Argyle Diamond Mine - Underground Project
110 km south of Kununurra, East Kimberley

Argyle Diamond Mines Pty Limited

Report and Recommendations
of the Environmental Protection Authority

Environmental Protection Authority
Perth, Western Australia
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Environmental Impact Assessment Process Timelines

Date	Progress stages	Time (weeks)
03/06/2004	**Referral received**	
28/06/2004	**Intention to set EPS Level of Assessment advertised (no appeals)**	**3**
-	**EPA accepts scoping document (if one provided)**	**-**
	Proponent's Final EPS document received by EPA	**28/10/05**
	EPA report to the Minister for the Environment; Science	**14/11/05**

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1. Introduction

This report provides the advice and recommendations of the Environmental Protection Authority (EPA) to the Minister for the Environment on the environmental factors relevant to a proposal by Argyle Diamond Mines Pty Limited (Argyle) to develop an underground mine and associated infrastructure, which will be located at their current open cut diamond mine site.

The EPA was advised of the underground proposal in June 2004. Based on the information provided, the EPA considered that while the proposal had the potential to have an effect on the environment, the proposal could be readily managed to meet the EPA's environmental objectives. Consequently it was notified in *The West Australian* newspaper on 28 June 2004 that, subject to preparation of a suitable Environmental Protection Statement (EPS) document, the EPA intended to set the level of assessment at EPS.

The proponent has prepared the EPS that accompanies this report (Argyle, 2005). The EPA considers that the proposal described can be managed in an acceptable manner subject to the commitments to the proposal being legally binding.

The EPA therefore has determined under Section 40 (1) that the level of assessment for the proposal is EPS, and this report provides the EPA advice and recommendations in accordance with Section 44 (1).

2. The proposal

Argyle proposes to further extend the life of the current open pit mine by developing an underground mine and associated infrastructure at the same site. The proposal is described in detail in Section 2 of the proponent's "*Argyle Diamond Mines – Underground Project, Environmental Protection Statement,*" EPS document (Argyle, 2005).

The Argyle Diamond Mine is located approximately 110 kilometres (km) south of Kununurra in the East Kimberley region of Western Australia (Figure 1). Mining commenced in the main Argyle ore body (referred to as AK1) in 1985. Open pit mining is currently scheduled to cease in 2008 with the processing of ore to be completed by the end of 2009. An additional resource in the northern section of the open pit, referred to as the Northern Bowl, is currently being investigated and if mined may extend the open pit processing operation until 2012.

In order to extend the life of mine to around 2024, a feasibility study was undertaken to assess the development of an underground mine and associated infrastructure at the site. The underground proposal will be next to and under the existing open cut mine accessing the AK1 ore body (Figure 3). The Exploratory Decline was subject of a proposal under the *Diamond (Argyle Diamond Mines Joint Venture) Agreement Act 19981-1983* which was submitted to the Minister for State Development in June 2003 and approved in August 2003. The development of the underground Exploratory Decline commenced in December 2003.

The lamproite pipe that contains the diamondiferous ore is approximately 1.5km long and ranges between 150-500m wide, and extends to approximately 600m below the planned final base of the AK1 pit (Figures 2 and 3). It is proposed that the ore body will be mined in two stages using both block cave mining and sub level cave mining from 2008. Stage 1 involves mining the Upper Block and Southern Tail Block. The proposed completion date for Stage 1

is 2017. Stage 2 involves mining the Lower Block and it is proposed to commence in approximately 2017 and be completed by 2024. The underground proposal will also include the construction of a new Tailings Storage Facility (TSF2) and a new Reclaim Pond (RCP3).

The proposal is described in detail in Section 4 of the proponent's EPS. The key components of the proposal are detailed in Table 1 below.

Table 1: Key Proposal Characteristics of the Argyle Underground Mine Proposal

Element	**Underground Project**
Life of Mine	Around 20 years
Mining depth	Maximum of 675m
Mining Methods	Stage 1 Upper Level Block Cave mining Stage 2 Sub Level Cave mining
Major Project Components Underground Declines Underground Mining Levels Underground and surface conveyors Box cut portal Surge bin Secondary crusher Extension to some existing surface infrastructure Temporary ore and waste stockpiles Laydown areas Refrigeration plant Bulk Air Cooler and fans Exhaust shafts Services corridor Dewatering system New Tailings Storage Facility New Reclaim Pond	Refer to Figures in the EPS especially 3-6, 4-1 and 4-2
Total Ore Production	Stage 1 - 60 Mt Stage 2 – 37 Mt
Ore Processing	Through existing Processing Plant at around 8 Mtpa for Stage 1 and 4.5 Mtpa for Stage 2
Key materials Ground support construction materials Fibrecrete Explosives Electric cables, pipes and ventilation ducting Diesel fuel Concrete Steel	 4, 700 t 330,000 t 15,000 t 6,000 t 26 ML 24,000 m^3 5,000 t
Total Waste Rock Over Project Life	4.3 Mt
Dewatering Requirements	19 – 83 ML/day
Crater Area	Mostly within the existing open pit and waste rock dump area
Tailings	100 Mt
TSF2 Area of Disturbance	126 ha

RCP3 Area of Disturbance	133 ha
Underground mine water requirements	700 kL/day
Processing water requirements	12, 000 - 22,000 kL/day
Water Supply	From dewatering operations, Gap Dam, Upper Limestone Creek Waste Rock Dump Seepage Retention Dam, Reclaim Ponds, and if necessary, Lake Argyle.
Power Requirements	Additional 4 - 12 MW
Power Supply	Ord Hydroelectric Scheme, with the deficit to be provided for an initial 2-3 years by the on site diesel power station until alternative power supply established
Heavy Vehicle Movements	Offsite – reduce from 12 per day to 1-2 per day On site – Reduce from 670 hours/day to 36 hours/day
Construction Workforce	Maximum of around 500
Total Workforce	Around 450

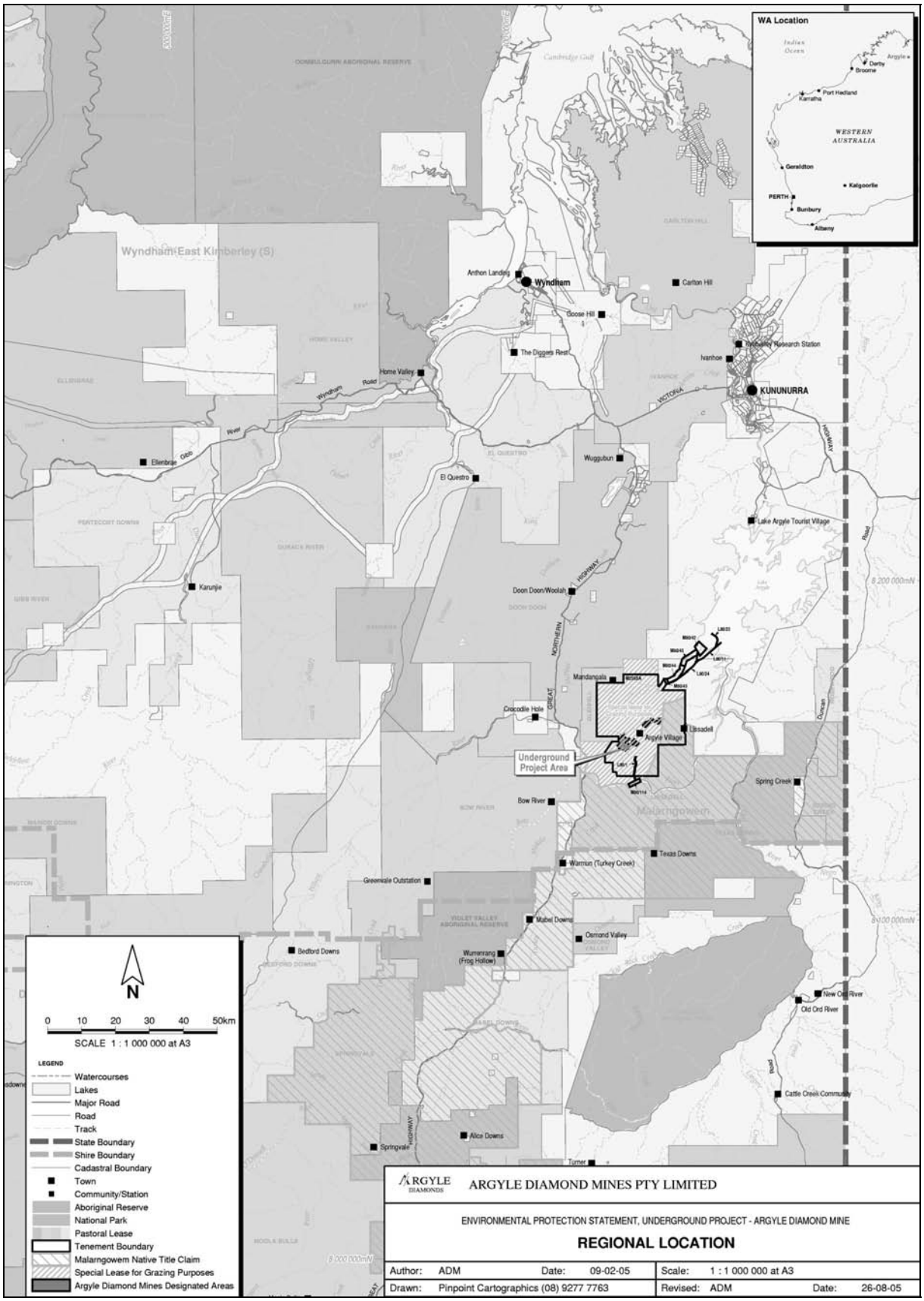

Figure 1: Regional Location of Argyle Diamond Mine Operations (Argyle, 2005)

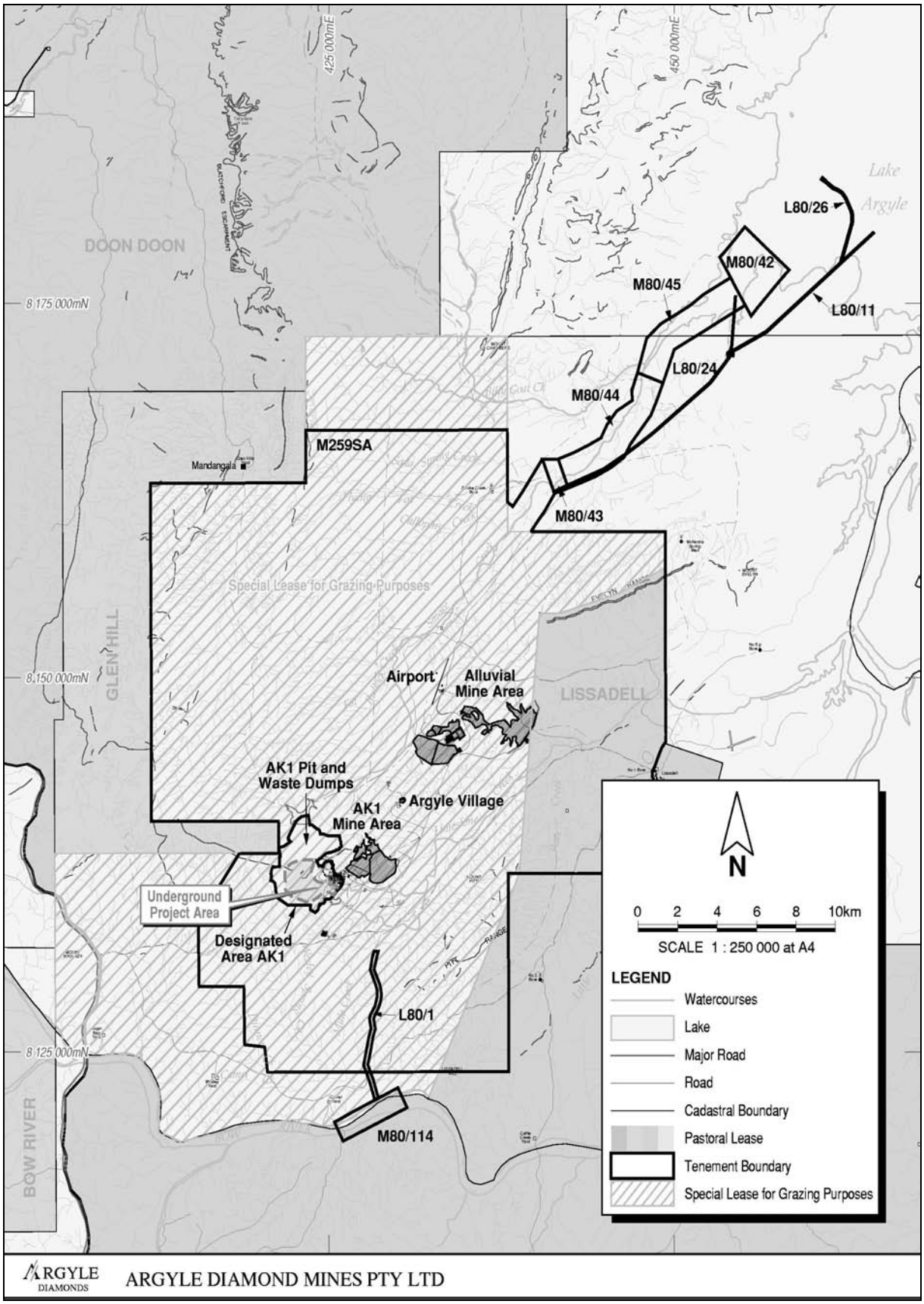

Figure 2: Argyle Diamond Mine Lease Areas and Surrounding Stations (Argyle, 2005)

