



Environment, Climate Change & Water

Your reference: 10_0121
Our reference: DOC10/44475, FIL10/3414
Contact: Sandra Jones, 6992 7002

Mr George Mobayed
Mining and Industry Projects
Department of Planning
GPO Box 39
Sydney NSW 2001

Dear Mr Mobayed,

RE: Exhibition submission for proposed Dargues Reef Gold Mine (MP10_0054)

I refer to your correspondence dated 27 September 2010, providing notification of the exhibition of the Environmental Assessment for the proposed Dargues Reef Gold Mine at Majors Creek (your reference MP10_0054).

The Department of Environment, Climate Change and Water (DECCW) has completed a review of the information provided in the Environmental Assessment. DECCW remains concerned about the potential for significant noise impacts on surrounding residents, especially at night, and the on site management of water and the protection of water quality in Major's and Spring Creek. Potential impacts on the Major's Creek State Conservation Area have also been identified.

A detailed documentation of these and other issues has been provided in Attachment 1.

If you have any queries about this matter please contact me on (02) 6229 7002.

Yours sincerely,

Sandra Jones 3/11/10

SANDRA JONES
Head of Operations - South East Region
Environment Protection and Regulation Group

ATTACHMENT 1 – Environmental Issues

1 Water

Legislation that DECCW implements such as POEO Act, do not support the discharge of water into other water bodies unless Ambient Water Quality Objectives are met. Therefore if the proponent intends to discharge water into Majors and/or Spring Creek then that water should meet the ambient water quality objectives of both water ways. It may be in the proponent's interest to begin monitoring water quality in both waterways so that they can establish appropriate ambient water quality levels.

1.1 Tailings storage facility

Page 4–82, under “Design and construct the Tailings storage facility (TSF) as per section 2.7...”:

- dot point 2 - *Ensure that the Tailings Storage Facility embankment is keyed into the underlying material in a manner that would prevent down slope migration of potentially contaminated groundwater from the facility;*
- dot point 4 - *“Construct seepage collection structures at the foot of the tailing storage facility embankment and ensure that any captured seepage is automatically pumped back to the tailings storage facility”;*
- dot point 5 - *“Install piezometers at appropriate interval at the base of the tailings storage facility embankment and monitor these regularly to assess the integrity of the facility.”*

These points indicate potential contamination of the material to be placed in the TSF and therefore potential impacts on downstream ground and surface waters. The EA does not include sufficient information on the processing chemicals and whether they will be part of tailings generated through the project. The longer term fate of the material and water in the TSF is an issue, for example, there is no indication as to when seepage collection and integrity monitoring end after the completion of the mining activities. DECCW believes that the main contaminant appears to be salinity, as it will be the most mobile. However the information regarding process chemicals and their resultant volumes within tailings or other waste streams has not been provided in the EA.

DECCW requires this information in order to ascertain the suitability of tailings management and monitoring for the project.

The proponent is investigating alternative measures for managing the tailings that would be produced by the Project. This may include using tailings to backfill completed stopes within the proposed mine using a process referred to as “paste fill.” The implications of any contaminants found to be present in the tailings might limit or prevent this use. The proposal to use the tailings in this manner should be further investigated and reported on prior to this activity commencing.

DECCW note that after completion of mining operations the proponent does not intend to put a clay capping on the tailings storage facility (see Section 2.14.8). DECCW do not support this position as there will be potential implications for the amount of ongoing seepage from the tailings storage facility. Modelling the effect of saline seepage water on the salinity/conductivity levels in Majors Creek to see if environmental values could be compromised is something that the proponent should be required to undertake.

1.2 Ore processing area

Previous DECCW comments on the proposal raised concerns with the recycling of water through the ore processing activities, particularly with the potential for contaminate concentrations to increase over time. DECCW is concerned that the exhibited EA did not fully address this issue, and believe that better controls around these processing areas are needed. This information will be relevant for licensing and setting licensing conditions. For example, does the proponent intend to put a bund around the area to capture major rainfall events, or have a catch dam close to the processing area that might discharge in a high rainfall event, or both? The proponent has also indicated that low grade ore would be used in the construction of the ROM pad, potentially becoming a source of acid mine drainage for the time it is emplaced. The proponent needs to consider these matters further and indicate how it will manage runoff and infiltration, and thus minimise the spread of contaminants.

1.3 Management of Surface Water, Pollutants and Erosion and Sediment

The proponent has proposed that they will develop a *Sediment and Erosion Control Plan* (as described in the Statement of Commitments). DECCW is concerned that this Plan does not sufficiently cover the ore processing area and run of mine pad well enough.

