GALILEE COAL PROJECT
INITIAL BIOSECURITY MANAGEMENT STRATEGY -
MINE AND TRAIN LOADOUT FACILITY

Waratah Coal
THE NEW ENERGY IN COAL

Appendix - Initial Biosecurity Management Strategy – Galilee Coal Project Mine and Train Loadout Facility

GALILEE COAL PROJECT
INITIAL BIOSECURITY MANAGEMENT STRATEGY -
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Waratah Coal
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1. Introduction

1.1 Scope

This Biosecurity Management Plan (BioMP) has been developed for the Galilee Coal Project (the Project) to identify, reduce and manage biosecurity risks associated with the construction and operation of the coal mine and rail infrastructure.

Waratah Coal acknowledges its responsibility to manage potential impacts associated with pests, weeds and diseases for the construction and operation of the coal mine and rail infrastructure associated with the Project. Waratah Coal seeks to manage lands used for the Galilee Coal Project in accordance with best-practice management protocols and guidelines as designated by State and Commonwealth government authorities.

Procedures for weed and pest animal control and mitigation on land managed by Waratah Coal will align with best practice management for each pest and weed species as provided by the Queensland Government Department of Employment, Economic Development and Innovation (DEEDI), the Commonwealth Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) and other agencies, and in accordance with Codes of Practice and Standard Operating Procedures available for each pest and weed species.

This BioMP assesses the current extent and distribution of significant weed and animal pest species and seeks to ensure that appropriate controls and procedures are implemented, in accordance with regulatory requirements, to avoid or manage the potential impact to the Project are and Queensland and Australia's biosecurity as a whole.

This BioMP is structured to provide initial guidance in regard to Waratah Coal's approach to managing potential biosecurity risks. Prior to commencement of construction Waratah Coal will have developed the following strategies:

- Weed and Plant Disease Management
- Terrestrial Pest Animal and Animal Disease Management
- Aquatic Pest Management Strategy.

The details of this document and the above strategies will be developed in parallel to the Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP).

The management strategies will be reviewed on a regular basis and updated to ensure management incorporates the most up to date information. The management strategies will also be reviewed to take into consideration changes in the distribution, priority, biosecurity risk and status of weeds and pests.

Where State and Commonwealth requirements do not apply to locally or regionally significant weed and pest species, weed and pest management will be undertaken in accordance with the requirements of management strategies developed by the relevant local authority. Where existing weed and pest animal mapping is available this will be integrated in the Project management strategies.

1.2 Project Description

Waratah Coal intends to establish a new coal mine, railway and coal stockyards and supporting infrastructure to export highly volatile, low sulphur, steaming coal to international markets. The Galilee Coal Project will incorporate:

- a new coal mine and associated infrastructure located near Alpha in the Galilee Basin, Central Queensland; and
- a rail network between the mine and the Abbot Point State Development Area (APSDA).

Figure 1 shows the location of the mine and rail infrastructure.

Waratah Coal proposes to mine 1.4 billion tonnes of raw coal from its existing tenements, Exploration Permit for Coal (EPC) 1040 and EPC 1079. The mine development involves the construction of four 9 Million Tonnes Per Annum (Mtpa) underground long-wall coal mines, two 10 Mtpa open cut pits, two coal preparation plants with raw washing capacity of 28 Mtpa.

The annual Run-of-Mine (ROM) coal production will be 56 Mtpa to produce 40 Mtpa of saleable export product coal. At this scale of operation, the capital expense of constructing the required rail and port infrastructure is economically viable over the life of the Project.

Processed coal will be transported by a new railway system approximately 453 kilometre (km) in length that runs from the mine in the Galilee Basin to the coal terminal at the existing Port of Abbot Point. The railway component includes a state of the art, heavy haul, standard gauge railway to support 25,000 tonne train units. The rail will initially be built to initially transport 60 Mtpa, and will ultimately cater for a capacity of 400 Mtpa. As such, Waratah Coal has undertaken the assessments to support, and are seeking approval for, a rail capacity of 400 Mtpa.

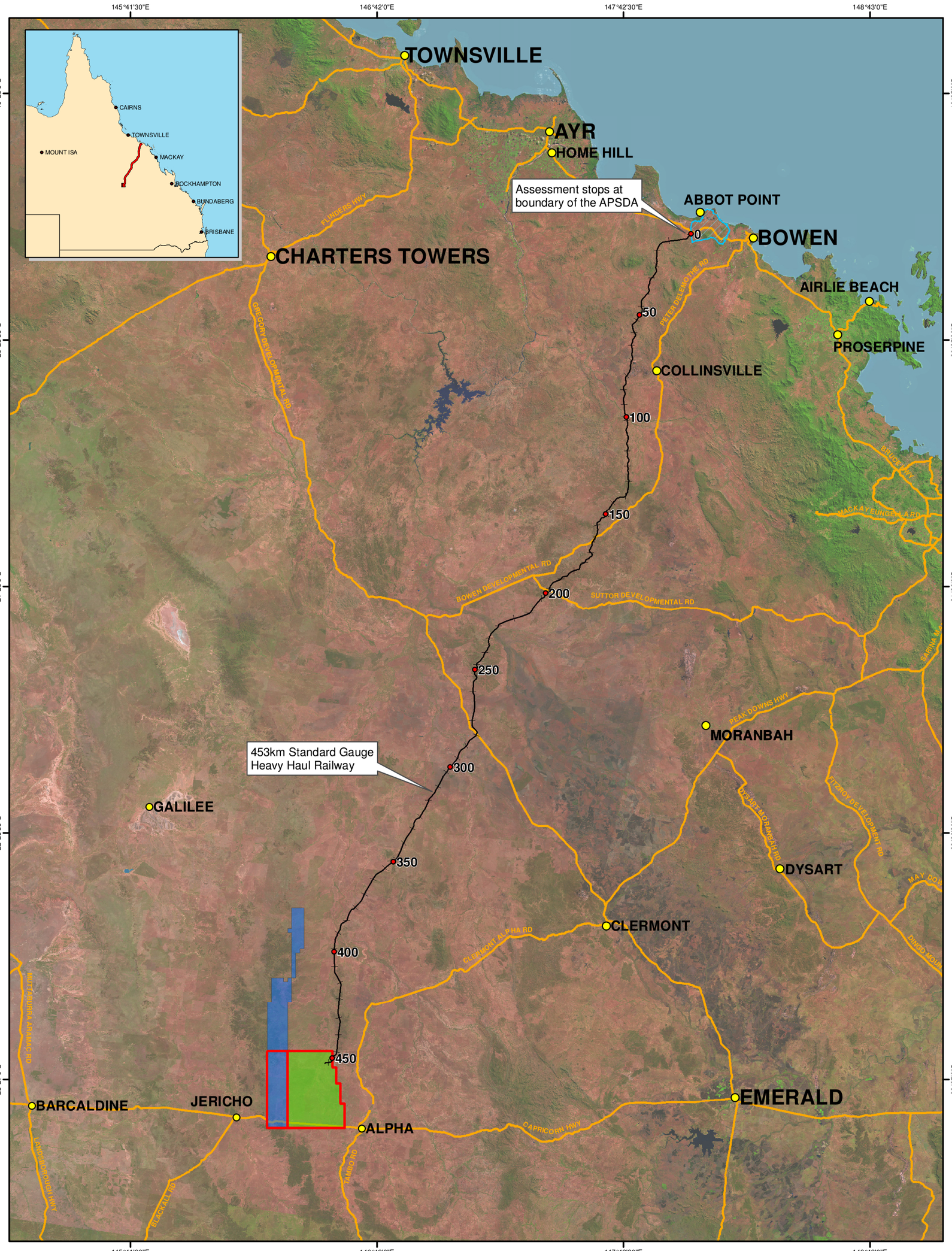
Until recently there was a commitment to utilise coal terminal, stockpiling and loading facilities being assessed as part of the North Queensland Bulk Ports (NQBP) T4-T9 and MCF proposals. However, given the recent Queensland Government directive to defer the approval process for the expansion of Abbot Point until the end of 2012, and the associated uncertainty over the T4-T9 and MCF proposals, the limit of the assessment for this project is now defined as the boundary of the APSDA.

Various supporting infrastructure will also be constructed as part of the Project including the connection to new power and water supply infrastructure being proposed by Government.

The Project will be developed over three years. The mine will have a life of approximately 30 years, whereas the rail will continue to operate to support other projects.

The mine will be a combination of two surface mines and four underground mines with an ultimate export capacity of 40 Mtpa. The surface and underground mines will be supported by a purpose built Mine Infrastructure Area.

The raw coal will be washed for the export market with an overall product yield of 72%. The annual raw coal production will be 56 Mtpa to produce 40 Mtpa of saleable export product coal.



GALILEE COAL PROJECT
(Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

Mineralogy House, Level 7, 380 Queen Street, Brisbane Qld 4000, Australia

Source:	LandSat Image: Geoscience Australia 2005 EPC: DEEDI 2012 Proposed Rail: Waratah Coal Pty. Ltd. 2012 Abbot Point State Development Area: Mipela 2009
Disclaimer:	This plan is based on or contains data provided by others. Waratah Coal Pty. Ltd. gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to and use of the data. Data must not be used for disect marketing or be used in breach of privacy laws.
File:	File:WAR20-26-SEIS003a-STUDY-AREA-120605

0 20 40 60 80
Kilometers
A3 Scale 1:1,500,000
Coordinate System: GCS GDA 1994

- Arterial Road
- Abbot Point State Development Area
- 50km Marker Point
- Proposed Rail Alignment (03.05.2012)
- Exploration Permit Coal (EPC) 1040
- Exploration Permit Coal (EPC) 1079

FIGURE 1:
PROJECT REGIONAL CONTEXT

GALILEE COAL PROJECT
INITIAL BIOSECURITY MANAGEMENT STRATEGY -
MINE AND TRAIN LOADOUT FACILITY

The mine general arrangement will incorporate the following operations producing raw coal:

- two surface mining pits in the B seam resource producing ten Mtpa total;
- two surface mining pits in the C and D seam resources producing ten Mtpa total;
- one long wall mine in the B seam producing nine Mtpa;
- three long wall mines in the C and D seam resources producing 27 Mtpa total;
- raw coal stockpiles at the underground mines;
- haulage roads to deliver raw coal from the surface mines to crushing and stockpile facilities;
- three overland conveyor systems to transport raw coal to the coal processing plants;
- three raw coal stockpiles to feed the coal preparation plants while providing blending capability;
- two coal preparation plants consisting of four 1,000 tonnes per hour modules each;
- two product coal stockpiles handling product coal to rail load out facilities;
- two railway turning loops each with a single coal load out facility;
- topsoil stockpiles and out of pit overburden spoil sites to create initial surface mining pit space;
- water management structures including dams, levee banks and sediment traps;
- tailings dams and coarse spoil disposal areas integrated into the mine spoil pile areas;
- refuelling and maintenance facilities;
- access roads, power lines and other services located in a central services corridor transgressing the entire resource area; and
- a mine office, communications, and associated amenities.

The surface mining method will be a combination of walking draglines for overburden removal in conjunction with truck and shovel fleets for partings removal and coal recovery.

An additional overburden removal system utilising large electric rope shovels loading onto overburden conveyors will also be used in conjunction with the draglines. This configuration offers the flexibility to create additional pit space by moving overburden over longer distances rather than through the use of walking draglines without the expense of truck and shovel fleets to achieve this.

The underground mining system is based on large scale long wall mining with each mine accessing the underground resource at 120 metre depth through two cross measure drifts and a ventilation shaft.

The rail corridor runs from the boundary of the APSDA to the mine and is approximately 453 km in length (to the beginning of the balloon loop at the mine end). The final railway easement is expected to be on average 40-80 m wide (40 m wide in sensitive environmental areas where topography permits). In areas where cross-slope cuttings are required the width of the easement will be wider – up to 150 m (with two instances exceeding this – up to a maximum width of 184 m). The easement includes both the rail and a service road.

The rail line traverses the Barcaldine, Isaacs and Whitsunday Regional Council administrative areas.

2. Weed and Plant Disease Management Strategy

2.1 Purpose and Objectives

This initial Weed and Plant Disease Management Strategy describes Waratah Coal's proposed approach to biosecurity risk management as it pertains to weed plant species associated with the construction and operation of coal mine and rail line within the Project area. The objectives of the initial management strategy are to:

- Assess the current extent and distribution of significant weed species within the Project area
- Manage weeds and plant disease, incorporating actions for the prevention of spread of weeds and plant disease, the treatment and control of weeds and plant diseases and the monitoring and reporting of weed and plant disease status
- Prevent the introduction and / or spread of significant weed species and plant diseases into areas presently unaffected within the project area as a result of Project activity;
- Contain and control identified priority weed infestations
- Monitor the effectiveness of weed and plant disease prevention and containment strategies to reduce the introduction and / or spread of significant weed species and plant diseases within the project area.

This the overall aim of the strategies outlined in this document, and in future management plans is to reduce the potential for Project activities (particularly the movement of project personnel, equipment and materials to and from Project sites during construction) to introduce and / or spread existing or new significant weed species and plant diseases. The strategy builds on current knowledge of weed species within the Project area and identified threats within the wider region.

The finalisation of the management strategy, and then the implementation of the strategy is part of Waratah Coal's commitment to minimise and mitigate impacts on the natural environment and the productivity of surrounding land.

2.2 Legislative requirements

2.2.1 Weed species

The Australian Weeds Strategy (AWS) identifies priorities for weed management within Australia, with the aim of minimising the impact of weeds on environmental, economic and social assets. To achieve this, a list of nationally-agreed priority plant species (Weeds of National Significance [WONS]) for control and management based on rankings of weed species invasiveness, potential to spread and impact to socio-economic and environmental assets has been established.

