



Jellinbah Group



LAKE VERMONT RESOURCES
ENVIRONMENTAL IMPACT STATEMENT
CHAPTER 12 BIOSECURITY



Table of Contents

12	Biosecurity	12-1
12.1	Environmental objectives	12-1
12.2	Existing biosecurity risk	12-1
12.2.1	Introduced fauna species	12-1
12.2.2	Introduced flora species	12-1
12.2.3	Introduced aquatic flora and fauna	12-4
12.2.4	Public health and agricultural pest species	12-4
12.3	Potential impacts	12-5
12.3.1	Introduced fauna species	12-5
12.3.2	Introduced flora species	12-5
12.3.3	Introduced aquatic flora and fauna	12-6
12.3.4	Public health and agricultural pest species	12-6
12.4	Mitigation and management measures	12-6
12.4.1	Introduced fauna management measures	12-6
12.4.2	Introduced flora management measures	12-7
12.4.3	Public health designated pest management	12-7
12.4.4	Pest and Weed Management Plan	12-8
12.4.5	Existing Lake Vermont Pest and Weed Management Plan	12-8
12.4.6	Monitoring program	12-9

List of Tables

Table 12.1:	Introduced fauna species	12-2
Table 12.2:	State declared introduced flora	12-3
Table 12.3:	Monitoring objectives, criteria and actions	12-9



12 Biosecurity

12.1 Environmental objectives

This chapter has been prepared to assist the DES in carrying out the environmental objective assessment in respect of the environmental objectives as stated in the Project ToR. With respect to biosecurity, the construction, operation and decommissioning of the Project should ensure that:

- The introduction and spread of weeds, pests and disease, pathogens, and contaminants will be avoided and minimised.
- Existing weeds and pests will be controlled, including biosecurity threats and their management.
- Performance outcomes will correspond to relevant policies, legislation and guidelines, and sufficient evidence will be supplied (including through studies and proposed management measures) that shows these outcomes can be achieved.

This biosecurity assessment has been prepared in accordance with the requirements of the DES 'Biosecurity-EIS Information Guideline' (DES 2020h).

12.2 Existing biosecurity risk

Biosecurity risks of relevance to the Project area include introduced species of fauna and flora, public health pests, and agricultural pests.

12.2.1 Introduced fauna species

Nine introduced terrestrial fauna species were recorded during the ecology surveys, as presented in Table 12.1 and Appendix G, Terrestrial Ecology Assessment (Section 9.4). All of these introduced species are listed as either a prohibited matter or a restricted matter under the *Biosecurity Act 2014* (Qld) (Biosecurity Act). The introduced fauna species have been recorded across the range of habitat types present in the Project area.

Under the 'Isaac Regional Council Biosecurity Plan 2020–2023 (IRC 2020)' (Biosecurity Plan), a pest animal is a prohibited or restricted animal as identified in the Biosecurity Act. Under the Isaac Regional Council Local Laws, a pest animal has, or has the potential to have, adverse environmental, economic or social impact on the Isaac region as defined in the Biosecurity Plan. The Biosecurity Plan identifies pests that are management priorities, including four introduced fauna species recorded during ecology surveys.

12.2.2 Introduced flora species

Thirty-five introduced flora species were recorded during the ecology surveys (Appendix G, Terrestrial Ecology Assessment, Section 8.4). The occurrence of prominent introduced flora species within the various vegetation groups of the Project area is described in Appendix G, Terrestrial Ecology Assessment, Section 8.3. Of the introduced species, seven are listed as restricted matters under the Biosecurity Act and five are Weeds of National Significance, as presented in Table 12.2.

Under the Biosecurity Plan, weeds are defined in Schedule 1, Part 2 of the Biosecurity Act as plants having, or with potential to have, adverse environmental, economic or social impact in the Isaac region. The Biosecurity Plan identifies invasive weeds as those considered a management priority. Six of the introduced flora species that have been recorded during the ecology surveys are identified as priority invasive weeds.

Species that have been identified as restricted matters or as Weeds of National Significance within the study area are known to occur commonly throughout the broader region. Parthenium is the most common weed species recorded in the Biosecurity Act and occurs in higher densities within cleared agricultural areas.



