GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

West Erregulla Field Development Program

Strike West Pty Ltd

Report 1748

September 2023

This assessment report has been prepared by the Environmental Protection Authority (EPA) under s. 44 of the *Environmental Protection Act 1986* (WA). It describes the outcomes of the EPA's assessment of the West Erregulla Field Development Program proposal by Strike West Pty Ltd.

The West Erregulla Field Development Program was determined under the Commonwealth *Environment Protection and Biodiversity Act 1999* to be a controlled action and to be assessed by the EPA under an accredited process. This document is also the result of the EPA's accredited assessment process.

This assessment report is for the Western Australian and Commonwealth Ministers for Environment and sets out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- an assessment of the matters of national environmental significance
- the EPA's recommendations as to whether or not the proposal may be implemented and, if it recommends that implementation be allowed, the conditions and procedures, if any, to which implementation should be subject
- other information, advice and recommendations as the EPA thinks fit.

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Proposal

The West Erregulla Field Development Program is a proposal to construct and operate a system of infrastructure to gather and connect gas from its West Erregulla gas field and convey the extracted gas to an upstream separating facility. The proposal is located within the Shires of Three Springs and Mingenew in the Midwest region of Western Australia, approximately 50 kilometres (km) southeast of Dongara and 234 km north of Perth.

The proponent for the proposal is Strike West Pty Ltd, a wholly owned subsidiary of Strike Energy Limited. The proposal includes a flowline gathering system to convey gas from four existing approved wells and two new conventional wells to an upstream third-party operated gas processing facility, which is subject to a separate assessment. This proposal terminates at the gas and liquids transfer point to the processing facility.

The development envelope for the proposal is 93.97 hectares (ha), requiring clearing of up to 38.46 ha of native vegetation with a total disturbance footprint, including existing well locations, of up to 65.66 ha. The operational life of the proposal is 20 years, with additional time for construction and decommissioning.

Context

Existing land uses in the region include petroleum and mineral exploration and operations, conservation, tourism and agricultural activities. The nearest sensitive receptor is a residence located approximately 4.6 km from the closest existing well site. Yardanogo Nature Reserve is located approximately 19.5 km to the west of the development envelope.

The proponent holds multiple gas assets and exploration acreage across the Perth Basin. Strike West Pty Ltd has taken over as operator for Warrego Energy's West Erregulla exploration program which comprised of a three-dimensional onshore seismic survey and an exploration drilling program within Exploration Permit EP 469.

The proposal involves the extraction of gas from the West Erregulla gas field, which will be transported to tie into a gas processing facility owned by an independent third-party, AGI Operations Pty Limited (AGIO). AGIO's proposal for the West Erregulla Processing Plant and Pipeline has also been assessed by the EPA (EPA Report 1748).

The EPA considered whether the proposal should be part of a larger combined proposal with AGIO's downstream gas processing plant, which was referred to the EPA around the same time. The EPA decided the proposals were sufficiently stand alone and the impacts were sufficiently capable of being jointly assessed, for the proposals to proceed under separate assessment without compromising the EPA's assessment or Minister's decision making.

Environmental values

Flora and Vegetation and Terrestrial Fauna are the key environmental factors that may be impacted by the proposal.

Consultation

The EPA published the proponent's referral information for the proposal on its website for seven-day public comment. The EPA also published the proponent's Environmental Review Document (ERD) with additional information on its website for public review for two weeks (from 16 May 2022 to 30 May 2022). The EPA considered the comments received during these public consultation periods in its assessment.

Mitigation hierarchy

The mitigation hierarchy is a sequence of proposed actions to reduce adverse environmental impacts. The sequence commences with avoidance, then moves to minimisation, rehabilitation, and offsets are considered as the last step in the sequence.

The proponent considered the mitigation hierarchy in the development and assessment of its proposal, and as a result has:

- located the proposal to avoid known mapped locations of conservation significant flora
- avoided ridge features associated with threatened flora
- minimised the extent of native vegetation clearing by using existing tracks and previously cleared areas
- committed to implement management measures, including weed control, hygiene measures and dust suppression measures to minimise impacts to flora and vegetation
- committed to implementing management measures, including vehicle speed limits and restricting movements to designated or existing roads and tracks, undertaking daily trench inspections and dust suppression measures to minimise impacts to terrestrial fauna
- committed to rehabilitating at least 30 ha of the disturbance footprint following completion of construction
- offset the significant residual impact to conservation significant flora and Carnaby's black cockatoo habitat through land acquisition and management within Lot 10106 and Lot 10107, 2087 Yandanooka West Road, Mount Adams, approximately 1.5 km north of the development envelope
- offset the significant residual impact to threatened flora *Paracaleana dixonii* through contribution to research opportunities to address knowledge gaps and support recovery of the species.

Assessment of key environmental factors

The EPA has identified the key environmental factors (listed below) in the course of the assessment. For each factor, the EPA has assessed the residual impacts of the proposal on the environmental values and considered whether the environmental outcomes are likely to be consistent with the EPA environmental factor objectives.

Flora and Vegetation

Residual impact or risk to environmental value		Assessment finding
1.	Clearing of up to 38.46 ha of native vegetation in mainly pristine condition. Loss of 4 individuals of threatened flora species *Paracaleana dixonii.* Loss of habitat for threatened flora species *Paracaleana dixonii, Thelymitra stellata* and *Daviesia speciosa.* Loss of individuals of 13 priority flora species and direct impact to priority flora habitat.	The proposal will result in the loss of vegetation, including individuals and habitat of threatened and priority listed flora. The proponent has prepared a Rehabilitation Management Plan to rehabilitate approximately 30 ha of the disturbance footprint with native vegetation including impacted threatened and priority flora listed species. The proponent has prepared an Offset Strategy to offset the residual impacts to conservation significant flora habitat. The EPA advises that subject to the recommended conditions, including condition A1 to limit the extent of native vegetation clearing, condition B1 to limit the disturbance to flora and vegetation, condition B3 requiring environmental offsets and condition B4 requiring implementation of rehabilitation, the significant residual impact can be managed and counterbalanced so that the environmental outcome is likely to be consistent with the EPA objective for Flora and vegetation.
2.	Indirect impact to flora and vegetation associated with dust deposition, spread of weeds and dieback and fire risk.	The EPA advises there is unlikely to be significant residual impacts from the spread of weeds, introduction of dieback, dust deposition and fire. The proponent has proposed management measures in the Dieback and Weed Hygiene Management Plan to ensure indirect impacts to flora and vegetation are minimised to the greatest extent possible including dust suppression, weed monitoring and control, hygiene management and fire management. The EPA considers that subject to the recommended condition B1 which includes the requirement for active weed, dieback and dust management the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.

