Whyalla Hydrogen Pipeline

Preliminary Documentation for the Whyalla Hydrogen Pipeline

163,796 | 65970

19 December 2024

This EPBC Act Preliminary Documentation Report has been prepared by JBS&G as advisors to Epic Energy.

Epic Energy
Level 6
70 Franklin Street
Adelaide SA 5000
Email:
epicenergy.com.au

JBS&G Australia Pty Ltd
ABN 62 100 220 479
100 Hutt Street
Adelaide SA 5000
www.jbsg.com.au

Disclaimer

The contents of this report are for general information only and are not intended as professional advice, and Epic Energy make no representation, express or implied, as to the accuracy, reliability or completeness of the information contained in this report or as to the suitability of the information for any particular purpose. Use of or reliance upon the information contained in this report is at the sole risk of the user in all things and Epic Energy disclaim any responsibility for that use or reliance and any liability to the user.

Date:	Comment:	Issued by:
19/12/2024	Rev3 – Issued for Use	JBS&G - A.Nambiar

Table of Contents

List of Tables

List of Figures

List of Plates

List of Attachments

Executive Summary

Overview of Proposed Action

The Proposed Action (the Project) is the construction, operation and eventual decommissioning of the Whyalla Hydrogen Pipeline (WHP) by Epic Energy South Australia (Epic Energy).

The WHP is an underground pipeline and associated infrastructure for the storage and transportation of hydrogen produced at the Whyalla Hydrogen Facility, and direct supply connection to the Whyalla Hydrogen Facility. The Whyalla Hydrogen Facility is proposed to be constructed as part of the South Australian Government's Hydrogen Jobs Plan (HJP) initiative and is the subject of a separate referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC Ref: 2023/09759).

Project components and timing

The WHP comprises the following three key components:

- A compressor station at the Whyalla Hydrogen Facility (located 5.5 km north of Whyalla) to compress hydrogen for injection and withdrawal of hydrogen from the pipeline
- A buried and looped dual pipeline designed to store and transport hydrogen, approximately 45 km in length (22.5 km construction right-of-way length)
- A valve station located near Fitzgerald Bay Road, Port Bonython (near to where the pipeline will loop and return to the Whyalla Hydrogen Facility).

Construction and commissioning of the WHP is estimated to take 12 months, commencing in 2026.

Project location

The WHP alignment commences at the Whyalla Hydrogen Facility at 27022 Lincoln Hwy, Whyalla Barson, South Australia, and extends approximately 22.5 km to the east towards Port Bonython. It is located primarily within the City of Whyalla local government area, with a small section crossing into the unincorporated land managed by the Eyre Peninsula Landscape Board. The Barngarla people are the Traditional Owners of this region. Whilst the WHP alignment may be refined further during detailed design, it is expected to remain within the defined Project area .

Approvals process

A Significant Impact Assessment of the Proposed Action was conducted in accordance with the relevant EPBC Act Guidelines. It concluded that no significant impacts to Matters of National Environmental Significance (MNES) were anticipated as a result of WHP. For certainty, in May 2024, Epic Energy submitted a referral under the EPBC Act for the Proposed Action (EPBC Ref: 2024/09873). In July 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 in section 15B and 15C (National Heritage places), section 18 and 18A (listed threatened species and communities) and section 20 and 20 A (listed migratory species), and that the action would be assessed by Preliminary Documentation.

This Report provides the EPBC Act Preliminary Documentation for the WHP in response to the information as requested by DCCEEW dated 28 July 2024 (LET 306 v4.1).

Impact Assessment

The impact assessment identified the key sources of potential impacts to MNES are:

- The clearing of native vegetation (direct impact)
- Construction activities which may increase noise, dust, light, human and vehicle disturbance, introduction of pest species, erosion and sediment transport into adjacent and downstream habitats and spills of fuels or chemicals washing into downstream habitats (indirect impacts).

As indicated in the table below, the Proposed Action is expected to result in the temporary clearance of approximately 102.17 hectares of native vegetation, of which 102 hectares (or 99.84 percent) will be rehabilitated after the pipeline is constructed. In the long term, 0.16 hectares of the cleared vegetation will remain permanently cleared at the site of the valve station.

Total disturbance footprint – temporary V permanent vegetation clearance

Disturbance areas	TOTAL FOOTPRINT (ha)	TEMPORARY Construction footprint (ha)	PERMANENT Operational footprint (ha)	Proportion to be revegetated (%)
Existing disturbance	31.99			
New disturbance	102.17	102.01	0.16	99.84
Total	**134.17**			

A Threatened Species Management Plan for the Proposed Action has been drafted and provided in Attachment D.

Key Findings

Regarding listed threatened species and ecological communities:

- Siting and design for the Project has applied the mitigation hierarchy and sought to avoid and minimise clearance of fauna habitat to the greatest extent practicable
- Permanent loss of fauna habitat will be largely avoided by rehabilitating the disturbance footprint following construction
- Vegetation clearance:
    - may have a short-term, localised impact on an important population of the Western Grasswren but with no long-term impact on the population
    - will have a negligible short-term impact on the Southern Whiteface but with no long-term impact on the population
    - may have a negligible short-term impact on the Malleefowl but is not expected to have any long-term impact on the species
    - is only likely to affect local populations of fauna species and is unlikely to have broader regional impacts
    - will have minimal impact on other EPBC-listed fauna species
- There may be potential for Western Grasswren, Southern Whiteface and Malleefowl displaced by vegetation clearance to disperse into surrounding areas
- Disturbance to native fauna from Project noise is expected to affect a very small proportion of available habitat and impacts would be localised, short term and minor.
- Construction of the Project is not expected to result in an increase in the number or abundance of weeds, pathogens and predators on the Project Area

- Changes to surface water flows or quality from Project construction are unlikely to occur or to modify habitat for EPBC listed threatened species
- Dust from Project construction and operation is unlikely to materially affect habitat for EPBC listed threatened species

Regarding listed migratory species:

- There will be no direct impacts from the Project on these species
- Construction noise, dust, light, human and vehicle disturbance and potential for introduction of pest species are all not expected to adversely impact listed migratory waders in the adjacent False Bay
- Sedimentation from the Project area during construction and operation is unlikely to adversely impact habitat for listed migratory species
- No cumulative impacts on these species are expected.

Regarding National Heritage values:

- There will be no direct impacts from the Project on the Cuttlefish Coast Sanctuary Zone (CCSZ)
- There is no credible risk that noise from construction and operational activities could adversely affect cuttlefish within the CCSZ.
- There is no credible risk that spills of fuel or chemicals in the Project area could wash into the CCSZ and adversely impact cuttlefish
- There is a negligible risk that sediment from the Project area could adversely impact water quality within the CCSZ and therefore degrade its National Heritage values.
- No cumulative impacts on the CCSZ are expected.

Conclusions

Epic Energy has undertaken a rigorous and detailed assessment of the relevant MNES against the DCCEEW significant impact criteria and concludes the following:

- there is **negligible risk** of the Proposed Action impacting the CCSZ
- the Proposed Action is **not likely to result in a residual significant impact** to any EPBC-listed threatened species
- the Proposed Action is **not expected to have any residual impact**s on listed migratory species.

Based on the above conclusions, Epic Energy proposes that no offsets will be required for the Proposed Action under the EPBC Act.

1. Introduction

1.1 Overview of the Proposed Action

The Proposed Action is the construction and operation (and eventual decommissioning) of the Whyalla Hydrogen Pipeline (WHP) by Epic Energy South Australia Pty Ltd (Epic Energy).

The WHP is an underground pipeline and associated infrastructure (including compression facilities) for storage and transportation of hydrogen and direct supply connection servicing the Whyalla Hydrogen Facility. The Whyalla Hydrogen Facility is proposed to be constructed separately and operated by, or on behalf of, the South Australian Government as part of the Hydrogen Jobs Plan (HJP) (refer Section 2.10 for further detail).

Hydrogen produced by the Whyalla Hydrogen Facility's electrolysers would be compressed, injected into, stored under pressure and transported through the WHP. This stored hydrogen would be used to feed the hydrogen power station at the Whyalla Hydrogen Facility at times when the power station is delivering dispatchable power into the energy grid. Excess hydrogen produced at the HJP site would be stored in the WHP to be used to generate dispatchable power into the grid when required. Further information for design and engineering of the WHP is provided in Section 2.5.

The proposed alignment for the WHP (henceforth referred to as 'the pipeline alignment', 'the alignment' or the 'WHP alignment') runs from north of Whyalla to approximately 4.5 km north-west of Port Bonython. Although still subject to refinement during detailed design, the alignment will remain inside the current Project area described in Section 2.2 and shown in Figure 2-1. Land use and tenure for the WHP alignment is described in Section 3.1.

Epic Energy currently holds a Preliminary Survey Licence (PSL) granted under the former *Petroleum and Geothermal Energy Act 2000* (now the *Energy Resources Act 2000* (ER Act)). The PSL encompasses the alignment and authorises Epic Energy to undertake preliminary activities including land, environment and heritage surveys, geotechnical investigations (including core sampling and shallow test pits), and associated planning activities prior to applying for a Pipeline Licence under the transitional provisions of the ER Act.

1.2 Referral under the *Environment Protection and Biodiversity Conservation Act 1999*

In April 2024, a Significant Impact Assessment (SIA) of the WHP was completed in accordance with the Significant Impact Guidelines 1.1 (Matters of National Environmental Significance (MNES)). The SIA concluded that no significant impacts to listed threatened species or communities, or listed migratory species are anticipated as a result of the WHP.

In May 2024 Epic Energy submitted a referral (the Referral) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the WHP (EPBC Ref: 2024/09873). The Referral concluded no significant impacts on MNES were anticipated as a result of the WHP.

On 28 July 2024, the Department of Climate Change, Energy, the Environment and Water (DCCEEW) advised the WHP had been determined a Controlled Action under the EPBC Act and would be assessed by preliminary documentation. The controlling provisions listed in the decision notice were:

- Listed threatened species and communities (under Sections 18 and 18A)
- Listed migratory species (under Sections 20 and 20A)
- National Heritage Places (under Sections 15B ad 15C).

In October 2024, Epic Energy applied for a variation to the proposed action for the reasons described in Section 1.3. The variation was approved by the Minister for Environment on 19 November 2024.

1.2.1 Listed threatened species and communities

The SIA (2024b, Attachment C) identified that the following listed species could occur in the Project area but would not be significantly impacted by the WHP: Western Grasswren (*Amytornis textilis myall*), Southern Whiteface (*Aphelocephala leucopsis*), Malleefowl (*Leipoa ocellata*), Grey Falcon (*Falco hypoleucos*) and Blue-winged Parrot (*Neophema chrysostoma*). Based on the SIA findings, the Referral concluded that no significant impacts to listed threatened species or communities are anticipated as a result of the WHP.

In the decision notice, DCCEEW requested the Preliminary Documentation include further information on Western Grasswren and Southern Whiteface, with regard to both the existing condition of these species, and the potential impact of the WHP on these species.

1.2.2 Listed migratory species

The SIA determined that several shorebird species have the potential to occur adjacent to the Project disturbance area, but there will be no direct impacts on these areas. It further concluded that any potential indirect impacts on these species would not be significant. In summary, the SIA and the Referral concluded that no significant impacts to listed migratory species are anticipated as a result of the WHP.

DCCEEW requested the Preliminary Documentation include further information on potential indirect impacts on migratory shorebird habitat adjacent to the Project area via sedimentation of surface waters as well as noise and visual disturbance.

1.2.3 National heritage places

The Referral concluded that there would be no direct impacts to the Cuttlefish Coast Sanctuary Zone (CCSZ) (which is a listed National Heritage Place) due to the large separation distance between it and the Project disturbance area. It further concluded that any indirect impacts on the CCSZ via surface water sedimentation during construction of the WHP was not likely, and would not result in a significant impact on the CCSZ.

DCCEEW requested the Preliminary Documentation include further information regarding the potential indirect impacts on the national heritage-listed CCSZ, via sedimentation of surface waters.

1.3 Variation of Proposed Action

After submission of the Referral in May 2024, ongoing stakeholder negotiations and detailed engineering design processes required several sections of the pipeline alignment to be altered. DCCEEW were informed of these changes via a formal request for variation of the Proposed Action, which was granted approval on 19 November 2024. In summary, these changes were:

- re-alignment to avoid areas of Aboriginal cultural heritage significance identified during a formal cultural heritage survey undertaken by representatives of the Barngarla Determination Aboriginal Corporation (BDAC) on 31 May 2024
- redirection of the last 3 km of the easternmost section to avoid crossing an ephemeral drainage line that connects to the coast near the Cuttlefish Coast Sanctuary Zone.
- addition of 1.1 km to the alignment length (equating to 2.2 km of looped pipeline) to accommodate an increase in pipeline wall thickness based on fatigue analysis completed during detailed engineering.

As a conservative approach was taken in defining the disturbance footprint of the Proposed Action in the Referral, the variation has resulted in minimal changes to the total disturbance footprint.

In summary, the variation has resulted in a revised pipeline alignment that now avoids the ephemeral drainage line that discharged into the CCSZ, and that is located in vegetation representative of the lowest quality habitat for threatened species such as Western Grasswren, as far as practicable.

No feasible alternative alignment exists that would result in a materially lower environmental impact.

1.4 Purpose of this Report

This report provides the EPBC Act Preliminary Documentation for the WHP in response to the information requested by DCCEEW in its letter dated 28 July 2024 (EPBC 2024/09873), and having regard to the Proposed Action variation, approved in November 2024. The specific content of the additional information requested by DCCEEW, and where it has been addressed in this Preliminary Documentation report, is provided in Attachment A.

2. Description of the Proposed Action

As noted in Section 1.1, the Proposed Action (also referred to as 'the Project' and 'the WHP') is the construction, operation and eventual decommissioning of the WHP by Epic Energy.

2.1 Key Components

The WHP comprises the following key components:

- A compressor station at the Whyalla Hydrogen Facility to compress the hydrogen for injection and withdrawal of hydrogen from the pipeline
- A buried and looped pipeline designed to store and transport hydrogen (nominally 900 mm diameter), approximately 45 km in length (approximately 22.5 km right-of-way length)
- A valve station located near Fitzgerald Bay Road, Port Bonython (near to where the pipeline will loop and return to the Whyalla Hydrogen Facility).

2.2 Location

The following spatial definitions apply to the location, boundaries and areas of the Proposed Action:

WHP alignment: a linear dual pipeline approximately 45 km in length which loops around and parallels itself such that the total length is approximately 22.5 km (refer to Figure 2-1)

Project area: 1,509 ha area of land that encompasses the proposed WHP alignment and all potential variations that could occur during final route selection and detailed design (refer to Figure 2-1)

Preliminary Survey Licence (PSL) area:7,232 ha of land subject to the PSL held by Epic Energy under the ER Act, permitting field-based investigations for the proposed action (refer to Figure 2-1).

The WHP alignment commences at the Whyalla Hydrogen Facility at 27022 Lincoln Hwy, Whyalla Barson, then extends a further 22.5 km to the east towards Port Bonython, as illustrated in Figure 2-1.

The proposed WHP is situated predominantly within the City of Whyalla local government area, with a short section in the unincorporated areas Whyalla (i.e. land not within a council area) and is within the region overseen by the Eyre Peninsula Landscape Board. The Barngarla people have been recognised as the Traditional Owners of this region.

The proposed pipeline route aligns with existing infrastructure corridors (including roads, tracks, rail and pipeline alignments) for the majority of its length. From its commencement at the Whyalla Hydrogen Facility, it crosses Lincoln Highway and the adjacent rail line, then parallels the rail line and highway northwards for approximately 2 km. It then heads generally eastwards for approximately 3 km, parallel to, and adjacent to the northern boundary of the proposed Cultana Solar Farm (remaining south of the proposed Yoorndoo Ilga Solar project), then bears north-east for approximately 3.5 km through the Cultana Industrial Estate to Point Lowly Road, where it crosses to the north side of the road. The alignment then heads in a generally south-easterly direction along the north side of Point Lowly Road and parallel to the existing Santos Moomba to Port Bonython liquids pipeline for about 11 km before heading in an easterly direction along the north side of Fitzgerald Bay Road. It loops back around at a location which is approximately 4.5 km north-west of Port Bonython.

The WHP alignment is indicative at this stage of development, with the final alignment subject to detailed engineering design and further refinement in some sections as consultation with affected landowners progresses.

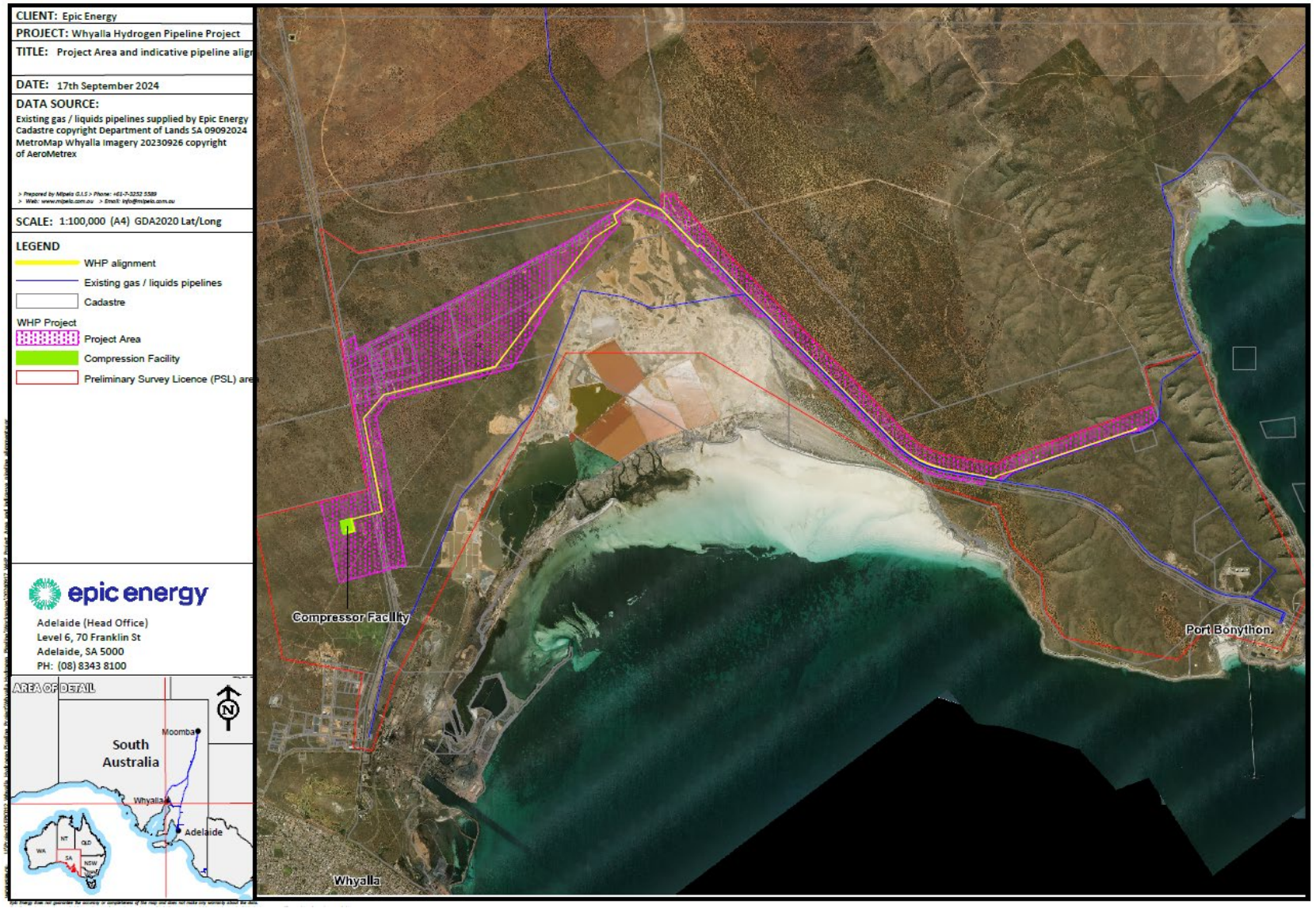

Figure 2-1: Project area and indicative pipeline alignment

2.3 Disturbance Footprint

The construction phase (temporary) disturbance footprint is approximately 134 ha, which includes 32 ha of existing disturbance area and 102 ha of new disturbance area (refer to Figure 2-2 and Figure 2-3 and Attachment G). The operational phase (permanent) disturbance footprint is approximately 0.16 ha at the location of the mainline valve (MLV) station (refer to Inset 1 in Figure 2-3) .

Consequently, approximately 102 ha of native vegetation will be cleared then rehabilitated following construction, and 0.16 ha will remain permanently cleared (refer to Inset 1 in Figure 2-3). Therefore, 99.84% of vegetation cleared for the Proposed Action will be rehabilitated after completion of construction. A series of larger scale maps showing the disturbance footprint along the entirety of the proposed WHP alignment is provided in Attachment G.

Table 2-1: Total disturbance footprint – temporary V permanent

Disturbance areas	TOTAL FOOTPRINT (ha)	TEMPORARY Construction footprint (ha)	PERMANENT Operational footprint (ha)	Proportion to be revegetated (%)
Existing disturbance	31.99			
New disturbance	102.17	102.01	0.16	99.84
Total	**134.17**			

The WHP disturbance footprint has been refined and minimised through rigorous ecological assessment and careful planning. It incorporates existing roads and access tracks and other existing disturbed areas such as borrow pits as far as possible. No permanent roads or access tracks will be constructed.

The total disturbance footprint of the Proposed Action per vegetation community is presented in Table 2-2. This indicates the majority of new (temporary) vegetation clearance will occur in Acacia Woodlands (34 ha), Mallee (26 ha) and Chenopod shrubland (38 ha). Of this, only 0.16 ha of vegetation will not be rehabilitated post construction.

Table 2-2: Total Disturbance Footprint - per vegetation community

Broad Vegetation Group	Broad Vegetation Community	Existing Disturbance (ha)	New Disturbance (ha)	Total Disturbance (ha)
Chenopod Shrubland	1. Chenopod / Samphire Low Open Shrubland on plains	3.99	15.06	19.04
	2. Chenopod Open Shrublands +/- Emergent Trees (e.g. False Sandalwood)	0.01	0	0.02
	4. Low Open Chenopod Shrublands	4.24	23.09	27.32
Acacia Woodlands (+/- Black Oak/False Sandalwood/ Bullock Bush)	5. Low open woodlands of Western Myall +/- False Sandalwood over Chenopods	0	0	0
	6. Low open woodlands of Western Myall over Chenopods	1.63	6.79	8.42

Broad Vegetation Group	Broad Vegetation Community	Existing Disturbance (ha)	New Disturbance (ha)	Total Disturbance (ha)
	7. Low open woodlands of Western Myall +/- Black Oak over Chenopods	4.19	11.01	15.2
	13. Western Myall low open woodlands +/- Black Oak/Bullock Bush/False Sandalwood	10.49	16	26.49
Mallee	8. Mallee with an open sclerophyll shrub over Chenopods on sand plains/ low dunes over calcareous loams	6.07	25.58	31.65
Samphire/Saltmarsh	12. Samphire +/- Chenopod shrublands with infrequent inundation/saline soils	0.52	2.8	3.32
Mixed Shrubland	3. Mixed shrublands in ephemeral drainage lines	0.31	1.44	1.75
Coastal Shrubland	11. Coastal tall shrubland	0.41	0.44	0.85
	Total	**31.99**	**102.17**	**134.17**
	Permanent Disturbance		**0.16**	

2.4 Project Timing

The South Australian Government has set an operational date in 2026 for the Whyalla Hydrogen Facility. The WHP will be required to be commissioned and in operation in line with the operations date for that facility.

It is anticipated that the WHP will take approximately 12 months to construct and commission. The schedule is dependent upon the timing of all required regulatory approvals.

The design life of the pipeline has not been finalised but is expected to be in the order of 40 years.

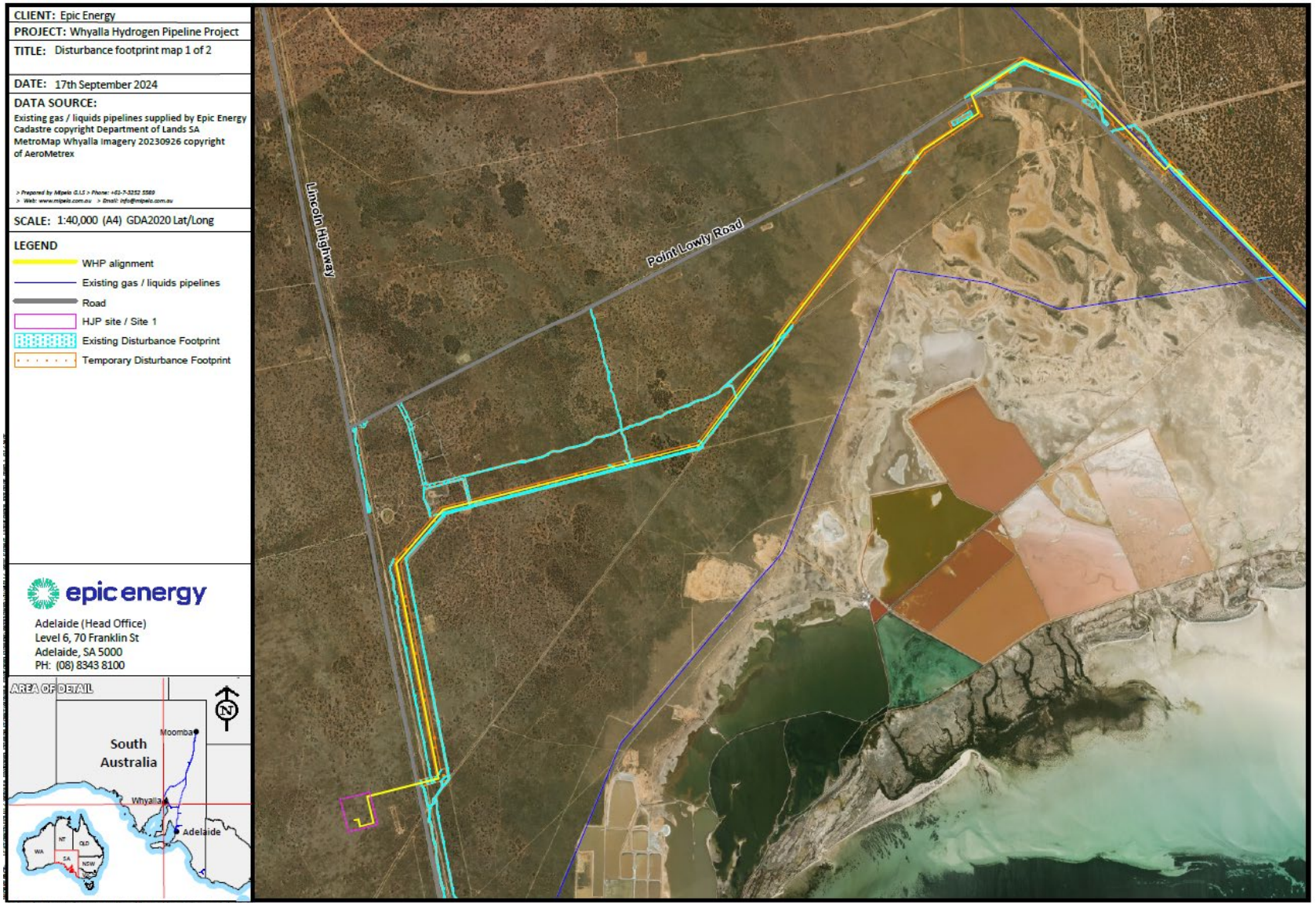

Figure 2-2: Disturbance footprint of the WHP (Part A)

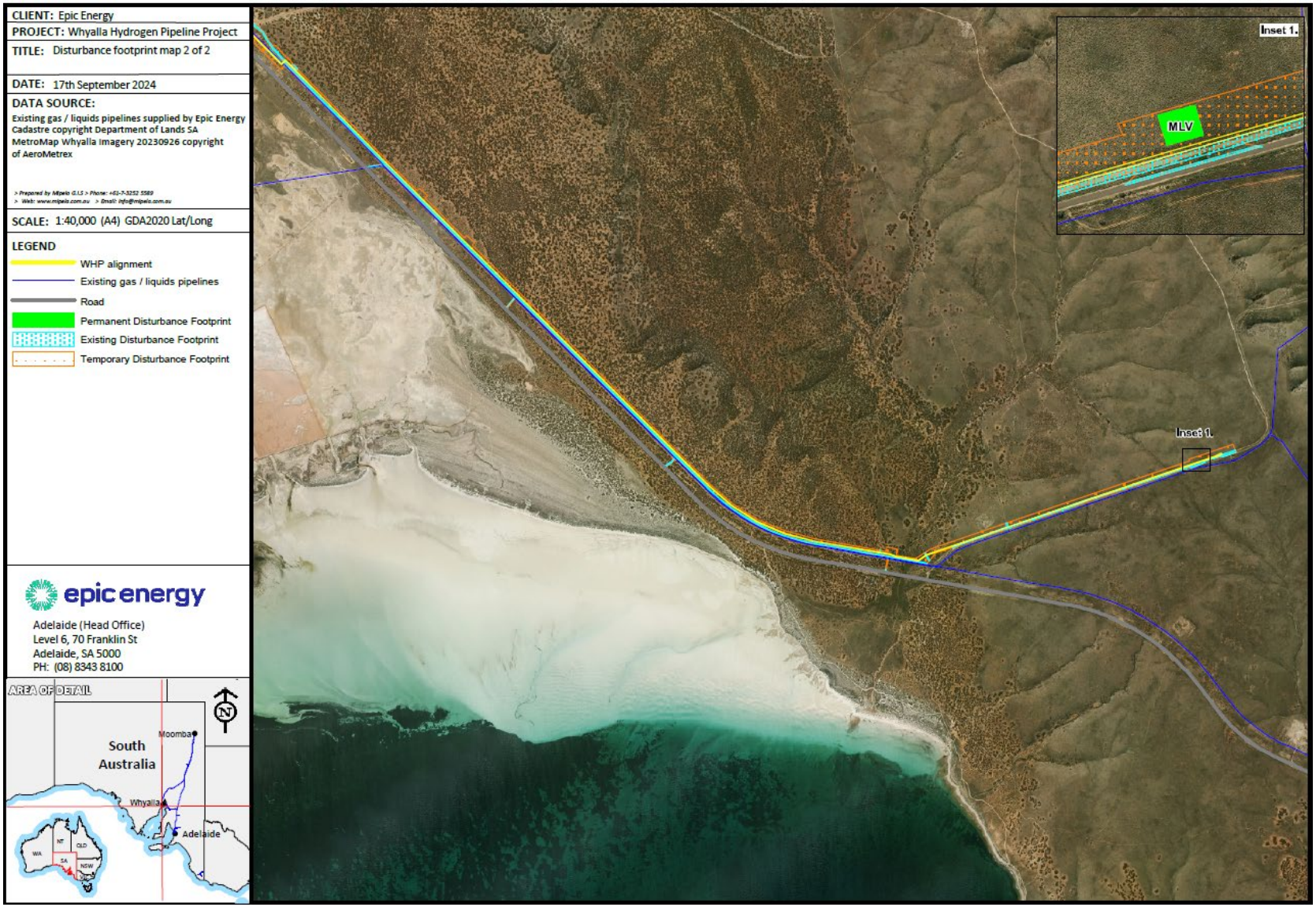

Figure 2-3: Disturbance footprint of the WHP (Part B)

2.5 Design and Engineering

The pipeline will be designed in accordance with the requirements of Australian Standard AS 2885, however, as the pipeline will be carrying hydrogen, the relevant requirements of the *Hydrogen Pipeline Systems Design, Construction and Operation: A Code of Practice for the Australian Pipeline Industry* (June 2024) (FF CRC, 2024) will also be incorporated, where appropriate, into the design of the pipeline.

The WHP has been designed to provide storage of 100 tonnes of hydrogen for the Whyalla Hydrogen Facility and to allow potential future hydrogen offtake to third-party users.

Key engineering and design features are provided in Table 2-3.

Table 2-3: Key engineering and design features

Design element	Details
Length	Approximately 45 km total (i.e. 22.5 km for each of the looped pipeline segments)
Pipeline easement	25-30 metres post construction (fully reinstated)
Diameter (nominal)	DN900 (i.e. 900 mm)
Separation between dual pipes	5 to 10 m
Wall thickness	27 mm
Pipe specification	API 5L X52 PSL2
Factory coating / field joint coating	DLFBE/HBE (dual layer fusion bond epoxy / high build epoxy)
Pipeline content	Hydrogen gas
Operational pressure (min / max)	1.5 / 6.5 MPa
Maximum Allowable Operating Pressure	6.5 MPag
Design flow rate	Filling: 5000 kgH2/hr Discharging: ~15,840 kgH2/hr
Nominal storage capacity	100 tonnes
Minimum depth of cover	In accordance with AS 2885:1, typically: • Location class R1 / R2 – 750 mm • Location class T1, HI – 900 mm • Road and track Crossings (sealed and unsealed) – 1200 mm • Major road crossings (bored) – 1500 mm • Rail crossings – 2000 mm • Watercourses– 1500 mm
Corrosion protection	Impressed current cathodic protection system
Non-destructive testing	100% radiography or ultrasonic testing of welded joints.
Hydrostatic pressure testing	Mainline test – 20.4 MPa (96% SMYS) Pipeline assemblies – 15.3 Mpa (1.5 x mechanical design pressure of 10.2 MPa) A leak test will be completed following the strength test.
Buried marker tapes	Installed above pipeline.

Design element	Details
Pipeline monitoring system	A supervisory control and data acquisition (SCADA) system for remote monitoring and control of all facilities along the pipeline.

A brief description of the pipeline facilities and associated infrastructure is provided in Table 2-4. The facilities will be designed in accordance with all relevant legislation and standards.

Table 2-4: Indicative pipeline facilities and infrastructure

Design element	Details
Compression facilities	Major components of the compressor station include 3x 33% electric drive reciprocating packages (with an allowance for potential future expansion to four packages) , gas filters to remove particulates, gas pressure regulation skids, air cooled heat exchanges, instrument air package, nitrogen generation package, a flare or cold vent, a HV transformer compound, lube oil storage, safety showers, a control room housing the automated control system and motors office, amenities, carpark and a workshop. The station is designed to be operated from the Pipeline Control Room at Epic Energy located at 70 Franklin Street Adelaide SA and would be visited regularly for maintenance and instrument calibration.
Metering and valve facilities	A mainline valve compound will be constructed at the far eastern end of the pipeline easement near Port Bonython.
Cathodic protection system	A cathodic protection system will be incorporated into the pipeline design to protect the pipeline from external corrosion in conjunction with the external corrosion coating. This involves the use of impressed current CP system located at the Whyalla Hydrogen Facility connected to the buried pipeline via cabling and electrically isolated from the above ground piping using monolithic isolation joints. In addition, cathodic protection test posts will be located approximately every 2 km. Test posts are required to allow for monitoring of the effectiveness of the cathodic protection system.
SCADA system	A SCADA system for remote monitoring and control of all facilities along the pipeline will be installed comprising of Remote Telemetry Units connected to the Epic Energy's Transportation Services Control Centre via Satellite Communication.
Pipeline markers	Pipeline marker signs will be located at intervals along the pipeline easement in accordance with AS 2885:1 so that a person can clearly see a marker sign in either direction. These marker signs will be placed closer at bends, on either side of road and watercourse crossings and at fence lines.

An indicative layout of the compression facilities is shown in Figure 2-4 (note that this layout is subject to revision in detailed design).

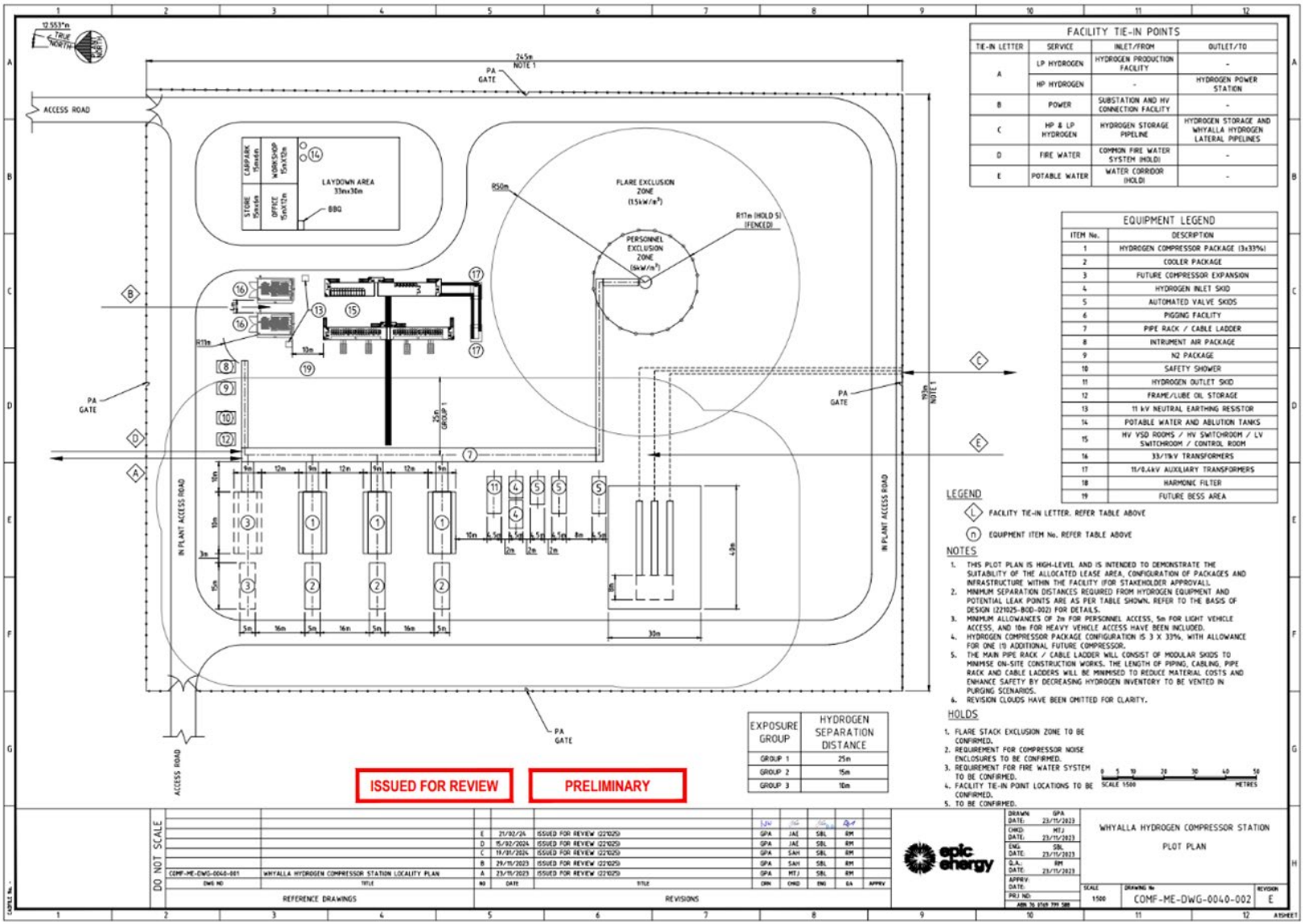

Figure 2-4: Indicative layout of compression facilities

2.6 Pipeline Construction

The pipeline will be sequentially constructed in accordance with the requirements of AS 2885 and in accordance with any conditions incorporated into the pipeline licence.

The pipeline will be buried effectively for its entire length and will generally involve trenched construction.

It is anticipated that construction of the looped pipeline will be undertaken by constructing each run of pipeline separately following the methods set out below. The first run of pipeline will be completed in a sequential manner (unless otherwise required by landowners) before the second run of pipeline (return loop) is constructed approximately 5-10 m from the first. This will minimise the construction footprint by enabling crews to use the disturbance area created during the first run for stockpiling topsoil when constructing the second run.

2.6.1 Construction activities

Pipeline construction activities and sequencing will follow standard industry practices and are described in this section. The key construction elements are listed in Table 2-5 and a typical pipeline construction layout is presented in Figure 2-5. These elements may change depending on detailed engineering design and any conditions set out in the pipeline licence to be issued under the ER Act.

Construction is expected to be undertaken by a series of specialised crews (e.g. clear and grade, stringing, bending, welding and non-destructive testing, coating, lowering-in, backfill, reinstatement) that sequentially move along the alignment.

[redacted]

Table 2-5: Key construction elements

Construction right-of-way width	45 – 50 metres with potential to pinch to 30 metres in short sections of greater sensitivity
Construction workforce	Peak workforce of approximately 520 people (inclusive of workforce for both pipeline and compressor facility construction activities)
Standard construction hours	0600-1800, 7 days/week
Construction duration	Approximately 12 months
Length of open trench	No limit – target 6km subject to ground conditions
Expected time between clear and grade and restoration	Approx. 6 months

2.6.1.1 Survey

Detailed engineering, environmental and cultural heritage surveys have been used to inform route selection and to determine where special construction techniques or mitigation measures will be required.

The centreline of the pipeline route will be surveyed and engineering aspects finalised. Markers (pegs) will be placed along the entire route to identify the pipeline route and right-of-way.

A survey crew will carefully survey and stake the construction right-of-way to ensure only the pre-approved construction workspace is cleared. All potentially impacted utilities will be identified and marked to prevent damage during construction. Areas of environmental or cultural heritage sensitivity that are not to be disturbed will be clearly demarcated from the work area by the use of signage and/or fencing.

2.6.1.2 Equipment laydown yard, plant yard and offices / carpark

During construction of the pipeline, a temporary area of approximately 9 ha or less will be required to house the equipment laydown yard, plant yard and offices / carpark areas.

The equipment laydown yard will be centrally located, with good access to transport links and away from flood prone areas. It will be used to store pipe (approximately 2,500 pipes, 18m long), induction bends, valves, facilities fittings, piping, spools, electrical and instrumentation materials and will contain site offices, sheds, kitchen and ablution blocks with generators. It is expected that the yard would be in an existing disturbed area, in reasonable proximity to the pipeline alignment.

The plant yard will be used for inspection, certification, storage, maintenance and repair of mechanical equipment such as excavators, sidebooms, graders, welding equipment, trucks and other plant and equipment required for construction, containers for storage of materials, parts, goods and a store for distribution of these to the crews, a diesel tank for vehicles and fuel trucks, sheds and ablution blocks (likely shared with pipe yard if it is adjacent).

The offices and carpark area will house temporary units of 12x12 m, 12x6 m and 6x3 m (for offices, meeting rooms, kitchen and ablution blocks), generators and parking spaces for light vehicles to access offices.

2.6.1.3 Clear and grade

To make the construction right-of-way a suitable work area, a clearing and grading crew will prepare the route so that construction equipment can operate safely. The clearing crew will remove trees, shrubs, boulders and other impediments that may prohibit construction. Cleared vegetation will be stockpiled on the edge of the construction right-of-way for re-spread during reinstatement.

The grading crew will prepare a working surface for the construction workers and equipment that will follow.

Topsoil will be stripped to a pre-determined depth (typically 100 mm) and stockpiled along the sides of the construction right-of-way to be returned to its original state. The stripping and stockpiling of the topsoil (and embedded seed stock) provide a ‘sterile’ work surface which is important in preventing the spread of weeds.

A surveyor will mark out the pipe centreline using pegs as well as any changes in design requirements such as depth of cover and wall thickness.

