APPENDIX 2 – PROTECTED MATTERS SEARCH TOOL

DISCLAIMER

This report was prepared by Australian Wildlife Conservancy in good faith exercising all due care and attention, but no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect of, their situation. The views expressed within are not necessarily the views of the Office of Environment and Heritage (OEH) and may not represent OEH policy.

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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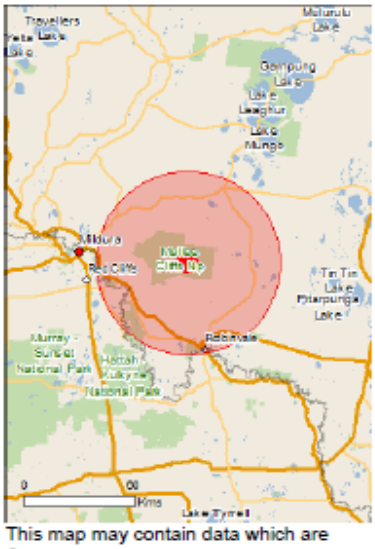

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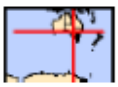

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	26
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	4
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	21
Regional Forest Agreements:	None
Invasive Species:	31
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Status
Willandra Lakes Region	NSW	Declared property

National Heritage Properties		[Resource Information]
Name	State	Status
Natural		
Willandra Lakes Region	NSW	Listed place

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	150 - 200km upstream
Hattah-kulkyne lakes	Within 10km of Ramsar
Riverland	100 - 150km upstream
The coorong, and lakes alexandrina and albert wetland	200 - 300km upstream

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community known to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Manorina melanotis Black-eared Miner [449]	Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Pezoporus occidentalis Night Parrot [59350]	Endangered	Extinct within area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Breeding likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Stipiturus mallee Mallee Emu-wren [59459]	Endangered	Species or species habitat likely to occur within area
Fish		
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat known to occur within area
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat likely to occur within area
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Plants		
Austrostipa metatoris [66704]	Vulnerable	Species or species habitat known to occur within area
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat likely to occur within area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat likely to occur within area
Solanum karsense Menindee Nightshade [7776]	Vulnerable	Species or species habitat likely to occur within area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land	[Resource Information]
The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.	
Name	
Commonwealth Land - Australian Telecommunications Commission	
Commonwealth Land - Australian Telecommunications Corporation	
Commonwealth Land - Commonwealth Trading Bank of Australia	
Commonwealth Land - Commonwealth Trading Bank of Australia & Moya Grace Murphy	

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Bumbang I261 B.R.	VIC
Bumbang I262 B.R	VIC
Bumbang I39 B.R.	VIC
Carwarp B.R. 2	VIC
Euston	NSW
Gadsen Bend Park	VIC
Hattah - Kulkyne	VIC
Karadoc N.C.R.	VIC
Kemendok	NSW
Kemendok	NSW
Kings Billabong Park	VIC
Lambert Island N.C.R.	VIC

Name	State
Mallee Cliffs	NSW
Mildura I15 B.R.	VIC
Murray - Kulkyne Park	VIC
Red Cliffs S.R.	VIC
River Murray Reserve	VIC
River Murray Reserve (non-PV)	VIC
Tarpaulin Bend	VIC
Toltol F.F.R	VIC
Toltol I263 B.R.	VIC

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat may occur within area
Carrichtera annua Ward's Weed [9511]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade,		Species or species

Name	Status	Type of Presence
White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Kings Billabong Wetlands	VIC

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-34.23519 142.68376

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

APPENDIX 3 – DETAILS OF PROPOSED FENCE DESIGN AND INFRASTRUCTURE AT OPERATIONS BASE

DISCLAIMER

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Attachments to Appendix 4

1. Summary

The proposal involves the construction of a feral proof fence designed in accordance with the drawings in Attachment 1, the location of which is shown in Figure 35 and Figure 36. These are proven designs that have most recently been used for AWC's successful Mt Gibson Wildlife Sanctuary reintroduction project. Some design improvements have been included in this proposal including the use of more plain support wires and changes to the gate mechanism.

Critical to ensuring the success of the Mallee Cliffs reintroduction project is the construction of an operations base to provide land management and science staff accommodation and operations facilities close to the fence (location shown in Figure 36). The operations base ensures that staff are on hand to respond to issues such as damage to the fence or security of the fenced area.

The operations base design has been developed to be consistent with the principles of the NPWS facilities manual, OEH sustainability assessment guidelines, NPWS policies and procedures. The design and layout also minimises visual impact through a setback from the main park thoroughfare, and incorporates designs that use colour schemes that will blend into the vegetation of the Mallee Cliffs NP. Further, the standard design principles are reflective of Australian designs and traditions with a strong use of colourbond cladding and roofing.

The operations base will aim to be ultimately self-sufficient for energy and water, utilising rainwater harvesting off all buildings, and solar PV systems to provide power supply. Notwithstanding this, a generator power supply will service the base during the initial phases of construction, and a bore may be installed should rainwater harvesting prove insufficient – particularly for providing suitable quantities of water for fire-fighting.