Table 12.1: Introduced fauna species

Species	Common name	Biosecurity Act status	Biosecurity Plan— priority pest species	Distribution	Abundance on Project site
<i>Bos taurus</i>	European Cattle	—	—	Field surveys identified species on site through opportunistic sightings and indirect observations (tracks and scats). Wildnet and Atlas of Living Australia mapping indicates that the distribution of species occurs from southern to northern QLD along the coast and in inland areas. The records in the Project area are within the known distribution for the species.	89 individuals identified during field surveys.
<i>Canis familiaris</i>	Wild Dog	Category 3, 4 and 6 restricted matter	✓		9 individuals identified during field surveys.
<i>Felis catus</i>	Feral Cat	Category 3, 4 and 6 restricted matter	✓		3 individuals identified during field surveys.
<i>Mus musculus</i>	House Mouse	—	—		4 individuals identified during field surveys.
<i>Oryctolagus cuniculus</i>	Rabbit	Category 3, 4, 5 and 6 restricted matter	—		28 individuals identified during field surveys.
<i>Rhinella marina</i>	Cane Toad	—	—		76 individuals identified during field surveys. One occurrence recorded in WildNet and Atlas of Living Australia.
<i>Sus scrofa</i>	Feral Pig	Category 3, 4 and 6 restricted matter	✓		16 individuals identified during field surveys.
<i>Vulpes vulpes</i>	European Red Fox	Category 3, 4, 5 and 6 restricted matter	—		1 individual identified during field surveys.
<i>Cervus elaphus</i>	Red Deer	Category 3, 4 and 6 restricted matter	✓	This species was recorded opportunistically during field surveys. The nearest publicly available record for the species is approximately 200 km north (Wildnet and Atlas of Living Australia), indicating the records may be at the edge of its distribution and the species is likely present in low density.	2 individuals identified during field surveys.



Table 12.2: State declared introduced flora

Species	Common name	Weeds of National Significance	Biosecurity Act status	Biosecurity Plan—priority invasive weeds	Distribution	Abundance (within 56 survey sites)
<i>Harrisia martinii</i>	Harrisia Cactus	—	Category 3	✓	Species were identified on site during field surveys. Wildnet and Atlas of Living Australia records indicate that the Project area is within the known distribution of these species.	Recorded at 9 survey sites
<i>Parthenium hysterophorus</i>	Parthenium	✓	Category 3	✓		Recorded at 17 survey sites
<i>Opuntia stricta</i>	Common Prickly Pear	✓	Category 3	✓		Recorded at 2 survey sites
<i>Cardiospermum grandiflorum</i>	Balloon vine	—	Category 3	—		Recorded at 1 survey site
<i>Lantana camara</i>	Lantana	✓	Category 3	✓		Recorded at 4 survey sites
<i>Cryptostegia grandiflora</i>	Rubber Vine	✓	Category 3	✓		Recorded at 2 survey sites
<i>Opuntia tomentosa</i>	Velvety Tree Pear	✓	Category 3	✓		Recorded at 12 survey sites



12.2.3 Introduced aquatic flora and fauna

No introduced aquatic flora or fauna species were recorded within the study area during the aquatic ecology surveys (Appendix H, Aquatic Ecology Assessment).

12.2.4 Public health and agricultural pest species

12.2.4.1 Public Health Act 2005 designated pests

Under the Queensland *Public Health Act 2005* (Public Health Act), designated pests to public health include:

- mosquitos;
- rats;
- mice; and
- other animals prescribed under a regulation.

Rodents are present within the Project area (Appendix G, Terrestrial Ecology Assessment, section 9.4). Leptospirosis, which is a notifiable disease under the Public Health Act, can be spread by rodents and has been recorded in the region previously (Blumer *et al.* 2003).

Mosquitos are present within the Project area and have the potential to act as vectors of disease. Queensland Health identifies several mosquito-borne diseases within Queensland that can be transmitted to humans (Queensland Health, 2019). The mosquito-borne notifiable diseases under the Public Health Act that could potentially occur in the Project region include (Business Queensland 2016):

- Dengue;
- Ross River Virus;
- Barmah Forest Virus;
- Japanese Encephalitis;
- Murray Valley Encephalitis;
- Malaria; and
- West Nile Virus Kunjin subtype.

