



Molyhil Tungsten - Molybdenum Project

DRAFT FIRE ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL MANAGEMENT PLAN PRODUCED TO
ACCOMPANY "MOLYHIL TUNGSTEN - MOLYBDENUM
PROJECT, PUBLIC ENVIRONMENTAL REPORT"

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1.0 INTRODUCTION

1.1 BACKGROUND

Bushfires are a natural hazard throughout the arid regions, especially in summer when electrical storms may occur. There are three important objectives of fire management. The first and most important is the preservation of life, second is ecological protection and third is the protection of infrastructure.

This document forms part of the overall Health, Safety and Environmental Management Plan for the Molyhil Project site. It includes the objectives, strategies, priorities and actions necessary for the reduction of bushfire impacts on life, property and the environment. This document will be reviewed regularly (annually as a minimum) and altered to reflect best practice when necessary. All modifications will be undertaken by the OHS and Environmental staff and approved by the resident manager/ project manager.

The Molyhil Tungsten-Molybdenum Project (Molyhil Project), owned by Molyhil Mining Pty Ltd (Sunsphere Pty Ltd) a 100% owned subsidiary of Thor Mining PLC (Thor), is a proposed open cut mine and processing facility to be constructed in the Northern Territory. The main objective of the proposed facility is to produce scheelite and molybdenite concentrate for sale.

Thor owns 100% of the Molyhil Project, which comprises EL 22349, totalling 829km² in area, and includes Mining Lease Application MLA 23825 which covers the deposit (former open pit, waste dumps and Run-of-Mine stockpile). In addition, Molyhil Mining Pty Ltd has applied for MLA 24429 to further extend the mining operation and MLA 25721 to cover the project infrastructure requirements. The combined mining lease applications cover an area of 247 ha.

1.2 LOCATION OF THE PROJECT

The Molyhil deposit is located 240 km northeast of Alice Springs (320 km by road) at latitude 22° 45' S, longitude 135° 45' E, on the Huckitta (SF 53-11) 1:250 000 and Jinka (6052) 1:100 000 scale maps, Northern Territory. Molyhil is serviced via Alice Springs (population approximately 25 000), a modern city with full amenities and infrastructure.

The mine site is located on the Plenty Highway, approximately 25 km north from the turnoff to Jinka Station along a single lane unsealed road (Figure 1).