As shown in the layout diagram in Figure 37, key elements of the operations base include:

- living quarters:
    - a 3-bedroom house for the Operations Manager (OM)
    - a 2-bedroom house for the Wildlife Ecologist (WE)
    - self-contained cabins x 3 for the Field Ecologists (FE) and Land Management Officers (LMO)
    - block accommodation with 8 single rooms for visiting personnel
    - communal living area (including kitchen and laundry)
    - communal ablutions block.
- workplace facilities:
    - office for up to 8 people
    - large workshop of at least 20 m by 9 m, of a height sufficient to park machinery, with a lockable bay for secure tool and equipment storage
    - power system with solar, batteries and 20 kVA diesel generator
    - rainwater storage
    - groundwater bore (if required)
    - chemical and general storage.

The base will be self-supporting with services such as:

- solar power generation supplemented with a diesel generator;
- gas for cooking and water heating;
- rainfall capture (supplemented with bore water if required); and
- compost and offsite waste disposal.

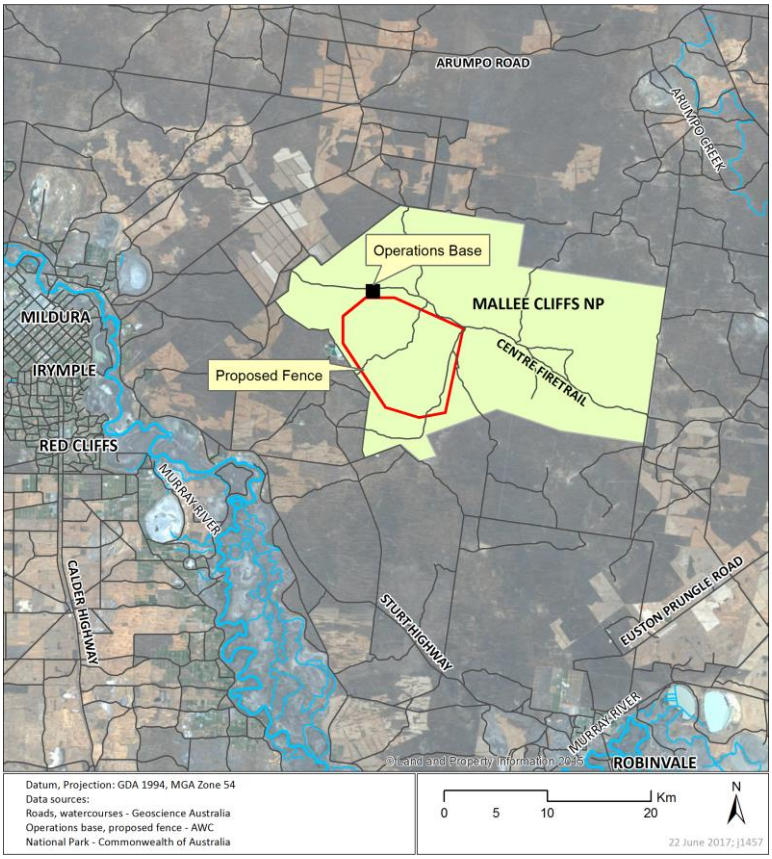


Figure 35: Regional setting of the study area applied to this REF

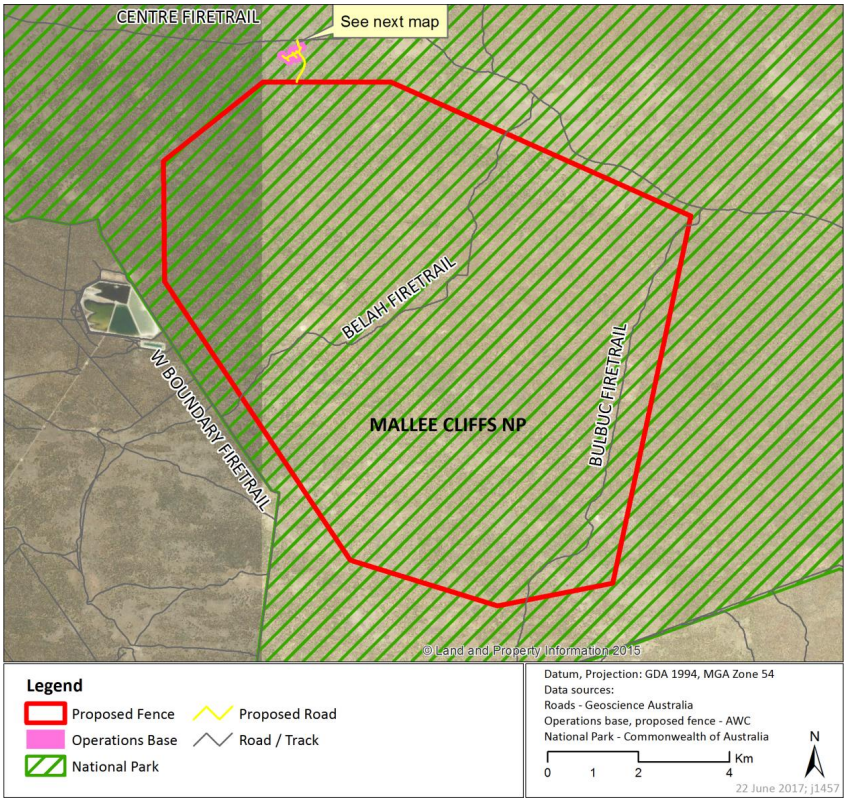


Figure 36: Proximity of proposed fence and operations base

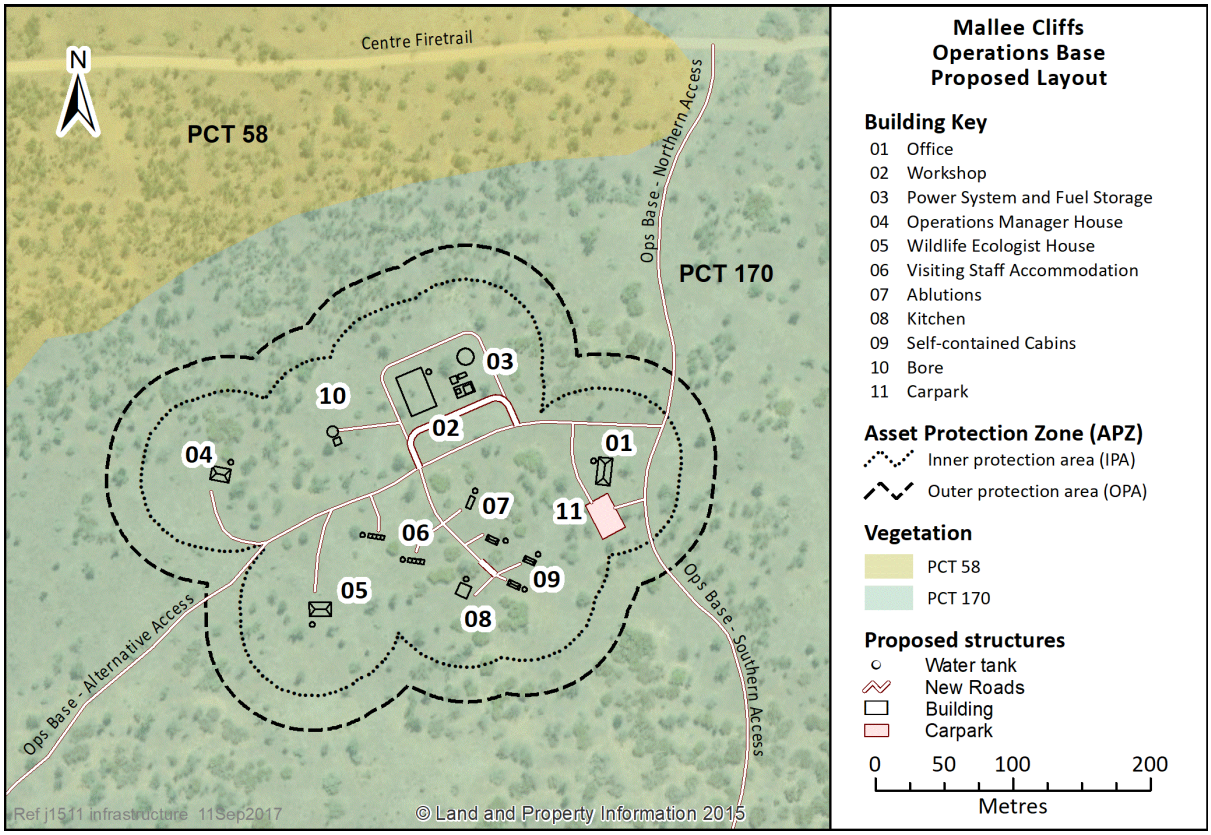


Figure 37: Layout of proposed operations base. NB: the vegetation boundaries in the map are taken from those of Morcom and Westbrooke (1990) for the area, and are incorrect in this location. The vegetation is entirely disturbed and partially cleared Black Oak-Western Rosewood open woodland (PCT 58).