The construction right-of-way is expected to be consistent with the widths outlined in Table 2-5, however additional workspace may be required in certain areas such as road, rail and other crossings.

2.6.1.4 Pipe stringing, welding and field joint coating

Stringing

Once the construction right-of-way has been sufficiently cleared to allow access of construction equipment, sections of pipe will be laid out along the right-of-way. This process is called 'stringing' the pipe (refer to Plate 2-1).

The pipes will be transported on trucks from the pipe mill to the pipe storage yard or directly to the right-of-way. Once at the right-of-way, the pipe will be lifted off the truck and placed on skid and sawdust bags to protect the pipe coating. The stringing crew will carefully distribute the various pipe sections along the right-of-way according to the design plan.

Plate 2-1: Example of pipe stringing

Bending

Pipe bends can be performed in the field or fabricated offsite. Using a series of clamps and hydraulic pressure, a bending machine makes field-formed controlled bends in individual sections of the pipe. This allows the pipe to follow the pipeline route and to conform to the topography. All bending must be performed in strict accordance with a qualified procedure to ensure integrity of the pipe.

Welding and non-destructive testing

To carry out the welding process, each pipe will be temporarily supported and ‘stabbed’ on to the preceding pipe section. The joint must be clamped, aligned and welded together to form one continuous string length, which may be up to 1 km in length. This is accomplished using manual or mechanised welding procedures. All welding procedures must be qualified, and the welding of the pipe controlled to strict specifications. Each weld procedure must be approved by a Welding Engineer for use on the Project.

Sidebooms will be used to pick up, support, and align each section of pipe with the next section to make the first pass of each weld.

Each welder must pass qualification tests prior to welding on a pipeline project. Typically, each welder must successfully complete test welds using the same process of pipe welding to be used in the Project. The welds are then evaluated by visual inspection, destructive testing, and non-destructive testing (NDT).

Weld quality will be monitored throughout the Project. To do this, qualified technicians will use NDT methods (radiographs (X-rays) or ultrasound) to inspect the pipe welds to ensure completed welds meet mandated quality standards. After evaluating the radiograph or ultrasonic images, the

technicians will interpret the NDT results to identify any defects and will either be repaired and re-inspected or removed entirely.

A number of production welds (typically 3 for the Project) will be randomly selected for cut out and undergo full destructive testing to ensure required metallurgical and mechanical properties are being maintained.

Field joint coating

While a factory coating is applied to the pipe during manufacturing, the ends of the pipe will remain uncoated to allow for welding. After the ends are welded together the uncoated portion of pipe will be thoroughly cleaned to remove any dirt and debris and a coating applied to the weld joint to prevent corrosion. Several different types of coatings may be used to coat field welds, such as high build epoxy. After application, the coating will be cured as per manufacturer's specifications and inspected to ensure it is free from defects before being lowered into the ground.

2.6.1.5 Trenching

A trench will be dug along the right-of-way to the surveyor's specifications using specialised trenching machines and excavators (refer to Plate 2-2). Two trenches will be dug running parallel to each other to accommodate the two looped pipeline sections; however it is anticipated that only one trench will be dug at a time.

Trenching is usually performed after pipe string fabrication (welding, NDT and joint coating) is completed, but may be performed ahead of these activities if drilling and blasting are required to clear rock obstructions in a controlled manner. Trench spoil will be stockpiled (windrowed) adjacent to the trench on the opposite side to the welded pipe string, keeping trench spoil segregated from stripped topsoil.

The trenches will be dug deep enough to allow adequate cover of the buried pipe (in accordance with the requirements of AS 2885) and wide enough to avoid coating damage during lowering-in operations. The trench is expected to be approximately 1100 mm wide and range in depth from 1650-2100 mm to facilitate installation of the pipeline and achieve the minimum design depth of cover (measured from the top of the pipe). Pipeline depth is expected to vary depending on surrounding features (refer Table 2-3). In other locations, such as where consolidated rock is present, the pipeline may be installed in a shallower trench.

Plate 2-2: Example of pipeline trenching

The time between the trench being opened and lowering-in will be minimised to prevent trench collapse and reduce the likelihood of fauna entering the trench. However, sufficient trench is needed

to be opened ahead of the lowering-in crew to avoid impeding progress of the subsequent crews in the pipeline construction operation. This may be as much as 6 km (or up to 10 days) depending on trenching progress.

Bellholes (enlarged areas of trench) would need to be excavated at the start and end of each string to enable tie-ins of adjacent pipe strings after being installed in the trench.

Figure 2-5 sets out how each pipeline run will be constructed for the Project. The second pipeline run will be constructed in a similar fashion, parallel to the first with a separation distance of approximately 5-10 m.

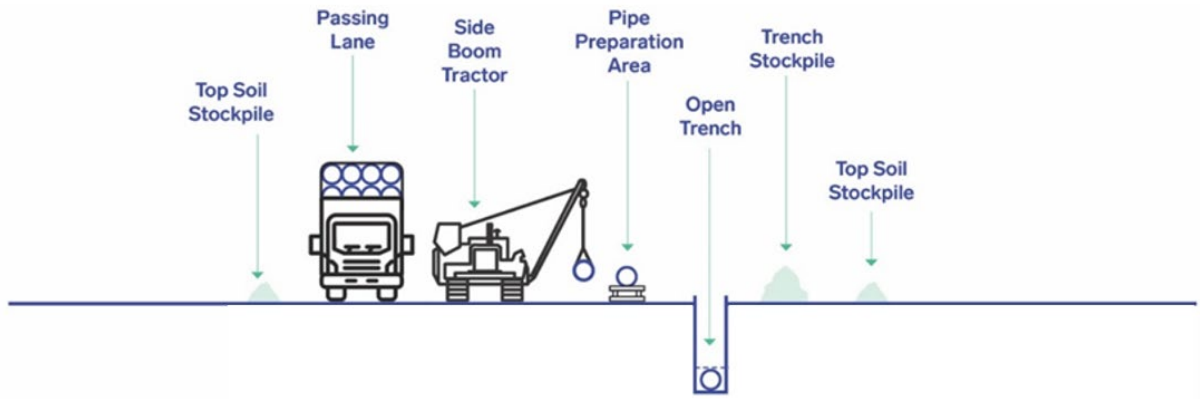

Figure 2-5: Typical layout for construction of a pipeline

2.6.1.6 Padding and Lowering-in

Prior to lowering-in of the pipeline string, the trench bed will be prepared by 'bedding' with a layer of material conforming to maximum particle size and distribution specification. This is usually achieved by screening the excavated trench spoil through a nominated screen size by use of a padding machine. Alternatively, imported sand or similar material conforming to specification can be used.

Once the trench is prepared, the pipeline string will be lowered into the trench in a smooth and uniform manner to prevent overstressing and damaging the pipeline, using sidebooms and excavators / cranes (refer to Plate 2-3).

The pipeline and coating will be protected from damage by 'padding' the pipeline with material similar to the bedding material referred to above, to a thickness of 300 mm above the top of the pipe. The remaining backfill material will be placed into the trench and compacted in layers. If large rocks (more than 300 mm diameter) are present in the backfill material, these will be separated and either re-placed on the surface of the trench, used for erosion control (e.g. rock beaching) or disposed of.

Plate 2-3: Example of pipeline lowering-in

2.6.1.7 Setting up work areas

The construction process may provide for the following activities to establish work areas:

- new access tracks as well as access upgrades
- establishment of groundwater monitoring bores, turkey nests and related infrastructure along the pipeline route, including a hydrotesting dam for construction and commissioning water
- establishment of equipment laydown yard, plant yard and offices / carpark areas to support construction activities
- pre-construction survey including survey control stations
- pipe stockpile
- temporary fencing.

These activities will be pre-agreed with landowners and will enable the timely mobilisation of pipeline construction personnel, equipment, and materials, while minimising impacts to landowner operations. These areas are integral to pipeline construction and will help ensure it is installed in the shortest period possible and in a safe and environmentally sound manner.

2.6.1.8 Backfilling

Stockpiled trench spoil excavated during trenching will be returned to the trench and compacted following the lowering-in of the pipe. Special care will be taken to ensure that excavated spoil and soil profiles are re-established to avoid soil inversion.

After the trench is fully backfilled and compacted, the subsoil contours will be reinstated, compacted areas de-compacted by ripping, and topsoil pulled back over the stripped area. This will ensure the topsoil is returned to its original position.

The time between lowering-in and backfilling will be minimised to reduce the likelihood of fauna entering the trench.

2.6.1.9 Pipe cleaning

Prior to hydrostatic testing, the pipeline will be cleaned with foam and/or brush pigs to remove weld debris, dust and surface scale.

2.6.1.10 Hydrostatic testing

Pipeline integrity will be verified using hydrostatic testing (hydrotesting) in accordance with AS 2885.5

All newly constructed hazardous liquid and gas transmission pipelines must be pressure tested (strength test and leak test) before they can be placed into service. The purpose of a strength pressure test is to find any defect that might threaten the pipeline's ability to sustain its designed maximum operating pressure. The purpose of the leak pressure test is to confirm integrity of the pipeline and identify and repair any defects detected before the pipe is placed into service.

To complete hydrostatic pressure testing, the pipeline will be filled with water and the internal pressure raised to a specified level above the intended maximum operating pressure. If there are any critical defects in the pipe, they will most likely fail during pressure testing. If the pipe does fail, these defects will be repaired, or cut out, and the pressure test repeated to establish the maximum operating pressure of the pipeline.

Potable water is preferred for hydrotesting, but non-potable hydrotest water may be treated prior to testing with chemicals such as biocide, oxygen scavengers and corrosion inhibitors (depending on factors such as the water quality of test water and the length of pipe tested). If the hydrotest water meets water quality guidelines and has landholder approval, it may be discharged to the surrounding land (away from watercourses or areas where it could impact surface water). Alternatively, it may be contained and treated on site or removed off site. A lined and fenced 'turkey nest' dam approximately 150 m x 150 m may be constructed on the Whyalla Hydrogen Facility site to hold water for hydrotesting.

Following successful strength and leak pressure tests, the pipeline will be dewatered, cleaned and dried.

2.6.1.11 Reinstatement, clean-up, and rehabilitation

Commencement of rehabilitation of the construction right-of-way will follow closely behind the mainline backfill of the second pipeline run, with strict adherence to all relevant regulatory requirements. The primary objective of rehabilitation works will be to restore disturbed areas to resemble their pre-clearance condition to the extent feasible.

Rehabilitation of the construction right-of-way will include the following steps:

- Stockpiled topsoil will be respread over the stripped area (as described in ‘Backfilling’ above)
- Surface drainage lines and other land features will be re-established
- Soils will be ripped in areas to relieve compaction (if applicable) and cleared vegetative material (e.g. shrubs and tree branches) reinstated along the construction right-of-way
- Natural regeneration will be allowed to occur within the disturbed areas to facilitate indigenous species regeneration and soil stabilisation
- Additional seeding will be undertaken using selected local species that match the vegetation communities traversed. Seed species selection will favour, where feasible, vulnerable fauna such as Western Grasswren, Southern Whiteface and Malleefowl.

In addition to the ecological rehabilitation works described, pipeline marker signs will be installed to identify the pipeline location (refer to Plate 3 4), crossovers, access tracks, temporary gates and fences

will be removed and reinstated to original condition or in accordance with requirements of the relevant landowner.

Plate 2-4: Example of rehabilitated right-of-way and marker post 12-18 months post construction (Epic Energy QSN3 pipeline)

Post-rehabilitation, a direct current voltage gradient (DCVG) survey will be conducted to verify the coating integrity of the pipeline. Subsequent inspections of the pipeline will be conducted to monitor the effectiveness of the rehabilitation activities detailed in the Project Construction Environmental Management Plan (CEMP).

Regular inspections will be scheduled both during and after construction to detect any signs of trench subsidence, with erosion and sediment control measures maintained as necessary.

Upon completion of all rehabilitation activities, access to the pipeline will be restricted to essential maintenance tasks only to ensure successful re-establishment of ground cover.

2.6.1.12 Waste Management

- Waste management controls and procedures will be detailed in the CEMP and Operations Environmental Management Plan (OEMP), and are likely to include the following:

- Waste disposal records and chemical manifests will be maintained.
- Waste spoil from trenching will be re-used on site, or disposed to a licensed facility.
- Acid sulfate soils, contaminated soils and wastewaters will be managed as described in Section 2.6.2.2 and Section 2.6.2.3.
- Waste will be promptly removed from work areas on the right of way, segregated and stored in a designated area, pending recovery, recycling or disposal with regard to the Environment Protection Authority (EPA) SA Waste Hierarchy:
- Wastes will be segregated appropriately and transported to an EPA licensed facility for recycling or disposal:
    - General waste (municipal solid waste) will be collected in dedicated and covered bins on site, and transported offsite for disposal at a licensed facility. The volumes of waste

generated during construction are generally small, and efforts will be made to reduce, re-use and recycle materials where possible.

- Putrescible waste will be collected in lidded bins and regularly collected for offsite disposal, to avoid an increase in, or attraction of, feral pest animals to the Project area.
- Any controlled wastes will be managed in accordance with the *National Environment Protection (Movement of Controlled Wastes between States and Territories) Measure 199*8).

2.6.2 Soil erosion, contaminated soil and acid sulfate soil management

Mitigation measures will be required to minimise potential impacts of soil erosion, sedimentation, and disturbance of contaminated soil or acid sulfate soils during construction. Such measures will be implemented via the CEMP or the OEMP.

In the pre-construction phase, planning and assessment will be conducted to identify constraints and areas requiring special management, such as those with acid sulfate soils, erodible soils, contamination, or steep banks, with efforts to avoid these areas where practicable. During operations, the easement will be routinely inspected, particularly after heavy or prolonged rainfall, to ensure erosion and sediment control structures remain intact and to address any recurring erosion or subsidence issues.

2.6.2.1 Soil erosion and sedimentation

To minimise sediment transport off the construction right of way, the following mitigation measures will be implemented, as approparite:

- limit ground disturbance and vegetation clearing to the minimum extent necessary for safe pipeline construction
- during periods of heavy rainfall, suspend all activities likely to result in erosion and sedimentation if their effects cannot be adequately controlled and they may result in pollution of the environment
- install and maintain erosion and sediment control structures in accordance with the CEMP
- limit the period between clear-and-grade and restoration to the minimum practicable
- compact the trench to a level consistent with surrounding soils
- promote rapid restoration by conserving and re-spreading topsoil and ripping / scarifying compacted areas where necessary to facilitate vegetation growth.
- implement appropriate physical and biological stabilisation and site rehabilitation measures in accordance with the CEMP
- ensure that windrows or changes in the level between the right-of-way and adjacent land are removed during reinstatement to prevent water channelling along the right-of-way
- leave periodic breaks in any crown left over the trench, to prevent channelling of run-off along the right-of-way.

The following industry-standard erosion and sediment controls will be implemented along the right of way, where appropriate:

- temporary geotextile fencing installed in susceptible areas (e.g. ephemeral drainage lines, along slopes) to filter runoff and intercept sediment
- sediment basins to capture and settle sediment before water is discharged

- water spraying to control dust during high winds
- hay bales or straw wattles placed along contours to slow runoff and trap sediment
- soil or rock berms to divert or contain runoff on slopes
- biodegradable mats to stabilize soil and promote vegetation growth
- re-seeding with selected local species along the construction right of way, to stabilise soil and reduce erosion post construction (Section 2.6.1.11 and Section 4.3.2.2 provide further detail on site rehabilitation and re-seeding).

Erosion and sediment controls will remain in place and be regularly inspected during and post-construction, and after significant rainfall events, until revegetation stabilises the construction right of way.

Refer to Section 4.3.3.5 for further detail on the sediment controls to be used during trenching and pipeline installation at watercourses.

2.6.2.2 Acid Sulfate Soil

There are no areas of potential acid sulfate soils (PASS) mapped on the alignment (DEW, NatureMaps, 2024) (CSIRO, 2024) and the alignment is mapped as 'extremely low probability of occurrence' for acid sulfate soils (ASS) (CSIRO, 2024). Therefore, the potential occurrence of ASS along the pipeline alignment is considered to be very low.

If geotechnical investigations identify ASS, detailed engineering design can ensure that the pipeline is appropriately designed for soil conditions. An appropriate construction methodology would also be developed to manage excavated ASS material and prevent any impacts (e.g. storage in a lined area, lime dosing and minimisation of exposure to oxygen prior to replacement in the trench).

The CEMP will detail the procedures and control measures to prevent the mobilisation of ASS, which may include the following:

- Complete a desktop assessment on the WHP alignment to identify any PASS
- Conduct soil sampling and ASS testing in 'risk areas' identified in the desktop assessment in accordance with the EPA Site Contamination – acid sulfate soil materials (November 2007) guideline
- If ASS are encountered during construction, implement relevant CEMP procedures, which may include:
    - placing soils identified as PASS in an isolated bunded stockpile area
    - treating any identified ASS with agricultural lime in accordance with the EPA guideline prior to backfill
    - transport and disposal at a licensed facility.

2.6.2.3 Contaminated Soil and Wastewater

Activities that could lead to soil or water contamination and the control measures proposed to prevent or minimise impacts are addressed below.

Spills of fuel or chemicals

Pipeline construction projects typically use relatively small quantities of chemicals, resulting in low potential spill volumes. Equipment like graders, bulldozers and side-boom tractors will be refuelled on the right-of-way from a standard fuel truck. Environmental controls such as erosion and sediment

controls, as well spill prevention systems and cleanup measures will be implemented. Consequently, if a chemical or fuel spill did occur, the impact would be localised, short term and readily manageable.

Disturbance of existing contaminated soil

A desktop assessment of existing contamination in the Project area was completed. It included a review of EPA records, Department of Defence unexploded ordinance databases, and historical aerial imagery. No Section 83A notifications (notifications of site contamination of groundwater) or EPA-licensed activities were identified within the Project area, nor any unexploded ordnance. Historical imagery revealed a small, unchanged structure, a rail corridor with potential surface soil impacts, and predominantly undisturbed vegetation. Overall, the potential for widespread site contamination is considered low, with nearby commercial activities (the salt works and beta-carotene farm) occurring down-gradient, and unlikely to affect the Project area.

However, some existing contamination has been observed in the Project area. Specifically, asbestos and potential asbestos containing materials (PACM) were observed at two locations during geotechnical investigations.

If asbestos or PACM is located within or near the construction zone, a licensed asbestos removalist will be engaged to remove and dispose of it. The site will then be inspected and validated by an accredited and experienced professional. If site contamination is identified during the pre-construction phase (e.g., during geotechnical investigations or site surveys), a soil contamination assessment will be conducted. The assessment's recommendations will inform detailed engineering design and be incorporated as site-specific soil management measures in the CEMP.

If potentially contaminated soil or groundwater is encountered during construction, CEMP procedures will be activated. These include containing the material, treating it on-site, or safely transporting it off-site for treatment or disposal at a licensed facility.

Dewatering of excavations

Trench dewatering, if not properly managed, can lead to soil erosion and affect soil and surface water quality. Any dewatering will comply with the Environment Protection (Water Quality) Policy and relevant guidelines, such as EPA 1093/18 *Environmental management of dewatering during construction activities* and mitigation measures. Water quality will be assessed against the relevant standards (e.g., EPA guidelines, ANZECC / ARMCANZ 2000 and ANZG 2018) to determine its suitability for land disposal, and discharge to surface waters, or areas where it may enter surface waters, will be avoided.

Hydrotest water discharge

Hydrotest water will ideally be potable but may include small amounts of corrosion inhibitors or biocides, depending on the source and test duration. The improper disposal of low-quality discharge water could cause localised soil contamination.

A CSIRO study (Tjandraatmadja, Gould, & Burn, 2005) found that hydrotest water from uncontaminated sources, without added biocides, does not increase environmentally hazardous compounds. While the water typically has elevated turbidity, sodium or ammonium sulfate, and low dissolved oxygen, it does not exhibit elevated nutrient levels. Standard industry treatment methods—such as sedimentation, filtration, and aeration—effectively improve water quality for disposal via irrigation, evaporation, or into suitable watercourses.

Appropriate measures, such as those identified by CSIRO and those outlined below, will be implemented to ensure hydrostatic test water is appropriately disposed of.

Proposed control measures:

In summary, the following control measures will be implemented to minimise the mobilisation of contaminated soil or water, where required:

- Implement spill prevention and response procedures outlined in the CEMP and OEMP
- conduct site inductions for all construction contractors, which includes explanation of CEMP procedures relating to spill prevention and response, and management of ASS and contaminated soil
- prior to construction, engage a suitably qualified and experienced professional to do a walkover of the construction right of way to identify (if present) asbestos and PACM materials within and immediately adjacent to the construction zone
- implement site-specific soil management measures in areas with contaminated soil, including removal of asbestos and PACM by a licensed asbestos removalist
- incorporate procedures for trench dewatering and hydrotest water disposal into the CEMP. These may include measures to:
    - dispose of water to land on site (away from any areas where it could enter surface waters) after assessment/analysis, provided that:
        - water quality meets relevant criteria for the disposal site (e.g. Environment Protection (Water Quality) Policy 2015, ANZECC/ARMCANZ 2000 and ANZG 2018 criteria)
        - dewatering is in accordance with relevant guidelines (e.g. APGA Code of Environmental Practice, EPA dewatering guideline)
        - landowner approval has been obtained
        - measures are in place to prevent erosion
    - contain and treat water on site (e.g. return hydrotest water to a lined dam constructed in accordance with relevant guidelines e.g. EPA 509/19 *Wastewater lagoon construction*)
    - remove water off site (where onsite disposal is not appropriate).

2.6.3 Ephemeral drainage line crossing

The proposed WHP crosses only one well defined ephemeral drainage line throughout the entire 22.5 km alignment (see Plate **3**-**1** and Plate 3-2). Construction works across this drainage line will be avoided, where practicable, during periods of flood or heavy rainfall. Should high flowing water be encountered, flow diversion techniques will be employed where necessary.

This drainage line crossing will be constructed using standard open cut (trenching) construction. This technique is most suited to the dry, low flow conditions characteristic of the arid lands. The standard open cut method involves establishing a stable working platform either side of the watercourse and creating a trench using excavators. The trench will not be completed through the banks until immediately prior to pipe installation. Tie-in points (where the section of pipe used for the water course crossing is connected to the adjacent pipeline section) will be located on high ground well away from the banks.

Watercourse bed and bank material and trench spoil will be stockpiled separately. Pipe string welding and field joint coating will occur prior to placement in the trench. If there is water in the trench, or in areas of significant inundation (as identified by risk assessment in compliance with AS 2885.1), trench

dewatering or buoyancy control measures may be implemented to prevent the pipe 'floating' once in place.

Flow diversion techniques can be used to prevent siltation during trenching, lowering in and backfilling if higher water volumes or flows are encountered (typically up to 1,000 litres per second). These techniques involve temporarily redirecting watercourse flows away from the active work area and require construction of barrier dykes or head walls upstream and downstream of the active work area. Once barriers are in place, waterflow will be either piped around the work area, or the work area will be pumped dry. Flow diversion techniques are unlikely to be required given the arid climate, the ephemeral nature of the drainage line to be crossed, and Epic Energy's commitment to, as far as practicable, avoid construction of this crossing during periods of flood or heavy rainfall.

To minimise the period of construction and potential environmental disturbance at the drainage line crossing, Epic Energy will aim to complete this crossing within 1-2 days. State agencies responsible for water resources will be consulted prior to construction and during restoration and appropriate approvals in place prior to construction.

Proposed control measures:

To minimise sediment transport at the drainage line crossing, the following mitigation measures will be implemented, as approparite:

- Ensure that all necessary approvals are in place (including Landscape South Australia Act permits for water affecting activities, if required)
- Complete crossing construction in the shortest time practicable (1-2 days)
- Rehabilitate the crossing point and banks as soon as possible after works are completed
- avoid construction works during periods of flood or heavy rainfall
- avoid material stockpiling nearby
- carry out grading and trenching immediately prior to pipe laying, that is, after the pipe is welded and the crossing site prepared.

2.6.3.2 Boring

The technique of boring will be used to install pipelines beneath infrastructure such as roads, the Australian Rail Track Corporation (ARTC) railway line and any buried utilities. It is a low impact technique involving drilling short distances from below ground within an enlarged trench area, or bellhole, located inside the construction right of way.

2.6.3.3 Horizontal directional drilling

Horizontal directional drilling (HDD) is a technique used to cross features such as major watercourses where standard open cut methods are not feasible. It may also be used for road or railway crossings. It is not expected to be used for the WHP, however remains a possibility while site investigations and engineering design are underway. The feasibility of using HDD is strongly limited by site conditions such as soil stability, slope, access, available workspace and the nature of subsurface rock.

The installation of the pipeline by HDD involves drilling a hole at a shallow angle beneath the surface, then pulling the welded pipe string pipe back through the drill hole. Drilling is conducted by a specially designed drill rig, operated by a specialist contractor. A variety of associated equipment and infrastructure is required. Excavations are typically required for a cuttings settlement pit and drilling mud containment pits at the drill entry and exit points. Depending upon the length of the crossing HDD can take anywhere between a few days to several weeks to complete. The size of the HDD rig and its associated footprint depends on the size of the pipe, subsurface geology and the length of the drill.

Although HDD may reduce above ground impacts, the technique introduces additional environmental considerations such as drill site sediment control, waste management, noise and increased duration of construction and workforce numbers. To address these issues, site specific management procedures will be prepared prior to drilling.

2.7 Compressor Station Construction

Initial compressor station construction activities will involve site establishment works including establishment of access to the Lincoln Highway, clearing of the site and establishment of general laydown hardstand areas (for office, amenities, car parking and equipment storage). These works will be undertaken by contractors on behalf of the Office of Hydrogen Power South Australia (OHPSA) as part of the Whyalla Hydrogen Facility works.

The construction footprint for the compression facility is nominally 250 m x 200 m. It will include an equipment laydown area, offices, and a truck quarantine area and carparking to support construction works.

After the site has been established by OHPSA, piles and concrete foundations will be installed for the buildings, pipework and equipment to be installed. Equipment and pipework will be both skid-mounted and constructed on site to maximise construction efficiency and minimise supply chain risk. Buried services such as earthing grids, service water and cable pits will be installed, and cables and pipework will be constructed to connect the installed equipment.

Most of the major equipment and structural, mechanical, piping, electrical and instrumentation components will be manufactured outside of Australia, although fabrication of skids and installation of equipment will be undertaken within Australia where equipment is shipped as separate components. It is anticipated that the major equipment and structural, mechanical, piping, electrical and instrumentation components will be transported to the Port of Adelaide by ship, then transported by semi-trailer to the compressor station in Whyalla for installation.

Testing and commissioning of the associated compressor station and pipeline equipment may involve hydrostatic testing of pipework, as well as non-destructive testing of mechanical and electrical equipment to ensure it has been installed correctly and is ready for commissioning. Commissioning involves the introduction of gas and fine tuning of equipment and instrumentation by running the equipment through various operating modes to test performance. Once performance is verified and the equipment is deemed safe to operate, the compressor station will be ready for commercial operation.

Construction of the associated surface facilities is estimated to take approximately ten months to complete, with around three months for commissioning. Commissioning will occur sequentially and overlap with the construction phase, such that construction and commissioning of the compressor station is estimated to require 12 months in total.

2.8 Pipeline Operation

After reinstatement of the construction right-of-way, there will be very little above-ground infrastructure visible. Above-ground infrastructure will be limited to marker posts to identify the location of the pipeline, compression and associated facilities on the main Whyalla Hydrogen Facility site and a small, fenced facility at the end of the line valve station.

The pipeline will be operated in accordance with the pipeline licence, an OEMP and all relevant legislation and standards. A summary of pipeline operational activities is provided below.

A routine operation and maintenance program will be implemented, which will include leak detection surveys, ground and aerial patrols, in-line inspection, repair or replacement of faulty pipe or other equipment, pigging and cleaning of the pipeline, corrosion monitoring and remediation and easement

and lease area maintenance. Aerial and / or ground inspections will include checking vegetation for discolouration which can be an indicator of a leak, detection of erosion, monitoring of rehabilitation success and detection of weed species.

Access to the easement will be necessary to follow-up issues identified from inspections. Low level maintenance for erosion, subsidence and weeds is likely to be necessary, particularly during the first 12 months following construction. Light vehicle access may be required at various points along the pipeline easement to allow inspection and maintenance, however a formal access track along the easement is not expected to be required. Existing access tracks would be utilised to access the easement where required.

More significant maintenance activities to address coating defects, such as dig-ups, are likely to be infrequent. However, any maintenance activities required will be conducted in accordance with the Statement of Environmental Objectives (SEO) and the OEMP. Dig-ups involve the excavation of material from around the pipeline (typically referred to as a bellhole), to allow sufficient room for operations technicians to safely undertake any remedial works that may be required. The excavation of material will be undertaken in accordance with the construction management conditions outlined in Section 2.6.1 (i.e. topsoil will be stockpiled separately from trench spoil, and the site will be restored as soon as practical following completion of maintenance works).

Prior to commencing extensive work, or where numerous sites are involved, operations personnel will consult with regulatory authorities as appropriate.

Operational pipelines generally have very little environmental or landholder impact. Regular consultation will be maintained with landowners whose properties are traversed by the pipeline. The 'Before You Dig Australia' service will be promoted for use by third parties wishing to locate the pipeline prior to undertaking excavations.

Table 2-6: Summary of pipeline operational and maintenance activities

Activity	Description
Easement maintenance	
Weed control	Localised spraying of weeds is undertaken along the easement as required.
Line of sight clearance	Clearance of the right-of-way to maintain line of sight is generally not required in arid regions with predominantly low open grassland or shrubland. Trees retained on the easement during construction will not be removed, however it may be necessary to remove trees that regenerate within 2 m of the pipeline as they pose a threat to pipeline integrity.
Patrolling / inspections – easement access	Vehicle travel along the right-of-way, on private / public roads or over paddocks and will involve access to private property and use of private tracks. Frequency depends on whether particular issue(s) require monitoring; frequency can range from weekly to monthly or longer. Vantage point patrols are performed every 3 months and full patrols conducted every 12 months.
Aerial inspection of easement	Use of low-flying aircraft, typically carried out every 12 months.
Pipeline operations	
Cathodic protection surveys	Surveys involve taking readings at Cathodic Protection test points (above-ground post) along the easement. Typically conducted twice per year.
Testing and inspection of relief valves	Controlled venting of minimal quantities of hydrogen gas to atmosphere is involved. Typically occurs once per year with a duration of approximately 30 seconds.

Activity	Description
Erosion events	Following major rainfall events creek lines or run-off areas on right-of-way can experience soil erosion. Repairs are effected immediately following the erosion event and include the replacement of similar materials and re-profiling. Given the area is so flat, this is not expected to be a regular occurrence.
Emissions	Hydrogen gas is released to the atmosphere as a result of pipeline and facility maintenance operations (i.e. unit blow downs/ venting, valve opening/testing). Small volumes are released. Occurs for duration of operational life.
Pipeline Incident	The main threats to public safety from pipeline operation and maintenance are fire, explosion or radiation exposure as a result of pipeline rupture. Pipeline risk assessments have identified that these threats are associated with factors such as third party or external interference to the pipeline and pipeline corrosion.
Pipeline maintenance	
Pigging / in-line inspection	Intelligent pigging will be conducted for in line inspections purposes. These inspections will be carried out every 5 years and will require the pipeline to be vented. As a part of planning, the pipeline pressure will be drawn down to the minimum operating pressure of 1.5 Mpa using the compressors and the remaining hydrogen vented or flared to atmosphere. This could be up to 30 tonnes of hydrogen every 5 years.
Excavations	Excavations of the pipeline follow the same processes as those identified in Section 2.6.1, namely clear and grade, trenching, backfill and restoration and rehabilitation but are generally on a much smaller scale. Once vegetation and topsoil have been cleared and stockpiled, the required area is excavated and spoil stockpiled. Pipeline maintenance activities are then undertaken (this may include welding, painting, sand blasting). Once complete the trench is backfilled, the ground surface is re-contoured and the topsoil and vegetation respread. Additional reseeding will be undertaken if necessary. These activities may occur during the first year of operation to rectify defects, but are expected to be very rare during the life of the pipeline.
Replacement of pipeline section	A section of the pipeline is isolated and a controlled release of hydrogen gas is undertaken from the affected section. The affected area is then excavated, the old pipeline removed and replaced (includes welding, blasting, coating) and the site reinstated. This is expected to be very infrequent.
Welding	Welding is usually required when pipeline repairs or modifications are made to existing infrastructure.
Coating	Sleeves or tape or epoxy painting (spray) are expected to be used to coat welds or repair areas of pipeline or above ground pipeline.
Pressure testing	Pressure testing is required when a section of pipe is replaced. Pressure testing, even for small sections of pipe, follows the same processes as those identified in Section 2.6.1– Hydrostatic testing.
Facility operation and maintenance	
Compressor facilities	This station would operate daily with an expected duty of up to 55% (4796 hours per year) to compress the hydrogen for storage in the pipeline of for supply of hydrogen to the power station. The flare at the compressor facility is expected to operate on an intermittent and infrequent basis (e.g. daily/weekly for a duration of under 15 minutes).
Weed control	Localised spraying of weeds is undertaken in and around compounds as needed.
Production of hazardous waste	Liquids and heavy metals (e.g. mercury) are not expected in the product, but if present they would be trapped in coalescing filters. Contaminated filters are generated from maintenance change-overs at the compressor facilities.

Activity	Description
	Contaminated waste and oils will be removed from site for disposal by a licensed contractor.
Waste disposal	General waste generated during operations is collected on site and removed to licensed facilities for disposal.
Station blow downs	Uncontrolled venting which is a result of equipment failure e.g. regulator failure. Duration would depend on type and duration of failure

2.9 Decommissioning

When the utility is no longer required, the pipeline will be decommissioned in accordance with the regulatory requirements and accepted environmental best practices of the day. Current decommissioning procedures require the removal of all above ground infrastructure and the restoration of associated disturbed areas.

At the time of decommissioning a decision will be made regarding the opportunities for future use of the pipeline. If no longer required, the pipeline, once purged of hydrogen, and below ground facilities will be left in-situ. However, if it is considered that the pipeline may offer some future benefits, it will be filled with an inert material and the cathodic protection system maintained to prevent corrosion. All above ground facilities will be removed.

2.10 Interdependent Developments Outside the area of the Proposed Action

2.10.1 Hydrogen Jobs Plan

The development of the WHP by Epic Energy (the Proposed Action) is a critical component of the South Australian Government's HJP initiative.

The HJP is a strategic initiative aimed at establishing a renewable hydrogen power station, electrolyser and storage facility 5.5 km north of Whyalla. The South Australian government has committed more than half a billion dollars to the HJP which is being overseen by OHPSA, established in May 2022.

The HJP will deliver dispatchable power generation into the energy grid, providing 'firming services' that will assist in balancing the renewable load and move South Australia closer to a fully renewable energy system. The HJP comprises the following key components:

- 260 MW electrolysers
- 200 MW hydrogen-fuelled power station
- 100 tonne capacity hydrogen storage facility.

The stored hydrogen will fuel the power station and also provide a source of hydrogen that could support local industry to decarbonise operations. It should be noted that the HJP intends to implement either onsite or offsite hydrogen storage, not both. Solutions for onsite and offsite hydrogen storage are being developed in parallel. Epic Energy is progressing the offsite storage option (the subject of this Report/ the Proposed Action), whilst the onsite solution forms part of the referral submitted by OHPSA for the HJP site. Epic Energy is not involved in the onsite storage solution. A decision is likely to be made as to the preferred storage solution by the end of 2024.

2.10.2 Offsite laydown areas

Offsite locations associated with Whyalla's industrial footprint may be utilised for activities such as an equipment laydown yard, plant yard and offices / carpark areas. Final locations have not been determined however they would not require vegetation clearance and would be within existing facilities or cleared areas.

3. Description of Existing Environment

The existing environment values of the Project area are summarised below and described in further detail in this section.

- The Project is in the Gawler IBRA bioregion and two IBRA subregions (Arcoona Plateau and Myall Plains).
- The Project area contains reasonably intact native vegetation communities with some disturbance, further described in Section 3.2.
- Air quality and the ambient noise environment are fair to good with the level of existing air and noise emissions influenced by the Lincoln Highway, Whyalla Steelworks, Spencer Gulf Saltworks, Port Bonython hydrocarbon facility and other industry in the area.
- The Project area is characterised by flat to gently sloping topography with little to no defined drainage
- Depth to shallow groundwater is mapped as between 5 and 20 m for the majority of the alignment, and 2-5 m for the eastern 3 km of the alignment.
- There are no outstanding natural features or other important or unique values within the project area. The project area traverses land near to, but not in, the Whyalla Conservation Park.
- There are no Commonwealth or State-listed heritage places within or immediately adjacent to the WHP. The closest National Heritage place is the CCSZ, located approximately 2.2 km south of the WHP.

3.1 Land Use and Tenure

The WHP is located largely within the City of Whyalla local government area.

Whyalla is an industrial city and the major centre for manufacturing, steel production and mineral resources processing and export in the Upper Spencer Gulf. Major industries in the broader region include the Whyalla Steelworks, Spencer Gulf Saltworks, Port Bonython gas fractionation plant and hydrocarbon import / export facility, water and gas pipelines and iron ore mining. There is no significant agricultural activity in the locality.

The steelworks are located approximately 2 km south of the western end, the salt works are located approximately 1 km east of the WHP alignment, and the petroleum refining and import /export facilities approximately 3.5 km east of the eastern end of the WHP alignment.

Existing land uses within the Project area include three sealed roads, a rail line and large areas of predominantly undeveloped land with many unsealed tracks used by motorbikes and recreational vehicles. The WHP alignment traverses land of mixed tenure, including freehold land held by State government, private entities and the ARTC), and Crown land held by the State government. Epic Energy will obtain permanent easements (or other appropriate tenure over Crown and ARTC land e.g. licences) for the land where the pipeline is located (refer to Figure 2-1).

Land uses adjacent to the Project area include water and petroleum transmission pipelines and the Cultana Training area operated by the Department of Defence (located over 1 km away adjacent to the eastern end of the Project area) (refer to Figure 3-1). The Referral concluded that no significant impacts are anticipated on Commonwealth land, including the Cultana Training area. The Proposed Action decision notification did not include a controlling provision for Commonwealth Land. As such, no further discussion of this matter is provided in this report.

Renewable energy, particularly solar and hydrogen development, is a current focus for the broader region. There are two proposed solar farms (Cultana Solar Farm and Yoorndoo Ilga Solar project) adjacent to the proposed alignment (east of the Lincoln Highway), which have been granted State development approval but which have not yet been developed. The proposed Whyalla Hydrogen Facility and associated infrastructure will be located at the western end of the Project area. There are several electricity transmission lines in the vicinity of the Project area and proposed additional electricity transmission lines and a substation associated with the HJP.

Conservation and tourism land uses are present in the broader locality including the Whyalla Conservation Park (refer Section 3.4). The WHP Project area is outside these land use areas and will not affect any of these activities.

The existing transport network carries traffic associated with industrial, agricultural, tourism and residential / commuter traffic. Several projects are proposed in the locality in addition to the WHP, which may present impacts to the transport network during their respective construction stages.

3.1.1 Native title

The WHP is located within the traditional lands of the Barngarla people who are both the Traditional Owners and recognised native title parties for certain land on the Eyre Peninsula. The Barngarla people are represented by BDAC.

The Barngarla Native Title Determination Area (SCD2016/001) extends across the majority of the eastern and central Eyre Peninsula from the Spencer Gulf to the Eyre Highway, incorporating an area of approximately 34,401 km2. The Federal Court determined in 2016 that native title rights and interests exist over some parts of the Eyre Peninsula (SCD2016/001).

The proposed alignment as set out in this Report does not traverse any land where native rights and interests exist or will exist. However, if the proposed alignment is revised to traverse any portion of land where native title rights and interests exist , Epic Energy will seek to negotiate and enter an Indigenous Land Use Agreement (ILUA) with BDAC to enable the construction and operation of the WHP over the relevant portion of land. It is anticipated that any matters with respect to cultural heritage may also be documented in an ILUA in accordance with section 19N of the *Aboriginal Heritage Act* 1988. This is discussed further under Section 3.3.

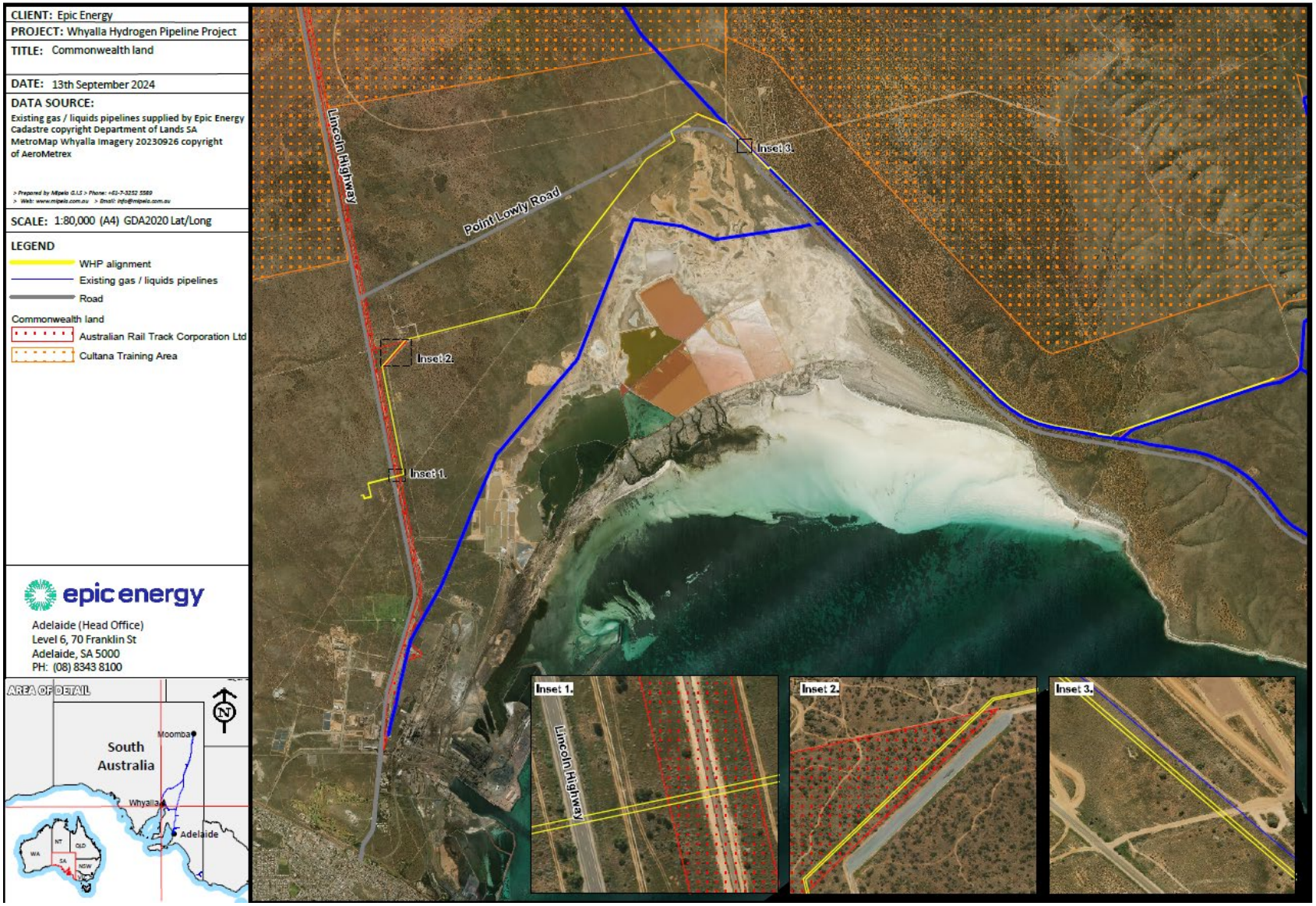

Figure 3-1: Commonwealth land

3.2 Fauna, Flora and Vegetation Communities

The following spatial definitions apply to the WHP ecology study undertaken by Lathwida Environmental:

Project area: as described in Section 2.2 and shown in Figure 2-1.

