FAQ's

1. Discuss the different uses of minerals.

Bauxite	Aluminum, foil, airplane parts
Borax	Antiseptic soaps, welding flux or cleaner (found in dry lake beds)
Calcite	Medicine, toothpaste, bldng. materials (hard water deposit, ancient sea beds)
Copper	Tubing, electrical wires, sculptures
Diamond	Cutting tools/ blades/ saws
Feldspar	Ceramics and porcelain, colors in granites (not black)
Galena	Source of lead
Graphite	Pencils, lubricant in machinery
Gypsum	Wall board, Plaster of Paris
Halite	Salt
Hematite	Source of iron
Jade	Jewelry, figurines
Limonite /Taconite	Source of iron (around Cedar City)
Muscovite (Mica)	White, gray material in electrical insulators
Quartz (massive type) Quartz crystal	Glass manufacturing, radios, computers and electronic equipment
Silver	Jewelry, photography, electrical equip.
Sulfur	Fungicides, kills bacteria, vulcanizes rubber, in coal and fuels, fertilizer
Talc	Baby powder, soapstone, gymnastics to grasp bars

2. What are the some of the major minerals of India?

India has vast deposit of minerals. Our metallic ores are very rich and of a very high quality. They are sufficient for maintaining most of our key industries. The major

minerals produced in India are Iron-ore, Bauxite, Mica, Coal and Petroleum.

Iron-ore: Presently, India is ranked third in Iron ore production. A large quantity of world's iron ore reserves is possessed by India. Iron ore of very good quality (Haematite and Magnetite) is obtained from principal areas in Orissa and Singhbhum in Bihar.

Bauxite: India is the fifth largest producer of Bauxite in the world. Bauxite is the ore of aluminium. Important bauxite deposits occur in Bihar, Goa, Gujrat, Jammu and Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Orissa and Tamil Nadu. Bauxite deposits are exploited at Lohardaga in Ranchi district. Amarkantaka in Madhya Pradesh contains the largest deposit of bauxite.

Mica: India is one of the largest mica-producing countries of the world. India is ranked first in sheet mica production. The Bihar mica is of the very high quality. In India, the largest supply of Mica comes from Bihar. In Bihar the most important areas are Gaya and Hazaribagh in the 'mica belt' 150 km. long and 32 km. wide.

Coal: Coal is unevenly distributed in India. India is one of the principal producers of coal in the world. Bihar and West Bengal produce the largest quantity of coal in India and the quality is good. Jharia, Giridih, Bokaro, Karanpura, etc. in Bihar and Raniganj in West Bengal are the most important mining centers. Besides these areas, coal is found at Talcher in Orissa, Tendur and Singareni in Andhra Pradesh, Pench Valley and Umaria in Madhya Pradesh, Bihar along supplies 44% of India's total output.

Petroleum: India is poor in petroleum resources. Assam has the oldest oilfields at Digboi, Naharkatia, Moran, etc. These oil-fields are situated in the north-eastern part of Assam. The important new oil-fields are at Lunej, Ankleshwer, Kalol—all near the Gulf of Cambay in Gujrat and the Bombay high offshore oil field.

Other Minerals: Coppor-ore, diamond, graphite, chromite ($FeCr_2O_{4)}$, lead, magnesite (($MgCO_3$), manganese-ore, etc. are other mineral products of India. Besides these, sand and lime are found in various parts of the country. They are widely used in glass-blowing industries.

3. What are the environmental impacts of mineral extraction?

Mining and processing of mineral resources normally have a considerable impact on land, water, air, and biologic resources.Social impacts result from the increased demand for housing and other services in mining areas.

Pollution:

Mining operations often pollute the atmosphere, surface waters and ground water. Rainwater seeping through spoil heaps may become heavily contaminated, acidic or turbid, with potentially devastating effects on nearby streams and rivers.

Trace elements (cadmium, cobalt, copper and others) when leached from mining wastes and concentrated in water, soil or plants, may be toxic or may cause diseases in people and other animals who consume contaminated water or plants, or who use the soil. Specially constructed ponds to collect runoff can help but cannot eliminate all problems.

