

BEMAX
RESOURCES LIMITED

**GINKGO AND SNAPPER MINERAL SAND MINES
AND
BROKEN HILL MINERAL SEPERATION PLANT**

TRANSPORT MANAGEMENT PLAN

SEPTEMBER 2007
Document No. TMP-R01-A

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	INTRODUCTION	1
	1.1 OBJECTIVES AND PURPOSE	1
	1.2 STRUCTURE OF THE PLAN	1
2	TRAFFIC CONDITIONS	5
	2.1 ROAD HIERARCHY	5
	2.2 TRAFFIC VOLUMES	5
3	CODE OF CONDUCT	7
	3.1 TRAFFIC AND TRANSPORT MANAGEMENT	7
	3.1.1 ROAD MAINTENANCE AND SAFETY	7
	3.1.2 VEHICLE MAINTENANCE AND SAFETY	7
	3.1.3 TRAFFIC MOVEMENT	8
	3.2 MANAGEMENT PROGRAMS, POLICIES AND PROCEDURES	10
	3.2.1 WASTE MATERIAL TRACKING PROGRAM	10
	3.2.2 FATIGUE MANAGEMENT PROGRAM	10
	3.2.3 DRUG AND ALCOHOL POLICY	11
	3.2.4 EMERGENCY RESPONSE PROCEDURES	11
	3.2.5 COMMUNITY CONSULTATION PROGRAM	11
	3.3 TRAINING	12
	3.4 MONITORING AND REPORTING	13
	3.5 CONTRACTOR OBLIGATIONS	13
4	TRANSPORT OF HAZARDOUS MATERIALS MEASURES	14
	4.1 WASTE PRODUCTION AND MANAGEMENT	14
	4.1.1 WASTE CLASSIFICATION	14
	4.1.2 LEVEL OF HAZARD ASSOCIATED WITH MONAZITE BEARING WASTES	14
	4.1.3 LABELLING, PLACARDING AND DOCUMENTATION	15
	4.1.4 MONITORING	15
	4.1.5 DRIVER INSTRUCTION	16
	4.2 EMERGENCY RESPONSE PROCEDURE	16
	4.2.1 FIRST RESPONSE	16
	4.2.2 COMMUNICATION	16
	4.2.3 RESPONSE EQUIPMENT	16
	4.3 WASTE MATERIAL TRACKING PROGRAM	17

LIST OF TABLES

Table 1	Development Consent Conditions Relevant to the TMP
Table 2	Estimated Base Case Average Weekday Traffic Flows
Table 3	Predicted Snapper Mine Daily Traffic Generation
Table 4	Potential Impacts of Snapper Mine on Baseline Traffic Flows

LIST OF FIGURES

Figure 1	Regional Location and Traffic Count Station Locations
Figure 2	Mineral Transport Route (Broken Hill) and Traffic Count Station Locations

LIST OF APPENDICES

- Appendix I Transport Placard
- Appendix II Dangerous Goods Shippers Declaration
- Appendix III Waste Tracking Data Form

1 INTRODUCTION

The Ginkgo Minerals Sands Project (Ginkgo Mine) is located approximately 85 kilometres (km) north of Mildura and some 35 km west of the township of Pooncarie in western New South Wales (NSW). The Snapper Mineral Sands Project (Snapper Mine) is located approximately 50 km west of the township of Pooncarie in western New South Wales (NSW) and approximately 10 km to the south-west of the Ginkgo Mine (Figure 1). The Mineral Separation Plant (MSP) is located on the south-western outskirts of Broken Hill in western NSW. The publicly listed company Bemax Resources Ltd (Bemax) is the proponent of the Ginkgo and Snapper Mines and the MSP.

1.1 OBJECTIVES AND PURPOSE

This Transport Management Plan (TMP) has been prepared as a requirement of Development Consent Condition 24 of Schedule 3 for the Snapper Mine. It also incorporates the requirements of Development Consent Condition 7.1 (a) for the Ginkgo Mine and Condition 6.4 (c) and 6.7 for the MSP (Table 1).

The TMP will be applied to all traffic and transport activities associated with Ginkgo and Snapper Mines and the MSP, with particular emphasis placed on the transport of mineral concentrate and waste backfill material between Ginkgo and Snapper Mines and the MSP along the mineral concentrate transport route. The mineral concentrate transport route comprises of the Highway Access Road (HAR), the Silver City Highway, Kanandah Road, and Pinnacles Road (Figures 1 and 2).

It is acknowledged that the TMP facilitates the orderly management of, but is not a substitute for, statutory and regulatory requirements relating to vehicle loading, haulage and axle loads on the road.

The primary objective of the TMP is to reduce the potential for traffic/transport associated incidents by establishing a traffic code of conduct and to outline arrangements for the safe transport of hazardous materials along the entire length of the mineral concentrate transport route and demonstrate that the transport of material is in accordance with the Code of Practice for Safe Transport of Radioactive Materials 2001, and the relevant NSW and Commonwealth regulations.

1.2 STRUCTURE OF THE PLAN

The TMP is structured as follows:

- Section 1: Outlines the objectives and structure of the plan.
- Section 2: Traffic Conditions - Provides a summary of existing traffic conditions within the Ginkgo and Snapper Mines area and the MSP and outlines proposed changes to traffic conditions as a result of activities associated with Ginkgo and Snapper Mines and the MSP.
- Section 3: Code of Conduct - Details measures for managing traffic and transport associated with Ginkgo and Snapper Mines and the MSP activities, outlines management, training and monitoring programs that will assist in the implementation of the code of conduct.
- Section 4: Transport of Hazardous Materials Measures - Outline arrangements for the safe transport of hazardous materials along the entire length of the mineral concentrate transport route and demonstrate that the transport of material is in accordance with the Code of Practice for Safe Transport of Radioactive Materials.

Table 1 presents the Development Consent Conditions relevant to the TMP and indicates which section of the plan addresses each condition.

**Table 1.
Development Consent Conditions Relevant to the TMP**

Condition	Consent Condition	Section of Plan
Snapper 24	<p>The Proponent shall prepare and implement a Transport Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <ul style="list-style-type: none"> (a) be prepared in consultation with the DECC and RTA; (b) be submitted to the Director-General for approval prior to carrying out development on the site; and (c) include: <ul style="list-style-type: none"> • Transport of Hazardous Material Measures that would be implemented to address the relevant requirements in the <i>Code of Practice for the Safe Transport of Radioactive Materials</i> (ARPANSA, 2001 or its latest version); • Code of Conduct for all drivers transporting materials to and from the site; and • a description of the measures that would be implemented to comply with Condition 23. 	<p>Section 4</p> <p>Section 3</p> <p>Section 3</p>
Snapper 23	<p>The Proponent shall:</p> <ul style="list-style-type: none"> (a) minimise the amount of dust and debris being carried onto the Silver City Highway by haul trucks from the project; and (b) regularly remove this dust and debris from the highway, to the satisfaction of the RTA. 	<p>Section 3.1.1</p> <p>Section 3.1.1</p>
Ginkgo 7.1 (a)	<p>The Applicant shall prepare a Traffic Code of Conduct for all haulage vehicles associated with the Ginkgo Project operating within the Wentworth Shires prior to commencement of construction and to the satisfaction of WSC, in consultation with the Director-General, requiring these haulage vehicles to comply with the Code. The Code shall include, but not be limited to:</p> <ul style="list-style-type: none"> (i) operators conforming to designated haulage routes; (ii) hours of operation; (iv) speed limits; (v) vehicle maintenance; (vi) load coverage; (vii) behavioural requirements; (viii) measures to incorporate the road noise management measures required by the condition 6.2.2; and (ix) protocols with school bus operations <p>The Code of Conduct shall also include measures that will be undertaken by the Applicant in the event it is established that haulage vehicles have not complied with the Code.</p>	<p>Section 3.1.3</p> <p>Section 3.1.3</p> <p>Section 3.1.3</p> <p>Section 3.1.2</p> <p>Section 3.1.2</p> <p>Section 3.2</p> <p>Section 3.1.2</p> <p>Section 3.1.3</p> <p>Section 3.5</p>
Ginkgo 7.1 (b)	<p>The Applicant is to include reports of violations of this condition in its AEMR and to observe any requirements of the Director General regarding the implementation of this condition.</p>	<p>Section 3.4</p>
Ginkgo 7.1	<p>The route to be taken by all restricted access vehicles such as B Doubles type and Road Train type shall conform to the designated routes as prescribed under the "General Notice for the Operation of B Doubles 2000" (or its latest version), and General Notice for the Operation of Road Trains 2000" (or its latest version).</p>	<p>Section 3.1.3</p>

