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# Draft EIS - Appendix O Biting Insect Management Plan

Western Desert Resources Limited  
Roper Bar Iron Ore Project

2012



# **Biting Insect Management Plan**

## **Appendix O**



**Western Desert Resources Ltd**


**DW120004**

**Roper Bar Iron Ore Project**

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Prepared by:	Casey Hawkey
Position:	Environmental Scientist
Signed:	
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Approved by:	INSERT NAME
Position:	INSERT POSITION
Signed:	
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EcOz (NT) Pty Ltd  
 trading as EcOz Environmental Services  
 ACN: 143 989 039

Winlow House, 3<sup>rd</sup> Floor  
 75 Woods Street  
 DARWIN NT 0800  
 PO Box 381, Darwin NT 0800

Telephone: +61 8 8981 1100  
 Facsimile: +61 8 8981 1102  
 Email: [ecoz@ecoz.com.au](mailto:ecoz@ecoz.com.au)

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# Contents

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1	Context .....	4
2	Project Description .....	4
2.1	Introduction .....	4
3	Previous Related Studies .....	5
3.1	McArthur River Mine.....	5
4	Management and Monitoring .....	5
4.1	Baseline Mosquito Monitoring Program .....	5
4.2	Biting Insect Management (Construction) .....	7
4.3	Biting Insect Management (Operations).....	8
5	Preventing Breeding Sites .....	9
5.1	Camp .....	9
5.2	Mine Site .....	9
5.3	Haul Road .....	9
5.4	Bing Bong Barge Loading Facility.....	9
6	Decommissioning and Rehabilitation .....	10
7	References .....	10

## Tables

Table 1: WDRL's Biting Insect Management for Construction .....	7
Table 2: WDRL's Biting Insect Management for Operations .....	8

## Figures

Figure 4-1 Baseline Biting Insect Trapping Sites .....	6
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## Appendices

Appendix O-1 Interim Mosquito Trapping Results.....	11
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# 1 Context

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Western Desert Resources Limited (WDRL) proposes to develop an iron mine in the Roper River region of the Northern Territory. Through the development of the Environmental Impact Statement (EIS) it was requested that a Biting Insect Management Plan be developed for WDRL's Roper Bar Iron Ore Project. The Biting Insect Management Plan has been developed with reference to the *Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites 2005* by the Northern Territory Government – Department of Health and Families.

This initial Biting Insect Management Plan is intended to minimise potential impacts or issues concerning biting insects as a result of works associated with WDRL's Roper Bar Iron Ore Project. Potential issues identified include;

- Local transmission of mosquito borne diseases
- Increase in adult mosquito populations
- Increase in mosquito breeding sites

A 12 month baseline mosquito monitoring program is currently underway to provide a seasonal distribution of the mosquito species present. Mine site infrastructure will be managed to minimise the potential to create new mosquito breeding sites or increase yields at existing sites. Potential breeding areas can be created in or around construction works, water storage facilities, sediment traps, pit dewatering, waste water disposal, mine waste dumps, site clearing burrow pits and storage of artificial receptacles. Any equipment sourced from North Queensland that is capable of holding even a small amount of water can potentially harbour the eggs of the dengue mosquito *Aedes aegypti*. Mitigation measures will be put in place to prevent the introduction of this species.

## 2 Project Description

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### 2.1 Introduction

Western Desert Resources Limited (WDRL) propose to mine Iron Ore reserves within existing Mining Leases under Application (MLA 28264 and 28963) in the Roper Bar Region of the Northern Territory. WDRL hold a number of Exploration Leases (ELs) and currently have (Five) Mineral Lease Applications (MLAs) lodged with the Northern Territory Government. WDRL has identified a number of deposits within the MLAs and hope to commence mining these resources once approvals are granted.

The majority of the WDRL project area is within the former St Vidgeon Pastoral Lease. St Vidgeon Station was abandoned due to its inability to support a sustainable pastoral enterprise and as a result, the Limmen Park proposal was gazetted by the Northern Territory government in 1991 for consideration to allocate the area as "Park or Reserve" status. A section of the project extends south from the former St Vidgeon Pastoral Lease into Nathan River Station. The predominant land uses in the region are the existing McArthur River Mine and ancillary infrastructure, pastoral leases, Aboriginal lands and outstations and large areas of undeveloped lands and coastline. There are no significant coastal townships, with the town of Borroloola located approximately 40 km inland from the Port of Bing Bong, and the Bing Bong Station homestead is located approximately 5 km to the west.

The proposal includes a 160km Haul Road between the mine site, and an existing port facility at Bing Bong. Iron ore will be transported to the existing Bing Bong facility via the proposed Haul Road, where it will be deposited and stockpiled inland at a Stock Yard Facility approximately 2-3 km from the coast.

