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30 April 2009

The Director-General
c/- Executive Director of Major Project Assessments
Department of Planning
The Western Gallery
Level 4, 23-33 Bridge Street
SYDNEY NSW 2000

Attention: Mr Chris Wilson

Dear Mr Wilson

RE: SNAPPER MINERAL SANDS MINE – OFFSET MODIFICATION

Please find enclosed BEMAX Resources Limited's (BEMAX's) request to modify the approved Snapper Mineral Sands Mine (the Snapper Mine) (Attachment A).

The enclosed Environmental Assessment (EA) (Attachment B) has been prepared in support of the modification request and sets out the details of the proposed modification which is sought and an assessment of the potential environmental impact implications of the proposed modification.

BEMAX requests that the Minister for Planning approve the proposed modification under Section 75W of the *Environmental Planning and Assessment Act, 1979*.

Please do not hesitate to contact me on (08) 8080 0835 if you have any queries.

Yours sincerely,

Greg Lamb
Senior Environmental Advisor

ATTACHMENT A

REQUEST TO MODIFY A MAJOR PROJECT FORM

Request to modify a major project

NSW GOVERNMENT
Department of Planning

Date duly made: ____/____/____ Modification No. _____

1. Before you lodge

This form is required under section 75W of the *Environmental Planning and Assessment Act 1979* (the Act) in order to request the Minister to modify the Minister's approval to carry out a project or concept plan to which Part 3A of the Act applies.

Before making this request, it is recommended that you first consult with the Department of Planning (the Department) concerning your modification. The Director-General may issue environmental assessment requirements that must be complied with before your request will be considered by the Minister.
If the changes proposed by the modification will result in a project that is consistent with the existing approval, the Minister's approval for a modification is not required.

Disclosure Statement
Persons making a request to modify a project or concept plan are required to declare reportable political donations (including donations of or more than $1,000) made in the previous two years.

Note: For more details about political donations disclosure requirements, including a disclosure form, go to **www.planning.nsw.gov.au/donations.**

Lodgement
All modification requests must be lodged with the Director-General of the Department of Planning, by courier or mail. An electronic copy should also be e-mailed to the assessment contact officer assigned to the project.

NSW Department of Planning
Ground floor, 23-33 Bridge Street, SYDNEY NSW 2000
GPO Box 39 SYDNEY NSW 2001
Phone 1300 305 695

2. Details of the proponent

Company/organisation/agency: BEMAX Resources Limited
ABN: 60009247858

☒ Mr ☐ Ms ☐ Mrs ☐ Dr ☐ Other

First name: Gavin
Family name: Swart

Position: Operations Manager

STREET ADDRESS

Unit/street no.: 138
Street name: Pinnacles Road

Suburb or town: Broken Hill
State: NSW
Postcode: 2880

POSTAL ADDRESS (or mark 'as above')

PO Box 444

Suburb or town: Broken Hill
State: NSW
Postcode: 2880

Daytime telephone: (08) 8080 0800
Fax: (08) 8080 0888
Mobile: 0429 727 326

Email: greg.lamb@bemax.com.au

3. Identify the land

STREET ADDRESS (where relevant)

Unit/street no.

Street or property name: Nob Road

Suburb, town or locality: via Pooncarie, NSW

Postcode: 2648

Local government area(s): Wentworth Shire

State Electorate(s): Murray-Darling

REAL PROPERTY DESCRIPTION

Refer to Figure 2 of the attached EA.

Note: The real property description is found on a map of the land or on the title documents for the land. If you are unsure of the real property description, you should contact the Department of Lands.

Please ensure that you place a slash (/) to distinguish between the lot, section, DP and strata numbers. If the proposed modification applies to more than one piece of land, please use a comma to distinguish between each real property description.

OR: detailed description of land attached: ☐

MAP: A map of the site and locality should also be submitted with this request.

4. Details of the original major project or concept plan

Briefly describe what the original approval allows

Development and operation of a mineral sands mine and associated facilities/infrastructure.

What was the original project application no.?: 06_0168

What was the date of the approval?: 28 August 2007

What was the original application fee?

Note: Clause 245K of the *Environmental Planning and Assessment Regulation 2000* provides information on calculating the maximum fee for a request for modification.

5. Describe the modification you propose to make to the approval

Describe the proposed modification

The proposed modification is referred to as the Snapper Mineral Sands Mine Offset Modification and is described in the attached Environmental Assessment.

Your modification request may need to be accompanied by an Environmental Assessment, including plans. An electronic and hard copy of this document will be required.

ESTIMATED CAPITAL INVESTMENT VALUE

Please indicate the estimated capital investment value (CIV) of the modification to the project approval or concept plan (excluding GST).

$

FULL TIME EQUIVALENT JOBS

Please indicate the number of jobs created by the proposed modification. This should be expressed as a proportion of full time equivalent (FTE) jobs over a full year.

Construction jobs (FTE) N/A

Operational jobs (FTE) N/A

6. Landowner's consent (where required)

As the owner(s) of the above property, I/we consent to this request being made by the proponent:

Land

Signature

Name

Date

Land

Signature

Name

Date

Note: Under Clause 8F of the *Environmental Planning and Assessment Regulation 2000* (the Regulation), certain applications for approval under Part 3A of the Act do not require consent of the landowner, however, the proponent is required to give notice of the application (e.g. linear infrastructure, mining & petroleum projects, and critical infrastructure).

7. Political donation disclosure statement

Persons making a request to modify a project or concept plan are required to declare reportable political donations (including donations of or more than $1,000) made in the previous two years.

Have you attached a disclosure statement to this request?

☐ Yes

☒ No

Note: For more details about political donations disclosure requirements, including a disclosure form, go to **www.planning.nsw.gov.au/donations**.

8. Proponent's signature

As the proponent(s) of the project and in signing below, I/we hereby:

- provide a description of the modification to the project approval or concept plan and address all matters required by the Director-General pursuant to Section 75W of the Act, and
- declare that all information contained within this form is accurate at the time of signing.

Signature

Name

GAVIN SWANS

Date

30/04/2009

In what capacity are you signing if you are not the proponent

Name, if you are not the proponent

ATTACHMENT B

SNAPPER MINERAL SANDS MINE
OFFSET MODIFICATION
ENVIRONMENTAL ASSESSMENT

SNAPPER MINERAL SANDS MINE
OFFSET MODIFICATION
ENVIRONMENTAL ASSESSMENT

APRIL 2009
Document No. EA - B
ID: 00278992.doc

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1 BACKGROUND

The Snapper Mineral Sands Mine (the Snapper Mine) was granted Project Approval under Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) by the New South Wales (NSW) Minister for Planning on 28 August 2007. BEMAX Resources Limited (BEMAX) is the proponent of the Snapper Mine. The Snapper Mine is located in far western NSW, approximately 10 kilometres (km) to the south-west of BEMAX's Ginkgo Mineral Sands Project (the Ginkgo Mine) and approximately 170 km south of BEMAX's other operation in the region, the Broken Hill Mineral Separation Plant (the MSP) (Figure 1). The Snapper Mine is described in the *Snapper Mineral Sands Project Environmental Assessment* (2007 EA) (BEMAX, 2007a).

BEMAX has made a request (Modification Request) to the Minister for Planning under Section 75W of the EP&A Act to modify Appendix 2, Appendix 3 and Statement of Commitment 4 (SOC 4) of Appendix 4 of the Project Approval. This Environmental Assessment (EA) has been prepared in support of the Modification Request and sets out the details of the proposed modification which is sought and an assessment of the potential environmental impact implications of the proposed modification.

2 PROPOSED AMENDMENTS TO THE PROJECT APPROVAL

SOC 4 of Appendix 4 of the Project Approval states:

A Flora and Fauna Offset will be implemented in the offset area (see Appendix 2). This offset area will:

(a) include an enhancement area and revegetation area (see table below): and

Area	***Description***	***Size (ha)***
Enhancement Area	*Enhancement of existing areas of native vegetation communities through natural regeneration and management for conservation.*	*5,870*
Revegetation Area	*Re-establishment of woodland in cleared cultivated paddocks by selective planting.*	*940*
	Total Minimum Area Conserved	*6,810*

Note: The offset shall be in addition to, and outside, the rehabilitated areas of the project disturbance area.