Condition	Consent Condition	Section of Plan
MSP 6.4 (c)	<p>As part of the OEMP for MSP, required under Condition 6.4(a) of this Consent, the Applicant shall prepare and implement the following Management Plans;</p> <p>(vi) A Transport Code of Conduct to outline management of traffic impacts associated with the MSP and minimum requirements for the movement of heavy vehicles to and from the site. The Code shall meet the requirements of BHCC and the RTA, should there be any. The Code shall include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> • restrictions to routes (consistent with the Transport of Hazardous Materials Study required above, where relevant); • restrictions to the hours of transport operations to avoid travelling through built-up areas late at night or at times of high traffic flows in those areas; • speed limits to be observed along routes to and from the site, in particular through built-up areas; • minimum requirements for vehicle maintenance to address noise and exhaust emissions; • load coverage requirements; and • behaviour requirements for vehicle drivers. 	<p>Section 3.1.3</p> <p>Section 3.1.3</p> <p>Section 3.1.2</p> <p>Section 3.1.2</p> <p>Section 3.1.2</p> <p>Section 3.2</p>
MSP 6.4 (c)	<p>(vi) (a) the Transport Code of Conduct required by condition 6.3 (c) (vi) shall be updated to include and reflect the works and activities described in the modification application MOD-130-8-2005i lodged with the Department of Infrastructure and Planning on 25 August 2005 and accompanied by Statement of Environmental Effects August 2005 Modification for Broken Hill Mineral Separation Plant, prepared by Resource Strategies. The Transport Code of Conduct should also reflect the requirements of the updated Waste Management Plan, Emergency Response Plan, Safety Management System and Transport of Hazardous Material Plan. The updated Transport Code of Conduct shall be submitted to the Director General for approval prior to commencement of construction of works or commencement of operations described in the modification application (130-8-2005i).</p>	All
MSP 3.12 (a)	<p>If the waste is transported from the Premises, the Applicant must ensure that the waste is transported:</p> <ul style="list-style-type: none"> • to a place which has been licensed by the EPA to issue consignment authorisation numbers; • to a place that can otherwise lawfully accept that class of waste. 	Section 4.3
MSP 3.12 (b)	<p>If the waste is transported from the premises, the Applicant must;</p> <ul style="list-style-type: none"> • obtain a consignment authorisation number from the consignee; • complete an approved waste data form in relation to the consigned waste in accordance with the instructions on the form and to the extent required, and give a copy of the form to the person transporting the waste; • ensure that the waste data form: <ul style="list-style-type: none"> • is completed accurately, • is retained for a period of not less than 4 years from the time the form was completed, and • is made available for inspection by an authorised officer on request; 	Section 4.3

Condition	Consent Condition	Section of Plan
MSP 3.12 (c)	Ensure, if the waste is of such an amount as to require the person transporting it to be licensed, that the person transporting the waste is licensed.	Section 4.3
MSP 6.7	The applicant must prepare and submit to the Director-General for approval prior to the transport of hazardous materials a Transport of Hazardous Materials Plan , outlining arrangements for the safe transport of hazardous materials along the entire length of the Mineral Concentrate Transport route and demonstrating that the transport of material will be in accordance with the Code of Practice for Safe Transport of Radioactive Materials published by the Australian Radiation Protection and Nuclear Safety Agency and the relevant NSW and Commonwealth regulations. It is recommended that the Hazardous Materials and Radiation section of the Department of Environment and Conservation is consulted prior to preparation of the plan. The Transport of Hazardous Materials Plan shall be submitted for the Director General's approval prior to the commencement of operations. Operations shall not commence until the transport of Hazardous materials Plan is approved by the Director General.	Section 4

2 TRAFFIC CONDITIONS

2.1 ROAD HIERARCHY

The main arterial road associated with Ginkgo and Snapper Mines and the MSP is the State Highway No 22 (Silver City Highway), which provides a sealed north-south route connecting Mildura to the south with Broken Hill in the north. The speed limit of the Silver City Highway is currently 110km/h reducing to 80km/h approximately 100m prior to Kanandah Road turn-off. This road is under the management and control of the RTA and is an approved road train route. This road is the main road within the mineral concentrate transport route for the hauling of mineral concentrate from Ginkgo and Snapper Mines to the MSP.

The other roads that form the mineral concentrate route are local roads under the care and control of the Wentworth Shire Council (WSC) and the Broken Hill City Council (BHCC). These are:

- **Highway Access Road (HAR)**, which will connect the Silver City Highway to the Ginkgo and Snapper Mines.
- **Kanandah Road**, which is a two-lane bitumen road that links the Kanandah Industrial Area with the Silver City Highway. Kanandah Road forms part of the RTA approved road train and heavy vehicle route to the Barrier Highway. Kanandah Road maintains a speed limit of 80km/h, reducing to 60km/h approximately 100m prior to Pinnacles Road turn-off.
- **Pinnacles Road**, links the Pinnacles Mine some 10km south-west of the MSP site to Kanandah Road. Pinnacles Road operates at 60km/h.

The existing Silver City Highway/Kanandah Road and Kanandah Road/Pinnacles Road intersections are designed to accommodate B-doubles and 36.5m road trains. The intersections both operate on 'Give Way' control with excellent sight distances on all approaches. Modifications have been carried out to these intersections to accommodate the 55t double road train arrangement. The modifications contemplated includes the installation of guardrail or guide posts to ensure the corner is not cut by turning traffic and an increased thickness of pavement by the use of concrete or asphalt to reduce scuffing (SKM, 2002).

2.2 TRAFFIC VOLUMES

A traffic impact assessment was undertaken to consider the potential impacts of Ginkgo and Snapper Mines and MSP related traffic on road transport networks (Traffix 2007 and Traffix 2001b). A copy of these reports is included in the Snapper Mine EA (2007) and the MSP EIS (2001b).

As a component of the Road Transport Assessment, available traffic flow data was reviewed and Snapper Mine specific traffic counts were conducted. In order to establish base case weekday traffic flows against which Snapper Mine traffic generation can be assessed, the measured traffic flows have been adjusted upwards to conservatively include peak operational Ginkgo Mine traffic.

The ease of travel (Level of Service) provided by the Silver City Highway, the HAR, Kanandah Road and Pinnacles Road at these traffic levels is considered to be Level of Service A (i.e. drivers are virtually unaffected by the presence of other vehicles in the traffic stream).

