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Rio Tinto Exploration India Limited

(Previously Known as ACC Rio Tinto Exploration Ltd.)

A member of the Rio Tinto Group

Final Relinquishment Report for Exploration of the Balangir Reconnaissance Permit (RP 73) Orissa, India

Report No: 27738

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Submitted: **Secretary, Department of Commerce & Industries, Government of Orissa, Bhubaneshwar.**

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SUMMARY

This is the final relinquishment report on the exploration for diamond and other mineral commodities carried out on the Balangir Reconnaissance Permit, executed on 29/04/2005, for the period of April, 2005 to April 2008, in compliance of Section 16 of the Mineral Concessions Rules, 1961.

As per the requirements of the MMRD Act and as per a letter addressed to the DMG Orissa dated 27th April 2007, about 50% of the permit was relinquished with only 125 km^2 of the original 265 km^2 permit area was retained for the 3rd year of exploration. Regional exploration completed within the Balangir Reconnaissance Permit (Balangir RP) in Balangir and Bargarh districts of Orissa did not discover any kimberlites or other precious or base metal mineralization. However, the exploration identified mantle sourced indicator minerals in some areas and anomalous incompatible element concentration in stream sediments indicating a potentially undiscovered mantle source of interest. This source could be a cluster of kimberlites/lamproites or mantle derived alkaline ultramafic intrusive with diamond or other mantle derived mineral potential. The RP area was finally relinquished on 29th April 2008 at the completion of the 3-year tenure of the RP (Refer to plan NDbg0792) as per regulatory requirements. However, Rio Tinto Exploration India Limited (RTX) has applied for one PL of 34.5 km^2 for further exploration.

Exploration completed including over 18 heavy mineral gravel samples and 38 –80# stream sediment geochemical samples collected at a nominal spacing of one sample per 7 to 25 square kilometres providing for regional coverage over 265km2 of the permit area. Approximately 700 heavy mineral grains recovered from the gravel samples were subsequently analysed for major oxide elements by manual and automated scanning electron microprobe. Mineral chemistries of the indicators are largely non kimberlitic, but a small population of the indicators returned indeterminate and potential mantle or high pressure facies chemistries, overlapping into the kimberlite / lamproite fields. No discrete targets have been defined by these indicators. To facilitate exploration over the Balangir RP, airborne geophysical data was purchased from the Orissa State Government. This survey was flown by World Geoscience in the early 1990's at a nominal line spacing of 250m at a mean terrain clearance of 80m. Airborne geophysical data included total field and reduced-to-pole (RTP) magnetics. Interpretation of this data could not reveal any possible kimberlitic signature.

Approx. 45% of the RP area falls within the Gandamardhan Reserve Forest which was kept out of any exploration activities. No detailed ground geophysical surveys over this permit area was undertaken as no discrete prospect was revealed with the prospecting carried out in the area.

INTRODUCTION

This is the final relinquishment report which incorporates all exploration activities carried out by RTX in the Balangir RP. The 265-km2 area of Balangir

RP was granted to ACC Rio Tinto on the 28th October 2004, and was subsequently executed on 29th April 2005.

The Balangir RP area is located within the west central part of Orissa State, approximately 17 km east of Nuapada town. The field area is accessed from Raipur via the Indian National Highway No. 6 (NH6) and National Highway No. 217 (NH 217) to the nearest town of Nuapada.

Summaries of exploration activities during this period are detailed in table 1. This report compliments previous biannual report including:

- ACC Rio Tinto Exploration Limited (October 2005); 1st Bi-annual Progress Report for Exploration of the Balangir Reconnaissance Permits For the period 29/04/2005 to 29/10/2005.
- Rio Tinto Exploration India Limited (April 2006); 2nd Bi-annual Progress Report for Exploration of the Balangir Reconnaissance Permits For the period 29/10/2005 to 29/04/2006.
- Rio Tinto Exploration India Limited (October 2006); 3rd Bi-annual Progress Report for Exploration of the Balangir Reconnaissance Permits For the period 29/04/2006 to 29/10/2006.
- Rio Tinto Exploration India Limited (April 2007); 4th Bi-annual Progress Report for Exploration of the Balangir Reconnaissance Permits For the period 29/10/2006 to 29/04/2007.
- Rio Tinto Exploration India Limited (October 2007); 5th Bi-annual Progress Report for Exploration of the Balangir Reconnaissance Permits For the period 29/04/2007 to 29/10/2007.

