Offset Strategy under the EPBC Act

Hydrogen Jobs Plan – South Australian Government Renewable Hydrogen Power Station, Electrolysers and Storage Facility

Office of Hydrogen Power South Australia

14 November 2024

SOUTH AUSTRALIA

Government of South Australia

Office of Hydrogen Power SA

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Acknowledgement of Country
The Office of Hydrogen Power South Australia acknowledges Aboriginal people as the First Nations Peoples of South Australia. We recognise and respect the cultural connections as the traditional owners and occupants of the land and waters of South Australia, and that they continue to make a unique and irreplaceable contribution to the state.

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This Offset Strategy under the EPBC Act has been prepared by JBS&G as advisors to the Office of Hydrogen Power South Australia.

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1. Introduction

1.1. Summary of the Project

The Hydrogen Jobs Plan (HJP, the Proposed Action, the Project) is a strategic initiative by the South Australian government to establish a cutting-edge hydrogen power station, electrolyser and storage facility 5.5 km north of Whyalla.

The HJP is overseen by the Office of Hydrogen Power South Australia (OHPSA), established by the South Australian Government in May 2022. The HJP integrates the following components:

- 250 MWe electrolysers
- Hydrogen storage facility
- 200 MW hydrogen-fuelled power generation.

The proposed HJP location is on the urban fringes of Whyalla, north of the Whyalla industrial precinct. The infrastructure included within the Proposed Action is in three key areas, as shown in Figure 1-1:

- Primary Facility including the hydrogen production plant, hydrogen purification, water purification, electrical substation, hydrogen-fuelled power station, onsite hydrogen storage facility and associated control rooms, laydown areas, workshops and amenities. The Primary Facility is on undeveloped land adjacent industrial land to the east across Lincoln highway, the Whyalla Conservation Reserve to the north and an approved solar farm (SIMEC Energy) to the south-east.
- Northern infrastructure including a high voltage transmission line extending north from the Primary Facility to a new Cultana East substation and west to connect to the Whyalla-Davenport transmission lines within the Cultana Training Area. This will use an infrastructure corridor to be established along the western side of the Lincoln Highway, on the eastern edge of the Whyalla Conservation Park.
- Southern infrastructure including service connections for water as well as road and intersection upgrades. Water supply connection to SA Water and water connection to the Whyalla Steelworks for supply of process water for reuse will extend east and south from the primary facility to connect to existing services (Figure 1-1).

Construction of the Proposed Action is planned to commence in late 2024 and last approximately 18 months, with operations planned to commence in early 2026 with a design life of 25 years.

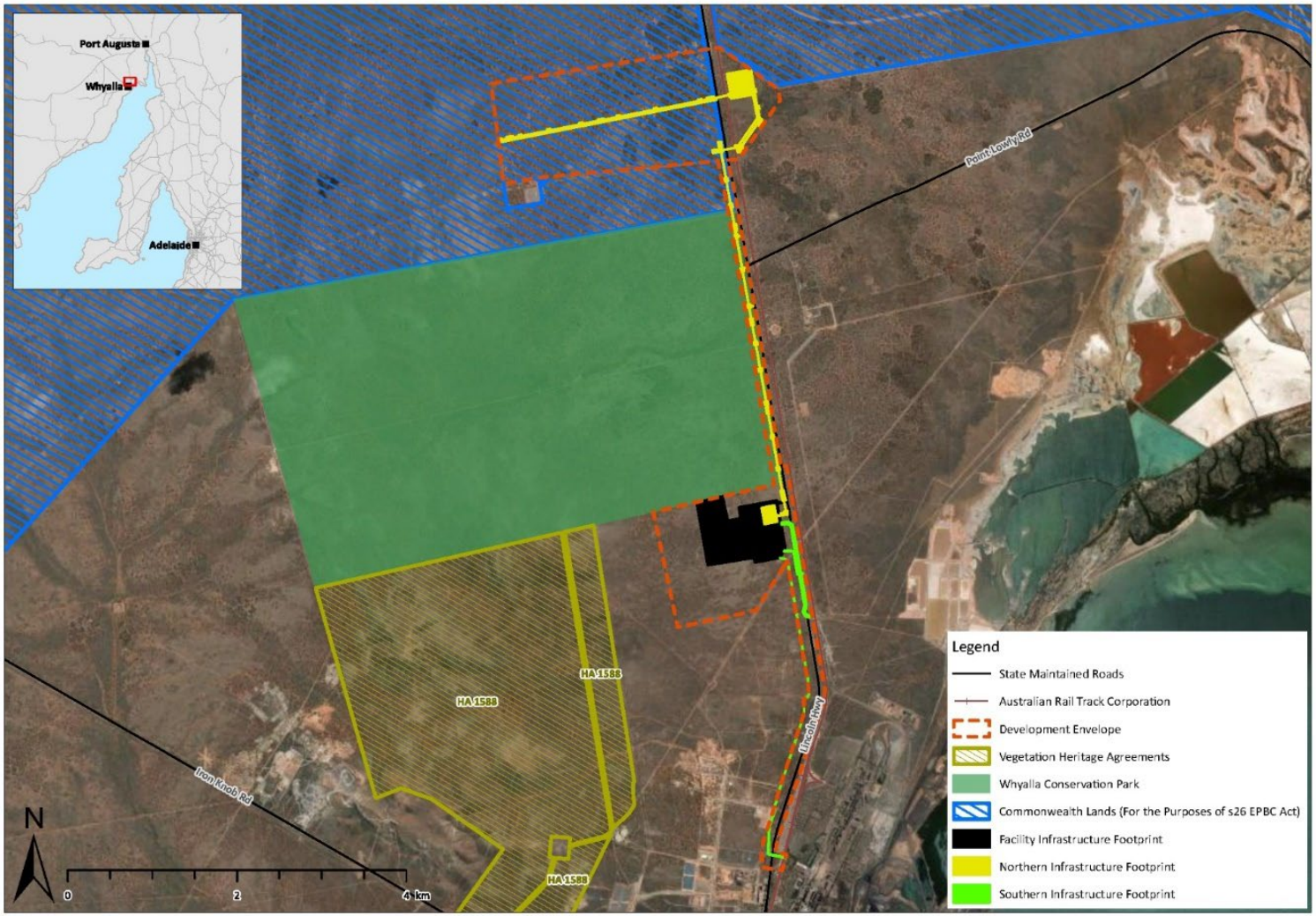

Figure 1-1: Hydrogen Jobs Plan location

1.2. Assessment under the EPBC Act

OHPSA submitted a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the Proposed Action (EPBC Ref: 2023/09759). On 3 April 2024, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) advised the Project had been determined a Controlled Action due to the controlling provisions section 18 and 18A (listed threatened species and communities). A decision was made under section 87 of the EPBC Act that it would be assessed by preliminary documentation.

The controlled action decision noted the potential for significant impacts on Western Grasswren (Gawler Ranges)[1] (*Amytornis textilis myall*) and Southern Whiteface (*Aphelocephala leucopsis*). OHPSA completed several ecological studies and prepared the Preliminary Documentation. The Preliminary Documentation was publicly exhibited from 5 September 2024 to 18 September 2024 and approved on 24 October 2024.

