

MURRAY DARLING BASIN MINERAL SANDS OPERATIONS SECTION 75W MODIFICATIONS

DA 345-11-01 Mod 3 (Broken Hill Mineral Separation Plant)
DA 251-09-01 Mod 10 (Ginkgo Mine)
MP 06_0168 Mod 4 (Snapper Mine)

1. BACKGROUND

1.1 Murray Darling Basin Operations

Cristal Mining Australia Limited (Cristal) has extensive mineral sands mining and processing operations in the Murray Darling Basin (see Figure 1). The operations include:

- the Ginkgo mine, which is located about 170 kilometres to the south of Broken Hill;
- the Snapper mine, which is located near the Ginkgo mine;
- the approved Atlas-Campaspe mine, which is located about 80 kilometres to the north of Balranald; and
- a Mineral Separation Plant on the south western outskirts of Broken Hill.

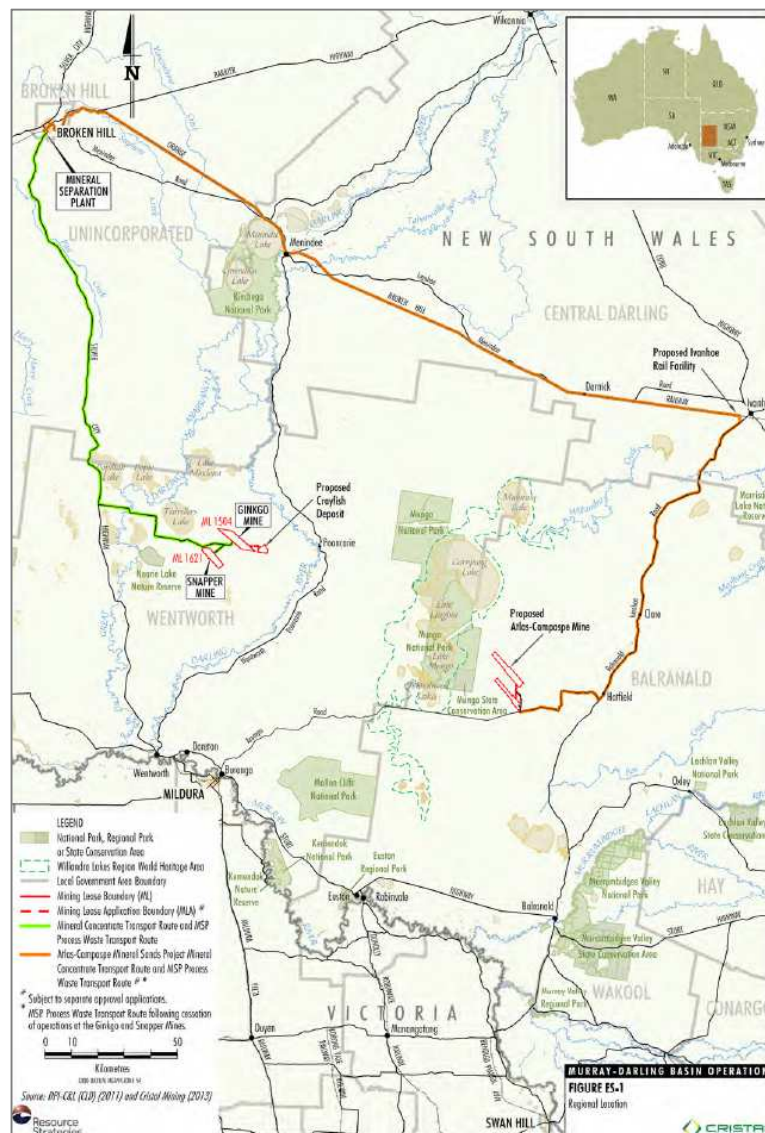


Figure 1: Regional Context

At this stage mineral sands are extracted from the Ginkgo and Snapper mines. This ore is then processed at the mine sites before being trucked to the Mineral Separation Plant (MSP) in Broken Hill for further processing. Mineral concentrates are then railed to South Australia and processing waste is returned to the mine sites by truck for disposal and incorporation into the final landform of both mines.