The relevant traffic counter locations are shown on Figures 1 and 2 and the base case daily traffic volumes (including estimated peak Ginkgo Mine flows) are summarised in Table 2.

**Table 2
Estimated Base Case Average Weekday Traffic Flows
– Including Ginkgo Mine at Full Production**

Station Number ¹	Road	Location	Estimated Traffic (combined two-way)	
			Daily Flows	% Heavy Vehicles
RTA 98.002	Silver City Highway	13 km south of Eyre Street (Broken Hill)	543 ²	35
Survey Site 1	HAR	East of Silver City Highway	162 ³	45
Survey Site 2	Kanandah Road	West of Silver City Highway	628	25
Survey Site 3	Pinnacles Road	East of MSP Access Road	406 ³	30

Notes

¹ Figures 1 and 2.

² Estimated weekday flow - based on 2002 Annual Average Daily Traffic (AADT), plus 10% plus peak Ginkgo Mine traffic.

³ Includes 2006 measured Annual Average Weekly Traffic (AAWT) traffic flows, plus peak Ginkgo Mine traffic

Predicted Snapper Mine daily traffic generation during the construction and operation phases would include light traffic associated with workforce and visitor movements as well as heavy vehicle deliveries and haulage of mineral concentrates to, and backloaded process waste from, the MSP (Table 3).

**Table 3
Predicted Snapper Mine Daily Traffic Generation**

Phase	Light	Heavy	Total
Construction	223	2	225
Operation	131	42	173

Predicted distribution of the additional Snapper Mine traffic on the local and regional road network is provided in Table 4. The traffic volumes shown in Table 4 are moderate and the predicted additional Snapper Mine traffic would have little effect on the existing levels of service of the road network, with all roads remaining at Level of Service A.

**Table 4
Potential Impacts of Snapper Mine on Baseline Traffic Flows**

Road	Station Number	Location	Baseline Traffic Volume ¹	Plus Snapper Mine Construction	Plus Snapper Mine Operation
Silver City Highway	RTA 98.002	13 km south of Eyre Street (Broken Hill)	543	657	651
HAR	Survey Site 1	East of Silver City Highway	162	387	335
Kanandah Road	Survey Site 2	West of Silver City Highway	628	742	736
Pinnacles Road	Survey Site 3	East of MSP Access Road	406	406	478

Notes

¹ Refer to Table 2

3 CODE OF CONDUCT

3.1 TRAFFIC AND TRANSPORT MANAGEMENT

Traffic and transport management measures to minimise the potential for traffic/transport incidents associated with Ginkgo and Snapper Mines and the MSP were identified in traffic impact assessments undertaken by Traffix (2001a, 2001b and 2007). These recommendations are included below.

3.1.1 ROAD MAINTENANCE AND SAFETY

Any roadworks that are required on the public road network would be designed in accordance with the RTA *Road Design Guide* (RTA, 2003a) and in consultation with the WSC, BHCC and RTA. The 7 km extension of the HAR should be designed and constructed as per the existing Ginkgo Mine HAR.

A monitoring programme developed to assess road pavement conditions along the mineral concentrate route for the Ginkgo Mine will be updated to include transport activities relevant to the Snapper Mine (including the extended section of the HAR for the Snapper Mine).

The Highway Access Road has been constructed and maintained in accordance with the WSC and the RTA. The highway access road is of an excellent quality, constructed and maintained for a design speed of 100km/h. The road was constructed with a carriageway width of approximately 9m, in accordance with detailed design requirements of the WSC and the RTA.

The 7 km extension of the HAR to access the Snapper Mine will be designed and constructed as per the existing Ginkgo Mine HAR.

A turn out bay has been constructed at the western end of the HAR to allow trucks to safely pull off the HAR to drop dust and debris prior to entering the Silver City Highway. Drivers are required to stop and inspect the vehicles to ensure they are free of excess dust and debris. The HAR and Silver City Highway intersection will be regularly inspected for any accumulation of dust and debris. If any build up occurs the highway will be cleared of debris.

3.1.2 VEHICLE MAINTENANCE AND SAFETY

A vehicle maintenance and safety program will be implemented at Ginkgo, Snapper and the MSP. The program will ensure all company vehicles operated (including light and heavy) are roadworthy and meet certification standards of the RTA and other government authorities. The program will require a pre-start of shift safety checklist to be completed prior to driving of vehicles. As a minimum a pre-start of shift checklist will involve the following:

- A visual inspection of vehicle, body, tubs (road trains only), tyres and axes;
- Checking of oil and water levels;
- Checking functionality of brakes and lights; and
- Inspection of safety signage displayed on vehicles.

Additional safety precautions will include the requirement for:

- Drivers to ensure that all loads are covered and secured in accordance with the National Load Restraint Guidelines immediately after loading to minimise the loss of heavy minerals during transport;
- Drivers to ensure operating equipment cannot leak materials hauled;
- Drivers to ensure that all materials placed in truck trays are evenly distributed to balance loads, and under no circumstances, cause any axle grouping to exceed statutory load limits.

- Trucks to be loaded via a calibrated loading unit prior to proceeding to the MSP. Trucks are to register each load across a certified weighbridge before entering the MSP site.
- Road train tubs to be side tipping to minimise the potential for spillage.
- Trucks will be washed at least once in every 24 hour period prior to leaving the MSP in Broken Hill.

Transport contractors are to develop and implement a maintenance program for the heavy haulage vehicles consistent with these safety and maintenance requirements.

3.1.2.1 VEHICLE REQUIREMENTS

The 55t double road train vehicles already operate on the Silver City Highway and other RTA approved routes in the area.

Other specific vehicle requirements will include:

- Air bag suspension to provide quieter travel and a smoother ride,
- Extra mud guard “brushes” to minimise the spray of rocks and debris from the wheels,
- Design principles to ensure that axle spacings and draw bar lengths provide the best directional travel with minimal trailer sway,
- The incorporation of high visibility devices to allow for easy identification by other motorists. As a minimum, all vehicles (light and heavy) entering the Ginkgo and Snapper Mines are to have a strobe or flashing light installed to ensure they remain visible at all times, and in all conditions,
- The incorporation of reflective signage on each of the trailers to ensure high visibility at night, and other such appropriate warning signage as required by the RTA (e.g. Do not overtake turning vehicle, Road Train etc).
- The incorporation of residential grade mufflers to minimise the potential of noise impacts along the mineral concentrate transport route.

3.1.3 TRAFFIC MOVEMENT

The fleet of heavy haulage vehicles will transport concentrate and waste material along the designated mineral concentrate transport route. All project generated traffic between the mine sites and the MSP will be restricted to this designated Mineral Concentrate Transport Route in accordance with the prescribed designated routes for restricted access vehicles under the “General Notice for the Operation of Road Trains 2000” (or its latest version). 55t double road trains will use only the route specified in the specific permits issued for these combinations.

The Road Transport Assessment (Traffix 2007) predicted that the ‘Level of Service A’ flow conditions (Austroads, Guide to Traffic Engineering Practice: Part 2 Roadway Capacity 1993) on all routes within the mineral concentrate transport route would not be altered by traffic from Ginkgo and Snapper Mines and the MSP. Therefore, there will not be a limit to operating hours for transporting minerals. The concentrate haulage operation will be conducted on a 7 day a week, 24 hours a day basis.

In situations where driver visibility and/or traffic safety on public roads is affected by activities associated with Ginkgo and Snapper Mines (eg dust), and proactive management measures are ineffective, mining operations responsible for these conditions will be modified or cease if necessary until favourable conditions are restored.

