

ATTACHMENT 10 - TABLE OF MITIGATION MEASURES (FLORA AND FAUNA)

The below tables summarises the flora, vegetation and fauna mitigation measures and their hierarchy. These will be included in an Environment Plan for assessment and acceptance under the *Petroleum and Geothermal Energy Resources Act 1967* (WA) and are included as the suite of mitigation measures in the *Environmental Protection Act 1986* (WA) Environmental Review Document.

Table 1: Proposed mitigation measures – flora and vegetation

Mitigation hierarchy	Mitigation measure	Further information
Avoid	Demarcation of clearing area	Demarcation of the proposed clearing area by a surveyor reduces, to the smallest possible extent, the chance of unplanned clearing outside the proposed footprint.
Avoid	Fire breaks	As required by local shire regulations, BNR is required to ensure clearances between vegetation and industrial activities are created and maintained to reduce the risk of causing a fire outside the site.
Avoid	Bush Fires Regulations 1954 and exemptions	Site preparation, construction and activities (e.g. hot work, off-road activities) (e.g. gas flaring) are prescribed activities in the Bush Fires Regulations 1954. As such, a range of management measures under the Regulations must and will be implemented.
Minimise	Topsoil windrows <2 m	With seeds and roots mainly conserved within the topsoil, topsoil will be removed and stockpiled into windrows following clearing, with subsoil left in place. It is a generally accepted industry standard that windrows should be no higher than two metres. The reason for this is that temperature in the centre of a windrow will get higher where the height / quantity of material increases. Because seed viability is reduced if temperatures increase, the quality / outcomes of revegetation using the topsoil and associated seedbank also reduces.
Minimise	Fill verified as having low weed risk	In accordance with DAVE's Arrive Clean, Leave Clean guidance (Commonwealth of Australia, 2015), it is considered good industry practice to prevent the spread of weeds by ensuring that any fill used on site (e.g. gravel, limestone marl, soil, sand) has been verified to have a low weed risk. BNR will follow this industry practice.
Minimise	Hygiene management requirements	It is considered good industry practice to prevent the spread of weeds by ensuring that civil earthmoving machinery is subject to an inspection and if required a clean-down before arriving on site and before starting ground-disturbing activities, and BNR will require its operators follow this practice.
Rehabilitate	Progressive rehabilitation	As required under the PGER(E)R, once drilling and HFS activities are complete, cleared areas that are not required to support the maintenance of infrastructure will be progressively rehabilitated to minimise environmental liability at the end of asset life. Topsoil is to be respread and rehabilitation sites actively monitored to ensure they meet the required completion criteria. Specifically, completion criteria will be developed to ensure that rehabilitation is conducted to enable long-term land use to continue. These completion criteria will be documented in the EP for acceptance by DEMIRS.

Table 2: Proposed mitigation measures – terrestrial fauna

Mitigation hierarchy	Mitigation measure	Further information
Avoid	Fauna exclusion and egress	In accordance with the Fauna Egress Matting and Ramps guidance (DMP, 2012), BNR will implement fauna exclusion and egress management measures where lined ponds / fauna traps are present to reduce likelihood of entrapment and allow egress if the initial exclusionary barriers fail. Water retention ponds will be fenced with 1 m high feral ring lock mesh fencing with small-animal mesh attached to the base of the fence to help prevent ingress of small animals. During drilling activities, one section of the mud sumps will be unfenced in front of the shakers to allow the cuttings chute to be directed into the sumps.
Avoid	Targeted Bilby Survey	At least 6 months prior to clearing activities commencing, a targeted survey will be undertaken to identify any active and non-active bilby burrows throughout the Disturbance Footprint. Where evidence of species presence exists, specific bilby management measures (detailed below) will be implemented.