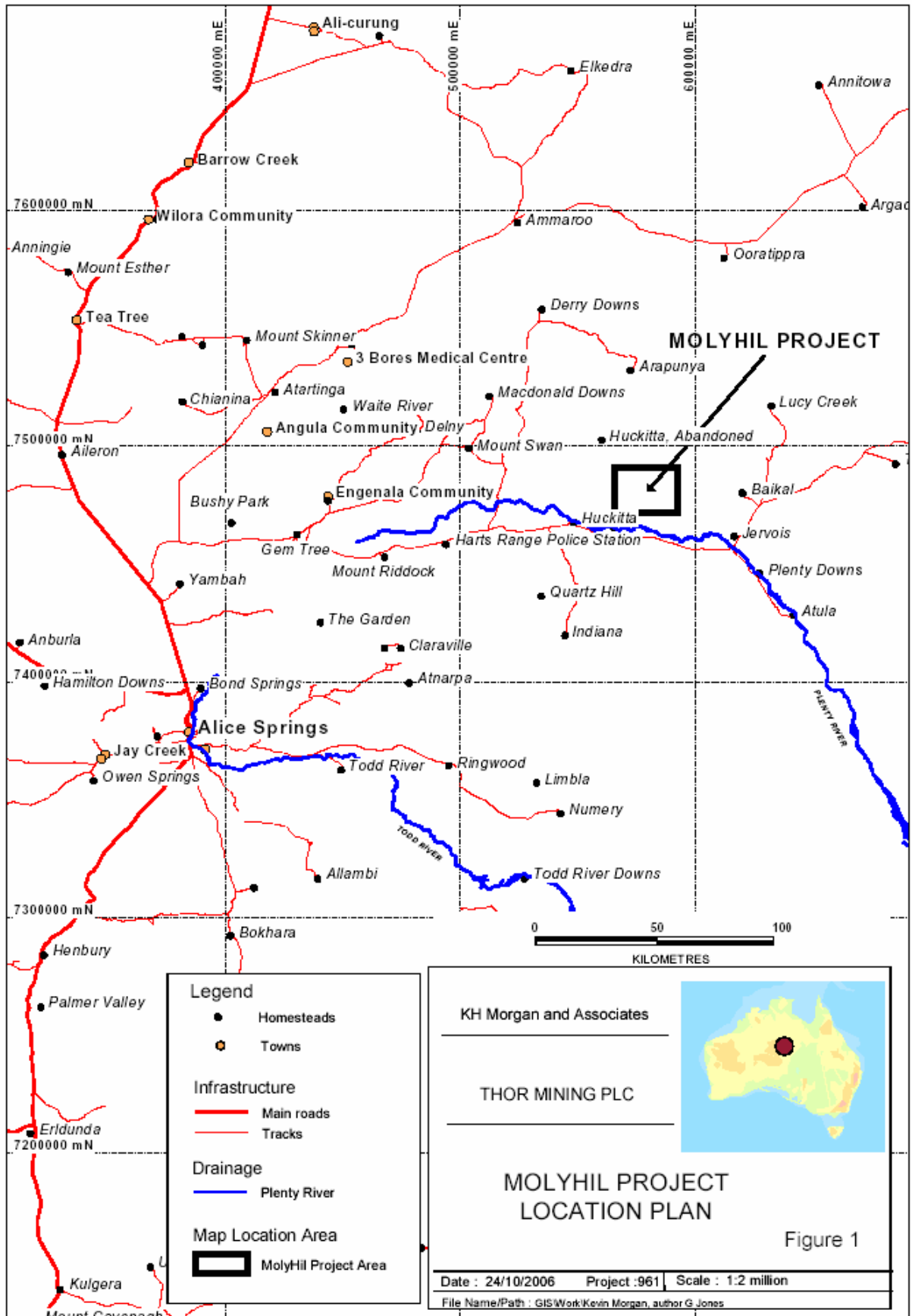


Figure 1 - Molyhil Project location map

1.3 CLIMATE

The climate of the area is semi-arid with the average annual rainfall between 1966 and 2003 being 299.6 mm (Table 1). Approximately 70% of rain is received between November and April, and annual evaporation averages about 3000mm (Slatyer 1962). The strong seasonality of the rainfall results in relatively wet humid conditions for 3-6 months of the year and progressively drier conditions through winter and spring, except for occasional winter rainfall depressions (Low and Strong 1985). Rainfalls in the wet season can exceed 200 mm resulting in locally inundated depressions, which could be a problem for several sections along the haul road. Monthly averages for temperature and rainfall between 1966 and 2003 are provided in Table 1.

Table 1 - Climatic data of Jervois station from Bureau of Meteorology

Jervois Station Climate													
Element	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean daily max.temp. (C)	38.4	36.6	34.4	30.4	25.3	22.1	21.9	25	29.65	33	35.8	37.8	30.6
Mean daily min.temp. (C)	22.4	22.1	19	14	9.8	6.5	5	6.8	11	152.2	18.6	21.1	14
Mean monthly rainfall (mm)	46.1	61.9	30.9	18.7	19.9	9.4	14	8.6	6	16.5	24.3	40.3	296.4

1.4 FIRE CYCLE

Bushfires are a natural phenomenon in the landscape occurring naturally as a result of lightning strikes. Fire plays an important role in the stability of ecosystems. It is an important step in the cycle of vegetation succession. It initiates seed germination and plays an important role in nutrient cycling. Many species are not only fire tolerant but rely on the fire cycle for their survival as a species in the long term. Fires that do not threaten lives or structures should be left to burn with close observation so that ecological systems are maintained.