In situations where drivers visibility and/or traffic safety on public road is affected by weather related conditions such as heavy rainfall or fog, road trains will reduce their speed limit until visibility improves and/or traffic safety has improved.

Communication with WSC and BHCC will also be important in the event that public road safety is compromised. In such an event traffic control measures may be required that include closure of affected roads or temporary lowering of speed limits.

There are currently no school bus routes coinciding with the mineral concentrate transport route. A school bus protocol will be developed in the event that bus routes coincide with the mineral concentrate transport route sometime in the future. This will be developed in consultation with local school bus contractors.

3.1.3.1 SILVER CITY HIGHWAY

The speed limit of the Silver City Highway is 110km/hr with 55t double road train vehicles being engine speed limited to 90 km/h in accordance with RTA road traffic requirements.

3.1.3.2 HIGHWAY ACCESS ROAD

The speed limit for the Highway Access Road will be 100km/h, however 55t double road trains will be engine speed limited to 90km/h. Speed limit signs have been installed at appropriate intervals along the Highway Access Road. Additional signs to be installed include 'stop signs' for mine traffic and warning signs advising Silver City Highway traffic of the upcoming intersection.

3.1.3.3 TRAFFIC COURTESY PRINCIPLES

The following traffic courtesy principles will be enforced within BeMaX, particularly with heavy haulage drivers.

- If areas along the Silver City Highway become congested with traffic as a result of vehicles being unable to overtake road trains, road train drivers will pull over to the side of the road (if safe to do so) to let traffic pass,
- 55t double road train vehicles are not to travel any closer than 200 m when trailing behind other long vehicles or 100m behind other vehicles on the mineral concentrate transport route,
- 55t double road train vehicles are to allow sufficient space for passing vehicles along the mineral concentrate transport route (i.e. are not to straddle centre lines),
- 55t double road train vehicles will stop prior to entering the Silver City Highway to drop any accumulated dust,
- 55t double road train vehicles will be scheduled at specific time separations on departure from the MSP.

3.2 MANAGEMENT PROGRAMS, POLICIES AND PROCEDURES

3.2.1 WASTE MATERIAL TRACKING PROGRAM

Waste movements from the MSP to the Ginkgo and Snapper Mines will be monitored in accordance with the requirements under the development consent conditions and Environment Protection Licences. Section 4.3 outlines the waste tracking program.

3.2.2 FATIGUE MANAGEMENT PROGRAM

A Fatigue Management Program has been developed as part of the Ginkgo and Snapper Mines and MSP Safety Management Plan. The Fatigue Management Program, based on the national Transit Fatigue Management Scheme for the road transport industry, provides procedures and guidelines for managing fatigue to minimising the occurrence of fatigue related incidents. The main principles and guidelines of the Fatigue Management Program are as follows:

DRIVING HOURS SCHEDULES MUST MEET REQUIREMENTS OF RELEVANT NSW REGULATIONS

- In any period of 24 hours, an employee should not work for more than 14 hours (12 hours driving heavy machinery), and should have a rest period of no less than 10 hours;
- Working Time shall not exceed 14 hours per 24 hours;
- Employees should be given at least 24 hours notice to prepare for a Working Time of 14 hours or more;
- Total Non Working Time in any 24 hours shall be at least 10 hours;
- Employees shall have the opportunity for at least 6 hours continuous sleep in a 24-hour period;
- Employees shall have at least one day (24 HOURS) of Time Not Working in 7 days,;
- Flexible schedules shall permit Short Break Time;
- Minimum Short Break Time total should be 30 minutes in 5 ½ hours;
- Health and fitness of employees directly affects the ability to deal with the stresses and demands of the job, and employees should be in a fit state to perform their tasks when presenting for work;
- Vehicle cabins shall meet the requirements of the Occupational Health and Safety Act and includes seating suspension that is adjustable to the operators weight and height;
- Vehicle cabins shall be air conditioned where practicable, comfortable, and checked before the shift.

Where shift work is to be extended beyond these requirements, a Fatigue Assessment Form is to be completed. Extra working hours are to be agreed by both the contractor and the employer and must comply with the Fatigue Management Program.

A key component of the Fatigue Management Program is the Transit Fatigue Management System, which provides an outline of the schedule for road train drivers. Specific rest breaks will be adhered to within the roster and work structure to ensure that all of the above guidelines are adhered to.

3.2.3 DRUG AND ALCOHOL POLICY

A Drug and Alcohol Policy has been developed as part of Ginkgo, Snapper and MSP Safety Management Plan. In accordance with this policy, it is the responsibility of every individual to ensure that they are not, by the consumption of alcohol or a drug, in such a state as to endanger their safety at work or the safety of any other person at work.

In summary the policy states:

- Being under the influence of alcohol by any employee while performing BeMaX business or while in a BeMaX facility is **prohibited** to the extent that such use or influence may affect the safety of co-workers or members of the public, the employees job performance, or the safe and efficient operations of Ginkgo Mine or MSP operation.
- The use or being under the influence of any legally obtained drug by any employee while performing BeMaX business or while in a BeMaX facility is prohibited to the extent such use or influence adversely affects job performance or poses a direct threat to the health or safety of the employee or others. Specifically, legal drugs which display the warning “THIS MEDICINE MAY CAUSE DROWSINESS AND MAY INCREASE THE EFFECT OF ALCOHOL. IF AFFECTED DO NOT DRIVE A MOTOR VEHICLE OR OPERATE MACHINERY” or feel that they have been informed that the use of a legal drug, may represent a health or safety risk are to report such drug use to their Supervisor.
- The presence in any detectable amount of an illegal drug on or in an employee while performing BeMaX business or while in a BeMaX facility is strictly prohibited.
- Unannounced searches for alcohol and drugs while on owned or controlled BeMaX property may be undertaken in accordance with BeMaX Security Standards.
- Unannounced or random, for cause and post-incident testing will be carried out for alcohol use in accordance with policy testing procedures.

All employees will be expected to abide by this policy. At the commencement of work, employees will be required to sign an employee acknowledgement of acceptance form.

3.2.4 EMERGENCY RESPONSE PROCEDURES

Emergency Response Plan (ERP) has been developed as part of the Safety Management System for Ginkgo Mine and the MSP. The ERP provides procedures for responding to a range of potential emergencies including safety incidents, traffic accidents, natural disasters, environmental incidents and spill response. Details of these procedures is provided in the Safety Management System.

An Emergency Response Team will be trained to respond and assist to emergencies and spills along the mineral transport route. The team will be supported by a dedicated emergency response vehicle, which would be equipped to provide equipment for fire control, spill clean up, and/or first aid capability as required.

3.2.5 COMMUNITY CONSULTATION PROGRAM

A formal community consultation program (CCP) will be established for Ginkgo and Snapper Mines and the MSP in accordance with development consent conditions for the all three sites. The CCP will consist of regular community presentations and informal communications.

The landholders in close proximity to the mineral transport route will receive copies of all relevant company literature, copies of the AEMR, and copies of the Mining Operations Plan. If requested,

landholders within close proximity to the mineral concentrate transport route will receive copies of compliance noise and dust monitoring results.

A complaint handling protocol will be established as part of the CCP. Members of the community will be able to register complaints via a telephone hotline, in person or in writing. Within 24 hours of the complaint being registered, an initial response will be provided to the complainant. Preliminary investigations will commence within 24 hours of the complaint receipt to determine likely causes of the complaint using all available information (i.e. climatic conditions, nature of mining activities, recent environmental monitoring results). If required compliance monitoring or independent investigation will be undertaken. Every effort will be made to ensure that concerns are addressed in a manner that results in a mutually acceptable outcome.

