water quality of effluent from placer deposits. The technique will be evaluated for possible long-term applications and further research. Data gathered from this study was useful in the review of the Yukon Placer Authorization

Julie Hunt has returned to Australia to undertake a PhD program at James Cook University. YGP is funding her fieldwork. Julie partnered with Derek Thorkelson to complete fieldwork on the Wernecke Breccias, and is taking advantage of the Australian connection by comparing the Yukon breccias with similar Australian rocks that host giant ore deposits.

## EXTERNAL SUPPORT

The YGP is providing financial and logistical support, or is a partner with graduate students and university researchers in the following projects:

John Laughton is completing an MSc thesis on the Slab volcanics in the Wernecke Breccias under the supervision of Derek Thorkelson at Simon Fraser University.

Kaesy Gladwin completed mapping and structural studies to characterize the boundary between the Yukon-Tanana and Cassiar terranes in southeast Glenlyon map area. This is an MSc project under the direction of Stephen Johnston at the University of Victoria.

Reza Tafti has begun a study of the Minto copper deposit for his MSc at the University of British Columbia under the supervision of Jim Mortensen. Through the project we will attempt to gain a better understanding of the nature, age and origin of the main host rocks to the Minto deposit and the Cu-Au mineralization contained within them. This information will be used as a basis for developing an exploration model for similar mineralization elsewhere in the Minto-Williams Creek belt.

Heather Douglas has begun a study of emerald and beryl occurrences in the Yukon and Northwest Territories for her MSc at the University of British Columbia under the supervision of Jim Mortensen and Lee Groat. The main focus of the study will be the Regal Ridge emerald deposit in the Finlayson Lake District. The purpose of the project is to understand the origin of the emerald occurrences and to develop exploration guidelines for the northern Canadian Cordillera.

Renée-Luce Simard is continuing a study of the volcanic stratigraphy, composition and tectonic evolution of Late Paleozoic successions in central Yukon for her PhD thesis at Dalhousie University under the direction of Dr. J. Dostal. The project will compare and contrast the depositional style, composition and tectonic setting of several volcanic successions within the belt of pericratonic terranes in the Northern Cordillera. These include the Klinkit succession in Wolf Lake map area, the Little Salmon succession in Glenlyon map area and the Boswell and Semenof formations in central Laberge map area.

Steve Piercey at Laurentian University, as part of the Ancient Pacific Margin NATMAP Project, began a study of the field, geochemical and isotopic attributes of volcanic and intrusive rocks in the Stewart River map area. The study will, in part, determine the similarities and differences of these rocks to volcanogenic massive sulphide (VMS)-bearing rocks in the Finlayson Lake district.

Dr. Dante Canil at the University of Victoria continued a study of the origin and emplacement of large ultramafic rock bodies in southwest Yukon, their potential for gold, nickel or platinum group element (PGE) mineralization, and their significance in Cordilleran tectonic evolution. This year, studies focussed on ultramafic rocks belonging

to the Windy-McKinley Terrane in Snag map area of west-central Yukon.

John Westgate at the University of Toronto continued his studies of late Cenozoic tephrochronology of eastern Beringia. The objectives of this program are to establish a comprehensive tephrochronological framework to support studies in Quaternary geology, paleoenvironments and related fields. This year's studies focused on extension of the late Cenozoic tephra record of the Klondike Goldfields; determination of a precise and reliable glass fission track, magnetostratigraphic and  $Ar^{40}/Ar^{39}$  record for the widespread Dawson tephra bed; and establishment of the tephrochronological record preserved at Thistle Creek.

In addition to providing geochronological support to the GSC's Stewart River project, Mike Villeneuve has been using argon geochronology to 1) determine the cooling and uplift history of the Klondike region to aid in understanding mineralizing and tectonic processes in that region; 2) define the timing of recent volcanism in the Yukon, particularly the Fort Selkirk region; and 3) provide timing constraints on intrusion-related gold mineralization in the Tintina Gold Belt.

