



Your reference: SSD No 5285
Our reference: EF13/5566; DOC15/198316-10
Contact: Jason Price 02 6969 0700

The Planner
Resource Assessments
Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Ms Donnelley

Re Balranald mineral sands project – SSD No 5285

Thank you for your electronic mail dated 1 June 2015 to the Environment Protection Authority (EPA) seeking comments on the Environmental Impact Statement (EIS) that supports the development application (State Significant Development No 5285) for a proposed mineral sands project near Balranald.

We have reviewed the information provided and determined that we can support the project subject to the Department of Planning and Environment (DPE) incorporating the recommended conditions provided in Attachment 'A' into the development consent.

Attachment 'B' contains our assessment of the EIS, including justification for our recommended conditions of consent. Given the scale of the proposed development we have recommended a number of management plans be developed for this project to ensure the information contained within the EIS is translated to the on-going mining activities.

Please note that inclusion of our recommended conditions in any development consent granted by the DPE is important for our ongoing support of the proposal. It is expected that the EPA will be given an opportunity to review and comment on the DPE's draft conditions of consent for this proposal.

Where development consent for the Balranald mineral sands project is granted an application for an Environment Protection Licence will be required to be submitted by the applicant to the EPA, prior to any construction work or activities associated with the proposal.

If you have any further enquiries about this matter please contact Jason Price by telephoning 02 6969 0700.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Darren Wallett', followed by the date '3/6/15'.

DARREN WALLETT
Head, Griffith Unit
Environment Protection Authority

ATTACHMENT 'A'

The Environment Protection Authority (EPA) recommends that the following conditions are included in any approval granted for the Balranald mineral sands project.

Air Quality

- Air Quality Management Plan

The Applicant must prepare and implement an 'Air Quality Management Plan' for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but not be limited to, the following matters:
 - a) the identification of potentially affected receptors from air quality impacts;
 - b) an air quality monitoring program for dust deposition that evaluates and reports on trends and against the air quality criteria identified in the EIS;
 - c) dust mitigation measures to be implemented consistent with Appendix E of the EIS;
 - d) the Ilmenite Separation Plant stack is constructed to meet the legislative emission criteria of 50mg/m³ for Total Suspended Particulates; and
 - e) detail the response to adverse trends or criteria exceedances identified by the monitoring program.

Noise

- Noise Criteria

The Applicant must ensure that the noise generated by the development does not exceed the noise criteria at any residence on privately-owned land or at any recreation area described in the table below.

Location	Day [dB(A) L _{Aeq} 15 minute]	Evening [dB(A) L _{Aeq} 15 minute]	Night [dB(A) L _{Aeq} 15 minute]	Night [dB(A) L _{A1} 1 minute]
All privately-owned land not assigned acquisition or mitigation rights	35	35	35	45
Any National Park or Conservation Area	50	50	50	-

Note: All noise measurements must be undertaken in accordance with the *NSW Industrial Noise Policy* (INP). All measurement terms in the table have the same meaning as defined in the INP. Appendix 9 of the INP sets out the meteorological conditions under which this criterion applies.

- Noise Management Plan

The Applicant must prepare and implement a 'Noise Management Plan' for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but not be limited to, the following matters:
 - a) the identification of noise affected properties and sensitive receptors;

- b) a noise monitoring program that evaluates and reports on noise impacts at the identified sensitive receptors against the noise criteria;
- c) noise mitigation measures to be implemented consistent with Appendix D of the EIS; and
- d) details about the proposed response to criteria exceedances identified by the monitoring program.

Surface and ground water

- **Water Management Plan**

The Applicant must prepare and implement a 'Water Management Plan' for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but not be limited to, the following matters:
 - a) a technical description of how the contaminated process water tailings storage facility, contaminated stormwater structures and ore/overburden stockpile pads will be designed, constructed and managed to protect local and regional surface water and groundwater resources identified in the EIS;
 - b) a comprehensive groundwater and surface water quality and quantity monitoring program that evaluates and reports against the baseline data established in Appendices H, I, J, K and Q of the EIS;
 - c) the proposed response to adverse impacts identified by the monitoring programs; and
 - d) details about the strategy for the decommissioning of water management structures associated with the development and the measures employed to ensure the final landforms will minimise the potential for the pollution of waters.

