OFFSETTING ENVIRONMENTAL IMPACTS TO FACILITATE MINING

Sarah Fish – Rio Tinto Coal Australia
David Snashall – ERM Australia Pty Ltd
James Streater - ERM Australia Pty Ltd

Introduction

Increasing pressures on land, the environment and society from economic development have often resulted in conflicting and competing demands that are not always sustainable. Rio Tinto Coal Australia (RTCA) faced such a challenge to its proposed new open cut extension at the Warkworth Coal Mine in the Upper Hunter Valley of NSW. The existing mine was planned to intersect its approved boundaries in April 2003, and the extension was required to allow it to extend the continuity of its operation and increase unprocessed coal output up to 18 million tonnes per annum. Without approval, the mine was facing wind down and closure of operations. Environmental impact assessments conducted in the mine extension area identified sensitive ecological issues including the presence of threatened species listed under both the State *Threatened Species Conservation Act 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act 2000,* regionally significant corridors for affected species of birds and bats and dispersal and colonisation habitat for sedentary species. In particular, an area of Warkworth Sands Woodland was identified that is listed as an endangered community under the *Threatened Species Conservation Act 1995*. As a result, it was unlikely that the development application for the extension of the mine would be successful without the development of an innovative approach that would provide a net environmental improvement.

The Principle of Green Offsets

The NSW Government has attempted to address such competing land conflicts through development of new economic tools intended to harness market forces. One of these economic tools is Green Offsets, a concept that allows development but requires offset actions to be undertaken near to the development site resulting in a net environmental improvement. The NSW Government has articulated this concept in a proposal for public consultation titled *Green Offsets for Sustainable Development* (NSW Government, April 2002). The key principles set out in this proposal are as follows:

- Environmental impacts must be avoided where possible using cost-effective prevention and mitigation measures. Where impacts cannot be avoided then the offset concept is used to address remaining issues;
- All regulatory requirements will remain applicable;
- The offsets should not reward poor environmental performance;
- The offsets are to complement other existing government programs and initiatives;
- The offsets must last for the lifetime of the impact;
- The benefits and impacts must be quantifiable;

- The impacts must be offset on a like for like basis;
- The impact must be offset in the same area;
- The offset must provide a greater benefit than the impact and must not be already funded through another scheme; and
- The offsets must be enforceable through conditions on development consents, licences or by covenants or a contract.

Development of a Green Offset Strategy for the Warkworth Mine Extension

While this concept and the principles involved are relatively simple in theory, they are more difficult to implement in practice. Specific issues faced by RTCA included:

- Identifying an available area within the mining lease that could be put to offset habitat loss from the extension;
- The need to include other affected stakeholders to obtain approval of the strategy;
- Management of threatening activities such as grazing and adjacent agricultural and mining activities;
- Expectations by some agencies for the offset to be undertaken in perpetuity; and
- Community concerns regarding bushfire risk.

To assist in its development application (submitted in August 2002) to PlanningNSW (now known as DIPNR), RTCA collaborated with the State Government to develop a 'Green Offset Strategy' based on the principles of the draft paper. Discussions were held with PlanningNSW and National Parks and Wildlife Service (now part of the Department of environment and Conservation) with respect to the likely impacts of the proposal and its regional significance. Following these discussions, the key principles and objectives of the strategy were developed. The key principles are that the offset will be in place while the impact is occurring which in this case may be beyond the life of the mine, there is a net improvement in the quality and quantity of fauna and flora in the area and that best practice of flora and fauna management must be implemented. The overarching objective is to develop an expanded and sustainable land system that:

- Results in a net improvement in ecological value and connectivity of the area;
- Protects and enhances the biological diversity of the area;
- Increases the area of woodland, and in particular the Warkworth Sands Woodland;
- Manages, maintains and enhances vegetation and habitat for threatened species in the area;
- Maintains a regional corridor; and
- Offers long-term management and protection.

In order to identify whether the objectives are being met, a set of performance criteria is required that can judge the adequacy of the strategy. The completion criteria need to be long-term and flexible such that they can be used to identify when a net positive improvement has been achieved. It is recognised that this may not occur within the estimated life of the impact and that the strategy may need to be continued past the estimated mine life if necessary. The completion criteria used to assess whether a net positive outcome is achieved include:

- The quantity of affected area offset - a greater or equal area of each vegetation community and habitat that is affected than that removed from the affected area will be protected, managed and regenerated in adjacent areas. A greater area of woodland and regrowth vegetation removed on the mine extension will be rehabilitated, protected and managed to enhance the ecological value and corridor function of the area;

- The quality of the offset in comparison to the affected area – the type of vegetation community and habitat retained in the offset area is to be similar in ecological value and corridor function;

- Enhancement of the strategic ecological role of the area; and

- Minimisation of activities and processes threatening the ecological value of the area (eg potential future development, spread and establishment of introduced plants, feral animals, human disturbance, agriculture, grazing, surface water run-off, erosion and inappropriate fire regimes).

Primary Components of the Strategy

RTCA identified that the offsets needed to be dynamic and that having a single fixed offset was not going to enable the objectives of the strategy to be met.