Terrestrial Fauna

Residual impact or risk to environmental value		Assessment finding
1.	Loss of 38.46 ha of foraging habitat for Carnaby's black cockatoo.	The proposal will result in the loss of moderate value foraging habitat for Carnaby's black cockatoo. The proponent has prepared a Rehabilitation Management Plan to rehabilitate approximately 30 ha of the disturbance footprint with native vegetation which will reflect the foraging habitat composition present in the pre-disturbed habitat type. The proponent has prepared an Offset Strategy to offset the residual impacts to significant fauna habitat. The EPA advises that subject to the recommended conditions, including condition A1 to limit the extent of native vegetation clearing, condition B2 to limit the disturbance to terrestrial fauna habitat, condition B3 requiring environmental offsets and condition B4 requiring implementation of rehabilitation, the significant residual impact can be managed and counterbalanced so that the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.
2.	Fauna mortality or injury during construction due to vehicle and machinery movements and being trapped in open trenches or water storage ponds, or coming into contact with drilling chemicals.	The EPA advises that subject to the recommended condition B2 to minimise the risk of physical injury or mortality, behavioural changes and health impacts, and setting trench construction requirements, the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.
3.	Indirect impact to terrestrial fauna associated with fragmentation of habitat, dust deposition, increased feral animal activity, light overspill, noise and altered fire regimes.	The EPA considers that, subject to the recommended condition B2 including the requirement to minimise the risk of adverse impacts and limit indirect disturbance to terrestrial fauna and habitat, the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.

Holistic assessment

The EPA considered the connections and interactions between relevant environmental factors and values to inform a holistic view of impacts to the whole environment. The EPA formed the view that the holistic impacts would not alter the EPA's conclusions about consistency with the EPA factor objectives.

Conclusion and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal

- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA objectives for the key environmental factors
- EPA's confidence in the proponent's proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the *Environmental Protection Act 1986*.

The EPA has recommended that the proposal may be implemented subject to conditions recommended in Appendix A.

Other advice

The EPA provides the following information for consideration by the Minister.

The EPA notes that onshore petroleum development activity associated with the proposal will be subject to the *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act) and associated regulations, administered by the Department of Mines, Industry Regulation and Safety (DMIRS). The *Petroleum Pipelines Act 1969* will apply to petroleum flowline/trunklines on land within the State. These Acts will apply further statutory requirements to limit potential impacts from the construction, operation and decommissioning of the proposal on the environment.

The Department of Water and Environmental Regulation (DWER) administers the *Rights in Water and Irrigation Act 1914* (RiWI Act) that provides for the granting of licences and permits to abstract groundwater and surface water. The EPA notes that abstraction of groundwater from the Yarragadee aquifer required for this proposal will be managed by DWER under the proponent's existing groundwater licence, which contains conditions to ensure that drawdown is monitored and impacts on nearby groundwater users are controlled. Further statutory requirements to limit potential impacts to groundwater from gas well operation will be subject to regulation by DMIRS under the PGER Act.

The EPA notes there are several existing and new proposals for gas extraction and processing in the Mid West region. The EPA considers there is a need for infrastructure planning in the region to avoid increased environmental impacts from clearing from multiple plants, fragmentation of habitat from multiple pipelines, decreased ability to take advantage of emissions efficiencies and reductions which are only available at scale and planning for offsets to deliver environmental protection at a local and regional scale. In the meantime, the EPA advises proponents to consider cumulative effects and avoid separate referral of co-dependent proposals which may undermine the EPA's ability to assess and the Minister's ability to make decisions about proposals.

While the potential greenhouse gas emissions from this proposal have not been assessed as significant, the EPA has considered the cumulative impacts on greenhouse gas emissions from this proposal and the connected AGIO West Erregulla Processing Plant and Pipeline proposal. It is noted that AGIO has considered the combined emissions for the processing plant and pipeline (West Erregulla Processing Plant and Pipeline proposal) and this proposal (West Erregulla Field Development Program) to assist in the cumulative impact assessment, and has prepared a Greenhouse Gas Environmental Management Plan which has been assessed by the EPA and will be subject to conditions associated with implementation of that proposal.

Consultation with the Department of Planning, Lands and Heritage recommended that the proponent establish a Cultural Heritage Management Plan with the Yamatji Nation Indigenous Land Use Agreement through the Yamatji Southern Regional Corporation, to address Aboriginal cultural heritage matters and manage the disturbance of any potential Aboriginal heritage sites in accordance with the requirements of the *Aboriginal Heritage Act 1972*.

The EPA notes there is community concern regarding this proposal and associated West Erregulla Processing Plant and Pipeline proposal, and their potential impact on the environment. The EPA recommends ongoing consultation between the proponent and the community as the project progresses.

1 Proposal

The West Erregulla Field Development Program is a proposal to construct and operate a gathering system, collectively known as the West Erregulla Field Development Program, to connect its West Erregulla gas field and convey the extracted gas to an upstream separating facility. The proposal will supply gas to a third party operated gas processing facility, which is subject to a separate environmental impact assessment.

The proposal is located within the Shires of Three Springs and Mingenew in the Midwest region of Western Australia, approximately 50 kilometres (km) south-east of Dongara and 234 km north of Perth (see Figure 1).

The proposal will allow for the conveying of extracted gas from West Erregulla field and comprises of the following components:

- installation of gathering network comprising flowlines/trunklines to convey gas from four existing wells to an upstream compound
- drilling two new conventional wells (G and J) and potential connection into gathering network
- remote terminal unit (RTU), metering and corrosion inhibitor chemical injection system at each well site
- pigging facilities for trunklines and flowlines
- an upstream compound consisting of pig receiver tie-in points and a common manifold.

The proposal terminates at the transfer point to the third-party gas processing facility.

The proponent for the proposal is Strike West Pty Ltd, a wholly owned subsidiary of Strike Energy Limited. The proponent referred the proposal to the Environmental Protection Authority (EPA) on 23 June 2021. The referral information was published on the EPA website for 7 days public comment. On 15 September 2021, the EPA decided to assess the proposal at the level of Referral information with additional information required. The EPA published the Environmental Review Document including additional information (Strategen-JBS&G 2022a) on its website for public review for 2 weeks (from 16 May 2022 to 30 May 2022).

The proposal was determined under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to be a controlled action and to be assessed by the EPA under an accredited process.

The proposal is set out in section 3 of the proponent's Environmental Review Document (Strategen-JBS&G 2022a), which is available on the EPA website.

The elements of the proposal which have been subject to the EPA's assessment are included in Table 1.

