

# The Importance of Minerals and Mining

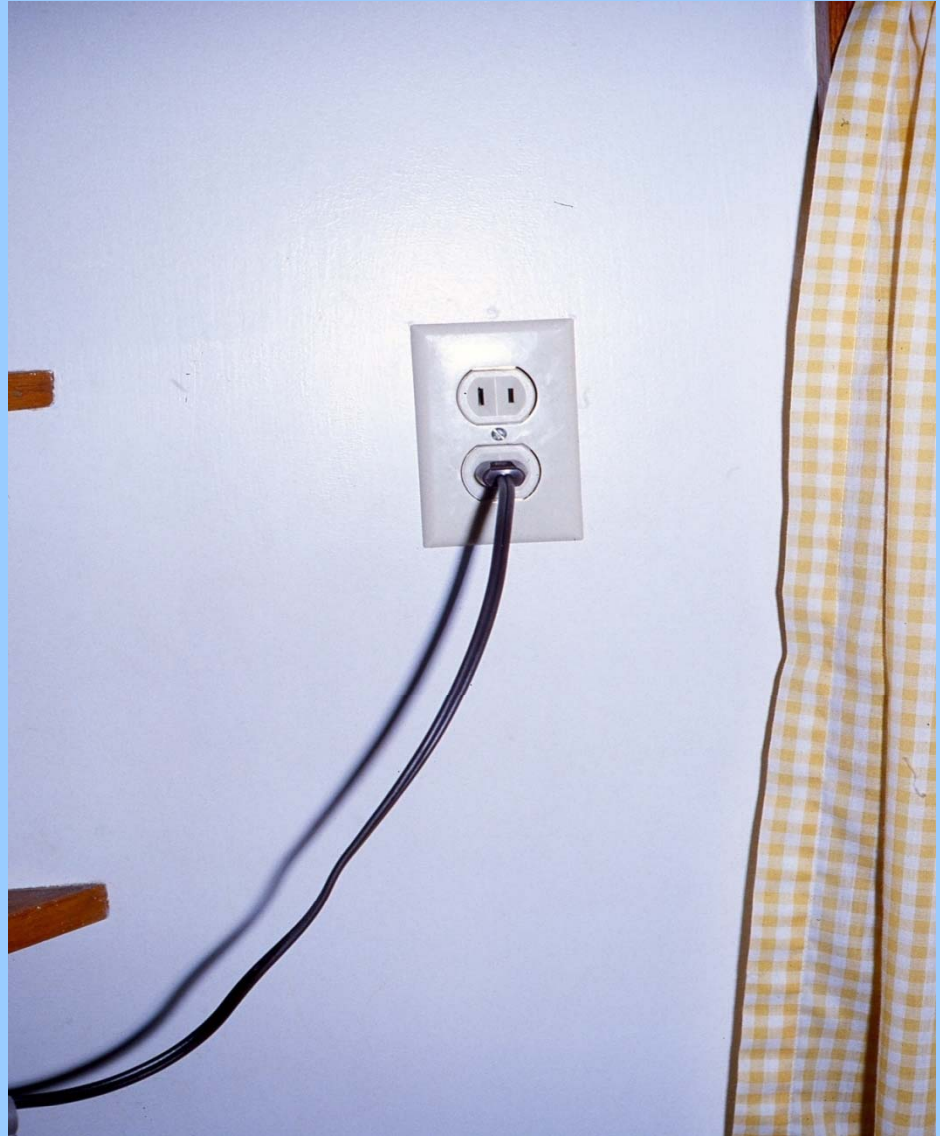
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Let's start on a Monday morning.

**Six o'clock Monday morning.  
Time to get up.**



Electricity to run the  
clock comes through  
**Copper** Wires.



Copper comes from a **Copper Mine**.  
**Copper Sulfide** minerals have to be concentrated to  
separate them from worthless **Minerals**.



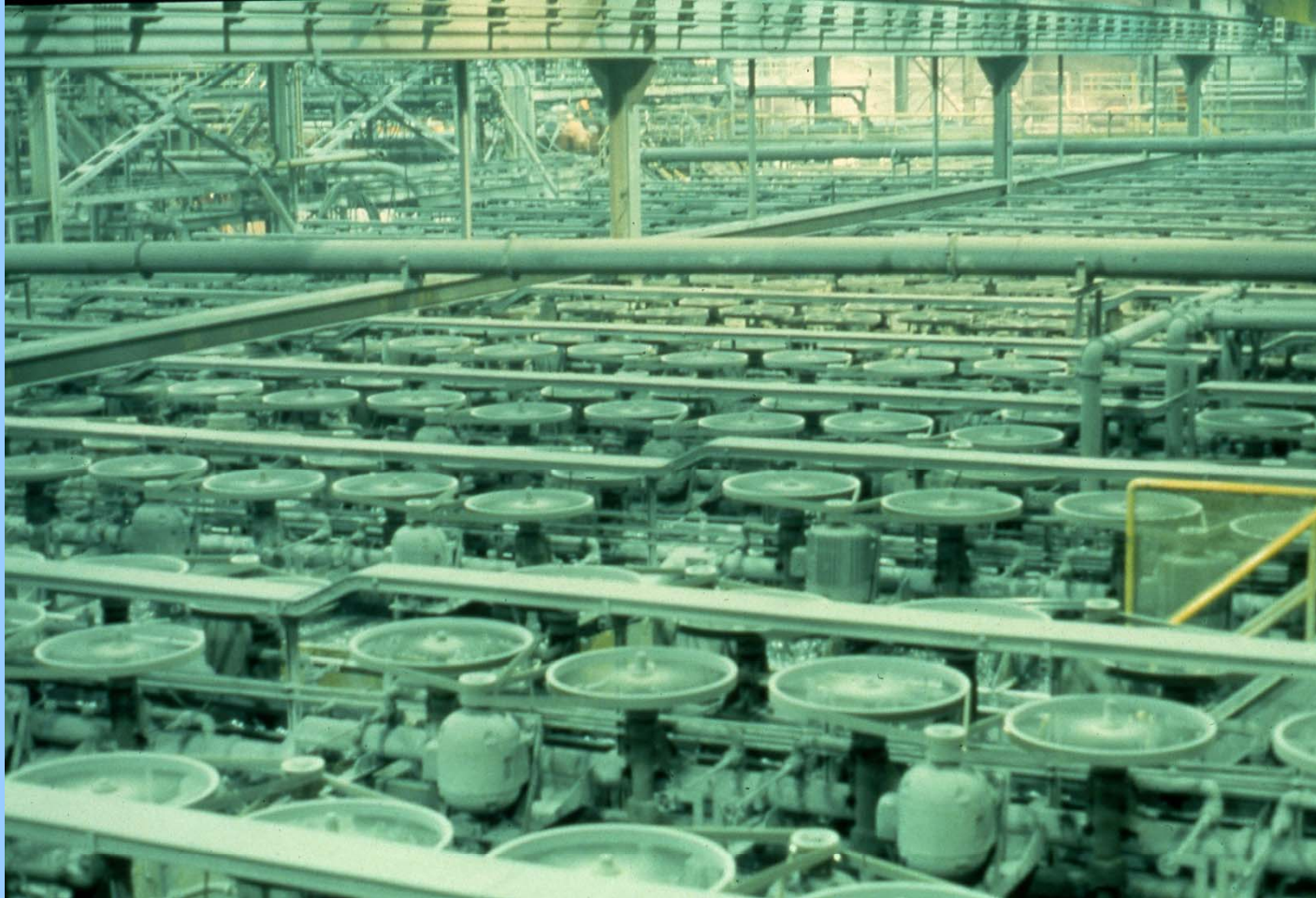
The ore is hauled In large **Haul Trucks**.  
Some are 24ft high and 30ft wide with tires 14 ft tall!!!