The common causes of fire during construction and operation of a mining project and associated infrastructure are:

- Electricity;
- Accidental activities: welding, grinding, burning, smoking, blasting, leakage of petroleum products;
- Spontaneous combustion;
- Friction: overheating of brakes, clutches etc.

1.5 EXISTING AND PROPOSED INFRASTRUCTURE

Currently the site has no infrastructure in place for fighting fires, however this will be implemented before the commencement of mining.

The infrastructure to be developed for the Molyhil Project includes:

- Expansion of existing open pit;
- Processing Plant;

- Tailings Storage Facility (TSF);
- Offices and workshops;
- Accommodation village;
- Sewage treatment plant.

1.6 OBJECTIVES

The objectives of this document include:

- the identification of fire risk areas on Thor's leases;
- minimising the risk of bushfire occurrences to protect the life, property and the environment;
- reducing the incidence of unintentional fires;
- minimise the severity and extent of any fires that occur;
- prevent the spread of bushfires onto adjoining leases.

This report suggests procedures for controlling potential incidences involving bush fire. These include:

- fire from beyond the site boundaries threatening the site;
- fire instigated within the site boundaries threatening surrounding land including that instigated within the accommodation camp; and
- fire threatening the accommodation camp from outside the camp boundary.

2.0 RELEVANT LEGISLATION

The primary act related to fire management is the *Bush Fires Act 1980* (NT) implemented by the Department of Natural Resources, Environment and the Arts. Research is usually carried out in a collaborative effort between Bushfires NT (BFNT), Tropical Savannas CRC, National Heritage Trust (NHT) and other commonwealth bodies. Thor will maintain contact with these government agencies in the incidence of fire.

A Northern Territory bushfire management strategy is being developed by Bushfires NT and the Bushfires Council. The guiding principles around which this strategy has been developed, and from which Thor have developed this plan, are:

- Fire prevention is the responsibility of individual landholders;
- Organised efforts towards fire management and control should be directed by the landholder;
- Bushfires NT as the umbrella organisation, has a planning and co-ordinating role in fire management as its primary purpose, rather than acting as a fire fighting service; and
- Traditional burning is still practiced on Aboriginal Land in the Northern Territory.

3.0 RESPONSIBILITY

Table 2 lists the roles and responsibilities of the personnel accountable for the Fire Management Plan.

Table 2 - Roles and Responsibilities of Thor Personnel

Position	Responsibility
Resident Manager	<ul style="list-style-type: none"> • Responsible for the overall implementation of the fire control plan; • Ensure that the project management team understand and appropriately implement the plan in their area of responsibility; and • Provide adequate resources for education, training, attend meetings, participate in risk assessments, fire drills and formal inspections.
Area Managers and Supervisors	<ul style="list-style-type: none"> • Regularly monitor the safety performance with the training that has been provided and site safe work procedures are followed; • Ensure all statutory and site rules and regulations are adhered to; • Scheduling and conducting regular inspections of each work area; • Conduct fire drills and actively participate in these, promoting participation from the workforce; and • Reviewing all incident reports, participating in investigations and applying measures in accordance with site procedures. • Exploration area manager must notify exploration personnel of location of the fire, risks and control activities and remain in contact with the team monitoring the fire. Supervise the temporary shut down of exploration activities in the instance of a fire threatening personal.
Occupational Health, Safety and Environmental Officer	<ul style="list-style-type: none"> • Provide direction and advice on all aspects of the fire control plan; • Responsible for fire risk assessment and regular audits required under the plan; and • Ensure relevant documentation is forwarded to the project manager as required and files on site are accurately maintained.
Employees and Contractors	<ul style="list-style-type: none"> • Report any occurrence of fire to their manager.
Authorised Bushfire Personnel	<ul style="list-style-type: none"> • Bushfire fighting; • Rescue of personnel.