## LIAISON AND SUPPORT TO INDUSTRY, FIRST NATIONS AND THE PUBLIC

Mike Burke and Bill LeBarge, our main links to the exploration industry, continued to monitor Yukon hard-rock and placer mining and mineral exploration activity, visit active properties, review reports for assessment credit, and maintain the assessment report library.

This year the YGP has focused more attention on increasing awareness among the public, schools and First Nations of geology and its importance to the mining industry, land use planning and environmental management. Karen Pelletier and Charlie Roots led the effort. The Geological Survey of Canada, with support from YGP, released its Geoscape Whitehorse Poster. The poster is one of a series that highlights geological features of interest in and around Canadian urban centres. The posters emphasize the impact of geology on everyday life. As a spin off to this project, a summer student gave presentations and led field trips through the Beringia Centre for school classes and the public. Karen Pelletier continued this initiative in the schools this fall. As part of the YGP 10<sup>th</sup> anniversary celebrations, an open house was held to again highlight Yukon geology and the activities of the YGP. Karen also organized field trips with

First Nations groups to visit the Brewery Creek mine site and other exploration properties to examine modern reclamation practices.

## ENVIRONMENTAL STUDIES

Karen Pelletier continued to manage the Mining and Environmental Research Group (MERG) in partnership with Lori Walton at YTG. Projects funded this year included 1) Evaluation of In-pit Algal Detoxification of Metal-Contaminated Pit Lakes by Laberge Environmental Services & Microbial Technologies Inc.; 2) Mine Sludge Stability and Densification in Cold Climates by CANMET; 3) Examination of Revegetation Methodologies for Dry Stack Tailings in Northern Environments by Access Mining Consultants Ltd.; and, 4) Follow-up Monitoring: Shrub Trial Plots at Brewery Creek Mine and Bioengineering Trials at Noname Creek by Stu Withers. Other activities included review of Mining Land Use and water license applications, and monitoring of reclaimed sites to document the effectiveness of mitigation practices. Karen also represents YGP on several committees that sponsor environmental research involving geology.

## INFORMATION MANAGEMENT AND DISTRIBUTION

With the increasing volume of information generated by YGP and others, and rapidly evolving digital technology, YGP has placed more effort and resources into making geological information more accessible. A large part of our effort has gone into developing and maintaining key databases. The other part of the effort has gone into making all of our information internet-accessible. Ongoing activities include support for the H.S. Bostock Core Library and the Elijah Smith Library.

### *Databases*

Yukon MINFILE, the Yukon's mineral occurrence database, is maintained by Robert Deklerk. A new Microsoft Access 2000 version was released in November, 2002. The database now contains 2593 records, of which 500 have been revised, and is complete to the end of 2000. The database has been simplified and is easier to use. Modifications allow better data table interaction, faster searching and editing speeds, improved data table and editing features, and easier export of data to a GIS system. It is expected that the database will become current over the next year.

The Yukon Placer Database, compiled under the direction of Bill LeBarge, was released in the fall of 2002. The database is in Microsoft Access 2000 format and is a comprehensive record of the geology and history of Yukon placer mining. The database contains descriptions of 440 streams and rivers, and 1356 associated placer occurrences. It also includes location maps in Portable Document Format (PDF).

The Yukon GEOPROCESS File, under the direction of Diane Emond, is an inventory of information on geological process and terrain hazards, including 1:250 000-scale maps showing permafrost, landslides, recent volcanic rocks, structural geology, and seismic events. It also includes references and summaries of bedrock and surficial geology. The GEOPROCESS File is intended as a planning aid for development activities and is available for most areas south of 66° latitude. The maps are now standardized in colour, and available on a single compact disk. Maps with text are in AutoCAD 2000 format and as PDF.

Steve Gordey and Andrew Makepeace of the Geological Survey of Canada undertook the Yukon Digital Geology Project with funding from YGP. It included syntheses of bedrock geology and glacial limits, compilations of geochronology, paleontology, and mineral occurrences, and a compendium of aeromagnetic images. All are now available on CD-ROM. Bedrock geology and glacial limit paper maps are also available at 1:1 000 000 scale. An updated version is scheduled for release in early 2003.

