IDAHO MINING AND EXPLORATION, 1993

Earl H. Bennett
Virginia S. Gillerman

FINAL REPORT COMPILED AND FORMATTED BY

Jacob A. Eldredge
Haley L. Nelson
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This report updates and replaces staff report S-94-1.

Staff Report 24-04
April 2024

Idaho Geological Survey
Morrill Hall, Third Floor
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Staff Reports present timely information for public distribution. This publication may not conform to the agency's standards.

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TABLE OF CONTENTS

FIGURES

*See supplemental document **S-24-04_suppl.pdf** for the visual presentation on Idaho Mining and Exploration in 1993.*

TABLES

IDAHO MINING AND EXPLORATION, 1993

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INTRODUCTION

The purpose of this paper is to summarize and describe all mining and mineral-related activity in Idaho for 1993. Sources used to compile this document include U.S. Forest Service and Bureau of Land Management mineral specialists in the state, the U.S. Bureau of Mines, information from the Mine Safety and Health Administration (MSHA), numerous company geologists and spokespersons, the Idaho Mining Association, and clippings from area and trade newspapers and periodicals. In 1993, the environment overshadowed everything else that affected the mining industry, and these issues are discussed in a separate section. We begin our annual review with a summary of national and international events that directly or indirectly influenced Idaho's mining sector.

The 42nd President of the United States, Bill Clinton, finished his first year in office in 1993. The first Democratic president in 12 years was busy, installing a new administration, taking care of pressing domestic problems, and dealing with international events at year's end.

The first test of the President's political acumen came with the passage of his budget, which just squeaked through Congress. The North American Free Trade Agreement (NAFTA) was approved by Congress in November. A turning point on NAFTA was a one- sided debate won by Vice President Al Gore over H. Ross Perot.

The greatest flood in 500 years left the upper part of the Mississippi Basin drowned in rampaging river waters. The disaster resulted in 48 deaths and over $10 billion in damage. Terrorism came to the United States with the bombing of the World Trade Center in New York in February. The nation watched in horror as 85 members of the Branch Davidian cult, including 17 children, died in a fiery grave at their compound near Waco, Texas.

The war in Bosnia, problems with the relief effort in Somalia, unrest in Haiti, a political upheaval in Russia, and the prospect of peace in the Middle East were important foreign policy questions during 1993.

THE NATION'S ECONOMY

The United States economy continued to enjoy the longest bull market since World War II. The Dow Jones Average posted a 450-point gain for the year spurred by low-low interest rates and

negligible inflation. The Dow broke its own record three times in December alone, reaching an all-time high of 3,792 on December 28. At year's end, some Wall Street analysts were predicting a downward correction while others forecast a continued bull market with the Dow predicted to reach the 4,000 mark.

The Federal Reserve supported the lowest interest rates in recent history as the economy slowly moved out of recession. Interest rates for Certificates of Deposit (CD's), government bonds, savings accounts, and other "safe" investments declined or remained at recent lows. Investors fled the low interest, but safe instruments and huge amounts of money flowed into mutual funds. Savings banks began to sell the funds and the capital available to industry by selling stock and other equity was almost unlimited. Every hint of a heating up of the economy, with possible increases in interest rates, fueled fears of inflation. But dire predictions of a sharp correction in the market did not come to pass. Oil, accounting for the lion's share of the U.S. trade deficit, whipsawed the markets with every rumor that the Organization of Petroleum Exporting Countries (OPEC) would limit production and thereby increase prices. As with inflation, these fears were proved groundless, as OPEC failed to set any production limits.

IDAHO'S ECONOMY

Drawn by the promise of jobs and a quality lifestyle, Idaho ranked second in the United States in population growth and enjoyed an annual non-agricultural employment increase of three percent in 1993. Since 1989, more than 75,000 people have moved to the state. Idaho finished the year the envy of most states in the country. Growth was centered in Ada, Kootenai, Canyon, and Bonneville counties. While not recession-proof, the state skipped through the economic slowdown plaguing the rest of the nation with little pain and lots of gain.

According to the Department of Employment, Idaho gained 30,900 non-agricultural jobs from 1990 to 1992. This was an 8.4% growth rate, which was excellent considering that the country was in recession. Almost all employment sectors gained, with the exception of the mining industry, which lost 1,300 jobs.

As with jobs, most areas of the state's economy remained strong. Revenues again exceeded projections, with the state ending the year with a $50+ million surplus above last year’s most optimistic estimate. The state's mining industry was again the exception. The value of non-fuel mineral production decreased from $306 million to $283 million based on preliminary figures supplied by the U.S. Bureau of Mines (Table 1).

SELECTED METAL ECONOMICS

A note in the Wall Street Journal (10/25/93) proclaimed, "the world is awash with metal." Metal inventories remained at record highs during the year, resulting in a continuing decline in base metal prices. Overproduction, excess smelter capacity, and a reluctance by miners to cut production were responsible for the oversupply.

As Japan and Europe slipped into full-blown recessions and the U.S. economy recovered very slowly, base metal demand waned. The Commonwealth of Independent States (CIS, the former

Soviet Union) dumped aluminum, cobalt, nickel, and other metals on an already oversupplied world market. China, recently a big buyer of copper, became a seller in mid-year.

Copper sold for over a dollar a pound in January, with Comex stocks at 107,490 short tons. The price fell to a 5 1/2-year low in May. Prices were artificially stabilized in the summer by Far East interests in a process called backwardization. Prices jumped with the political problems in Russia in September, indicating just how important the CIS countries have become in the world metal markets. When backwardization was removed in October, the price fell to 72 cents per pound, the lowest in six years. Exchange stocks reached a 15-year high of 612,900 tons in October. Copper improved at year's end to 82 cents per pound.

Spot prices for lead fell to 18 cents per pound and zinc to 41 cents per pound in November, after starting the year at 20 cents and 50 cents, respectively. Rumored and real cutbacks in Canada's and Europe's production stabilized zinc at 44 cents per pound and lead at 22 cents per pound late in the year.

At year's end, the gloom and doom forecasts began to brighten. Fundamentals of supply and demand had not changed for most base metals, but investor confidence had reversed, and money flowed into commodity funds, fueling better prices.

Cobalt commanded the most interest and was the most volatile of any of the minor metals during 1993. The metal could be important to Idaho because of the Blackbird mine in east-central Idaho, which is the nation's most readily available source of cobalt.

Political and economic unrest in Zaire (35% of world production) and Zambia (19%) drove cobalt prices to the $30 per pound range at the beginning of 1992. Dumping of cobalt by Russia (20% of world production) helped soften this market and prices finished the year in the $15 per pound range. China played the cobalt market, taking advantage of cheap lower-grade Russian cobalt, which sold for under $10 per pound by mid-year. Adding to the available stocks were auctions of cobalt rondelles and granules from the Defense National Stockpile (24,000 tonnes) by the Defense Department. Although the African countries continue to have problems, prices stabilized in the $14-$15 range for western metal and the $10-12 range for lower-grade Russian cobalt. Cutbacks in nickel production (cobalt byproduct) and decreased exports in the second half of 1993 by the Russians helped the market. Other sources of cobalt include Canada (15%) and Finland (6%). Prices jumped at year's end when Zaire's Shaba province threatened to secede and assume its former name, Katanga. The province contains most of Zaire's copper and cobalt resources.

Shareholders approved a merger between Cyprus Minerals Company and Amax, Inc., in November. The two firms accounted for about 73% of domestic molybdenum production (46 million pounds) in 1992. Combined, Cyprus Amax Minerals Company will be the largest molybdenum company in the world, producing about 53 million pounds next year. The two companies have assets of $5 billion and posted separate earnings of $2.8 billion last year. The merger may save $120 million or more in separate administrative costs annually. Cyprus shut down the Thompson Creek molybdenum mine in Idaho and its moly operation at Tonopah last year taking write-downs of $66.5 million and $44 million, respectively. The company produces almost as much of the metal from its Bagdad and Sierrita copper mines (over 25 million pounds), as Amax

did from its Henderson mine in Colorado, which is still operating. Recent fatalities in the glutted market were Molycorp's mine at Questa, New Mexico, and Amax's own Climax mine in Colorado. Moly prices continued to improve from last year's 20-year low of $1.60-$1.70 per pound. Oxide was selling at $2.55-$2.63 per pound in November and had improved by 10 cents per pound at year's end. The price hit highs in the $20 per pound range in the late l 970's. Antitrust concerns about the merger were removed by the Justice Department after Cyprus agreed to sell Thompson Creek (its primary moly producing mine) and Amax said it would get rid of a roasting facility in Pennsylvania.

Gold prices started the year in the pits, following an almost steady decline of the June contract price last year from $370 per ounce to the $330 range at year's end. The plunge was caused in part by lackluster demand last year and by the sale of some 400 metric tons of gold by the Dutch Central Bank in October and November to finance budget deficits. Rumors were that the Chinese, enjoying a huge trade surplus, picked up the bulk of the Dutch liquidation. According to Gold Fields Mineral Services, Ltd., the Chinese were the largest buyers of gold in 1992. Chinese investors flocked to the metal to avoid rampant inflation (20% in some cities) in an overheated Chinese economy. Belgium sold 6.5 million ounces in April, 1992. The report noted that central banks dumped some 599 tonnes during 1992, the largest sales since 1968. With more selling by Middle East speculators, the metal hit a seven-year low of $328 per ounce at the new year.

Demand from India and the Middle East improved the price to $333 in January before it sank again to a new low of $326 per ounce in early March. With the threat of inflation renewed (but unreal), the price rose to $338 in late March.

A rally began on April 26th, when Sir James Goldsmith (General Oriental Investments) sold a 13% stake (10 million shares) in Newmont Mining Company to George Soros for $395 million. Sir James then invested the windfall in gold futures, and it was off to the races. George Soros was the canny currency trader who reportedly made over $1 billion betting against the British pound and the Italian lira in the European currency collapse last year. Racial unrest in South Africa, the world's largest producer of the yellow metal, fueled the rally in mid-April. The price soared to $353, the highest in eight months, and continued to climb.

There was more excitement in early May, when the 50-day moving average of the metal's price came close to overtaking the 200-day average, a benchmark known as the "Golden Cross" by investors. Also in May, Goldsmith sold another 9.5% in Newmont to institutional investors via three international investment banks who had bought the shares earlier. The value of the transaction was $296 million and left Sir James with 19.5% of Newmont. India continued to be a major buyer, purchasing some 114 tonnes of gold in the first four months of the year. The rally continued to $384 in mid-May (the highest price since the Gulf War in 1991), finally reaching $406 per ounce (a three-year high, stimulated by another European currency crisis and huge investments by mutual funds) on August 2.

With a calming of the latest currency crisis and selling by the Chinese, the price began to retreat. The biggest single-day sell-off in gold since the Persian Gulf war occurred on August 6th, with the December contract falling $22.60 to $380.

Prices rose to the $365 level in mid-September due to the Russian political crisis, fell back to $340 on September 13, and then rose again to over $370 in mid- October. A sharp retreat to $362 occurred in late October. This was followed by a jump to the $378- level in early November. A failure by OPEC to limit petroleum production caused a sharp falloff in crude oil prices early in December. Also, the Nikkei Index of Japanese stocks took a sharp decline, reflecting the recession in Japan. The Russians announced plans to sell domestically some $975 million in gold to pay for additional government spending. Gold reacted and the price declined to $371 as fears of inflation waned early in December. But following a general year-end rally in metals, gold soared to the $390 range in late December. Part of the increase was in reaction to the news that the fourth largest bank in Spain (Banesto) might fail.

One of the great mysteries of the rally is, "why is it happening?" One answer may be from a Wall Street Journal article by Getler and Raghavan (5/21/93), appropriately called the "lemming theory." The theory says that everybody followed Goldsmith and Soros. Other ideas such as, "gold is a traditional hedge against inflation" are not believable because inflation was a non-entity in 1993. Deacon D de Zoete Wedd notes that fabrication demand was not the cause (the demand actually decreased in the second quarter due to increased prices) and that bull markets in gold rely not on fabrication demand, but on investment demand (i.e., speculation). Helping the rally was the fact that gold producers did not sell forward and stall rising prices early in the rally, as has happened in the past. Indeed, many companies sold new stock offerings to raise money rather than hedge on precious metals. Another big factor was the vast capital available through mutual funds (specifically the precious metal funds), which have grown to huge amounts as investors fled safer, but lower interest, instruments. Central banks, holding some 35,000 tonnes of the yellow metal, also sat on the sidelines and did not sell into the market. Finally, although the economy of Europe and Japan remained depressed, the U.S. economy stirred to life in mid-year and was almost robust by the year's end.

The average price of silver in 1992 was $3.94 per ounce, the lowest since 1973. Idaho's favorite metal remained tarnished until late March when a mid-year rally began. Riding on gold's coat tails, the metal rose to $3.60 per ounce in May and finally broke through the $5.00 per ounce barrier in July. Supported by the Silver Institute's Annual Report, claiming fabrication demand was again exceeding newly mined stocks, the price stabilized until early August. Again, following gold, the metal plunged on August 6th to the $4.60 range. The price retreated farther in early September to below $4.00 per ounce but climbed back above this mark where it remained until early October. Speculative buying by Middle Eastern interests then drove the price 30 cents per ounce higher to $4.38 the first week in October. Xerox Corporation announced in late October that they had developed a new film for graphics arts and printing applications that does not use any silver. Although the new product has the potential to capture only about 6% of the film market (the largest use of silver) the price of the metal plunged 14.2 cents per ounce. On November 30, the metal followed gold with the price of the March contract falling 19.9 cent to $4.49 per ounce. But the rally in silver continued. Eastern investors were heavily in the futures market in December, driving the price to $4.95 on the eighth and to over $5.00 in mid-month. The March contract finished the year at $5.11 per ounce. Small investors and Japanese dealers were responsible for the support.

Warehouse stocks of silver on COMEX reached an all-time high of 275.2 million ounces on March 16, 1992. The stocks increased to the 279–280-million-ounce range during August and September

of this year. On November 2, 1993, the stocks were 276,797,487 ounces, which fell to 268,454,290 ounces by December 17. The near-record volume of silver stored in COMEX indicates that there is little shortage of the metal for industrial use. The run-up in silver prices, like gold, is driven by speculation stimulated by commodity funds.

Mexico, the top silver-producing country in the world (65 million ounces in 1992), literally put its silver where its money is. The government introduced a 20-peso silver-bearing coin (1/4 ounce of silver) in addition to the 10-peso piece (1/6th of an ounce) released last year. Although meant to be circulating money, the coins are reportedly being hoarded as collectibles as fast as they are produced. The coinage is expected to soak up some 23 million ounces of Mexican silver per year.

MINING IN IDAHO

INTRODUCTION

The Mine Safety and Health Administration (MSHA) inspected 48 active metal, phosphate, and other industrial rock and mineral mines and 131 stone and rock crushing and sand and gravel operations during the year. According to the Department of Employment, there were 2,500 people employed in the state's mining industry in October (3.8% decrease from last year), with 1,200 in metal mining (14.3% decrease). Another 1,300 worked in the stone, glass, and concrete-related products sector (most using materials mined in Idaho) and some 4,500 were employed in chemical industries, with many of these jobs in phosphate and related businesses in southeast Idaho. From 1990 to 1992, the mining industry lost 1,300 jobs. The average wage paid by the industry in 1992 was $38,193, and in 1993, wages remained among the highest for industrial workers in the state.

Estimated nonfuel mineral production for Idaho in 1993, along with 1992 data for comparison, is shown in Table 1. Production from 1982 to 1993 is shown graphically in Figure 1. Based on the preliminary figures, the state enjoyed an increase in the amount and value of gold production, sand, and gravel, but a decrease in phosphate and the combined value of other minerals. In 1992, for the first time in recent history, the value of sand and gravel used for construction materials exceeded the value of the state's silver production. In 1993, this trend continued, but the value of sand and gravel nearly equaled the value of Idaho's gold production. This is a reflection of low international precious metal prices and the local construction boom currently under way in Idaho.

Note that starting last year, IGS showed the value of the state's phosphate production based on finished products (merchant grade phosphoric acid or elemental phosphorus) as shown in Table 2 and Figure 2. Using this method, the 3.9 million tons of newly mined phosphate ore would be converted into products worth $411 million ($105 per ton for acid and elemental phosphorus) as shown in Table 2, instead of $59.75 million ($15 per ton, the value of the raw ore) as shown in Table 1.

Table 1. Nonfuel Mineral Production in Idaho.

Table 1. Nonfuel Mineral Production in Idaho.				
MINERAL	1992		1993/e	
	Quantity	Value*	Quantity	Value*
Gemstones	NA	390	NA	70
Gold[2] ----------kilograms	3,177	35,241	4,300	49,078
Phosphate rock --thousand metric tons	5,208	84,000	3,880	59,750
Pumice ----------metric tons	55,525	401	59,626	451
Sand and Gravel: Construction --thousand short tons	14,096	40,728	17,000	47,600
Industrial ----thousand short tons	802	9,214	W	W
Silver[2] ----------metric tons	254	32,131	246	33,218
Stone (crushed)-thousand short tons	4,000e/	19,200e/	5,100	25,000
Combined value of antimony, cement, clays, garnet, copper, lead, molybdenum (1992), perlite, stone (dimension), vanadium, zinc, lime, and values indicated by symbol W -----	XX	84,756	XX	67,401
Total	XX	306,061	XX	282,568

* (in thousands)
e/Estimated. NA/Not Available. W/Witheld to avoid disclosing company proprietary data: value included with "Combined value" figure. XX/Not applicable.
1/Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
2/Recoverable content of ores, etc.
Data from U.S. Bureau of Mines

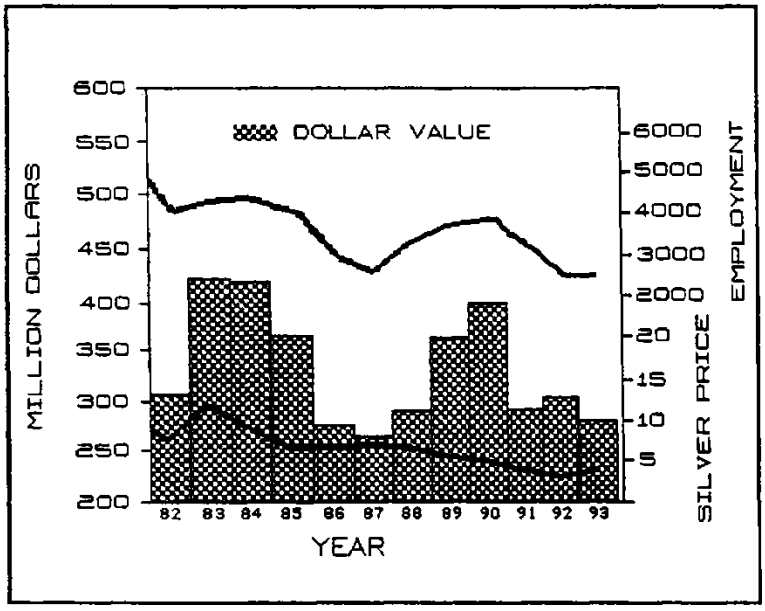

Figure 1. Nonfuel mineral production in Idaho, 1982-1993.

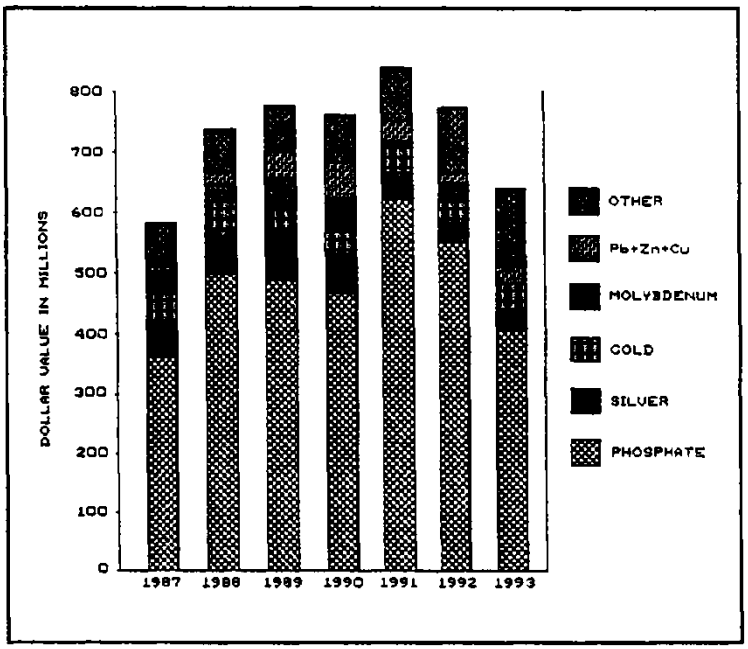

Figure 2. Nonfuel mineral production in Idaho by commodity, 1987-1993.

