

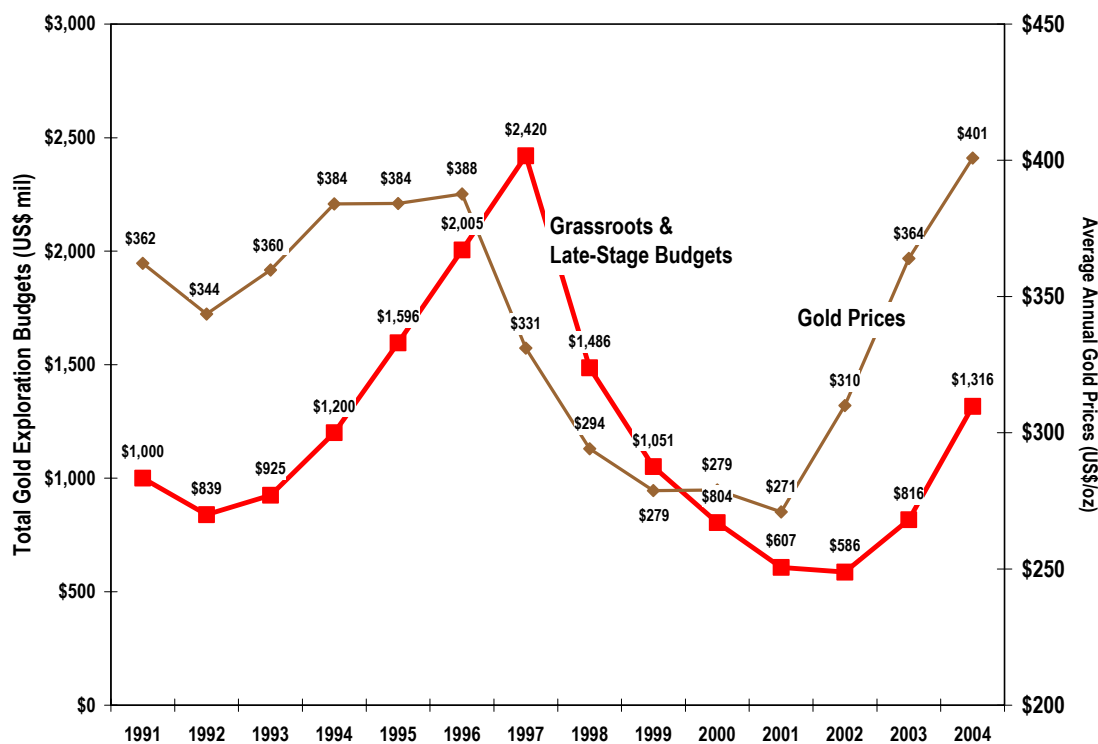
MAJOR GOLD DISCOVERIES WORLDWIDE, 1991-2004

Gold exploration budgets tend to follow gold prices

Discoveries of major gold deposits boomed during the 1990s, but the pace of discovery slackened thereafter in the atmosphere of falling gold prices and sharply reduced gold exploration budgets. So far in 2004, the average LME cash gold price of \$401/oz is the highest in more than 15 years, continuing an upward trend that began in mid-2001. The 2003 average price of \$364/oz was 17% higher than the \$310/oz 2002 average and was the first annual average gold price of more than \$350/oz since 1996, representing the second two-digit percentage increase in a row.

As illustrated in Figure 1 below, exploration budgets roughly follow price trends. MEG data for 2004 confirm this trend, with budgets for grassroots and late-stage gold exploration increasing 62% to \$1.32 billion in 2004 from \$816 million in 2003, following a 39% increase in 2003 from the historic low of \$586 million in 2002.

