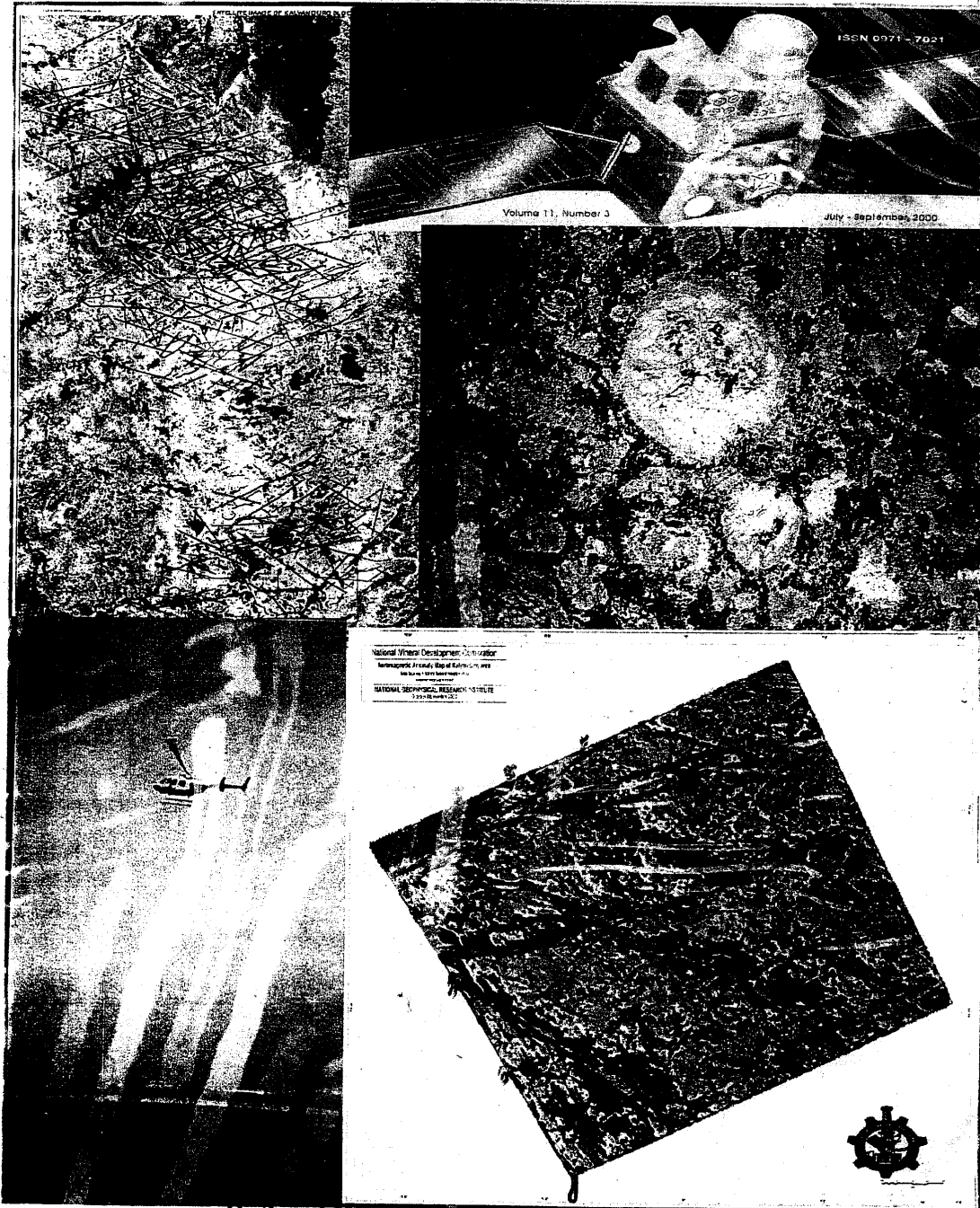


**RELINQUISHMENT - CUM TECHNICAL REPORT ON THE WORK DONE IN  
KALYANDURG DIAMOND R.P. BLOCK, ANANTAPUR DIST., A.P.**



**National Mineral Development Corporation Ltd., Hyderabad  
(A Government of India Enterprise)**

NMDC also carried out detailed exploration of diamondiferous gravels at Ramkheria, Panna and Krishna basin in Andhra Pradesh and diamondiferous conglomerates in Ramallakota in Kurnool Dist. A.P. Against this background, NMDC applied for Reconnaissance permit for diamonds on 16-2-2000 over an area of 2300 Sq.Km. in Kalyandurg Block in Anantapur Dist. Of Andhra Pradesh.

