

# ***EXECUTIVE SUMMARY***

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## **ES 1.0 Background**

ABM Resources NL (ABM) is proposing to build a high-grade gold mine based on the Old Pirate deposit at the Twin Bonanza project located approximately 625km north-west of Alice Springs in the Tanami Region of the Northern Territory. The project is located on Aboriginal trust land and a mining agreement has been reached with the Traditional Owners via the Central Land Council (CLC).

ABM has been exploring on the project since 2010 and has built on the previous work of Newmont and other companies in the region.

The project will sustain the long-term future of ABM through the use of a staged approach to mining which is designed to incrementally grow the project whilst minimising capital expenditure and environmental risks.

The Old Pirate deposit within the Twin Bonanza project area will be one of the highest grade open pit gold operations in Australia and has the added advantage of gold liberating easily via gravity gold recovery methods. The resulting operation will therefore have a considerably smaller footprint per ounce of gold recovered compared to other mines around Australia. This will be the first new gold mine in the region for more than 15 years and marks a key milestone not just for ABM but for mining in the Central Desert of the Northern Territory.

## **ES 2.0 Project proponent**

The project proponent is ABM and the Twin Bonanza project will be the first and initially the only operating mine of the proponent.

ABM's headquarters are in Perth, Western Australia and the company has an operational logistics base in Alice Springs, Northern Territory. The proponent is entirely focused on the discovery and development of gold throughout the Central Desert of the Northern Territory.

The proponent has, over the past four years, built a close working relationship with the CLC and strongly believes that the development of the mineral wealth of the Northern Territory is for the benefit of all stake holders including company shareholders, Traditional Owners, the wider Northern Territory community and Australia as a whole.

ABM is committed to sound environmental practices and aims to minimise negative impacts on the environment of the areas in which it operates.

This draft EIS has been written and developed principally by company staff (as opposed to outsourcing authorship of this document) as the company strongly believes that its staff must ultimately implement risk management as the stewards of the land on which this project sits. Consultation was conducted with the Traditional Owners / CLC, various Northern Territory and commonwealth government departments and specialist consultants where applicable.

## **ES 3.0 Environmental commitments**

ABM's corporate environmental policy is as follows:

"ABM Resources is committed to responsible exploration and development. ABM conducts its exploration to minimize impact of the environment and has ongoing programs of environmental rehabilitation.

ABM acknowledges its responsibilities to conduct its business in harmony with the stakeholder's and wider community's desire to protect the natural environment. ABM recognizes that it conducts exploration on land owned by Traditional Owners and that ABM's access to this land is guided through process with the Central Land Council. ABM is committed to a close working relationship with the Central Land Council, the communities and the Traditional Owners of the areas in which it works.

Exploration discovery by ABM is for the benefit of both the shareholders and stakeholders including the Traditional Owners."

ABM is committed to operating in a responsible manner, which minimises impact on the environment and will:

- comply with legislative and regulatory requirements for the environment
- proactively develop and maintain management systems to measure and continually improve environmental performance
- operate in a responsible manner to minimise impacts on the environment and prevent pollution
- care for the environment and its heritage value
- work closely with the community and governing bodies to ensure that a good approach is always followed relating to environmental protection
- encourage employees to value the heritage and the environment in which ABM work
- reduce waste, recycle and recognise the by-product of ABM's consumables
- maintain an open consultation process with regulators, the community and stakeholders
- minimise workplace exposure to hazards, ecosystem disturbance or degradation
- re-establish disturbed areas as sustainable ecosystems and community assets
- facilitate the training of employees and contractors in relation to their roles and responsibilities to environmental management

- periodically audit ABM's environmental systems and performance to further improve environmental outcomes.

In light of the above the Environmental Impact Statement (EIS) has been written in response to the guidelines for the preparation of the EIS for the Twin Bonanza project, but also to reflect ABM's corporate environmental policy.

