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News Release/Communiqué

MINISTRY OF ENERGY, MINES
AND PETROLEUM RESOURCES

ENERGY, MINES AND
RESOURCES CANADA

For immediate release

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114 P002

December 7, 1989

WINDY CRAGGY PROJECT ROAD ACCESS STUDY

Victoria, B.C. - Energy, Mines and Resources Minister Jake Epp and B.C. Minister of Energy, Mines and Petroleum Resources Jack Davis today announced funding for road access planning studies to the Windy Craggy mineral property in northwestern B.C.

"Funding of up to \$50,000 is being made available under the federal-provincial Mineral Development Agreement, which helps promote responsible resource development in B.C.'s mining sector," said Mr. Epp.

The Windy Craggy property, located in the Haines Triangle of northwestern B.C. near the Yukon-Alaska border, contains a large copper ore body with traces of cobalt, gold and silver. A 30-year mine, employing 600 workers, is envisaged by the owners, Geddes Resources Limited.

The proposed road corridor would connect the existing Highway 3, from within British Columbia's borders, with the Windy Craggy site and would be approximately 100-140 kilometres long, depending on which of several route options is selected.

. . . / more

"Access is the key to the economic viability of mining in the remote parts of B.C.'s northwest," said Mr. Davis. "We intend to develop a road proposal that has minimal impacts on the area's highly-valued wilderness recreation potential."

Studies will focus, in particular, on bridge location and design and the visual impacts of the road and bridge within the Tatshenshini Valley. Outside the valley, potential impacts on the regional Dall sheep population and other wildlife values will also be evaluated.

The Windy Craggy project is now in B.C.'s Mine Development Review Process which integrates the economic, social and environmental review of all major mining projects in the province. Once the access studies are complete, they will contribute to the company's Stage I submission, to be filed with the Mine Development Steering Committee early next year.

- 30 -

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Canada
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pr/windy

Windy Craggy awaits prefeasibility

With a \$13-million exploration program at its Windy Craggy polymetallic project in northwestern British Columbia under way, Toronto-based Geddes Resources (TSE) is moving at full speed to have a pre-feasibility study on the table by late fall.

Having outlined 118.8 million tons of grade 1.89% copper over a 1,900-m strike length and to a vertical extent of about 800 m, the company is looking at the various options available to it.

"We are trying to identify the preferred options so that we don't go into the feasibility stage looking at all the available options," said President Gerald Harper, who is already planning for a 20,000-ton-per-day open pit operation.

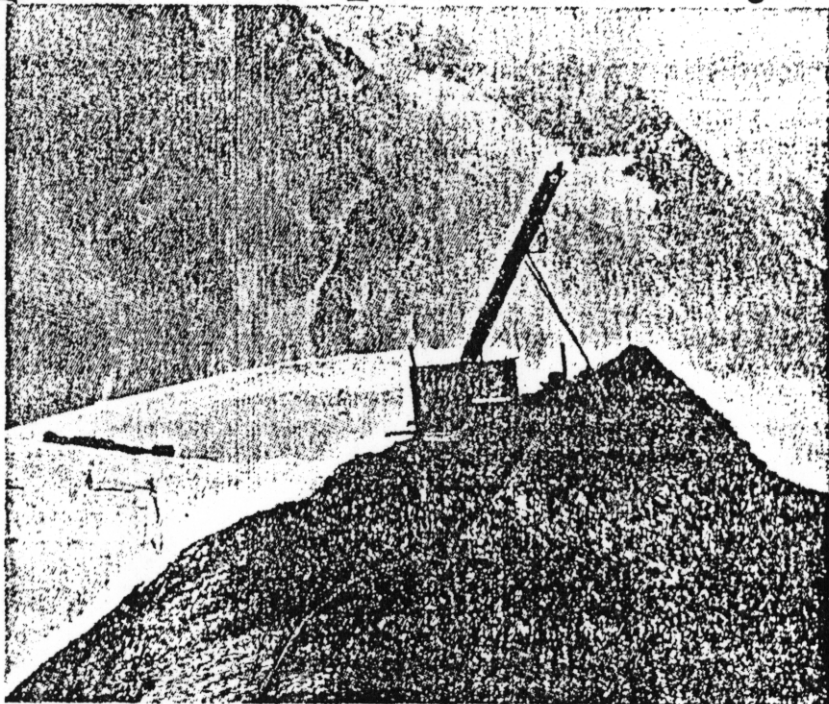
Regarded as one of the biggest undeveloped copper deposits in North America (reserves include 93.5 million tons of grade 1.93% copper, 0.08% cobalt, 0.19 g gold and 3.26 g silver), the deposit is near the top of a mountain near the Alaska border.

The 31%-owned Northgate Exploration (TSE) affiliate is currently driving a cross cut into the North zone at an elevation of about 1,400 m. The North zone is one of two zones, about 300 m apart,

Fatal accident at Windy Craggy

VANCOUVER — An underground accident at the Windy Craggy exploration site in northwestern British Columbia has killed an employee of Main Street Mining, the Whitehorse-based mining contractor for Geddes Resources. Investigations into the cause of the accident are continuing.

