Exploration in Rio Tinto

Rio Tinto is a leading international business involved in each stage of metal and mineral production.

We have a multi-commodity exploration portfolio composed of the best opportunities available to us. We have an exceptional set of assets and growth opportunities, both in established projects and exploration prospects. We aim for a multi commodity exploration portfolio composed of the best opportunities available to us.

We set ourselves apart from the rest of the mining industry by having a clear focus on finding and mining only the best resources. These resources must be profitable in all parts of the price cycle and deliver long term economic value to Rio Tinto.

Rio Tinto Exploration is organised into three regional teams: the Americas, Australasia and Africa-Eurasia. The Project Generation Group (PGG) is responsible for coordinating project prioritisation and searches the world for new opportunities. PGG also provides specialist commercial and technical assistance to the regional teams and coordinates research programmes.

At the end of 2009, the Exploration group was actively exploring in 17 countries, and assessing opportunities in a further 19 for a broad range of commodities including bauxite, copper, coking coal, diamonds, iron ore, nickel and uranium.

The Group combines Rio Tinto plc, which is listed on the London Stock Exchange, and Rio Tinto Limited, which is listed on the Australian Securities Exchange.

Within Rio Tinto, the Exploration group is mandated with increasing the value of the company by discovering or acquiring new mineral resources.

Exploration involves the identification, prioritisation and testing of geological, geochemical and geophysical targets. The exploration process ends when a discovery is handed over to one of Rio Tinto’s product groups (ie Aluminium, Copper, Diamonds & Minerals, Energy and Iron Ore) for detailed evaluation.

Rio Tinto’s exploration strategy brings us sustained success in a highly competitive market. We have maintained our commitment to exploration over the years and the consistency of expenditure and activity has produced extraordinary results.
Exploration
Rio Tinto fact sheet
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**Deposit focus**

Our focus is on only the largest and highest value mineral deposits, which we refer to as Tier 1 deposits. This prevents distraction of people and financial resources onto lower value projects, enabling us to deliver maximum value to the shareholder.

**In house approach**

We operate the majority of exploration programmes ourselves rather than outsourcing to others. This ensures that we retain management control over our performance in the areas of safety, environment and community relations, as well as corporate governance. It also means we can keep the exploration programme focused on only those targets that are important to Rio Tinto.

We will, however, partner readily with smaller exploration companies if that gives us access to attractive opportunities, tenure, local knowledge, or operational skills that we do not possess in house.

**Regional structure**

We operate in regional groups that can explore for multiple commodities, rather than global groups that are focused on a single commodity. This gives us local presence and a sound understanding of our operating environment.

**Competitive strengths**

We play to our competitive strengths, rather than trying to compete across the board. These strengths include:

- World leading expertise in bulk commodity, base metal and diamond exploration.
- An ability to operate effectively in highly prospective emerging jurisdictions. Our scale and long term view mean that we can be successful in complex cultural and regulatory environments where smaller companies may be unable to sustain their exploration efforts.
- A strong corporate reputation that makes us a preferred partner for host governments and local communities.
- A reputation for excellent project management, commercial skills and mining expertise that has given us entry to major projects worldwide.
- Extensive geological knowledge collected through many years of experience.
- A practice of using simple, well tried and cost effective geochemical and geophysical search techniques to detect near surface orebodies.
- A strong tradition of developing and applying innovative technologies to resolve specific exploration challenges.

**There are four basic elements to our exploration strategy:**

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Our approach

Rio Tinto conducts exploration in both greenfield and brownfield environments.

Greenfield exploration

Greenfield exploration involves discovering deposits in new geographical locations, or diversifying from our existing product portfolio.

All greenfield exploration is carried out by Rio Tinto Exploration. If a deposit meets the criteria to be assessed as a “discovery”, it is then passed over to the appropriate product group (ie Aluminium, Copper, Diamonds & Minerals, Energy and Iron Ore). The product group will conduct detailed evaluation and feasibility studies, before a decision is taken on whether to develop the deposit.

Our greenfield successes include bauxite deposits in Weipa, Australia, and uranium deposits in Rössing, Namibia – both of which continue to deliver economic benefit to Rio Tinto after more than 40 years.

Brownfield exploration

Brownfield exploration aims to grow or sustain the value of our existing operations. It capitalises on projects in which we have already made significant investment. Costs are lower and access is simpler than greenfield exploration, since brownfield exploration usually takes place on land that we already own.

As Tier 1 resources are often found in clusters, this provides another reason why the brownfield environment offers the easiest opportunity for creating value through exploration.

Exploration and subsequent evaluation of brownfield sites is carried out by the appropriate business unit. Rio Tinto Exploration provides technical support to the business unit during brownfield exploration.

Recent brownfield successes include iron ore discoveries in Western Australia’s Pilbara region.
Our exploration stages

The evolution of a project from initial testing to commissioning can take 10 to 20 years involving a series of study stages to reach investment approval and implementation. The exploration process can be divided into five stages. The number of opportunities that progress to the next stage decreases as we move through the process.

**Area selection**
- deciding where to explore
The Exploration team conducts desktop evaluations of geological, geochemical and geophysical data to find areas that have the potential to contain an orebody. Issues relating to health, safety, the environment and communities, or technical or political risks, are identified at this stage. The team often makes an initial visit to the area.

**Target identification**
- determining whether a deposit may exist
Mapping and surveying takes place within a selected area. The team determines whether a target exists that represents the mineral deposit they seek. Discussions take place with local communities to obtain temporary land access, and to assess opportunities for local sourcing and employment.