4.0 FIRE MANAGEMENT STRATEGY

This Fire Management Plan outlines the system used to prevent and control fires at the Molyhil Project. The plan forms part of the Molyhil Management Plan and will be used in conjunction with the plan and the Emergency Response Strategy. The objective of the plan is to ensure that Thor plans for the effective prevention and control of fires. The Plan applies to all Thor employees and contractors while at the Molyhil Project.

The plan is based on the concepts of:

- developing controls for fire prevention;
- monitoring to ensure the continuing effectiveness of prevention controls;
- contingency controls which minimise the effects of fire should one occur and the monitoring of these controls.

4.1 FIRE CONTROL OBSERVATION, HAZARD REPORTING, INVESTIGATION AND RECORDING

All activities and processes on site are reviewed and a risk assessment undertaken to develop control measures to minimise the risk of fire to people, the environment and equipment.

The identification and assessment of all fire hazards shall be carried out according to Thor's inspection standard. Identified hazards and control measures shall be included in the formal risk assessment and also included in the site hazard register. It is the responsibility of the OHS&E manager to maintain the hazard register and ensure the appropriate personnel are informed of their responsibilities with regard to closing out of hazards that are registered.

All incidents involving fire outbreaks or cases of potential outbreaks must be reported as soon as possible so that action may be taken to address fire hazards or potential fire hazards. This must be conducted in accordance with Thor's incident reporting system for fires that begin around Molyhil operations.

A key aspect of any fire incident investigation will be the identification of fuel and ignition source and the elimination or control of these sources.

4.2 FIRE INCIDENT RESPONSE

The Molyhil Emergency Response Plan (ERP) will be the overarching document in determining the response to fire incidents on site.

4.3 COMPLIANCE WITH FIRE CONTROL PLAN

Regular auditing will be undertaken by the OHS&E Manager in liaison with Thor Managers to test compliance with the fire control plan. Deficiencies shall be recorded on the corrective action register and actioned accordingly.

Periodic review will encompass company policy, procedures and emergency and/or actual drills and include:

- the results of internal audits of this plan;
- safety statistics particularly related to fire related incidents;
- legislative changes; and
- feedback from Thor.

4.4 EMERGENCY DRILLS

Emergency drills will be conducted at a minimum of once every six months. All emergency plans and procedures will be reviewed quarterly with a comprehensive review following each drill.

The review process will allow amendments to be made to the plan where practicable and procedures will be changed to suit site needs. The OHS&E Manager is responsible to ensure drills are carried out in accordance with the emergency drill plan.

THOR MINING PLC ENVIRONMENTAL MANAGEMENT PROGRAM –		Program No. 1
OBJECTIVE: Reduce the incidence of unintentional fires.		
TARGET: No incidences of fire caused by project operations.		
Target Date:	Accountable: Resident Manager	Approved:
Action Required:	Action by:	Date:
1. Thor will conduct a risk assessment and will identify hazards and control measures that will included in the site hazard register		Ongoing
2. Maintain a fire break of a minimum of 4m around all mine infrastructure.	Resident Manager	Ongoing
3. Train all personnel in the use of fire fighting equipment and awareness of general fire procedures.		On-going
4. Ensure all vehicles/machinery carry fire fighting equipment that complies with the relevant Australian standards.	Resident Manager	On-going
5. Restriction vehicles to designated access roads and tracks (exception of new exploration areas).	Resident Manager	On-going
6. Ensure all machinery, vehicles and equipment is serviced regularly and maintained to minimise the potential of fires from motors/exhausts etc.	Resident Manager and all staff	On going
7. Provide adequate disposal methods for cigarette butts to reduce the risk of them starting a fire.	Resident manager	On-going
8. Prohibit any burning at site. Any campfires will have a minimum 4m fire break around them.	Resident manager	On-going
9. Issue hot work permit for all work that has potential to create an ignition source.		On-going
10. All grinding equipment to carry fire fighting equipment.		On-going
Key Performance Indicators (KPI's)		
<ul style="list-style-type: none"> • Management actions completed. • Construction firebreaks around all infrastructure. • All vehicles/machinery installed with fire extinguishers. 		