Mitigation hierarchy	Mitigation measure	Further information
Minimise	Specific bilby management measures	<p>To mitigate potential impacts to bilbies during site preparation, these steps will be implemented if a bilby burrow is identified within the disturbance footprint:</p> <ul style="list-style-type: none"> the disturbance footprint will be scouted for new burrows (within a range of ~75 m) no clearing will be undertaken within 50 m of any identified burrows no clearing will be undertaken within 75 m of identified active burrows vehicle speed limits will be reduced from dusk to dawn to: <ul style="list-style-type: none"> 20 km/h in areas where bilbies have been recorded 40km in areas where bilbies have not been recorded.
Minimise	Speed limits	Vehicle speed limit signage will be installed along access tracks and at well sites. By reducing speed limits where limits are not set by law, the number of fauna strike incidents are expected to be reduced.
Avoid	Fire breaks	In accordance with local shire regulations, firebreaks will be installed and maintained to ensure clearances between vegetation and the petroleum activities reduce the risk of causing a fire.
Avoid	Bush Fires Regulations 1954	Under the Bush Fires Regulations 1954, site preparation, construction and activities (hot work and off-road activities) (i.e. gas flaring) are considered prescribed activities. As such, a range of management measures under the Regulations will be implemented, including the clearing of flammable material from around buildings, creating firebreaks and ensuring firefighting equipment is kept and well maintained at each well site.
Minimise	Site inspections of fauna traps	BNR will conduct routine inspections of areas considered to be potential fauna traps. These include open excavations or well cellars, if they need to be left open. Egress paths from ponds will also be regularly inspected to ensure their useability.
Minimise	Weed management measures	<p>BNR will comply with the Arrive Clean, Leave Clean guidance (Commonwealth of Australia, 2015), to prevent spread of weeds by ensuring that fill for civil works (e.g. gravel, limestone marl, soil, or sand) has been verified to have a low weed risk.</p> <p>Good hygiene measures will also be implemented, as prior to entering the well sites, earthmoving machinery and equipment being checked for weeds or weed-contaminated materials and cleaned if necessary.</p>
Minimise	Introduced predator management	BNR will provide all records of introduced predatory species opportunistically observed over the course of the activity to DBCA. Where consistently high numbers are observed, and in consultation with DBCA, BNR will identify and implement measures that are considered suitable and commensurate to the nature of the activity.
Rehabilitate	Progressive rehabilitation	In accordance with the PGER(E)R requirements, once drilling and HFS activities are complete, cleared areas that are not required to support the maintenance of infrastructure will be progressively rehabilitated to minimise environmental liability at the end of asset life. Topsoil and vegetation will be respread, and rehabilitation sites actively monitored to ensure they meet required completion criteria. Completion criteria will be documented in the EP and approved by DEMIRS.

Table 3: Proposed mitigation measures –migratory fauna

Mitigation hierarchy	Mitigation measure	Further information
Avoid	Fauna exclusion and egress	<p>In accordance with the Fauna Egress Matting and Ramps guidance (DMP, 2012), BNR will implement fauna exclusion and egress management measures where lined ponds / fauna traps are present to reduce likelihood of entrapment and allow egress if the initial exclusionary barriers fail.</p> <p>During drilling activities, one section of the mud sumps will be unfenced in front of the shakers to allow the cuttings chute to be directed into the sumps.</p>
Minimise	Bird diverters	Consideration of installing bird diverters on and around ponds
Minimise	Speed limits	Vehicle speed limit signage will be installed along access tracks and at well sites. By reducing speed limits where limits are not set by law, the number of fauna strike incidents are expected to be reduced.

Mitigation hierarchy	Mitigation measure	Further information
Avoid	Fire breaks	In accordance with local shire regulations, firebreaks will be installed and maintained to ensure clearances between vegetation and the petroleum activities reduce the risk of causing a fire.
Avoid	Bush Fires Regulations 1954	Under the Bush Fires Regulations 1954, site preparation, construction and activities (hot work and off-road activities) (i.e. gas flaring) are considered prescribed activities. As such, a range of management measures under the Regulations will be implemented, including the clearing of flammable material from around buildings, creating firebreaks and ensuring firefighting equipment is kept and well maintained at each well site.
Minimise	Site inspections of fauna traps	BNR will conduct routine inspections of areas considered to be potential fauna traps. These include open excavations or well cellars, if they need to be left open. Egress paths from ponds will also be regularly inspected to ensure their useability.
Minimise	Weed management measures	BNR will comply with the Arrive Clean, Leave Clean guidance (Commonwealth of Australia, 2015), to prevent spread of weeds by ensuring that fill for civil works (e.g. gravel, limestone marl, soil, or sand) has been verified to have a low weed risk. Good hygiene measures will also be implemented, as prior to entering the well sites, earthmoving machinery and equipment being checked for weeds or weed-contaminated materials and cleaned if necessary.
Minimise	Introduced predator management	BNR will provide all records of introduced predatory species opportunistically observed over the course of the activity to DBCA. Where consistently high numbers are observed, and in consultation with DBCA, BNR will identify and implement measures that are considered suitable and commensurate to the nature of the activity.
Rehabilitate	Progressive rehabilitation	In accordance with the PGER(E)R requirements, once drilling and HFS activities are complete, cleared areas that are not required to support the maintenance of infrastructure will be progressively rehabilitated to minimise environmental liability at the end of asset life. Topsoil and vegetation will be respread, and rehabilitation sites actively monitored to ensure they meet required completion criteria. Completion criteria will be documented in the EP and approved by DEMIRS.