The copper ore is crushed and then ground to a fine powder in **Ball Mills**.

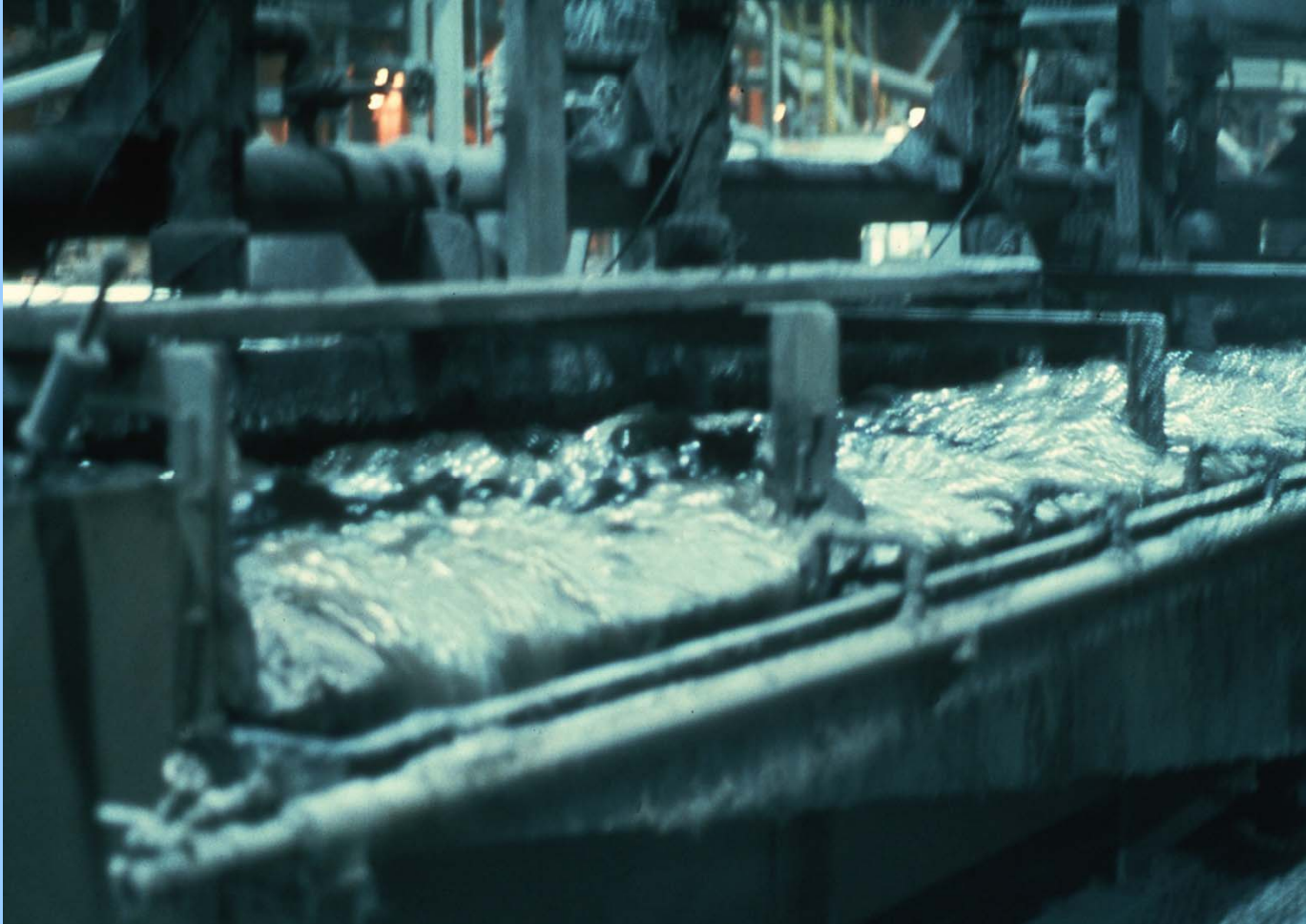


The fine ore goes to banks of **Flotation Cells**  
in the Copper **Concentrator**,