Disturbance footprint: as described in Section 2.3 and shown in Figure 2-2 and Figure 2-3.

PSL area: as described in Section 2.2 and shown in Figure 2-1.

Ecology Study Area: consists of the PSL area plus a 5 km buffer (as shown in Figure 3-2). This also serves as the PMST search area, covering approximately 47,170 ha.

The results of the ecology study undertaken by Lathwida Environmental are summarised in Sections 3, 4, and 5, and the full reports are provided in Attachment B (Baseline Ecology Assessment) and Attachment C (Significant Impact Assessment (SIA)) (Lathwida Environmental, 2024a) (Lathwida Environmental , 2024b). These reports have been updated to address the additional matters the subject of the Variation.

3.2.1 Vegetation communities

The majority of the Project area and surrounds is mapped as remnant native vegetation based on the Department for Environment and Water SA (DEW) vegetation mapping layers (Attachment C, Section 1.7, pp 12-13). Vegetation has also been mapped following field surveys described in Attachment C, Table 1.1, pp 10-11. The broad vegetation groups mapped as occurring within the Project area are listed in Table 3-1 and shown in Figure 3-3.

Table 3-1: Vegetation communities

Community	Description
Chenopod Shrubland	Broadly comprises Pearl Bluebush (*Maireana sedifolia*) mid sparse shrubland over Ruby Saltbush (*Enchylaena tomentosa var. tomentosa*), Thorny Saltbush (*Rhagodia spinescens*), speargrass, (*Austrostipa* sp.) and mixed shrubs. Generally present at the eastern end and sections of the western end of the Project area.
Eucalyptus Mallee Forest and Mallee Woodland:	Broadly comprises Yorell (*Eucalyptus gracilis*), +/- White Mallee (*E. dumosa*) +/- Gilja (*E. brachycalyx*), +/- Red Mallee *(E. oleosa ssp. ampliata*) mid open mallee forest over Sheep Bush (*Geijera linearifolia*), Dryland Teatree (*Melaleuca lanceolata*) shrubs over Ward's Weed - exotic (*Carrichtera annua*), speargrass, emubush, Mealy Saltbush (*Rhagodia parabolica*), Ruby Saltbush, Grey Bindyi (*Sclerolaena diacantha*) shrubs. Present in areas adjacent the centre of the Project area, along Point Lowly Rd and pockets in the south-east of the Project area.
Acacia Woodlands	Broadly comprises Western Myall low woodland over Bladder Saltbush, Pearl Bluebush, Ruby Saltbush and Intricate Saltbush (*Rhagodia ulicina*) low shrubs. Broadly present at the western end of the Project area.
Casuarina Woodland	Broadly comprises Black Oak low woodland over Sheep Bush, Spiny Fan Flower (*Scaevola spinescens*) tall shrubs over Ruby Saltbush, Balcarra Grass (*Austrostipa nitida*), +/- Silver Mulla Mulla (*Ptilotus obovatus var. obovatus*), +/- Pearl Bluebush, +/- Bitter Saltbush (*Atriplex stipitata*) low shrubs over Ward's Weed – exotic. Small pockets of this vegetation are at the western end along the existing pipeline and also occur east of the Lincoln Hwy, where the communities have been combined to represent the on-ground scenario, i.e. within Acacia Woodlands.
Samphire Shrubland	Brown-head Samphire (*Tecticornia indica* ssp.), +/- Saltbush (*Maireana oppositifolia*), +/- Marsh Saltbush, +/- Bladder Saltbush low open shrubland over +/- Native Pigface. Described as 'stranded samphire' zone, this vegetation does not qualify as a TEC. Is associated with the edges of the Whyalla Saltfields and inland from False Bay beach

	areas east and south of (but not within) the Project Area. It is noted that the Whyalla Saltfields / Saltworks / Evaporation Pans are documented as a known Coastal Wader Bird and Seabird site (refer to Attachment F, Section 1.7, p 13).

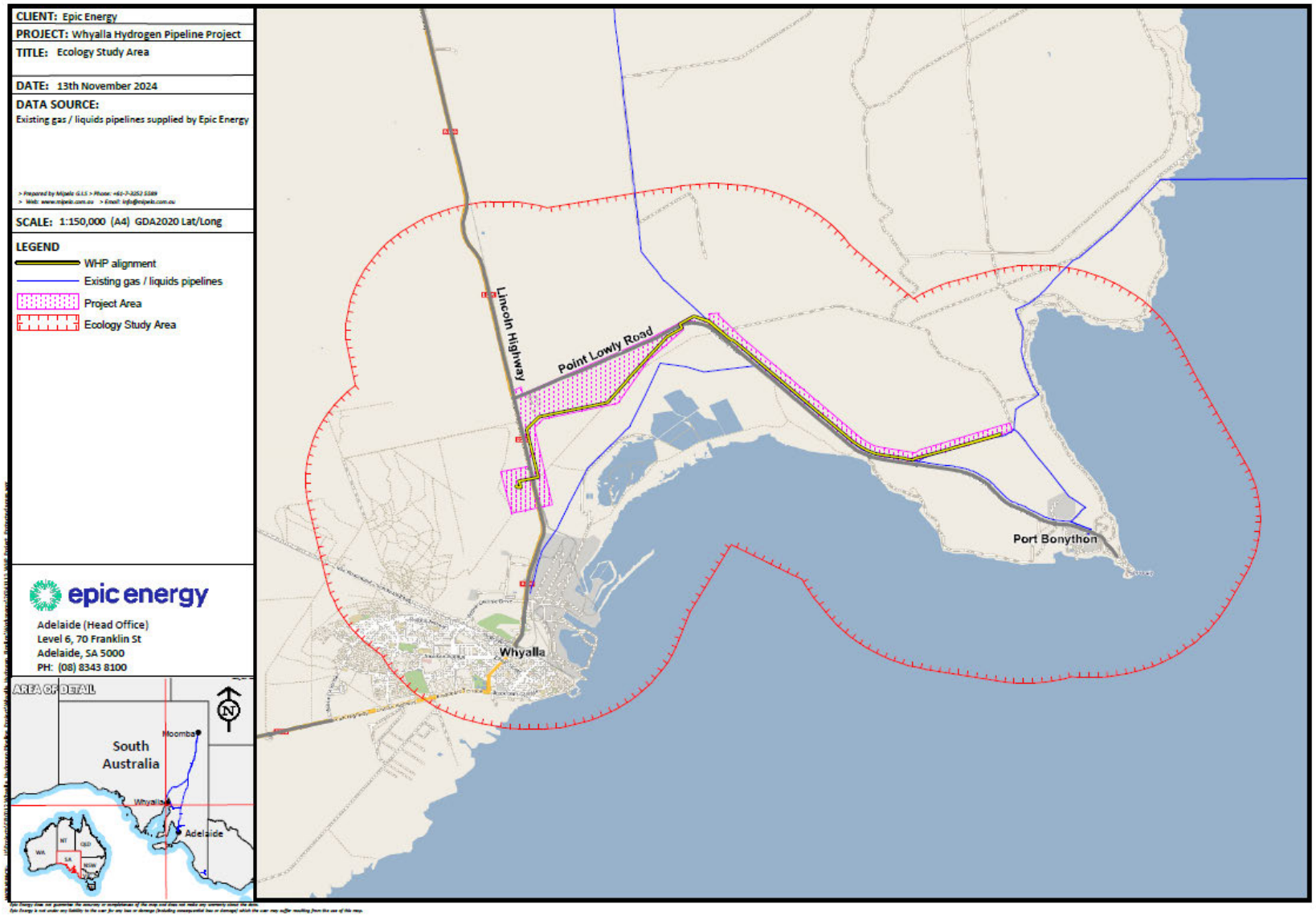

Figure 3-2: Ecology Study Area relative to Project Area and WHP alignment

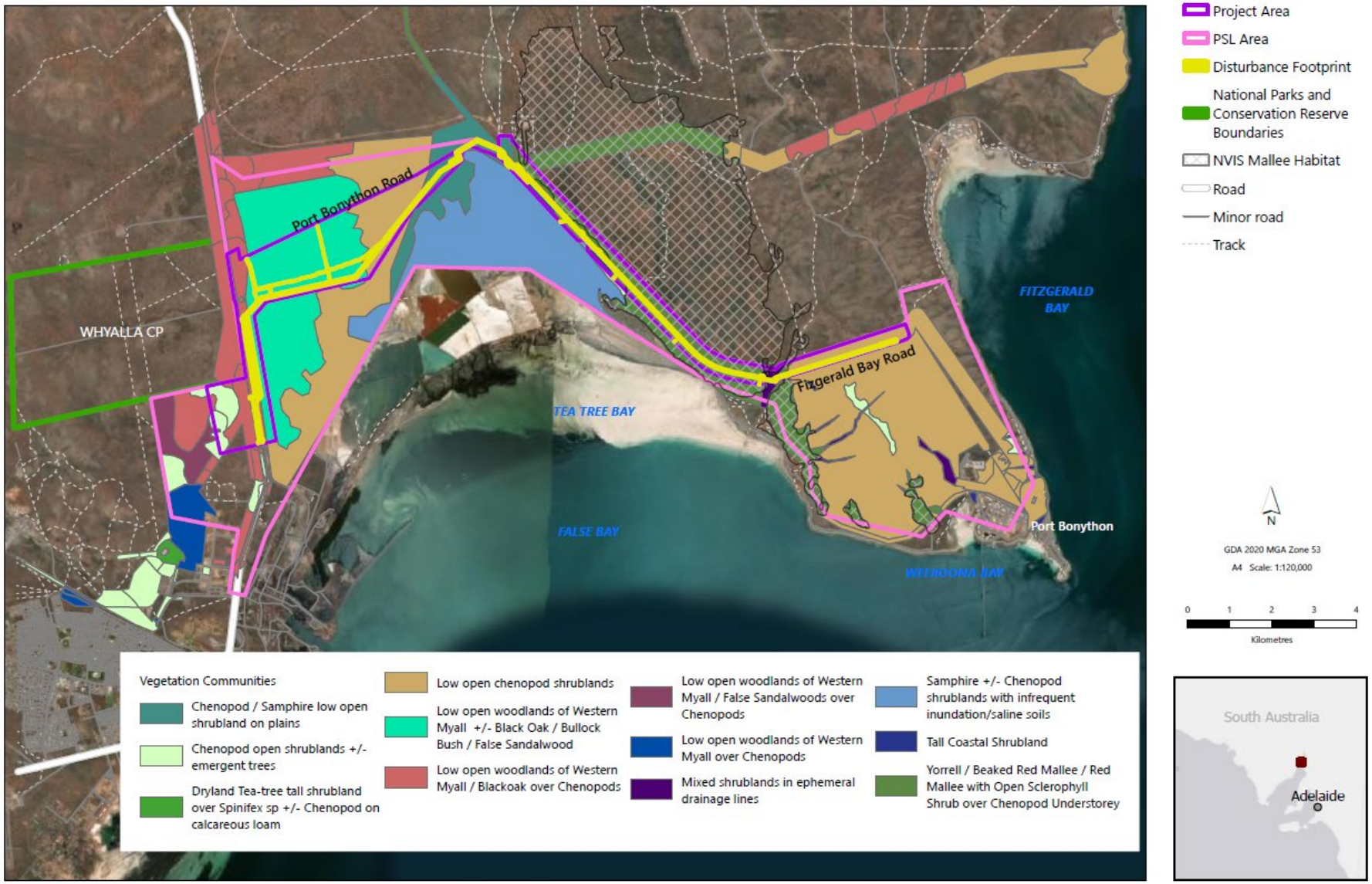

Figure 3-3: Vegetation communities within and surrounding the Project area

3.2.2 Listed flora and fauna

3.2.2.1 Flora

There are records of five flora species listed under the *National Parks and Wildlife Act 1972* (NPW Act) within the Ecology Study Area. Three of these are considered unlikely to occur and two are considered likely to occur in the Project area: Sandalwood (*Santalum spicatum*) (listed as Vulnerable) and Australian Broomrape (*Orobanche cernua var. australiana*) (listed as Rare).

The Protected Matters Search Tool (PMST) indicated four EPBC-listed threatened flora species have the potential to occur in the Ecology Study Area. These four species are addressed in Section 4.

No NPW Act or EPBC Act listed species were recorded in the field surveys.

3.2.2.2 Weeds

Eight declared weeds were detected within the PSL area during the 2023-24 site surveys (refer to Table 3-2). There are records for a further 17 weed species within the Ecology Study Area, including numerous records of the declared weeds Salvation Jane (*Echium plantagineum*) and Buffel Grass (*Cenchrus ciliaris*). Previous surveys have highlighted the presence of Buffel Grass along Point Lowly Road.

Table 3-2: Summary of weeds observed within the PSL area (Dec 2023/March 2024)

Name	Weed Status	Comment
Wild Turnip *Brassica sp.*		Sparsely present throughout Project area
Horehound *Marrubium vulgare*	*Declared	Scattered clumps
Prickly Pear *Opuntia sp.*	*Declared WoNS	One clump recorded
Mustard *Sisymbrium sp.*		Sparsely present
Iceplant *Mesembryanthemum sp*		Present in mallee areas
Ward's Weed *Carrichtera annua*		Ranging from sparse to moderately dense across the Project area
Onion Weed *Asphodelus fistulosus*		Present in road reserve
African Boxthorn *Lycium ferocissimum*	*Declared WoNS	Only one plant recorded

*Declared under *Landscape South Australia Act 2019* (SA), WoNS = Weed of National Significance

3.2.2.3 Fauna

There are records for 27 fauna species listed under the NPW Act within the Ecology Study Area. The Slender-billed Thornbill (Western) (*Acanthiza iredalei iredalei*) (Rare) is known to occur and a further six species (all listed as Rare) are considered likely to occur: Common Tern (*Sterna hirundo longipennis*), Elegant Parrot (*Neophema elegans elegans*), Rock Parrot (*Neophema petrophila zietzi*), Shy Heathwren (*Hylacola cauta cauta*), Sooty Oyster Catcher (*Haematopus fuliginosus fuliginosus*) and Spotless Crake (*Zapornia tabuensis*). A number of other species are considered possible or likely in aquatic habitats adjacent to the Project area or as overfly species.

The PMST identified 46 threatened fauna species as potentially occurring in the Ecology Study Area which are addressed in Section 4. Forty-five (45) migratory species identified in the PMST as potentially occurring in the Ecology Study Area are addressed in Section 5.

3.2.2.4 Pest species

Four pest species were recorded within the PSL area during the 2023-24 field surveys for the baseline assessment: (European Fox (*Vulpes vulpes*), Feral Cat (*Felis catus*), Rabbit (*Oryctolagus cuniculus*) and Sheep (*Ovis aries*)). An additional nine species of exotic fauna have database records within the Ecology Study Area.

3.3 Heritage

There are no Commonwealth or State-listed heritage places within or immediately adjacent to the WHP. The closest State-listed heritage place is the Point Lowly Lighthouse (refer to Figure 3-4), located approximately 6 km to the south-east. The closest National Heritage place is the CCSZ, located approximately 2.2 km south of the WHP. Further information on the CCSZ is provided in Section 0.

3.3.1 Aboriginal cultural heritage

As noted in Section 3.1.1, the Barngarla people are the Traditional Owners of much of the eastern Eyre Peninsula including Port Lincoln, Whyalla and lands west of Port Augusta. The Barngarla traditionally lived by the coast and visited inland seasonally and for ceremonial and special purposes. The Barngarla people's dreaming includes local stories and universal Dreamtime stories that link into other places and other tribes, such the Seven Sisters stories which connect to the moon, stars, landscapes and islands. Undisturbed coastal areas and salt lakes are generally accepted as having a high-risk profile for the presence of Aboriginal cultural heritage sites, objects or remains.

Searches of the Central Archive, part of the Register of Aboriginal Sites and Objects maintained by Aboriginal Affairs and Reconciliation within the SA Attorney-General's Department, were undertaken in early 2023 and early 2024. No registered or recorded sites, objects or remains were located within the Project area.

To further reduce the risk of damaging, disturbing or interfering with unknown sites, objects or remains, Epic Energy and members of the Barngarla community undertook a preliminary on ground cultural heritage survey in early April 2024. A formal on ground cultural heritage survey followed on 31 May 2024 with members of the Barngarla community, an independent anthropologist engaged on behalf of BDAC and Epic representatives.

Following receipt of the confidential survey report documenting the formal cultural heritage survey findings, Epic has engaged with BDAC with respect to the re-alignment or revision of the proposed pipeline alignment to avoid and minimise impact to identified areas of cultural heritage significance. Epic will continue to work with BDAC to formalise these discussions.

Ground disturbance will be required to construct the pipeline creating the potential for disturbance of unrecorded and / or unregistered sites, objects or remains of cultural significance. Using the learnings from the formal cultural heritage survey to revise the alignment and locate the Proposed Action within existing infrastructure corridors and disturbed areas wherever possible will reduce the risk of impacts to cultural heritage values, whether known or unknown.

Epic will also work with BDAC on the development and implementation of a Cultural Heritage Management Plan (CHMP) for the Project. The CHMP will include, at a minimum, measures to be implemented to manage and protect Aboriginal cultural heritage, heritage discovery protocols including cultural heritage monitoring, 'stop work' procedures, relevant contact protocols, and any conditional access requirements.

3.4 Protected Areas

There are no outstanding natural features or other important or unique values within the Project area, which includes all proposed temporary disturbance areas and the extent of the PSL.

The Project area is in the vicinity of land held under a Heritage Agreement (No. HA 1588) and the Whyalla Conservation Park, both located on the opposite side of Lincoln Hwy (refer to Figure 3-4). The park covers 1971 ha, and is located approximately 10 km north of the centre of Whyalla[1]. The park has a high conservation value, with undisturbed native vegetation dominated by Western Myall, Saltbush and Bluebush, and is home to over 80 species of birds, 20 species of reptiles, and several threatened species including the EPBC Vulnerable Western Grasswren and Southern Whiteface. The park also incorporates 'Wild Dog Hill', a topographical feature in the north-western corner, approximately 5.5 km from the Project area. Wild Dog Hill is known to be an important cultural site for the Barngarla People.

The nationally important wetlands of False Bay (SA020-Upper Spencer Gulf) are located approximately 180 m at the closest point from the WHP. The pipeline is aligned to the north and east of the edges of this area, on the opposite side of Point Lowly Rd (refer to Figure 3-5). This area is characterised by tidal sand and mud flats, with some areas of shingle and sandy beaches. This area is also known for the Whyalla Saltfields, where a number of threatened and migratory or resident shorebirds / beach nesting birds are known to occur or potentially occur.

Most of the coastline and marine environment south of the Project area is within the Upper Spencer Gulf Marine Park (including the CCSZ), which extends approximately 80 km from the northern extent of the gulf, near Port Augusta, to south of Whyalla.

The WHP alignment does not encroach on the Whyalla Conservation Park, the land under a Heritage Agreement, the nationally important wetlands or the marine park.

[1] www.parks.sa.gov.au/parks/whyalla-conservation-park.

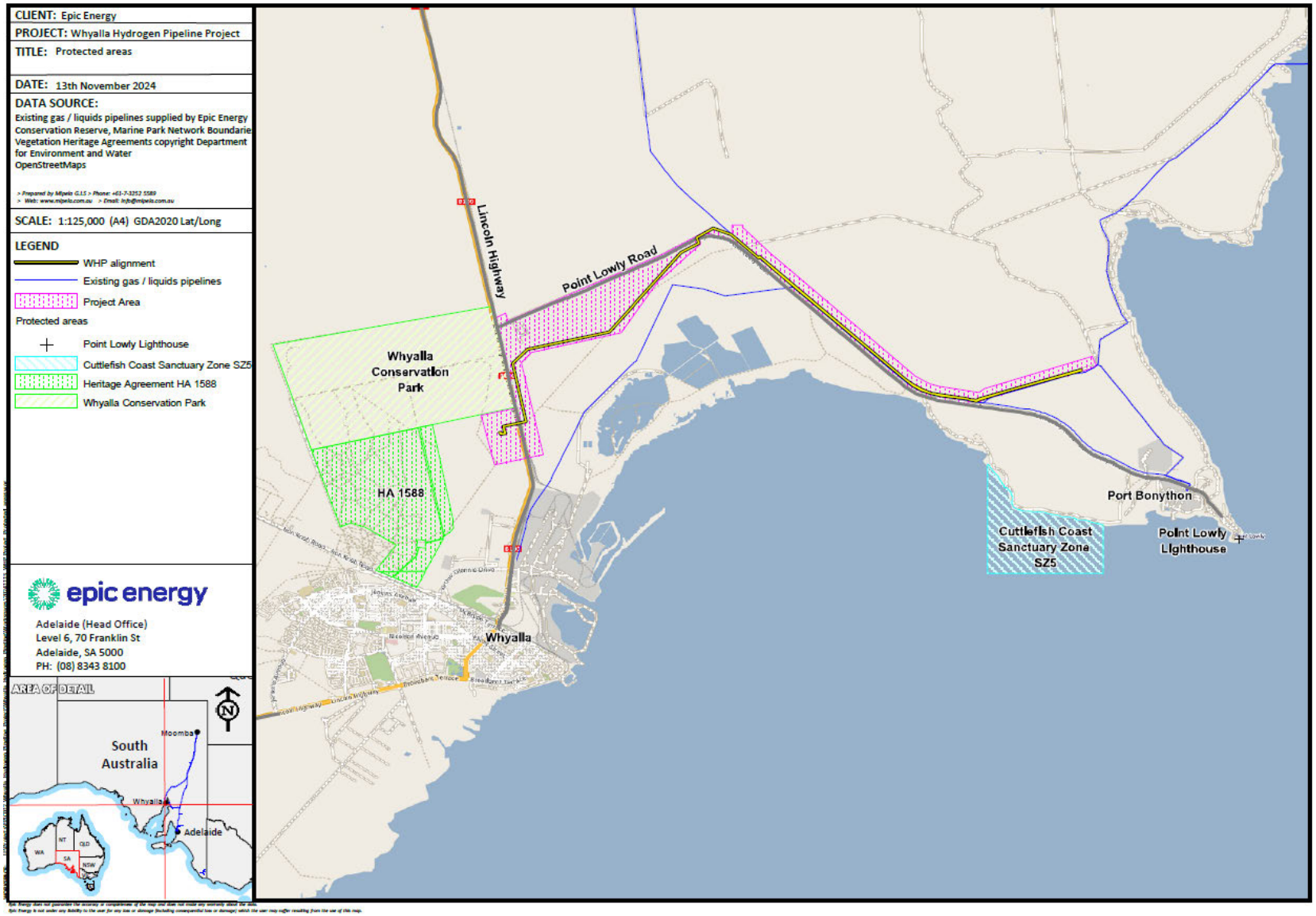

Figure 3-4: Protected areas near the Project area

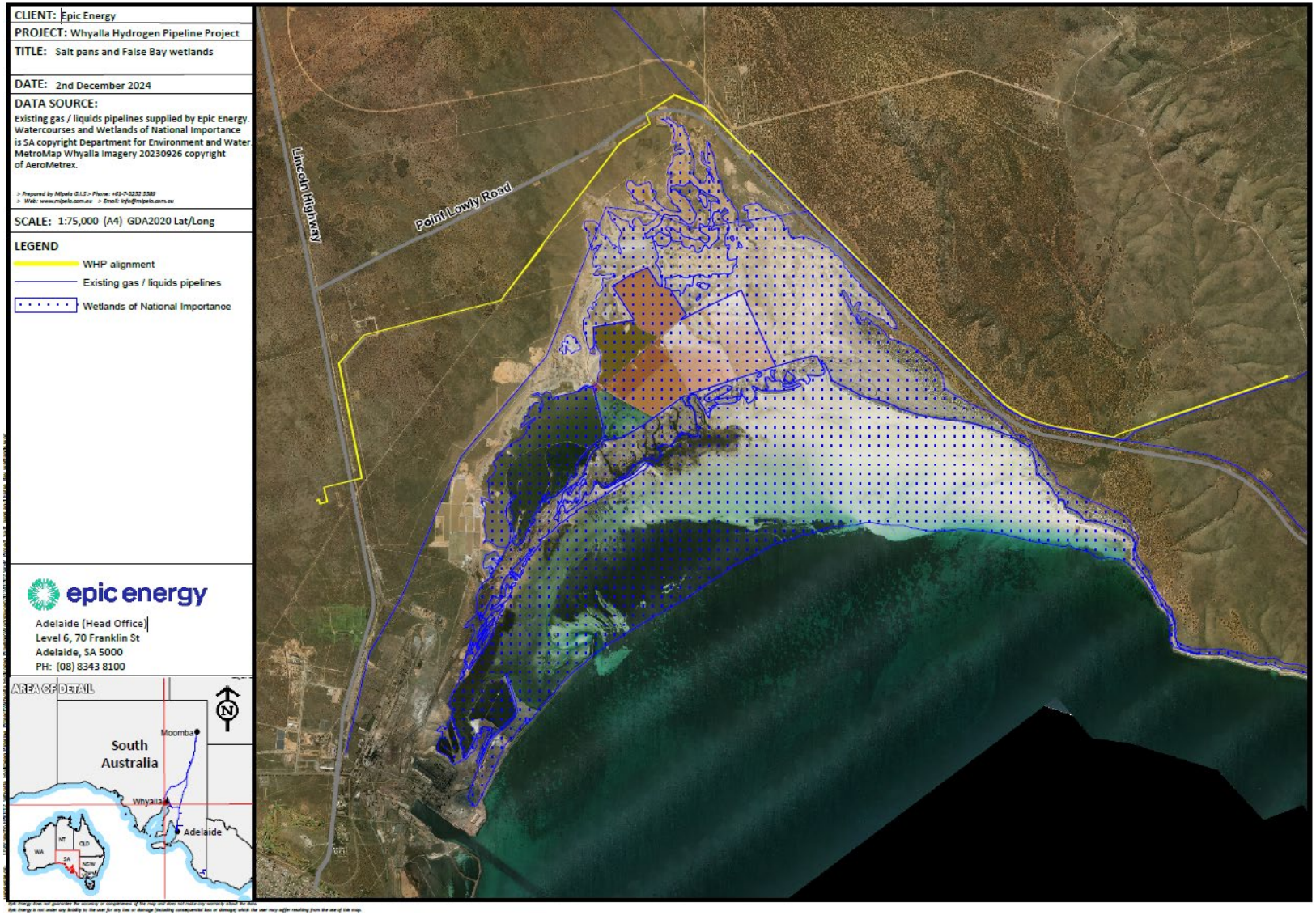

Figure 3-5: Salt pans and False Bay wetlands

3.5 Topography and hydrology

The WHP is located primarily on flat to gently sloping terrain. The western half of the alignment occupies relatively flat land that slopes gently downwards towards the south-east. The eastern half of the alignment occupies land that is flat to gently undulating and generally slopes down to the south-west towards the coast.

As shown in Figure 3-6, elevations along the WHP alignment range from 5 to 30 mAHD for the first 20 km, then rise steadily over the last 5 km from about 20 to 80 mAHD.

Figure 3-6: Elevation of WHP alignment from west to east

3.5.1 Surface water

The Project area is characterised by relatively flat topography with little to no defined drainage. The WHP alignment crosses only one well defined ephemeral drainage line at its eastern end, prior to it diverting northeast along Fitzgerald Bay Road (refer to Plate **3-1**). At this location, the drainage line is a narrow, very shallowly incised channel that flows southwards, within a broader drainage depression that also receives flows from a small channel from the north-east. This channel flows through one of several culverts under Point Lowly Road (Plate 3-2), ultimately reaching the coast approximately 1.6 km to the south.

There are a small number of culverts in other locations that allow water to flow under Point Lowly Road, however there are no defined drainage lines associated with these culverts, either on the alignment, or on the far side of Point Lowly Road.

The defined drainage line in the eastern end of the Project area (shown in Plate **3-1** and Plate 3-2), would usually be dry and would only flow intermittently for short periods in response to seasonal rainfall and storm events. Under some conditions (depending on factors such as soil moisture and rainfall intensity and duration) surface runoff might make its way to the coast and discharge into the sea. Elsewhere in the Project area, overland flows from storm events would generally pool in lower lying areas before dissipating by infiltration or evaporation.

After significant rainfall, water quality in these drainage lines would be characterised by low salinity and high turbidity. Evidence of erosion and high sediment load is apparent where such drainage lines cross the unsealed coast road (at Cuttlefish Drive).

Plate 3-1: Ephemeral drainage line at proposed WHP crossing point (blue marker) and photo point (green marker)

Plate 3-2: Ephemeral drainage line looking north (left) and south (right) above the culvert on Point Lowly Road (green marker in Plate 3-1)

3.5.2 Groundwater

Groundwater data is limited in the Project area. Based on mapping (SARIG, 2024) - GIS datasets 1021 [Shallow Standing Water Level] and 1026 [Shallow Total Dissolved Salts]) and one groundwater well with water quality data in the vicinity, groundwater is expected to be brackish to saline.

Depth to shallow groundwater is mapped as between 5 and 20 m for the majority of the alignment, and 2-5 m for the eastern 3 km of the alignment (SARIG - GIS dataset 1021).

Shallow groundwater salinity is mapped as between 14,000 mg/L and 35,000 mg/L along the majority of the alignment, and between 7,000 mg/L and 14,000 mg/L for the eastern 4.5 km of the alignment (SARIG - GIS dataset 1026).

There are two groundwater wells in the Project area in the WaterConnect database that were drilled between 1975 and 1980 (WaterConnect, 2024), one of which has water quality data. This well (6432-

22), near Point Lowly Rd, was drilled to a depth of 68 metres and flowed at 11 litres per second with a salinity of 23,000 mg/L.

Groundwater recharge in the Project area is likely to be very low due to the low rainfall, high evaporation and relatively low permeability of soils in the eastern end of the Project area.

There are no known groundwater users in the Project area.

4. Threatened Species and Ecological Communities

4.1 Overview

The Significant Impact Assessment (SIA) Report (Attachment C) assessed the likelihood of occurrence of listed threatened species and ecological communities within the Project area. This is summarised below. The data is based on a desktop assessment and on-ground ecological surveys. The desktop assessment included a search of the EPBC Act Protected Matters database via the online Protected Matters Search Tool (PMST) applied to the PSL area plus a 5 km buffer (the Ecology Study Area).

4.1.1 EPBC listed Threatened Ecological Communities

The PMST predicted that one EPBC listed Threatened Ecological Community (TEC) is likely to occur in the Ecology Study Area: Subtropical and Temperate Coastal Saltmarsh (Vulnerable).

No TECs were recorded within the Project area. The areas of samphire / saltmarsh vegetation adjacent to the Project area do not meet the criteria for the TEC as they are 'stranded saltmarsh' (i.e. isolated from tidal influence). They may provide a buffer to the TEC that occurs adjacent to False Bay.

Irrespective, TECs in the Vulnerable category are not listed as an MNES under section 18 of the EPBC Act and the need to obtain EPBC Act approval for actions impacting vulnerable TECs is specifically excluded under section 18A(4)(b) of the EPBC Act. Consequently, this TEC has not been considered further.

4.1.2 EPBC listed flora

The PMST indicated four EPBC-listed threatened flora species have the potential to occur in the Ecology Study Area. However, the SIA determined that three species are unlikely to occur based on a lack of historic records, a lack of suitable habitat and having not been observed during field surveys.

Although there are no records for any threatened EPBC listed flora species within the Project area, the Yellow Swainson-pea (*Swainsona pyrophila*) (Vulnerable) is considered to have the potential to occur in mallee areas, given it can remain dormant and respond to fire and disturbance. This species was not detected during the surveys and there are no records within the Ecology Study Area. If present, it would not be part of a known important population of the species. Given the above, the SIA considered the Project would not have a significant impact on this species.

Although not predicted in the PMST output, the baseline assessment also suggested that the EPBC listed (Vulnerable) Bead Samphire (*Tecticornia flabelliformis*) could possibly occur in samphire shrubland adjacent to the Project area. However, there are no records for this species around Point Lowly / Port Bonython or along the coast north and south of Whyalla (DEW, Biological Databases of South Australia, 2023) (DEW, 2024). The habitat may not be suitable given the stranded inundation regime and historical sand quarrying. It has not been detected in surveys to date and there are no historical records in the Ecology Study Area. It is therefore, considered unlikely to occur in the Project area.

Potential impacts on the Yellow Swainson-pea and Bead Samphire will be managed through standard mitigation measures including:

- Delineating the construction footprint to avoid unintentional disturbance outside construction areas.
- A walk-though by an experienced ecologist, arborist and construction design specialist to further reduce the construction right of way where possible, and to assist with demarcation of no-go zones for particularly sensitive areas.

- Preparing a project-specific construction environmental management plan (CEMP) to address weed hygiene and management.
- Preparing an operations environmental management plan (OEMP) to include weed monitoring and control.

Given both species are unlikely to be significantly impacted by the Project, they have not been considered further.

4.1.3 EPBC listed fauna

The PMST identified 46 threatened fauna species that have the potential to occur in the Ecology Study Area. These included 22 oceanic and marine species that were excluded from further assessment, as the Proposed Action will have no direct or indirect impact on the marine environment.

The SIA considered the likelihood of occurrence on the Project area for the remaining 24 species. Five species were assessed as having the potential to occur. Of these, three species are known to occur (Malleefowl, Southern Whiteface, Western Grasswren) and two have the potential to occur as occasional visitors (Blue-winged Parrot, Grey Falcon).

The following coastal species were assessed as unlikely to occur on the Project area but with the potential to occur (or known to occur) on the adjacent intertidal mudflats and saltmarsh areas: Ruddy Turnstone, Sharp-tailed Sandpiper, Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Nunivak Bar-tailed Godwit, Eastern Curlew, Australian Fairy Tern, Eastern Hooded Plover, and Common Greenshank.

These species are addressed below in Section 4.2 and Section 4.3.

4.2 Occurrence and Description of Relevant Threatened Species

4.2.1 Desktop assessment

The desktop assessment for the Project included a review of the following:

- EPBC Act Protected Matters Search Tool (PMST) data output for the study area to identify potential MNES (Attachment C)
- Biological Database of South Australia (BDBSA) records searches for the study area to further refine species list and identify species records at and surrounding the site (DEW, Biological Databases of South Australia, 2023)
- DEW NatureMaps website for relevant ecological constraints (DEW, 2024)
- Atlas of Living Australia (ALA, 2024) records where necessary for species distributions or where additional species information was required
- Previous studies in and adjacent the study area including existing vegetation and habitat data publicly available, which was collected for the HJP and extrapolated for the associated proposed pipeline (e.g. (EBS, 2023; EBS, 2023), (Jacobs, 2023b))
- Publicly available literature (e.g. Species Profile and Threats Database (SPRAT), Threatened Species Conservation Advice and Recovery Plans, and the Commonwealth Survey Guidelines for Australia's Threatened Birds (DEWHA, 2010, amended 2017)
- LiDAR data provided by Infrastructure SA for the locality (unpublished).

Results of the desktop assessment informed field assessment preparation including the SA Native Vegetation Council's Bushland Assessment Method (BAM) site selection and target areas. Combined with regional knowledge, the database survey results were used to undertake likelihood of occurrence

assessments for threatened flora and fauna species and highlight specific species to be targeted during field survey (Western Grasswren, Southern Whiteface and Malleefowl).

- In March 2023, several species were added as 'threatened' under the EPBC Act including Diamond Firetail (*Stagonopleura guttata*), Blue-winged Parrot (*Neophema chrysostoma*) and Southern Whiteface (*Aphelocephala leucopsis*). A further search of the PMST database was completed on 31 January 2024 to inform the SIA. A final PMST search was completed on 25 November 2024, to account for the minor adjustment to the Project area (described in Section 5). The resulting PMST report yielded no changes to relevant species.

- As noted in Section 3.2, the Ecology Study Area (47,170 ha) includes the PSL area (7,232 ha) held by Epic Energy under the ER Act, with an additional 5 km buffer. Consequently, the Ecology Study Area is significantly larger than the Project area (1,509 ha), as shown in Figure 3-2.

4.2.2 Field surveys

4.2.2.1 Survey effort

A substantial survey effort has informed the WHP alignment and design with a focus on avoidance and mitigation of impacts to threatened species habitat. This section outlines the individual surveys undertaken including their purpose and timing and provides an assessment of the survey effort.

Deliberate effort was made to ensure the survey effort met or exceeded the DCCEEW survey requirements for the Western Grasswren and Malleefowl as outlined in the Survey Guidelines for Australia's Threatened Birds (DEWHA, 2010, amended 2017) and to similarly exceed fit for purpose survey requirements for the Southern Whiteface, consistent with the methods and effort for other small passerine birds in the absence of a targeted guideline. The survey methodology was developed by ecological teams with extensive local knowledge and experience.

Given the amount of recent survey work that has occurred in and around the Project area, the baseline assessment involved desktop assessments and three Project-specific field surveys with a strong focus on target EPBC-listed species.

Several ecological studies have been conducted in the vicinity of the Project area since 2023. These are summarised in Table 4-1 and Figure 4-1.

Table 4-1: Existing studies and field surveys used in assessment

Survey type and location	Report	Description
Type: Vegetation mapping and bird surveys. **Location**: at the proposed Port Bonython Hydrogen Hub, and areas of land south of Whyalla Conservation Park and west of the Lincoln Hwy in Whyalla.	Port Bonython Hydrogen Export Hub Project – Terrestrial Ecology Assessment (Jacobs, 2023a). **Report not published.** The unpublished report has been considered in the SIA (Attachment C) and Baseline Ecology report (Attachment B).	Desktop and preliminary field assessments conducted for the Port Bonython Hydrogen Hub project, on behalf of OHPSA. The studies included preliminary likelihood assessments, draft vegetation mapping, bird surveys, song meter deployment and Bushland Assessments (vegetation assessments). Six broad vegetation communities were mapped. No EPBC listed species were detected (at Port Bonython).
Type: Targeted Western Grasswren Survey. **Location:** at the HJP Site 1 at 27022 Lincoln Hwy in	Hydrogen Jobs Plan - Targeted Western Grasswren Survey (EBS, 2023).	A targeted Western Grasswren survey conducted for the Hydrogen Jobs Plan project, on behalf of OHPSA, in October 2023. Call playback methods were used at 24 sites. Nine of the sites were located adjacent and west of the Lincoln Hwy

Survey type and location	Report	Description
Whyalla, and in an area adjacent and west of the Lincoln Hwy, and north and south of Point Lowly Road.	This report was published in March 2024, as Attachment C of EPBC Referral #2023/09759. Provided in **Attachment E** of this report.	north and south of Point Lowly Rd and align within the PSL Area. Western Grasswren were detected at three of these sites; two were north of Point Lowly Rd, one was south of Point Lowly Rd, immediately adjacent the Lincoln Hwy and near the southern extent of the PSL. Another eight sites were within the HJP Site 1, west of the Lincoln Hwy. Western Grasswren were detected at four of these sites.
Type: Bird surveys and vegetation mapping. **Location:** at the HJP Site 1 at 27022 Lincoln Hwy in Whyalla, and in an area adjacent and west of the Lincoln Hwy, and north and south of Point Lowly Road.	Hydrogen Jobs Plan - Site 1 and Transmission Line Ecology Baseline Assessment . This report was published in March 2024, as Attachment B of EPBC Referral #2023/09759. Provided in **Attachment F** of this report.	Desktop and field assessments conducted for the Hydrogen Jobs Plan project, on behalf of OHPSA. Surveys included song meter deployment, bird survey, Bushland Assessment Methodology (BAM) assessments and habitat mapping.
Type: Vegetation and habitat assessment and targeted Western Grasswren and Southern Whiteface surveys. **Location:** areas adjacent to the PSL area - along Point Lowly Road, in the Department of Defence land, and along the Lincoln Highway.	Northern Water Project – Draft Terrestrial Ecology Assessment (Jacobs, 2023c). This report was published in March 2024, as Attachment C V2, Appendix D, of EPBC referral #2023/09717.	Desktop and several field assessments conducted for the Northern Water Project, on behalf of Infrastructure SA. Surveys included vegetation mapping, targeted Western Grasswren surveys, song meter deployment and opportunistic detection of Southern Whiteface (prior to listing). Surveys occurred concurrently or separately from HJP surveys.
Type: Vegetation mapping, Western Grasswren, Southern Whiteface and Malleefowl surveys. **Location:** The Whyalla Hydrogen Pipeline PSL Area (Point Lowly Road / Lincoln Highway as shown in Figure 3-2).	WHP Baseline Ecology Assessment (Lathwida Environmental, 2024a). Provided in **Attachment B** of this report. WHP Significant Impact Assessment (Lathwida Environmental , 2024b). Provided in **Attachment C** of this report.	Desktop and field survey to fill in some of the gaps of previous 2023 surveys. The initial survey (**Survey 1**) involved vegetation mapping, BAM assessment and song meter deployment for one day/night at four sites (totalling 75 hours). Western Grasswren were observed at one site and detected via song meter at three sites in December 2023. The sites were considered suboptimal habitat, nonetheless they extended the species range to east of the Lincoln Hwy. Habitats where Western Grasswren were detected included: Chenopod Shrubland, Western Myall +/- Black Oak Bullock Bush over Chenopods, and Western Myall over Chenopods. Ward's weed cover was moderate to high in some areas and a fox was sighted. Malleefowl surveying (**Survey 2**) was undertaken in March 2024. Two ecologists surveyed mallee

Survey type and location	Report	Description
		habitat (<43 ha) along Point Lowly Rd (12 person hours, plus 8 person hours while doing vegetation assessments), as per relevant criteria (National Malleefowl Recovery Team, 2020), (DEWHA, 2010, amended 2017). No evidence of Malleefowl was detected (i.e. no mounds or tracks). In August 2024, a desktop and field survey was undertaken within the revised disturbance footprint areas located in the centre and eastern end of the WHP alignment (**Survey 3**). The survey effort concentrated on habitat considered suitable for Malleefowl, Western Grasswren and Southern Whiteface. The survey effort comprised 37 hours of Song Meter recordings and 10.6 person hours of bird survey. Refer to Attachment B, Section 3.5.4, p.56, for an overview of the survey effort.

Figure 4-1: Bird Survey Effort

4.2.2.2 Survey adequacy

Western Grasswren

The surveys were undertaken by teams including avifauna specialists with substantial experience in visual and audio identification of small passerines, including Grasswrens, both local to the project and throughout South Australia.

The Commonwealth Survey Guidelines for Australia's Threatened Birds (DEWHA, 2010, amended 2017) refers to the 'Thick-billed Grasswren (Gawler Ranges) (*Amytornis textilis myall*)', which is now known as Western Grasswren in the region of the Project. The guidelines suggest survey effort for species detection should include:

- area searches and transect surveys early in the morning in suitable habitat
- detection via calls and / or sightings
- response to broadcast surveys during the breeding season (June to September), although it is noted that the species responds to sufficient rainfall, and in recent years has been detected in the region in December (Jacobs, 2023b), (Jacobs, 2023c)
- 15 person hours of survey over three days in areas less than 50 ha, noting, failure to detect the species should be reported as 'not detected', not 'absent'.