In the future, mineral sands concentrate would also be sent to the MSP for further processing from Atlas-Campaspe mine (once it becomes operational). However, this concentrate would arrive by rail rather than by truck. The waste from processing this concentrate would initially be returned by truck to the Ginkgo and Snapper mines for disposal. Once these mines are rehabilitated, the waste from the MSP would be loaded onto trains and railed to the Ivanhoe Rail Facility before being trucked to the Atlas-Campaspe mine for disposal.

The Ginkgo and Snapper mines are currently approved to extract a combined total of 22.1 million tonnes per annum (tpa) of mineral sands ore. A maximum of 1.2 Mtpa of mineral concentrate can be produced from both these mines for further processing at the MSP.

The Atlas-Campaspe mine has approval to extract 7.2 million tpa of ore from the mine, and is able to transport a maximum of 450,000 tpa of mineral concentrate from the site

The MSP currently has approval to process up to 650,000 tpa of mineral concentrate from the Ginkgo and Snapper mines.

Cristal's current operations within the Murray Darling Basin employ a total of 274 people plus an additional 200 employees once the Atlas-Campaspe mine becomes operational.

1.2 Existing Approvals

The Ginkgo mine was approved by the Minister for Planning on 30 January 2002 under Part 4 of the EP&A Act. The consent allows the extraction of approximately 13 million tonnes per annum (Mtpa) of mineral sands ore to produce a maximum of 576,000 tpa of mineral sands concentrate over a period of 14 years. The mine was commissioned in 2005 and the approval has been modified on eight occasions. The Department is also currently assessing a separate, larger modification (Mod 9) for the development of an additional ore extraction area referred to as the Crayfish deposit. This modification has not yet been determined.

The Snapper mine was approved by the Minister for Planning on 28 July 2007 under Part 3A of the EP&A Act. The approval allows the extraction of approximately 9.1 Mtpa of mineral sands ore to produce a maximum of 450,000 tpa of mineral sands concentrate over a period of 18 years. The mine was commissioned in 2008 and the approval has been modified on three occasions.

The MSP was approved by the Minister for Planning on 27 May 2002 under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Since this time, the approval has been modified twice to allow the MSP to receive and process mineral sands concentrate from both the Ginkgo and Snapper mines. The MSP is approved for an operational life of 19 years and produces leucoxene, rutile, zircon, sulphate ilmenite and roasted ilmenite which are transported via rail to South Australia for export.

Cristal was also granted approval for the Atlas-Campaspe Mineral Sands Mine (Atlas-Campaspe mine) by the Executive Director, Development Assessment Systems & Approvals, as delegate for the Minister for Planning on 6 June 2014.

2. PROPOSED MODIFICATIONS

In November 2013, Cristal lodged three applications to modify its approvals for the:

- Broken Hill MSP;
- Ginkgo Mine; and
- Snapper Mine.

The need for the proposed modifications has arisen as a result of the Minister's approval of the Atlas-Campaspe mine as it would:

- allow concentrate from this project to be processed at the MSP; and
- allow the additional MSP process waste generated by the Atlas-Campaspe project to be emplaced at Snapper and Ginkgo mines for the first 12 years of the project, after which the waste material would be taken to the Atlas-Campaspe site for disposal.

In summary, the modifications involve:

- an increase in the capacity at the MSP from 650,000 tpa to 1.2 Mtpa;
- an increase in the life of the MSP by 7 years (i.e. from 2025 to 2032); and
- planning approval for the:
 - receipt of 450,000 tpa of concentrate from the Atlas-Campaspe project at the MSP;
 - receipt of any additional concentrate produced by the Ginkgo and Snapper mines; and
 - receipt of the additional waste material generated by the Atlas-Campaspe project at the Ginkgo and Snapper mines.