## **ES 4.0 Regulatory environment / legal framework**

The development of the EIS has taken into consideration the following commonwealth and Northern Territory legislation:

- *Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)*
  - *Environment Protection and Biodiversity Conservation Regulations 2000*
- *Native Title Act 1993 (Cth)*
- *Aboriginal Land Rights (Northern Territory) Act 1976 (Cth) (ALR Act)*
- *Environmental Assessment Act 1982 (NT)*
  - *Environmental Assessment Administrative Procedures*
- *Mining Management Act 2001 (NT)*
  - *Mining Management Regulations*
- *Mineral Titles Act 2010 (NT)*
  - *Mineral Titles Regulations*
- *Territory Parks and Wildlife Conservation Act 2000 (NT) (TPWC Act)*
  - *Territory Parks and Wildlife Conservation Regulations*
- *Water Act 2004 (NT)*
  - *Water Regulations*
- *Heritage Act 2011 (NT)*
- *Aboriginal Land Act 1980 (NT)*
- *Northern Territory Aboriginal Sacred Sites Act 1989 (NT) (Sacred Sites Act)*
- *Planning Act 1999 (NT)*
  - *Planning Regulations*
- *Work Health and Safety (National Uniform Legislation) Act (and related Regulations) 2007 (NT) (WHS(NUA) Act)*
  - *Work Health and Safety (National Uniform Legislation) Regulations*

## **ES 5.0 Staged approach to development at Twin Bonanza**

The Old Pirate high grade gold deposit within the Twin Bonanza project area consists of fine and coarse gold grains principally contained within quartz veins hosted in sedimentary rocks. Due to the coarse gold and associated sampling effect, detailed drilling is not able to

accurately represent the magnitude and geometry of the mineralisation. As a result the proponent has devised a staged approach whereby each stage of development informs the design parameters and economics of the subsequent stage. This approach sees capital expenditure spread through the various stages. This has the added benefit of minimising environmental impact and limiting disturbance accordingly.

The coarse gold also presents a key advantage and the proponent is proposing principally gravity gold extraction methods with the use of reagents limited to small in-line concentrate leaching rather than large scale cyanide plants.

### **5.1 Stage one – trial mining and processing**

Stage one consists of trial mining and processing which is currently being carried out under an exploration licence and with permits and consent of the Northern Territory Department of Mines and Energy (DME) and the CLC. Stage one consists of the extraction of quartz veins from the top 5 metres of the deposit and processing through a small-scale pilot plant.

### **5.2 Stage two – open pit mining to ~35m depth**

Utilising the same processing plant (with minor upgrades) used in stage one, ABM has developed a mine-plan to optimally extract ores from surface to a depth of approximately 35 metres. The processing throughput is anticipated to be 140 000 tonnes per annum and will last about 2 years.

### **5.3 Stage three – expansion stage**

Stage three economics and design cannot be accurately estimated until mining history is established during stage two. However, given the high grade nature of the Old Pirate deposit and compared to other similar projects around the world it is anticipated that the stage three project will be economically feasible at an undetermined scale. Stage three will include deepening of the open cut pits to continue high grade quartz vein mining at depth and will likely include an expansion of the stage two plant to processing 240 000 tonnes per annum and will last a further 4 to 6 years.

### **5.4 Key mining and milling components stages one to three**

Open pits will be excavated using conventional drill, blast, load and haul practices. ABM does not anticipate intersecting the water table through open pit stages two or three. All pits will be bunded, and where practicable back-filling will be undertaken.

Two waste rock dumps have been designed taking into account geotechnical requirements and are located to minimise the impact on threatened species habitat. Waste rock dumps will be contoured and at a height and angle that is sympathetic to the natural contours of the area. Upon completion and closure of the mine waste rock dumps will be covered with

topsoil and re-seeded. Waste rock consists principally of sandstone and shale with low to negligible levels of acid generating sulphides.

The stage one pilot plant will be expanded in stages two and ultimately stage three. It consists of crushing circuit, gravity gold jigs, ball mill and Knelson concentrators. In-line cyanide leaching may be applied in a closed circuit on concentrates only and at a lower level than conventional carbon in leach / carbon in pulp processing. If used, cyanide will be broken down and be effectively inert prior to discharge into a purpose built dam.

Tailings dams will be constructed for storage of finely ground rock from processing. This material is ground-up quartz, shale and sandstone rock and has had no reagents added. Following completion and closure, all tailings dams will be rehabilitated as per the conceptual mine closure plan.

