

Final Report of RP 68 over an area of 1930 Sq. Km. in the District of Koraput, Orissa, for the Period from 25th September 2006 to 26th March 2009.

1. Introduction:-

Geological investigation to locate the primary source of diamondiferous/ kimberlitic/ lamprotic and allied rocks were taken up over an area of 1930 Sq. Km. in parts of Koraput districts, Orissa held under RP 68.

This report highlights the exploration activities carried over the said RP area for the above period as above. The investigations are aimed at delineating positive mineralogical haloes and to discard negative blocks as far as occurrence of diamond bearing formations. To achieve the above objective Regional loam/ gravel soil sampling. Procedures were adopted in the first stage to locate possible positive areas. This was supported by the interpretation of satellite imageries, aerial photographic studies followed by ground truthing. Further based on the results, closed spaced soil sampling was designed in such a way that all the 1st, 3rd order streams as well as the areas devoided of streams were fully covered.

1.1. Location:

The area under report is featured in SI T.S. No. 65 I/4 and 65 I/8 and is included in the Koraput District and under the administrative control of Kotpad Tahsil. The area is in the close proximity to the eastern part of Chhattisgarh.

1.2. Accessibility:

Kotpadu being the block has is connected ot Jeypore and Nawarangpur towns by all weather roads. National Highway 43 passes through the area as well as the Kotvalsa - Kirindul Railway Link passes through the RP area.

1.3. Geomorphology:

The area presents gentle rolling topography with large mounds occupied by laterite cappings. Thick soil profiles dominate the area; it is mostly underlain by shale sequences. Due to the open and gentle rolling topography, the drainage density is medium to low, with moderate sediment loads.

1.4. Climate Drainage:

The climatic conditions of the area under report area are influenced by the south west monsoon winds. The area experiences extreme climatic conditions during summer and winter. The average rainfall is around 1400 mm with rainy days averaging around 100. The drainage density is moderate to low showing dendritic and semi-trellis patterns. The Kolab River is the principal river in the area.

1.5. Flora and Fauna:

Since the area is an open valley with gentle gradient plenty of agricultural activities are gearing up in general round the year. A few isolated patches of modern forest growth are marked by Eucalyptus and Acacia plantations. As no extensive forest cover is found in the area, the sighting of wild animals is rare, with the exception of bears and jackals.

1.6. Objective :

The objective of the exploration was to sample the areas through gravel and loam sampling methods coupled with ground surveys i.e. geophysical and morphological expressions to locate possible occurrences of kimberlitic/ lamproite bodies.

II. Geology:

2.0 Geology:

Regionally the area forms a part of the older metamorphites of Archaean age and meta-sediments of Middle to Upper Proterozoic Age. It is situated in the eastern margin of the Bhandara Craton. This craton is an old stabilized block with low heat flow and has been the home for intrusion of diamondiferous K.L.

The lithological units encountered in the area are quartzites, organic limestones, shales, basic intrusives, quartz veins and lateritic cappings. The geological succession of the litho units encountered in the area is as follows:

Recent	Soil and alluvium
Tertiary	Laterite
Middle to Upper Proterozoic	Quartz veins organic Limestone purple shale, quartzite.

Archaean – Older metamorphic

-----Base not seen-----

The major part of the area is covered with a thick soil mantle, followed by shales, laterite cover and patches of limestone. Due to thick soil cover and vast expanse of underlying shales, the contacts between the various formations are difficult to trace. However, the contact of older metamorphites with the Proterozoic rocks is observed to the south east of Kotapad town. The laterite coverings/ caps are derived from the sub-horizontal shales; which are invariable purple coloured.

Occasional quartz veins are seen occupying the joint planes of mafic rocks and Achaean granites. Stromatolitic limestone patches often occur along the banks of the Kolab River. The older metamorphites have a limited exposure around the town of Kotapad.

2.1. Structure:

Primary structures such as bedding planes are observed in the shales and quartzites. Lineaments striking in NW-SE, NE-SW and ENE-WSW directions are observed. Cross-cutting lineaments are observed southwest of Kotapad town.

Secondary structures such as lineations and joints are often seen in the quartzites and granites.

2.2. Metamorphism:

The lithological units of this area are the least metamorphosed rocks within the region. Dynamo-thermal metamorphic activity is observed along the contact zones.

III. Exploration:

3.0. Exploration:

Exploration activities undertaken in the R.P. 68 block were directed to cover a maximum area, using the following measures:

- (i) Collection of gravel/ loam samples from the most appropriate trap sites.
- (ii) Scanning of the area through ground checking along strike across traverse lines.
- (iii) Ground checking of topographical signatures.
- (iv) Checking of all lithological exposures.

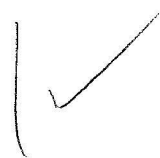
Systematic collection of gravel samples from appropriate trap sites, selected preferably in the 2nd/ 3rd order creeks, was employed as the main tool to explore the area, & to delineate positive areas for further detailed exploration. The gravel/ loam samples were collected at a density of 1 sample per 8 Km². Each sample weighed more than 40Kg, conforming to the size fraction of -1.5mm. In all sample locations the bed rock was reached when collecting the gravel samples. Most of the bedrock comprised either shale formations or granite gneiss.

Systematic cross traverses were made to check the lithological exposures. It is found that the majority of the litho-exposures were either shales, or mafic intrusives/ gneissic rocks. It is a conspicuous fact that the central part of the area is filled with thick soil or alluvium. No positive rock exposure for Kimberlitic/ Lamproiitic or any ultramafic rocks was observed.

Ground checking of the geomorphic signatures was done especially for gentle warps on the ground surface and circular to semi- circular features. Most of the gentle warps are found to be laterite cappings over shale bedrock and geomorphic depressions were due to structural disturbances in the shale's.

Some suspected rocks were examined and samples have been collected to identify the petrology. The following is the total quantum of work done during the period under review.

- (i) No. of gravel samples collected: 74
- (ii) Cross Traverse line for ground checking: 15 Km.
- (iii) Ground checking of topographical signatures: 12 nos.



4. Conclusion:

Regionally the RP area forms a part of older metamorphites of Archaean age and meta sediments of middle to upper proterozoic age and situated in the eastern margin of the Bandara Craton, which is a favourable place for the presence of strata to kimberlitic/ lamprotic rocks.

Although a number of soil samples collected in the above RP area containing grains of garnets, chromites, ilmenite, other minerals fail to establish kimberlitic origin. As such the chances of getting KL rocks seems to be remote.