In the event that monitoring results indicate that noise, dust amenity or health criteria are exceeded; affected landowners/occupiers will be notified (verbal and written notification). Appropriate management action will then be taken in consultation with the affected landowner/occupier in accordance with the Air Quality Environmental Management Plan or the Noise Environmental Management Plan.

3.3 TRAINING

Contractors employed for driving of heavy vehicles are to be accredited licence holders and have adequate training for the specific equipment to be operated. Prior to commencement of work, contractors are to supply copies of licences and appropriate training records for inclusion in Ginkgo and Snapper and MSP training records.

All contractors will undergo an induction program. The induction program will include information on the following:

- Requirements of the TMP;
- Safety handling and transport of concentrate and MSP waste materials;
- Emergency Response Procedures including spill response.
- Information about the causes of operator fatigue and symptoms, and management of fatigue and strategies for making lifestyle changes.
- Hazard Incident Reporting System

Additional training packages that will be developed include:

- Environmental Awareness programs will be developed and implemented to educate road train drivers on the effects of noise and the use of quiet work practices such as avoiding exhaust braking at night in the vicinity of homesteads along the highway access road.
- Drivers will be given a formal general briefing about radiation and radioactivity, so as to be able to understand the nature of the (small) hazard associated with transporting this material. All drivers, before their first trip carrying waste material, will also be required to attend a Driver's Radiation Safety and Accident Response Briefing, and will be given a specific set of instructions regarding what to do in the event of an accident which causes a spill. The briefing and instructions will be signed off individually by each driver.

3.4 MONITORING AND REPORTING

An audit trail system will be developed between the contractor and Bemax to certify benchmarks for this TMP. This will include verifying weights, schedules, driving speeds, load type carried, collection and delivery points.

A Hazard Incident Reporting System will be implemented at Ginkgo and Snapper Mines and the MSP. All traffic/transport associated incidents including harm to fauna or livestock are to be reported via the Incident Reporting System as soon as practical.

As detailed in Section 4.1.4, gamma radiation readings will be taken outside of the containers and at 1 metre from the truck to determine the Transport Index and Category number. Readings will also be taken inside the driver's cabin after the truck is loaded. These readings will be recorded. Personal radiation badges (Thermo-Luminescent Dosimeters or TLD badges) will be issued to drivers for an initial period of data collection, so as to determine accurately their gamma radiation doses.

An Annual Environmental Management Report (AEMR) will be prepared for the Ginkgo Mine and the MSP. The AEMR will provide a summary of the traffic/transport initiatives implemented for the Ginkgo and Snapper Mines and MSP, present the results of the road monitoring programme, and report on any traffic/transport associated incidents during the 12 month period.

3.5 CONTRACTOR OBLIGATIONS

Bemax will retain a Contractor to undertake the haulage operations required by the Ginkgo Mine and the MSP. This TMP has been prepared to assist the Contractor in the implementation of appropriate environmental and safety management measures during the construction and operation of the Ginkgo and Snapper Mines and the MSP. Contractors are required to comply with the requirements outlined in this Code of Conduct. Failure of contractors to comply with this code of conduct (without due reason) could lead to dismissal from Ginkgo, Snapper and/or MSP operations.

In the event that there is any conflict between the provisions of this TMP and the Contractor's obligations under the Contract including the various statutory requirements (i.e. licenses, permits, consent conditions and relevant laws) the Contract and statutory requirements are to take precedence. In the case of any real or perceived ambiguity between elements of this TMP and the above statutory requirements the Contractor shall first request clarification from the Principal prior to implementing that element of this TMP over which the ambiguity is identified.

4 TRANSPORT OF HAZARDOUS MATERIALS MEASURES

4.1 WASTE PRODUCTION AND MANAGEMENT

4.1.1 WASTE CLASSIFICATION

Waste materials generated at the MSP include silica and quartz from the feed preparation circuit, monazite and silcrete minerals from the ilmenite and leucogene circuits and silicate materials from the zircon and other dry circuits. The monazite fraction of the MSP waste would determine the activity levels of the MSP waste.

The total activity of the combined waste materials generated at the MSP would be approximately 125 Becquerels per gram (Bq/g) during Stage 1 and would increase to approximately 190 Bq/g during Stage 3. Therefore under the DEC Environmental Guidelines: *Assessment, Classification and Management of Liquid and Non-liquid Wastes* (EPA, 1999), the combined waste materials produced would be classified as *hazardous wastes* (ie. total activity would be more than 100Bq/g). These materials are classified as hazardous on the basis they contain radioactive material from the separation circuit and except for this radioactive component would be classified as inert waste as specified in Schedule 1 of the Protection of the Environment Operations Act (POEO).

Under the NSW Radiation Control Act 1990 (RCA) and the Radiation Control Regulation 2003 (RCR), 100 Bq/g is set as the cutoff concentration above which a bulk material is defined as 'radioactive', and to which the Act and Regulation apply.

Under the Protection of the Environment Operations Act (POEO) and its Schedule 1 and its Guideline of Assessment and Classification of Wastes, a waste material which is radioactive under RCA is ipso facto a hazardous waste.

The Radiation Control Regulation requires that any substance which is classified as 'radioactive' under the Act must in its transport, comply with the Code of Practice for the Safe Transport of Radioactive Material, 2001, issued by ARPANSA (herein referred to as the 'Transport Code').

Within the Transport Code, there is an exemption provision allowed by application of Clause 107(e), together with the entries for U-nat and Th-nat in Table 1, which provides a lower cutoff of 10 Bq/g applicable to Thorium as the head of its decay chain. This translates to a 'total decay chain' figure of 100 Bq/g for the thorium chain. The MSP waste material does not however come in under this exemption level. Thus, the transport of these wastes from the MSP at Broken Hill must be under the rules of the 'Transport Code'.

Basically, for bulk transport, these rules state that vehicles must be labelled and placarded appropriately, the loads must be monitored, that the drivers must be instructed appropriately, and that the drivers shall carry a properly filled out Dangerous Goods Shipper's Declaration accurately describing the material being transported. There should be a plan which provides for appropriate response in the case of emergencies, most particularly those involving a spill of material.

4.1.2 LEVEL OF HAZARD ASSOCIATED WITH MONAZITE BEARING WASTES

All the waste material is a physical concentrate of thorium in the form of (very) impure monazite. Under Section II, Clause 226 of the Transport Code, it will be classified as being in the category of

'uranium or thorium ores or concentrates', which are generically designated LSA, standing for Low Specific Activity material.

LSA material which is inert and dense, as the waste material is, and is not prone to dusting, and this waste can be so described, is inherently a low hazard material. It does not require shielding and persons can work near it for an extended period (about 100 hours) before approaching or exceeding the Annual Radiation Dose Limit for Members of the Public as set by RCR; and if there is no dust suspension into the air, then radiation dose by inhalation will not occur.

Under Section V, Clause 523 of the Transport Code, LSA material may be transported unpackaged, i.e., in bulk, provided the transport is under 'exclusive use', meaning that there is no other goods carried and the totality of the trip is under the control of the consignor. It would also generally be expected that there are appropriate means employed to minimize release during transport, such as use of some means to minimize the risk of leaks or spills from trucks, and tarping of the load.

MSP waste material will be transported in bulk, at about 5% moisture content, in closed-tub side tipper trucks, roll- tarped to prevent wind liftoff, so as to minimize risk of leaks or dust release.