The existing MSP consent allows up to 300,000 tpa of waste to be transported and disposed of at the Ginkgo and Snapper mines. However, Cristal currently only transports around 180,000 tpa of waste from the MSP to the Ginkgo and Snapper mines. Cristal has advised that the additional waste generated by processing the concentrate from the Atlas-Campaspe project (i.e. up to 50,000 tpa) would not require any increase to the existing limit in the MSP consent.

The Atlas-Campaspe approval already provides for the transport and receipt of waste from the MSP once the Ginkgo and Snapper mines cease to operate (i.e. after 12 years).

The feed preparation, leucoxene and illmenite circuits at the MSP all have in-built capacity to process the increased volume of mineral concentrate and no upgrades would be required to these facilities to accommodate for the increased processing rate (i.e. from 650,000 tpa to 1.2 Mtpa).

The proposed modifications are described in detail in the consolidated Environmental Assessment (EA) (see Appendix A) and the key changes are summarised in Table 1 below.

Table 1: Summary of Proposed Modifications

PROJECT COMPONENT	EXISTING	PROPOSED
MSP		
Project life	<ul style="list-style-type: none"> • 19 years (i.e. to 2025) 	<ul style="list-style-type: none"> • 26 years (i.e. 2032)
Mineral concentrate processing rate	<ul style="list-style-type: none"> • 650,000 tpa • Processing concentrate from Snapper and Ginkgo mines 	<ul style="list-style-type: none"> • 1,200,000 tpa • Processing concentrate from Snapper, Ginkgo and <u>Atlas-Campaspe</u> mines
Mineral concentrate received by rail	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Receive 450,000 tpa of concentrate from the Atlas-Campaspe mine
MSP process waste	<ul style="list-style-type: none"> • Transport up to 300,000 tpa of MSP process waste to Ginkgo and Snapper mines via road for disposal • MSP process waste from processing of Ginkgo and Snapper mine mineral concentrate 	<ul style="list-style-type: none"> • No change to transport limit for MSP process waste • MSP process waste from processing of Ginkgo, Snapper and <u>Atlas-Campaspe</u> mine mineral concentrate
Processing fuel types	<ul style="list-style-type: none"> • Liquefied Petroleum Gas (LPG) • Brown coal briquettes • Black coal 	<ul style="list-style-type: none"> • Use of Liquefied Natural Gas (LNG) as an alternative to LPG • No change to other processing fuel types

PROJECT COMPONENT	EXISTING	PROPOSED
Mobile equipment	<ul style="list-style-type: none"> Front end loaders, integrated tool carrier, water truck and light vehicles 	<ul style="list-style-type: none"> Additional mobile equipment
Mineral product transport	<ul style="list-style-type: none"> 6 train movements per week Each train would transport approximately 3,200 t of mineral concentrate per train (50 wagons per train) 	<ul style="list-style-type: none"> No change to train movements Each train would transport approximately 6,400 t of mineral concentrate per train (100 wagons per train)
Ginkgo and Snapper Mines		
Process waste management	<ul style="list-style-type: none"> MSP process waste disposed of at Ginkgo and Snapper Mines MSP process waste from processing of Ginkgo and Snapper mine mineral concentrate 	<ul style="list-style-type: none"> No change MSP process waste from processing of Ginkgo, Snapper and <u>Atlas-Campaspe</u> mine mineral concentrate
Biodiversity offset	<ul style="list-style-type: none"> Total offset areas of 6,066 ha 	<ul style="list-style-type: none"> Minor change to reflect boundary refinements Total area of offsets would not change.

3. STATUTORY CONTEXT

3.1 Section 75W

The MSP and Ginkgo mine were approved under Part 4 of the EP&A Act. However, under Clause 8J(8)(c) of the *Environmental Planning and Assessment Regulation 2000*, section 75W of the EP&A Act (although repealed) continues to apply to any modification of a development consent which was granted by the Minister under Part 4 of the EP&A Act. Consequently, these modifications can be considered under Section 75W of the Act.