- **Borefield Impact Management Plan**

The Applicant must prepare and implement a 'Borefield Impact Management Plan' for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but not be limited to, the following matters:
 - a) minimise harm to groundwaters and the environment by planning and co-ordinating the construction, commission, operation and de-commission of all groundwater bores;
 - b) identify all mitigation measures to protect the groundwater resource from borefield impacts;
 - c) identify how drilling fluids and muds will be managed;
 - d) develop a groundwater quality and quantity monitoring programme that evaluates and reports on the impacts of de-watering and re-injection of groundwater; and
 - e) include regular scheduled reviews of the monitoring results and develop response mechanisms where adverse impacts are identified.

Note – We recommend that DPE also require the NSW Office of Water to be consulted in the preparation of these plans.

Waste

• Waste Management Plan

The Applicant must prepare and implement a 'Waste Management Plan' for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but not be limited to, the following matters:
 - a) ensure that prior to disposal all waste is classified in accordance with the *NSW Waste Classification Guidelines* (EPA 2008);
 - b) generally meets the environmental goals listed in *Environmental Guidelines: Solid Waste Landfills* (EPA 1996 – or the latest version);
 - c) comprehensive detail about the handling, storage and disposal of tailings and mining by-products and the management of tailings storage facilities;
 - d) the strategies and procedures for the management of drilling fluids and muds associated with groundwater well construction;
 - e) include the strategies for handling and storage of overburden and develop a strategy for blending Potential Acid Forming (PAF) and Non Acid Forming (NAF) overburden material and describe how this will be incorporated into the protocol for disposal of overburden in the void; and
 - f) integrate waste monitoring and management with rehabilitation and closure plans.

• Acid Metalliferous Drainage Plan

The Applicant must prepare and implement an 'Acid Metalliferous Management Plan' (AMD) for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but not be limited to, the following matters:
 - a) co-ordinate effective site wide management of AMD issues associated with the development;
 - b) detail AMD management strategies that encompass construction, operation and post-closure phases of the development;
 - c) include procedures for material characterisation, classification, segregation, handling, stockpiling and leachate management;
 - d) investigate blending options for AMD and PAF material, and develop blending methods and operating protocols for materials management;
 - e) incorporate monitoring requirements for each phase including geological, geochemical, water quality and water level monitoring and seepage flow rates; and
 - f) integrate AMD monitoring and management with waste, rehabilitation and closure plans.

Note – We recommend that DPE also require the NSW Office of Water to be consulted in the preparation of this plan.

• Radiation Waste Management Plan

The Applicant must prepare and implement a 'Radiation Waste Management Plan' for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but not be limited to, the following matters:

- a) consider the requirements of the *NSW Radiation Control Act 1990*, *NSW Protection of the Environment Operations (Waste) Regulation 2014* and be consistent with the *Code of Practice and Safety Guide on Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing* (ARPANSA 2005);
- b) classify the nature of the wastes, including the radionuclide content and their physical and chemical states;
- c) describe how radiation waste will be managed and disposed, based on discussion about the environment into which the waste is discharged, estimated radiation doses, the potential escape pathways and impacts;
- d) develop a monitoring programme that reviews and revises the disposal of radiation waste; and
- e) integrate radiation waste monitoring and management with waste, rehabilitation and closure plans.

Environmental Management

- **Environmental Management Strategy**

The Applicant must prepare and implement an 'Environmental Management Strategy' for the development to the satisfaction of the Secretary, and prior to any construction works. This plan must -

- (i) be prepared in consultation with the EPA; and
- (ii) include, but is not limited to, the following matters:
 - a) provide the strategic framework for environmental management of the development;
 - b) identify and manage the statutory approvals that apply to the development;
 - c) identify and manage the strategies, plans and programs approved under the conditions of this consent;
 - d) identify and implement all the monitoring requirements to be undertaken under the conditions of this consent and statutory approvals that apply to the development;
 - e) identify and implement all legislative requirements of the development;
 - f) describe the roles and responsibilities, authority and accountability of all key personnel involved in the environmental management of the development;
 - g) develop a complaints register with response mechanisms and dispute resolution procedures; and
 - h) develop emergency and pollution response management plans.