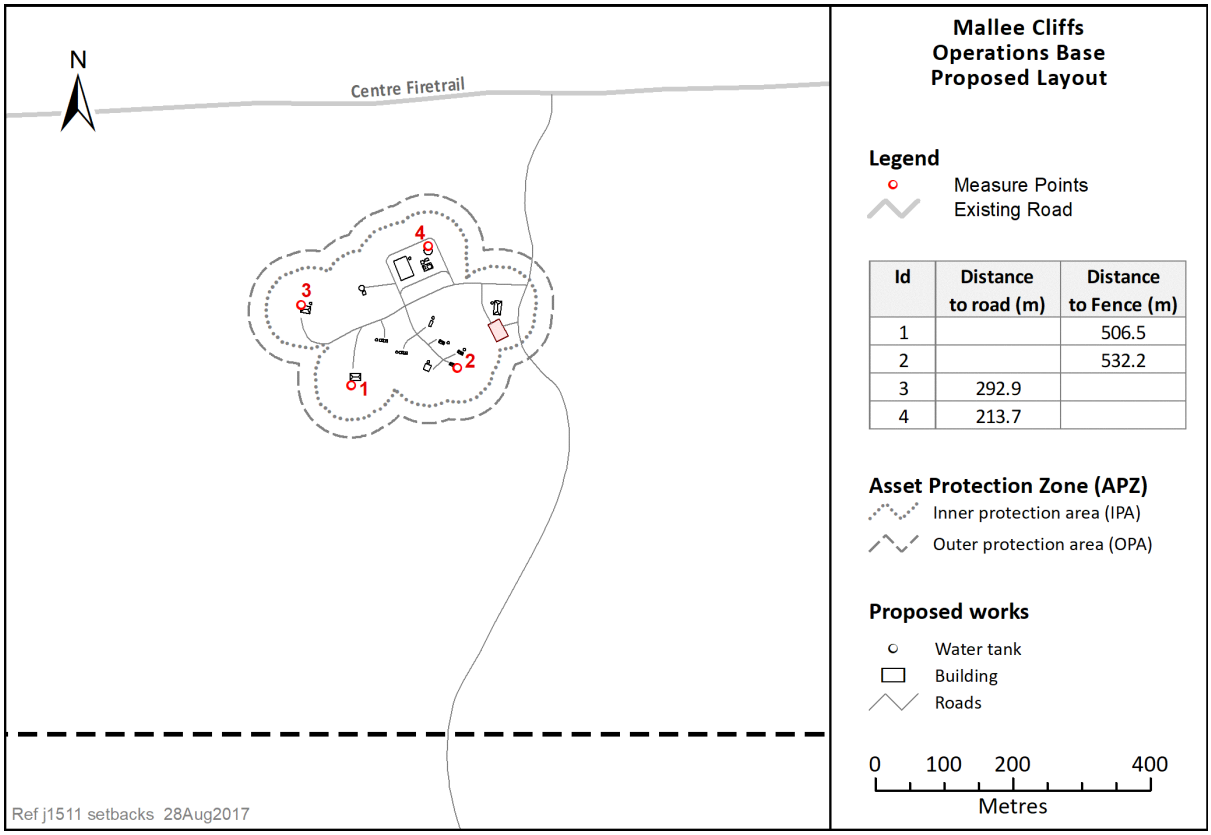


Figure 38: Setbacks from Centre Firetrail and conservation fence for operations base

A repeater antenna with a footprint of approximately 3 m^2 will be erected about 17 km ESE of the operations base, on a disturbed site that provides good coverage of the NP. The proposed site is at or 142°41'2.5"E, 34°13'6.5"S (Figure 1). It will be set to a private channel and will provide staff working across the NP with a means of communication for any emergency, for scheduled safety check-ins, and for general task-related purposes. The antenna will be 20 m tall and have a small solar package and housing for the radio repeater.

2. Height and siting of operations base

The project involves establishment of new buildings between the Centre Firetrail and proposed conservation fence in the Mallee Cliffs NP. The proposed site contains no existing infrastructure, however it has been disturbed by past grazing and clearing activities. The site is flat and is not located on ridgelines, hill-tops or in drainage flow-paths. It will be setback more than 200 m from the Centre Firetrail (Figure 38).

Public access will be strictly regulated with no access to unauthorised persons to the operations base and feral predator-proof fence area. This restriction will aid in security, safety and the success of the proposal. Authorised persons include representatives of AWC and NSW including our partners who are engaged in project delivery. Examples include resident AWC staff; visiting AWC staff; NSW Government staff; contractors; volunteers involved in activities such as bird surveys; external researchers such as university students and, from time to time, guests involved in promoting awareness and outreach (e.g. representatives of media, Federal and local government, local community organisations, representatives of other conservation projects and participants in the philanthropic sector relevant to conservation).

In addition to the factors noted above, AWC have also considered the following when selecting the proposed site:

- Positioning for ease of access by AWC staff to the proposed feral predator-proof fence area to maintain patrols (2-3 patrols per week) and provide rapid response in the event of impact to the fence, noting that other conservation fence projects have seen a significant loss of native species where the fence has not been patrolled or maintained adequately (for example, Currawinya NP, Qld).
- Advice from OEH staff.
- Close to, but not on, the main thoroughfare (Centre Firetrail) which provides several options for emergency exits in the event of a critical incident such as bushfire.
- Protection from bushfire provided by several firetrails (Centre Firetrail, Belah Firetrail, Public Firetrail) and low remnant tree and shrub density.
- Positioning out of potential flood zones.
- Avoiding threatened native flora and fauna, ecological communities and Malleefowl mounds.
- Complying with Rural Fire Services (RFS) requirements i.e. Area Protection Zones (APZs) and establishment of fire and maintenance tracks in a bushfire prone area Fire Danger Indicator (FDI) 80 and Bushfire Attack Level 12.5.
- Avoidance of any cultural heritage sites.
- Positioning the site off a major park thoroughfare to assist with security and dust impact on staff and buildings.
- Privacy and comfort for AWC staff living and working at the site.