The assessment concluded the Project could have a significant residual impact on the Western Grasswren, but not on the Southern Whiteface. This conclusion was supported by the delegate of the Commonwealth Environment Minister in setting the approval conditions. As such, this offset strategy focuses only on the Western Grasswren (though by its nature will also be beneficial to the Southern Whiteface).

1.3. Relevant approval conditions

This document addresses the EPBC approval conditions (10 – 12) relating to the requirement for an Offset Strategy. Table 1.1 shows compliance with those conditions.

Following approval of the Offset Strategy by the Minister, the approval conditions require OHPSA to:

- Within 12 months of approval of the Offset Strategy, prepare an Offset Management Plan for each offset site. The plan must be approved by the Minister (Conditions 13 – 15)
- Secure the offset site(s) specified in the Offset Strategy (Conditions 16 – 17)
- Subsequently achieve the required offset outcomes for each site in the specified timeframes (Conditions 18 – 19).

[1] For brevity, references to 'Western Grasswren' in this strategy mean the Western Grasswren (Gawler Ranges).

Table 1.1: Compliance with EPBC approval conditions

Condition No.	Condition	Strategy references	How the strategy addresses the condition
10	To compensate for the residual significant impacts of the Action on the Western Grasswren (Gawler Ranges), the approval holder must submit to the department for approval by the Minister an Offset Strategy.	Whole document	This document is the Offset Strategy
11	The approval holder must not commence the Action unless the Offset Strategy has been approved by the Minister in writing. The approval holder must commence implementing the approved Offset Strategy from the date of approval by the Minister and continue to implement the Offset Strategy at least until the expiry date of this approval.	Whole document	For noting
12	The Offset Strategy must include but not be limited to, to the satisfaction of the Minister:		
a)	be prepared in accordance with the Environmental Offsets Policy	Section 3.3	This section describes how the Offset Strategy is consistent with the policy
b)	identify and propose one or more environmental offset sites suitable to compensate for the residual significant impacts of the Action on the Western Grasswren (Gawler Ranges)	Section 3.1 Section 3.2	Section 3.1 provides details of the proposed offset site. Section 3.2 provides the inputs to the offsets calculator and justification to demonstrate the site meets over 100% of the offset required.
c)	include summary information on the residual impacts to protected matters that will be compensated for by the proposed offset(s) including all areas of habitat, and the habitat quality for protected matters at all locations impacted by the Action which the Offset Strategy is to address	Section 2	Summarises residual impacts on Western Graswren based on assessment in preliminary documentation.
d)	detail the areas of habitat, and the habitat quality, for protected matters at each proposed offset site	Section 3.1	Provides details of quality of Western Grasswren habitat at the offset site.
e)	specify achievable proposed offset outcomes for each	Section 3.5	Performance indicators for measuring achievement of

Condition No.	Condition	Strategy references	How the strategy addresses the condition
	proposed offset site and timeframes for their achievement		offset outcomes are provided in section 4.
f)	detail how each offset site will be protected, including evidence of securement, and offset outcomes for the protected matters will be maintained at least until the expiry of this approval	Section 3.4	Provides details of the proposed Heritage Agreement.
g)	a monitoring, evaluation and reporting framework that includes:	Section 4	Table 4.1: Monitoring, evaluation and reporting framework
i)	performance indicators	Section 4	Table 4.1: Monitoring, evaluation and reporting framework
ii)	trigger values for corrective measures	Section 4	Table 4.1: Monitoring, evaluation and reporting framework
iii)	the timing and frequency of monitoring, ensuring monitoring is capable of detecting trigger values and changes in the performance indicators	Section 4	Table 4.1: Monitoring, evaluation and reporting framework
iv)	monitoring and analysis on the implementation of the strategy	Section 4	Table 4.1: Monitoring, evaluation and reporting framework
v)	any other specific monitoring measures to ensure that the environmental outcomes are being achieved.	Section 4	Table 4.1: Monitoring, evaluation and reporting framework

2. Residual significant impacts of Project

Impacts on the Western Grasswren were assessed in the Preliminary Documentation prepared by OHPSA under the EPBC Act.

2.1. Western Grasswren habitat in Project area

There are multiple historical records for the Western Grasswren within and near the Project area, within and close to Whyalla, along highways, and in particular, in the adjacent Whyalla Conservation Park. It was recorded several times during on-ground surveys for the HJP ecological assessment in Spring 2022 and in a targeted survey in October 2023 by EBS Ecology. Figure 2-1 shows historical records and those from both on-ground surveys conducted for the HJP.

Western Grasswren potential habitat classifications vary across the landscape and depend on site specific characteristics (e.g. density and cover of dominant species, presence and height / cover of spiny shrubs). This Offset Strategy uses the habitat classification developed by Jacobs and used in the ecological assessment for the HJP (Table 2.1).

Table 2.1: Western Grasswren habitat criteria

Habitat suitability	Criteria
Preferred Habitat (highly suitable)	• Total shrub cover 0 – 1 m > 30% • Cover of spiny shrub > 0.5 m, or other dense tall chenopod shrubs (0.5 – 1 m) represents a high proportion of the total shrub cover • Dominant shrub species include *Maireana pyramidata* (Blackbush), *Lycium australe* (Australian Boxthorn), *Rhagodia spinescens*, *Atriplex vesicaria* • Can occur with Western Myall, Bullock Bush low woodlands (less typical, includes Spiny Fan Flower) • Likelihood of use also considered Biological Databases of South Australia (BDBSA) / Jacobs records within 5 km and habitat connectivity within the landscape.
Atypical Habitat (suitable)	• Total shrub cover 0 – 1 m > 20% • Cover of spiny shrub > 0.5 m, or other dense tall chenopod shrubs (0.5 – 1 m) represents a high to moderate proportion of the total shrub cover • Dominant shrub species include *Maireana sedifolia, Scaevola spinescens, Dodonaea lobulate, Acacia nyssophylla, Atriplex vesicaria* +/- shrubs (e.g. Senna sp.) • Can occur with Western Myall, Bullock Bush +/- False Sandalwood low woodlands • Include *Casuarina pauper* with spiny shrubs present • Likelihood of use also considered BDBSA / Jacobs records within 5-10 km and/or habitat connectivity within the landscape.

Habitat suitability	Criteria
Low Potential (potential suitable, buffer areas)	• Spiny shrubs and/or dense chenopod shrubs present, but at low cover or < 0.5 m tall • Likelihood of use also considered BDBSA / Jacobs records not within 20 km and limited to no habitat connectivity within the landscape.
Not suitable	• Total shrub cover 0-1 m is very low; spiny shrubs are not present or <1% cover • Consider BDBSA / Jacobs records not within 20 km and limited to no habitat connectivity within the landscape.

While the quality of the habitat is variable, nearly all vegetation within the project area was mapped as 'Preferred Habitat' (regarded as highly suitable for the Western Grasswren) or 'Atypical Habitat'. Atypical habitat is regarded as suitable habitat but is more likely to be utilised during good seasonal conditions (noting the observation by Black et al (Black, Carpenter, & Pedler, 2009) that, during drought, grasswren populations are likely to contract into refuge areas of optimal habitat). The only exceptions were small areas of unsuitable habitat in old quarries and borrow pits in the north east, central east and south of the primary facility and southern infrastructure areas. Atypical habitat was also more degraded in the north-east within the primary facility area.