Figure 1: Gold Exploration Budgets And Annual Gold Prices

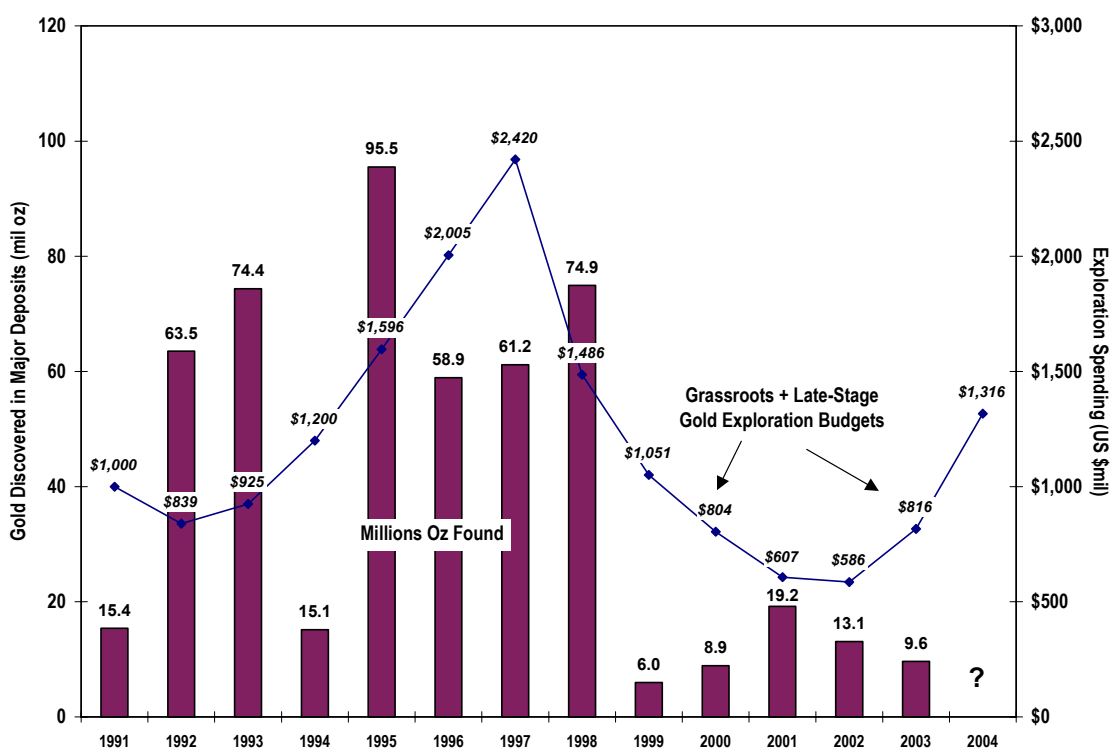


Data sources: Metals Week, Corporate Exploration Strategies.

Will increased exploration spending reverse declining discoveries?

As illustrated in Figure 2 below, the quantity of gold defined in deposits with current total resources of greater than 3 million oz has declined precipitously in the past five years. Some of the decline is simply a function of the time it takes to define a major deposit, but statistics also indicate that as total exploration spending declines the percentage allocated to grassroots exploration declines. In lean years, companies tend to focus on late-stage and minesite exploration at the expense of grassroots. Therefore during the lean years, such as from 1999 to 2002, the more advanced projects were developed further, but initial discoveries were less likely to occur. During that period, grassroots exploration spending for gold slipped from 45% to 37% of the budget total, while late-stage and minesite spending increased from 55% to 63%.

Figure 2: Gold Exploration Spending And Major Discoveries, 1991-2004



Data source: MEG's Corporate Exploration Strategies and MineSearch database.

Current development status of major gold discoveries

Of the 54 gold deposits that we have classified as major discoveries for the years 1991 to 2003, 18 are in production and have yielded a combined 37.3 million oz of gold since their discoveries. We have included this production, plus 10% to allow for processing losses, in the reserves, resources, and past production totals in the table below.