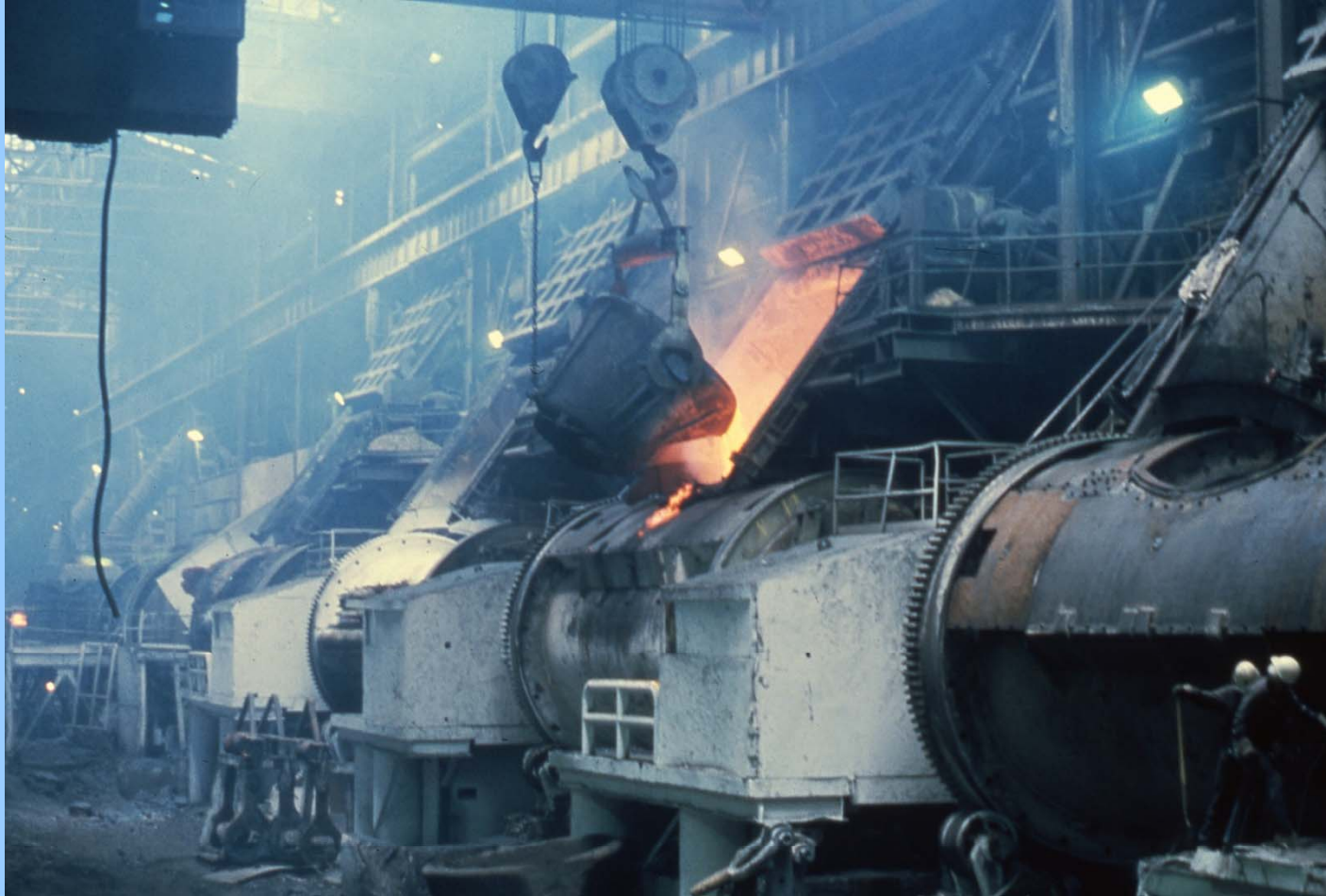




**and the Copper Sulfide Minerals are collected on bubbles.**



The **Concentrate** is dried and the **Sulfur** is burned off in a furnace.



Molten copper is cast into **Anodes** which are refined to make Copper Rods.



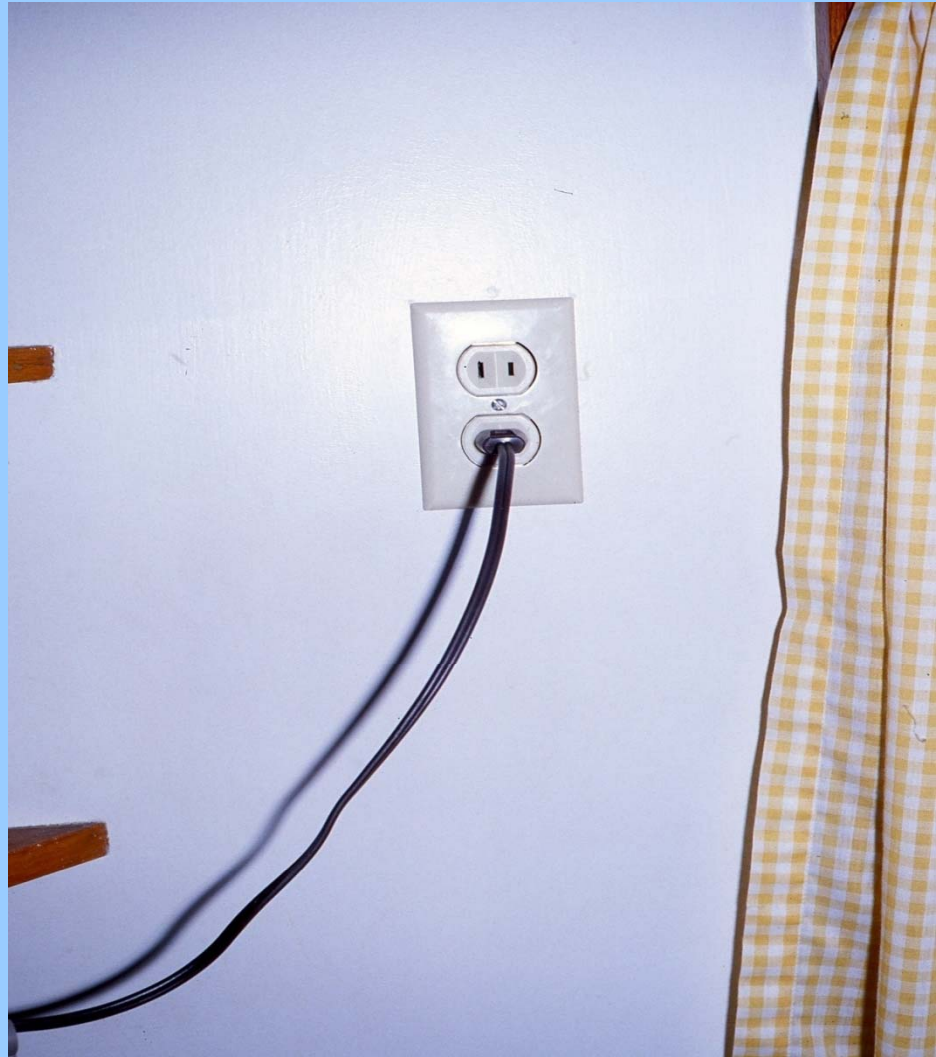
**The Copper Rods are heated and extruded  
to make Copper Coils,**