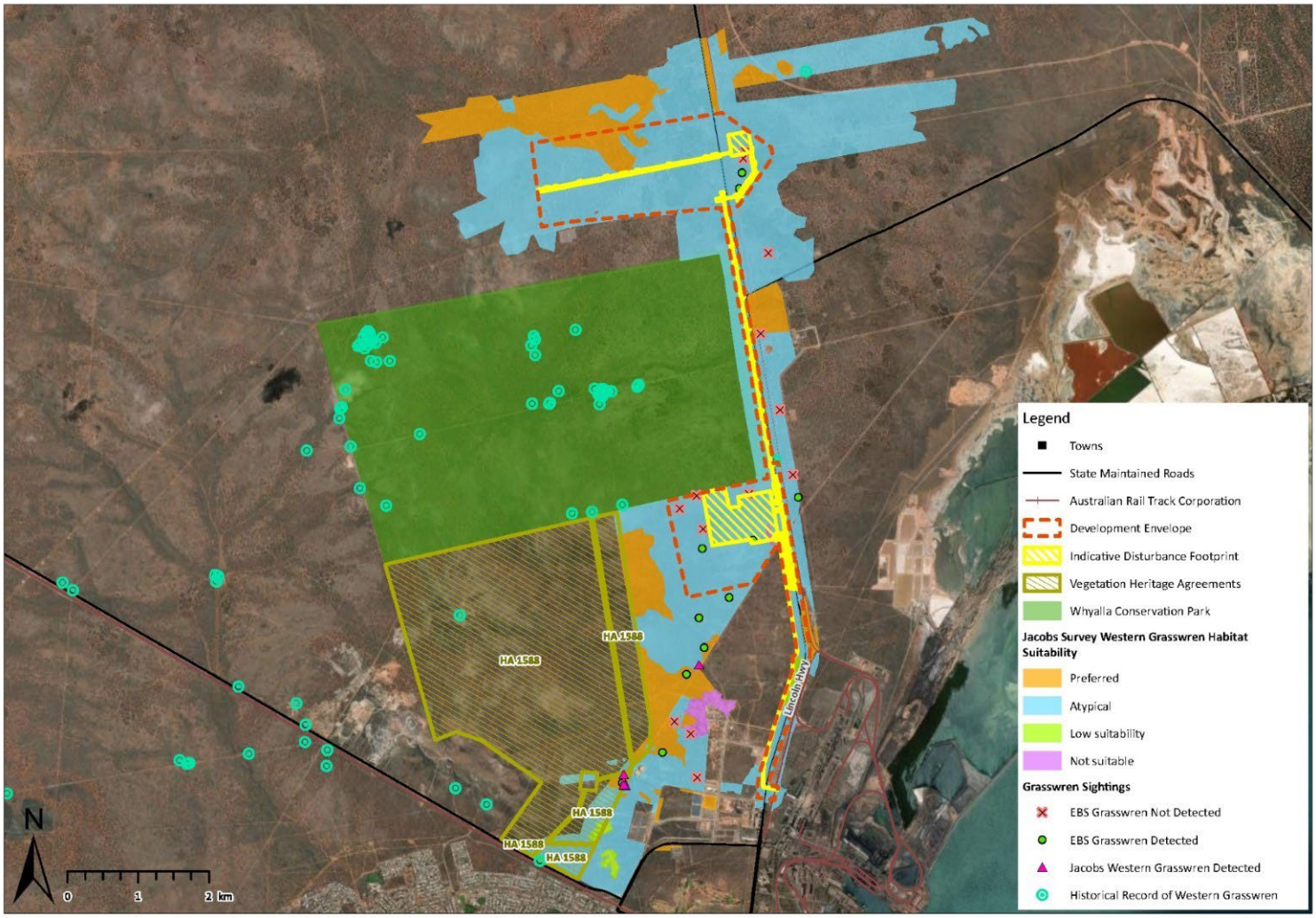

Figure 2-1: Western Grasswren mapping and records

2.2. Habitat clearance for the Project

The action requires clearance of 89.4 ha of Western Grasswren habitat. Almost all this clearance is in atypical (but still suitable) habitat as shown in Figure 2-1.

Table 2.2: Worst case clearance of habitat for Western Grasswren

Habitat suitability	Disturbance footprint (ha)
Preferred Habitat (highly suitable)	0.9
Atypical Habitat (suitable)	85.2
Low Suitability Habitat	0.04
Not suitable	3.3
Total	**89.4**

In relation to habitat clearance, the assessment in the Preliminary Documentation concluded:

- All populations of Western Grasswren are considered to have high conservation value (DCCEEW 2023a) and therefore represent important populations. The Action Plan for Australian Birds and IUCN assessments data suggest there is one large subpopulation of approximately 12,000 individuals (Garnett & Baker, 2020). This population is known to extend west to northwest of Whyalla for approximately 170 km. The individuals present at the HJP site would represent small family groups at the edge of the entire large continuous population. These individuals are not a discrete important population but do form part of a larger important population.

- Clearance required for the HJP could lead to a decrease in the size of an important population, while noting this represents a relatively small area of disturbance compared to the area of occupancy for the species. The HJP disturbance footprint would require clearance of approximately 89.4 ha of habitat representing 0.04% of the area of occupancy for the species, based on EBS Ecology estimations using a 5 x 5 km grid (if a 2 X 2 km grid is used, this increases to approximately 0.1% noting, however, that, due to the area being under-surveyed, this likely overestimates the impact). Following revegetation of areas not required for operation, the permanent disturbance footprint will represent 0.03% of the area of occupancy. Cumulative impacts from projects in the Whyalla area could potentially affect 0.4% of the area of occupancy.

- Based on (Garnett & Baker, 2020) estimates of population density (noting low reliability), habitat loss would displace 7 – 18 birds. As 85.2% of the habitat loss is in atypical habitat, which may only be utilised following good seasonal conditions, the impact is more likely to be in the mid, rather than upper, end of that range. Displacement of these birds has the potential to lead to territorial competition with resulting impacts on breeding success.

- The Project site is surrounded by conservation areas benefiting the Grasswren (significant vegetation heritage agreement area and the Whyalla Conservation Park), and areas under Department of Defence management which are also of benefit to

Grasswren habitat value). These areas provide substantial adjoining habitat for Western Grasswren and have significant potential to absorb some birds displaced by clearance. The extent to which this may occur is unknown.

- Approximately 20% of the population of the species lives within the Cultana Training Area (DoE 2014). The transmission line planned for the HJP will require minimal vegetation clearance within this area (maximum of 5.8 ha within the Cultana Training Area with up to 74% of this revegetated following construction).
- More broadly, the HJP sits within the Myall Plains IBRA subregion, 97% of which contains remnant vegetation of varying habitat condition.

Since the entire population is considered an important population, the Preliminary Documentation concluded that habitat clearance of 0.04% of the area of occupancy may be considered a significant impact.