Broadly, the December 2023 field survey by Lathwida involved the following:

- Ground-truthing broad vegetation description across the Project area against existing mapping (OHPSA, 2024). and SA Vegetation mapping. This was achieved by logging a 'Vegetation Check' point and taking a minimum of one photo, along with a brief description of the vegetation community / dominant species that were present.
- Vegetation survey (BAM survey sites), including collection of north, east, south, west photos of the site.
- Bird Surveys: This involved conducting roaming area search bird surveys and recording all species detected (individuals, signs of presence). Surveys were only conducted at Song Meter sites given the survey was targeted to the most suitable habitat within the Project area east of Lincoln Highway. There was a focus on detecting the high pitch call of the Western Grasswren. Surveys were conducted during active periods (e.g. in the morning until 11am and between 3pm and 5pm in the afternoon). Given the survey was at the end of the breeding period, where young may be present, ethical birding was undertaken. Brief playing of relevant species calls via a smart phone / bird application were used sparingly to check identify if birds were cryptic and not showing themselves. Surveys were generally undertaken for 20 to 30 minutes at each site by separate observers (ranging over different areas), concurrently with vegetation assessment. In addition, species were also recorded opportunistically whilst traversing around the site.
- BAM / Song Meter sites were assessed regarding the suitability and quality of the habitat for Western Grasswren. Key features included presence of preferred Chenopod species and / or spiny shrubs, height and density of these species and presence of other habitat features (e.g. grassy understory / weedy understory versus bare patches were considered). Habitat quality categories are summarised as follows:
    - *Habitat quality 1: Unsuitable* – not expected to occur, contains minimal or no recognized habitat qualities for the species.
    - *Habitat quality 2: Marginally suitable* – expected to occur rarely and only temporarily. Breeding not expected to occur. Contains some known habitat elements, but these are either sparsely present or of very poor quality or too dense to support foraging activity.

- *Habitat quality 3: Moderately suitable/suboptimal* – expected to occur at times. May not support resident populations and breeding may not occur; unlikely to provide core or refugial habitat. Habitat contains some characteristics described for the species, but the quality is compromised / missing key habitat characteristics, e.g. required cover or openness, dense bushes, only minor presence of key habitat species, has impacts from grazing / poor environmental conditions (at time of assessment), weeds present, predation by introduced predators.
- *Habitat quality 4: Suitable habitat* – expected to occur. Habitat contains key elements and within the known vegetation cover range recorded for the species, but either of a lower quality or without known records for the area. Breeding possibly occurs in such habitat if the species present, but may not represent a refugial area.
- *Habitat quality 5: Very suitable* – either observed/detected, or there are known records for the area or contains the highest quality habitat for the species. Where the key characteristics and flora species are present, breeding is expected to occur and possibly provide refugial habitat during poor environmental conditions.

- Four Song Meters were deployed at four survey sites for one night from 6 to 7 December 2023, primarily to detect the potential presence of Western Grasswren (but also to characterise the avian fauna within the survey area). The recording schedule was set as follows:
  - 25 minutes recording and 5 minutes not recording starting at 04:00 and finishing at 10:00 (five hours per 24 hours)
  - 30 minutes recording and 30 minutes not recording starting at 10:00 and finishing at 03:30 (nine hours per 24 hours).

- The August 2024 field survey by Lathwida was conducted in the revised sections of the disturbance footprint, and involved:

- Four Song Meters deployed at four survey sites for two nights from 28 to 30 August 2024, to detect the potential presence of Western Grasswren and Southern Whiteface. Three of the song meters malfunctioned, so no data was recorded. One song meter recorded for 37 hours between 1500 on 28 August and 1030 on 30 August.
- Bird surveys were conducted over three consecutive days at seven survey sites, totalling 10.6 survey hours, following the same methodology as the December 2023 surveys.
- The seven survey sites were assessed regarding the suitability and quality of the habitat for Western Grasswren following the same methodology as the December 2023 surveys.

Malleefowl

The March 2024 survey by Lathwida was conducted in 42.2 hectares of habitat which intersected with the proposed pipeline temporary disturbance area. The primary purpose of the survey was to search for evidence of Malleefowl within vegetation mapped as Mallee along Point Lowly Road.

The survey exceeded the requirements of the National threatened bird survey guidelines (DEWHA, 2010, amended 2017). The guidelines suggest survey effort for species detection should include:

- area searches in suitable habitat for active mounds (used for nesting), tracks/footprints and sightings of birds
- transect surveys in sandy areas for detection of Malleefowl footprints
- ten-person hours minimum per 50 ha.

Two ecologists experienced in Malleefowl detection surveyed on foot the 60 m wide proposed disturbance corridor for signs of Malleefowl (e.g. mounds, footprints). The corridor was surveyed by

walking parallel transects within the corridor (i.e. up one side and back the other side, with approximately 15 m to 20 m between). A total of 12 dedicated person hours were spent searching for Malleefowl. In addition, an extra 8 person hours was spent within the 42.2 ha conducting vegetation assessments.

Malleefowl are sedentary and remain in the same area throughout the year. Egg-laying usually starts in September and can continue to early autumn. Chicks usually emerge from the nesting mound in November but may continue until March (DEWHA, 2010, amended 2017). Based on this, if Malleefowl were present within the proposed Disturbance Footprint, evidence of a nesting mound, with or without remains of hatched eggs would be expected in March. Hence the timing of the survey is considered suitable.

In August 2024, Lathwida surveyed sections of the updated disturbance footprint. As access to the former Defence land was limited, two ecologists performed a slow drive by, high-level visual search for Malleefowl mounds along the transect shown in Figure 4-1. In September 2024, LiDAR data collected by Infrastructure SA covering the area was used to identify potential Malleefowl mounds, which were subsequently verified in the field as 'not a mound' by Epic Energy staff.

Southern Whiteface

Southern Whiteface is not included in the 'Survey Guidelines for Australia's Threatened Birds: Guidelines for detecting birds listed as Threatened under the *Environment Protection and Biodiversity Conservation Act 1999*' (DEWHA, 2010, amended 2017), as it was listed as threatened in March 2023 after the publication of the guidelines. For the purposes of the assessment, survey methods employed were consistent with other small passerine bird species listed in the guidelines. This included survey effort and search protocols (including use of Song Meter recordings and audio analysis). Advice from the survey team indicates that methods deployed were suitable for detection of the species.

The species was detected in the EBS 2023 survey. In the previous Jacobs surveys, all species observed or heard (including via Song Meter) were recorded, rather than just noting the survey target species, meaning that field surveys would have reported Southern Whiteface if observed, heard or recorded.

Survey limitations

During Lathwida's Surveys One and Two, weather conditions were less than ideal for bird detection due to high temperatures, humidity, and heavy winds—typical of the coastal location. Despite these challenges, the December 2023 survey successfully achieved its primary objectives of habitat and vegetation mapping and placement of Song Meters in suitable Western Grasswren habitat. While weather conditions did not affect the detection of Malleefowl mounds or signs, high winds, industrial noise, rail activity, and heavy traffic compromised some Song Meter recordings, rendering portions unusable. Additionally, the similarity between Western Grasswren calls and those of common fairywren species further complicated identification. Automated vocalisation detection via Kaleidoscope was employed, but only select clusters were manually verified due to time constraints.

For Survey three, no data was collected on three of four Song Meters. Song Meter 06 collected a total of 37 hours, of which 20 hours were during optimal morning conditions, detecting Western Grasswren in at least three recordings. Bird surveys were also conducted at each Song Meter site primarily during optimal morning times and weather conditions.

Despite these limitations, the surveys were sufficient to confirm the presence of the target species.

4.2.3 Western Grasswren (Gawler Ranges)

4.2.3.1 Abundance, distribution, ecology and habitat preferences

Western Grasswren is one of five subspecies of *Amytornis textilis* and occurs in the eastern Gawler Ranges and north-eastern Eyre Peninsula. The species is scattered and widespread in the Myall Creek and Pine Creek drainages of the north-eastern Eyre Peninsula, bounded in the south by Munyaroo Conservation Park, and in the north towards Lake MacFarlane and eastern Lake Gairdner and Lake Gilles Conservation Park (Garnett & Baker, 2020).

The Western Grasswren was listed as Vulnerable under the EPBC Act in November 2014 and remains under this status. Loss of habitat due to over-grazing was identified as a significant threat to the species (Higgins, Peter, & Steele, 2001). The species is also vulnerable to several introduced species including predation by fox and feral cat, and habitat degradation by rabbit and feral goats overgrazing (Higgins, Peter, & Steele, 2001) (Australian Government, 2009).

The species' conservation advice suggests all populations of the species are considered to have high conservation value (DotE, 2014). The Action Plan for Australian Birds and IUCN assessment data suggests there is one subpopulation which is not severely fragmented (Garnett & Baker, 2020).

The Western Grasswren is found in pockets of dense spiny chenopod and acacia shrubland along drainage lines. It may also occur in open chenopod shrublands with a sparse or open canopy of small trees and shrubs (Black, Carpenter, & Pedler, 2009) (Higgins, Peter, & Steele, 2001). Previous assessment of this species' habitats found that 64% of the sites known to be occupied with Western Grasswren were covered with low shrublands (predominantly Australian boxthorn *Lycium australe* and Blackbush *Maireana pyramidata*) and 28% were covered with low woodlands (predominantly with Western Myall *A. papyrocarpa*) (Black, Carpenter, & Pedler, 2009).

The structure of habitat is particularly important in determining whether habitat is suitable for the Western Grasswren. Black et al (Black, Carpenter, & Pedler, 2009) found that sites where the species was detected had greater total shrub cover, particularly from large shrubs with a dense structure extending to the ground, than sites where the species was not detected.

Black et al (Black, Carpenter, & Pedler, 2009) also note seasonal variation in habitat conditions in discussing the absence of Western Grasswrens from one quarter of previously identified localities during surveys in 2006: 'The year 2006 was particularly dry and followed a succession of years of below average rainfall. During this time it is likely that grasswren populations contracted into refuge areas of optimal habitat. Prolonged drought had reduced the cover and density of many plant species, causing dieback or leaf-drop in Blackbush and Bladder Saltbush independently of grazing intensity'.

In 2006, Western Grasswren were present at 76% of 62 sites surveyed, with sites chosen based on previous records of the subspecies occurring there (Black, Carpenter, & Pedler, 2009). Based on these surveys results it was deemed that Western Grasswren have a relatively stable population. It was deemed that the relative stability of the area of occupancy (AOO) of the Western Grasswren is likely due to plant species, such as *Maireana pyramidata* (Blackbush) and other spiny shrubs, that are important habitat features, being favoured by light to moderate grazing (Black, Carpenter, & Pedler, 2009). The absence of Western Grasswrens from approximately 25% of their previous identified localities may have been due to several factors, including drought and grazing by stock, mainly sheep and cattle, and rabbits (Black, Carpenter, & Pedler, 2009).

Although there is no more recent published data on stability of the Western Grasswren population in the region, ecologists working across the region have observed that the species continues to be commonly recorded in field surveys across their habitat, and in recent years high numbers have been detected in field surveys, including in habitat types that are considered sub-optimal. This indicates that the species is likely to be stable (or possibly increasing) across its range in the region.

Garnett et al. (Garnett, Szabo, & Dutson, 2011) estimated the Western Grasswren population to be between 4,800-12,000 individuals based upon the species AOO and population density. The mid-point of 8,400 individuals (Garnett, Szabo, & Dutson, 2011) is used in the approved Conservation Advice for the species (DotE, 2014), which is still the only, and thus current, conservation advice for the species.

Garnett and Crowley (Garnett & Crowley, 2000) estimated the Western Grasswren's AOO as 5,000 km^2. The 2020 Action Plan for Australian Birds (Garnett & Baker, 2020) revised this estimate to 760 km^2 (range 400 – 1600 km^2) with a population estimate of approximately 12,000 (range 8,000 – 16,000) mature individuals (Garnett & Baker, 2020). This estimate is acknowledged by Garnett and Baker to have low reliability. The trend is noted as declining. However, Black et al. consider the population trend of Western Grasswren to be stable although note there is a paucity of empirical data to support this (Black, Copley, & Garnett, 2021).

The extent of occurrence (EOO) and area of occupancy of Western Grasswren has more recently been estimated by EBS Ecology based on the *Guidelines for assessing the conservation status of native species according to the EPBC Act and EPBC Regulations 2000* (Threatened Species Scientific Committee, 2000). The area of occupancy was estimated as 2,550 km^2, based on verified historical database records as well as observations collected by EBS Ecology in 2022 and 2023 (EBS, 2023). All historical database records available at the time of the assessment were sourced from the Biological Database of South Australia (DEW, 2023).

The area of occupancy was calculated using a 5 x 5 km grid, rather than the standard 2 x 2 km grid. EBS Ecology considered this provided a more conservative approach given the lack of survey effort across most of the species' range. The Western Grasswren occur only in the semi-arid pastoral districts of South Australia. This area tends to be under-surveyed biologically, and therefore current records for Western Grasswren are considered an underestimate. For this reason, a more conservative 5 x 5 km grid was applied to current records to estimate the AOO, in line with the guidance for dealing with uncertainty in the AOO (IUCN Standards and Petitions Committee, 2024). In circumstances where there is uncertainty in the AOO (i.e. poorly surveyed / inaccessible areas) the guidelines suggest that a plausible upper bound of AOO could be generated from where the 2 x 2 km grid intersects with potential habitat for the species, rather than just historic records. Given the presence of remnant vegetation across the majority of the Western Grasswren range, this approach would calculate a larger AOO estimate than the more reasonable assumption applied to this assessment of using a 5 x 5 km grid.

For completeness, the AOO both using the 2 x 2 km grid and 5 x 5 km grid are shown below (EBS, 2023). The EOO remains the same.

- AOO using 2 x 2 km grid is 44,850 ha
- AOO using 5 x 5 km grid is 255,000 ha
- Extent of occurrence (EOO) is 1,504,086 ha

Garnett and Baker (Garnett & Baker, 2020) suggest a population density of 8 – 20 birds per km^2 (0.08 – 0.2 birds per ha) noting these numbers also have low reliability. Schodde (Schodde, 1982) note they often occur in pairs with a territory of four to five hectares. However, this does not provide a good basis for a population estimate as not all of the area of occupancy will be taken up with breeding territories.

There is currently little information available on this species' biology and behaviour. Studies suggest it is sedentary, often occurring in pairs (Schodde, 1982). Similarly, relatively little is currently known on the breeding behaviour of the Western Grasswren. While its breeding season is described as from late June to September (Higgins & Peter, 2002), Black et al (Black, Carpenter, & Pedler, 2011) consider that the breeding season of the Thick-billed Grasswren (which is from the same genus and

behaviourally similar to the Western Grasswren) extends into October and young and eggs have been identified from August to end of October. The species utilises low shrubs for nesting.

The lack of data on the Western Grasswren partly reflects the species usually being furtive and difficult to observe (DCCEEW, 2023a). Its brown partly streaked plumage also enables effective camouflage. For these reasons, it is less likely to be recorded during broad ecological surveys and targeted survey methods are required. The species also occurs in semi-arid pastoral districts that tend to be under-surveyed biologically.

4.2.3.2 Potential for Western Grasswren habitat within the Project area

Western Grasswren are known to occur within the Project area, particularly the western part. There are multiple historical records for the species within and near the Project area, within and close to Whyalla, along highways and, in particular, in the nearby Whyalla Conservation Park and Cultana Training Area (refer to Figure 4-3). A targeted survey in October 2023 by EBS Ecology for the HJP recorded 23 individuals across 11 of the 24 survey sites located throughout the study area for that project (EBS, 2023).

The Project area east of Lincoln Hwy does not contain any 'preferred habitat' of drainage lines with dense Black Bluebush. However, during targeted field surveys for the Project conducted in 2023 and 2024, the species was detected at five locations east of the Lincoln Highway, three of which were within or immediately adjacent to the Project Area (Figure 4-3). These were in moderately suitable to marginally suitable habitat containing some potential roosting vegetation. Based on anecdotal evidence, the species has been undergoing a ‘boom’ period in recent years, with increased detections through its range in both preferred, atypical and suboptimal habitats where they have not been detected previously (including east of Lincoln Hwy) (Attachment C, Table 3.2, p.30).

Conservative habitat mapping and records of the Western Grasswren are shown in Figure 4-3.

The proposed action will primarily occur east of the Lincoln Hwy, at or beyond the edge of the species known AOO. The recent records indicate a minor eastern extension of the species AOO. The individuals detected east of the Lincoln Hwy would be considered part of small family groups on the edge of the entire population.

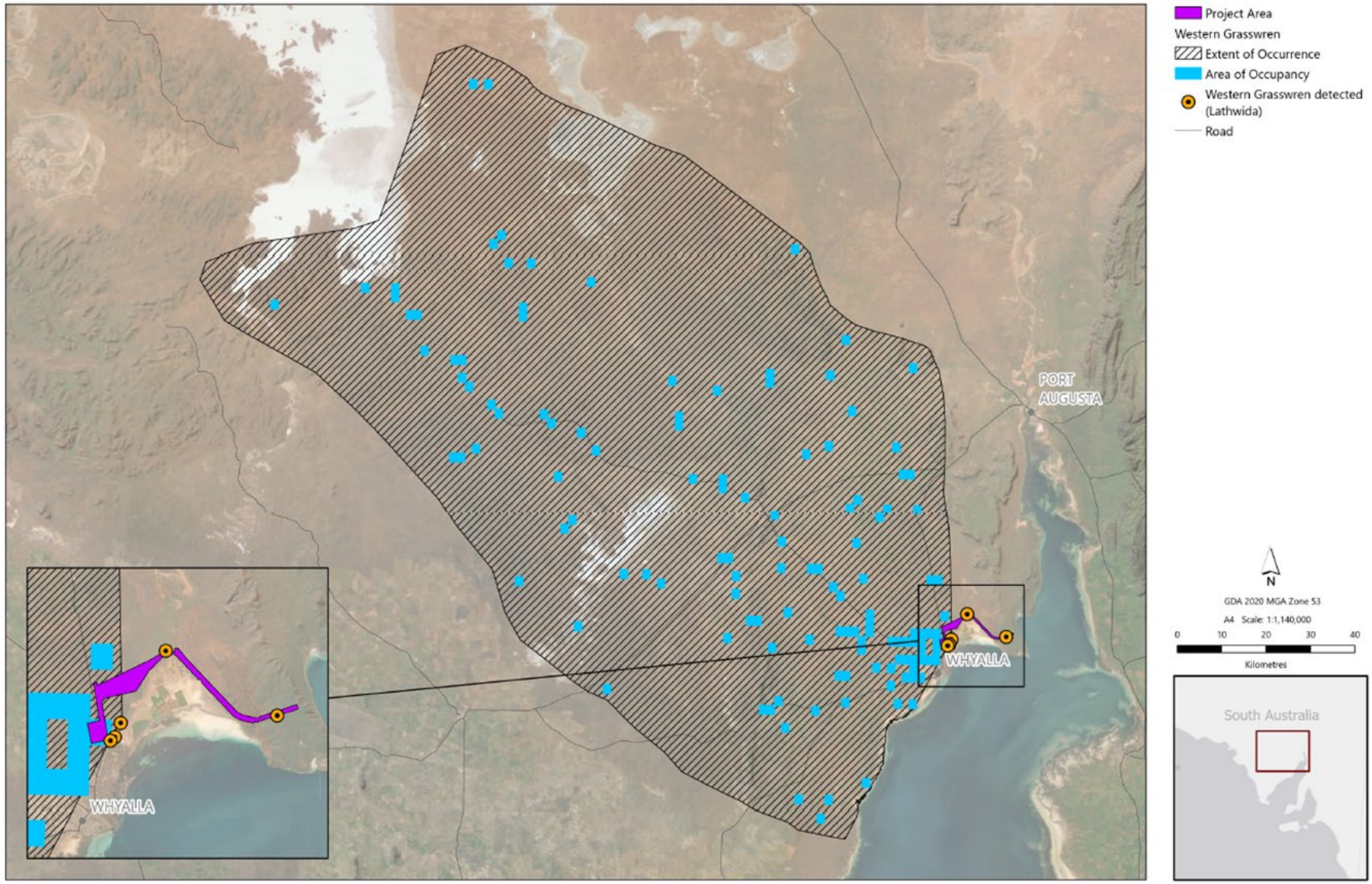

Figure 4-2: Extent of occurrence and area of occupancy of the Western Grasswren

Figure 4-3: Existing records of Western Grasswren within and near the Project area

4.2.4 Southern Whiteface

4.2.4.1 Abundance, distribution, ecology and habitat preferences

The Southern Whiteface *Aphelocephala leucopsis* (Southern Whiteface) is an Australian bird with a large distribution that includes most of mainland Australia south of the tropics ((Schodde & Mason, 1999) cited in DCCEEW, 2022) (refer to Figure 4-4). Its area of occupancy is estimated to cover approximatively 70,000 km^2 and its current population is estimated to be around 477,000 mature individuals (Ehmke, et al., 2021); (Australian Government, 2021).

Whilst Southern Whiteface distribution is widespread, their distribution is patchy in woodlands and tall shrublands with grassy / low shrub layers (Menkhorst, et al., 2017). Once considered common, this species was recently listed as Vulnerable under the EPBC Act due to the substantial decline in its population since 1999 from habitat loss and fragmentation (DCCEEW, 2023b). Clearing for agriculture and overgrazing have been identified as the main cause of its decline, particularly where there is complete habitat removal for intensive agriculture as evidenced by the absence of the species in intensive agriculture areas in the south-west of Australia. However, a study on the influence of agriculture-driven degradation on ground-foraging birds in Victoria (Maron & Lill, 2005) found no effect of habitat fragment area, isolation, fragmentation, quality or vegetation complexity on Southern Whiteface.

The Threatened Species Scientific Committee (DCCEEW, 2023b) concluded:

- The species' geographic distribution was not precarious for its survival
- The species is not subject to extreme fluctuations in EOO, AOO, number of subpopulations, locations or mature individuals
- The total number of mature individuals is not considered low.
- Population viability analysis has not been undertaken for the species.

The movements, home range and social structure of Southern Whiteface are relatively poorly understood. Southern Whiteface occur in small family groups of up to 20 individuals and often with thornbills (Readers Digest, 1977); (Menkhorst, et al., 2017). Although considered sedentary, they may move into wetter areas outside of their normal range during drought years (Higgins & Peter, 2002). Breeding typically takes place from July to October throughout most of the species' range.

Habitat critical to the survival of this species is identified as including relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both; habitat with low tree densities and an herbaceous understory litter cover which provides essential foraging habitat; and living and dead trees with hollows and crevices which are important for roosting and nesting (DCCEEW, 2023b).

No important populations of the Southern Whiteface are highlighted in the species Conservation Advice, and the species has no conservation listing in South Australia (DCCEEW 2023b).

Southern Whiteface habitat in South Australia varies between the intensively used agricultural zone which is characterised by extensive vegetation clearance, and the pastoral rangelands with stock grazing of native vegetation. The availability of habitat within the agricultural zone has been significantly reduced since European settlement through broad scale land clearing activities to accommodate cropping and other intensive agricultural activities. The habitat that remains within these areas is often highly fragmented and with remaining patches degraded.

The pastoral rangelands zone across the Eyre Peninsula continues to support remnant native vegetation and therefore potentially suitable habitat for Southern Whiteface, as the majority of this

area has been used for stock grazing and has not been subject to broad scale land clearing. Whilst the habitat available may have been modified to varying degrees depending on density of stocking, this has resulted in the habitat being essentially contiguous throughout the region with only small areas of complete clearance across the region. Therefore, it is considered that extensive suitable contiguous habitat is available for Southern Whiteface across the pastoral rangelands region of South Australia.

Although there is no published data on stability of the Southern Whiteface population in the Gawler IBRA region, ecologists working across the region and in adjacent regions have observed that the species continues to be commonly recorded in field surveys across their habitat. This indicates that the species is likely to be stable across its range in the region.

The area of occupancy of this species is estimated at approximately 7,000,000 ha (DCCEEW, 2023b); (Ehmke, et al., 2021). Within the Gawler IBRA bioregion, the AOO is estimated at 375,600 ha (Attachment C, section 4.2, p 65).

4.2.4.2 Potential for Southern Whiteface habitat within the Project area

Although the species itself was not detected in field surveys for the Project, suitable habitat in the Project area was confirmed during on-ground surveys. This consisted of habitat identified in Figure 3-3 as Western Myall Woodland over Chenopod, with or without other tree species such as Black Oak, False Sandalwood and Bullock Bush (in the west of the Project Area), as well as Mallee.

Other nearby proposed projects have detected Southern Whiteface via Song Meter in and near the western half of the Project area (refer Figure 4-5), and several BDBSA records exist within the broader Ecology Study Area (Attachment C, Section 4.2, pp 64-65).

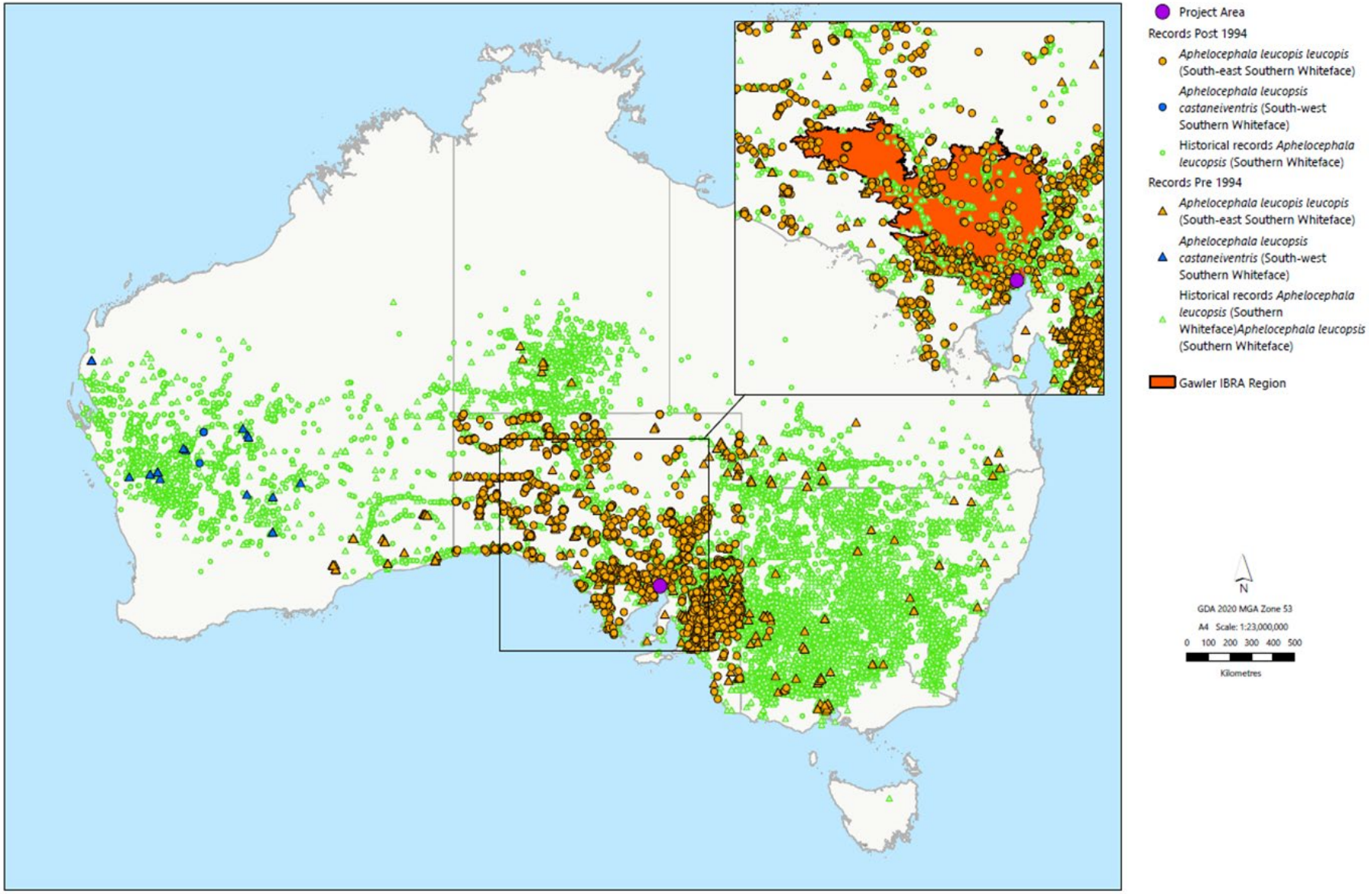

Figure 4-4: Southern Whiteface extent of occurrence

Figure 4-5: Existing records of Southern Whiteface within and near the Project area

4.2.5 Malleefowl

4.2.5.1 Abundance, distribution, ecology and habitat preferences

Malleefowl is a large ground-dwelling bird found mostly in mallee-dominated shrublands and low woodlands in the southern half of Australia. The species is listed as vulnerable under the EPBC Act. It is wide-ranging in mallee dominant habitats, and associated adjoining habitats such as dense acacia shrublands, *Callitris verrucosa* (Scrub Pine), *Melaleuca uncinata* (Broombush) (for foraging). Deep sandy soils and abundance of leaf litter are required for breeding / nesting (Benshemesh, 2007). Within South Australia, most records of the species are from the Eyre Peninsula and Murray Darling Basin region.

Fire history is also important, with the species preferring a mosaic of long unburnt vegetation. Over the course of a year the birds may range over 100 to 300 ha and home ranges overlap considerably. Densities of birds are greatest in areas of higher rainfall and on more fertile soils where shrub diversity is greatest (Benshemesh, 2007) (Benshemesh, 2021). No specific important populations have been defined for the species (Benshemesh, 2007) (Benshemesh, 2021).

No specific important populations have been defined for the species, but all populations and areas occupied by Malleefowl are considered equally important for the species recovery ((Benshemesh, 2007) (DCCEEW, 2024a)).

The AOO for the species is most recently estimated at 5,000,000 ha (Garnett & Baker, 2020). The Extent of Occurrence, across Australia, is depicted in Figure 4-6.

4.2.5.2 Potential for Malleefowl habitat within the Project area

The Malleefowl is considered known to occur in the Ecology Study Area, with three previous records from 2019 all recorded crossing Point Lowly Road in mallee areas on or along the edge of the Project area (refer to Figure 4-7).

No Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint within mallee habitats during targeted searches of the Project area in March and August 2024. Given the lack of deeper sand in the Project area and proximity to Point Lowly Rd, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur further north of Point Lowly Rd in the large patch of mallee on Department of Defence (DoD) land that is contiguous with the eastern half of the Project area (Figure 4-7). During the assessment, potential Malleefowl mounds identified using LiDAR data in this eastern half of the Project area were later verified as ‘not mounds’ by on-ground inspection (Refer to Attachment B, Appendix C3. LiDAR Results).

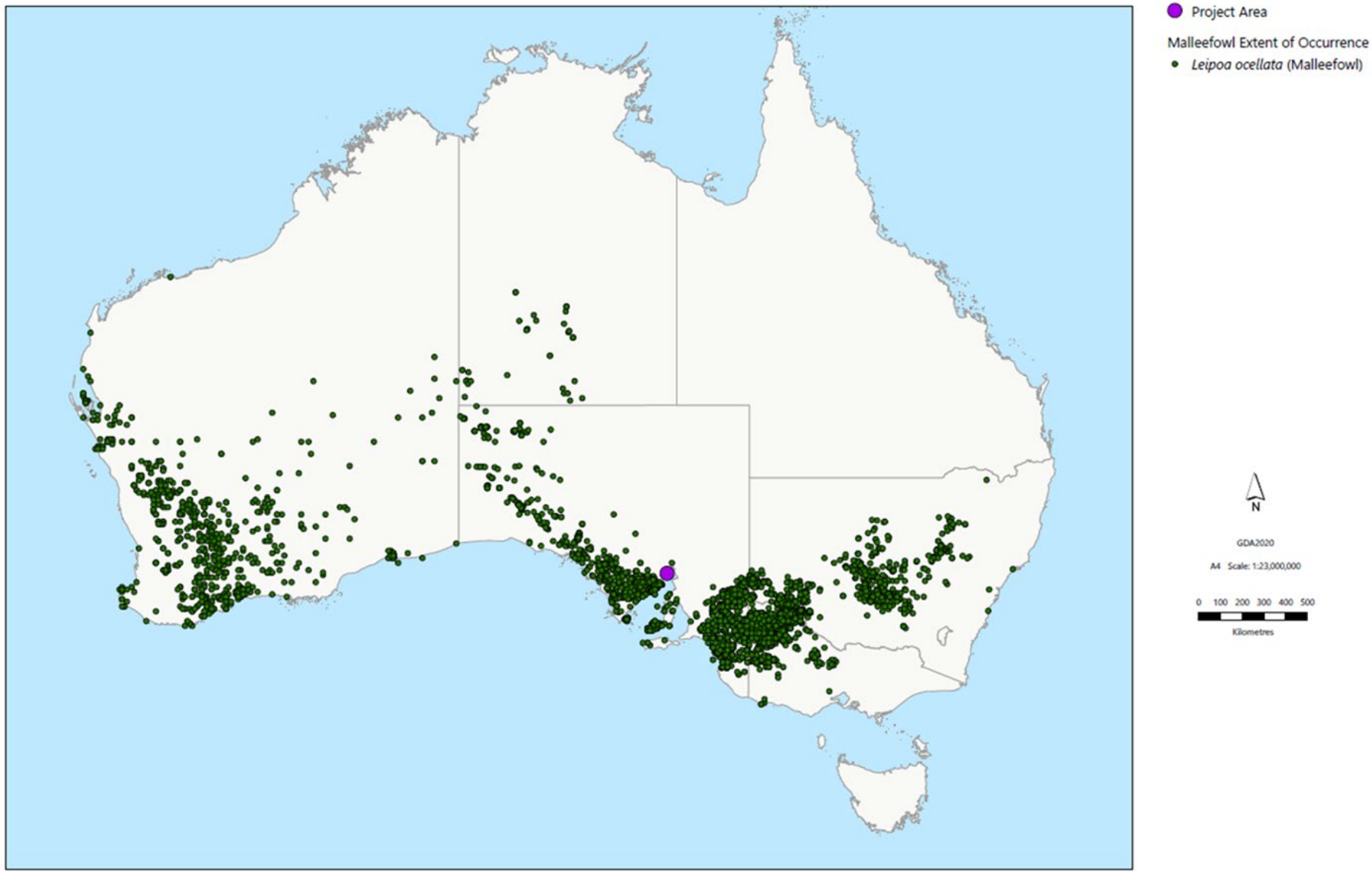

Figure 4-6: Malleefowl extent of occurrence

Figure 4-7: Conservative habitat mapping for Malleefowl and previous records

4.2.6 Grey Falcon

4.2.6.1 Characteristics of the Grey Falcon

The Grey Falcon is an Australian Falcon with a widespread distribution in arid and semi-arid zones on the Australian mainland (ALA, 2024) (Figure 4-8). Its area of occupancy is estimated at 1,690,000 km^2, and the total size of the population is estimated to be approximately 1,000 mature individuals (Garnett & Baker, 2020). The Grey Falcon was listed as Vulnerable under the EPBC Act in 2020 due to the small number of mature individuals in the total population. Research suggests the species has always been rare, and there is no evidence of recent decline (Garnett & Baker, 2020).

The Grey Falcon's preferred habitat includes open plains and treed watercourses in arid inland areas. When not actively hunting it roosts in shady trees or communications towers.

Typically, breeding occurs June to November utilising the old nests of raptors or corvids. Such nests are usually in the tall trees along water courses particularly River Red Gum and Coolibah. An important population of this species has not been defined.

4.2.6.2 Potential for Grey Falcon habitat within the Project area

The Grey Falcon was not observed in ecological surveys. There are no large, treed watercourses present within the Project area, but the species may forage widely and feeds exclusively on other birds. Conservatively, if present, the species may use open areas for foraging and treed areas for roosting. There is one record from 2011 (no spatial reliability) within 5 km of the Project area (BDBSA, 2023). Breeding is unlikely to occur in the Project area due to the lack of breeding habitat.

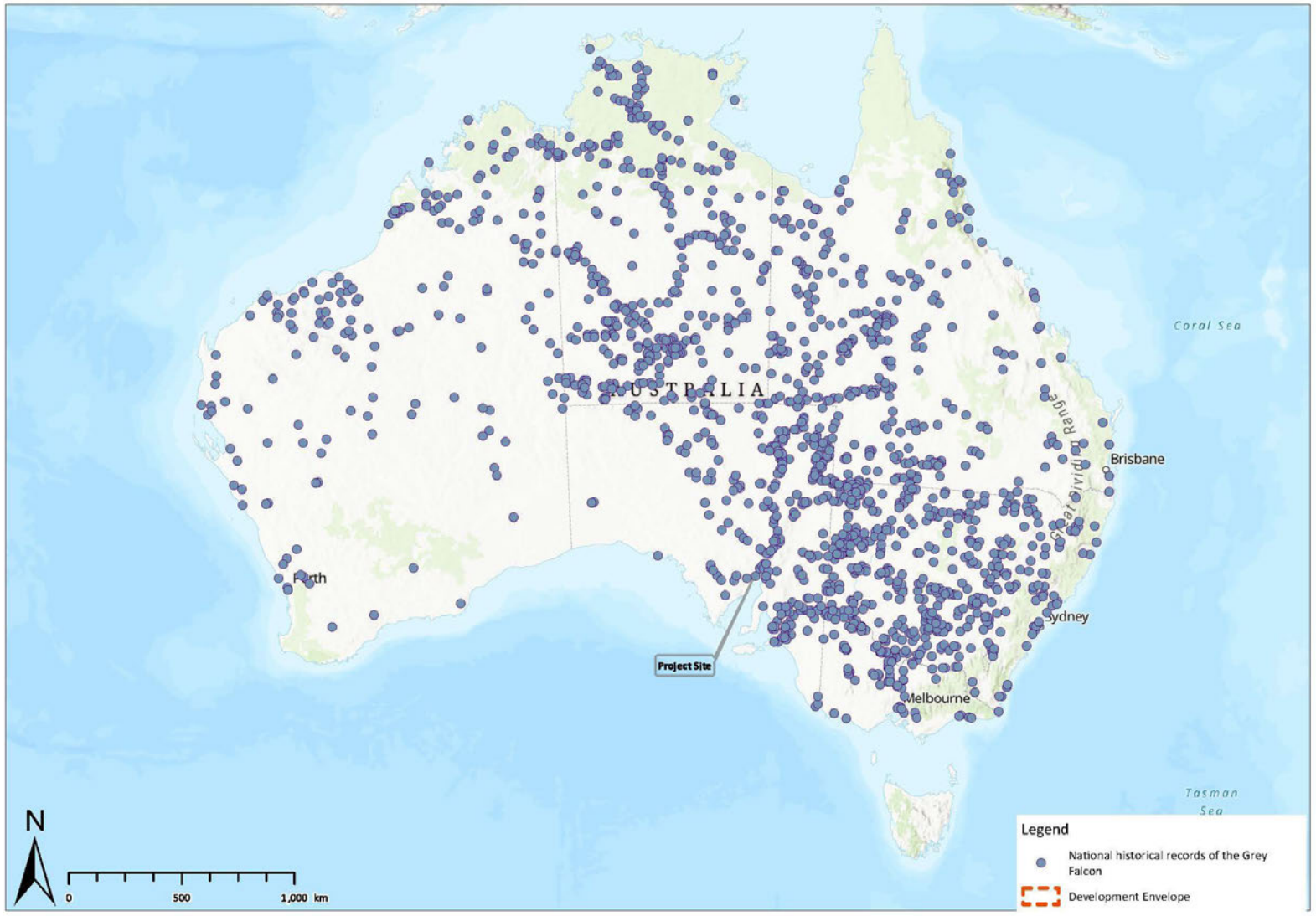

Figure 4-8: Distribution of historical records for Grey Falcon (Source: OHPSA, 2024)

4.2.7 Blue-winged Parrot

4.2.7.1 Characteristics of the Blue-winged parrot

The Blue-winged Parrot is a migratory parrot listed as Vulnerable under the EPBC Act. The species breeds in Tasmania and mainland Australia south of the Great Dividing Range in southern Victoria, and sometimes in the far south-east of South Australia. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales (Figure 4-9). There has been a strong decline in the species population in the last decade, leading to a listing as Vulnerable under the EPBC Act in March 2023. Habitat loss caused by land clearing was identified as a high threat to the survival of this species (DCCEEW, 2023c).

(DCCEEW, 2023c) reports that critical habitats for the survival of this species include:

- grasslands, grassy woodlands, semi-arid chenopod shrubland and wetlands both near the coast and semi-arid zones (foraging and staging habitat)
- eucalyptus forests and woodlands containing trees and stumps with hollows (breeding habitat).

An important population of this species has not been defined. The species' area of occupancy is estimated at 11,000 km^2 with approximately 10,000 mature individuals (Garnett & Baker, 2020).

4.2.7.2 Potential for Blue-winged parrot habitat within the Project area

The Project area occurs within the species' occasional range. There are no records within 5 km of the Project area, and only one record in the broader region. It was not observed in on-ground surveys in the Project area or in surveys for the nearby HJP.

Given the extremely broad distribution of this species through a range of different habitat types through their non-breeding period, and the occurrence of records of the species in the broader region, it is possible that the species could occur in the open chenopod areas within the Project Area during inland migration periods.