## 1.1 Introduction

The Government of Andhra Pradesh (G O AP) vide its letter No. GO MS No.15 dated 10-1-2001 granted Reconnaissance permit (RP) in Kalyandurg Block in Anantapur Dist. Of Andhra Pradesh for a period of three years, i.e. the maximum period for which RP permit shall be granted (Annexure – I). The location map on 1:250000 scale and the Geographical coordinates of the area granted to NMDC are placed at Annexure-II. The details of the G.O and the co-ordinates are given in Table-II and Ila.

Table.II Details of the Government orders

Area/Block	Date of Application	Extent	Grant vide	Executed vide
Kalyandurg Block Anantapur District	12-06-2000 GM/INV/RP/2 000/Dia/KD	2300 Sqkm.	G.O. Ms. No. 15 dated 10-01-2001 From: 1)DMG, F.No. 18693/ R5/ AJ/ 2006 dated 15-12-2000 2)Govt. Lr. No. 24422/M.III-1/2000-7 dated 19-12-2000 3)GOI, Min. of Mines Lr. No. 4/161/2000-M.IV dated 01-01-2001	Progs. No. 341/M1/20 01 dated 01-03-2001

Table.IIa Latitudes and Longitudes of NMDC's R.P. area.

Part-I

LATITUDE	LONGITUDE
14°55'00"	76°52'00"
14°20'00"	77°17'00"
14°14'00"	77°02'00"
14°26'00"	76°56'30"
14°31'00"	76°50'00"
14°38'00"	76°46'00"



PART-II

LATITUDE	LONGITUDE
14°00'00"	77°20'00"
13°52'00"	77°23'00"
13°54'00"	77°15'00"
13°46'00"	77°00'45"
14°55'00"	77°09'45"
14°02'00"	77°05'30"

## 1.2 Objectives

The aim of reconnaissance permit was to identify the most promising diamond bearing areas and their possible surface and subsurface extension through regional, aerial, geophysical or geochemical surveys and geological mapping.

The pre-conditions specified in the GO MS No.15 dated 10-1-2001 were

- i) To conduct aerial surveys with representative of Director General, Civil Aviation or Ministry of Defence.
- ii) To strictly adhere to the minimum expenditure commitment and specify physical targets;
- iii) To progressively relinquish the area granted under the permit i.e.
  - a) After completion of two years, the area shall be reduced to one thousand square kilometers or fifty percent of the area granted, which ever is less and
  - b) The area would be further relinquished so that the permit holder is left with any area not more than twenty five square kilometers at the end of third year.

To achieve this aim, a two-stage multi disciplinary reconnaissance scheme consisting of Remote Sensing Studies, Helicopter borne Geophysical Survey, Stream Sediment Sampling and ground geological, geophysical and geochemical



survey was proposed. The relinquishment scheme, the physical targets and minimum commitment is placed at **Annexure III and IIIA** respectively.

This permit was important to NMDC, as it was the first RP granted to NMDC and NMDC does not want any stone left unturned. Therefore, NMDC engaged a foreign consultant, Dr.J.W.Bristow from South Africa for guiding the RP works. NMDC also took the services of M/s Mike Scott Associates (MSA), Johannesburg, South Africa, for identification, separation and analysis of Heavy Indicator Minerals obtained by processing the stream sediment samples.

As the Airborne Geophysical Survey was mandatory, NMDC carried out the job of about 18000 line kms Airborne Magnetic Survey through National Geophysical Research Institute, Hyderabad at an estimated cost of Rs. 2.23 crores.

A total of 934 stream sediment samples were collected to study the Heavy Indicator Minerals (HIM's) having Kimberlitic affinity. A Gerrytz Jig plant was established by the NMDC Geologists under the guidance of Mr.John Spencer of M/s MSA Geoservices, South Africa for processing the stream sediment samples. The lineaments and their intersections are favourable sites for emplacement of Kimberlites. The remote sensing data was obtained from NRSA, Hyderabad and RRSSC; Nagpur and NMDC scientists did mapping on regional scale and delineation of the structure of various tectonic belts, lineaments and fracture pattern jointly.

### 1.3 General Information

Kalyandurg RP block covers an area of 2300 Sq.Km and is bounded by North latitudes  $14^{\circ}15'00''$  -  $15^{\circ}00'00''$  and East longitudes  $76^{\circ}45'00''$  -  $77^{\circ}25'00''$ (approx) in parts of Toposheet No. 57 B and F in Anantapur District, Andhra Pradesh (Fig.1).



The area is well connected by a network of roads. Bellary-Rayadurg broad gauge railway line of South Central Railway passes through Northwest part of this block. State highways connect Kalyandurg with Anantapur, Rayadurg and Uravakonda.

The area forms an undulating terrain with dendritic to sub-dendritic drainage pattern. Kalyandurg-Uravakonda area forms a major water divide between the Hageri and the Pennar River drainage basins. The Pennar river gravels are locally worked for corundum, and in the Hagari drainage basin, extensive cover of black-cotton soil is noticed.