The above reports have been submitted with the relevant government institutions and are further archived with RTX in Bangalore.

Table 1: Summary of exploration completed by RTX in the Balangir RP

Name (District)	Granted RP Area km^2	Date of Execution	Heavy Mineral Samples	Heavy Mineral Chemistry (grains)	Geochemical samples	Geophysics	Drilling
Balangir RP	Granted 265	29 April 2005	18 ✓	700	38 ✓	Nil	Nil

1 GEOMORPHOLOGY

The area exhibits diverse topography. It can be divided into

a) The western part, which is pediplained rolling granite gneiss country with elevations varying between 280 – 300 m.
b) Mounds of granite gneiss, occurring at times as tors/pediment rising between 450 – 640 m over the pedeplains.
c) The eastern margin shows denudational ridges of Eastern Ghats Mobile Belt with elevation varies from 800m to 950m.

The contact of the Bastar Craton with the Eastern Ghats Mobile Belt acts as a major drainage divide. The drainage is controlled by Mahanadi River occurring north and east of the RP and flowing northeast. Ong, a main tributary to the Mahanadi River, flows north within the RP area.

2 REGIONAL GEOLOGY

The regional geology of the area has been established by the systematic geological mapping carried out by the Geological Survey of India (GSI). Our source of information includes the 250,000 scale published geological maps by the GSI and discussion with GSI geologists. The Archean-Palaeoproterozoic Bundeli Granitoids batholith (also called Dongargarh Granitoid elsewhere in the Bastar Craton) occurs in the western part of the area. The granitoid intrude into Archean Baya Gniessic Complex (also known as Bengpal Gneissic Complex elsewhere in the Bastar Craton), enclaves of which are found within the batholith. The granitoids show magmatic fabrics including plagioclase phenocryst alignment, magmatic flow orientation, K-feldspar megacrysts and occasional rapakivi texture. The Eastern Ghats Mobile Belt, characterised by 2-pyroxene granulites, khondalites, leptynites, enderbites and charnockites, occurs in the eastern part of the tenement. The contact between the two terrains is somewhat irregular and gradational and is considered to be a thrust contact with the EGMB pushed like a sheet of nappe over Bastar Craton. A crustal scale shear zone (Sileru shear) has been identified at the contact between the craton and EGMB. Khondalite suites of rocks are the major components found along the western contact; however mafic-ultramafic complexes, series of alkaline rocks and massif anorthosites also form part of the Eastern Ghat orogeny. The oldest vestiges of EGMB are known to date between 2.9 to 2.4Ga while the peak thermal metamorphism occurred around 1000 to 900 Ma. The alkaline emplacements are known to date between 1400 Ma to 800Ma.

3 RESULTS OF EXPLORATION

3.1 Collation of Available Database

RTX has procured all the available 250,000 geological maps of the RP area from the Geological Survey of India (GSI) and topographic maps from the Survey of India (SOI). Other available and published geological, geophysical and land information data from GSI and other agencies are also being

collated. All the data have been appropriately geo referenced and stored in digital format for incorporation into a GIS database of the area. Other data purchased and processed include the Landsat TM digital data, IRS digital data and airborne magnetic survey (Orissa DGM) data. In-house interpretation of these datasets and images for geology, structure and regolith terrain mapping have helped in planning the exploration.

3.2 Geology

Geological traversing in combination with other exploration activities has found the regional 1:250,000 geological mapping of the GSI to be accurate and sufficient for the interpretation of most of the regional and prospect datasets. A compilation geological plan has been presented in NDbg0793.

The RP area comprises of geological formations ranging from Archaean to Recent. Stratigraphically the area can be classified into unexposed oldest Baya gneiss (basement), undifferentiated granitoids of Bastar craton, Eastern Ghats Mobile Belt and laterite/bauxite.