(b) contain the following vegetation communities:

- *Black Oak-Rosewood-Wilga Woodland;*
- *Chenopod Mallee Woodland/Shrubland;*
- *Bluebush Shrubland; and*
- *Austrostipa Grassland.*

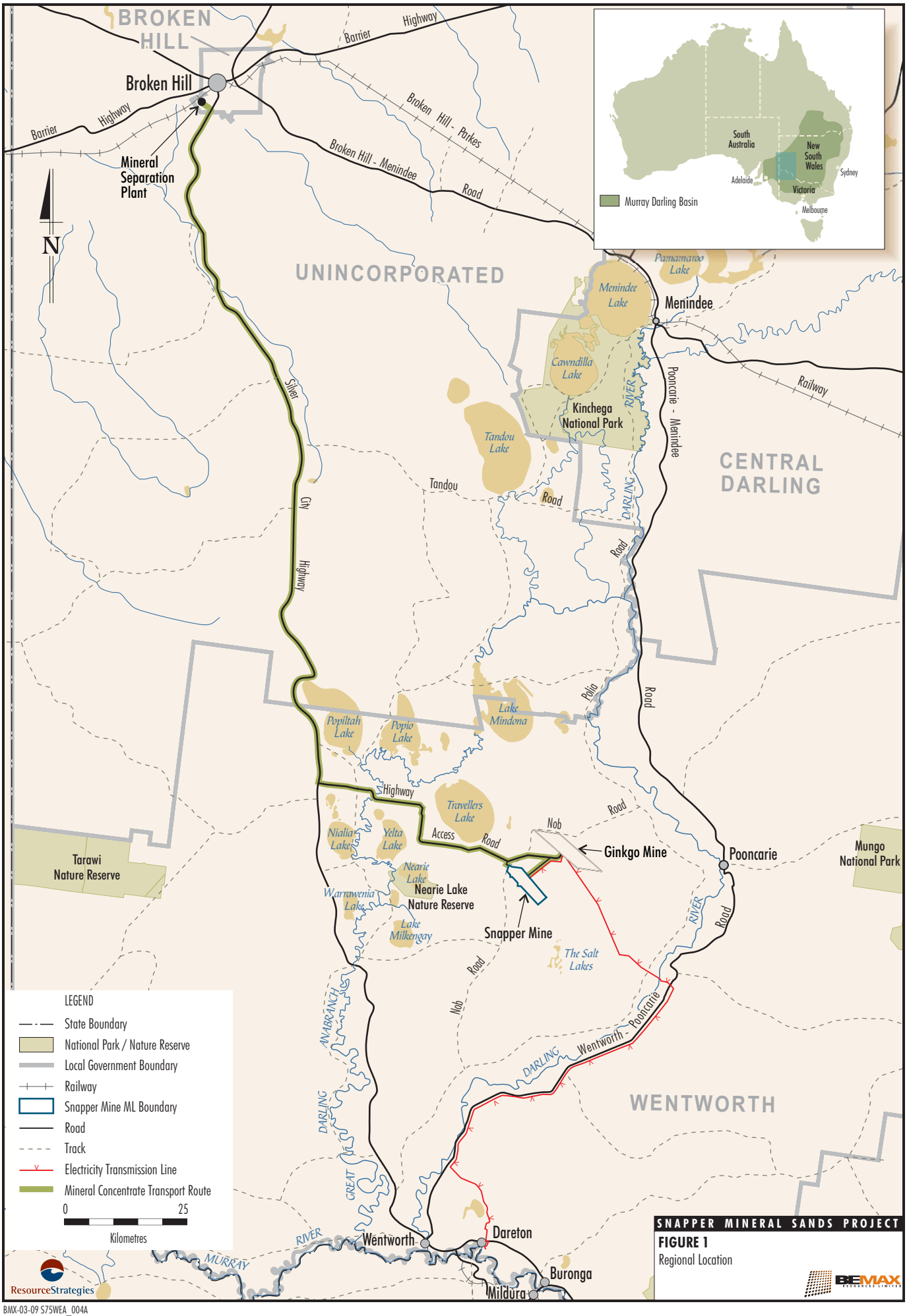
BEMAX propose the following modification of SOC 4 of Appendix 4 of the Project Approval (as underlined):

A Flora and Fauna Offset will be implemented in the offset area (see Appendix 2). This offset area will:

(a) include an enhancement area (see table below): and

Area	***Description***	***Size (ha)***
Enhancement Area	*Enhancement of existing areas of native vegetation communities through natural regeneration and management for conservation.*	*<u>5,216</u>*
	Total Minimum Area Conserved	*<u>5,216</u>*

Note: The offset shall be in addition to, and outside, the rehabilitated areas of the project disturbance area.



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(b) contain the following vegetation communities:

- *Black Oak-Rosewood-Wilga Woodland;*
- *Chenopod Mallee Woodland/Shrubland;*
- *Bluebush Shrubland; and*
- *Austrostipa Grassland.*

Appendix 2 of the Project Approval provides a figure showing the regional location of the Snapper Mine, including the offset area. BEMAX propose the replacement of Appendix 2 with the figure provided in Attachment 1 of this EA.

Appendix 3 of the Project Approval provides a figure showing the general layout of the Snapper Mine, including the offset area. BEMAX propose the replacement of Appendix 3 with the figure provided in Attachment 2 of this EA.

BEMAX propose the removal of Condition 18 (Offset Bond) of Schedule 3 of the Project Approval.

Condition 8 of Schedule 4 of the Project Approval states:

> *Within three months of submitting the audit report to the Director-General, the Proponent shall review, and if necessary revise the*
>
> *(a) strategies/plans/programs required under this approval;*
>
> *(b) Flora and Fauna Offset Bond,*
>
> *to the satisfaction of the Director-General.*

BEMAX propose the following modification of Condition 8 of Schedule 4 of the Project Approval:

> *Within three months of submitting the audit report to the Director-General, the Proponent shall review, and if necessary revise the strategies/plans/programs required under this approval to the satisfaction of the Director-General.*

3 REASONS FOR THE MODIFICATION REQUEST

Approved Snapper Mine Offset Area

The Project Approval and Statement of Commitments include a commitment for BEMAX to implement a flora and fauna offset for the Snapper Mine (Section 2).

The approved Snapper Mine offset area is described in the *Snapper and Ginkgo Mines Offset Management Plan* (Offset Management Plan) (BEMAX, 2007b), prepared in accordance with Project Approval Condition 17.

The approved Snapper Mine offset area is located adjacent to the Snapper Mine and approximately 10 km south-west of the Ginkgo Mine. It is located on the Trelega Property within Western Lands Leases, which are leased to BEMAX. The BEMAX-held Trelega Property Western Lands Leases are all perpetual leases which include conditions for grazing purposes.

As discussed during consultation with the NSW Department of Environment and Climate Change (DECC) (pers. comm., 8 November 2007), the objectives of the offset are as follows:

- secure the tenure of the offset area for long-term conservation purposes;
- enhance flora and fauna habitats within the offset area;
- establish native vegetation characteristic of a woodland in cleared cultivated paddocks; and
- implement the offset under the conditions of the Western Lands Lease and requirements of the *Native Vegetation Act, 2003*.

Modified Snapper Mine Offset Area

BEMAX has conducted a mineral resource sterilisation drilling programme[1] in an area of the Trelega property between the Ginkgo and Snapper Mines since the approval of the Snapper Mine offset area. The tenure of this area comprises Western Lands Leases currently held by BEMAX. An alternative to part of the approved Snapper Mine offset area has been identified in this area (i.e. proposed modified Offset Area 2 – Figures 2 and 3) which, in addition to being available from a mineral resource perspective, is also considered to have more attractive ecological attributes than the approved Snapper Mine offset. The modified Snapper Mine offset area would include the modified Offset Area 2 (Figure 3) and the retained existing Snapper-proportion of the approved Offset Area 1[2] (Figure 4).

The modified Snapper Mine offset area would allow the objectives of the offset to be met, whilst providing for several advantages over the approved Snapper Mine offset (detailed in Sections 4 and 5). In particular, the majority of the modified Snapper Mine offset is considered to be in good to moderate condition and does not contain any areas of cleared land that would require revegetation, thereby removing any uncertainty associated with the performance of revegetation. The DECC have been consulted with respect to the modified Snapper Mine offset area and have provided in-principle support for the proposed modification.

The proposed modification has been lodged in order that BEMAX can better manage the potential environmental impacts of the Snapper Mine by providing for an offset area that has more attractive ecological attributes than the approved Snapper Mine offset.