The ore will then be transported to a barge loading facility at the Bing Bong port facility via conveyor where it will be loaded onto a bulk carrier to be conveyed to Ocean Going Vessels (OGV) moored approximately 20-30 km offshore in accordance with existing operations at Bing Bong.

## 3 Previous Related Studies

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### 3.1 McArthur River Mine

A baseline Biting Insect survey was performed for the McArthur River Mine (MRM) project for sites at the mine, Bing Bong Port and Borroloola in 1994. This survey was performed in conjunction with the Medical Entomology Branch of Territory Health Services (now the Department of Health). The most relevant information from this survey to the WDRL's Roper Bar Iron Ore Project is the information gathered from the Bing Bong site – where WDRL intend to construct their loading facility.

MRM currently has a mosquito monitoring system, which commenced in 2009. Information from this system has found that the two main pest species at the mine site are temporary ground pool breeders and therefore controlled with residual bifenthrin insecticides (URS 2005).

#### 3.1.1 Bing Bong

During MRM's baseline biting insect study – a total of 2,307 mosquitos were trapped across two sites which contained 10 and 13 species at each site respectively. The two most abundant species present were *Ae. vigilax* (salt marsh mosquito) and *Cx. sitchensis* (the salt water Cullex mosquito) respectively – it was inferred that stable breeding sites were present – and that the three most abundant species bred in brackish to salt water habitats (URS 2005). To date, control at Bing Bong has been limited to coils and spray cans. However during future wet seasons, large scale spraying will be investigated for the mine site. (URS 2005). MRM's mosquito monitoring program has continued post baseline studies, however, the results of this program are not currently internally managed and were not available for inclusion in this Management Plan.

## 4 Management and Monitoring

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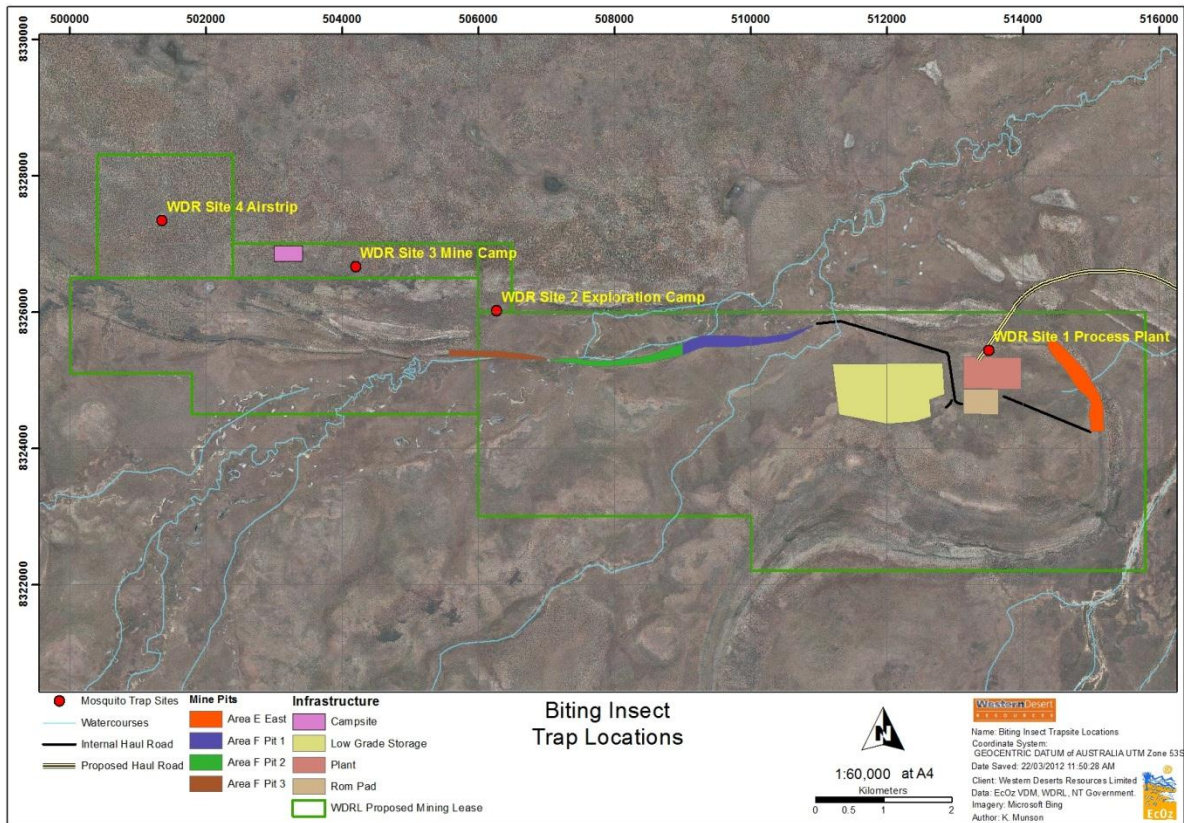
WDRL is committed to ensuring the health and safety of its workforce. Biting Insect Management on-site will be performed in accordance with the *Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites 2005* by the Northern Territory Government – Department of Health and Families. Key management objectives will be to prevent mosquito breeding opportunities on-site, reduce the potential for contact between personnel and mosquitoes and detail monitoring and response strategies to severe outbreaks or incidence of disease.