2.3. Other residual impacts

Indirect impacts including noise, dust, light spill, vehicle and human disturbance were assessed in the Preliminary Documentation as being able to be managed in accordance with industry standard control measures to prevent impacts to threatened species.

Specifically, in relation to noise, the assessment relied on conservative noise modelling undertaken by AECOM. Noting there was no potential for the Project to result in threshold shift in the hearing of Western Grasswren, the assessment focused on the potential for masking impacts. These can occur when birds are subject to continuous noise of sufficient intensity in the frequency region of bird hearing that has a detrimental effect on their detection and discrimination of vocal signals (Dooling & Popper, 2016).

The assessment concluded that noise from the operation of the HJP outside the Project's disturbance footprint is unlikely to cause masking in Western Grasswren. At worst, the impact would affect less than 1 ha of habitat in the Whyalla Conservation Park. Given impacts are unlikely, no allowance has been made in offset calculations for noise impacts. However, the offset area selected sufficiently exceeds the requirements of the EPBC Offsets Policy to provide for any impact, should it occur.

3. Proposed offset

In the context of the EPBC Act, 'environmental offsets' refers to measures that compensate for the residual adverse impacts of an action on the environment after avoidance and mitigation measures have been undertaken. An EPBC environmental offset is required where residual impacts of an action on the environment are deemed to be significant. For this Project, the Offset Strategy seeks to offset significant residual impacts to Western Grasswren (*Amytornis textilis myall*).

The Offset Strategy provides an on-ground offset that achieves 100% of the requirement for the offset, as determined through application of the Offsets Assessment Guide (v. 2 October 2012) and in accordance with the associated Offset Assessment Policy (DSEWPAC, 2012). The Offsets Assessment Guide supports the policy by providing a formula-based calculator sheet to compare criteria from a Project's impacts to the proposed offset to ensure offsets are commensurate with, or exceed, the environmental loss arising from the Project impacts.

3.1. Description of offset environment

3.1.1. Offset location

The proposed offset is within the broader HJP Project Area land parcel, outside of the Project Area, but contiguous with the existing conservation estate (Figure 3-1).

The close proximity of the proposed offset area to the disturbance footprint (with a buffer of 730 m between the disturbance and the offset envelope), aligns with one of the key offset principles. It is within the same broad vegetation community as the disturbance for the Project and includes both similar and the same vegetation associations (and therefore habitat types).

The proposed offset extends along the boundary of the broader HJP Project Area land parcel, from the Whyalla Conservation Park in the northwest, along the eastern boundary of the existing Heritage Agreement conservation area (HA 1588), with an easement for the existing transmission line retained. Immediate proximity to existing conservation reserves results in an expansion of the area under conservation for Western Grasswren. The location also reduces edge effects on the offset area from potential future disturbance.

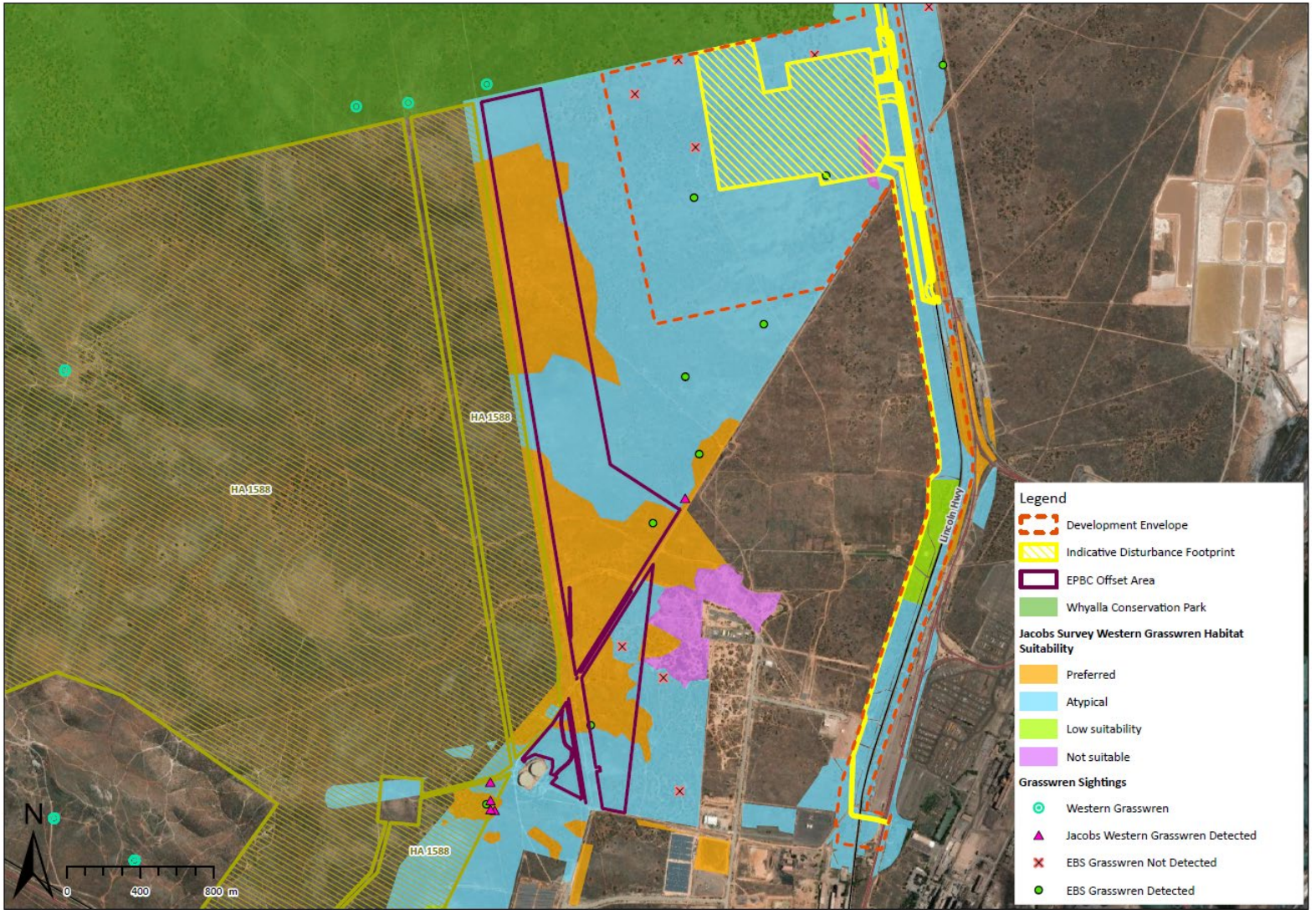

Figure 3-1: Proposed offset area

3.1.2. Habitat assessment of the offset area

A considerable amount of data on habitat quality in the offset area and surrounding area was collected during ecological surveys completed for the HJP. In addition to desktop assessments, these included:

