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# Norgold Encouraged By Exploration Results At Yarnell Mine Project

RENO — Norgold Resources Inc. announced that, based upon exploration data received from its joint venture partner and analysis by its consulting engineers, preliminary geological reserves at its Yarnell mine project are an estimated eight million tons grading between .04 and .05 ounce gold per ton. The Yarnell mine project is approximately 1,000 acres in Yavapai County, Arizona.

Preliminary metallurgical tests indicated gold recovery of up to 80% with moderate to low cyanide consumption.

Currently, detailed bench studies are being conducted on a 20,000 pound bulk sample to determine the optimum crushing size amenable to heap leach extraction techniques.

A reverse circulation drill program of 65 holes has defined a structurally-con-

trolled gold-bearing zone of 2,500 feet along the strike and up to 800 feet down dip, averaging 60 feet in thickness. This structure is open in several directions and the stripping ratio is expected to be less than 3:1.

Additional drilling is ongoing at the project to further expand and confirm the extent of the reserves. Surface sampling and trenching has commenced on additional stepout targets along the northeast extension of the Yarnell Fault Zone. Norgold said that preliminary sampling of the extension shows gold values consistent with the previous drill program results.

Management is most encouraged by exploration results to date. Currently, Norgold Resources Inc. is committed to an aggressive exploration and development program in Arizona.

The company's U.S. Exploration Office is located at 13933 Chamy Drive, Reno, Nevada 89511, (702) 851-3177. Home office address is 2380 Harbour Centre, P.O. Box 12122, 555 W. Hastings Street, Vancouver, B.C. V6B 4N6, (604) 681-5566.

## NORGOLD RESOURCES INC. <sup>10/89 WTMAR</sup> Yarnell Project Reserves

Vancouver, BC — Norgold has released preliminary geologic reserves on the 1,000-acre Yarnell JV project located in Yavapai Co., AZ, of 8.0 MM tons grading 0.04 to 0.05 opt gold. These reserves were calculated by Norgold's consulting engineers from data provided by JV operator Asarco.

Metallurgical tests indicate gold recovery up to 80% with low to moderate cyanide consumption. A 20,000 pound bulk sample is undergoing additional metallurgical tests.

A drill program of 65 holes has defined a structurally controlled gold-bearing zone 2,500 feet long, 60 feet wide, and up to 800 feet down dip. Stripping ratio is expected to be less than 3:1 waste to ore. The structure is open in several directions. Additional drilling is in progress and sampling and trenching has begun along the strike of the structure. Source: NR. Contact: Christopher S. Moat, president, (604)681-5566.

10-1-90 No. MINER

## Norgold becomes sole owner of Arizona gold prospect

VANCOUVER — The Yarnell gold property, 72 miles northwest of Phoenix, Ariz., is now 100% owned by Norgold Resources (VSE), following a decision by Asarco (NYSE) to drop the property.

Asarco had an option to earn a 51% interest in the property by providing a feasibility study by July 1, 1991. More than US\$1 million has been spent on the property in 1989 and 1990, with a total of 96 reverse circulation holes and four diamond drill holes completed to date.

At last report, the Yarnell project had 8.4 million tons of preliminary reserves grading an average of 0.042 oz. gold per ton. Norgold reports that metallurgical testing indicates

that crushing to minus 1.5 inches and using standard heap leaching techniques will result in gold recoveries ranging from 70% to 75%.

The company has hired consultants James Askew Associates of Denver to provide an independent ore reserve calculation. A preliminary and minable reserve should be released shortly.

Steven Potter, president of Norgold, said Asarco dropped the property simply because the resource was not deemed to be large enough. He said the company is now reviewing Asarco's exploration data on the property.

If Norgold can arrange financing, Potter said the development of the property will continue on the basis of 100% ownership. However, he did concede that given current market conditions, the company may have to find another partner to fund expenditures.

# Norgold And ASARCO Fast-Track Yarnell Gold Property In Arizona

11-1-89 *mining record*

YARNELL, AZ — In less than a year, Norgold Resources Inc. and its joint venture partner, ASARCO, have fast-tracked the Yarnell property from an undrilled past gold producer to a well-defined gold bulk tonnage deposit. The Yarnell Mine is located 1 1/2 miles south of Yarnell, Yavapai County, Arizona. Yarnell is 72 miles northwest of Phoenix and 16 miles northeast of Wickenburg.

Norgold entered into a joint venture agreement with ASARCO Incorporated in January 1989; ASARCO has the right to earn 51% of the project and will be the operator under a joint management committee.

By May 1989, ASARCO had conducted 3,030 feet of reverse circulation drilling which confirmed the presence of a bulk tonnage gold deposit. The low-grade mineralization is part of an alteration zone associated with the principal Yarnell fault system which was partially mined in the early 1900s and 1940s.

Phase II and III reverse circulation drilling with excess of 20,000 feet and eighty holes have no delineated reserves (all categories), as interpreted

by Norgold's independent consultant, of 8.4 mm tons grading .042 ounce gold per ton (348,000 ounces). The favorable surface topography and low angle of the Yarnell fault is anticipated to maximize the overall stripping ratio at 2:1.

Reserves will be upgraded once sufficient diamond drilling has been completed and analyzed. Norgold reported that there is excellent potential to expand reserves along strike, in both directions.

Preliminary metallurgical studies indicate the ore is amenable to heap leaching extraction techniques with low to moderate cyanide and lime consumption.

Preliminary bottle roll leach tests for 24 and 72 hours leach time were conducted on three selected interval samples. The leach test results in-

dicated that a 70 to 80 percent gold recovery was achieved in these samples and that cyanide and time consumptions averaged approximately 0.4 and four pounds per ton, respectively.

Currently detailed bench studies are being conducted to determine the optimum crushing size versus recovery of gold that is amenable to heap leach extraction.

The property is logistically well-located to all amenities. There is sufficient room to set up the infrastructure to support a moderate heap leach operation with less than one half a mile haulage distance.

Norgold reported that the primary group of four patented and seven unpatented mineral claims are subject to an option to purchase agreement. The company has also entered into an

agreement with other minor land holders within the area to consolidate its land position. Norgold stated that the cost to purchase these properties is insignificant compared to the core property. Norgold and ASARCO have also staked additional mining claims on BLM land and have consolidated a land package of 1,000 plus acres.

A Norgold official said that management is encouraged about the Yarnell project's future and is anticipating a positive feasibility study in 1990.

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**Yarnell And Mariposa Canyon Projects**

Vancouver, BC - WestMAR has reviewed additional information on the Norgold/Asarco Yarnell project prepared by a consultant. The +1,000-acre project is located 1.5 miles south of Yarnell, Yavapai Co., AZ. The Congress mine of Malartic Hygrade is located five miles due west.