ACTIVE MINES AND PROCESSING PLANTS

COEUR D'ALENE MINING DISTRICT

Introduction

Hard times continue to plague the Silver Valley's mining community. Only 670 people were employed in mining in north Idaho in September, compared to 1,744 in 1990. Unemployment in Shoshone County was about 20% versus 5- 6% for the state as a whole.

Asarco, Inc.

The closure of the Galena and Coeur mines in 1991 and 1992 cost 400 miners their jobs and helped drive unemployment in Shoshone County to nearly 25%. About 30 employees are still working at the two mines doing maintenance. Both mines are owned by Coeur d'Alene Mines Corporation and operated by Asarco. Three employees working at the Morning shop and another eight caretaking the Galena mine were affected by a new labor contract which froze wages and benefits for three years.

Asarco added its own Troy mine in Montana to the list of closures in 1993, with the loss of another 300 jobs. Low silver prices were the problem for all three mines. The company is proceeding with plans to develop the Rock Creek mine (copper/silver, similar to Troy) in Montana.

Asarco's office in Wallace was closed, with only a couple of employees remaining on the permanent payroll at year's end. Most of the Wallace office's functions have been transferred to

Salt Lake City. Fred Owsley, manager of the highly successful Northwestern Mining Department for many years, retired. The mines are now the responsibility of Mr. Curtis Bates, who will run the Western Metals Division of Asarco from Salt Lake City.

Bunker Hill Mine

(For more Bunker Hill news see, Environmental News-Bunker Hill Superfund)

Bob Hopper, owner of Placer Mining Corporation, purchased the mineral rights to the Bunker Hill mine last year. Eight men were employed this year in the cleanup and restoration of the mine. Rehabilitation is concentrating on the main Kellogg tunnel level. The company is trying to interest a major operating partner in the property. In the interim, the company is mining pyromorphite crystals, which are sold to gem and mineral collectors. A gravity mill is planned for the property, which will process 40-50 tons of ore per day.

At Mr. Hopper's request, all of the Bunker Hill mine maps and technical files were returned by IGS in mid-year. The Survey owns the records, which were moved to Osburn for safekeeping following the bankruptcy of the Bunker Hill Company in 1991.
Harry Magnuson, well-known north Idaho businessman, was a partner in the Bunker Limited Partnership, which went bankrupt in 1992. He was ordered by Judge John Bengston in Moscow to pay Gulf Resources and Chemical Company $1.8 million, as his share outstanding from the original purchase agreement. The Partnership purchased the mining and. smelting complex in 1982. Duane Hagadone and J.R. Simplot, the other principals in the original partnership, settled earlier with Gulf. Their arrangements have not been made public, but an unsealed affidavit reportedly noted Simplot's share was $1.1 million.

In December, it was announced that Mr. Magnuson's home and office in Wallace and other holdings would be auctioned at the Shoshone County Courthouse at a Sheriffs sale on January 5, to satisfy the judgement. Mr. Magnuson is appealing the decision. (Note-- The auction of Mr. Magnuson's property was canceled early in January, 1994.)

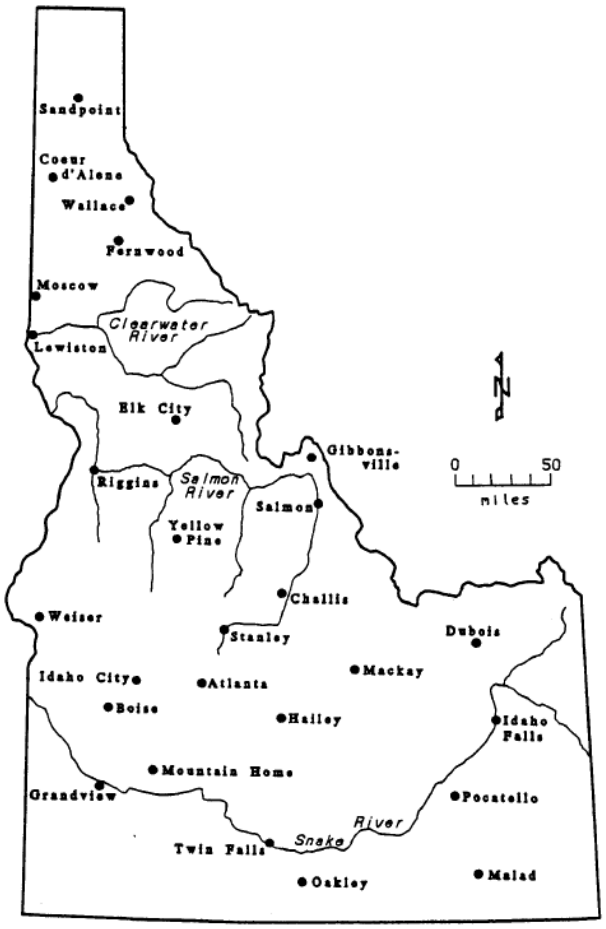

Figure 3. Location of selected cities and towns in Idaho.

Table 2. Value of nonfuel mineral production in Idaho, 1988-1993

(add 000 to all dollar figures)

Commodity	1988	1989	1990	1991	1992	1993/p
Gold	45,349	37,602	45,649	39,107	35,241	49,078
Moly	30,000e	53,890	44,634	13,419	28,841	-0-
Pb+Zn+Cu	19,089	41,830	67,947	18,400	18,000	17,500
Silver	71,512	77,651	68,418	43,807	32,131	33,218
Phosphate	498,730	488,236	464,280	627,626	552,048	411,280
Other	73,655	77,533	83,011	97,518	112,194	126,653
Total	738,335	776,742	773,939	839,877	778,455	637,729

Based on figures provided by the U.S. Bureau of Mines (USBM) except phosphate, which equals the USBM newly mined (not stockpiled) tonnage multiplied by a value of $106 per tonne. Annual totals include this new phosphate value and are therefore different that USBM totals. Other includes antimony, cement, clay, garnet, lime, stone (dimension and crushed), vanadium , feldpspar, perlite, pumice, gemstones, and sand and gavel.
e = Estimate. p = Preliminary.

Coeur d'Alene Mines Corporation

Coeur d'Alene Mines Corporation reported a loss of $759,000 in 1992, but this was a big improvement over the $14.4 million loss in 1991. The company produced 56,638 ounces of gold and 6.3 million ounces of silver in 1992. Unfortunately, none of this production was from Idaho, as the Galena and Coeur mines were closed. The company ended 1992 with the most ambitious financing plan in its history, raising some $75 million in convertible subordinated debentures to finance and purchase new mining operations. By the end of the third quarter of 1993, the company had a net loss of $8.2 million on revenues of $57.2 million. Included in the red ink was a one-time, out-of-court settlement of $1.9 million in cash and 4 million shares of stock, resolving a class action suit over a 1990 public stock offering. The company also settled with the Environmental Protection Agency (EPA) over the Bunker Hill Superfund site, paying $1.2 million as its share of cleanup costs, even though neither Cda Mines nor Callahan Mining Corporation (merged with Cda in 1991) ever owned or operated any property in the 21-square-mile area. By the agreement, the company is absolved of any further Superfund liability. The loss also included $2.3 million in write-offs on old delinquent promissory notes acquired from Royal Apex Silver when it merged with Cda Mines in 1988. Company mines produced 4,410,154 ounces of silver and 82,646 ounces of gold through the third quarter.

In May, the company purchased an 80% interest in the Golden Cross mine in New Zealand from Cyprus Gold New Zealand, Ltd., for $53 million in cash. The mine produced 100,000 ounces of gold and 370,000 ounces of silver last year, its first year of operation. Production costs are about $210 per ounce of gold and the mine has estimated reserves of 800,000 ounces. The new venture boosts the company's gold reserves to a high of 4 million ounces.

Coeur Alaska, Inc. (a wholly owned subsidiary) purchased a 2/3 interest in the Jualin gold property from International Curator Resources, Ltd. The property is adjacent to the Kensington gold project under way by Coeur and Echo Bay Exploration, Inc., near Juneau, Alaska. Coeur also entered a joint venture with Curator on the Boleo property in Southern Baja California, Mexico. Reserves at Boleo are 12.1 million tonnes of ore grading 3.32% copper and 0.10% cobalt. If placed in production, Boleo would be the first venture for the company outside of the precious metals market. Coeur will be the operator, if the Jualin and Boleo projects go forward.

At other mines, Coeur continued full operations at the Rochester silver/gold mine in Nevada and was evaluating results from a $3.6 million exploration venture at the Fachinal gold/silver project in southern Chile.

The company was one of twenty receiving a Star award from the National Environmental Development Association. The recognition is for Coeur's focus on natural resource protection, planning for pollution avoidance, and participation in community and government outreach programs. The company has received a number of awards for reclamation at the Thunder Mountain mine in central Idaho, which closed in 1990.

Coeur d'Alene Mines received some adverse publicity in May when a director quit the board over a dispute with company officers over executive compensation and the purchase of a Lear Jet and hanger for $2.1 million. The company claimed its salaries are in line with general business

practices and that the jet is badly needed for international and remote travel demanded by recent acquisitions.

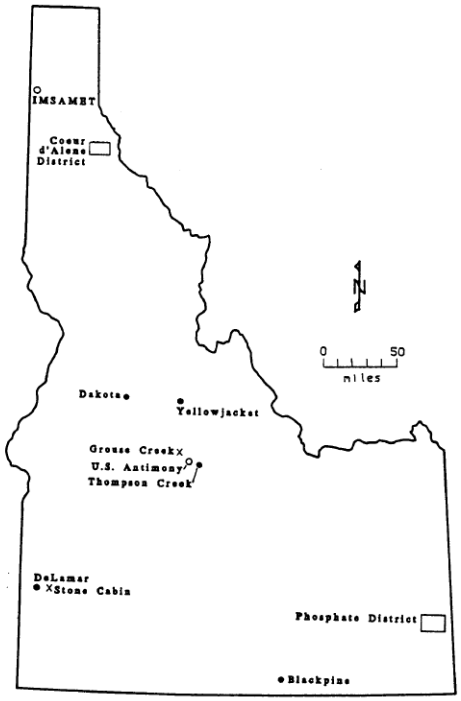

Figure 4. Active mines(•). processing plants (o), and mines under development (x) in Idaho, 1993.

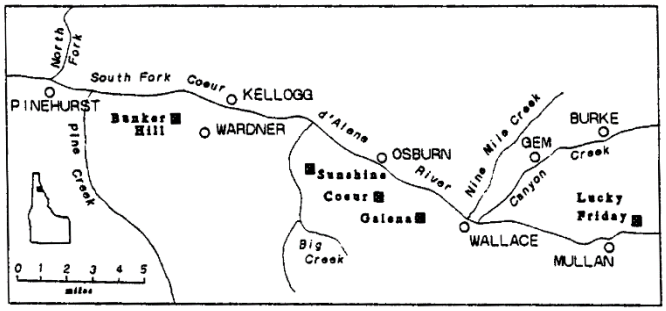

Figure 5. Coeur d'Alene Mining District, Idaho, 1993.

Hecla Mining Company

Hecla finished 1992 with a loss of $49.3 million due to write-downs and reclamation expenditures, including $8.5 million for Hecla's share of the accrued cleanup costs at the Bunker Hill Superfund site. As with other precious metal companies, a substantial part of the red ink was due to low metal prices. Although prices improved in 1993, the company still reported a $10 million loss for the first nine months of the year. Hecla sold $100 million (2 million shares) of Series B convertible preferred stock from May to June. Much of the new funding will be spent for starting up the Grouse Creek mine ($80 million) in Idaho and the LaChoya project ($10 million) in Mexico. Hecla continues to profit from its industrial minerals division, including the Kentucky-Tennessee Clay Company and the Colorado Aggregate Company.

Production increased from the Knob Hill Gold mine near Republic, Washington, due to improvements in the mill's crushing circuit. However, reserves at Republic and the nearby Golden Promise vein (the work horse for Hecla for the past few years) were down to 10 months in September.

The Golden Promise started the year with about 140,300 ounces in reserve and will produce about 50,000 ounces in 1993. Company geologists were frantically searching for additional reserves at year's end.

The company continued to develop the LaChoya mine near Hermosillo, Mexico. It will cost about $10 million to bring the mine online. The property contains reserves of 179,000 ounces of gold, or about 2 years of production. Company officials noted that it took 10 months to permit the LaChoya project versus 3 years for Grouse Creek. The processing plant from the Yellowpine mine (closed in 1992) was moved to the LaChoya site.

Hecla received an award for Excellence in Annual Operations of Large Hard Rock Mines from Governor Cecil Andrus and the state Land Commissioners in August. The recognition was for reclamation at the Yellowpine mine, which closed last year after producing about 100,000 ounces of gold. The reclamation project made headlines when Hecla used a new technology called bio-neutralization to neutralize cyanide in the leach pile. Hecla previously received the Industrial Pollution Control Award for Idaho in 1992 and the Top Reclamation Award for Excellence-Annual Operations in 1991, also for Yellowpine.

The Lucky Friday mine (Figure 6) remained in operation all year despite losing money. As in past years, it is still cheaper to keep the mine in production than to close it down. Development of the new discovery made last year on the 4050 level beneath the old Gold Hunter mine was placed on hold, waiting for better metal prices. Twenty-five miners, hired for the $2 million exploration project, were laid off early in the year.

A new 3 to 6-year contract was signed between the company and the United Steelworkers of America, Local 5114, who represent miners at the Friday. Workers will get a 25-cent-per-hour raise over each of the next three to six years. If Hecla decides to do more work in the Gold Hunter, the contract can be extended to six years, but if they do not, then the contract will be renegotiated in three years. Even if the Gold Hunter work proceeds, some parts of the contract can be revisited. The unique arrangement was the result of hard bargaining during the month of June, which included a federal mediator.

The last ore car was loaded at the Union Pacific siding at the Lucky Friday mine on April 28, 1993. The railroad is abandoning the line. Hecla will now have to ship its concentrates to the smelter by truck, at an additional cost of about $15,000 per month.

Hecla objected when the Shoshone County assessor valued the Lucky Friday mine at $24.1 million for tax purposes. The company claims that the mine is not worth anywhere near that much because it has lost money for the past few years. The county has experienced a serious erosion of its tax base due to mine closures. Hecla and the county are negotiating the disagreement.

In early November, the company announced plans to merge with Equinox Resources, Ltd., of Vancouver, B.C., Canada. Hecla will exchange 5.7 million shares of stock for 18.9 million outstanding shares in Equinox. Equinox mines about 35,000 ounces of gold per year from its 50%-owned American Girl mine in California. The company is developing the Rosebud gold mine in Nevada, which could produce up to 70,000 ounces of gold per year by 1996. Equinox has reserves totaling about 750,000 ounces. The merger along with LaChoya and Grouse Creek will enable Hecla to maintain gold production at about 200,000 ounces per year. The agreement must be approved by Equinox shareholders and should be completed soon.

Mergers and acquisitions continued right up to the end of the year. In December, the company announced that they had purchased Mountain West Bark, headquartered in Rexburg, Idaho. Mountain West sells bark, potting soil, and peat, and operates three quarries (Soda Springs, St. Anthony, and Fairfield) for lava rock for landscaping. Hecla obtained the company in a stock swap worth $7.2 million.

In February, Kennecott Corporation announced that the Greens Creek mine on Admiralty Island in Alaska, largest silver-producing mine in the United States, would close indefinitely due to low metal prices. The mine produced about 7 million ounces of silver in 1992 at a cost of $4.00 per ounce. Hecla owns a 28% interest in Greens Creek.

After a 2 1/2-year hiatus in gallium/germanium production, the company's Apex Unit in St. George, Utah, was back in business, but is now processing cobalt. The plant's main product is cobalt sulfate, which is sold to the copper industry for use in the electrowinning process.

Moving outside of mining, Hecla began building the infrastructure for a multimillion-dollar office and retail park on 20 acres near its headquarters in Coeur d'Alene. The company will expend $500,000 on the venture, which will be called the Silver Lake Office Park. The company bought 145 acres in this area in 1984 but is only using a small acreage for its headquarters building. Silver Lake Mall is built on land Hecla sold in 1989.

Sunshine Mining Company (Sunshine Precious Metals)

The fabulous Sunshine mine (Figure 7), largest single silver-producing mine in the world, made it through another year to the relief (and surprise) of many experts. The company finished last year with a profit in the last quarter, but only because they restructured $71.5 million in silver-backed bonds. In reality there was a loss of $6.2 million for the quarter, contributing to a total loss of $40.3 million for the year. Since the mid- 1 980's, the mining firm has lost more than $300 million. This included a whopping $115 million loss in 1990 due to sour investments in oil futures. The red ink was still accumulating at $350,000 per month at year's end. Last year the company declared Chapter 11 bankruptcy and had only $5 million in existing funds, which would barely carry the mine into 1994 at current metal prices. The work force at the mine was cut from 300 to 186 miners in 1991. Along with other companies, Sunshine protested the mines assessment at $21 million by Shoshone County, claiming that the true value of the property was $6.9 million.

The company planned to auction over $7.4 million in delinquent notes held on Montana Reserves Company (a partner in the Montanore silver/copper project in Montana) in May, but the sale was postponed.

Early in 1993, Sunshine Precious Metals announced that they were getting back to basics to try and survive. Management changed and moved back to Idaho from Dallas, Texas. Corporate jets and other trappings were sold, and the company returned to what it knows best, mining silver. Early in the year, the company sold its mint (Sunshine Bullion) at Haydn Lake to the previous owner. Restructuring of the company's debt in the form of silver-backed bonds has been successful. By November, only $7.6 million out of a total of $57.2 million in debt remained on the company's books.

In January, the company announced that it had to find a new high-grade silver vein to stay in production. Without higher grade ore, the mine might close. The mine has substantial reserves, but with low metal prices, the company has to sell more silver to stay in business and that means finding and mining richer ore.

Lady Luck has smiled on the "Shine" many times in the past and '93 was no exception. Better metal prices helped, and the value of the company's stock increased significantly. The stock rose from a low of 44 cents per share, to $1.63 per share in June, to over $2.50 at year's end. In September, the company announced that a new high-grade vein had been discovered during exploration from the 4200 level in the west end of the mine. The discovery, called the 413 vein or West Chance area, is possibly an extension of the Copper vein and lies 1,500 feet west of the No. 12 shaft. The new vein was discovered by geologists using sophisticated structural interpretations coupled with hard work, a little luck, and underground drilling. Another discovery, called the C-fault area, lies west of the West Chance. Elsewhere in the mine, a new drift is probing a newly discovered showing called the Silverline vein, 1,500 feet north of the Jewell shaft.

Production at the silver refinery was increased by custom processing ore from other sources. In spite of hard times, Sunshine upgraded the antimony plant on Big Creek, enabling production of a higher quality metal. The investment is expected to lower the company's per-ounce-of-silver cost. Washington Water Power will pay the company some $345,250 in energy conservation incentives over the next two years for improving the plant and saving electricity.

On the last day of the year, Sunshine announced plans to raise $25 million via a securities offering. The money will be used to fund exploration in the mine and improve the custom refinery. The company will sell "investment units" to existing stockholders. Each unit will consist of two shares of common stock and a warrant to buy an additional share.

While cautious, the company still is interested in a potential diamond mine in Sierra Leone, Africa. Sunshine has invested about $3 million in the project over the past four years.

New discoveries and improved silver prices could not make up for very low metal prices in the first half of the year. Sunshine posted a loss for the first three quarters of 1993 of $35.3 million, compared to twice that in '92. Much of the current loss was due to debt restructuring. Production

during the third quarter was 644,000 ounces of silver, 211,000 pounds of copper, and 186,000 pounds of antimony from 26,710 tons of ore, for an average of 24.7 ounces of silver per ton.
The cost of producing an ounce of silver at Sunshine in September was $4.82 per ounce. The mine produced 2.5 million ounces of silver, 871,000 pounds of copper, and 817,000 pounds of antimony from 104,602 tons of ore in 1992.

Other Coeur d'Alene News

The Silver Valley Economic Development Corporation received a $13,000 grant from the U.S. Forest Service to study the suitability of the valley as a Regional Mining Heritage Corridor. Part of the money will be used to prepare a field guide to many of the area's mines and historical sites. A short description of selected mines and maps showing locations will be included, along with excerpts from the district's fascinating history. Don Springer, Richard Magnuson, Wendell Brainard, Ray Chapman, John Amonson, and William Etheridge, all well-known historians of the district, will oversee the project.