The *Queensland Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) identifies target weed species within Queensland that have, or may potentially have, serious economic, environmental or social impact. Declared plants are classified into three management priorities, based on their current extent and potential to spread:

- Class 1 plants are species that are not commonly present in Queensland and, if introduced, would cause an adverse economic, environmental or social impact. Current infestations in Queensland

are subject to eradication from the state and landowners must take reasonable steps to keep their land free of these species

- Class 2 plants are species that are established in Queensland and have, or could have an adverse economic, environmental or social impact. Landowners must take reasonable steps to keep their land free of Class 2 plants
- Class 3 plants are established in Queensland and have, or could potentially have, an economic, environmental or social impact. The primary objective of this listing is to prevent the sale and therefore spread of these pests into new areas. Landholders are not required to control these species unless their land is adjacent to an environmentally significant area including:
    - Land dedicated as a reserve for environmental purposes under the Queensland *Land Act 1994*
    - A World Heritage Area listed under the World Heritage Convention
    - An area supporting a critically endangered ecological community in the list established under the *Environment Protection and Biodiversity Conservation act 1999* (EPBC Act)
    - A declared Ramsar wetland under the EPBC Act
    - An area of high nature conservation value under the Queensland *Vegetation Management Act 1999*
    - A protected area, other than state-controlled land, identified in a local government's pest management plan as an area that has special environmental significance for native wildlife.

The LP Act regulates the supply of declared weeds and pest animals, the supply of things containing reproductive material of particular declared pest plants and the movement of vehicles or other things on a road if the person knows, or ought reasonably to know, soil or other organic material in or on the vehicle or thing is likely to contain the reproductive material of a declared pest plant.

2.2.2 Plant diseases

The Australian Quarantine Inspection Service (AQIS) administers various Acts, such as the *Quarantine Act 1908*, *Imported Food Control Act 1992* and subsequent legislation in order to minimise the risk of exotic pests and diseases from entering the country and to protect Australia's plant health status. DEEDI identifies significant plant pests and diseases that are of concern to Queensland's agricultural industry, environment and economy. Depending on their current distribution in Australia listed species are classified into two management priorities:

- Exotic pests: Exotic plants, pests and diseases are either not present in Australia, or are present but not established and are under an official containment and/or eradication program
- Emerging pests: Emerging plants, pests and diseases are present in Queensland but their presence is being monitored.

In addition to classification by DEEDI, plant diseases may be deemed 'notifiable' under Queensland's Plant Protection Regulation 2002. There is a legal requirement for sightings of notifiable pests to be reported to Biosecurity Queensland.

2.2.3 Regional Council Requirements

Where State and Commonwealth requirements do not apply to locally or regionally significant weed species, weed management will be undertaken in accordance with the requirements of regional council pest and weed management strategies. The implementation of weed and pest management for the Galilee Coal Project will where possible be consistent with Management Programs developed by the relevant regional councils.

2.3 Target species

Target weed species for this weed and plant disease management strategy include all species listed under the AWS and / or LP Act with distribution ranges within, or have the potential to spread to within the Galilee Coal Project area. WONS, declared plants of Queensland and high priority regional weed species along with AQIS-targeted species are considered significant weed species. All other non-native species are considered environmental weed species.

Target plant pathogens for this initial strategy include all plant pathogens listed as significant by DEEDI and all additional diseases identified as a management concern by AQIS.

For the purposes of this initial strategy, targeted species have been classified into two quarantine management priorities: Priority and Alert Species. Priority Species are those with the greatest potential to impact upon the Project site and surrounding lands based on the species' current extent and distribution at the site. Management efforts will be specifically targeted at Priority Species to reduce the spread of weeds across the Project site and to surrounding land.

Alert Species are those species which are uncommon or that do not currently occur in Queensland but have been recognised as having the potential to occur and impact upon the Galilee Coal Project and the central Queensland region based on known and potential distributional ranges and habitat preferences. This may include species that are not currently present in Australia, or that are present but not established. Alert Species are unlikely to be encountered with the Project area but should be recognised for their potential invasiveness and potential to impact the environment, primary production and the economy. Should Alert Species establish infestations, they will be controlled as per non-declared priority weeds or according to legislative requirements.

2.3.1 Weed species

Target weed species are listed in **Table 1** with detailed descriptions of the species' biology, ecology, distribution and potential impact provided in the associated pest fact sheet.

Weeds presently identified within the Project area are listed in **Table 2** and **Table 3**. As field surveys continue as part of the pre-clearing scouting process for the rail corridor these tables will be revised to include any further weed species when identified.

Table 1. Priority Weed Species

Weed Species		Status	
		Cwlth	QLD
Priority Weed Species			
Common Name	Scientific Name		
Common Lantana	*Lantana camara*	WONS	3
Mother-of-Millions	*Bryophyllum delagoense*		2
Mother of Millions***	*Bryphyllum tubiflorum*		2
Mother-of-Millions hybrids	*Bryophyllum delagoense* var. Hybrids		2
Harrisia Cactus	*Eriocereus martini*		2
Tiger Pear	*Opuntia aurantiaca*		2
Velvety pear	*Opuntia tomentosa*		2
Common Prickly Pear	*Opuntia stricta*		2
Devil's Rope Pear	*Cylindropuntia imbricata*		2
Rubber Vine	*Cryptostegia grandiflora*	WONS	2
Balloon Cotton	*Gomphocarpus physocarpus*		ND

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INITIAL BIOSECURITY MANAGEMENT STRATEGY - MINE AND TRAIN LOADOUT FACILITY

Weed Species		Status	
		Cwlth	QLD
Parthenium	*Parthenium hysterophorus*	WONS	2
African Boxthorn	*Lycium ferocissium*		2
Parkinsonia	*Parkinsonia aculeate*	WONS	2
Crownbeard	*Verbesina encelioides*		ND
Snake Cotton	*Froelocia floridana*		ND
Spiny Burrgrass	*Cenchrus incertus*		ND
Lippia	*Phyla canescens*		ND
American Rat's-tail Grass	*Sporobolus indicus* var. *Pyramidalis*		2
Groundsel Bush	*Baccharis halimifolia*		2
Green Panic	*Megathyrsus maximus*		ND
Buffel Grass	*Cenchrus ciliaris*		ND
African Lovegrass	*Eragrostis curvula*		ND
Fireweed	*Senecio madagascariensis*		2
Cat's Claw Creeper***	*Macfadyena unguis-cati*		3
Camphor Laurel	*Cinnamomum camphora*		3
Heart-seed Vine	*Cardiospermum grandiflorum*		3
Giant Rats Tail Grass ***	*Sporobolus natalensis*		2
Flannel weed	Sida cordifolia		ND
Alert Species			
Exotic *Acacia* spp. other than *A. nilotica* and *A. farnesiana*			1
Mesquite	*Prosopis* spp.	WONS	1
Prickly Acacia	*Acacia nilotica indica*		2
African Turnip-weed	*Sisymbrium thellungii*		ND
Alligator Weed	*Alternanthera philoxeroides*	WONS	1
Athel Pine	*Tamarix aphylla*	WONS	3
Anchored Water Hyacinth	*Eichhornia azurea*		1
Annual Thunbergia	*Thunbergia annua*		1
Badhara Bush***	*Gmelina elliptica*		1
Bellyache Bush***	*Jatropha gossypifolia*		2
Bitou Bush	*Chrysanthemoides monilifera* ssp. *rotundata*	WONS	1
Blue Helitrope	*Heliotropium amplexicaule*		ND
Bridal Creeper	*Asparagus asparagoides*	WONS	1
Broad-leaved Pepper Tree***	*Schinus terebinthifolius*		3
Candleberry Myrth	Myrica faya		1
Castor Oil Plant***	Ricinus communis		ND
Chilean Needle Grass	Nassella neesiana	WONS	1
Chinee Apple***	Ziziphus mauritiana		2
Cholla Cactus	*Cylindropuntia* spp. and their hybrids, other than *C. spinosior*, *C. fulgida* and *C. imbricata*		1
Christ's Thorn	*Ziziphus spina-christi*		1
Common Sowthistle	*Sonchrus oleraceus*		ND
Creeping Lantana***	*Lantana montevidensis*		3
Easter Cassia***	*Senna pendula* var. *Glabrata*		ND
Erect tar vine **	*Boerhavia erecta*		ND
Eurasian Milfoil	*Myriophyllum spicatum*		1
Fanwort	*Cabomba* spp. Other than *C. Caroliniana*		1
Floating chestnut	Trapa spp.		1
Fragrant thunbergia	Thunbergia fragrans		1

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Weed Species		Status	
		Cwlth	QLD
Giant sensitive plant**	Mimosa invisa		2
Glush weed	Hygrophila costata		1
Gorse	*Ullex europaeus*	WONS	1
Green amaranth	*Amaranthus viridis*		ND
Hawkweed**	*Hieracium* spp.		ND
Honey locust	*Gleditsia* spp.		1
Horsetails	*Equisetum* spp.		1
Hymenachne***	*Hymenachne amplexicaulis*	WONS	2
Kochia	*Kochia scoparia* syn. *Bassia scoparia*		1
Koster's curse	*Clidermia hirta*		1
Lagarosiphon	*Lagarosiphon major*		1
Laurel clockvine	*Thunbergia laurifolia*		1
Leuceana***	*Leuceana leucocephala*		ND
Limnocharis	*Limnocharis flava*		1
Maderia vine***	*Anredera cordifolia*		3
Madras thorn	*Pithecellobium dulce*		1
Mexican bean tree	*Cecropia* spp.		1
Mexican feather grass	*Nassella tenuissima*		1
Mikania vine	*Mikania micrantha*		1
Mimosa bush***	*Acacia farnesiana*		ND
Mimosa pigra***	*Mimosa pigra*	WONS	1
Minconia	*Miconia calvescensis*		1
Noogoora burr***	*Xanthium occidentale*		ND
Paramatta grass***	*Sporobolus africanus*		2
Peruvian primrose	*Ludwigia peruviana*		1
Red sesbania	*Sesbania punicea*		1
Saffron thistle***	*Carthamus lanatus*		ND
Salvinia***	*Salvinia molesta*	WONS	2
Salvinia	*Salvinia spp. Other than S. Molesta*		1
Senegal tea plant	*Gymnocoronis spilanthoides*		1
Serrated tussock	*Nassella trichotoma*	WONS	1
Siam weed	*Chromolaena odorata*		1
Singapore daisy***	*Sphagneticola trilobata*		3
Sisal hemp***	*Agave sisalana*		ND
Spiked pepper**	*Piper aduncum*		1
Thornapple***	*Datura stramonium*		ND
Water hyacinth***	*Eichornia crassipes*		2
Water lettuce***	*Pistia stratoites*		2
Water mimosa	*Neptunia oleracea* and *N. Plena*		1
Witch weeds**	*Striga* spp. Other than native species		1
Yellow oleander***	*Casabela thevetia*		3

*Status: Commonwealth (CTH): WONS = Weed of National Significance; Qld (listed under the LP Act): 1 = Class 1 declared plant, 2 = Class 2 declared plant, 3 = Class 3 declared plant, ND = not declared. **Species identified by AQIS. ***Species also identified as priority species within either the CPMG Regional Pest Management Strategy 2004 – 2009 and/or the Central Queensland Strategy for Sustainability - 2004 and Beyond.

Table 2. Significant and environmental weed species identified in the mine study area

Family	Common name	*Scientific name*
Apocynaceae	Rubber Vine	*Cryptostegia grandiflora*^*

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Family	Common name	*Scientific name*
Asteraceae	Cape Weed	*Arctotheca calendula*
Asteraceae	Crownbeard	*Verbesina encelioides*
Asteraceae	Dahlberg Daisy	*Thymophylla tenuiloba*
Cactaceae	Prickly Pear	*Opuntia stricta*
Cactaceae	Velvet Tree Pear	*Opuntia tomentosa**
Fabaceae	Arsenic Weed	*Senna obtusifolia**
Fabaceae	Parksonia	*Parkinsonia aculeate*
Fabaceae	Shrubby Scabra	*Stylosanthes scabra*
Poaceae	Buffel Grass	*Pennisetum ciliare*#
Poaceae	Durban Grass	*Dactyloctenium australe*
Poaceae	Natal Grass	*Melinis repens*
Poaceae	Olive Hymenachne	*Hymenachne amplexicaulis*
Poaceae	Red Natal Grass	*Melinis repens*
Poaceae	Tropical signalgrass	*Urochloa subquadripara*
Poaceae	Wattle Signalgrass	*Urochloa piligera*
Verbenaceae	Mayne's Pest	*Verbena aristigera*

* Declared
^ WONS
#Pasture grass

Table 3. Significant and environmental weed species identified in the rail corridor study area

Family	Common name	Scientific name
Apocynaceae	Rubber Vine	*Cryptostegia grandiflora*^*
Asteraceae	Cape Weed	*Arctotheca calendula*
Asteraceae	Crownbeard	*Verbesina encelioides*
Asteraceae	Cobbler's Pegs	*Bidens pilosa*
Asteraceae	Dahlberg Daisy	*Thymophylla tenuiloba*
Asteraceae	Noogoora Burr	*Xanthium occidentale*
Asteraceae	Parthenium Weed	*Parthenium hysterophorus*
Cactaceae		*Opuntia* sp.
Cactaceae	Harissa Cactus	*Harrisia martini*
Cactaceae	Prickly Pear	*Opuntia stricta*
Cactaceae	Velvet Tree Pear	*Opuntia tomentosa**

Family	Common name	Scientific name
Euphorbiaceae	Castor Oil Plant	*Ricinus communis*
Fabaceae		*Stylosanthes scabra*
Fabaceae	Arsenic Weed	*Senna obtusifolia**
Fabaceae	Mimosa	*Mimosa pigra*
Fabaceae	Parksonia	*Parkinsonia aculeate*
Fabaceae	Shrubby Scabra	*Stylosanthes scabra*
Lamiaceae	Lion's Tail	*Leonotis nepetifolia*
Lamiaceae	Mint Weed	*Hyptis suaveolens*
Lythraceae		*Ammania* sp.
Mimosaceae	Prickly Acacia	*Acacia nilotica* subsp. indica
Papaveraceae	Mexican Poppy	*Argemone ochroleuca*
Passifloraceae	stinking passionflower	*Passiflora foetida*
Poaceae	Buffel Grass	*Cenchrus ciliaris#*
Poaceae	Durban Grass	*Dactyloctenium australe*
Poaceae	Natal Grass	*Melinis repens*
Poaceae	Red Natal Grass	*Melinis repens*
Poaceae	Olive Hymenachne	*Hymenachne amplexicaulis*
Poaceae	Tropical signalgrass	*Urochloa subquadripara*
Poaceae	Wattle Signalgrass	*Urochloa piligera*
Solanaceae	Fierce Thornapple	*Datura stramonium*
Verbenaceae		*Stachytarpheta* sp.
Verbenaceae	Common Lantana	*Lantana camara*
Verbenaceae	Mayne's Pest	*Verbena aristigera*

* Declared
^ WONS
#Pasture grass

2.3.2 Plant diseases

No targeted plant diseases have been reported on site during initial field surveys. Should plant diseases be identified during future surveys, or during construction and operational stages of the Project, Waratah Coal will report the finding and implement the necessary management strategies to minimise the risk of further spread of the disease.