Table 1: Discoveries By Development Stage

Current Status	Number of Discoveries	Reserves & Resources Tonnage (mil mt)	Average Grade (g/mt)	Reserves & Resources Gold (mil oz)	Past Production (mil oz)	Reserves, Resources & Past Production (mil oz)
Production	18	2,527.3	1.454	118.1	37.3	159.2
Reserves Development	15	5,321.6	0.814	139.2		139.2
Feasibility	14	4,330.8	0.991	138.0		138.0
Preproduction	7	1,662.9	1.487	79.5		79.5
Totals/Average	54	13,842.6	1.067	474.8	37.3	515.9

The 15 reserves development-stage projects contain 139.2 million oz of gold in reserves and resources, but have a lower average gold grade than the producers. This is largely because this group encompasses nine copper-gold projects, including the giant Oyu Tolgoi project in Mongolia. Using a copper price of \$0.87/lb and a gold price of \$360/oz, the gold equivalent grade in the reserves development deposits would be 1.55 g/mt Au.

The 14 feasibility-stage projects contain 138 million oz of gold at an average grade of 0.99 g/mt Au; this includes the gold content of three primary copper projects. The smallest group is in the preproduction stage, with seven primary gold projects totaling 79.5 million oz of gold in reserves and resources at an average grade of about 1.49 g/mt Au.

Major gold discoveries from 1991-2003 contain 515.8 million oz of gold

Table 2 on the next page lists the major gold discoveries in the years 1991 to 2003. Each of these major gold discoveries contains a minimum of 3 million oz of in-situ gold in defined reserves, resources, and past production, and has seen at least preliminary economic evaluation. Thus, the gold content of each of these deposits is potentially worth \$1 billion or greater, depending on the gold price used. In the current metals and equity markets, some projects that looked marginal at best a few years ago are receiving positive preliminary financial appraisals. It is uncertain when or if these deposits will reach production, due to factors such as low grades, infrastructure requirements, and political issues. Production decisions are

generally based on the economics of one project compared with other potential projects and the needs of the markets, and the listed projects are the ones that seem to have the most potential at this time.

Another way of looking at exploration success is by calculating the total in-situ value of all metals in the resources. The total in-situ value of the 54 deposits included in this survey is \$264.3 billion, using the MEG nominal metals values listed below. Of this total, the gold content is valued at \$185.7 billion, copper at \$70.7 billion, and other metals (primarily silver) at \$7.9 million.

MEG Nominal Metals Values 2004							
	Gold	Copper	Zinc	Lead	Nickel	Silver	Platinum
Short Term	\$425	\$0.90	\$0.40	\$0.22	\$4.00	\$5.00	\$600
Long Term	\$325	\$0.85	\$0.48	\$0.24	\$3.25	\$5.00	\$450
MEG Value	\$360	\$0.87	\$0.45	\$0.23	\$3.50	\$5.00	\$500

Because it usually takes a few years to define a significant deposit, there may well be more discoveries credited to the exploration of recent years, and even earlier years, as technology and economics change. So far, none of the recently announced new gold resources are large enough or advanced enough to be identified as a 2004 major discovery.

Table 2: Major Gold Discoveries By Year, 1991-2003

Year	Number of Major Discoveries	In-Situ gold (mil oz)	Reserves & Resources Tonnage (mil mt)	In-Situ Value of All Metals (US\$ mil)	Grassroots + Late-Stage Gold Explo Spending (US\$ mil)	Explo \$/oz of Gold Found	In-Situ Value/Explo \$ Spent
1991	3	15,386,994	87,289,172	\$5,539.3	\$1,000.0	\$65.0	\$5.5
1992	5	63,531,957	1,981,635,000	\$33,160.2	\$839.0	\$13.2	\$39.5
1993	8	74,384,093	2,272,195,088	\$37,820.6	\$925.0	\$12.4	\$40.9
1994	3	15,140,700	563,519,000	\$10,939.2	\$1,200.0	\$79.3	\$9.1
1995	8	95,508,016	2,531,256,346	\$43,489.2	\$1,595.8	\$16.7	\$27.3
1996	5	58,902,671	1,563,351,306	\$24,904.6	\$2,005.0	\$34.0	\$12.4
1997	9	61,155,189	2,593,557,730	\$50,351.4	\$2,420.0	\$39.6	\$20.8
1998	5	74,943,765	1,082,777,000	\$29,196.5	\$1,486.0	\$19.8	\$19.6
1999	1	5,975,000	19,736,000	\$2,151.0	\$1,051.2	\$175.9	\$2.0
2000	2	8,913,000	662,000,000	\$5,350.9	\$804.0	\$90.2	\$6.7
2001	2	19,212,000	688,716,287	\$13,196.3	\$606.6	\$31.6	\$21.8
2002	2	13,121,000	97,900,000	\$4,723.6	\$586.1	\$44.7	\$8.1
2003	1	9,645,000	150,000,000	\$3,472.2	\$816.4	\$84.6	\$4.3
Totals/ Averages	54	515,819,385	14,293,932,929	\$264,295.0	\$15,335.10	\$29.73	\$17.2