According to Geddes Resources, the Royal Canadian Mounted Police and the coroner from Atlin, B.C., have visited the site as have mining inspectors from the Smithers office of the British Columbia Ministry of Energy, Mines and Petroleum Resources.



A drill rig on the Windy Craggy property gives an indication of the topography of the area.

which contain all of the Windy Craggy reserves. Future plans include drilling between the zones to see if they are joined together in a giant U-shaped fold. According to Harper, a 200-ton underground bulk sample and a second surface sample are being extracted to test the deposit's metallurgical characteristics.

Extra drilling, completed since the previous reserve calculation was announced in June 1989, has provided a lot more confidence in the grade and distribution of the reserves, he said.

As part of an attempt to table a pre-feasibility study by freezeup, Geddes recently drilled nine holes, for which results have been made available.

According to Harper, two holes drilled downwards at the northern limit of the North zone confirm the downward continuity of the deposit. Hole 107 intersected 48 m of grade 1.49% copper, 0.07% cobalt,

0.08 g gold and 0.4 g silver while hole 108 cut 14 m of grade 1.38% copper, 0.10% cobalt, 0.05 g gold and 0.6 g silver.

The first surface hole drilled this year intersected 3.2% copper over a core length of 114 m (including 6.5 m of high gold and zinc values).

"Bench scale metallurgical test-work of the sample material mined from the crosscut tunnel through the South zone recently confirmed that a good quality copper concentrate can be produced," Harper said.

Diamond drilling has also shown the near-surface mineralization includes the secondary copper minerals chalcocite and chalcantite as well as the primary chalcopyrite. "If recoverable, they could enhance the grade of copper concentrate produced in an open pit mining operation," said Harper.

Mt. Calvary Resources has changed its name to Triumph Resources Ltd. (TUM:VSE) on a 1-new-for-4-old share basis.

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dyne 'France' loader, mucking the ore into millholes completed by raise-boring during preparatory phases of the stope. An Alpine continuous miner was also used at various stages to mine the orebody.

Ground support in waste areas, depending on the conditions, varied from Swellex rockbolts to steel sets. Steel sets were required in the poorest of ground conditions. Because of the ever-present hazard of radiation in the underground areas, ventilation was given priority in the design of the mine itself. This, coupled with the climate of the region, which is like the Sahara in summer and Siberia in winter, makes the existence of a mining operation in Cluff Lake even more remarkable. And it all makes the experience of underground mining at Cluff Lake applicable to the formidable obstacles yet to be faced at Cigar Lake and the Midwest project.

I hope my comments help give your readers a further knowledge of uranium mining in Saskatchewan.

Rainer Semler,
Mine Technologist,
Echo Bay Mines

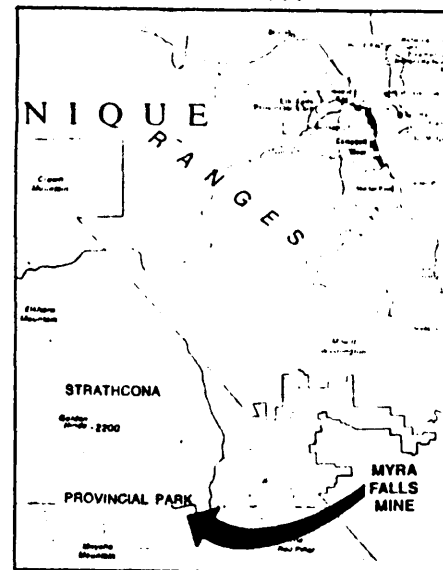
could provide the largest contribution towards restoring Canada's proven and probable reserves to the 16-million-tonne level.

Geddes Resources' investment of \$25 million to date at Windy Craggy gives a discovery cost per pound of copper of six-tenths of a cent. Further capital investment will further increase that reserve.

Gerald Harper,
President,
Geddes Resources

Location Please!

RE: "FORMIDABLE EXPERTISE" in your August, 1989, issue. As expected, the article on Westmin Resources' Myra Falls complex was interesting and informative. But...



I have been to Campbell River several times, and am aware of how things environmental are taken on Vancouver Island. I wanted to see more closely where the mine was, so I turned to my rather authoritative *Atlas of Canada*, 1981 edition, as published by *Reader's Digest* in conjunction with the Canadian Automobile Association. Finding Butte Lake was no problem, but Myra Falls, Thelwood Creek and Jim Mitchell Lake were strikes one, two and three in a losing cause. They just don't exist in my fancy big atlas. Describing the mine as "55 miles west of Campbell River" was no help either, because Canadian maps have been metric for some time now.

I can live without knowing exactly where the mine is situated, but I suggest that in some cases a sketch should be included amongst those fine pictures.