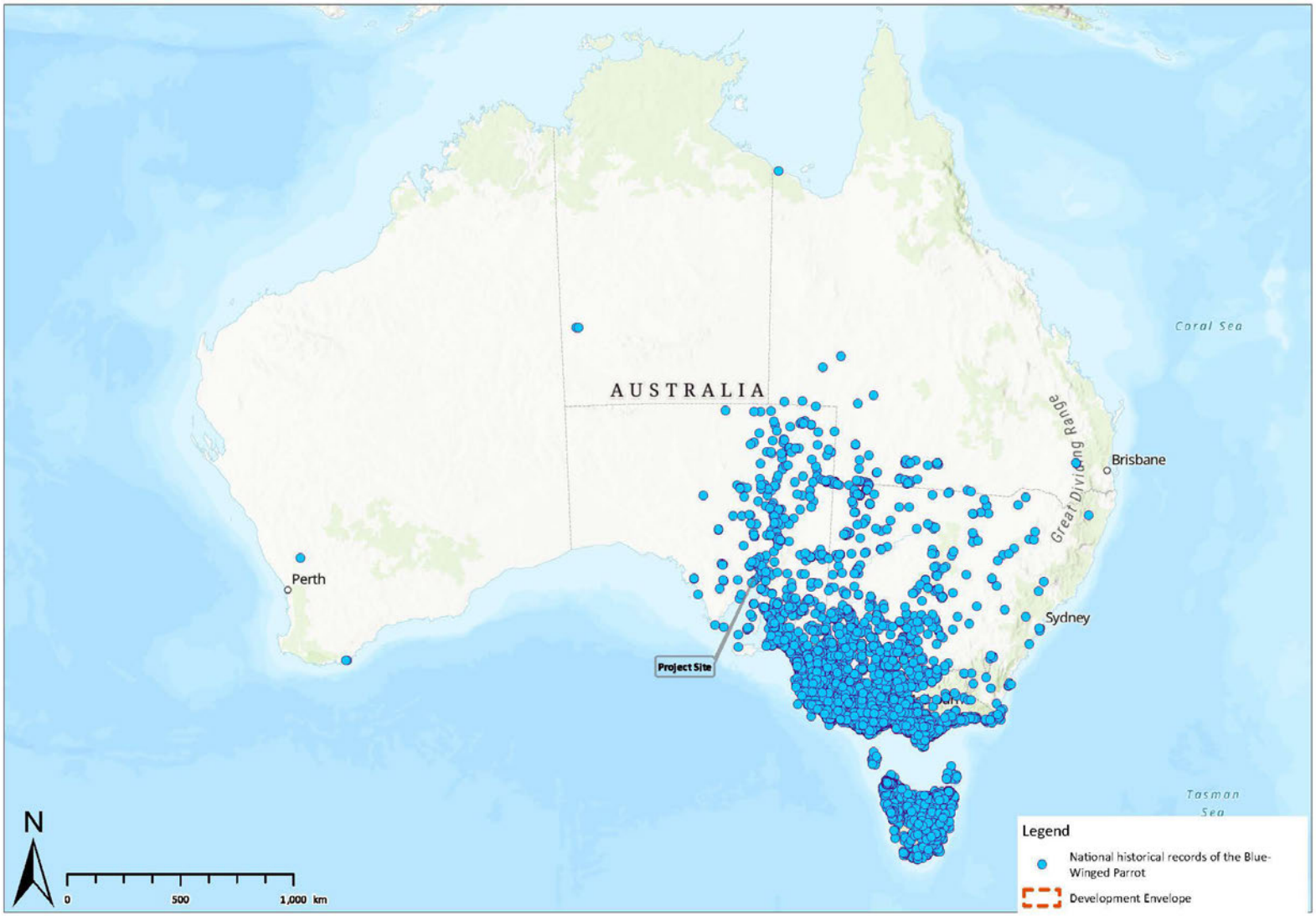

Figure 4-9: Distribution of historical records for Blue-winged Parrot (Source: OHPSA, 2024)

4.2.8 Shorebirds

As noted in Section 4.1.3, a number of threatened shorebirds were considered unlikely to occur on the Project area but had the potential to occur on the adjacent intertidal mudflats and saltmarsh areas. These are described in Table 4-2. A more detailed assessment can be found in Attachment C.

Table 4-2: Threatened shorebirds with potential to occur near Project area

Name	Status	Characteristics	Potential for habitat adjoining the Project area
Ruddy Turnstone (*Arenaria interpres*)	VU, MW	Range includes coastline of Australia except Great Australian Bight. Breeds in Siberia and Alaska. When in Australia prefers rocky coastlines, coral and sand islands. The species is also strongly associated with beaches that have large expanses of rotting seaweed and will roost nearby in a range of habitats including low saltmarsh. In southern Australia they prefer rockier coastlines and occur in fewer numbers on extensive mudflats.	Historical and recent (2021) records at the salt pans adjacent to the Project area. Has the potential to occur adjacent the Project Area along the nearest beach 350m south of Point Lowly Road or roosting in samphire/saltmarsh.
Sharp-tailed Sandpiper (*Calidris acuminata*)	VU, MW	Migratory shorebird occurs widespread in Australian coastal and inland areas, but prefers non-tidal fresh or brackish wetlands, damp grasslands, will also utilise farms dams, wastewater irrigation areas, tidal flats, beaches. Breeds in Siberia, migrates to New Guinea and Australia (summer).	Several recent (2006, 2021) records at salt pans. Known to occur adjacent the Project area along the nearest beach 350m south of Point Lowly Road or in samphire/saltmarsh areas if holding water (e.g. in claypans following rainfall).
Red Knot (*Calidris canutus*)	VU, MW	Global migratory wader species widespread around all coastal areas of Australia. More common in northern and eastern parts of Australia. When in South Australia (Sept –April) occurs on extensive intertidal mud flats, with some inland records to November in very small numbers.	No recent records in the study area but could visit the adjacent Whyalla Saltfields / False Bay beaches and samphire shrubland areas, particularly following rainfall events.
Curlew Sandpiper (*Calidris ferruginea*)	CE, MW	Migratory species breeds in the high artic tundra. When in Australia prefers exposed intertidal mudflats and less frequently inland freshwater / brackish wetlands.	Several historical and recent (2019) records in the salt pans. Has the potential to visit the adjacent evaporation ponds in False Bay, samphire shrubland areas in the centre / west end of Study Area, particularly in following rainfall events / when in Australia.
Great Knot	VU, MW	Migratory shorebird that does not breed in Australia. Prefers	No recent records in Study Area and few historical

Name	Status	Characteristics	Potential for habitat adjoining the Project area
(*Calidris tenuirostris*)		sheltered coastal habitats, with large intertidal mudflats or sandflats, including natural environments along and close to the coast, and artificial environments such as ponds in saltworks/saltfields. In South Australia, strongholds are western Eyre Peninsula, Adelaide International Bird Sanctuary and Coorong.	records. Has a low potential to occur in beach habitats adjacent the Project Area.
Greater Sand Plover/Large Sand Plover (*Charadrius leschenaultii*)	VU, MW	Early migratory bird that visits Australia (Aug-March) and remains in Aus for first austral winter. Occurs in tidal flats and roosts on beaches at high tide.	No recent records in Study Area and historical records have low spatial reliability. Has a low potential to occur in the adjacent saltfields / beaches.
Nunivak Bar-tailed Godwit / Western Alaskan Bar-tailed Godwit (*Limosa lapponica baueri*)	EN	Large migratory shorebird that does not breed in Australia, but rather Siberia and Alaska. When in Australia, the sub-species mainly occurs along the north and east coasts. In South Australia, mainly occurs form the coast near Lake Alexandrina (Coorong) to Denial Bay (past Ceduna).	No recent or spatially reliable records within 5 km of the Project area but there are five historical records (1980s) from the 'Whyalla Saltfields' / False Bay. Has the potential to occur adjacent the Project area at the Whyalla Saltfields and False Bay beaches.
Eastern Curlew, Far Eastern Curlew (*Numenius madagascariensis*)	CE, MW	Breeds in NE Asia, Siberia and is a spring migrant to Australia where it is found in all states. Within Australia, has a primarily coastal distribution, with very few inland records. Its preferred habitat is coastal lakes, inlets, bays and estuaries where it occupies intertidal mudflats, particularly exposed seagrass beds.	Few historical records around Whyalla (1980s). No BDBSA records in Study Area, however, one individual was recorded in 2023 Winter Birdlife surveys at the Whyalla Saltpans adjacent the Project Area. Hence this species is considered likely to occur adjacent the Project Area in suitable coastal habitat.
Australian Fairy Tern (*Sternula nereis nereis*)	VU	Occurs along coasts and estuaries, and breeds on sandy beaches or spits. Along the coast, this sub-species generally nests on sandy beaches and banks above the high tide line and below vegetation. The sub-species' distribution extends along the coasts of South Australia, Tasmania, and central Western Australia, and there are a number of breeding sites along the Eyre Peninsula, some near Coffin Bay, Port Lincoln and	Previous BDBSA records (2006, 2019) within 5 km of the Project Area in Whyalla salt evaporation pans / saltfields. The species was also detected during winter surveys in 2023 (4 birds). The 'Whyalla Saltfields' are listed as a coastal seabird site (population 11 to 50, breeding September to December).

Name	Status	Characteristics	Potential for habitat adjoining the Project area
		across the Gulf at the base of Yorke Peninsula.	
Eastern Hooded Plover (*Thinornis cucullatus cucullatus*)	VU	The sub-species mainly occurs on wide beaches backed by dunes, in creeks or inlet entrances. Known to occur on many South Australian beaches, including some with human activity / presence. In South Australia the coastlines of Kangaroo Island and Yorke Peninsula are considered important to the species.	No previous spatially records within 5 km of the Project Area. May occur in immediately adjacent salt pans and open areas amongst stranded saltmarsh following rainfall, and beach habitats south of Point Lowly Road.
Common Greenshank (*Tringa nebularia*)	EN, MW	Migratory shorebird with extensive breeding grounds in Europe / Siberia. Has a widespread distribution throughout Australia, in summer. Arrives in Australia from Aug to Oct / Nov. Occurs throughout most of eastern South Australia. Occurs in all types of wetlands (fresh and saltwater) along the coast or inland as well as intertidal mudflats, in locations near mangroves, saltmarsh and or with fringing sedges.	Previous records (1998,2006, 2017, 2019) in Study Area in Whyalla salt evaporation pans. Has potential to occur adjacent to the Project Area in adjacent salt pans and open areas amongst stranded saltmarsh following rainfall.

(VU = Vulnerable, EN = Endangered, CE = Critically Endangered, MW = Migratory Wader)

4.3 Assessment of Relevant Impacts including Avoidance, Management and Mitigation

This assessment addresses the relevant direct and indirect impacts identified in the Significant Impact Assessment, the DCCEEW Statement of Reasons (dated 21 October 2024) and Preliminary Documentation RFI (2024/09873).

The assessment discusses direct, indirect and cumulative impacts to threatened species, (with a focus on key species) and presents a detailed assessment of impact significance against significant impact criteria (DotE, 2013) for Western Grasswren, Southern Whiteface, Malleefowl, Grey Falcon, Blue-winged Parrot and listed threatened shorebirds. It is supported by the Significant Impact Assessment provided in Attachment C, which addresses these species and all other relevant listed species. The Threatened Species Management Plan (Attachment D) also provides further detail on avoidance, mitigation and management measures for potential risks and impacts and identifies outcomes, monitoring and corrective actions.

The assessment concludes that the impacts on listed threatened species, most notably the Western Grasswren, Southern Whiteface and Malleefowl, are short-term and not significant. The impacts are considered acceptable as the mitigation hierarchy has been applied, impacts are likely restricted to local populations of these species and unlikely to have regional impacts, important populations of Southern Whiteface and Malleefowl are not likely to be present on the Project Area, and revegetation of the disturbance footprint will prevent any long-term impacts.

4.3.1 Identified sources of impact

The assessment of potential impacts to listed threatened species identified the following key sources for impact:

- **Clearing of native vegetation to enable construction of WHP and associated infrastructure (direct impact)**. Approximately 102 ha of native vegetation will be cleared for construction. This includes 35 ha of suitable habitat (and 41 ha of low suitable habitat) for the Western Grasswren, 61 ha of potential suitable habitat for Southern Whiteface (and 23 ha of low suitable habitat) and 27 ha of suitable habitat for Malleefowl.
- **Construction activities may increase noise, dust, light, human and vehicle disturbance and introduce pest species (indirect impacts).** The clearance of vegetation, earthworks and other construction activities for the facility will result in increased dust and noise, more humans and vehicles will be present and there is potential for weed seeds to be introduced on tyres or inappropriate management of wastes to increase populations of pest species. These impacts can all be managed using industry standard control strategies.

These direct and indirect impacts are assessed in Sections 4.3.2 and 4.3.3 below. These assessments also draw on the detailed assessments of impact significance for each species that are presented in Section 0.

4.3.2 Direct impact (vegetation clearance)

4.3.2.1 Siting and design for the Project has applied the mitigation hierarchy and sought to avoid and minimise clearance of fauna habitat to the greatest extent practicable

Since the inception of the Project, seven alternate route alignments were considered during the route selection process. The preferred pipeline route was selected having regard to the following key criteria set out in AS 2885 Pipelines – Gas and liquid petroleum (Standards Australia, 2008):

- public safety
- pipeline integrity
- environmental impact
- consequences of escape of gas
- constructability and cost.

In addition to these criteria, the following factors were also considered:

- pipeline length and location to minimise costs to the Project and to optimise operation of the pipeline
- topography, geology, soil types, ground stability, possible inundation and constructability
- existence of known national parks, conservation areas and other route constraints
- habitat for EPBC listed species
- existence of areas of cultural heritage significance
- utilisation of existing infrastructure corridors.

The preferred alignment was informed by stakeholder feedback and having regard to other proposed projects in the area such as the Yoorndoo Ilga Solar Farm and the Cultana Solar Farm. The alignment was also designed to follow along existing roads, unsealed tracks, rail and pipeline infrastructure for most of its length to minimise vegetation disturbance.

The proposed action will temporarily clear approximately 102 ha of vegetation, including Chenopod shrubland (approximately 38 ha), Acacia woodlands (approximately 34 ha), Mallee (approximately 26 ha) and other shrublands (approximately 5 ha).

Project construction will be further optimised in detailed design to minimise disturbance by:

- Decreasing the 50 metre construction right-of-way in areas of sensitivity such as watercourses and cultural heritage sites
- Avoiding any identified areas of higher density preferred chenopod/spiny shrublands (potential Western Grasswren habitat), low woodland, or higher density and taller shrublands (potential Southern Whiteface habitat) and minimising clearance in mallee, where practicable
- Restrict all vehicles and equipment movements to the construction right of way or designated access tracks and roads
- Where the construction footprint comes within proximity to key habitats supporting EPBC species or communities, delineating the construction footprint boundary to avoid unintentional disturbance outside of defined construction areas
- Undertaking a walk through with an experienced ecologist, arborist and construction design specialist to further reduce the construction right of way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas.

Native vegetation in the Project area is protected under the South Australian *Native Vegetation Act 1991* and *Native Vegetation Regulations 2017*. This requires the project to achieve a Significant Environmental Benefit offset for the clearance of native vegetation associated with the project. It is anticipated that Epic will make a payment into the Native Vegetation Fund to achieve the Significant Environmental Benefit requirements. However, options for an on-ground offset in the Whyalla region will be investigated where available.

4.3.2.2 Permanent loss of fauna habitat will be largely avoided by rehabilitating the Disturbance Footprint following construction

Long term impacts from vegetation loss will be minimised through rehabilitation of the Disturbance Footprint. After construction and rehabilitation is completed, an estimated 0.16 ha of permanent disturbance will remain.

Disturbed areas along the construction right of way will be revegetated through reinstating topsoil and cleared vegetative material (completed progressively as the pipeline is installed) and additional reseeding with selected local species (completed within 3 to 6 months of backfilling and reinstatement, on targeted areas identified as requiring reseeding). Directly over the pipe, species selected will be limited to shallow rooted vegetation that will not disrupt the fill material surrounding the buried infrastructure. These include *Maireana pyramidata* (Black Bluebush) and *Lycium australe* (Australian Boxthorn) along with other common low chenopod species. These are all known as preferred habitat plant species for the Western Grasswren. Such species should readily recolonise the disturbed areas, particularly in the absence of stock pressure. Genetic diversity will be maintained by collecting seed from several locations along the alignment to match the vegetation communities traversed.

Although there is limited published research on regeneration or revegetation efforts in vegetation types similar to those present in the Project area, observational evidence supports the assumption that the proposed rehabilitation methods (particularly with supplementary reseeding as proposed) will result in successful regeneration of vegetation and habitats:

- Existing buried pipelines adjacent to the WHP have high vegetation cover which is difficult to distinguish from adjacent vegetation.

- Trials with reseeding at the Carrapateena mine (located north of the Project area in the same IBRA bioregion) have indicated that standard rehabilitation with supplementary seeding results in high levels of regeneration / revegetation success.
- Key habitat species, including Blackbush *Maireana pyramidata* are known to readily regenerate in disturbed areas, particularly in the absence of grazing by stock, which is the case for the Project area

Published information on revegetation undertaken by Succession Ecology at the ash dam at Port Augusta power station (approximately 45 km to the north) has resulted in generally high revegetation success within 2-5 years, particularly in areas without adverse underlying soil quality from the power station ash deposits (Succession Ecology, 2019) (Succession Ecology, 2023). Although the nature of this rehabilitation (restoring a very large power station ash dam) is not directly comparable the Project, it did involve use of respread topsoil and supplementary reseeding in a very similar climatic environment, indicating likely success of proposed rehabilitation.

With active management (if required) successful revegetation will result in a longer-term return of suitable habitat for Western Grasswren and other threatened species. The timeframe for this is rainfall dependent but it likely to be in the order of 5 – 10 years based on experience on other sites within the region. This timeframe will also allow suitable foraging habitat for the Southern Whiteface to establish.

Revegetation of the construction right of way will be monitored on a quarterly basis until a vegetative cover has been successfully reestablished. Success criteria will be developed to ensure:

- Erosion risk on revegetated areas is no greater than on adjoining areas
- Species composition is consistent with that required for the desired habitat (i.e. to reflect the habitat that previously existed).

If revegetation is not successful in areas, remedial actions will be considered such as site preparation and/or additional reseeding.

Once the above criteria have been met, annual monitoring will be used to determine whether habitat restoration has been successful. The success criteria will consider species composition, per cent cover, vegetation height and structure.

Soil management practices will promote successful regeneration of vegetation. Stockpiled trench spoil excavated during trenching for the pipeline will be returned to the trench and compacted following the lowering-in of the pipe. Special care will be taken to ensure that excavated spoil and soil profiles are re-established to avoid soil inversion and that stockpiled topsoil is returned to its original position to provide suitable conditions for revegetation.

As detailed further below, weed hygiene measures will be implemented during construction to ensure habitat quality is maintained. The OEMP will include weed surveillance and control programs targeting WoNS and Declared Weed species (if weeds identified) on an annual basis.

4.3.2.3 Vegetation clearance may have a short-term, localised impact on an important population of the Western Grasswren but with no long-term impact on the population

All populations of Western Grasswren are considered important. Based on the highly conservative habitat mapping in Figure 4-3, construction of the Project will require temporary new clearance of up to 35 ha of suitable habitat for Western Grasswren and 41 ha of low suitable habitat, as shown in Table 4-3. The Project will not impact any 'preferred habitat' of drainage lines with dense Black Bluebush and spiny shrubs.

Following construction, all suitable habitat will be revegetated and permanent clearance will be restricted to 0.16 ha of low suitability habitat. As described above, revegetation will use local flora species that provide suitable habitat for the Western Grasswren.

Table 4-3: Estimated (worst case) direct impact on Western Grasswren

Habitat suitability	Construction temporary footprint (ha)	Existing disturbance (ha)	Total new disturbance (ha)	Operational disturbance footprint (ha)
Suitable (Western Myall chenopod shrubland +/- Black Oak, Bullock Bush, False Sandalwood and Chenopod open shrublands +/-emergent trees, mixed shrubland in drainage line)	51.87	16.65	35.23	
Low suitability (Low open Chenopod shrublands)	49.68	8.74	40.94	0.16
Total (ha)	101.55	25.39	76.17	0.16

The conservative clearance estimate represents at most 0.03% of the AOO (on the edge of or outside the AOO), that will be temporarily impacted, and 0.0001% of the species habitat (0.16 ha) that will be permanently lost (primarily to permanent operational facilities such as the valve station, in low chenopod shrublands). The temporary loss of habitat is not considered to be significant. The common chenopod species proposed to be used in rehabilitation/ revegetation readily colonise disturbance areas (including key habitat species such as Black Bluebush *Maireana pyramidata*), particularly in the absence of grazing and there is a high degree of certainty that cleared habitat can be successfully re-established.

Most of the clearance for the Project is well east of the range of previous records for the species. Based on anecdotal evidence, the species has been undergoing a 'boom' period over the last couple of years, being detected throughout its range in both atypical and suboptimal habitats where they have not been detected previously (Attachment C, Section 4.1, p 58).

The sites where the species was detected east of the Lincoln Highway were in suboptimal habitat in terms of cover and species composition, no drainage lines were present and there was Ward's Weed in the understory. These records represent a minor range extension into suboptimal habitat across a busy highway. There are also vast areas of suitable habitat to the north of Port Bonython Road and north and south of Fitzgerald Bay Road that individuals of the species can retreat to or utilise if need. Some of these areas are also highly suitable and include drainage lines and dense cover of chenopods and spiny shrubs. Consequently, the habitat that would be cleared for the Project is not core preferred habitat and could not be considered critical to the species survival.

Fragmentation effects from temporary habitat clearance are not expected to be significant for the following reasons.

- The location and linear nature of the temporary habitat clearance would not lead to significant fragmentation effects. Fragmentation is typically defined as the division of large, continuous areas of habitat into smaller unconnected areas of habitat. The temporary, linear clearance for the Project would not result in the creation of smaller unconnected areas of habitat. The Project Area is surrounded by large continuous areas of vegetation, including extensive areas to the north-west in Defence land. These areas would remain accessible to any Western Grasswren present in the vicinity of the Project. The areas of vegetation surrounding the Project would also remain continuously connected to the west (and to the east) of the Project, meaning that the species would be able to disperse through the landscape without traversing the cleared pipeline construction right of way. Consequently, even if the cleared construction right of way presented a complete barrier to movement (which is not expected, as discussed below), effects would be localised, affecting only a small number of individuals, and fragmentation would not occur on a landscape scale. Following construction and rehabilitation, continuous vegetation would be re-established over the pipeline right of way and there would be no ongoing potential effects.

- It is not expected that the narrow, linear, cleared construction right of way would present a complete barrier to Western Grasswren movement. Although the cleared construction right of way could discourage direct movement of individuals across the cleared area it is not expected to present a complete barrier to Western Grasswren. Although Western Grasswren are predominantly terrestrial and do not fly high above the ground, grasswrens are known to cross open areas by flying at a low height (Black & Gower, 2017). It is therefore expected that individuals could cross the cleared construction right of way if necessary. In addition, the alignment is near existing cleared corridors for most of its length (e.g. Point Lowly Road, Lincoln Highway, train line). These do not appear to present a barrier to Western Grasswren movement, based on the apparent dispersion of the species to the east of Lincoln Highway in recent years. This also suggests that the cleared right of way would also not present a complete barrier to movements of the species. The presence of Western Grasswren on both sides of the train line that runs north from Whyalla through the Cultana Training Area also supports the expectation that linear features do not represent a complete barrier to movement and dispersal.
- The open pipeline trench will only be open for a short period of time (typically less than 10 days) and would only represent a temporary potential impediment to movement of individuals. As noted above, grasswren can fly at low height above the ground and the trench (which will be approximately 1100 mm wide) is not expected to be a significant barrier to movement.
- The progressive nature of construction means that construction activities at any given location are relatively short term. Consequently, noise and presence of construction personnel would only represent a temporary impediment to Western Grasswren crossing the construction right of way and would not represent a long term fragmentation effect.
- Following the completion of construction, the buried infrastructure and rehabilitated construction right of way is also unlikely to provide a complete barrier to movements of this species.
- Once vegetation is re-established, vegetation and habitat would be continuous across the pipeline and the Project would not present any barrier to Western Grasswren movement (similar to the existing buried Epic Energy pipelines that occur within the Project area).

Mitigation measures to reduce impacts on the Western Grasswren from construction include:

- Avoid any identified areas of higher density preferred chenopod/spiny shrublands, where practicable.
- Where practicable, micro-siting the pipeline to avoid impacts to habitat of threatened fauna species and maintaining connectivity corridors between existing patches of habitat to facilitate fauna movement.
- Clearly delineate (and flag off where required) any potential habitat identified adjacent to proposed infrastructure areas to ensure no disturbance beyond the essential clearance footprint required.
- Undertake pre-construction weed surveys and controls, post-construction weeds surveys and controls, and ongoing weed survey and control during operation.
- Undertake daily inspection of open trenches with any fauna handling or removal to be undertaken in accordance with statutory requirements.
- Installation of fauna ramps at excavations/trenches and fauna shelter devices (e.g. sandbags, logs, planks) at regular intervals along the length of the trench.
- Minimise (as far as practicable) the amount of time the trench is open.
- Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project area.

- Rehabilitate disturbed areas following the completion of the construction activities, noting opportunities to undertake progressive rehabilitation will be identified and implemented in accordance with the AGPA Code of Environmental Practice (APGA 2017).
- Undertake revegetation using local flora species that provide suitable habitat for the Western Grasswren, as described in Section 4.3.2.2.

In addition to those listed above, the following mitigation measures will be implemented to reduce impacts on Western Grasswren during the breeding season (late June to October):

- A qualified ecologist will be engaged to determine and identify any areas of high quality breeding habitat along the final pipeline alignment and where feasible, the construction schedule will take into account these areas when considering nature and type of work effort to be undertaken during the breeding season.
- Pre-clearance surveying of the construction right of way will be undertaken by a qualified ecologist covering all areas containing suitable or low-suitable Western Grasswren habitat, that are scheduled for clearing or grading activities in the following 2-4 weeks.
- If evidence of species presence/breeding activity (e.g. direct observations of the species, bird call identification or nesting behaviour) is identified, the following measures will be put in place in those locations:
    - reduction of the width of the construction right of way near potential nest locations, to avoid clearance of vegetation that may contain a nest where possible or increase the distance of clearance and other construction activities from potential nest locations
    - modification of the nature and type of work effort in the vicinity of potential nest locations to minimise disturbance (noting that due to the sequential nature of construction activities along the right of way, complete avoidance of disturbance may not be possible).
- Ensuring all construction machinery in the active working area is switched off and not left idling when not in use.

The Western Grasswren population in this area is located largely to the west of the Project, including in large areas of protected habitat in the Whyalla Conservation Park and Cultana Training Area, as well as broadly within remnant vegetation across other properties. If clear and grade operations in the suboptimal Western Grasswren habitat that is present on the proposed alignment coincides with the breeding season, it could (at most) affect the breeding success of a small number of individuals, if their nests are on or immediately adjacent to the construction right of way. This would not affect the breeding cycle of the population.

4.3.2.4 Vegetation clearance will have a negligible short-term impact on the Southern Whiteface but with no long-term impact on the population

Based on the highly conservative habitat mapping in Figure 4-5, construction of the Project will require temporary new clearance of up to 61 ha of suitable habitat for Southern Whiteface and 23 ha of low suitability habitat, as shown in Table 4-4. Following construction, all suitable habitat will be revegetated and permanent clearance will be restricted to 0.16 ha of low suitable habitat. The clearance includes roosting/nesting (habitats that include trees) and potential foraging habitat (habitats that include trees as well as adjacent habitats).

Table 4-4: Estimated (worst case) direct impact on Southern Whiteface

Habitat suitability	Construction temporary footprint (ha)	Existing disturbance (ha)	Total new disturbance (ha)	Operational disturbance footprint (ha)
Suitable (Western Myall chenopod shrubland +/- Black Oak, Bullock Bush, False Sandalwood)	50.11	16.32	33.79	
Suitable (mallee)	33.4	6.38	27.02	
Low suitability (Low open Chenopod shrublands +/- emergent trees)	27.34	4.25	23.09	0.16
Total (ha)	110.84	26.95	83.9	0.16

The temporary new clearance of 84 ha of suitable and low suitability habitat represents a negligible impact on the AOO for the species, representing at most 0.001% of the Australia-wide AOO and 0.02% of the AOO within the Gawler IBRA bioregion. Once the disturbance footprint has been revegetated with species that provide suitable habitat for Southern Whiteface, permanent clearance will represent 0.000002% of the Australia-wide AOO and 0.00004% of the AOO within the Gawler IBRA bioregion.

An important population of the Southern Whiteface has not been defined in published conservation advice, guidelines or recovery plans. Generically an 'important population' is defined as a population that is necessary for a species' long-term survival and recovery (DotE, 2013), and may include populations identified by recovery plans and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity and/or
- populations that are near the limit of the species range.

The percentage of area of occupancy temporarily affected is of such a small scale that it is unlikely the Project Area includes a key source population for breeding/dispersal, or a population necessary for maintaining genetic diversity. As noted above, permanent loss of habitat is considerably smaller.

Examples of populations that do not represent important populations would include small portions of much larger and/or predominantly continuous populations (as is the case for this species). Based on the evidence, it is reasonable to conclude that the Southern Whiteface observed within the Project area are not defined as an important population as per the criteria in DoE, 2013.

Mitigation measures for the Southern Whiteface will be the same as those for the Western Grasswren, noting that avoidance will focus on areas of low woodland, or higher density and taller shrublands, where practicable (e.g. areas of Western Myall, Black Oak, False Sandalwood, Bullock Bush and Mallee), and that pre-clearance surveys for Southern Whiteface would be undertaken during the breeding season between July and October and the same impact avoidance and mitigation measures employed as those listed for Western Grasswren during this time.

Vegetation clearance may have a negligible short-term impact on the Malleefowl but is not expected to have any long-term impact on the species

The proposed action will temporarily clear approximately 27 ha of suitable habitat for Malleefowl (primarily foraging habitat) as shown in Table 4-5. It is anticipated that all of this habitat will be rehabilitated. This temporary clearance represents at most 0.001% of the AOO for the species and is considered a negligible impact.

Table 4-5: Estimated (worst case) direct impact on Malleefowl

Habitat suitability	Construction temporary footprint (ha)	Existing disturbance (ha)	Total new disturbance (ha)	Operational disturbance footprint (ha)
Suitable (mallee), primarily foraging	31.65	6.07	25.58	
Suitable Coastal tall shrubland, primarily foraging	0.85	0.41	0.44	
Suitable Mixed shrublands in ephemeral drainage lines	1.75	0.31	1.44	
Unsuitable (Chenopod / samphire shrublands)				0.16
Total (ha)	34.25	6.79	27.46	0.16

In the short-term, a diversity of colonising mallee species would continue to provide suitable foraging habitat for the Malleefowl that often use a mosaic of dense mallee to burnt mallee and adjacent habitats for foraging. In the longer-term, mallee species will return to the area and habitat values will be fully restored. In addition, the mallee that will be disturbed is adjacent a noisy, busy road with existing traffic heading to and returning from Port Bonython. The remaining mallee is contiguous with a large tract (2,870 ha) of mallee on the Department of Defence land. Less than 1% of this large tract of mallee will be temporarily cleared. Hence any local Malleefowl have a vast area of contiguous habitat to move in to, and this available habitat is further away from the road.

As noted above, no Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint during targeted searches. Given the lack of deeper sand in the Project area and proximity to Point Lowly Rd, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur in the Department of Defence land.

In addition to the mitigation measures for Western Grasswren, measures specific to the Malleefowl will include:

- Minimise clearance and disturbance within mallee, where practicable.
- Undertake preclearance surveys in mallee that cannot be avoided to detect any active or non-active nests, and undertake adaptive mitigation to avoid impacts to Malleefowl, if required (e.g. establish no go areas, relocate live Malleefowl or eggs in collaboration with Department of Environment and Water staff and in accordance with legislative requirements).

4.3.2.5 There may be potential for Western Grasswren, Southern Whiteface and Malleefowl displaced by vegetation clearance to disperse into surrounding areas

Field observations of the presence or absence of these species, and the presence of habitat in the vicinity of the Project suggest that there may be potential for individuals of these species to disperse into surrounding areas if they are displaced by the Project. This is discussed further below.

However, it is noted that the linear nature of vegetation clearance for the Project is unlikely to result in complete displacement of individuals of Western Grasswren or Southern Whiteface, as clearance along the alignment would represent only a proportion of their territory (unlike clearance of a large block of vegetation). As Malleefowl range across large areas, the project is not expected to result in any material displacement of individual Malleefowl.

As noted in Figure 4-3 there are numerous records of Western Grasswren to the west of the Project area. The individuals detected east of the Lincoln Hwy in surveys for the Project would be considered part of small family groups on the edge of the entire population. These individuals were in sub-optimal

habitat and there is a significant area of similar habitat in this area (refer to Figure 4-3). Western Grasswren were not detected by the Song Meter at higher quality (moderately suitable) habitat nearby (Attachment C, p.49) suggesting there may be areas of potentially suitable unoccupied habitat. It is also possible that the species may contract in less favourable seasons to the higher quality habitat west of the Lincoln Highway.

The movement ecology of the Southern Whiteface is likely influenced by rainfall and associated productivity, and population numbers are expected to fluctuate based on local productivity (e.g. rainfall patterns, insect numbers, etc). Given the size and availability of good quality habitat nearby (in Whyalla Conservation Park (approximately 2,000 ha) and the Cultana Training Area (over 200,000 ha)), there is opportunity and potential capacity for the limited number of birds that may be dispersed by the Project to move into this adjoining habitat.

Malleefowl are wide-ranging in mallee-dominated habitats. Over the course of a year the birds may range over 100 to 300 ha and home-ranges overlap considerably (Attachment C, p.71). As noted above, there was no evidence of nesting in the Project area. The loss of a thin strip of foraging habitat near a major road is unlikely to significantly reduce foraging or dispersal opportunities for Malleefowl resident nearby. The remaining mallee is contiguous with a large tract (2,870 ha) of mallee on the Department of Defence land. Less than 1% of this large tract of mallee will be temporarily cleared. Hence any local Malleefowl have a vast area of contiguous habitat available for foraging and nesting and this habitat is further away from the road.

It is acknowledged that the letter from DCCEEW dated 28 July 2024 requested evidence regarding the ability of Western Grasswren and Southern Whiteface to disperse into surrounding areas ability. However, literature reviews and consultation with relevant experts has confirmed that specific details of dispersal behaviour for Western Grasswren and Southern Whiteface, or information regarding the carrying capacity of these species at specific locations, is not available, and would take multiple years to collect.

Evidence from other local and regional semi-arid and arid zone surveys, including repeated surveys at the same locations year after year (e.g. Carrapateena mine, Iron Baron and Iron Duke mines, proposed Oak Dam mine, the Northern Water Project) indicate marked fluctuation in abundance and presence of both of these species between years. Accordingly, and setting aside the practicalities of data collection, it is suggested that measuring abundance and estimating carrying capacity within dynamic surrounding landscapes is unlikely to yield information that is material to the decision.

4.3.2.6 Vegetation clearance is only likely to affect local populations of fauna species and is unlikely to have broader regional impacts

It is unlikely that the habitat that will be lost through temporary vegetation clearance is significant in a regional context. The Myall Plains IBRA subregion contains 97% remnant vegetation. While this is of varying habitat condition, primarily as a result of grazing, vegetation communities across the region provide suitable habitat for Western Grasswren, Southern Whiteface and Malleefowl. The higher number of records for Western Grasswren and Southern Whiteface in and around the Project Area are very likely a reflection of survey effort rather than an indication of superior habitat quality. Both species are under-surveyed in the Myall Plains IBRA subregion other than around the Whyalla area. The higher survey effort around Whyalla reflects numerous surveys undertaken for several recent proposed developments in the area (e.g. solar farms, water infrastructure) and the closeness to a population centre (providing accessibility for local and visiting bird observers).

As shown in Figure 4-3, there are many records of the Western Grasswren within the Cultana Training Area which is estimated to contain about 20 per cent of the population (DotE, 2014). While this area is managed for Defence training purposes and not specifically for conservation, the 2014 expansion of the Cultana Training Area from approximately 50,000 ha to approximately 209,300 ha via the inclusion of six adjacent pastoral leases, with associated destocking and environmental management by Defence, is likely to have resulted in habitat improvement. As noted in the Cultana Environmental

Management Plan (Department of Defence, 2015): 'General experience at other Australian sites is that many areas of native vegetation will improve in condition under Defence management, and the overall site is expected to revert towards a state closer to a natural condition'. The Project will not impact habitat within the Cultana Training Area.

As noted in Section 4.2.4, the pastoral rangelands zone across the Eyre Peninsula continues to support remnant native vegetation and therefore potentially suitable habitat for Southern Whiteface, as the majority of this area has been used for stock grazing and not been subject to broad scale land clearing. While the habitat available may have been modified to varying degrees depending on density of stocking, the habitat is essentially contiguous throughout the region with only small areas of complete clearance. Therefore, it is considered that extensive suitable contiguous habitat is available for Southern Whiteface across the pastoral rangelands region of South Australia.

4.3.2.7 Vegetation clearance will have minimal impact on other EPBC-listed fauna species

The proposed action would result in the temporary clearance of approximately 102 ha of habitat that may be used by the Grey Falcon as general foraging habitat only. The species occurs in low densities across much of arid and semi-arid Australia. As a habitat generalist, there is little known about important populations except for their preference to nest in tall trees adjacent watercourses where, while breeding, they feed almost exclusively on other birds (Threatened Species Scientific Committee, 2020).

There are no large, treed watercourses in the Project area (OHPSA, 2024) and hence the Project Area is unlikely to support an important population of this species. Project clearance represents a very small fraction of the total available foraging habitat for this species. There is only one record of this species in the study area dating from 2011.

The Significant Impact Assessment (Attachment C, p. 41-42) concluded the Project was unlikely to have a significant impact on this species.

The action would also result in the temporary clearance of approximately 102 ha of habitat that may occasionally be used by Blue-winged Parrot during periods of inland migration. Almost all this habitat will be rehabilitated, with an estimated 0.16 ha remaining as permanent disturbance.

The Blue-winged Parrot favours open grassy woodlands and is predominantly found in the south-eastern portions of Australia, occasionally extending into arid and semi-arid Australia during non-breeding periods. As such, no important populations of the species are considered to occur in the Project Area. There are no records of this species in the study area. The total disturbance from the Project construction is likely to represent a loss of occasional foraging habitat only (predominantly low open chenopod shrublands, with some clearance of mallee / myall and shrubland habitats), representing a very small fraction of total available habitat for this species across much of Australia.

The Significant Impact Assessment (Attachment C, p. 47-48) concluded the Project was unlikely to have a significant impact on this species.

Other EPBC-listed fauna species are considered unlikely to occur in the Project area (refer Attachment C) and therefore will not be directly impacted by vegetation impact. This includes the shorebirds described in Section 4.2.8 which may utilise the adjoining saltmarsh, mudflats and beaches but are unlikely to occur on the Project area.

4.3.3 Indirect impacts

4.3.3.1 Disturbance to native fauna from Project noise is expected to affect a very small proportion of available habitat and impacts would be localised, short term and minor.

During construction of the pipeline, noise emissions will be concentrated at the work front. Earthmoving equipment, vehicles delivering pipeline and fill material, cranes and other machinery will

be the main noise generating sources. Similarly, during construction of the compression facility and valve station, earthmoving equipment, vehicles and other building works will be the main noise sources.

Impacts on fauna from construction activities are expected to be short term, localised and generally of limited significance for the following reasons:

- Background noise in the Project area is already elevated due to its proximity to the Lincoln Highway, Point Lowly Road, ARTC rail and the steelworks and port.
- With the proximity to port operations, background noise in the saltmarsh, mudflats and beaches adjoining the Project area that provide habitat for EPBC-listed shorebirds is also elevated. In addition, the pipeline alignment is generally several hundred metres or more from the boundary of the nationally important wetlands of False Bay (and approximately 180 m at the closest point), providing some attenuation of noise.
- While the construction period is expected to be 12 months, construction activities and associated noise will not be continuous at any location along the pipeline alignment. Instead, construction will consist of a series of discrete, short-term activities, i.e. clearing, grading, trenching, stringing, lowing in, backfilling and rehabilitation.
- The potential for noise impacts will be further reduced through standard management and control measures in the CEMP, such as:
    - selecting low noise plant and equipment, where practicable
    - ensuring all plant and equipment are well maintained
    - using sound dampening material to cover metal surfaces onto which materials must be dropped and minimising drop heights
    - locating the site compound away from areas of good quality habitat for EPBC-listed fauna species
    - using broadband or directional reversing beepers.
- There are a number of records of the Western Grasswren on the outskirts of Whyalla and alongside roads and tracks. While this likely reflects observer bias in these areas close to the township, it indicates the species is relatively tolerant of noise. Similarly, Southern Whiteface also seems to persist in high background noise environments in the area, such as near the port, and shorebirds appear to tolerate noise from port activities.

Operational noise from the Project would not result in a significant impact to EPBC-listed species beyond that assessed for the Whyalla Hydrogen Facility (OHPSA, 2024). Highly conservative modelling of operational noise for the Project (which assumed that compression facilities for the Project would operate in addition to compression facilities for the on-site storage option, which would not be the case) has indicated even with highly conservative assumptions there would be at most a marginal increase (less than 5 dB(A)) in operational noise levels from the Project above those predicted for OHPSA's Whyalla Hydrogen Facility. Away from the Whyalla Hydrogen Facility, the Project has minimal operational noise (generally restricted to maintenance traffic).

Consequently, noise impacts have been assessed as a low risk to listed fauna.

4.3.3.2 Construction of the Project is not expected to result in an increase the number or abundance of weeds, pathogens and predators on the Project Area

Weeds, pathogens and predators can potentially be introduced to the Project area through movement of construction machinery and vehicles and food waste attracting pest animals. Imported fill can potentially introduce weed species, though this is unlikely as material should be obtained from weed-free sources and the padding is buried at depth in the trench. The construction of the pipeline is not

expected to significantly increase the access of predatory pests to habitats, as there are existing tracks or roads present along most of the proposed alignment.

Weeds, pathogens and predators will be managed by implementing a Weed, Pest and Disease Management Plan which will include:

- Undertaking pre-construction weed surveys and controls, post-construction weed surveys and controls, and ongoing weed survey and control during operation targeting Weeds of National Significance (WoNS) and Declared Weed species (if weeds identified) in accordance with the Weed Control Handbook for declared plants in South Australia
- Implementing appropriate hygiene practices when equipment is brought on site, including checking equipment prior to moving it to site
- Ensuring all fill materials (e.g. sand, aggregate) imported to site are sourced from weed and pathogen free sites
- Ensuring construction compounds are kept neat and tidy at all times to prevent pest animals from inhabiting the area, and food waste is placed in enclosed / covered bins to prevent access by pest animals

With these measures, there is a low risk that habitat for EPBC listed threatened species will be degraded through the presence of weeds, pathogens and predators.

4.3.3.3 Lighting required for construction and operation of the Project is expected to present a low risk to EPBC-listed fauna species.

Project construction would generally occur between 6 am and 6 pm, minimising the need for lighting other than some supplementary lighting in early morning and late afternoon during the winter months. The need for construction lighting would be largely restricted to security lighting at layout yards and at construction works at the Whyalla Hydrogen Facility. Lighting at the latter would only be a minor extension of that required for construction of that facility.

Disturbance to fauna from operational activities is expected to be very limited. Away from the Whyalla Hydrogen Facility (where the Project's operation is a small component of overall site operations), the Project operations do not require significant lighting.

All lighting will be designed to AS/NZS 1158 and AS/NZS1680, and applicable laws and regulations. Lighting will be shielded and directional and designed where possible to minimise the impact to any surrounding sensitive receptors and wildlife, consistent with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023d).

Given the short-term nature of construction activities and existing background lighting from industrial sources, the impacts of lighting on EPBC-listed fauna species are considered to be short term, localised and manageable. The level of risk has been assessed as low.

4.3.3.4 Changes to surface water flows from Project construction are unlikely to modify habitat for EPBC listed threatened species

As discussed in Section 3.5.1, the Project area is characterised by relatively flat topography with little to no defined drainage The alignment crosses only one ephemeral watercourse at its eastern end. At this location, the watercourse is a narrow, very shallowly incised channel that flows southwards, within a broader drainage depression that also receives flows from a small channel from the north-east.

Construction activities may result in physical disturbance to flow in defined watercourses and to overland flow. Potential impacts would be associated with the presence of temporary linear stockpiles of topsoil and trench spoil, and modifications to surface contours during earthworks, which may impede or change natural overland flows. Such impacts would generally be short term and localised.

Surface drainage patterns would be restored following successful reinstatement of the construction right-of-way.