A very crude look at the relationship between exploration spending and gold resources in major deposits can be calculated by dividing the dollars spent seeking gold by the amount of gold found. This calculation does not take into account capital requirements, mining costs, or recovery rates, which will eventually determine the economics of any deposit. In the 13 years covered by this survey, the industry's average cost of finding gold in a major discovery is \$29.73/oz.

Looking at the same group of discoveries in terms of the U.S. dollar value of all metals in the resources, using MEG's nominal metals values, the average in-situ value found per dollar spent over the 13 years surveyed is \$17.20. This figure does not take into account processing losses or operating costs, nor any net-present-value calculation, and is simply a number that can allow comparisons between various exploration results involving mixed metals.

44% of gold in major discoveries found in Latin America

As illustrated in Figure 3 below and Table 3 on the next page, Latin America has been the most successful region for the discovery of large gold deposits in the past 13 years, with more than 223 million oz of gold defined in 18 significant deposits. Gold discoveries in Africa and the Middle East

Figure 3: Gold In Major Discoveries By Location

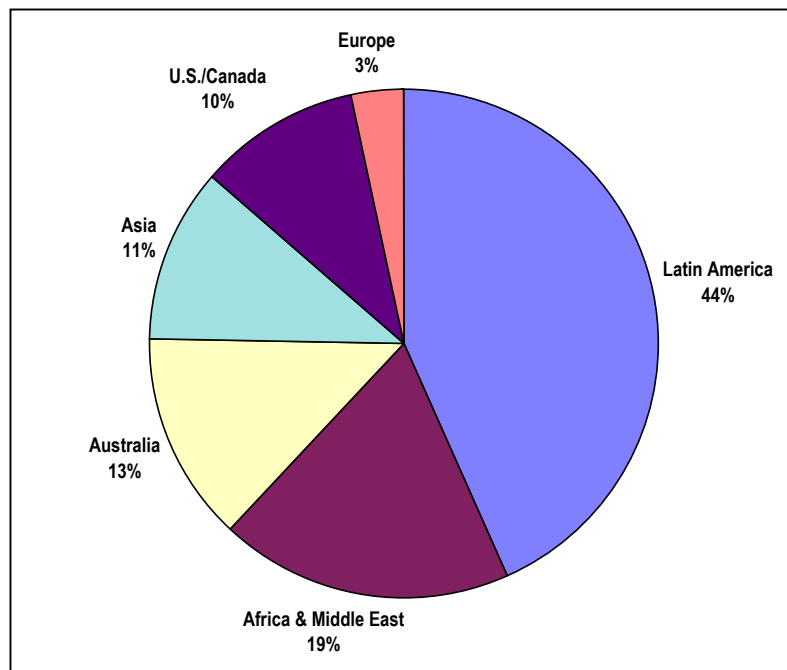


Table 3: Major Gold Discoveries By Location

Location	Number of Major Discoveries	Reserves & Resources Tonnage (mil mt)	Average Grade (g/mt)	Reserves & Resources Gold (mil oz)	Past Production (mil oz)	Reserves, Resources & Past Production (mil oz)
Latin America	18	7,727.2	0.81	200.9	20.4	223.4
Africa & Middle East	12	889.0	3.10	88.7	6.6	96.0
Australia	7	1,696.5	1.11	60.3	8.2	69.4
Asia	7	2,831.5	0.62	56.8		56.8
U.S./Canada	9	262.7	5.93	50.1	2.1	52.4
Europe	1	435.6	1.27	17.8		17.8
Totals/Average	54	13,842.5	1.07	474.6	37.3	515.8