## **ES 6.0 Project rationale and alternatives**

The development of the Twin Bonanza mine presents many benefits:

1. Direct employment opportunities:
  - a. Indigenous employment programs
  - b. decreased overall unemployment
  - c. increased income tax and payroll tax contributions.
2. Increasing gold production as contribution to the economy of Australia including:
  - a. increased GDP and net exports of Australia
  - b. increased GSP and net exports of the Northern Territory.
3. Increased contractor / business opportunities to regional centres including Alice Springs.
4. Increased revenues to the CLC/ Traditional Owners (as key stakeholders).
5. Increased revenues to the Northern Territory Government through the *Mineral Royalty Act 1982* (NT).
6. Return to ABM shareholders on exploration and development investment in the region.
  - a. potential for increasing company value and dividends.

The proponent has a commitment to operate in a responsible manner, which minimises impact on the environment. This EIS and subsequent findings of the EIS process will form the basis of the environmental management measures implemented on site to minimise the impact on the surrounding environs.

Mining of finite resources is by definition not 'sustainable'. However, throughout ABM's operations ABM intends to grow the company with on-going investment in exploration for

the future of the company, the Central Desert, the Traditional Owners, the Northern Territory and Australia as a whole.

## **ES 7.0 Risk assessment**

The proponent has conducted its risk assessment associated with identified aspects and potential impacts of the project. The risk assessment is designed to identify the potential hazards that affect human health, socio-cultural environment and the natural environment. The approach is systematic and congruous with international best practice standard methodologies including:

- AS/NZS ISO 31000:2009: Risk management— Principles and guidelines (Standard)
- HB 203:2006: Environmental risk management — Principles and process (Guide)
- HB 158:2010: Delivering assurance based on ISO 31000:2009 — Risk management – Principles and guidelines (Guide)

The objectives of the risk assessment are specifically to:

- identify the hazards and resultant risks from the project and potential threats from aspects to the project
- rank and prioritise risks through a risk assessment process
- evaluate the risks and identify management measures to mitigate the risks.

Value judgments are involved in determining key assumptions based on existing knowledge of the project and environment as well as determining a level of tolerable risk.

The tolerable risk approach using the 'As Low As Reasonably Practicable' (ALARP) concept in line with AS/NZS ISO 31000:2009 helps identify and rank potential risks according to the ability of the operation to manage the risk. This method identifies risks that are either:

- intolerable
  - risk cannot be justified or managed
- tolerable
  - risk can be managed
  - acceptable
  - risk is minimal and requires little if any intervention or management.

Risk management measures to be implemented aim to reduce significantly the likelihood, and seek to eliminate any potentially extreme or high risks to people and the environment.

Regular reviews of risk assessment will also be conducted during the operational phase of the project to ensure that it remains appropriate and to incorporate any project design changes.

The risk assessment includes the implementation of a variety of management plans including:

- a. Mine Management Plan
- b. Water Management Plan
- c. Ground Disturbance Management Plan
- d. Erosion and Sedimentation Control Plan
- e. Hazardous Substances Management Plan
- f. Weed Management Plan
- g. Emergency Response Management Plan.
- h. Biodiversity Management Plan
- i. Cultural Heritage Risk Management Plan
- j. Social Impact Management Plan
- k. Fire Management Plan
- l. Noise Management Plan
- m. Air quality Management Plan
- n. Biting Insects Management Plan
- o. Conceptual Mine Closure Plan
- p. Conceptual Care and Maintenance Plan
- q. Vehicle Management Plan

The proponent is committed to reporting, audits and incident notification. All employees, contractors and visitors to the site will be inducted to ensure constant and consistent compliance with the company's environmental policies and procedures as well as the implementation of the management plans.

An extensive risk assessment has been completed for the project covering both the social and environmental impact of the project. The assessment has highlighted the risks associated with the project can be categorised as follows:

- change to the socio-economic environment
- change to cultural and heritage values
- fragmentation of threatened fauna habitat and population dynamics
- effect on the quality and quantity of surface water
- effect on the quality and quantity of groundwater
- liability and legacy at closure.

Through the risk assessment ABM has subsequently investigated project design (including location), management processes and mitigation measures to diminish the impact on the environmental values to be protected. This process has shaped the proposed social and environmental management strategies detailed in the EIS.