Mitigation measures that will be implemented to minimise potential impacts on surface water flows include:

- construct the pipeline below the base of the channel of the existing watercourses
- reinstate surface contours as soon as reasonably practicable
- restore surface drainage profiles to pre-construction conditions
- leave periodic gaps in stockpiles to allow overland flow
- implement measures identified in Section 4.3.3.5 (which are primarily aimed at protection of surface water quality but would also minimise potential impacts on surface water flows).
- Mitigation measures that will be implemented during construction of the ephemeral drainage line crossing at the eastern end of the WHP alignment are provided in Section 2.6.3.

Consequently, the Project will not result in changes to surface water flows that could impact habitat for EPBC-listed species on the Project area, or further downstream in the adjoining saltmarsh / mudflat areas that provide habitat for listed shorebirds.

4.3.3.5 Changes to surface water quality from Project construction are unlikely to modify habitat for EPBC listed threatened species

As noted in the previous section, the pipeline alignment crosses only one well defined ephemeral drainage line at its eastern end, prior to it diverting northeast along Fitzgerald Bay Road (refer to Plate **3**-**1**). This channel and the adjacent area flow through several culverts under Point Lowly Rd, ultimately reaching the coast approximately 1.6 km to the south of the alignment.

Water quality in this watercourse would be characterised by low salinity and high turbidity following a significant rainfall event. The watercourse shows evidence of bare soil exposure in the channel and high sediment load, at the crossing of Point Lowly Road and particularly at the crossing of Cuttlefish Drive near the coast.

Ephemeral drainage lines in this area are usually dry and only flow intermittently for short periods during seasonal rainfall and storm events. Under some conditions (depending on factors such as soil moisture and rainfall intensity and duration) surface runoff may make its way to the coast and discharge into the sea. Elsewhere in the Project area, overland flows from storm events generally pool in low lying areas before dissipating by infiltration or evaporation.

The pipeline alignment is located on the opposite side of Point Lowly Road to the nationally important wetlands of False Bay. This area provides potential habitat for the shorebird species discussed in Section 4.2.8. At its closest point, the alignment is approximately 180 m from the boundary of these wetlands (and on the opposite side of Point Lowly Road).

Pipeline construction activities (and to a lesser extent, earthworks associated with operational activities) have the potential to result in a temporary reduction in water quality caused by increased sediment load in surface run-off, or inappropriate disposal of turbid trench water. This could degrade habitat for EPBC-listed species in the Project area and downstream in the False Bay area. However, the inherent risk that sediment from the Project area could impact wetland habitat for listed shorebirds is considered low as:

- Sediment picked up from the Project area would represent a very minor proportion of the sediment load in this watercourse given the size of the catchment.

- Sediment transport would only occur after significant rain events and for a short period. As a result, any sedimentation in False Bay, should it occur, would also be short-term and diluted within days through tidal action.

Surface gradients in the vicinity of False Bay are very low (Figure 4-10) and there is very limited surface water drainage from the Project area to False Bay. The Project area is separated from False Bay by the Point Lowly Road with flows across the road generally restricted to several culverts.

- The watercourse crossing is 1.6 km from the coast providing for some deposition and/or dilution of any sediment from the alignment.

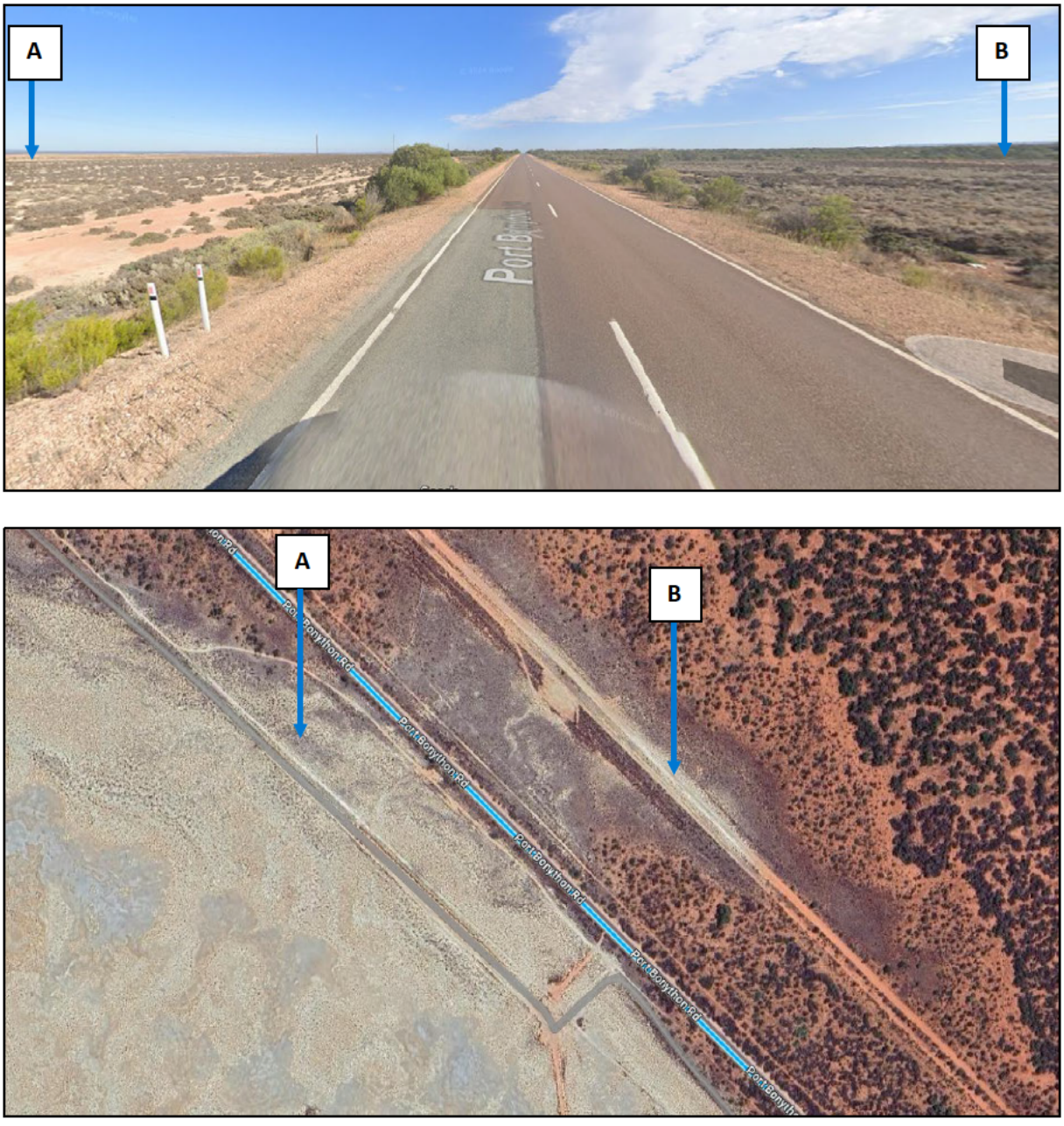

Figure 4-10: Flat surface gradients along Point Lowly Road, showing the stranded saltmarsh area (A) at its closest point to the WHP alignment (B)

Due to the nature of the environment and the management measures that will be in place, significant sedimentation impacts are not expected to occur. As noted above, the terrain is relatively flat to gently sloping, and there is limited evidence of erosion on the existing pipelines and other areas of

disturbance. The pipeline alignment is distant from receiving environments (i.e. coastal areas) with very limited drainage connectivity to these areas.

Trenching and pipeline installation at the watercourse would be undertaken in dry conditions, and sediment and erosion controls (such as berms on slopes, hay bales and geotextile fencing) would be in place during construction and following rehabilitation to control erosion on the alignment and sediment transport downstream. The controls will be inspected on a regular basis during construction and at the completion of construction, and following any significant rainfall events. Erosion and sediment controls will remain in place until the alignment has been stabilised through revegetation (see Section 4.3.2).

These controls are industry standard measures and have been demonstrated to be effective in reducing erosion and sedimentation. If sedimentation and increased turbidity did occur, they would generally be short term and localised (in an environment where turbidity is naturally high).

Potential sources of contamination of surface water from the Project include minor spills of fuel or chemicals, leachate from acid sulfate soils exposed during excavation (which is not anticipated) and discharged hydrotest water.

Pipeline projects involve relatively small quantities of chemicals and the risks to surface water associated with minor spills is generally low, particularly in the Project area where there are limited surface water features. Management measures implemented would include restrictions on refuelling near watercourses and spill prevention and immediate clean-up measures.

Hydrotest water may contain low levels of corrosion inhibiting chemicals. Trench water could also have elevated salinity (if shallow groundwater is intercepted, which is likely to be a very limited occurrence). Any contaminated water will be treated on site or removed for disposal off site. Measures for management of hydrotest water and trench water are detailed in Section 2.6.2.3.

Surface water management at the compressor station would be consistent with site stormwater management for the overall Whyalla Hydrogen Facility, which includes separation of ‘clean’ surface water streams from water in contact with plant areas, detention and reuse on site of ‘clean’ water streams and piping of water in contact with plant areas to GFG’s Whyalla Steelworks for reuse and management.

Mitigation measures that will be implemented to minimise potential impacts on surface quality include:

- restrict the level of activity during wet weather, particularly at watercourse crossings
- remain vigilant for expected storm or flood warnings (particularly during construction or major operational activities) and developing a contingency plan for such events
- install adequate erosion and sediment controls (e.g. berms or drains on slopes leading to watercourses or surface water features; contour banks, silt fences and / or hay bales for interim on-site erosion control as described in Section 2.6.2.1)
- monitor and maintain erosion and sedimentation controls to ensure they remain effective
- avoid vehicle refuelling in close proximity to watercourses
- implement measures for fuel, oil and chemical management, spill prevention, response and clean-up, trench dewatering, hydrotest water disposal and management of contaminated water (e.g. leachate from acid sulfate soils) as described in Section 2.6.2
- obtain hydrotest water from an appropriate source in consultation with relevant landowners and regulatory bodies, in accordance with statutory requirements
- undertake field screening to determine presence of acid sulfate soils if excavating in a risk area and apply procedures as needed.

Specific measures will be implemented for watercourse crossings as described in Section 4.3.3.5 above.

With the implementation of the above measures, the risk that Project construction could adversely impact surface water flows and quality is considered low. Therefore, the Project's impacts on surface water are unlikely to cause changes in fauna habitat quality, including habitat in False Bay for listed threatened shorebirds.

4.3.3.6 Changes to groundwater quality from Project construction are unlikely to modify habitat for EPBC listed threatened species

The intersection of shallow groundwater by the open trench has the potential to create localised disturbance to groundwater flow patterns, particularly in recharge or discharge zones. There is also the potential for infiltration from surrounding waters or stormwater entry.

Due to the minor depth of the intrusion (typically 1.5 m up to 3 m below watercourses and major roads), the short period for which the trench is open (several days to several weeks, depending on the location) and the depth to groundwater in the Project area, the resultant impact on groundwater resources is considered to be inconsequential.

Backfilling the trench after the pipeline has been installed is intended to compact returned trench spoil consistent with pre-existing conditions. This minimises any potential for altering local hydrology or impeding lateral flows of groundwater (which are not expected to occur due to the shallow depth of the trench relative to the depth to groundwater).

The level of risk has been assessed as low and is unlikely to impact habitat for EPBC-listed species.

Potential sources of groundwater contamination are minor spills of fuel or chemicals, leachate from acid sulfate soils exposed during excavation (which is not anticipated) and discharged hydrotest water.

Pipeline projects involve relatively small quantities of chemicals and the risks to groundwater associated with minor spills are extremely low, particularly in the Project area where groundwater is relatively deep. Pipeline construction equipment (such as graders, bulldozers and side-boom tractors) may be refuelled on the right-of-way from a standard fuel truck. Management measures would be implemented, including spill prevention and immediate clean-up measures.

Hydrotest water may contain low levels of corrosion inhibiting chemicals. Inappropriate disposal of this water may result in localised contamination of shallow groundwater. This will be managed through the measures above for surface water.

Mitigation measures for groundwater include:

- compact the trench to a level consistent with surrounding soils
- install trench plugs to prevent longitudinal water flow within the trench
- implement measures for fuel, oil and chemical management, spill prevention, response and clean-up, trench dewatering, hydrotest water disposal and management of contaminated water.

Contamination impacts to groundwater and down gradient habitat for EPBC-listed species are not expected to occur and represent a low risk.

4.3.3.7 Dust from Project construction and operation is unlikely to materially affect habitat for EPBC listed threatened species

Construction earthworks and vehicle movements have the potential to generate dust which can affect ecological receptors via impacts to air quality, dust deposition or visible dust plumes.

Construction activities are expected to generate short-term particulate (dust) emissions especially during trenching and backfilling, and from vehicle movements on unsealed roads. The generally dry

conditions of the Project area are likely to increase the potential for dust generation. Potential impacts such as dusting of vegetation are expected to be temporary and localised.

Dust impacts on fauna habitat will be minimised through standard mitigation measures such as road and exposed area watering, and road speed reductions. Cleared areas will be progressively revegetated to minimise the amount of exposed ground, reducing the potential for dust to be raised during construction. Disturbance to fauna from dust will be buffered to an extent by the existing track and pipeline easements.

With implementation of standard mitigation measures, residual impacts associated with fugitive dust emissions from construction of the Project are anticipated to be negligible. Dust from construction is unlikely to materially affect vegetation health and therefore will not impact EPBC threatened species.

During operations, dust caused by light vehicles or equipment undertaking pipeline inspection and maintenance works will be minor, short-term and localised.

4.3.3.8 No impacts on fauna habitat are expected from bushfire resulting from project activities

There is potential for construction activities, such as welding, to cause fire ignition. Under adverse weather conditions, a bushfire could cause major damage to habitat for EPBC-listed species.

Mitigation measures to reduce fire risk will include:

- implement fire prevention procedures and maintain fire prevention and control equipment on site for high risk activities
- develop policies and procedures to appropriately manage bushfire risk to visitors, staff and contractors, including site induction, bushfire response, actions on forecast high fire danger days, reported bushfire emergencies, visitor management and site closure
- obtain any necessary permits under the Fire and Emergency Services Act for ‘hot work’ on days of total fire ban
- ensure contractors carry basic firefighting equipment (including fire extinguisher) along with communications devices in all vehicles during construction activities
- when undertaking ‘hot work’ activities:
    - the area of construction over which hot work will take place will be maintained free from combustible material
    - firefighting equipment, including a validated portable fire extinguisher and trained personnel, will be available
    - water trucks will be available.

With the above measures, the likelihood of fire ignition causing major environmental damage is considered to be rare. Therefore, no impacts on fauna habitat are expected.

4.3.3.9 Construction and operational traffic is unlikely cause injury or death of EPBC-listed fauna

The movement of vehicles and machinery along existing roads and access tracks has the potential to impact native fauna, principally through collisions.

Vehicle strike is likely to be relatively insignificant due to the type of local fauna, level of existing traffic, the short-term nature of the activities and the limited extent of significant fauna habitats. Mitigation measures such as speed restrictions and limitation of movements at night are also expected to reduce the potential level of impact.

4.3.3.10 Fauna entrapment in excavations is unlikely to result in mortality

The open trench during construction provides a temporary barrier to fauna movement. There is also the potential for ground-dwelling fauna to fall into the trench and become trapped and exposed to overheating, dehydration, predation and / or drowning.

The time between the trench being opened and lowering-in will be minimised to prevent trench collapse and reduce the likelihood of fauna entering the trench. However, sufficient trench is needed to be opened ahead of the lowering-in crew to avoid impeding progress of the subsequent crews in the pipeline construction operation. This may be as much as 6 km (or up to 10 days) depending on trenching progress.

Measures to minimise the potential for fauna mortality due to entrapment include:

- install trench plugs with slopes no greater than 50% at regular intervals to provide ramps for fauna to exit the trench
- install measures to minimise fauna fatality in the trench and allow fauna to exit the trench (e.g. sawdust filled hessian sacks soaked in water, branches or ramped gangplanks)
- welded pipe strings will be end capped to prevent fauna entry
- undertake daily inspection of open trenches during the working cycle
- ensure presence of appropriately trained (and licensed) fauna handlers during construction to assist with removal of, and relocation of, any trapped (and/or injured) fauna displaced during vegetation clearance activities.

With the above measures, impacts would be short term, localised and manageable. The level of risk has been assessed as low.

4.3.4 Cumulative impacts

While Whyalla is central to a number of renewable energy projects that support the transition to a clean economy, the cumulative impacts arising from these projects are not expected to result in Western Grasswren, Southern Whiteface or Malleefowl becoming unviable in and around the Whyalla area, or across the broader upper Eyre Peninsula region. Table 4-6 lists known projects that have been referred under the EPBC Act or publicly announced, which have potential impacts to these species.

Table 4-6: Known proposed projects in Whyalla area

Project	Current status	Proximity to proposed action	Potential impacts on EPBC listed threatened species
Cultana Solar Farm	Undergoing EPBC assessment	Adjoining	Clearance of approximately 110 ha of known habitat and 380 ha of potential habitat for Western Grasswren. Clearance of approximately 380 ha of known suitable habitat for Southern Whiteface.
Northern Water	Undergoing EPBC assessment	A small portion of the project adjoins the proposed action.	Clearance of potential habitat for Western Grasswren (estimated along the entire length of the pipeline as 126 ha of preferred habitat, of which 98 ha can be rehabilitated, and 156 ha of atypical habitat, of which 115 ha can be rehabilitated). Clearance of 'numerous' areas of potential suitable habitat for the Southern Whiteface, with most areas able to be rehabilitated.
Hydrogen Jobs Plan	Undergoing EPBC assessment	Adjoining – allied project	Clearance of 89.4 ha of Western Grasswren habitat, including 85.2 ha of atypical habitat, and 89.4 ha of Southern Whiteface habitat.

Project	Current status	Proximity to proposed action	Potential impacts on EPBC listed threatened species
			Approximately 15% of the clearance area to be revegetated following construction.
Yoorndoo Ilga Solar	Not referred	East of the proposed action	Project site is 665 ha. Information on clearance of habitat for Western Grasswren and Southern Whiteface not available. Mostly outside area of occupancy for Western Grasswren.
Port Bonython Hydrogen Hub	Not referred	Mostly east of proposed action	Development at conceptual stage so clearance area is not available. Project area provides mostly low suitability habitat for Western Grasswren with some patches of atypical habitat. Mostly outside area of occupancy for Western Grasswren.

Cumulatively, these projects have the potential to result in clearance in the Whyalla area of approximately 800 - 900 ha of vegetation providing habitat for the Western Grasswren and a similar area for the Southern Whiteface, with some additional clearance likely from the Port Bonython Hydrogen Hub. Data for clearance of Malleefowl habitat is not available.

The Project will clear 35 ha of suitable habitat for the Western Grasswren, 61 ha of suitable habitat for Southern Whiteface and 27 ha of suitable habitat for Malleefowl. This corresponds to approximately 5 % of the potential cumulative clearance area for the Western Grasswren and approximately 8 % of the cumulative area for the Southern Whiteface. Following revegetation of the Project area after construction, the residual clearance will be insignificant compared to the cumulative clearance in the region.

The estimated cumulative clearance is not certain and is subject to regulatory assessment and approval and proponents continuing to progress toward development. The cumulative clearance could potentially reduce the area of occupancy for the Western Grasswren at the eastern extent of its range. However, several factors mitigate that impact:

- Individual projects require their own site selection, impact mitigation and offsetting strategies.
- Some cleared areas will be revegetated following construction, reducing permanent habitat loss.
- There is minimal development activity occurring over most of the area of occupancy for Western Grasswren, which extends to the west across the upper Eyre Peninsula. Most of this area is under pastoral lease and subjected to low intensity grazing where remnant vegetation, and thus suitable habitat, persists. Consequently, the species is unlikely to be subject to broader cumulative impacts beyond the Whyalla region.
- Development activities such as solar present opportunities for habitat loss avoidance through targeted construction techniques, e.g. rolling and retention of vegetation between solar arrays where possible.
- Significant areas of intact remnant vegetation of high-quality adjoining or in vicinity of these projects will remain protected, notably the Whyalla Conservation Park and the heritage agreement area to the west of the HJP site. These conservation reserves support the same vegetation communities as present within the HJP site, and several of the other project sites, and will allow Western Grasswren to persist in the local region.

- The conservation estates also have direct connectivity to the Cultana Training Area and broader pastoral estate. The Cultana Training Area is estimated to support approximately 20 per cent of the Western Grasswren population (DotE, 2014).
- This higher value vegetation/habitat, along with the substantial areas of conservation reserve and defence estate described above, provide regional high quality 'refuge' habitat in areas around Whyalla which the species will persist within, and migrate out of, during and following periods of drought. As a result, the species is expected to persist within the Whyalla region irrespective of potential cumulative impact resulting from proposed development.
- This regional habitat enables the species to readily move across the landscape in the Whyalla area, either seasonally, or as new fledglings emerge and disperse, noting that shrub cover, abundance and density within high quality habitat provide adequate cover for such movement to occur unimpeded.
- It is expected that projects undergoing EPBC Act assessment will, if approved, be required to provide an offset for any residual impacts to MNES, in addition to Significant Environmental Benefit offsets provided under South Australian Native Vegetation legislation. Over time, these offsets will provide a net environmental benefit of direct relevance to the target species.

Cumulatively, these projects impact less than 0.4% of the currently known area of occupancy for the Western Grasswren, noting that recent records of the species have been identified which expand the area of occupancy, and which have not been included in the current area of occupancy calculations. Consequently, while the actions present some potential to cause a decline in population numbers around Whyalla, the development context indicates they are unlikely to result in a significant decline in the population of the species at either a local or regional level. In addition, assuming effective implementation of offsets, any decline is likely to be short-term.

Potential for relevant local cumulative impact to the Southern Whiteface within the Whyalla area are similar to the Western Grasswren and the above mitigating factors apply. In this instance, the impact would be to a lesser fraction of 0.01% of its area of occupancy if cumulative impact were to be in the order of 1000 ha. As noted in the approved conservation advice (DCCEEW, 2023b), the main threat to this species is from habitat clearance for agriculture. This is not a significant threat in the local and regional context. The pastoral rangelands zone across the Eyre Peninsula continues to support remnant native vegetation and therefore potentially suitable habitat for Southern Whiteface, as the majority of this area has been used for stock grazing and has not been subject to broad scale land clearing.

As with the Western Grasswren, the ongoing presence of the Whyalla Conservation Park, heritage agreement area and Cultana Training Area will ensure that a population of Southern Whiteface in the Whyalla region is able to readily move throughout the landscape and will not become isolated. The species is known to utilise a range of habitat types for nesting and foraging, including nesting in old fence posts and other human-influenced structures. Therefore, despite the loss of habitat in and around the Whyalla area, the species can be expected to successfully breed and persist within this area and across the broader Eyre Peninsula.

There is limited potential for cumulative impact to Malleefowl as other projects are located outside areas of suitable mallee habitat.

There is a limited potential for cumulative impacts on EPBC-listed shorebirds in False Bay given the location of these projects and absence of drainage lines over much of this area. It is reasonable to expect that all projects would be required to implement standard erosion and sediment control measures as part of their construction Environmental Management Plans.

4.3.5 Assessment of impact significance and residual impacts

The following sections provide an assessment of the significance of potential impacts to key species against the criteria for listed threatened species provided in the EPBC Significant Impact Guidelines (DotE, 2013).

They are complemented by the detailed significant impact assessments for these (and all other relevant species) provided in Attachment C.

4.3.5.1 Western Grasswren

Table 4-7: Assessment of significant and residual impacts to the Western Grasswren

Criteria	Key mitigation measures	Residual impact	Assessment of impact
1 – The action leads to a long-term decrease in the size of an important population of a species	• Alignment designed to follow existing roads, unsealed tracks, rail and pipeline infrastructure, where possible, to minimise vegetation disturbance. • Identified areas of higher density preferred chenopod/spiny shrublands (potential Western Grasswren habitat) avoided where practicable • Delineate construction footprint boundary near habitat for listed species to avoid unintentional disturbance outside defined construction areas • Undertake a walk through with an experienced ecologist, arborist and construction design specialist to further reduce the construction right of way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas. • Revegetate and rehabilitate pipeline alignment following construction through reinstating topsoil and cleared vegetative material and additional reseeding with selected local species. • Minimise the amount of time the trench is open and undertake daily inspections of the trench with any fauna handling or removal to be	Potential temporary decrease in the local population through clearance of up to 76 ha of habitat for Western Grasswren (35 ha suitable, 41 ha low suitability). No long-term decrease in the population following revegetation of construction areas.	**Not significant** It is considered that long-term impacts on the size of an important population of the Western Grasswren will not be significant: • All populations of Western Grasswren are considered to have high conservation value (DCCEEW, 2014) and therefore represent important populations. More recently, 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 Project site would represent small family groups at the edge of the entire large continuous population. The individuals present at the site are not a discrete important population though it is acknowledged that they form part of a larger important population. • There is no preferred habitat within the Project area (drainage lines, with dense *M. pyramidata*) and whilst several individuals are present, they constitute a very small proportion of the wider population. • Clearance required for the Project could lead to a temporary decrease in a local population but not a long-term decrease in the size of an important population. • The Project area is near 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 (DotE, 2014). The Project does not disturb this area.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	undertaken in accordance with statutory requirements • Implement fire prevention procedures and maintain fire prevention and control equipment on site for high risk activities. • Managing dust during construction through standard suppression methods such as watering of roads and exposed areas. • Preparing and implementing a project-specific CEMP with a Threatened Species Management Plan as a sub-plan to the CEMP and an OEMP prior to commissioning		
2 – The action reduces the area of occupancy of an important population	• As above.	Temporary decrease in the AOO through clearance of up to 76 ha of suitable and low suitable habitat for Western Grasswren. Negligible long-term decrease in the AOO (0.16 ha of low suitability habitat).	**Not significant** The action will result in a short-term (5 – 10 years) loss of habitat on the edge of the species' area of occupancy corresponding to no more than 0.03% of the AOO. In the longer term, the loss of habitat will be restricted to 0.16 ha of low-quality habitat representing a negligible (0.0001%) reduction in the AOO.
3 – The action fragments an existing important population into two or more populations	• Alignment designed to follow existing roads, unsealed tracks, rail and pipeline infrastructure, where possible, to minimise vegetation disturbance. • Identified areas of higher density preferred chenopod/spiny shrublands (potential Western Grasswren habitat) avoided where practicable.	No fragmentation of the population expected.	**Not significant** The Project is considered unlikely to fragment an existing important population as: • The Project area is at the southeast limit of the species' known distribution. Previous records in the vicinity of the HJP show that this species is mostly found to the north, south and west of the Project area. • The site is surrounded by native vegetation providing highly suitable habitat for this species, including the Whyalla Conservation Park and the Cultana Training Area. This provides for a high level of connectivity which the Project will not interrupt. • The narrow linear clearance for the construction right of way would not present a complete barrier to movement of individuals into adjacent habitat, should they be present in the vicinity of the Project. • In the longer term (5-10 years), almost all of the cleared area for the project would be revegetated and providing suitable habitat for the Western Grasswren.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
			• More broadly, the HJP sits within the Myall Plains IBRA subregion, 97% of which contains remnant vegetation of varying habitat condition.
4 – The action adversely affect habitat critical to the survival of a species	• Identified areas of higher density preferred chenopod/spiny shrublands (potential Western Grasswren habitat) avoided where practicable • Other measures to minimise habitat impacts as listed under criteria 1.	Negligible short-term impact on habitat critical to the survival of the species.	**Not significant** The Project is expected to have a negligible impact on habitat critical to the survival of a species as: • While critical habitat has not been defined for Western Grasswren, important habitats and critical habitat plants include Black Bluebush and Native Boxthorn, and habitat of secondary importance includes low Western Myall woodlands along drainage lines and on low rocky hills (DotE 2014). Minimal temporary new clearance of habitat will occur where the Project traverses east of Lincoln Highway and heads east to Port Bonython. There are extensive areas of similar suitable / suboptimal habitats for the species in this area. • The Project area (pipeline east of Lincoln Highway) does not include drainage lines, with the majority of the preferred habitat for the species occurring north / north - west/south -west of Whyalla. • The loss of potential quality habitat for the species will be short-term (5 – 10 years) other than for 0.16 ha of low suitability habitat.
5 – The action disrupts the breeding cycle of an important population	• Identified areas of higher density preferred chenopod/spiny shrublands (potential Western Grasswren habitat) avoided where practicable • Revegetate pipeline alignment following construction through reinstating topsoil and cleared vegetative material and additional reseeding with selected local species. • Reduce potential for noise impacts through standard management and control measures in the CEMP • Lighting will be shielded and directional and designed where possible to minimise the impact to any surrounding sensitive receptors and wildlife, consistent with the	No disruption expected to the breeding cycle of an important population.	**Not significant** The Project is considered unlikely to disrupt the breeding cycle of an important population as: • Well documented records for the entire population occur largely to the west of the Project area, near Whyalla. The project will require temporary new clearance of a very small 0.03% (up to 76 ha, of suitable and low suitability habitat) of the area occupied by the species, at the eastern extent of its range. • Retention of large areas of protected habitat in the Whyalla Conservation Park and Cultana Training Area, as well as broadly within remnant vegetation across other properties, will allow movement of the species across the landscape to enable breeding and dispersal. • Once constructed, the buried pipeline and existing access tracks / very low traffic volume for maintenance access are not expected to disrupt movement across the landscape for this species, hence impacts to the breeding cycle of an important population are not anticipated. • Indirect impacts will be very short-term and unlikely to disrupt the breeding cycle of the population.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	National Light Pollution Guidelines for Wildlife (DCCEEW, 2023d).		
6 – The action modifies, destroys, removes or isolates or decreases the availability or quality of habitat to the extent that the species is likely to decline	• Refer to measures listed under criteria 1.	Temporary clearance of up to 76 ha of habitat for Western Grasswren (35 ha suitable, 41 ha low suitability) and permanent clearance of 0.16 ha of low suitability habitat is not expected to result in decline of the species.	**Not significant** The Project is considered unlikely to impact the availability or quality of habitat to the extent that the Western Grasswren is likely to decline as: • The Project will require clearance of a small fraction of the habitat of this species (0.03% of its area of occupancy). Almost all this area will be revegetated. • The Project area is at the southeast limit of the species' known distribution, and previous records show that this species is mostly found to the north, south and west of the Project area. • The site is surrounded by native vegetation providing highly suitable habitat for this species, including the Whyalla Conservation Park and Cultana Training Area. • As noted above, the Myall Plains IBRA subregion contains 97% remnant vegetation. While this is of varying habitat condition, it provides some capacity for the species to adapt to climate change, also noting that the distribution of Western Grasswren extends north-south across a range of latitudes.

7 – The action results in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	• Implement a Weed, Pest and Disease Management Plan which will include:
	  ○ Undertaking pre-construction weed surveys and controls, post-construction weed surveys and controls, and ongoing weed survey and control during operation targeting Weeds of National Significance (WoNS) and Declared Weed species (if weeds identified) in accordance with the Weed Control Handbook for declared plants in South Australia
	  ○ Implementing appropriate hygiene practices when equipment is brought on site,
		No residual impact expected.	**Not significant**
			Impact on the Western Grasswren population through the introduction of harmful invasive species because of the Project is considered unlikely as:
			• Introduced annual species such as Ward's Weed do not appear to influence this species (Black, Carpenter, & Pedler, 2009).
			• The Project will implement weed hygiene practices during construction including vehicle checks and washdowns as required on vehicles or plant entering the construction site.
			• Weed surveillance and control programs targeting WoNS and Declared Weed species (if weeds identified) will continue during operation.
			• Waste will be appropriately covered and managed to avoid attracting pest species which may be predators.
			• No domestic animals will be permitted on the site (other than personal assistance animals).

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	including checking equipment prior to moving it to site ○ Ensuring all fill materials (e.g. sand, aggregate) imported to site are sourced from weed and pathogen free sites • Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project area • Ensuring construction compounds are kept neat and tidy at all times to prevent pest animals from inhabiting the area, and food waste is placed in enclosed / covered bins to prevent access by pest animals • Implementing rodent control measures to reduce potential food sources for pests such as foxes and feral cats.		
8 – The action introduces disease that may cause the species to decline	• Implementing appropriate hygiene practices when equipment is brought on site, including checking equipment prior to moving it to site	No residual impact expected.	**Not significant** The introduction of disease from the Project that may impact the Western Grasswren is considered unlikely as: • There is no evidence indicating that the introduction of disease is a likely outcome of the proposed development or likely significant risk to the Western Grasswren. • The Approved Conservation Advice (DotE, 2014) does not list disease as one of the key threats to the species. • The Project will implement weed and pathogen hygiene practices during construction including vehicle checks and washdowns as required on vehicles or plant entering the construction site. • There is no previous record of Phytophthora in the area, and the Project area is not within a high-risk Phytophthora area (DEW, NatureMaps, 2024).

Criteria	Key mitigation measures	Residual impact	Assessment of impact
9 – The action interferes substantially with the recovery of the species	• Refer to measures listed under criteria 1.	The action is not expected to interfere substantially with the recovery of the species	**Not significant** The Western Grasswren does not have an adopted or made recovery plan. Conservation Advice indicates the key conservation objectives are: • The primary conservation objective for this species is to ensure that all known populations are stable (DotE, 2014). Refer to Criteria 1 above for assessment of this objective. • The Conservation advice for the Western Grasswren (DotE, 2014) further recommends research studies and monitoring to better understand the risks associated with livestock and feral herbivores grazing and predation by foxes and feral cat. The Project will not result in an increase in herbivore grazing and foxes and feral cat predation (refer to Criteria 7 above).

4.3.5.2 Southern Whiteface

Table 4-8: Assessment of significant and residual impacts to the Southern Whiteface

Criteria	Key mitigation measures	Residual impact	Assessment of impact
1 – The action leads to a long-term decrease in the size of an important population of a species	• Alignment designed to follow existing roads, unsealed tracks, rail and pipeline infrastructure, where possible, to minimise vegetation disturbance. • Delineate construction footprint boundary near habitat for listed species to avoid unintentional disturbance outside defined construction areas • Minimise the amount of time the trench is open and undertake daily inspections of the trench with any fauna handling or removal to be undertaken in accordance with statutory requirements • Undertake a walk through with an experienced ecologist, arborist and construction design specialist to further reduce the construction right of way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas. • Revegetate pipeline alignment following construction through reinstating topsoil and cleared vegetative material and additional reseeding with selected local species. • Implement fire prevention procedures and maintain fire prevention and control equipment on site for high risk activities.	Potential temporary decrease in the local population of Southern Whiteface due to clearance of up to 84 ha of potential habitat (61 ha suitable and 23 ha low suitable). No long-term decrease in the local population following revegetation of construction areas. No impact on an important population.	**Not significant** It is considered unlikely the Project will lead to a long-term decrease in the size of an important population of the Southern Whiteface as: • The Conservation Advice for the species (DCCEEW, 2023b) does not define an important population. The percentage of area of occupancy temporarily affected is of such a small scale that it is unlikely the Project Area includes a key source population for breeding/dispersal, or a population necessary for maintaining genetic diversity. Permanent loss of habitat is considerably smaller. • Examples of populations that do not represent important populations would include small portions of much larger and/or predominantly continuous populations (as is the case for this species). Based on the evidence, it is reasonable to conclude that the Southern Whiteface observed within the Project area are not defined as an important population as per the criteria in (DotE, 2013). • Clearance for the Project is temporary with almost all habitat for the Southern Whiteface revegetated. • The Project is not expected to decrease habitat quality in the area surrounding the Project area to the extent that population size would be impacted over the long-term. • Hence, the action will not lead to a long-term decrease in the size of an important population of this species.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	• Managing dust during construction through standard suppression methods such as watering of roads and exposed areas. • Preparing and implementing a project-specific CEMP with a Threatened Species Management Plan as a sub-plan to the CEMP and an OEMP prior to commissioning		
2 – The action reduces the area of occupancy of an important population	As above.	Temporary decrease in the AOO through clearance of up to 84 ha of suitable and low suitable habitat for Southern Whiteface. Negligible long-term decrease in the AOO (0.16 ha).	**Not significant** The Project will not reduce the area of occupancy for an important population as: • As per criterion 1 above, it is concluded that the Southern Whiteface observed within the Project Area are not defined as an important population as defined in (DotE, 2013). • Individuals present within the HJP Project area are likely to be part of the continuous population across the majority of Australia (range 236,000 – 954,000 individuals (DCCEEW, 2023b), rather than part of a specifically identified important population. • Regardless, the area of occupancy of this species is estimated at approximately 7,000,000 ha across Australia (DCCEEW, 2023b) (Ehmke, et al., 2021) and 375,600 ha in the Gawler IBRA bioregion (Attachment C). The temporary new clearance for the Project of 84 ha represents a negligible impact on the AOO for the species, representing at most 0.001% of the Australia-wide AOO and 0.02% of the AOO in the Gawler IBRA bioregion. • Once the disturbance footprint has been revegetated with species that provide suitable habitat for Southern Whiteface, permanent clearance will represent 0.000002% of the Australia-wide AOO and 0.00004% of the AOO in the Gawler bioregion. • As it is concluded that the Southern Whiteface observed within the Project Area are not defined as an important population, it is further concluded that the action will not reduce the area of occupancy of an important population.
3 – The action fragments an existing important population into	• Alignment designed to follow existing roads, unsealed tracks, rail and pipeline infrastructure, where possible, to minimise vegetation disturbance.	No fragmentation of the population expected.	**Not significant** Notwithstanding that no 'important population' of Southern Whiteface has been identified, it is considered unlikely the Project will fragment an important population of Southern Whiteface as:

Criteria	Key mitigation measures	Residual impact	Assessment of impact
two or more populations	• Identified areas of low woodland, or higher density and taller shrublands (potential Southern Whiteface habitat) avoided where practicable.		• Individuals present within the Project area are likely to be part of the continuous population across the majority of Australia, rather than part of a specifically identified important population. A relatively small potential impact in the middle of that distribution is unlikely to fragment the population. • The pipeline alignment mostly follows existing roads and tracks. • The narrow linear clearance for the construction right of way would not present a complete barrier to movement of individuals into adjacent habitat, should they be present in the vicinity of the Project. • Although the Project will result in removal of suitable habitat for the species, once constructed, the underground pipeline will not stop movement of the species or restrict gene flow. • The Project area will be surrounded by intact and contiguous native vegetation that will be minimally impacted by the Project, notably the Whyalla Conservation Park and Cultana Training Area. Presence of intact vegetation surrounding the Project Area enables individuals to continue to freely move throughout their range. • A study of Southern Whiteface has found no effect of habitat fragmentation area, isolation, fragmentation quality or vegetation complexity on the species (Maron & Lill, 2005).
4 – The action adversely affect habitat critical to the survival of a species	• Identified areas of low woodland, or higher density and taller shrublands (potential Southern Whiteface habitat) avoided where practicable • Other measures to minimise habitat impacts as listed under criteria 1.	Negligible short-term impact on habitat critical to the survival of the species.	**Not significant** Due to the small scale and localised nature of the proposed clearance, and the availability of intact native vegetation around the Project area, it is considered the Project will not have a significant impact on habitat critical to the survival of this species as: • Habitat deemed critical to the survival of the species includes areas of undisturbed open woodland and shrublands with an understorey of grasses of shrubs, habitat with low tree densities and herbaceous understorey / litter cover which provides essential foraging habitat. Living and dead trees with hollows and crevices are essential for roosting and nesting (DCCEEW, 2023b). Such habitat is widespread within and surrounding the Project Area • The Project will not result in the degradation of suitable habitat in the area surrounding the project. • A study of Southern Whiteface has found no effect of habitat fragmentation area, isolation, fragmentation quality or vegetation complexity (Maron & Lill, 2005). Other than the direct clearance area (refer to criterion 2 for assessment of significance) no other impacts are expected which adversely affect habitat which is critical to the survival of the species.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
			• The percentage of area of occupancy effected is of such a small scale it is considered that the action will not adversely affect habitat critical to the survival of a species.
5 – The action disrupts the breeding cycle of an important population	• Identified areas of low woodland, or higher density and taller shrublands (potential Southern Whiteface habitat) avoided where practicable • Reduce potential for noise impacts through standard management and control measures in the CEMP • Lighting will be shielded and directional and designed where possible to minimise the impact to any surrounding sensitive receptors and wildlife, consistent with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023d).	No disruption expected to the breeding cycle of an important population.	**Not significant** It is considered unlikely that the Project will disrupt the breeding cycle of an important population of the Southern Whiteface as: • Individuals present within the Project area are likely to be part of the continuous population across the majority of Australia, rather than part of a specifically identified important population. • Habitat deemed critical for roosting and nesting (open include woodland and shrubland with hollows and crevices, fence posts and other artificial structures with crevices). Impacts to this type of habitat within the Project area are limited compared to the broader availability of similar habitat adjacent the proposed Project Area. • Once the Project is constructed, Southern Whiteface will move freely across the Project Area. Isolated clearance of suitable breeding habitat is not expected to disrupt the breeding cycle of an important population of this species.
6 – The action modifies, destroys, removes or isolates or decreases the availability or quality of habitat to the extent that the species is likely to decline	Refer to measures listed under criteria 1.	Temporary clearance of up to 84 ha of potential habitat (61 ha suitable and 23 ha low suitable) and permanent clearance of 0.16 ha of low suitability habitat is not expected to result in decline of the species.	**Not significant** The Project is considered unlikely to impact the availability or quality of habitat to the extent that the Southern Whiteface is likely to decline as: • Clearance for the Project corresponds in total to approximately 0.001% of the Australia-wide species predicted area of occupancy and 0.02% of the AOO in the Gawler bioregion. • Almost all this area will be revegetated following construction. • The Project area is surrounded by native vegetation providing highly suitable habitat including the Whyalla Conservation Park and the Cultana Training Area.
7 – The action results in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	• Implement a Weed, Pest and Disease Management Plan which will include: ○ Undertaking pre-construction weed surveys and controls, post-construction weed surveys and controls, and ongoing weed survey and control during operation targeting Weeds of	No residual impact expected.	**Not significant** Impact on the Southern Whiteface through the introduction of harmful invasive species is considered unlikely as: • The Project will implement weed hygiene practices during construction including vehicle checks and washdowns as required on vehicles or plant entering the construction site. • Weed surveillance and control programs targeting WoNS and Declared Weed species (if weeds identified) will continue during operation.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	National Significance (WoNS) and Declared Weed species (if weeds identified) in accordance with the Weed Control Handbook for declared plants in South Australia ○ Implementing appropriate hygiene practices when equipment is brought on site, including checking equipment prior to moving it to site ○ Ensuring all fill materials (e.g. sand, aggregate) imported to site are sourced from weed and pathogen free sites • Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project area • Ensuring construction compounds are kept neat and tidy at all times to prevent pest animals from inhabiting the area, and food waste is placed in enclosed / covered bins to prevent access by pest animals Implementing rodent control measures to reduce potential food sources for pests such as foxes and feral cats.		• Waste will be appropriately covered and managed to avoid attracting predators. • No domestic animals will be permitted on the site (other than personal assistance animals). • Tracks already exist through the area and the pipeline alignment largely follows existing tracks and disturbance areas. Consequently, the Project is not expected to increase movement of feral predators through the landscape.
8 – The action introduces disease that may cause the species to decline	Implementing appropriate hygiene practices when equipment is brought on site, including checking equipment prior to moving it to site	No residual impact expected.	**Not significant** The introduction of disease from the Project that may impact the Southern Whiteface is considered unlikely as: • There is no evidence indicating that the introduction of disease is a likely outcome of the proposed development or likely significant risk to the Southern Whiteface. • The Approved Conservation Advice (DCCEEW, 2023b) does not list disease as one of the key threats to the species.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
			• The Project will implement hygiene practices during construction including vehicle checks and washdowns as required on vehicles or plant entering the construction site. • There is no previous record of Phytophthora in the area, and the Project area is not within a high-risk Phytophthora area (DEW, 2024).
9 – The action interferes substantially with the recovery of the species	Refer to measures listed under criteria 1.	The action is not expected to interfere substantially with the recovery of the species	**Not significant** The Project is unlikely to interfere substantially with the recovery of this species as: • Conservation Advice for the Southern Whiteface focuses on preventing habitat degradation from agriculture activities and domestic livestock grazing (DCCEEW, 2023b). The Project will result in temporary degradation of a negligible fraction of the Southern Whiteface habitat, corresponding to 0.001% of its estimated area of occupancy. • Although the Southern Whiteface is a sedentary bird, it was previously shown to be able to move in response to a stress (drought) (Higgins & Peter, 2002), and therefore has the capacity to avoid the Project area if needed.