Table 1: Proposal content document

Proposal element	Location	Maximum extent or range
Physical elements		
Gathering network comprising flowlines/ trunklines, wells and an upstream compound	Figure 2	Clearing of up to 38.46 ha of native vegetation within a 93.97 ha development envelope, with a total disturbance footprint, including the existing facilities, of up to approximately 65.66 ha.
Proposal elements with greenhouse gas emissions		
Scope 1	Vegetation clearing estimated loss of bio-sequestration: 11,634 tCO_2-e Estimated fuel consumption: 149 tCO_2-e Estimated flaring and venting: 13,798 tCO_2-e	
Scope 2	No Scope 2 emissions	
Rehabilitation		
Following completion of construction up to 30 ha within the disturbance footprint will be rehabilitated.		
Commissioning		
Not applicable.		
Decommissioning		
Plugging of well and removal of all surface infrastructure and buried pipeline infrastructure.		
Other elements which affect extent of effects on the environment		
Proposal timeframes	Maximum proposal life	20+ years
	Construction phase	Approximately 1 year
	Decommissioning phase	Approximately 2 years post operation

Units and abbreviations
ha – hectare
tCO_2-e – tonnes of carbon dioxide equivalent

Proposal amendments

The original proposal is set out in section 2 of the proponent's referral documentation (Strategen-JBS&G 2021a), which is available on the EPA website.

The proponent requested changes to the original proposal during the assessment (section 43A amendment). This change was to clarify the disturbance footprint to include the existing cleared area of 27.2 ha and the proposed clearing of 38.46 ha of native vegetation comprising a total disturbance footprint of 65.66 ha within a development envelope of 93.97 ha. The EPA Chair's notice of 7 January 2022 consenting to the change is available on the EPA website.

The consolidated and updated elements of the proposal which has been subject to the EPA's assessment is included in Table 1.

Proposal alternatives

The proponent did not consider alternative locations for the proposal.

Proposal context

The proposal is located within the Shires of Three Springs and Mingenew in the Midwest region of Western Australia. The development envelope is situated within land which is subject to the Yamatji Nation Indigenous Land Use Agreement, overseen by the Yamatji Marlpa Aboriginal Corporation and Yamatji Southern Regional Corporation.

Existing land uses in the region include petroleum and mineral exploration and operations, conservation, tourism and agricultural activities. The nearest sensitive receptor is a residence located approximately 4.6 km from the closest proposed well site. Yardanogo Nature Reserve is located approximately 19.5 km to the west of the development envelope.

The proponent holds multiple gas assets and exploration acreage across the Perth Basin. Strike West Pty Ltd has taken over as operator for Warrego Energy's West Erregulla exploration program which comprised of a three-dimensional onshore seismic survey and an exploration drilling program within Exploration Permit EP 469.

The proposal involves the extraction of gas from the West Erregulla gas field, which will be transported to tie into a gas processing facility owned by an independent third-party, AGI Operations Pty Limited (AGIO). AGIO's proposal for the West Erregulla Processing Plant and Pipeline has also been assessed by the EPA.

The EPA considered whether the proposal should be part of a larger combined proposal with AGIO's downstream gas processing plant, which was referred to the EPA around the same time. The EPA decided the proposals were sufficiently stand alone and the impacts were sufficiently capable of being jointly assessed, for the proposals to proceed under separate assessment without compromising the EPA's assessment or Minister's decision making.