## **ES 8.0 Surface water and groundwater**

The majority of the project area is located on topographic highs or diverging slope areas, where the potential for converging local surface water flows is minimal. There are no significant streams or springs identified within the vicinity of the project area, and there are no known current users of surface water in the area. As there are no permanent surface water features present within the proposed mining lease the management of surface water quality across the project will involve:

- preventing overtopping of the water storage facilities by constructing and operating with a minimum freeboard sufficient to hold the entire volume of a 1:100-yr, 72-hr rainfall event
- minimising sediment erosion by the use of diversion drains and banks to redirect any “clean” surface water flows around site and water crossing disturbed areas pass through sediment settling ponds
- using erosion-resistant materials and limiting slope gradients of waste rock dumps and tailings dams to angles that have been demonstrated to be stable
- bunding of all fuel and chemical storage areas to contain the potential volume of spillage
- minimising land disturbance within low lying areas to limit erosion.

The water table is typically situated approximately 100m below surface within the project area, therefore dewatering is unlikely to be required. Water required for the operation is to be sourced from two distinct aquifers that occur in the area surrounding the project and can be categorised as:

- hard-rock fractured aquifers
- unconsolidated sedimentary aquifers hosted within tertiary to recent palaeochannels.

Mine water requirements during the staged development include, but are not limited to, ore processing, dust suppression, laundering, camp and a wash-down bay. Stage one and stage two, water requirements are in the order of 4.1 L/s. Water requirements will be in the order of 11.1 L/s for stage three; including loss to tailings, loss at the processing plant, camp use and mining.

The water in the palaeochannels is saline reducing the potential for groundwater sensitive ecosystems. However, monitoring will be conducted to measure the effects of water extraction on vegetation within the vicinity of any production bores installed in palaeochannel aquifers. If monitoring detects potential habitat degradation management actions will be taken to reduce the effect on the aquifer.

## **ES 9.0 Biodiversity**



The project area has been examined in relation to its contribution to local, regional, national and international biodiversity values and overall conservation significance. A particular focus has been placed on identifying threatened species and sensitive habitats.

The Twin Bonanza project falls within the Tanami bioregion. The terrain is mostly flat red sand plains with minor dunes and exposed rock occurring at hills and low lying ranges. The dominant vegetation is hummock grassland with patches of open Eucalyptus forests on a grassy understory. The habitat of the Tanami palaeodrainage system and the relative absence of exotic animals and plants make this area a refuge to a high concentration of threatened species.

The proponent has conducted several fauna surveys to confirm the habitat of native and endemic species. A total of 112 species including 30 reptiles, 58 birds and 24 mammals were identified during surveys.

In particular, threatened and vulnerable species that are known, likely or may occur in the Twin Bonanza project area include:

- greater bilby (*Macrotis lagotis*) listed as vulnerable and known to occur
- brush tailed mulgara (*Dasycercus blythi*) listed as vulnerable and known to occur
- great desert skink (*Liopholis kintorei*) listed as vulnerable and may occur.

All infrastructure and mining operations have been located so as to minimise the effect on the threatened / vulnerable species. Both land clearing procedures and the biodiversity management plan have been designed to protect habitat and species. The presence of feral cats has also been noted and the environmental off-sets program will see the removal of cats to reduce risks presented to Australian native species.

No threatened flora species were identified within the project area. Vegetation surveys identified three weed infestations, all related to buffel grass and previous land clearing practices. A weed management plan is put in place to prevent the spread and eventually eradicate the weeds from the project area.

The key focus for managing threatened species and associated biodiversity has been on minimising habitat disturbance as well as ensuring operational activities are performed in a manner to minimise population disturbance.

## **ES 10.0 Air quality and greenhouse gas emissions**

Emissions from the project are generated primarily from mining activities that result in movement of waste rock and ore, and subsequent ore processing. The main particulate emission of concern is dust, and to a lesser extent, emissions associated with the vehicles, processing plant and power station operations.

The main impacts on air quality in regards to the Twin Bonanza project include:

1. impacts of dust from operations associated with mining
2. vehicle exhaust emissions
3. emissions from power station (gen sets)
4. emissions from processing plant
5. emissions and dust from blasting
6. odours from sewage and landfills.