The core of the patented, unpatented, and state lease property position lies in Sections 14, 15, and 23, T10N, R5W. Norgold has commitments of about \$100,000 per year on the 11 optioned claims and the JV has staked additional claims bringing the total land package to over 1,000 acres.

Asarco can earn a 51% interest in the project by providing Norgold with a bankable feasibility study by July 1991 and placing the property into production within three years if the feasibility is favorable. Asarco must also maintain all underlying property payments and commitments and provide Norgold with cash payments totaling \$145,000 in quarterly installments by July 1, 1991. Norgold has the option to elect a 25% carried interest. Asarco is operator under a JV management committee.

The report reviewed states that Norgold's consultant has calculated a probable reserve of 8.4 MM tons @ 0.042 opt gold totaling 352,800 ounces from over 80 holes drilled to date. Waste to ore stripping ratio is expected to average 1.7:1. Preliminary bottle roll tests indicate the ore is amenable to heap leaching.

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Initial studies indicated the gold occurs in free form associated with veinlets of silica, carbonate, and along fractures associated with iron oxides. Subsequent work indicates the gold may also be associated with pyrites which occur throughout the fine-grained and quartz-rich matrix of the altered granite.

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Norgold also owns an option on the 3,000-acre Mariposa Canyon project located on the west flank of the Toquima Range in southwest-central Nevada. The project area lies midway between Echo Bay's Round Mountain project on the north and the Manhattan mine on the south.

The Company says the property has structural characteristics typical of nearby gold deposits. Norgold reports it has identified six areas of high precious metals content with biogeochemical exploration. Noranda drilled 30 holes in mid-1989 and intersected silicification and alteration but failed to encounter significant mineralization. These data have served to narrow the area of interest and future work is targeted to primary biogeochemical gold anomalies that appear to coincide with northwest and northeast structures. The Company is looking for a JV partner. Source: Consultants report, CB, PC. Contact: Tench C. Page, exploration manager, (702)851-3177.

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September 25, 1990

At 9:45 am today a call came in for me from "ADRIAN" at NORGOLD 415-743-8988.

I came into the office just before 11:30 am. The call was returned before 12 noon.

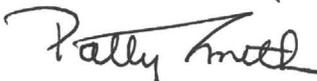
The nature of the call was in response to a survey from NORGOLD to see if we wanted to remain on their mailing list for annual reports and news items. I answered yes in my capacity as librarian for CAMBIOR.

On the call back to ADRIAN he inquired if we had an operating mine in the States and I said yes, "Valdez in Alaska". He inquired what this office did for Cambior and I responded that we were the exploration headquarters for U.S. operations.

He then asked if we were open to 100% acquisitions such as the YARNELL in Arizona. He also explained that Asarco was now out because of permitting problems they had due to a previous chemical problem in another area of their company.

I advised him I would take this to the office staff and call him back later in the day. He then gave me another telephone number to use after 3 pm today.

YARNELL was offered by NORGOLD and not solicited by this office.



PATTY SMITH  
OFFICE MANAGER

# Boom in Nevada spreads to neighboring states<sup>14</sup>

2-26-90 No. MINER  
VANCOUVER — Mineral deposits have no respect for state boundaries. That explains why Nevada's mining boom has spilled over into almost every western state.

Precious metals are still the big attraction in neighboring Idaho where smaller companies, including a good number of Canadian juniors, have found it easier and less expensive to acquire a land position.

Idaho's "big one" is the Bear-track deposit near Salmon held by operator Meridian Minerals and partner Canyon Resources (NASDAQ). A feasibility study is expected to be completed this year and permitting is under way for a proposed open pit, heap leach mine. Although a new reserve calculation is in progress, geological reserves were last reported (late 1988) as 37 million tons grading 0.055 oz. gold.

Atlanta Gold (TSE) has been tied up in legal battles with an unsuccessful takeover candidate. Now that the matter is resolved, it is looking to develop the metallurgically complex Atlanta gold property in Elmore City. If approval is given, the company would first mine the East pit (one of two on the property). East pit reserves are reported as 8.27 million tons grading 0.087 oz. gold.

Having brought on stream the Champagne mine last fall, Bema Gold (TSE) and partners plan to develop several other small open pit, heap leach gold-silver mines in Idaho. The Buffalo Gulch and Erickson Reef deposits are expected to be brought on stream this summer.

The Yellowjacket property in Lehmi City contains a small, low-grade gold deposit that partners Shamrock Resources (VSE) and United States Antimony (NASDAQ) hope to develop. Now at the prefeasibility stage, the near-surface deposit is reported to contain 407,112 tons averaging 0.11 oz. gold.

Nerco Minerals, a unit of Nerco (NYSE), is well into the permitting process for a new gold-silver mining operation near its DeLamar mine in Owyhee City. The Stone Cabin project will be a satellite operation of DeLamar.

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Precious metals may be the main attraction in Nevada and Idaho, but copper is still king in the neighboring states of Utah and Arizona.

The big news in Utah this year is a US\$227-million expansion at the Bingham Canyon copper mine

operated by Kennecott, a unit of RTZ. The expansion will boost daily production by 35,000 tons, with construction expected to start in June. Kennecott's overall copper production in Utah is expected to increase to 270,000 tons copper per year from 235,000 tons as a result of the expansion.

□ □ □

Arizona is holding its ground as the leading copper producing state. But a growing number of companies have begun to explore its potential for precious metals.

Although best known as a modest-sized gold producer in Quebec's Val d'Or mining camp, Malartic Hygrade Gold Mines (VSE) is looking to a spring opening for its recently acquired Congress gold mine near Wickenburg in this state.

Construction of a 350-ton-per-day mill is nearing completion on site, and when up to full capacity it is expected to add about 32,000 oz. gold per year to the company's existing production from Val d'Or. Unlike most new mines in the U.S., Congress is an underground mining operation with existing minable reserves of 480,000 tons of 0.29 oz. gold. Malartic will be carrying out exploration programs aimed at increasing reserves in other areas of the property.

South Atlantic Ventures (VSE) has slated a mid-1990 startup for its Oracle Ridge copper-silver project near Tucson, Ariz., a joint venture with Continental Materials.

Before making its positive production decision, South Atlantic as operator completed a feasibility study for a 285-ton-per-year mine and mill to be developed on the property. Oracle Ridge is reported to have proven and probable reserves of about four million tons grading 2.33% copper and 0.67 oz. silver. (A cutoff grade of 1.5% copper, plus a similar amount of possible reserves, is used.)

A fast-track exploration program by Norgold Resources (VSE) and partner Asarco (NYSE) on the Yarnell mine property, a former producer near Wickenburg, has led to the delineation of a bulk tonnage gold deposit.

A feasibility study is considered likely this year, aimed at development of an open pit, heap leach mining operation. Geological reserves are reported by Norgold as 8.4 million tons grading 0.042 oz. gold.