12.2.4.2 Agricultural pest species

Mosquitos can spread diseases and viruses to livestock as well as humans. In livestock, vector-borne diseases spread by mosquitos and ticks can lead to:

- infertility;
- sickness;
- fevers;
- neuromuscular impairment;
- heart murmurs;
- diarrhoea;
- spontaneous abortions; and
- death.



The Project is within the cattle tick-infested biosecurity zone where cattle ticks are endemic and will thrive if left unmanaged (Business Queensland 2019).

12.3 Potential impacts

Proposed Project activities have the potential to change the distribution of introduced flora, fauna and other pest species in the area. Changes to the distribution of introduced and pest species has the potential to cause impacts to the environmental values of the Project area.

12.3.1 Introduced fauna species

Introduced fauna species are the cause of several EPBC Act 'Threatening Processes', including:

- biological effects (e.g. lethal ingestion of Cane Toads/*Bufo marinus*);
- predation by European red foxes;
- predation by feral cats;
- predation, habitat degradation, competition and disease transmission by feral pigs; and
- competition and land degradation by rabbits.

In addition to the EPBC Act 'Threatening Processes', introduced fauna species can pose risks to Queensland's economic, environmental and agricultural values, including:

- damage to crops, dams and pastures;
- lowered pasture production;
- impacts on natural resources, including water sources, soils and canopy cover;
- increased costs associated with management and control programs;
- increased competition for habitat, shelter, food and other resources;
- overgrazing of native vegetation and inhibition of native species regeneration; and
- risk of disease transmission to livestock and native species.

The presence and abundance of most introduced fauna recorded at the site is unlikely to increase because of the Project. However, changes to land conditions, particularly subsidence induced water ponding, may increase habitat suitability for feral pigs and/or aquatic pest species. Management measures for introduced fauna species are proposed in section 12.4.1.

Given the absence of aquatic pests identified through field surveys, the predicted infrequency of ponding conditions potentially occurring for a few months every few years (Appendix W, Geomorphological Modelling and Assessment Report, Section 3.3.3.), and the implementation of the Pest and Weed Management Plan, aquatic pest and weed species are considered unlikely to establish in the Project area as a result of changes to land conditions (refer Chapter 11, Aquatic Ecology, Section 11.5.2). Should aquatic pests establish in the Project area, these will be addressed in accordance with the Pest and Weed Management Plan.

12.3.2 Introduced flora species

The impact of novel biota (e.g. introduced flora species) on biodiversity is an EPBC Act 'Key Threatening Process'. Introduced weed species can also cause specific social, economic, agricultural and environmental impacts; for example, they can:

- poison livestock and native fauna;
- impede on open space and the ability for farmers to muster livestock;



- harbour spines and thorns that can harm livestock and prevent them from eating;
- change floristic structure of grasslands, pastures, open woodlands and waterways;
- outcompete native species;
- reduce biodiversity;
- impede native fauna movement;
- reduce food availability for fauna species; and
- reduce the availability and diversity of habitat types.

Project activities have the potential to cause an increase in the presence and abundance of introduced weeds. Weeds could be introduced by vehicles entering the area, or materials and equipment brought to the site that are contaminated by seeds or propagules. Disturbance activities may also create conditions that exacerbate weed density. Management measures for introduced flora species are proposed in section 12.4.2.

12.3.3 Introduced aquatic flora and fauna

No aquatic pest flora or fauna species have been recorded in the Project area. The Project is not expected to create conditions that will result in the introduction of pest aquatic species, and no impacts from aquatic pest species are anticipated.

12.3.4 Public health and agricultural pest species

Project activities have the potential to impact the presence and abundance of potential Public Health Act designated pests. Mosquito populations may be impacted by on-site material storage practices, subsidence induced water ponding or water management practices.

Public health pest rat and mouse populations may be impacted by the provision of scavenging areas (e.g. discarded food scraps and other rubbish). Project activities are unlikely to impact cattle tick populations, which are established in the area and dependent on livestock populations. Measures to manage public health and agricultural pest species are proposed in section 12.4.3.