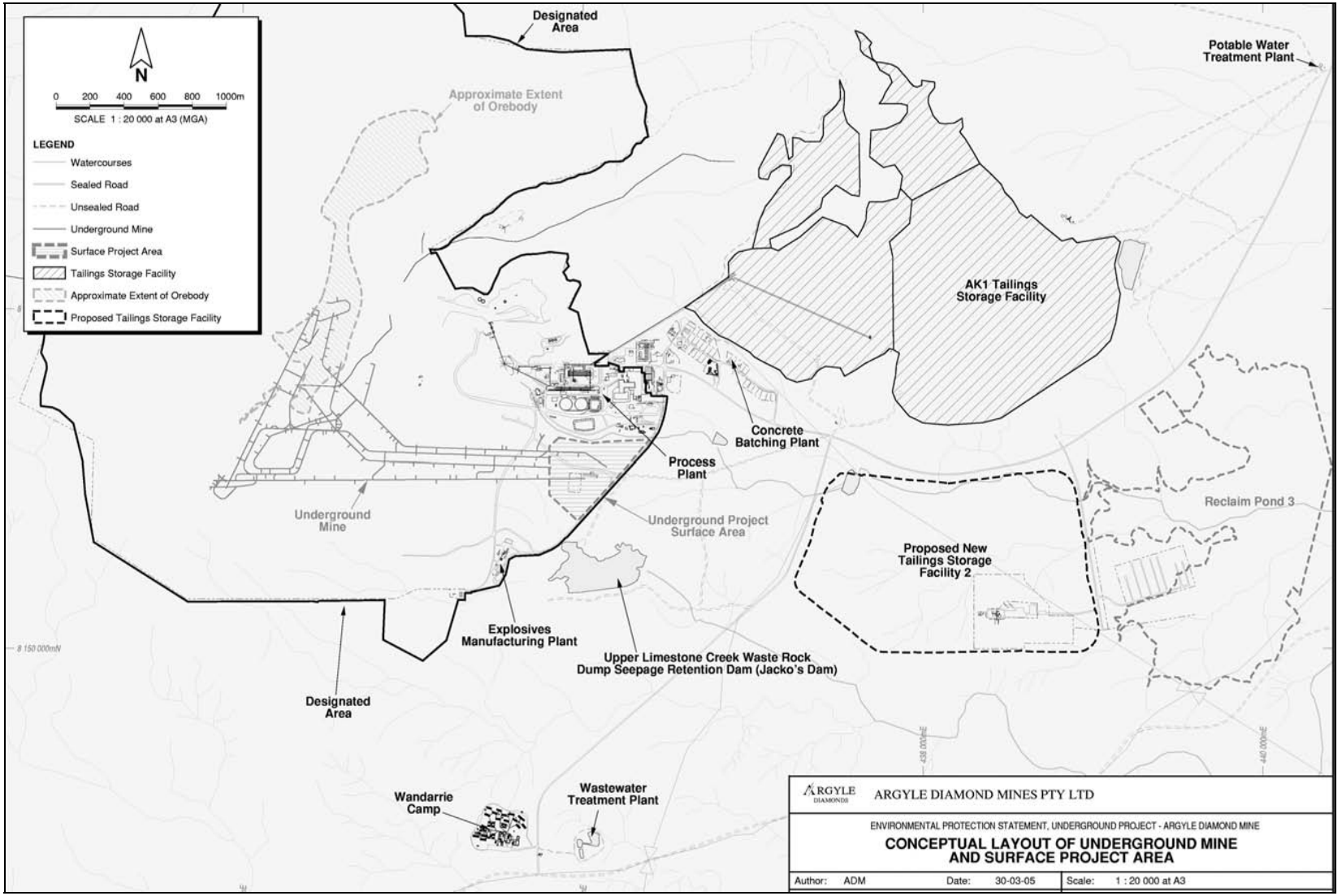

Figure 3: Location of the Proposed Works for the Underground Mine (Argyle, 2005)

3. Consultation

During the preparation of the EPS, the proponent has undertaken consultation with key stakeholders including government agencies, the Traditional Owners, the Kimberley Land Council, Environs Kimberley and local communities. In addition to the Traditional Owner groups that were involved in Indigenous Land Use Agreements (ILUA), the proponent also consulted with an additional 30 Aboriginal communities and 24 community organisations in the East Kimberley.

Argyle has applied the stakeholder input obtained from the 2002-2003 consultation programme activities to identify issues and to assist in the scoping of the studies to be undertaken for the exploratory decline, the underground project and during the preparation of the EPS.

Argyle has been working with the Kimberley Land Council (KLC) and Traditional Owners since 2001 to establish an ILUA. This ILUA was signed in September 20004 and was registered with the National Native Title tribunal in April 2005. In the ILUA the Traditional Owners provided their consent for past, present and future mining operations including the proposed underground mine (Argyle, 2005). The traditional owners also agreed that the current mining area is acceptable in relation to Aboriginal heritage. Further information on Aboriginal sites is addressed in Section 3.17 of the EPS (Argyle, 2005).

In addition to the ILUA, a management plan agreement has been established to address the day-to-day relationship between Argyle and Traditional Owners. This additional agreement contains management plans that address issues including Aboriginal site protection, land access and land management.

Argyle will continue to liaise with the key stakeholders and government agencies during the operational and closure stages of the proposal and has provided a summary of consultation in Appendix E of the EPS document. The main issues raised by stakeholders during meetings held with the proponent during preparation of the EPS were:

- Indigenous Land Use Agreements (ILUA) and heritage protection;
- dewatering and impact on springs, flora and fauna, acid rock drainage and tailings management; and
- rehabilitation, closure and decommissioning.

The EPA considers that hydrological impacts, biodiversity, and mine rehabilitation and closure to be the most important issues and these are addressed in Section 4.

4 Relevant environmental factors

The summary of all of the environmental factors and their management is outlined in Table ES2 of the EPS, pages xx-xxvii, (Argyle, 2005). It is the EPA's opinion that the following are the environmental factors relevant to the proposal which require assessment in this report:

a) Impacts to Hydrology;

b) Biodiversity –Terrestrial flora and fauna, subterranean fauna; and

c) Decommissioning, Closure and Rehabilitation

The EPA considers that the remaining factors can be adequately managed through the proponent's environmental management plans (EMPs), which have been presented with the EPS document, Appendix G. The proponent has made a commitment to implement the EMPs.

4-1 Impacts to Hydrology

Description
The project area is within the Ord River catchment, upstream of Lake Argyle and is drained by four creeks (Flying Fox, Smoke, Limestone and Wesley Spring Creek). The depth to groundwater beneath the plains is generally within 15 m of the ground surface. There are also a number of springs in the area, the closest being Devil Devil Spring and Tjamindum/Nanbum (Wesley Spring). It is thought the dewatering may have the greatest potential impact on these two springs.

Dewatering will occur as part of this underground project. Dewatering, as well as the construction and operation of the underground mine, will cause changes to the local hydrological conditions. Potential impacts could include:

- change in local and regional aquifer pressures;
- leakage of groundwater from the shallow alluvial zone;
- change of runoff in surface drainages;
- loss of yield at the Springs;
- change in groundwater quality; and
- those relating to post mining recovery of groundwater levels.

Dewatering for the underground mine was computer modeled to determine impacts on local and regional groundwater systems. Groundwater level declines were identified as having the potential to impact on spring hydrology and biodiversity. Drawdown caused by dewatering is predicted to expand outward along the east and west ridges for distances of around 4km and 7km respectively (Argyle, 2005). The total predicted drawdown at the proposed completion date in 2024 is shown in figure 6.1 of the EPS. Hydrological studies indicate that groundwater will need to be removed from the underground mine at an average rate of 4ML/day at the completion of open cut mining to around 10ML/day towards the completion of the underground mine in 2024.

Groundwater modeling has indicated that although groundwater pressures will be affected in the area, no significant changes to surface runoff in local drainages, shallow aquifer hydrology, and groundwater quality will result. In the event that any adverse impacts are detected near the springs, the proponent has developed plans to manage the impacts.

Dewatering for the open pit mine has already dewatered the rock strata near Devil Devil Spring and therefore the spring no longer flows during the dry season. Wesley Spring is located to the southwest of the mine and to date has not been affected by dewatering operations for the open pit. Wesley Spring is located approximately 1km from the predicted area of drawdown and it may have a number of source areas. It is possible that these source areas will be impacted from dewatering, therefore indirectly impacting on Wesley Springs. Given seepage to Wesley Spring Creek is likely to be sourced through elevated groundwater storage that is depleted during the dry season, this spring may naturally cease to flow during extreme dry spells.

Leakage of groundwater may affect the recharge process within the predicted depressurisation zone (see figure 3-7 of EPS) extending beneath the south of the southern water rock dump (Argyle, 2005). The rate of leakage is estimated at 3.3% of the average annual rainfall. However, since the rate of leakage is low, and the potential impact location is near the mine pit and southward of the southern waste rock dumps (WRDs), predicted impacts on vegetation are low and are discussed further in section 4.2.

As part of total site operations Argyle currently monitors groundwater for both water quality and level in order to identify any potential impacts from mining operations. Argyle will expand the monitoring program with the proposed underground operations. Argyle (2005) has predicted that, following the completion of mining operations, groundwater levels will recover, due to the contribution from groundwater seepage and annual runoff during the wet season over a period of 150 years.

Acid Rock Drainage (ARD) has also been identified as a potential issue for the project. An ARD Management Plan has been prepared that allows for characterisation, selective placement, and minimisation of rainfall infiltration into potentially ARD forming materials. Collection of seepage from waste rock dumps and monitoring of dewatering discharge, groundwater and surface water will also occur to identify if ARD products are entering the environment.

Acid rock drainage (ARD) will cause an impact when runoff and seepage containing sulphides and magnesium sulphate ($MgSO_4$) enters the environment resulting in adverse impacts. On the Argyle lease area deposits of $MgSO_4$ have been recognised as a symptom of ARD from WRDs (Argyle, 2005), although nothing has been directly identified in the underground proposal area. Studies are also to be carried out to determine the ecological impacts of ARD products such as $MgSO_4$ in the environment.

To be able to control the ARD material in the WRDs, Argyle will control the flow of oxygen and water flow through the material. Argyle is investigating control methods to do this. Potential acid forming materials will be placed in 'cells' within the WRDs, in areas that are not susceptible to erosion. The cells would be effectively sealed from air and water by the use of low permeable covers and barriers or inert waste rock material (Argyle, 2005). The other method will be to control surface water flow over the WRDs by designing them for water shedding or by constructing 'a store and release cover system' which will lower the rainfall infiltration into any potentially acid forming materials. The controls will minimise the formation and movement of primary and secondary ARD products with the seepage from the site (Argyle, 2005).