**and wire is made from the Copper Coils.**



**It takes a lot of work to get from the Minerals in the rocks in the Copper Mine to the Copper wire bringing electricity to the clock.**



**The electricity  
comes through  
power lines,**



from a Coal fired **Power Plant** made out of  
Concrete and Steel.  
Over 50% of all electricity used in USA comes  
from Coal Fired Power Plants.





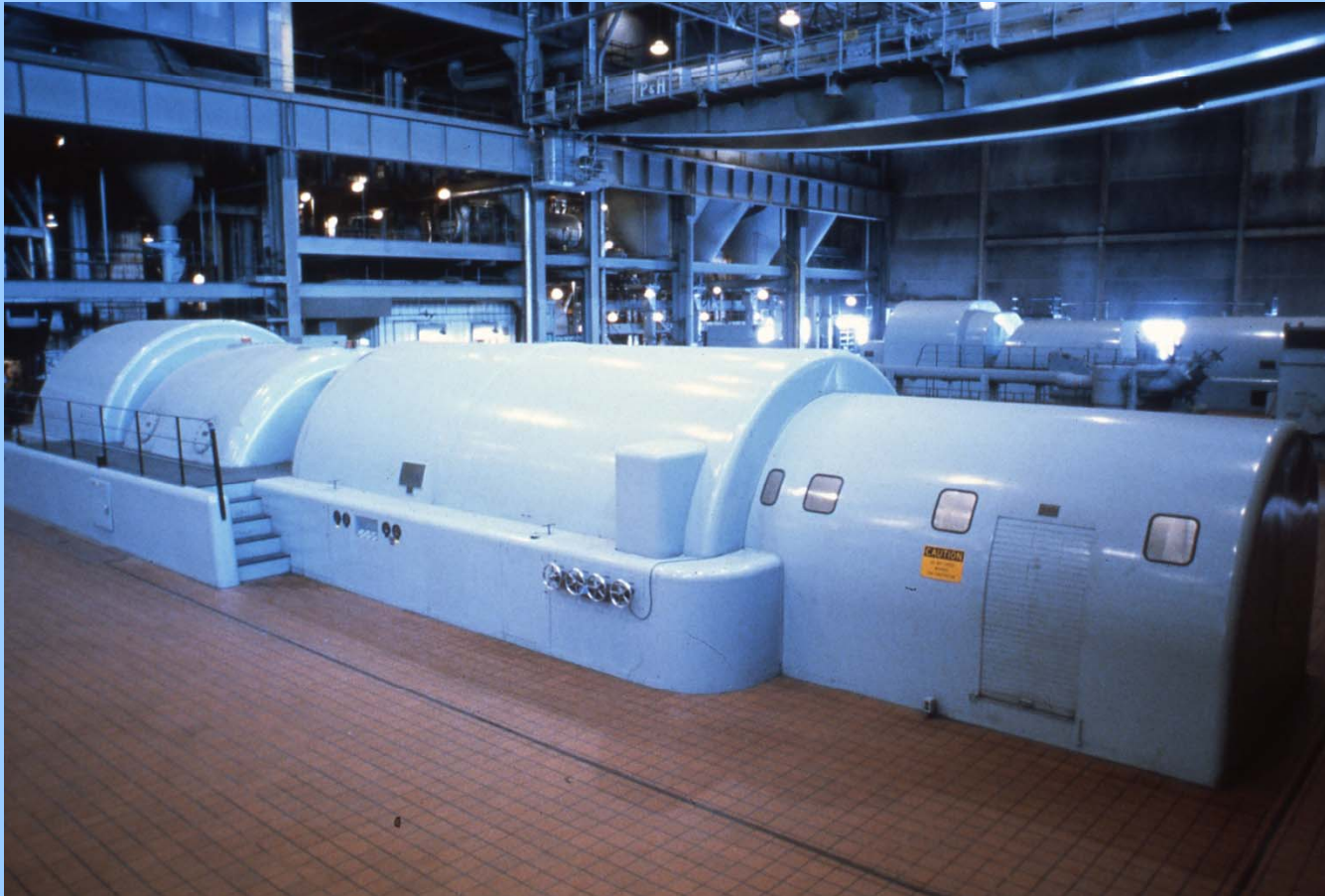
The **Coal** might come from a distant  
**Open Pit** Coal Mine,



delivered by long **Unit Trains.**



**The Coal is burnt in boilers to generate steam which drives the generators to make electricity.**



**Power distribution requires a lot of  
Structural Steel,**



**which comes in many different shapes and sizes.**



To make Steel we need **Iron Ore**.  
Here it comes from a Minnesota **Taconite** Mine.