accounted for 96 million oz in 12 deposits, followed by Australia with 69.4 million oz in seven deposits, Asia with 56.8 million oz in seven deposits, U.S./Canada with 52.4 million oz in nine deposits, and Europe with 17.8 million oz in one deposit, Gabriel Resources's Rosia Montana in Romania, currently the subject of feasibility work.

Twelve primary copper projects also considered major gold discoveries

Table 4 on the next page lists the 54 projects identified as major gold discoveries originally found between 1991 and 2003. In addition to 42 primary gold projects, the list includes 12 primary copper projects that also contain at least 3 million oz of gold each.

The largest of the three 1991 discoveries is AngloGold Ashanti's *Sadiola Hill* gold mine in Mali, which was discovered by Iamgold, with the government of Mali retaining a 20% carried interest. In 1993, AngloGold earned into a 40% interest, and in 1994 the IFC obtained a 6% interest in the project as part of the financial arrangements for the mine, diluting the percentages of the other owners. In 2003, Sadiola Hill produced 452,630 oz of gold at total production costs of \$275/oz. Currently, the partners are infill drilling the hard sulfides, with a final feasibility study on that aspect of the project scheduled for completion by 2005.

The largest of the five 1992 discoveries is Crystallex's *Las Cristinas* project in Venezuela, found by Placer Dome, which completed a positive feasibility study in 1996. However, the project was mired in political and legal controversy for years, and Placer sold out to Vanessa Ventures in 2001. The legal arguments are continuing, although rival claimant Crystallex, which is conducting some drilling and is re-assessing the project design, seems to have control. The deposit contains 11.1 million oz of gold in 297 million mt of reserves grading 1.17 g/mt Au, with an additional 27.5 million oz in resources.

Table 4 : 54 Major Gold Discoveries, 1991-2003
(listed by year of discovery and size)

Discovery Year/Project	Location	Development Stage in 2003	Primary Metal	Discovered by	Gold in Reserves, Resources, and Past Production (oz)	Value of All Metals (US\$ mil)
1991						
Sadiola Hill	Mali	PRD	AU	Iamgold 80% Government of Mali 20%	6,936,994	\$2,497.3
Hope Bay	Canada	FEA	AU	BHP Minerals	5,420,000	\$1,951.2
Tanami	Australia	PRD	AU	North Flinders	3,030,000	\$1,090.8
Totals					15,386,994	\$5,539.3
1992						
Las Cristinas	Venezuela	FEA	AU	Placer Dome	38,709,000	\$13,935.2
Target	South Africa	PRD	AU	Anglovaal	8,424,957	\$3,033.0
Tampakan	Philippines	RD	CU	WMC	6,759,000	\$12,721.9
South Pipeline	United States	PRD	AU	Placer Dome	5,138,000	\$1,849.7
Leeville	United States	PRE	AU	Newmont Mining 60% High Desert 40%	4,501,000	\$1,620.4
Totals					63,531,957	\$33,160.2
1993						
Pascua-Lama	Chile	PRE	AU	Lac Minerals	23,673,000	\$12,672.7
Cadia Hill	Australia	PRD	AU	Newcrest Mining	19,746,406	\$13,614.8
Sunrise Dam	Australia	PRD	AU	Billiton (Shell)	6,569,944	\$2,365.2
Agua Rica	Argentina	FEA	CU	BHP Minerals	5,546,000	\$2,382.4
Akyem	Ghana	FEA	AU	Gencor	4,911,000	\$1,768.0
North Mara	Tanzania	PRD	AU	East African Gold	4,755,478	\$1,712.0
Vanguardia	Argentina	PRD	AU	AngloGold	4,665,266	\$1,679.5
Pogo	United States	PRE	AU	Sumitomo	4,517,000	\$1,626.1
Totals					74,384,094	\$37,820.7
1994						
Yamfo-Sefwi	Ghana	FEA	AU	Mine Or	6,326,000	\$2,277.4
Cadia East	Australia	PRD	AU	Newcrest Mining	5,597,700	\$2,015.2
Marcapunta	Peru	RD	CU	El Brocal	3,217,000	\$6,646.7
Totals					15,140,700	\$10,939.3