4.1.3 LABELLING, PLACARDING AND DOCUMENTATION

In accordance with the Section V, Clause 533 of the Transport Code the transport placards displayed by the trucks will be 'Radioactive Category III Yellow'. The identification on the placard will be LSA-1. Transport Index (T.I.), which is equal to 0.1 x measured gamma dose rate in microsieverts per hour ($\mu\text{Sv/hr}$) at 1 metre from the outside surface of the transport container, will be listed on the placard in accordance with Section V, Clause 526 of the Transport Code. Appendix I shows a copy of the placard as provided in Section V, Clause 541 of the Transport Code.

The label shown in Appendix I, when used as a placard, must have minimum dimensions of 250mm as detailed in Section V, Clause 546 of the Transport Code. The placard must be accompanied by another label giving the UN number (UN 2912) as detailed in Section V, Clause 547 of the Transport Code

All transport vehicles carting waste from the Broken Hill MSP to the Ginkgo Mine will be labelled as LSA-1, UN 2912, and be Dangerous Goods Class 7, Radioactive Category III Yellow.

In accordance with the Section V, Clause 550 of the Transport Code every load of waste material that leaves the MSP drivers shall carry a properly filled out Dangerous Goods Shipper's Declaration accurately describing the material being transported. A copy of the form is provided in Appendix II. The waste tracking program is outlined in Section 5.

4.1.4 MONITORING

As implied in Section 4.1.3 above, gamma radiation readings will be taken outside of the containers and at 1 metre from the truck to determine the Transport Index and Category number. Readings will also be taken inside the driver's cabin after the truck is loaded. These readings will be recorded. Personal radiation badges (Thermo-Luminescent Dosimeters or TLD badges) will be issued to drivers for an initial period of data collection, so as to determine accurately their gamma radiation doses.

4.1.5 DRIVER INSTRUCTION

In accordance with Section 5 of the Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material 2002 issued by IAEA (herein referred to as the 'Safety Guide'), drivers will be given a formal general briefing about radiation and radioactivity, so as to be able to understand the nature of the (small) hazard associated with transporting this material. All drivers, before their first trip carrying waste material, will also be required to attend a Driver's Radiation Safety and Accident Response Briefing, and will be given a specific set of instructions regarding what to do in the event of an accident which causes a spill. The briefing and instructions will be signed off individually by each driver.

4.2 EMERGENCY RESPONSE PROCEDURE

In accordance with Section 5 of the Safety Guide, the primary consideration in a vehicle accident is to respond to the immediate first aid needs of any injured persons. When giving first aid to a contaminated worker, remember (i) water-washing of wounds to remove monazite contamination is effective and will be adequate; visually clean wounds are good enough; (ii) it is literally impossible to get a radiation dose yourself (at least, anything above an absolutely trivial level, while attending to a contaminated accident victim.

4.2.1 FIRST RESPONSE

The next priority in any accident response is to attend to any firefighting task. It is more important to control a fire than to worry about the minor radiation from a spill of monazite waste.

The radiation risk is literally insignificant compared with the prior needs of first aid and firefighting.

Only after these priorities are under control is it appropriate to address the radiation control task.

The radiation control task reduces to the need to (i) barricade off the area of spillage, so as to prevent entry by people or vehicles into the spill area, and (ii) to do whatever is sensible to minimize dispersal, so that as much as possible of the material can be later recovered.

4.2.2 COMMUNICATION

As soon as practical, communication must be made with base so that the spill recovery crew can be dispatched, and so that police and regulatory agency can be contacted. When police arrive on site, control is to be handed to them.

4.2.3 RESPONSE EQUIPMENT

Each waste transport vehicle will have either radio or satphone, first aid kit, and fire extinguisher, and additionally will have witches hats, star pickets, sledgehammer, and barricade tape. The *spill recovery trailer* will in addition to the above be equipped with accident emergency response equipment (normal emergency services kit) as its crew may well be the first rescue services on site. It will also have equipment for spill recovery, including tarps, shovels, drums, lights, drum-

mount type vacuum cleaner and genset, disposable overalls and dust masks, hand and face cleaning facility, etc.

4.3 WASTE MATERIAL TRACKING PROGRAM

Waste movements from the MSP to the Ginkgo and Snapper Mines will be monitored in accordance with development consents, and Environment Protection Licences.

As set out in Section 4.1.1, waste material to be transported from the MSP to Ginkgo and Snapper Mines will be classified as hazardous on the basis they contain radioactive material from the separation circuit and except for this radioactive component would be classified as inert waste as specified in Schedule 1 of the Protection of the Environment Operations Act (POEO).

A waste material tracking system will be implemented as outlined in the Ginkgo Mine Landfill Environmental Management Plan (LEMP) and the Snapper Waste Management Plan (WAMP). The waste material tracking system will monitor:

- The types of waste transported by providing a statement identifying the waste class in accordance with Schedule 1 of the *Protection of the Environment Operations Act 1997* ;
- the volume of waste to which each consignment applies;
- the number of loads per consignment;
- the destination for each consignment;
- the total period required for transportation of the consignment; and
- the date of dispatch and receiving dates of at least the first load in the consignment.

Any waste dispatched from the MSP to Ginkgo and Snapper Mines will require a consignment authorisation number to be issued from the Ginkgo and Snapper Mine prior to transport. An approved waste data form will be completed which will document all waste details required for the waste material tracking system (Appendix III). A copy of the form will be provided to the person transporting the waste. The waste data form will be retained for a period of not less than 4 years.

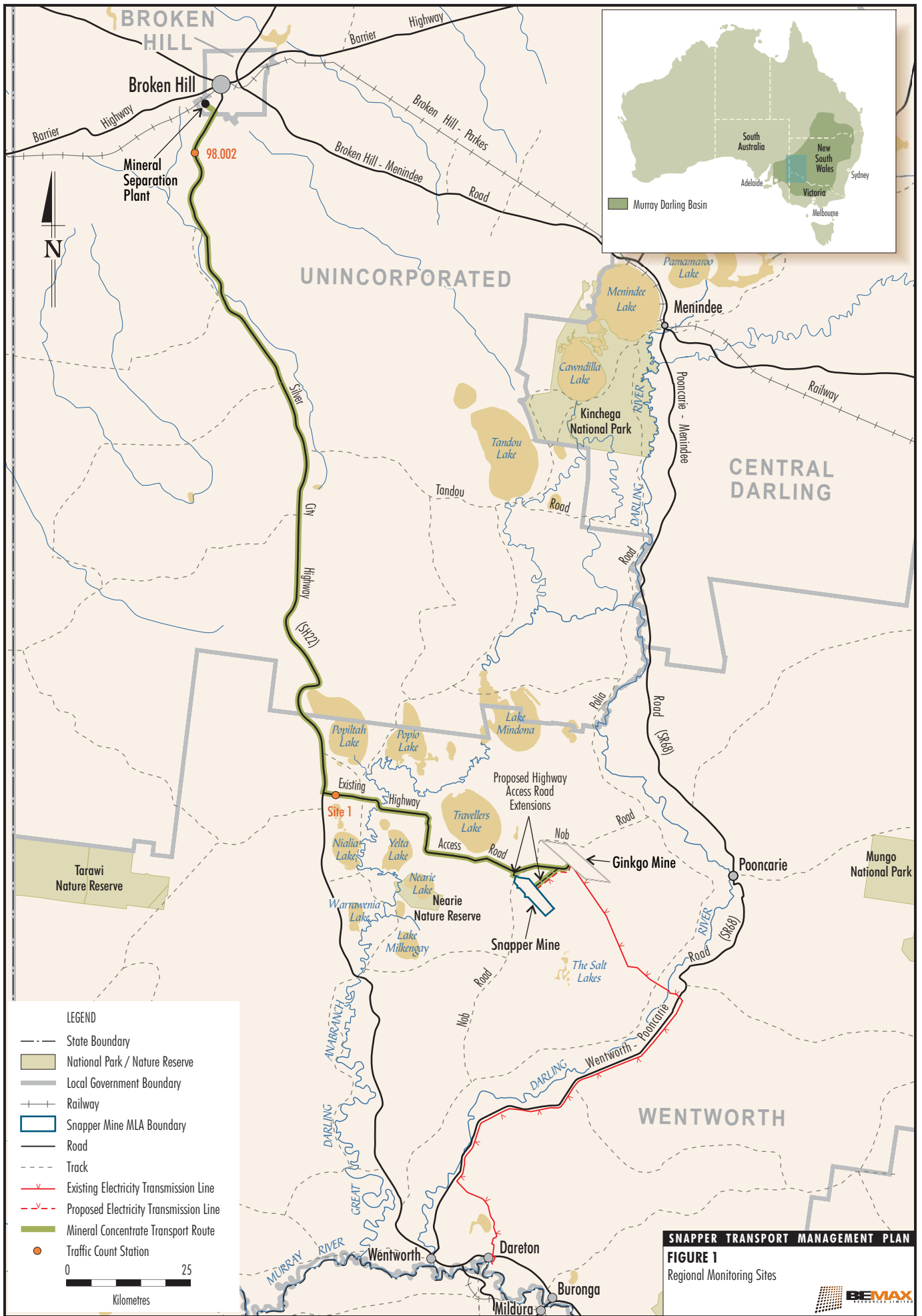
All drivers transporting the waste will be licensed to transport hazardous waste.