THOR MINING PLC ENVIRONMENTAL		Program No. 2	
OBJECTIVE: Minimise the severity and extent of any fires that occur.			
TARGET: Reduce severity of potential fires occurring at the project.			
Target Date: 2007	Accountable: Resident Manager	Approved:	
Action Required:		Action by:	Date:
1. Train all personnel in the use of fire fighting equipment and awareness of general fire procedures.			Ongoing
2. Ensure training of personnel is carried out regularly.			On-going
3. Fire fighting equipment (extinguishers, hoses and tanks) will be available in all buildings and on all vehicles and machinery,		Resident Manager	Ongoing
4. All vehicles will be fitted with two-way radios for communication.		Resident Manager	On-going
5. A dedicated emergency channel and phone line to report an emergency will be established.		Resident Manager	On-going
6. Undertake regular emergency response drills on a bi-annual basis.		Resident Manager and all staff	On going
Key Performance Indicators (KPI's)			
<ul style="list-style-type: none"> • Management actions completed. 			

5.0 BUSHFIRE MANAGEMENT PROCEDURES

Fire management is an important ecological consideration because bushfire has the potential to endanger lives, equipment and mining operation and destroy vegetation on rehabilitation areas. Bushfire is a common occurrence in natural environments and are therefore unavoidable. Management consists of maintenance of existing firebreaks, quick response and management of fire outbreaks, training in fire response for Health and Safety personnel, maintenance of suppression equipment, communication with Department of Natural Resources, Environment and the Arts, BFNT, NHT and other Commonwealth bodies.

5.1 STRATEGIES TO REDUCE THE IMPACT OF BUSHFIRES

Strategies to be implemented by Thor to reduce the impact of bushfires include:

- maintain firebreaks;
- maintain an effective communication system, incorporating a 'call-out' system;
- maintain education of fire awareness;
- maintaining the integrated fire management plan; and
- on-going training.

In the event of a fire on site the following steps will be taken:

- notification of the OHS&E Manager;
- registered manager informed;
- exploration area manager informed;
- the identification of critical limits for the fire before action is required;
- planning of fire control if required;
- mobilisation of water trucks, back burning operations, earthmoving equipment and fire tender if required;
- continuous monitoring of the fire's progress and wind direction changes.

5.2 MUTUAL AID AGREEMENT

Thor will look into development of a Mutual Aid Agreement with surrounding communities and operations. This would be used in circumstances where the nature of an emergency, such as fire, is such that the resources immediately available at Molyhil may be insufficient to maintain an effective response. In such a circumstance, assistance would be available from surrounding communities and operations that support this agreement.

5.3 PROCEDURES FOR BACKBURNING AND CLEARING

Back burning and clearing should occur along the fire suppression access ways and tracks with consideration of the direction of the fire and predicted prevailing winds.

Back burning and clearing should extend to around 20 meters wide and should be contained with fire hoses, fire hydrants and the fire tank if available. The use of earthmoving equipment is more effective than back burning and does not risk further fire, however is not always an option. The area bulldozed should be as wide as possible.

5.4 BUSHFIRES

Methods to manage fire will include back burning, use of earthmoving equipment, use of fire hoses, fire extinguishers and the fire tank. Recommended methods of control will depend upon the severity of the fire, the infrastructure threatened and the direction of its travel.

The siting of a fire should be reported to emergency in channel X. The emergency services and project manager officer should be contacted and briefed on the situation as soon as possible. Details of the fire should be discussed with the OHS&E Manager.

Thor personnel will be assigned the task of locating the fire and estimating its direction and size. An emergency response team will meet to consider the options and establish a plan of action considering the circumstances that may prevail. Wind direction and position of the fire should be closely monitored until the termination of the fire.