#### 1.4 Geology

The area is occupied mainly by Archaean Peninsular Gneissic Complex (PGC) with younger Closepet Granite (CG) batholith and relicts of greenstone rocks. The eastern part of the Block is occupied by hornblende – biotite gneisses, granodiorite, migmatites and injections of granite. In the western side at the contact of Closepet Granite (CG) gneisses are exposed (Fig.2).

The area is mostly traversed by NW-SE and ENE-WSW trending mafic dyke swarms. Three deformations have been recorded which resulted in the formation of F<sub>1</sub>, F<sub>2</sub> and F<sub>3</sub> folds. The F<sub>1</sub> folds are tight isoclinal with NNW-SSE trending axial traces, while F<sub>2</sub> are broad open to tight folds, coaxial to F<sub>1</sub> folds. The F<sub>3</sub> folds represent the cross folds trending in E-W direction. The gneisses and greenstones show metamorphism upto amphibolite facies. At the contact of the Closepet Granite batholith imprints of contact thermal metamorphism is noticed. The area is traversed by ENE-WSW trending regional faults.

#### 1.5 Basis for Exploration

Diamonds are found in two environments - (1) Kimberlites the primary source and (2) terrace gravels along the Pennar river.



- (i) The Kalyandurg RP block, which forms a part of the granite-greenstone terrain, hosts diamondiferous kimberlites.
- (ii) Occasionally diamonds were being picked up by locals. A large diamond weighing 85 carats was recovered from Bomaganapalli village, which is 3 km north of Pillalapalli (KL-1) pipe.

## 1.6 Earlier work done

Geological Survey of India (GSI) which carried out regional surveys during 1997-98 in the RP area located three kimberlite bodies in Pillalapalli, Muppalakunta and Nagireddipalli. These are designated as KL-1, KL-2 and KL-3 respectively. The details of these pipes are given in **Table. III**.

**Table.III Kimberlites in Kalyandurg Diamond RP Block, A.P.**

S.No.	Kimberlite Pipe No.	Coordinates	Dimension	SOI Toposheet No.
1.	KL-1 Pillalapalli 1km N of Pillalapalli	14°34'41" 77°00'50"	250x50m	57F/2
2.	KL-2 Muppalakunta 3km E of Pillalapalli	14°34'09" 77°01'57"	100x100m	57F/2
3.	KL-3 Nagireddipalli 1km NW of Nagireddipalli	14°33'56" 76°57'51"	300x200m	57B/14

Emplacement of Kimberlites appears to be controlled by the **ENE-WSW** trending faults passing through close to structural domes (culminations) and **NW-SE** trending tectonic contacts (shears), which appear to have been, reactivated around **1100 Ma**.

## 1.7 Inputs

Various published literature, reports, Toposheets, Geological maps from various agencies were studied thoroughly before starting exploration in the block. The various inputs are as under:



**Survey of India Toposheets (1:50,000 scale)**

- 1) 57F/7
- 2) 57F/2
- 3) 57F/3
- 4) 57G/1
- 5) 57B/16
- 6) 57B/14
- 7) 57F/8
- 8) 57G/5
- 9) 57B/15

**Geological quadrangular sheets from GSI**

- 1) Anantapur quadrangle (scale 1:2,50,000)
- 2) Chitradurga quadrangle (scale 1:2,50,000)

**GSI reports**

- 1) Geological studies on granitoid and associated rocks of Kalyandurg – Atmakur – Anantapur area Anantapur district, Andhra Pradesh (progress report for the field season –1991-92) by T. Gopal Reddy & G. Suresh
- 2) Systematic mapping in part of Kalyandurg, Rayadurg, Urvakonda and Madakasira taluks of Anantapur district, Andhra Pradesh and in part of Karnakata. (Progress report for the field season 1978 – 79) by P.K. Sinha, & C.P. Sisodia.
- 3) Discovery of diamond bearing kimberlites in Kalyandurg area, Anantapur District, Andhra Pradesh by S.S.Nayak and S.A.D.Kudari, Current Science, vol.76, pp.1077-1079, 1999.
- 4) Delineation and assessment of Kalyandurg kimberlites, Anantapur District, Andhra Pradesh by M.V.Dhakate and K.R.P.Rao, Rec.Geol.Surv.India, vol.133, pp.50-55, 2002.



**R.R.S.S.C report**

- 1) Geological study of Kalyandurg block, Anantapur district, A. P. for diamond exploration using remote sensing data (2002)

**J.W.Bristow's reports**

- 1) A review of South African Kimberlites and exploration techniques.
- 2) Stream sediment sampling techniques.