4.3.5.3 Malleefowl

Table 4-9: Assessment of significant and residual impacts to the Malleefowl

Criteria	Key mitigation measures	Residual impact	Assessment of impact
1 – The action leads to a long-term decrease in the size of an important population of a species	• Alignment designed to follow existing roads, unsealed tracks, rail and pipeline infrastructure, where possible, to minimise vegetation disturbance. • Identified areas of mallee avoided where practicable • Undertaking preclearance surveys in mallee that cannot be avoided to detect any active or non-active nests and undertaking adaptive mitigation to avoid impacts to mallee fowls if required. If any active or potentially active mallee fowl nests are detected, implement	Potential (although unlikely) temporary decrease in the local population of Malleefowl due to clearance of up to 27 ha of suitable habitat. No long-term decrease in the local population following revegetation of construction areas. No impact on an important population.	**Not significant** It is considered unlikely the Project will lead to a long-term decrease in the size of an important population of the Malleefowl as: • The National Recovery Plan for the Malleefowl (DCCEEW, 2024a) does not define an important population for the species. • No Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint during targeted searches. Given the lack of deeper sand in the Project area and proximity to Point Lowly Rd, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur in the Department of Defence land. • Consequently, the Project area is considered unlikely to contain an important population of the species. • In the short-term, a diversity of colonising mallee species would continue to provide suitable foraging habitat for the Malleefowl that often use a mosaic of

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	construction constraints within 100 m where feasible. • Delineate construction footprint boundary near habitat for listed species to avoid unintentional disturbance outside defined construction areas • Undertake a walk through with an experienced ecologist, arborist and construction design specialist to further reduce the construction right of way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas. • Revegetate pipeline alignment following construction through reinstating topsoil and cleared vegetative material and additional reseeding with selected local species. • Minimise the amount of time the trench is open and undertake daily inspections of the trench with any fauna handling or removal to be undertaken in accordance with statutory requirements • Implement fire prevention procedures and maintain fire prevention and control equipment on site for high risk activities. • Managing dust during construction through standard suppression methods such as watering of roads and exposed areas. • Preparing and implementing a project-specific CEMP with a		dense mallee to burnt mallee and adjacent habitats for foraging. In the longer-term, mallee species will return to the area and habitat values will be fully restored. • In addition, the mallee that will be disturbed is adjacent a noisy, busy road with existing traffic heading to and returning from Port Bonython. The remaining mallee is contiguous with a large tract (2,870 ha) of mallee on the Department of Defence land. Less than 1% of this large tract of mallee will be temporarily cleared. Hence any local Malleefowl have a vast area of contiguous habitat to move in to, and this available habitat is further away from the road. • Mitigation measures will be in place to minimise clearance of mallee areas and prevent disturbance of adjoining areas. • Hence, the action will not lead to a long-term decrease in the size of an important population of this species.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	Threatened Species Management Plan as a sub-plan to the CEMP and an OEMP prior to commissioning •		
2 – The action reduces the area of occupancy of an important population	As above.	Temporary decrease in the AOO through clearance of up to 27 ha of habitat for Malleefowl. No long-term decrease in the AOO.	**Not significant** The Project will result in an insignificant short-term reduction in the area of occupancy for this species as: • As discussed in criteria 1, the Project area consists of foraging habitat and is unlikely to contain an important population of the species. • All cleared habitat will be rehabilitated – there will be no permanent disturbance of Malleefowl habitat. • Route selection, footprint minimisation and other mitigations have been proposed to minimise disturbance to habitat for Malleefowl. The temporary clearance represents 1.1% of the localized large patch of mallee and at most 0.001% of the AOO for this species where an important population is not defined. • Given the clearance is on the edge of a very large patch, adjacent an existing highway, with existing tracks present, it is considered unlikely that the Action will significantly impact the species by reducing the AOO of an important population.
3 – The action fragments an existing important population into two or more populations	• Alignment designed to follow existing roads, unsealed tracks, rail and pipeline infrastructure, where possible, to minimise vegetation disturbance. • Identified areas mallee avoided where practicable.	No fragmentation of the population expected.	**Not significant** Notwithstanding that no 'important population' of Malleefowl has been identified, it is considered unlikely the Project will fragment an important population of Malleefowl as: • The proposed action will temporarily clear up to 27 ha of suitable habitat for Malleefowl (primarily foraging habitat). All of this habitat will be rehabilitated – there will be no permanent disturbance of Malleefowl habitat. • The mallee that will be disturbed is adjacent a noisy, busy road with existing traffic heading to and returning from Port Bonython. The remaining mallee is contiguous with a large tract (2,870 ha) of mallee on the Department of Defence land. Less than 1% of this large tract of mallee will be temporarily cleared. • Hence any local Malleefowl have a vast area of contiguous habitat to move in to, and this available habitat is further away from the road. • Given the above, the Project is considered unlikely to restrict movement of individuals nor restrict gene flow of this species across the landscape.
4 – The action adversely affect habitat critical to	• Identified areas of mallee avoided where practicable	Negligible short-term impact on habitat critical to the survival of the species.	**Not significant** Due to the small scale and localised nature of the proposed clearance, and the availability of intact native vegetation adjacent the Project area, it is considered the

Criteria	Key mitigation measures	Residual impact	Assessment of impact
the survival of a species	• Other measures to minimise habitat impacts as listed under criteria 1.		Project will not have a significant impact on habitat critical to the survival of this species as: • The National Recovery Plan (DCCEEW, 2024a) notes the difficulty in defining habitat critical to the survival of the Malleefowl given its 'extensive distribution encompasses a variety of climatic conditions and geomorphological and biological features and systems'. • Suitable habitat is widespread for this species regionally on the Eyre Peninsula and species records are spread throughout the central and southern Eyre Peninsula. • No Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint during targeted searches. Given the lack of deeper sand in the Project area and proximity to Point Lowly Rd, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur in the Department of Defence land. • The proposed action will temporarily clear up to 27 ha of suitable habitat for Malleefowl (primarily foraging habitat). All of this habitat will be rehabilitated – there will be no permanent disturbance of Malleefowl habitat. • With mitigation measures proposed to minimise clearance areas where practicable, and the widespread nature of available habitat, particularly to the north of Point Lowly Road on Defence land, the Action is considered unlikely to significantly impact habitat considered critical for survival of the species.
5 – The action disrupts the breeding cycle of an important population	• Identified areas of mallee avoided where practicable • Reduce potential for noise impacts through standard management and control measures in the CEMP • Lighting will be shielded and directional and designed where possible to minimise the impact to any surrounding sensitive receptors and wildlife, consistent with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023d).	No disruption expected to the breeding cycle of an important population.	**Not significant** It is considered unlikely that the Project will disrupt the breeding cycle of an important population of the Malleefowl as: • No Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint during targeted searches. Given the lack of deeper sand in the Project area and proximity to Point Lowly Rd, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur in the Department of Defence land. • Measures will be in place during construction to prevent any damage to the adjoining land. • All of the cleared habitat will be rehabilitated. • Once the pipeline is buried the post-construction rehabilitated areas are unlikely to inhibit movement of individuals nor geneflow across the landscape. Therefore, the proposed Action is considered unlikely to disrupt the breeding cycle of the local population, regardless of whether it is considered an important population.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
6 – The action modifies, destroys, removes or isolates or decreases the availability or quality of habitat to the extent that the species is likely to decline	Refer to measures listed under criteria 1.	Temporary clearance of up to 27 ha of habitat for Malleefowl is not expected to result in decline of the species.	**Not significant** The Project is considered unlikely to impact the availability or quality of habitat to the extent that the Malleefowl is likely to decline as: • No Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint during targeted searches. Given the lack of deeper sand in the Project area and proximity to Point Lowly Rd, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur in the Department of Defence land. • Measures will be in place during construction to prevent any damage to the adjoining land. • All of the cleared habitat will be rehabilitated. • Mitigations such as weed management will reduce further impact to the quality of habitat for this species. • The known distribution of Malleefowl is widespread across the Eyre Peninsula, through the Great Victorian Desert, and also broadly across large parts of WA, Central NSW and western Victoria. As such, the proposed Action is not expected to result in an impact on habitat extent and quality such that it results in decline of the species.

7 – The action results in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	• Implement a Weed, Pest and Disease Management Plan which will include:
	  ○ Undertaking pre-construction weed surveys and controls, post-construction weed surveys and controls, and ongoing weed survey and control during operation targeting Weeds of National Significance (WoNS) and Declared Weed species (if weeds identified) in accordance with the Weed Control Handbook for declared plants in South Australia
	  ○ Implementing appropriate hygiene practices when equipment is brought on site,
		No residual impact expected.	**Not significant**
			Impact on the Malleefowl through the introduction of harmful invasive species is considered unlikely as:
			• The Project will implement weed hygiene practices during construction including vehicle checks and washdowns as required on vehicles or plant entering the construction site.
			• Weed surveillance and control programs targeting WoNS and Declared Weed species (if weeds identified) will continue during operation.
			• Waste will be appropriately covered and managed to avoid attracting predators.
			• No domestic animals will be permitted on the site (other than personal assistance animals).
			• Tracks already exist through the area and the pipeline alignment largely follows existing tracks and disturbance areas. Consequently, the Project is not expected to increase movement of feral predators through the landscape.

Criteria	Key mitigation measures	Residual impact	Assessment of impact
	including checking equipment prior to moving it to site ○ Ensuring all fill materials (e.g. sand, aggregate) imported to site are sourced from weed and pathogen free sites • Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project area • Ensuring construction compounds are kept neat and tidy at all times to prevent pest animals from inhabiting the area, and food waste is placed in enclosed / covered bins to prevent access by pest animals •		
8 – The action introduces disease that may cause the species to decline	Implementing appropriate hygiene practices when equipment is brought on site, including checking equipment prior to moving it to site	No residual impact expected.	**Not significant** The introduction of disease from the Project that may impact the Malleefowl is considered unlikely as: • There is no evidence indicating that the introduction of disease is a likely outcome of the proposed development or likely significant risk to the Malleefowl. • The National Recovery Plan (DCCEEW, 2024a) notes there is no information on disease in wild Malleefowl populations but it is susceptible to a range of diseases in captive populations. The Project will not involve any captive populations. • The Project will implement hygiene practices during construction including vehicle checks and washdowns as required on vehicles or plant entering the construction site. • There is no previous record of Phytophthora in the area, and the Project area is not within a high-risk Phytophthora area (DEW, NatureMaps, 2024).
9 – The action interferes substantially with	Refer to measures listed under criteria 1.	The action is not expected to interfere substantially with the recovery of the species.	**Not significant** The Project is unlikely to interfere substantially with the recovery of this species as: • No Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint during targeted searches. Given the lack of deeper sand in

Criteria	Key mitigation measures	Residual impact	Assessment of impact
the recovery of the species			the Project area and proximity to Point Lowly Rd, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur in the Department of Defence land. • Measures will be in place during construction to prevent any damage to the adjoining land. • All of the cleared habitat will be rehabilitated. • Recovery strategies in the National Recover Plan (DCCEEW, 2024a) include: o Enhance protection and improve or maintain quality, connectivity and extent of habitat for Malleefowl o Manage fire o Manage impacts of herbivore grazing and habitat destruction by feral animals o Manage and monitor impacts of introduced predators on Malleefowl. • The Project will not compromise any of these strategies.

4.3.5.4 Grey Falcon and Blue-winged Parrot

Although not recorded in surveys, the Grey Falcon and Blue-winged Parrot have the potential to occur in the Project area. There are no existing records of these species within the Project area, but on-ground surveys suggested they may very occasionally utilise open areas within and near the Project area for hunting or foraging.

Given the lack of records for these species in or near the Project area, the Project is unlikely to significantly impact these species. A detailed significant impact assessment for these species is provided in Attachment C.

4.3.5.5 Listed threatened shorebirds

False Bay is a nationally important wetland and could potentially support important populations of some of the listed shorebirds discussed in Section 4.2.8. However, there will be no direct impacts from the Project on habitat for these species. As discussed above in Section 4.3.3, indirect impacts such as sedimentation and spread of weeds can be managed through appropriate controls to ensure habitat is not adversely affected. Consequently, the project is not expected to:

- impact an important population of these species
- reduce their area of occupancy
- affect habitat critical to the survival of these species
- decrease the availability of habitat
- introduce weeds or diseases
- interfere with the recovery of these species.

A detailed significant impact assessment for listed threatened shorebird species is provided in Attachment C.

4.3.6 Residual impact

The assessment above (Table 4-7, Table 4-8 and Table 4-9) against the DCCEEW significant impact criteria concluded that the proposed action was **not likely to result in a residual significant impact** to any EPBC-listed threatened species. On this basis, no offsets are required for the Project under the EPBC Act.

5. Migratory Species

5.1 Overview

The PMST identified 45 migratory species as potentially using the Ecology Study Area. Oceanic or marine species (marine mammals, sharks and fishes, marine reptiles and oceanic birds) accounted for 23 of these and were not considered further as the Project will have no direct or indirect impact on the marine environment. Of the 22 migratory species considered to potentially occur in the Project area, 10 species are also listed as threatened and were considered unlikely to occur in the Project area. Eight threatened species (shorebirds) were considered to have the potential to occur in the adjoining saltmarsh and mudflats of False Bay. These species are described in Section 4.2.8 and impacts on these species are assessed in Section 4.3.

The Significant Impact Assessment (Attachment C) considered the likelihood of occurrence of the remaining 12 species in the Project area. Two species (Grey Wagtail and Osprey) were considered unlikely to occur on the basis of known distribution, suitability of habitat and absence of records in the Study Area. One species, Fork-tailed Swift, is only known to occur as an overfly species. The remaining 9 species are:

- Common Sandpiper (*Actitis hypoleucos*)
- Sanderling (*Calidris alba*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Red-necked Stint (*Calidris ruficollis*)
- Oriental Plover / Oriental Dotterel (*Charadrius veredus*)
- Pin-tailed Snipe (*Gallinago stenura*)
- Bar-tailed Godwit (*Limosa lapponica*)
- Ruff (Reeve) (*Philomachus pugnax*)
- Marsh Sandpiper, Little Greenshank (*Tringa stagnatilis*).

These migratory waders mostly migrate from the northern hemisphere and are non-breeding visitors to Australia.

Habitat preferences vary from predominantly coastal or near-coastal / intertidal (Sanderling, Pectoral Sandpiper, Bar-tailed Godwit), to predominantly inland (Pin-tailed Snipe, Ruff), or shallow water generalists that range between coastal and inland wetted environments (Common Sandpiper, Oriental Plover and Little Greenshank).

5.2 Details of migratory species and habitat present

The migratory waders discussed above are unlikely to be present in the Project area due to lack of suitable habitat. There is, however, suitable habitat in the adjoining Whyalla saltfields / saltpans, and areas of stranded saltmarsh with claypans that may temporarily fill with water following rainfall. These areas are generally several hundred metres or more from the alignment and extend over 5 km from the alignment (see Figure 3-5). In addition, some species could utilise beach areas south of Point Lowly Road (which are 350 m from the alignment at the closest point).

These areas of habitat are within False Bay which forms part of the nationally important Upper Spencer Gulf wetland. This wetland is noted as a migration stop-over for 14 species of shorebird. Consequently, these migratory waders could be present in the area adjoining the Project area during the migration season (September – February).

5.3 Assessment of Relevant Impacts including Avoidance, Management and Mitigation

This assessment addresses the relevant direct and indirect impacts identified in the significant impact assessment, the DCCEEW Statement of Reasons (dated 21 October 2024) and Preliminary Documentation RFI (2024/09873).

It discusses direct, indirect and cumulative impacts and then presents a detailed assessment of impact significance against significant impact criteria (DotE, 2013). It is supported by the Significant Impact Assessment provided in Attachment C.

The assessment concludes that the Project is not expected to have any residual impacts on listed migratory species.

5.3.1 Identified sources of impact

The assessment of potential impacts to listed migratory species identified the following key sources for impact:

- Construction activities may increase noise, dust, light, human and vehicle disturbance and introduce pest species (indirect impacts). The clearance of vegetation, earthworks and other construction activities for the pipeline will result in increased dust and noise, more humans and vehicles will be present and there is potential for weed seeds to be introduced on tyres or inappropriate management of wastes to increase populations of pest species. These impacts could extend into the adjoining wetland habitat for migratory waders but can all be managed using industry standard control strategies.
- Erosion on the alignment during construction and operation could impact habitat for migratory waders through sediment transport. There is a very low risk that sediment from the Project area could adversely impact habitat for listed migratory waders in False Bay.

5.3.2 Direct impacts

There are no direct impacts from the Project on these species as all are unlikely to occur within the Project area. The Project area contains no suitable habitat for these species.

5.3.3 Indirect impacts

5.3.3.1 Construction noise, dust, light, human and vehicle disturbance and potential for introduction of pest species are all not expected to adversely impact listed migratory waders in False Bay.

The potential impacts on migratory waders are identical to those for the listed threatened shorebirds (most of which are also migratory waders) as discussed in Section 4.3.3. To summarise the findings in that section:

- Disturbance to native fauna from Project noise is expected to affect a very small proportion of available habitat and impacts would be localised, short term and minor.
- Construction of the Project is not expected to result in an increase the number or abundance of weeds, pathogens and predators on the Project Area with standard mitigation measures.
- Lighting required for construction and operation of the Project is expected to present a low risk to EPBC-listed fauna species.
- Changes to groundwater quality from Project construction are unlikely to modify habitat for EPBC listed threatened species.

- Dust from Project construction and operation is unlikely to materially affect habitat for EPBC listed threatened species.
- No impacts on fauna habitat are expected from bushfire resulting from project activities.
- Construction and operational traffic is unlikely cause injury or death of EPBC-listed fauna.

At its closest point, the alignment will be approximately 180 m from the mapped boundary of the False Bay wetland. It is also separated by the Point Lowly Road. Most of the wetland habitats are several hundred metres to several kilometres from the alignment. This separation, and the mitigation measures proposed in Section 4.3.3, mean there is a low risk to migratory species from the above impacts.

5.3.3.2 Sedimentation from the Project area during construction and operation is unlikely to adversely impact habitat for listed migratory species.

Once again, the potential impacts on migratory waders from sedimentation are identical to those for the listed threatened shorebirds as discussed in Section 4.3.3. This section concludes:

- Changes to surface water quality from Project construction are unlikely to modify habitat for EPBC listed threatened species.

This section notes that the inherent risk of sedimentation impacting habitat for migratory waders is very low. The risk will be further reduced through the proposed erosion and sediment control measures.

5.3.4 Cumulative impacts

Other than the Port Bonython Hydrogen Hub, there is a very low risk that other projects in the area, as identified in Table 4-6, could impact habitat for EPBC-listed migratory species as all have no or minimal hydrological connection to the False Bay wetland.

The Port Bonython Hydrogen Hub is at the conceptual stage so it is not possible to assess impacts from this project on False Bay. However, the Port Bonython Hydrogen Hub site does not drain directly to False Bay and it can reasonably be expected that erosion and sediment control measures would be required for any development in this area.

Given the above, cumulative impacts on habitat for migratory species in False Bay are not expected.

5.3.5 Assessment of impact significance and residual impacts

Table 5-1 provides an assessment of the significance of potential impacts against the significant impact criteria for listed migratory species (DotE, 2013).

5.3.6 Residual impact

The Project is not expected to have any residual impacts on listed migratory species.

Table 5-1: Assessment against significant impact criteria for listed migratory species

Criteria	Key mitigation measures	Residual impact	Assessment of potential impact
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:			
- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	• Implement an erosion and sediment control plan including adequate erosion and sediment controls (e.g. berms or drains on slopes leading to watercourses or surface water features; contour banks, silt fences and / or hay bales for interim on-site erosion control) • Rehabilitate watercourse crossing points and banks as soon as possible after works have been completed • Avoid watercourse crossing works during periods of flood or heavy rainfall • Avoid the stockpiling of materials in watercourses / drainage lines • Carry out grading and trenching across watercourses immediately prior to pipe laying, that is, after the pipe is welded and watercourse crossing site prepared • Implement measures for fuel, oil and chemical management, spill prevention, response and clean-up, trench dewatering, hydrotest water disposal and management of contaminated water (e.g. leachate from acid sulfate soils) • Undertake field screening to determine presence of acid sulfate soils if excavating in a risk area and apply procedures as needed • Revegetate pipeline alignment following construction through reinstating topsoil and cleared vegetative material and	No residual impact expected	**Not significant** The Project Area avoids impacts to wetted or ephemeral environments, which may represent foraging habitat for migratory wader species. Where the alignment passes adjacent stranded saltmarsh / Whyalla Saltfields (>650 m -1 km away) / beach areas >350 m south of Point Lowly Road, the pipeline is co-located to align with existing infrastructure (roads and tracks). The majority of these migratory waders breed overseas and in areas that will not be influenced by this Project. Whilst core feeding areas are not within the Project Area, habitats in the adjacent Whyalla Saltfields might be temporarily used by some migratory species on the way to core feeding grounds, however these areas will not be directly impacted by the Project. As such, the Action will not substantially modify, destroy or isolate an area of important habitat for a migratory wader species.

Criteria	Key mitigation measures	Residual impact	Assessment of potential impact
	additional reseeding with selected local species. • Implement fire prevention procedures and maintain fire prevention and control equipment on site for high risk activities.		
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	• Implement a Weed, Pest and Disease Management Plan which will include: ○ Undertaking pre-construction weed surveys and controls, post-construction weed surveys and controls, and ongoing weed survey and control during operation targeting Weeds of National Significance (WoNS) and Declared Weed species (if weeds identified) in accordance with the Weed Control Handbook for declared plants in South Australia ○ Implementing appropriate hygiene practices when equipment is brought on site, including checking equipment prior to moving it to site ○ Ensuring all fill materials (e.g. sand, aggregate) imported to site are sourced from weed and pathogen free sites • Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, feral pest animals to the Project area • Ensuring construction compounds are kept neat and tidy at all times to prevent pest animals from inhabiting the area, and food waste is placed in enclosed / covered bins to prevent access by pest animals	No residual impact expected	**Not significant** Mitigation measures proposed will control the spread of existing and new weed and pest species during construction and operation of the Project. Existing service corridors and tracks run through the Project Area, and predator species are already present. Any additional tracks are unlikely to increase the existing level of invasive species presence. The Project is not expected to impact on important habitat features to migratory wader species, such as intertidal beach areas and there are no inland ephemeral lakes or wetland areas present within the PSL Area.

Criteria	Key mitigation measures	Residual impact	Assessment of potential impact
	• Implementing rodent control measures to reduce potential food sources for pests such as foxes and feral cats.		
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	See above measures	No residual impact expected	**Not significant** The project is not located in an area where an ecologically significant proportion of a population of migratory species exists. Potential foraging habitat adjacent the Project Area will be avoided. The Project will not seriously disrupt the life cycle of an ecologically significant proportion of the populations of migratory species

6. National Heritage

6.1 Cuttlefish Coast Sanctuary Zone

The Cuttlefish Coast Sanctuary Zone (Figure 6-1) was added to the National Heritage List under the EPBC Act in February 2023. The sanctuary is of outstanding significance to Australia as the largest known breeding habitat of the Giant Australian Cuttlefish (*Sepia apama*). The sanctuary's shallow, fringing, rocky reef system lures thousands of cuttlefish to breed each year. Occurring between May and August, it is the largest and most significant breeding aggregation for the species.

The area was listed for the following values (DCCEEW, 2024b):

- Criterion B Rarity: The CCSZ in South Australia is of outstanding heritage value to the nation under criterion (b) because each winter a breeding aggregation of an iconic population of the Giant Australian Cuttlefish, involving tens of thousands of individuals, occurs there. This is the only known spawning aggregation of Giant Australian Cuttlefish in the world. During the event, intense competition between male cuttlefish within the aggregation leads to complex behaviours and spectacular massed displays of colour and shapeshifting. A shallow, fringing, rocky reef system within the place may offer a specific, spatially rare resource which benefits spawning success in the Giant Australian Cuttlefish.
- Criterion C Research: The CCSZ is of outstanding heritage value to the nation under criterion (c) because the place, and the annual aggregation of Giant Australian Cuttlefish it supports, is likely to yield further information on this iconic marine species, its habitat, and its role in broader marine ecology. The Giant Australian Cuttlefish exhibits complex and deceptive behaviour within the aggregation, using rapid camouflaging and signalling, which have provided the biological context for potential new bioinspired materials.

The Australian Heritage Database (DCCEEW, 2024b) identifies the following as potential threats to the CCSZ:

- Commercial fishing: These risks are being managed by the South Australian Government through protection in a marine protection area and fishing bans.
- Industrial developments with potential pollution from hydrocarbons and metals: These are noted as having been detected in the marine environment but not at levels that could affect the cuttlefish.
- Noise impacts from explosions at the Cultana Training Area. While cuttlefish can be sensitive to noise, the database notes, given the distance between the training area and the CCSZ, noise will be well below the level demonstrated to harm cuttlefish.
- Coastal pollution is noted as a potential future concern.

The database entry (DCCEEW, 2024b) concludes: ‘In summary, the integrity of the site has been maintained despite the presence of nearby developments such as the SANTOS Point Bonython plant, Department of Defence activities and nearby commercial fisheries’.

6.2 Assessment of Relevant Impacts including Avoidance, Management and Mitigation

6.2.1 Identified sources of impact

The assessment of potential impacts to the National Heritage values of the CCSZ identified the following key sources for impact:

- **Noise from construction or operational activities could adversely affect cuttlefish within the CCSZ.** The distance between construction activities and the CCSZ mean this risk is not credible.
- **Spills of fuel or chemicals in the project area could wash into the CCSZ and adversely impact cuttlefish.** This risk is also regarded as not credible given the quantities of fuel and chemicals used and distance to the CCSZ.
- **Erosion on the alignment during construction and operation could impact water quality within the CCSZ through sediment transport.** There is a negligible risk that sediment from the Project area could adversely impact water quality within the CCSZ and therefore degrade its National Heritage values.

6.2.2 Direct impacts

There are no direct impacts from the Project on the CCSZ. At its closest point, the CCSZ is 2.2 km from the proposed alignment.

6.2.3 Indirect impacts

6.2.3.1 There is no credible risk that noise from construction and operational activities could adversely affect cuttlefish within the CCSZ.

During construction, earthmoving machinery, vehicle movements and building works will be the key noise sources. SARDI (SARDI, 2022) note that 'high sound levels can adversely affect cuttlefish by causing direct damage to statocysts and that acoustic trauma can be triggered at approximately 140dB'.

During construction of the pipeline, noise emissions will be concentrated at the work front. Earthmoving equipment, vehicles delivering pipeline and fill material, cranes and other machinery will be the main noise generating sources. There is no risk that construction noise could adversely impact cuttlefish underwater in the CCSZ given the separation distance from the Project area of at least 2.2 km.

During construction of the compression facility and valve station, earthmoving equipment, vehicles and other building works will be the main noise sources. These activities are nearly 15 km from the CCSZ and would not be audible at the CCSZ. The same applies to operational noise at the compression facility.

6.2.3.2 There is no credible risk that spills of fuel or chemicals in the Project area could wash into the CCSZ and adversely impact cuttlefish

The risk from spills of fuel or chemicals is assessed in section 4.3.3. This notes that pipeline projects involve relatively small quantities of chemicals and the risks to surface water associated with minor spills is generally low, particularly in the Project area where there are limited surface water features. Management measures implemented would include restrictions on refuelling near watercourses and spill prevention and immediate clean-up measures.

The risk is further mitigated by the distance of the Project area from the CCSZ. In addition, the pipeline does not cross any watercourses that discharge directly into the CCSZ. As a variation to the original referral, the alignment has been rerouted north along Fitgerald Bay Road and now avoids the drainage line that discharges to the CCSZ. The alignment only crosses one ephemeral watercourse that reaches the coast approximately 1 km west of the CCSZ. This is described in section 4.3.3. In addition to the very low risk of any spills impacting surface water noted above, it is noted that any discharge from this watercourse would be considerably diluted if it reached the CCSZ.

Given the above, the risk to the CCSZ from spills of chemicals or fuels is not considered credible.

6.2.3.3 There is a negligible risk that sediment from the Project area could adversely impact water quality within the CCSZ and therefore degrade its National Heritage values.

The potential for sediment from Project construction to impact water quality and fauna habitat in False Bay is discussed in section 4.3.3. This concludes that changes to surface water quality from Project construction are unlikely to modify habitat for EPBC listed shorebirds in False Bay. This risk derives from the single watercourse crossed by the Project that discharges into False Bay. As noted above, this discharge point is approximately 1 km west of the CCSZ. No watercourses crossed by the Project discharge directly into the CCSZ.

As noted in Section 4.3.3:

- Watercourses present in this area are usually dry and only flow intermittently and for short periods in response to seasonal rainfall and storm events. These intermittent flows are characterised by high turbidity and high sediment loads. Flows that are large enough to reach the coast would result in natural short term increases in turbidity in the marine environment.
- During Project construction, trenching and pipeline installation at watercourses will be undertaken in dry conditions, and sediment and erosion controls (such as berms on slopes, hay bales and geotextile fencing) will be in place to control erosion on the construction right of way and sediment transport off the right of way.
- The pipeline alignment will be revegetated following construction through reinstating topsoil and cleared vegetative material and additional reseeding with selected local species.

Given the distance of the alignment from the coast, the distance of the alignment and the watercourse it crosses from the CCSZ, the buffering provided by Point Lowly Road, the naturally high sediment loads carried by the ephemeral watercourses in the area, the relatively small width of disturbance on the construction right of way in relation to the length of unvegetated channel downstream of the Project area, the sediment and erosion controls that will be in place during construction and the limited duration of construction proposed action, there is a negligible risk that sedimentation from the Project could impact the CCSZ.

6.2.4 Cumulative impacts

As there is a negligible risk that the Project could impact the CCSZ, there are no cumulative impacts.

6.2.5 Assessment of impact significance and risk

The following table provides an assessment of the significance of potential impacts to the CCSZ against the criteria for National Heritage places provided in DoE (2013).

Table 6-1: Assessment against significant impact criteria for National Heritage places

Criteria	Assessment of potential impact
An action is likely to have a significant impact on the National Heritage values of a National Heritage place if there is a real chance or possibility that it will:	
General	
- cause one or more of the National Heritage values to be lost	No credible risk
- cause one or more of the National Heritage values to be degraded or damaged, or	No credible risk
- cause one or more of the National Heritage values to be notably altered, modified, obscured or diminished.	No credible risk

Criteria	Assessment of potential impact
Criteria for National Heritage places with natural heritage values[1]	
- substantially increase concentrations of suspended sediment, nutrients, heavy metals, hydrocarbons, or other pollutants or substances in a river, wetland or water body in a National Heritage place	As discussed above, there is a negligible risk that sediment from the Project could impact the CCSZ.
- modify or inhibit ecological processes in a National Heritage place	No impact
- reduce the diversity or modify the composition of plant and animal species in a National Heritage place	No impact
- fragment or damage habitat important for the conservation of biological diversity in a National Heritage place	No impact
- cause a long-term reduction in rare, endemic or unique plant or animal populations or species in a National Heritage place	No impact
- fragment, isolate or substantially damage habitat for rare, endemic or unique animal populations or species in a National Heritage place.	No impact
- involve construction of buildings, roads or other structures, vegetation clearance, or other actions with substantial and/or long-term impacts on relevant values	As discussed above, there is a negligible risk that sediment construction works could impact the CCSZ.
- introduce noise, odours, pollutants or other intrusive elements with substantial and/or long-term impacts on relevant values	As discussed above, there is no credible risk that noise from construction and operational activities could adversely affect cuttlefish within the CCSZ.

[1] All criteria for *Biological and ecological values* and *Wilderness, aesthetic, or other rare or unique environment values* the relevant criteria for *Values associated with geology or landscapes* have been included.

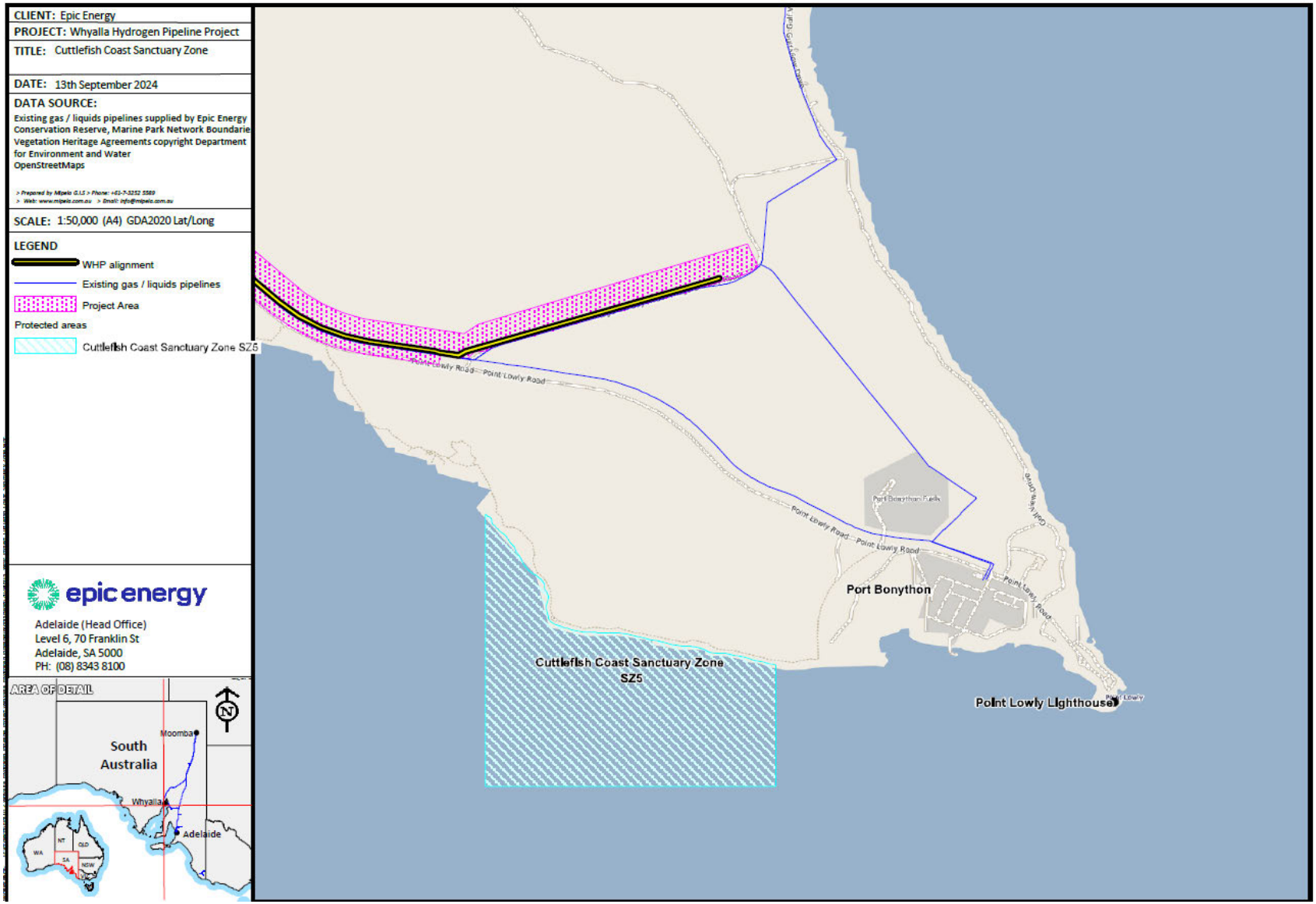

Figure 6-1: Location of WHP alignment relative to the Cuttlefish Coast Sanctuary Zone

7. Social and Economic Matters

7.1 Public Consultation

Epic Energy is aware that the Whyalla and surrounding community is the focus of a number of significant projects ranging from the OHPSA Whyalla Hydrogen Facility and the Northern Water project, to other proposed hydrogen-related and renewable energy projects. Epic Energy's engagement approach takes this into account in setting its engagement objectives and ensuring that consultation is genuine, informative, targeted and responsive.

Epic Energy has worked closely with OHPSA to ensure that the community and interested stakeholders are fully informed, involved and able to actively contribute to the development of the Project and understand its role in the broader Whyalla Hydrogen Facility project. Epic Energy has already undertaken an extensive engagement program for the WHP environmental investigations and will continue with this approach during preparation of approvals documentation.

7.1.1 Engagement objectives

Epic Energy has adopted the principles and practices of the International Association for Public Participation (IAP2) to guide its consultation and engagement approach. Prior to commencing stakeholder consultation and engagement Epic developed a Consultation and Engagement Plan to guide its approach to engagement. The objectives of this plan include:

- collaboration with the Office of Hydrogen Power South Australia (OHPSA) and other delivery parties
- building genuine and respectful relationships to achieve a high level of awareness about the project with stakeholders and community members
- encouraging participation and providing opportunities for stakeholders and community members to be involved
- communicating in a timely, clear, accessible, and easily understandable manner in respect of the project
- demonstrating how community and stakeholder issues or concerns have been considered as the project develops.

7.1.2 Identified stakeholders and consultation methods

Commencing in March 2023, Epic Energy has compiled a database of project stakeholders who have had and will continue to play an active part in the Pipeline Licence application process. The identified stakeholders can be grouped into the following categories:

- Local community (including False Bay Shack Owners)
- Local businesses and industry (including South Australian Chamber of Mines and Energy, SA-H2H Hydrogen Technology Cluster)
- Local government / association and elected officials (including State Member for Giles, Eddie Hughes MP, City of Whyalla, Eyre Peninsula Landscape Board, Regional Development Australia Eyre Peninsula)
- Government departments and regulatory agencies (including DCCEEW, DoD, Department for Energy and Mining SA (DEM), Environment Protection Authority SA, OHPSA, Aboriginal Affairs and Reconciliation)

- Landowners and occupiers of relevant land (including private landowners, OneSteel, ARTC, the Crown)
- Traditional Owners (BDAC)
- Infrastructure and utilities providers (including Santos, Amp Energy, SIMEC Energy, ElectraNet, SA Power Networks, SA Water)
- Local, state and national media.

Consultation with landowners and other stakeholders commenced in October 2023 utilising different methods in order to engage and encourage feedback:

Direct engagement: In person, virtual meetings, community drop-in sessions and industry briefings have been held with stakeholders throughout the planning and development of the WHP. A dedicated 1300 number has been set-up for stakeholders to contact the project team with any concerns or queries.

Targeted consultation with directly affected and adjacent landowners has been undertaken and regular communication maintained in accordance with their preferred communication method. Drop-in community information sessions at a publicly accessible facility were held in Whyalla on 10 and 11 April 2024 targeted at local residents, industry and people from the community. The sessions included static displays and provided project information such as fact sheets. Epic Energy has and will continue to attend and participate in local events including supporting, exhibiting and contributing to community events where appropriate.

Traditional Owners: Epic Energy conducted introductory sessions with BDAC to present alternative pipeline route alignments. There has been ongoing email, phone and face to face engagement with BDAC in respect of cultural heritage surveys, cultural heritage monitoring, required statutory consents / ILUA and other agreements. Epic also met with a number of indigenous businesses and contractors at an Industry Briefing on 29 February 2024 many of whom are keen to be involved in the project and continue to explore potential opportunities in respect to land rehabilitation post construction.

Digital communications: A project specific webpage has been set up on Epic's existing website containing up to date project information which will be continually updated as the project progresses (https://epicenergy.com.au/whyalla-hydrogen-pipeline/). Promotion of community events including community drop-in sessions are advertised on the social media channels of OHPSA and the City of Whyalla and through the local newspaper, Whyalla News.

Print communications: Fact sheets and other written communications have been developed to provide updates on the WHP and provide specific information based on stakeholder feedback. Fact sheets have been made available in hard copy at the OHPSA office in Whyalla, at the community drop-in sessions and in soft copy on the Epic website.

The project has been promoted in the local media, including for industry briefing sessions in November 2023 and February 2024 and Community Information Sessions in April 2024 and a story in the Whyalla News in April 2024.

7.1.3 Key findings from engagement

Epic Energy has incorporated feedback from stakeholders and the community into the design of the project and the pipeline alignment. Several revisions have been made to the pipeline alignment in response to consultation and discussion with landowners and other stakeholders including BDAC as the Traditional Owners.

A snapshot of feedback received during consultation activities undertaken to date is provided below, together with a brief summary of future actions.

Community: Key areas of interest at community drop-in sessions included general questions about the WHP and how the pipeline works, land rehabilitation, and potential construction and noise impacts on False Bay shack owners (at the eastern end of the alignment in the vicinity of the valve station).

Epic Energy has completed comprehensive ecological investigations to inform measures to reduce or avoid the effects on listed, threatened and protected species in the Project area and along the pipeline route. Clear information on environmental management systems and regulatory process will be provided to the community and project maps, diagrams, images and other visuals will be developed to mitigate aesthetic concerns. Overall sentiment of community members who attended the drop-in sessions was supportive of the project.

Traditional Owners: Consultation with BDAC resulted in the revision of the alignment alternatives to avoid areas of significant cultural heritage sensitivity, the engagement of cultural heritage monitors during geotechnical investigations and the completion of both a preliminary cultural heritage survey of the proposed alignments to facilitate geotechnical investigations and a formal cultural heritage survey with an independent anthropologist and BDAC representatives.

Epic Energy will continue to engage with BDAC and develop, amongst other things, a CHMP to address concerns in relation to any potential impacts to Aboriginal cultural heritage.

Business and industry: Key areas of interest for business and industry groups included opportunities for local businesses and employment. As part of the procurement process, Epic Energy will require partners and contractors to prioritise local procurement and employment where commercially competitive suppliers exist. Where available, local suppliers will also be prioritised for general bulk construction materials.

Economic stimulation to the local area from the project and the broader HJP is generally welcomed.

Local government: Concerns related to the cumulative impact of major projects in the region will be addressed, working with other project proponents to ensure that opportunities to work collaboratively are maximised and to minimise community disturbance. Epic will work collaboratively with City of Whyalla and OPHSA to ensure adequate workforce accommodation is available during HJP and WHP construction activities, recognising potential strain on local accommodation if adequate provision is not made.

7.1.4 Ongoing engagement

Epic Energy is committed to continuing to inform, consult and involve community members and stakeholders during the next phases of the project. Subject to receipt of all required regulatory approvals, Epic Energy and its contractors will start to prepare for construction. During the construction phase, a key priority will be to keep the community and key stakeholders informed of construction timing and associated impacts prior to works commencing.