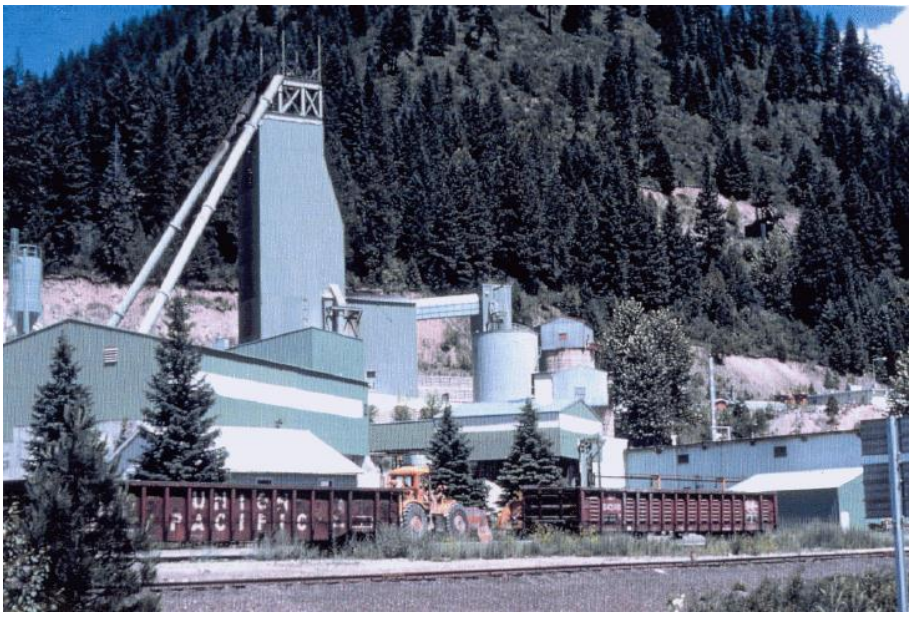

Figure 6. Lucky Friday mine, Coeur d'Alene district, Shoshone County, Idaho.

Figure 7. Sunshine mine, Coeur d'Alene district, Shoshone County, Idaho.

The last Union Pacific train to serve the Silver Valley left Mullan on May 28, 1993 for its 71.5-mile trip to Plummer and then Spokane. The train, hauling 16 cars of lead and zinc concentrate from the Lucky Friday mine, made its way down the valley, passing over the swinging railroad bridge that crosses the St. Joe River at Chatcolet (Figure 8) on its way to Plummer. The swinging bridge will be demolished and eventually the road's rails removed. Low metal prices have forced the district's mines to close one by one, with only the Sunshine and Lucky Friday mines still holding on. The Sunshine has its own refinery, so only the Friday still ships concentrates by rail. The railroad has been threatening to close the line for several years. As the voices of protest fell silent, Union Pacific finally had its way, closing the unprofitable line. The loss is another problem for valley leaders, as they try to attract new business to the area. Truly marking the end of an era, no bands played, nor were flags flown on this sad day, in contrast to when the railroad was first completed to Wallace, Burke, and then Mullan at the turn of the century. There is always hope, however, and Union Pacific will not remove the rails until all lawsuits and other attempts to reverse the closure have been exhausted.

Another facet of the history of the Coeur d'Alene was preserved when Bill Zanetti purchased the Oasis Rooms, one of the better-known bordellos in the district. Mr. Zanetti plans on opening the house as a museum and tourist attraction. The new owner found that the rooms were just as they had been left when the house closed eight years ago. The red lights were not extinguished by the law or outraged citizens; in fact, most of the community supported (or at least tolerated) the business, which is as old as the district itself. What man could or would not do, nature did; the fear of AIDS and other social diseases finally closed the houses. Zanetti will sell souvenirs from the lobby, but the rest of the "museum" will stay just as it was when purchased.

A new book, "Death of a Proud Union-The story of the 1960 strike at the Bunker Hill Mining Company," by Art Nolan, was released in December. The story chronicles the seven-month strike at the big mine, which marked the end of the Mine, Mill, and Smelter Workers Union and ushered

in the Northwest Metal Workers Union (later the United Steel Workers Union that represents miners in the district today).

A group of miners have formed a new social group called the MOLES. Anybody is welcome to join the new organization.

Public Television featured underground mining in the Silver Valley on its award-winning program, "Outdoor Idaho." The segment, entitled "Under Idaho," described activities which take place in our state underground or underwater. Included were the Sunshine mine, scuba diving in springs near Hagerman, exploring a lava tube in south Idaho, and a trip through the abandoned Taft railroad tunnel on the Idaho-Montana border at Lookout Pass.

The Taft (Milwaukee) tunnel has become a favorite haunt of mountain bikers, who love to ride the old, abandoned right-of-way. The Forest Service, concerned with public safety, has discouraged bikers from riding through the 8,771-foot-long tunnel. In an effort to get the bike trail preserved, Congressman LaRocco rode the tunnel in mid-year. He emerged soaked to the skin after falling off in the tunnel darkness and plunging into cold water covering the tunnel floor. Although everything else was wet, the Congressman's boundless enthusiasm was not dampened, and he promised to look into saving the trail.

During the year, problems arose between several Idaho mining companies and the Northwest Mining Association (NWMA). Coeur d'Alene Mines Corporation, Hecla Mining Company, and Asarco, Inc., withdrew corporate membership from NWMA over a dispute regarding changes in the 1872 mining law. NWMA refused to support the Reid-Domenici amendments to the Interior Appropriations Bill which died in conference last year. One of the amendments called for paying full surface value for patented claims, rather than $2.50 to $5.00 required by the 1872 law. The changes were supported by the American Mining Congress. The AMC felt the amendments would defuse some objections of opponents to the 1872 law. As a result of the disagreement, an unsuccessful attempt was made to remove Bill Mote, Executive Director of the NWMA, from his position. In protest, the three companies withdrew their membership.

The Idaho Department of Health and Welfare is seeking some $250,000 in damages from Aqua-Tech Precious Metals of Spokane, Washington. The suit cites improper storage, transport, and disposal of hazardous substances at the old Dayrock mine, located on Ninemile Creek north of Wallace. An inspection of the site in March, 1992, identified 25 violations of the Hazardous Waste Management Act.

Little had been done to correct the problems by a follow-up visit in November. Aqua Tech operated the facility as a testing laboratory for a new metallurgical extraction process. The state wants a complete cleanup of the site, in addition to payment for attorney's fees and the fine.

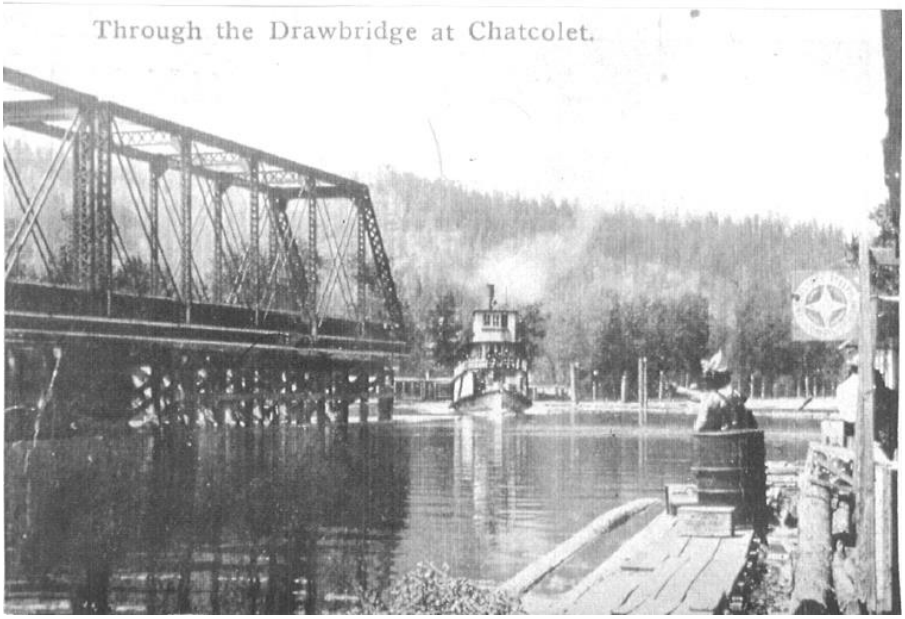

Figure 8. Swinging railroad bridge at Chatcolet circa 1910, Union Pacific Railroad.

Hecla Mining Company and Asarco, Inc. launched a $50,000 television and radio campaign to promote mining. The theme of the campaign is "Mining: Imagine life without it." The ads point out how important mining and its products are to each of us and to the entire nation.

The Sierra Silver mine tour remained one of the state's top tourist attractions. In 1993, just under 20,000 people visited the mine, located just north of Wallace on Ninemile Creek.

OTHER PRODUCING METAL MINES

Cyprus Minerals Company

The big Thompson Creek Molybdenum mine, owned and operated by Cyprus Minerals Company, remained idle. The mine produced some 14.9 million pounds ofMoS2 last year before closing. The closure cost not only jobs but eroded the tax base of county and city governments. The Challis School Board cut over $200,000 from the 1993 budget in anticipation of reductions in funding and numbers of students. The school system had an enrollment of 665 students in 1992, but it was expected that there might be significant losses if laid-off parents could not find new work locally and were forced to move.

In November, it was announced that Cyprus had sold Thompson Creek to Tonopah Mineral Resources Limited Liability Corporation, owned by Denver, Colorado, businessman F. Steven Mooney (former president of Cyprus' copper and molybdenum division). The sale was to satisfy concerns of the Antitrust Division of the Department of Justice about the merger between Cyprus and Amax. Mr. Mooney is evaluating his options for the mine. The sale generated great interest in the Challis area and rumors of 150 new jobs quickly circulated.

Although the mine was shut down, reclamation efforts continued. In the spring, a Supplemental Plan of Operations was filed with the U.S. Forest Service addressing acid mine waste drainage. The original EIS recognized the potential for this problem but did not state how it would be mitigated. The plan will be debated, and the public will have input into the process. In August, work began on reclaiming a 40-acre dump area at the mine. About 150 acres have been restored since mining began.

Dakota Mining (formerly MinVen Gold Corporation)

Eliminating debt and obtaining capital from a private $11 million placement, MinVen Gold Corporation restructured and changed its name to Dakota Mining. The company operates the seasonal Stibnite heap-leach gold mine in Valley County. The mine produced 31,549 ounces of gold in 1992. Minimal mining was started in August at the West End Pit, the only currently permitted deposit. About one and a half million tons of rock were moved but only 100,000 tons of that was ore. Stibnite produced just under 1,000 ounces of gold this year with half coming from a cleanup of last year's ore.

The poor performance in 1993 is due to new Forest Service regulations that limit transporting hazardous materials (including petroleum products and explosives) over the Johnson Creek road. Only four trucks loaded with these materials can use the road per week and these vehicles cannot exceed specific weight limits. These limitations severely curtailed supplying the mining operation. The restriction is temporary until a biological assessment of the risks to Chinook salmon are completed. The study was prompted by the listing of the salmon as a threatened species last year.

In another matter, Dakota will pay a fine of $3,800 under an agreement with the Department of Environmental Quality. The fine covers the company's failure to determine if chemicals from the mine's lab, as well as lead containers used in the plant, were hazardous materials. Other fines that could total $43,000 are being negotiated regarding a diesel fuel spill and other ground water quality violations.

Kinross Gold

In February, Pacific Corporation announced that a subsidiary, Nerco, Inc., would be sold to Kennecott Corporation (a subsidiary of RTZ Corporation) for $470 million. Included were Nerco's coal, oil and gas, and precious metals units. In August, Kennecott sold the DeLamar mine in Owyhee County and the Candelaria mine in Nevada to Kinross Gold a Canadian firm, for $16.25 million. The DeLamar mine has reserves of 14.6 million tons grading 0.043 ounces of gold and 1.27 ounces of silver per ton. When other reserves are added, the total gold- gold/silver value exceeds 1 million ounces of gold. Production costs are about $256 per ounce of gold. About 140 people are employed at the remote location.

Mining at DeLamar continued as usual, extracting about 1.2 million tons of ore in 1993. Production was mainly from the South Wahl and Glensilver pits. Slope stability problems in the South Wahl adversely affected mining, but the company was still able to extract most of the planned ore blocks and the South Wahl pit is nearly exhausted. Approximately 15,000 feet of development drilling

was done in the Glensilver and South Wahl pits. The Acidification, Volatilization and Reabsorption (AVR) plant for reclaiming cyanide, inaugurated last year, is working well (Figure 9).

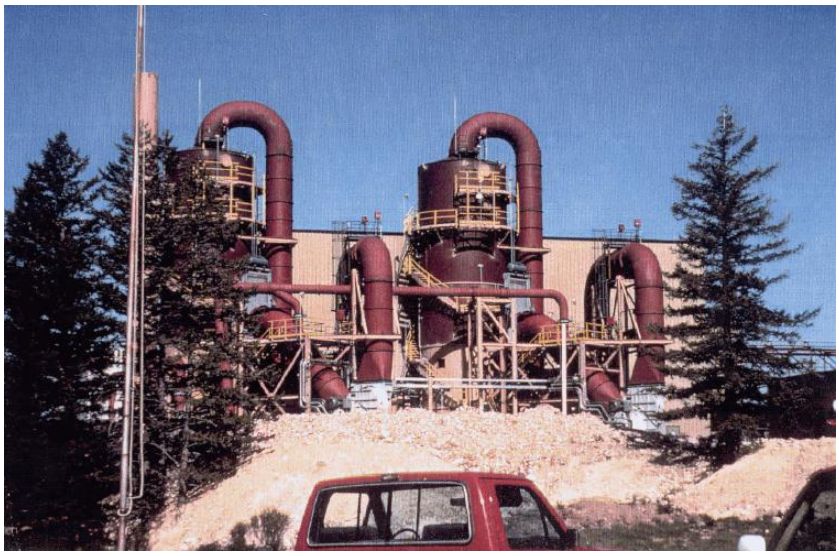

Figure 9. Acidification, Volatilization and Reabsorption (AVR) plant, Delamar mine Kinross Gold, Owyhee County, Idaho.

Kinross is calculating a new reserve figure for the proposed Stone Cabin mine on Florida Mountain, several miles east of the Delamar mine They intend to move to the new site in the next year or two and expect that Stone Cabin will add 8-10 years to the Delamar operation.

Idaho Gold Corporation

Idaho Gold Corporation (a subsidiary of Bema Gold) continued reclamation work at the Champagne mine, located west of Arco in Butte County. The mine, started in 1989, was closed last year after mining some 6.86 million tons of rock, including 3.65 million tons of ore, which was treated using heap- leach technology. Reclamation included neutralizing the 27-acre leach pad by using biological remediation techniques. So far, the company has reclaimed 70 of the 125 acres disturbed by the operation. J.D. Welch and Associates was awarded a 30-month contract to handle the mine closure. In addition to neutralizing the heap, plans call for contouring and revegetating pits and waste dumps and returning Champagne Creek to its pre-mining course.

Pegasus Gold Corporation

Pegasus Gold's Black Pine Mine in Cassia County was in full production, expecting to pour over 60,000 ounces of gold won from 3 million tons of ore in 1993 Mining is finished in the Tolman Pit and the B Pit was mined out in July Both pits have been reclaimed. With a south-facing slope, the small B-extension Pit helped the production schedule in bad weather. Mining started from the 14 million-ton A Pit early in the year and will continue for 3 years.

Pegasus earned out a major exploration program, including regional stream sediment geochemistry and 80,000 feet of reverse circulation drilling

The company plans on expanding the heap-leach operation and would like to mine IO million tons of ore and 14.3 million tons of waste from three new pits, which will extend the mine's life by three years to 1998 The expansion includes 255 additional acres and will yield about 50,000 ounces of gold per year. The current leach pad will be heightened by 50 feet to accommodate the new ore. The project will require an Environmental Impact Statement. Only one person showed up at a public meeting about the expansion in August. The lack of public concern is not too surprising, as Pegasus is known for having excellent public relations with local residents and government agencies.

The abnormally heavy rains this spring caused problems at Black Pine. The leach pad was designed to handle the runoff from a 500-year storm, but Mother Nature overwhelmed man's best laid plans this spring. To avoid flooding due to the heavy runoff, the company was forced to spray some 6.7 million gallons of water from the pad onto about 23 acres of BLM land adjacent to the mine. The weak cyanide solution was first neutralized with sodium hypochlorite in the leach plant. The problem cost the company, as the solution contained some $43,000 worth of dissolved gold and it cost an additional $74,000 to neutralize the water. Testing and monitoring of the sprayed area did not detect any major metal contamination after the emergency.

Early in the year, part of the highwall at the B pit caved in. The failure sent about 72,000 cubic yards of material cascading into the pit. No one was injured, as the hazardous area had been blockaded when a crack was discovered in the wall. Although seemingly a large amount of material, only a small part of the pit was affected. Another exciting event was the discovery of a large limestone solution cave in the B Pit.

U.S. Antimony Corporation

U.S. Antimony Corporation operated their Yellowjacket mine in Lemhi County, selling the gold concentrate to Cominco's smelter in Trail, British Columbia. Twelve people work at the open-pit mine and mill, which produced 2 to 3 tons of concentrate per week.

John Lawrence defended the operation of USAC's Preacher's Cove mill to the Division of Environmental Quality (DEQ), the Forest Service, and elected officials in May. The problem is cyanide, which has been pumped into two tailings ponds near the mill since 1990. In 1991, DEQ decided that there was too much cyanide and heavy metals in the pond water and prohibited USAC from further discharges. The solution to the problem was to build a third pond, which would require filing an application to Modify an Existing Cyanide Plant. The application takes six months to process, and Lawrence did not apply for one. Heavy runoff in the spring of 1993 threatened to flood the ponds. The USFS gave Lawrence permission to build the third pond. After construction was completed, DEQ asked to see the pond specifications, noted that they were inadequate, and said it could not be used. A solution to the problem is being negotiated. USAC is winding down operations at the mill. Over 90% of the chemicals at the mill have been neutralized and the site cleaned up. The mill has been an environmental headache for USAC and the Forest Service and is scheduled to be shut down in the spring of 1994.

Hecla Mining Company-Grouse Creek

Construction began on the new Grouse Creek gold mine (Figure 10) located on Jordan Creek (tributary to the Yankee Fork of the Salmon River) in east-central Idaho. In October, Hecla Mining Company announced that Great Lakes Minerals, Inc., had purchased a 20% share of Grouse Creek for $6.8 million and could increase their interest to 30%. Great Lakes will also pay 20% of the mine's construction costs. Industrial Contractors Corporation from Missoula will build the surface plant and employ about 250 people during construction. This will taper off to about 130 permanent employees when production begins. The open-pit mine has reserves sufficient for 8 years at a production schedule of 100,000 ounces of gold and 1.6 million ounces of silver per year. The closed-circuit mill and gravity circuit will process 6,000 tons of ore per day. Current reserves at Grouse Creek are 831,000 ounces of gold and 17.5 million ounces of silver. Open pit mining from two deposits, the near- surface Sunbeam and deeper Grouse Creek zones, will be supplemented by underground mining of a deep high-grade gold zone (Grouse South) discovered during an extensive winter drilling program early in the year. The ore deposits define a classic zoned epithermal system, hosted by Challis volcanics and syn-tectonic black shale basins. Production costs are estimated at $155 per ounce of gold, placing the mine among the lowest cost operations in the world. Capital cost of the project is about $85 million, and production is planned for late 1994. The company is still exploring the rest of its 32,500-acre holdings in the area. The announcement of the mine opening brought a sigh of relief from residents of Challis, hit hard late last year by the closure of the huge Thompson Creek molybdenum mine owned by Cyprus Minerals. Many ex-Cyprus employees stayed in the area, hoping to work at Grouse Creek.

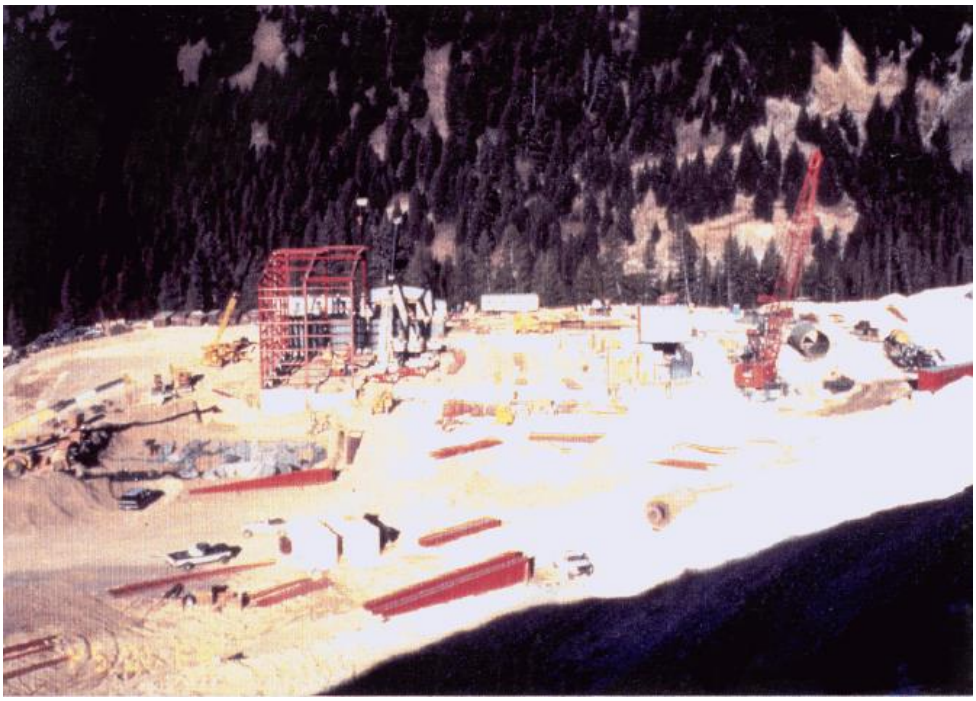

Figure 10. Grouse Creek project, Hecla Mining Company, Custer County, Idaho.