The proponent has committed to having various mitigation and control measures covering groundwater and surface water. These measures will be important but there are few other areas that need to be considered and addressed.

One aspect of mitigation and control that the proponent has not specifically discussed or committed to (eg see commitments 7.16 to 7.18) is how it will deal with the inevitable spills, leaks and maintenance activities that will occur in the area or areas where the ore will be processed (ie from grinding through to the final flotation concentrate). This is unsatisfactory. DECCW require that the proponent provides information on the management of processing chemicals, reagents and processing leachate within the processing areas so that DECCW can determine if the proposal complies with industry standards and includes sufficient pollutant prevention measures.

Similarly, the company has discussed (but not tabulated a commitment covering) containment measures for the final floatation concentrate (see Section 2.6.5) There seems to be little or nothing said about containing and managing spills, leaks, overflows, washdown waters, oil and grease and runoff from treatment process areas prior to the final flotation concentrate area. Process streams in these areas will contain one or more of: recycled water with a build up of contaminants, elevated levels of metal sulphides, and process chemicals. The proponent needs to have some system(s) of contaminant minimisation and containment and water management in this/these areas otherwise contamination will spread downstream. This aspect needs to be explicitly addressed in detail and it needs to be done in the planning/design phase not retrofitted afterwards. Such a system would simplify licensing including supervision, monitoring and the number of discharge points. The detail of how the proponent plans to contain contamination and manage water should be a documented commitment describing how the matters will be explicitly addressed.

DECCW recommend that prior to commencement of works, the proponent must develop and provide to DECCW for comment, a comprehensive Water Management Plan for the ore processing area and run of mine pad to manage, at source, potential pollutants spills of chemicals during processing or runoff from contaminants in the ore from the run of mine pad. The Water Management Plan must include measures to prevent pollution from the processing area and run of mine pad including:

- limiting overland runoff from the run of mine pad and processing area for example use of additional bunding to contain the work area;
- minimising infiltration to groundwater from the run of mine pad and processing area;
- capturing and reusing or treating any runoff from the runoff mine pad and processing area, such as directing flows to detention basins adjacent to the processing areas and run of mine pad;

If discharges are proposed from the processing area or run of mine area, wet weather discharge licence limits or monitoring conditions may be required for, but not limited to, process chemicals, pollutants mobilised from the ore, salinity, pH, suspended solids, oil and grease. It should be noted that DECCW does not support the pollution of waters and instead would require appropriate pre-treatment options be identified prior to discharge to the environment.

Sediment and erosion control around the processing area and run of mine pad during construction and operational phase should be guided by "Volume 2E: Mines and quarries" from the Managing urban stormwater: soils and construction publications, available on the DECCW website at:

<http://www.environment.nsw.gov.au/stormwater/publications.htm>

2 Noise

The proponent has not determined what, if any, modifying factor adjustments should be made. It is considered that tonality / low frequency and/or impulsiveness will be an issue, and therefore adjusted

levels could be 5 – 10 dB(A) above their modelled L_{Eq}(15min) values. This may result in the proponent not being able to meet amenity criteria at a number of receivers under any stability conditions.

Recommendation: That the proponent investigate which modifying factor adjustments (detailed in section 4 of the Industrial Noise Policy (INP)) should be made to predicted noise levels at receivers, and report these adjusted values, with additional mitigation as necessary.

The proponent has also not qualified which future drilling activities for exploration would occur on the licensed premises.

Recommendation: DECCW considers that any exploratory drilling proposed for the premises would constitute activities ancillary to the licensed activity. As that ancillary activity would be undertaken on the licensed premise, it would be captured under the EPL for the premises. The proponent should therefore detail and consider in their modelling, the cumulative impact of any exploratory drilling on predicted noise levels at receivers, and propose any additional mitigation measures as necessary.

The proponent has also not justified their assumptions about the duty cycles or locations used in the model (i.e. haul trucks and semi trailer had a “time-based correction” applied, but this correction has not been explained or justified).

Recommendation: That the proponent fully justify all assumptions made about the duty cycles of plant and equipment proposed for the premises, as well as adjustments made to plant noise levels based on location.

The proposal is located within one kilometre of the Majors Creek State Conservation Area (SCA). At present the noise assessment does not address the potential for noise impacts on the amenity of this SCA.

