

SWEDEN

By Sven Arvidsson
Geological Survey of Sweden

Economic growth in Sweden continued to develop in a satisfactory manner during 2000. GDP grew 3.6% to SK2,083 billion. The inflation rate rose marginally from 0.9% in 1999 to 1.0% in 2000. There was also an increase in the industrial production, which rose by 6% and investments are estimated to have increased by 5%. The average exchange rate with the US dollar was SK9.16, compared with SK8.26 in 1999. The unemployment rate was reduced to 4.4% of the workforce by the end of the year, compared with 5.7% the previous year. The labour costs for manufacturing and mining rose 2.5%.

There were some cutbacks in exploration compared with the previous year, but not as substantial as anticipated. Thus exploration expenditures in 2000 are estimated to have fallen to SK190 million from SK205 million in 1999 mainly because of low metal prices. For 2001 the exploration expenditures are forecast to be approximately the same as in 2000.

The number of exploration permits granted mainly for ore minerals was 169 (322 in 1999) covering an area of 3,782 km², with a further 23 permits being granted for diamonds, covering 578 km². There are an increasing number of permits, which are extended. During 2000 there were 137 extended exploration permits covering 4,449 km². The area covered by permits at the end of the year was 12,629 km² and an additional 11,711 km² related to diamonds.

There was a high frequency of exploration geologists visiting the Geological Survey of Sweden office at Malå where the number of exploration reports being made available in digital format is increasing. Also, at the Geological Survey's national drill core yard, the amount of core available for inspection and sampling is increasing.

Boliden was awarded an exploitation concession at the Maurliden (1.5 Mt) zinc-copper orebody. An open-pit operation was started up in mid-2000. Two exploitation concessions were awarded to Woxna Graphite AB at Mattsmyra and Gropabo, in addition to Månsberg which was given in 1999. They are all close to the company's graphite operations in Kringelgruvan.

Some new deposits are being investigated for future mining. North Atlantic Natural Resources (NAN) is investigating the Norrliden copper-zinc deposit situated close to Boliden's Maurliden mine. The deposit includes 775,000 t of ore containing 0.7% Cu, 7.8% Zn, 1.1 g/t Au and 100 g/t Ag. At Blaiken, ScanMining has got permits also from the environmental authorities for the start up of its operations including the two mines of Ersmarksberget and Svärträsk. At Ersmarksberget, the company reports proven reserves of 1.9 Mt with 1.8% Zn, 0.7% Pb and 0.5 g/t of Au, and probable reserves of 5.6 Mt with 1.7% Zn, 0.8% Pb, 9 g/t Ag and 0.5 g/t Au. At Svärträsk, it is reported probable reserves of 1.8 Mt at 3% Zn and 0.3% Pb.

Boliden has signed an agreement for co-operation in a US\$8.5 million exploration programme with Inmet of Canada spread over four years, and focusing on the Bergslagen area in south central Sweden. It is in this area that Boliden has its mines at Garpenberg and Garpenberg North. The exploration programme is targeted on Boliden's extensive exploration permits in the area.

Iron Ore Mining

The production of crude ore at LKAB's Kiruna mine rose from 19.8 Mt in 1999 to 22.3 Mt in 2000. In that year the entire production was hauled from the new main haulage level at a

depth of 1,045 m, with the present sub-level caving performing above expectation. The volume drilled at Kiruna increased by some 10%, with increased productivity. By the end of the year there were six (two more than last year) remote-controlled Atlas Copco rigs equipped with Wassara water-powered drilling machines and two, also remote-controlled, Solo 1000 rigs. Mine development during 2000 included 16,500 m of drifts. The new annual ore production target of 24 Mt will require 17,000 m of drifting per year, including some 900 m of inclined ramps.

During 2000 the number of remote-controlled (RC) 25 t loaders was increased from three to four, and the RC equipment now carry out some 40% of all loading. The high degree of remote control has facilitated work at night in the mine with better safety and increased productivity.

The output of finished products at Kiruna and Svappavaara increased from the previous year to 2.7 Mt of sinter fines and 10.9 Mt pellets of which 3.0 Mt came from Svappavaara. Productivity also included 0.2 Mt of special products (products intended for non-metallurgical purposes).

The pellets works at Kiruna produced 150,000 t more than the former record level from 1997, whereas Svappavaara lost one month of production (300,000 t of pellets) after a fire in May which occurred during maintenance work.

A new apatite flotation plant is planned in Kiruna in order to make mining easier as the middle grade phosphorous ore can be treated there. This will eliminate the need to separate this ore from the low phosphorous ore in the mine. There will also be space made for buffer stocks between the flotation plants and the pellets plants. A new type of pellet product was tested in 2000. It is designed for use in mixed pellets-sinter feeds and will be introduced during 2001.

The crude ore production at LKAB's Malmberget mine was 12.4 Mt during 2000, somewhat lower than in the previous year. The mixing of waste rock with ore in the hoisted ore is causing dilution of the ore with decreased grades delivered to the surface. A new main haulage level, at a depth of 1,000 m, was inaugurated in the autumn of 2000. It contributed 1.7 Mt of ore during the year and will be in full operation in 2001.

Production drilling was performed utilising solely remote-controlled drill rigs, which achieved 390 km of drilling. This is a reduction of 14% on the previous year, and was done in order to utilise some of the buffer of drilled rock from previous years. The productivity in the mine was high, and several production records were achieved. Development work during 2000 included 12.3 km of drifting, 0.5 km more than in the previous year.