All plant diseases listed in **Table 4** are considered to be Alert Diseases, as defined in Section 2.3. These species may be encountered in the Project area and are recognised for the potential impact to agriculture, existing environmental values and the economy, should the species be introduced to the project area. Detailed descriptions of the biology, ecology, distribution and potential impact of these pathogens are provided in **Table 4** within the link to the relevant fact sheet.

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Table 4. Targeted plant disease, distribution and vectors

		Status				
Plant Diseases	**Organism**	**AQIS**	**DEEDI**	**Notifiable**	**Distribution and Potential Impacts**	**Common Vectors**
Black Sigatoka (*Mycosphaerella fijiensis*)	Fungus		Exotic	Yes	Has occurred in Cape York Peninsula and Tully Queensland. Has been eradicated. Worldwide is the most devastating leaf disease of bananas.	Spread by the movement of infected plant material, fungal spores, wind or by water splash. http://www2.dpi.qld.gov.au/health/4025.html
Branched Broomrape (*Orobanche ramosa*)	Parasitic weed	Concern	Exotic		Occurs in South Australia. It is a threat to agricultural industries.	Spread by contaminated agricultural seed, fodder and livestock. http://www.daff.gov.au/__data/assets/pdf_file/0010/146719/broomrape.pdf
Banana bunchy top virus	Virus		Emerging	Yes	Occurs in southern areas of Queensland and northern New South Wales. Affected plants cannot produce fruit and can devastate farms.	Spreads via planting of contaminated plants and aphids (*Pentalonia nigronervosa*). http://www2.dpi.qld.gov.au/health/4203.html
Citrus canker (*Xanthomonas axonopodis pathovar citri*)	Bacteria		Exotic	Yes	Outbreaks in Australia are rare. The last detection of citrus canker in Australia was in Emerald, Queensland, in May 2005. Infected plants suffer from reduction in fruit quality and quantity impacting on citrus production.	Lesions ooze bacterial cells when wet, rain, overhead irrigation, and severe weather events can cause short and long distance spread. Movement of contaminated vehicles, equipment and infected plants also spread the disease. http://www.dpi.qld.gov.au/4790_5495.htm
Citrus greening (*Huanglongbing*) (*Candidatus liberobacter spp*)	Bacteria		Exotic	Yes	Not present in Australia. Serious disease in Asia. Infected plants suffer from poor fruit quality	Spread by grafting from infected plants and insect vectors http://www.dpi.qld.gov.au/4790_10827.htm
Eucalyptus/guava rust (*Puccina psidii*)	Fungus		Concern		Native to North, Central and South America. Greatest threat to native Myrtaceae	Spread by contaminated pollen and seeds http://www.daff.gov.au/aqis/quarantine/pestsdiseases/plants/eucalyptu s-guava-rust
Grapevine leaf Rust (*Phakopsora euvitis*)	Fungus		Exotic	Yes	Was detected in Northern Territory and successfully eradicated. Common throughout South-East Asia. Attacks grapevines causing defoliage and affects fruit quality	Spread through wind-borne spores and the movement of infested plant material. http://www.dpi.qld.gov.au/4790_7410.htm
Karnal bunt (Tilletia indica)	Fungus	Concern			Not present in Australia. Found in India, Middle East, South America, South Africa and USA. Affects grains of wheat, durum and triticale and reduces grain quality	Spreads via spores in contaminated grains and soil http://www.daff.gov.au/aqis/quarantine/pestsdiseases/plants/karnalbunt

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		Status				
Plant Diseases	**Organism**	**AQIS**	**DEEDI**	**Notifiable**	**Distribution and Potential Impacts**	**Common Vectors**
Mango malformation Disease (*Fusarium* spp.)	Fungus		Exotic	Yes	Not present in Australia. Is found India, Brazil, Central America, Egypt, Florida, Israel, Mexico, Pakistan, South Africa, Sudan, Swaziland and Uganda, and possibly Malaysia. Causes abnormal flower and leaf development, resulting in reduced plant growth and fruit yield. Can devastate orchards.	Spreads via infected plant material http://www.dpi.qld.gov.au/4790_15965.htm
Myrtle rust (*Uredo rangelii*/*Puccinia psidii*)	Fungus		Exotic		Detected in Southeast Queensland in 2010. Widespread throughout east coast NSW. Myrtle rust is known only to affect myrtaceous plants and causes deformation of leaves, heavy defoliation of branches, dieback, stunted growth and even plant death	Spread by very small spores carried by wind, bees and/or birds, on clothing, shoes, equipment and vehicles http://www.dpi.qld.gov.au/4790_17185.htm
Panama disease (*Fusarium oxysporum* var *cubense*)	Fungus		Exotic	Yes	Found in Queensland, WA, SA and NSW.	Spread through the movement of contaminated soil, water or plant materials http://www.dpi.qld.gov.au/4790_20405.htm
Papaya ringspot virus (PRSV-P)	Virus		Emerging		Occurs in Queensland Adversely affects papaya and cucurbit plants and fruit	Commonly spread by aphids http://www2.dpi.qld.gov.au/horticulture/5333.html
Pierce's disease (*Xylella fastidiosa*)	Bacteria		Exotic	Yes	Not present in Australia. Occurs in the USA, Mexico and Central America. Can kill grape vines	Spread by insect vectors, commonly the glassy winged sharpshooter (*Homolodisca coagulate)* (not found in Australia) http://www.dpi.qld.gov.au/4790_8658.htm
Pine pitch canker (*Fusarium circinatum*)	Fungus	Concern			Not present in Australia. Is found in North, Central and South America and has been reported from Japan, Spain and South Africa. Serious disease of plantation species and kills trees of any age.	Spread by insect vectors, contaminated soil, pine litter, equipment and vehicles. http://www.daff.gov.au/aqis/quarantine/pestsdiseases/plants/pinepitch-canker
Plum pox virus (PPV) (Sharka)	Virus	Concern	Exotic	Yes	Not present in Australia. Found in Europe, USA and Canada. Can be extremely damaging to stone fruit production and devastate crops.	Spreads via aphids and movement of infected plants and plant material. http://www.dpi.qld.gov.au/4790_11220.htm

		Status				
Plant Diseases	Organism	AQIS	DEEDI	Notifiable	Distribution and Potential Impacts	Common Vectors
Sugar cane smut (*Sporisorium scitamineum*)	Fungus		Emerging	Yes	Widespread throughout Queensland. Sugarcane smut is a serious disease of sugarcane which can reduce yields by 30 to 100 percent.	It is highly infectious and can be spread by wind or carried on clothing and machinery. http://www2.dpi.qld.gov.au/health/18510.html
Tomato leaf curl virus and Tomato yellow leaf curl virus	Virus		Emerging		Two viruses from this group occur in Australia, restricted to the northern parts of Queensland and the Northern Territory. Exotic strain (Tomato tallow leaf curl virus) was found in Brisbane and Bundaberg. Commonly affects tomatoes but can affect several other host plants.	Transmitted between plants by silver leaf white fly (*Bemisia tabaci*) biotype B, which is a horticultural pest in coastal and some inland districts of Queensland and New South Wales http://www2.dpi.qld.gov.au/health/18450.html

2.4 Management area

2.4.1 Site assessment

Initial field weed assessments of the Project area were undertaken by botanists (from WorleyParsons, BAAM and Unidel) in 2009 and 2010 for the Galilee Coal Project EIS. Further assessments for the SEIS were undertaken by Rob Friend and Associates in 2012. Due to the scale of the linear nature of the majority of the disturbance within the rail corridor, weed assessments will be on-going as ecological and preclearance surveys are undertaken for each of the properties that will have Galilee Coal infrastructure.

Areas of known weed infestation will be mapped and stored as a weed layer in the Project GIS. Information on weed locations and weed management actions that occur will be provided to the contractor prior to entering each property.

2.5 Weed management strategy

2.5.1 Prevention

Prevention is the most effective way to manage weeds by minimising the introduction of new weed species and / or plant disease and spread of existing weed species across the Project Area.

Initial measures to prevent the introduction and / or spread of significant weed species and plant diseases across the Project area and to the surrounding land are summarised at **Table 5**. Waratah Coal will refine these measures as further preclearance activities are completed. It is important to note that due to high levels of disturbance that will result to soils and vegetation as a result of project activities it is expected that weeds will colonise and establish within the disturbance footprint. Waratah Coal will implement the following measures to minimise the extent to which the weed infestations impact on the environmental values of the Project area.

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Table 5. Initial weed management measures

Aspect	Management Action
Importation of plant and equipment	Vehicles, machinery and plant equipment imported from overseas will be inspected by quarantine and customs in accordance with the requirements and protocols of AQIS.
Importation or interstate movement of material	Materials including gravel, mulch, packing materials, sand and soil from interstate shall be inspected and be certified weed and pest free before being brought into Queensland. A copy of the DEEDI weed hygiene declaration forms is available at the following link http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Weed_Hygiene-Declaration.pdf

Inspection and certification - Intrastate	High risk materials entering Project sites via road transport shall be inspected and be certified weed and pest free using the DEEDI weed hygiene declaration form.
	Vehicle and equipment hygiene, inspection and certification requirements will meet as a minimum the requirements of the Waratah Coal Vehicle Weed Hygiene Procedure. The Vehicle Weed Hygiene Procedure and inspection report follows the requirements of DEEDI.
	Inspection and certification requirements are outlined below.
	All Project sites:
	• All vehicles, machinery and plant must be inspected by qualified Project personnel or a third party inspector for weeds and high risk materials such as soil prior to entering a project site. An inspection report will be issued once the inspector confirms the vehicle is free of all organic material.
	• The following activities do not require a vehicle or equipment to undergo inspection or require an inspection report:
	  ○ Any vehicle/equipment travelling exclusively on formed roads to a major facility administration area (e.g. to a car parking area) or cleared corridor other than in a prescribed weed outbreak area
	  ○ Emergency vehicles responding to an emergency - Private landholders who are moving around their own properties and where the Galilee Coal Project is constructing or maintaining an asset
	  ○ Guests of landholders that are visiting a property on non-business and where the Galilee Coal Project is constructing or maintaining an asset - Where an emergency has been declared on all Project sites all authorised vehicles are exempt.
	• It is the responsibility of the driver or machine operator to organise this inspection prior to travelling to site. Drivers and machine operators may inspect their own vehicle/machinery if they are a trained staff member or authorised third-party inspector.
	• A register of trained staff members is to be kept at each site.
	• The level of inspection and wash-down requirements are determined using the weed risk matrix.
	• A copy of the valid inspection report is to be kept within the vehicle. A duplicate copy of the vehicle/equipment inspection report must be retained by the inspector and these copies handed over to Galilee Coal Project staff when a new book of vehicle/equipment inspection reports is issued.
	• Administration staff will keep a record of vehicle/equipment inspection report forms for a period of no less than five years as required by the LP Act.
	All vehicles entering a project site must have a valid inspection report in the vehicle at all times. Vehicles/equipment will not be permitted to enter the site or will be required to undergo cleaning prior to leaving the site if found to be without a valid inspection report.