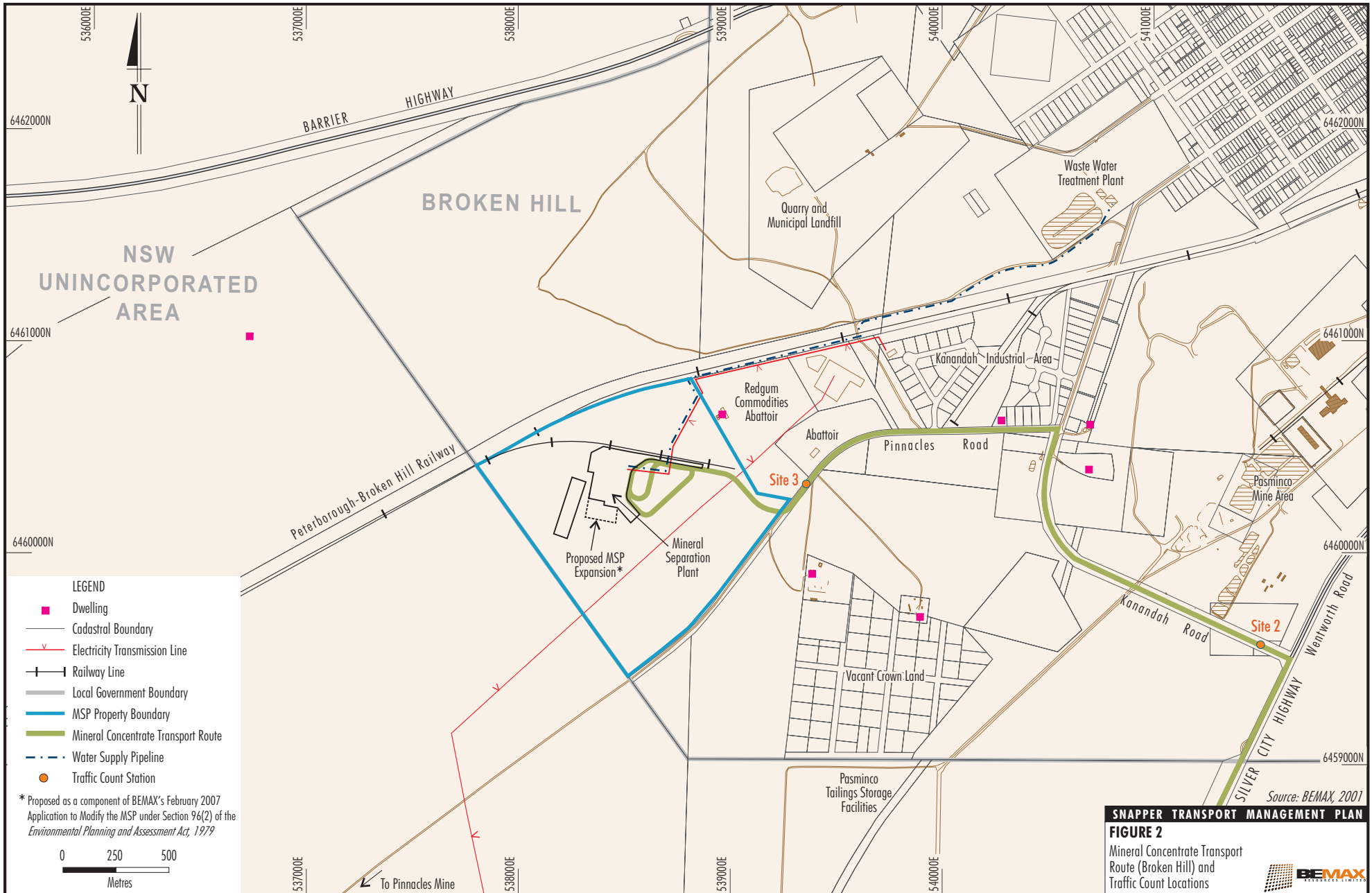
Prior to receiving any waste at the Ginkgo and Snapper Mines from the MSP, a consignment authorisation number will be issued upon written application containing the following information:

- a statement describing the waste and identifying the waste class in accordance with Schedule 1 of the *Protection of the Environment Operations Act 1997* (Section 2.2);
- an estimate of the amount of waste to which the application applies;
- whether the consignment will consist of a single load or multiple loads;
- an estimate of the total period required for transportation of the consignment;
- the date of dispatch of at least the first load in the consignment; and
- copies of all information used by the consignor to classify the waste.

Only waste that has been issued a valid consignment authorisation number will be accepted at the Ginkgo and Snapper Mine from the licensed transporter. The licensed transporter will provide a copy of the waste data form for records at the Ginkgo Mine. A copy of the waste receipt record for each waste collection at the Ginkgo and Snapper Mine will be provided to the MSP within 21 days of the date the waste is collected.