Assessment

The area considered for assessment is the lease area where the underground project infrastructure will be constructed and surrounding areas that may become affected by dewatering. The EPA's environmental objectives for this factor are:

- to ensure that lowering of groundwater due to dewatering operations does not cause adverse impacts on local hydrology and the environment; and
- to ensure that ARD does not cause adverse impacts on the environment.

The EPA notes that dewatering activities in the AK1 open pit have already lowered local groundwater levels around the pit and surrounds and will continue to do so until the end of mine life. Development of the underground mine will further expand the dewatered zone around the mine until Stage 2 mining is completed. Cessation of dewatering at the end of

mining will result in groundwater levels recovering over many decades to form a partially water-filled crater-lake.

To date, Wesley Spring has not been affected by dewatering operations for the open pit and hydrogeological modelling has indicated that impacts on the spring due to dewatering for the proposed underground operations are unlikely. However, on advice from the Department of Environment (DoE) the proponent developed a Wesley Springs Management Plan (WSMP) (Appendix G - B17, Argyle, 2005) as a contingency measure in case dewatering activities do affect the spring.

The EPA notes that the WSMP outlines monitoring and reporting protocols that will be followed in the event of changes to the typical groundwater and surface water conditions. Argyle has committed to minimising adverse impacts to Wesley Spring in all its forms. In addition to existing hydrological data for the spring, a variety of methods will be used to collect further baseline conditions within 3 months of the start of underground development.

The proponent has consulted with the DoE in order to explore potential management options should impacts on Wesley Spring occur in the future. The intent of this early consultation was to reduce time lag associated with development of triggers and management actions at a later stage.

Potential management actions in the event of adverse impacts on Wesley Spring include:

- determining baseline flow rates, pond dimensions, groundwater elevations and creek vegetation;
- monitoring of the above parameters;
- identifying and evaluating any changes, including the cause of the change, to the above parameters;
- consulting with Traditional Owners on proposed management measures; and
- implementation of agreed management actions.

The management measures that may be implemented should impacts be identified will include:

- replenishment of the surface water using either redirected surface water runoff or groundwater;
- replenishment of the groundwater aquifer zones.

Any replenishment that may be considered and the various sources or replenishment water will firstly be discussed with the Traditional Owners and then the regulatory authorities prior to any actions being implemented (Argyle, 2005). Artificial Recharge is not an option due to the beliefs of the Traditional Owners.

The EPA notes that Argyle has produced the WSMP. However, advice from the DoE to the EPA raised concerns regarding the WSMP, which commits to consultation, but to date has no prescriptive actions. The EPA recommends that Argyle set up a ‘site team’ to develop a Wesley Spring response strategy. On advice from DoE the ‘site team’ should include Argyle environmental personnel, a groundwater specialist, and staff from the Water and Rivers Commission in an overview capacity (draft recommended condition 8). The response strategy would develop probabilities of environmental impacts on the spring, mathematically model the impacts and then devise sound response actions. Once this strategy is in place, then the company would have a modelled response prepared in advance of any impact triggers, and

could immediately engage in discussions with traditional owners on the management actions available.

Traditional Owners and Argyle have also prepared and agreed upon a Management Plan for Devil Devil Spring. Presently, groundwater levels for Devil Devil Spring are approximately 120mAHD, well below the surface elevation of the spring, and are expected to drawdown a further 70m to approximately 50mAHD by the end of mine life in 2024. No further impacts on Devil Devil Spring are anticipated to occur as a result of this proposal as there is no hydraulic connection between the spring and the dewatered groundwater system.

Baseline groundwater elevations, groundwater and surface water quality information, and spring vegetation health will be determined prior to the start of underground mine development. The EPA considers that these measures will provide adequate baseline data in order to assess any future impacts. Groundwater and surface water conditions will continue to be monitored following the characterisation of baseline conditions. The hydrological model will be recalibrated if predicted and actual groundwater responses differ. This will assist Argyle to better identify other areas at potential risk.

There are 112 bores that are monitored and 80 of these are distributed throughout the lease area, see figure 3.6 of the EPS. The bores are automatically monitored. The results received are analysed quarterly to detect any variation in groundwater pressures. Should dewatering at the mine impact on deep groundwater beneath Wesley Spring, or leakage of shallow aquifer stores to the deeper aquifer occurs, piezometers will register the change and management mitigation measures will follow.

Groundwater quality in the lease area is not expected to alter in response to dewatering activities. This is due to the active recharge-discharge flow regime of the groundwater systems in the lease area and its surrounds. Changes to local groundwater flow rates due to dewatering are not likely to result in significantly increased dissolution of regolith minerals, and therefore groundwater chemistry. The EPA notes that this monitoring has assisted in the production of the Groundwater Management Plan and will continue to assist Argyle in identifying potential impacts. The implementation of this plan is ensured through draft recommended condition 6.

The EPA notes that to date there have been no major impacts at the site resulting from ARD. From advice received from the Department of Industry and Resources (DoIR) the EPA recognises that the issue of ARD is adequately managed. Testing completed by Argyle on the underground waste rock shows there have been no potentially acid forming materials identified to date. The EPA also notes that Argyle has made the commitment to continually test for potentially acid forming materials from underground waste as the project progresses. Argyle has stated that modified monitoring will continue after decommissioning.

Although studies have shown that any potential impacts from ARD will be minimal in proposal area Argyle has made commitments to manage any potential impacts. The EPA notes that Argyle have produced an ARD Management Plan that included a review and assessment of ARD at the site and describes various aspects of the management strategy and operations requirements.

Summary

Having particular regard to the:

a) the completed modelling on the potential areas of groundwater drawdown;

b) the testing of waste rock for potential acid forming materials;
c) the development of the Groundwater Management Plan for the underground project;
d) the development of the Wesley Spring Management Plan
e) the development of the Acid Rock Drainage Management Plan; and
f) recommended Ministerial Conditions and proponent commitments,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor.

4-2 Biodiversity –Terrestrial flora and fauna and subterranean fauna

Description

There will be loss of flora and fauna through the construction of TSF2 and RCP3. Whilst clearing may alter the extent of some vegetation communities, there are no plant species or communities of conservation significance that occur solely in the areas designated for clearing (Argyle, 2005).

Development of the TSF2 and RCP3 will result in the loss of both rehabilitated and undisturbed native vegetation that supports native fauna. The area of disturbance caused by the proposed construction of TSF2 and RCP3 will be 126ha and 133ha respectively.

Terrestrial flora and fauna

The mine is located in the Northern Botanical Province, within the Hall Botanical District (often referred to as the East Kimberley). Vegetation and flora surveys of the lease area were conducted for the original Argyle Impact Assessment in 1982. Additional surveys have been completed in 1998, 2002 and 2003. These surveys included undisturbed sites, remnant vegetation in mining areas, alluvial mining rehabilitated areas and modified landscapes. The survey defined and mapped 13 plant communities within the Limestone Creek alluvial mining areas (proposed locations for TSF2 and RCP3). These consist of:

- 3 communities of Hummock Grasslands;
- 9 communities of Woodlands; and
- 1 community of Sedgeland.

A survey was also conducted in 2004 (Mattiske Consulting, 2004) of the proposed sites for the new TSF2 and RCP3. This survey is detailed in Appendix B of the EPS. A total of 206 vascular plant taxa from 124 genera and 51 families were recorded in the area surveyed for the TSF2 and RCP3. No Declared Rare Species were located within the survey area. Previous surveys had identified a Priority One species, *Goodenia lunata*. However it has since been determined that the plant was mis-identified and that its correct identity is *Goodenia coronopifolia*, which is not of particular conservation significance.

The proposal (underground mine and associated facilities) is mostly located on land that has been previously disturbed by mining activities, some of which has been rehabilitated. Fauna surveys have been conducted for the lease area in 1980/1981, 2000 and 2002. In 2003 a fauna assessment was undertaken during the site selection phase for the new TSF2 and RCP3 (Biostat, 2003). A further review was conducted by Bamford (2005).

There are 2 mammal species that were identified as potentially being impacted on. Lakeland's Down Mouse and the Water Rat are listed as Priority 4 (species needing monitoring) under the Western Australian Department of Conservation and Land Management List. The Lakeland's Downs Mouse (*Leggadina lakedownensis*) was recorded near the proposed TSF2 area and appears to be associated with the hummock grasslands on the alluvial soils and the

Water Rat (*Hydromys chrysogaster*) is also likely to occur in the Limestone Creek area (Bamford, 2005).

The reptile fauna of the Argyle area is quite rich with only a subset of the total reptile fauna would be expected to occur in the proposed TSF2 area. The only reptile species of conservation status known to be present is the Freshwater Crocodile (*Crocodylus johnstoni*), which occurs in water bodies in the area but it is unlikely that this species will be affected due to this proposal.

Most of the avian fauna recorded at the site are water birds therefore there will be minimal impact caused by the proposal as there is little suitable habitat at the site of the proposed TSF2, (Argyle, 2005). The other avian fauna recorded includes the Priority 4 Star Finch (*Neochmia ruficauda*) and to some extent the Priority 4 Pictorella Mannikin (*Heteromunia pectoralis*) may be found in the bulrush areas of Limestone Creek and could therefore be affected by loss of habitat.

Argyle (2005) states that the area of the proposed new TSF2 and RCP3 does support fauna habitats and presumably fauna typical of the Argyle Lease area. Any impact on fauna is likely to be localised and will be a small proportion of the total population of species in the area.

Subterranean fauna
Subterranean fauna includes stygofauna, which are aquatic species that inhabit the interstitial spaces within groundwater systems and troglofauna, which occur in open caves or voids.

Stygofauna sampling by the Western Australian Museum began in 2002 and continued in 2003 to better define the distribution of species in a regional context. The two years sampling encompassed 105 sites in the northeast Kimberley between Weaber Range and Texas Downs with Stygofauna found at 18 sites. These surveys have indicated the presence of unexpectedly diverse interstitial species of stygofauna occurring in the vicinity of the mine, including the areas heavily impacted by mining operations (WA Museum, 2003a).

At least 15 stygal species are known from the Argyle lease area, and many of these taxa are known only from that area. This represents a significant fauna habitat as locations with 20 or more species are considered to be hotspots of subterranean diversity (Culver and Sket, 1999). Additional sampling of stygofauna at the same location typically yields additional species. However, in the actual underground proposal area only 1 species *Kimberleybathynella* n.gen *argyle* n.sp was found in the area of predicted groundwater drawdown in bore PB1 and this species was also identified elsewhere in bore 37S, which is located in a separate drainage channel outside the dewatering area.

New data gathered in the end of 2004 confirmed the presence of *Psuedoscorpionida hyidae,* a troglobitic species. However, the location of the find lies outside the immediate effects of mining activity and suggests that the species may be widespread (WA Museum, 2005).

Assessment
The area considered for assessment is the land where project infrastructure will be constructed, drainage systems, and areas surrounding lease that may become affected by potential clearing and groundwater drawdown impacts.

The EPA's environmental objectives for this factor are:

- Maintain the abundance, species diversity, geographic distribution and productivity of terrestrial flora and fauna and subterranean fauna;
- to ensure that no species will be come extinct or have an increased risk of extinction as a result of the proposal; and
- Improve the understanding of subterranean fauna through appropriate research, including sampling, identification and documentation.

Terrestrial flora and fauna

The EPA notes that the proponent has determined that there are no plant species or communities in the proposed area of disturbance that is restricted to these areas or at risk. It also notes that no declared rare or priority flora has been identified in the lease area and that Argyle will continue to search for priority species known to the larger region, near operations, throughout the project.

In order to manage any potential impacts on flora and vegetation, the proponent has prepared a Flora and Vegetation Management Plan (Argyle, 2005). The main management actions resulting from this plan include:

- vegetation and flora surveys;
- rehabilitation;
- minimising area of disturbance;
- vegetation monitoring;
- remediation actions, where required; and
- a vegetation monitoring program to allow changes in groundwater flow to be assessed.