The Snapper mine was approved under the former Part 3A of the EP&A Act. Although Part 3A was repealed on 11 October 2011, the project remains a 'transitional Part 3A project' under Schedule 6A of the EP&A Act, and the proposed modification can also be considered under Section 75W of the Act.

The Department is satisfied that the applications can be characterised as modifications to the existing development consents/project approval (as modified) as the proposals would:

- not alter the mining, processing, operating hours or transportation methods;
- not alter the existing limits on the volume of waste material permitted to be transported and emplaced at the Ginkgo and Snapper mines;
- not alter the footprint of the MSP or the Ginkgo and Snapper mines; and
- not significantly increase the environmental impacts of the approved projects, as modified (see Section 5 below).

Given these considerations, the Department is satisfied that the proposed modifications are within the scope of Section 75W, and may be determined accordingly.

3.2 Approval Authority

Under Section 75W of the EP&A Act, the Minister for Planning is the approval authority for these modification applications. However, under the Minister's delegation, the Secretary of the Department of Planning & Environment may determine the three applications on behalf of the Minister as:

- no public submissions were received;
- Cristal has made no reportable political donations; and
- Wentworth Shire Council and Broken Hill City Council have not objected to the modifications.

3.3 Environmental Planning Instruments

The Department has considered the proposed modifications against the relevant environmental planning instruments, as well as Cristal's consideration of these instruments (see Section 6 of the EA). Based on its assessment of these instruments and consideration of the environmental impacts

of the proposals, the Department is satisfied that none of these instruments substantially govern the carrying out of the projects (as modified).

4. CONSULTATION

After receiving Cristal's applications and the associated EA, the Department:

- made the EA publically available from 20 November 2013 until the 13 December 2013;
- referred the EA to relevant government agencies for comment; and
- advertised the exhibition in the Broken Hill Barrier Daily Truth and the Mildura Sunraysia Daily newspapers.

The Department received a total of 5 submissions on the proposed modifications - all from government agencies. Broken Hill City Council and Wentworth Shire Council were consulted in regard to the proposed modifications, but neither Council made a submission.

No submissions from the general public or special interest groups were received.

A copy of the submissions is provided in Appendix B, and a summary of the issues raised in submissions is provided below.

The following comments and recommendations were provided by public authorities:

- the **Roads and Maritime Service (RMS)** did not object to the proposals and recommended that heavy vehicle movements be kept to a minimum;
- the **Environment Protection Authority (EPA)** supported the proposal and recommended draft conditions of approval regarding noise limits, operating noise conditions, construction noise and waste; and
- the **NSW Office of Water (NOW)** recommended that any additional water sources be confirmed and that existing management plans relating to waste management be reviewed and updated.

The Department has reviewed and updated the existing conditions that apply to the MSP and the mines to incorporate the recommendations made by public authorities.

The Office of Environment and Heritage (OEH), the Division of Resources and Energy (DRE) within the NSW Department of Trade and Investment, Regional Infrastructure and Service made submissions but did not raise any concerns.

Cristal submitted a response to the issues raised in submissions (see Appendix C). The response also included a slight revision to the boundaries of the Snapper and Ginkgo biodiversity offsets to reflect the boundaries of the relevant Western Lands Leases, and an air quality review for the proposed use of LNG instead of LPG.

5. ASSESSMENT

In assessing the merits of the applications, the Department has considered:

- the various environmental assessments for the original projects;
- the existing conditions of approval/consent;
- the EA for the modification, submissions and Response to Submissions;
- relevant environmental planning instruments, policies and guidelines; and
- the objects of the EP&A Act.

The findings of the Department's assessment are summarised below.

5.1 Transport

The Department has considered the potential road and rail transport impacts associated with:

- the transport of process waste from the MSP (including waste associated with processing of concentrate from Atlas-Campaspe mine) to Snapper and Ginkgo mines for disposal;
- the increase in the volume of product to be transported via rail from the MSP;
- impacts associated with additional fuel deliveries; and
- cumulative traffic impacts.