### 4.1 Baseline Mosquito Monitoring Program

A 12 month baseline adult mosquito monitoring program was initiated in February 2012 in line with the recommendations outlined in the *Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites 2005* by the Northern Territory Government – Department of Health and Families. During this survey, adult mosquitos will be sampled monthly to provide an indication of the seasonal distribution of the mosquito species present and the relative potential impact of mosquito borne disease to mine personnel.



An interim report containing trapping results for mosquito species within WDRL's proposed Roper Bar Iron Ore Project (Figure 4-1), as well as a desktop analysis of potential mosquito breeding sites has been prepared by NT Medical Entomology and is attached as Appendix O-1.



**Figure 4-1 Baseline Biting Insect Trapping Sites**

This is the initial assessment of mosquito species present, and a further detailed report will be produced at the end of the baseline surveys in January 2013.

Information gathered from the baseline survey will provide detail on mosquito species present, their relevant numbers, and the temporal and spatial distribution of mosquito species in the area. This information will be utilised to further refine management methods and inform personnel of peak abundance periods.

## 4.2 Biting Insect Management (Construction)

Table 1: WDRL's Biting Insect Management for Construction

<b>OBJECTIVES</b>	<b>Prevent the occurrence of mosquito breeding sites and the presence of adult mosquitos</b>
<b>TARGETS</b>	No mosquito breeding sites generated during construction operations
<b>ACTIONS</b>	<p>Any depressions generated with the potential to hold water will be drained to prevent ponding</p> <p>Storage containers capable of holding water will either be discarded after use or stored in a manner to prevent water ponding</p> <p>Ponds, dams, drains, sediment traps, bunded areas and onsite excavations will be periodically inspected for the presence of mosquito larvae at a frequency to be recommended by NT Department of Health. Detected populations will be managed under recommendations from the Medical Entomology Branch NT.</p> <p>Erosion and wash-down management infrastructure will be controlled to prevent standing water bodies adjacent to site.</p> <p>All spoon drains/drainage channels will have sufficient grade where possible to prevent ponding, and be maintained free of sediment and vegetation.</p> <p>Ponds, dams and other water holding structures will be designed appropriately and maintained to minimise the potential for mosquito breeding.</p> <p>Runoff sediment ponds will be emptied immediately post storm events to prevent standing water, or be designed as deep (&gt;1m), steep sided (1V:2H) ponds.</p> <p>All construction workers will be educated of the risk of mosquito borne disease through onsite inductions. This will include a description of peak abundance periods and personal protective measures including long sleeve shirts and trousers, regular application of repellents and avoidance of outdoor operations at sundown. Outdoor lanterns or portable gas powered insecticide vaporisers could be used in outdoor areas at night when required, as well as permethrin impregnated work clothing.</p> <p>Workers will be educated about the early symptoms associated with exposure to mosquito borne arbovirus and will be instructed of the need to report any observed symptoms.</p> <p>All construction accommodation will be screened and external lighting will utilise yellow bulbs to discourage attracting insects. Barrier insecticide treatment of accommodation and work buildings will control adult mosquitoes around these areas.</p>
<b>MONITORING</b>	WDRL will monitor mosquito activity in construction accommodation and work areas to identify if mitigation measures are not successful and to determine whether control measures should be implemented.
<b>REPORTING</b>	Significant mosquito activity will be reported to WDRL's General Manager as well as the Medical Entomology Branch NT.



