SOUTH DAKOTA – 2003 Mineral Summary
Production, Exploration and Environmental Issues

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http://www.state.sd.us/denr/DES/mining/mineprg.htm

Production

Gold: Gold production continued to decrease in 2003. Homestake Mining Company, LAC Minerals, and Wharf Resources Inc. produced 78,805 ounces of gold in 2003. This represented a 34 percent decrease in the amount of gold produced compared to 2002. The main reason for the decrease is that Wharf Resources is now the only producing large scale gold mine in the state. Homestake, which ended operations in January 2002, recovered 7,754 ounces of gold during mill demolition activities. LAC Minerals recovered 149 ounces of gold during removal of sediments from its process ponds. Gold continued to remain the leading mineral commodity in South Dakota in terms of value. The average price of gold in 2003 was $363.38, yielding a gross value of about $28.6 million. This was 22 percent lower than the 2002 gross value of $36.7 million. Table 1 compares gold production for 2002 and 2003 from the active large scale gold operations in South Dakota. The mines are surface heap leach operations, with the exception of Homestake.

Table 1 – Gold Production in South Dakota – 2002 and 2003

Company	2003 Production (ounces)	2002 Production (ounces)
Golden Reward Mining Co., LP	0	50
Homestake Mining Company	7,754	36,334
LAC Minerals (USA), LLC	149	0
Wharf Resources (USA), Inc.	70,902	82,127
Total	**78,805**	**118,511**
Estimated Value	**$28,636,161**	**$36,706,412**

Wharf was the only company to report silver production, which is a by-product of its gold recovery process. A total of 76,577 ounces of silver was recovered in 2003. At an average price of $4.87, the value of the silver was $372,930. This is an increase from the 59,015 ounces and $270,879 value reported in 2002.

Homestake, a subsidiary of Barrick Gold, continued closure activities at its historic gold mine in Lead during 2003. The mine was closed at the end of 2001 due to low gold prices, high productions costs, and lower than expected ore grades. On June 10, 2003, a milestone was reached as Homestake turned off the pumps to the underground mine and allowed it to begin filling with water. Before the pumps were turned off, department staff conducted several inspections of the underground mine to ensure that all waste materials, equipment, fuels, solvents, and other chemicals were removed from the mine. Homestake also continued reclamation at its former mill site. The company plans to return the area to an interpretive park. The company also closed an aqueduct that diverted Little Spearfish Creek to its Hydroelectric Plant #2 in Spearfish Canyon. As a result, in November, year round flows returned to Spearfish Falls for the first time in many years.

After Homestake announced that its mine would close at the end of 2001, a group of scientists began work to establish an underground laboratory in the mine to study neutrinos and other sub-atomic particles. On May 30, 2003, a National Science Foundation committee selected the Homestake Mine as the best site for an underground laboratory. In June 2003, Governor Michael Rounds created the Homestake Laboratory Conversion Office to prepare a plan to submit to the National Science

Foundation for converting the mine into an underground laboratory. Homestake has worked cooperatively with the office and has taken steps to protect the main mine shafts from deterioration while the lab proposal proceeds. However, because there were still no approved plans or funding to convert the mine into a lab, Homestake decided to shut off the underground pumps on June 10, 2003. This created some controversy and concern within the scientific community about possible delays in accessing the lower levels of the mine.

In the fall of 2003, Governor Rounds worked out an agreement with Barrick Gold, Homestake's parent company, for donating the mine to the state. Under the agreement, Homestake would donate the mine to a newly created state Science and Technical Authority that would make the mine available to the National Science Foundation for scientific research. The Authority would indemnify Homestake for all future liabilities associated with the lab. Liability insurance and an indemnification fund would be created to cover any claims against Homestake and its successors. The South Dakota Legislature approved this plan in early 2004 and also approved state funding to provide for insurance, an indemnification fund, and operating funds for the Authority. The lab still needs final action and funding from the National Science Foundation before it can be constructed.

There are currently 11 mine permits that cover seven large scale gold mining operations in South Dakota. Wharf Resources, the only gold mine still actively mining in South Dakota, holds four of these permits. No new mine permits or mine permit amendments were issued to large scale gold operations in 2003.

Industrial and Other Minerals: Industrial and other mineral production for 2003 is summarized in Table 2. During the 2003 reporting period, 501 companies and individuals had active mine licenses in South Dakota. An operator must obtain a license to mine for sand, gravel, pegmatite minerals, materials used in the process of making cement or lime, and rock to be crushed and used in construction. There were also 35 mine permits that covered the mining of other minerals such as slate, bentonite, placer gold, and dimension stone.