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Environmental opposition and time-consuming permitting procedures have taken the wind from

the sails of a number of companies hoping to develop mines in California.

The latest is Plexus Resources, which was recently denied a permit by authorities in Yuba City to mine its 50% owned joint venture Western World copper deposit. The company has filed a writ of mandate in the California courts to overturn this decision.

Despite delays relating to environmental and other concerns, Viceroy Resource (TSE) is in the final stages of permitting for its proposed 8,000-ton-per-day Castle Mountain heap leach gold project in San Bernardino County. The deposit, minable by open pit methods, contains proven and probable reserves of 24.6 million tons grading 0.047 oz. gold, plus possible reserves of an additional 13.4 million tons of similar grade.

Amax Gold (NYSE) and partner U.S. Gold (NASDAQ) are looking to a 1992 start for production at the Hayden Hill open pit gold mine project north of Susanville. Hayden Hill, a combined heap leach and 3,500-ton-per-day milling operation, is expected to produce 145,000 oz. gold and 445,000 oz. silver annually for at least eight years.

The proposed US\$72-million mine will have the distinction of being one of the lowest-grade, precious metal mines where conventional milling is used. Proven and probable reserves are reported as 45.3 million tons grading 0.032 oz. gold and 0.22 oz. silver.

Glamis Gold (TSE) was recently granted the final permits to bring its main Yellow Aster pit into production in Kern County. Movable reserves are estimated at 11.43 million tons grading 0.022 oz. gold per ton. And Eastmaque Gold Mines (TSE) is expanding production at its Cargo Muchacho mine near Ogilby, a combined heap leach and milling operation that will treat both open pit and underground reserves.

Royal Gold (NASDAQ) is in the permitting stage at the Long Valley gold deposit in Mono County, where it is earning a 60% interest. Royal Gold hopes to develop an open pit, heap leach mining operation based on reserves of 1.8 million tons proven and 0.4 million tons probable, all at a grade of 0.023 oz. gold.

Although work remains to be done to prove up the numbers, Plexus is eyeing production at its recently acquired Bornite polymetallic project east of Salem in neighboring Oregon. This project is reported to contain geological reserves of 3.1 million tons averaging 2.49% copper, 0.023 oz. gold and 0.67 oz. silver.

Pegasus Gold (TSE) is assessing the production potential of the Quartz Mountain gold project in Lake County, where it has an option to earn a 50% interest from Quartz Mountain Gold (TSE). Pegasus' work at this Oregon property is aimed at economic modelling of an oxide heap leach reserve and assessment of a larger disseminated sulphide reserve.

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Washington's newest mine, the Kettle River, was recently brought to production by Echo Bay Mines (TSE). (See Page One story.)

Hecla Mining (NYSE) is well into a US\$6.6-million development program to gain access to new reserves at its low-cost (US\$94 per oz.) Republic gold mine near the town of the same name. This high-grade mine has produced over two million ounces of gold since 1941.

Although gold projects appear to dominate recent activity, base metal projects are beginning to appear on the Washington mining scene. A unit of Cominco recently agreed to provide funding to Equinox Resources (TSE) for use in the preparation of a bankable feasibility study for the Van Stone zinc-lead project, some 25 miles south of Cominco's smelter at Trail, B.C.

Equinox is looking to reactivate the former base metal producer which still has operating infrastructure, including a 1,100-ton-per-day mill. The property has existing minable reserves of 1.6 million tons grading 6.5% zinc and 1.5% lead contained within a 7.5-million-ton deposit grading 4.1% combined zinc-lead.

RFC Resource Finance (TSE) is at the feasibility stage with the Pend Oreille lead-zinc deposit, 55 miles south of Trail. Also a former producer, Pend Oreille is reported to have reserves of three million tons grading 9.8% zinc and 1.9% lead. If all goes well, the company expects it could begin mill tune-up by the end of this year for a 1991 production start.

12-24-90 N.MINER

## Norgold seeks buyer for Yarnell

VANCOUVER — **Norgold Resources** (VSE) is looking for a buyer for its Yarnell gold project in Arizona where a reserve calculation was recently completed.

million tons grading 0.037 oz. Both calculations were prepared by consultant, James Askew Associates.

The company said it is evaluating proposals from several major mining companies which may include an offer to all shareholders or, alternatively, the sale of the property.

Situated 732 miles northwest of Phoenix, the Yarnell property is now reported to contain minable reserves of 5.1 million tons grading 0.038 oz. gold per ton. This calculation is based on inverse distance square method and a cutoff grade of 0.017 oz. gold per ton.

Reserves were slightly higher if kriging is used; an estimated 5.2



NORGOLD RESOURCES INC.

# NEWS RELEASE

SYMBOL: NGR

EXCHANGE: V.S.E.



September 11, 1990

**FOR IMMEDIATE RELEASE**

**YARNELL GOLD PROJECT, ARIZONA**

NORGOLD ESTABLISHES 100% CONTROL OF YARNELL

RESERVE ESTIMATE BEING COMPLETED

Norgold is pleased to announce that the company has gained a 100 percent operating interest in the Yarnell Gold Project, located 72 miles northwest of Phoenix, Arizona. Joint venture partner ASARCO has elected to discontinue its option to earn a 51% interest in the project.

As required by Norgold's joint venture agreement, ASARCO has provided Norgold with an extensive data base resulting from more than US \$1.0 million in work completed on the project during 1989 and 1990. Management is evaluating this information and formulating plans for the development of the Yarnell deposit. A total of 96 reverse-circulation drill holes, and 4 diamond drill holes have been completed which define an important near-surface gold deposit with substantial exploration potential. Metallurgical tests indicate that standard heap leach techniques utilizing a 1.5 inch crust will result in a 70 to 75 percent gold recovery. Other technical and capital and operating cost data have also been received and should accelerate development of the deposit.

Norgold has contracted James Askew Associates of Denver, Colorado to provide an independent ore reserve calculation and anticipates receiving preliminary geologic and mineable reserve estimates within about one month. Project engineering and permit scoping studies are also being initiated. Based on a preliminary evaluation of the drilling and trenching accomplished to date, several excellent, undrilled exploration targets have been identified and will be drilled as soon as appropriate logistics can be arranged.

.../2

The Vancouver Stock Exchange has neither approved nor disapproved the contents of this release.

**FOR MORE INFORMATION CONTACT CORPORATE RELATIONS**

Head Office: 210 - 475 Howe Street, Vancouver, British Columbia V6C 2B3

Telephone: (604) 681-5566

Fax: (604) 687-8789



NORGOLD RESOURCES INC.

# NEWS RELEASE

SYMBOL: NGR

EXCHANGE: V.S.E.