- Survey 1, spring 2021 (5-7 October): a vehicular and foot survey by Jacobs' ecologists was undertaken. The survey was undertaken in spring to verify ecological constraints identified during the desktop phase and provide data for broad mapping of vegetation groups, identify potential threatened species habitat and potential land management issues to feed into site infrastructure planning.
- Survey 2, undertaken by Jacobs during spring 2022 (5-13 October): vegetation survey and targeted EPBC listed species and communities habitat survey (Western Grasswren, Malleefowl), bird surveys, Song Meter deployment.
- Survey 3, undertaken by Jacobs during summer 2022 (5-9 December): follow up vegetation and habitat survey to fill previous data gaps, additional bird surveys, Song Meter deployment.
- Survey 4, undertaken by Jacobs during summer 2023 (21-22 February): additional vegetation and habitat survey assessments. Assessment included characterisation of habitat features which were used to determine habitat suitability for Western Grasswren.
- Survey 5, undertaken by Jacobs during spring 2023 (25-26 September): detailed vegetation and habitat mapping of target areas within the Hydrogen Site 1 Project Area and broad assessment of the Transmission Line Envelope. Assessment included characterisation of habitat features which were used to determine habitat suitability for Western Grasswren.
- Survey 6, undertaken by EBS during spring 2023 (3-5 October): targeted Threatened Bird Survey within the study area.
- Survey 7, undertaken by Jacobs during spring 2023 (November 5): brief assessment of potential habitat characteristic used to determine habitat suitability for Western Grasswren within the proposed sub-station location in the Transmission Line Envelope.
- Survey 8, undertaken by Jacobs during summer 2024 (February): data gap and infill assessment of infrastructure corridors and alignments (for vegetation type and condition, and habitat value for threatened bird species combined with vegetation and habitat assessment of potential on-ground offset sites.
- Survey 9, undertaken by EBS during Spring 2024: avifauna monitoring prior to commencement of Project construction, to add to the previously collected baseline data.

Vegetation assessments were undertaken in line with the South Australian Bushland Assessment Manual and employed the Bushland Assessment Method (BAM) appropriate for

the region in which the Project is located. Part of the BAM includes reporting of threatened species recent and historic records which contribute to the site 'threatened species scores' and therefore the offset requirement under the South Australian *Native Vegetation Act 1991*.

3.1.3. Habitat quality of the offset site relative to the Project area

The Project area includes the following vegetation communities:

- 59.010 ha of Chenopod open shrublands +/- emergent trees
- 19.517 ha of Low open woodlands of Western Myall with a Chenopod shrub understorey
- 8.934 ha of Low open woodlands with Western Myall and Black Oak over Chenopod shrub understorey.

Chenopod shrublands, which represent the majority of the disturbance footprint, and which are generally suitable habitat for Western Grasswren, are represented in varying condition within the Project area (Jacobs 2024). Much of the chenopod shrubland in the Project area is more degraded than in areas of the broader HJP Project area, including areas proposed for the offset site. Degradation in the Project area (particularly the area for the primary facility) includes more widely spaced plants due to historical grazing and local disturbance, lower overall floristic diversity, decreased structural diversity and increased weed abundance (particularly of Wards Weed (*Carrichtera annua*) and Declared Plant Carrion Flower (*Orbea variegata*)).

Areas of Preferred Western Grasswren habitat were not observed in the areas proposed for the primary hydrogen facility with vegetation dominated by *Maireana sedifolia* and lacking floristic and structural diversity compared to other areas. Chenopod shrubland in better condition within the disturbance footprint is reported in small pockets on the eastern side of the proposed primary hydrogen facility (Jacobs 2024).

The majority of open woodlands within the disturbance footprint were in good to excellent condition, and in general became slightly more degraded near existing infrastructure. Most woodlands within the Project area occur in the location for the proposed substation, in the Whyalla Conservation Park, and some pockets within the main hydrogen facility footprint.

By comparison, vegetation within the proposed offset location includes areas of the same Chenopod open shrublands with and without emergent trees, along with areas of low open Western Myall woodland with a chenopod understory. The proposed offset site also encompasses two ephemeral drainage lines where shrub cover and density are typically higher, resulting in ideal habitat conditions for Western Grasswren.

Vegetation condition within the proposed offset area is broadly consistent with the disturbance footprint. Chenopod shrublands across the whole of the Jacobs (2024) assessment area (including the proposed offset area) are in variable condition, considered moderate to good, and include signs of existing disturbance from historic grazing, presences of weeds, reduced floristic diversity and reduced vegetation cover. Open woodland areas with chenopod

understory, which make up a larger portion of the offset area than chenopod shrublands, are in good to excellent condition (Jacobs 2024). Comparison of vegetation condition criteria against benchmark conditions indicate both community types are beneath what would be considered pristine condition, and therefore there is scope for improvements in condition.

There are historic and recent survey records of Western Grasswren within or immediately adjacent to the proposed offset area within continuous habitat. The most recent survey (EBS Spring Survey 2024) yielded three Western Grasswren records within the offset area. As such, it is highly likely that Western Grasswren are throughout the offset area, and that habitat is suitable to support the species. The proposed offset location shares a boundary with the Whyalla Conservation Park where there are numerous historic records of Western Grasswren. It also shares a boundary with the existing HA 1588 where there are a small number of records. Recent surveys as part of the Project by both EBS and Jacobs recorded Western Grasswren within the southern portion of the proposed offset area, including within the ephemeral drainage lines captured by the offset area (Figure 2-1).

The offset area is zoned Strategic Employment, which seeks to provide a 'range of industrial, logistical, warehousing, storage, research and training land uses together with compatible business activities generating wealth and employment for the state'. Hence, in the absence of protection as an offset area, there is a high likelihood this area will be developed for uses incompatible with conservation.

3.2. Criteria applied to determine offset

The Offset Assessment Guide has been used to determine an appropriate area for the proposed Offset. Inputs into the calculator and justification for scores applied are summarised in Table 3.1.

Table 3.1: Offset Assessment Guide criteria, scores, and justification

Criteria	Score	Justification
Threatened species habitat Impacts		
Area of Impact	90 ha	Disturbance of habitat for the HJP project is a total area of 89.436 ha, or which 87.461 ha is native vegetation
Quality	7	Jacobs (2024) describe the condition of the impacted area in detail within the Native Vegetation Data Report (a requirement for clearance under the SA *Native Vegetation Act 1991*). Chenopod shrublands, which represent the majority of the disturbance footprint are in variable condition, and include existing disturbance from historic grazing, presences of weeds, reduced floristic diversity and reduced vegetation cover (Jacobs 2024). Open woodlands with chenopod understorey which make up the remainder of the disturbance footprint are in good to excellent condition, generally with poorer condition in proximity to existing infrastructure (Jacobs 2024).