A. W. Scarle,
La Ronge, Sask.

Not in Decline

I WOULD LIKE TO COMMENT ON your editorial "In Decline?" which appeared in the July, 1989 issue. In spite of the current wariness of speculative investors to the stock market in general and base metals investments in particular, junior mining companies are taking a very prominent role in discovering and defining major new base metal reserves. Away from established mining camps, four of the largest reserve-creating projects in Canada are operated and financed by juniors. I am referring to Audrey Resources' 1100 Zone copper/zinc/silver/gold deposit in Quebec, Continental Gold's Mt. Milligan copper/gold discovery, Sulphuret Gold's Kerr copper/gold discovery and Geddes Resources' Windy Craggy copper/cobalt/gold/silver/zinc deposit in British Columbia.

All are characterized by significant values in other metals besides their primary copper or zinc. Combined 1989 expenditures on all those projects will be in excess of \$20 million. None has been fully defined yet, but on the basis of preliminary announcements, the Windy Craggy deposit, hosting 1.9 million tonnes of copper in probable and possible categories,

oront raises funds for Grubline Project

Noront Resources (VSE) has agreed, subject to regulatory approval, to place up to \$550,000 of flow-through shares with a NIM and Company limited partnership. Proceeds will be used to con-

tinue exploration programs in the Grubline Project in Newfoundland with Noranda Exploration as operator, and in the Hemlo, Mishibishu and Chisholm Island areas of Ontario.

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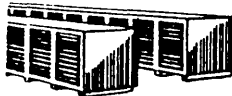
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Juniors with base metal prospects commanding attention of investors

by Nicholas Tlaxer

During the gold boom which reached its peak in August, 1987, few juniors had the foresight to begin scouring the landscape for promising base metals properties. Copper was dead and not a soul in his right mind would trade a wooden nickel for the real thing.

How times have changed. Juniors devoted to gold find their shares at record lows whereas the handful with good base metal plays are commanding the attention of what few junior mining investors remain.

Investors remain fickle, however, even with respect to base metals, demanding two things — reserves and grade. Pure grassroots exploration plays are still tough to sell even during a base metals bull market.

Also, investors have had to educate themselves. Compared with gold plays, base metals projects are markedly different, presenting a host of positive and negative variables not usually associated with gold exploration projects — variables which mining investors must learn to understand.

One of the positive features of base metals deposits, specifically volcanogenic massive sulphide deposits (VMS), is their general tendency to occur as continuous lenses. This is in contrast to typical quartz vein shear-hosted gold deposits found in the greenstone terranes of the Canadian Shield.

Many an investor has learned the hard way that continuity, grade and tonnage problems abound in such gold deposits as a result of their habit to "pinch and swell."

The Aur Resources (TSE) copper-zinc massive sulphide find in Louvicourt Twp. Que., is an excellent example of a VMS deposit which is being delineated by drilling at a wide 200-ft spacing. Several exploration holes have stepped out even further.

Based on such widely spaced drilling, the company has outlined a drill-indicated reserve in excess of 18 million tons. Several analysts are confident that the drilling has defined reserves of about 40 million tons and more.

This continuity of sulphide mineralization, both massive and disseminated, between drill holes in a VMS deposit is in contrast to the erratic nature of gold mineralization which requires close-spaced drilling and detailed sampling before a reserve figure of any confidence can be calculated.

Investors are also confused by just what is supposed to be a good drill hole. Most know that 55 ft of 0.5 oz gold per ton is exceptional,

but what about zinc, copper and nickel? At current commodity prices, values of 8%, 2.5% and 1.5% respectively would likely be economic grades. Zone widths should exceed 15 ft in order to enjoy the benefits of low-cost mechanized mining methods. VMS deposits also tend to carry precious metal values which provide an additional dollar credit per ton.

Unlike most gold deposits, base metal deposits are very sensitive to infrastructure. As a result, the Louvicourt Twp. deposit, being close to roads, power and a supply centre in Val d'Or, is superbly suited for mining. Falconbridge Ltd.'s Izok Lake zinc-copper deposit in the Northwest Territories sits undeveloped. Hosting reserves of 12 million tons grading 2.85% copper, 14.5% zinc, 1.2% lead and 1.85 oz silver per ton, Izok Lake would have been a mine if situated near Timmins. But 225 miles north of Yellowknife, N.W.T., the remote location precludes mining.

Costs exclusive to base metal mines include concentrate transportation, smelting, refining and metal handling and loss charges, in addition to normal mining, milling and general operating costs found at all mines.

Another factor critical to the success of a copper, nickel or zinc mine is the net smelter return generated by each ton of ore. This is the revenue after smelting, refining, handling and transportation charges — charges that are not applicable to gold operations. In base metals, these charges can be excessive, skimming up to 25% off the value of the produced mineral.

Also, capital costs in building base metals mines are, on average, much higher than those for gold mines. This is a result of base metals mining operations taking advantage of economies of scale which result in low operating costs per ton. Facilities between 2,000-3,000 tons per day can be expected to cost up to \$100 million to construct.

However, operating costs per ton tend to be lower. At Trout Lake near Flin Flon, Man., for example, all-in mining and milling costs averaged less than \$35 per ton in 1988. Typical costs at gold mines in Ontario, excluding Hemlo, average around \$65 per ton.