Facilities sites and properties with construction	The weed certification inspection report will remain valid as long as the vehicle/equipment complies with the following conditions: • The vehicle/equipment travels only on sealed or formed roads

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Aspect	Management Action
occurring	• The vehicle/equipment does not pass through areas containing declared weeds • The driver/operator does not operate the vehicle/equipment after disembarking the vehicle and entering an area of declared weed infestation • The vehicle/equipment, if operating on unsealed roads, remains within a designated work area and does not cross a property boundary or other designated boundary. On proceeding out of a weed infested area, all equipment and vehicles will be thoroughly cleaned down in accordance with Queensland Government, local shire requirements and Waratah coal's Vehicle Weed Hygiene Procedure.
Project sites - General	• Prior to arrival on-site all vehicles, machinery and plant equipment will require a vehicle/equipment weed-free inspection certification sticker appropriate to the location. • A register will be maintained of all vehicles, plant and equipment cleaned and issued with a sticker. • Vehicle cleanliness will be re-established at identified points on the alignment sheets. • All access tracks to the corridor from laydown areas are to be inspected for presence of weeds. Weed species identified along these tracks must be controlled under best practice management guidelines from DEEDI prior to the use of the track. • On proceeding out of a weed infested area, all equipment and vehicles will be thoroughly washed in accordance with Queensland Government, local shire requirements and Waratah Coal's Vehicle Weed Hygiene Procedure. This will include removal of all equipment belly plates and completion of a certified wash-down, with certification to be provided by an accredited person as defined by relevant legislation.
Vehicle and equipment wash-down facilities	The Galilee Coal Project will utilise wash-down facilities that satisfy the minimum requirements as specified by this plan. All vehicle and machinery wash-downs will comply with the procedures available from DEEDI, at the following link: http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Cleandown-Procedures.pdf The Galilee Coal Project will develop several vehicle wash-down areas associated with the rail corridor to coordinating weed control measures with regional Councils. These undertakings are consistent with government agency and regional council requirements. Vehicle wash-down will occur at either a council-provided wash-down facility, a permanent facility in compliance with the Queensland Guidelines for the Construction of Vehicle and Machinery Washdown Facilities (2000), a commercial car cleaning facility, or a temporary facility at the edge of an area of known weed infestation. Wash-down facilities will be constructed in accordance with Queensland Guidelines for the Construction of Vehicle and Machinery Wash-down Facilities (see following link): http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPAWashdown-Fac-Guidelines.pdf. The above guidelines require monitoring of wash-down sites for weed establishment, and ensuring that weed seed is trapped and disposed of properly. The Environmental Protection (Water) Policy 2009 and *Environmental Protection Act 1994* refer to the prevention of pollution of ground and surface water. Wash-down facility design and operations need to address this issue, as part of a duty of care, to avoid contamination of water via grease and oil run-off. Temporary wash-down facilities may include portable solutions such as a vehicle-mounted high pressure spray for cleaning vehicles at the edge of a known infestation. Temporary constructed facilities may be built inside the rail corridor in order to manage risk between properties while negating the need to travel long distances to reach a permanent wash-down facility. Locations for Project wash-down facilities and the

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Aspect	Management Action
	potential upgrades of existing facilities will be developed based on the outcomes of field surveys prior to construction and will be dependent on the type of site and works. Portable wash-down facilities will not be located within road reserves or other public lands. Details of the proposed locations of portable wash-down facilities as well as the proposed location of disposal points for contaminated mud and waste water generated from these facilities will be provided to the relevant regional Council prior to facility operation. Inspection procedures will be in accordance with the Queensland checklist for inspection procedures, available from DEEDI at the following link: http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Inspection-Procedures.pdf
Identification of weed infestations and areas requiring weed control	Identification of areas requiring weed control will be determined by undertaking a pre clearance weed survey. These surveys will continue during construction and a GIS layer will be maintained. Weed surveys of the project area will be undertaken by qualified Project personnel. Weed surveys will be undertaken where practicable during periods of high weed growth risk (e.g. after rainfall periods). Once the location of a weed infestation is known a risk assessment will be undertaken to identify: • Areas of high weed risk within the project area and access roads (based on weed survey information) • Activities that involve high risk of spreading weeds. Control and follow-up monitoring will be undertaken as soon as practicable following identification of weed infestations to prevent further weed spread.
Site access - Facilities	Access routes will be clearly identified on maps and with signs in the field. Only the identified access routes will be used. All operators of vehicles, plant and equipment will strictly adhere to the approved roads, tracks, and work areas to minimise contact with vegetation. Vehicles that have been off road and machinery used that has been used to clear weed infestations will require a certified weed inspection. If seeds or vegetative materials are found and cannot be easily removed and disposed of, the vehicle is to be cleaned in a facility as close as possible to the area of infestation. A weed containment area will be set up to stockpile priority weeds and materials known to contain priority weed seeds before disposal. Any weeds with seed on them will be disposed of in plastic bags to prevent seed dispersal. Personnel will check clothing (boots, socks, pants, pockets, cuffs) for any weeds, seeds, or burrs before entering a vehicle, and when entering and leaving site. For any staff working in areas of declared weed infestations there will be brushes and plastic bags available for removal and disposal of seed on their person after leaving the immediate area of the weed infestation. Such personnel are to remove all weed seeds prior to leaving the area adjacent to the weed infestation. All weed material is to be disposed of at the weed containment area or other designated weed disposal point.
Site access - Mine site	Access routes will be clearly identified on maps and with signs in the field. Only the identified access routes will be used. All operators of vehicles, plant and equipment will strictly adhere to the approved roads, tracks and work areas to minimise contact with vegetation. Vehicles travelling off the approved access roads will be subject to additional wash-down as per the Galilee Coal Project Vehicle Hygiene Procedure. Personnel will be responsible for checking clothing (boots, socks, pants, pockets, cuffs) for any weeds, seeds, or burrs before entering and removing any weed materials found before leaving site. All weed material is to be disposed of at a designated weed disposal point.

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Site protocols - facilities	Existing weed infestations of priority species will be treated or removed from all work areas and access routes, treated in accordance with DEEDI best practice management and disposed of at a licensed facility. All vehicles, plant and equipment are to remain in cleaned areas and minimise contact with vegetation. At any time an authorised person may declare a vehicle / equipment inspection report void if they deem the vehicle / equipment to contain seed or weed material that presents a threat to biosecurity. Regular inspections of vehicles, plant and equipment will be conducted and wash-downs undertaken if the item fails inspection or if equipment is moved to other areas.
Site protocols - mine	Priority existing declared weed infestations will be treated or removed from all work areas and access routes, treated in accordance with DEEDI best practice management and disposed of at a licensed facility If paddocks have severe infestations they may be declared “dirty” and vehicles leaving the field will require cleaning at a temporary wash-down facility. All vehicles, plant and equipment are to remain in cleaned areas and minimise contact with vegetation. Stockpile weed vegetation matter separately to top soil and other excavated material and dispose of at a designated disposal site or otherwise appropriately managed to avoid weed seed spread to other areas along the corridor or surrounding lands.
Site protocols – rail corridor	Priority existing declared weed infestations will be treated or removed from all work areas and access routes, treated in accordance with DEEDI best practice management and disposed of at a licensed facility Weed treatment will be conducted in accordance with best-practice management according to DEEDI. Any live weed material containing seed or suspected of containing seed is to be placed into sealed plastic bags and disposed of at a licensed refuse facility. All vehicles, plant and equipment are to remain in cleaned areas and minimise contact with weed infestations unless undertaking weed control activities. Stockpile weed vegetation matter separately to top soil and other excavated material and disposed of at a designated disposal site or otherwise appropriately managed to avoid weed seed spread to other areas along the corridor or surrounding lands. Points for clear and grade wash-down will be identified (marked on construction drawings and in the field) at locations where infestation levels change. Stationary weed wash-downs will be provided at locations appropriate to movement into and out of weed infested areas. Vehicle cleanliness will be re-established at identified points (marked on construction drawings and in the field). Vehicles, plant and equipment failing inspection will require cleaning and re-inspection. Boundary fence lines will be marked on construction drawings and in the field and crews will limit soil transfer across these lines. All lay down areas and camp sites are to be inspected and weeds controlled or removed in accordance with Queensland Government and other local government requirements and must be maintained free from declared weeds.
Compliance audits – all project sites	Environmental personnel and other approved construction crew members will check / review for use of un-authorised access routes by project vehicles on an ongoing basis. All completed checklists will be lodged with the site coordinator. Checklists and complaints registers will be reviewed regularly to monitor compliance with this plan. Vehicles, plant and equipment failing spot checks will be sent for wash-down at the nearest facility.
Compliance audits - facilities	Vehicle, plant and equipment will be inspected for appropriate vehicle hygiene inspection report before site entry. Regular spot checks for weed material of vehicles, plants and equipment that remain on site.

Aspect	Management Action
Compliance audits – mine site	Vehicles, plant and equipment will be inspected for a vehicle hygiene inspection report and authorisation sticker when entering and / or leaving the Project site when crossing authorised inspection / wash-down points. Authorisation stickers expire 14 days from the date of issue or as determined by the site environmental officer. Regular spot checks will be conducted for weed material on vehicles, plants and equipment that remain on site. Vehicle inspections will be conducted for each vehicle / equipment moving to the next property if it is required by the receiving landowner, otherwise normal certificate validity rules apply.
Compliance audits – rail corridor	Vehicles, plant and equipment will be inspected when entering and/or leaving the Project site across inspection / wash-down points for vehicle hygiene inspection reports and sticker. The service crew will make visual checks of all vehicles for vegetative matter once every 28 days (or each work cycle). Spot-checks of plant and equipment, which are expected to predominantly remain within the corridor and associated work areas, will be randomly carried out by the nominated person. Plant or equipment will be spot-checked each work cycle (28 days).
Training if staff	Key staff and contractors are to attain proficiency in the identification of common and declared weed plants within the Project regional area in which they are working. All contractors working within the Project area will be made aware of the weed Priority Species of the region and their potential impact on the project and surrounding lands. During site induction and "tool-box talk" presentations, construction contractors will be made aware of their responsibilities to manage their activities so as to minimise the introduction and / or spread of Priority Species on site and to surrounding land. Selected Project personnel will be trained in machinery inspection for and cleaning of plant, animal and soil matter (RTD2312A and RTD2313A) and will be authorised to inspect vehicles, issue inspection reports (and authorisation sticker) and void inspection reports (and authorisation stickers) if a vehicle is deemed unclean following vehicle wash-down.

2.5.2 Treatment and control

Priority weed infestations will be identified during pre-clearance surveys. Priority infestations will be the focus of treatment application works for the site in order to reduce the potential for these species to spread to new, unaffected areas across the Project area and onto surrounding lands. Treatment applications will be species specific and relevant to the size and growth stage of each infestation and the timing of application. A summary of best practice management guidelines based on species specific management plans (where available) and species Biosecurity Queensland fact sheets is provided at **Table 6**. Declared weeds will be controlled in general accordance with best practice management for each species.

Surrounding land use, sensitive environmental areas and weather conditions will also be considered when choosing a treatment application. Treatment applications will employ various methods including mechanical, chemical, biological and land management methods to reduce the size of infestations and minimise the potential to spread to new, unaffected areas.

Treatment applications will be documented and kept by the Galilee Coal Project for auditing purposes. Control methods of chipping / spraying will depend upon the weed species identified and the extent of the outbreak.

2.5.2.1 Physical/mechanical control

Physical / mechanical control can be highly effective for the treatment of small infestations. Physical / mechanical control can often be applied with machinery or equipment already on site. This type of control is often cost effective but clearing and disturbance to soil often encourages further weed growth. Hand-pulling of weeds is typically labour intensive and requires specialist knowledge of what plants to avoid, and is not recommended except for very small areas of weed infestation.

Physical / mechanical methods may include one or a combination of any of the following methods:

- Hand-pulling
- Grubbing
- Slashing/mowing
- Cultivation (ripping/rotary hoeing/stick raking)
- Bulldozing
- Netting
- Mulching.

Minimal handling of weeds that have seed present should be undertaken to reduce the potential for spreading additional seed. Rapid revegetation and mulching of bare soil cleared of weeds is necessary to prevent weeds returning to the area in the absence of competition from other flora.

2.5.2.2 Chemical control

All chemical treatment methods will be undertaken by experienced and licensed spray operators in accordance with the Queensland *Agricultural Chemicals Distribution Control Act 1966* (ACDC Act).

The type and method of application for chemical treatments vary depending on the targeted species, situation (e.g. proximity to waterways, adjacent pastures), size of infestation and growth stage of individuals. Contractors will be required to be licenced with DEEDI and relevant Material Data Sheets for chemical treatments will be retained as part of typical site safety procedures.

2.5.2.3 Biological control

Biological control involves the use of insects or pathogens (diseases) that affect the health of the weed. Biological control methods are often successful in combination with mechanical and/or chemical treatments.

Suitable biological control methods for the different priority weed species are detailed in the relevant Biosecurity Queensland weed fact sheets listed in this strategy.

2.5.2.4 Cultural control/ land management

Cultural control refers to land management and focuses on adopting better management practices in order to reduce weed infestations and prevent weed spread. These methods are most effective when used in conjunction with other physical / mechanical, chemical and biological control applications and may include:

- Revegetation
- Quarantine
- Hygiene.

All vegetation areas to be retained and cleared areas to be revegetated will be identified prior to the commencement of construction. Suitable remediation and monitoring actions will been developed for retained and cleared areas that aims to minimise weeds.