The EPA notes that as well as the preparation and implementation of the Flora and Vegetation Management Plan, studies have been initiated by Argyle on the water requirements of vegetation at the site. These studies were based on water stress, physiology and long-term impacts of regional drawdown on the vegetation. This assisted the proponent to understand the potential impacts of dewatering and identified all species and communities that could be impacted from mining operations. These findings will assist to focus the vegetation monitoring already in process and in future planned expansions.

The EPA notes that Argyle already monitors vegetation in a range of valley systems, flats and gullies (Argyle 2005) and has proposed to include more sites downstream of the proposed location of the new TSF. As previously discussed in section 4.1 vegetation monitoring has also been occurring at Wesley Spring to establish baseline data. This will assist in the determination of potential, although unlikely, impacts on vegetation that depend on the spring for its water supply. The EPA notes that the monitoring of the vegetation at Wesley Spring will continue on a triennial basis and with the frequency increasing if changes are observed.

The EPA notes that, as well as vegetation and flora monitoring, fauna monitoring sites will be established during operations and the return of fauna to rehabilitated areas will be encouraged. Argyle will monitor all clearing done by contractors and will maintain appropriate records of any impacted species, vegetation association, flora community and habitat areas of conservation significance.

The EPA also notes that, prior to choosing the potential site options for TSF2 and RCP3, fauna assessments were carried out. An assessment (Bamford, 2005) was also undertaken on the potential impacts once the site was chosen. The results of this showed that there will be

little impact on the fauna of the area and the proponent states that any impact on fauna is likely to be localised and will be a small portion of species in the area.

A Fauna Management Plan has been developed to address these potential impacts and includes measures to minimise the area of habitat loss, rehabilitate disturbed areas as soon as practicable, and design storage infrastructure to provide habitat for water birds and aquatic fauna. The main management measures that will be introduced include:

- minimising the area of habitat loss;
- concentrating habitat loss to previously disturbed areas;
- minimising the hydrological impacts on the creeks to avoid downstream impacts;
- rehabilitation; and
- designing TSF2 to provide habitat for water birds and aquatic fauna.

The Department of Agriculture (DoA) raised the issue of weed control with the introduction of new equipment for the underground mine. The EPA notes that in response, Argyle has undertaken various management trials that in conjunction with DoA, has resulted in the preparation of a Weed Management Plan (Appendix G – B7, Argyle, 2005) and the draft recommended condition 10.

Subterranean fauna

The EPA notes that Argyle conducted sampling for Stygofauna in 105 bores. It was found that bore 13 had the richest Stygofauna in the region (Argyle, 2005). This indicates that Stygofauna communities are still present in close proximity to the processing plant despite the extensive mining and processing operations.

Argyle also conducted a review of the mining practices and an assessment of groundwater contamination. This review indicated that, in general, there have been low levels of impact on Stygofauna and improved environmental management measures at the site should reduce any potential impacts (Argyle, 2005). Monitoring work will also continue in the colluvial and alluvial deposits that are in restricted areas.

Argyle's stygofauna studies have been used to develop a Subterranean Fauna Management Plan (Appendix G – B9, Argyle 2005). The main actions resulting from this plan include:

- detail subterranean fauna surveys to be conducted in areas that would be affected by water bore operations to establish the conservation significance of any species in the affected areas;
- describe subterranean fauna surveys that would be conducted in areas with similar
- habitats outside of the borefield operations to help to establish the conservation significance of fauna within the areas to be affected; and
- offer specific measures to record and preserve biological information on any species collected in the project area.

The EPA has endorsed this initiative and formalised it with draft recommended condition 12.

Although one species of troglobites was found during the survey process the EPA notes that the location was outside the predicted areas of mining impacts. The EPA also notes that any potential impacts from groundwater drawdown are unlikely as troglobitic fauna are not directly dependent on groundwater.

The EPA notes that although *Kimberleybathynella* n.gen *argyle* n.sp was found in the area of predicted groundwater drawdown in bore PB1, this species was also identified elsewhere in

bore 37S which is located in a separate drainage channel outside the dewatering area. The WA Museum (2004) advised that the location of this species on either side of the water divide suggests that it will also occur in the upper reaches of both the Limestone Creek and Smoke Creek drainages to their confluences several kilometres downstream.

Summary
Having particular regard to the:

a) Terrestrial Flora and Vegetation Management Plan that has been produced and will be implemented;
b) Terrestrial Fauna Management Plan that has been produced and will be implemented;
c) Subterranean Fauna Management Plan that has been produced and will be implemented;
d) Weed Management Plan that has been produced and will be implemented;
e) vegetation associations and fauna habitat within the area being relatively common and widespread;
f) monitoring of terrestrial flora and fauna and subterranean fauna that has already been completed and that is planned;
g) location of stygofauna and troglobites outside the area of direct impact; and
h) recommended Ministerial Conditions on weeds and proponent commitments,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objectives for this factor.

4-3 Decommissioning, Closure and Rehabilitation

Description
Decommissioning and closure
Decommissioning and closure planning of the site is essential as it encompasses many rehabilitation goals and ensures that post-mining land use, aesthetics, safety and environment issues are dealt with prior to lease relinquishment. Decommissioning details of the underground mine are included within the overall mine site Closure Plan (Appendix G – B16, Argyle 2005). Argyle's objective for decommissioning and closure is to ensure that decommissioning and closure activities are undertaken by safe and effective methods, and that the site is left in a safe, stable and non-polluting manner (Argyle, 2005). Details include removal of all hazardous materials and items of value, closing the mine and sealing entrances to prevent access.

As a result of the proposed mining method to be used at Block Cave (stage 1), a crater void will develop at the surface and subsidence of the existing pit walls will occur. If not managed appropriately, there is potential for this to pose a safety risk for people and wildlife and potential impacts on land stability, surface and groundwater. The object is for the final void to naturally recharge with water from rainfall and underground fractures. No rehabilitation will occur and all vehicle access will be restricted. Argyle (2005) has stated that the void will not affect social and environmental values supported by groundwater or surface water.

Approximately 3.2Mt of waste rock will be generated throughout the life of the underground project. This constitutes a very small addition to the existing 700Mt of waste rock that currently forms the WRDs and the further 167Mt that are expected to be deposited during the remaining life of the open pit. Processing of underground ore will generate around 90Mt of tailings over the life of the project. Underground tailings will be disposed of in the existing

Tailings Storage Facility (TSF1). However the TSF2 and RCP3 will be required to accommodate mineral processing wastes.

The WRDs are designed so that their long-term landform will be stable, safe and conform to the surrounding landscape. The TSF2 will also be formed into safe, stable structures with no significant impacts on the environment from seepage or runoff from the TSF area.

The post-mining land use and retention of any surface infrastructure (e.g. roads, buildings, dams) will be determined in consultation with the major stakeholders and approved by the regulatory authorities. Guiding closure and decommissioning plans will also be developed in consultation with key stakeholders and will be regularly revised during the operational phase of the project. A final closure and decommissioning plan will be submitted to regulatory authorities 5 years prior to expected date of the cessation of operations.

Rehabilitation
The proponent has developed a Rehabilitation Managemement Plan (RMP) (Argyle, 2005) for existing disturbed areas as well as those to be disturbed by the project. The RMP incorporates the development of completion criteria in order to determine the success of the rehabilitation program. Argyle's rehabilitation objective is to ensure that rehabilitation achieves a stable and functioning landform, which is consistent with the surrounding landscape and other environmental values (Argyle, 2005). Rehabilitation undertaken at the site has been primarily on the alluvial mining areas as waste dumps and the TSF1 are still operational.

The preparation of a RMP is necessary as it prevents the potential impacts of ineffective rehabilitation of disturbed areas including:

- land instability;
- weed proliferation;
- visual amenity loss;
- adverse hydrological changes; and
- loss of fauna habitat and other ecological value.

Rehabilitation of around 2.85ha was undertaken on the Northern Waste Rock Dump in 1997 -1998, however, much of this area has since been covered by waste rock. A 2003 survey of the rehabilitated WRD area (Hyde, 2003) recorded a wide variety of species including Spinifex and eucalyptus. Spinifex and eucalypts are important for revegetation as eucalypts are the dominant trees on rocky slopes in the area and Spinifex compromises almost 65% of the total cover on undisturbed hillslopes around the mine (Salt, 1990). The survey also contributed to knowledge of plant seeding and establishment techniques for future mine rehabilitation.

Currently, Argyle is establishing further trials on the Southern WRD to assess the various surface treatments, growth mediums, slope length, slope angle, and types of cover systems. Tailing storage facilities and the existing reclaim ponds are still in operation and have not undergone rehabilitation.

Assessment
The area considered for assessment is the entire mining lease, plus the surrounding drainage systems. The EPA's environmental objective for this issue is to

- ensure that mine closure planning and rehabilitation are carried out in a coordinated, progressive manner and are treated as an integral part of mine development, consistent

with the ANZMEC/MCA *Strategic Framework for Mine Closure* and best practice;
- ensure there is no liability to the state as a result of the proposal;
- ensure that no contaminated sires are created as a result of the proposal;
- ensure that landforms remaining after closure are in a safe and stable condition with the erosion rates comparable to those of natural landforms in the area; and
- ensure that self-sustaining vegetation communities are established, composed of native plant species of local provenance.

Closure of the underground project has been incorporated into Argyle's Decommissioning and Closure Plan for the site. The proponent has stated that this plan will be regularly revised during operations with a commitment to submit a Final Closure Plan five years prior to the cessation of operations date (draft recommended condition 13). The EPA notes that site-specific completion criteria for rehabilitation and closure planning are to be developed during the operational life of the project, and finalised within the Closure Plan. The criteria will be developed in consultation with stakeholders. The plan will guide Argyle to an environmentally acceptable level of rehabilitation for disturbed land and relinquishment of the lease area. Effectiveness of rehabilitation work will be measured through ecosystem function indicators that may include species diversity, faunal habitat complexity, and indices relating to soil surface stability, infiltration, nutrient cycling, plant cover and density.

Monitoring and management of the project is also incorporated in the Final Closure Plan. Measures identified include:
- mitigating adverse effects from seepage from WRDs and TSFs over the long term;
- identification and remediation of contaminated sites;
- ensuring proper rehabilitation; and
- that agreed completion criteria are met.

Major stakeholders will determine post-decommissioning and post-relinquishment monitoring and management requirements for the site near the end of mine life.

Decommissioning and closure planning for the crater void include provisions to ensure that access is restricted, the crater area is safe for people and wildlife and will not cause adverse impacts on the environment. The proponent intends to remove all equipment and access tracks to the crater and monitor movement of the subsidence. Perimeter bunds, fencing and signage will also be erected where required. Maintenance of the safety fence post-site relinquishment will be addressed in the final plan. The EPA notes that the total dissolved solids (TDS) concentration in the final crater-lake is not likely to become hypersaline primarily due to annual influxes of large volumes of fresh water. Modelling indicates that TDS concentrations of around 2000 mg/L are likely to be reached after 300 years. These concentrations are not vastly higher than background groundwater concentrations.

Advice was sought from DoIR and the Department of Consumer and Employment Protection (DOCEP) during the consultation phase of this assessment. From this advice the EPA notes that the proponent will prepare a Project Management Plan (PMP) for the underground proposal for approval by the State Mining Engineer prior to commencement of the proposal. The EPA also notes that DoIR and DOCEP were satisfied with the proposed management of the crater and will review the PMP.

The EPA notes that Argyle will continue to monitor ground movements of the crater areas until the ground is considered stable, even after decommissioning. The EPA recommends that the decision on the stability of the crater be achieved with advice from DOCEP.

Following the end of open pit operations, only a small amount (3.2Mt) of underground waste rock will be added to the WRDs. Open pit operations are expected to cease in 2008 or 2012, the later date if additional resources in the pit's northern section prove economic. In view of this, the EPA considers that the effective life of a large proportion of the WRD will be reached over the short to medium term. The EPA commends the near-complete rehabilitation of the alluvial mining areas, however it encourages the proponent to expedite rehabilitation of WRDs and other areas. The EPA notes that, following mapping of all disturbed areas, the RMP also requires areas available for rehabilitation to be scheduled into operating plans. Targeted and actual performance of progressive rehabilitation at the mine will be reported in the proponent's publicly available Annual Environmental Review document.