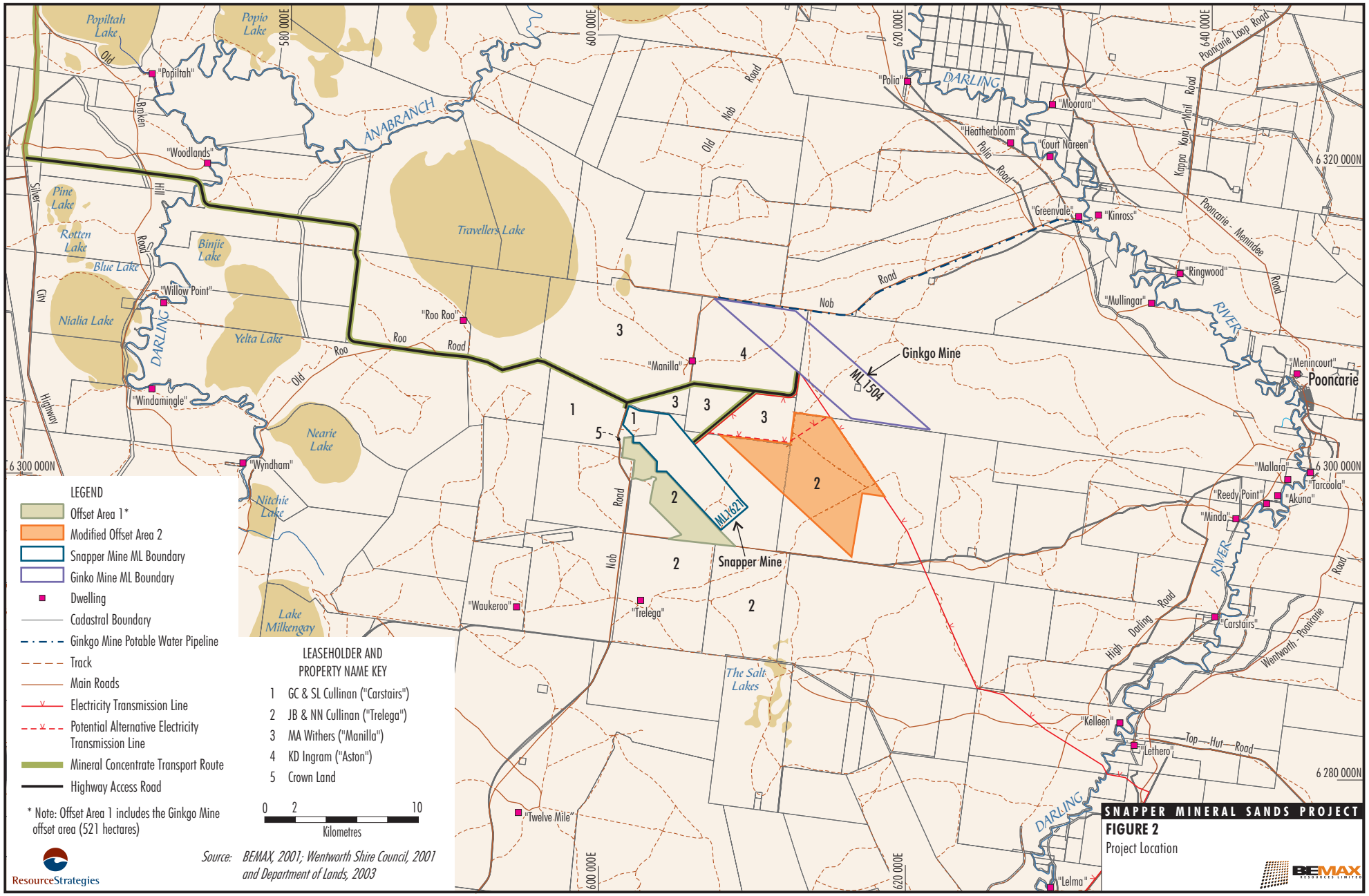
4 DESCRIPTION OF THE PROPOSED MODIFICATION

This section describes the proposed modification (i.e. the modified Snapper Mine) and provides a comparison with the Snapper Mine as approved on 28 August 2007 (i.e. the approved Snapper Mine).

Table 1 provides a summary comparison of the approved and modified Snapper Mine. The modified Snapper Mine includes the modified Snapper Mine offset area (including Offset Areas 1 and 2) as shown on Figure 2.

[1] The objective of the sterilisation programme was to identify areas which do not contain economically-recoverable minerals.

[2] The existing Offset Area 1 has an area of 1,579 hectares (ha). This includes 521 ha which represents the approved Ginkgo Mine offset and 1,058 ha which represents part of the approved Snapper Mine offset.



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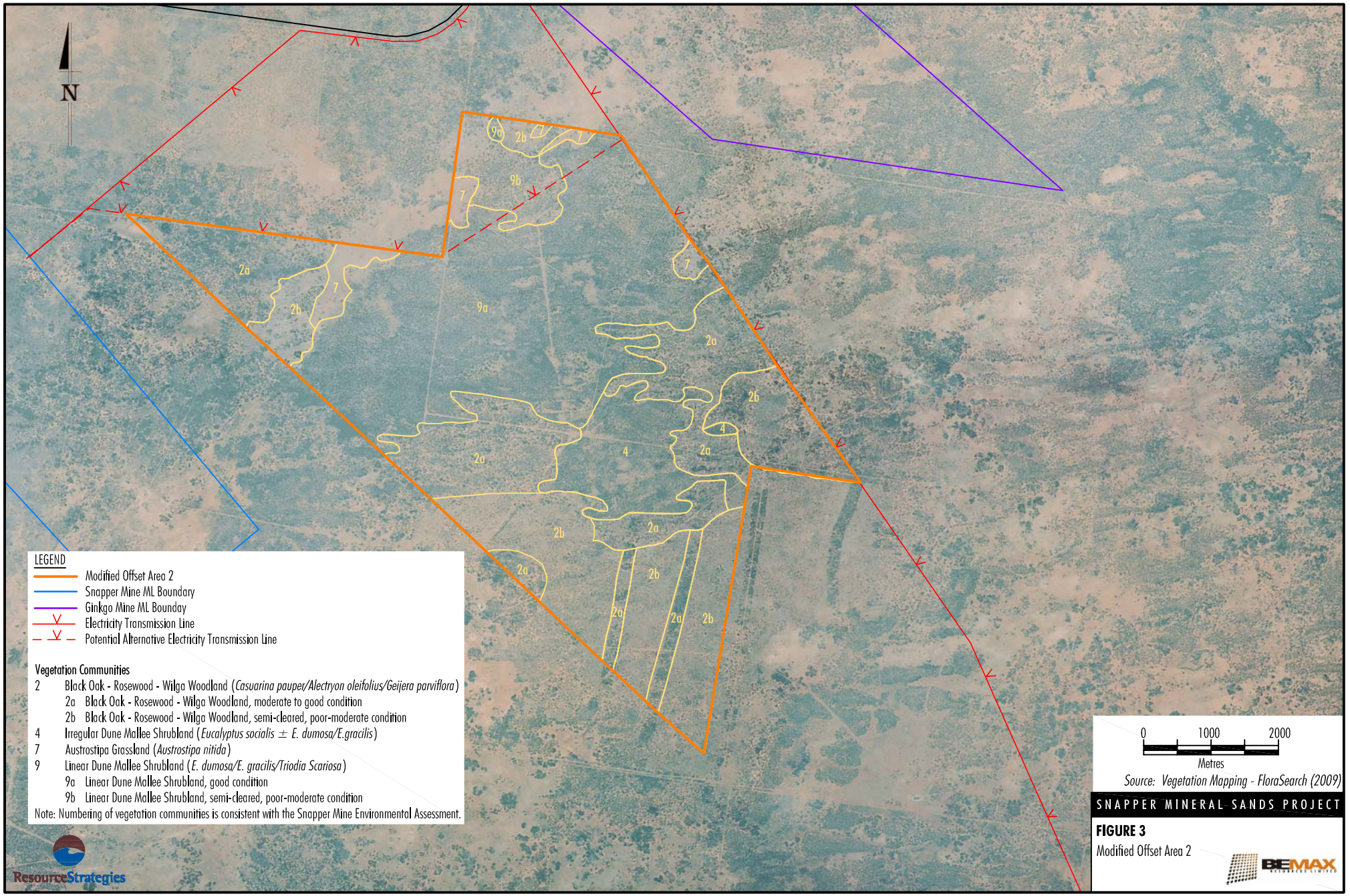