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Table 6. Best practice management weed control recommendations

Species	Scientific Name	Control Measure	Timing	Mitigation of reinfestation
Common lantana	*Lantana camara*	Herbicide spray until run-off	Autumn	Follow up spraying on all to deplete soil seed bank
Mother-of-millions	Bryophyllum delagoense	Herbicide until total saturation. Fire, hand grubbing in conjunction with biological control	Winter	Biological control in conjunction with fire and chemical control spot spraying
Mother of millions	*Bryphyllum tubiflorum*	Herbicide until total saturation. Fire, hand pulling in conjunction with biological control	Winter	Biological control in conjunction with fire and chemical control spot spraying
Mother-of-millions hybrids	*Bryophyllum delagoense* var. *Hybrids* and *Kalanchloe* sp.	Herbicide until total saturation. Fire, hand pulling in conjunction with biological control	Winter	Biological control in conjunction with fire and chemical control spot spraying
Harrisia cactus	*Eriocereus martini*	Biological control with mealy bug. Mechanical removal of all tubers. Spot spraying Spring and early	Summer	Biological control takes four years and herbicide is necessary as follow up on regrowth. Landholder coordination required for effective biological control
Tiger pear	*Opuntia aurantiaca*	Biological control with tiger pear cochineal, multiply agent before release	Annual	Herbicide and mechanical follow-up necessary
Velvety pear	*Opuntia tomentosa*	Biological control by tree-pear beetle. Herbicide Picloram + Triclopyr	Annual	Follow-up basal cut or overall application of herbicide
Common prickly pear	*Opuntia stricta*	Biological control followed by herbicide	Annual	Reintroduction of biological control insects followed by herbicide spraying
Devil's rope pear	*Cylindropuntia imbricata*	Cochineal followed by herbicide and mechanical	Annual	Slow control by biological agent, follow-up spraying on regrowth
Rubber vine	*Cryptostegia grandiflora*	Burning, biological agents and herbicide	Annual	Continual follow-up of herbicide as plants are discovered
Balloon cotton	*Gomphocarpus physocarpus*	Herbicide (Glyphosate or Triclopyr with wetting agent)	Spring	Follow-up herbicide when plants are discovered
Parthenium	*Parthenium hysterophorus*	Biological control and repeated herbicide.	Annual	Ongoing herbicide treatment
African boxthorn	*Lycium ferocissmium*	Mechanical removal with follow-up herbicide on seedlings	Annual	Herbicide required for regrowth following initial control
Parkinsonia	*Parkinsonia*	Mechanical removal	Summer	Herbicide required on

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Species	Scientific Name	Control Measure	Timing	Mitigation of reinfestation
	aculeata	of old trees and herbicide on seedlings		seedlings that recruit after initial control
American rat's-tail grass	*Sporobolus jacquemontii*	Integrated control of mechanical and herbicide. Burning of stools/root clumps	Summer, or annual	Ongoing treatment combining burning and herbicide
Groundsel bush	*Baccharis halimifolia*	Herbicide to runoff. Hand-pull on small plants	Winter or annual	Herbicide on regrowth from rootstock or seed
Cat's claw creeper	*Macfadyena unguis-cati*	Cut-stump and immediate application of glyphosate. Foliar spray on regrowth	When actively growing	Herbicide to control regrowth from tubers
Camphor laurel	*Cinnamomum camphora*	Basal bark or inject herbicide when <3 m or foliar herbicide when >3 m.	Annual	Regenerates from roots and may require follow-up. Seedling recruitment can be hand-pulled
Heart-seed vine	*Cardiospermum Grandiflorum*	Manual pulling and herbicide	Spring and summer	Regrowth from root stock requires herbicide follow-up
Giant rats tail grass	*Sporobolus natalensis*	Integrated control of mechanical and herbicide. Burning of stools / root clumps	Summer, or annual	Ongoing treatment combining burning and herbicide
African Lovegrass	*Eragrostis curvula*	Integrated control of mechanical removal, herbicide (glyphosate) and over-sowing	Summer, or annual	Prolific seed producer. Ongoing treatment is required. Slashing is counter-productive
Spiny Burrgrass	*Cenchrus incertus*	non-selective herbicides such as glyphosate can be followed by cultivation of other species or fire	Summer, or annual	Ongoing treatment is required to deplete seed reserves. Maintaining grass and ground cover with preferred species
Crown Beard	*Verbesina encelioides*	Manual pulling and spot herbicide application	Early Summer before seeding	Ongoing manual pulling is required in the months following the initial treatment
Snake Cotton	*Froelichia floridana*	Herbicide application to growing plants	Spring / Early summer	Ongoing treatment is required to deplete seed reserves
Lippia	*Phyla canescens*	Integrated control of herbicide and mechanical with land management practices	Whenever present	Ongoing treatment is required. Difficult to control

Declared LP Act and project Priority Species on site and summary of best practice control recommendations are listed in **Table 6.** For each of the Declared Priority Weed species the best practice management guidelines and appropriate herbicide treatments are detailed by DEEDI.

2.5.2.5 Disposal of weed plant material

Declared weeds will not be transported from a site of infestation. Any declared weeds identified within the Galilee Coal Project will be treated and disposed of within the site using best practice control measures appropriate for the species. Non-declared weeds may be removed and relocated to a waste disposal facility.

2.5.3 Monitoring and reporting

Monitoring is an integral part of the weed management approach to be adopted by Waratah Coal. Monitoring establishes benchmarks for assessing the extent and distribution of significant weed species across the Project area over time. It enables assessment of the effectiveness of management strategies including treatment to minimise the introduction and/or spread of weeds and diseases.

This initial strategy will be reviewed regularly to accommodate findings of weed monitoring activities, such as new infestation of known species or infestations not previously recorded in the Project area.

2.5.3.1 Monitoring activities

Disturbed areas within the Galilee Coal Project will be inspected every six months to monitor weed infestations and to undertake weed control measures as required. Suitably qualified project staff will monitor the extent and distribution of weed populations including new infestations. The timing for species specific monitoring will coincide with the optimal monitoring times for target weed species (see **Table 7**). Weed checks and photo monitoring of sites will be conducted prior to and post construction. Data will be collected using GPS loggers.

Lands adjacent to disturbed areas under will be inspected when declared weeds are present within disturbed areas. If infestations on the adjoining land are identified a suitable control program shall be investigated with the relevant land owner. Programs on adjoining lands will then be integrated into the broader project management strategy.

Table 7. Optimal monitoring times for weed species

Species	*Scientific Name*	Monitoring Time
Common lantana	*Lantana camara*	Common lantana is readily detectable throughout the year
Mother-of-millions	*Bryophyllum delagoense*	Mother-of-millions is detectable throughout the year however the species is most conspicuous during winter flowering period
Mother of millions	*Bryphyllum tubiflorum*	As above
Mother-of-millions hybrids	*Bryophyllum delagoense* var. *Hybrids* and *Kalanchloe* sp.	As above
Harrisia cactus	*Eriocereus martini*	Harrisia cactus is readily detectable throughout the year
Tiger pear	*Opuntia aurantiaca*	Tiger pear is readily detectable throughout the year
Velvety pear	*Opuntia Tomentosa*	Velvety pear is readily detectable throughout the year
Common prickly pear	*Opuntia stricta*	Common prickly pear is readily detectable throughout the year
Devil's rope pear	*Cylindropuntia imbricate*	Devil's rope pear is readily detectable throughout the year
Rubber vine	*Cryptostegia Grandiflora*	Rubber vine is readily detectable throughout the year

Species	*Scientific Name*	Monitoring Time
Balloon cotton	*Gomphocarpus Physocarpus*	Balloon cotton is detectable throughout the year however the species is most conspicuous during spring-autumn flowering period
Parthenium	*Parthenium hysterophorus*	Parthenium is an annual herb and therefore will only be detectable during its growing period. The species normally germinates during spring and early summer and grows through to late autumn. However with suitable conditions the species can grow and produce flowers at any time of the year
African boxthorn	*Lycium ferocissmium*	African boxthorn is readily detectable throughout the year
Parkinsonia	*Parkinsonia aculeate*	Parkinsonia is readily detectable throughout the year
American rat's-tail grass	*Sporobolus jacquemontii*	American rat's-tail grass is a perennial species however it is generally most conspicuous during the summer growing period
Groundsel bush	*Baccharis halimifolia*	Groundsel bush is detectable throughout the year however the species is most conspicuous during the autumn flowering period
Cat's claw creeper	*Macfadyena unguis-cati*	Cat's claw creeper is detectable throughout year however the species is most conspicuous during the spring flowering period
Camphor laurel	*Cinnamomum camphora*	Camphor laurel is readily detectable throughout the year
Heart-seed vine	*Cardiospermum Grandiflorum*	Heart-seed vine is readily detectable throughout the year
Giant rats tail grass	*Sporobolus natalensis*	Giant rats tail grass is a perennial species however it is generally most conspicuous during the summer growing period
African Lovegrass	*Eragrostis curvula*	African lovegrass is a perennial species however it is generally most conspicuous during the summer to autumn flowering period
Spiny Burrgrass	*Cenchrus incertus*	Spiny burrgrass can be either annual or perennial depending on the environment. The species is generally most conspicuous during the summer growing period
Crown Beard	*Verbesina Encelioides*	Crown beard is an annual species that is generally most conspicuous during the summer flowering period
Snake Cotton	*Froelichia floridana*	Summer Snake cotton can be either annual or perennial. The species is generally most conspicuous during spring to early summer
Lippia	*Phyla canescens*	Lippia is detectable throughout year however the species is most conspicuous during the spring to autumn flowering period

2.5.3.2 Reporting requirements

Staff and contractors will be required to observe their work area and report all new infestations, particularly Parthenium outbreaks as soon as possible so that suitable management can be applied. Weeds will be reported to the appropriate project area.

Where required notification will be provided to the relevant Council and to Biosecurity Queensland (DEEDI) on the locations of declared weed infestations identified within the Galilee Coal Project area.

2.6 Plant disease management strategy

Vehicles, machinery, plant equipment and materials imported from overseas will be inspected by quarantine customs in accordance with the requirements and protocols of AQIS.

Landscaping materials and plants sourced from the nursery trade must be declared disease and pest free. Plants that are high risk vectors shall be avoided or accompanied by a weed hygiene declaration.

Construction contractors and visitors to the Project sites will be made aware of plant disease quarantine requirements including how to identify Alert Plant diseases and the risks these pose to Australia, how their actions can contribute to and prevent the introduction and / or spread of these diseases and penalties that might be incurred as a result of introducing plant diseases to the region.

Plants and plant materials suspected of being affected by an Alert Plant disease will be immediately reported to Biosecurity Queensland so they may provide instruction on further action to be taken such as diagnosis, containment and treatment.

If any plant disease listed in **Table 4** is suspected, the following actions will be taken:

- Stop work and notify site environmental representative, exclude workers from site
- Appropriate manager to report to Biosecurity Queensland if the disease is confirmed notifiable
- Establish controlled site access and containment measures.

Biosecurity Queensland will be consulted to work with the proponent to properly manage any plant disease occurrence within the Project area. If any work is undertaken in an area where any plant diseases have been identified the following actions are required as a minimum subject to consultation with Biosecurity Queensland:

- Minimise the number of sites or properties visited per day
- Wash down vehicles and plant equipment if they have been in contact with vegetation
- Launder personnel clothing and wash-down PPE
- Clean boots with water and detergent
- Clean any other equipment (hand held) if it has been in contact with infected vegetation
- Set up a 'wash down' area so personnel can wash their face and hands, and clean their footwear, when leaving the site.

High risk sites or sites with known plant diseases may have a site specific management plan developed to be approved by the relevant manager.

3. Pest animal management strategy

3.1 Purpose and objectives

This initial Pest Management Strategy describes China First's proposed approach to biosecurity risk management relating to pest fauna species associated with the construction and operation of the Galilee Coal Project proposed rail. The strategy will be further refined as field assessment continues and a final management strategy will be developed prior to the commencement of construction activities. The key outcome of this initial strategy is to ensure that appropriate biosecurity controls and procedures are implemented for the construction and operation of the Project, and manage pest animals across lands managed by the Galilee Coal Project in compliance with relevant legislation and policies.

All animals will be controlled in accordance with the *Animal Care and Protection Act 2001* (ACP Act) and the Model code of practice for the destruction or capture, handling and marketing of feral livestock animals available from the CSIRO.

3.2 Legislation

3.2.1 State and Commonwealth Requirements

The Australian Pest Animal Strategy (APAS) addresses the undesirable impacts caused by pest (invasive) vertebrate animals in Australia and focuses on preventing new pest species from becoming established in Australia. The APAS recognises that pest animals have major impacts on biodiversity, and additional economic and social costs. The strategy outlines specific guidelines for animal pest management in Australia including the need to establish a list of Pest Animals of National Significance, on which management efforts can be focused. Once developed, the list will be considered as part of Waratah Coal's longer term management of pest species in and adjoining the project area.

In Queensland the LP Act identifies declared animals that have been nominated for control. Declaration of pest animals imposes a legal responsibility for control by all landowners on land under their management, including all landowning state agencies. Under the LP Act it is considered an offence to introduce a pest animal into Queensland or feed, keep or release a declared pest animal in Queensland without a permit. There are three categories of declared animal pests in Queensland; class 1, 2 and 3, outlined below:

- Class 1 pest animals are not commonly present in Queensland, and if introduced would cause an adverse economic, environmental or social impact. Class 1 pests established in Queensland are subject to eradication from the state. Landowners must take reasonable steps to keep land free of Class 1 pests. Other powers of the Act apply.
- Class 2 pest animals are established in Queensland and have, or could have, a substantial adverse economic, environmental or social impact. The management of these pests requires coordination and they are subject to local government-, community- or landowner-led programs. Landowners must take reasonable steps to keep land free of Class 2 pests. Other powers of the Act apply.
- Class 3 pest animals are established in Queensland and have, or could have, an adverse economic, environmental or social impact. A pest control notice can only be issued for these pests on land that is, or is adjacent to, an environmentally significant area. Thus, the adverse impact of species in this class is primarily environmental. Only some of the other powers of the Act apply.