Epic Energy proposes to undertake the following communications and engagement activities during the construction phase of the project:

- Ongoing communications via project updates and newsletters, website information and email updates
- Responding to phone enquiries
- Providing updated community information at the OHPSA office in Whyalla.

7.2 Consultation with Indigenous Stakeholders

Epic Energy recognises that the area of the Proposed Action and the surrounding region represent one of the oldest landscapes on earth and the Barngarla people have occupied this region over many

thousands of years. Epic also recognises that the Barngarla people express a complex tangible and intangible attachment to the land which is defined, in part, through a series of Dreaming stories which are represented through geographical features across the landscape.

Relationships with the Barngarla people, as the Traditional Owners of land in and around the Whyalla area, are of the highest priority and Epic continues to work with the BDAC and Barngarla community as the Project develops.

Engagement with BDAC commenced in November 2023, is ongoing and has included to date:

- Regular meetings with the external legal team acting on behalf of BDAC on potential route alignment options and land tenure arrangements
- Regular and ongoing contact with the Community Liaison Officer for BDAC in respect of cultural heritage monitoring
- A preliminary on ground cultural heritage survey in early April 2024 with members of the Barngarla community and Epic representatives
- Cultural heritage monitoring during geotechnical investigations in April 2024 with members of the Barngarla community in attendance with Epic representatives
- A formal on ground cultural heritage survey on 31 May 2024 with members of the Barngarla community, an independent anthropologist (engaged on behalf of BDAC) and Epic representatives
- Cultural heritage monitoring during further geotechnical investigations in September and October 2024 with members of the Barngarla community in attendance with Epic representatives

Epic will continue to engage with members of the Barngarla community, BDAC and BDAC's external legal team in the following key areas:

- As the future freehold proprietor of two parcels of land on which the WHP alignment pipeline alignment will traverse and more particularly described in Crown Record 6253/2 (DP125055/5) and Crown Record 5346/949 (DP42001/6)
- As the native title holder of a parcel of land within the broader project area (not on the proposed alignment) and more particularly described in Crown Record 6252/999 (DP125055/2)
- On cultural heritage matters pertaining to the Project area, including monitoring and the development of a CHMP
- Potential opportunities for members of the Barngarla community and BDAC during the construction and operation of the Project.

7.3 Socio-economic Assessment

Epic Energy has undertaken a high-level social impact assessment regarding the impact of construction, operation, and maintenance of the WHP on the socio-economic environment in Whyalla and its immediate surrounds. Census data from the Australian Bureau of Statistics was utilised to obtain snapshot demographics including residents, workforce, housing and industry statistics. This assessment was completed as part of the Pipeline Licence application that will be submitted to DEM in due course together with an Environmental Impact Report (EIR) and draft Statement of Environmental Objectives.

Under the ER Act, Epic Energy is not required to undertake a full social impact assessment; however, it should be noted that OHPSA is procuring a third-party provider to undertake a social impact assessment in respect of the broader HJP project. The social impact assessment will aim to:

- Determine key opportunities and risks to critical social services (e.g. health and emergency services) as well to local businesses for the procurement of general goods and services
- Identify risk mitigation measures and opportunities to maximise strategies.
- Establish mechanisms for ongoing monitoring of the impact of the HJP on Whyalla and its surrounds.

The assessment will utilise social impact assessment data prepared for the State Government's Northern Water project, providing the HJP access to data relevant to a broader geographical area across the Eyre Peninsula that, while not directly adjacent to the project site, is highly relevant in terms of supply chains, labour, health, social services, transport, and other issues.

7.3.1 Social impact considerations

Social impact considerations with corresponding proposed measures and programs that will be included in the EIR as part of the Pipeline Licence application are summarised in Table 7-1.

Table 7-1: Social impact considerations

Social impact considerations	Details of measures and programs
Employment opportunities	• Identification of opportunities to maximise the use of local suppliers, workforce and businesses in the provision of goods and services to the Project. • Implementation of a local procurement policy for the Project prioritising local employment, services and materials where practicable and available, in collaboration with OHPSA and the City of Whyalla. • Ongoing engagement with Council, local businesses and suppliers, employment groups and social services to provide a better understanding of likely requirements for the WHP including timing of works and to minimise impacts to labour force shortages. • Hosted community engagement sessions in Whyalla to garner interest in employment opportunities for the Project.

Business opportunities	• Local Supply Chain Procurement Policies and Strategies, for example:
	  ○ OHPSA has engaged a third-party provider to assess local supply capability in coordination with the Northern Water project.
	  ○ OHPSA and its partners have released expressions of interest registrations on the Industry Capability Network SA website.
	• Business Support Services
	• Indirect Business Development and Support (hospitality, retail, tourism, etc.), for example:
	  ○ OHPSA convened a workshop of key stakeholders on 8 May 2024. A report has been created and is currently being circulated for comment.

Housing and accommodation	• Working with OHPSA to understand and plan for the potential impact on housing availability and affordability and to make provision for accommodating construction workers required for the Project. • This aspect is being addressed as a whole of project matter and Epic will benefit from the survey work and monitoring being undertaken by OHPSA.
Social licence and community sentiment	• Monitoring social licence and community sentiment throughout construction activities • Maintaining the 1300 number on a 24/7 basis to accept calls during construction • Maintaining regular project updates on website

Social impact considerations	Details of measures and programs
	• Implementation of a Construction Environmental Management Plan that includes a consultation and stakeholder process to enable local businesses and residents to provide feedback and to lodge concerns or issues to be addressed.
Transport	• Implementation of a traffic management plan to manage impacts to traffic and transport throughout construction. This plan will be reviewed by local council.

7.3.2 Monitoring and evaluation

To ensure the effectiveness of the proposed measures and programs, a comprehensive monitoring and evaluation framework would be established and include:

- Baseline data collection: Collection of baseline data on key socio-economic indicators before construction begins.
- Regular reporting: Production of regular reports on the progress and impact of the construction project.
- Stakeholder feedback: Gathering of feedback from key stakeholders, including residents, businesses, Traditional Owners and community groups.
- Adjustment mechanisms: Implementation of mechanisms to adjust measures and programs based on monitoring results and stakeholder feedback.

7.4 Projected Costs and Benefits of the Proposed Action

An assessment of the socio-economic impacts of the project will be included in the Pipeline Licence application. Key benefits and impacts are summarised in the following sections.

7.4.1 Projected Costs

The Project forms part of the SA Government Hydrogen Jobs Plan project which represents an investment of $593M in South Australia, focusing on the Whyalla region to develop the Hydrogen Jobs Plan project and is predicted to help accelerate South Australia's green hydrogen industry and to unlock South Australia's $20B pipeline of renewable energy developments and opportunities across various sectors. The South Australian government has committed $593M investment for the completion of the Hydrogen Jobs Plan project which will include electrolysers, hydrogen-fuelled power generation and hydrogen storage capacity (the latter component being the Project).

7.4.2 Employment opportunities

The Project will generate increased employment opportunities for Whyalla and Port Augusta, as well as the broader region and State. It is expected to create approximately 500 jobs FTE (Full time equivalent) jobs during construction (12-18 months) and 4-6 FTE jobs based in Whyalla over the operational period. The major industries in Whyalla currently include mining and manufacturing, with the top occupations including technicians and trade workers, machinery operators and drivers. While the percentage of technicians and trade workers were lower in Port Augusta, they still ranked in the top three with labourers being fourth most common.

Given the available skills and percentage of unemployed and underemployed people in the region as indicated by 2021 Census data (ABS, 2021), it is possible a proportion of the workforce can be sourced locally. However, given the significant number of jobs required during construction, a significant Fly in Fly Out (FIFO) workforce will likely be required. Some jobs will also require specialist technical

expertise for which recruitment across greater South Australia, interstate and / or overseas may be required.

While this can result in a positive impact of community growth by creating increased employment opportunities, conversely it could lead to increased competition for workers potentially impacting on local businesses. In addition, there are a number of other projects in the Whyalla area which could occur in similar timeframes and further increase competition for workers, goods and services, accommodation and public infrastructure.

In addition to the measures being adopted by OHPSA in respect pf the broader HJP project, the following measures are proposed to enhance the positive benefits of the Project (increased job creation in the region) and decrease the negative impacts (increased competition for workers) as a result of the Project:

- Engagement with the Industry Capability Network is ongoing to identify opportunities for local businesses to supply goods and services for the Project.
- Policies will be developed around indigenous employment and procurement and local employment and procurement to increase proportions of project benefit for the local community.
- Policies and programs will be developed to encourage employment of traditionally underrepresented groups in the industry including Indigenous Employment and Procurement policies and Equal Opportunity policies.

7.4.3 Environmental benefits

The WHP forms an integral part of the HJP being developed by OHPSA with a commitment to environmental sustainability and stewardship. By harnessing South Australia’s abundant renewable energy resources and providing the necessary storage and transmission infrastructure, the Project helps to facilitate the production of hydrogen at the HJP site and to enable the hydrogen-fuelled power station's dispatchable generation capabilities to contribute to grid stability and resilience, facilitating the integration of renewable energy into South Australia's energy mix when wind and solar does not meet demand. The broader HJP's environmental benefits extend beyond emissions reduction, supporting a sustainable energy ecosystem that aligns with South Australia's climate change mitigation objectives and a future greening of industry.

7.4.4 Social benefits

The WHP presents a myriad of social benefits, ranging from job creation and skills development to community engagement and empowerment. The Project's construction and operational phases are anticipated to generate employment opportunities, contributing to economic growth and social inclusion. The implementation of Targeted Industry Participation Plans (TIPP) by Epic Energy ensures local community and stakeholder involvement and capacity-building (e.g. employment, training, facilities, contracts) generating a sense of ownership and pride.

Community engagement initiatives delivered by Epic Energy have sought to provide an opportunity for the community to understand and contribute to the development of the Project. The Project will also provide the opportunity to upskill in a nascent industry.

Epic Energy is working with the local Council, OHPSA and state government agencies to reduce cumulative impacts from the planned and future projects in the Whyalla area.

7.4.5 Economic benefits

In addition to creation of approximately 500 FTE jobs during construction and 4-6 FTE during operations, the Project will diversify job opportunities available in the region to create a stronger economy.

By assisting in the HJP being able to diversify the sources of energy injected into the grid, the Project will also enhance South Australia's grid security.

The broader HJP, of which the Project is an integral part, will be the first large-scale green hydrogen plant in Australia. It will act as a catalyst for the other hydrogen projects under development in South Australian and Australia more broadly, including export focused projects, and will help unlock the State's potential for renewable energy developments and associated manufacturing opportunities.

8. Ecologically Sustainable Development

The Project has taken into consideration the principles of ecologically sustainable development (ESD) as outlined in Table 8-1 and detailed further below.

Table 8-1: ESD principles and Project considerations

ESD principle	Consideration by Project	Further details
Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.	Environmental impacts have been assessed as part of the Pipeline Licence application for the Project which is supported by an EIR and draft SEO. The construction phase (short term) considerations include the largest impacts (both positive and negative) with the operational (long term) impacts on social, economic and environmental (including supporting the transition to a low emission economy) being predominantly positive.	8.1
The principle of inter-generational equity-that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	This Project is an integral part of the HJP project which is part of a broader action plan to reduce the levels of greenhouse gas (GHG) and consequently reduce the impacts of anthropogenic induced climate change. While some of the social and economic benefits of the Project will be immediate, such as job creation and industry diversification, the most significant benefit is the support of reducing climate change severity for future generations.	8.2
The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.	The pipeline route selection process has sought to use existing infrastructure corridors and disturbed areas as far as practicable. The alignment has been located in vegetation that represents the lowest quality habitat for threatened species where practicable and to avoid areas of Aboriginal cultural heritage significance. The presence of MNES, habitat value of the vegetation communities and location of cultural heritage sites identified by the Traditional Owners were key decision criteria in the alignment selection.	8.3
Improved valuation, pricing and incentive mechanisms should be promoted.	Valuation, pricing and incentive mechanisms are integrated into legislation and Government policy. The Project will comply with all relevant legislation and policy including provision of offsets as a valuation and pricing mechanism to support ecological restoration. The costs associated with provision of offsets, rehabilitation, mitigation, management and maintenance have been incorporated into the cost of the Project.	8.4

8.1 Long-term and short-term considerations

A full assessment of the economic, environmental and social impacts was undertaken for the Pipeline Licence application and accompanying EIR and draft SEO in accordance with the ER Act for WHP and the outcomes are summarised in Table 8-2 (JBS&G, 2024). Both positive and negative impacts have been identified for construction and operations. The majority of negative impacts are shorter term (limited to the ~12 month construction period), with the benefits of the Project generally being longer term (supporting the transition to 100% renewable energy and decarbonisation of the steel industry) with job creation occurring through both stages.

Table 8-2: Economic, environmental and social considerations

Considerations	Short Term (construction ~12 months)	Long Term (operations ~100 years)
Environmental	• Clearance of 102 ha of habitat. • Increased dust during construction period. • Increased noise during construction period. • Minor change in visual character along pipeline alignment.	• Provision of an alternative method of storing energy to reduce reliance on natural gas in the South Australian Energy Grid. • Provision of green hydrogen to support a green steel industry (decarbonise the steel industry). • Reduce statewide GHG emissions (via above) to decrease potential impacts of climate change.
Social	• Increased Whyalla population from construction workforce potentially: • increasing pressure on housing and accommodation availability • increasing pressure on public services such as health and emergency. • increasing anti-social behaviour as a result of a large construction workforce. • Cumulative impact on community due to the number of energy and public infrastructure projects being developed or under development at the same time.	• Creation of four to six FTE jobs associated with the operation of the compressor facilities as part of the WHP and additional support / multiplier roles. • Diversification of industries within Whyalla and upskilling of workforce in nascent industry. • Increase in available cabins for tourism opportunities (accommodation village constructed for long term use by community post construction).
Economic	• Creation of approximately 500 FTE jobs (construction) • Increased need for the provision of goods and services from local business to support the Project during construction	• Creation of four to six FTE jobs (operations).

8.2 Principles of Inter-generational Equity

The aim of the Project is to support the transition to 100% renewable energy and decarbonisation of the steel industry. The South Australian Government's Climate Change Action Plan 2021 – 2025 identifies 68 actions under seven themes to address the inter-generational problem of anthropogenic enhanced climate change. The WHP falls under action 1.7 under the Clean Energy Transformation theme.

The temporary loss of 102 ha of native vegetation will be offset in accordance with state and federal government requirements to ensure no net loss of biodiversity. The benefits of the Project in

supporting a transition to a low emissions economy will have economic, social and environmental benefits to current and future generations.

8.3 Biological Diversity and Ecological Integrity

The Project has integrated biological diversity and ecological integrity into key decision-making criteria from the early stages of planning.

During the preliminary stages of the Project, seven route alternatives were considered for the pipeline. These route alternatives were assessed having regard to the criteria for assessment set out in AS2885:1 – Pipelines Gas and Liquid Petroleum and to potential impacts to landowners, land uses, site topography and scale, avoidance of impacts to MNES and areas of cultural heritage significance and minimising impacts to high value native vegetation.

Potential impacts to biological diversity and ecological integrity have been identified with mitigation measures proposed to reduce impacts, preserve biological diversity and encourage ecological integrity surrounding the direct disturbance footprint (refer to Sections 4, 5 and 6).

8.4 Valuation, Pricing and Incentive Mechanisms

This principle relates to government policy development to encourage ecologically sustainable development. The Project will comply with all relevant government requirements and policies including the offset requirements under the *Native Vegetation Act 1991* (SA) and where applicable, the EPBC Act which set out the valuation for biodiversity.

The costs associated with site rehabilitation, impact mitigation, management and maintenance activities have been incorporated into the overall Project costs.

9. Proponent

Proponent details are provided in Table 9-1.

Table 9-1: Proponent details

Proponent	
Proponent Name	Epic Energy South Australia Pty Ltd
Registered ABN	54 068 599 815
Registered Address	L6 70 Franklin Street, Adelaide SA 5000
Nominated Contact	Jade Rowarth
Phone	0439 508 850
Email	jade.rowarth@epic.com.au
Website	epicenergy.com.au

9.1 Environmental Management System

The Epic Energy Environmental Management System (EMS) provides a framework for the management of environmental responsibilities, issues and risks associated with the operation, maintenance, construction and decommissioning of pipelines and associated infrastructure. The EMS ensures that commitments contained within Epic Energy's Environmental and Land Access Policy are achieved and provides clarity and direction for employees and contractors. The EMS is based on a continuous improvement model as defined in the Australian/New Zealand Standard ISO 14001:2015 *Environmental Management Systems – Requirements with guidance* for use (refer Figure 9-1).

The EMS applies to all personnel associated with activities undertaken for Epic Energy and addresses pipeline construction (including route selection, design, land access and construction activities), pipeline operations and maintenance, and operation and maintenance of ancillary facilities.

The 'environment' is defined as the surroundings in which Epic Energy operates including:

- land, air, water (surface and underground), organisms and ecosystems
- buildings, structures, cultural artefacts, and other heritage factors
- social and economic life
- amenity value of an area.

The EMS is used to integrate objectives, plans and activities into daily operations to ensure a systematic approach to environmental management. The EMS consists of an Overview Manual and supporting documents including the policy, risk and compliance registers, management plans, procedures, work instructions, as well as monitoring and auditing programs. The EMS consists of five elements and associated sub elements:

- Commitment
- Planning
- Implementation
- Measurement and Evaluation
- Review and Improvement.

The elements are interrelated, and the proper implementation of each element is essential for the effective functioning of the EMS. The relationship between these five elements is shown in Figure 9-1.

The following section details the key components of the EMS that are relevant to operation, maintenance, and construction of the WHP. Any contractors engaged by Epic Energy are required to undertake environmental inductions and carry out their work in compliance with Epic's EMS and associated procedures and work instructions. The EMS provides full description of environmental requirements including supporting documents.

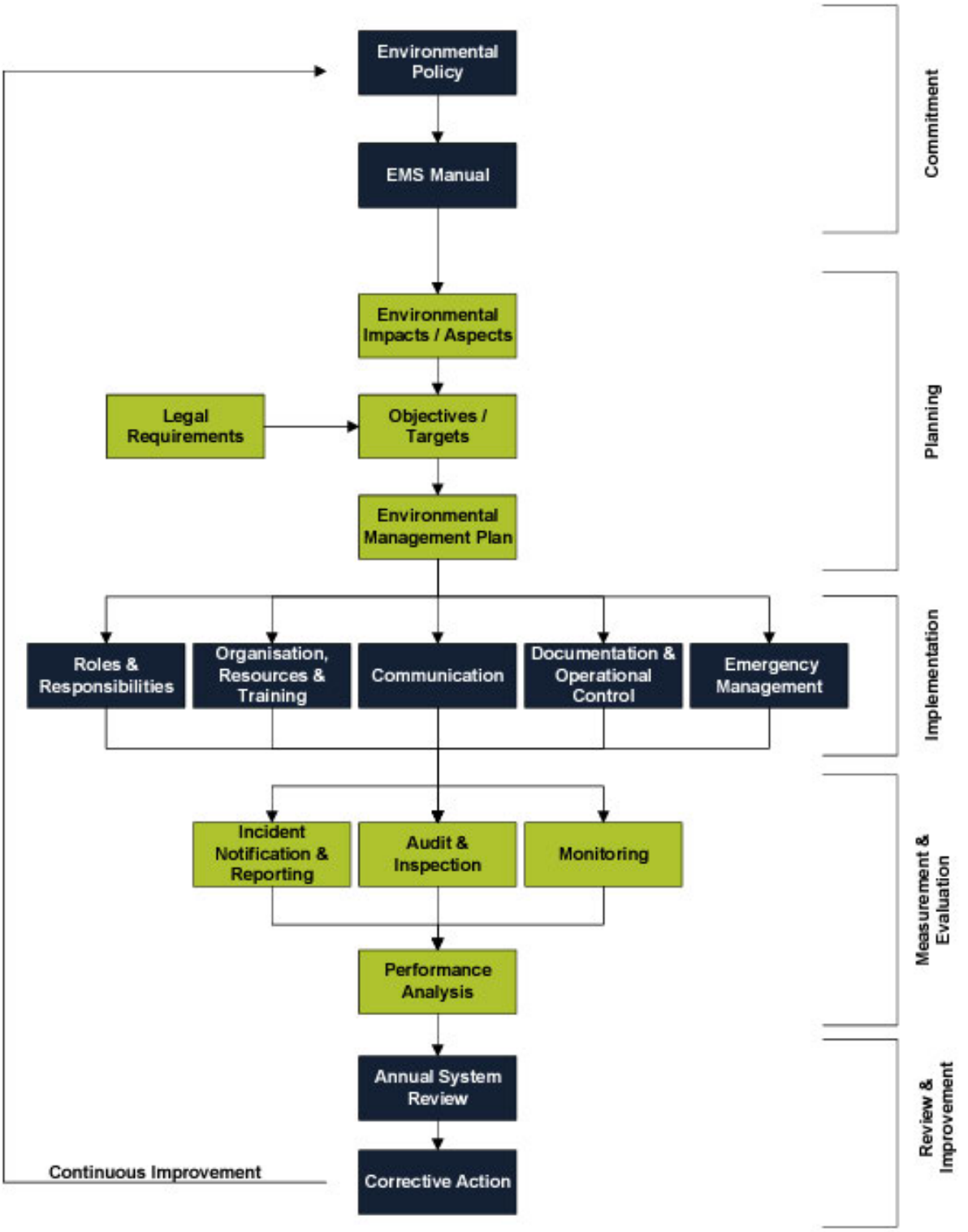

Figure 9-1: Structure of the Environmental Management System

9.1.1 Environmental commitment

Epic Energy has a sound environmental record and reputation and is committed to conducting its business operations in an environmentally responsible manner.

Environmental Values: Epic Energy has a culture which stresses environmental, health and safety excellence and makes this the responsibility of every employee and contractor. Epic seeks to be recognised as a leader in the protection of the environment, the public, its employees, contractors, and the communities it works with.

Policy: Epic Energy's Environmental and Land Access Policy outlines in broad terms how environmental objectives will be achieved. The policy is endorsed by the Chief Executive Officer, reviewed annually, and updated as required. It commits Epic Energy to achieve a high standard of environmental compliance and is communicated by a number of methods to all personnel and contractors. It is available in all new staff and contractor packages, communicated at corporate and field inductions, and displayed on the internet, intranet and in all foyer areas.

Leadership: Leadership accountability and visibility is key to the success of the EMS. Leaders direct the management system process, set objectives that challenge the organisation to achieve continuous improvement, and monitor progress via management review. Leaders demonstrate their commitment through engagement with the workforce, setting personal examples in day-to-day work and sharing information learned inside and outside of the workforce.

9.1.2 Planning

Epic Energy's activities are managed to reduce environmental impacts through the following methods:

- conducting activities in accordance with relevant regulatory and corporate obligations
- considering the concerns of the community and landowners
- conducting risk assessment workshops to identify environmental aspects and impacts
- implementing measures during the Project planning phase to minimise environmental impacts
- developing and documenting control measures for all activities considered to have a potentially significant impact on the environment
- defining responsibilities for the implementation of environmental control measures.

9.1.3 Environmental impacts and aspects

Epic Energy is committed to identifying and managing environmental impacts for all activities and maintains an Environmental Risk Register, managed via the online Corporate Governance Risk system, which documents key activities, environmental aspects and impacts, business consequence and control measures identified through risk assessment processes.

Control measures for environmental impacts are implemented through:

- development of control documentation such as environmental procedures, work instructions, guidelines, emergency response plans and management plans
- implementation of the above documentation via the Environmental Management Induction and the Operations Field Induction
- briefing staff on environmental responsibilities
- complying with regulatory requirements
- ongoing monitoring of the effectiveness of control measures
- corrective action to improve on control measures.

9.1.4 Legal requirements

Epic Energy is required to be compliant with the relevant regulatory obligations and other standards to which it subscribes. The Risk and Compliance Advisor maintains a Compliance Register and provides guidance on legislative obligations, including licences, codes, industry standards, commitments and relevant legislation to be consulted for particular licensing requirements.

9.1.4.1 Objectives and targets

Epic Energy has developed a number of environmental objectives, targets, indicators and programs consistent with the environmental policy and commitments. It aims to conduct its activities in line with the environmental objectives to ensure appropriate environmental work practices are applied.

In establishing the environmental objectives, targets and programs, Epic Energy has considered:

- the company's Environmental Policy
- environmental aspects and impacts
- relevant Australian Standards and other standards
- legal and other requirements
- measurability of objectives
- the drive for continuous improvement.

9.2 Environmental Records

Epic has a sound environmental record and reputation and is committed to conducting its business operations in an environmentally responsible manner. Epic Energy has not been involved in any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources. The construction and operation of the proposed pipeline will be conducted in accordance with Epic Energy's Environmental Management System.

10. Other Approvals and Conditions

10.1 Energy Resources Act 2000

The ER Act is the principal legislation in South Australia relevant to onshore gas (including hydrogen) and petroleum pipelines and is administered by DEM. The ER Act is a revision of the *Petroleum and Geothermal Energy Act 2000* which was amended in April 2024 and the name changed to reflect the broader scope of energy resources regulated by the ER Act. The ER Act is the legislation under which the WHP is seeking State approval.

The ER Act covers regulated substances and activities defined under the legislation which includes hydrogen, hydrogen compounds or by-products of the creation of hydrogen. The relevant regulated activity is defined in section 10(g) as 'constructing, operating, maintaining, modifying or decommissioning a transmission pipeline'. The ER Act defines a transmission pipeline as a pipeline for conveying a regulated substance from place to place.

Under the ER Act, Epic Energy will be required to obtain a pipeline licence, through submission of an application which is accompanied by an EIR and a draft SEO. These documents provide detailed environmental information for the WHP pipeline route area, identifying potential environmental impacts relating to the Proposed Action and describing the appropriate mitigation strategies that will be employed to avoid or minimise these impacts. The EIR and SEO are currently being prepared for submission to DEM for consultation and approval.

A PSL under section 14 of the *Petroleum and Geothermal Energy Act 2000* was granted to Epic Energy to allow low impact surveys, environmental evaluations and other initial assessments to be conducted to inform preparation of the EIR and SEO and the pipeline licence application. The area authorised for the PSL is significantly larger than the area that would be subject to the eventual pipeline licence, to allow for refinement to address potential environmental and other issues raised during consultation with stakeholders, including BDAC.

10.2 Other Legislation

Key South Australian and Commonwealth legislation which may be relevant to WHP activities is discussed in Sections 10.2.1 and 10.2.2. Additional legislation which may be relevant is outlined in Table 2 1.

10.2.1 South Australia

Aboriginal Heritage Act 1988

The *Aboriginal Heritage Act 1988* provides protection for all Aboriginal sites, objects and remains across South Australia, whether registered, recorded or unknown, unless authorisation has been obtained to damage, disturb or interfere with Aboriginal sites, objects or remains. Penalties apply for failure to comply.

As noted by in Section 3.3, the risk of damaging, disturbing or interfering with sites, objects or remains of Aboriginal heritage significance as a result of the Proposed Action has been reduced by the undertaking of two searches of the Central Archive, including the Register of Sites and Objects, maintained by Aboriginal Affairs and Reconciliation, Attorney-General's Department, and a cultural heritage survey by Barngarla representatives and Epic Energy.

Environment Protection Act 1993

The *Environment Protection Act 1993* (EP Act) imposes a general duty of care not to undertake an activity that pollutes, or might pollute, the environment unless all reasonable and practicable measures have been taken to prevent or minimise any resulting environmental harm. The EP Act

includes protection for air and water quality, disposal of water to marine or inland waters. Environmental authorisations are required to undertake activities prescribed under the EP Act.

Environment Protection Policies (EPPs) are regulatory mechanisms which must be adhered to in addition to the EP Act and Regulations. The EPPs that may apply to the Project include:

- Environment Protection (Air Quality) Policy 2016
- Environmental Protection (Water Quality) Policy 2015
- Environmental Protection (Commercial and Industrial Noise) Policy 2023.

The EP Act does not apply to exploration activity undertaken under the ER Act or to wastes produced in the course of an activity (not being a prescribed activity of environmental significance) authorised by a lease or licence under the ER Act when produced and disposed of to land and contained within the area of the lease or licence.

Native Vegetation Act 1991

The *Native Vegetation Act 1991* and the *Native Vegetation Regulations 2017* apply to vegetation clearance for operational activities under the ER Act. Under Regulation 14 of the Native Vegetation Regulations, clearance of native vegetation incidental to operations authorised under the ER Act is permitted if it is undertaken in accordance with a SEO, a management plan approved by the Native Vegetation Council for implementation, or an authorised payment into the Native Vegetation Fund that results in a significant environmental benefit.

Landscape South Australia Act 2019

The *Landscape South Australia Act 2019* (Landscape SA Act) provides for approval for water-affecting activities, water sourcing (e.g. from new bores) and management of declared pest plants and animals.

Drilling of a new water well (e.g. for water sourcing or groundwater monitoring) would require a permit under this Act. Decommissioning of a water well would also require a permit, or a formal transfer of ownership if it is left in the care and ownership of a third party.

The Landscape SA Act and the Water Affecting Activity Control Policy (Landscape South Australia Eyre Peninsula, 2022) also set out a number of water-affecting activities that must not be undertaken without a permit. The Project is expected to require Water Affecting Activity permits for watercourse crossings.

10.2.2 Commonwealth

Native Title Act 1993

The *Native Title Act 1993* (Cth) (NT Act) provides for the recognition and protection of native title and establishes ways for future dealings on native title land to proceed.

As noted in Section 3.1.1, the Barngarla people are the Traditional Owners and recognised native title parties of certain land on the eastern and central Eyre Peninsula. The proposed alignment referred to in this report does not traverse any parcels of land where native title rights and interests exist or will exist.

10.2.3 Additional legislation

Other key State and Commonwealth legislation relevant to the Project is summarised in Table, noting that this is not an exhaustive list.

Table 9-2: State and Commonwealth legislation

Legislation	Relevance	Agency
South Australia		
Crown Land Management Act 2009	The WHP traverses Crown Land held under licence from the Crown	Department for Environment and Water
Dangerous Substances Act 1979	Licences may be required for storage or transport of dangerous substances if certain limits are exceeded.	SafeWork SA
Fire and Emergency Services Act 2005	This Act provides for the prevention, control and suppression of fires and for the handling of certain emergency situations. Permits may be required in relation to fire bans and hot work activities for construction of the WHP.	Police and Emergency Services
Highways Act 1926	Construction of the WHP will temporarily impact on roads and highways during construction. Approval for temporary closures and/or rerouting of traffic may be required.	Department for Infrastructure and Transport
Local Government Act 1999	The WHP may temporarily impact on roads under the care and control of the Whyalla City Council during construction. Approval for temporary closures and/or rerouting of traffic may be required.	Whyalla City Council
Work Health and Safety Act 2012	Includes health and safety duties of care, including the primary duty to protect all persons from exposure to risks and hazards that arise from work.	SafeWork SA
Commonwealth		
Aboriginal and Torrens Strait Islander Heritage Protection Act 1984	While Aboriginal heritage is primarily dealt with under State legislation (e.g. the *Aboriginal Heritage Act 1988*), the Commonwealth legislation enables the Australian Government to protect cultural heritage that may be under threat if State or Territory laws have failed to protect it.	DCCEEW

11. Acronyms and Glossary

	Definition
AGPA	Australian Pipelines and Gas Association
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AOO	Area of occupancy
ARTC	Australian Rail Track Corporation
AS	Australian Standards
ASS / PASS	Acid Sulfate Soils / Potential Acid Sulfate Soils
BAM	Bushland Assessment Method
BDAC	Barngarla Determination Aboriginal Corporation
BDBSA	Biological Database of South Australia
CCSZ	Cuttlefish Coast Sanctuary Zone
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth)
DCVG	Direct current voltage gradient
DEM	Department for Energy and Mining (SA)
DEW	Department for Environment and Water (SA)
DoD	Department of Defence (Cth)
EIR	Environmental Impact Report
EMS	Environment Management System
EOO	Extent of occurrence
EPA	Environment Protection Authority (SA)
EP Act	*Environment Protection Act 1993* (SA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
Epic Energy	Epic Energy South Australia Pty Ltd
EPP	Environmental Protection Policy
ER Act	*Energy Resources Act 2023* (SA)
ESD	Ecologically sustainable development
FTE	Full time equivalent
HDD	Horizontal directional drilling
HJP	Hydrogen Jobs Plan
IBRA	Interim biogeographic Regionalisation for Australia
ILUA	Indigenous Land Use Agreement

	Definition
km	kilometres
km^2	square kilometres
m	metres
MLV	Mainline Valve
MNES	Matters of National Environment Significance
NDT	Non-destructive testing
OEMP	Operations Environmental Management Plan
OHPSA	Office of Hydrogen Power South Australia
PACM	Potential Asbestos Containing Material
PMST	Protected Matters Search Tool
PSL	Preliminary Survey Licence
SCADA	Supervisory control and data acquisition
SEO	Statement of Environmental Objectives
TEC	Threatened Ecological Community
WHP	Whyalla Hydrogen Pipeline
WoNS	Weeds of National Significance

12. References

ABS (2021). Whyalla 2021 Census All persons QuickStats, Significant Urban Area Code 408. *Australian Bureau of Statistics*. Retrieved from: https://www.abs.gov.au/census/find-census-data/quickstats/2021/4008

ALA. (2024). *Atlas of Living Australia*. Retrieved from https://www.ala.org.au/

Australian Government. (2009). Commonwealth listing advice on Amytornis textilis myall (Thick-billed Grasswren (Gawler Ranges)).

Australian Government. (2021). Southern Whiteface Aphelocephala leucopsis extent of occurrence statistics. *Department of Agriculture, Water and the Environment. Geospatial and Information Analytics (GAIA) Branch*.

BDBSA. (2023). *Biological Databases of South Australia*. Retrieved July 1, 2024, from Department of Environment and Water: https://www.environment.sa.gov.au/topics/science/information-and-data/biological-databases-of-south-australia.

Benshemesh, J. (2007). *National Recovery Plan for Malleefowl.* Department for Environment and Heritage, South Australia.

Benshemesh, J. (2021). *Science, data and learnings. Recorded Presentations from the 2021 National Maleefowl and WA Threatened Species Forum*. Retrieved May 2022, from National Malleefowl Recovery Team.

Black, A., & Gower, P. (2017). *Grasswrens Australian Outback Identities.* Malaysia: Axion Publishing.

Black, A., Copley, P., & Garnett, S. (2021). Eyre Peninsula Western Grasswren Amytornis textilis myall. In The Action Plan for Australian Birds 2020. *(Eds S. T. Garnett and G. B. Baker) pp. 565-568. CSIRO Publishing, Melbourne*.

Black, Carpenter, & Pedler. (2009). Distribution and Habitats of the Thick-Billed Grasswren Amytornis textilis, subspecies myall. *South Australian Ornithologist 35 (7)*.

Black, Carpenter, & Pedler. (2011). Distribution and habitats of the Thick-billed Grasswren Amytornis modestus and comparison with the Western Grasswren Amytornis textilis myall in South Australia. *South Australian Ornithologist 37 (2)*.

CSIRO. (2024, March). *Australian Soil Resource Information System - Acid Sulfate Soils - Detailed*. Retrieved from CSIRO: https://portal.ga.gov.au/

DCCEEW. (2014). *Conservation Advice Amytornis textilis myall Western Grasswren (Gawler Ranges).* DCCEEW.

DCCEEW. (2023a). Amytornis textilis myall — Western Grasswren (Gawler Ranges). *Species Profile and Threats Database. Retrieved from: https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?*

DCCEEW. (2023b). Conservation Advice for Aphelocephala leucopsis (southern whiteface). *Department of Climate Change, Energy, the Environment and Water. Retrieved from https://www.environment.gov.au/biodiversity/threatened/species/pubs/529-conservation-advice-31032023.pdf*.

DCCEEW. (2023c). Conservation Advice for Neophema chrysostoma (blue-winged parrot). *Department of Climate Change, Energy, the Environment and Water. Retrieved from http://www.environment.gov.au/biodiversity/threatened/species/pubs/726-conservation-advice-31032023.pdf*.

DCCEEW. (2023d). National Light Pollution Guidelines for Wildlife . *Department of Climate Change, Energy, the Environment, and Water*.

DCCEEW. (2024a). *National Recovery Plan for the Malleefowl (Leipoa ocellata).* Retrieved from https://www.dcceew.gov.au/sites/default/files/documents/national-recovery-plan-malleefowl.pdf

DCCEEW. (2024b, 10 22). *Place Details: Cuttlefish Coast Sanctuary Zone, Whyalla, SA, Australia*. Retrieved from Australian Heritage Database: https://www.environment.gov.au/cgi-bin/ahdb/search.pl?mode=place_detail;place_id=106353

Department of Defence. (2015). *Cultana Environmental Management System: (2) Environmental Management Plan.* Retrieved October 2024, from Expansion of Cultana Training Area: https://www.defence.gov.au/sites/default/files/2022-12/EnvironmentalManagementPlan_0.pdf

DEW. (2023). Biological Databases of South Australia. *South Australian Department for Environment and Water*.

DEW. (2024). *NatureMaps*. Retrieved from https://data.environment.sa.gov.au/NatureMaps/Pages/default.aspx

DEWHA. (2010, amended 2017). Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act. *Department of the Environment, Water, Heritage and the Arts*.

DotE. (2013). Significant Impact Guidelines 1.1 - Matters of National Environmental Significance. *Department of the Environment, Water, Heritage and the Arts*.

DotE. (2014). Conservation Advice Amytornis textilis myall western grasswren (Gawler Ranges). *Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/64454-conservation-advice.pdf*.

EBS. (2023). *Hydrogen Jobs Plan: Targeted Western Grasswren Survey.* Torrensville, South Australia.

Ehmke, G., Antos, M., Bennett, A., Ford, H., Barnes, M., Tulloch, A., . . . Garnett , S. (2021). South-west Southern Whiteface Aphelocephala leucopsis castaneiventris and South-east Southern Whiteface A. l. leucopsis. In *The Action Plan for Australian Birds 2020.* (Eds ST Garnett and GB Baker). CSIRO Publishing, Melbourne.

FF CRC. (2024). *RP3.2-10: Hydrogen Pipeline Code of Practice: Design, Construction and Operation.* Future Fuels Cooperative Research Centre .

Garnett, S., & Baker, G. (2020). The Action Plan for Australian Birds. December 2021. *CSIRO Publishing*.

Garnett, S., & Crowley, G. (2000). The Action Plan for Australian Birds. *Environment Australia, Canberra*.

Garnett, S., Szabo, J., & Dutson, G. (2011). *The Action Plan for Australian Birds 2010.* Collingwood: CSIRO Publishing.

Higgins, P., & Peter, J. (2002). Handbook of Australian, New Zealand and Antarctic Birds.

Higgins, P., Peter, J., & Steele, W. (2001). *Handbook of Australian, New Zealand and Antarctic Birds. Volume 5: Tyrant-Flycatchers to Chats.* Melbourne: Oxford University Press.

Infrastructure SA. (2024). *EPBC Referral # 2023/09717 - Northern Water Desalination and Pipeline Infrastructure Project, South Australia.* Infrastructure SA.

IUCN Standards and Petitions Committee. (2024). Guidelines for Using the IUCN Red List Categories and Criteria. *Version 16*.

Jacobs. (2023a). *Port Bonython Hydrogen Export Hub Project - Terrestrial Ecology Assessment. Document IS439100 Version C. Report prepared for the Office of Hydrogen Power SA.*

Jacobs. (2023b). *Hydrogen Jobs Plan – Site 1, Terrestrial Ecological Assessment. Version 0 (Final). Report prepared for the Office of Hydrogen Power SA. August 2023. Provided in OPSA EPBC Referral#2023/09759.*

Jacobs. (2023c). *Northern Water Project - Terrestrial Ecology Assessment (Draft), 15 November 2023 Document no: 1S439100; Version: Rev D. Report prepared for Infrastructure SA; Provided as part of ISA EPBC Referral #2023/09717 (in Appendix D of Attachment C V2).*

JBS&G. (2024). Crown Development Application - Hydrogen Jobs Plan, prepared on behalf of OHPSA.

Lathwida Environmental . (2024b). *EPBC Act Significant Impact Assessment for the Whyalla Hydrogen Pipeline Project.* Prepared for Epic Energy.

Lathwida Environmental. (2024a). *Baseline Ecology Assessment for the Whyall Hydrogen Pipeline Project.* Prepared for Epic Energy.

Maron, M., & Lill, A. (2005). The influence of livestock grazing and weed invasion on habitat use by birds in grassy woodland remnants. *Biological Conservation*, 124, 439-450.

Menkhorst, P., Rogers, D., Clarke, R., Davies, J., Marsack, P., & Franklin, K. (2017). The Australian Bird Guide. *CSIRO Publishing, Clayton South Victoria*.

National Malleefowl Recovery Team. (2020). *National Malleefowl Monitoring Manual: Edition: v2020_1 - (Revised June 2020).*

OHPSA. (2024). *EPBC Act Preliminary Documentation, Hydrogen Jobs Plan - South Australian Government Renewable Hydrogen Power Station, Electrolysers and Storage Facility.* Office of Hydrogen Power South Australia.

Readers Digest. (1977). Complete Book of Australian Birds. *Reader's Digest Services Pty, Ltd. Sydney*.

SARDI. (2022, June 8). *Memorandum.* Retrieved from SARDI: https://www.pir.sa.gov.au/__data/assets/pdf_file/0005/422573/SARDI_ADVICE_NOTE_Impact_of_sound_on_cuttlefish_08JUN22.pdf

SARIG. (2024). *Government of South Australia Department for Energy and Mining*. Retrieved from South Australia Resources Information Gateway: https://map.sarig.sa.gov.au/

Schodde, R. (1982). The Fairy-wrens. *Landsdowne, Melbourne*.

Schodde, R., & Mason, I. (1999). The Directory of Australian Birds: Passerines. *CSIRO Publishing, Melbourne*.

Standards Australia. (2008). Pipelines—Gas and liquid petroleum. Sydney, NSW, Australia. Retrieved from https://www.saiglobal.com/pdftemp/previews/osh/as/as2000/2800/2885.0-2008.pdf

Succession Ecology. (2019). *Post-seeding Monitoring: April 2019. Succession Ecology report ES0519 - 01 prepared for Flinders Power.* Retrieved from https://www.epa.sa.gov.au/files/15864_post_seeding_monitoring_report_2019-04_redacted.pdf

Succession Ecology. (2023). *Post-seeding monitoring - September 2023. Succession Ecology report ES1023-08 prepared for Port Augusta Operations.* Retrieved from https://www.epa.sa.gov.au/files/15865_post_seeding_monitoring_report_2023-09_redacted.pdf

Threatened Species Scientific Committee. (2000). *Guidelines for assessing the conservation status of native species according to the Environment Protection and Biodiversity Conservation Act 1999 and Environment Protection and Biodiversity Conservation Regulations 2000.* Australian Government Department of Agriculture, water and the Environment.

Threatened Species Scientific Committee. (2020, July 9). *Conservation Advice Falco hypoleucos Grey Falcon.*

Tjandraatmadja, G., Gould, S., & Burn, S. (2005). *Analysis of Hydrostatic Test Water - Final Report for APIA.* CSIRO Manufacturing and Infrastructure Technology. CMIT Report Number: CMIT-2005-259.

WaterConnect. (2024). *Groundwater Data.* Retrieved July 1, 2024, from DEW: https://www.waterconnect.sa.gov.au