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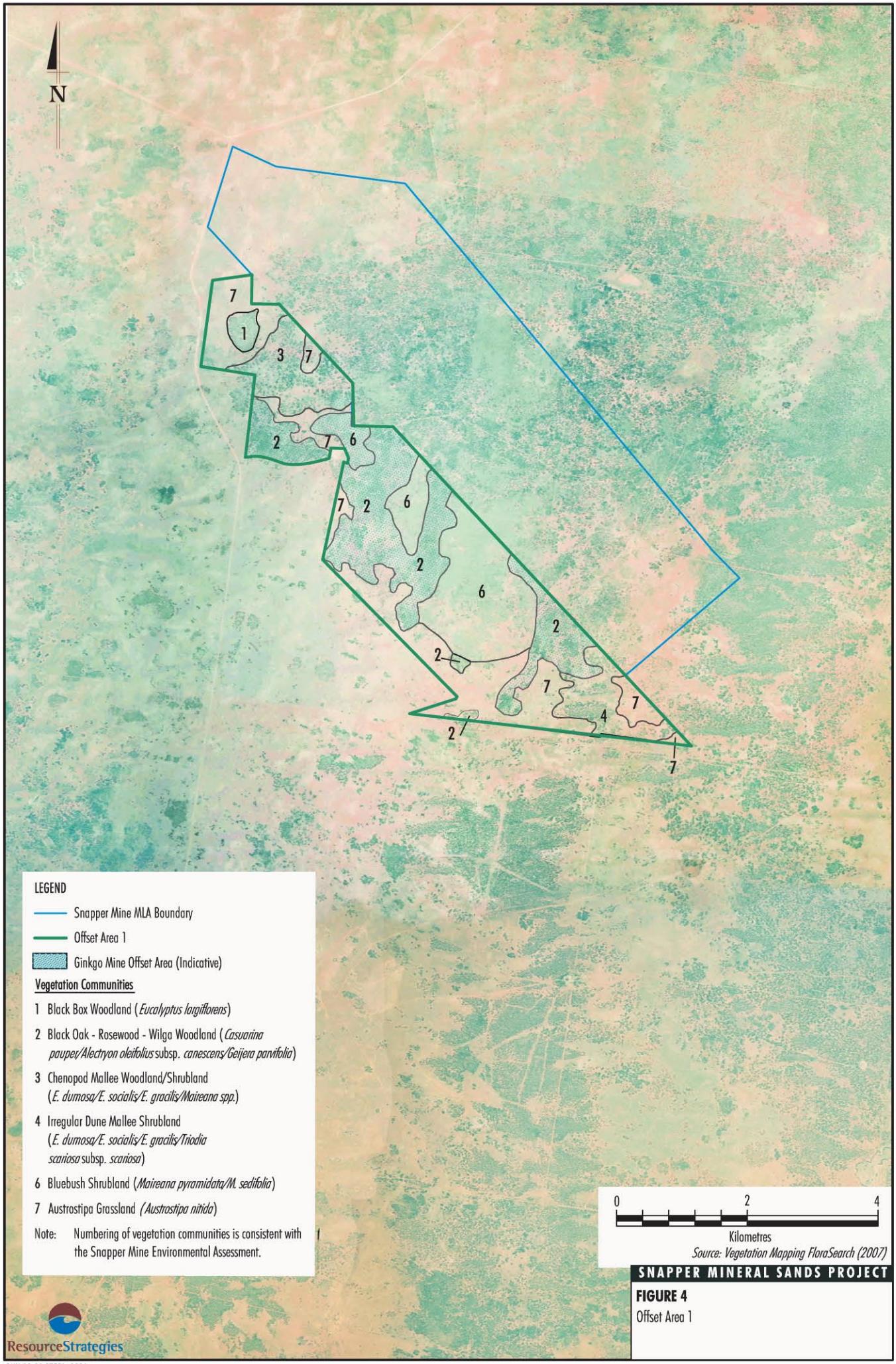
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LEGEND
Snapper Mine MLA Boundary
Offset Area 1
Ginkgo Mine Offset Area (Indicative)
Vegetation Communities
1 Black Box Woodland (Eucalyptus largiflorens)
2 Black Oak - Rosewood - Wilga Woodland (Casuarina pauper/Alectryon oleifolius subsp. canescens/Geijera parviflolia)
3 Chenopod Mallee Woodland/Shrubland (E. dumosa/E. socialis/E. gracilis/Maireana spp.)
4 Irregular Dune Mallee Shrubland (E. dumosa/E. socialis/E. gracilis/Triodia scariosa subsp. scariosa)
6 Bluebush Shrubland (Maireana pyramidata/M. sedifolia)
7 Austrostipa Grassland (Austrostipa nitida)
Note: Numbering of vegetation communities is consistent with the Snapper Mine Environmental Assessment.
0
2
4
Kilometres
Source: Vegetation Mapping FloraSearch (2007)
SNAPPER MINERAL SANDS PROJECT
FIGURE 4
Offset Area 1
ResourceStrategies
BMX-03-09 S75EA_102A

Table 1
Summary Comparison of Approved and Modified Snapper Mine

Development Component	Approved Snapper Mine[1]	Modified Snapper Mine[2]
Tenement	Mining operations conducted within Mining Lease (ML) 1621.	No change.
Mining	Predominantly dredge mining of approximately 8.2 million tonnes per annum (Mtpa) of ore.	No change.
Life of Mine	Approximately 16 years.	No change.
Mineral Concentration	Mineral concentration to be undertaken in a primary gravity concentration unit (comprising a screen, surge bin and wet concentrator). Heavy Mineral Concentrate (HMC) produced would either be separated through the Wet High Intensity Magnetic Separators (WHIMS) circuit on-site or at the MSP. Concentrates would be further separated and treated at the MSP.	No change.
Concentrate Transport	Double road trains or other NSW Roads and Traffic Authority (RTA)-approved vehicles (e.g. AB-triple vehicles) would be used to transport mineral concentrate from the Snapper Mine to the MSP via the mineral concentrate transport route.	No change.
Overburden Management	Replacement of the majority of deeper overburden would be undertaken by slurrying. Replacement of the majority of shallow overburden would be undertaken by conventional earthmoving equipment. Slurried overburden material would be covered by an appropriate depth of non-slurried material, to provide a suitable revegetation medium.	No change.
Sand Residue Management	Sand residues from the primary gravity concentration unit would be placed in an initial sand residue dam for approximately the first six months of operation. For the remainder of the Snapper Mine life, sand residues would be stacked directly into the back of the dredge pond.	No change.
Backloaded MSP Process Waste Management	Following transport from the MSP, backloaded MSP process waste would be deposited in a designated stockpile at the mine site. Backloaded MSP process waste would be slurried and deposited or placed directly on the sand residue beach and/or with overburden and covered with overburden.	No change.
Water Supply	Water requirements would be supplied primarily by two borefields within the ML area. The maximum water supply requirement from either borefield would be 370 litres per second (L/s), much of which is returned to the water table after use. Water would be recycled on-site (where practicable) to minimise the quantity of water extracted from the borefields.	No change.
Rehabilitation Works	Progressive rehabilitation would be undertaken as mining advances. Rehabilitation trials and investigations would be undertaken to assess the effectiveness of rehabilitation techniques, cover depths and the performance of different plant species over the life of the Snapper Mine.	No change.
Offset	An offset to be implemented to offset approximately 1,630 (ha) of native vegetation communities that would be removed by the Snapper Mine. The offset area would comprise of an enhancement area of approximately 5,870 ha and a revegetation area of approximately 940 ha.	An offset to be implemented to offset approximately 1,630 ha of native vegetation communities that would be removed by the Snapper Mine. The offset area would comprise of an enhancement area of approximately 5,220 ha, including Offset Area 2 (4,160 ha) and a proportion of Offset Area 1 (1,060 ha). The offset would not include areas of cleared land (other than unnecessary access tracks) that would require revegetation, thereby removing any uncertainty associated with the success of revegetation.

Table 1 (Continued)
Summary Comparison of Approved and Modified Snapper Mine

Development Component	Approved Snapper Mine[1]	Modified Snapper Mine[2]
Offset (Continued)	The offset area to contain the following vegetation communities: • Black Oak – Rosewood – Wilga Woodland; • Chenopod Mallee Woodland/Shrubland; • Bluebush Shrubland; and • Austrostipa Grassland.	No change.
Access	Snapper Mine traffic would share the existing 64 km highway access road (HAR) from the Ginkgo Mine to the Silver City Highway. The HAR would be extended in two locations to access the Snapper Mine site.	No change.
Mine Site Electricity Distribution	A 10 km long 66 kilovolt (kV) electricity transmission line (ETL) would be constructed to extend the existing ETL from the Ginkgo Mine to the Snapper Mine.	No change.
Hours of Operation	24 hours per day, seven days per week.	No change.
Employment	Construction workforce averaging around 200 people with a maximum of approximately 250 employees required during peak construction activity. Operational workforce of approximately 110 employees.	No change.

[1] Approved Snapper Mine approved 28 August 2007.
[2] Proposed modification to the Approved Snapper Mine.

As shown in Table 1, the offset would be the only development component that would change as a result of the modified Snapper Mine. The proposed modification **does not** involve any changes within ML 1621. Further, to be clear, the proposed modification **does not** involve any change to: mining; life of mine; mineral concentration; concentrate transport; overburden management; sand residue management; backloaded MSP process waste management; water supply; rehabilitation works; site access; mine site electricity distribution; hours of operation; or employment.