Bastar Craton: It is a greenstone-granite province where greenstone components occur as enclaves within oldest dated tonalite gneiss (3.5 to 3.0 Ga, Rb-Sr and Pb-Pb) (M Hussain 2004), and younger greenstone belts intruded by batholithic granites dated between 2.6 and 2.4 Ga (Rb-Sr and Pb-Pb) (Sarkar 1989). The Archean-Palaeoproterozoic Bundeli Granitoids batholith (known as Dongargarh Granitoid elsewhere in the Bastar Craton) occurs in the western part of the area. The granitoid intrude into Archaean Baya Gneissic Complex (also known as Bengpal Gneissic Complex elsewhere in the Bastar Craton), enclaves of which are found within the batholith. Coarse-grained porphyritic granite, biotite granodiorite, quartz rich leucocratic granite metasomatic granite and granophyres are the major rock types in the RP area.

Eastern Ghats: The Eastern Ghats Mobile belt occupies the south-eastern part of the RP. The granite-greenstone belts of the Singhbhum-Orissa Craton bound this granulite belt to the north and Bastar craton to the west. The western extents of the Eastern Ghats Mobile Belt characterised by 2-pyroxene granulites, khondalites, leptynites, enderbites and charnockites, occurs in the eastern part of the tenement. The contact with the Bastar Craton is somewhat irregular and gradational, however is considered to be a thrust contact with the EGMB thrusted over the Bastar Craton.

Khondalite suites of rocks are the major components found along the western contact; however mafic-ultramafic complexes, series of alkaline rocks and massif anorthosites also form part of the Eastern Ghat orogeny. The shear zone is characterised by mylonitic foliation and stretching lineation. (Bhattacharya et al 2005).

3.3 Reconnaissance Heavy Mineral (Gravel) Sampling

A total of 14 primary gravel samples were collected from third and higher order streams at a catchments size ranging from 20 to 50 square kilometres effectively sampling all large active drainage areas over the entire Balangir RP. 4 follow up gravel samples were collected from the anomalous catchments. Complete data of gravel sample locations are given in Appendix 1.

Each gravel sample comprised approximately 20kg to 30kg of –1mm sand collected by hand from heavy mineral concentration zones within the active stream sediment bed load. All samples are processed at the company's specialist processing facilities by dense media separation, magnetic and heavy liquid techniques with mineral concentrates manually observed for any potential kimberlitic indicators.

The following table gives an analysis of observation and major oxide SEM mineral chemistries (table 2) of kimberlitic indicator minerals in the gravel samples collected from the RP area.

Observation and major oxide SEM mineral chemistries (table 2) identified only minor potentially kimberlitic chromite (37 grains in 10 samples) and no pyropes in any of the samples. Detailed SEM major oxide results for all heavy mineral indicators are listed in Appendix 4.

Table 2: Summary of kimberlitic indicator minerals and positive samples based on major element oxide SEM data

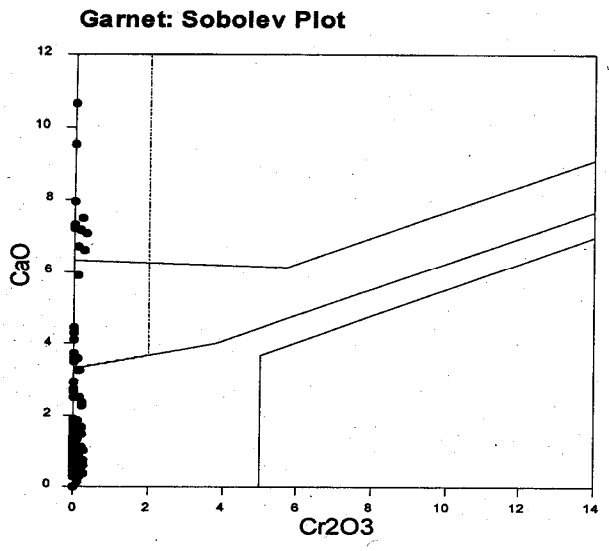
	Pyrope	Mantle Chromite	Picro Ilmenite	Chrome Diopside
No of grains	0	61	0	0
Maximum grain count	0	32	0	0
No of positive samples	0	4	0	0
% of positive samples	0%	22%	0%	0%

3.3.1 Heavy Mineral Sample Diamond Results

No diamonds were identified from observation of heavy mineral concentrates.