Rehabilitation of disturbed areas is site-specific and success varies according to techniques employed and plant growth conditions. Ongoing rehabilitation trials will be performed to investigate and identify the most successful methods for wider use at the mine site. The EPA notes that the proponent intends to conduct trials on WRDs, TSFs and other areas for the variables of ground preparation, growth medium, species selection, and nutrition. The results of these trials will assist in the refinement of procedures for rehabilitation at the mine.

About 50Mt of tailing from underground mining activities will be deposited in TSF1 until its storage capacity is reached. TSF2 will be constructed on already disturbed land to the south of the TSF1. The EPA considers that because use of TSF1 and TSF2 are necessary for underground mine development, a condition of approval be that significant rehabilitation (including contouring and revegetation) of TSF1's outer embankment begin immediately after commencement of initial civil works for construction of TSF2 (draft recommended condition 13). The objective of this condition is to encourage progressive rehabilitation of larger mine areas that have come to an end of their functional life without unnecessary delay. Early rehabilitation of TSF1 will also have environmental benefits, as the developing ecosystem will serve as a fauna habitat and provide working knowledge for further rehabilitation. On the advice of the DoIR, a further condition of approval is that TSF2 be be designed so that the outer embankment slope will not be steeper than 1:3 across any section and to be compatible with the final landform (draft recommended condition 13).

Summary

Having particular regard to the:

a) Plans developed by the proponent, including the
   - Rehabilitation Management Plan that will be submitted to the regulatory agencies; and
   - Decommissioning and Closure Plan forming the basis for a Final Closure Plan.
b) rehabilitation trials have already begun as well as some being completed; and
c) recommended Ministerial Conditions and proponent commitments,

it is the EPA's opinion that the proposal can be managed to meet the EPA's environmental objective for this factor.

5. Conclusions

Section 44 of the *Environmental Protection Act 1986* requires the EPA to report to the Minister for the Environment on the environmental factors relevant to the proposal and on the conditions and procedures to which the proposal should be subject, if implemented. In addition, the EPA may make recommendations as it sees fit.

Hydrology
The EPA concludes that the factor of hydrology, particularly impacts on Wesley Springs can be managed to meet the EPA's objectives to ensure that lowering of groundwater due to dewatering operations does not cause adverse impacts on local hydrology and the environment; and to ensure that ARD does not cause adverse impacts on the local hydrology and environment.

The proponent has made commitments to ensure that the EPA's objectives are met in that there will be no adverse impacts on the environment. Argyle has developed a number of management plans that have been assessed by the EPA and Department of Environment. The EPA is satisfied that these plans identify all potential impacts on the spring and that Argyle has prepared actions to manage all potential impacts if they do occur.

Prior to the start of underground mine development Argyle will conduct surveys to determine baseline groundwater elevations, groundwater and surface water quality information, and vegetation health in the vicinity of Wesley Spring.

The EPA is also satisfied that Argyle has appropriately addressed the issues of ARD. Argyle has prepared an ARD Management Plan as well as completing work to identify areas of potential impact. Monitoring for ARD will continue throughout the life of the project.

Biodiversity
The EPA concludes that the factor of biodiversity (terrestrial flora and fauna and subterranean fauna) can be managed to meet the EPA's objective to maintain the abundance, species diversity, geographic distribution and productivity of terrestrial flora and fauna and subterranean fauna; to improve the understanding of subterranean fauna through appropriate research, including sampling, identification and documentation; and to ensure that no known or unknown species will be come extinct or have an increased risk of extinction through the mine operations.

Argyle has completed multiple field surveys to ensure that no declared rare flora (DRF), priority flora or endangered species are impacted from the proposed operations. Argyle has stated that clearing may alter the extent of some vegetation communities however, there are no plant species or communities of conservation significance that occur solely in the areas designated for clearing.

Argyle has completed surveys for flora and fauna (both terrestrial and subterranean). Monitoring for stygofauna has been extensive and has indicated that operations are unlikely to have any major impacts on stygofauna.

Studies have shown that only one species of stygofauna is located in the predicted area of groundwater drawdown all other species of stygofauna and the identified troglobite are outside the area of impact. The Proponent has prepared to and begun to implement management plans (flora and vegetation, fauna, weed, stygofauna) that will assist in the protection of flora and fauna (both terrestrial and subterranean). The measures in these plans will see protection and potential impact contingency measures implemented when and where needed.

Decommissioning, Closure and Rehabilitation.
The EPA concludes that the factor of decommissioning, closure and rehabilitation can be managed to meet the EPA's objective to ensure that mine closure planning and rehabilitation are carried out in a coordinated, progressive manner and are treated as an integral part of mine development, consistent with the ANZMEC/MCA *Strategic Framework for Mine Closure* and best practice; there is no liability to the state as a result of the proposal; that no contaminated sites are created as a result of the proposal; that landforms remaining after closure are in a safe and stable condition with the erosion rates comparable to those of natural landforms in the area; and that self-sustaining vegetation communities are established, composed of native plant species of local provenance.

Argyle has made the commitment to produce regularly revised draft closure and decommissioning plans that will be developed in consultation with key stakeholders during the operational phase of the project. A final closure and decommissioning plan will be submitted to regulatory authorities 5 years prior to expected date of the cessation of operations. Argyle has also prepared a Rehabilitation Management Plan.

The proponent will also ensure that all access to the site is restricted after operations cease and that the crater area is safe for people and wildlife and will not cause any adverse environmental impacts.

Argyle has already begun trials to determine the effectiveness of the rehabilitation program and has committed to begin rehabilitation of TSF1 as soon as TSF2 is operational. This will encourage progressive rehabilitation.

6. Recommendations

The EPA considers that the proponent has demonstrated, in the EPS document, that the proposal can be managed in an environmentally acceptable manner and provides the following recommendations to the Minister for the Environment:

1. That the Minister notes that the proposal being assessed is for the Argyle Underground project.
2. That the Minister considers the report on the relevant environmental factors as set out in Section 4.
3. That the Minister notes that the EPA has concluded that it is unlikely that the EPA's objectives would be compromised, provided there is satisfactory implementation by the proponent of the recommended conditions and proponent commitments as set out in Appendix 2, including the provision for implementation of an EMP,
4. That the Minister imposes the conditions and procedures recommended in Appendix 2 of this report.

Appendix 1

References

ANZMEC/MCA, 2000. Strategic Framework for Mine Closure. Australian and New Zealand Minerals and Energy Council; and The Minerals Council of Australia, Canberra, ACT.

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Western Australian Museum, 2005. *Appendix 4, to the Report on 2003 Stygofauna Sampling at the Argyle Diamond Mine, Kimberley, Western Australia*. Report prepared by W.F. Humphreys for Argyle Diamond Mines Pty Ltd. March 2005.

Appendix 2

Recommended Environmental Conditions

and Proponent's Commitments

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
(PURSUANT TO THE PROVISIONS OF THE
ENVIRONMENTAL PROTECTION ACT 1986)

ARGYLE DIAMOND MINE, UNDERGROUND PROJECT, 110KM SOUTH OF KUNNUNURRA, SHIRE OF WYNDHAM-EAST KIMBERLEY

Proposal: To extend the current Argyle Diamond Mine Operations at Argyle Diamond Mine to develop an underground diamond mine and associated infrastructure, as documented in schedule 1 of this statement.

Proponent: Argyle Diamond Mines Pty Limited

Proponent Address: Private Mail Bag 11
WEST PERTH WA 6872

Assessment Number: 1606

Report of the Environmental Protection Authority: Bulletin 1205

The proposal referred to above may be implemented by the proponent subject to the following conditions and procedures:

1 Implementation

1-1 The proponent shall implement the proposal as documented in schedule 1 of this statement subject to the conditions of this statement.

2 Proponent Commitments

2-1 The proponent shall implement the environmental management commitments documented in schedule 2 of this statement.

3 Proponent Nomination and Contact Details

3-1 The proponent for the time being nominated by the Minister for the Environment under section 38(6) or (7) of the *Environmental Protection Act 1986* is responsible for the implementation of the proposal until such time as the Minister for the Environment has exercised the Minister's power under section

38(7) of the Act to revoke the nomination of that proponent and nominate another person as the proponent for the proposal.

3-2 If the proponent wishes to relinquish the nomination, the proponent shall apply for the transfer of proponent and provide a letter with a copy of this statement endorsed by the proposed replacement proponent that the proposal will be carried out in accordance with this statement. Contact details and appropriate documentation on the capability of the proposed replacement proponent to carry out the proposal shall also be provided.

3-3 The nominated proponent shall notify the Department of Environment of any change of contact name and address within 60 days of such change.

4 Commencement and Time Limit of Approval

4-1 The proponent shall substantially commence the proposal within five years of the date of this statement or the approval granted in this statement shall lapse and be void.

Note: The Minister for the Environment will determine any dispute as to whether the proposal has been substantially commenced.

4-2 The proponent shall make application for any extension of approval for the substantial commencement of the proposal beyond five years from the date of this statement to the Minister for the Environment, prior to the expiration of the five-year period referred to in condition 4-1.

The application shall demonstrate that:

1. the environmental factors of the proposal have not changed significantly;

2. new, significant, environmental issues have not arisen; and

3. all relevant government authorities have been consulted.

Note: The Minister for the Environment may consider the grant of an extension of the time limit of approval not exceeding five years for the substantial commencement of the proposal.

5 Compliance Auditing and Performance Review

5-1 The proponent shall prepare an audit programme in consultation with and submit compliance reports to the Department of Environment which address:

1. the status of implementation of the proposal as defined in schedule 1 of this statement;

2. evidence of compliance with the conditions and commitments; and

3. the performance of the environmental management plans and programs.

Note: Under sections 48(1) and 47(2) of the *Environmental Protection Act 1986*, the Chief Executive Officer of the Department of Environment is empowered to audit the compliance of the proponent with the statement and should directly receive the compliance documentation, including environmental management plans, related to the conditions, procedures and commitments contained in this statement.

5-2 The proponent shall submit a performance review report every five years after the start of operations, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority, which addresses:

1. the major environmental issues associated with implementing the project; the environmental objectives for those issues; the methodologies used to achieve these; and the key indicators of environmental performance measured against those objectives;

2. the level of progress in the achievement of sound environmental performance, including industry benchmarking, and the use of best available technology where practicable;

3. significant improvements gained in environmental management, including the use of external peer reviews;

4. stakeholder and community consultation about environmental performance and the outcomes of that consultation, including a report of any on-going concerns being expressed; and

5. the proposed environmental objectives over the next five years, including improvements in technology and management processes.

5-3 The proponent may submit a report prepared by an independent auditor to the Chief Executive Office of the Department of Environment on each condition/commitment of this statement which requires the preparation of a management plan, programme, strategy or system, stating whether the requirements of each condition/commitment have been fulfilled within the timeframe stated within each condition/commitment.

6 Groundwater

6-1 The proponent shall review and revise, if deemed necessary by the Department of Environment, the Groundwater Management Plan which forms part of the *Argyle Underground Environmental Management Plan* (September 2005).

6-2 The proponent shall implement the Groundwater Management Plan referred to in condition 6-1.

6-3 The proponent shall make the Groundwater Management Plan referred to in condition 6-1 publicly available.

7 Surface Water

7-1 The proponent shall review and revise, if deemed necessary by the Department of Environment, the Surface Water Management Plan which forms part of the *Argyle Underground Environmental Management Plan* (September 2005).

7-2 The proponent shall implement the Surface Water Management Plan referred to in condition 7-1.

7-3 The proponent shall make the Surface Water Management Plan referred to in condition 7-1 publicly available.

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8 Wesley Springs Management Plan

8-1 The proponent shall review and revise, in consultation with the Water and Rivers Commission, if deemed necessary by the Department of Environment, the Wesley Springs Management Plan which forms part of the *Argyle Underground Environmental Management Plan* (September 2005).