There are no settlements within 100km of the site and as a result the immediate down-wind effects of dust are considered negligible on local communities.

The proponent has devised and will implement an Air Quality Management Plan to identify, monitor and control potential air quality impacts. This plan includes dust suppression. Given the scale of operations, the mining fleet and power generation will have minimal impact on greenhouse gas emissions.

## **ES 11.0 Waste management**

Waste management principally deals with waste generation from the site village (human waste, food scraps and packaging). Operational waste (waste rock and mine consumables) is dealt with separately.

ABM's waste management strategy reduces the level of risk associated with pollution generation onsite. Aspects of waste management include:

1. Landfill – a landfill site for inert waste material. To prevent the creation of new habitats for feral animals and manage the potential for windblown rubbish, the landfill will be surrounded by a wire mesh fence with entry via a secure gate.
2. Reduction, recycle and reuse – ABM will aim to reduce landfill using best practice package selection, reuse where possible and segregate recyclable materials and transport them, where practicable, to the nearest recycling centres.
3. Contaminated wastes / hazardous materials – All chemicals on site have a material safety data sheet (MSDS) which provides the correct process for use and disposal. Fuel drums and chemical products are stored within bunded and lined areas and containers will be removed from site to a regulated disposal area.
4. Putrescible and solid waste – for materials such as paper and cardboard that cannot be recycled, when weather conditions are suitable the material will be incinerated using a turbo-burner.
5. Sewage treatment and waste water – sewage treatment and waste water is disposed of via septic tanks, leach and evaporation systems in line with public health regulations.
6. Water treatment / reverse osmosis plant – all water for cooking, drinking and showering is treated with a reverse osmosis plant. Saline water rejected from the

plant will be recycled and mixed with water for the processing plant where it will be suitably diluted.

## **ES 12.0 Tailings and waste rock management**

Waste rock storage and tailings dam facilities present the most visual aspects and legacies of mining.

At the Twin Bonanza project, ABM proposes to construct two waste rock dumps to store an estimated total of 10.9 Mt of material that is removed during the extraction of ore. The northern waste dump will receive waste material from the Old Pirate deposits. Once constructed the northern waste rock dump (NWRD) will attain a nominal height of 20 m with a footprint of 41.8 ha. The southern waste rock dump (SWRD) will receive waste from the Old Glory and Golden Hind deposits with a footprint of 18.8 ha and a nominal height of 16.5 m. The two WRDs have been located to the west of the pits based on a number of factors:

- Limited surface water will intersect the dumps as the upstream catchment is reduced due the presence of the pits.
- The WRDs are situated to avoid any Aboriginal heritage sites.
- The WRDs are situated to avoid an area of known bilby activity and preferred habitat.
- The WRDs are in close proximity to the pits.
- The WRDs are positioned outside of the zone of instability.
- The WRDs are positioned in a zone of mineralised soils similar to the chemical signature overlying the proposed pits.

ABM proposes using benign waste rock units such as sandstone, which are stable and chemically benign, for the purposes of constructing the outer batters of the WRD.

Chemical characterisation studies of the waste rock have shown low-levels of acid producing minerals.

Following completion of mining the WRDs will be contoured, covered in top soil and reseeded. This will reduce both the aesthetic impact and the impact on the cultural landscape.

The tailings dams include three parts:

1. The current stage 1 tailings dam will be converted into a water storage dam.
2. A lined concentrate residual dam (CRD) – a small scale dam used for leached concentrates.
3. Tailings Dams for crushed / ground rock from gravity separation only with no reagents used.

Samples of material to be stored in tailings dams have been geochemically analysed and characterised. The bulk tailings material is classified as benign with minimal potential for acid mine drainage.

The main tailings dam will be composed of two adjoining impoundment cells each covering an area of approximately 13.3 hectares. As with other aspects of the project, the design of the tailings dam uses a staged approach. Each cell will consist of a below ground component and an above ground component. The below ground component will be a 5 metre excavated pit that will be able to hold 250 000 tonnes. If the project does not proceed further the pit can be backfilled forming a low contoured mound. The above ground component will consist of 5 metre high geotechnically designed and constructed embankments that can hold an additional 600 000 tonnes. Once the cell is full the top surface can be capped with a soil profile that promotes revegetation.