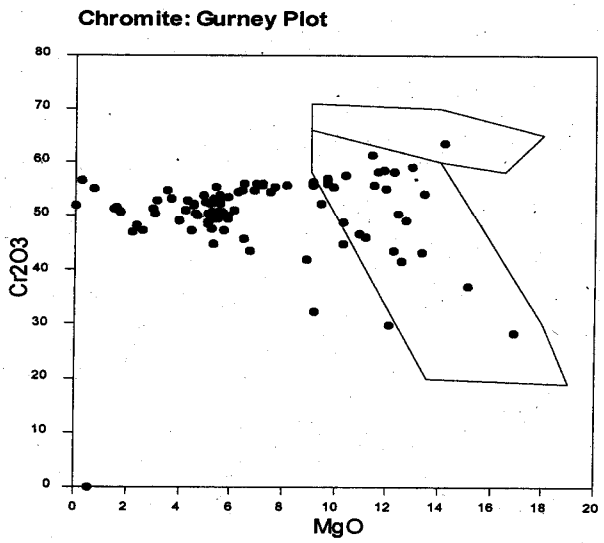
3.3.2 Heavy Mineral Sample Garnet Results

Over 265 garnet grains from 16 samples were tested by probing; returning no kimberlitic pyrope in any of the samples. The garnets are dominated by grossular, Spessartine and almandine.



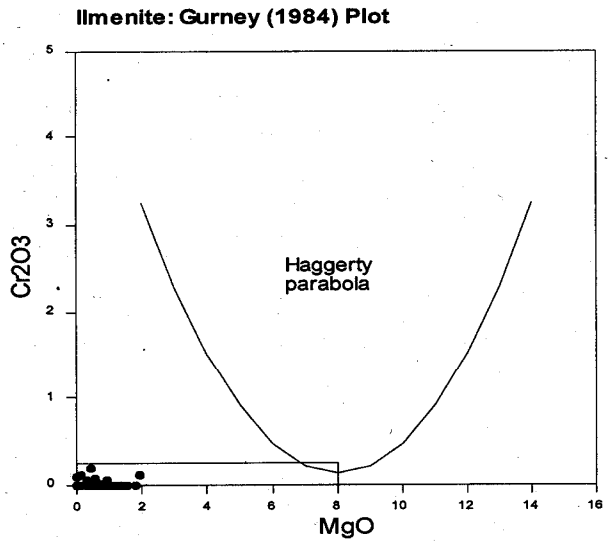
3.3.3 Heavy Mineral Sample Chromite Results

Mineral chemistries of 92 probed chromite grains are predominantly consistent with a shallow magmatic paragenesis with one fractionated trend centred on approximately 40-60% Cr_2O_3. The population exhibit variable MgO of 0-14% with the higher MgO varieties overlapping into the fields of kimberlite-sourced chromites. 61-chromite grains in 4 samples plot within this overlap area and are possibly shallow mantle sourced.



3.3.4 Heavy Mineral Sample Ilmenite Results

Probing of 136 ilmenite grains in 7 samples did not identify any kimberlitic Picro ilmenite.



3.3.5 Heavy Mineral Sample Chrome Diopside Results

No chrome Diopside was identified from the observation of heavy mineral concentrates.