ATTACHMENT 'B'

Proposal

Iluka Resources Limited (Iluka) proposes to develop and operate a mineral sands mine known as the Balranald Mineral Sands Project over a 15 year period. The project area totals 9,964 hectares and there are two deposits known as 'West Balranald' which commences 12 kilometres north-west of the town of Balranald and continues 20 kilometres to the north-west. The 'Nepean' deposit commences 66 kilometres north-west of Balranald runs in that direction for a further 12 kilometres.

The mineral sand resource is estimated at 15.8 mega tonnes and is located between 40 metres and 80 metres below ground level and within the upper groundwater aquifer. The resource is proposed to be accessed by traditional truck and shovel methods by de-watering the strike area and re-injecting groundwater into a borefield site away from the mine void.

Ore will be processed on-site and further processing will occur after transport of heavy mineral concentrate to a processing plant in Hamilton (VIC). Processing by-products may be returned for disposal in the mine void after blending with overburden stockpiles. Both the by-products and some portions of the overburden contain radioactive characteristics which need to be managed in conjunction with saline and potentially acid forming properties of the overburden.

Iluka have submitted a development application with the Department of Planning and Environment (DPE) for the project which is supported by an Environmental Impact Statement (EIS) titled "Balranald Mineral Sands Project" prepared by EMGA Mitchell McLennan Pty Limited and dated May 2015. The Environment Protection Authority (EPA) has reviewed the EIS consistent with our responsibilities for pollution control and environmental management under the *Protection of the Environment Operations Act 1997*. The following advice is our assessment of the EIS and provides justification for our recommended conditions of consent.

Access to project area

The EPA notes that the EIS refers to the Exploration Licence (EL) that currently sits over the West Balranald and Nepean deposits and that there is no reference to an existing mining lease for the proposed project area. We also note that the proposed borefield re-injection locations are outside the EL and residential dwellings and rural properties are in and around the project area.

The EPA expects that DPE will ensure that prior to any development consent being issued for this development that Iluka have legal access to the project area through formally executed written documents and/or appropriate statutory instruments being issued. The EPA also expects that affected landholders are adequately compensated for the impacts suffered from this proposal.

Air Quality

The primary concern for this development in terms of air quality is the potential for impacts from dust and associated airborne particulates generated from construction works, sand mining, heavy vehicle movements and stockpiling of overburden.

The methodology used in the EIS to assess the potential impacts from the project is generally consistent with the EPA's guideline the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW' (EPA 2005). CALMET meteorological modelling and AERMOD dispersion modelling software is used in the Air Quality and Greenhouse Gas Assessment which are accepted by the EPA as appropriate modelling tools.

We note the nearest sensitive receptor (uninhabited residential premises – identified as R5) to mining activities is about 5 kilometres from the proposed West Balranald sand mine. Cumulative impacts from particulate matter less than 10 micro metres in aerodynamic equivalent diameter (PM₁₀) can potentially exceed the 24 hour averaging criteria in Year 4 at one receiver known as R5 (using a statistical evaluation implemented for the 24-hour PM₁₀). However ambient background dust levels contribute to the potential exceedence and the EPA expects receiver R5 to be offered acquisition or mitigation rights as part of any development consent in accordance with DPE's Voluntary Land Acquisition & Mitigation Policy (noise).

To assess the actual impacts of the development against the predicted impacts, the EPA recommends conditions are imposed that require the proponent to prepare an 'Air Quality Monitoring Plan' (AQMP). We expect dust mitigation measures and dust monitoring to be included in the AQMP and implemented at the mine.

Noise

The Noise Assessment for the project prepared by EMGA Mitchell McLennan and dated 1 May 2015 was completed generally in accordance with our Industrial Noise Policy (INP - EPA 2000).

The noise modelling methodology employs the Bruel Kjaer Predictor Version 8.14 predictive software, which is an acceptable modelling tool. As expected the background noise levels are assigned the minimum 30 dB(A) (L_{Aeq} 15 minute) criteria consistent with the INP and the project specific noise criteria for the mine is determined at 35 dB(A) (L_{Aeq} 15 minute).

The modelling predicted that noise impacts from plant and vehicle movements associated within the project area will unreasonably impact some sensitive receptors and the EPA expects these receptors (identified at 6.2 & 6.3 of Appendix D of the EIS) to be compensated in accordance with DPE's Voluntary Land Acquisition & Mitigation Policy.