Other Small Mining Operations

Bonneville Power will fund the cleanup of an old antimony mine located about three miles south of Yellowpine on Johnson Creek. Most of the work will involve stabilizing erosion and reducing sediment flow into Johnson Creek.

Placer Mines

The low price of gold during the first half of the year and changes in assessment fees slowed interest in placer, as well as lode, mining.

Jim Riggans ran his placer operation (300 tpd) on the North Fork of the Salmon River below Gibbonsville all year. This was believed to be the largest gold placer in the state in 1993. Emerald Creek Garnet is the largest placer operation in Idaho but Emerald Creek mines garnets, not gold.

Boulder Creek Partnership reclaimed 10 acres at the Napias Creek placer in Lemhi County.

Steve McGlisik of Placerville gave tourists a chance to relive the good old days of the l860's. For $3.00 you could pan a 5-gallon bucket of placer gravel and reportedly, there was some nice gold recovered by the amateur prospectors. Besides cleaning up from the tourists, the entrepreneur did reclamation work on some placer claims during the summer.

As usual, there were a number of small hobby suction dredges operating in many old placer districts throughout the state. The Department of Water Resources issued 648 one-stop permits (required to run these dredges) in 1993, compared to 518 last year.

PHOSPHATE MINES AND PLANTS

Introduction

Prices for phosphate fertilizer remained in the doldrums for the first half of 1993, after crashing to 17-year lows last year. The price for diammonium phosphate (DAP), a common fertilizer, fell from $150 per ton in 1991 to $100 per ton last summer, near the cost of production and the lowest price in 20 years. The loss was exacerbated when buyers insisted on sharing in savings when poor sales resulted in price reductions last year. Both domestic and foreign demand was down sharply. A number of producers worldwide shut their doors.

The two largest U.S. fertilizer companies, IMC Fertilizer Group and Freeport McMorRan Resource Partners, L.P., agreed to slash costs by jointly operating their businesses. The new venture will account for 50% of domestic phosphate rock production and 30% of DAP production. The agreement will save the companies an estimated $80 million per year.

Cominco Fertilizers, Ltd., bucked the downward trend and was spun off as a separate company by cash-starved Cominco, Ltd., a Canadian mining company. The fertilizer company raised some $71 million in its initial stock offering. Unlike other fertilizer companies, Cominco made $13 million in 1992. Cominco, Ltd., still owns 49.8% of the fertilizer company and garnered $158 million in

cash from the stock sale and debt issued by the new company. Freed from its parent, the fertilizer company made $16.2 million in profits on sales of $236 million in the first 9 months of 1993. One casualty of poor phosphate prices was the closure of Cominco's Warm Springs mine, located near Garrison, Montana. Started in 1934, this was the only underground phosphate mine still operating in the United States.

As with most commodities, what comes down will eventually go back up. The gloomy outlook for fertilizer began to improve in October. Floods in the mid-continent washed fertilizer from fields, which will have to be refertilized. The U.S. exports about half of its fertilizer production and two-thirds of this goes to China and India. Both countries became active again in world markets. In addition, the Russians, who were dumping fertilizer in the U.S. and other markets last year, slowed exports and were using more product at home. The value of DAP increased from $110 per ton last summer to $120 per ton in 1993, with even higher prices predicted.

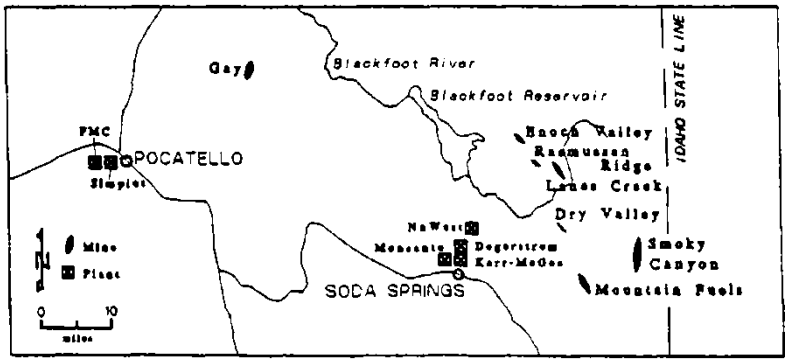

Figure 11. Phosphate mines and plants in Idaho, 1993.

FMC Corporation

A friend of the North American Free Trade Agreement (NAFTA), FMC Corporation has watched exports to Mexico grow by 30% a year from $5 million in 1990 to $11.4 million in 1992. Part of this growth comes from the company's Phosphorus Chemicals Division, which operates the largest elemental phosphorus plant in the world in Pocatello (Figure 13). All of the phosphorus from Idaho is shipped to other sectors of the Chemicals Division for use in a variety of products. The facility employs about 550 people and can produce about 260 million pounds of elemental phosphorus per year. The plant is the largest private employer in the Pocatello area.

Proctor and Gamble is one of several companies that have greatly reduced or entirely eliminated using phosphorus in laundry soaps and other detergents. Over the past few years, many local governments and seventeen states have banned the use of phosphate detergents over concern for water quality. Phosphorus, as a nutrient, promotes the growth of algae in waterways. Too many algae are bad, as the plants reduce the oxygen content of the water which is detrimental to other aquatic life. The bans were adopted in spite of the fact that phosphate detergents account for less than three percent of the nutrient problem. Most of the excess phosphorus comes from non-point sources, such as agriculture and other land development. The remainder is from point sources, including sewage treatment plants.

Figure 12. Office and maintenance center, Dry Valley mine
FMC Corporation, Caribou County, Idaho.

The effectiveness of the bans is illustrated by the Pocatello plant's output. Ten years ago, over half of the plant's production of 260 million pounds of phosphorus was used for making laundry detergents versus 25% today and this is still declining. The reduction in the use of phosphate in detergents resulted in an announcement in November that the Pocatello plant would cut their work force by 5%, or 20 people. The slowdown will be accomplished by operating one of the four furnaces at the plant only during the spring months when electrical rates are lowest. The other three furnaces will operate year- round. Production will drop to about 230 million pounds of elemental phosphorus per year. In another cost-saving move, FMC shut down a spray dryer at Newark, California.

Figure 13. FMC's ore stacker/reclaimer installed at a cost of $10 million in 1989
to efficiently handle phosphate ore and reduce dust emissions.

The company completed its first year of operations at the new Dry Valley phosphate mine (Figure 12). FMC used to get its phosphate ore from the Gay mine, co-owned with JR. Simplot, which closed this year. The company has invested some $25 million in the new facility. The first year's production will be about 1.3 million tons. The ore is shipped from Dry Valley to Pocatello by rail. The mine employs 56 people. Mining is done by a 23- cubic-yard shovel and 150- ton trucks.

J.R. Simplot Company

Another page turned in the history of the state's phosphate industry when the Gay mine closed. Named for Jack Simplot's only daughter, the mine was opened 46 years ago to provide fertilizer for Simplot's potato business. The Gay is located on the Fort Hall Indian Reservation. Joint owners FMC and Simplot leased thousands of acres from the Shoshone/Bannock tribes and paid (in recent years), over $2 million annually in royalties (equal to 10% of the ore's value) to the tribe. Ore from the Gay was shipped 30 miles by rail to Pocatello to provide feed for both Simplot's fertilizer plant and FMC's giant elemental phosphorus plant. At one time, the mine employed over 200 people. Simplot now gets its ore from the Smoky Canyon mine located near the Idaho- Wyoming border. The phosphate ore is pumped to Pocatello through an 87-mile-long slurry pipeline.

At the Pocatello plant, Simplot installed a new $400,000 liner on a 26-acre impoundment pond. Water laden with phosphorus nutrient had begun to leak through the pond's clay liner. The phos-rich water is sold locally to farmers for fertilizer.

A dike at another storage pond broke this winter spewing 300 gallons of gypsum-laden water into the Portneuf River. The ponds behind the dike allow the water to evaporate, leaving the gypsum behind. The river was ice-covered, but DEQ was concerned that some of the gypsum-laden water may have leaked through cracks in the ice. All of the contaminated soil and ice were quickly removed by Simplot crews and the river pH was monitored for some time. No problems were encountered as a result of the spill.

NuWest Industries, Inc.

NuWest, suffering from a $4.6 million loss for the fiscal year, warned in June that it might have to seek Chapter 11 bankruptcy protection. The loss was in spite of $87.3 million in gross sales last year. The company generated $10.5 million for servicing its debt, in spite of poor conditions in the fertilizer market. The red ink continued with a $1.9 million loss in their first quarter (fiscal year July-June) including $1.5 million in losses from fertilizer and $400,000 from interests in Nu-Tee Mineral and Chemical Company's high-grade silica operation, started last year. Sales for the first fiscal quarter were $18.2 million (compared to $19.6 million last year), reflecting the soft fertilizer market.

NuWest failed to make a $2.1 million payment to lenders in June and got an extension until October. The company then missed a payment of $582,000 in October and extended the due date for an additional $6.5 million until the end of the month. Officials were trying to restructure NuWest's debt of $53.6 million and the balance of a $20 million working capital line. Talks were originally under way with the Network Company II, a New York investment firm, who was interested in buying NuWest's subordinated debt. This deal fell through in late August. NuWest then began negotiations with the Banque Indosuez for $40 million in loans and a $20 million capital credit line. These negotiations were more fruitful, and a successful refinancing was announced in early November.

NuWest will lease $13 million worth of mining equipment from Caterpillar, Inc. The equipment will be used in a seven-year mining agreement with Rhone-Poulenc Basic Chemicals Company.

Rhone will provide phosphate ore for NuWest's fertilizer plant at Conda from Rhone's South Rasmussen Ridge mine. Ore deliveries will start next year. Conda Mining (a division of Washington Construction Company), the former mining contractor for NuWest, will continue to do some mining (about 80,000 tons from South Maybe Canyon) and plant maintenance. NuWest will mine out the Mountain Fuels lease in Dry Valley by year's end. The company uses 1.8 million tons of ore per year, which is processed into various grades of phosphoric acid and fertilizer. About 250 people are employed at the Conda facility.

Monsanto Company

Monsanto literally rounded up profits, doubling last year's second quarter results to $200 million. The windfall came from sales of its herbicide Round Up, which was used in huge quantities by Midwest farmers to clear their fields this year for spring planting.

Closer to home, operations were normal at the company's elemental phosphorus plant in Soda Springs and at the Enoch Valley mine. Dravo-Soda Springs, the mining contractor, employs about 70 people at the mine. The plant produces about 225 million pounds of elemental phosphorus per year, won from about 1 million tons of phosphate ore. The decline in the use of phosphate for detergents has not eluded Monsanto, as the company closed an elemental plant in Tennessee in 1986 at the cost of some 600 jobs. Today, very little of the Soda Springs plant's production is used to make detergents.

The company's long-term commitment to rehabilitating mined-out areas in Idaho continued. Monsanto supported a study by the University of Idaho on the effects of grazing on reclaimed lands at the Henry mine, which closed last year. The results will help determine the best use for these lands.

Rhone-Poulenc Basic Chemicals Company

Rhone is seeking permits to build a new section of haul road from the South Rasmussen Ridge mine to its wash plant and rail loading facility. The new road is needed to accommodate increased mining related to the NuWest agreement. About 2 miles of the new 3.2-mile road will be on National Forest land. Previously, ore was stockpiled on Wooley Ridge and then moved by conveyor to the rail facility. The company mines about 600,000 tons of phosphate ore for its own account, which is washed and then shipped to Rhone's elemental phosphorus plant at Silver Bow, Montana. An additional 1.5 million tons will be mined under the contract with NuWest. Rhone-Poulenc is owned by the French government. In a move towards privatization, France will sell 43% of the company though share offers to individuals, institutional investors, and Rhone's employees.

Kerr McGee Corporation

Kerr-McGee is the largest producer of vanadium in the country. The company extracts the steel and catalyst additive from ferrophosphorus metal, a byproduct of the elemental phosphorus process. Most of the raw material comes from Monsanto's plant across the road from Kerr-McGee. The price of vanadium continued a long decline, forcing the company to close down one of three

processing lines early in the year. The slowdown resulted in nine layoffs and will continue until prices improve. The price for vanadium pentoxide began the year at $170-$1.80 and slipped to $1.30-1.40 per pound in July.

Carlson Food, Ltd.

Carlson Food, Ltd., received a special use permit from the Bear Lake Planning and Zoning Commission. The permit is for trucking phosphate ore from the old Paris Canyon mine. About 50 truckloads will be removed for testing and market studies. The County Commissioners have the final say about the proposal.

Other Phosphate News

An Environmental Impact Statement is under way with the Bureau of Land Management (BLM) for two new phosphate leases near the Dairy syncline and Manning Creek. The project is a result of last year's Conda and Simplot joint exploration and drilling venture. A third-party contract for completing the EIS should be let this winter.

INDUSTRIAL MINERALS

Limestone

In general, the stone industry did a lot of small residential jobs in 1993, but few big buildings were under construction. Idaho Travertine completed work on a new Fine Arts Building at Albertson's College, which is faced with sandstone from the Table Rock Quarry in Boise. A unique feature of the building is tapered sandstone columns which were turned using a special 4-foot-long by 18-inch-in- diameter carborundum grinding wheel (Figure 15). The repairs to the state Capitol Building (damaged by fire last year) were completed, using Table Rock stone, and a new building at Idaho State University will also use the attractive stone. Besides Table Rock Sandstone, the company cut white marble imported from Alabama. It did not quarry travertine from the Fan Creek mine or its claims on the continental divide but will work both sites next year. A patent application on the Fan Creek claims has gone through three appeals with the U.S. Forest Service and is now in Federal district court. The issue is whether a patent can be granted on a stone quarry like other mineral occurrences. The company employs 17 people at the cutting and polishing plant in Idaho Falls, one of the largest such facilities west of the Mississippi River.

Chemstar Lime continued operations at their new Ten-Mile plant and quarry near Bancroft. This is one of the most energy efficient and environmentally sound lime plants in the world. The company employs 26 people to mine and calcine limestone. The lime is used as a water purifier, for soil stabilization, and for manufacturing glass, paper, cement, copper, steel, and asphalt. Most production was from leases on BLM administered land. The company also has several state leases in reserve.

No lime was processed in Idaho Lime's plant at Grangeville. The company did some drilling on claims near Slate Creek but is having problems with the Forest Service. Work will begin in the Orofino lime quarry (Sewell deposit) next year. This lime quarry sits right on the railway. The

Orofino deposit contains graphite, which is not a problem for ag-lime. The graphite could be separated by flotation and the lime used for other applications. The company's highest priority is getting the Grangeville plant operating for ag-lime.

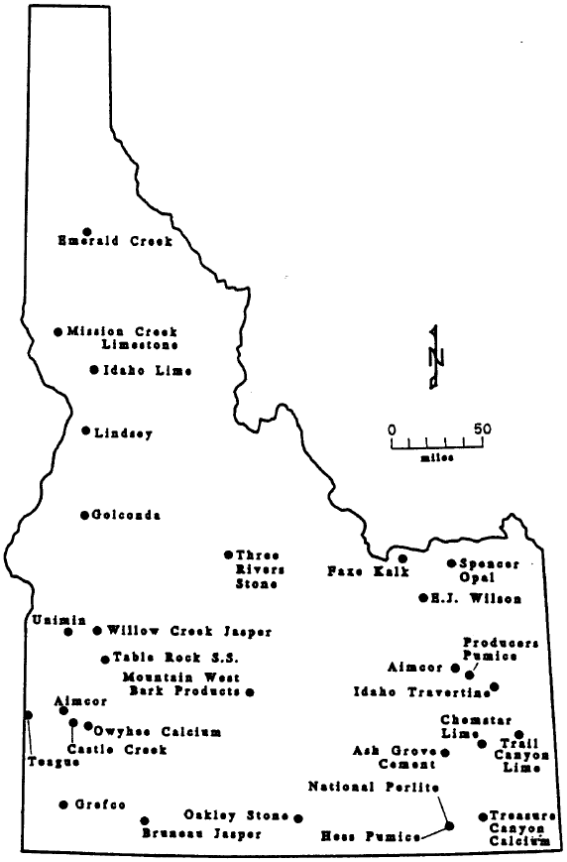

Figure 14. Industrial mineral mines, plants, and exploration projects in Idaho, 1993.

Idaho's only cement producer, Ash Grove Cement, had another good year, producing a little less than the 220,000 tons of cement made last year. The reduction was due to a shutdown of their rotary kiln to incorporate a feed mechanism for spent tires. The company burned 881 tons of used tires from July 1 to October 1. The kiln is fired by natural gas or coal, but the tires now account for about 11-12% of the kiln's fuel and this may eventually reach 25%. The tires contain a higher BTU content than coal. Ash Grove gets the tires from CenEnergy, who collects spent cases from distributors. The company received a $45,000 state grant last year to try using the tires for fuel. The grant comes from a $1 tax on each new tire sold in Idaho. The tax will be used to deal with the growing problem of what to do with mountains of old tires. The cost to convert the kiln to burn tires was over $400,000, but Ash Grove believes the changeover may save $200,000- $300,000 per year in fuel costs. The tires are fed into the middle of the kiln (Figure 16), which operates at a temperature of about 1,900 deg F. The spent casings stay in the kiln for about 20 minutes and the residue exits at a temperature of about 2,400 deg F. The ash and any other material in the tires end up in the clinker, which is crushed to make cement, so there is no waste from the process. The tires do require some handling, but the ultimate goal of the company is to burn them essentially as a free fuel. Much of Ash-Grove's cement production is shipped out of state, but a major repaving job on I-84 (near Mountain Home) used a considerable amount of concrete with the cement being

supplied by the Inkom plant. The company obtains silica and limestone for making cement from quarries located adjacent to the plant.

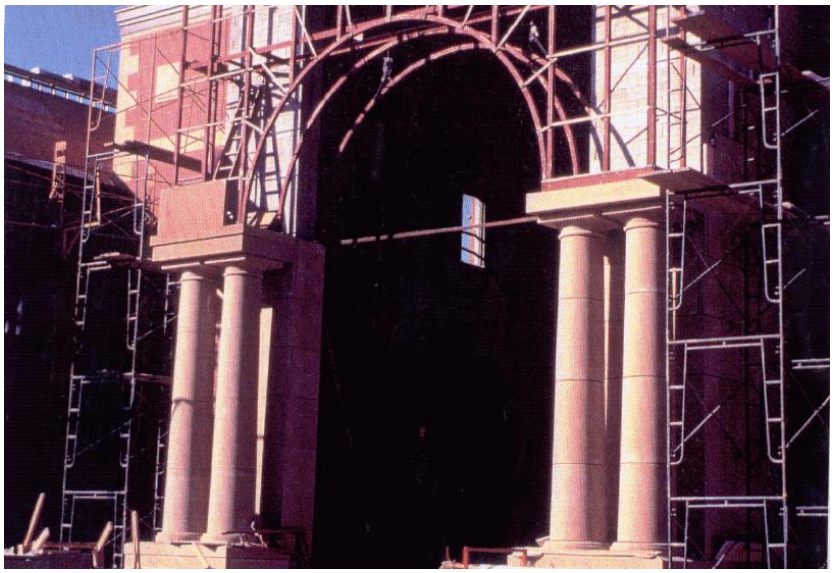

Figure 15. Columns made from Table Rock Sandstone, Albertson's College fine arts building, Caldwell, Idaho.

The Nez Perce Tribe continued to operate the Mission Creek limestone quarry. Limestone is shipped to Potlatch Forest Industries paper plant in Lewiston. The tribe mined about I0,000 tons during 1993, employing six people

Faxe Kalk (a Danish Company) plans on building a precipitated calcium carbonate (PCC) plant in the U.S. When the plant is finished, they will be able to offer paper manufacturers a complete line of lime paper fillers from the lime deposit near Lidy Hot Springs in eastern Idaho, their chalk deposits in Europe, and the new PCC plant. The company is expected to begin operations in Idaho in the near future. E.J. Wilson and Sons, former owner of the very pure lime deposit (Morning Glory claims), has an option to do the mining and processing for Faxe Kalk when operations begin.

E. J. Wilson and Sons mined 5,500-6,000 tons of limestone and 500-1,000 tons of dolomite for animal feed supplement from claims near Lidy Hot Springs.

Treasure Canyon Calcium shipped about 20,000 tons of limestone from its quarry and plant in Franklin County to Simplot's fertilizer plant in Pocatello. The company employs about a dozen people. The limestone is used in making phosphoric acid.