Other terrestrial pest species of significance are those species identified as key threatening processes to the long-term viability of native fauna species of national environmental significance listed under the EPBC Act.

Further information on the classes of declared pest animals is available at http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Declared-Animals-Qld-PA2.pdf

3.2.2 Local Authority Requirements

Where State and Commonwealth requirements do not apply to locally or regionally significant pest species, pest management will be undertaken in accordance with the requirements of regional council pest management strategies. The implementation of pest management for the Galilee Coal project will where possible be consistent with Management Programs developed by the relevant regional councils.

3.3 Terrestrial pest animal species

A total of 15 terrestrial pest animal species have been identified in the Project area from field surveys and database searches. Four of these species are declared Class 2 species by the LP Act.

Pest class, distributions and possible impacts of the pest species identified are listed in **Table 8**.

Table 8. Terrestrial animal pest species of the Project area

Common Name	Scientific Name	LP Act Status	Occurrence on Site
Cane Toad	*Rhinella marina*	Non Declared	Abundant across project area and increasing in distribution
Asian House-gecko	*Hemidactylus frenatus*	Non Declared	Abundant on buildings across project area
Rock Dove	*Columba livia*	Non Declared	Common and localised around townships
House Sparrow	*Passer domesticus*	Non Declared	Common and localised around townships
European Starling	*Sturnus vulgaris*	Non Declared	Common and localised around townships and agricultural land
Indian Myna	*Sturnus tristis*	Non Declared	Common and localised around townships
Spotted Dove	*Streptopelia chinensis*	Non Declared	Common and localised around townships
Wild Dog	*Canis lupus familiaris*	Class 2	Common across project area
Feral Cat	*Felis catus*	Class 2	Abundant across project area
House Mouse	*Mus musculus*	Non Declared	Abundant across project area
Rabbit	*Oryctolagus cuniculus*	Class 2	Abundant across project area
Black Rat	*Rattus rattus*	Non Declared	Common and localised around townships and agricultural land
Feral Pig	*Sus scrofa*	Class 2	Abundant across project area

3.3.1 General pest animal management

The Project area is a substantial geographic area that traverses a number of land uses.

Pest animal management within the mine footprint will form part of the annual maintenance program for the site. From time to time target species programs may be required (such as regional wild dog poisoning program) and such activities will be coordinated with the broader community effort.

Pest animal management along the rail corridor is generally not feasible due to the highly mobile nature of most pest animal species. Pest animal species may traverse the rail easement; however, it is unlikely that they will persist solely within the corridor, instead utilising a substantial body of land outside of that managed by China First.

Pest animal management within the rail corridor, which consist of particular sized land units, is achievable when a pest species remains within the project area and control is feasible within that specifically sized area. Some control measures such as trapping and shooting will not be feasible within smaller geographic units. If the development of the Galilee Coal Project infrastructure occurs within an area frequented by a pest species, or a declared pest species becomes resident within an area managed by China First, the species will be managed in accordance with legislative requirements.

The following sections provide information on specific pest species that are prevalent within the project area.

3.3.2 Cane Toad

Status

The cane toad is listed as a non-declared pest animal under the LP Act. All life stages of the cane toad are toxic, eggs, tadpoles, metamorphs and adults (Shine, 2009), and, in 2005, lethal ingestion of cane toads by native wildlife was listed as a key threatening process to native fauna species listed under the EPBC Act (DSEWPaC 2010).

History and ecology

The cane toad was introduced into Australia in the early 20th century to control sugar cane pests in northern Queensland. Cane toads are currently distributed throughout much of Queensland, northern NSW, the Northern Territory and northern parts of Western Australia.

Cane toads are opportunistic feeders that can consume a wide range of prey. Direct poisoning of predators is the most significant pathway by which cane toads impact on native fauna. Direct poisoning by cane toads has been widely reported in native reptiles, amphibians, birds and mammals (Shine, 2009). Due to their high population densities cane toads may compete with native vertebrates for food and shelter.

Occurrence

Cane toads are found across the Project area.

Management

There is currently no broad scale control method for cane toads (e.g. trapping or baiting).

Artificial water-holding facilities can be designed to mitigate their utilisation by cane toads. Cane toads are selective about breeding sites, and utilise shallow pools with still water, open, sparsely vegetated gradually

sloping banks in preference to sites with steep edges, thick vegetation along the bank, deep water or flowing water (Hagman and Shine, 2006; Semeniuk et.al., 2007).

3.3.3 Feral pig

Status

Feral pigs are listed as a Class 2 pest animal under the LP Act. Predation on native wildlife species, habitat degradation, competition with wildlife for resources and disease transmission by feral pigs was listed in 2001 as a key threatening process to native fauna species listed under the EPBC Act.

History and ecology

Feral pigs are found in a wide variety of habitats. The two requirements that restrict the distribution of feral pigs are abundant water and suitable cover. Feral pigs are considered to be one of the most widespread and damaging pest animals in Queensland (McGaw and Mitchell, 1998). Impacts may be through direct predation of smaller native animals or the consumption of native plants and soil disturbance. The feral pig additionally poses a serious threat to Queensland's livestock industry and human health as a potential carrier or amplifier of disease (McGaw and Mitchell, 1998). An indirect impact is through the spread of the root rot fungus *Phytophora cinnamomi* in areas where the fungus is prevalent.

Pigs have a high reproductive rate during favourable years. Breeding can occur throughout the year with a litter, averaging six young, produced every 12-15 months. Pigs are creatures of habit, tending to utilise the same tracks, water holes, feeding and resting areas unless disturbed by predators or human activities (McGaw and Mitchell, 1998).

Occurrence

Feral pigs are abundant and localised across the Project area.

Management

The eradication of pigs from a given region is not possible except on small islands and in some local areas (DEWHA, 2005). The Galilee Coal Project will employ a suitably qualified person to remove feral animals from site where they persist. Fences associated with the rail corridor will be maintained to exclude pigs. Pigs will continue to occur outside of these fenced areas.

Considering dispersal abilities and rates of reproduction, a control program within the Galilee Coal Project area alone will have limited impact on the regional pig population.

Establishment of long-term trapping sites is an effective way of monitoring the changes in pig populations in an area. If feral pigs are recorded on the land managed by China First, traps will be considered to firstly remove any trappable pigs, thus mitigating damage from pigs and secondly to be incorporated into future mitigation efforts. Guidelines for population estimates and trap designs for feral pigs are available through DEEDI. It is essential that standardised, consistent trap effort and methodology is used to provide the most accurate population census data.

Coordinated management with the key stakeholders can reduce human and environmental impacts. Options, other than trapping, include poisoning, shooting and the use of dogs and fencing. There are standard operating procedures for humane vertebrate pest control that will be complied with during any management actions targeted to the feral pig undertaken by China First.

Further information can be found at: http://www.dpi.qld.gov.au/4790_8280.htm

3.3.4 Wild dog

Status

Wild dogs are listed as Class 2 pest animals under the LP Act. Wild dogs are unmanaged domestic dogs and dingo/domestic dog hybrids.

History and ecology

Wild dogs are found throughout Queensland. These dogs cause significant widespread impacts on the cattle, sheep and goat industries through predation, disease transmission and lost production due to stress. It is estimated that wild dogs cost Queensland $67 million in 2008/09 (Hewitt, 2009).

Occurrence

Wild dogs are abundant and localised to widespread throughout the Project area.

Management

The management of wild dogs in Queensland is directed and co-ordinated through the Queensland Wild Dog Strategy and a Memorandum of Understanding (MoU) 2005. The current Queensland Wild Dog Strategy aims to ensure reduction of wild dogs in coastal and rural areas, such as across the Project area.

A large body of documentation is available to direct land managers in the best practice management of wild dogs, available from DEEDI at http://www.dpi.qld.gov.au/4790_9154.htm#wild_dog_control Guidelines for wild dog control are also specified by Biosecurity Queensland and are available at http://www.dpi.qld.gov.au/4790_8503.htm

The Galilee Coal Project will employ a suitably qualified person to remove wild dogs from site.

Camera traps should be considered to enable easier monitoring of activity around the mine site if necessary.

If 1080 baiting is to be conducted a 1080 Pest Animal Bait User Declaration Form (or equivalent) will be completed and displayed accordingly and is available at http://www.animalcontrol.com.au/pdf/1080PestAnimalBaitUserDeclarationForm.pdf

The code of practice for use of sodium monofluoroacetate poisoning for wild dogs is available from DEEDI Qld at http://www.dpi.qld.gov.au/4790_9160.htm

Any large-scale efforts to control wild dogs within the wider Project area will need to be undertaken in consultation with the key stakeholders as part of a broad scale control strategy.

3.3.5 Red fox

Status

The red (or European) fox is listed as a Class 2 pest under the under the LP Act. Predation by the red fox is listed as a key threatening process to native fauna species listed under the EPBC Act.

History and ecology

Foxes are established over most of Australia except the tropical far north. Foxes prey on a large range of native species and are implicated in the demise of numerous native species. Foxes range over large home ranges that may exceed 500 ha making control and detection of individuals difficult.

Occurrence

Foxes are abundant and widespread across the Project area, although were not recorded in the survey effort todate. Because of the high dispersal ability and large home range of foxes it is likely that they will occasionally be observed on-site.

Management

Baiting for foxes can be effective in reducing numbers when conducted over large areas in conjunction with trapping and shooting. Removal of foxes from a region is not feasible due to the fecundity and secretive nature of the species. Control of foxes is not possible without a substantial input of resources from all stakeholders in the area. Foxes are likely to disperse back into areas from which they are eradicated if control is not ongoing (DEWHA, 2008a). Any large scale efforts to manage foxes within the wider area will need to be undertaken in consultation with the key stakeholders. The fox fact sheet is available from DEEDI: http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Fox-PA13.pdf

3.3.6 Feral cat

Status

The feral cat is listed as a Class 2 pest under the under the LP Act. Predation by feral cats is listed as a key threatening process to native fauna species listed under the EPBC Act

History and ecology

The first record of cats being brought to Australia is with the first European settlers. Feral cats are now found throughout Australia, including Tasmania and on many offshore islands. Cats can colonise a wide range of habitats and eat a wide range of prey. Feral cats can survive with limited access to fresh water as adequate moisture is obtained from prey. Cats can kill fauna up to 3 kg in weight but preferentially kill mammals less than 220 g in weight and birds less than 200 g in weight (DEWHA, 2008b). Feral cats carry infectious diseases that can be transmitted to native animals, domestic livestock and humans (DEWHA, 2008b).Cats produce two litters each year, in autumn and in spring, each containing about four kittens.

Occurrence

Feral cats are abundant and widespread across the whole Project area. They may be attracted to campsites.

Management

Eradication of feral cats from the Australian mainland is not possible, particularly considering the prevalence of domestic cats; however, localised control may be possible (DEWHA, 2008b). Feral cat control within the facility boundary alone would be ineffectual as feral cats disperse widely.

The interaction between pest species means that the control of cats can have impacts on other invasive animals, such as rabbits and rats whereby the release from cat depredation allows increases in other pest

species numbers. The impacts of a control program on other feral species will need to be considered along with programs for the control of these species.

The primary methods for the control of feral cats is trapping and shooting. Baiting for feral cats is less effective than baiting for wild dogs or foxes. Cats cannot be practicably excluded by fencing without significant cost related to fence maintenance. Feral cat control best practice management guidelines and fact sheet are available from DEEDI: http://www.dpi.qld.gov.au/4790_8271.htm

3.3.7 Rabbit

Status

The rabbit is listed as a Class 2 pest under the under the Queensland LP Act. Competition and land degradation by feral rabbits are listed as a key threatening process under the EPBC Act (DEWHA 2008c).

History and ecology

The European rabbit was deliberately released on the Australian mainland in the mid to late 1800's and is now found across most of the Australian mainland, except the far north. Rabbits are considered to be Australia's most serious vertebrate pest. Rabbits impact native flora and fauna along with agricultural and pastoral industries. Rabbits have been implicated in the decline and extinction of many of Australia's terrestrial mammals that weigh between 35 – 5,500 g (DEWHA, 2008c).

Breeding is confined to the time of year when fresh young shoots are available; however, as many as nine litters can be produced in a good year. A litter can range from 4-6 kittens.

Occurrence

Rabbits occur on lands managed by The Galilee Coal Project as part of the Project. It is unlikely that they will remain in site development areas due to general activity levels, clearing of vegetation and earthworks.

Management

The focus of rabbit management generally includes abating impacts rather than prevention or eradication. Effective rabbit control requires integration of different methods of control including baiting, shooting and warren destruction. Poisoned rabbits have been implicated in trophic uptake of poisons and death of native wildlife species. As such any poisoned rabbits should be sought and removed following targeted baiting campaigns. Rabbits are an important food source for foxes and cats. Considering this, control of rabbits should be integrated with the control of other pest species, such as cats and foxes.

Biosecurity Queensland fact sheets for rabbit control and best practice management guidelines are available here: http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPAEuropeanRabbits-guideline.pdf

3.3.8 Introduced rodents

There are three species of rodents that have been dispersed widely in association with the global movement of humans. These species are the House Mouse (*Mus musculus*), Brown Rat (*Rattus norvegicus*) and Black Rat (*R. rattus*).

Rodents are considered carriers of zoonotic diseases and control programs for these species will reduce the risk of transmission to people (AHA, 2005). A presence on the Australian mainland and islands is an on-going risk to biodiversity. Exotic rodents:

- Eat native species and compete for food
- Carry diseases that may affect native animals, livestock and human health
- Change ecosystems by more complex indirect effects by causing changes in species that 'engineer' the ecosystem – such as seabirds
- Act as the primary prey for other exotic predators such as feral cats or foxes, which then threaten native species (DEWHA, 2009).