Alternative options considered included two disturbed sites further east and close to the Centre Firetrail. The proposed site was selected primarily based on lower bushfire risk as well as less exposure to wind and greater offset from the main Centre Firetrail thoroughfare.

The proposed site is disturbed, vegetation having been partially cleared for grazing prior to the area becoming a national park. It consists of scattered Black Oak trees and ground cover which includes several non-native species (that is, disturbed PCT 58, see Figure 39). This area has been mapped as PCT 170 (‘Chenopod sandplain mallee woodland/shrubland’, Morcom and Westbrooke, 1990) but this is in error.

It is anticipated that up to 11 ha of vegetation will be cleared or modified without significant impact to the local environment. AWC intends to reduce vegetation clearing where possible through retention of canopies, subject to RFS requirements.

Surveys undertaken by suitably qualified consultants engaged by AWC, supported by members of the local aboriginal land councils, identified no cultural or heritage sites within the building envelope.

The buildings will be of single-storey design with pitched roofing for the main buildings and skillion roofing over decking to maximise use of the natural elements (i.e. capture sun for photovoltaic panels fitted to building roofs). Spacing between buildings allows for passive design elements to be implemented to reduce greenhouse gas emissions, along with affording privacy and livability for resident AWC staff, and providing shelter from Centre Firetrail (setback not less than 200 m, see Figure 38). The spacing also ensures no overshadowing will occur.

Figure 39: Photographs showing the disturbed and partially cleared vegetation, formerly Black Oak-Western Rosewood open woodland (PCT 58), at the proposed operations base site. Photos: AWC

3. Separation and setbacks

As detailed previously, AWC has sited each building to allow for passive design elements to be implemented to reduce greenhouse gas emissions, along with affording visual and acoustic privacy to AWC staff and ensuring setback from Centre Firetrail.

Two tracks lead to the operations base, one from the Centre Firetrail and one from the feral predator-free fenced area. They will be clearly sign-posted 'authorised persons only', with relevant contact information for key AWC contacts. AWC will install wayfinding signage within the operations base (which will only be visible within the operations base). In addition, all buildings will be secured when not in use and security features such as sensor lighting (at dark) will be installed where required. All signage will be compliant with NSW Government requirements.

The building designs and layout of the operations base fuse to create living and working spaces open to experiencing the natural sights and sounds while blending into the local environment.

4. Density and footprint

The operations base has been planned to minimise, where possible, the footprint whilst also remaining consistent with the essential considerations as detailed previously including compliance with RFS planning, visual and acoustic privacy, setback from the Centre Firetrail and to maximise passive design elements. There are no extraneous or unnecessary design elements.

The building designs offer minimal ground or soil disturbance and are predominantly of a prefabricated modular construction (built off-site), transported for installation on ground penetrating concrete footings. In addition, footings will be required for the verandahs and carports. The workshop and battery storage areas will require concrete slabs.

The layout of the operations base has been planned to ensure the best outcome for the project balancing the requirements of NPWS and OEH, the proposed activity, AWC staff, the environment and most importantly to ensure safety of staff during emergency incidents such as bushfires.

The operations base is self-sufficient and therefore careful consideration has been made when locating service infrastructure and communal ablutions, living and working facilities to minimise energy use, water use and wastage. Based on AWC's experience at more than 25 managed properties throughout Australia in mainly remote areas, AWC has designed and sited the buildings and services to optimise their use and efficiency.

5. Design and appearance

AWC will utilise simple and practical designs that blend with the natural landscape of the Mallee Cliffs NP, as well as being suitable to the local environmental conditions. The design intent is to:

- Be respectful and appropriate to the location and the parkland setting.
- Be contemporary and Australian, without being imitative or false in its intentions.
- Incorporate high quality materials and a subdued and complementary colour palette.
- Be fit for purpose.
- Be consistent with NPWS facilities development policies and procedures.

Shades of blue, grey and white complemented with wood tones have been selected for the buildings to blend with the local vegetation. Use of colourbond for roofing and cladding, with the addition of covered verandahs, evokes the Australian spirit of the design.

AWC has opted for low maintenance, robust and quality flooring, fitting and fixtures to ensure the buildings remain at a high standard throughout the life of the project as well as materials resistant to environmental risks such as termites with steel and/or treated pine frames, concrete footings and use of 'Modwood flameshield' or equivalent incorporated into the designs.

