MINERAL EXPLORATION
Look for mineral concentrations to be 100 to 1000 times greater than normal
Use planes with special instruments to detect the minerals
Things that shows lots of minerals are:

- High magnetism
- Change in gravity
- Change in radioactivity
The next step is taking rock samples to look at ore qualities.

If high quality then they may open a mine.
This is when the ore is more than 50m below the surface
There are many types and styles of mines like this and most can be dangerous to work in
LONGWALL MINING

- A very efficient way to mine
- A large shedder machine goes back and forth along a seam (of mineral ore) and cuts it out
- Hydraulics hold up the roof until the shedder moves forward
- The roof collapses behind shedder and workers
This is a longwall mining machine
Longwall Mining Machine (Works back and forth across coal face)

Source:
Energy Information Administration
SOLUTION MINING

- Very economical, if ore is soluble
- Hot water is injected into ore and dissolves it
SURFACE MINING
- Done when ore is near or on the surface
- Open pit mining is when there is a large amount of ore and is removed layer by layer
The rock and soil above the coal is called the Overburden. Overburden is removed, the coal is mined and the overburden is used to fill in the hole left behind.
Quarrying is useful for building materials like sand, granite, limestone etc.

Used to remove large pieces at a time.
SOLAR EVAPORATION

- For using evaporites like sea water
- Shallow pools are created and the sun evaporates the water, leaving the mineral
- Works in areas with little rainfall (like Egypt)
Salt flats
PLACER MINING
These mines are at places where streams and rivers have weak currents
The weak currents drop the minerals the water is carrying
Gold rush in California is a great example
Smelting is the melting of ore to remove unwanted material.

*Flux* is added to the molten rock and ore to bind to impurities.

Flux and impurities form *slag* which float and are removed.
Molten metal