Examples of large capital outlays can be found in British Columbia, where the immense porphyry copper-molybdenum mines of the Highland Valley were constructed at a capital cost in excess of \$150 million. In Alaska, Cominco Ltd. is developing its Red Dog zinc mine

at a capital outlay of more than \$400 million. And Escondida, the world's largest copper mine in Chile, is being developed in the Andes Mountains at a cost of more than \$1 billion (US).

Although base metals plays have been overshadowed by the gold boom of the 1980s, they've come back into vogue following the commodities price boom which began in early 1988.

The play which has garnered the most attention is Aur's big find in Quebec. Shared with Leveum Mining (ISE), the discovery is already marred by a lawsuit between both companies.

Despite the courtroom hostilities, drilling continues to build reserves in what is fast-becoming the most important mineral discovery in Canada since Hemlo. Yet to be fully drilled off, the deposit has the potential for hosting in excess of 40 million tons. The find has excited investors to such an extent that Aur's share price has vaulted to a high of \$13 from \$2.88 when the discovery was first announced last June.

Investors have also noticed VSM Exploration (ME) which has a 50% interest in the Grevet M deposit near Quevillon, Que. The partner is French mining company Serem-Quebec. Grevet M should pass the 5-million-ton mark this fall after the next phase of drilling is completed. Current reserves stand at 2.2 million tons grading 8.79% zinc and 0.45% copper with silver credits.

One of the few juniors to have the foresight to get into base metals early is Audrey Resources (ISE). Company founder and President Guy Hebert has built a much-admired company around the Mobrun copper-zinc deposit which had been lying dormant for years until he optioned it from Corporation Falconbridge Copper (now Minnova Inc.), way back in 1985. Today the site hosts a new mill and concentrator, a new discovery at depth and is producing copper, zinc, gold and silver.

In Saskatchewan, considerable attention has been focused on the Hanson Lake zinc-copper find. Controlled by Cameco, a government company and Trimin Resources (TSE), the deposit hosts 7.7 million tons grading 6.5% zinc, 1.1% copper, 1.0 oz silver and 0.02 oz gold per ton.

Remarkably continuous between drill sections, the big lens remains open at depth where drilling is expected to add tonnage. A measure of the growing investor interest in base metals, Trimin's stock surged to \$3.25 from \$1.90 immediately after a plane load of mining analysts left the property on Sept. 11. A mere two years ago, it's likely that not one analyst would have

In British Columbia, Geddes Resources (TSE) is completing a feasibility study on its large Windy Craggy copper deposit. Reserves total 118 million tons grading 1.8% copper. Several years ago, Windy Craggy had become a gold play after a big intersection of core assayed economic grades of gold. Once copper started its rally from the 60¢ range up to more than \$1.30 (US) per lb today and gold began to crumble to \$300 (US) per oz, Windy Craggy became a copper play once again.

Nickel plays are not as common as copper and zinc plays, but several have emerged. Near Timmins, Ont., Timmins Nickel (TSI) has opened the Redstone nickel mine. A small 5-million-lb-per-year producer, the mine processes high grade ore of 2.9% nickel. In Manitoba, Black Hawk Mining (TSE) continues to get encouraging results from drilling on the Minago nickel deposit. Like Redstone, the Minago is not new, having been discovered in the 1970s by other companies.

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Geddes raises \$10m for Windy Craggy

Financing of \$10 million has been raised by the Toronto based Geddes Resources for further exploration and development of the company's Windy Craggy property. The funds will be raised through two common-share private placements, a \$4.5 million rights offering and an underwritten \$3 million financing by First Marathon Securities.

The Windy Craggy copper property, in the St. Elias mountains of northwestern B.C., has mineable reserves of 111.5 million tonnes, according to the company, grading 1.7% copper. Much of the mineralized zone remains to be investigated. 1149 002

Northwest
Prospector
Nov./Dec. 1989

Zinc, copper prices boost Cominco Ltd. earnings

VANCOUVER — Higher prices for zinc and copper brought about an increase in unaudited consolidated earnings for Cominco Ltd. (TSE) during the first nine months of 1989.

The company reported earnings of \$175.5 million for the nine months ended September 30, up considerably from the \$128.3 million reported for the comparable period last year.

Cominco noted, however, that earnings were reduced by the loss of copper production in the third quarter due to the strike at the Highland Valley Copper mine in British Columbia. Despite the strike, the mining and integrated metals business segment reported a pre-tax operating profit of \$331.4 million, compared with \$249.4 million in the comparable 1988 9-month period.

Earnings for the 1989 third quarter were \$34.2 million or 42¢ per common share on sales of \$330.5 million, compared with earnings of \$49.8 million for the same quarter last year. The company attributed this decline to the strike, to losses in the fertilizer division, and to increased exploration expenditures.

Despite speculation by some analysts that base metal prices may be headed for a downturn, Cominco called the outlook for metal prices "good" and the demand for its products "strong." The major mining company is not anticipating any serious decline in demand for either zinc or copper, its most important products.

Earlier this year Cominco and Teck Corp. (TSE) entered into agree-

ments with Aur Resources (TSE) that will result in the two associated companies collectively holding 19% of the issued common shares of Aur.