8-2 In addition to the matters included in the Wesley Springs Management Plan referred to in condition 8-1, the proponent shall implement and address the following matters:

1. a response strategy in the event of unacceptable environmental impacts on the spring;

2. a risk assessment of potential unacceptable impacts on the spring;

3. mathematical models of the potential impacts on the spring;

4. determination of appropriate response actions;

5. formation of a site team to decide on trigger levels for the response strategy (the site team to include the proponent's environmental personnel, a groundwater specialist and a representative of the Water and Rivers Commission; and

6. incorporation of the findings of this site team in the Plan.

8-2 The proponent shall implement the Wesley Springs Management Plan referred to in condition 8-1 and 8-2.

8-4 The proponent shall make the Wesley Springs Management Plan referred to in condition 8-1 publicly available.

9 Flora and Vegetation

9-1 The proponent shall review and revise, if deemed necessary by the Department of Environment, the Flora and Vegetation Management Plan which forms part of the *Argyle Underground Environmental Management Plan* (September 2005).

9-2 The proponent shall implement the Flora and Vegetation Management Plan referred to in condition 9-1.

9-3 The proponent shall make the Flora and Vegetation Management Plan referred to in condition 9-1 publicly available.

10 Weed Management

10-1 The proponent shall review and update, in consultation with the Department of Agriculture, if deemed necessary by the Department of Environment, the Weed Management Plan which forms part of the *Argyle Underground Environmental Management Plan* (September 2005).

10-2 The proponent shall implement the Weed Management Plan referred to in condition 10-1.

10-3 The proponent shall make the Weed Management Plan referred to in condition 10-1 publicly available.

11 Terrestrial Fauna

11-1 The proponent shall review and update, if deemed necessary by the Department of Environment, the Terrestrial Fauna Management Plan which forms part of the *Argyle Underground Environmental Management Plan* (September 2005).

11-2 The proponent shall implement the Terrestrial Fauna Management Plan referred to in condition 11-1.

11-3 The proponent shall make the Terrestrial Fauna Management referred to in condition 11-1 publicly available.

12 Subterranean Fauna

12-1 The proponent shall review and update, if deemed necessary by the Department of Environment, the Subterranean Fauna Management Plan which forms part of the *Argyle Underground Environmental Management Plan* (September 2005).

12-2 The proponent shall implement the Subterranean Fauna Management Plan referred to in condition 12-1.

12-3 The proponent shall make the Subterranean Fauna Management Plan referred to in condition 12-1 publicly available.

13 Decommissioning, Closure and Rehabilitation

13-1 The proponent shall decommission and rehabilitate the new project areas in accordance with the Decommissioning and Closure Management Plan and the Rehabilitation Management Plan which form part of the *Argyle Underground Environmental Management Plan* (September 2005), or subsequent revisions of the Plans, to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority.

Note: In preparation of advice to the Minister for the Environment, the Environmental Protection Authority expects that advice of the following agencies will be obtained:

- Water and Rivers Commission;
- Department of Industry and Resources;
- Department of Consumer and Employment Protection;
- Department of Agriculture; and
- Department of Conservation and Land Management.

The objective of these plans is to ensure that closure planning and rehabilitation are carried out in a coordinated, progressive manner and are integrated with development planning, consistent with the Australian and New Zealand Minerals and Energy Council / Minerals Council of Australia *Strategic Framework for Mine Closure (2000),* current best practice, and the agreed land uses.

The Decommissioning and Closure Management Plan and the Rehabilitation Management Plan shall set out procedures and measures to:

1. manage over the long term ground and surface water systems affected by the underground operations, tailings dams, reclamation ponds and waste rock dumps;

2. rehabilitate all disturbed areas to a standard suitable for the agreed end land use(s);

3. rehabilitate disturbed areas to level determined by a set of completion criteria;

4. identify contaminated areas, including provision of evidence of notification and propose management measures to relevant statutory authorities;

5. develop management strategies and/or contingency measures in the event that operational experience and/or monitoring indicate that a closure objective is unlikely to be achieved;

6. review and revise of the plans at appropriate intervals;

7. contour and revegetate the outer embankment of Tailings Storage Facility 1 immediately after commencement of initial civil works for construction of Tailings Storage Facility 2; and

7. Tailings Storage Facility 2 to be designed so that the outer embankment slope will not be steeper than 1:3 across any section and to be compatible with the final landform.

13-2 The proponent shall make the Decommissioning and Closure Management Plan and the Rehabilitation Management Plan referred to in condition 13-1 publicly available.

13-3 At least five years prior to the anticipated date of closure, or at a time agreed with the Environmental Protection Authority, the proponent shall prepare a Final Closure Plan which is consistent with the Australian and New Zealand Minerals and Energy Council / Minerals Council of Australia *Strategic Framework for Mine Closure (2000)* and is designed to ensure that the site is left in an environmentally acceptable condition, to the requirements of the Minister for the Environment.

The Final Closure Plan shall be based on the Decommissioning and Closure Management Plan and the Rehabilitation Management Plan that forms part of the *Argyle Underground Environmental Management Plan* (September, 2005) and its subsequent revisions.

13-4 The proponent shall implement the Final Closure Plan referred to in condition 13-3 until such time as the Minister for the Environment determines, on advice of the Environmental Protection Authority, that the proponent's closure responsibilities have been fulfilled.

13-5 The proponent shall make the Final Closure Plan referred to in condition 13-3 publicly available.

13-6 The proponent shall monitor the crater void formed from the mine operations against stability criteria, until the ground is deemed stable in the opinion of the Department of Consumer and Employment Protection and Department of Industry and Resources.

Procedures

1 Where a condition states "to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority", the Environmental Protection Authority will provide that advice to the Department of Environment for the preparation of written notice to the proponent.

2 The Environmental Protection Authority may seek advice from other agencies or organisations, as required, in order to provide its advice to the Department of Environment.

3 Where a condition lists advisory bodies, it is expected that the proponent will obtain the advice of those listed as part of its compliance reporting to the Department of Environment.

Notes

1 The Minister for the Environment will determine any dispute between the proponent and the Environmental Protection Authority or the Department of Environment over the fulfilment of the requirements of the conditions.

2 The proponent is required to apply for a Works Approval and Industry Licence for this project under the provisions of Part V of the *Environmental Protection Act 1986*.

3 Compliance and performance reporting will endeavour to be in accord with the timing requirements of reporting under the *Diamond (Argyle Diamonds Mines Joint Venture) Agreement Act 1981-1983*.

Schedule 1

The Proposal (Assessment No. 1606)

The proposal extends the life of the current open pit mine by developing an underground mine and associated infrastructure at the same site. The Mine is located approximately 110km south of Kununurra in the East Kimberley region (figure 1). The ore body will be mined in two stages using both block cave mining and sub level cave mining from 2008. Stage 1 involves mining the Upper Block and Southern Tail Block. The proposed completion date for Stage 1 is 2017. Stage 2 involves mining the Lower Block and it is proposed to commence in approximately 2017 and be completed by 2024. The underground proposal will also include the construction of a new Tailings Storage Facility (TSF2) and a new Reclaim Pond (RCP3).

The main characteristics of the proposal are summarized in Table 1 below.

Table 1: Key Proposal Characteristics

Element	**Underground Project**
Life of Mine	Around 20 years
Mining depth	Maximum of 675m
Mining Methods	Stage 1 Upper Level Block Cave mining Stage 2 Sub Level Cave mining
Major Project Components Underground Declines Underground Mining Levels Underground and surface conveyors Box cut portal Surge bin Secondary crusher Extension to some existing surface infrastructure Temporary ore and waste stockpiles Laydown areas Refrigeration plant Bulk Air Cooler and fans Exhaust shafts Services corridor Dewatering system New Tailings Storage Facility New Reclaim Pond	Refer to Figure 2 and 3
Total Ore Production	Stage 1 - 60 Mt (approx) Stage 2 – 37 Mt (approx)
Ore Processing	Through existing Processing Plant at around 8 Mtpa for Stage 1 and 4.5 Mtpa for Stage 2
Key materials	(approximate values)
Ground support construction materials	4, 700 t
Fibrecrete	330,000 t
Explosives	15,000 t

Electric cables, pipes and ventilation ducting Diesel fuel Concrete Steel	6,000 t 26 ML 24,000 m^3 5,000 t
Total Waste Rock Over Project Life	4.3 Mt (approx)
Dewatering Requirements	19 – 83 ML/day (approx)
Crater Area	Mostly within the existing open pit and waste rock dump area
Tailings	100 Mt (approx)
TSF2 Area of Disturbance	126 ha (approx)
RCP3 Area of Disturbance	133 ha (approx)
Underground mine water requirements	700 kL/day (approx)
Processing water requirements	12, 000 - 22,000 kL/day
Water Supply	From dewatering operations, Gap Dam, Upper Limestone Creek Waste Rock Dump Seepage Retention Dam, Reclaim Ponds, and if necessary, Lake Argyle.
Power Requirements	Additional 4 - 12 MW
Power Supply	Ord Hydroelectric Scheme, with the deficit to be provided for an initial two - three years by the on site diesel power station until alternative power supply established
Heavy Vehicle Movements	Offsite – reduce from 12 per day to one - two per day On site – Reduce from 670 hours/day to 36 hours/day
Construction Workforce	Maximum of around 500
Total Workforce	Approx. 450

Abbreviations:

ha	hectares
m	metres
Mt	Million tonnes
Mtpa	Million tonnes per annum
T	tonnes
ML	Megaliters
MW	Mega watts

Figure 1 - Regional Location of Argyle Diamond Mine Operations.
Figure 2 – Argyle Diamond Mine Operations.
Figure 3 - Location of the Proposed Works for the Underground Mine Proposal.

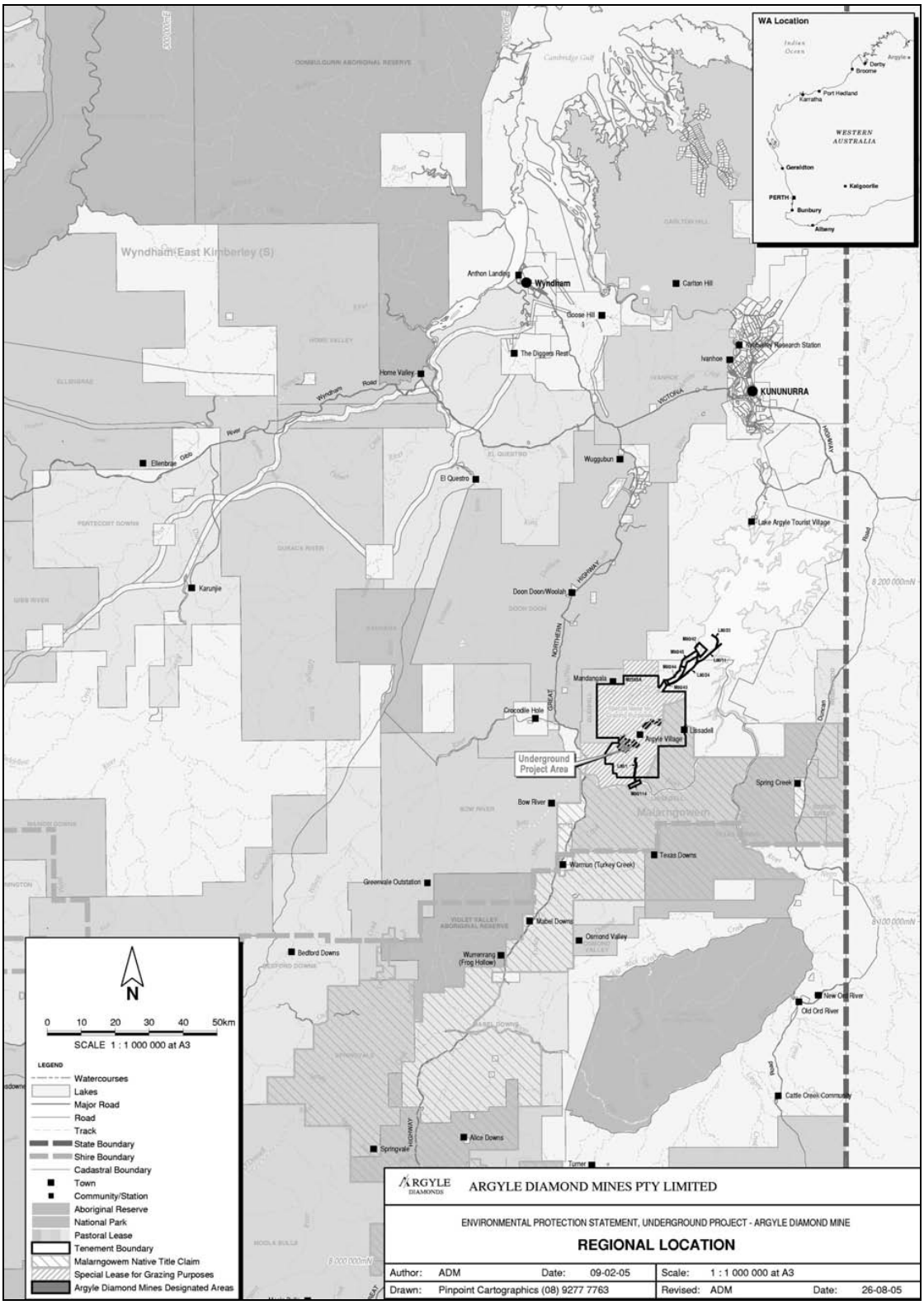

Figure 1 - Regional Location of Argyle Diamond Mine Operations.