Owyhee Calcium shipped some 10-12,000 tons of limestone to cattle growers for use as an animal feed supplement. The material was sold to J.R. Simplot,

Beef Northwest, and other growers. An average of four people are employed in the operation. The oolitic limestone (Glenns Ferry Formation) is mined from a quarry south of Grandview. The company applied for a patent on their claims.

The Washington Water Power Company (WWP) donated some 565 acres on the Snake River to the Idaho Heritage Trust (successor to the Idaho Centennial Commission). The donation is the biggest made to the trust so far. The acreage includes Lime Point, the largest known limestone deposit in the area (Martinsbridge Limestone of Triassic age). The land, near the confluence of the Snake and Grande Ronde Rivers, is expected to sell for some $500,000. The Idaho Fish and Game Department and the Conservation Fund are expected to be strong bidders. The land can only be sold for conservation purposes and is surrounded by state land. The lime deposit was originally owned by the Limestone Company, incorporated in 1917. WWP bought the property in 1952 as a source of lime for cement for building dams that were planned for the Snake River. The dams were never built, and Lime Point was never mined. Fish and Game have leased the property from WWP for the past decade for wildlife habitat. There have been several inquiries over the years regarding the possibility of shipping lime from the Point by barge down the Snake/Columbia River system to Portland.

Castle Creek Mines are looking for new markets with gold mining companies and hope to use oolitic limestone to neutralize heap-leach gold mine dumps. The company mines the limestone from a quarry on Castle Creek in Owyhee County. The material is also sold as an additive to neutralize soil acidity.

Vaughn Smith Construction Company employed four people to mine about 10,000 tons from the Trail Canyon limestone mine. The material is sold to Kerr McGee for use in their vanadium extraction plant in Soda Springs.

Silica

Unimin Corporation operates the only plant in the state which produces silica sand for bottle glass, sandblasting, filtration, and golf course bunkers. Business was a little slower than last year, but production was about the same. The company obtains feldspathic sand from quarries on Freezeout Hill located east of Emmett. Unimin successfully patented several claims last year and applied for patent on seven more claims this year. The company has about 12 employees at the Emmett plant. City Transfer is Unimin's mining contractor.

Silica is used for slag production in the elemental phosphorus process. Conda Mining employs 18 people mining silica for Monsanto's plant at Soda Springs and FMC operates a similar quarry near their facility at Pocatello.

Perlite

National Perlite (a division of Oglebay Norton) owns a perlite plant and the Wrights Creek mine in Malad. The mine and plant were shut down last year by the state because of air quality (dust) problems and remained closed in 1993. The company apologized to the town for the dust emitted by the plant on Fathers' Day last year. Since the closure, the company has hired an expert in air pollution and emissions have been reduced by 90%. The plant and mine are reportedly for sale.

Pumice

Hess Pumice continued to expand business by adding more overseas markets. The company produced about 40,000 pounds of pumice this year. A growing market is a fine polishing abrasive for finishing cathode ray tubes (televisions, computer monitors, etc.). Other uses include light-weight aggregate and other abrasives. Hess opened new markets in Malaysia, India, and Germany this year. Last year they were exploring the Japanese market, which paid off with significant contracts. The plant is located in Malad's industrial park and employs about 40 people. Due to a strike at a major pumice operation in Italy, Hess will add another shift to meet demand, bringing production up to 100% of plant capacity.

Amcor, Inc., mined 4,500 tons of pumice from the Sunnyside pit near Idaho Falls. The material is used for lightweight aggregate. About 5-7 men are employed in the seasonal mining operation.

Producers Pumice had mined some 15,859 tons of pumice from the Rock Hollow mine near Idaho Falls by November. Two men handle the mining operation which runs from about April until the snow flies. All of the pumice is used for lightweight aggregate.

Garnet

Emerald Creek Garnet continued full operations as the largest garnet operation in the country. The company will produce an estimated 27,000 tons of finished garnet product in 1993 and employs 45 people. The garnet is dredged from Emerald and Carpenter Creeks using draglines and washing plants.

The garnet is separated from other materials in a jig plant and then sized and bagged in a packing plant. The finished product is used as an abrasive, in filtration, and in water-jet cutting equipment. The company plans on expanding production and may mine garnet from bed rock sources in addition to the placer deposits.

Diatomite

Grefco, Inc., applied for a patent on claims held for diatomite near Deep Creek in Owyhee County. This remote deposit is supposedly one of the purest in North America and has been under evaluation by Grefco for several years. Diatomite consists of microscopic plant skeletons that are excellent for filtering beer and wine, swimming pools, and drinking water.

Clay

E.J. Wilson and Sons mined about 1,800 to 2,000 tons of bentonite from near Lidy Hot Springs. The clay is used to seal ponds, irrigation canals, and basements.

Applied Industrial Minerals Corporation (AIMCOR) did not mine any new bentonite from the Ben-Jel quarry near Oreana in Owyhee County. The company plans on doing some work next year. AIMCOR shipped 2,000 tons of stockpiled bentonite to pulp paper companies. The clay is used as

a retention and drainage agent in the papermaking process. The market was lax due to a slowdown in the newsprint market. AIMCOR's mineral division is reportedly for sale.

Scoria

In December, Hecla Mining Company announced that they had purchased Mountain West Bark headquartered in Rexburg. Mountain West sells bark, potting soil, and peat, and operates three mines (Soda Springs, St. Anthony, and Fairfield) for lava rock for landscaping. (See Hecla Mining Company for more information.)

Stone

Northern Stone Supply, Dave Rodriguez, and Oakley Valley Stone mined Oakley decorative stone from quarries south of Oakley during the year. Northern Stone Supply sold 10,000 tons of stone in 1993, their 22nd year in the business. The company employed 50 people at the Rocky Mountain Quartzite quarry during the summer. Oakley Valley Stone obtains quartzite from the Valley View mine.

Northern Stone and Oakley Valley Stone continued to patent claims.

The Rocktile Company in Boise cuts Oakley Stone into tiles for facing stone and other uses. The company has been in business 12 years and employs 8-11 people. Rocktile gets its stone from Northern Stone Supply in Oakley.

The Ketchum District office of the U.S. Forest Service (Sawtooth National Forest) sold a lot of building stone and had to curtail operations, as too many people were bootlegging rock. The USFS did three appraisals on granite, river rock, and rhyolite. They sold 350 tons of granite (valued at $160/ton) from a quarry on Porphyry Peak (above the Triumph mine) for facing stone on a new restaurant at the top of Baldy Mountain. Baldy is the site of Sun Valley's main ski runs.

Progress was made in the BLM's environmental assessment and application to withdraw mining rights on a section of the Big Wood River canyon north of Shoshone. The scenic and geologically unique slot canyon became controversial last year when United Mining Corporation (International Stone) wanted to mine the polished and potholed basalt for landscape rock. A court hearing about the withdrawal is set for April, 1994.

Three Rivers Stone Company quarried decorative stone from near Clayton. The company employed six people in the last quarter and mined about 313 tons of slate. The company will also quarry quartzite next year. The rock is sold to brokers in California and in Las Vegas, Nevada, for landscaping and construction. The company would like to expand into overseas markets.

Decorative stone was mined by Table Rock Sandstone, Inc., from the Table Rock quarry in Boise. Three people were employed in the operation. The rough blocks were shipped to Idaho Travertine in Idaho Falls for cutting. The stone was used in a new building at Albertson's College in Caldwell (Figure 15) and to repair the State Capitol Building, damaged in a fire last year.

Gemstones

Starting in November, Golconda Gold, Inc., of Alberta, Canada, drilled about 20 test holes for diamonds in the Bear Basin and Ecks Flats areas, four miles north of McCall on land owned by Boise Cascade. The holes, located along the old Brundage and Ecks Flats roads, were between 10 and 200 feet deep. The drilling project followed last year's report of the discovery of indicator minerals for kimberlite and lamproitic pipes. Idaho's only rumored diamond find was three diamonds supposedly found in the Rocky Flat placer, just west of McCall, in the 1920's. Golconda claims to have found at least six pipes similar to ones which contain diamonds in Arkansas and elsewhere in the world. Bulk samples from trenches in two of the pipes are said to contain pyrope, chrome diopside, and chromite compositions compatible with an origin in the Earth's mantle where diamonds originate. If Golconda's results prove up, it would be one of the few identified lode sources for the alluvial diamonds found in the western U.S.

Diamonds are on many people's minds these days, following the discoveries of diamond-bearing kimberlite pipes in the Lac De Gras area of the Northwest Territories in Canada. The Canadian finds are being pursued by Kennecott and BHP Minerals with partner DiaMet Minerals, the original discoverer.

The public continued to enjoy the US Forest Service's star garnet digging area near Fernwood. There were 3,378 visitors to the popular spot, including 1,741 who paid a $10 fee entitling a rockhound to remove up to five pounds of garnet.

Digging this year was concentrated in the head of 281 Gulch. The yield of garnets was down a little, but this should improve farther down the drainage. The site is administered by the Forest Service office in St. Maries.

A number of other small mines producing gemstones in Idaho were:

- the Bruneau Jasper mine in Owyhee County.
- the Willow Creek Jasper mine located northeast of Boise and owned by Larry Ridley (applied for patent).
- Spencer Opal mine near Spencer in east Idaho (completed patenting process last year).

Figure 16. Feeding old tires into the kiln at Ashgrove Cement, Inkom, Idaho.

Aluminum Recycling Plant

Imsamet continued with full operations at Idaho's only aluminum recycling plant located at Hauser Lake. The plant recycles about 100 million pounds of used beverage cans (UBC's), 56 million pounds of other scrap and 45 million pounds of dross per year. The molten aluminum is transported in special crucibles to Kaiser Aluminum's Trentwood plant, 12 miles away near Spokane. The company hosted a field trip for the Association of American State Geologists in June.

Zeolites

Teague Minerals Products in Adrian, Oregon, applied for patent on zeolite claims near Sheaville. The company did little mining this year but did a fair amount of reclamation work. Glen Teague hosted a field trip for the International Zeolite Conference held in June in Boise.

Applied Industrial Minerals Corporation (AIMCOR) shipped one load of zeolite from the Castle Creek Quarry near Oreana in Owyhee County to a Wyoming firm for testing.

EXPLORATION

Coeur d'Alene District

Exploration by major companies in the Coeur d'Alene district was minimal. Hecla Mining Company closed down the Gold Hunter project in the Lucky Friday mine but announced at year's end that the project might continue if silver prices continued to improve (see Hecla Mining Company). As noted, rehabilitation of the Kellogg Tunnel level of the Bunker Hill mine continued during the year.

There was some underground mapping completed at the Silver Strand mine. A study on acid mine drainage was also under way.

Mine Systems Design, Inc. (MSD), continued work at the New Jersey mine, located 3 miles east of Kellogg. MSD leases the mine from the Gold Run Mining Company and this year purchased adjoining land from the Bunker Hill Mining Company. A road was improved to the mine portal. A blast hole drill was used to bore 70 2.5-inch holes to a depth of about 10-12 feet on surface exposures. The holes were spaced on 6x6 foot patterns. Fifty-one of the holes were blasted. Cuttings from the holes were analyzed using various metallurgical techniques. Average grade indicated by cuttings from 36 of the holes is 0.251 ounces of gold per ton. The mine is in a quartz vein system in the Prichard Formation. About one acre of land was cleared looking for the source of gold mineralization exposed in two short tunnels, and two veins were discovered.

Company spokesmen believe the potential of the property is good, with a rough estimate of over one million ounces of gold in reserve. The veins have not been explored at depth. The gold has a nugget effect and is very fine grained, which has made extraction difficult in the past. Tests were run to see if bromine could be used to extract the gold instead of cyanide, which is difficult to permit.

Arbor Resources and Wealth Resources, two Canadian junior companies, were pleasantly surprised by drilling results at the Galena Giant property located near the old Jack Waite mine, 12 miles north of the Coeur d'Alene district. Kennecott drilled the property last year. Arbor geologists were looking for a deep Sullivan-type lead-zinc target with anomalies defined by mercury, gravity, magnetics, resistivity, and structural intersections. A deep drill hole, located a half mile over the state line in Montana, intersected banded sulfides from a depth of 900 to 3,250 feet where the hole bottomed. The companies acquired an option on the Jack Waite and plan to do further exploration next year.

Other North Idaho

Idaho Gold Corporation continued to hold the Buffalo Gulch properties near Elk City. The company did some reclamation work and is said to be looking for a buyer for the deposits. Some of their permits are near expiration.

NJB Mines, Inc., continued fine tuning their 10 ton-per-day mill at the Red River mine southeast of Elk City. The extremely wet weather this spring and summer slowed operations.

Robert Painter proposed a trenching and drilling program at the Mammoth mine near Dixie. He was able to reopen one old working before equipment problems ended the effort.

Idaho Consolidated Metals Corporation continued work at their gold prospect near Cottonwood. The company completed mill construction and was testing a halogen extraction process on the ore. The process may also be useful for cleaning up old mine sites, and the samples from a number of western mines were tested for this purpose.

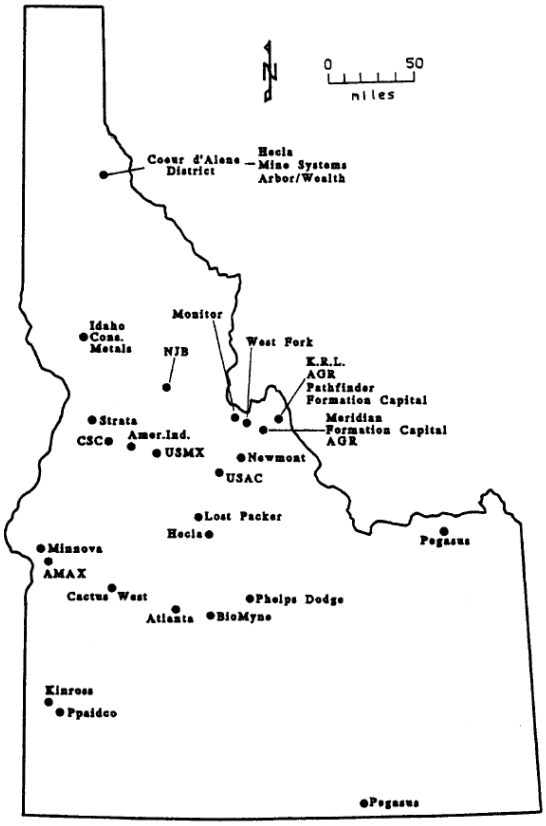

Figure 17. Exploration projects in Idaho, 1993.

Salmon Area

The Salmon area experienced a mini-boom in exploration activity this summer. Base metals, particularly the Proterozoic-age copper-cobalt-gold mineralization in quartzites and siltites, were the major target. In addition to the projects mentioned below, several major companies (Minnova, Rio Algom, Kennecott, Phelps Dodge, and Hudson Bay) were reportedly doing reconnaissance exploration.

Development of the Beartrack heap-leach gold project is still "on hold" by Meridian Minerals (a subsidiary of FMC Gold Corporation). Meridian has an 87% interest in the project and Minex holds the balance. The deposit contains some 27.6 million tons of ore averaging 0.035 ounces of gold per ton. It will cost $55 million to bring the property into production. Mining costs are estimated at $205 per ounce assuming a 100,000 ounce-per-year production schedule. Permitting for the property is virtually complete. FMC wrote down the entire $50 million investment in the Beartrack property, taking the loss in the fourth quarter.

Formation Capital Corporation pursued an aggressive program at the Blackpine mine, 17 miles southwest of Salmon in Lemhi County. The strataform copper-cobalt deposit, acquired last year, is located between the Blackbird mine and the Iron Creek prospect within the Idaho copper-cobalt belt. Mineralization occurs at several horizons within a thick sequence of Proterozoic-age elastic sediments. Alkaline mafic volcanics are associated with some of the ore, which may be related to hydrothermal activity along basin margin faults. A study by the Defense Minerals Exploration

Administration (DMEA) in the l 950's estimated a reserve at Blackpine of 580,000 tons of 3.5% copper. Underground workings at that time included 4,610 feet of tunnel on two levels.

Formation completed over 15,000 feet of core drilling in over 45 holes from April through November of this year. Surface work, including geophysics, soil geochemistry, and trenching, has extended mineralization along 17,000 feet of strike, of which 6,000 feet have been drilled. Higher grade intercepts include: Hole BP-7 with 7 feet of 7.26% copper and 0.006 ounce-per-ton gold, BP-19 with 4.8 feet of 6.37% copper and 0.039 ounce-per-ton gold, and BP-25 with 8.4 feet of 3.96% copper and 0.052 ounce-per-ton gold. Mineralization occurs in seven stratigraphic horizons over a vertical interval of 300 feet. One horizon in BP-5 assayed 5 feet of 0.276% cobalt. Most of the holes have intersected mineralization, typically including a thick zone of low-grade copper. For example, BP-34-14 found a 125-foot intercept grading 0.8% copper, 0.01% cobalt, and 0.006 ounce-per-ton gold.

Mineralogically the ores are low in sulfur and include siderite gangue. Additional drilling is already permitted for next spring.

Encouraged by favorable results from Blackpine, Formation expanded their holdings in the Idaho copper-cobalt belt. The company picked up the Badger Basin property southeast of Blackpine, the Sweet Repose Adit north of the Blackbird mine, and Salmon Canyon Copper, which has a reserve of 1.2 million tons of 1.1% copper. Drilling is planned for next year at Salmon Canyon which is located on the northwestern margin of the belt. The company is also in the process of negotiating a joint venture on its Bobcat property, a porphyry copper target north of Leesburg.

Newmont Exploration drilled five core holes at its Musgrove project, which was acquired from Atlas Precious Metals last December along with the Grassy Mountain, Oregon, deposit. The inclined holes went to an average depth of 1,000 feet and penetrated ore- grade values 300 to 600 feet below the surface. The holes were collared at Johnny's Point at the top of a cliff. Newmont is encouraged by the results and is planning an active field program in 1994. Three of the holes were drilled with a portable Longyear LF-70 drill, which has less of an environmental impact than conventional, larger drill rigs. Excavation for road work in the rugged terrain is being done by Copeland Construction using a new type of excavator that does minimum surface damage. The equipment is also being used by Meridian at Beartrack and AGR at Arnett Creek.

American Gold Resources (AGR, a wholly owned subsidiary of International Gold Resources Corporation) continued delineation drilling at the Arnett Creek gold property with 17 reverse circulation holes. They also did baseline water quality studies and archaeological and cultural surveys, plus substantial reclamation. Forest Service personnel noted that AGR did an outstanding job restoring roads and drill sites. The company drilled a total of 206 holes from 1988 to October, 1993. On November 18, International Gold Resources Corporation (IGR- formerly Gateway Uranium Mines Limited), announced that an amalgamation of Gateway and IGR was complete. In addition to its Idaho properties, IGR has an interest in a mineral concession in Ghana.

AGR drilled the Ditch Creek property (also called the Humbug gold project) near North Fork. In November they were drilling hole 22 of a 35-hole program. The area has been explored by several companies over the last few years.

Also near North Fork, Iron River Resources, Limited and K.R.L. Resources, Ltd., started a late-season, 14-hole reverse circulation drilling program on the Eclipse property in Bums Gulch north of the Wagonhammer property. The bulk tonnage gold target is located eight miles northeast of the Beartrack deposit. Iron River also did soil geochemistry and geophysical surveys over the faulted Yellowjacket terrain.

Phelps Dodge finished drilling five reverse circulation holes at the Kenney Creek property of Modroo and Associates. Results were being evaluated at year's end.

Cominco American Resources was in the third year of a regional stream sediment sampling program aimed at base metal targets. The company dropped their interest in the Iron Creek property a year ago, but picked up two new claim blocks, for a total of four in the Salmon area and Beaverhead Range. Some project mapping and sampling was done in addition to the land work. One of the properties is on Poison Creek, near Iron Creek.

As noted, the Iron Creek copper/cobalt prospect is no longer held by Cominco. Rumor has it that Siskyon Gold, a California company, may have it.

Pathfinder Mines finished four holes on the Morning Glory claims near the King Solomon mine on Bob Moore Creek. The company completed their reclamation work and returned the property to Formation Capital.

Jettra finished reseeding last year's exploration project at the Queen of the Hills and Tendoy prospects between Wallace and Bob Moore Creeks.

Corona did final reclamation work on the Redrock property. The company drilled the prospect over a year ago.

Charles Duus completed a patent survey at the Monitor mine. The application was approved by the state office of the Bureau of Land Management (BLM) but was on hold in the Department of Interior which must now review and approve all patent applications.

Legal problems at West Fork Gold Mining Company's property near Shoup in Lemhi County climaxed in a tragic resolution in December. Geologist and prospector Paul de Renne shot and killed his brother, Don de Renne, and another principal in the company in Boise. Paul signed an agreement in March to sell the claims to West Fork, which he and his brother had started in 1987. Although he was to be well compensated for the claims, Paul apparently was bitter over losing control of the property and wished to back out of the agreement. His brother and the company filed a lawsuit in Fourth District Court to block Paul's plans to reveal secrets about the claims and back out of his previous contract. The parties were taking depositions in the case when the shooting occurred. An attorney was slightly wounded in the altercation, which shocked the Capitol City.