Road Transport

Concentrate is currently transported via double road trains along the approved transport route from the Gingko and Snapper mines to the MSP (see Figure 1). The waste material from the MSP is then back-loaded onto empty trucks that return to the mines via the approved haul route.

As mentioned above, the existing limit in the development consent for transporting waste from the MSP to the Gingko and Snapper mines is 300,000 tpa. However, the MSP is currently operating well below the approved process waste production rate (i.e. around 180,000 tpa). Hence, the additional MSP waste associated with the processing of concentrate from the Atlas-Campaspe mine could be comfortably accommodated within the existing approved limits.

Furthermore, the Department notes that the additional waste produced at the MSP would not increase the current truck movements on the haulage route. This is because the Gingko and Snapper mines produce up to 735,000 tpa of concentrate, and there are more than enough empty trucks available to cater for back-loading the additional waste from the MSP.

The increased throughput at the MSP would require an additional delivery of fuel each week. The traffic assessment in the EA considered the potential cumulative impacts associated with the construction of the nearby Broken Hill Solar Plant. However, given the minimal increase in traffic at the MSP, the Department does not believe there would be any potential for significant cumulative traffic impacts with the construction of the Solar Plant.

Finally, it is important to note that neither the RMS nor Broken Hill City Council objected to the proposed modification to the MSP. However, the RMS recommended that heavy vehicle movements be minimised as far as practicable. The Department believes that this would be achieved through the fact that the MSP waste material would be back-loaded onto empty trucks that would be returning to the mines irrespective of whether the modification to the MSP is approved.

Given the above, the Department is satisfied that there would be no additional traffic impacts beyond those already approved. Nonetheless, the Department has recommended a condition requiring Cristal to update the Transport Code of Conduct for the MSP, in consultation with Broken Hill City Council and the RMS to reflect changes associated with the modification.

Rail Transport

Cristal is proposing to double the volume of product transported by rail from the MSP to South Australia from 3,200 tonnes to 6,400 tonnes per train. However, because Cristal is proposing to increase the size of the trains from 50 to 100 wagons, there would be no increase in the frequency of trains (i.e. 6 movements per week).

Currently, the MSP only receives mineral concentrate via road from the Gingko and Snapper mines. However, under the Atlas-Campaspe project approval, Cristal can transport up to 450,000 tpa of mineral concentrate to the MSP by rail. The impacts on the rail network were assessed as part of the Atlas-Campaspe project, but the consent for the MSP must be modified to allow Cristal to receive this waste by rail.

The Department is satisfied that the proposed modification to the MSP consent would have no material impact on the rail network, and that by increasing the size of the trains, Cristal has effectively minimise any consequential impacts that may have occurred with a greater frequency of train movements.

5.2 Noise

Currently, the loading of trains with the MSP product only occurs during the day and evening. However, as a result of the additional concentrate from the Atlas-Campaspe project, Cristal is seeking approval to unload containerised concentrate at night using mobile equipment so that it can be stockpiled and processed in the MSP. Apart from this, there are no other alterations to the MSP that would increase the noise impacts of the facility.

A noise assessment of these changes was prepared by Renzo Tonin in accordance with the *NSW Industrial Noise Policy* (INP). The assessment used meteorological data from the Broken Hill airport weather station which showed that there was no prevailing wind condition, but that noise enhancing temperature inversions were a feature of the area.

Under calm conditions, the noise modelling indicated that there would be no exceedances of the project specific noise level (PSNL) of 35dB(A) $L_{Aeq15-min}$ at any time.

However, under temperature inversion conditions, modelling indicated that there would be a 4 dB(A) exceedance of the PSNL, and a 4 dB(A) exceedance of the sleep disturbance noise criteria of 45dB(A) $L_{Aeq1- minute}$, at one receiver (i.e. R3 – see Figure 2).