Cominco noted that drilling results on Aur's joint venture copper-zinc massive sulphide deposit near Val d'Or, Que., "have continued to be encouraging."

More recently Cominco purchased 2,193,000 shares of Geddes Resources (TSE) which owns the Windy Craggy copper property in northwestern British Columbia. As a result of the transaction, Cominco will own 4.24 million shares, or about 17% of Geddes, plus 501,000 common share purchase warrants.

Cominco said at the time it would consider purchasing additional shares of Geddes, "if the opportunity arises." The company stressed, however, that it had no present intention of making a formal takeover bid.

In other news, Cominco is reporting excellent progress on construction of the Red Dog base metal mine in Alaska. Tune-up operations are expected to begin shortly. Construction of the new lead smelter at Trail, B.C., is also reported to be progressing well, with start-up scheduled for this month.

On a less positive note, the company said the recent "expensive" settlement ending the strike at Highland Valley Copper will have an impact on the mine's competitive position if copper prices drop to levels experienced in the past.

Consolidated Stikine Silver has changed its name to Stikine Resources Ltd. (SKZ:VSE).

Nfld. exploration ac

by Norman Mercer, Department of Mines and Energy, Newfoundland

Mineral exploration in Newfoundland during 1989 maintained a very healthy level of activity as more mining companies realized that Newfoundland is one of the prime areas for mineral exploration in the country.

Statistics for the first three quarters of 1989 stand at 15,921 new claims, and 67,219 claims in good standing, compared with the 1988 figures of 19,178 and 61,878 respectively. Exploration expenditures for 1989 are forecast to be in the \$30-35 million range; down from the \$41.1 million for 1988. Diamond drilling is forecast to be in the range of 100,000 m, off considerably from the whopping 234,831 m drilled in 1988 but a 25% improvement over the 81,000 drilled in 1987.

An increased proportion of the exploration effort in 1989 was directed to grassroots, regional and reconnaissance work.

The emphasis and effort in 1989 appear to be balanced between gold and base metals, with a smaller but growing interest in industrial minerals. Newfoundland has a long history of production of base metals while the understanding of gold environments and the success rate in prospecting for gold is a phenomenon that has developed during the 1980s.

The growing demand for industrial minerals and Newfoundland's strategic location relative to North American and European markets and shipping lanes has prompted interest in this area.

Some of the highlights in exploration are outlined below.

— Noranda (TSE) is exploration work on a of its Duck Pond base south of Millertown Newfoundland. Cor mond drilling and fe environmental studies the activities during indicated geological r at four million tonnes copper, 6.6% zinc, 1.1% silver and 1 g gold pe

— Dolphin Explorat undertaking a \$4.1-mil of drilling and underground on its Cape Ray The 1989 program, w the completion of a road to the site, was completed by the en with a feasibility stud cluded in November drill-indicated reser 1,034,545 tonnes grad

— Newfoundland R Mining will complete work on its Lower Co aggregate operation t ber. The company is i of commissioning th and processing facilit pany is planning for a ment of product to U.S. markets before y

— Noranda Explora ront Resources' (TSI joint venture has res discovery of a significa zone and two strong zones. The Hunan sho Gander has been trace over a strike length of economic values of an four trenches over of 70 m.

— The Corona Corp Varna Gold (VSE) join the Pine Cove property Bight continues to ret couraging drill results. / the Lightning zone has by drilling over a strik 150 m to a maximum d m.

— Equity Silver Mine Bitech Corp. (ASE) hav reserves of 513,744 ton 13.13 g on their Nugget erty near Betts Cove o Verte peninsula. And un

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Integrated encouraged at Goat

Edmonton-based **Integrated Resources** (ASE), which is making a takeover bid for **Northern Minerals** (TSE), recently obtained some encouraging results from exploration at its Goat gold project near Telegraph Creek, B.C.

According to an independent report, six new zones of widespread gold mineralization were found in altered sediments, syenite, sulphide-rich shear zones and quartz-sulphide veins.

But the program, which consisted of prospecting and rock sampling, was too limited to determine the dimensions of the gold zones, according to **Integrated Resources**.

Integrated is attempting to locate the source of the gold in stream

sediment anomalies previously found in four main streams draining the property.

Results included 13 ft of grade 0.1 oz gold per ton, 1.048 oz gold over 2.2 ft and 1.06 oz gold over 3.3 ft. "Numerous other grab samples from within these zones returned gold values in excess of 1,000 parts per billion gold," said Vice-president Al Jenkins.

These results have persuaded

Armistice taking on partner at Virginiatown gold bet

A new underground drilling program at the gold property belonging to **Armistice Resources** (ME) at Virginiatown, Ont., will be undertaken using the idle underground workings of the adjacent Kerr mine.

GSR Acquisition, which wants to revive the Kerr property's bankrupt owner, **Golden Shield Resources**, and its operations, has been granted an option to acquire a 49% interest in the Armistice property by spending \$5.5 million on exploration work within 18 months.