The Yukon Regional Geochemical Database analysis was compiled this year by Daniele Héon and released in November. The database contains all of the available digital data for regional stream sediment surveys that have been gathered in the Yukon under the Geological Survey of Canada's National Geochemical Reconnaissance Program. It is available on CD-ROM in Microsoft Excel 2000 format (.xls) and in ESRI ArcView Shapefile format (.shp).

The YukonAge 2002 Database was compiled this year by Katrin Breitsprecher and Jim Mortensen at the University of British Columbia, and Mike Villeneuve with the Geological Survey of Canada with funding from YGP. The database contains over 1500 age determinations derived from over 1100 rock samples from the Yukon Territory and is available in both Microsoft Access 2000 format and as a flat file in Microsoft Excel 2000 format so that the data may be viewed without Microsoft Access.

### *H. S. Bostock Core Library*

Mike Burke and Ken Galambos maintain the H.S. Bostock Core Library. The facility contains about 128 000 m of diamond drill core from about 200 Yukon mineral occurrences. Confidentiality of material is determined on the same basis as mineral assessment reports. Confidential core can be viewed with a letter of release from the owner. Rock saws and other rock preparation equipment are available to the public.

### *Elijah Smith Library*

The library in the Elijah Smith Building is an invaluable resource that is available to the public, but often overlooked. The library also houses Yukon assessment reports and contains most geological journals and a good selection of references on general geology, Yukon geology, and economic geology. YGP has begun the process of converting all of the assessment reports into PDF Format. Conversion may be complete in 2003.

### *Information distribution*

The Yukon Geology Program is now converted fully to digital publishing and has developed a threefold strategy for distribution of information. We sell and distribute paper maps and reports through our Geoscience Information and Sales Office. In addition, many of our recent publications and databases are available in digital formats at considerably lower prices than our paper copies. Our main effort over the last year has been to make all of our publications available through our website ([www.geology.gov.yk.ca](http://www.geology.gov.yk.ca)), free of charge. A directory of assessment reports is also available online. We are also pleased to make spatial data available through our interactive map server; the Map Gallery can be accessed through the YGP website. It currently allows viewing of regional geology, MINFILE locations, regional stream geochemistry, topography, roads and communities, and First Nations Land selections. Vector data can now be clipped and downloaded. Planned enhancements include addition of geophysics, geochronology and paleontology, and addition of more attribute data to existing coverages. Coverages from other agencies such as mineral claims will soon be available. Users are encouraged to provide feedback and suggest improvements.

Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada publishes Yukon Geology Program publications. Hard copies are available at the following address:

Geoscience Information and Sales  
c/o Whitehorse Mining Recorder  
102-300 Main Street  
Whitehorse Yukon Y1A 2B5  
Ph. (867) 667-3266  
Fax (867) 667-3267  
E-mail: [geosales@inac.gc.ca](mailto:geosales@inac.gc.ca)

To access publications and to learn more about the Yukon Geology Program, visit our homepage at <http://www.geology.gov.yk.ca> or contact us directly:

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# Le Service de géologie du Yukon

*Maurice Colpron<sup>1</sup> et Grant Abbott<sup>2</sup>*

*Le Service de géologie du Yukon*

Colpron, M. et Abbott, G., 2003. Le service de géologie du Yukon. *In: Yukon Exploration and Geology 2002*, D.S. Emond and L.L. Lewis (eds.), Exploration and Geological Services Division, Yukon Region, Indian and Northern Affairs Canada, p. 47-50.

## APERÇU

Il y a dix ans, le Bureau géoscientifique Canada-Yukon a ouvert ses portes, marquant en fait le début de la commission géologique du Yukon. Il y a sept ans, quand l'accord de développement minéral Canada-Yukon s'est terminé, le nom du bureau a changé pour celui de Service de géologie du Yukon (SGY). Le SGY (fig. 1) consiste en deux bureaux intégrés présentant des structures administratives différentes mais qui sont gérés conjointement (fig. 2). Le financement par le gouvernement fédéral est fourni par l'entremise de la Division des Services d'exploration et de géologie de la région du Yukon du ministère des Affaires indiennes et du Nord canadien (MAIN), alors que le financement par le gouvernement du territoire du Yukon (GTY) et à coûts partagés (GTY/MAIN) est obtenu par l'entremise de la Direction du développement minéral du ministère de l'Énergie, des mines et des ressources (GTY). Le GTY gère et finance indépendamment le Groupe d'évaluation du potentiel minéral et le Programme d'encouragement pour l'exploration minérale du Yukon; ce dernier est décrit brièvement ci-dessous. La Commission géologique du Canada (CGC) maintient également un bureau auprès du Service.