Huge volumes of dust generated by explosions, transportation and processing may lead to the death of surrounding vegetation. Chemicals used in the extrac-tion processes, such as drilling muds, are often highly polluting substances.

Destruction of Land:

Mining activity can cause a considerable loss of land because of chemical contamination, destruction of productive layers of soil, and often permanent scarring of the land surface. Large mining operations disturb the land by directly removing material in some areas and by dumping waste in others. There can be a considerable loss of wildlife habitat.

Subsidence:

The presence of old, deep mines may cause the ground surface to subside in a vertical or horizontal direction. This may severely damage buildings, roads and farmland, as well as alter the surface drainage patterns.

Noise:

Blasting and transport cause noise disturbance to local residents and to wildlife.

Energy:

Extraction and transportation requires huge amounts of energy which adds to impacts such as acid rain and global warming.

Impact on the Biological Environment:

Physical changes in the land, soil, water and air associated with mining directly and indirectly affect the biological environment. Direct impacts include death of plants or animals caused by mining activity or contact with toxic soil or water from mines. Indirect impacts include changes in nutrient cycling, total biomass, species diversity, and ecosystem stability due to alterations in groundwater or surface water availability or quality.

Long-term Supplies of Mineral Resources:

The economies of industrialized countries require the extraction and processing of large amounts of minerals to make products. As other economies industrialize, their mineral demands increase rapidly. The mineral demands of countries in Asia, such as Malaysia, Thailand and South Korea have grown phenomenally in the last twenty years.

Since mineral resources are a non-renewable resource, it is important for all countries to take a low-waste sustainable earth approach to dealing with them. Developed countries need to change from a high-waste throw away approach and developing countries need to insure that they do not adopt such an approach. Low-waste approach requires emphasis on recycling, reusing and waste reduction and less emphasis on dumping, burying and burning.

4. Discuss the common issues with respect to dam construction.

The dam wall itself blocks fish migrations, which in some cases and with some species completely separate spawning habitats from rearing habitats. The dam also traps sediments, which are critical for maintaining physical processes and habitats downstream of the dam (include the maintenance of productive deltas, barrier islands, fertile floodplains and coastal wetlands).

Another significant and obvious impact is the transformation upstream of the dam from a free-flowing river ecosystem to an artificial slack-water reservoir habitat. Changes in temperature, chemical composition, dissolved oxygen levels and the physical properties of a reservoir are often not suitable to the aquatic plants and animals that evolved with a given river system. Indeed,

reservoirs often host non-native and invasive species (e.g. snails, algae, predatory fish) that further undermine the river's natural communities of plants and animals.

The alteration of a river's flow and sediment transport downstream of a dam often causes the greatest sustained environmental impacts. Life in and around a river evolves and is conditioned on the timing and quantities of river flow. Disrupted and altered water flows can be as severe as completely de-watering river reaches and the life they contain. Yet even subtle changes in the quantity and timing of water flows impact aquatic and riparian life, which can unravel the ecological web of a river system.

A dam also holds back sediments that would naturally replenish downstream ecosystems. When a river is deprived of its sediment load, it seeks to recapture it by eroding the downstream river bed and banks (which can undermine bridges and other riverbank structures, as well as riverside woodlands). Riverbeds downstream of dams are typically eroded by several meters within the decade of first closing a dam; the damage can extend for tens or even hundreds of kilometers below a dam.

Riverbed deepening (or "incising") will also lower groundwater tables along a river, lowering the water table accessible to plant roots (and to human communities drawing water from wells) . Altering the riverbed also reduces habitat for fish that spawn in river bottoms, and for invertebrates.

In aggregate, dammed rivers have also impacted processes in the broader biosphere. Most reservoirs, especially those in the tropics, are significant contributors to greenhouse gas emissions (a recent study pegged global greenhouse gas emissions from reservoirs on par with that of the aviation industry, about 4% of human-caused GHG emissions). Recent studies on the Congo River have demonstrated that the sediment and nutrient flow from the Congo drives biological processes far into

the Atlantic Ocean, including serving as a carbon sink for atmospheric greenhouse gases.

Large dams have led to the extinction of many fish and other aquatic species, the disappearance of birds in floodplains, huge losses of forest, wetland and farmland, erosion of coastal deltas, and many other unmitigable impacts.