In its submission, the EPA recommended that:

- the noise limit at R3 under temperature inversion conditions should be 39dB(A) (instead of 35dB(A));
- compliance monitoring be undertaken at R3 within 12 months to ensure Cristal is complying with this limit; and
- that the landowner of R3 should be entitled to noise mitigation measures such as double glazed windows, insulation and air conditioning.

However, Cristal argued that if R3 was entitled to additional noise mitigation, the higher noise limit of 39 dB(A) should be applied at all times, rather than only during adverse weather conditions. Cristal argued that applying the lower noise limit of 35 dB(A) outside adverse weather conditions would complicate compliance and would not be consistent with contemporary regulatory practice.

The Department acknowledges Cristal's objections, but has adopted EPA's recommended approach in the modified conditions. Applying the higher limit (as suggested by Cristal) would not support the intent of the INP, which is to achieve appropriate amenity noise levels by avoiding 'noise creep' from other developments that may be established in the same area. Furthermore, because temperature inversions are a feature of the area (i.e. they occur more than 30% of the time). The Department believes it is reasonable, and consistent with the INP, to have a specific noise limit that only applies when these conditions occur.

Overall, the Department is satisfied that noise impacts associated with increased processing at the MSP can be appropriately managed, provided the recommended management measures are implemented. The Department has incorporated these measures into the modified conditions, including a requirement for Cristal to notify the owner of R3 that he/she is entitled to additional noise mitigation measures.

Finally, the Department is satisfied that there would be no additional noise impacts associated with the transportation and emplacement of the process waste at the Ginkgo and Snapper mines.

5.3 Hazards & Waste

Additional process waste would be generated at the MSP due to the processing of concentrate from the Atlas-Campaspe mine. The additional process waste is estimated to amount to approximately 50,000 tpa. As discussed in Section 5.1, this additional waste can be accommodated within the existing 300,000 tpa process waste production limit until mining ceases at the Ginkgo and Snapper mines in 2016 and 2025 respectively.

After this time, 50,000 tpa of process waste would be transported via road and rail to the Atlas-Campaspe mine for disposal. The transport and management of process waste to the Atlas-Campaspe mine after 2025 has been assessed and approved as part of the Atlas-Campaspe development consent.

The proposed modification would not result in a change to the classification of process waste to be transported to the Ginkgo and Snapper mines, and the waste would continue to be managed in accordance with the existing approvals and associated management plans. The EA also indicated that the proposed modifications would not require any changes to dangerous goods storage and management at the MSP, apart from one additional delivery of fuel per week (resulting in a total of only two deliveries per week).

Given the above, the Department is satisfied that the modification would result in negligible changes to the storage and transport of hazardous materials, and that potential impacts can be adequately managed in accordance with the existing conditions of consent/approval for the MSP, Snapper and Ginkgo mines.