L'année qui se termine fut un temps de transition. En préparation pour le transfert entre le MAIN et le GTY des responsabilités d'administration des terres et des ressources, le GTY s'est engagé dans un processus de renouvellement, qui portait sur l'évaluation de l'organisation du gouvernement et sur sa façon de servir le public. C'est à la suite de ce processus que le nouveau ministère de l'Énergie, des mines et des ressources (GTY) a été introduit. Sa fonction sera d'assumer la responsabilité pour les minéraux, le pétrole et le gaz, les forêts, l'agriculture et les terres. Au premier avril 2003, le Service de géologie deviendra finalement une seule organisation au sein de la Direction du développement minéral (fig. 2) de la Division des ressources pétrolières, gazières, et minérales. Le Service de géologie va continuer d'être géré conjointement par Grant Abbott et Rod Hill. Jesse Duke assumera la responsabilité pour le Service de géologie en tant que directeur de la Direction du développement minéral.

Au cours de 2002, le programme a eu la chance d'avoir une base d'employés stable, sauf qu'on a été triste de voir partir Anna Fonseca et Gary Stronghill.

Cette année étant le dixième anniversaire du Service de géologie du Yukon, les employés ont entrepris plusieurs activités commémoratives. L'artiste locale Chris Caldwell a été commissionnée pour peindre l'affiche qui apparaît sur la couverture de ce volume. Nous avons aussi ouvert nos portes aux écoles et au public afin d'augmenter la connaissance du public de notre service, de la géologie du Yukon, et de l'industrie minière. Lors du Colloque géoscientifique annuel, Grant Abbott a présenté un exposé soulignant les accomplissements du Service au cours de sa première décennie. Il a entre autre mentionné l'amélioration de la qualité et de la quantité d'information géoscientifique maintenant disponible sur le Yukon; les effets positifs que le Service a apporté sur

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l'industrie d'exploration minérale; l'identification du potentiel minéral important, mais sous-exploré, du territoire; et une meilleure gérance de l'information géoscientifique. Les activités du Service de géologie ont entre autre contribuées à doubler la couverture de cartographie géologique de détail du territoire; ont générées au moins \$50 million en dépenses d'exploration sur des cibles identifiées à l'aide de nouvelles données géologiques, géochimiques et géophysiques produites par le SGY; ont identifiées plusieurs nouvelles cibles géologiques, géochimiques et géophysiques qui doivent toujours être vérifiées dans le Terrane de Yukon-Tanana; et ont développées plusieurs nouvelles bases de données. De plus le Service de géologie distribue maintenant la plupart de ses publications et bases de données par l'entremise de l'internet.

Les travaux de terrain du Service de géologie du Yukon n'ont pas seulement pour objet de stimuler de façon immédiate l'industrie minière, mais aussi de développer une meilleure connaissance de la géologie régionale du Yukon et d'augmenter la base de données géoscientifiques pour les générations à venir. Les travaux de terrain exécutés au cours de l'année 2002 sont indiqués sur la figure 3 et l'état actuel des couvertures géologiques, géochimiques et géophysiques du territoire est illustré sur la figure 4.