Recommendation: That the proponent assess noise impact on the Majors Creek State Conservation Area via methodology detailed in the Industrial Noise Policy.

DECCW recommend that a Traffic Noise Management Strategy (TNMS) be developed by the proponent, prior to commencement of construction and operation activities, to ensure that feasible and reasonable noise management strategies for vehicle movements associated with the facility are identified and applied, that include but are not necessarily limited to the following;

- driver training to ensure that noisy practices such as the use of compression engine brakes are not unnecessarily used near sensitive receivers,
- best noise practice in the selection and maintenance of vehicle fleets,
- movement scheduling where practicable to reduce impacts during sensitive times of the day,
- communication and management strategies for non licensee/proponent owned and operated vehicles to ensure the provision of the TNMS are implemented,
- a system of audited management practices that identifies non conformances, initiates and monitors corrective and preventative action (including disciplinary action for breaches of noise minimisation procedures) and assesses the implementation and improvement of the TNMS,
- specific procedures for drivers to minimise impacts at identified sensitive receivers,
- clauses in conditions of employment, or in contracts, of drivers that require adherence to the noise minimisation procedures and facilitate effective implementation of the disciplinary actions for breaches of the procedures.

3 Air Quality

Page ES-7, Processing Operations, describes the proposed processing arrangements for the site. In this section it states “.....to produce a gravity concentrate. This would then be dried before being smelted to produce gold dore.” Page 2-28 states that “The final gravity concentrate would be dried before being smelted with suitable fluxes to produce gold dore and slag.” DECCW is concerned that if gold is being smelted on-site, that no details of this process have been included in the EA.

The air quality impact assessment does not provide any assessment of the smelting process.

An updated air quality impact assessment must be completed in accordance with the DGR's if gold is being smelted on-site so that DECCW can assess the potential for impacts on air quality of the proposed smelting. In addition DECCW requires information on the smelting process including a detailed process diagram and identification of the types of fluxes that will be used.

4 Aboriginal Cultural Heritage

As identified previously, DECCW is concerned about the adequacy of the Aboriginal Archaeological Assessment as it has not been prepared in accordance with best practice guidelines. Particular issues are detailed below:

4.1 Literature review and archaeological significance

DECCW has previously indicated to the proponent that there is not an adequate review of previous archaeological work. The AHIMS database indicates that there are seven archaeological reports that are relevant to the study area (Attenbrow 1984, Barber 2000, Bonhomme 1984, Boot 1999, Byrne 1981, Grinbergs 1995 and Williams 1987). Most of these reports can be accessed at Hurstville or Queanbeyan. This information should be reviewed in order to complete and fully inform the Aboriginal Cultural Heritage assessment. The assessment of archaeological significance at page 5a-45 section 8.3 does not meet DECCW DGR's because only research value has been assessed. An adequate significance assessment must also consider representativeness (ie, how common are these sites locally and regionally), educational value and aesthetic value for each recorded site.

4.2 Site cards

The recorded sites are still not listed on AHIMS, indicating that the proponent potentially has not submitted the site cards to DECCW. This is a potential breach of s89A of the National Parks and Wildlife Act 1979, which requires site cards to be submitted within a reasonable time of discovery.

5 Biodiversity and Threatened Species

It is unclear if the eight water harvesting dams and associated pipelines have been included in the biodiversity assessment, especially in terms of quantification of impacts. DECCW would like this point clarified.

The principles of Avoid, Mitigate and Offset are applied to assessment of all Part 3A applications. It is extremely disappointing to see that the only patch of Natural Temperate Grassland that occurs on the site will be destroyed through the development process. DECCW do not concur with the consultant's view that this patch is "not viable." It is well known that native grasslands survive in small areas and continue to do so for many years.

The offset strategy for the project is vague. DECCW notes that there needs to be a net environmental benefit of the proposed offset and biodiversity management on the site and this is not a clearly identified outcome from the information provided in the EA. DECCW consider that the Biodiversity Management Plan is separate from the offset strategy. The BMP should guide biodiversity management on the site during the construction and operation phases and should therefore be completed prior to any works being started on the site. The offset strategy, which the proponent has stated will be a Property Vegetation Plan, is designed to offset the impacts of the project on biodiversity by protecting and improving biodiversity management on the site in perpetuity. This commitment needs to be reflected in any consent if it is granted for the project.

DECCW require the proponent to clearly identify and implement protection works around key biodiversity areas before any work is undertaken on site. This specifically includes the remnant wooded vegetation, Gang-gang Cockatoo nest site plus buffer and the habitat for the Major's Creek Leek Orchid. These measures should be clearly articulated in the Statement of Commitments.