5.4.1 Fire Within the Village

If a fire is instigated inside the camp (inside the fire break) it should be contained with the use of fire extinguishers and fire hoses. If the fire is large the fire tank may be utilised. Surrounding vegetation and buildings that are not on fire should be wet with available fire hoses. Those closest buildings to the fire should be attended to first.

Containing fire instigated within the site is the responsibility of the Molyhil team. If a fire can not be contained with fire hoses and tanks further measures should be taken to contain it. This may involve back burning or use of earth moving equipment. These measures will be critical if fire is likely to escape past the fire access track. This should be contained to around 20 metres wide. Burning and clearing may be instigated from the fire break. Surrounding bush must be monitored to ensure burning embers do not start additional fires.

Assistance with the control of large fires should involve the fire brigade and other mutual aid teams.

5.4.2 Fire heading towards the Village

If the fire is large and travelling toward the camp, back burning or bulldozing to create a wider fire break will be required. Again, the area to be burned/cleared is ideally 20 metres.

These actions can be instigated from the fire break. The buildings and surrounding vegetation should be saturated using fire hoses. Alternatively, burning could be controlled to burn up to the buildings and out to the fire break, being controlled with camp fire hoses.

5.4.3 Fire within the site (excluding village)

Containing fire instigated within the site is the responsibility of the Molyhil team. If a fire can not be contained with fire hoses and tanks further measures should be taken such as back burning or use of earth moving equipment. Again, this should occur on the down wind side of the fire and be contained to around 20 metres wide. Burning and clearing may be instigated from areas along the access track network.

Assistance with the control of large fires should involve the Alice Springs fire brigade and other mutual aid teams.

5.5 FIRE SUPPRESSION ACCESS: INTERCEPTING THE BUSHFIRE AT A DISTANCE

In the event of encroaching fire from outside the area priority will be given to intercepting the fire at a significant distance from infrastructure. This will be enabled by a defined by access roads surrounding the area. These access tracks will enable movement of fire fighting equipment and earth moving equipment. Addressing bush fire in this manner will maximise the time to stop the fire before it threatens the safety of persons working at thunderbox and in exploration activities.

Activities at these tracks may involve;

- back burning,
- removal of vegetation with earthmoving equipment and
- fire suppression with water tankers.

5.6 MANAGEMENT AND MAINTENANCE AFTER FIRE

A designated team should remain to patrol the area affected by fire to ensure there is no recurrence from remaining embers.

THOR MINING PLC ENVIRONMENTAL		Program No. 2	
OBJECTIVE: Prevent the spread of fire to surrounding leases.			
TARGET: Reduce severity of potential fires occurring at the project.			
Target Date: 2007	Accountable: Resident Manager	Approved:	
Action Required:		Action by:	Date:
1. Ensure Molyhil has at least one truck fitted with a water cannon that can potentially be used in the event of a bushfire within the mining operation.			Ongoing
2. All vehicles fitted with two-way radios.			
3. Designation of an emergency channel and phone line.		Resident Manager	Ongoing
4. Maintenance of a resource list of all fire crews, contacts, equipment lists and contacts for other organisations.		Resident Manager	On-going
5. Carry out emergency drills on a biannual basis.		Resident Manager	On-going
6. Follow procedures in the emergency response plan.		Resident Manager and all staff	On going
7. In the event of an uncontrolled fire, all surrounding property holders will be notified.			
Key Performance Indicators (KPI's)			
<ul style="list-style-type: none"> • Management actions completed. 			

6.0 REFERENCES

Low, W.A. and Strong, B. (1985) Resource Appraisal of Jervois Station Pastoral Leases 813. Report prepared for the Conservation Commission of Northern Territory, Alice Springs.

Slyter, R.O. (1962) Climate of the Alice Springs Area. Part III in Perry et al. 1962. q.v.