Criteria	Score	Justification
		Comparison of vegetation condition criteria against benchmark conditions indicate both community types are beneath what would be considered pristine condition.
Total quantum of impact	63.00 Adjusted Hectares	From calculator
Threatened species habitat offset		
Start area	150 ha	Area required to exceed 100% of the impact to Western Grasswren through habitat loss being offset by the proposed offset, based on all other criteria and scores.
Start quality	7	Jacobs (2024) describe the condition of the impacted area in detail within the Native Vegetation Data Report (prepared in accordance with the requirements for clearance under the SA *Native Vegetation Act 1991*), as well as providing data on areas within the broader Project Area which are outside of the disturbance footprint (i.e. including the proposed offset area). Chenopod shrublands across the whole of the Jacobs (2024) assessment area are in variable condition, considered moderate to good, and include signs of existing disturbance from historic grazing, presences of weeds, reduced floristic diversity and reduced vegetation cover. Open woodlands with chenopod understory which make up a larger portion of the offset area than chenopod shrublands are in good to excellent condition (Jacobs 2024). Comparison of vegetation condition criteria against benchmark conditions indicate both community types are beneath what would be considered pristine condition.
Future quality without offset	6	Jacobs (2024) describe the condition of the impacted area in detail within the Native Vegetation Data Report (a requirement for clearance under the SA *Native Vegetation Act 1991*), as well as providing data on areas within the broader Project Area which are outside of the disturbance footprint (i.e. including the proposed offset area). Jacobs (2024) note vegetation and habitat is in varying condition, with signs of existing disturbance from historic grazing, recreational activities including four wheel driving and dog walking, and presences of weeds resulting in reduced floristic diversity and reduced vegetation cover. Other areas, closer to existing development, generally have lower condition scores as the level of disturbance increases. It is reasonable to assume, that as development encroaches upon these areas, detrimental activities will increase and habitat condition will decline. There is also a risk that stock may be re-introduced to the area in the future.
Future quality with offset	8	Tried and true management measures that are achievable within short timeframes and have demonstrated ecological benefits at other locations could readily be applied to the proposed offset site, and result in an improvement in habitat condition for Western Grasswren. These include:

Criteria	Score	Justification

		• Protection of the ephemeral drainage lines and targeted weed management:
		  ○ Will facilitate natural regeneration in these important habitat areas
		• Closing and rehabilitating access tracks and potential fencing of targeted parts of proposed offset area:
		  ○ Will remove or reduce future grazing pressure, thereby allowing grasses, shrubs and trees to maximise recruitment success, and in-fill areas of low vegetation density (noted by Jacobs) and improve floristic diversity. This will result in herbaceous and grassy ground layers as well as denser, taller shrub layers which are critical for Western Grasswren
		  ○ Will reduce or entirely remove the occurrence of recreational activity within the proposed offset site, which will subsequently reduce disturbance to avifauna including Western Grasswren. Currently, the broader Project Area (which the proposed offset site forms part of) is subjected to pedestrian (and dog) traffic, motorbikes, particularly in the southern areas, and four wheel drives
		  ○ Will reduce the risk of weed spread or introduction, and thereby encourage diverse native vegetation understorey cover, which is important foraging habitat for Western Grasswren
		  ○ Will reduce the occurrence of feral animals, including cats and foxes (depending on type of fencing used) which will maximise the breeding success and reduce mortality through predation of Western Grasswren
		A single 'point' of increased condition from 7 to 8 for a site under offset is considered reasonable (even conservative).

Confidence in result (quality)	50%	Estimates for current condition, condition without offset (if not lost) and condition with offset are conservative. Current condition is estimated based on in-field assessment using the SA Government's Bushland Assessment Method, which is well recognised in South Australia and provides data which can be readily compared with future assessment to measure change in condition. The sites were assessed as ranging from moderate to good quality (i.e. many native species present, but some evidence of degradation through presence of weeds, or historic impacts). Only minor improvements in habitat condition are required to achieve the single point of gain in condition applied to the habitat quality with the offset in place which could be achieved through minimal intervention and removal of disturbance. Conversely, if the site is left without the protection of an offset, it is plausible that the quality will continue to degrade through continual traffic (pedestrians, dogs, bikes, four wheel drives, trail bikes) risking disturbance and introduction/spread of weeds, as well as risk of the return of stock grazing to the area. A single point of habitat condition loss in the absence of the protection of an offset is considered conservative.

Criteria	Score	Justification
Time over which loss is averted	15	Fifteen years is considered a conservative timeframe as to when the proposed site may be lost to alternate development, given the frenetic level of development proposals and activity within the Whyalla region at the current time, driven by the State and Commonwealth Government initiatives to bring forward large scale renewable energy and hydrogen industry development in the region. The site was previously approved for a solar farm in 2017 under both the EPBC Act and the Native Vegetation Act. Had that development proceeded, the site would substantially already be cleared.
Time until ecological benefit	7	Closure and rehabilitation of tracks and potential fencing of targeted parts of the proposed offset site (where boundaries are not adjacent the existing Heritage Agreement area or the Whyalla Conservation Park) would result in an immediate reduction in the level of pedestrian, four wheel drive and trail bike traffic, and reduce disturbance to potential breeding birds. It would also prevent any future impacts through stock grazing pressure, as have been present in the past. Protection of the ephemeral drainage lines and targeted weed management in these areas would facilitate natural regeneration in these important habitat areas following decent rainfall (which may take 3-4 years to arrive). These habitats are critical for Western Grasswren as they support dense, spiky shrubs. Even low investment in weed management across the site would enable an improvement in vegetation condition at the site which would be achievable in 2-3 years.
Risk of loss without offset	75%	The proposed offset area protects areas of important habitat for the target species that are at a high level of risk from future development. The area is zoned 'Strategic Employment' (e.g. industrial) and earmarked as an extension to the Whyalla industrial estate (to the south and east) and the significant number of proposed developments in the region as Whyalla progresses towards its vision as a renewable energy development hub has resulted in active competition to secure land for development. As evidence of the risk of future development, the parcel of land for the proposed offset site was already part of an area previously approved for clearance under the EPBC Act and NV Act for the (Adani Infrastructure 2017).
Risk of loss with offset	0%	The offset site would be protected by a Heritage Agreement in perpetuity, under State control.
Confidence in result (risk of loss)	70%	The risk of loss estimate is high, but is deliberately scored as such from an informed position. OHPSA, as a State Government development agency, have visibility of numerous land tenure and development negotiations, and are aware of several proposed developments within the immediate region and of a number of developers looking to negotiate and secure

Criteria	Score	Justification
		land parcels in the region. The site is currently zoned for development. The mechanisms in place to secure the proposed offset property for conservation in perpetuity are established, and well demonstrated in South Australia. There is a very low risk of loss of a Heritage Agreement area once established, and if it was lost, it would be subjected to additional loadings (for state offset requirements) and scrutiny during the future project approvals assessments.
Net present value (Adjusted Hectares	64.84	From calculator
Percent of impact	102.92%	From calculator

3.3. Assessment of proposed offset against principles

As described above, the proposed offset for the Project will be developed and implemented in accordance with the EPBC Environmental Offsets Policy (DSEWPAC, 2012) and the associated Offsets Assessment Guide.

The Environmental Offsets Policy provides overarching principles that are to be applied in determining the suitability of offsets. These, together with further guidance provided by DCCEEW, have been considered in the development of the Offset Strategy for the HJP Project, as described in Table 3.2.