The concentrate material that has undergone leaching and has been neutralised will report to the CRD which will be lined and geotechnically constructed to a height of 5 metres. At closure this facility will be water shedding with a soil profile to promote revegetation.

## **ES 13.0 Closure and rehabilitation**

The proponent has conducted studies and developed a Conceptual Mine Closure Plan that will form the basis of the operational closure plan to be implemented following the completion of mining at Twin Bonanza. The main objectives of the rehabilitation of the Twin Bonanza project are to:

1. ensure the characterisation, handling and placement of mine wastes is in a manner as to produce safe, stable and non-polluting landforms consistent with surrounding environs and environmental values
2. conduct trials and studies to refine rehabilitation strategies to improve rehabilitation outcomes
3. minimise risk while optimising rehabilitation success
4. ensure that rehabilitation achieves an acceptable standard, compatible with the agreed post mining land use and management practices
5. create the integrity, ecological functions and environmental values of landscapes and landforms.

Rehabilitation strategies will evolve as a better understanding of the environment is gained and rehabilitation techniques develop. This process will be reflected in further updates and refinements of the closure plan during the life of the mine to reduce uncertainty and enhance site rehabilitation strategies. Where practicable, disturbed areas no longer required for operational purposes will be progressively rehabilitated.

## **ES 14.0 Social, economic, cultural and heritage risks**

The proponent has sought to develop a risk assessment of social, economic, cultural and heritage risks throughout the life-cycle of the project. The key stakeholder group is the underlying trustees / Traditional Owners of the project area.

The proponent has had the benefit of an open and honest working relationship with the Traditional Owners via the CLC. A mining agreement has been signed with the Traditional Owners. The mining agreement sets out:

1. rents on mineral leases
2. protection of sacred sites
3. royalty payments on production
4. capital expenditure payments
5. major activities and infrastructure
6. indigenous people employment programs
7. rehabilitation
8. liaison and consultation.

The details of payments are confidential and cannot be disclosed in this document. Training opportunities will be offered to Indigenous Australians and particularly those associated with the Traditional Owner groups of the project area. ABM also proposes voluntary and discretionary contributions to individual programs for support of Indigenous Australians with an emphasis on education and health outcomes as well as sporting or cultural groups.

As well as the surveys and clearances conducted by the CLC / Traditional Owners, ABM has also carried out a cultural heritage survey. Six scatters / stone tool sites were noted and will be protected under the Cultural Heritage Risk Management Plan.

Stage two open-pit mining is modelled to contribute between \$124M and \$165M, depending on gold price, to the gross domestic product (GDP) of Australia. Stage three, is conceptual in nature and not yet proven with mine design and assessment and will be ultimately informed by the results of stage two. However, assuming a 70% resource to reserve conversion, stage three is modelled to contribute between \$387M and \$517M to the GDP of Australia. Further contributions include the Northern Territory mineral royalties, employee income tax contributions, company tax contributions, government rents and rates.

The estimated work-force of the project for project is 68 as well as indirect employment opportunities via supply companies. The proponent will supply and procure services for the project from regional centres as well as nationally and thus contribute to indirect employment.

ABM has devised a Social Impact Management Plan to monitor adverse risks and to enhance benefits for the communities of the region, regional centres, and Australia as a whole.

## ES 15.0 Environmental offsets

Environmental offsets is the process by which proponent will attempt to enhance the physical environment as an offset against overall disturbance.

Key environmental concerns raised by the Northern Territory Environmental Protection Authority (NTEPA) and then Department of Sustainability, Environment, Water, Population and Communities through the assessment of the Notice of Intent (NOI) included:

1. the potential for the action to impact sites with Indigenous and non-Indigenous cultural or archaeological significance
2. the clearing and loss of potential habitat, and individuals of a number of species listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and the *Territory Parks and Wildlife Conservation Act 2000* (NT)
3. an increased risk of environmental damage or degradation to the site. In the absence of suitable mitigation or management measures, ongoing degradation could result in significant impacts to the environment, in particular flora and fauna and remnant vegetation
4. potential ongoing impacts to groundwater resources through the establishment and abstraction of water from at least two bores and a bore field
5. uncertainty around the scope of the project in relation to the scale, size and complexity of all components
6. the potential for ongoing land degradation and impacts associated with the management and disposal of wastewater and other contaminants
7. based on the information provided and in the absence of further assessment or analysis, the introduction and operation of a new development with associated infrastructure is likely to significantly alter the current social and economic aspects of the region.