Table 4: Major Gold Discoveries, 1991-2003 (cont'd)
(listed by year of discovery and size)

Discovery Year/Project	Location	Development Stage in 2003	Primary Metal	Discovered by	Gold in Reserves, Resources, and Past Production (oz)	Value of All Metals (US\$ mil)
1995						
Minas Conga	Peru	RD	AU	Newmont 60% Buenaventura 40%	47,483,000	\$20,334.9
Yanacocha	Peru	PRD	AU	Newmont 60% Buenaventura 40%	12,795,251	\$4,606.3
Red Lake	Canada	PRD	AU	Goldcorp	9,693,460	\$3,489.6
Pierina	Peru	PRD	AU	Arequipa Resources	8,057,305	\$2,987.5
Rodeo	United States	PRD	AU	Barrick Gold	6,304,000	\$2,269.4
Tantahuatay	Peru	RD	CU	Buenaventura	4,398,000	\$7,361.8
Jinfeng	Chile	FEA	AU	Province of Guizhou	3,447,000	\$1,240.9
Jerritt Canyon	United States	PRD	AU	Independence Mining	3,330,000	\$1,198.8
Totals					95,508,016	\$43,489.2
1996						
Yanacocha (La Quinua)	Peru	PRD	AU	Newmont Mining	25,303,171	\$9,109.1
Kucing Liar	Indonesia	RD	CU	Freeport-McMoRan Copper & Gold	18,931,000	\$8,526.9
Ridgeway	Australia	PRD	AU	Newcrest Mining	6,851,500	\$3,715.7
Meliadine West	Canada	RD	AU	WMC	4,503,000	\$1,621.1
Dolores	Mexico	FEA	AU	Minefinders	3,314,000	\$1,931.7
Totals					58,902,671	\$24,904.5
1997						
Veladero	Argentina	PRE	AU	Argentina Gold	14,314,000	\$6,115.1
Morila	Mali	PRD	AU	Randgold Resources	12,304,189	\$4,429.5
Reko Diq	Pakistan	FEA	CU	BHP Minerals	9,130,000	\$13,933.4
El Morro	Chile	RD	CU	Metallica	7,625,000	\$8,185.4
Alemao	Brazil	RD	CU	CVRD	4,919,000	\$6,987.8
Martabe	Indonesia	RD	AU	Newmont	3,665,000	\$1,319.4
Esquel	Argentina	FEA	AU	Sunshine Mining	3,115,000	\$1,149.2
Sukari	Egypt	FEA	AU	Centamin	3,071,000	\$1,105.6
Mirador	Ecuador	FEA	CU	Billiton	3,012,000	\$7,126.1
Totals					61,155,189	\$50,351.5

Table 4: Major Gold Discoveries, 1991-2003 (cont'd)
(listed by year of discovery and size)