The ore goes to a Taconite **Pellet Plant**,



and is made into **Taconite Pellets**,





**which are delivered by train to  
Lake Superior docks,**



and transported by ship to  
Lower Lakes **Steel Mills**,



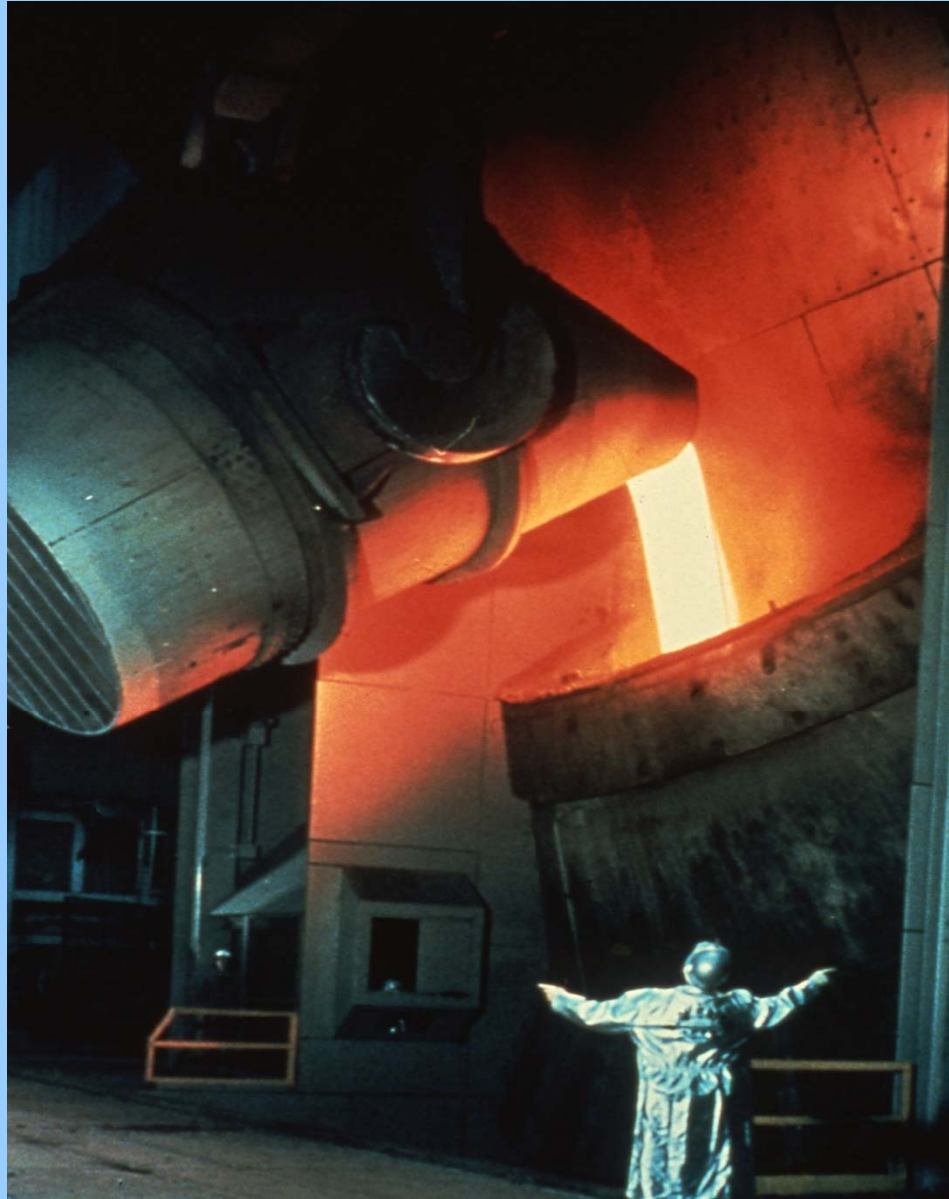
where they are  
fed into a  
**Blast Furnace**  
With **Coke** (made  
from coal) and  
**Limestone** to  
make liquid iron.