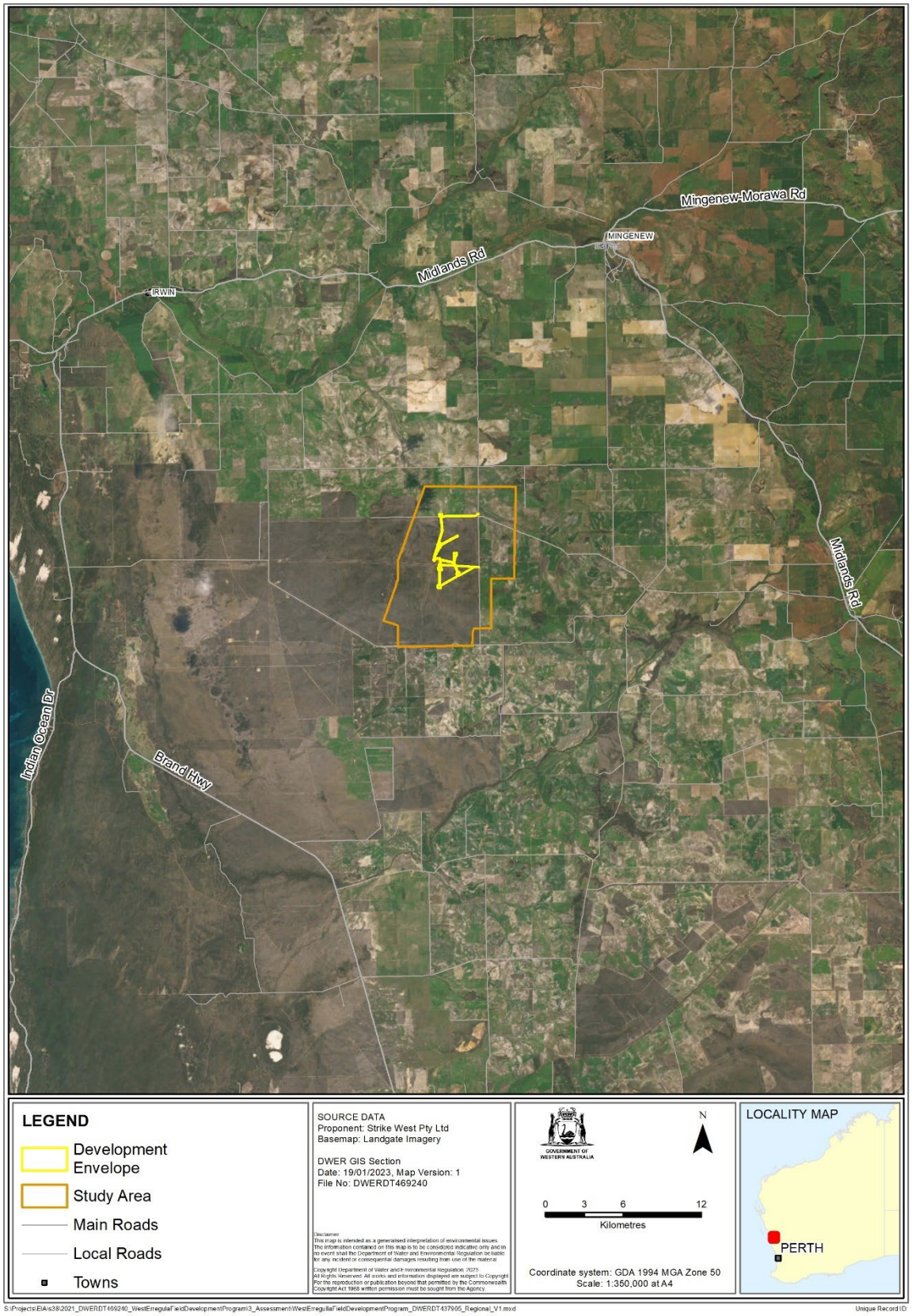

Figure 1: Project location

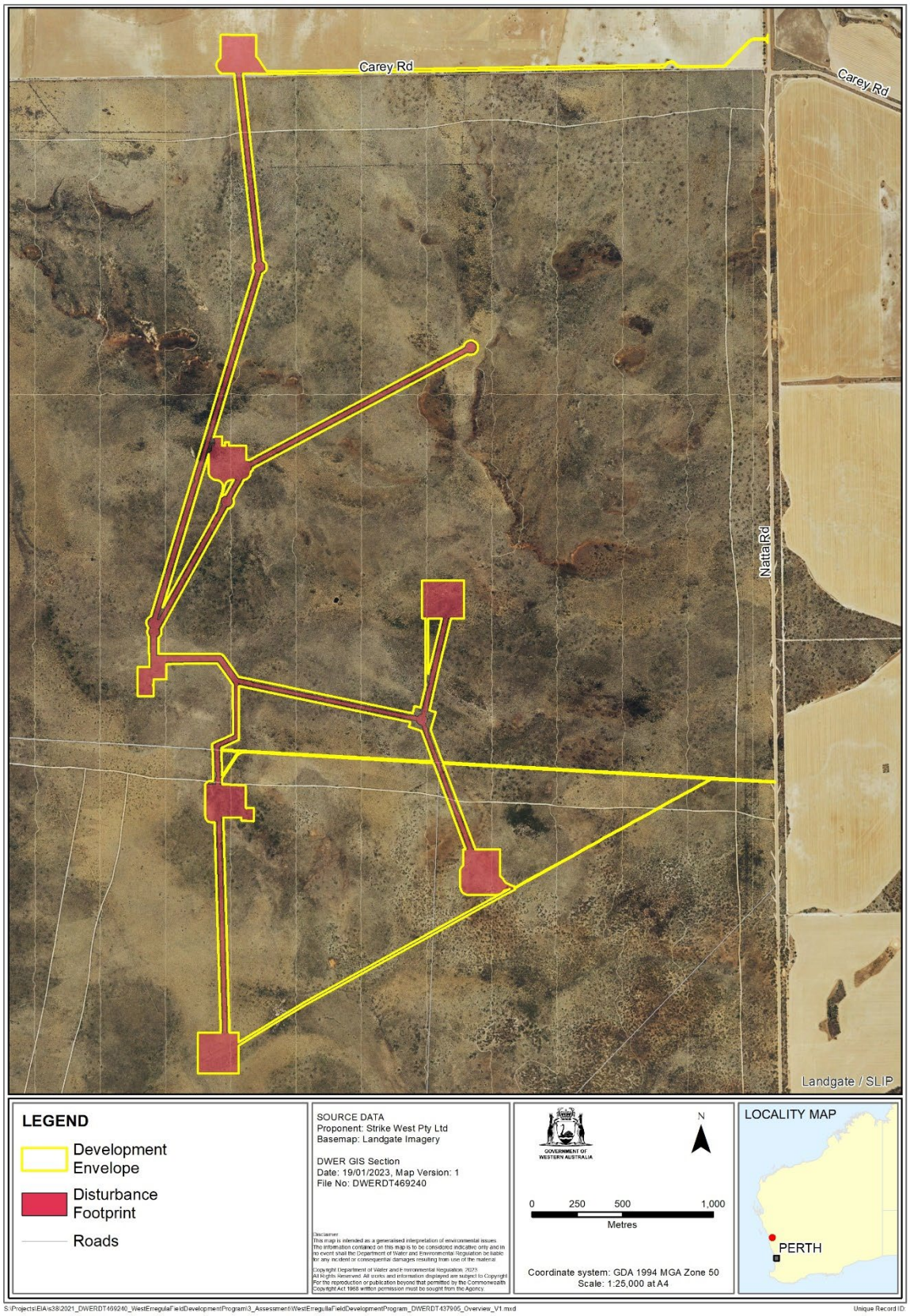

Figure 2: Development envelope and disturbance footprint

2 Assessment of key environmental factors

This section includes the EPA's assessment of the key environmental factors. The EPA also evaluated the impacts of the proposal on other environmental factors and concluded these were not key factors for the assessment. This evaluation is included in Appendix D.

2.1 Flora and Vegetation

2.1.1 Environmental objective

The EPA environmental objective for flora and vegetation is *to protect flora and vegetation so that biological diversity and ecological integrity are maintained* (EPA 2016a).

2.1.2 Investigations and surveys

The EPA advises the following investigations and surveys were used to inform the assessment of the potential impacts to flora and vegetation:

- Flora and Vegetation of the Proposed Eneabba – Moonyoonooka 330kv (Woodman Environmental 2009a)
- West Erregulla-2 Well Site Flora and Vegetation Assessment (Woodman Environmental 2009b)
- Transmission Line, Supplementary Field Survey 2008, 2009 Survey Addendum (Woodman Environmental 2010)
- *West Erregulla Project Flora and Vegetation Assessment* (Woodman Environmental Consulting 2013) (Appendix B of the ERD)
- Targeted Threatened Flora Survey West Erregulla 2018 (Ecologia 2018) (Appendix B of the ERD)
- West Erregulla Exploration Program Wells 4 and 5 Flora and Vegetation Risk Assessment (Woodman Environmental Consulting 2020a) (Appendix B of the ERD)
- *West Erregulla Exploration Program Targeted Flora Survey* (Woodman Environmental Consulting 2020b) (Appendix B of the ERD)
- West Erregulla 4 – Targeted Flora Survey and Black Cockatoo Habitat Assessment (Strategen 2020)
- Review of Key Potential Flora, Vegetation and Fauna Values on the Proposed Pipeline for Strike Energy Near Dongara (Mattiske Consulting 2020)
- West Erregulla Pipeline Flora and Fauna Survey (Eco Logical Australia 2020).

The earlier surveys were not consistent with the *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016b). The EPA notes that the surveys dated 2009, 2010 and 2013 were undertaken prior to contemporary EPA 2016 technical guidance, however, are provided for context to

the environmental values that are proposed to be impacted. The EPA notes that the results of the targeted flora survey (Woodman 2020b) were impacted by a fire in April 2019, however, the methodology is consistent with EPA technical guidance.

Limited regional data was provided by the proponent and therefore was not consistent with EPA technical guidance for regional surveys. However, the EPA obtained and considered information about the region, which was sufficient to enable the assessment to proceed.

The EPA expects the proponent to undertake flora and vegetation assessments consistent with *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016b) for any future assessments.

2.1.3 Assessment context – existing environment

As defined in the Interim Biogeographic Regionalisation for Australia (IBRA), the proposal occurs within the Geraldton Sandplains bioregion and Lesueur Sandplain subregion.

The development envelope comprises two vegetation associations, both occurring within the Lesueur Sandplain subregion. The pre-European extent of each vegetation association remaining includes 13,618.88 ha of Tathra 49 (41.10%) and 111,632.48 ha of Tathra 379 (30.17%) (Strategen-JBS&G 2022a).

Mapping of vegetation communities identified eight vegetation types present within the development envelope. A total of 71.18% of the vegetation with the development envelope is in pristine condition (Woodman 2013). A large proportion of this area was affected by a fire which occurred in 2019. On-ground surveys indicated that the fire has altered structural elements of the vegetation communities, however, strong post-fire recovery was observed during the 2020 survey (Strategen-JBS&G 2022a). No areas within the development envelope were identified as impacted or infested with dieback (*Phytophthora*).