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September 11, 1990

**FOR IMMEDIATE RELEASE**

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Page 2

Norgold's management is exceedingly optimistic about the development of the Yarnell deposit. All information available suggests the presence of an economically viable, open-pit mineable resource with good expansion potential. Norgold's mining team has extensive experience in mineral exploration and mine development and is capable of "fast-tracking" the Yarnell Gold Project to production. Further information will be available upon completion of the management review in progress.

On behalf of the Board of Directors,

Steven C. Potter  
President and CEO

The Vancouver Stock Exchange has neither approved nor disapproved the contents of this release.

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Head Office: 210 - 475 Howe Street, Vancouver, British Columbia V6C 2B3  
Telephone: (604) 681-5566 Fax: (604) 687-8789



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DESERT VENTURES, INC.

12 December, 1989

Michel:

For some time I have been following the press releases of a company called Norgold Resources. They have a (49%) joint venture with Asarco (51%) on a property in Arizona called the Yarnell Project. I had looked at some preliminary assay data for the Yarnell Project for Cambior last spring and was trying to reach the property owner to schedule a visit when I learned that Norgold already had the property leased. Shortly thereafter they announced the JV with Asarco. Under the terms of our existing Finders Fee agreement I am hereby submitting the Yarnell project for Cambior's review and consideration.

Mineralization on the project is hosted in a moderately dipping shear zone in Precambrian granite. To date over 80 holes have been drilled and drill indicated reserves are 8.4 million tons at a grade of 0.042 opt Au. The mineralization is all in the oxide zone and leaches well.

I have learned that the Chairman of Asarco, Mr. Richard de J. Osborne, has been reviewing the activity of the precious metal exploration group with a critical eye. Asarco had 1988 sales of 1.9 billion and is primarily engaged in base metal mining. The potential financial impact to Asarco of even a 10 million ton gold deposit would be minimal and it sounds like the Chairman is realizing this. If this deposit is of interest to Cambior, I would suggest that we correspond immediately with Asarco and express a strong interest in relieving Asarco of this small deposit. Perhaps if they saw the opportunity to recover their sunk costs, and realize a small gain on the ounces they have developed to date they would sell the deposit.

Copies of the presently available data on the project are attached for your review. I have spent considerable time with Mike Philpot, President of Norgold, reviewing the project data at the San Francisco gold show. Norgold is tightly held and Mike is a competent, aggressive geologist. Their goal is stock appreciation and they might have an interest in being acquired or at least selling more of their interest in the project for Cambior stock.

Ken Brook , December 13, 1989

sufficiently encouraging for Noranda to maintain their option and the property was returned to NGR. It is currently being evaluated by another mineral exploration company with regard to a farm-in proposal.

The Yarnell Project (Arizona):- this property is the core asset of NGR and will be discussed at length below.

### The Yarnell Project

#### Introduction

Commencing in 1987 Norgold has assembled a land package consisting of patented, unpatented and State lease property that completely encompasses the Yarnell mine site, located 1.5 miles south of the town of Yarnell, Yavapai County, Arizona. The Congress Mine (recently sold by Echo Bay Mines Ltd. to Malartic Hygrade Gold Mines (Canada) Inc.) is 5 miles to the west of the Yarnell Mine.

A net smelter return (n.s.r.) is included in the underlying agreement, this calls for a payment by NGR of 2% or \$100,000 U.S., whichever is the smaller, for the initial 2 years. In year 3 it is reduced to 1% or \$100,00 U.S., whichever is the smaller. In year 5 it is reduced to 0.5% or \$100,000 U.S, whichever is the smaller.

### Joint Venture Agreement

On January 28 of this year Norgold entered into an agreement with Asarco Incorporated whereby ASARCO has the right to earn a 51% working interest in the the project. The terms of the agreement are as below :-

- ASARCO assumes NGR's underlying agreements and payments.
- ASARCO makes intermittent cash payments to NGR totalling \$145,000 U.S. by July 1, 1991. (Balance remaining - \$90,000).
- ASARCO have to present NGR with a positive feasibility study by July, 1991 and place the property into production within a 3 year period . NGR has the option to elect a 25% carried interest . ASARCO will be the operator under a joint venture agreement.

Since the Agreement was signed the joint venture partners have acquired more ground and have consolidated a total land package in excess of 1,000 acres.

### Property History

Intermittent exploration and development at this location has occurred since the late 1800's/early 1900's. During the period 1914-16 250,000 tons of ore at a grade of \$6.00 per ton (0.29 o.p.t. gold) were supposedly blocked out, however the mine was closed in 1916.

A U.S. Bureau of Mines Report, dated 1938, refers to the existence of a 70 tons per day mill, flotation and cyanidation operation during 1936. The head grade was apparently running at \$8.00 to \$10.00 per ton (0.39 to 0.48 o.p.t. gold).

The mine capacity was increased to 125 tons per day in 1940 with extraction being achieved by a modified shrinkage method. Unfortunately it appears that the mill was running the mine and a considerable volume of low grade development material was processed. Heads averaged \$4.00 per ton (0.19 o.p.t. gold) and recoveries ranged from 83.1% to 91.2%. The mine was closed in 1942 by the War Production Board.

During the period from the 1940's to the early 1980's the property received only minor exploration and/or development activity. Homestake Mining Corp. held an option on the property during 1983/4 and sampled an open cut and other areas on the property to determine the viability of an underground mining operation. Samples of the main "vein" ranged from 0.28 to 0.42 o.p.t. gold across a width of 1.5 to 8.0 feet. Homestake did not proceed with further development of the ground.

### Geology and Mineralization

Mineralization at the Yarnell Mine is structurally controlled within an altered and strongly jointed Pre-Cambrian granite. The main structure and interpreted feeder for the mineralization and alteration is the Yarnell Fault. On the basis of a recent field examination by Resource Research Group the fault is interpreted to be a low angle, reverse type structure

- a thrust fault. As such it is probably part of the Maria fold and thrust belt, a deformation event of Mesozoic age.

The fault has an average strike of north 45 degrees east and an average dip of 30 degrees towards the northwest. At its base there is a gouge zone and a breccia zone, within the gouge zone a fabric has been developed that indicates the reverse nature of the movement. Grades within these zones vary from 0.1 to 0.5 o.p.t. gold, the thickness of the zone varies from 2.0 to 20.0 feet. In the hangingwall there appears to be a set of fractures (imbricate faults) that are related to the main fault. These faults appear to have acted as hanging wall feeders and are probably responsible for the thick zone of alteration and mineralization that overlies the Yarnell Fault proper. The zone attains a thickness of up to 200 feet, grades within this zone vary from 0.01 to 0.05 o.p.t. gold.

#### Recent Work

Since signing the Agreement ASARCO has been very active in their exploration program on the property. An initial program of 9 reverse circulation holes, spaced on 200 foot centers, broadly outlined the potential for a bulk tonnage deposit. Each hole intersected gold mineralization over widths ranging from 35 to 155 feet and grades varying from 0.029 to 0.050 o.p.t. gold.