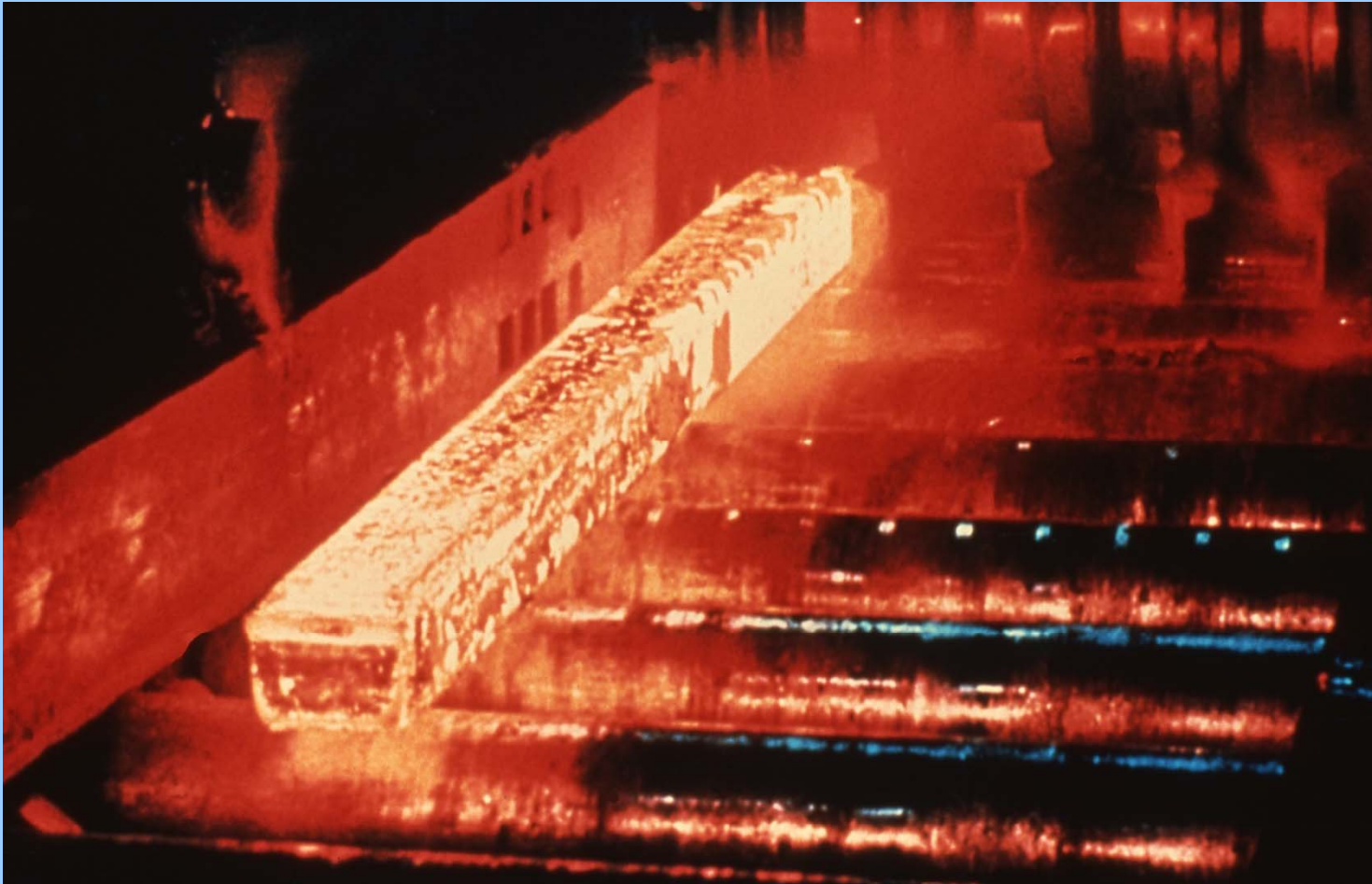
**Molten iron is tapped from the  
Blast Furnace,**



and poured  
into a **Basic  
Oxygen Furnace**  
to make Steel.



Large steel sections are made from ingots  
in large **Integrated Steel Mills**,



while small shapes like rebar are often made from **Scrap Iron** in **Mini Mills**.



What about **Concrete**?  
All roads and buildings need **Concrete**.