No occurrences of threatened ecological communities (TEC's) or priority ecological communities (PEC's) protected under the EPBC Act or the *Biodiversity Conservation Act 2016* (BC Act) were recorded within the development envelope (Strategen-JBS&G 2022a).

No World Heritage Areas, National Heritage or Ramsar wetlands are located within or near the development envelope. The Yardanogo Nature Reserve (R36203) is located approximately 19.5 km west of the proposal.

The following threatened flora were recorded within the development envelope:

- *Paracaleana dixonii* (Sandplain duck orchid)
- *Thelymitra stellata* (Star sun orchid).

Paracaleana dixonii is listed as endangered under the EPBC Act and Vulnerable under the BC Act. The species is known to occur over a range of approximately 191 km from Arrowsmith East (30 km south of Dongara) to 36 km east of Lancelin.

Thelymitra stellata is listed as endangered under the EPBC Act and the BC Act. The species is known to occur over a range of approximately 450 km from Three Springs in the north to near Darkan in the south. There are also outlying records to the east as far as Holt Rock, east of Lake Grace.

Daviesia speciosa (Beautiful Daviesia) is listed as endangered under the EPBC Act and the BC Act. The species is known to occur from north-east of Eneabba and extends over 40 km. Two populations occur within Tathra National Park and in gravel pits beside road verges near Mingenew. No individuals of *Daviesia speciosa* were recorded within the development envelope; however, the species is potentially associated with some of the vegetation types found in the development envelope.

The threatened flora species discussed above are recognised as Matters of National Environmental Significance (MNES) under the EPBC Act and are discussed further in section 5.

A total of 14 priority flora species as listed under the BC Act were recorded within the development envelope including the following:

- Lasiopetalum ogilvieanum (Priority [P]1)
- Micromyrtus rogeri (P1)
- *Stylidium carnosum* subsp. Narrow leaves (J.A Wege 490) (P1)
- Schoenus badius (P2)
- Comesperma rhadinocarpum (P3)
- Haemodorum loratum (P3)
- *Hemiandra* sp. *Eneabba* (H. Demarz 3687) (P3)
- Mesomelaena stygia subsp. deflexa (P3)
- Persoonia filiformis (P3)
- Persoonia rudis (P3)
- Stylidium drummondianum (P3)
- Synaphea oulopha (P3)
- Banksia scabrella (P4)
- Schoenus griffinianus (P4)

The proposal will impact 13 of these priority flora species, which are known to occur outside of the development envelope, within the local area and regionally. Table 7.7 of the proponent's Response to Submissions document (Strategen-JBS&G 2023) lists the significant flora species recorded during the surveys.

A total of 33 introduced flora species or habitat for such species are known to occur in the local area. Four of these introduced species are Declared Pests under the *Biosecurity and Agricultural Management Act 2007* (WA), 3 of which are also listed Weeds of National Significance.

2.1.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the Response to Submissions document (Strategen-JBS&G 2023). Key issues raised during public consultation on the proposal included the clearing of native vegetation in particular the threatened *Paracaleana dixonii*, fragmentation of bushland, spread of weeds and dieback, and the cumulative impacts of vegetation clearing.

How these issues have been considered in the assessment are described in the sections below (sections 2.1.6, 2.1.7, 2.1.8 and 2.1.9).

2.1.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on flora and vegetation from:

- clearing of up to 38.46 ha of native vegetation, of which the majority is in pristine condition
- clearing of individuals of threatened flora species *Paracaleana dixonii* and *Thelymitra stellata*
- loss of habitat for threatened flora species *Paracaleana dixonii, Thelymitra stellata* and *Daviesia speciosa*
- clearing of individuals of 13 priority flora species (P1, P2, P3 and P4) and loss of potential habitat
- indirect impacts including:
    - fragmentation of native vegetation
    - introduction and/or spread of weeds
    - introduction of dieback
    - smothering of vegetation by dust generated by construction
    - damage or loss of surrounding vegetation through accidental bushfires.

The issues raised during public consultation about potential direct and indirect impacts to flora and vegetation have been considered in this assessment.

2.1.6 Avoidance measures

The proponent has designed the proposal to avoid impacts to flora and vegetation by:

- locating the proposal to avoid mapped locations of conservation significant flora
- avoiding ridge features which are associated with a number of threatened flora
- restricting vehicle and equipment access to designated roads/tracks and cleared areas.

2.1.7 Minimisation measures (including regulation by other DMAs)

The proponent has proposed the following measures to minimise impacts to flora and vegetation:

- using existing access tracks and previously cleared areas to minimise the extent of additional vegetation clearing
- implementing strict hygiene measures to reduce the risk of introducing or spreading weeds or dieback
- implementing dust suppression measures to minimise significant dust lift off during construction and minimising the duration between clearing and construction activities to reduce the duration of potential dust generation
- ensuring all machinery and vehicles undertaking clearing activities have fire extinguishers
- monitoring of Department of Fire and Emergency Services (DFES) alerts regarding fire bans during high-risk activities
- undertaking all ground disturbance, construction and operational activities in accordance with a DMIRS approved Environment Plan as required under the *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act) and associated regulations.

2.1.8 Rehabilitation measures

The proponent has proposed that an area of at least 30 ha which is not required for ongoing operation will be rehabilitated following completion of construction. The proponent has indicated that the rehabilitation areas will be re-contoured to match the surrounding landforms and erosion controls implemented where necessary and minimise the risk of ongoing dust lift off.

The EPA notes that the proponent has prepared a Rehabilitation Management Plan outlining proposed activities post-construction but does not explicitly refer to rehabilitation undertaken as part of future decommissioning and closure. The EPA notes that this management plan will require updating to include closure rehabilitation and monitoring following the completion of operations.

The EPA notes that rehabilitation of all conservation significant flora species has not been demonstrated by the proponent to date. However, the EPA is satisfied that the environmental outcomes included in condition B4 ‘Rehabilitation’ can be achieved based on other rehabilitation undertaken in the region.

2.1.9 Assessment of impacts to environmental values

The EPA considers that the key environmental values for flora and vegetation likely to be impacted by the proposal are native vegetation in pristine condition, threatened flora species and priority flora species.

In assessing this proposal, the EPA has had regard to the combined and cumulative effect that surrounding approved and proposed projects may have on flora and

vegetation, particularly the associated West Erregulla Processing Plant and Pipeline proposal.

Vegetation in pristine condition

The EPA has assessed the likely residual impacts of the proposal on vegetation to be the clearing of up to 38.46 ha of native vegetation in pristine condition. The EPA recognises that increased indirect impact and cumulative loss of native vegetation through the implementation of current and future developments is a key threat to flora and vegetation values within the Geraldton Sandplains bioregion.