### 4.3 Biting Insect Management (Operations)

Table 2: WDRL’s Biting Insect Management for Operations

<b>OBJECTIVES</b>	<b>Prevent the occurrence of mosquito breeding sites and the presence of adult mosquitos</b>
<b>TARGETS</b>	No mosquito breeding sites generated during operation activities
<b>ACTIONS</b>	<p>Any depressions generated with the potential to hold water will be drained to prevent ponding</p> <p>Storage containers capable of holding water will either be discarded after use or stored in a manner to prevent water ponding</p> <p>Ponds, dams, drains, sediment traps, bunded areas and onsite excavations will be periodically inspected for the presence of mosquito larvae at a frequency to be recommended by NT Department of Health. Detected populations will be managed under recommendations from the Medical Entomology Branch NT.</p> <p>Erosion and wash-down management infrastructure will be controlled to prevent standing water bodies adjacent to site.</p> <p>All spoon drains/drainage channels will have sufficient grade where possible to prevent ponding, and be maintained free of sediment and vegetation.</p> <p>Ponds, dams and other water holding structures will be designed appropriately and maintained to minimise the potential for mosquito breeding.</p> <p>Runoff sediment ponds will be emptied immediately post storm events to prevent standing water, or be designed as deep (&gt;1m), steep sided (1V:2H) ponds.</p> <p>All operation workers will be educated of the risk of mosquito borne disease through onsite inductions. This will include a description of peak abundance periods and personal protective measures including long sleeve shirts and trousers, regular application of insecticide and avoidance of outdoor operations at sundown. Outdoor lanterns or portable gas powered insecticide vaporisers could be used in outdoor areas at night when required, as well as permethrin impregnated work clothing.</p> <p>Workers will be educated about the early symptoms associated with exposure to mosquito borne arbovirus and will be instructed of the need to report any observed symptoms.</p> <p>All construction accommodation will be screened and external lighting will utilise yellow bulbs to discourage attracting insects. Barrier insecticide treatment of accommodation and work buildings will control adult mosquitoes around these areas.</p>
<b>MONITORING</b>	WDRL will monitor mosquito activity in on-site accommodation and work areas to identify if mitigation measures are not successful and to determine whether eradication measures should be implemented.
<b>REPORTING</b>	Significant mosquito activity will be reported to WDRL’s General Manager as well as the Medical Entomology Branch NT.

## 5 Preventing Breeding Sites

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This chapter identifies the key structures proposed by WDRL for their Roper River Iron Ore Project that have the potential to become breeding sites for biting insects. These areas will be constructed in accordance with recommendations outlined in the *Guidelines for Preventing Mosquito Breeding Sites Associated with Mining Sites 2005* by the Northern Territory Government – Department of Health and Families.

### 5.1 Camp

- Potable Water Storage Tanks
- Septic Systems
- Storm Water Containment Bunds
- Stormwater drains and sediment traps
- Cleared areas
- Borrow pits for roads/building pad construction
- Waste Dump Area
- Any additional potential water pooling receptacles associated with this area

### 5.2 Mine Site

- Storm water drains, storm water collection ponds, sediment traps, discharge sites
- Excavation Pits
- Any additional potential water pooling receptacles associated with this area
- Water dams and water tanks
- Process water/wash down water
- Borrow pits for roads/building pad construction

### 5.3 Haul Road

The Haul Road will be constructed to minimise any potential for constricting flow to mitigate flooding potential. As a result, pooling water will also be avoided. Borrow pits rehabilitated to be free draining, or not located within 5km of any current or planned accommodation.

### 5.4 Bing Bong Barge Loading Facility

- Storm Water Containment Bunds
- Storm Water Collection Ponds
- Dust Suppression Water Tanks
- Truck Wash Down Bay
- Septic Systems
- Any additional potential water pooling receptacles associated with this area.

## 6 Decommissioning and Rehabilitation

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A decommissioning and rehabilitation plan will be in place for all mining operations to ensure no actual or potential mosquito breeding sites remain after cessation of mining operations. All disturbed areas should be rehabilitated to be free draining where practical.

Aspects to consider when decommissioning and rehabilitating a mine site include;

- Removing and contouring all sediment ponds,
- Removing all bund walls created for the development,
- Removing infrastructure and artificial receptacles that could pond water,
- Removing water dams and reinstating existing flow paths where practical, otherwise leaving dams and pit voids and deep, steep sided water features
- Rehabilitating borrow pits,
- Removing wetland filters, sediment traps, and other facilities that could pond water and breed mosquitoes.

## 7 References

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METSERVE 2012 *Draft Environmental Impact Statement – McArthur River Mine Phase 3 Development Project, January 2012*, Xtrata Zinc, Brisbane, Australia

URS 2005 *Draft Environmental Impact Assessment – McArthur River Mine Open Cut Project*, August 2005, Xtrata Zinc, Brisbane, Australia

Whelan, P and Warchott, A, 2005 *Guidelines for the preventing mosquito breeding sites associated with mining sites*, November 2005, Department of Health and Families, Northern Territory Government, Darwin, Australia.

# Appendix O-1