12.4 Mitigation and management measures

Measures to mitigate and manage the potential impact from biosecurity risks have been developed in accordance with measures authorised under the Biosecurity Act and the Biosecurity Plan. The following management measures will be implemented at the Project to control and limit the spread of biosecurity risks.

12.4.1 Introduced fauna management measures

Management measures to mitigate potential impacts from introduced fauna species include:

- maintaining a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas;
- storing domestic waste in appropriate receptacles and locations in accordance with a Waste Management Plan; and
- updating the Lake Vermont Mine 'Pest and Weed Management Plan (2016)' to ensure consistency with pest control strategies outlined by the Department of Agriculture and Fisheries, the Biosecurity Plan and Threat Abatement Plans applicable to the EPBC Act 'Key Threatening Processes'.

It is considered unlikely that the Project will cause an increase of introduced fauna, given the management measures that will be implemented.



12.4.2 Introduced flora management measures

Management measures to mitigate potential impacts from introduced flora species will include;

- limiting soil disturbance as far as practicable;
- Conducting vegetation clearance progressively, as required by the Project schedule, to limit the period that land is unvegetated;
- monitoring of weeds by trained site personnel who will
 - record major infestations; and
 - update the Lake Vermont Mine Pest and Weed Management Plan to ensure consistency with weed control strategies outlined by the Department of Agriculture and Fisheries and the Biosecurity Plan;
- treating weeds in a manner consistent with Government recommendations, and following up inspections to assess the effectiveness of the weed management measures implemented and the requirement for any additional management measures; and
- progressively rehabilitating disturbance areas in accordance with the Project PRCP.

It is considered unlikely that the Project will cause an increase in introduced flora, given the management measures that will be implemented.

12.4.3 Public health designated pest management

The Queensland Joint Strategic Framework for Mosquito Management (Queensland Health, 2010) identifies priorities for mosquito management in Queensland including:

- dengue;
- exotic mosquito-borne diseases such as Chikungunya, malaria and Japanese encephalitis;
- mosquito borne diseases of high prevalence in Queensland;
- exotic mosquito species; and
- climate change and effects on mosquito management programs.

Given that in the operational experience of the Lake Vermont Mine (over approximately the past 12 years) the priorities for Queensland mosquito management framework have not been identified as problems at the site, development of a mosquito management plan is considered unnecessary. The efforts to mitigate ponding in the subsidence footprint are considered avoidance of potential mosquito borne disease impacts and it is identified that the existing and post-subsidence landscape both contain substantial gilgai and temporary ponding areas which are considered comparable mosquito habitat. In the interest of managing mosquito borne disease issues in the future, surveillance will be continued provide detection and identification of mosquito problems. Should a mosquito infestation develop as a management concern in future, management measures will be implemented in accordance with Queensland Health guidelines to prevent the spread of mosquito-borne disease on-site.

Management measures to control rats and mice will include:

- maintaining a clean, rubbish-free environment to discourage scavenging and reduce the potential for colonisation of these areas;
- storing and disposing of potential attractant waste material in accordance with the Lake Vermont Waste Management Plan and as described in Chapter 15, Waste Management; and
- implementing eradication programs (if and when necessary).

It is considered unlikely that the Project will cause an increase in public health designated pests, given the management measures that will be implemented.



12.4.4 Pest and Weed Management Plan

The Lake Vermont Mine Pest and Weed Management Plan will be reviewed and revised to consider Project specific risks and control measures in accordance with the requirements of the Biosecurity Act and the Biosecurity Plan. This management plan update will also incorporate the introduced fauna and flora management measures, as outlined in Sections 12.4.1 and 12.4.2.

The existing Pest and Weed Management Plan developed for the Lake Vermont Mine describes relevant legislation, identifies weed and fauna pest species recorded at the site, and describes management strategies (refer to section 12.4.5). Not all species listed in the existing management plan were identified during field surveys and several new pest species were recorded.