The pre-European extent of native vegetation currently remaining is approximately 43% within the Lesueur Sandplain subregion. On a regional scale, the proposed clearing of native vegetation for the proposal will impact 0.03% for both Tathra 49 and Tathra 379 vegetation associations. The eight vegetation types mapped within the disturbance footprint are known to extend within and beyond the development envelope. Given the range and extent within the region, it is unlikely the proposal will have a significant impact on the vegetation associations or vegetation types.

The EPA acknowledges that the proposal is located within an area containing regionally significant vegetation types and is of high floristic diversity, containing a high number of significant flora species, including threatened and priority taxa.

The EPA has had consideration for the proponent's proposed rehabilitation of the disturbance footprint, in addition to the proposed offsets comprising acquisition of land containing similar vegetation types in proximity to the development envelope.

The EPA advises that the residual impact to vegetation in pristine condition should be subject to recommended conditions A1 'Limitations and Extent of Proposal', B1 'Flora and Vegetation' and B4 'Rehabilitation' to ensure the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.

Threatened flora

The EPA has assessed the likely residual impacts of the proposal on threatened flora to be the loss of four individuals of *Paracaleana dixonii* and the loss of potential habitat for *Paracaleana dixonii, Thelymitra stellata* and *Daviesia speciosa* (Table 2).

The proponent has considered direct impacts to threatened flora to include the individuals located within five metres either side of the disturbance footprint boundary due to their sensitivity from impacts such as dust, ground disturbance or minor vehicle deviations from the designated access tracks that may result in a loss.

Table 2: Threatened flora species impacted by the proposal

Species	Number of individuals recorded (local extent)	Number of individuals in development envelope	Number of individuals in disturbance footprint	Number of individuals in disturbance footprint (including 5m from disturbance footprint)	Percentage loss of known individuals within disturbance footprint (includes 5m)
Paracaleana dixonii	471	4	2	4	0.85%
Thelymitra stellata	427	9	0	0	0%

Paracaleana dixonii

The proponent's Response to Submissions (Table 7.7) indicates there is a known local extent of 471 individuals from within 40 populations (Strategen-JBS&G 2023). There are 17 populations reported to occur within Department of Biodiversity, Conservation and Attractions (DBCA) managed tenure including South Eneabba Nature Reserve, Lake Logue Nature Reserve, Lesueur National Park, Coomallo Nature Reserve, Moore River National Park and Unnamed Reserve 39744.

There are two individuals of *Paracaleana dixonii* within the disturbance footprint. A further loss of two individuals may occur as they are located within five metres of the disturbance footprint boundary, which would account for a loss of 0.85% of the local population.

While only four individuals from within the development envelope have been recorded during surveys, it is noted that the species is cryptic in nature and therefore its potential occurrence within the development envelope cannot be discounted. *Paracaleana dixonii* is potentially associated with vegetation types (VT) 7b, 10 and 13a located within the development envelope. The proposal will result in the direct loss of 14.78 ha of potential habitat for the species which represents 0.49% of the known local habitat extent and a further potential indirect loss of 4.79 ha (within five metres of the disturbance footprint), totalling 19.57 ha, which represents 0.65% of the known local habitat extent.

The EPA notes that the proponent has prepared a Rehabilitation Management Plan outlining the proposed rehabilitation of approximately 30 ha of the disturbance footprint post-construction activities with native vegetation species suitable for providing *Paracaleana dixonii* habitat.

While the proposal would result in a relatively small impact to the known local extent of this species, the EPA considers the residual impact to *Paracaleana dixonii* to be significant based on the limited knowledge of the species and relatively low known population numbers. The EPA considers that the significant residual impact can be appropriately regulated through recommended conditions A1 'Limitations and Extent

of Proposal', B1 'Flora and Vegetation', B4 'Rehabilitation' and counterbalanced by offsets (condition B3 'Environmental Offsets') so that the *Paracaleana dixonii* is protected, and the environmental outcome is consistent with the EPA objective for flora and vegetation.

The EPA notes that the take or potential take of individuals of threatened flora would require Ministerial authorisation under section 40 of the BC Act.

Thelymitra stellata

The proponent's Response to Submissions (Table 7.7) shows there is a known local extent of 427 individuals from within 20 populations, with a number of these populations in a secure conservation estate including Lesueur National Park and Coomallo Nature Reserve (Strategen-JBS&G 2023). A total of nine individuals of *Thelymitra stellata* were recorded from within the development envelope; however, none will be cleared from implementation of the proposal.

Thelymitra stellata is potentially associated with habitats that align with vegetation types 7a, 7b, 8, 11 and 13a in the development envelope. The proposal will result in the direct loss of 21.44 ha of potential habitat for the species which represents 0.56% of the known local habitat extent and a further potential indirect loss of 8.29 ha (within five metres of the disturbance footprint), totalling 29.73 ha, which represents 0.83% of the known local habitat extent.

The EPA notes that the proponent has prepared a Rehabilitation Management Plan outlining the proposed rehabilitation of 30 ha of the disturbance footprint post-construction activities with native vegetation species suitable for providing *Thelymitra stellata* habitat.

While the proposal would result in a relatively small impact to the known local extent of habitat for this species, the EPA considers the residual impact to *Thelymitra stellata* to be significant based on the relatively low known population numbers. The EPA considers that the significant residual impact can be appropriately regulated through recommended conditions A1 'Limitations and Extent of Proposal', B1 'Flora and Vegetation', B4 'Rehabilitation' and counterbalanced by offsets (condition B3 'Environmental Offsets') so that the *Thelymitra stellata* is protected, and the environmental outcome is consistent with the EPA objective for flora and vegetation.

Daviesia speciosa

The proponent's Response to Submissions (Table 7.7) shows there is a known local extent of 316 individuals from within four populations (Strategen-JBS&G 2023). No individuals have been recorded within the development envelope. However, *Daviesia speciosa* is potentially associated with habitats that align with vegetation types 7a, 7b and 8 in the development envelope.

The proposal will result in the direct loss of 10.28 ha of potential habitat for the species which represents 0.60% of the known local habitat extent with a further potential indirect loss of 4.02 ha (within five metres of the disturbance footprint), totalling 14.3 ha, which represents 1.12% of the known local habitat extent.

The EPA notes that the proponent has prepared a Rehabilitation Management Plan outlining the proposed rehabilitation of 30 ha of the disturbance footprint post-construction activities with native vegetation species suitable for providing *Daviesia speciosa* habitat.

While the proposal would result in a relatively small impact to the known local extent of habitat for this species, the EPA considers the residual impact to *Daviesia speciosa* to be significant based on the low known population numbers. The EPA considers that the significant residual impact can be appropriately regulated through recommended conditions A1 'Limitations and Extent of Proposal', B1 'Flora and Vegetation', B4 'Rehabilitation' and counterbalanced by offsets (condition B3 'Environmental Offsets') so that the *Daviesia speciosa* is protected, and the environmental outcome is consistent with the EPA objective for flora and vegetation.