Phases II and III of reverse circulation drilling promptly followed with greater than 79 holes having now been drilled. Company data (NGR) indicates that a mineralized zone with a 1700 foot strike extent, 400 to 1000 foot downdip length and a thickness varying from 50 to 75 feet has been outlined. This mineralized zone is open along strike to the northeast and southwest.

A small diamond drill program (5 holes) has been initiated by ASARCO the purpose of which is to gain further geological control, compare analytical results between reverse circulation and diamond drill recovery and to assist the mining department with regard to pit design and rock stability.

#### Metallurgical aspects

Preliminary bottle roll leach tests were conducted during 24 hour and 72 hour periods on three selected samples. Seventy to eighty percent gold recovery was achieved with the cyanide and lime consumption being 0.4 and 4.0 pounds per ton respectively.

Detailed metallurgical bench studies are in progress to determine the optimum crush size for heap leach extraction of the gold.

#### Environmental aspects and Infrastructure

Norgold's joint venture partner, ASARCO, has a very visible presence in the State of Arizona via its copper mining operations. Consequently there is a well developed awareness of the environmental concerns of the State

and how to accommodate them. ASARCO is apparently regarded as an exemplary corporate citizen.

The Yarnell prospect is adjacent to the community of Yarnell which has a population of 500. The property is readily accessible to power and Highway 89 is located within 1,000 feet of the old Yarnell mine site. Two old shafts on the property are currently flooded indicating that access to water will not be a major problem. As yet there have not been any concerns voiced by the people of Yarnell concerning potential mine development, a number of the inhabitants are currently employed on the exploration program

### Technical Observations and Comments

The location of the property is very attractive; it is in the southwest of the U.S. and benefits from a climate that is ideal for the heap leach extraction of gold. Arizona has not as yet adopted the very strict regulatory stance that is prevalent in California with regard to obtaining permits to operate a mining venture.

The geological aspects of the deposit are relatively simple; the Yarnell fault is a very strong structure and it extends along strike well beyond the confines of the property. The altered, oxidized and mineralized granite appears to be the only rock type on the property.

The type of the mineralization within the oxidized ore appears to be confined to gold, there is little or no silver content and a very restricted sulphide content. Some of the samples have returned quite high gold assays, in excess of 0.3 o.p.t.; this is not necessarily a problem as long as the gold is not coarse in form. If there is a portion of the ore that contains a "coarse" fraction the overall recovery from the heap leach pad may be reduced. Finer crushing, a pre'cyanidation or a longer leach cycle are potential solutions to this problem. Metallurgical testing is ongoing, results to date have not indicated that the clay content of the ore is sufficient to warrant agglomeration or inhibit gold recovery. It is anticipated that the ore will require crushing, the fineness of the crush required is not as yet determined.

To date the majority of the assay data has been obtained from air return, reverse circulation drilling rock chips. It is interpreted that the majority of the mineralization occurs on fractures within the granite, if this is correct then it is quite probable that the sampling method is undervaluing the tenor of the mineralization. Currently some of the reverse circulation holes are being twinned with diamond drill holes, comparison of results should indicate as to whether or not this problem exists.

The mineralized structure has a long surface trace on the property i.e. it can be traced on surface a distance in excess of 3,000 feet. It is known that there is a feather edge to the mineralization both along strike and down dip so it is not anticipated that the entire length of the surface trace is prospective with regard to gold mineralization. The mineralized structure has a gentle dip, the overlying topographical slope dips in the same direction both down dip and obliquely down dip. This aspect will assist in containing the strip ratio once open pit extraction

has commenced.

The nature of the topography and the interpreted distribution of the mineralization are such that the pit will be less than 0.5 mile from the proposed pad site. The pit shape will be long, wide and shallow thus permitting rapid, easy and cost effective movement of the ore and waste.

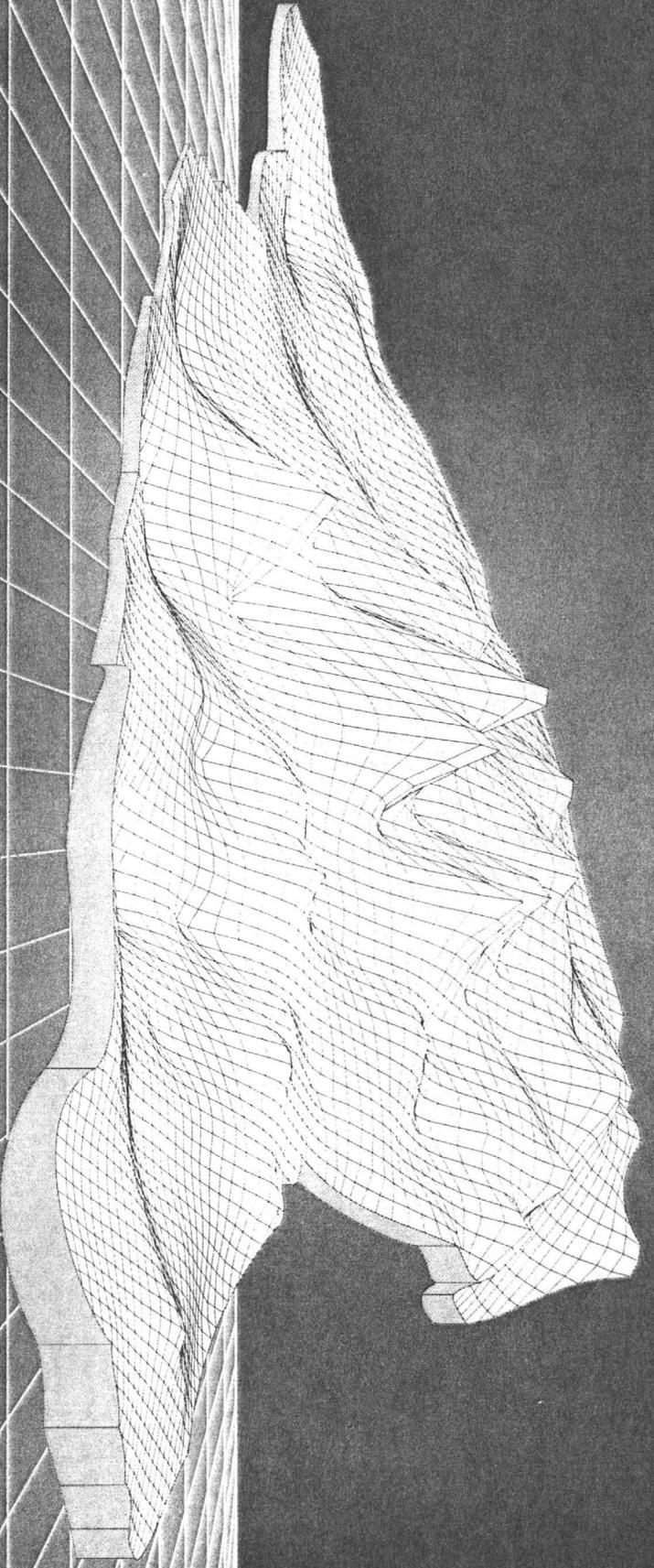
The zone of mineralization has been drilled on approximately 100 foot centers, such spacing should be sufficient to provide a reasonable level of comfort with regard to establishing geological reserves for a bulk tonnage deposit. NGR commissioned an independent reserve estimate the result of which was a figure of 8.4 million tons at a grade of 0.042 o.p.t. gold. The strip ratio varied from 0:1, where the mineralized zone outcrops, to a maximum of 3:1. The average strip ratio of the geological reserve is midway which is the maximum that the grade will carry. It is believed, but not confirmed, that the unofficial reserve estimate made by ASARCO is smaller in tonnage but higher in grade. However the mineralization is open along strike; whilst the author was on the property another mineralized zone was located along strike to the northeast.