The designs reflect modern living and working requirements, with open spaces and privacy afforded to accommodate the resident AWC staff and families for the duration of the project. In addition, verandahs with skillion roofs provide generous outdoor living space suited to the local climate and taking advantage of the natural setting.

The accommodation and office buildings will be modular and prefabricated (constructed off-site) to a high quality using reputable builders with Australian made materials used where possible. The buildings and all materials will meet the Building Code of Australia (BCA) and other relevant Standards and Statutory Requirements such as the Premises Standards and AS3959-2009 Construction of buildings in bushfire-prone areas. In addition, as per the requirements of the National Construction Code (NCC), a National House Energy Rating Scheme (NatHERS) rating of 6 stars for the residential buildings (excluding short-term accommodation) will be achieved. For the short-term accommodation, office and communal areas, AWC will aim to achieve a National Australian Built Environment Rating System (NABERS) rating of 4 stars.

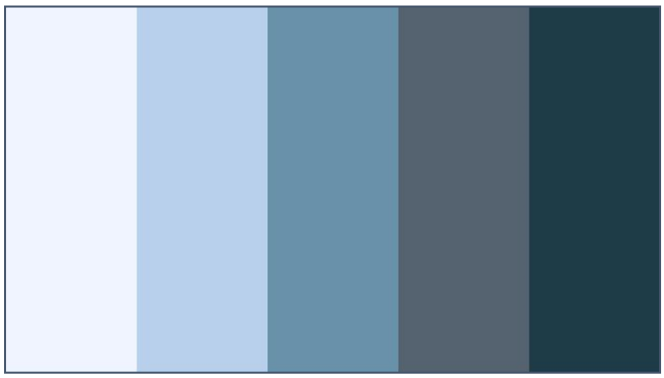
In addition, all construction will be undertaken in accordance with relevant Park Specific Strategies and in accordance with relevant Approvals. AWC will meet the requirements where applicable of the:

- NSW Government Sustainability Policy,
- NSW State Environmental Planning Policy (Infrastructure),
- NSW National Parks Construction Assessment Procedure,
- DECCW Park Facilities Manual,
- DECCW Construction Assessment Procedures,
- NSW Planning for Bushfire Protection,
- Disability (Access to Premises – Buildings) Standards 2010,
- National Parks and Wildlife Act 1974,
- NPWS Sewage Manual, and
- Any other relevant requirement.

Photograph of woodlands in Mallee Cliffs NP inspiring the colour palette

Photo:AWC

Colour Palette inspired bythe local vegetation



6. Orientation, solar access and ventilation

Where possible, the buildings will be sited to optimise the natural elements of the sun and wind to ensure capture of winter sun, protection from hot summers and taking advantage of any cool breezes in summer. Using passive design strategies, the buildings aim to achieve relatively comfortable temperatures all year round, subsequently reducing greenhouse gas emissions.

Natural ventilation will be enhanced with effective design of shading (use of block-out blinds) and windows to encourage sun penetration in winter and protect the spaces in summer. Where possible this effect will be further enhanced through selection of appropriate floor coverings as well as through use of high ceilings, pitched roofing, skillion roofing, and ceiling fans.

Insulation of floors, walls and ceilings combined with building position, verandahs, skillion roofing, window placement and blockout blinds will assist with creating thermally passive spaces. The aim to stabilise internal temperatures making spaces cooler during the day and warmer at night.

Clear glazing will promote daylight penetration with block-out blinds to protect from glare and excess radiant heat where necessary. Solar energy will be captured through PV panels installed on the roof of all buildings. Subject to water quality testing, solar hot water systems with gas boosters may be utilised.

Building occupants (staff) will have the ability to manually adjust block-out blinds and to use air conditioning systems in extreme heat and cold. Noting that as the buildings are self-sufficient with all energy generated on site, staff will be mindful of limiting use of mechanical heating and cooling devices.

AWC will aim to achieve a NatHERS rating of 6 stars for all new residential buildings and NABERS rating of 4 stars for the office and communal living areas.

7. Amenity

The site of the operations base has no adverse impact on significant viewpoints. Vegetation will only be cleared to allow for the construction of the buildings and to meet the requirements of the RFS (inner and outer protection areas). With the exception of the construction period, the buildings are not expected to produce on-going noise, dust, odour or similar that impacts adversely or affects the tranquility or amenity of the EMA project area.

During construction periods any potential noise or dust impacts will be addressed via the preparation of a detailed Construction Management Plan (CMP) prior to the commencement of works. The CMP will outline such detail as construction hours, use of equipment and tools, waste management, traffic management, noise management, dust management, work health safety, etc.

This proposal will significantly benefit the public by restoring regionally extinct fauna, and protecting communities of important and sensitive flora. Further, opportunities for employment, commercial supply arrangements, education and enjoyment of Mallee Cliffs NP will be increased by the proposal. Overall, it is considered that the proposal will result in immense public benefit, without any significant adverse impacts on the amenity.

