

## **FUNCTION OF THE DEPARTMENT**

The Directorate of Geology and Mining has been committed to discharge the following functions:-

1. Mineral Exploration
2. Mineral Administration

### **Mineral Exploration –**

Under this, the directorate carries out geological survey of the mineralized areas and delineate the potential zone for mineral exploration. Such potential zones are prospected by pitting/trenching and drilling. Geochemical, Geophysical, Petrological and Remote Sensing Techniques are utilized for the geological survey of mineralized zones to prove the quantity and quality of the mineral present in the area to evaluate their industrial potentiality.

### **Mineral Administration –**

It is an important aspect being executed through mining Officers/Assistant M.O. posted in all the district head quarters in the Collectorate. They receive applications for various mineral concessions, process them within stipulated time and grant the leases to the applicant. Apart from this they also assess and realize the royalty on the minerals produce. Strict check on illegal extraction of minerals, pilferage of mineral revenue, implementation of rules and regulations by the lessee are being carried out by departmental MO/AMO's through mining inspectors of the concerned districts. The reconnaissance permit granted by Govt. is also monitored by this wings.

### **Geophysical Laboratory -**

Geophysics is a useful aid to geology specially in the field of mineral Exploration. Experience has demonstrated that most sub surface structures and mineral deposits can be located by exploration Geophysics. The Department has established a Geophysical Laboratory at Head Office Raipur and carried out various types of Geophysical survey.

The Geophysical surveys conducted by the Department have imparted valuable assistance in the exploration of tin mineralisation in Dentawara, Gold mineralisation in Sonakhan area of Raipur district and

demarcation of diamondiferous Kimberlite pipes in Behradih and Payalikhhand areas of Raipur district.

As regards the Geophysical instruments, the laboratory is well equipped with resistivity meters, potentiometer, magnetometers, lectromagnetic units, seismograph, induced polarisation unit etc.

### **Chemical Laboratory –**

The quality of the minerals plays a vital role in the establishment of mineral based industries in the State. The laboratory established in 1960 assess the quality of the minerals in the State. It is now one of the most modern Laboratory with qualified foreign trained personnel and modern equipments. In addition to classical equipments, modern equipments available in the laboratory are -

1. Atomic Absorption spectrophotometer
2. Emission spectrograph
3. U.V. Visible spectrophotometer
4. Zeeman Modulated atomic absorption spectrophotometer

Constant and surprise spot collection of mineral samples by the geologists and its correct assessment by the laboratory had a deterrent effect on the theft of royalty by lease holders and this increases the revenue of the State.

The Directorate has also established a coal analysis laboratory at Bilaspur to ascertain the quality and grade of coal in new coal bearing area as well as assessment of royalty. This coal laboratory will also well equipped with all modern instruments.

### **Drilling Section –**

Drilling is most reliable technique for ascertaining the depth persistence of mineralisation. In addition, it gives a complete cross section of the underground formations and samples there of which, otherwise could not have been possible to make study. Therefore, the drilling, particularly diamond drilling, which the department undertakes, is an important asset for the mineral development.

The drilling section is actively engaged in assisting the mineral investigation programmes. The section is equipped with 22 drilling rigs consisting of 4 light drills, 6 Medium duty drills and 4 heavy duty drills.

## **Petrology Laboratory -**

Petrological laboratory is actively engaged in the Petrological study of various rocks, minerals, gemstones, heavy minerals which are received from the various geological investigations conducted by the department.

Following works are undertaken by petrology laboratory:-

1. Petrological study of rock, mineral and ore mineral.
2. Identification of heavy minerals from stream sediments/soil samples.
3. Identification of precious, semiprecious minerals received from Police deptt/Forest deptt.
4. Study of cutting and polishing properties of dimension stone.

## **List of Instruments and their uses:-**

Petrology laboratory is equipped with a number of instruments like-

- i. **Rock cutting machine (Volco):**  
Trimming or slabing of rocks, minerals, ores and core samples.
- ii. **Wards standard cut off machine:**  
Preparation of thin sections with capacity to cut the rock chips upto 3 mm thickness.
- iii. **Petrothin Thin Sectioning System:**  
For preparation of thin sections and rocks and minerals.
- iv. **Modern balance:**  
Weighing of mineral grains/ gemstones and determination of specific gravity
- v. **Walker steel yard balance:**  
Determination of specific gravity of large rock and mineral samples.
- vi. **Electric agate mortar:**  
Mineral and rock pulverizing
- vii. **Duplex refractometer:**  
Determination of refractive index of polished minerals and gemstones.
- viii. **Hand magnet:**  
Separation of magnetite and magnetic material.

### **Photogeology and Remote Sensing Laboratory:**

Photogeology and remote sensing laboratory is established at the Head Office of DGM, and is involved in application of remote sensing techniques for mineral exploration projects of the Directorate. Since 1990, Photogeology and remote sensing laboratory has potentiality to carry out natural resource management projects under approval of the Government.

### **Services available:**

Interpretation of remote sensing data & aerial photographs for natural resources management especially geomorphic, hydromorphic, geological, structural, lineament, drainage maps of the terrain, supported by associated ground truth collection, land use, land hazards zoning maps, mineral targeting and exploration.

Trained manpower from the national and international institutions in interpretation of aerial photographs and remote sensing data, digital image analysis and GIS. Aerial photographic coverage of almost entire Chhattisgarh on approximately 1:50,000 scale.

Instrument and equipment essential for visual interpretation of aerial photograph and digital image analysis of remote sensing data in lab and field and facility for digitization of maps and GIS.