The modified Snapper Mine offset area has been designed to maintain or improve biodiversity values after consideration of the results of the flora and fauna surveys and assessments (Section 5.1). As shown on Figure 3, the modified Offset Area 2 has been developed and designed in consideration of the ecological principles commonly used in the design of reserves for wildlife conservation. Factors which were considered include the size, shape, location and spatial pattern/connectivity of the area to be conserved (Environment Australia, 2000; NSW National Parks and Wildlife Service, 1998) as well as the location of existing habitat resources and conservation values (e.g. threatened species).

While approximately 1,630 ha of native vegetation communities would be removed by the Snapper Mine, it is proposed that a significant area of native vegetation within the modified Snapper Mine offset area would be enhanced – approximately 5,220 ha, comprising a proportion of the approved Offset Area 1 (approximately 1,060 ha) and the modified Offset Area 2 (approximately 4,160 ha).

The total area conserved as a result of the Snapper Mine in the modified Snapper Mine offset area (approximately 5,220 ha) would be additional to the 521 ha to be conserved to satisfy offset requirements for the Ginkgo Mine (i.e. both mines would result in the conservation of a combined area of approximately 5,741 ha).

Approved Ginkgo Mine Offset Area

There would be no change to the approved Ginkgo Mine offset area. The approved Ginkgo Mine offset area is located within the approved Offset Area 1 (Figure 4).

As outlined in the letter from BEMAX to the NSW Department of Planning (DoP) (dated 22 June 2007), the same vegetation communities proposed to be cleared for the Ginkgo Mine as a result of various Development Consent modifications (May 2005 modification, April 2006 modification and March 2007 modification) would be provided in the approved Ginkgo Mine offset area as shown in Table 2 and illustrated on Figure 4.

Table 2
Vegetation Communities in the Approved Ginkgo Mine Offset Area

Vegetation Community*		Ginkgo Mine Offset Area (ha)#
2	Black Oak-Rosewood-Wilga Woodland	477(1)
3	Chenopod Mallee Woodland/Shrubland	4(2)
6	Bluebush Shrubland	40(3)
	TOTAL AREA	**521**

* Vegetation Community descriptions and number are in accordance with the 2007 EA (BEMAX, 2007a).

\# Areas are based on vegetation mapping shown on Figure 4.

1 102 ha for the May 2005 Modification (BEMAX, 2005), 130 ha for the March 2007 modification (BEMAX, 2007c) and 245 ha for the April 2006 modification (BEMAX, 2006).

2 May 2005 Modification (BEMAX, 2005).

3 March 2007 Modification (BEMAX, 2007c).

5 ENVIRONMENTAL ASSESSMENT

The following section presents the environmental assessment for the modified Snapper Mine, including an assessment of the potential impacts of the modified Snapper Mine with respect to flora and fauna (Section 5.1).

The impact assessment findings presented in the 2007 EA for other environmental aspects potentially relevant to the modified Snapper Mine have been reviewed. The assessment of potential impacts and the mitigation measures, management and monitoring outlined in the 2007 EA are considered to be appropriate for the modified Snapper Mine. Therefore, these other environmental aspects are not considered further in this EA.

5.1 FLORA AND FAUNA

5.1.1 Environmental Review

The 2007 EA for the approved Snapper Mine assessed the potential impacts of the approved Snapper Mine on flora and fauna. Given that the proposed modification does not involve any changes within ML 1621, this EA focuses on the ecological gains from the modified Snapper Mine offset area and whether the modified Snapper Mine offset area would achieve an improve or maintain outcome for biodiversity values.

An evaluation of the modified Offset Area 2 was conducted by flora specialists FloraSearch and fauna specialists Cenwest Environmental Services in October/November 2008. The *Trelega North Flora Survey and Assessment* (FloraSearch, 2009) and *Trelega North Fauna Survey and Assessment* (Cenwest Environmental Services, 2009) can be provided to the DoP or DECC on request. A summary of the survey results is provided below, including: vegetation mapping; vegetation condition assessment; inventory of flora and fauna species; and an assessment of threatened flora and fauna species and their habitats.

Vegetation Mapping

Figures 3 and 4 provide FloraSearch's vegetation mapping of the approved Offset Area 1 and modified Offset Area 2 (which together comprise the modified Snapper Mine offset area). Table 3 provides the area of each vegetation community disturbed by the Snapper Mine and the area proposed to offset the disturbance within the approved Snapper Mine offset area and modified Snapper Mine offset area.

Of the vegetation communities in Table 3, Turpentine Shrubland (Community 5), Bluebush Shrubland (Community 6) and Austrostipa Grassland (Community 7) are considered to be secondary vegetation communities resulting from removal of the original tree cover by pastoral landholders to promote grass and herb growth for stock grazing (FloraSearch, 2009). However, these communities also provide important habitat resources for local flora and fauna (e.g. forage resources/seed, shelter) (FloraSearch, 2009; Cenwest Environmental Services, 2009).

Table 3
Comparison of Approved and Modified Snapper Mine Offset Areas[#]

Vegetation Community[1]		Snapper Mine Disturbance Area (ha)	Approved Snapper Mine Offset Area (ha)	Modified Snapper Mine Offset Area (ha)*
1	Black Box Woodland	0	33	24
2	Black Oak-Rosewood-Wilga Woodland	1,075	787	2,020
3	Chenopod Mallee Woodland/Shrubland	30	69	136
4	Irregular Dune Mallee Shrubland	0	1,835	428
5	Turpentine Shrubland	0	0	0[2]
6	Bluebush Shrubland	200	342	331
7	Austrostipa Grassland	325	2,784	574
8	Samphire Shrubland	0	20	0
9	Linear Dune Mallee Shrubland[3]	0	0	1,703
TOTAL AREA		**1,630**	**5,870**	**5,216**

[#] Areas do not include Cleared Cultivated Paddocks with Scattered Trees (i.e. Revegetation Area).

* Areas are based on vegetation mapping shown on Figures 3 and 4.

[1] The numbering of vegetation communities is consistent with the 2007 EA.

[2] Vegetation Community 5 occurs in small amounts within the modified Snapper Mine offset area (not mapped).

[3] Vegetation Community 9 is an additional community type to those identified in the Snapper Mine ML.

5.1.2 Potential Impacts

The modified Snapper Mine offset area would result in ecological gains when compared to the approved Snapper Mine offset area. Table 4 provides an overview of the ecological gains from the modified Snapper Mine offset area which would achieve and improve or maintain outcome for biodiversity values. The ecological gains from the approved Snapper Mine offset area are also provided for comparison.

Vegetation Condition Assessment

A vegetation condition assessment was undertaken on the modified Offset Area 2. The condition of the vegetation in the modified Offset Area 2 is influenced by a number of factors including land clearing, cultivation for wheat cropping, grazing by sheep and the effects of recent drought conditions (FloraSearch, 2009). The quality of the existing habitat is also attributed to key threatening process (listed under the *Threatened Species Conservation Act, 1995* [TSC Act]) such as clearing of native vegetation (including regrowth), removal of dead wood and dead trees (by burning) and proliferation of Feral European Rabbit and European Red Fox.

Table 4
Ecological Gains of the Modified Snapper Mine Offset

Impact from the Snapper Mine	Ecological Gain from the Vegetation Offset	
	Approved Snapper Mine Offset	**Modified Snapper Mine Offset**
Size		
Approximately 1,630 ha of native vegetation communities would be removed by the Snapper Mine (BEMAX, 2007a).	• Approximately 5,992 ha of native vegetation would be enhanced and some 940 ha would be revegetated.	• Approximately 5,220 ha of native vegetation would be enhanced. The modified Snapper Mine offset area would comprise a proportion of the approved Offset Area 1 (1,060 ha) and the modified Offset Area 2 (4,160 ha). • The modified Snapper Mine offset does not include areas of cleared land (other than unnecessary access tracks) that would require revegetation, thereby removing any uncertainty associated with the success of revegetation works for the approved Snapper Mine offset area.
	• The ecological gain of the size of the offset is that a significantly larger area would be conserved than that which would be disturbed.	• As for the approved Snapper Mine offset, the ecological gain of the size of the offset is that a significantly larger area would be conserved than that which would be disturbed.
	• The Snapper Mine offset would be combined with the Ginkgo Mine offset required by the Ginkgo Mine Development Consent 3.4.4 (b) to create a single conserved area.	• The modified Snapper Mine offset would create a large conserved area providing a link between the Snapper and Ginkgo Mine sites, following rehabilitation and mine closure.
Location		
The Snapper Mine ML and infrastructure is within the South Olary Plain, Murray Basin Sands (Part D) Sub-region (FloraSearch and Resources Strategies, 2007).	• Given that there is only one Protected Area (i.e. Nearie Lake Nature Reserve) and one privately managed conservation reserve in the sub-region[1], (Figure 1), it is considered that there would be an ecological gain by conserving more vegetation in the sub-region.	• As for the approved Snapper Mine offset, it is considered that there would be an ecological gain by conserving more vegetation in the sub-region, given that there is only one Protected Area (i.e. Nearie Lake Nature Reserve) and one privately managed conservation reserve in the sub-region[1] (Figure 1).
	• The offset area's location adjacent to the Snapper Mine ML would provide refuge for displaced fauna (including threatened species) from the Snapper Mine.	• As for the approved Snapper Mine offset, the offset area's location adjacent to the Snapper Mine ML would provide refuge for displaced fauna (including threatened species) from the Snapper Mine. • The modified Snapper Mine offset area's location adjacent to the Ginkgo Mine ML would also provide refuge for displaced fauna (including threatened species) from the Ginkgo Mine.