On the haul route between West Balranald and Nepean a sensitive receptor (residential premise – identified as R13) is located about 1 kilometre away from the road and this receptor is predicted to suffer short term impacts from road construction above the Interim Construction Noise Guidelines outside of normal daytime construction hours. The EPA expects this receptor to be appropriately compensated or the impacts mitigated for this exceedence.

To ensure the impacts of the development meet the modelled predictions and that no sensitive receptors on privately owned land are unreasonably impacted from the project, we have recommended noise limit conditions are placed in the development consent and a noise monitoring programme is developed.

Ground and Surface Water

The Balranald mineral sands project is a dry sand mining proposal utilising conventional mobile equipment. The West Balranald deposit is located in the Loxton Parilla Sands (LPS) formation and predominantly below the existing regional groundwater table.

Up to a maximum of 22,400 mega litres (in year 4) each year will be extracted from the LPS formation in the project area via de-watering bores, to permit the dry mining process. Extraction bores will result in some drawdown (2 metres) up to 5 kilometres from the mined areas. Re-injection of all the de-watered groundwater is proposed back into the LPS via a large re-injection borefield. Initially during construction excess extracted groundwater from the LPS is proposed to be stored in dams prior to re-injection.

The key risk for the EPA from this process is an adverse impact on the groundwater quality from iron sulphides oxidation. There is potential for localised vertical mixing between the LPS and the Shepparton formation and whilst water chemistry is similar, both units should be protected from pollution impacts from the development and consistent with the *NSW Aquifer Interference Policy*.

As part of the EIS a groundwater model was developed to simulate groundwater management during and after mining operations. The model used hydrogeological data from the existing network of groundwater quality and level monitoring bores that have been located across the project area and sampled quarterly since 2013. It is proposed that this network will continue to be used for this purpose during the life of the development to assess trends, verify model predictions and assess the degree of inter-aquifer mixing, and primarily to enable early detection of any change in groundwater quality or contamination.

There are no permanent surface water courses or features within the proposed mining impact areas and no surface water users. The key feature is the ephemeral Box Creek which has no defined beds and flow only occurs after heavy local rainfall which drains into terminal dry lakes or depressions. There is little evidence of re-charge to groundwater from these events and it is understood this is due to primarily low permeability of soils and evaporation.

The West Balranald mine project area totals <1% of the Box Creek catchment area and based on proposed surface water management measures (primarily capturing and containing contaminated water and directing clean rainfall runoff away from the mine path) and the proposed rehabilitation and final landforms, the EPA expects the development to have minor short term impacts and negligible long term impacts on local and regional surface water flows and quality. The Nepean mine project area is elevated on the western boundary of the Box Creek catchment area and is likely to have no measureable impact on surface waters.

Our assessment is that there is a moderate risk to groundwater and low risk to surface waters from the development and the EPA has recommended conditions for a ground and surface water management plan to be developed which incorporates mitigation measures proposed in the EIS and relative risk based ground and surface water monitoring programmes to be implemented.

Waste

Wastes generated by this development include drilling muds, de-watered groundwater, overburden, on site tailings and mining by-products and further processed by-products which may be back-loaded from the Iluka mineral separation plant in Hamilton (VIC).

All wastes present a risk of contamination to land and/or ground and surface waters. In particular, portions of the overburden taken from below the regional groundwater level have saline and potentially acid forming (PAF) geochemical properties and the mineral ore by-products have radiation properties which require specific management, monitoring and disposal methods.

The classification of the saline, PAF and radiation affected wastes has been thorough and in accordance with various guidelines which govern the assessment methodology. All wastes are proposed to be disposed on-site and various mitigation measures to protect the environment are proposed, including containment and treatment where there is potential for contaminants to migrate away from their storage or disposal location. However specific detail on some of the actual treatments does not appear to be presented and further investigation is recommended in the EIS. For example mining by-products radiation material is proposed to be blended with overburden and placed in the void behind the advancing mine, but final blending materials, volumes and rates are either unknown or not given.

Whilst experience with mineral sand mining in the region has demonstrated the waste management proposals are feasible the EPA has recommended that a 'Waste Management Plan', an 'Acid Metalliferous Drainage Plan' and a 'Radiation Waste Management Plan' are developed to ensure the assessment, handling, storage, transport, disposal and ongoing monitoring of the relevant wastes is finalised and has all relevant approvals prior to the construction and operation of the mine. The EPA will review these plans prior to implementation to ensure they are comprehensive, robust and harm to the environment is minimised.