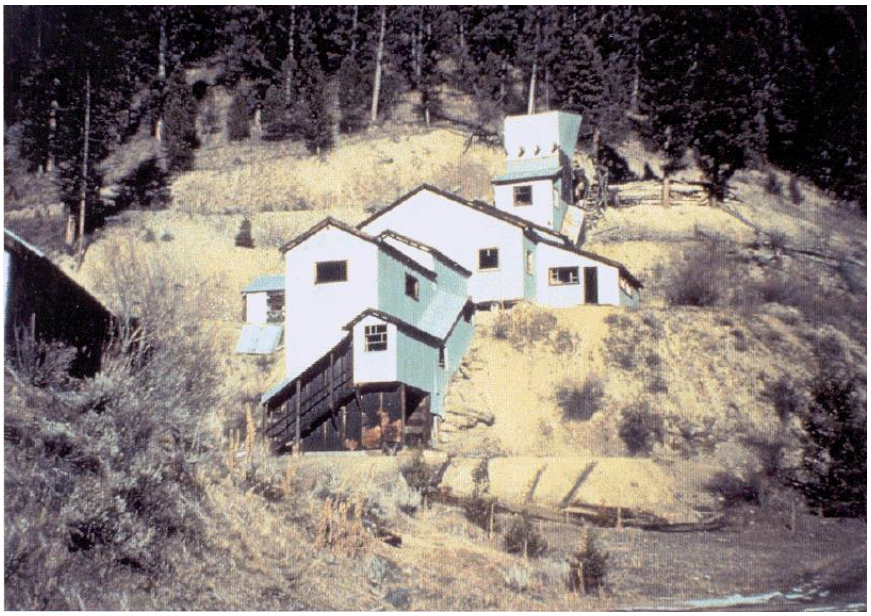

Figure 18. Old Blackpine mill, Formation Capital, Lemhi County, Idaho.

Figure 19. Dewey mine, USMX, Inc., Valley County, Idaho.

West-Central Idaho

Kennecott terminated an agreement with Thunder Mountain Gold, Inc., and the Dewey Mining Company in February, after drilling some 3,689 feet, mostly on Dewey ground. Thunder Mountain and Dewey consolidated their properties in March, 1992. A new exploration agreement was signed between the two companies and USMX, Inc., of Lakewood, Colorado, in mid-year. If USMX spends $200,000 by April, 1994, and an additional $300,000 by April, 1995, they can buy the property for $5 million. From previous work, reserves at the Dewey are 5.2 million tons, grading 0.45 ounce-per-ton gold. Starting in July, 76 reverse circulation holes (totaling 16,500 feet) were

drilled at the Dewey to improve reserves. The deepest hole went to 290 feet and one hole was lost in alluvium. All the rest of the holes contained mineralization. Work focused on the Dewey Reef, which hosts gold on fracture surfaces and in carbonaceous trash in volcaniclastic sediments. Coalified logs in the sediments contain native gold crystals in the tree's growth rings. The gold may have been mobilized from the nearby Sunnyside mine, site of Coeur d'Alene Mines Corporation's Thunder Mountain mine, which closed in 1990. The gold at Dewey is recoverable by gravity methods. The mill at the mine site used a Reichert Cone and sluice boxes to recover the metal when last operated in 1983. Metallurgical testing of the Dewey ore is under way at Hazen Research.

At Warren, CSC Mining employed eight men to install a 30 tpd gravity mill at the Rescue mine. Parts for the mill, which has a design capacity of 120 tpd, were scavenged from locations in the Midwest and eastern United States. The mill catches coarse gold in a jig and also makes a sulfide concentrate consisting of pyrite, galena, and sphalerite. Water used in the circuit is recirculated to avoid discharge to the environment. Drifting west on the gold-quartz vein exposed in the Rescue decline revealed that the vein is consistently about three feet thick with local high-grade intervals. Development work will continue through the winter.

Strata Mining and Exploration, Inc., a privately held company, is exploring the Wallawalla, Alberta, Golden Anchor, and other mines in the remote Marshall Mountain Mining District in Idaho County. Owner Rod Johnson, a former oil company geophysicist, says that geophysics and remote sensing have been very useful in extending the gold veins and tracing offset segments. A 100 tpd gravity mill has been constructed, and underground drifting and sampling along the Gold Crest vein is in progress. The company is optimistic and plans more work next season.

Jack Walker (American Independence Mining) was working out the bugs on a 50 tpd gravity mill at the Fourth of July mine. The company employed four men during the summer.

East-central Idaho

There was a little development and exploration work done at the Lost Packer mine near Loon Creek. Three men worked on the project during the summer months.

Hecla Mining Company did some exploration drilling on Estes Mountain, east of the Grouse Creek site.

Western Mining Company dropped their interest in the Bayhorse District. The company drilled two holes last year, one near the Ramshorn mine and the other on Poverty Flat.

Bill Yearsley did some exploration trenching at the La Riviere Perdue Mine on South Creek in the Lemhi Mountains north of Howe.

South-Central Idaho

Biomyne, Inc., returned for their third year of gold exploration on 543 claims near the West Fork of Warm Springs Creek west of Ketchum. They built about a mile of temporary road and drilled

approximately ten holes with a track-mounted rig. The company has found that constructing a temporary road across the steep terrain allows greater road slope grades and less surface disturbance. End of the season recontouring and concurrent reclamation of the road adds only a small amount to the cost of the program. An environmental assessment regarding plans for another 30 holes (up to 1,500 feet deep at four sites) will be out shortly. A group of local residents have opposed the Biomyne project, which is partially visible from the Bald Mountain ski slopes.

Part of the DSA property, located at the head of the North Fork of the Big Lost River, changed hands. Claims on the Sawtooth Forest side were dropped by Curator American after reclamation work was completed. Phelps Dodge continued a program on part of the property on the Challis National Forest. The company did some mapping and drilled six rotary holes. Results were disappointing and the property was returned to International Curator.

There was no activity at the Princess Blue Ribbon mine in Camas County. The mine closed after a tailings impoundment failed in 1990. The original claimants have moved to McLean, Virginia. Storage sheds and equipment left at the site have been vandalized and stolen. Erosion is also a problem.

Atlanta Gold Corporation continued to hold their claims at Atlanta but did no new surface work except some mapping.

Boise Basin

Cactus West put down nine exploration drill holes at their property between Alder Creek Summit and the Gold Hill mine. Results were disappointing. Later work included additional IP and soil surveys as well as reclamation.

Southeast Idaho

Atlas Precious Metals dropped their claims located on the Third Fork of Rock Creek in the South Hills south of Twin Falls. No reason was given for the decision, although local opposition to the project was vocal. Atlas drilled one hole on the property last year and 12 holes on Forest Service land just west of Rock Creek. The company closed their exploration office in Boise in November and is concentrating domestic exploration efforts at the Gold Bar mine in Nevada.

Pegasus Gold Corporation took over the Kilgore project in Clark County from Placer Dome, who has explored the epithermal deposit for several years. Pegasus drilled 20 reverse circulation holes into the very young volcanic-hosted precious metal system.

Southwest Idaho

Amax Gold, Inc., still holds an option on the Idaho-Almaden mine northeast of Weiser. Amax drilled the gold-mercury hot spring system a couple of years ago, and there are a large number of drill holes from previous owners. The only work this year was metallurgical modelling and new reserve calculations. Natural mercury concentrations in rock and waste at the former mercury mine

constitute an environmental hazard which the company needs to evaluate. Amax merged with Cyprus Minerals, and, like many mining companies, is moving more of its efforts overseas.

Minnova completed reclaiming a drilling program at the Blue Dog property in Washington County. Thirteen holes were drilled to test geophysical targets, but results were disappointing. The prospect was returned to owner, Gold Canyon Resources. The Adit zone at the prospect contains six million tons of 0.033 ounce-per-ton gold, based on previous work. Blue Dog is a hot springs gold occurrence that has been under study for several years.

The owners of the Silver Soldier mine (also known as the Copper King mine) on South Mountain in Owyhee County applied for a patent.

Pacific Power and Industrial Company, Inc., known as PpaidCo, obtained rights to claims on top of War Eagle Mountain, as well as the Sinker Tunnel near Silver City. Owner and company president, Robert Corrigan of Boise, said the company intended to reopen the 6,000-foot-long Sinker Tunnel, located at the base of War Eagle Mountain. The tunnel drains old workings on three veins, which were developed farther up the hill. The company opened and retimbered the portal. PpaidCo started a cultural resource survey this year and hopes to do some surveying of vein locations this winter. In addition to mining, PpaidCo is rumored to be interested in generating hydropower utilizing the large elevation difference between workings.

ENVIRONMENTAL NEWS

Bunker Hill Superfund

Gulf USA Corporation (successor to Gulf Resources and Chemical Corporation) is the major player in the $120 million, 21-square-mile Bunker Hill Superfund site remediation. The company is responsible for pension payments and court-ordered medical benefits for some 3,000 former Bunker Hill employees. The company has spent some $32 million on the cleanup effort and another $30 million on employee benefits so far. On July 19, Gulf announced that management was considering declaring Chapter 11 bankruptcy proceedings. By most guesses, the company was very close to insolvency. In August, Nycal Corporation (a British company that owns 44% of Gulf stock) and other shareholders were successful in replacing Gulfs management; however, the new managers also. announced intentions to seek Chapter 11 protection. Another upheaval by Nycal in October brought more management changes. These managers assured EPA that the company would honor its share of the Superfund costs, but pensioners and officials were worried.

In October, the Justice Department, joined by pensioners and 1,000 Gulf bond holders, asked the courts to force Gulf into involuntary bankruptcy, thereby freezing any remaining assets. On October 22, Gulf USA sought bankruptcy protection in Delaware, listing liabilities exceeding $100 million. The courts will now decide how Gulfs assets will be divided.

As many of Gulf's liabilities are in Idaho, local creditors wanted the bankruptcy decided here, but Gulf wanted to keep the proceedings in Delaware. Early in November, the company agreed to have the case settled in Idaho. Gulf will also open its books for inspection, reorganize under oversight

of its creditors, and loosen ties to Nycal. Gulfs subsidiary in the Silver Valley, Pintlar Corporation, received assurances from the parent that pensioners and Superfund would receive top priority.

The first hearing in bankruptcy court was held in Coeur d'Alene in November. The courtroom was packed by about 75 concerned retirees, while another 40, who could not get into the chamber, waited outside. Judge Alfred Hagen admitted the Coeur d'Alene tribe to the case, because of their interest in cleaning up the entire drainage in the Coeur d'Alene basin. The retirees formed a committee to represent themselves in the proceedings. Gulf and Pintlar were expected to submit a reorganization plan to the creditors in December.

The bondholders and pensioners each have claims totaling about $75 million. If Gulf cannot pay the pensioners, the federal government will pick up the tab for about 82 cents on the dollar, but the pensioners will lose all medical insurance.

The case was delayed when Gulf was unable to come up with a reorganization plan by December 15. The company asked for an extension, which was refused by creditors. The move leaves creditors with the option of filing their own reorganization plan for the company. Meanwhile, legal fees continue to eat away at Gulfs remaining assets, an added concern for pensioners. The only bright spot by year's end was the news that recycling some 62,000 tons of steel and 15 million feet of lumber from salvage of the smelter and zinc plant may raise as much as $10 million. This money should be available to cover Gulfs liabilities, including company pensions.

In 1989 and 1990, Gulf liquidated or lost many of its U.S. holdings and moved revenue estimated at $160 million offshore (mainly into commercial real estate in New Zealand) through a subsidiary, Gulf Resources Pacific, Ltd. These assets are believed to be worth about half or less of their original value due to a depressed market in New Zealand. Gulf tried to reorganize in Bermuda, but this move was blocked by the Justice Department. Governor Cecil Andrus blamed the Justice Department for not acting sooner before Gulf moved assets offshore. A Senate subcommittee may look into the affair.

Gulfs insolvency leaves many questions about pensioners benefits and the Superfund cleanup. It is probable that Gulf will be unable to pay the $100 million cost, therefore, Superfund (i.e., the taxpayer) will have to pick up the tab. The state of Idaho will then be responsible for 10 cents on every federal dollar spent on the site for a possible liability of $10 million. Currently, the company owes EPA about $20 million for past expenditures and is obligated for $40 million for cleanup of residential soils and $60-$70 million for removal and cleanup of the smelter complex. As noted, besides Superfund and pensioners, Gulf owes about $75 million to nearly 1,000 investors.

In spite of Gulfs insolvency, Pintlar Corporation, which oversees Superfund for Gulf in the Valley, proceeded with cleanup efforts, including:

- planting more trees on the hillsides above Kellogg
- constructing an experimental water treatment cell in Deadwood Gulch to remove metals. The cell is lined with gravel and covered with cattails, which take up the metals. If successful, larger cells will be built on Smelterville flats. The system is especially good at removing zinc.

- solidifying hazardous material that cannot be recycled. The materials will be encased in cement and stored in a waterproofed concrete basement in one of the smelter buildings. I-Tex, a Texas company specializing in the removal of hazardous substances, will do this work under contract to Pintlar.
- constructing new roads to facilitate the removal of the smelter and zinc plant buildings next summer.
- dropping the two big stacks at the smelter and zinc plant (perhaps in 1995).
- adding lumber mill waste to soil on Smelterville flats to support vegetation.

In September, EPA ordered Gulf and seven other Principal Responsible Parties (PRP's) to continue the residential lawn replacement program. There are about 1,500 residential yards that need to be replaced. Each yard costs about $13,000 to clean. Since 1989, about 400 yards in Kellogg, Page, Smelterville, Elizabeth Park, Wardner, and Pinehurst have been cleaned. Plans called for treating about 30 more yards this year, but the wet weather in north Idaho delayed the program.

Consent decrees concerning the Record of Decision about the site were being considered in December. The decrees concern the multi-million-dollar agreement between the state, federal regulators, and the mining companies regarding the Superfund cleanup effort. Details will be released early next year. In general, Asarco, Inc., Hecla Mining Company, Coeur d'Alene Mines Corporation, and Sunshine Mining Company will pay $40 million over the next few years, which will be used for residential cleanup (essentially any ground containing over 1,000 ppm lead will be cleaned). Hecla and Asarco will foot most of this bill. Pintlar Corporation (Gulf USA Corp.) will pay about $60 million for cleanup of less populated areas, including the smelter, zinc plant, tailing impoundments, and Smelterville Flats. Funding is, of course, uncertain for Gulfs responsibilities at the present time, because of the bankruptcy.

EPA noted that it had spent about $25.8 million at the site to date and has recovered only about $6.1 million from the PRP's. Collection of the deficit may be difficult, considering Gulfs fiscal woes. Nationwide, EPA has written off about $270 million on Superfund. A study by the Rand Corporation noted that one out of every three dollars spent on Superfund goes to lawyer's fees.

The Idaho Department of Health and Welfare, Division of Environmental Quality, was given a clean bill of health for spending some $2.7 million in federal grants for cleanup efforts at Bunker Hill. An audit last year by a contractor of the federal Inspector General's office recommended that EPA recover some $275,000, which had allegedly been spent illegally. Questions were raised by Terragraphics Environmental Engineering and Information Services about a contract awarded to CH2M Hill in 1987 for the cleanup. Other queries concerned purchasing practices under the grants. Regional officials reviewed the audit and found no wrongdoing.

A new multi-million-dollar contract to oversee the cleanup for the state was won by Terragraphics in February. The company completed the latest round of blood lead-level testing and reported a leveling off and even a slight increase in lead values after several years of declining values. The increase may be due to new families with young children moving into homes that have not yet had yards cleaned.

Lake Coeur d'Alene Restoration

The Coeur d'Alene Indians would like to have the 21-square-mile Bunker Hill Superfund site expanded to include the entire 80-mile-long drainage basin of Lake Coeur d'Alene and the Coeur d'Alene River. Last year the tribe received $1.2 million from the Department of Interior to begin assessing the damage to the basin. A preliminary report has been prepared. Within 18 months the tribe, the U.S. Fish and Wildlife Service, and the U.S. Forest Service hope to be able to place a price tag on a basin restoration plan, which may exceed $1 billion. The tribe plans on suing eight mining companies and a railroad for the cleanup costs once the initial assessment is completed. The tribe also claims ownership of Lake Coeur d'Alene, and this issue is in the U.S. 9th Circuit Court of Appeals. An earlier decision went against the tribe's claim.

It is estimated that some 72 million tons of mill tails were dumped into the South Fork of the Coeur d'Alene River from 1884 to the 1960's. These tails eventually were washed down the river and into Lake Coeur d'Alene. If spread evenly, the layer would cover the lake bottom to a depth of 14 inches. The lake sediments and water quality have been under study by the U.S. Geological Survey for several years. Last year, Art Horowitz, a USGS scientist, compared the lake contamination to the heavily polluted Rhine and Meuse Rivers in Europe. The good news is that most of the metals in the lake are confined to the sediment on the lake bottom and are essentially inert.

A new USGS study by Paul Woods notes that there is evidence that some of the metals in the lake sediments might be moving upwards. This could be from a change in water chemistry. Compared to tests in the 1970's and with the exception of zinc, there is little evidence of metal contamination in the lake water, with most metals at or below detection. However, a major problem could be the concentration of nutrients, such as phosphorus and nitrogen, in the water. Phosphorus induces algal blooms and algae remove oxygen (eutrophication) from the lake. This could lead to freeing the metals from the lake sediments. Woods' study indicates that phosphate pollution in the lake is not a result of septic tanks or sewage systems from lakeshore dwellers, but from agricultural runoff and soil erosion due to logging. Much of the phosphorus is coming into the lake via the St. Joe River system. Lead is still entering the lake from the South Fork of the Coeur d'Alene River, but the source is old tailings between Cataldo and Harrison, not the active mines in the district.

Woods' study was sponsored by the Coeur d'Alene Basin Interagency Group (CBIG), a joint committee formed of EPA, DEQ, and the Coeur d'Alene tribe. CBIG was established last year to coordinate studies of the river and lake. CBIG oversees the Coeur d'Alene Restoration Project, which was set up in 1991 to begin the cleanup of the basin outside of the 21-square-mile Superfund area. The project director, Al Murrey, was under fire at year's end. Mr. Murrey works for the Idaho Water Resources Research Institute at the University of Idaho, but answers to EPA, DEQ and the tribe. Two of the project's three full-time employees quit this fall over a lack of commitment to fund their positions for more than a year at a time.

A source of present-day pollution, so far apparently ignored in published studies, is the hundreds of mounds of lake sediments dredged from the bottom of some of the chain lakes by the state Department of Fish and Game. The mounds were built to provide nesting sites for ducks and other waterfowl. These mounds consist of sediments from the lake bottoms that contain metals as oxides

and sulfides. The sulfide minerals at the surface oxidize and these oxides can then be transported by lake and river water.

A new environmental scare surfaced in April when a number of barrels were found near the Cataldo mission. Rumors flew that the containers held toxic waste. Tests revealed no problems. The barrels are probably left over from the dredge, owned by the Mine Owners Association, which removed mine tailings from the Coeur d'Alene River for many years. The dredge floated on similar barrels and used them for pipelines.

In May, the area around the boat launch at Cataldo was closed and fenced off as the Mine Owners Association (Asarco, Hecla Mining Company, and Bunker Ltd. Partnership) began to clean up and stabilize about 20 acres of mine tailings (at a cost of $20,000) deposited by the dredge. The area was contoured and will be seeded to stop windblown dust. The site has been a playground for off-road vehicles for many years, which has exacerbated dust and erosion problems with the old mill tails.

The Coeur d'Alene tribe announced plans to cap or remove contaminated soil from the west side of the Cataldo Mission by late summer. Many tourists stop at the site, which contains a picnic area and is used by the tribe during a celebration of the Feast of the Assumption in August. The tribe received $350,000 from Coeur d'Alene Mines Corporation and Callahan Mining Corporation last year in an out-of-court settlement to start the cleanup process along the South Fork. The companies will help the tribe with the mission cleanup. Plans were postponed at year's end until after next spring's runoff.

A $300,000 project to clean a 1/2 mile stretch of the South Fork near Elizabeth Park was close to approval in November. The project will be funded from the Idaho Natural Resources Trustees, keepers of a $5.5 million fund created in 1986 in an out-of-court settlement between the state and mining companies. Mine waste will be moved away from the riverbanks and separated from the waterway by a levee. Trees will be planted along the river to attract insects to feed fish. The project is the Trustee's first in the area and will start next August when the river is lowest. The plan was criticized by the U.S. Fish and Wildlife Service, who noted that fish already living in this stretch of the river could be harmed by the reclamation effort.