Table 4 (Continued)
Ecological Gains of the Modified Snapper Mine Offset

Impact from the Snapper Mine	Ecological Gain from the Vegetation Offset	
	Approved Snapper Mine Offset	**Modified Snapper Mine Offset**
Shape		
The shape of the Snapper Mine disturbance area is shown on Figure 1-2 of the 2007 EA (BEMAX, 2007a).	• In the recognition of the importance of wildlife corridors to regional biodiversity, the offset area provides: – revegetation areas positioned adjacent to existing patches to increase connectivity and the integrity of smaller remnant vegetation patches and reduce edge effects on larger remnants. – an area adjacent to the Snapper Mine ML which contains similar habitat types and therefore the potential to provide refuge for displaced fauna (including threatened species) from the Snapper Mine.	• As for the approved Snapper Mine offset, in the recognition of the importance of wildlife corridors to regional biodiversity, the offset area provides an area adjacent to the Snapper Mine ML which contains similar habitat types and therefore the potential to provide refuge for displaced fauna (including threatened species) from the Snapper Mine. • Unlike the approved offset area, the modified Snapper Mine offset area would not surround agricultural areas. • The modified Snapper Mine offset would also provide a link between the Snapper and Ginkgo Mine sites, following rehabilitation and mine closure. • The modified Snapper Mine offset area would also provide an area adjacent to the Ginkgo Mine ML which contains similar habitat types and therefore the potential to provide refuge for displaced fauna (including threatened species) from the Ginkgo Mine.
	• The shape of the offset area has taken into consideration the location of existing habitat resources, conservation values (e.g. threatened species) and the existing and potential connectivity of habitat.	• As for the approved Snapper Mine offset, the shape of the offset area has taken into consideration the location of existing habitat resources, conservation values (e.g. threatened species) and the existing and potential connectivity of habitat.
	• The ecological gain of the shape of the offset is that it encompasses most recorded locations of threatened species resulting from the site evaluation.	• As for the approved Snapper Mine offset, the ecological gain of the shape of the offset is that it encompasses most recorded locations of threatened species resulting from the site evaluation.

Table 4 (Continued)
Ecological Gains of the Modified Snapper Mine Offset

Impact from the Snapper Mine	Ecological Gain from the Vegetation Offset	
	Approved Snapper Mine Offset	**Modified Snapper Mine Offset**
Vegetation Communities/Habitats		
A mosaic of four vegetation communities would be disturbed for the Snapper Mine.	• The ecological gain would be that a greater variety of vegetation communities would be conserved than disturbed for the Snapper Mine.	• As for the approved Snapper Mine offset, the ecological gain would be that a greater variety of vegetation communities would be conserved than disturbed for the Snapper Mine.
	• A total of seven vegetation communities occur in the vegetation offset area.	• A total of seven vegetation communities occur in the vegetation offset area and are mapped on Figures 3 and 4, *viz*.: – Black Box Woodland; – Black Oak-Rosewood-Wilga Woodland; – Chenopod Mallee Woodland/Shrubland; – Irregular Dune Mallee Shrubland; – Linear Dune Mallee Shrubland; – Bluebush Shrubland; and – Austrostipa Grassland. • As for the approved Snapper Mine offset, these vegetation communities include the four vegetation communities that would be disturbed for the Snapper Mine. • Turpentine Shrubland also occurred in the area in small amounts (not mapped).
Threatened Species		
Vegetation clearance for the Snapper Mine is unlikely to result in a significant impact on any threatened species/ ecological communities (BEMAX, 2007a). However, local fauna (including threatened species) would be displaced from the areas cleared of vegetation.	• The approved Snapper Mine offset area contains: – Known habitat for four threatened fauna species, namely, the Grey-crowned Babbler, Major Mitchell's Cockatoo, Yellow-bellied Sheath-tail Bat and Little Pied Bat. – Potential habitat for threatened flora and fauna species recorded during the flora and fauna surveys for the Snapper Mine (e.g. Western Blue-tongued Lizard and Hooded Robin) and those species which may also potentially occur.	• The modified Snapper Mine offset area contains: – Known habitat for six threatened fauna species, namely, the Grey-crowned Babbler, Major Mitchell's Cockatoo, Brown Treecreeper, Jewelled Gecko, Crowned Gecko and Little Pied Bat. – Potential habitat for threatened flora and fauna species recorded during the flora and fauna surveys for the Snapper Mine (e.g. Western Blue-tongued Lizard, Hooded Robin and Yellow-bellied Sheath-tail Bat) and those species which may also potentially occur.
	• The offset would result in an ecological gain in habitat for threatened species which may be disturbed by the Snapper Mine, through enhancement and conservation measures. Further, the offset area is adjacent to the Snapper Mine ML and contains similar habitat types and therefore the potential to provide refuge for displaced fauna (including threatened species).	• As for the approved Snapper Mine offset, the offset would result in an ecological gain in habitat for threatened species which may be disturbed by the Snapper Mine, through enhancement and conservation measures. Further, the offset area is adjacent to the Snapper Mine ML and contains similar habitat types and therefore the potential to provide refuge for displaced fauna (including threatened species).

Table 4 (Continued)
Ecological Gains of the Modified Snapper Mine Offset

Impact from the Snapper Mine	Ecological Gain from the Vegetation Offset	
	Approved Snapper Mine Offset	**Modified Snapper Mine Offset**
Security		
The vegetation to be cleared is currently not secure as it occurs on a Western Lands Lease for agriculture/grazing purposes. The vegetation could potentially be cleared at any time assuming relevant approvals are obtained.	• The offset area would be secured over the long term (i.e. in perpetuity) for conservation purposes through re-conditioning the lease to reflect conservation purposes in the offset area.	• As for the approved Snapper Mine offset, the offset area would be secured over the long term (i.e. in perpetuity) for conservation purposes through re-conditioning the lease to reflect conservation purposes in the offset area.
	• The security of the offset area would facilitate an ecological gain from the protection from agriculture/grazing landuse practises.	• As for the approved Snapper Mine offset, the security of the offset area would facilitate an ecological gain from the protection from agriculture/grazing landuse practises.
Landuse		
The Snapper Mine ML and infrastructure is used for agriculture/grazing purposes (BEMAX, 2007a).	• The offset area is also currently used for agriculture/grazing purposes and the landuse within the offset area would be changed to conservation.	• As for the approved Snapper Mine offset, the offset area is also currently used for agriculture/grazing purposes and the landuse within the offset area would be changed to conservation.
	• The change in landuse from agriculture/grazing purposes to conservation purposes would facilitate an ecological gain from the likely improvement in condition of vegetation/habitats within the offset area overtime, due to stock exclusion.	• As for the approved Snapper Mine offset, the change in landuse from agriculture/grazing purposes to conservation purposes would facilitate an ecological gain from the likely improvement in condition of vegetation/habitats within the offset area overtime, due to stock exclusion.
Condition		
The condition of the vegetation in the Snapper Mine area is degraded mainly due to past pastoral land management practices (eg. grazing, thinning, burning, pests and weeds), therefore the vegetation is sub-optimal with respect to its flora and fauna components. Under current pastoral land management practices the conservation and production values appear to be slowly further degrading and may result in landscape dysfunction.	• The ecological gain in condition of the offset area can be measured by the difference between the anticipated future degradation of the area without the offset and the anticipated future improvement in condition from implementing the offset. The condition of the vegetation and habitats within the offset area are currently degrading due to past and continued grazing and cropping, vegetation clearance, pests and weeds. As such, there is an opportunity to enhance and conserve the flora and fauna habitats.	• The majority of the vegetation within the modified Offset Area 2 is considered to be in good to moderate condition, and therefore likely to achieve the offset objectives in a shorter timeframe than the approved Offset Area 2. • The modified Snapper Mine offset area would require minimal revegetation (e.g. revegetation along unnecessary access tracks) given the good to moderate condition of the majority of the vegetation within the modified Offset Area 2.