Status

The house mouse, brown rat and black rat are listed as non-declared pests under the LP Act. In 2006, the presents of exotic rodents on islands was listed as a key threatening process to native fauna species listed under the EPBC Act.

History and ecology

House mouse (*Mus musculus*)

The house mouse is widespread through the Australian mainland and many of the offshore islands.

Mice are considered a major agricultural pest, reaching plague proportions under favourable conditions. Mice are opportunistic breeders, with a gestation period of 19 days and the ability to have a litter of 4-8 pups. Outside of plague periods, mice remain in low numbers within the landscape and it is often difficult to detect their presence. The house mouse is known to swim during plague periods, although it is not considered to be a very competent swimmer (DEWHA, 2009b).

Black rat (*Rattus rattus*)

Black rats are common around the Australian coastline with the highest densities being reached near human habitation. The rats are not found in the central region of Australia, considered to be due to a lack of water and competition from native rodents. Breeding can occur throughout the year with litter sizes ranging from 5-10 young (DEWHA, 2009b).

Brown rat (*Rattus norvegicus*)

The brown rat has a patchy distribution around Australia, associated with coastal cities and towns in wetter regions. It is however, rare in the tropics. Breeding can occur throughout the year, with litter sizes ranging from 7-10 offspring (DEWHA, 2009b).

Occurrence

The house mouse, black rat and brown rat are found across the Project area.

Management

There are several native rodents across the wider Project area that will be negatively impacted by broad-scale non-species specific rodent eradication measures. These species include threatened species. Any broad scale or non-specific rodent control program will need to consider potential impacts to non-target species. Environmental managers on site will be trained to positively identify native rodents from pest rodent species to avoid impacting on protected species during rodent control operations if required.

Baiting stations are designed to allow access by pest rodents but limit access by non-target species. Further investigation would be required in the design of targeted baiting stations used in the wider project area in consultation with a qualified ecologist. Baiting and trapping for pest rodents is only to be conducted once target species have been identified using non-injurious trapping and census techniques by a qualified ecologist.

Food waste from the proposed Project facilities will be contained within sealed rodent-proof containers prior to disposal and will not at any time be in a condition that is accessible to rodents.

Human food waste is a principle cause of increased pest rodent numbers and will be managed.

Garbage facilities used for food waste will be inspected on an ongoing basis to ascertain the effectiveness of rodent-proofing. Immediate improvements to garbage storage and disposal will be implemented if rodents are found to be accessing food waste on site until there is no evidence of rodents accessing food waste.

3.3.9 Introduced birds

Five species of introduced birds occur within the Project area: the Rock Dove, Spotted Turtle dove, Indian Myna, House Sparrow and European Starling. None of these pest bird species are declared pests, and their control is difficult without coordinated efforts by landholders within a region. It is likely that without access to grains and other crops that these species will increase in numbers within the project area. Therefore it is unlikely that control measures will need to be implemented by China First. Should broader community based programs be initiated for the introduced birds, Waratah Coal will consider its participation in such programs.

3.3.10 Pest animal control adjacent to the proposed Galilee Coal Project

Confirmed presence of Class 2 and 3 pest animal species will be managed adjacent to disturbed areas under The Galilee Coal Project management where feasible. Because of the shared property boundaries with various landholders, and the spread of the tenure, pest animal control will be undertaken in consultation and coordination with affected landholders where practicable. When pest animals are identified through monitoring a pest alert will be created for key stakeholders.

Records of agreed control strategies implemented, will be recorded for distribution to key stakeholders in a dedicated format.

3.3.11 Pest animal control across the proposed Galilee Coal Project

The clearing of vegetation within the project are will mobilise pest animal species that occur on site prior to construction works including pigs, foxes, rabbits and wild dogs. These species are highly mobile and utilise large areas of habitat, and are likely to vacate the site due to disturbance during construction and clearing of vegetation.

Should individual specimens be found within fenced sections of the project area (and therefore unable to easily leave the fenced area) suitably qualified project staff will eradicate these individuals under the LP Act. Eradication measures can be through baiting, trapping or shooting in accordance with ethical and practical considerations and is to be determined by the relevant project manager.

Garbage disposal facilities will be managed to minimise attraction to rodents. The use of sealed waste storage containers on site is necessary to mitigate increases in pest rodents on site. Baiting for rodents will occur in consultation with a qualified biologist following accurate identification of target species using non-lethal trapping methods. If pest rodent numbers increase on site the Galilee Coal Project will consult with a qualified

ecologist to design and implement baiting stations, otherwise no poison baiting or trapping for rodents will occur within the proposed Galilee Coal Project site.

3.3.12Construction of water holding bodies

Construction of permanent water-holding bodies on site should be in accordance with measures to mitigate use by cane toads. Because cane toads cannot be feasibly eradicated from an area, best practice management currently precludes facilitation of breeding on site by cane toads. By constructing steep-walled water holding bodies and establishing vegetation around the perimeter of these water bodies, their utilisation by cane toads and suitability as breeding sites for the species are mitigated against. Shallow water, gently-sloped banks and sparsely vegetated banks should be avoided where practicable (Hagman and Shine 2006). Environmental managers on site will be trained to identify cane toads at all stages of development from eggs to adults to avoid impacting negatively on native, protected frog species that may be subject to accidental control measures, due to confusion with cane toads.

3.3.13 Tramp ants

Tramp ant species are those that are able to establish invasive colonies from a small founder population once introduced to an area. The majority of tramp ant incursions into Australia are within sub-tropical and tropical regions and the frequency of establishment is linked to climate matching between source regions and target localities. Southeast Queensland represents a high risk area for tramp ant incursions because of the subtropical environment and over 40% of tramp ant interceptions in Australia have been in the Brisbane region. Invasive (tramp) ant species pose a major threat to Australian biodiversity and agriculture (PIAG 2004).

Tramp ant species of high concern throughout the Pacific region including Australia are:

- Red Imported Fire Ant (*Solenopsis invicta*)
- Tropical Fire Ant (*Solenopsis geminata*)
- Yellow Crazy Ant (*Anoplolepis gracilipes*)
- Big Headed Ant (*Pheidole megacephala*)
- Singapore Ant (*Monomorium destructor*)
- Ghost Ant (*Tapinoma melanocephalum*)
- Papuan Thief Ant (*Solenopsis papuana*)
- Crazy Ant (*Paratrechina longicornis*)
- Electric Ant (*Wasmannia auropunctata*)
- Argentine Ant (*Linepithema humile*)
- Pharaoh Ant (*Monomorium pharaonis*)
- White Footed Ant (*Technomyrmex albipes*).

Of these high concern species, nine have been recorded as established in Australia or with incursions in Australia and all have the potential to be contaminating pests (or 'hitchhikers') of commodities (DEH, 2006). The primary transport vector of tramp ants is the movement of substrates and materials already containing the species. High risk materials include soil, pots and potting mix, mulch and construction materials.

Status, history, ecology and occurrence

There have been incursions by five species of tramp ant into Queensland, these being:

- Tropical Fire Ant
- Argentine Ant,
- Yellow Crazy Ant,
- Electric Ant

- Red Imported Fire Ant.

The Argentine ant and tropical fire ant incursion have been the focus of eradication programs by BQCC in Brisbane.

The following three species are currently undergoing management in Queensland for incursions. **Table 9** provides information on tramp ants currently known in Brisbane. Current exclusion zones for imported ant incursions are available from DEEDI: http://www.dpi.qld.gov.au/4790_7500.htm.

Yellow Crazy Ant (*Anoplolepis gracilipes*) - Yellow crazy ants are a Class 1 declared pest in Queensland. This species is found throughout the Pacific region and is commonly transported in sea cargo. There are current containment areas for this species in Cairns and Townsville, with historic incursions at several other sites along the coast line. The Biosecurity Queensland Control Centre (BQCC) undertakes the program to control and eradicate the yellow crazy ant. Further information on yellow crazy ants is available from DEEDI: http://www.dpi.qld.gov.au/4790_5772.htm

Electric ant (*Wasmannia auropunctata*) - Electric ants are native to Central and South America. Electric ants are now found in several near neighbours in the Pacific region including New Caledonia, the Solomon Islands and Vanuatu. In 2006, an outbreak of this species was discovered in the northern suburbs of Cairns and is currently the target of an eradication campaign by BQCC. Further information on the electric ant is available from DEEDI: http://www.dpi.qld.gov.au/4790_5772.htm

Red imported fire ant (*Solenopsis invicta*) - The red imported fire ant is the species of most concern in the region of the proposed Project area due to present incursions of the species in Southeast Queensland. There are current containment zones for this species in south-east Queensland with BQCC undertaking the control and eradication program. Additionally BQCC conducted surveillance within a 5km buffer of a known infestation in Yarwun. Fire ants are a venomous, stinging species able to inflict repeated stings, resulting in a painful burning itching sensation. This species is native to South America. Further information is available from DEEDI: http://www.dpi.qld.gov.au/4790_4538.htm

Table 9. Notifiable tramp ant species presently known in Queensland

Common name	Scientific name	Current Distribution	Possible Impact
Yellow Crazy Ant	*Anoplolepis gracilipes*	This species is found throughout the Pacific region and is commonly transported in sea cargo. There are current containment areas for this species in Cairns and Townsville.	Disruption to natural environments including native birds, animals and plants
Electric Ant	*Wasmannia auropunctata*	Recent incursions have been in the suburbs of Cairns and restriction zones exist for the movement of high risk material.	Displace native ants Can cause decline in invertebrates and small vertebrates
Red Imported Fire Ant	*Solenopsis Invicta*	There are current containment zones and restriction zones for the movement of high risk material in Brisbane, Ipswich, Logan and Gold Coast suburbs.	Displace native ants. Very aggressive and feed on small ground fauna, including insects, spiders, lizards, frogs, birds and mammals May displace or eliminate native ground fauna Eat or damage seeds of native flora

			Predate or disturb the insects and animals that pollinate native plants, which may also result in long-term change to the vegetation

The Big Headed Ant, Singapore Ant, Ghost Ant, Crazy Ant, Pharaoh Ant and White Footed Ant are either not established in Queensland or are not considered an agricultural or economic pest and therefore currently not the focus on any eradication programs. http://www.issg.org/database/welcome/

3.3.14 Pest Management Actions

The responsibility for implementing the actions will principally rest with China First. During construction, the day to day responsibility for the actions will likely be combined between Waratah Coal and the various construction contractors. The responsibility to implement the pest management actions will form part of the construction contract.

Initial species specific management actions to be implemented across the project area are provided in **Table 10**. Administrative management actions are detailed at **Table 11**.

Table 10. Terrestrial pest animal management actions

Pest Species	Target	Action
Cane toads	Reduction in the breeding habitat available across Project area.	The water holding facilities on site will be designed to minimise the occurrence of shallow pools with still water and open unvegetated gradually sloping banks.
Feral horse Feral pigs Red fox Rabbit	No increase in the spatial distribution or abundance of these feral species on lands supporting Galilee Coal Project infrastructure. Control of these species within areas managed by the Galilee Coal Project where feasible.	If pest species numbers are increasing in Project site, liaise with local government authority and local landowners.
Wild dog	Control of wild dogs within areas managed by the Galilee Coal Project where feasible. Coordinated approach to wild dog control with adjacent landholders where practicable	Key stakeholders in Project area will be engaged with to determine management objectives for wild dogs.
	No increase in the spatial distribution or abundance of wild dogs on lands supporting the Galilee Coal Project infrastructure	No domestic dogs will be allowed on to any sites within the Project area.
Feral cat	No increase in the spatial distribution or abundance of the feral cat on lands supporting The Galilee Coal Project infrastructure	No domestic cats will be allowed on to any sites within the project area.

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Pest Species	Target	Action
House Mouse and Black Rat	Rodent management	Rodent baits will be maintained within the site buildings and accommodation camps if rodents are prevalent and correctly identified. The baits will be placed and contained to minimise exposure to non- target species.
		Any reports of rodents within the sites of the wider project area will be followed up with non lethal trapping and confirmed identification of the rodent species, prior to any actions being taken. Landowners of the affected properties will be consulted prior to any trapping or control actions.
		Management of food refuse to mitigate pest rodent occurrence.
All pest fauna	Control of pest fauna within the wider Project area	Key stakeholders will be engaged with to coordinate efforts to manage pest fauna within the wider Project area.
		The outcomes of the key stakeholder engagement will be implemented across the Project area.
		Specific corrective actions may be provided by Biosecurity Queensland for specific invasive species, such as tramp ants.

Table 11. Administrative pest management actions

Aspect	Management Action
Training	All staff and contractors will be made aware of the strategies to manage pest animals on site, including specific procedures for rodent control at Project facility and camp sites, as part of the induction process. Selected Project personnel shall be trained in the identification and management of the target pest animal species.
Monitoring	Disturbed areas within the Galilee Coal Project will be inspected regularly to monitor pest activities and to undertake pest control measures as required. Visual monitoring will be undertaken during general activities on site. Camera traps may be installed at breaks in the boundary fences and within the properties to monitor pest animal activity. A sample of water bodies will be assessed annually by field personnel for cane toad breeding activity. Annual monitoring of rodent activity around the rail corridor and all site camps will be conducted using non-lethal trapping.
Reporting	All sightings of pest animals or signs of pest animal activity will be reported to the site manager and environmental representative. Timely notification will be provided to the relevant Council on the locations of pest activity identified within the Galilee Coal Project. A record of pest animal sightings will be maintained in a register. A six monthly report on pest animal activity will be prepared by Galilee Coal Project. This report will include a summary of all relevant training provided to staff and contractors, a summary of the pest animal register, the findings of the annual monitoring programs and recommendations for any corrective actions required.