Mechanisms and features used to implement the strategy include the following key components:

- Setting up an Advisory Group comprising regulators and Aboriginal cultural groups. The role of the group is to cooperatively develop best management practice, advise on rehabilitation and provide a broad-based review of management actions;

- Development of a Plan of Management (POM), approved by the Advisory Group, under which the strategy was implemented. The POM provides an agreed set of management specifications to best offset the environmental impacts of mining. It is binding on the company and must be completed to the satisfaction of the Advisory Group and regulatory authorities. The POM is a dynamic document that sets milestones to be achieved, criteria to monitor performance and corrective actions, if necessary;

- Undertaking research to ensure the objectives of the POM are being met through investigation, assessment and application of best practice in mine rehabilitation and enhancing biodiversity;

- Identifying and managing non-disturbance areas (NDAs) and Habitat Management Areas (HMAs). NDAs are areas of land that will be rezoned as Environment Protection Zones

under the Singleton Local Environmental Plan in which no open-cut mining, agriculture or grazing will be allowed. The NDAs will be managed to enhance the ecological value and control threatening processes including feral animals and weeds, bushfire and unauthorised access. The HMAs will be managed in the same way for the life of the mine but are not rezoned. The purpose of the HMAs is to offset the short to medium term loss of habitat and maintain connectivity in the area until rehabilitation of the mine can restore these values;

- Rehabilitation of 50% of the extension area with open woodland/ woodland resulting in a net improvement in the area's regional corridor function;

- Monitoring of regeneration, rehabilitation and management against offset milestones and performance criteria; and

- Reporting in the mine's annual environmental report with independent auditing every five years.

Risks to Implementation and Mitigation Measures

Several key risks to the implementation of the strategy were identified including the potential inadequacy of resources for management and monitoring; conflicts of land use; inadequate levels of knowledge on soils, vegetation and fauna; and potential constraints to rehabilitation and regeneration such as seed sources, soil types, topography, surface water and groundwater and potential threatening processes.

However, the nature of the strategy will minimise these risks as the gradual nature of mining will allow time for the collection of the necessary information about rehabilitation potential, best practice rehabilitation techniques, flora, fauna, soils, seed sources, water and threatening processes.

Management of the Strategy over the Life of the Mine

The management of the strategy is divided into short (Year 0 to 10), medium (Year 10 to 20) and long (Year 20 to 30) timeframes. Each management timeframe has its own secondary objectives with facets of the strategy implemented during each timeframe to meet the overall objective.

In the short term, the objective is the protection and management of a viable area of woodland with the aim of enhancing it over time. The actions to be undertaken include:

- Set up of the Advisory Group;

- Development and approval of the POM including performance criteria and monitoring strategies;

- Rezoning of NDAs to environment protection zone under the LEP;

- Commencement of management of the NDAs and HMAs;

- Investigation and rehabilitation of the existing mine to create the fauna and flora habitat and enhanced landscape connectivity required by Year 30;
- Research the extent of the Warkworth Sands Woodland and identify areas in the NDAs, HMAs and rehabilitation areas that could be naturally regenerated or rehabilitated over the mid to long term;
- Commence natural assisted regeneration of the Warkworth Sands Woodland in the NDAs and HMAs;
- Monitor the distribution and abundance of affected species and identify areas where habitat can be regenerated and landscape connectivity enhanced;
- Create, enhance or maintain habitats for affected species and enhance connectivity;
- Review the POM every five years against the performance criteria to monitor regeneration, the distribution and abundance of affected species and rehabilitation progress; and
- Undertake corrective actions, if necessary.

Over the medium term, the objective is to increase the extent of rehabilitation to create habitat in the NDAs and HMAs ensuring that viable habitats and landscape connectivity are protected and enhanced. The actions to be implemented include:

- Review of the POM and continued monitoring of regeneration, affected species and rehabilitation against performance criteria with corrective action, if necessary;
- Ongoing management of the vegetation communities, flora and fauna habitat and connectivity in the NDAs and HMAs;
- Continued rehabilitation of land to improve habitat and increase landscape connectivity towards the Year 30 goal;
- Removal of soils (Warkworth Sands) during the mining process and commencement of rehabilitation of the Warkworth Sands Woodland in the nominated rehabilitation areas; and
- Maintenance of created habitat features.

In the long term, the objective is to have a sustainable land system that is greater in area, of higher vegetation quality and increased biodiversity value than before mining commenced. The land system will include the NDAs and rehabilitation areas. The actions to be implemented during this timeframe include:

- Review of the POM and continued monitoring of regeneration, affected species and rehabilitation against performance criteria with corrective action, if necessary;
- Ongoing management of the vegetation communities, flora and fauna habitat and connectivity in the NDAs and rehabilitation;

- Continued management of rehabilitated land to improve habitat and increase landscape connectivity towards the Year 30 goal;
- Monitoring of assisted natural regeneration within the NDAs and recreated Warkworth Sands Woodland in the regeneration area;
- Maintenance of created habitat features; and
- A confirmation study as to whether the offset goals have been achieved at Year 30 and the landform is ecologically sustainable and self-perpetuating.

Outcomes

Based on the implementation of this strategy, it is predicted that it will more than offset the impact of the proposed mine extension for the duration of the impact and, in the long term, result in a net improvement in the ecological value of the area and the regional connectivity. The offset will ensure that vegetation and habitat is conserved and managed to enhance its ecological value.

As a result of RTCA's commitment to the implementation of this strategy, development consent for the mine extension was granted in May 2003. It is the first example of any business using the concept for native vegetation offsets and provides a practical example that can be used by other organisations.

References

NSW Government; April 2002; Green Offsets for Sustainable Development - concept paper for consultation.