Table 4 (Continued)
Ecological Gains of the Modified Snapper Mine Offset

Impact from the Snapper Mine	Ecological Gain from the Vegetation Offset	
	Approved Snapper Mine Offset	**Modified Snapper Mine Offset**
Management for Conservation Purposes		
The Snapper Mine ML and infrastructure is currently located on a Western Lands Lease used for agriculture/grazing purposes.	• The following measures were proposed to increase the ecological gain from the offset area: – fencing to exclude grazing; – incremental destocking; – removal of unnecessary fencing; – erosion control; – signage of the offset area; – revegetation of unnecessary access tracks; – animal pest control; – weed management; – fire management; – threatened species management; – security of artificial water sources; – revegetation; – vehicle access management; and – an environmental induction for employees and contractors.	• The management measures for the approved Snapper Mine offset would be applicable to the modified Snapper Mine offset, with the exception of revegetation works. The modified Snapper Mine offset area would require minimal revegetation (e.g. revegetation along unnecessary access tracks) given the good to moderate condition of the majority of the vegetation within the modified Offset Area 2.
	• The Offset Management Plan has been prepared to facilitate the management of the offset area.	• The Offset Management Plan would be revised to reflect the location of the modified Snapper Mine offset area.
	• The performance of the vegetation offset will be monitored and managed over time (e.g. exclusion of stock, control of introduced species and other management and maintenance measures). BEMAX welcome synergies with the DECC and/or the Lower Murray Darling Catchment Management Authority to conduct monitoring of threatened species populations within the vegetation offset area.	• As for the approved Snapper Mine offset, the performance of the vegetation offset will be monitored and managed over time.

[1] South Olary Plain, Murray Basin Sands (Part D) Sub-region – between the Great Darling Anabranch and Darling River south of Kinchega National Park.

The Linear Dune Mallee Shrubland community on linear sand dunes that occupies about a quarter of the study area is considered to be in good condition, despite some thinning and periodic burning (FloraSearch, 2009). The Black Oak – Rosewood – Wilga Woodland has moderate to good areas (*ibid*.). The Irregular Dune Mallee Shrubland is considered to be in poor to moderate condition, due to more extensive clearing, thinning and grazing than for the Linear Dune Mallee Shrubland (*ibid*.). The Austrostipa Grassland represents a secondary vegetation community resulting from removal of the original tree cover by pastoral landholders to promote grass and herb growth for stock grazing (*ibid*.).

The following measures would be implemented within the modified Snapper Mine offset area, and would be anticipated to enhance areas in poor to moderate condition:

- fencing to exclude grazing;
- incremental destocking;
- removal of unnecessary fencing;
- erosion control;
- signage of the offset area;
- revegetation of unnecessary access tracks;
- animal pest control;
- weed management;
- fire management;
- threatened species management;
- security of artificial water sources;
- vehicle access management; and
- an environmental induction for employees and contractors.

Inventory of Flora and Fauna Species

An inventory of flora and fauna species found during the survey for the modified Offset Area 2 was prepared. A total of 56 native flora (FloraSearch, 2009) and 98 (potentially 99) (Cenwest Environmental Services, 2009) native fauna were recorded (note: this does not include species recorded within the approved Offset Area 1).

The survey undertaken for the approved Snapper Mine offset area in April/May 2007 recorded a total of 84 native flora (FloraSearch, 2007) and 77 native fauna (Western Research Institute, 2007).

Threatened Flora Species and Their Habitats

No flora species listed as threatened under the TSC Act or the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) were identified during the survey of the modified Offset Area 2 (FloraSearch, 2009). No threatened ecological communities listed under the TSC Act or the EPBC Act were found during the survey of the modified Offset Area 2 (*ibid*.).

While a number of threatened flora species may potentially occur in the offset area, only two other threatened flora species are considered to have a high chance of occurring on the offset area (FloraSearch, 2009):

- Blue Daisy-bush (*Cratystylis conocephala*); and
- Yellow Swainson-pea (*Swainsona pyrophila*).

The saltbush *Atriplex infrequens*, is considered to have a moderate probability of occurring (FloraSearch, 2009).

The survey undertaken for the approved Snapper Mine area in April/May 2007 tentatively identified a juvenile plant of a Swainson-pea (*Swainsona* species) from its foliage as Yellow-keeled Swainsona, (*Swainsona flavicarinata*), which is listed as Endangered under the TSC Act. The presence of *S. flavicarinata* on the offset area was not expected, due to a lack of nearby records, and requires confirmation by examining flowering material. *S. flavicarinata* is currently known only from a flat treeless plain in the Broken Hill – Menindee area in NSW (DECC, 2009). However, it also occurs in a variety of habitats in northern South Australia and the southern Northern Territory.

Threatened Fauna Species and their Habitats

Six threatened species were recorded during the survey of the modified Offset Area 2, namely, the Grey-crowned Babbler (*Pomatostomus temporalis temporalis*), Major Mitchell's Cockatoo (*Cacatua leadbeateri*), Brown Treecreeper (*Climacteris picummus*), Jewelled Gecko (*Strophurus elderi*), Crowned Gecko (*Diplodactylus stenodactylis*) and Little Pied Bat (*Chalinolobus pictatus*) (Cenwest Environmental Services, 2009) (note: this does not include species recorded within the approved Offset Area 1). A seventh species, the Inland Forest Bat (*Vespadelus baverstocki*), was also potentially identified[3] (*ibid*.).

The survey undertaken for the approved Snapper Mine offset area in April/May 2007 identified five threatened fauna species were identified, namely, the Swift Parrot (*Lathamus discolor*), Grey-crowned Babbler (eastern sub. species) (*Pomatostomus temporalis temporalis*), Major Mitchell's Cockatoo (*Cacatua leadbeateri*), Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris*) and Pied Bat (*Chalinolobus picatus*) (Western Research Institute, 2007). The Inland Forest Bat (*Vespadelus baverstocki*), was also potentially identified during that survey[3] (*ibid*.).

Summary of Potential Impacts

While approximately 1,630 ha of native vegetation communities would be removed by the Snapper Mine, it is proposed that a significant area of native vegetation within the modified Snapper Mine offset area would be enhanced – approximately 5,220 ha, comprising a proportion of the approved Offset Area 1 (approximately 1,060 ha) and the modified Offset Area 2 (approximately 4,160 ha).

The total area conserved as a result of the Snapper Mine in the modified Snapper Mine offset area (approximately 5,220 ha) would be additional to the 521 ha to be conserved to satisfy offset requirements for the Ginkgo Mine (i.e. both mines would result in the conservation of a combined area of approximately 5,741 ha).

The modified Snapper Mine offset area would allow the objectives of the offset to be met, whilst providing for several advantages over the approved Snapper Mine offset. In particular, the majority of the modified Snapper Mine offset is considered to be in good to moderate condition and does not contain any areas of cleared land that would require revegetation, thereby removing any uncertainty associated with the performance of revegetation. The DECC have been consulted with respect to the modified Snapper Mine offset area and have provided in-principle support for the proposed modification.

The proposed modification would enable BEMAX to better manage the potential environmental impacts of the Snapper Mine by providing for an offset area that has more attractive ecological attributes than the approved Snapper Mine offset.

[3] Echolocation calls of the threatened Inland Forest Bat were not distinguishable from those of the common Little Forest Bat (*Vespadelus vulturnus*).

5.1.3 Mitigation Measures and Management

Offset measures for the approved Snapper Mine are described in the Offset Management Plan. The Offset Management Plan would be revised to reflect the modified Snapper Mine offset area. The revised Offset Management Plan would be prepared in consultation with the DECC.

The management and monitoring of flora and fauna during construction and operation of the Snapper Mine is described in the *Snapper Mineral Sands Project Flora and Fauna Management Plan* (BEMAX, 2007d). The approved Flora and Fauna Management Plan would be continued for the modified Snapper Mine.

6 REFERENCES

BEMAX Resources Limited (2005) *Ginkgo Mineral Sands Project Modification Application – May 2005*.

BEMAX Resources Limited (2006) *Ginkgo Mineral Sands Project Modification Application – April 2006*.

BEMAX Resources Limited (2007a) *Snapper Mineral Sands Project Environmental Assessment*.

BEMAX Resources Limited (2007b) *Snapper and Ginkgo Mines Offset Management Plan*.

BEMAX Resources Limited (2007c) *Ginkgo Mineral Sands Project Modification Application – March 2007*.

BEMAX Resources Limited (2007d) *Snapper Mineral Sands Project Flora and Fauna Management Plan*.

Cenwest Environmental Services (2009) *Trelega North Fauna Survey and Assessment*. Prepared for BEMAX Resources Limited.

