

## NON-RENEWABLE MINERAL RESOURCES

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Includes any ores or minerals that are being removed at or below the surface of the Earth, processed into a usable form, used, then burned for energy or placed in areas of disposal after use. Coal would typically be a good example. Mineral resources are considered non-renewable because their production by earth forces on a geologic timescale cannot keep up with their consumption by humans on a human timescale.

Mineral Resources:

- Energy Resources—coal, oil, natural gas, uranium, geothermal energy
- Metallic mineral resources—iron, copper, aluminum, gold, silver
- Nonmetallic mineral resources—salt, gypsum, clay, sand, phosphates, water, soil

Metallic Mineral Resources:

- Vocabulary:
  - Ore—A metal-yielding material that can be economically extracted.
  - Economically Depleted—when cost of finding, extracting, transporting and processing remaining deposits exceed the returns.
  - Techniques used to find mineral resources
    - \* Aerial photos
    - \* Satellite images
    - \* Effect on the Earth's magnetic and gravitational

fields.

Types of Mining Minerals:

- Subsurface mining—removal of deep deposits of minerals
- Surface mining—used to retrieve shallow mineral deposits
  - \* Overburden—soil and rock which lies over shallow mineral deposits. Must be removed.
  - \* Spoil—waste material

Open-pit mining—dig a large hole to remove ores

Dredging—scrape up mineral deposits underwater using chain buckets and draglines

Types of Mining Minerals:

- Strip mining—overburden is removed in strips.
  - 2 types:
- Area Strip mining—terrain is flat, overburden is stripped away and mineral deposit is removed by power shovels then trench is filled with overburden; Spoil banks are left forming a wavy series of hills
- Contour Strip mining—terrain is hilly. Terraces are cut into the side of the hill; overburden is removed and mineral is extracted. Overburden from each terrace dumped into the one below.
- Mountaintop Removal—mountain tops are completely removed. Debris is dumped into the valleys.

Environmental Effects of Mining:

- Requires a huge amount of energy
- Scarring and disruption of land
- Fires in coal mines
- Land subsidence
- Erosion of spoil heaps by water and wind
- Air and water pollution
- Rainwater carries toxins to nearby streams
- Other mine waste—radioactive uranium compounds, lead, mercury, arsenic (gold mines) and cadmium

Mining Legislation:

Surface Mining Control and Reclamation Act—Requires mining companies to restore most surface mined land so it can be used for the same purpose as it was before it was mined.

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