In relation to commitment 5.6, DECCW recommend the proponent engage a suitable qualified wildlife carer or fauna ecologist to supervise activities that involve direct impacts to the wombat burrows.

DECCW supports conditional consent to implement a Biodiversity Management Plan applied to the site during the construction, operation and rehabilitation phases of the project. In developing a plan DECCW suggest the proponent implement specific conditions that are transparent to avoid management actions that cause ambiguity and adverse affects on the environment. For example, weed management must be supported by detail which demonstrates, for example, type and number of treatments, species of particular interest, the frequency and methods for monitoring and reporting. General statements in management plans are not supported by DECCW.

The BMP will also include maps/figures that clearly define management actions across the site. For example, areas that will exclude stock grazing from those which have grazing restrictions set by biomass limits should be mapped.

Additionally, DECCW recommend the proponent considered these factors during the preparation of the BMP.

- A sound strategy to "maintain or improve" habitat integrity and water quality of Majors Creeks
- A sound strategy to ensure tailings storage does not impact on the surrounding ecosystems and native species
- A sound strategy to ensure groundwater changes does not impact on the surrounding ecosystems and native species
- Rehabilitate degraded drainage lines
- A sound strategy to monitor and protect the Majors Creek Leek Orchid.
- Promote wildlife or vegetation corridors
- Eradicate weed and pest species, including exotic pasture species
- A grazing strategy based on biomass limits in addition to ground cover
- Sediment & Erosion Control
- Monitoring & reporting
- Site rehabilitation

6. Potential Impact on nearby Conservation Areas

Parks and Wildlife Group (PWG) manages a number of reserves in the Braidwood area which cover a broad range of forest types, conserve habitat for a number of rare and threatened species and preserve watersheds for iconic rivers such as the Deua, Mongarlowe and Shoalhaven. PWG has particular interest in the project proposed at Dargues Reef as it is within close proximity to the Majors Creek State Conservation Area (SCA). The SCA covers 667ha of almost entirely *Araluen Scarp Grassy Forest*, an Endangered Ecological Community listed under the Threatened Species Conservation Act (TSC Act). PWG has particular concerns relating to the surface water modelling, resultant balance and ameliorative action triggers for Majors Creek, control of noxious weeds, the availability of groundwater and the impact of noise and vibration on surrounding environments namely fauna within and adjacent the Majors Creek SCA.

Specialist Consultative Studies - Part 4: Surface Water Assessment 5.1.4 Return of baseflow to Majors Creek pg 4-23 states "*Big Island Mining Pty Ltd propose to 'return' water to the Majors Creek system at a rate commensurate with the modelled losses (i.e. up to 2.1L/s).*" PWG believes that the proponent must apply the precautionary principle rather than rely on the accuracy of the modelled losses in determining the rate at which water is returned to the system. If modelled data is completely relied on, the potential remains that this rate could fall below the required baseflow to sustain ecosystems within the Majors Creek State Conservation Area (SCA) and beyond due to errors in such data. It is in our opinion that to ensure the natural baseflows are achieved, this rate should be tested against historically monitored flow data for the Majors Creek and any available adjacent creek systems. If this information is not available, monitoring stations such as v-notch gauges should be established as soon as possible in order to gain robust data.

Environmental Assessment – Section No. 4: Assessment and Management of Key Environmental Issues. 4.5.7 Monitoring pg 4-111 states that the results of [surface water]

monitoring “*would be presented in the Annual Environmental Management Report...*”. PWG notes that any changes to the baseflow, turbidity and chemical properties of water entering Majors Creek has the potential to affect the ecosystems that rely on this creek particularly those contained within the Majors Creek SCA. Unlike the detailed description of the monitoring and ameliorative action process made on pg 4-97 and 4-98 in relation to groundwater, we note that there is no such commitment to take ameliorative action based on the results of the surface water monitoring program. This absence is also reflected in the Draft Statement of Commitments on pg 5-18.

Draft Statement of Commitments: point 5.7 pg 5-6 The PWG manages the Majors Creek SCA which is located downstream of the proposed project site. PWG notes that the site contains large expanses of woody weeds containing declared class 4 noxious weeds such as Scotch Broom and Blackberry. There is clear evidence that these species have migrated down the Majors Creek catchment and are impacting on lands such as the SCA and beyond. Good catchment management requires threats such as noxious weeds to be controlled at the head of the catchment before sustainable progress can be made downstream. As this site is at the head of the catchment, PWG supports the stated commitment to continue ongoing control of Blackberry and Broom in the south of the site.