Discovery Year/Project	Location	Development Stage in 2003	Primary Metal	Discovered by	Gold in Reserves, Resources, and Past Production (oz)	Value of All Metals (US\$ mil)
1998						
Target North	South Africa	FEA	AU	Anglovaal	24,480,000	\$8,812.8
Telfer	Australia	PRE	AU	Newcrest Mining	17,911,000	\$8,277.7
Rosia Montana	Romania	FEA	AU	Gabriel Resources	17,838,000	\$6,808.7
Kisladag	Turkey	PRE	AU	Eldorado	5,064,000	\$1,823.0
Granny Smith	Australia	PRD	AU	Placer Dome	9,650,765	\$3,474.3
Totals					74,943,765	\$29,196.5
1999						
Burnstone	South Africa	RD	AU	Southgold	5,975,000	\$2,151.0
2000						
Boyongan	Philippines	RD	CU	Anglo American	5,210,000	\$4,017.8
Esperanza	Chile	RD	CU	Antofagasta	3,703,000	\$1,333.1
Totals					8,913,000	\$5,350.9
2001						
Oyu Tolgoi	Mongolia	RD	CU	Ivanhoe Mines	9,705,000	\$9,773.8
Alto Chicama	Peru	PRE	AU	Barrick Gold	9,507,000	\$3,422.5
Totals					19,212,000	\$13,196.3
2002						
Cortez Hills	United States	RD	AU	Placer Dome	9,019,000	\$3,246.8
Copler	Turkey	RD	AU	Anatolia	4,102,000	\$1,476.7
Totals					13,121,000	\$4,723.5
2003						
Sari Gunary (Dashkasan)	Iran	FEA	AU	Rio Tinto	9,645,000	\$3,472.2
Grand Totals					515,819,386	\$264,295.1

A good year for gold exploration was in 1993, with eight deposits discovered that currently contain 74.4 million oz of gold in reserves and resources. The largest of these deposits is *Pascua-Lama*, which was originally discovered by Lac Minerals and was subsequently acquired by Barrick Gold. In July 2004, Barrick announced plans to proceed with the \$1.45 billion development of Pascua-Lama after construction was suspended three and a half years ago due to metals prices. First gold output is expected in 2009, taking into account a proposed 18-month permitting period and a planned three

years of construction. An average annual production of 687,500 oz of gold and 33 million oz of silver is projected for the first five years of operation.

In 1994, a joint venture between Gold Fields (57%) and BRGM subsidiary Min Or discovered **Yamfo-Sefwi** in Ghana. Through several transactions in 1999, Normandy Mining acquired a 90% interest in the project (government of Ghana 10%), through the restructuring of assets between Normandy and BRGM and by the purchase of Gold Fields's equity interest in the Centenary project. Newmont subsequently acquired Normandy. In 2003, Newmont cleared up ownership of resources at Yamfo-Sefwi by buying out Moydow Mines's interest in the nearby Ntotoroso property in a deal valued at \$20 million. Ntotoroso contains 1.2 million oz of reserves grading about 2.4 g/mt Au and is a 50/50 joint venture between Moydow and Newmont. Newmont is looking to develop Ntotoroso as part of the Yamfo-Sefwi project.

In 1995, Buenaventura (60%) and Newmont (40%) discovered the **Minas Conga** copper-gold and **Cerro Yanacocha** gold deposits as part of the Yanacocha joint venture in Peru. Cerro Yanacocha was brought into production, but a prefeasibility study completed in 2003 estimated that Minas Conga would require \$900 million in initial capital and a total \$1.3 billion over a potential 16-year mine life. Total production over the 16 years is projected at 8.78 million oz of gold, or an average of 585,000 oz/y of gold, and 1.2 million mt of copper, or 72,600 mt/y of copper, with annual production rates varying considerably over the mine life. After a 28-month permitting process, construction could start in 2008, preproduction in 2009, and mining in 2010. More than 31 million oz of the reported 47.4 million oz of total resources are in reserves.