3.4 Geochemical Exploration:

33-stream sediment and 5 soil samples were collected from the RP area. Each sample consisted of approximately 100gm of –80# (-0.180mm) silt collected for the analysis of a suite of lithophile, chalcophile, precious metals and kimberlitic compatible and incompatible elements by ICP-OES and ICP-MS techniques. Elements analysed and their detection limits for each are as follows: Ag (0.1 ppm); Al (10 ppm); As (0.5 ppm); Ba (10 ppm); Ca (10 ppm); Cd (0.1 ppm); Co (2 ppm); Cr (2 ppm); Cu (2 ppm); Bi (0.1 ppm); Fe (100 ppm); K (10 ppm); Mg (10 ppm); Mn (5 ppm); Mo (0.1 ppm); Na (10 ppm); Nb (0.2 ppm); Ni (2 ppm); P (5 ppm); Pb (0.5 ppm); Sb (0.5 ppm); Sr (2 ppm); Ta (1ppm) Th (20 ppm); Ti (10 ppm); U (0.02 ppm); V (2 ppm); W (0.1 ppm); Zn (2 ppm); Zr (10 ppm).
Summary statistics of stream sediment is given in table 3. Complete data assay results are listed in Appendix 2.

3.4.1 Stream Sediment Geochemical Results

The stream sediment analysis is concurrent with the regional geology. The granites shows a background ranging between 12 to 30ppm of Nb. Contact between granite and Eastern Ghat Mobile Belt (EGMB) and within EGMB shows high concentration of rare Earths elements, indicates possible alkaline activity at the contact. Elevated Nb, Ce and La at places characterize the basement gneisses. No base metal anomalism is defined in the area Stream sediment sample locations are given in Plan NDbg0794.

	Ag ppm	Al %	As ppm	Au ppb	Ba ppm	Bi ppm	Ca %	Cd ppm	Ce ppm	Co ppm	Cr ppm	Cs ppm	Cu ppm	Fe %
Mean	0.2	6.7	0.5	N/A	748.7	0.0	0.5	0.2	318.2	29.6	150.0	2.1	33.4	4.6
Median	0.1	6.5	0.5	N/A	598.0	0.0	0.4	0.1	268.8	31.0	138.0	2.0	35.0	4.6
Mode	0.1	N/A	0.5	N/A	N/A	0.0	N/A	0.1	N/A	33.0	149.0	2.4	24.0	N/A
Standard Dev	0.1	1.1	0.0	N/A	349.8	0.0	0.4	0.1	203.1	8.2	70.6	0.8	7.7	1.3
Minimum	0.1	4.8	0.5	N/A	454.0	0.0	0.1	0.1	90.1	17.0	36.0	0.9	22.0	2.6
Maximum	0.5	8.6	0.5	N/A	1826.0	0.0	1.6	0.5	945.7	47.0	299.0	4.4	50.0	7.7

	Ga ppm	In ppm	K %	La ppm	Mg %	Mn ppm	Mo ppm	Na %	Nb ppm	Ni ppm	P ppm	Pb ppm	Pt ppb	Pd ppb
Mean	16.3	0.1	2.0	153	0.4	1062	1.8	0.5	28.6	31.7	580	2.9	NA	NA
Median	16.6	0.1	1.8	131	0.4	898	1.9	0.2	24.1	31.0	534	1.7	NA	NA
Mode	N/A	0.1	N/A	N/A	N/A	N/A	0.1	N/A	N/A	32.0	N/A	0.0	NA	NA
Standard Dev	2.5	0.0	0.6	94.8	0.1	658	0.9	0.5	15.1	6.2	171	4.4	NA	NA
Minimum	11.4	0.1	1.2	52.0	0.2	295	0.1	0.1	11.6	23.0	366	0.0	NA	NA
Maximum	19.4	0.1	3.2	441	0.5	2791	3.2	1.8	61.5	51.0	921	20.4	NA	NA

	Rb ppm	Sb ppm	Se ppm	Sr ppm	Ta ppm	Te ppm	Ti %	Tl ppm	V ppm	W ppm	Y ppm	Zn ppm	Zr ppm
Mean	93.2	0.5	0.5	105.3	2.0	0.2	1.0	0.4	99.9	0.9	31.7	80.3	91.5
Median	90.8	0.5	0.5	72.0	1.6	0.2	0.8	0.4	98.0	0.6	34.2	77.0	78.0
Mode	N/A	0.5	0.5	55.0	0.0	0.2	N/A	0.4	84.0	0.0	N/A	82.0	78.0
Standard Dev	21.9	0.0	0.0	70.6	1.6	0.0	0.5	0.1	24.9	0.6	7.1	25.1	34.0
Minimum	58.6	0.5	0.5	47.0	0.0	0.2	0.4	0.2	65.0	0.0	17.3	43.0	54.0
Maximum	144.2	0.5	0.5	299.0	5.5	0.2	2.0	0.8	152.0	2.2	42.9	148.0	195.0

Table 3: Basic statistics of stream sediment geochemistry.