Table 2 – 2003 Non-Metallic Mineral Production

Mineral	Production (Tons)
Dimension Stone	360,369
Gypsum	45,265
Iron Ore	47,706
Limestone	3,402,322
Mica Schist	6,488
Pegmatite Minerals	8,341
Placer Gold Ore	84
Quartzite	3,522,914
Shale	227,914
Slate	1,577
Sand & Gravel	14,440,046

Source: Annual reports submitted by mining companies

Sand and gravel was the major non-metallic mineral commodity produced during 2003 with 14,440,046 tons reported. Sand and gravel is produced in nearly every county in South Dakota and is used mainly for road construction projects.

Sioux quartzite overtook limestone in 2003 as the second most prolific non-metallic mineral commodity produced during 2003. Sioux quartzite production was reported at 3,522,914 tons and limestone production was reported at 3,402,322 tons. Sioux quartzite is quarried from four locations in southeastern South Dakota. Most of the quartzite is crushed and used in construction. Some larger blocks are used for rip-rap, railroad ballast, and occasionally for decorative purposes. Limestone is produced in the Black

Hills of western South Dakota and is used primarily in the production of cement and for construction projects.

A total of 360,369 tons of dimension stone was mined by Dakota Granite Company and Cold Spring Granite Company from quarries near Milbank in northeastern South Dakota. Due to its beauty and distinctive red color, the "mahogany" granite is used primarily for monuments and building construction. Much of it goes to international markets.

Other minerals produced in smaller amounts during 2003 include iron ore, mica schist, pegmatite minerals (feldspar, mica, rose quartz), placer gold, shale, and slate.

Exploration

Gold exploration activities in South Dakota continued to be limited despite higher gold prices. Only one of the large scale gold mines conducted exploration activities in 2003. Wharf Resources completed 36 exploration drill holes in the vicinity of its existing operation in Lawrence County. WMC Explorations conducted nickel and copper exploration in southeast South Dakota in November and December. The company is currently evaluating drilling results.

Two exploration permits were issued to a prospecting club and an individual for placer claims in the Black Hills. Exploration activities began shortly after the permits were granted.

Environmental Issues

Gilt Edge Mine: The Gilt Edge Mine was an open pit heap leach gold mine operated by Brohm Mining Company. The company abandoned the site after its parent, Dakota Mining, declared bankruptcy in 1999. The site was placed on the Superfund National Priorities List in 2000, and the state and EPA are currently in the process of reclaiming the site.

A major milestone at the mine was completed in 2003. Reclamation of the Ruby waste rock depository, the major source of acid mine drainage at the site, was completed. Capping of the waste depository was completed in 2002, and topsoil placement and hydroseeding were completed in June 2003. By late summer, a mixture of grasses and clover were becoming established on the depository.

Water treatment at the site resumed in September 2003 after the water treatment plant was shut down in August 2002 to convert it from a caustic system to a high density sludge lime treatment system. Acid water was stored in the mine pits until the water treatment plant resumed operations. EPA dedicated the plant in a public ceremony on September 19, 2003. After some adjustments were made to the treatment system, the plant is currently treating water at a rate of 170 gallons per minute.
EPA and the state are currently preparing plans to reclaim the rest of the site, including the mine pits and heap leach pad.

Reclamation at Richmond Hill Mine: Reclamation activities at the Richmond Hill Mine, an open pit heap leach gold mine that developed an acid mine drainage problem during operations, continue to be successful. The bulk of reclamation was completed by the mine operator, LAC Minerals (USA), LLC, in the mid-1990s. The pit impoundment, backfilled with acid-generating rock and covered with a low permeability capping system, is still performing as designed. Monitoring data shows that only minimal amounts of oxygen and water are being detected in the impoundment. This indicates the cap is effective in limiting oxygen and water infiltration and is preventing acid generation.

In addition, the capped leach pads continue to perform well. Monitoring data shows that the capping systems are effective in reducing water infiltration into the spent ore. Most parameters in the pad effluent continue to show a decreasing trend.

During routine surveys of both the pit impoundment and leach pads, no signs of settling, slumping, or cracking were noted. A dense, self-sustaining vegetative cover has become established on these facilities.

LAC operated its water treatment plant from May to September 2003 and discharged about 14.7 million gallons. Water is treated periodically based on the amount of water needing treatment and the pond storage capacities at the mine site. Effluent from the leach pads is collected and stored in the former process ponds and is then treated prior to discharge. LAC plans to treat water throughout 2004 in an effort to reduce the amount of water stored at the site. The company plans to reduce the size of its Stormwater Pond in 2005 which will help reduce the amount of water needing treatment.

Ground and surface water quality around the mine site is closely monitored. Ground water impacted by acid rock drainage prior to mine reclamation is generally improving. Monitoring wells show decreasing trends in sulfate and metal concentrations and increasing pH. Biological assessments of Squaw Creek below the mine show that the stream remains healthy and supports a viable cold water fishery.