Le Service de géologie du Yukon contribue toujours d'importantes ressources au projet CARTNAT (Programme national de cartographie géoscientifique du Canada) de l'ancienne marge du Pacifique, une initiative conjointe des commissions géologiques du Canada, de la Colombie-Britannique et du Service de géologie du Yukon. Ce projet est une étude multidisciplinaire visant à mieux comprendre les terranes de Yukon-Tanana et de Kootenay, soit les parties considérées comme les moins bien connues de la cordillère nord-américaine. Au Yukon, des travaux de cartographie géologique ont été exécutés dans les régions de Finlayson Lake, de Glenlyon, de Stewart River, et de Wolf Lake. Ce projet inclut aussi des travaux de cartographie géologique dans le sud de la Colombie-Britannique et dans le centre-est de l'Alaska, de même que des études de gîtes minéraux en Alaska. La participation de nombreux chercheurs universitaires, d'étudiants de deuxième et de troisième cycle, et d'autres spécialistes ont grandement contribué à la valeur scientifique du projet. En outre, en 2002 on a entamé une étude lithogéochimique dans la région de Stewart River et l'on poursuit des études de gîtes minéraux à plusieurs endroits au sein du terrane de Yukon-Tanana.

En 2002, la partie yukonnaise du projet CARTNAT a une fois de plus reçu du financement additionnel par l'entremise de l'Initiative géoscientifique ciblée du ministère de ressources naturelles du Canada. Ces fonds additionnels ont permis de compléter un levé géochimique du till et la cartographie géologique de plus de la moitié de la carte de Glenlyon. Des cibles géologiques et géochimiques d'intérêt furent identifiées lors de ce programme.

Ailleurs, la cartographie géologique des régions de Finlayson Lake et de Wolf Lake est maintenant complétée et en est à la phase de compilation et de rédaction. Dans la région de Stewart River, outre les travaux de cartographie géologique, le programme de cartographie des dépôts superficiels par la CGC s'est complété en 2002 et l'étude des placers entreprise par le Service de géologie du Yukon est maintenant en phase de compilation et de rédaction.

Les travaux de terrain du projet CARTNAT de l'avant-pays central, auquel le Service de géologie du Yukon participe, se sont aussi complétés au cours de l'année 2002. Ce projet, qui recouvre en partie le nord de la Colombie-Britannique, le sud-ouest des territoires du Nord-Ouest, et le sud-est du Yukon, a pour principal objectif d'augmenter les connaissances géoscientifiques des régions présentant un potentiel d'hydrocarbures. Les travaux de cartographie géologique menés par le Service de géologie du Yukon dans la région de La Biche River ont permis de reviser les interprétations stratigraphiques et structurales de cette région, qui contient le plus haut potentiel d'hydrocarbures au Yukon.

Au nombre des autres objectifs majeurs visés par le Service de géologie du Yukon, mentionnons celui consistant à synthétiser et à améliorer la base de données géologiques du district d'Anvil, initiative qui comprend la cartographie géologique du socle rocheux et des dépôts superficiels, et des levés géochimiques de till, en plus de l'étude des gîtes minéraux. Un rapport couvrant la cartographie des dépôts superficiels et la géochimie du till, de même qu'une carte de compilation géologique régionale à l'échelle de 1 : 100,000 sont maintenant disponibles. Le rapport géologique final devrait être disponible au printemps 2003.

Derek Thorkelson a joint le Service de géologie du Yukon pour une période de six mois lors de son congé sabbatique de l'université Simon Fraser. Il a complété une carte à l'échelle de 1 : 50,000 dans la région de Wind River, dans les monts Wernecke, où l'on retrouve de



nombreux indices Cu-U-Au associés aux brèches de Wernecke. Les brèches de Wernecke continuent d'être l'objet d'une étude métallogénique, où les brèches yukonnaises seront comparées aux équivalents australiens qui renferment plusieurs gisements importants.

L'étude des indices aurifères du Yukon se poursuit. Une série d'articles portant sur la ceinture aurifère de Tintina et d'autres indices du Yukon est maintenant en préparation. De plus une étude préliminaire des indices minéraux associés aux intrusions dans la partie nord de la région de Frances Lake a été entamé au cours de 2002.

Un autre projet étudie la relation entre la sédimentologie, la répartition granulométrique et la qualité de l'eau des effluents provenant des gisements placériens. Les travaux de terrain sont maintenant complétés et la technique sera évaluée pour d'éventuelles applications à long termes.