3.5 Geophysical Survey

3.5.1 Airborne Geophysics

To facilitate exploration over the Balangir Reconnaissance Permit, airborne geophysical data were purchased from the Orissa State Government. This data were flown by World Geoscience in the early 1990's at a nominal line spacing of 250m at a mean terrain clearance of 80m. Airborne geophysical data included total field and reduced-to-pole (RTP) magnetics. Interpretation was based on identification of discrete targets, possibly representing an intrusive kimberlite/Lamproite source. The area shows quite magnetic background and no targets that can be attributed to a kimberlitic intrusion could be identified.

3.5.2 Ground Geophysics

No ground geophysical survey was carried out in the Balangir RP.

4 RECOMMENDATIONS /PROPOSED EXPLORATION

As discussed above, the exploration identified mantle sourced indicator minerals in some areas and anomalous incompatible element concentration in stream sediments indicating a potentially undiscovered mantle source of interest. This source could be a cluster of kimberlites/lamproites or mantle derived alkaline ultramafic intrusive with diamond or other mantle derived mineral potential. Even though no discrete prospect has been identified, RTX has decided to file PLs over alkaline source derived mineral potential area.

5 HEALTH, SAFETY, COMMUNITY RELATIONS AND ENVIRONMENT

Rio Tinto recognizes that excellence in managing health, safety, environment and community responsibilities is essential to long-term success. Through effective management practices the Group aims to ensure the health and safety of its employees, to minimise any adverse impacts its activities may have on the environment and to establish mutually beneficial relationship with local community.

5.1 Health and Safety

Rio Tinto Group policies on Health and Safety are designed to minimise the risk of injury or occupation illnesses. A minimum management requirement at all of the company-managed operations is to ensure full compliance with the Rio Tinto Standards. The goal is for zero work related injuries or occupation illnesses. Minimum prerequisites require that all work activities be based on risk assessments ensuring that effective controls and safe work procedures exist for all hazardous activities. Further the standards require a system for ensuring that employees are trained, equipped and where applicable, certified to carry out their work according to the applicable safe work procedures, and that their competence has been tested. Personal protective equipment of international standards has been issued to each of the employees relevant to

their conditions of working. All drivers employed are specially trained in 4WD driving and safety by international driving consultants. All field staffs are also trained in advanced first aid by international trainers. Rio Tinto organises periodic refresher courses of these training programme maintain the standards.

5.2 Environmental

Rio Tinto's Environmental Policy aims to prevent or otherwise minimise, mitigate and rehabilitate any effects that the group's operations have on the environment. The internal environmental systems adapted by Rio Tinto has been accredited with ISO 14001 certification. Although exploration activities in reconnaissance permits are essentially non-invasive to the environment, the same rigor and level of compliance to the standards, systems and procedures is followed.

For all the Orissa RP's an Environmental Management Plan has been devised prior to the initiation of field activities. This plan will be constantly updated as the program develops. The plan evaluated potential environmental impacts associated with the activities and provided procedures to prevent or minimize impacts. In case where an impact was unavoidable or accidental, appropriate rehabilitation procedures are in place. Relevant exploration personnel including those of contractors are inducted and trained in these procedures. Control systems include incident reporting and annual environmental reporting to first-line management and corporate audits.

5.3 Community Relations

There are more than 71 villages within the RP areas with a total population estimated to be over 68,000. Agriculture is the main occupation for over 90% of the population. Industrial activity is mainly agro-based. Agriculture is mostly single crop restricted to the monsoon season with less than 10% area under irrigation.

During the term of the exploration specific community relation policies are undertaken which includes distribution of community briefing sheets, employment of local people for work, relationships with preferred local suppliers/services, continuous consultation with stakeholders and development of internal system of recording, reporting and monitoring community activities.

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