8. Materials choice and embodied energy

The design of the operations base will aim to minimise impacts to the environment whilst also providing opportunities for minimising carbon emissions. Designs will aim to deliver buildings that minimise greenhouse gas emissions, with an overall goal of becoming carbon neutral.

To support this goal, and to enhance opportunities for the local community, materials and labour will be sourced locally, including the engagement of local skilled and unskilled labour to assist with the implementation and completion of buildings, and for ongoing maintenance. There is no existing infrastructure at the proposed site for the operations base.

Materials will be prioritised to create healthy buildings through the selection of low VOC sealants, adhesives and paints and low/zero formaldehyde composite wood products. Low environmental impact products, including reused or FSC-certified timber and high recycled

content materials will also be prioritised. Floor finishes and furnishings will be selected from GECA-certified (or similar) product lists where available.

Accommodation for visiting personnel will be sourced from quality secondhand stock, which will be refreshed with colourbond cladding, verandahs with skillion roof and upgrades as necessary to meet the design intent of the operations base buildings.

All buildings, with the exception of the workshop and infrastructure services, will be modular and prefabricated (off-site) using Australian contractors to meet the BCA and any other relevant requirements and standards as described above. The workshop will be erected on-site from kit form, while infrastructure services will be erected on-site by skilled labour. Where possible, equipment and materials will be sourced locally.

Where possible, steel will be used for framings to assist in combating termites, a known environmental local risk.

9. Energy use

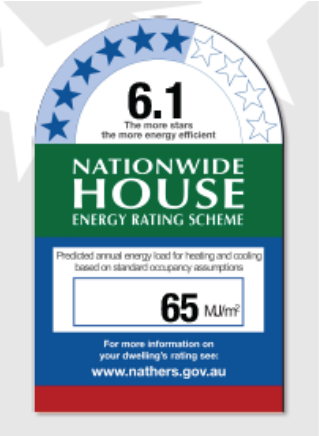
Due to the location and nature of the site, the operations base will be self-sufficient with the majority of energy sourced from a hybrid power system combining PV panels, battery storage and diesel generation. In addition, gas will be used for cooking and water heating. The operations base development aims to minimise demand for energy, selecting energy efficient appliances where possible, and ensuring strategies are in place such as:

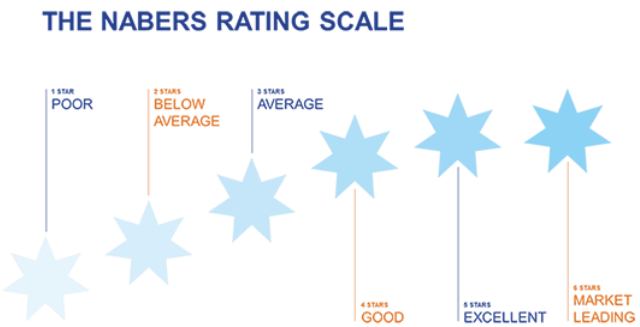
- Selecting star-rated equipment with a minimum 4-star rating where possible.
- Using LED lighting and other low energy lighting where possible.
- Applying passive design elements to moderate room temperatures reducing the need for artificial heating and cooling.
- Selecting low-energy, high-efficiency inverter air-conditioning systems for limited use.
- Houses will aim to achieve a minimum NatHERS 6 star energy rating.
- All other buildings (with exception of the workshop) will aim to achieve a NABERS rating of 4 stars. This will be measured through self-assessment.

AWC has addressed the above considerations relevant to this proposal in previous sections of this document.

The workshop, ablutions block and infrastructure services structures will not be subjected to the rating system due their type of use, however as noted above AWC is conscious of minimising energy use as the operations base is self-sufficient generating the majority of its energy through the hybrid power system.

Ratings AWC is striving to achieve for the operations base





10. Water use

The remote location of the operations base necessitates that the base must be self-sufficient with rainfall harvesting from available roof space, and where rainfall harvesting proves inadequate, the use of a bore to access ground water. The use of a bore will be subject to an assessment of rain harvesting and accessibility of the groundwater table and water quality.

It is not anticipated to recycle grey water (typically used on gardens) as gardens will not be established. Strategies to minimise water use will include:

- Selecting low-flow Water Efficiency Labelling and Standards (WELS)-rated fittings and fixtures, where available.
- Selecting WELS-rated appliances and equipment where available.
- Maximising rainwater capture through design.
- Meeting the requirements of the OEH Park Facilities Manual and consideration of the NPWS Sewage Manual.

AWC has incorporated the relevant above considerations in its design.

As the site will be self-sufficient, AWC will not seek to obtain an accredited rating for water use, however AWC staff will be conscious of minimising water use due to the operations base water source being limited to local rain capture and a single bore.

11. Miscellaneous materials

As described in previous sections, new materials will be prioritised to create healthy spaces through selection of low VOC sealants, adhesives and paints and low/zero formaldehyde composite wood products. Materials containing PVC, volatile organic compounds, copper chrome arsenate and herbicides and pesticides will also be avoided where possible.