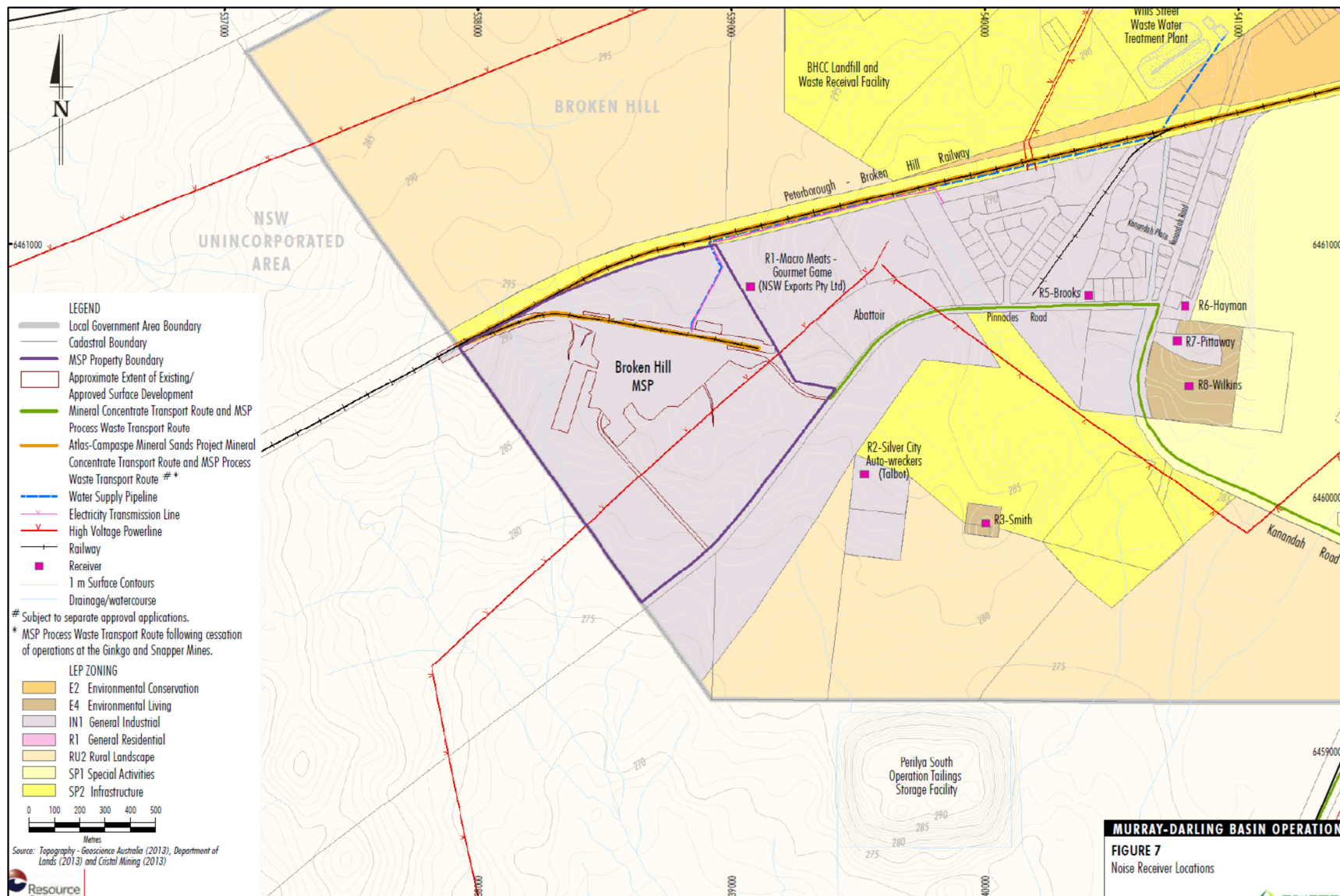


Figure 2: Receiver locations

5.4 Air Quality

An air quality assessment was prepared by Pacific Environment Limited generally in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*.

The modelling found that the modification would not cause any additional exceedances of any of the EPA's air quality criteria, including annual average PM₁₀, 24 hour PM₁₀, total suspended particulates (TSP) and nitrogen dioxide (NO_x) emissions.

The assessment also found that the estimated PM₁₀ and NO_x emissions from the combustion of LNG would be lower than those associated with LPG. Based on this, the Department is satisfied that LPG could be substituted for LNG with no additional air quality impacts.

No additional air quality impacts are anticipated at the Snapper and Ginkgo mines.

The EPA did not provide any recommended conditions of approval in regard to air quality. However, it advised that once the proposed processing circuits and associated stacks at the MSP are commissioned, it would amend the EPL for the site to incorporate any necessary additional air quality monitoring requirements.

As the modelling demonstrated that there would be no exceedances of air quality criteria at the MSP, the Department is satisfied that the modification would not result in any additional air quality impacts beyond those already approved. The Department has undertaken a review of the existing MSP approval and notes that no amendments are necessary to provide flexibility in the type of fuel used. Consequently, the Department has not made any changes to the existing conditions of approval in regard to air quality.