#### Financial Comments

The initial capital cost estimate by ASARCO (unconfirmed verbal communication from NGR personnel) is U.S. \$5.00 million, this appears to be reasonable.

The underlying agreement contains a maximum n.s.r. of 2% which is however capped at \$100,000. Should a mine go into production this n.s.r. will amount to a fraction of a single percent and as such is a negligible burden.

# THE YARNELL PROJECT



NORGOLD RESOURCES INC.

## THE PROJECT

The Yarnell Gold Project is a joint venture between Norgold Resources Inc. and Asarco Inc. The two companies expect to place the property, which is located 72 miles northwest of Phoenix, Arizona, into production within one and a half years.

The property completely encompasses the old Yarnell Mine site (elevation 4,800 ft.) and lies between the towns of Prescott and Wickenburg on Highway 89. The mine site is easily accessible, near all necessary mining amenities, and can be worked year round.

The project consists of patented and unpatented lode claims controlled by Norgold and Asarco. In all, the joint venture partners control over 2,000 acres in the area.

Drilling has been completed on approximately one hundred foot centres in the area encompassing the old Yarnell Mine site. Assays from this exploration programme have defined a large low-grade, gold ore-body.

Norgold owns 100 percent of the Yarnell Project. Under the joint venture agreement Asarco has the right to earn 51 percent of the project under the following terms:

Asarco assumes Norgold's underlying agreements and payments; Asarco makes scheduled cash payments totalling \$90,000 by July 1, 1991;

Asarco presents Norgold with a bankable positive feasibility study by July 1, 1991 and places the property into production within a three year period; and

Asarco assumes operation of the project.

The underlying agreement includes a net smelter return of two percent for the initial two years, one percent in years three and four, and one-half percent thereafter. The annual production royalty is capped at \$100,000.

## GEOLOGY AND RESERVES

The Yarnell reverse circulation drill reserve, defined by 80 holes, consists of 8.4 million tons drill-indicated mineralization grading .042 ounces per ton gold. The mineralization is open in both strike directions as well as down dip, so there is good potential to expand reserves.

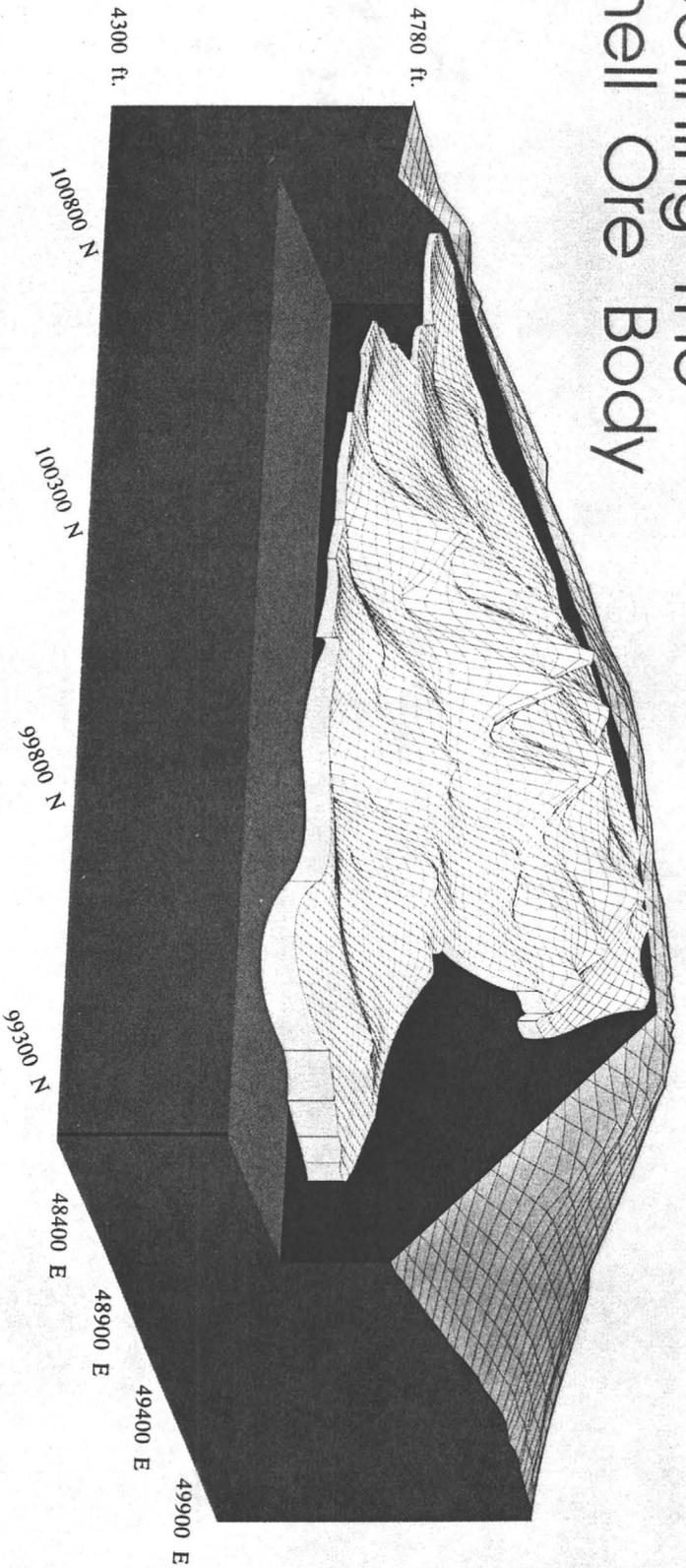
Detailed pit design studies are currently being reviewed and it is expected the overall stripping ratio will be less than 2:1.