12. Waste management and recycling

A Waste Management Plan (WMP) will be developed for the Mallee Cliffs Operations Base. The WMP will detail:

- Collection of recyclable materials using receptacles located adjacent to the workshop. This would typically include paper and card products, aluminum and steel, and glass. The actual recycling will be subject to that able to be managed with local suppliers.
- Selection of materials and products that minimise extraneous wrappings and packaging.
- Installation of septic tanks and leach drains (or equivalent) for each accommodation and office unit with waste drainage. Sewerage management systems will be installed in accordance with relevant regulations and the NPWS Sewage Manual, and no closer than 130 m from watercourses.
- The removal of all trade waste from the construction of the fence and operations base. No trade waste will be buried or disposed of on site.

13. Sustainability during construction

AWC will ensure that the buildings are consistent with and satisfy the requirements of the Building Code of Australia (BCA), Australian Standards, legislation (such as bushfire and disability) and any other OEH requirements (such as the Facilities Manual). Typically, this will be achieved through engaging a BCA consultant.

The BCA consultant will issue certifications to prove compliance such as Certificate of Design Compliance (CDC) and an Occupancy Certificate or equivalent. In addition, contractors will provide NatHERS compliance confirming the houses achieve the 6-star rating. AWC will conduct NABERS surveys of the visitor accommodation, communal buildings and office using the NABERS suite of tools provided online.

The practical completion (PC) milestone of each building will not be accepted until proof of compliance is received.

A construction management plan (CMP) will be drafted prior to commencement of construction, detailing construction hours, use of equipment and tools, waste management, traffic management, noise management, dust management, work health safety, etc. during construction. In addition, any works on site need to comply with the AWC Mallee Cliffs plans including Work Health Safety Management Plan (WHSMP), Environmental Management Plan (EMP) and any other relevant requirements. A project risk assessment will also be undertaken with staff, contractors and relevant visiting stakeholders being required to sign on to the risk assessment.

These requirements will be detailed in contracts and will be enforced through contract administration activities such as reviewing plans to ensure they comply with requirements, certifying contract works milestones (linked to progress payments) are achieved as agreed, conducting safety audits during works, etc.

In addition, AWC will ensure reputable and registered contractors are engaged for the works.

14. Sustainability during operation, ongoing use and decommissioning

During the operation of the facilities, energy and water use and waste generation will be monitored and reviewed periodically to ensure that the buildings are performing optimally and in-line with best practice. This includes monthly reviews in accordance with AWC operations of fuel and energy usage.

The maintenance requirements will be developed to be consistent with NPWS Facilities Manual or as otherwise agreed.

The maintenance requirements will be informed by environmental monitoring standards, as well as detailed frequency and specific requirements. Generally, however maintenance will occur as needed to ensure that the buildings remain in good condition and fit for purpose. Maintenance activities and asset condition will be provided in a format consistent with OEH's Asset Management System (AMS).

The design of facilities minimises impacts associated with decommissioning, should the OEH decide to decommission in the future. For instance,

- use of prefabricated and modular buildings that may be removed upon completion of the project;
- limiting ground disturbance and penetrations where possible;
- use of reputable and registered builders and contractors;
- use of long-life materials (for example, galvanized wire and steel products).

15. Contribution to park management activities

The contributions the proposal offers include:

- A high likelihood of success in reintroducing mammal species which are listed as regionally extinct in NSW and for which predation by foxes and feral cats is the most significant threatening process.
- Substantial increase in the population of at least ten threatened mammal species, currently listed as extinct in NSW.
- Substantial benefits for other species, including many species listed as threatened in NSW, as a result of the removal of feral animals including, but not limited to, Malleefowl and Western Pygmy-possum.
- Significant increase in scientific knowledge as a result of the proposal.
- Restoration of ecosystem processes such as digging/turnover of soil by small mammals.

The Mallee Cliffs operations base will be developed primarily for use by representatives of AWC and NSW including our partners who are engaged in project delivery. Examples include resident AWC staff; visiting AWC staff; NSW Government staff; contractors; volunteers involved in activities such as bird surveys; external researchers such as university students and, from time to time, guests involved in promoting awareness and outreach (e.g. representatives of media, Federal and local government, local community organisations, representatives of other conservation projects and participants in the philanthropic sector relevant to conservation).

The establishment of the operations base plays a key role in realising the benefits of the proposal, including:

- it is essential to ensure the integrity of the fence and therefore secure the environmental benefits of the project including the reintroduction of threatened mammals;
- it is essential to adequately support the very substantial increase in scientific activity that will occur and which will require scientists to be based in the Mallee Cliffs NP;
- it will play a critical role in supporting public education and stakeholder engagement activities; and

- it will deliver economic benefits through the proposed investment in local communities in the establishment of the base and during the ongoing operation of the project.

Upon completion of the reintroductions, facilities for park visitation will be developed. These facilities will be subject of future reviews.