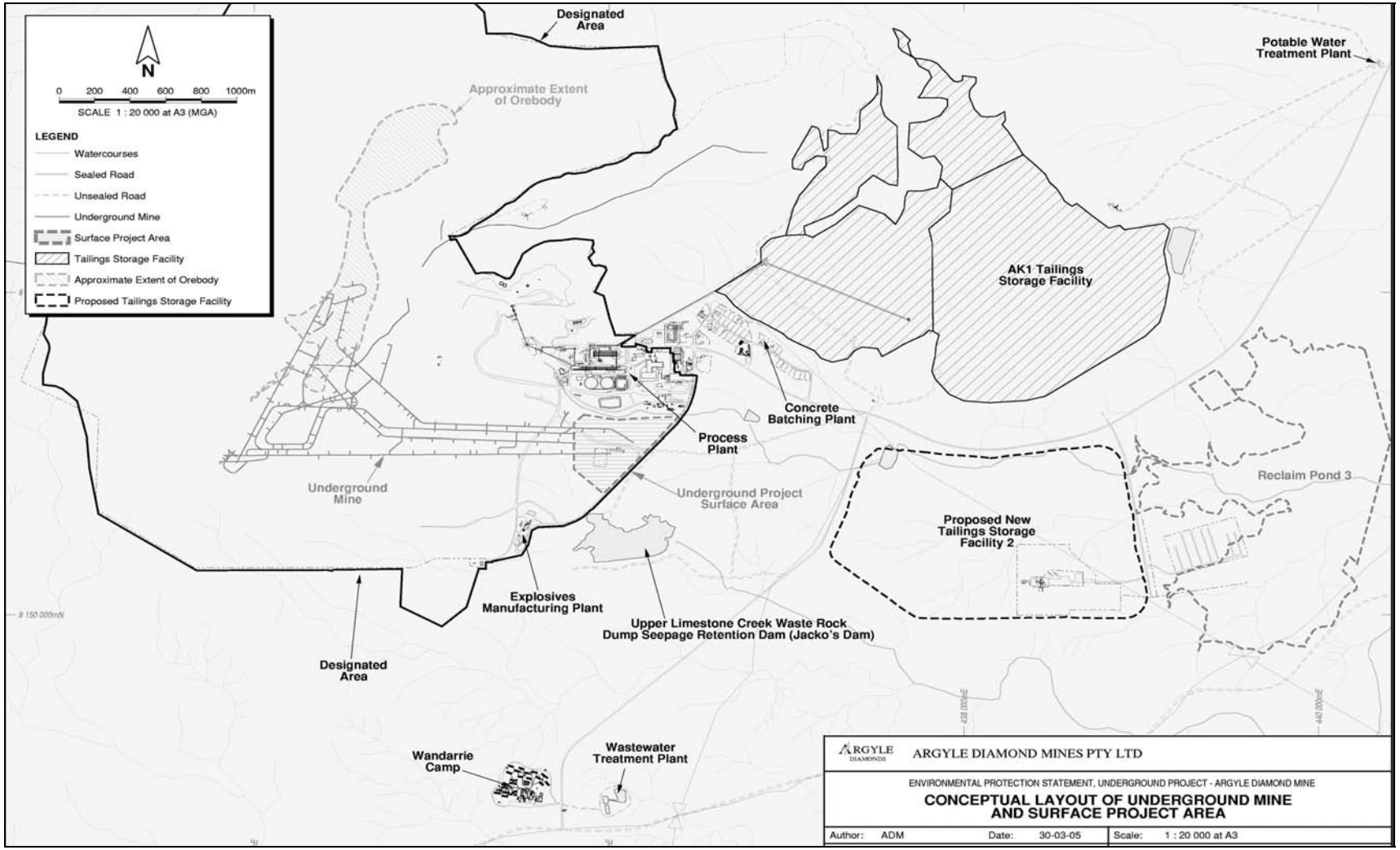

Figure 2 – Argyle Diamond Mine Operations

Figure 3 - Location of the Proposed Works for the Underground Mine Proposal.

Schedule 2

Proponent's Environmental Management Commitments

14 November 2005

Argyle Diamond Mine Underground Project

(Assessment No. 1606)

Argyle Diamond Mines Pty Limited

Proponent's Environmental Management Commitments – November 2005

Argyle Diamond Mine Underground Project (Assessment No. 1606)

Note: The term "commitment" as used in this schedule includes the entire row of the table and its six separate parts as follows:

- a commitment number;
- a commitment topic;
- the objective of the commitment;
- the 'action' to be undertaken by the proponent;
- the timing requirements of the commitment; and
- the body/agency to provide technical advice to the Department of Environment

No.	Topic	Objective	Action	Timing	Advice
1	**Area of Disturbance**	To minimise the area of disturbance required for the Project infrastructure	**Commitment 1.1** The Proponent will ensure that the area of disturbance for the Project is minimised and that all required internal and external clearance approvals have been obtained prior to any areas being disturbed.	**1.1 -**During planning, construction, operation and decommissioning.	**1.1** DoIR, DIA
2	**Groundwater**	To ensure that the lowering of groundwater due to dewatering operations does not cause adverse impacts on local hydrogeology and the environment.	**Commitment 2.1** The Devil Devil Spring Management Plan prepared and agreed with Traditional Owners in conjunction with the Indigenous Land Use Agreement, will be implemented during the construction and operation of the Project. **Commitment 2.2** The groundwater monitoring programme conducted at the site will be continued and expanded by the Proponent during the construction, operation and decommissioning of the Project. **Commitment 2.3** Monitoring results will be provided by the Proponent to Traditional Owners (via the Relationship Committee), regulatory authorities in the Annual Environmental Report and will be made publicly available.	**2.1** Construction, operation and decommissioning phases. **2.2 –**Construction and operations. **2.3–** Relationship Committee – quarterly, AER – annually,	**2.1** DIA **2.2** DIA **2.3** DoIR, DIA, CALM, D Ag
3	**Dewatering Discharge**	To ensure that the dewatering discharge is managed to ensure that its disposal does not adversely affect the environment.	**Commitment 3.1** The Proponent will handle and manage the dewatering discharge as described in the Groundwater Management Plan for the Underground Project submitted to the regulatory authorities.	**3.1 –** Submission prior to construction. Implementation during construction and operation.	
4	**Surface Hydrology**	To maintain surface hydrology so that environmental values, including ecosystem maintenance, are protected.	**Commitment 4.1** Surface water management infrastructure will be established by the Proponent to manage surface water flows in the Project Area.	**4.1** Construction	

		To ensure that surface water runoff is managed to ensure that it does not adversely affect the environment.	**Commitment 4.2** The Surface Water Management Plan, submitted to the regulatory authorities, will be implemented by the Proponent during the construction and operation of the Project. **Commitment 4.3** The surface water monitoring conducted at the site will continue and be expanded by the Proponent during the construction and operation of the Project. **Commitment 4.4** The results of surface water monitoring will be provided by the Proponent to Traditional Owners (via the Relationship Committee), the regulatory authorities in the Annual Environmental Report, and also made publicly available.	**4.2-**Submission prior to construction. Implementation during construction and operation. **4.3** Construction and operations **4.4** Relationship Committee quarterly, AER annually	**4.4** DoIR, DIA, CALM, D Ag
5	**Acid Rock Drainage and Magnesium Sulphate Generation**	To ensure that ARD and magnesium sulphate generation does not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	**Commitment 5.1** The ARD Management Plan, submitted to the regulatory authorities, will be implemented during the construction and operation of the Project. **Commitment 5.2** All waste rock material to be removed from the underground mine will be characterised for its ARD potential by the Proponent, any acid forming material will be identified and managed in accordance with the ARD Management Plan. **Commitment 5.3** The Proponent will ensure that seepage water and rainfall infiltration entering the underground mine is collected and regularly analysed, and pumped to the process water storage areas. **Commitment 5.4** The Proponent will place any potentially acid forming waste rock material removed during the development of the underground mine into dedicated areas of the waste rock	**5.1** Submission prior to construction. Implementation during construction and operation. **5.2**. During construction. **5.3** During construction and operation **5.4** During construction.	**5.1** DoIR **5.2** DoIR **5.3** DoIR **5.4** DoIR

			dumps and isolate the material by the use of appropriate cover systems. **Commitment 5.5** The Proponent will investigate and implement surface water drainage measures, which are agreed by the regulatory authorities, in the waste rock dump design in order to manage rainfall runoff, infiltration and the quality of surface and sub surface drainage. **Commitment 5.6** The Proponent will characterise all material to be processed from the underground mine for its ARD potential. **Commitment 5.7** Monitoring of the groundwater, surface water, tailings, water storage dams and seepage will be undertaken by the Proponent to determine if any products of ARD are being generated. **Commitment 5.8** Results of the monitoring will be provided by the Proponent to the Traditional Owners (via the Relationship Committee), regulatory authorities in the Annual Environmental Reports, and be made publicly available.	**5.5** During construction and operation **5.6** During construction and operations **5.7** Prior to and during construction and operations **5.8** Annually	**5.5** DoIR **5.6** DoIR **5.7** DoIR **5.8** DoIR
6	**Air Emissions**	To ensure that air emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	**Commitment 6.1** The Proponent will position discharge vents from the underground mine downwards into a collection pond.	**6.1** During construction	**6.1** DoIR
7	**Dust**	To ensure that dust emissions do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting	**Commitment 7.1** The Dust Management Plan, submitted to the regulatory authorities, will be implemented by the Proponent during the construction and operation of the Project.	**7.1** Submission prior to construction. Implementation during construction and operation.	**7.1** DoIR

		statutory requirements and acceptable standards.	**Commitment 7.2** The dust-monitoring programme undertaken by the Proponent at the site will continue and may be expanded to include the area near the tailings storage facilities. **Commitment 7.3** Dust monitoring results will be provided to the regulatory authorities in the Proponent's Annual Environmental Report.	**7.2** During operation **7.3** Annually	**7.2** DoIR **7.3** DoIR
8	**Greenhouse Gas Emissions**	To minimise emissions to levels as low as practicable on an ongoing basis and consider offsets to further reduce cumulative emissions.	**Commitment 8.1** The Greenhouse Gas Emissions Management Plan, submitted to the regulatory authorities, will be implemented by the Proponent during the construction and operation of the Project. **Commitment 8.2** Greenhouse Gas emissions will be calculated by the Proponent and reported under the National Greenhouse Challenge Programme by Rio Tinto on an annual basis.	**8.1** Submission prior to construction. Implementation during construction and operation. **8.2** Annually	**8.1** DoIR **8.2** Australian Greenhouse Office
9	**Radiation**	To ensure that radiological impacts to people and the environment are kept as low as reasonably achievable and comply with acceptable standards.	**Commitment 9.1** The Proponent will develop and implement a radiation monitoring programme, which will be submitted to the Department of Industry and Resources, for those working in the underground mine. **Commitment 9.2** The Proponent will report the results of the radiation monitoring to the Department of Industry and Resources on a 12 monthly basis, if required.	**9.1** During construction and operation. **9.2** Annually	**9.1** DoIR **9.2** DoIR
10	**Noise**	To protect the amenity of nearby residents from noise impacts resulting from the activities associated with the proposal by ensuring that noise levels meet statutory requirements and acceptable standards.	**Commitment 10.1** Noise sources will be identified, evaluated, prioritised and managed by the Proponent.	**10.1** During design, construction and operation	

