



Photo: Lars de Wall

**AITIK, SITUATED OUTSIDE** the town of Gällivare in the very north of Sweden, is Sweden's largest copper mine. Aitik is also the most efficient open pit copper mine in the world. The deposit consists of chalcocopyrite and pyrite yielding copper, gold and silver. Approximately 40 Mtonnes of ore is mined and concentrated here every year. The open pit is 3 km long, 1.1 km wide and 450 meters deep – so far.

Aitik is also home to some of the largest machines in the world. Here you'll find rock trucks that weigh 570 tonnes when fully loaded – the wheels alone are 4 meters in diameter. There are shovels with buckets that can hold up to 45 cubic meters of rock, wheel loaders that weigh 190 tonnes and drilling machines that weigh 181 tonnes and drill depths of 16 meters. Large amounts of waste rock must be

removed in order to produce the ore. Much of this waste rock is crushed and recycled for the construction of roads and as ballast material in cement.

Although the deposit was discovered at the beginning of the 1930's, its exploitation only became possible in the 1960's, thanks to modern mining equipment and technology. The mining capacity was gradually tuned up through the large Aitik Expansion in 2010, to reach a level of 39 million tonnes ore per year from 2014 and on.

Aitik employs over 770 people and is the largest private employer in the municipality of Gällivare.

## SHORT FACTS

Established: 1968

Employees: 771

Production 2019

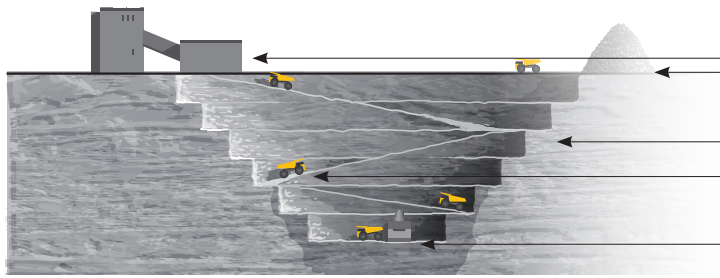
Ore:	41 Mton
Copper:	91 Kton
Silver:	38 ton
Gold:	3 ton

## Did you know that ...

Pure copper oxidises very slowly. Copper cylinders are therefore used to store spent nuclear fuel. A copper cylinder with 10 cm thick walls will last for one million years before oxidising through.

# Mining process

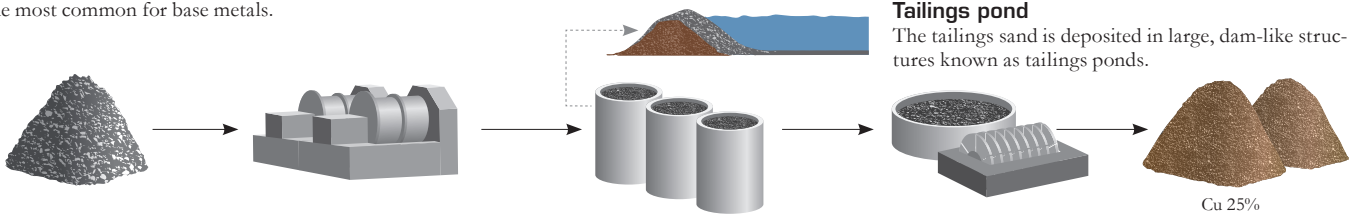
The mining takes place in open-pit mines when the ore body is located close to the surface and in underground mines when the ore is located at greater depth.



## Open-pit mine

- The concentrator processes the mined ore to produce metal concentrate.
- Waste rock dump for storage of waste rock (rock that contains no valuable minerals).
- The ore is mined in horizontal slices, known as benches.
- Trucks haul ore and waste rock on ramps in the open-pit mine.
- Rock crusher for crushing ore before it is transported by conveyor belt up out of the open-pit mine to the concentrator.

The ore is crushed in several stages in the concentrator. Different minerals are then separated out from one another and from waste rock through a variety of concentration methods, of which flotation is the most common for base metals.



## Crushed ore

Crushed ore containing copper and subsidiary metals.

## Primary and secondary mills

Mills grind the crushed ore. The milling is carried out in two phases to produce sand with a grain size of up to 250 micrometres.

## Flotation

The sand is carried to open throughput tanks, where chemicals are added and air injected, causing different types of minerals to float up, forming a froth on the surface. Non-mineral-bearing particles (tailings sand) collect on the bottom of the tank and are transported to tailings pond.

## Tailings pond

The tailings sand is deposited in large, dam-like structures known as tailings ponds.

## Dewatering and filtering

The mineral froth is gathered up, dewatered and filtered.

## Metal concentrate

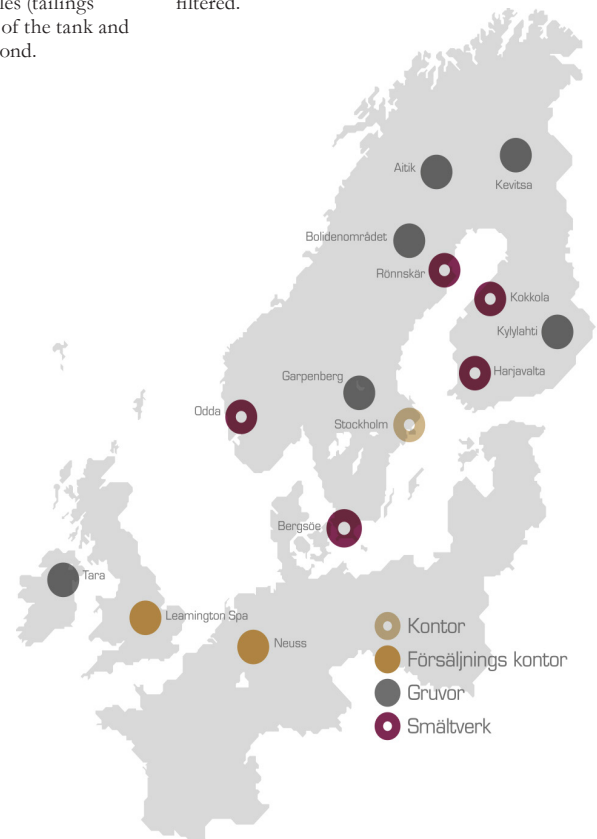
The end result is copper concentrate that contains approximately 25% copper.

# The Boliden Group

Metals are an ever-present and vital component of society. Boliden extracts minerals and produces high quality metals in a cost-efficient way. The work – from exploration to customer delivery – is characterised by care for people, the environment and society.

The Boliden Group operates five mines and five smelters in Sweden, Finland, Norway and Ireland and has a total of approximately 6 000 employees. Our core expertise is in exploration, mining, smelting and recycling.

Boliden's main metals are zinc and copper, but the production of lead, gold, silver and other products is also of considerable importance for our profitability. The annual turnover is approximately SEK 50 billion.



## Our value chain

**Exploration** Successful exploration is vital to long-term metal production. The exploration is conducted in the vicinity of existing mines and in new areas in order to find new deposits.

**Mines** Zinc-, copper-, lead-, gold- and silver-bearing ores are mined in Boliden's mining areas. The ore is processed to metal concentrate, the majority of which is delivered to smelters within the Group.

**Smelters** Boliden's smelters refine metal concentrates and other raw materials, such as electronic scrap, to produce both pure metals and customised alloys.

**Customers** Our products are mainly sold to industrial customers in Europe. Most of the zinc is sold to steel companies, while the copper is supplied to manufacturers of for example wire rod