In 1996, the Yanacocha joint venture made another major discovery in Peru, the **La Quinua** deposit, which was subsumed into the Yanacocha operation and came onstream as an open pit mine in 2001. Also in 1996, Freeport-McMoRan (51%) and Rio Tinto (40%) discovered the **Kucing Liar** deposit (government of Indonesia 9%) in the Grasberg area of Indonesia. While primarily a copper deposit, with 6.5 million mt of copper contained in 499 million mt of reserves grading 1.31% Cu, Kucing Liar also contains almost 19 million oz of gold at 1.18 g/mt Au and 90 million oz of silver at 5.63 g/mt Ag. Kucing Liar reserves are included within the Grasberg project, and the deposit will be developed as a satellite orebody in due course.

The largest of the nine 1997 discoveries is **Veladero** in Argentina, discovered by Argentina Gold (60%) and Lac Minerals (40%) and currently wholly owned by Barrick Gold. During the June 2004 quarter, Barrick signed a \$250 million project financing for Veladero with commercial banks and export credit agencies. The first drawdown was anticipated during the September 2004 quarter.

The 24.5-million-oz **Target North/Sun** deposit was discovered in 1998 by Anglovaal north of its smaller Target underground mine (which itself was one of the major discoveries in 1992). The project is currently owned by Avgold (Harmony 54%, African Rainbow 43%), with the rest held by the public. Harmony and Avgold are performing a joint feasibility study on the Target North resource. There are several development models under consideration, with capital costs likely to start at \$111 million (R700 million) and to eventually amount to billions of rand.

The only 1999 discovery identified so far is Great Basin Gold's 80%-owned underground **Burnstone** deposit (Tranter Investments 20%) in South Africa, which was discovered by Southgold Exploration, under the direction of the management of Pangea. While still relatively early stage, some analysts believe Burnstone is one of the top undeveloped gold prospects in the world, because of its size and relatively high grades. According to a technical review completed for Southgold by South African engineering firm The Mineral Corporation, initial potential annual gold production at Burnstone is estimated to be 144,000 oz, which Great Basin expects could be substantially increased with additional engineering work.

The **Boyongan** copper-gold porphyry deposit was discovered in August 2000 under a joint venture between Philex Gold and Anglo American. Philex Gold recently reported that inferred oxide and sulfide resources at Boyongan total 219 million mt grading 0.51% Cu and 0.74 g/mt Au. Drilling is continuing, with some recent success at the Bayugo prospect, 1,200 meters northwest of Boyongan.

Ivanhoe Mines drilled the discovery hole at the Hugo Dummett deposit at **Oyu Tolgoi** in Mongolia in July 2001. Previously, during the 1997 field season, BHP carried out geological, geochemical, and geophysical surveys, and completed a diamond drilling program that identified copper-gold mineralization at the South deposit, but the project did not pass BHP's preliminary economic criteria. BHP sold the prospect to Ivanhoe in 1999 and sold its remaining 2% royalty to Ivanhoe this year for \$37 million in cash.

In October 2002, the sixth hole of the Cortez joint venture's (Placer Dome 60%, Rio Tinto 40%) seven-hole RC program resulted in the discovery of **Cortez Hills**, 12 km southeast of Cortez's Pipeline complex in Nevada. The hole intercepted 36.6 m grading 9.5 g/mt, and three follow-up holes were drilled around it to confirm continuity. Reserves were recently increased to 7.4 million oz of gold contained in 42.9 million mt grading 5.4 g/mt Au, with an additional 1.6 million oz of gold in resources.

In May 2003, the Iranian Ministry of Mines reported that Rio Tinto had shifted its focus to the *Sari Gunary* gold discovery (formerly known as Dashkasan) in the district of Dashkasan in Kurdistan province, where Rio Tinto had spent \$4 million in gold exploration since 1999. Reconnaissance and evaluation programs conducted by Rio Tinto identified the Dashkasan property, and Rio Tinto began drilling there in early 2003. The Ministry reported grades of 1.8-2 g/mt Au, and other sources estimated a total of 10 million oz of gold. Rio Tinto reports that feasibility studies on the project will start within the next two years, but declined to comment on possible reserves in the deposit. In the March 2004 quarter, Rio Tinto transferred Sari Gunary to its technology group for the next stage of evaluation. ♦