Concrete is made with **Sand** from **Sand Pits**,



and Crushed Rock **Aggregates**,



from a **Rock Quarry**,



and **Cement.**



Cement is made at a **Cement Plant** in a high temperature **Cement Kiln**,



**from Limestone and other minerals,**



with the Limestone mined in a  
**Limestone Quarry.**



**It's 6:05.  
Time to get up and go to the bathroom.**

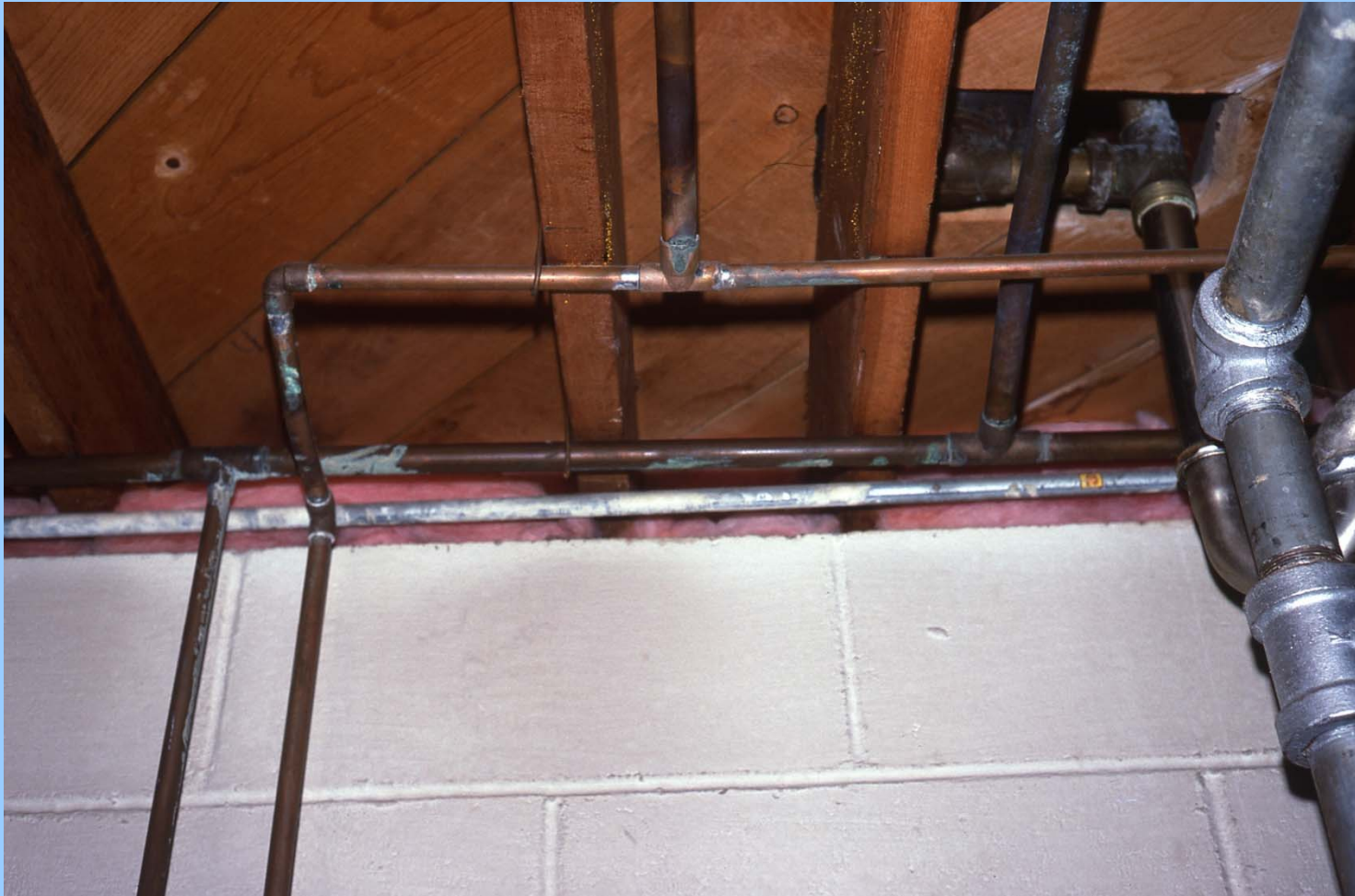




**We use the toilet, clean our teeth  
and take a shower.**



**Where does the water come from?  
It comes into the house through  
**Copper Pipes,****



after purification in the local  
**Water Treatment Plant,**



which receives large volumes of water  
through **Steel Pipes**,



or large **Concrete Conduits**,



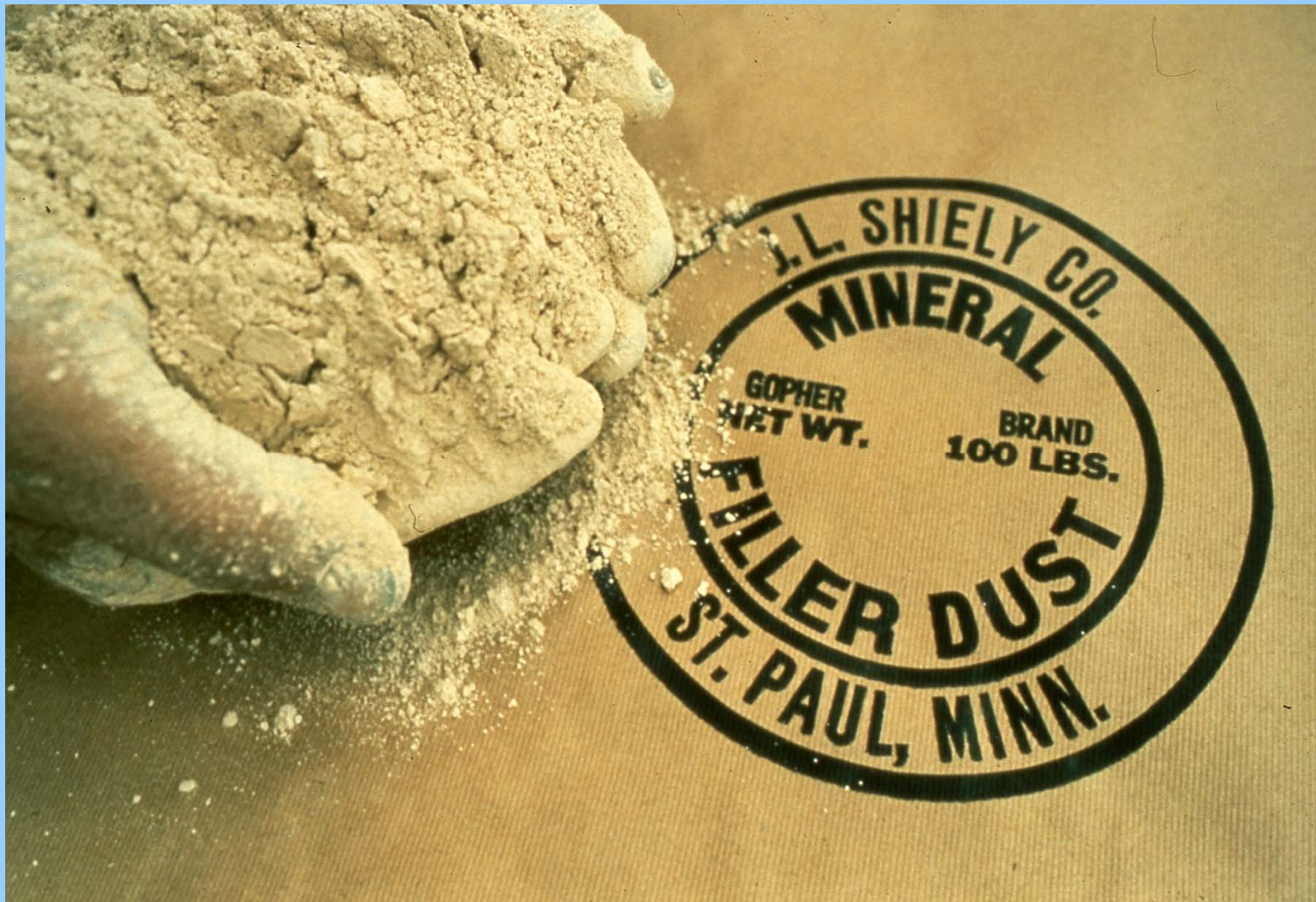
from a River or a  
**Reservoir** behind a **Concrete Dam**.