Finallement, le Service de géologie du Yukon continue son assistance financière et logistique de nombreuses études thématiques conduites par des étudiants de deuxième et de troisième cycle, et par des chercheurs universitaires.

### **PROGRAMME D'ENCOURAGEMENT POUR L'EXPLOITATION MINÉRALE DU YUKON**

Cette année, 99 demandes relatives au programme ont été reçues avant la date limite. Au total, 982 000 \$ ont été accordés à 62 demandeurs. Neuf demandes ont été approuvées dans le cadre du volet 'Grassroots' et du volet 'Grubstake', 36 demandes ont obtenu du financement dans le cadre du volet Évaluation de cibles, tandis que les 17 autres faisaient partie du nouveau volet de Cibles régionales. Un peu moins d'explorateurs commandités dans le cadre de ce programme ont recherché des métaux précieux : environ 41 % des candidats ont recherché de l'or et des éléments du groupe du platine, 45 % des métaux communs, et 14% des pierres précieuses et d'autres matières premières. Des programmes d'exploration ont été proposés dans les quatre districts miniers et presque partout sur le territoire du Yukon. Bien les dépenses totales d'exploration soient à la baisse par rapport à l'année précédente, le nombre de concessions minières qui ont fait l'objet d'options est à la hausse. Jusqu'à date, neuf ententes entre prospecteurs et entreprises minières ont été signées pour des concessions qui furent explorées dans le cadre de ce programme.

### **PRIX ROBERT E. LECKIE**

Pour une quatrième année consécutive, on a décerné à l'industrie minière les prix Robert E. Leckie pour la restauration de sites miniers. Le prix pour les pratiques exceptionnelles de restauration de mines a été décerné à la société Viceroy Resource Corporation pour les travaux qu'elle a effectué sur la mine Brewery Creek. On a remis le prix pour les pratiques exceptionnelles de restauration de placers à David McBurney pour les travaux de restauration qui ont été exécutés à Indian River.

### **DIFFUSION DE L'INFORMATION**

Le Service de géologie du Yukon produit maintenant une gamme complète de publications numériques. Toutes nouvelles cartes et rapports géologiques sont disponibles sur demande en format numérique, et toutes publications récentes sont aussi disponibles (sous format PDF) sans frais sur notre site internet (<http://www.geology.gov.yk.ca>). De plus, une gammes de rapports d'évaluation de propriété minières est maintenant disponible par l'entremise de notre site internet. Nous sommes aussi fier de notre service de carte interactive ('Map Gallery'). Ce service est disponible par l'entremise de notre site internet et permet la visualisation de la géologie régionale, des sites MINFILE, des levés régionaux de géochimie des sédiments de ruisseaux, de la topographie, des routes et des communautés du Yukon, et des sélections des terres des nations autochtones. Les données vectorielles peuvent maintenant être sélectionnées et téléchargées. Certaines des améliorations à venir incluent l'addition de données géophysiques, géochronologiques et paléontologiques. De plus, la couverture des concessions minières sera bientôt disponible.

Les publications du Service de géologie du Yukon sont diffusées par la Division des services géologiques et d'exploration (MAIN). Elles sont disponible à l'adresse suivante :

Bureau d'information et des ventes en géosciences

a/s Conservateur des registres miniers  
Affaires indiennes et du Nord canadien  
300 rue Main-bur. 102  
Whitehorse (Yukon) Y1A 2B5  
Téléphone : (867) 667-3266  
Télécopieur : (867) 667-3267  
Courriel : [geosales@inac.gc.ca](mailto:geosales@inac.gc.ca)

Pour en savoir plus long sur le Service de géologie du Yukon, visitez notre page d'accueil à <http://www.geology.gov.yk.ca> ou communiquez directement avec :

Grant Abbott, Géologue principal intérimaire  
Division de l'exploration et des services géologiques  
Affaires indiennes et du Nord canadien  
300 rue Main-bur. 345  
Whitehorse (Yukon) Y1A 2B5  
Téléphone : (867) 667-3200  
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Rod Hill, Gestionnaire  
Division des ressources minérales  
Ministère de l'Énergie, des mines et des ressources  
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