The existing Pest and Weed Management Plan will be suitable for application to the proposed Project with the inclusion of Project specific updates relating to the following:

- legislative changes relating to the Biosecurity Act, the policies of the Biosecurity Plan (IRC 2020) and Threat Abatement Plans applicable to the EPBC Act 'Key Threatening Processes';
- invasive species recorded in the Project area;
- proposed management measures outlined in section 12.4.1, section 12.4.2 and section 12.4.3;
- establishment of a monitoring program to identify introduction and establishment of invasive species and for the evaluation of success achieving objectives of the Management Plan (refer section 12.4.6);
- description of the personnel roles and responsibilities for implementation of the Management Plan; and
- establishing a review process for the Management Plan.

12.4.5 Existing Lake Vermont Pest and Weed Management Plan

The existing Lake Vermont pest and weed management plan currently includes flora and fauna pest management strategies. These are detailed below:

Weed management:

- list of weeds identified on the project site;
- management strategies to minimise spread of pre-existing weed and preventing the introduction of new species:
 - monitoring of weeds by site personnel;
 - recording of major site infestations;
 - treating identified weeds as per the Department of Natural Resources and Water (DNRW) Pest Fact sheets as soon as possible;
 - treated weeds to be monitored on a regular basis; and
 - areas of disturbance minimised to prevent establishment of weed species; and
- weed control methods specific to each identified species.

Fauna pest management:

- list of faunal pests that occur on the Project site; and
- management strategies:
 - domestic waste to be stored appropriately and located in areas in accessible to feral animals;
 - waste to be disposed of in deep land fill on a regular basis; and
 - landfill sites to be regularly covered to reduce the occurrence of feral cats, pigs and nuisance birds.



Weeds and pests have been successfully controlled at the existing Lake Vermont site through management in accordance with the management plan, including the ongoing monitoring of weeds, treatment with standard control methods and post-treatment monitoring. Weeds established at the site have been contained and monitoring for new occurrences of listed weeds has been achieved.

12.4.6 Monitoring program

Monitoring protocols for introduced fauna and flora to determine success of pest and weed species management objectives will be contained in the updated Lake Vermont Mine Pest and Weed Management Plan. Monitoring will be conducted every six months, or as required, in response to biosecurity risk developments. The success of biosecurity measures and management actions will be audited at defined intervals as specified within the Management Plan. Pest and weed biosecurity risks identified through monitoring will be acted on in accordance with the Pest and Weed Management Plan protocols. Table 12.3 provides recommended objectives, actions and timeframes for a potential monitoring program for the proposed project and as updates to existing monitoring programs. The management of biosecurity risks are shown on Figure 3.24, Project Description, including the proposed location of washdown facilities and exclusion fencing around storage compounds.

Table 12.3: *Monitoring objectives, criteria and actions*

Objectives	Monitoring approach	Time frames
<ul style="list-style-type: none"> Prevent the introduction and establishment of new fauna pest species within the Project area; control and reduce populations of established fauna pest species; and minimise the damage caused by activities of fauna pest species. 	<ul style="list-style-type: none"> The Pest and Weed Management Plan will include a fauna pest monitoring program with the following components: <ul style="list-style-type: none"> fauna pest surveys will be conducted by site personnel periodically; a fauna pest register will be maintained to record fauna pest observations;- and records of new fauna pests or substantial increase in fauna pest populations will be addressed through applicable management measures (refer to section 12.4.1). 	<p>Prior to Project commencement and ongoing during Project construction and operations.</p>
<p>Prevent the introduction and establishment of aquatic pest species within the Project area.</p>	<ul style="list-style-type: none"> The Pest and Weed Management Plan will include provision for a register of aquatic pest species to record any observed introduction or establishment of aquatic pest species. Introduction or establishment of aquatic pests will be addressed through applicable management measures (refer to section 12.4.1 and section 12.4.2). 	<p>Prior to Project commencement and ongoing during Project construction and operations.</p>
<ul style="list-style-type: none"> Prevent the introduction and establishment of weed species within the Project area; and control and reduce the populations of established weed species. 	<p>The Pest and Weed Management Plan will be include a weed species monitoring program with the following components:</p> <ul style="list-style-type: none"> detail the monitoring program for introduced flora species cognisant of staged clearing and progressive rehabilitation programs; and weed species introductions or substantial increases in weed populations will be addressed through applicable management measures (refer to section 12.4.2) 	<p>Prior to Project commencement and ongoing during Project construction and operations.</p>