FIGURES



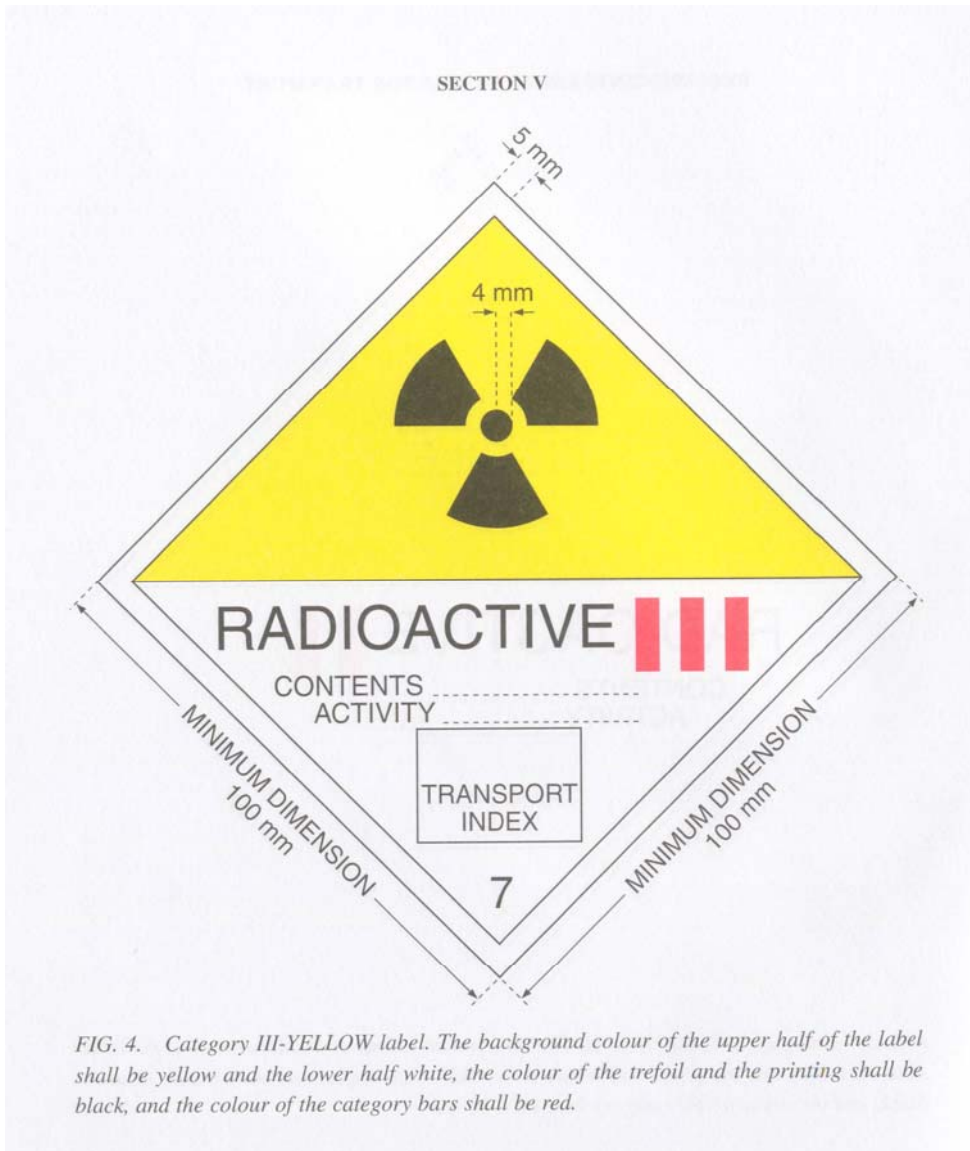


SNAPPER TRANSPORT MANAGEMENT PLAN

FIGURE 2
Mineral Concentrate Transport Route (Broken Hill) and Traffic Count Locations



APPENDIX I
TRANSPORT PLACARD



APPENDIX II

DANGEROUS GOODS SHIPPERS DECLARATION

**ROAD/RAIL/MARINE SHIPPER'S DECLARATION FOR DANGEROUS GOODS
CLASS 7 RADIOACTIVE MATERIAL**

TWO COMPLETED AND SIGNED COPIES OF THIS DECLARATION MUST BE PROVIDED TO THE
CARRIER

CONSIGNOR (SENDER'S NAME AND ADDRESS)		NAME OF TRANSPORTING COMPANY AND CONSIGNMENT No:			
		CONSIGNOR'S REFERENCE No:			
CONSIGNEE (RECEIVER'S NAME AND ADDRESS)		MARINE USE ONLY PORT OF LOADING DATE OF LOADING..... PORT OF DISCHARGE VESSEL..... CONTAINER No.....			
NATURE AND QUANTITY OF RADIOACTIVE MATERIAL See applicable Codes International Atomic Energy Agency - Safety Series No. 6 (IAEA) Maritime Dangerous Goods Code (IMO) Code of Practice for Safe Transport of Radioactive Material (ARPANSA)					
PROPER SHIPPING NAME Refer Overleaf		RADIONUCLIDE Name or symbol of principal radioactive content eg Iridium-192 Ir-192 or ¹⁹² Ir	FORM Physical state: gas, liquid, solid or special form	UNITED NATIONS NUMBER	SUBSIDIARY RISK (If applicable) Classes 1 to 8
Radioactive LSA-1		Th-232	solid	2912	NA
NUMBER OF PACKAGES	ACTIVITY OF RADIONUCLIDE in Becquerel units (Bq) Curie units (Ci) may be used	HAZARD CATEGORY Delete category not applicable	TRANSPORT INDEX Definition: The maximum radiation dose in millirem per hour at 1 metre	PACKAGE CLASSIFICATION Delete classification not applicable	COMPETENT AUTHORITY CERTIFICATE NUMBER(S) required only for Type B containers
	(eg) 5 GBq	111 Yellow	For Yellow hazard categories only T.I. = 5 (eg)	NA	NA
Road Train (eg two trailers)		(eg) 5 GBq	111 Yellow	NA	NA

"WARNING"

FAILURE TO COMPLY IN ALL RESPECTS WITH THE APPLICABLE RADIOACTIVE MATERIALS TRANSPORT REGULATIONS MAY BE IN REACH OF THE APPLICABLE LAW, SUBJECT TO LEGAL PENALTIES. THIS DECLARATION MUST NOT, IN ANY CIRCUMSTANCES BE COMPLETED AND/OR SIGNED BY A CONSOLIDATOR. A FORWARDER OR CARGO AGENT.

APPENDIX III
WASTE TRACKING DATA FORM

WASTE DATA FORM

NEW SOUTH WALES

BEFORE COMPLETING AND SIGNING THIS FORM

READ THE BACK OF THIS FORM FOR IMPORTANT INFORMATION ON HOW TO FILL IN THIS FORM.
AND FOR INFORMATION ABOUT OBLIGATIONS AND OFFENCES

Dangerous Goods

Complete this part if waste is a dangerous good.

Proper Shipping Name
Dangerous Goods Class Subsidiary Risk/s (if any) | UN Number Packing Group No
Type of Packaging Number of Packages Aggregate Net Quantity

Load Identification

Consignment Authorisation Number — Load Number
This consignment authorisation is valid: From / / To / / (DD / MM / YY)

Waste Consignor (Activity)

Licensed Non-licensed Licence No.
Company Name Address of waste source
Company Address (if not the same as
..... company address)
Contact Phone
Name of Consignor (print) Signature of Consignor Date / /

Waste Description

List Contaminants

--	--	--	--

Waste Origin Code (ANZSIC) Waste Code Amount of Waste tonnes kilograms
Physical nature of waste (solid, liquid, sludge, etc)
Waste Type (hazardous, industrial, group A)
Proposed treatment at destination (landfill, incineration, immobilisation, storage, treatment etc)

Dates of Waste Movements

Date of dispatch / / Expected date of delivery to destination / /

Transporter

Licensed Non-licensed Licence No.
Company Name) RTA Registration No. of Vehicle
Address) Type of Transport (Road, Rail, Road & Rail)
.....
Contact Phone)
★Name of Driver (print) ★Signature of Driver ★Date / /

Waste Consignee (Destination)

Company Name Licence No.
Destination Address ★Quantity Received
..... ★Treatment given to waste at destination
Contact Phone) ★Date Received
★Name of Representative (print) ★Signature of Representative

**EMERGENCY CONTACT NUMBER
(24 HOURS)**