Priority flora

The EPA has assessed the likely residual impacts of the proposal on priority flora to include the loss of individuals and up to 38.46 ha of potential priority flora habitat. A total of 14 priority flora species were recorded within the development envelope; 13 of these will be directly impacted from implementation of the proposal (refer to Table 3). All these priority flora species are known to occur within the local area and have the potential to occur in vegetation types located within and beyond the development envelope (refer to Table 4). Only those species which have a higher priority listing level or impact are discussed below.

Table 3: Priority flora species impacted by the proposal

Species	Number of individuals recorded (local extent)	Number of individuals in development envelope	Number of individuals to be cleared	Percentage loss of known individuals as a result of clearing
Priority 1				
Micromyrtus rogeri	21,064	616	458	2.17%
Stylidium carnosum subsp. Narrow leaves (J.A Wege 490)	18	6	4	22.22%
Priority 2				
Schoenus badius	177	140	0	0%
Priority 3				
Comesperma rhadinocarpum	104	94	19	18.27%
Haemodorum loratum	183	28	9	4.92%

Species	Number of individuals recorded (local extent)	Number of individuals in development envelope	Number of individuals to be cleared	Percentage loss of known individuals as a result of clearing
Hemiandra sp. *Eneabba* (H. Demarz 3687)	157	37	14	8.92%
Mesomelaena stygia subsp. *deflexa*	42,350	4,733	2,402	5.67%
Persoonia filiformis	407	182	140	34.40%
Persoonia rudis	27	3	2	7.41%
Stylidium drummondianum	18,673	9,101	2,881	15.43%
Synaphea oulopha	2,260	748	455	20.13%
Priority 4				
Banksia scabrella	34,260	8,179	3,429	10.01%
Schoenus griffinianus	26,122	16,393	6,908	26.45%

Table 4: Significant flora habitat impacted by the proposal

Species	Known local extent of habitat (ha)	Habitat area impacted within disturbance footprint (ha)	Percentage habitat impacted from disturbance footprint within known local extent
Priority 1			
Micromyrtus rogeri	427.17	0.77	0.18%
Stylidium carnosum subsp. Narrow leaves (J.A Wege 490)	381.7	6.43	1.68%
Priority 2			
Schoenus badius	68.11	0.44	0.65%
Priority 3			
Comesperma rhadinocarpum	1,274.23	10.28	0.81%
Haemodorum loratum	1,590.6	8.47	0.53%

Species	Known local extent of habitat (ha)	Habitat area impacted within disturbance footprint (ha)	Percentage habitat impacted from disturbance footprint within known local extent
Hemiandra sp. *Eneabba* (H. Demarz 3687)	1,974.05	2.91	0.14%
Mesomelaena stygia subsp. *deflexa*	1,947.22	17.49	0.90%
Persoonia filiformis	981.7	6.43	0.65%
Persoonia rudis	1,346.85	7.30	0.54%
Stylidium drummondianum	1,036.07	2.81	0.27%
Synaphea oulopha	1,036.07	2.81	0.27%
Priority 4			
Banksia scabrella	4,166.95	26.96	0.65%
Schoenus griffinianus	1,365.15	0.87	0.06%

Micromyrtus rogeri (Priority 1)

The clearing of 458 individuals of *Micromyrtus rogeri* in the disturbance footprint equates to the loss of 2.17% of the known individuals within the local area. The species occurs across a range of 178 km in Western Australia (where it is endemic), from Arrowsmith East (30 km south-east of Dongara) in the north to 21 km south of Moora in the south. The development envelope is on the boundary of the known range of this taxon. This taxon is known from 618 population records locally, none of which occur within DBCA-managed tenure. *Micromyrtus rogeri* is potentially associated with vegetation type 8. The proposal will result in the clearing of 0.77 ha of potential habitat which represents 0.18% of the local known extent for this species. The impact of the proposal on this species is unlikely to be significant.

Stylidium carnosum subsp. Narrow leaves (J.A Wege 490) (Priority 1)

The clearing of four individuals of *Stylidium carnosum* subsp. Narrow leaves (J.A Wege 490) in the disturbance footprint equates to the loss of 22.22% of the known individuals within the local area. The species occurs across a range of 74 km in Western Australia (where it is endemic), from 15 km west of Arrowsmith East (approximately 30 km south of Dongara) in the north to 20 km north-east of Jurien Bay in the south. The development envelope is on the edge of the known range of this taxon. This taxon is known from 11 population records with 18 individuals recorded, with two populations occurring within DBCA-managed tenure (Lesueur National Park). *Stylidium carnosum* subsp. Narrow leaves (J.A Wege 490) is

potentially associated with vegetation type 10. The proposal will result in clearing of 6.43 ha of potential habitat which represents 1.68% of the local known extent for this species. The impact of the proposal on this species is unlikely to be significant.

Comesperma rhadinocarpum (Priority 3)

The clearing of 19 individuals of *Comesperma rhadinocarpum* in the disturbance footprint equates to the loss of 18.27% of the known individuals within the local area. The species occurs across a range of 480 km in Western Australia (where it is endemic), from 35 km south of Kalbarri in the north to Kenwick (in the Perth Metropolitan Area) in the south. The development envelope is on the edge of the known range of this taxon. This taxon is known from 20 records that represent approximately 18 populations, eight of which occur within DBCA-managed tenure (Lake Logue Nature Reserve, South Eneabba Nature Reserve, Badgingarra National Park, Drummond Nature Reserve, Kenwick Wetlands Nature Reserve, Mount Manning – Helena and Aurora Ranges Conservation Park). *Comesperma rhadinocarpum* is potentially associated with vegetation types 7a, 7b and 8. The proposal will result in clearing of 10.28 ha of potential habitat which represents 0.81% of the local known extent for this species. The impact of the proposal on this species is unlikely to be significant.

Persoonia filiformis (Priority 3)

The clearing of 140 individuals of *Persoonia filiformis* in the disturbance footprint equates to the loss of 34.40% of the known individuals within the local area. The species occurs across a range of 135 km in Western Australia (where it is endemic), from Arrowsmith East (30 km south of Dongara) in the north to nine km north-west of Cooljarloo in the south. The development envelope is on the boundary of the known range. This taxon is known from 21 population records, eight of which occur within DBCA-managed tenure (Badgingarra National Park, Coomallo Nature Reserve, South Eneabba Nature Reserve and Lesueur National Park). *Persoonia filiformis* is potentially associated with vegetation type 10. The proposal will result in clearing of 6.43 ha of potential habitat which represents 0.65% of the local known extent for this species. The impact on this species is unlikely to be significant.

Stylidium drummondianum (Priority 3)

The clearing of 2,881 individuals of *Stylidium drummondianum* in the disturbance footprint equates to the loss of 15.43% of the known individuals within the local area. The species occurs over a range of approximately 62 km in Western Australia (where it is endemic), from Arrowsmith East (which is 30 km south-east of Dongara) to 10 km south of Eneabba. The development envelope is within this known range. This taxon is known from 36 records that represent approximately 25 populations, five of which occur within DBCA-managed tenure (South Eneabba Nature Reserve, Wotto Nature Reserve and Wilson Nature Reserve). *Stylidium drummondianum* is potentially associated with vegetation types 7a and 8. The proposal will result in clearing of 2.81 ha of potential habitat which represents 0.27% of the local known extent for this species. The impact of the proposal on this species is unlikely to be significant.