The plan calls for GSR to explore the Kerr 21 zone from the 3850-ft

level of the Kerr mine. The company proposes rehabilitating an abandoned drift on the 3850 level which enters the Armistice property about 1,500 ft north of the Armistice shaft.

Integrated to acquire a group of contiguous units bringing its land position in the Telegraph area to more than 25,000 acres.

Shareholders of **Northern Minerals** (formerly **Pacific Trans-Ocean Resources**) are being offered one **Integrated share** for three **Northern shares**, under a recent takeover bid. **Northern Minerals** shareholders who wish to accept the offer were being asked to tender their shares by Nov 1.

GSR hopes to extend this drift by 1,900 ft parallel to the Kerr 21 zone uncovered by deep drilling earlier this year by Armistice. Drilling totalling 17,000 ft on the Armistice property would be undertaken.

After GSR earns its 49% interest, a milling agreement may be negotiated between the company and Armistice, should GSR succeed in acquiring the Kerr mill.

The Armistice property lies immediately west of the Kerr mine, a prolific gold producer which went into production in 1938. Armistice is hoping to prove the main Kerr deposit down-faulted at the Kerr property's western boundary, and continues on to the Armistice side.

Armistice deepened an existing shaft and drove a 1,200-ft-long drift at 2,250 ft to allow for drilling of both the deeper Kerr zone and the shallower Sheldon zone.

Armistice officials are confident they have found the Kerr zone.

Northgate increases stake in Geddes after Cominco buys 17%

Toronto-based **Northgate Exploration** (TSE) was prompted recently to protect its investment in the **Windy Craggy** copper gold project by increasing its stake in **Geddes Resources** (TSE) to 42% from 31%.

Northgate President **John Kearney** said he was caught a little off guard when **Vancouver** resource giant **Cominco Ltd.** (TSE) revealed that it had purchased 2,193,000 **Geddes** shares on the open market.

The purchase brings the number of **Geddes** shares held by **Cominco** to 4.24 million or 17%, plus 501,000-share purchase warrant.

While **Cominco** said "it had no present intention of making a formal takeover bid for **Geddes**," **Northgate** immediately moved to bolster its own position by purchasing 2.3 million common shares of **Geddes** and 400,000-share purchase warrants.

As a result, **Northgate** now holds over 11.1 million shares of **Geddes** which controls the 118-million-tonne (grading 1.9% copper, 0.08% cobalt and 0.2 g gold per tonne)

Windy Craggy project in **British Columbia**.

"We knew they liked the project but we were a little surprised that they (**Cominco**) moved up so quickly," he said.

"We wanted to leave no doubt as to who is calling the shots at this time," said **Kearney**, who isn't anticipating any immediate agreement involving **Northgate** and **Cominco** with respect to **Windy Craggy**. "At the appropriate time, we may bring in partners," he said.

Elsewhere, **Northgate** has informed **Geddes** that it intends to exercise its right to subscribe for and purchase 750,000 common shares and 750,000-share purchase warrants of **Geddes** after a \$4.5-million rights offering is completed.

Those shares and warrants, when exercised, will bring **Northgate's** investment in **Geddes** to about \$18 million and its stake in the company to about 42%.

The **Cominco** stock was trading recently at \$1.05. The **Toronto Stock Exchange** weekly range of \$1.05 to \$1.15.

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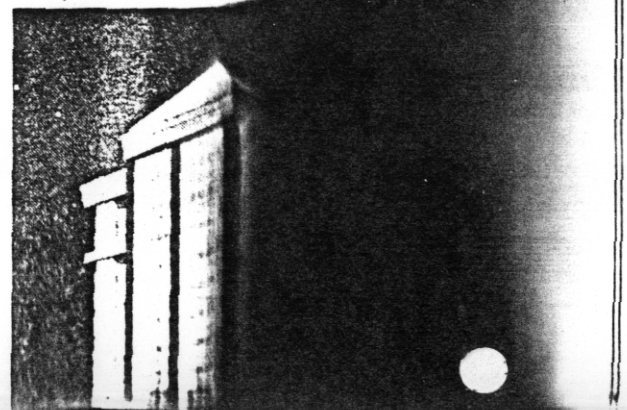
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UNDERGROUND MINE ENGINEERING

March 26-April 12, 1990

A series of courses developed by the Department of Mining Engineering at Queen's University. The 3 week Core Program covers vital technical aspects of underground mine designs and operation. The Part-time Program consists of the individual sections within the Core Program which run between two and five days each.

Those attending the course may register for either the Core Program or for any of the Part-time Programs.

The course will cover various aspects of underground mine engineering. Participants will have the opportunity to work with software packages covering geostatistics, mine planning, numerical modelling, explosives modelling and ventilation analysis.

Core Program	March 26-April 12
Mine Feasibility and Design	March 26-March 30
Géomechanical Mine Design	April 2-April 6
Drilling and Blasting	April 9-April 10
Mine Ventilation	April 11-April 12

For additional information contact:

Peter Scott
Department of Mining Engineering
Queen's University
Kingston, Ontario
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Telephone 613-545-2212
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ations made in 1988.