The Council for Mineral Information (CMI) is an organization supported by the mining industry to look into pollution problems in the Silver Valley, the Coeur d'Alene River, and Lake Coeur d'Alene. The CMI announced in September that they would begin a study to find out why Tundra swans (also called Whistler swans) are dying along the lateral lakes between the Cataldo Mission and the main lake. Estimates range from 20 to 200 swan fatalities per year. The problem has been recognized since the l930's. The swans die from lead poisoning, to which they are very susceptible. The lead is believed to be in plants that are part of the swan's food. The plants are contaminated by metals from old mill tailings in the lakes.

Gordon Crow, Director of the CMI, announced he would be leaving to pursue other interests. Holly Houston, formerly with KREM-TV in Spokane, has been named as Crow's replacement.

A second Superfund site may be added to the Silver Valley. The designation will allow EPA to begin a 2–3-month emergency cleanup at the old Success mine located on the East Fork of Ninemile Creek. The $750,000 project will divert the creek from the old mine dump (200 by 600 feet in size), which will be capped with a foot-thick layer of loose rock. About 400 yards of road were removed, as the road and dump are too near the creek. EPA was criticized for failing to inform citizens that the road would not be replaced. Presently, the creek, which feeds into the South Fork of the Coeur d'Alene River, is contaminated by heavy metals from the old dump. The metals pose no danger to humans but are stressful to aquatic life in the Ninemile drainage.

The U.S. Department of Health's Agency for Toxic Substances and Disease Registry (ATSDR) announced in December that it would start a study of the effects of lead on 300-350 women who worked in the smelter or zinc plant in the 1970's, when lead exposure peaked. However, a clinic to disseminate information about lead problems to local citizens is not in the cards. A concerned citizens group called the Idaho Citizens Network (ICN) has been actively soliciting the ATSDR and EPA to spend $5 million from Superfund for such a clinic. The ICN is also calling for cleaning home and school interiors, completely ridding the smelter site of heavy metals, and hiring cleanup contractors from the Silver Valley.

Phosphate and the Environment

Environmental issues have made headlines for the phosphate producers in Pocatello for the past few years. One concern is about slag, a waste product of the elemental phosphorus process that has long been used as an aggregate in the Pocatello/Soda Springs area. In 1990, EPA conducted a study of the slag and concluded it posed a cancer risk due to contained radionuclides. Most people stopped using the material and the companies stopped selling it. It was soon discovered that EPA's original studies, if not flawed, could be challenged. An internal review by EPA agreed that the findings were questionable and called for a new study. EPA then met with industry leaders and a Technical Work Group (TWG) was formed. Members of TWG include representatives from EPA, the state, industry, the Shoshone-Bannock tribe, and local communities. Several meetings of the TWG were held in 1993 to solicit input to the slag issue. A new study was started in September, under the jurisdiction of TWG, and will take an estimated 250 days to complete. The study will focus on employees of FMC and Monsanto who live in homes with slag and non-slag foundations. Monsanto and FMC are paying for the new study.

In May, Simplot and FMC were ranked 4th and 8th on an EPA list of Idaho companies releasing the most toxic substances in 1991. Simplot installed a scrubber this year, which will remove most of their emissions. The toxins from FMC are not harmful to people and are captured and stored in lined ponds for future reclamation, according to a company spokesman.

In May, officials from FMC and Simplot agreed to pay fines amounting to $30 for each ton of air pollutants emitted from their plants. Both companies noted that the fines were a good incentive for them to find better ways to reduce air pollution. Simplot will pay about $120,000 for the first year's fines, with increases in following years tied to the Consumer Price Index. FMC will probably have to pay about $253,000 the first year.

Early results from the Michaud Flats Superfund site evaluation program are encouraging. The site was added to the National Priorities List in 1990 by EPA and includes the Simplot and FMC plants west of Pocatello. Bechtel Environmental Services, Inc., is doing the testing for EPA and the companies. They have analyzed numerous air, water, and soil samples, producing some 1.2 million pieces of information from a three-mile radius around the plants. Air quality will be monitored using automated sampling stations, which have been installed at the plants and the surrounding area. The air program alone is expected to cost some $10 million over the next year. Bechtel has drilled 115 wells on the flats to study water quality and plans on drilling more. To date, the highest levels of heavy metals and sulfates in groundwater have been confined to company property and are in the upper aquifer. Employees have been encouraged for several years to drink bottled water in Simplot's plant. Drinking water in FMC's plant comes from a deep well that recently was tested free of contamination by EPA. Offsite samples and samples from the lower aquifers in the area are below federal standards for contaminants so far. The data will be used to improve air quality and determine how to clean up any water problems.

Concerns about air quality in the Pocatello area are an old and ongoing story. At a public meeting held by the state Division of Environmental Quality in Pocatello, citizens voiced concerns over small particle air pollution (referred to as PM10), which is partly blamed on the phosphate plants. A few dozen citizens called for tighter controls on plant emissions. Dust from handling phosphate ore at FMC is a problem. Fugitive dust from dirt roads and wood smoke are also big PM10 contributors. Simplot noted that they have reduced emissions 80 percent during the past two years, so there must be other sources of PM10 emissions. A net of 110 PM10 emission monitors has been installed around the Pocatello Valley.

In 1990 EPA estimated that 9,663 tons of PM10 had been released to the atmosphere in the Lower Portneuf Valley. This was reduced to 6,750 tons in 1992. Contributors included Simplot's plant, 16% of the total emissions in 1990, reduced to 1% in 1992; FMC's plant, 33% in 1990 and 24% in 1992; Agricultural sources of dust, 19% in 1990 increased to 27% in '92; road dust, 16% in 1990, and 25% in '92; and residential heating smoke, 3% in '90 and 4% in '92. DEQ, EPA, and the Shoshone/Bannock tribe collaborated on a study to reduce PM10 emissions. The study is being reviewed by EPA to see if it will bring the Bannock-Power County area into compliance with the Clean Air Act. The plan calls for:

- reducing emissions of small particles from FMC's and Bannock Paving Company's plants.
- revising operations at Simplot's plant.
- working to reduce emissions from wood burning stoves.
- cutting road dust in the winter and reducing dust generated from agricultural practices.

In the past few years, both Simplot and FMC have made significant improvements and investments to minimize air pollution. Simplot cut dust problems significantly by installing their slurry pipeline. FMC has spent millions on improved scrubbers for their calciners and on new ore handling equipment. Both companies have pledged to do more.

Blackbird Mine

Cleanup work began at the tailings dam at the Blackbird mine in Lemhi County. The old earthen mill-tailings impoundment on the West Fork of Blackbird Creek was built in the 1950's. The creek was channeled under the dump via a 2,200-foot-long concrete culvert, which was found to be in poor condition. The culvert was repaired. Officials have worried for a long time about the effects on Blackbird and Panther Creeks if the dam failed. The tails contain copper, cobalt, nickel, and (it was recently discovered) high levels of arsenic. In August, Noranda announced that they would voluntarily solve the problem. A diversion channel was constructed to contain the stream and channel it over, rather than under, the tailings. The channel is engineered to handle a 500-year flood. In addition, a slurry wall was built upstream to stop water from going through the tailings. Eleven hundred truckloads of clay were hauled up Panther Creek to serve as liner material for the new spillway, which includes concrete steps to break up water flow down the front of the dam. The work was completed in the fall and cost over $2 million.

Figure 20. Reclamation at the Blackbird mine
Noranda Mining Company, Lemhi county, Idaho.

Noranda purchased the Blackbird mine in 1978 from Hannah Mining Company and invested some $30 million in the property. The price of cobalt collapsed, and Noranda shut down the operation without processing any ore from the cobalt/copper mine. The state filed suit against Noranda in 1983 for the cleanup of the mine site. In 1990, Noranda filed suit against the Department of Interior and previous owners, claiming that they had contributed to the mess at the mine. The government's participation is tied to the Defense Minerals Exploration Administration (DMEA), which formed partnerships with mines throughout the West to explore for minerals needed by the government in the 1940s and 1950s. The U.S. Geological Survey and the U.S. Bureau of Mines worked closely with DMEA on these projects. Later, DMEA became known as the Office of Mineral Exploration (OME), which continued the exploration program. Cobalt was discovered during a DMEA program at Blackbird. The metal was of interest to the government as a strategic and critical

mineral. Mining began with the price of the metal guaranteed by the government. When the DMEA contract was completed in 1960, Howe Sound, the operator, applied for renewal of the price guarantee, which was refused. The mine closed.

Noranda has done a lot to clean up the mine site and mitigate hazards. A water treatment plant purifies 130,000 gallons of acid water draining from the mine every day. Noranda is willing to clean up the property but has been frustrated by a lack of consensus between government agencies and officials as to how the cleanup should proceed. The issue is even more clouded with the entry of the National Marine Fisheries Service (NMFS) and the National Oceanographic and Atmospheric Administration (NOAA) into the picture in response to the listing of the Sockeye and Chinook salmon as endangered and threatened species.

Triumph Mine

The Triumph mine on the East Fork of the Big Wood River in Blaine County garnered more media attention in Idaho in 1993 than any other single mining story. A group of about 45 local, and very vocal, citizens took on the Environmental Protection Agency over the listing of the mine as a Superfund site. The residents joined with five other communities in the Superfund Coalition Against Mismanagement or SCAM. The issue was simple: EPA claimed old mill tails at the mine are hazardous (arsenic and lead) and that the site should be listed on the National Priorities List (NPL) for Superfund cleanup; the local citizens see little, if any, health risk from the tailings and do not want the mine listed on the NPL. The concerned citizens, led by Donna Rose, were very successful in getting attention. Fruits of their efforts included a visit by Idaho's Congressional delegation in August, a front-page story in the Wall Street Journal in September, a 10-minute story on CNN in late October, national news coverage on ABC-TV in November, a segment on Day One, and a story in the works for the National Enquirer.

After the visit by Idaho's solons, Congressman Crapo asked EPA to delay plans for cleaning up the yards in about a dozen Triumph homes. Everyone outside of EPA wants to avoid the NPL listing, as this will add years and countless expense to the remediation process. Blood tests of area residents have not revealed any elevated blood lead levels.

Residents have pointed out that a world-class skier, Picabo Street, lived in Triumph for 16 years and apparently suffered no ill effects from the tailings. The site, with a Hazard Ranking score of 90.33, was officially proposed as an addition to Superfund by EPA in May. EPA claims that the Triumph score is the highest ever recorded by the agency. Representative Crapo was able to delay the listing in April and get a 60-day extension for public comments in August, buying a little more time before final NPL listing. EPA authorized spending an additional $500,000 at the site in April, in addition to the $269,098 spent over the past two years.

Estimates for the tab for EPA's cleanup plan, which includes removing the topsoil in the area, were $606 million. Short-term remediation at the mill site could include:

- Fencing the tailings pile.
- Additional testing for metals in yards, play areas, and gardens.
- Putting new gravel on the East Fork road as a barrier against contamination.

- Posting warning signs at the most contaminated areas.

In October, a proposal by EPA to meet with individual property owners at Triumph, especially ones with children, to discuss yard cleanups was rejected. Instead, residents asked for a public meeting. Initially EPA refused, but was reconsidering the issue in late October, with meetings proposed for November. A meeting with the County Commissioners, planned in November, brought down the citizens' wrath, as they claimed they did not have enough notice to arrange time off from work to attend.

Most ideas for solving the tailings problem at Triumph include capping the material with clean soil. A different proposal by the University of Idaho was rejected by local citizens, who do not want to spend a lot of time studying the problem but would rather get on with remediation. The U of I program would have taken 5-6 years and involved re-mining the old tails, using cyanide to extract precious metals from the waste material and pumping the remaining waste back underground into the old mine workings. The university withdrew the proposal in March.

The Idaho Geological Survey prepared a detailed history of the Triumph mine during the year. The mine was a big producer of silver, lead, and zinc from 1884 to 1957. Tailings from the old mill were identified as hazardous by EPA in 1991. Named as potential Principal Responsible Parties were Triumph Mining Company, Asarco, Inc., and the State of Idaho, as 20 of the 60 acres containing old tails (estimated at almost 1 million cubic yards) are on state land. The state received $641 for the easement on the land years ago.

As the state has some responsibility for the cleanup, the Department of Lands took the lead and asked the Legislative Council for $250,000 to hire consultants and start the planned remediation. The department estimates it will cost some $5-6 million for the cleanup. The council did not grant the request but suggested that Lands proceed as best as possible. Earlier the Land Board had endorsed moving rapidly in cleaning up the mess to avoid the NPL listing by EPA. Governor Cecil Andrus visited the site in June and pledged his assistance in seeing that the state accepts its responsibility and gets on with a fast-track program.

EG&G officials signed an agreement in November with the Idaho Land Board to study ways to clean up Triumph. The prime contractor at the Idaho National Engineering Laboratory is looking for ways to diversify, now that defense spending and the nuclear threat with the former Soviet Union are winding down. Mine remediation may well be one of these areas. Sampling of the site by EG&G personnel began at year's end.

The local citizens at the mine support the EG&G proposal. In addition to the EG&G plan, the Department of Lands also circulated a Request for Proposals for a contractor to study the Triumph problem and oversee the cleanup effort. In November, Governor Andrus requested from Carol Browner, Director of EPA, that the agency give the state the lead in the Triumph cleanup. In December, the EPA confirmed that it is willing to turn over control of the cleanup to the state and that it would postpone listing the site on the Superfund National Priorities list.

The Western Governor's Association listed Triumph as a potential pilot project for cleanup. An advisory committee composed of the Secretaries of Defense, Interior, and Energy, the

Administrator of the Environmental Protection Agency, and the governors of Idaho, Nevada, Arizona, and California are providing the association with guidance to Demonstrate On-site Innovative Technologies (DOIT). In Idaho, the Triumph mine, the Blackbird mine in Lemhi County, and the Coeur d'Alene River Basin in north Idaho, were identified as possible DOIT sites by the committee. Four sites on the Idaho National Engineering Laboratory (Rad and Haz Mat Measurement Systems, the Rapid TRU Monitoring Lab, the Dig Face Characterization, and the Fixed Plasma Hearth) near Idaho Falls were also listed as possible rad-waste cleanup demonstration sites.

Salmon Issue

In 1991, the wild Sockeye salmon was listed as an endangered species and two species of wild Chinook salmon were listed as threatened last year. In the 1950's the number of summer and spring Chinook salmon returning to Idaho numbered about 125,000 annually but that dropped to about 9,600 in the l980's. Fall Chinook fell from 12,700, the yearly average from 1969-1974, to 450 since 1989 and the Sockeye salmon run was reduced from 4,361 in 1955 to a single fish (named Lonesome Larry by the press) last year. Although most experts agree that the dams and reservoirs on the Columbia and Snake Rivers are the root cause of the problem, other contributing factors including competition from hatchery fish, spawning habitat degradation, predators, and ocean/river harvesting are not well understood and are as controversial as the dams themselves.

Most experts believe that the eight dams on the Columbia River are too much of an impediment to the juvenile fish (smolts). It is estimated that each dam and reservoir may kill 15% of the little fish trying to pass the dam. Some propose that a big "flush" in the spring is the only way to get enough salmon smolts to the sea to insure their survival. The increased water flow would lessen the juvenile fish's residence time in the river and in reservoirs, thereby decreasing their exposure to disease and predators. The flush would be accomplished by rapidly drawing down the reservoirs behind dams on the Snake and Columbia River system.

The Northwest Power Planning Council (two members from each state, appointed by the Governors of Idaho, Montana, Washington, and Oregon) recommended the drawdown concept in 1992. The council was created in 1980 to give the states authority over the Bonneville Power Administration, the federal agency that markets hydroelectric power from the Columbia system dams. Drawdowns were endorsed by the four state governors in mid- December.

In May, National Marine Fisheries Service (NMFS) noted that they intended to try further drawdowns on some reservoirs to study the impact on salmon migration. Another idea, called the "single pool" scheme, calls for drawing down just Lower Granite reservoir, the first dam the fish meet on their way to the ocean, and then barging the fish past the other seven dams on the Snake and Columbia Rivers.

A one-month test drawdown of the Lower Granite pool in March, 1992, cost an estimated $4 million ($1.1 million in direct damage and $2.9 million in business losses). The Pioneer Ports River Alliance and others in the Lewiston-Clarkston area protested strongly against the drawdown. Opponents criticized the impact on river transportation, cited the damage to facilities such as

marinas and docks, and noted the need for the reservoir water for recreation, hydroelectric power, and irrigation.

Congress was warned by experts in April that hatcheries could not do the job of saving nearly extinct fish. The hatcheries have released more fish, but still fewer return. The hatchery-raised fish is apparently no replacement for the fish spawned in the wild. The scientists noted that when the dams on the Columbia were built, the biology of the wild salmon was not well understood, and it was believed that the hatchery fish could replace the loss of wild runs resulting from the dams.

Other experts suggest that improved barging or trucking of the smolts around the dams is the answer to the salmon problem, but critics claim this is ineffective and results in killing the fish or exposing them to disease. The Army Corp of Engineers received a permit from NMFS to collect and barge the fish, which was immediately protested by several environmental groups.

In late December, a federal judge ruled that the Corp must complete a full Environmental Impact Statement before barging any salmon smolts around Columbia River dams. This means that the controversial barging program will have to be debated in a public forum.

In September, the State of Idaho filed suit against the U.S. Corp of Army Engineers, the Bureau of Reclamation, and NMFS, claiming that a study by NMFS was ignoring the real salmon problem—the dams on the Columbia River—and was designed to protect downstream interests and utilities. A draft of the NMFS's report (called the Bevan plan) listing details of the NMFS's salmon recovery plan was released for scientific review in October. The plan recommends a test drawdown of Lower Granite Dam, but the report made it clear that the authors do not believe drawdowns are the answer. The draft study also calls for:

- placing the NMFS in charge of all recovery efforts.
- establishing a Salmon Oversight Committee appointed by the Secretary of Commerce.
- evaluating fish passages at all dams.
- studying and improving the barging and trucking of smolts around the dams.
- having NMFS take over control of Dworshak Dam and use it exclusively for enhancing fish runs.
- developing plans to protect habitat throughout the Columbia River Basin, including studying the effects of mining, logging, irrigation, and grazing on the habitat.
- releasing only full-grown steelhead so they will not eat salmon smolts.
- stop stocking trout in water where threatened or endangered salmon live.
- asking Indian tribes to cut back on ceremonial salmon harvests.
- assessing the impact of harbor seals and other predators on salmon populations.
- eliminating all attempts to improve habitat for competing fish such as bass, shad, walleye, and catfish.

The report was termed a study by "academicians who order salmon in a restaurant and don't know what is in the river" by Governor Andrus. The Governor also blames the Bonneville Power Authority for failing to identify the dams as the main problem for fish migration. He believes drawdowns and modifying the lower Snake dams are the main solutions to the problem.

Governor Andrus, joined by the governors from Washington, Oregon, and California, asked President Clinton to appoint a federal "Salmon Czar" to oversee recovery efforts. The overseer would be able to coordinate federal agency efforts, which are now fragmented and waste millions of dollars.

The cost of saving the salmon is as poorly understood as other facets of the issue. A report by the General Accounting Office noted that it could cost anywhere from $2 to $211 million per year to save the fish.

The endangered and threatened species listing for the salmon virtually guarantees that all activities on federal lands within the Columbia drainage system (salmon habitat) are under close scrutiny. Studies mandated by federal agencies are causing innumerable delays and costing millions of dollars to developers. More action on the salmon question happened in November when National Marine Fisheries requested that 300-foot buffers be established along all streams in the salmon habitat. Activity in the buffer zones would be limited, and vehicle use and even cutting firewood would be prohibited or severely curtailed. Grazing will also be restricted. The buffers will be established first in the Salmon National Forest but will be required in other forests within a year. As salmon can spawn in very small drainages, the buffers may close down most activities in the central Idaho forests. Lemhi County officials asked to participate in this process. If refused, they threatened to file an injunction against NMFS in late November. The county has a land-use plan for public lands in its jurisdiction (which includes part of the Salmon National Forest) and intends to be in on the decision-making process.

In May, the Fish and Wildlife Service stated that they may list the bull trout as an endangered species in six western states. The species is currently being studied in Washington, Oregon, California, Idaho, Nevada, and Montana. The Endangered Species Act is 20 years old and is applauded by environmentalists and hated by opponents. The act will be reauthorized in 1994 and should prove to be a major battle in Congress.

Bruneau Snail

The famous Bruneau snail was back in the news (Wall Street Journal, 11/02/93 and 11/23/93, among others). The mite-size mollusk (distinguished from other tiny snails by its oversize sex organ) lives in hot springs along the Bruneau River and was added to the endangered species list by the U.S. Fish and Wildlife Service in January. It was the 615th species on the list. The service claims that over pumping irrigation wells on some 59 ranches and farms is drying up the hot springs and destroying the animals' habitat. Owners of some 265 water rights in the area claim that the recent drought is the culprit. The Bruneau snail joined five other snails on the Snake River that were listed last year.