Table 3.2: EPBC Offset Principals and relevant DCCEEW Guidance

Principle	Guidance	Alignment of proposed Offset with Principal
Deliver an overall conservation outcome that improves or maintains the viability of the protected matter	The Offset(s) must: • improve or maintain the long-term viability of the protected matter compared to what would have occurred under the status quo (i.e. no action and no offset) • be like-for like. Achieve a positive conservation outcome for the same protected matter as being impacted, and the same attribute (i.e. habitat) or, where this is not possible/desirable, delivers a benefit to one or more attributes that have as good or greater conservation value • include evidence that the protected matter is either present at the subject site/area, or adjacent to (with connecting habitat/vegetation)	The proposed offset will result in a larger area of currently at-risk suitable habitat for Western Grasswren being protected in perpetuity than that being residually impacted by the HJP Project. The proposed offset area is currently zoned in support of industrial purposes and is within the industrial estate of Whyalla where land for development is highly sought after and numerous proponents are seeking project approvals. The proposed offset provides like-for-like habitat to that being lost and therefore is suitable for Western

Principle	Guidance	Alignment of proposed Offset with Principal
	and likely to inhabit the area once the offset project makes it suitable for the matter • be implemented for the duration of the impact • commit to a future quality that is equal to, or greater than, the quality of the impact site to be attained by the nominated time until ecological benefit and then maintained for the duration of the impact.	Grasswren. There are recent records of both species from either within or immediately adjacent the proposed offset area, as well as several recent and historic records within surrounding areas. Habitat quality is equal to, or better (in some areas substantially better) than that being impacted for the target species.
Be built around direct offsets but can include other compensatory measures	The Offset(s) must be comprised of at least 90% direct offset, unless it can be demonstrated that a greater benefit will be realised from other compensatory measures, or if scientific uncertainty is too high. • Direct offsets provide a measurable and enduring conservation gain for the relevant protected matter by addressing key threats and priority actions in relevant Recovery Plans, Threat Abatement Plans, Conservation/Listing Advices • Other compensatory measures are anticipated to provide benefits to the same aspect of the impacted protected matter.	The proposed offset is to provide an on-ground, direct, offset which achieves 100% of the requirement for the offset, as determined through the application of the Offset Assessment Guide. As such, the proposed Offset provides a measurable and enduring conservation gain for Western Grasswren in portions of their distribution that are under threat of development.
Be in proportion to the level of statutory protection that applies to the protected matter	Consider and be consistent with the level of statutory protection (vulnerable, endangered or critically endangered) for the listed threatened species or ecological community.	The Western Grasswren is listed as Vulnerable under the EPBC Act. The species is distributed across the central portion of upper Eyre Peninsula. Primary threats are considered to be overgrazing resulting in reduced understory quality, land use change, and/or introduced predators. High stocking rates in the local environment are not common, and although somewhat degraded, remnant native vegetation persists in the region.

Principle	Guidance	Alignment of proposed Offset with Principal
Be of a size and scale proportionate to the residual impacts on the protected matter	Demonstrate the proportionate nature of the benefit against the impact, with consideration to: • the attributes of the protected matter being impacted, the quality and importance of those attributes and the nature of the impact (e.g. permanent or temporary) • the attributes of the protected matter being improved, the quality and importance of those attributes, the time it will take to achieve a conservation gain, and risk of the conservation gain not being realised.	The proposed offset will result in a larger area of currently at-risk suitable habitat for Western Grasswren being protected under conservation reserve in perpetuity than that being residually impacted by the HJP Project. The proposed offset area contains key habitat qualities that align with the preferred and important habitat requirements of the target species (e.g. ephemeral drainage lines that support dense assemblages of spiny and other shrubs and are preferred by Western Grasswren, and old growth open woodland (Western Myall).
Effectively account for and manage the risks of the offset not succeeding	• Consider the reduced risk of using direct offsets compared to other compensatory measures • Propose compensatory measures if the offset fails, such as additional offsets to compensate for both the impact and the failed offset • Include a risk analysis with input from multiple environmental specialists, of factors that could affect the: – attainment of the desired outcomes within the nominated timeframe (timeframe until ecological benefit) – maintenance of outcomes for the duration of the impact. Analysed risks must include, but not be limited to those associated with administrative, financial and governance risks, stochastic events and the efficacy of legal mechanisms as well as management and corrective actions.	An Offset Management Plan will be developed and approved by DCCEEW that outlines the expected conservation outcomes from the offset, and the mechanisms by which these outcomes will be measured and monitored. This information is provided in a preliminary form in section 254 of this Offset Strategy. Adaptive management will be implemented where outcomes are not being met or where risks of not succeeding become evident. The Offset Management Plan will include a risk assessment for the proposed offset, and response mechanisms in the event of failure.
Be additional to what is already required, determined by law or planning regulations, or agreed to	The Offset(s) must: • Provide conservation gains that are in addition to the existing duty of care, environmental planning laws or other schemes	The proposed offset does not overlap with the 'Significant Environmental Benefit' offsets required in South Australia under the *Native Vegetation Act 1991*, and as such, are

Principle	Guidance	Alignment of proposed Offset with Principal
under other schemes or programs	• Exclude conservation gains paid for or achieved while participating in other schemes (pre-existing or otherwise).	additional to those offset measures. There are no pre-existing conservation offsets associated with the HJP Project.
Be efficient, effective, timely, transparent, scientifically robust and reasonable	• Demonstrably consider the appropriate allocation of funds and resources to ensure the offset(s) and offset actions are fully funded for the required timeframe (cost schedule). • Include provisions to ensure the offset(s) will be implemented before or at the same time as the impact occurring. • Offset selection must be based on scientifically robust and verifiable information, including best-practice and peer-reviewed methodologies, utilised by suitably qualified experts/agencies. Ensure that: – all supporting evidence is included, and assumptions or limitations are specified – the Precautionary Principal is applied if there is not scientific certainty. • All aspects of implementation (i.e. securing, managing, monitoring etc.) must be based on scientifically robust, verifiable, best-practice and peer-reviewed methods. • Ensure offset commitments, outcomes and completion criteria are realistic and are likely to be achieved despite any potential threats or risks, within the nominated timeframe.	The Offset Management Plan will outline the financial funding schedule for the proposed offset. Substantial vegetation and habitat data has been collected within the impact area and within surrounding areas including the proposal offset area. Data has been collected using the South Australian Bushland Assessment Methodology. As such, empirical data is available to support the fact that vegetation and habitat within the offset area is largely 'like-for-like' with the impact habitat, and of suitable quality to support the target species. Expected outcomes of the proposed offset are achievable, realistic, and measurable. Monitoring and measurement criteria will be detailed in the Offset Management Plan.
Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	• Detail the offset(s) governance arrangements, including the provisioning of funds for offset establishment and implementation; • Detail offset performance measurement, monitoring, reporting and record keeping mechanisms (including as relevant to the Department); and	As a State initiative, with the offset to be adjoining the existing long-established conservation estate and resolved in direct consultation with State and Commonwealth regulators and specialists, suitable governance arrangements will be implemented to ensure the integrity of the strategy.

Principle	Guidance	Alignment of proposed Offset with Principal
	• Do not use non-committal and ambiguous language (i.e. may, if possible) without detailed explanation (i.e. why wouldn't something be done? Why wouldn't it be possible?).	

3.4. Security mechanism

OHPSA will secure the proposed offset area through a Heritage Agreement under the *Native Vegetation Act 1991* (SA). A Heritage Agreement is an agreement between a land owner and the Minister responsible for the Act for the permanent protection of native plants and animals on private land.