Environmental offsets provide a mechanism for development to proceed while ensuring that the environmental values that the policies are designed to protect, are conserved in the longer term. Offset policies are usually applied to development where all efforts to retain the existing environmental values have been demonstrated by the proponent.

This offset strategy considers the estimated unavoidable impacts of the proposed project and includes the proposed approach to manage direct offsets. The intention of this strategy is to provide government and community with sufficient confidence that the proposed offset methodology will deliver suitable offsets to adequately compensate for unavoidable impacts associated with the project.

ABM will endeavour to offset, where reasonably practicable, these impacts in the form of the following initiatives:

1. Bilby research with the involvement of recognised researchers in consultation with the CLC which aims to:
  - a. increase the knowledge of the bilby populations in the Tanami Desert and add to the peer reviewed conservation literature on bilbies
  - b. simultaneously study the effect of mining on the bilbies and establish the relationship between mining and desensitisation of the populations.
2. Feral animal control aimed at preventing the expansion of predator numbers (including cat) and to reduce feral animal predation of native fauna, including bilby and brush tailed mulgara.
3. Prevent the potential spread of declared weeds and the further spread of buffel grass (*Cenchrus ciliaris*) across the site.
4. Provide funding and support to regional biodiversity monitoring in the Tanami Desert in a collaboration between mining companies, the CLC, Warlpiri and Wulain traditional rangers. The program intersects both the Northern and Southern Tanami Indigenous Protected Areas (IPA).
5. Social and economic contributions to the Indigenous and non-Indigenous communities.
6. Reduce fuel consumption and greenhouse gas emissions by using solar power generation (research project).

## **ES 16.0 Additional environmental impacts**

### **16.1 Fire management**

The six main objectives of the Fire Management Plan are to:

1. ensure a comprehensive fire risk management process is applied across all work areas to ensure a high level of safety for persons, property and environment
2. reduce the occurrence, and minimise the impact, of bush fires on the Twin Bonanza area, thereby reducing the threat to life, property and the environment

3. document fire prevention requirements of the Twin Bonanza mine site
4. ensure that fire safety problems that arise are quickly and effectively contained and resolved
5. ensure that ABM complies fully with its legal obligations in relation to fire safety
6. ensure that appropriate training and information is provided on fire safety and fire control to all staff on site.

## **16.2 Noise management**

The site is located in a remote area and noise and vibration will not have an impact on any communities in the district. However, with the intention of minimising impacts on native fauna staff a Noise Management Plan has been devised.

## **16.3 Biting insect management**

ABM has devised a Biting Insect Management Plan (BIMP). The purpose of the BIMP is to ensure that biting insect control practices are implemented on site to minimise the risk of creating biting insect breeding sites, namely mosquitos, associated with mining activities. The objectives of the plan are to:

1. prevent the occurrence of potential mosquito breeding sites and the presence of adult mosquitos
2. minimise mosquito breeding sites created by construction activities.

The BIMP applies existing industry management practices and policies regarding biting insect management and expands to include all biting insect management during construction, operation and closure of the proposed mine at Twin Bonanza. The BIMP will be subject to ongoing review and change to ensure that it remains relevant and effective throughout the life of the operation.

## **ES 17.0 Summary**

ABM has developed this EIS taking into account relevant acts, regulations, leading practice guidance, and industry standards. The company aims to reduce uncertainty and impact of the Twin Bonanza project as well as adopt robust operational practices. In addition to being guided by these documents during preparation of the EIS, ABM has consulted with the CLC, government agencies (including NTEPA and DME) and various consulting groups. The company has documented the impacts of developing mining operations at the Twin Bonanza project and has developed a comprehensive set of management plans and measures to minimise the impacts on the key environmental and social values.