11	**Flora and Vegetation**	To maintain the abundance, diversity, geographic distribution and productivity of flora at species and ecosystem levels through the avoidance and/or management of adverse impacts and improvement in knowledge.	**Commitment 11.1** The vegetation monitoring programme undertaken on the site will continue and be expanded by the Proponent to include additional monitoring sites that will allow impacts associated with changes in groundwater flow to be assessed. **Commitment 11.2** Vegetation monitoring results will be provided to the regulatory authorities in the Proponent's Annual Environmental Report.	**11.1** During construction, operation and rehabilitation **11.2** Annually	**11.1** CALM, DoIR, D Ag **11.2** DoIR, CALM, D. Ag, DIA
12	**Terrestrial Fauna**	To maintain the abundance, diversity, geographic distribution and productivity of fauna at species and ecosystem levels through the avoidance and/or management of adverse impacts and improvement in knowledge.	**Commitment 12.1** The feral cat control programme undertaken by the Proponent at the site will continue as required during the construction and operational phase of the Project.	**12.1** During construction and operations	**12.1** DoIR, D.Ag. CALM
13	**Aquatic Biota**	To maintain the abundance, diversity, geographic distribution and productivity of aquatic biota at species and ecosystem levels through the avoidance and/or management of adverse impacts and improvement in knowledge.	**Commitment 13.1** The Proponent will undertake ecotoxicological studies on the impacts of magnesium and sulphate ions on aquatic biota. **Commitment 13.2** The results of any aquatic biota studies will be provided to the regulatory authorities in the Proponent's relevant year Annual Environmental Report. **Commitment 13.3** The fish and macroinvertebrate monitoring programme undertaken by the Proponent on the Lease Area will be regularly assessed, and continued on an as required basis.	**13.1** Prior to and during construction and operation **13.2** Annually **13.3** As required	**13.1** CALM, DoIR **13.2** DoIR, CALM, DIA **13.3** DoIR, CALM
14	**Erosion**	To ensure that erosion does not adversely affect environmental values and land uses by meeting statutory requirements and	**Commitment 14.1** The erosion management measures presented in the Erosion Management Plan submitted to the regulatory authorities will be implemented by the Proponent during the construction,	**14.1** Submission prior to construction. Implementation during construction,	**14.1**, DoIR

		acceptable standards.	operation and rehabilitation phases of the Project. **Commitment 14.2** The Proponent will undertake erosion modelling on the waste rock dumps and rehabilitated areas.	operation and rehabilitation. **14.2** Prior to during construction and operation	 **14.2** DoIR
15	**Waste Rock**	To ensure that the placement of waste rock in waste rock dumps does not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	**Commitment 15.1** The Waste Rock Dump Management Plan developed for the waste rock removed from the underground mine, submitted to the regulatory authorities, will be implemented by the Proponent during the development of the underground mine.	**15.1** Submission prior to construction. Implementation during construction.	**15.1** DoIR
16	**Tailings**	To ensure that the storage of tailings does not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	**Commitment 16.1** The Proponent will construct and operate the new Tailings Storage Facility as per the Design Report submitted to the Department of Industry and Resources. **Commitment 16.2** The Tailings Management Plan, submitted to the regulatory authorities, will be implemented by the Proponent for the management of the tailings generated by the Project.	**16.1** During the life of the Project **16.2** Submission prior to construction. Implementation during construction and operation.	**16.1** DoIR **16.2** DoIR
17	**Process Wastewater**	To ensure that process wastewaters are managed to ensure that they do not adversely affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	**Commitment 17.1** The Proponent will handle and manage the process wastewater generated by the Project as described in the Surface Water Management Plan submitted to the regulatory authorities.	**17.1** During operation	
18	**General Waste**	To ensure that wastes are managed to ensure that their disposal does not adversely	**Commitment 18.1** General waste generated by the Project activities will be disposed of by the Proponent in accordance with the Non-	**18.1** Submission prior to construction. Implementation	**10.1** DoIR

		affect environmental values or the health, welfare and amenity of people and land uses by meeting statutory requirements and acceptable standards.	Mineral Waste Management Plan, submitted to the regulatory authorities. **Commitment 18.2** The waste recycling programme undertaken on site by the Proponent will continue for the Project.	during construction and operation. **18.2** During construction and operation.	
19	**Sewage**	To ensure that sewage and sewerage facilities do impact on people's health and the environment.	**Commitment 19.1** Sewage will be managed at the site in accordance with the Proponent's Non–Mineral Waste Management Plan prepared for the Project, and submitted to the regulatory authorities.	**19.1** During construction and operation	
20	**Hydrocarbons**	To ensure that hydrocarbons are managed and do not impact on people's health and safety, and the environment.	**Commitment 20.1** The measures presented for hydrocarbon management in the Hazardous Materials Management Plan, submitted to the regulatory authorities, will be implemented by the Proponent during the construction and operation of the Project.	**20.1** Submission prior to construction. Implementation during construction and operation.	**20.1**, DoIR
21	**Hazardous Materials**	To ensure that hazardous materials do not impact on people's health and safety, and the environment.	**Commitment 21.1** The Hazardous Materials Management Plan, submitted to the regulatory authorities, will be implemented by the Proponent during the construction and operation of the Project.	**21.1** Submission prior to construction. Implementation during construction and operation.	**21.1** DoIR
22	**Site Contamination**	To ensure that the environment is not impacted by contaminants.	**Commitment 22.1** The Proponent will apply the management measures described in the Environmental Management Plan, submitted to the regulatory authorities, to minimise the risks of contamination due to the Project.	**22.1** Submission prior to construction. Implementation during construction, operation and decommissioning.	**22.1** DoIR, CALM, D.Ag, DIA
23	**Crater Formation**	To ensure that the formation of a crater due to underground cave mining does not adversely affect environmental values or the health, welfare and amenity of people and meets statutory requirements and acceptable standards.	**Commitment 23.1** As the crater forms, its shape will be surveyed by the Proponent and the actual profile will be compared with the crater modelling predictions. **Commitment 23.2** Water levels and quality in the groundwater surrounding the underground mine and crater area will be monitored by the	**23.1** During operations **23.2** During operations	**23.1**DoIR **23.2** DoIR

			Proponent during the crater formation process. **Commitment 23.3** The Proponent will restrict people access to the crater area and will erect fencing, where appropriate, and signage around the crater area.	**23.3** During operations, decommissioning and closure.	**23.3** DoIR
24	**Health, Safety and Risk**	To plan and implement the Project to ensure that risks are minimised and safety aspects are maximized.	**Commitment 24.1** A Project Management Plan will be prepared by the Proponent and submitted to the Department of Industry and Resources prior to commencement of the Project.	**24.1** Prior to construction	**24.1** DoIR
25	**Rehabilitation**	To ensure, as far as practicable, that rehabilitation achieves a stable and functioning landform, which is consistent with the surrounding landscape and other environmental values.	**Commitment 25.1** Site specific completion criteria will be developed by the Proponent together with regulatory authorities and other key stakeholders and will be included in the Rehabilitation and Closure Plan for the Project. **Commitment 25.2** Indicators required to monitor the ecosystem function will be selected by the Proponent in conjunction with the regulatory authorities. **Commitment 25.3** The Proponent will investigate the use of Ecosystem Function Analysis as a measure for developing completion criteria and for the assessment of rehabilitation. **Commitment 25.4** The Proponent will develop appropriate revegetation completion criteria together with the regulatory authorities. **Commitment 25.5** The Proponent will develop, together with the regulatory authorities, appropriate completion criteria for assessing fauna return to rehabilitated areas.	**25.1** During construction, operations, decommissioning and closure. **25.2** During construction, operations, decommissioning and closure **25.3** Prior to and during construction and operations. **25.4** During construction, operations and decommissioning. **25.5** During construction, operations and. decommissioning	**25.1** CALM, DoIR, D. Ag, DIA **25.2** CALM, DoIR, D. Ag, DIA **25.3** DoIR, CALM, D. Ag **25.4** DoIR, CALM, D. Ag **25.5** DoIR, CALM, D. Ag

			Commitment 25.6 Studies will be implemented by the Proponent to determine acceptable water quality criteria that does not cause adverse environmental impacts.	**25.6** During construction, operations and decommissioning.	
			Commitment 25.7 Water quality criteria will be agreed between the Proponent and the regulatory authorities.	**25.7** During construction, operation and. decommissioning.	
			Commitment 25.8 The Proponent will conduct studies to determine the appropriate local seed mix and rates. The results will be applied to revise the Rehabilitation Plan submitted to the regulatory authorities.	**25.8** During construction and operation.	**25.8** CALM, DoIR
			Commitment 25.9 Revegetation trials will be conducted by the Proponent on areas disturbed by mining activities including the waste rock dumps and tailings storage facility.	**25.9** During construction and operations.	**25.9** CALM, DoIR
			Commitment 25.10 Results of the rehabilitation trials will be provided to the regulatory authorities in the Proponent's Annual Environmental Report and will also be used to revise the site's Rehabilitation Plan and Programme.	**25.10** Annually	**25.10** DoIR, CALM, D.Ag
			Commitment 25.11 The Proponent will develop and implement a rehabilitation monitoring programme that will assess progress against the agreed completion criteria.	**25.11** Following rehabilitation	**25.11**DoIR, CALM, D Ag
			Commitment 25.12 The results of the monitoring programme will be provided to the regulatory authorities in the Proponent's Annual Environmental Report.	**25.12** Annually	**25.12** DoIR, CALM, D.Ag

			Commitment 25.13 Rehabilitation trials will be undertaken by the Proponent on the waste rock dumps to assess various treatments and designs. The Proponent will apply the results, once obtained, in the development of a detailed Rehabilitation Plan for the waste rock dumps to be submitted to the regulatory authorities.	**25.13** During construction, operations.	**25.13** DoIR, CALM
			Commitment 25.14 The Proponent will ensure that progressive rehabilitation is undertaken on areas of the waste rock dumps identified as being completed.	**25.14** Following completion of sections of the waste rock dumps.	**25.14** DoIR
			Commitment 25.15 Rehabilitation will be undertaken on the waste rock dumps by the Proponent to ensure that the resulting landforms are safe, stable, minimal eroding, non polluting and will conform with the surrounding landscape.	**25.15** Following completion of the waste rock dumps.	**25.15** DoIR, CALM
			Commitment 25.16 Rehabilitation trials will be undertaken by the Proponent on the tailings storage facility to assess various methods and treatment for revegetation. The Proponent will apply the results, once obtained, in the development of a detailed Rehabilitation Plan for the tailings storage facilities to be submitted to the regulatory authorities.	**25.16** Following completion of sections of the TSF.	**25.16** DoIR, CALM
			Commitment 25.17 Rehabilitation will be undertaken on the tailings storage facility by the Proponent to ensure that the resulting landforms are safe, stable, minimal eroding, non polluting and will conform with the surrounding landscape.	**25.17** Following completion and filling of the TSF	**25.17** DoIR, CALM
26	**Decommissioning and Closure**	To ensure that decommissioning and closure activities are undertaken in safe and effective manner and that the site is left in	**Commitment 26.1** The Decommissioning and Closure Plan prepared by the Proponent for the Underground Project and submitted to the regulatory authorities will be regularly revised and submitted	**26.1** Revised and submitted on a five yearly basis.	**26.1** DoIR

		a safe stable and non-polluting manner.	to the regulatory authorities on a five yearly basis.		