The Native Vegetation Council is an advisory body to the Minister on all Heritage Agreement matters and, according to Section 23(5) of the *Native Vegetation Act 1991*, the Minister must not enter into, vary or terminate a Heritage Agreement without first consulting and obtaining the approval of the Council.

The Heritage Agreement scheme is administered by the Native Vegetation Council and the Department for Environment and Water.

Heritage Agreements are established in perpetuity to protect and enhance the natural character of the site's flora and fauna. Each Heritage Agreement, while bound by standard conditions, is unique and can include clauses specific to the management of the native vegetation within the conservation area. The following activities are generally prohibited within a Heritage Agreement area:

- Removal of native vegetation
- Introduction of non-indigenous vegetation
- Grazing by livestock (unless an approved NVC management plan is in place)
- Activities that deteriorate water quality, flow or quantity – such as a dam
  Introduction of non-indigenous animals
- Removal of wood or timber – whether standing or fallen, dead or alive
- Removal or disturbance of rocks or soil, including cultivation
- Application of fertiliser
- Erection of buildings or other structures
- Recreational use of trail bikes and other vehicles

Any change in ownership or lease to the property that contains a Heritage Agreement area must be noted to the Native Vegetation Branch. Regardless of lease, transfer or sale, the Heritage Agreement remains binding on the property title holder at that time.

Termination of a Heritage Agreement is generally not supported by the Native Vegetation Council, other than in exceptional circumstances i.e. the land will be subject to a higher level of protection such as proclamation as a National Park under the *National Parks and Wildlife Act 1972*.

3.5. Statement of proposed outcomes

OHPSA commit to achieving the following outcomes from the proposed offset, which align with the conservation and management priorities set out in the Conservation Advice for the Western Grasswren. Timeframes and measurement criteria for the below outcomes are detailed in section 4.

- A measurable decrease in weed abundance and diversity within the offset area
- No introduction of new weeds, pathogens or pest animals within the offset area
- Improvement in the condition of habitat for the Western Grasswren within the offset area
- Sustained breeding of Western Grasswren within the offset area.
- Grazing by domestic stock and disturbance by recreational activities are restricted from the offset area

4. Monitoring, evaluation and reporting framework

The proposed monitoring, evaluation and reporting framework for the offset strategy is shown in Table 4.1. This is preliminary and a more detailed framework will be included in the Offset Management Plan. Compliance with the performance indicators below will be reported in the Annual Compliance Report, required under condition 37 of the EPBC approval.

The monitoring, evaluation and reporting framework requires a baseline condition against which future data collection can be compared. The baseline condition within the offset area will be established through collection of the following data:

- Establishment of repeatable weed transects (100 m) transects, and assessment of weed species abundance and diversity.
- Baseline Unit Biodiversity Scores within each vegetation association present across the offset area, measured using the repeatable Bushland Assessment Method (BAM) surveys at established plots within the offset area.
- Assessment of the diversity of pest fauna that are present within the offset area, through review of existing survey data for the area, historic records for the area, and through visual observation (scats, tracks, traces, records) whilst conducting other baseline survey work within the offset area.

The framework focuses on monitoring threats to Western Grasswrens, habitat condition and breeding success as these are all measurable and comparable. It is not practicable to determine and compare population numbers from year to year as Western Grasswren populations can fluctuate widely with seasonal conditions. This makes it extremely difficult to establish a baseline condition that can be used as a basis for comparison with subsequent years. Improvement in habitat condition along with evidence of ongoing breeding success provide a good surrogate for demonstrating the offset is contributing to the recovery of the species. Breeding success within the offset area provides opportunities for dispersal of birds into adjoining areas.

Table 4.1: Monitoring, evaluation and reporting framework

Outcome	Performance indicator	Key actions	Monitoring	Trigger values for corrective measures
A measurable decrease in weed abundance and diversity within the offset area	A statistically measurable decrease in the abundance and diversity of weeds on the offset area compared to the baseline condition is obtained within 3 years and subsequently maintained.	Targeted and ongoing weed control (as required) in the offset area, with particular focus on Wards Weed and Carrion Flower.	Annual weed survey at established weed transects by suitably qualified ecologist.	Annual survey shows no reduction in weed abundance compared to the previous year. The need for additional control will be considered taking into account seasonal conditions, and the current level of weed abundance and diversity (i.e. no actions required when weed abundance is low).
No introduction of new weeds, pathogens or pest animals within the offset area	A survey by a suitably qualified ecologist confirms there has been no introduction of new weeds, pathogens or pest animals in the offset area.	Targeted and ongoing weed control (as required) in the offset area. Ensure any equipment brought to the offset area is free of weeds and pathogens. Any waste generated during activities on the offset area will be appropriately stored to discourage pest animals.	Annual weed survey at established weed transects by suitably qualified ecologist. No visible records of new pest species within the offset area (scats, tracks, traces, records) during annual monitoring.	Appropriate control program developed and implemented if annual survey identifies new weeds, pathogens or pest animals.

Outcome	Performance indicator	Key actions	Monitoring	Trigger values for corrective measures
Improvement in the condition of habitat for the Western Grasswren within the offset area	Within 7 years, habitat condition, as measured using average Unit Biodiversity Scores (through BAM), improves compared to the baseline condition (acknowledging variations in annual seasonal conditions).	Actions as above	Annual survey by a suitably qualified ecologist using the South Australian Bushland Assessment Methodology to record Unit Biodiversity Scores at established survey locations within the offset area.	Annual survey shows no improvement in habitat condition compared to the previous year – the need for additional management actions will be considered taking into account the monitoring results, current condition, and annual seasonal conditions.
Sustained breeding of Western Grasswren within the offset area	Consistent observations of Western Grasswren breeding within the offset area over a 10 year period.	Actions as above	Annual survey by a suitably qualified ecologist during breeding season records successful breeding behaviour of Western Grasswren (e.g. pairing, nest building, activity at nest sites, young birds)	The need for additional management actions will be considered if the performance measure is not met.
Grazing by domestic stock and disturbance by recreational activities are restricted from the offset area	Tracks closed and fences constructed and maintained to exclude stock and human activity.	Unnecessary tracks closed and rehabilitated, and fencing installed in targeted locations where offset area boundaries are not adjacent the existing Heritage Agreement areas or Whyalla Conservation Park, and existing Aboriginal cultural heritage interests or infrastructure	Biannual inspection of tracks and fencing to ensure it remains in good condition. Inspections of offset area for any signs of stock intrusion or human induced disturbance (e.g. motor bike tracks).	New tracks or damage to fence – repairs completed as soon as practicable. Evidence of stock or human disturbance – corrective actions and repairs to fencing as required (e.g. signage)

Outcome	Performance indicator	Key actions	Monitoring	Trigger values for corrective measures
		easement rights are not in conflict.		

5. Acronyms and glossary

Term	Definition
AOO	Area Of Occupancy
BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia
DCCEEW	Department of Climate Change, Energy, the Environment and Water
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
HJP	The Hydrogen Jobs Plan (the Proposed Action)
MWe	Mega Watt electric
OHPSA	Office of Hydrogen Power South Australia
the Proposed Action	The Hydrogen Jobs Plan
Western Grasswren	Western Grasswren (Gawler Ranges) Amytornis textilis myall
WoNS	Weeds of National Significance

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