The output of finished products at Malmberget was 6.9 Mt, slightly lower than in 1999. The decrease was due to limited availability of magnetite ore from the mine and production performance below expectations at the haematite concentrator. Work has been initiated in order to reach higher recovery in the haematite plant. The finished products consisted of 4.1 Mt of pellets and 2.8 Mt of concentrate. The pellets are based on 15% haematite and 85% magnetite.

Swedish Ore And Mineral Production ('000 t)			
	1998	1999	2000
Iron ore products ¹	20,930	18,853	20,557
Processed sulphide ores	24,182	23,526	23,608
Copper concentrate	270	262	252
Lead concentrate	155	157	147
Zinc concentrate	297	316	320
Gold concentrate (kg)	4,400	1,700	186
Lime and limestone	7,196	6,604	8,351
Cement	2,250	2,300	2,600
Talc/soapstone	24	19	20
Graphite concentrate	3.2	4.5	5.6

¹. Marketable products.

During the September quarter of 2000, prototypes of a new locomotive and rail cars were delivered to LKAB's transport company MTAB. The locomotive was delivered by Adtranz. It is a 15,000 hp electrical locomotive with a weight of 360 t. A train of 68 new cars with a design capacity of 100 t is being tested on the railway between Malmberget and Luleå. The train capacity is planned to increase from 3,800 t to 6,800 t. This will be possible now that the upgrading of the railway to an axial load of 30 t has been completed.

Base and Precious Metals

Boliden Mineral AB was operating ten mines in Sweden during 2000. The total production of crude ore from these mines was 22.8 Mt. They were served by four concentrators situated at Aitik, Laisvall, Boliden and Garpenberg. The production in the Aitik open-pit mine was 18.2 Mt of copper ore. At Laisvall, 1.9 Mt of lead ore was mined underground by room and pillar methods. In the mines of Garpenberg and Garpenberg North 1.1 Mt of copper, zinc and lead ore were mined at depths of between 800 m and 1,000 m utilising backfill. The six mines in the Boliden area include Kristineberg, Åkerberg, Petiknäs, Renström, Maurliden and Kedträsk.

Mining in the open pit at Maurliden started during 2000. It is Boliden's 28th mine to open in the Skellefte ore field since the start in 1925.

Exploration continued at the deeper levels of the Renström mine between 1,070 m and 1,750 m where high zinc grades have been discovered. Also in the Kristineberg mine, exploration continued where the rich gold-copper Einarsson West zone and a newly discovered zinc zone have been drilled. The Einarsson West zone is reported to contain 491,000 t of probable reserves with 7.0 g/t Au and 0.98% Cu.

At the ore-dressing plant in the city of Boliden, a new leaching plant is under construction in order to treat mainly gold from the Einarsson and Einarsson West gold ore

zones at the Kristineberg mine.

An agreement has been reached between Boliden and North Atlantic Natural Resources (NAN), in which Boliden is holding a 38% stake, stating that Boliden will operate NAN's Storliden mine. Underground mining with room and pillar, backfill and open stoping methods is expected to start in late 2001. The ore will be transported by truck to Boliden's concentrator in Boliden.

The Rönnskär copper smelter, which has been upgraded from 140,000 t/y of copper cathode to 240,000 t/y has been one of Boliden's largest investments ever at SK2 billion. The upgraded plant was inaugurated by the Swedish Prime Minister Göran Persson at the end of August.

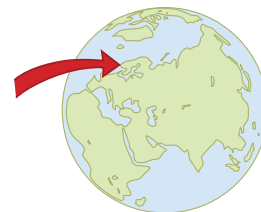
Boliden and Rio Tinto both have agreed to sell their equal half shares of the Norzink zinc smelter in Norway to Outokumpu of Finland.

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Mineral Resources Information Office
Skolgatan 4, SE-930 70 Malå, SWEDEN
Phone: +46 953 346 00 Fax: +46 953 216 86
mala@sgu.se

Zinkgruvan Mining AB is now owned by Rio Tinto, which acquired the company (including the Zinkgruvan mine) as part of the purchase of North Ltd of Australia. Ore production during 2000 was 733,000 t grading 10.8% Zn, 4.0% Pb and 102 g/t Ag, 60,000 t less than in 1999. Of the ore production, 78% came from drifts and benching work, 21% from development work and the remainder from back-fill mining. Drifting in barren rock produced 233,000 t of rock of which 76,000 t were dumped in open rooms in the mine. Work has started on ramp connections between all levels in the central part of the mine.

Output from the ore-dressing plant reached record levels of 135,500 t zinc concentrate and 35,500 t lead concentrate. Meanwhile, exploration was concentrated on the central and western parts of the mine. Drilling has indicated continuation of the ore zone in the western part at 1,000 m. In the central part, widely separated drill holes indicate the presence of the ore zone even at depths of 1,200 m and 1,400 m.

At the open-pit gold mine of Björkdal, no work has been done since the owner Terra Mining went bankrupt in 1999. The concentrator is kept on a care and maintenance programme awaiting a new operator to take over the ownership.

Industrial Minerals

In 2000, Partek Nordkalk AB produced 3.3 Mt of lime and limestone in Sweden, down 0.2 Mt from the previous year. Most of the production comes from the Storugns mine on the island of Gotland. The other major producers of limestone and dolomite are Svenska Mineral and Omya. Svenska Mineral is running quarries at Gåsgruvan, Rättvik and Stucks on the island of Gotland. Omya's quarries are situated in Sala, Glanshammar and Larsbo.

Graphite is produced by Woxna Graphite at its open pit and concentrator in Kringelgruvan in the district of Hälsingland. Cement is made by Cemeta AB at its plants in Slite, Degerhamn and Skövde. The company is part of the Heidelberg Cement Group.