The stage was set for a new kind of battle over endangered species. If drawdowns of the dams along the Snake River are needed to flush endangered or threatened salmon smolts to the Pacific, the changing water levels could impact the habitat of the endangered Snake River snails. Finally, reason prevailed. Late in December, U.S. District Judge Harold Ryan removed the Bruneau Snail from the Endangered Species List and chastised the U.S. Fish and Wildlife Service for the listing.

Even Secretary of the Interior, Bruce Babbitt, was having second thoughts about the snail listing when he visited Idaho late in the year.

Starting with the listing of the Northern Spotted Owl as threatened in 1990, endangered species, land withdrawals, a general reduction in allowable cut on most National Forests, and other environmental concerns have had a dramatic economic impact on the Northwest timber industry. The decline in available timber from public lands resulted in major increases in lumber prices. In April, the average cost of 1,000 board feet of framing lumber hit $507. Prices fell during the summer, but then rose again to $510 per thousand in December. It cost an estimated $3,000 more to build a home at year's end than during the summer, due to the price increases. Mining companies were criticized when they logged patented claims to take advantage of skyrocketing prices. However, with record high prices, logging on all private land became very lucrative at year's end.

Idaho Wilderness Bill

In late March, Congressman Larry LaRocco introduced a wilderness bill for Idaho's First Congressional District, which included 1.2 million acres for wilderness, 558,000 acres for special management, and 2.5 million acres released to Forest Service management under the forest planning process. The returned area could not be considered for preservation for 10 years. The proposal ran into trouble over the Meadow Creek area, located just east of Elk City. Governor Cecil Andrus said he would like to champion LaRocco's bill but could not go along with the inclusion of Meadow Creek. Andrus and timber industry spokesmen noted that a deal had been made by Senator Frank Church and timber interests to exclude the 160,000-acre block in exchange for other areas which are now part of the Frank Church-River of No Return Wilderness. Meadow Creek is considered an important source of timber for a mill near Elk City, the major employer in the area.

Congressman Crapo, representing District 2, also pondered the fate of about 4.5 million acres of federal land that could be designated wilderness. He held town meetings to solicit input. The Boulder-White Clouds, always contentious, are still a question, as environmentalists and cattle and sheep ranchers argue over the 500,000-acre parcel.

Both of Idaho’s Senators are also studying the wilderness issue, and in mid-year the entire delegation decided to work on the problem as a team. Each delegate was studying certain parts of the wilderness equation. In August, the delegation flew over areas in the state that are prime candidates for wilderness and held meetings with invited citizens, groups, and key agencies. The delegation hoped to arrive at an All Idaho Wilderness bill by October, but the process is taking more time and was still unfinished at year's end. Rather than drawing lines on a map, the delegation focused on questions such as how special management zones will be administered and what kind of release language will be applied to lands returned to multiple use.

Figure 21. Endangered species; the famous snail, Bruneau, Idaho.

A dispute between Congressman LaRocco (Democrat) and Senator Craig (Republican) over allegations in a fund-raising letter threatened the cooperative wilderness work at year's end. The senator referred to LaRocco as a "tax-and-spend liberal with a socialist agenda" in the letter. The Congressman noted that he may submit his original wilderness bill for western Idaho to the House Natural Resources Committee as early as February. He will meet with Governor Andrus to try and iron out a compromise on the Meadow Creek area.

Eastern interests barged into the wilderness picture when Rep. Carolyn Maloney from New York introduced a bill (Northern Rockies Ecosystem Protection Act) designating some 16.3 million acres in five western states, including 8 million acres in Idaho, as wilderness. By December, the bill had 42 co-sponsors and the endorsement of many environmental groups including the 500,000 member Sierra Club. The bill was announced as dead on arrival by Congressman LaRocco, who sits on the House Natural Resources Committee, which must approve all such legislation. Many believe, however, that the message is clear: If Idaho cannot come up with its own wilderness bill, there are others more than willing to make our decisions for us.

Mining Claim Fees

A new law, passed by Congress last year, does away with the assessment work provision of the 1872 Mining Law and replaces it with an annual $100 per claim rental fee. The fees for both 1993 and 1994 ($200 total) had to be paid by August 31, 1993. A small miners' exemption covers those who own 10 claims or less and applies only to lode and placer claims (fees must be paid on tunnel and mill site claims). The claims must also have less than 10 acres of unreclaimed surface disturbance resulting from exploration or mining activities. With an exemption, the small miner can still do assessment work without paying the flat $100 per claim. To get an exemption, the miner must file a plan of operations with the federal agency which administers the land where the claims are located. A Catch 22 is that the miner will not know if his operating plan has been accepted until next year. If it is not accepted, he can lose his claims. There is great confusion about

this exemption, and it will probably continue to cause problems into 1994. Experts noted that many claims would be dropped rather than claimants paying the $200 fee. BLM estimated that 50-70% of the approximately 800,000 active claims in the West, including 55,000 in Idaho, would be dropped as of the August deadline. Since 1989, when BLM imposed a $20 per claim administrative fee, there have been 35,000 claims dropped in our state.

BLM's estimate of how many claims would lapse was close. A compilation by F.B. "Ted" Mullin in the November issue of The Professional Geologist gave the numbers in Table 3. In Idaho 65% of the active claims were dropped; 51% lapsed in Nevada, and 61% of the total claims in the nation were abandoned.

Abandoned Mine Lands

The Mineral Policy Center, a Washington, D.C., based environmental group, released a report entitled the "Burden of Gilt". The paper calls for the cleanup of an estimated 557,650 abandoned mines in the United States at a cost of some $35-$71 billion. Senator Dale Bumpers of Arkansas, author of a mining reform bill in the Senate, Rep. George Miller, chairman of the powerful House Natural Resources Committee, and Rep. Nick Rahall, author of a mining reform bill in the House, applauded the report and called for assessing fees on the mining industry to pay for the cleanup. The Rahall bill calls for a lease on all minerals removed from federal land to pay for the reclamation (see Mining Law Reform discussion). There is a question as to whether federal mineral leases could even begin to pay for the cleanup effort, so the Policy Institute suggested that a tax be levied on all minerals produced on all lands in the country to pay for the program.

Many in the mining industry questioned the Institute's numbers and most believe the magnitude of the problem has been greatly exaggerated. In Idaho, for example, the report claims there are 5,000 mines with problems. Few state officials believe that the problem is anywhere this large. However, because of the language in the proposed mining law bills, a number of federal and state agencies began to vie for the lead in abandoned mine reclamation.

Ahead of the pack in Idaho, both the U.S. Forest Service and the Bureau of Land Management are looking at inactive and abandoned mine lands as mandated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The federal agencies are inventorying mine sites and doing field studies to assess the magnitude of the problem in preparation for remediation of physical hazards (like open mine shafts) and environmental problems (including hazardous materials or "HazMat" problems). The term "abandoned mines" is somewhat of a misnomer, as most non-working mines with any significant past production are still owned by somebody.

Table 3. Claims dropped in the United States due to new claim fees.

State	# of claims, 2/28/93	# of claims, 9/1/93	Claims dropped
Alaska	21,012	11,004	10,008
Arizona	64,199	29,397	34,802
California	85,859	22,700	63,159
Colorado	29,150	10,955	18,195
Eastern States	5,907	67	5,840
Idaho	60,685	21,086	39,599
Montana	67,182	24,953	42,229
New Mexico	18,483	9,650	8,833
Nevada	258,000	125,721	132,279
Oregon	36,852	14,863	21,989
Utah	59,263	16,061	43,202
Wyoming	37,126	13,942	23,184
Total	759,668	294,678	464,990

Mining Law Reform

Mining law reform continued to be a major issue for the nation's mining industry in 1993. Public meetings debated both sides of the issue, including a local rally in Mission Park in Spokane in September. All of Idaho's Congressional delegation has held public meetings to solicit input on this contentious issue. In May, 45 women from all over the West descended on Washington, D.C., in support of the mining industry. The women met with 83 members of Congress in support of the Craig Bill. By all accounts, their trip was very successful.

In the first year of the Clinton administration, the floodgates opened to reform the Mining Law of 1872. With an administration sympathetic to reform, Senator Dale Bumpers (Arkansas) introduced a bill (S-257) on January 29 which was very similar to House Bill H.R. 322 introduced earlier in the month by Rep. Nick J. Rahall II (West Virginia). Both bills called for mineral leases (Rahall-8% on gross income), stringent environmental regulations regarding mining operations, mined land reclamation programs, abandonment of the patenting process, and other major changes. An administration report, entitled "A vision of change for America," called for a 12.5% royalty on the gross value of all minerals extracted from mining claims on federal lands. The Secretary of Interior followed up with an order in March, which in effect placed a moratorium on patenting mining claims. There were 580 patent applications nationwide in December, with 43 each in Idaho, Washington, and Oregon, and 58 in Montana. Having to clear the patent with Interior (if it can be cleared) adds 6 months or more to the process, which generally takes 18 months to 2 l/2 years.

In addition to the royalty on gross income, one of the most feared parts of the Rahall bill is the suitability clause. Under this clause, the Secretary of Interior would be able to decide the suitability of federal lands for mining. He could not shut down existing mines, but lands declared unsuitable would be off limits to any new mineral development.

Senator Larry Craig (Idaho) labeled the Bumpers bill another "to heck with the West bill." In April, Senator Craig introduced the "Hardrock Mining Reform Act of 1993 (S.775) as an alternative bill to Bumpers'. This bill calls for mining reform but is less stringent than the Bumpers or Rahall plans. It is supported by the American Mining Congress and the mining industry. Craig's bill calls for a 2% royalty on net profits (as opposed to gross income) on minerals extracted from federal lands, provides for the fair payment of surface values for patented claims, establishes a reclamation plan for abandoned mines, and calls for reclaiming mined lands in accordance with state and local regulations. A similar bill was introduced in the House by Rep. Bill Orton from Utah.

Sen. Bennett Johnston (Louisiana), Chairman of the Senate Energy and Natural Resources Committee, announced that the Craig bill would be considered by the committee in April. Johnston made it clear that S.775 was only a vehicle to get the issue to a House- Senate conference committee for resolution. The Craig bill passed the Senate in May, setting the stage for a major showdown in conference with the Rahall Bill in the House. Conferees for the Senate will be Bennett Johnston (D-LA), Dale Bumpers (D-AR), Daniel Akaka (D-HI), Bill Bradley (D-NJ), Malcolm Wallop (R-WY), Frank Murkowski (R-AK), and Larry Craig (R-ID). House committee members had not been named at year's end.

In September, a vague proposal appeared on the agenda of the Select Revenue Subcommittee of the House Ways and Means Committee, calling for a severance tax on hard rock minerals such as gold, silver, and copper. A similar proposal was rumored to be under consideration by the Department of Interior as a way to generate funding for an abandoned mine lands reclamation program. Such a tax could be applied to all minerals mined in the country, regardless of land ownership.

The House Natural Resources Committee considered the Rahall Bill in October. A substitute bill, virtually identical to Rahall's, was introduced by Rep. Richard Lehman of California. The Lehman bill would allow miners to deduct some processing and transportation costs from royalty payments. The Lehman bill was voted out of the Committee early in November and passed the full House by a 316 to 108 vote on November 18 and is now headed for conference. Representative Mike Crapo from Idaho offered a motion to send the bill back to the committee, but the motion failed 148 to 271. Representative Larry LaRocco from Idaho voted for the bill. By doing so, he stands a chance of getting on the House/Senate conference committee and perhaps softening the legislation from the House side.

As access to minerals on federal lands tightens, there is renewed interest in pursuing mining on Native American lands. Several tribes were very visible at the trade show at the Northwest Mining Association Convention held in Spokane, Washington, in December. The tribes displayed lots of technical data about minerals on their reservations. While interested in promoting their land for its mineral wealth, the tribes are also insistent that any operations be conducted in an environmentally sound way. There were 15 mineral-related projects funded in 1993 on reservations nationwide. Four were in the Northwest, according to the Bureau of Indian Affairs.

Other Environmental News

Envirosafe Services of Idaho was cited for 25 regulatory violations that could carry fines totaling $127,000. The company operates a hazardous waste disposal site in Owyhee County that receives material from all over the country. It is the 33rd time in the past 12 years that the company has been cited and it has paid fines totaling over $200,000. The company was accused of failing to operate the facility in a manner which minimizes the possibility of fire, explosion, or an unplanned release of hazardous waste. Envirosafe has said it will address the problems and work cooperatively with the state Division of Environmental Quality.

The Idaho Department of Transportation (IDOT) ran into a problem usually reserved for the mining industry—acid water. A section of I-90 just east of Coeur d'Alene goes through the Prichard Formation which contains a lot of sulfide minerals. The sulfides decompose, making runoff water acidic. The IDOT is mitigating the problem by using limestone to reduce the pH of the effluent.

A bill to protect 171 miles of the upper Boise River system, including Mores Creek and the North and Middle Forks, was introduced in the state legislature. The bill would specifically prohibit the construction of a dam at Twin Springs, which has been proposed as a damsite in the past.

Record rainfall early in the year led to a number of landslides throughout the state. A large slide blocked the road near Elk Creek north of Elk River in April. The Tillie Creek slide (east of Mt. Idaho and Grangeville) periodically blocked Highway 14 to Elk City all spring. The largest of the slides was a 100- acre failure near Bliss on the Snake River that actually dammed the Snake momentarily and almost wiped out a group of people rafting on the river. A road over the slide area is a major route for agricultural products. The road was rebuilt during the summer. Another slide went into the Snake River in Hells Canyon. Tragedy struck when a flash flood washed debris across state Highway 3, a half-mile northeast of Juliaetta. A couple perished when their car was caught in the flood and instantly buried by a cascade of mud and rock. Slides and flash floods are common in this area, especially in years when the spring months are very wet. In December, a rockslide damaged vehicles on Highway 200 east of Sandpoint on another dangerous stretch of Idaho road.

The watchword for the Clinton Administration's environmental movement is "Ecosystem." Although the term does not appear to have a clear-cut definition, it implies studying all aspects of a biological system as an entity rather than as separate parts. The Department of the Interior plans on establishing a new National Biological Survey (somewhat along the lines of the U.S. Geological Survey) to study the nation's ecosystems. The survey will be made up of parts of existing Interior programs and some new people. Universities are expected to play an important role in the data gathering and interpretation process for the new agency. The House approved $163 million for the new survey in November. The first study areas may include the Everglades in Florida, Southern California, and the Puget Sound area in the Pacific Northwest.

Idaho set a record in 1993 for drinking water problems. There were 16 instances of contaminated drinking water, most related to coliform bacteria. Notices to boil drinking water were common. Starting next year, the Division of Environmental Quality will begin to test individual home water

systems for lead (15 ppb limit) and copper, as required by the Safe Drinking Water Act passed by Congress in 1986.

The Division of Environmental Quality (part of the Department of Health and Welfare) administers the Safe Drinking Water Program in Idaho under authority from EPA The program is funded by fees levied against towns and cities for water sampling and analysis. In November, the program was in trouble when 16 towns and cities refused to pay the fees. Bonner's Ferry, for example, refused payment, stating that the testing was a mandated program without any consideration of how it would be funded. The program is an example of a federally mandated program handed over to the states, with the proviso that the states pay for it. The program cost $1.6 million, with $600,000 provided by the federal government. Twenty-eight people administer the program for DEQ. If DEQ cannot continue the program due to a lack of funds, EPA will take it over, probably with much tougher enforcement. Previously, the $1 million came from the state General Fund, but the legislature asked Health and Welfare to find another source of revenue. The state Board of Health and Welfare then set up the fee system, which averages $3 annually for each hookup to the water system.

As part of a statewide ground water monitoring program, the Department of Water Resources, in cooperation with the U.S. Geological Survey, tested some 400 wells statewide for water quality in 1992. The results showed that forty wells failed to meet federal standards. The water was tested for radon, bacteria, pesticides, and metals such as arsenic.

The Department of Energy declassified documents at year's end about the Idaho Engineering Laboratory. It was learned that there may be twice as much plutonium buried at the site than was previously thought. This raised the total from 807 pounds to 1,320-1,980 pounds. The DOE is not sure where some 600 pounds of the deadly material are located. Governor Andrus demanded an accountability and full funding for the state/DOE cleanup plan for the site.

The Krassel Ranger District was awarded the 1992 National Primitive Skills and Minimum Tool Leadership Award from the U.S. Forest Service. District personnel and local outfitters cleaned up the Yellowjacket mine, located on Big Creek in the Frank Church River of No Return Wilderness Area. The team had to dismantle three buildings by hand, cutting apart old refrigerators, hot water tanks, pipes, and other junk into packable pieces. About 7.5 tons of refuse were removed from the site by pack string. Work continued this year, with another 7.5 tons of material removed. The area will be rehabilitated and planted with native trees and grasses in 1994.

Trees began to fall in the Cove-Mallard area of the Nez Perce National Forest, which is located east of the small hamlet of Dixie. Logging in the area has been hotly contested for the past two summers by Earth First, a radical environmental group which believes in "monkey wrenching" and civil disobedience to accomplish its goals. The USFS closed a 21-square-mile section of the Cove-Mallard to all public access after vandals damaged road building equipment. Fifteen Earth Firsters were arrested for violating the closure notice. The Cove-Mallard sale will be developed by 135 miles of roads. About 81 million board feet of timber will be logged from the area. The protest by Earth First has led to 150 arrests by county and U.S. Forest Service law enforcement officers. Earth First vacated their camp near Dixie in the fall after the North Central District Health Department expressed concern over poor sanitary facilities at the site. They vowed to return next year. Several

environmental groups filed suit against the USFS in the fall, seeking an injunction to stop the sales. In spite of the litigation, the sales proceeded as soon as the ground was frozen hard enough for Shearer Lumber Company to begin logging. The harvest will include six sites in the Grouse Creek area that will be harvested by next June.

A Senate subcommittee placed "on hold" $6.7 million earmarked for purchasing 7,000 acres of private land. The acquisition was for extending the Saylor Creek bombing range used by the Idaho National Guard and regular Air Force units at Mountain Home Air Force Base. The project is supported by Governor Cecil Andrus, who is worried that Mountain Home might be put on the next base closure list without the expansion. The state would own the land and lease it to the Air Force. Environmentalists and the Shoshone-Paiute Tribes have expressed concerns over the expansion ever since it was proposed several years ago.

A rock concert held in April was billed as the Greenstock Music festival but was renamed "Mudstock" by the press after 8,000 participants and hundreds of vehicles became mired in deep mud from torrential rains. The gathering, 15 miles east of Kendrick, was a financial disaster for promoters.

OTHER MINING RELATED NEWS

Proposed cuts in the U.S. Bureau of Mines FY-95 budget included closing the Western Field Operations Center and a Research Center, both in Spokane, Washington. The two units employ about 220 people, with an annual payroll of $10 million. The offices serve California, Idaho, Montana, Nevada, Oregon, and Washington. Department of Interior officials dropped the idea after Representative Thomas Foley (Speaker of the House of Representatives) from Washington nixed the proposal. The Bureau and other Interior agencies are facing budget reductions which can be used to fund the new National Biological Survey and other programs.

Ben Harrison, dean of the stockbrokers on the now-defunct Spokane Stock Exchange, died in November. He began his 64-year career on the Exchange in 1929, and his name was connected with many companies in the Coeur d'Alene Mining district.

Arthur D. Fahrenwald (1890-1983) was inducted into the National Mining Hall of Fame in September. Fahrenwald was a former researcher with the U.S. Bureau of Mines and served as Dean of the College of Mines at the University of Idaho, where he worked for many years. He was best known as the inventor of the Fahrenwald Hydraulic Classifier and the Sub-A cell for selective flotation in 1920 and 1923, respectively. Both machines were widely used throughout the world for mineral dressing for many years. Much of the development work for the cell was done at the University and at the Bunker Hill mill in Kellogg, Idaho.

Craters of the Moon National Monument continued to be a big tourist attraction for Idaho. There were 244,800 visitors in 1992, a 12% increase over the previous year. It is estimated that tourists enriched the area by some $6.7 million. Over 90% of the visitors to the geologic wonder were from outside southern Idaho.

Ground was broken for McClure Hall, the new home of the College of Mines and Earth Resources at the University of Idaho. By year's end, the steel superstructure of the $12 million facility was almost completed. Construction is expected to take almost two years with occupancy scheduled for late 1994 or early 1995.

The Idaho Geological Survey hosted the 85th annual meeting of the Association of American State Geologists in early June in Coeur d'Alene. About 135 people from 44 states and several federal agencies were present. The meeting was last held in Idaho in 1961. In addition to business sessions, the geologists, spouses, and guests enjoyed field trips to the Silver Valley, Imsamet's aluminum can recycling plant at Hauser Lake, and the Sunshine metal refinery in Hayden Lake. Thirty people enjoyed a post- meeting tour of Hells Canyon by jet boat. Almost every mining company, large and small, with operations in Idaho supported the meeting. The Idaho Mining Association was a major sponsor of the event. The Survey staff handled all of the logistics for the meeting including pre-meeting planning, leading field trips, and providing transportation.