**Target testing**
- assessing the nature of mineralisation
The team performs the first sub-surface evaluation of the better prospects through limited drilling and trenching. They may start to collect environmental and social baseline data at this stage.

**Resource delineation**
- determining deposit size, grade and metallurgy
If results from initial drilling are encouraging, additional drilling takes place to estimate the extent of mineralisation. The team works increasingly closely with local stakeholders to analyse environmental and community issues, and starts baseline studies if these have not previously begun.

**Resource evaluation**
- judging whether a deposit will be economical
The team carries out more detailed investigation of a deposit to decide whether it will be economic to develop. This involves more drilling, metallurgical and engineering studies and economic analysis. After this stage, called an Order of Magnitude Study, a deposit is handed over to a product group evaluation team if it has significant potential value to Rio Tinto.

Investing in exploration

Global mineral exploration expenditure responds to changes in the commodities cycle. We examine each opportunity individually to decide the level of exploration investment we will make. The size of our exploration investment is determined by the quality of the opportunity and project risk, as well as our assessment of the long-term prospects for the commodity. The split of our annual expenditure is therefore not predetermined, nor is it necessarily in line with the contribution that a commodity makes to Rio Tinto’s overall net earnings.
Our commitment

Rio Tinto Exploration is an integral part of the sustainable development equation for Rio Tinto.

The Group’s strategy of investing in large, long life mines and businesses means that we operate on extended time horizons. Some of our projects last 40 years or more from mineral discovery through to closure, representing large scale, long term investments in fixed capital.

These long term commitments provide opportunities for us to plan and implement projects in such a way that they deliver sustainable contributions to social wellbeing, environmental stewardship and economic prosperity.

The Exploration group’s core objective of finding long life, low cost resources is the starting point for the entire Group’s efforts in sustainable development. These discoveries can become the catalyst for local economic diversification, skills development in the local workforce and improvements to infrastructure.

Each of the countries and regions we explore in has different cultures, peoples, laws and expectations. Our exploration teams are often the first contact the Group has with people who may be our neighbours for generations. Respecting the diversity of local communities, we engage in a manner that is direct and personal, and tailored to the specifics of each region, village, or individual stakeholder.

On a day to day basis our Exploration group contributes to local communities through employment of local people and introducing improvements in local health and safety practices. We actively encourage community engagement, striving to establish trust at an early stage so that we can bring about mutual benefits through the development of high quality mineral resources.

There is no room in Rio Tinto Exploration for anything but the most value-creating opportunities; the most constructive, collaborative and adaptable behaviours; and a personal commitment to sustainable development from everyone in our team.

Successful sustainable development outcomes help us achieve not just a licence to operate, but also a licence to grow.
Our successes

The mining industry norm is that approximately 0.03 per cent of conceptual targets that are assessed lead to a discovery. This means that only one in 3,000 of all ideas in the exploration pipeline would proceed to the detailed evaluation stage. At Rio Tinto Exploration, we strive to significantly exceed this benchmark.

To add value to a Group the size of Rio Tinto, our exploration teams must regularly discover what others might call “company maker” deposits. Known as “Tier 1” deposits, these are the deposits that contribute disproportionately to global production of a commodity due to their size and character. Our target is to make one Tier 1 discovery each year.

Tier 2 deposits are smaller or lower quality than Tier 1 – they are the 80 per cent of deposits that contribute 20 per cent of global production. The following table illustrates our exploration track record, listing the Tier 1 and Tier 2 discoveries that we made between 1990 and 2009.

<table>
<thead>
<tr>
<th>Year</th>
<th>Tier 1 Discovery</th>
<th>Tier 2 Discovery</th>
<th>Mineral</th>
<th>Tier 2 Mineral</th>
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<tr>
<td>1990</td>
<td>Century</td>
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<td>Zinc</td>
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<td>1993</td>
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<td>Honeymoon Well</td>
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<td>Nickel</td>
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<td>1994</td>
<td>Diavik</td>
<td>Fortaleza</td>
<td>Diamonds</td>
<td>Nickel</td>
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<td>1995</td>
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<td>Las Cruces</td>
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<td>Copper</td>
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<td>1998</td>
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<td>Penasquito</td>
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<td>2000</td>
<td>Potasio Rio Colorado</td>
<td>Murowa</td>
<td>Potash</td>
<td>Diamonds</td>
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<tr>
<td>2001</td>
<td>Resolution</td>
<td>Kazan</td>
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<td>Soda ash</td>
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<tr>
<td>2002</td>
<td></td>
<td>Sari Gunay</td>
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<td>Gold</td>
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<td>2003</td>
<td></td>
<td>Eagle</td>
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<td>2004</td>
<td>Simandou</td>
<td>Welthandaithaluna</td>
<td>Iron ore</td>
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<td>La Granja</td>
<td>Volcano</td>
<td>Copper</td>
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<td>2007</td>
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<td>Kintyre</td>
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<td>Diamonds</td>
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<td>2008</td>
<td>Mutamba/Chilubane</td>
<td>Kinde</td>
<td>Titanium</td>
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<td>2009</td>
<td>Jadat</td>
<td>Bunder</td>
<td>Lithium borate</td>
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Rio Tinto Exploration has an enviable track record in both greenfield and brownfield environments, such as at Mutamba in Mozambique (top) and in the Pilbara of Western Australia (bottom).
Fact sheets

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