3.3.15 Tramp ant management strategy

The primary focus for the management of tramp ants on-site is detection and prevention. The inspection of all cargo arriving from areas known to be occupied by a tramp ant species is vital to prevent introduction and further invasion. Detection requires the awareness of all staff and contractors to the threat of tramp ants establishing on-site. Early detection of an incursion will enable a more effective mitigation response. Biosecurity Queensland will be requested to provide specific advice on the management of an incursion by tramp ants should they be found on-site.

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Management of fire ants is to be conducted in cooperation with Biosecurity Queensland Control Centre (telephone 13 25 23) and any discovery of an incursion is to be reported immediately. A request for site inspection for commercial operations is available at the DEEDI site: http://www.dpi.qld.gov.au/4790_8027.htm.

All staff on site are to be familiar with the potential for fire ants to occur on site, and regular inspections are to be conducted for fire ant mounds by the site environmental officer or equivalent. Initial management strategies for tramp ants are at **Table 12**.

Table 12. Tamp ant management strategy

Aspect	Management Action
Training and awareness	Project site inductions will include an overview of tramp ant impacts and behaviour, identification of fire, electric, and yellow crazy and the reporting procedure if tramp ants are identified or suspected in a Project site or area. Selected Project personnel shall undergo fire ant general awareness training run by Biosecurity Queensland. Personnel who have been trained in vehicle / equipment Inspection RTD2313A and fire ant general awareness will be authorised to inspect all vehicles and equipment on site.
Inspection and certification	Materials, equipment and machinery will be inspected to minimise the potential for introduction of fire ants to the site. High risk materials (soil, bailed hay and straw, plants, mulch, green waste, construction materials, equipment) will be sourced from suppliers who have a DEEDI Approved Risk Management Plan (ARMP) if the business trades in, handles or moves high risk materials from a restricted area. Where suppliers do not have an approved ARMP, a fire ant declaration form before moving high risk materials to areas outside the restricted area will be completed as part of the management strategy. All suppliers of high risk items must declare whether they operate within a restricted zone. A copy of the ARMP for any materials sourced within a restricted area will be lodged with the relevant project manager.
Monitoring and reporting	All Project personnel and contractors shall immediately report any suspected tramp ants to the Site environmental representative. Tramp ant sightings will be reported as an environmental incident. The environmental representative will immediately report any sightings or suspected sightings of tramp ants to the relevant Galilee Coal Project manager. The Galilee Coal Project will notify Biosecurity Queensland
Treatment and control	Treatment will be undertaken by Biosecurity Queensland. On property not owned by China First, the Landowner Liaison team will work in conjunction with the landowner and Biosecurity Queensland to implement the following treatment and control strategies: • Baiting: bait will be broadcast across designated treatment areas by Biosecurity Queensland officers using hand held spreaders, on all-terrain vehicles, or aerially from helicopters. The method of distribution will be dependent on the size of the property and accessibility. • Surveillance: Monitoring of the affected properties will be ongoing by site environmental representatives. Formal surveillance will be undertaken by Biosecurity Queensland officers if required. All sightings of suspect ants will be reported to Biosecurity Queensland. • Containment: Project related transport of materials and vehicle entry to the affected properties will be restricted to prevent fire ants being spread to new areas. Access will be restricted to the contaminated site and controlled by the Contractor Site Manager.

3.3.16 Animal disease legislation

The following legislation and government regulations, guidelines and strategies will be adhered to:

- *Quarantine Act 1908*
- *Imported Food Control Act 1992*
- *Stock Act 1915*
- Australian Veterinary Emergency Plan (AUSVETPLAN).

Australia quarantine regulations apply to all animals and animals products entering Australia. All products and materials imported into Australia require AQIS inspection and clearance.

The Australian Veterinary Emergency Plan (AUSVETPLAN) outlines the national co-ordination of emergency animal disease response. Under this plan each state and territory has operational responsibility for the control and eradication of animal diseases, whether endemic or exotic, within its borders.

Notifiable diseases listed under the Stock Act 1915 must be reported to Biosecurity Queensland.

3.3.17 Animal diseases

The animal diseases in **Table 13** are declared notifiable diseases found in Queensland and have been identified in the Australian Veterinary Emergency Plan (AUSVETPLAN) Wild Animal Response Strategy as emergency diseases that may affect native and domestic animals. Whilst not an exhaustive list of potential animal disease, the diseases in **Table 13** require notification if identified.

Table 13. Declared notifiable animal diseases

Disease	Occurrence in Australia
African horse sickness	Does not occur in Australia
African swine fever	Does not occur in Australia
Anthrax	Anthrax belts found in Australia. Rare in Queensland.
Aujeszky's disease (pseudorabies)	Does not occur in Australia
Bluetongue	Found in Northern Australia – NT, Qld, WA and NSW.
Brucellosis	Two species occur in Australia – *Brucellosis ovis* and *Brucellosis suis*
Classical swine fever (hog cholera)	Not present in Australia. Last outbreak 1961.
Contagious equine metritis[#]	Last outbreak 1980.
Equine influenza	Queensland declared equine influenza free in 2008.
Foot-and-mouth disease	Does not occur in Australia
Highly pathogenic avian influenza	Does not occur in Australia
Japanese encephalitis	Cape York Peninsula
Lumpy skin disease	Does not occur in Australia
Newcastle disease	Occurs in Australia. Last outbreak 2002.
Peste des petits ruminants	Does not occur in Australia
Porcine reproductive and respiratory syndrome	Does not occur in Australia
Porcine reproductive and respiratory syndrome	Does not occur in Australia
Rabies	Does not occur in Australia
Rift Valley fever	Does not occur in Australia
Rinderpest	No longer occurs in Australia
Screw-worm fly	Does not occur in Australia
Sheep pox and goat pox	Does not occur in Australia
Surra	No longer occurs in Australia
Swine vesicular disease	Does not occur in Australia
Transmissible gastroenteritis	Does not occur in Australia

Disease	Occurrence in Australia
Transmissible spongiform encephalopathies#	Does not occur in Australia
Vesicular exanthema#	Does not occur in Australia
Vesicular stomatitis	Does not occur in Australia

Not listed in the AU SVET Disease Manual

3.3.18 Disease management strategy

There will be no live animals imported directly to any project sites. Vehicles, machinery, plant equipment and materials imported from overseas will be inspected by quarantine and customs in accordance with the requirements and protocols of AQIS.

If the presence of any notifiable disease is suspected in any species of animal, it must be reported to Biosecurity Queensland. Signs of disease may include the following:

- Numerous of ill or dead animals including birds or aquatic animals
- Rapid spread of disease through a herd or flock
- Animals that are lame, drooling or salivating excessively
- Animals that have ulcers, erosions or blisters around the feet, muzzle, udder or teats and/or in the mouth
- Unusual nervous signs
- Profuse bloody diarrhoea
- Respiratory distress or persistent coughing in horses
- Deep smelly, fly struck wounds
- Any link to another country
- Any unusual or unfamiliar disease in animals or birds.

Initial management actions to manage the risks of animal disease are detailed at **Table 14**.

Table 14. Animal disease management strategy

Aspect	Management Action
Training and awareness	Staff, contractor and visitors to the Project sites will be inducted with respect the quarantine requirements of the site, including: • Identification of the main transmission pathways for animal diseases • Signs of disease Reporting of potential items that may facilitate the transmission of animal disease.
Monitoring and reporting	Any suspected diseased animals will be reported to the site environmental representative. The site environmental representative will work the Landowner Liaison team to consult with the property owner. If the animal is confirmed to be infected with a notifiable disease, the Galilee Coal Project manager will notify Biosecurity Australia Biosecurity Queensland will outline further actions to be taken for containment of the material prior to diagnosis and possible treatment.

3.4 Exotic fish management strategy

3.4.1 Purpose and objectives

This initial Exotic Fish Management Strategy outlines the potential risks associated with invasive freshwater fish pests, the legislative requirements with respect to declared habitat management and identifies a range of other management measures for the minimisation and/or mitigation of the risk of introduction or translocation of fish pests.

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This strategy is relevant to biosecurity management in areas that could potentially be impacted by upstream waterway crossings and released associated water and immediate surrounds.

This management plan seeks to prevent the spreading of pest fish and other water-borne pest species within the river systems that span the Project area. These catchment systems include:

- Belyando
- Suttor
- Bowen / Bogie.

Waratah Coal is committed to working with Fisheries Queensland and Biosecurity Queensland and other users to minimise the risk of aquatic pest introductions and to protect fish habitats.

3.4.2 Legislation

Exotic fish species are regulated by the *Fisheries Act 1994* (Fisheries Act) and the Fisheries Regulation 2008. A noxious fish is one that has been declared as harmful by Australian statute law because they are, or may become, a pest to native aquatic communities. Noxious fish have characteristics which are detrimental to other fish, aquatic habitats or humans.

The Fisheries Act prohibits the possession, propagation, transportation or trade of certain exotic fish species and regulates the keeping and use of other exotic fish species in Australia. It is an offence to release or cause non-indigenous fish to be released (e.g. pond or dam overflowing) into Queensland waters.

The Fisheries Act also prohibits the taking of freshwater fish from regulated waters. No fish will be taken from waterways during Project operations.

3.4.3 Exotic fish species

The resilience of the introduced fish species allows them to easily establish themselves in disturbed waterways. Exotic fish that have successfully invaded Australian waters have one or more of the following attributes:

- Wide environmental tolerances
- Flexible food requirements
- High reproductive output
- Early maturation
- Aggressive behaviour
- Lack of predators and competitors.

3.4.3.1 Declared noxious fish species

Noxious fish species have established self -sustaining populations in some of Queensland's waterways. These species are highly invasive and problematic. Elimination of noxious fish species is impracticable with present control methodologies. Queensland's priority noxious fish and their distributions within the wider Project area are listed in **Table 15**. Population control and prevention of translocation of these species due to Project activities is the main focus of this management plan.

Table 15. Priority pest fish species and their distribution

Species	Scientific Name	Distribution
Tilapia	*Oreochromis mossambicus*; other species within the genera *Oreochromis*, *Sarotherodon* and	Northern and southern Queensland; not yet occurring within the Project area but increasing in distribution and likely to spread to within Project

	Tilapia	area waterways in coming years
Gambusia	Gambusia holbrooki, Gambusia affinis, all other Gambusia species	Widespread through eastern Queensland and abundant throughout Project area

3.4.3.2 Exotic/non-indigenous

Most non-indigenous fish which have established in Queensland waters have been released by members of the public. The following exotic pest fish have established populations in Queensland waterways may be found in the Project area: There is a link to further information provided by DEEDI following each species name:

- Gambusia - http://www.dpi.qld.gov.au/28_13877.htm
- Guppy (*Poecilia reticulata*) - http://www.dpi.qld.gov.au/28_14153.htm
- Rosy barb (*Puntius conchronius*) - http://www.dpi.qld.gov.au/28_14155.htm
- Platy (*Xiphophorus maculatus*) - http://www.dpi.qld.gov.au/28_14158.htm
- Sailfin molly (*Poecila latipinna*) - http://www.dpi.qld.gov.au/28_14160.htm
- Swordtail (*Xiphophorus hellerii*) - http://www.dpi.qld.gov.au/28_14161.htm
- Three spot gourami (*Trichogaster trichopterus*) - http://www.dpi.qld.gov.au/28_14162.htm
- White cloud minnow (*Tanichthys albonubes*) - http://www.dpi.qld.gov.au/28_14163.htm.

3.4.4 Species management strategy

Exotic fish have a range of negative impacts on both native species and ecosystem processes.

Exotic fish species displace native fish and amphibians through completion, predation and aggression in addition to altering the physical environment of natural ecosystems. Initial pest and exotic fish management strategies are at **Table 16**.

Table 16. Initial pest and exotic fish management actions

Aspect	Management Action
Waterway crossings	Clearing and bank stabilisation will be undertaken to prevent the degradation of natural watercourses, as degraded watercourses may be more susceptible to incursions and establishment of exotic fish species. Procedures to mitigate damage to watercourses by construction activities include but are not limited to: • Prior to clearing of riparian vegetation, photographic evidence will be taken of crossing area to be disturbed • Any weed species identified in the construction area will be cleared and removed from site to minimise risk of seeds and weed material entering the waterway Rehabilitation and revegetation will be undertaken as soon as reasonably practicable designed to promote native plant growth and maintain groundcover.
Fish Passage	Construction activities in a watercourse will be undertaken during low or no flow periods, wherever possible Construction activities in major watercourses will be avoided, where practicable, during periods of fish migration or spawning. Exotic fish species will not be translocated between catchments or within catchments by application of the following procedures: No surface water will be transferred between water catchment systems.
Monitoring and aquatic pest assessment	For the rail corridor, a detailed in-field aquatic values assessment will be undertaken at representative watercourses during the final field design. This aquatic values survey is to be completed prior to construction and will provide a baseline for the ongoing monitoring plan. Priority pest fish species identified in waterways within the Project area will be reported to Fisheries Queensland and Biosecurity Queensland. Population management or removal techniques will be implemented with consultation with the relevant authorities and landholders in accordance with the Queensland Exotic fish Operational Strategy 2008, detailed

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	below: http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/ExoticPestFish-Operational-Strategy.pdf

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