Sales and shipments of zinc concentrate from the Pine Point operations in the Northwest Territories are expected to be completed during the first nine months of 1990. Lead concentrate deliveries should continue to the end of 1991.

Pine Point Mines plans to continue joint venture exploration programs near the existing Polaris mine (Northwest Territories) and in the Republic of Ireland in 1990.

Pine Point Mines (TSE)		
Year ended Dec. 31	1989	1988
Sales Revenue (000s)	226,051	189,729
Net Earnings (000s)	94,100	62,011
Net Earnings (per share)	20.30	13.38

	Output (oz.)	Cash cost (US\$/oz)
Mine		
El Indio	107,139	114
Bullfrog	56,771	314
Golden Pat	43,461	223
Colosseum	33,142	378
Richmond Hill	23,359	245
Yuba (placer)	4,117	280

Ohio drilling

A 5,000-ft. drilling program is set to get under way this month on Ohio Resources' (VSE) gold property near Pickle Lake, Ont. Various geophysical targets will be tested on the 24-claim property. The junior company, which has about 11 million shares issued and outstanding, is financing its exploration work from revenue earned on gas wells in Ohio.

exploration and acquisition of precious metals.

Shares of the company were trading in Toronto recently at \$21.25 in a 52-week range of \$15.50-21.63.

Bryndon financing

Bryndon Ventures (TSE) has completed a \$150,000 financing through a private placement of flow-through shares. The money will fund exploration on Bryndon's gold prospect in northwestern British Columbia.

Sulphide-bearing boulders from the property have assayed up to 2.9 oz. gold per ton. The Bryndon claims are about 12 miles northeast of the Johnny Mountain and Snip gold projects.

Geddes tables Windy Craggy study

A 2-year study on the environmental impact of developing the remote Windy Craggy copper deposit in British Columbia has been submitted to the provincial government by Geddes Resources (TSE).

Situated in northwestern British Columbia, near the Yukon-Alaska border, the potential \$400-million copper mining project is at least four years away from production, but it has the potential to increase British Columbia's annual copper output by 120,000 tonnes per year, or about 1% of world production, according to Geddes.

Northgate Exploration holds a 42% stake in Geddes Resources, while Cominco (TSE) holds another 17% interest. Preliminary estimates have placed reserves in the mountaintop sulphide deposit at 118 million tonnes grading 1.9% copper, 0.08% cobalt, 0.19 grams gold per tonne and 3.26 grams silver.

The recently completed environmental impact report not only describes the technical and socio-

economic aspects associated with developing the proposed copper mining project, but it includes extensive data on the environment gathered over a 2-year study period.

Copies of the report will be distributed to communities in British Columbia, as well as the Yukon and Alaska so that interested parties and the general public may familiarize themselves with the project. Company personnel are also planning to visit several communities in order to discuss the project, said Gerald Harper, president of Geddes.

"Exploration has identified sufficient reserves of copper, gold, silver, cobalt and zinc to support mining at a rate of 20,000 tonnes per day," said Harper. That amounts to about seven million tonnes per year, for at least 20 years.

"The full extent of the deposit has not yet been defined, and the ultimate mine life could be 40 years," he said.

Geddes' development plan incor-

perates initial mining by open pit methods and recovery of a copper concentrate with some byproduct gold and silver.

Up to 500,000 tonnes of concentrate per year could be transported to the seaport of Haines, Alaska, for shipment to smelters, with access to the mine provided by a 105-km road constructed to link up with the Haines Highway in British Columbia.

The access road would include a bridge crossing at the Tatshenshini River, followed by a 20-km road along the river valley. In an effort to minimize the environmental impact of the project, the company has also investigated transporting concentrates in slurry form along a buried pipeline beyond the Tatshenshini Valley section of the road.

With an estimated construction period of three years, the Windy Craggy project would create about 500 jobs, and if the mine starts production in 1994, employment could eventually be as high as 600, according to Geddes.

Price slide in stride

Nickel producers to help shore up the price, Lazarovici said, include curbing back on production and building up inventories (showing). The world's largest nickel producer Inco (TSE), has already achieved a small reduction of its nickel production for 1990, 400 million lb. to 400 million company says the reduction achieved primarily by the reduction of overtime at Inco's Ontario and Manitoba divisions, its refinery at Clydach,

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Wales. Bob Purcell of Inco's public relations department said overtime in 1989 by the company's Ontario and Manitoba workers totalled 871,000 hours and was worth almost \$28 million in extra pay. "I don't think anyone among the nickel producers is losing money at these prices," Lazarovici said of the current price levels. Inco's cash production cost for the first nine months of 1989 stood just below \$2. Because the cost was trending higher throughout 1989, Inco's cash cost for that year is expected to be slightly above \$2.

The cash cost of Canada's other major nickel producer, Falconbridge Ltd., is said to be higher than Inco's. Falconbridge no longer trades as a public company, which was taken over last year by Noranda and Trelleborg. Falconbridge has made no announcement regarding a production cutback.

Lazarovici said a sustained price below \$2.50 would likely be required to bring about any major production changes.