Mineralization at the Yarnell Project is structurally controlled within an altered and strongly jointed Precambrian granite. The main structure is the Yarnell Fault, a low angle thrust fault, which is the interpreted feeder for the mineralization and alteration.

*(continued on back cover)*



# Defining the Yarnell Ore Body



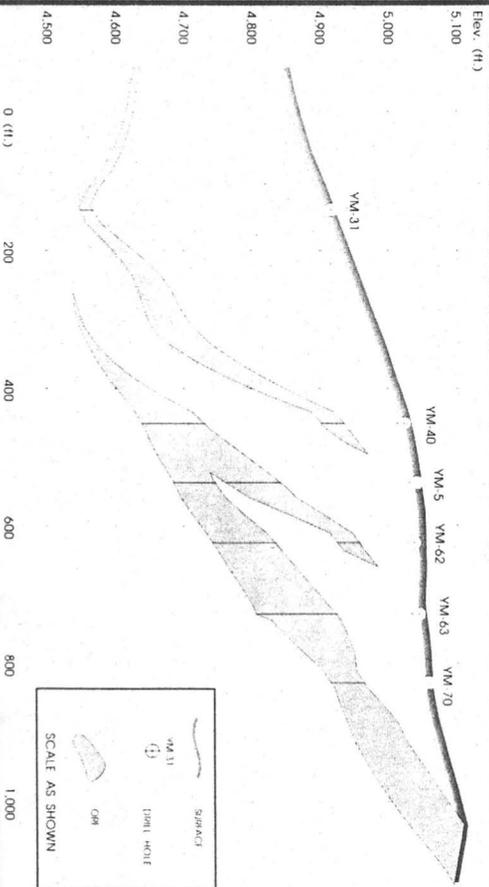
The images used to define the Yarnell Ore Body were generated by geological software from three surfaces: the overlying topography, the top of the ore body, and the bottom of the ore body.

The surface coordinates were entered into the system and were then gridded to produce a three dimensional perspective view of the topographic surface.

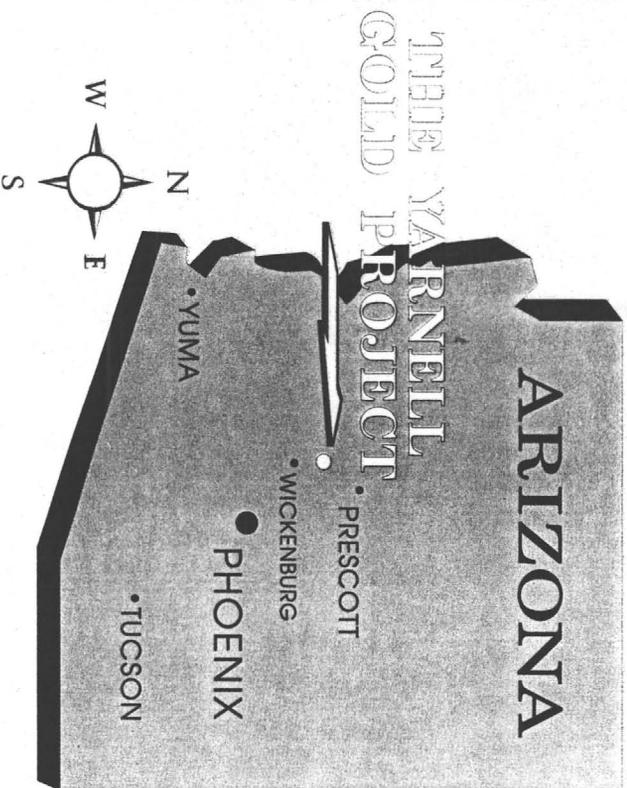
Assays from 80 drill holes were used to determine an economic ore body. Coordinates were determined for the periphery of the ore body, based on a 200 foot radius area of influence.

These coordinates were then gridded to produce three dimensional perspective views of both the top and the bottom surface of the ore body.

The three surfaces were combined to produce the above image, which has a portion of the surrounding waste rock removed to reveal the ore body. The accompanying cross-section (right) is a geological interpretation of the economic ore body.



Cross-section Looking North East



(continued from inside page)

The fault has a strike of north 45 degrees east and an average dip of 30 degrees to the northwest. At its base, there are gouge and breccia zones which grade 0.10 to 0.50 ounces per ton gold over two to 20 feet. In the hanging wall there appear to be a set of fractures (imbricate faults) that are related to the main fault. These faults appear to have acted as hanging wall feeders and are probably responsible for the thick zone of alteration and mineralization. The altered zone attains a thickness of up to 230 feet with a grade varying from 0.01 to 0.05 ounces per ton.

Preliminary bottle roll leach tests were conducted during 24 hour and 72 hour periods on three selected samples. Seventy to eighty percent gold recovery was achieved with the cyanide and lime consumption being 0.4 and 4.0 pounds per ton respectively.

Detailed metallurgical bench studies are in progress to determine the optimum crush size for heap leach extraction of the gold.

## HISTORY

Work began on the Yarnell Mine around the turn of the century. In 1914, 250,000 tons of ore grading 0.29 ounces per ton gold were reportedly blocked out.

In 1936, a shoot 300 feet long and 11 feet wide grading 0.36 ounces per ton gold was encountered. This ore supported a 70 ton per day flotation and cyanidation mill. In 1940, modified shrinkage stopping was used and the capacity of the mill was increased to 125 tons per day.

In 1942, the Yarnell Mine, along with most other gold mines in the U.S., was shut down by the War Production Board. Inflation, low gold prices, and high start-up costs prevented most of these mines, including the Yarnell, from re-opening. Several major mining companies have since examined the property, but failed to recognize its potential as a low-grade, open pit operation.

Historically, the Yarnell was mined underground for free milling gold ore from a two to 20 foot wide shear zone. This zone had a strike length of over 1,000 feet and averaged over 0.30 ounces of gold per ton. Mining on the shear structure was undertaken on three adit levels (325 feet vertical) connected by raises.

For further information call:  
Patrick McCleery or Adrian Hobkirk

Canada:

210-475 Howe Street  
Vancouver, B.C. V6C 2B3  
(604) 681-5566  
Fax (604) 687-8789

U.S.A.:

13935 Charny Drive  
Reno, Nevada 89511  
(702) 851-3177



**Norgold Resources Inc.**

# CAMBIOR USA, INC.

October 26, 1990

Tench C. Page  
Exploration Manager  
NORGOLD RESOURCES (US) INC.  
4600 Kietzke Lane, Ste. G-177  
Reno, NV 89502

RE: Yarnell Project, Yavapai County, Arizona

Dear Tench:

Following our meeting and data review of yesterday, I have discussed the Yarnell deposit with our management.