Department of Environment and Climate Change (2009) *Threatened Species Home Page*. Internet Site: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx Date Accessed: April 2009.

FloraSearch (2007) *Trelega Property Flora Survey and Assessment*. Prepared for BEMAX Resources Limited.

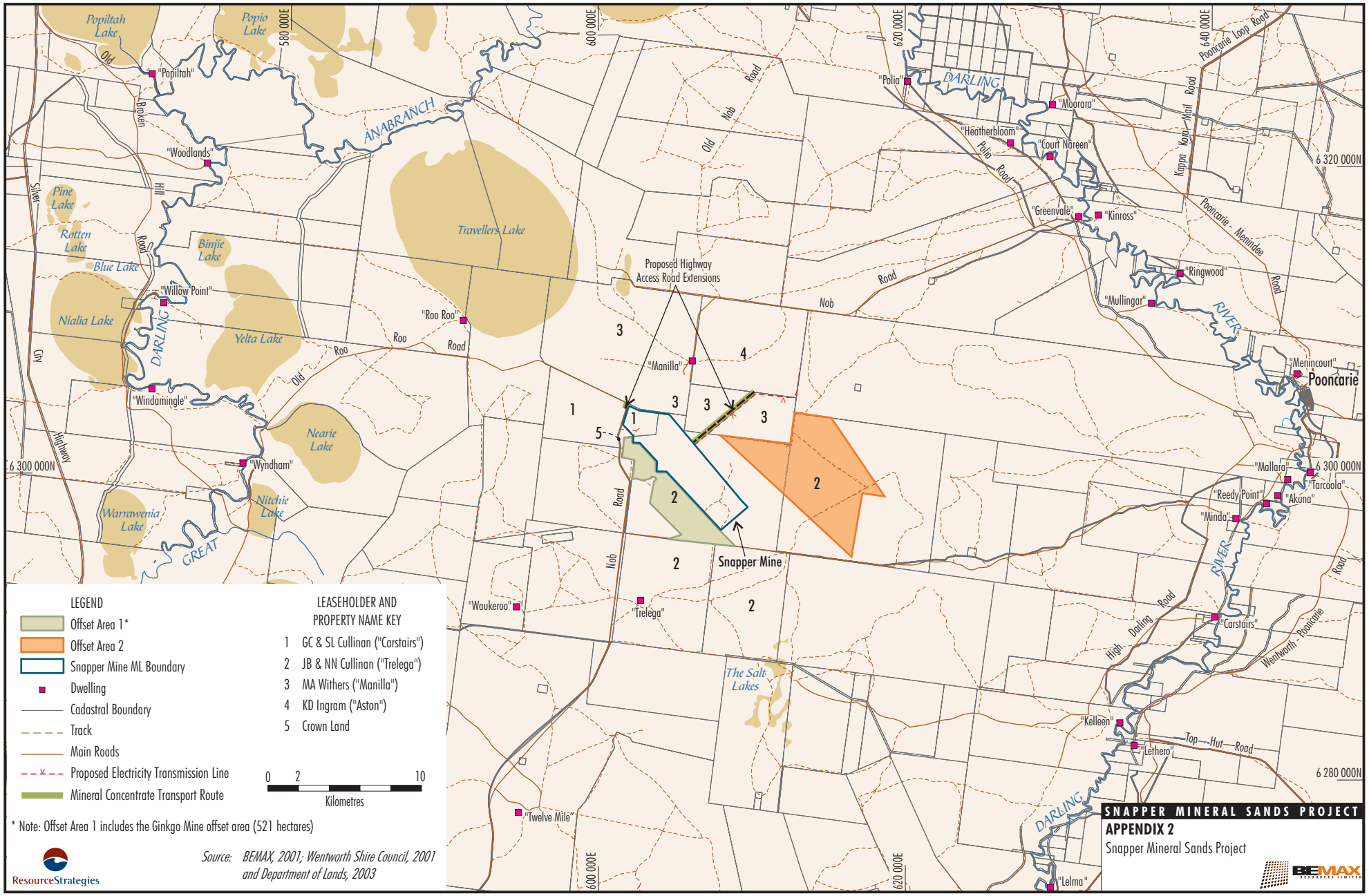
FloraSearch (2009) *Trelega North Flora Survey and Assessment*. Prepared for BEMAX Resources Limited.

FloraSearch and Resource Strategies (2007) *Snapper Mineral Sands Project Flora Assessment*. Appendix E in BEMAX Resources Limited (2007a) *Snapper Mineral Sands Project Environmental Assessment*.

Western Research Institute (2007) *Trelega Property Fauna Survey and Assessment*. Prepared for BEMAX Resources Limited.

ATTACHMENT 1

PROPOSED APPENDIX 2 OF THE PROJECT APPROVAL



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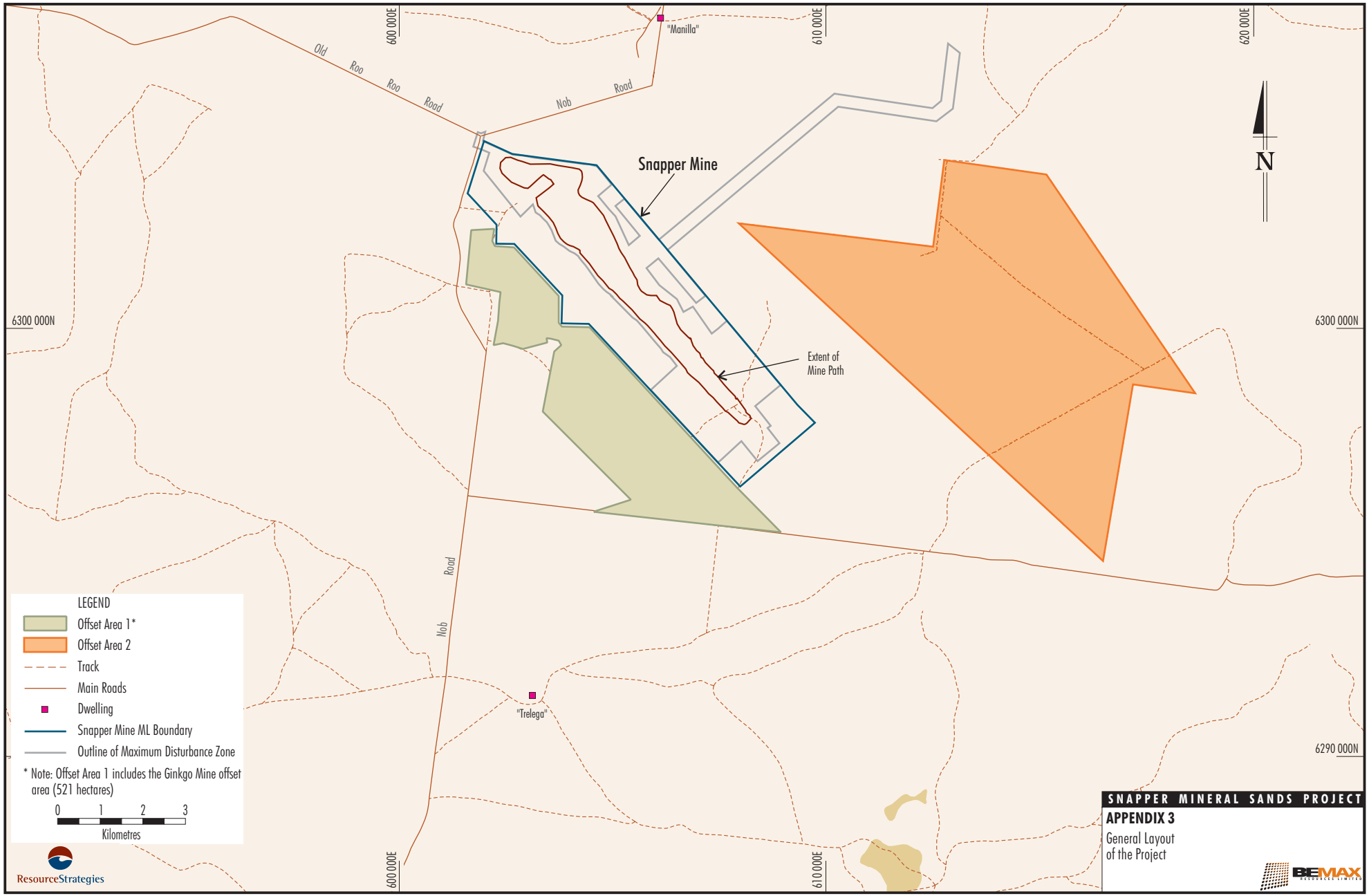
ATTACHMENT 2

PROPOSED APPENDIX 3 OF THE PROJECT APPROVAL



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