Inco's production cutback this year will result in a 7% decrease in output compared with 1989. The company was already anticipating lower total production this year; the Thompson open pit in Manitoba is near exhaustion and will cease being mined this year. The company has also been experiencing declining nickel grades at its Thompson operations.

So great was the demand for nickel in 1989 that Inco purchased about 80 million lb. of the metal from the LME to fulfill its contract obligations with customers.

The price of Inco stock has also been dropping; the company was recently trading in the \$27 per share range.

Carlos Leitao, an economist with the Royal Bank of Canada, says the speed with which nickel prices have fallen has been a surprise.

"This is largely attributable to a glut of stainless steel scrap which came on to the market late last year and which ultimately resulted in a large increase in nickel inventories at the LME," he said. "Nickel prices are therefore likely to remain under strong downward pressure until overall inventories return to more normal levels."

Noranda to spend \$3.5 million on Abermin property

A recent option agreement between Abermin (TSE) and Noranda Exploration, a unit of Noranda (TSE), could see the senior company spend up to \$3.5 million on Abermin's Hope Bay gold claims in the Northwest Territories.

Drilling indicates continuity on Newhawk's R-8 structure

VANCOUVER — Recent infill drilling on the R-8 structure of the Sulphurets property owned 60% by Newhawk Gold Mines (TSE) indicates the zone is continuous to at least the 1,100-metre level.

The drilling established the zone to have a strike length of about 270 ft. and a dip length of at least 700 ft. extending to the 1,100-metre level with the zone still open to depth.

Results ranged from 2.5 ft. grading 0.28 oz. gold per ton and 14.7 oz. silver to the widest intercept of 40.9 ft. grading 0.25 oz. gold and 14.1 oz. silver.

Selected results from the R-8 drilling include (uncut): 18.6 ft. grading 1.04 oz. gold and 25.74 oz. silver; 19.7 ft. of 0.75 oz. gold and 18.90 oz. silver; and 27.1 ft. of 1.38 oz. gold and 35.81 oz. silver.

The structure could not be drilled below the 1,100-metre level without further drifting. Four holes were

drilled to the south of the established R-8 zone, intersecting several additional mineralized shoots in the footwall at the 1,150-metre level.

The four holes intersected 4.8 ft. grading 0.24 oz. gold and 50.13 oz. silver, 10.6 ft. of 0.19 oz. gold and 3.36 oz. silver, 9.2 ft. of 0.19 oz. gold and 20.41 oz. silver and 4.9 ft. grading 0.22 oz. gold and 20.50 oz. silver.

Fred Hewett, vice-president and exploration manager, noted that the latest drilling results would be included in the reserve calculation being done by Watts Griffis McQuat of Toronto. The reserve calculation will be used by Cominco Engineering Services in a final feasibility report, which is expected to be completed by the end of February.

Granduc Mines (TSE) owns the remaining 40% of the property, north of Stewart, B.C.

Geddes to apply for permit to mine Windy Craggy copper 114P002

Geddes Resources (TSE) says it is within weeks of applying for a permit to mine the huge Windy Craggy massive sulphide deposit in northwestern British Columbia.

The project could produce as much as half a million tonnes of copper concentrates annually, including 140,000 tonnes of pure copper metal per year for at least 22 years, according to the company plans.

Results from the 1989 drill program indicate that the operation could be much larger, if and when it goes into production in 1994. At a cutoff grade of 1.5% copper, 87.6 million tonnes of probable reserves grading 1.96% copper per tonne have been outlined so far.

But even though the huge deposit is situated at the peak of a remote mountain about 240 km southwest of Whitehorse, Y.T., construction of a 80-km access road connecting the property to Haines Hwy. won't begin until all the permits are received.

It explains why Geddes has spent the past 15 months compiling data on such things as glacial measurements, bird and wildlife counts and long-term weather patterns. "By the time we have finished the cost of travel and holding public meetings will bring the cost of an environmental study to about \$500,000," President Gerald Harper told *The Northern Miner*.

Once the environmental reports have been sent out to the British

Columbia, Yukon and Alaska governments, it should be about nine months before a decision is handed down by a Ministry of Environment steering committee in Victoria, B.C., said Harper. He expects to send 75 copies of the total package to 15 offices and departments within five different government bodies.

"We are assuming that the permits will be in place by the spring of next year," said Harper who doesn't expect the two federal governments involved to make a major issue out of the project. "But the Alaska government may be concerned with the ramifications of a larger mine," he said.

Just how large the project will be was still an open question recently as Geddes released more results from last year's drilling. In addition to the North and South zones, about 300 metres apart, the company has been getting indications of two new zones.

As more geophysical targets have yet to be tackled, possible reserves could go as high as 300 million tonnes if the new zones are as large as the North and South, Harper said.

Sensing the potential at Windy Craggy, Cominco (TSE) recently forced Northgate Exploration (TSE) to protect its investment in the project by purchasing a 17% stake in Geddes. Northgate responded by increasing its stake in Geddes to 42% from 31%.

Trillion to earn 90% interest