Cambior has elected not to pursue the evaluation and possible acquisition of the project. Thus, we will not be making a site visit next week.

As promised, please find enclosed a copy of the press release as it appeared in the Northern Miner.

Thank you for considering Cambior as a possible partner in the development of the Yarnell Project.

Yours truly,

CAMBIOR USA, INC.



Michel Drouin  
Exploration Manager

MD:lat  
Enclosure

YARNELL PROJECT SUMMARY

File Yavapai County  
ARIZON

- Location:**
- 73 miles NW of Phoenix, Arizona
  - Accessible by paved state Hwy. 89, 28 miles NE of Wickenburg
  - Community of 200 located in Yarnell, 1.5 miles N. of project area
- Property:**
- Comprised of patented, unpatented BLM and state leases comprising 2,000+ acres
  - Principal patented claims are subject to buyout of \$463,000, of which \$63,000 has been paid.  
Balance payable over four years at \$100,000 per annum on January 1, 90, 91, 92, 93 *\$150,000 on 01/01/93*
  - Underlying NSR of 2% first 2 years production  
1% years 3 & 4 of production  
0.5% year 5 and thereafter
  - Royalty is capped at \$175,000/annum
  - Other property payments minimal (*< 50,000 per year*)
- Work to Date:**
- Geological mapping & sampling
  - 96 reverse circulation drill holes, 23,000 feet
  - 4 diamond drill holes (twinned for metallurgical purposes)
  - Detailed metallurgical reports
  - Preliminary water studies
  - Pre-feasibility study (Kilborn for ASARCO)

**Reserves:**

<u>Method of Calculation</u>	<u>Tons of Ore</u>	<u>Grade</u>	<u>Ounces</u>	<u>Stripping Ratio</u>
<i>ASARCO Kilborn study</i>	4,260	.040	179,000	
ASARCO - Triangle method	6.85 MM	.038	256,207	1.45 : 1
Combining Zone A & B				
ASARCO - Engineering Dept.	5.08 MM	.049	248,920	1.42 : 1
ASARCO - Computer Model	3.93 MM	.049	192,257	1.72 : 1
NORGOLD - Geological	8.40 MM	.042		<i>- 06/90</i>
<b>Reserves</b>				
NORGOLD - Detailed Study by James Askew & Assoc.	(expected date of report Oct 30/90)			

- Metallurgy:**
- Ore is amenable to heap leach cyanidation treatment
  - Optimum heap leach feed size for max. recovery is 80% - 3/8" @ 77% recovery 60 days
  - Optimum heap leach feed size with respect to project economics is 80% - 1 1/2" @ 72% recovery 60 days
  - Tests were conducted with agglomeration though it is likely agglomeration will not be required on a coarse crush + 1 1/2"

**Operating Costs: (Kilborn)**

- Contractor Mining/Crushing
- 720,000 tons/year = \$6.35 / Ton = *5.9 year mine life*

**Capital Costs: (Kilborn)**

- Included: yard/services, fine ore crushing & handling, ADR plant, leaching, ancilliary buildings, construction overheads, general, contingency = \$9.6 MM  
*plus 1,870,000 on going capital costs during 5.9 year mine life*

- Risk Factors:**
- Permitting has not been initiated, estimated time frame; 12 - 18 months
  - Environmental; no significant problems foreseen
  - Water; a number of sources located within four miles of project area; cost will be a factor
  - Proximity to Hwy 89 and town of Yarnell

Total Expenditures to Date: *± 1,500,000 All by ASARCO*

**NORGOLD RESOURCES INC.**

**CORPORATE SUMMARY**

**Directors & Officers:**

Michael D. Philpot  
Patrick W. McCleery  
Gordon C. Guttrath  
Brian D. Edgar  
Christopher S. Moat

Chairman of the Board, President & Director  
Vice-President Finance, Director  
Director  
Director  
Director

**Share Structure:**

Non diluted	(August 31, 1990)	4,757,776
Fully diluted	(August 31, 1990)	5,829,126

- Including stock options and warrants at prices ranging from \$0.61 to \$1.15, if fully exercised \$801,197 will be generated to treasury

Officers/Directors	2,300,000	shares
Business Associates	1,000,000	shares
Funds	500,000	shares
Estimate Float	2,000,000	shares

**Financials:**

- Refer to Annual Report, fiscal year ended August 31, 1990.
- Cash on hand (August 31, 1990) = \$230,000

**Primary Asset:**

- Yarnell Gold Project, Arizona

**Secondary Assets:**

- Nevada Chance Project, Nevada (50/50 Joint Venture with LAC - new recent gold discovery)
- General Grant Project, Arizona

5 holes drilled to date; 4 are DUDS  
1 hole encountered 230' averaging .031 opt Au starting at a depth of about 175'  
still too early to judge significance of hole

# Yamell Project

MD

## Geology:

35° Dipping structure (Qty vein with wall rock disseminations) hosted by a Precambrian Granite

No Copper ; no toxics (As, Hg)

## Economics

NORyolo seeking either a share exchange or a cash offer

Shares are controlled by the directors; In November of 1989 directors purchased by way of a private placement shares at \$1.05  
Minimum Price per share being sought would be around \$1.15

- Cost to buy out all shares  $\$1.15 \times 5.8 \text{ million shares} = \$6.7 \text{ million}$

Start-up Capital Cost estimate by Kilborn. 9.6 million

- capital required during operations 1.87 million

- Recoverable ounces  $\pm 140,000$

- Annual gold production  $720,000 \text{ tons} \times 0.049 \times 70\% = \pm 25,000 \text{ oz}$

- ASARCO's estimated cash cost  $\pm 300 / \text{ounce}$

- Non-cash - Depreciation/purchase per recoverable ounce  $+ \$129 / \text{ounce}$

## Summary of Asarco Deal

- Aggregate cash payments of \$145,000 by July 1, 1991 to NORyolo

- Complete positive feasibility prior to July 01/1991

- Place property into production within 3 years after positive feasibility

- ASARCO to earn a 51% interest

10-22-90 N. MINER  
**LAC drilling on  
Norgold claims**

VANCOUVER — A 10-hole exploration program is halfway complete on the Nevada Chance "East" claim block, some 60 miles north of Lovelock, Nev. The gold project is a joint venture between **LAC Minerals** (TSE) and **Norgold Resources** (VSE).

The property is adjacent to the producing Lewis-Crofoot gold mine owned by **Hycroft Resources** (VSE), and the Rosebud gold property, a joint venture between LAC and **Equinox Resources** (TSE).

The drilling program on the Nevada Chance claims was designed to test three targets identified by preliminary geologic, geophysical, and geochemical work.

Preliminary results from hole RL-113 returned a 170-ft. intercept, from 395 ft. to 565 ft., grading 0.072 oz. gold per ton. Complete results from the first five holes are expected shortly.

270 x .031

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