5.5 Offsets

Cristal manages two biodiversity offset areas for the Ginkgo and Snapper mines respectively. During a recent application to the Department of Primary Industries (DPI -Catchment and Lands) to secure the offset areas, DPI requested minor refinements to the offset boundaries in order to align them with the relevant Western Lands Leases.

The Department notes that the offset boundary refinements are very minor and would not change the overall area of either offset, which would remain at a total of 6,066 hectares. Accordingly, the Department has recommended that the development consent/approvals for the Ginkgo and Snapper mines be updated to include a figure that shows the revised biodiversity offset boundaries.

5.6 Other Issues

The Department has considered other potential impacts of the proposed modifications, and is satisfied that none of these issues would result in any material change to the impacts associated with the existing projects. Consequently, the Department is satisfied that no further changes to the existing conditions of approval/consent are warranted.

6. RECOMMENDED CONDITIONS

The Department has recommended notices of modification (see Appendix D) for the proposed modifications as well as consolidated versions of the development consents/project approval as modified (see Appendix E).

In summary, the majority of the recommended changes relate to the MSP, although the Department has also made minor amendments to the Snapper and Ginkgo approval/consents to provide planning approval to receive the process waste from the Atlas-Campaspe mine.

Cristal has reviewed the recommended development consents/project approvals, and has raised no objections.

7. CONCLUSION

The Department has assessed the modification applications and associated EA in accordance with the relevant requirements of the EP&A Act. Based on this assessment, the Department is satisfied that the proposed modifications would not result in any material increase in the environment impacts of the Snapper and Ginkgo mines.

At the MSP, there would be an increase to the noise levels at one residential receiver near the MSP. However the Department has recommended that Cristal be required to install appropriate noise mitigation measures at the request of the landowner and undertake noise monitoring at this residence to demonstrate compliance with the EPA's recommended noise limits.

Importantly, Cristal employs 274 people at its current operations at the MSP, Ginkgo and Snapper mines. The proposed modifications would allow the MSP to process the mineral concentrate from the Atlas-Campaspe mine, with this project resulting in a range of substantial economic and social benefits including the employment of 200 people once it is operational. The increase in throughput at the MSP would also maximise productivity of Cristal's existing mining operations at Ginkgo and Snapper.

Overall, the Department is satisfied that the benefits of the proposed modifications substantially outweigh any residual impacts. Consequently, the Department believes that the proposed modifications are in the public interest, and should be approved, subject to conditions.

8. RECOMMENDATION

It is RECOMMENDED that the Secretary, as a delegate to the Minister for Planning:

- **consider** the findings and recommendations of this report;
- **determine** that the proposed modifications are within the scope of Section 75W of the EP&A Act;
- **approve** the application to modify the project approval/development consents, subject to conditions, under Section 75W of the EP&A Act; and
- **sign** the attached notices of modification (Appendix D).


Mike Young
Manager
Mining Projects
17.10.14


David Kitto
A/Executive Director
Resource Assessments
20/10/14

APPENDIX A: ENVIRONMENTAL ASSESSMENT

The EA can be viewed on the Department's website at the following links:

Ginkgo Mine

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6269

Snapper Mine

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6252

Broken Hill MSP

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6270

APPENDIX B: SUBMISSIONS

The submissions can be viewed on the Department's website at the following links:

Ginkgo Mine

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6269

Snapper Mine

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6252

Broken Hill MSP

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6270

APPENDIX C: RESPONSE TO SUBMISSIONS

The Response to Submissions can be viewed on the Department's website at the following links:

Ginkgo Mine

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6269

Snapper Mine

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6252

Broken Hill MSP

- http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6270

APPENDIX D: NOTICES OF MODIFICATION

APPENDIX E: CONSOLIDATED PROJECT APPROVALS