Environmental Assessment – Section No. 4: Assessment and Management of Key Environmental Issues. 4.4.5.6 Impact on groundwater dependent ecosystems pg 4-94 This section states that the project is “*not expected to result in adverse impacts to groundwater dependant ecosystems as none are likely to exist within the site*”. In 4.4.2.2 Regional Groundwater Setting pg 4-72 the proponent assumes the fractured rock (granodiorite) is “hydraulically tight” and not able to transmit groundwater flow. This statement is in direct contrast to that of the Specialist Consultative Studies - Part 3: Groundwater Assessment which on pg 3-25 9.3.1 Distribution and Yield states that paired monitoring bores indicate “the two [granodiorite and regolith] aquifers are in direct hydraulic connection”. Therefore any changes in the granodiorite will affect the groundwater level in the two other aquifers and surface water systems not supplemented with compensatory baseflows such as Majors Creek. This is evidenced in Appendix 6: Drawdown and recovery contours – Years 1-8.

PWG would like to make reference to the occurrence the Endangered Ecological Community *Araluen Scarp Grassy Forest in the South East Corner Bioregion* contained within and around the Majors Creek SCA. This community and the SCA occurs less than 1km from the modelled extent of the groundwater 1m drawdown contour. The final determination for this community expressly states that “*The community is susceptible to extreme dry spells*” and that “*Field sampling in 2003-04 identified extensive dieback of eucalypt crowns and understoreys attributed to recent extended drought, particularly on the spurs of the escarpment*” which testifies the importance of groundwater security for this community.

Additionally, a number of vegetated streams feeding Majors Creek outside of the proposed site still fall within the 1m drawdown contour, one at least falling within the 5m contour. It is likely that in times of drought, the vegetation contained within these stream corridors relies on groundwater for survival. Groundwater seepage would appear to be a key contributor in the replenishment of pools and freshes within the streambed and thus be utilised by a range of native fauna species during dry times. It is of our opinion that impacts from the changes to groundwater levels on the ecosystems of the Majors Creek SCA namely the *Araluen Scarp Grassy Forest in the South East Corner Bioregion* and impacts on the fauna and vegetation utilising streams adjacent the project site should have been considered in the EA.

Specialist Consultative Studies - Part 2: Ecology Assessment 6.TSC Act Detailed Impact Assessment pg 2-66 PWG believes this does not adequately address the Director Generals Requirements (DECCW) for threatened species and for all other species, populations and ecological communities that may be potentially impacted by the proposal, particularly in relation to altered noise, light and vibration pg 2-103 Table 1 (c) v. and (c) viii. We note that there has been very little or no attempt to quantify the impacts of noise and vibration on the fauna of the surrounding area, at this point we draw your attention to the proximity of the Majors Creek SCA which is located less than 1km from the project site. It is of our opinion that this potential impact must be addressed as failing to may have unknown consequences for ecosystems within and surrounding the reserve.

7. Statement of Commitments

DECCW recommend modifying Statement of Commitments to reflect the following comments:

3.0 Operating Hours

DECCW will only support blasting between 9.00 am and 3.00 pm, Monday to Friday.

The SoC should be modified to reflect standard definitions of Daytime etc:

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays,
- Evening is defined as the period from 6pm to 10pm on any day,
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays

4.0 Noise and Blasting

DECCW will only support blasting between 9.00 am and 3.00 pm, Monday to Friday.

Noise monitoring should be undertaken by a suitably qualified and experienced acoustical consultant. The SoC should be modified to make this explicit.

The Noise Management Plan should be prepared prior to any works occurring on-site. The SoC should be modified to reflect this change in timing.

6.0 Groundwater

Remove reference to "where practicable" in SoC 6.7, 6.8, so that a commitment to achieve these restrictions is made by the proponent.

7.0 Surface Water

Discharging water from sediment basins, as detailed in 7.6, does not appear to be compliant with s120 of the POEO Act and should be modified.

8.0 Aboriginal Heritage

Buffer area stated in 8.1 should be 20 m not 15 m, SoC should be amended to reflect this change.

10 Traffic and Transportation

The reference to "where practicable" should be removed from 10.6, and a strong commitment to achieve these restrictions made.

11 Air Quality and Energy

A dust management plan should be prepared for the site that identifies control methods and appropriate areas for dust monitoring.