Where does the toilet come from?  
The toilet is a **Ceramic** product,



and all Ceramic products are made from **Clay**,





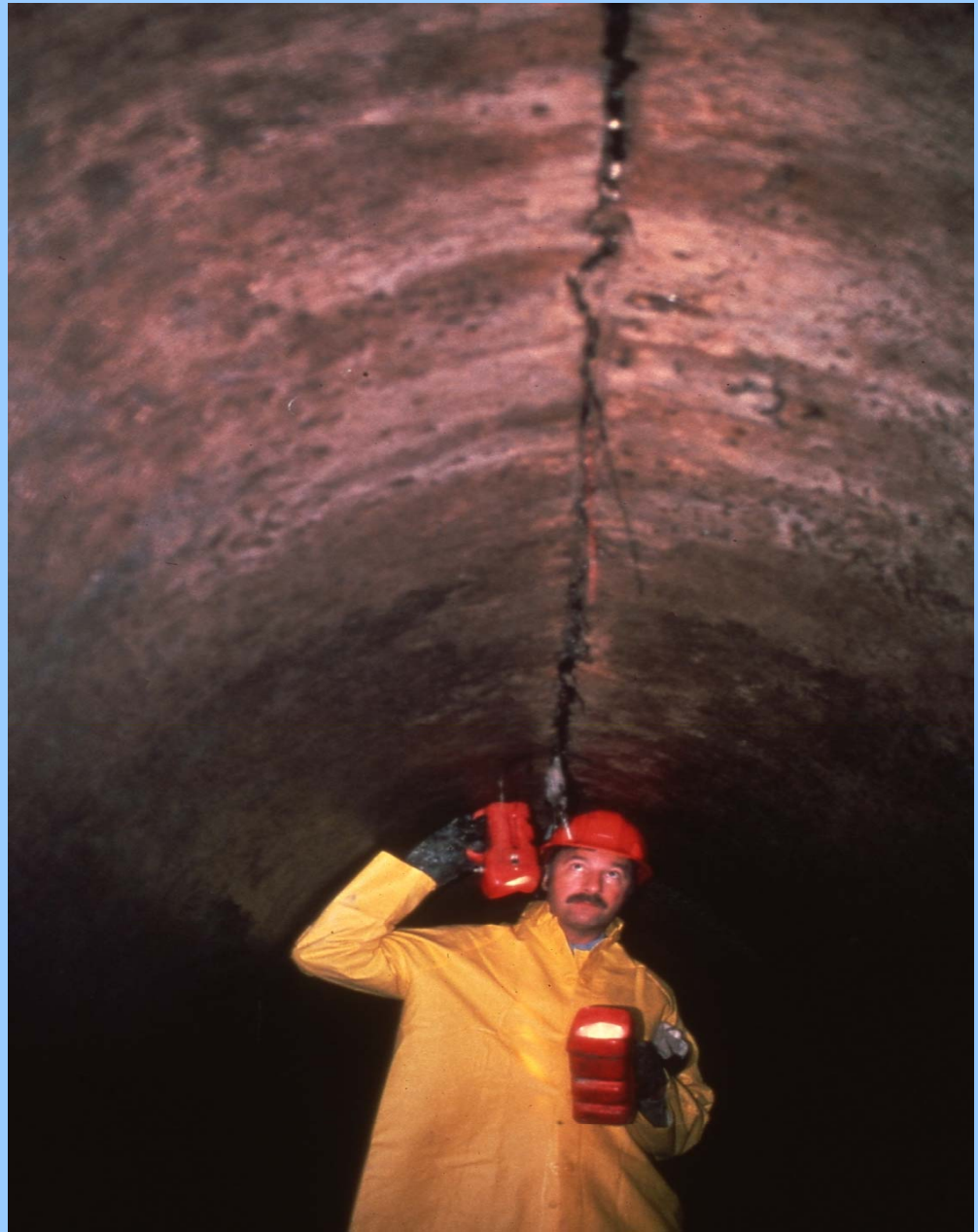
mined from a **Clay Pit.**



When we flush,  
the waste water  
leaves the house  
in **Cast Iron** Pipes,



and goes through  
large Concrete  
**Sewer Pipes,**



to a **Waste Water Treatment Plant,**



**and now it's 6:15.  
Time for breakfast.**



**Our food is stored  
in Refrigerators  
made with Steel,  
Copper, Aluminum,  
Plastics and Paints.**



But before breakfast  
be sure to get  
your **Vitamins**  
and **Minerals**.

They're essential  
for good health.



**Let's have a donut.  
Finally something that's not mineral.**





**But the donut comes from the bakery,**



and the bakery needs **Flour**,



which comes from a **Flour Mill**  
constructed with concrete and steel.



**The grain is transported  
by train on steel rails,**



and is harvested by large  
**Combine Harvesters.**



All plants need mineral **Fertilizers**.  
**Nitrogen (N)** is provided by **Liquid Ammonia**,  
**Urea** or **Ammonium Salts**.



**Phosphorus (P)** comes from a  
**Phosphate Mine,**



and **Potassium** (K) from a **Potash** Mine,





where the **Underground Mine** tunnels  
can extend for many miles.



**Agricultural machinery is needed  
to till the ground.**



Without modern machinery  
we go back to **Horse Power**,



**and without Minerals: no donuts, no television,  
no cities, no modern civilization.**



**That's the first half hour of the week and look at all the Mines and Minerals we've had to rely on.**



**So: Are Minerals Important?**

# **You Betcha**

**Absolutely everything  
we depend on is either  
made from minerals  
or relies on minerals  
for its production.**

## RED WORD LIST

COPPER COPPER MINE COPPER SULFIDE MINERALS HAUL TRUCKS  
BALL MILLS FLOTATION CELLS CONCENTRATOR CONCENTRATE  
SULFUR ANODES POWER PLANT COAL OPEN PIT UNIT TRAINS  
STRUCTURAL STEEL IRON ORE TACONITE PELLET PLANT  
TACONITE PELLETS STEEL MILLS BLAST FURNACE COKE LIMESTONE  
BASIC OXYGEN FURNACE INTEGRATED STEEL MILLS SCRAP IRON  
MINI MILLS CONCRETE SAND SAND PITS AGGREGATES  
ROCK QUARRY CEMENT CEMENT PLANT CEMENT KILN  
LIMESTONE QUARRY COPPER PIPES WATER TREATMENT PLANT  
STEEL PIPES CONCRETE CONDUITS RESERVOIR DAM CERAMIC CLAY  
CLAY PIT CAST IRON SEWER PIPES WASTE WATER TREATMENT PLANT  
VITAMINS AND MINERALS FLOUR FLOUR MILLS COMBINE HARVESTERS  
FERTILIZERS NITROGEN LIQUID AMMONIA UREA AMMONIUM SALTS  
PHOSPHORUS PHOSPHATE MINE POTASSIUM POTASH  
UNDERGROUND MINE HORSE POWER

For more information about minerals and their uses, visit:  
The Mineral Information Institute at [www.mii.org](http://www.mii.org)