Synaphea oulopha (Priority 3)

The clearing of 455 individuals of *Synaphea oulopha* in the disturbance footprint equates to the loss of 20.13% of the known individuals within the local area. This species is known to occur over a range of approximately 68 km in Western Australia (where it is endemic), from Arrowsmith East (which is 30 km south-east of Dongara) in the north to 10 km south of Eneabba in the south. The study area is within the known range of this taxon. This taxon has previously been known from 15 records which represent approximately 12 populations, five of which occur within DBCA-managed tenure (Wilson Nature Reserve, Wotto Nature Reserve and South Eneabba Nature Reserve). *Synaphea oulopha* is potentially associated with vegetation types 7a and 8. The proposal will result in clearing of 2.81 ha of potential habitat which represents 0.27% of the local known extent for this species. The impact of the proposal on this species is unlikely to be significant.

Impacts to priority flora

The EPA acknowledges that the proponent has applied the mitigation hierarchy to reduce the impact to these priority flora species through design of the proposal achievable within the engineering constraints of the flowlines/trunklines and pad designs. Impacts to some of these priority flora species cannot be avoided and may be considered significant at a local scale.

The EPA notes that regional surveys have not been undertaken, however, records of several populations within the region are known. The EPA considers that the proposed clearing will not significantly impact potential available habitat within the local area and the proposal is unlikely to change the conservation status of these priority flora species.

The EPA notes that the proponent has prepared a Rehabilitation Management Plan outlining the proposed rehabilitation of native vegetation with suitable habitat for impacted priority flora species within the disturbance footprint. The Rehabilitation Plan is expected to be implemented for the restoration of 30 ha of habitat following construction activities.

The EPA has recommended limits for the removal of individuals for *Micromyrtus rogeri* (P1) and *Stylidium carnosum* subsp. Narrow leaves (J.A Wege 490) (P1) which would be directly impacted by the proposal (condition B1). It is noted that due to the known and likely regional extent of these species, offsets are not required to be established to counterbalance direct and indirect impacts associated with implementation of the proposal.

The EPA advises that the residual impact to priority flora should be subject to recommended conditions A1 ‘Limitations and Extent of Proposal’, B1 ’Flora and Vegetation’ and B4 ‘Rehabilitation’ to ensure the environmental outcome can be consistent with the EPA objective for flora and vegetation.

The EPA notes that the offset site proposed by the proponent contains the same vegetation types and some of the priority species that are present within the

disturbance footprint and therefore provides potential habitat for the priority flora directly impacted by the proposal (see section 4 ‘Offsets’).

Indirect impact to flora and vegetation

The EPA notes that occurrences of threatened and priority flora within 20 metres of the development envelope may be indirectly impacted from activities associated with the proposal.

The EPA has assessed likely residual impacts to flora and vegetation which may cause a loss or degradation of vegetation from indirect impacts to be:

- dust deposition from construction activities
- increase in the abundance and diversity of weeds
- potential introduction of disease such as dieback
- altered fire regimes.

The potential indirect impacts need to be actively managed to ensure the biological diversity and ecological integrity of the flora and vegetation in the local area is not adversely impacted by implementation of the proposal. The EPA notes that the proponent has prepared a Dieback and Weed Hygiene Management Plan and a Rehabilitation Management Plan to manage potential indirect impacts.

The proponent has committed to implementing a range of management measures to ensure indirect impacts to flora and vegetation are minimised to the greatest extent possible including dust suppression, weed monitoring and control, hygiene management and fire management (Strategen-JBS&G 2022a).

Noting the proponent’s proposed management measures, the EPA is of the view that the proposal is not likely to result in an increased risk of weed or disease spread to surrounding native vegetation above existing levels or result in adverse impacts from dust deposition.

The EPA considers that with appropriate management and implementation of condition B1 ‘Flora and Vegetation’, these indirect impacts can be managed such that the proposal can be implemented to be consistent with the EPA objective for flora and vegetation.

Cumulative impacts

The proponent has considered the potential impacts from the proposal along with existing and reasonably foreseeable cumulative impacts to flora and vegetation occurring in the vicinity of the proposal within the Lesueur Sandplain subregion and provided cumulative data in its ERD (Strategen-JBS&G 2022a) and Response to Submissions document (Strategen-JBS&G 2023).

The EPA’s cumulative impact assessment has considered: cumulative effects due to the range of impacts and pressures in the area affected by the proposal; and whether the environment affected by the proposal has significant value due to other successive, incremental, and interactive cumulative impacts in the assessment area.

It is considered that the cumulative impacts to vegetation in excellent condition, threatened flora and priority flora are not at a level that would warrant a decision to allow no further clearing of these values for this proposal. However, several existing and new proposals for gas extraction and mining impact pressures in the region are such that the EPA must consider and appropriately manage the incremental loss of these values.

The EPA has had regard to the cumulative effects of the proposal by considering this proposal in addition to the existing and proposed projects in close proximity including: West Erregulla 2, 4 and 5 Exploration Wells; Ocean Hill, Natta and Raven Seismic Surveys; Dongara Titanium Minerals Project; Northern Goldfield Interconnect Pipeline; Waitsia Gas Project Stage 2; Cervantes-01 Conventional Well Drilling; Eneabba Mineral Sand Mine; and West Erregulla Field Development Program. The cumulative impacts of the connected West Erregulla Processing Plant and Pipeline proposal are particularly relevant, noting the impacts to local occurrences of several of the significant flora species and similar vegetation types being impacted by this proposal.

Cumulatively, the proposal will contribute to approximately 0.95% of the reasonably foreseeable impact of clearing in the region. Native vegetation remaining in the Lesueur Sandplain subregion is predicted to be 498,930.54 ha (42.43%) as shown in Table 7.13 of the proponent's Response to Submissions (Strategen-JBS&G 2023).

Table 7.15 of the Response to Submissions indicates the proposal will account for 0.03% of clearing to both vegetation associations Tathra 49 and Tathra 379 current remaining extents (Strategen-JBS&G 2023). If all listed proposals proceed, the cumulative impact of clearing to Tathra 49 is 36.27 ha (0.27%) and to Tathra 379 is 296.95 ha (0.27%). Cumulative clearing within the bioregion is not considered to have a significant impact on vegetation associations.

The cumulative impacts to conservation significant flora are provided in the proponent's Response to Submissions (Strategen-JBS&G 2023), which indicates that cumulatively there are 10 significant flora species that will be impacted from other proposals (refer to Table 5 below).

The proponent has indicated that a large extent of the preferred habitat of these significant flora species that align with the mapped vegetation types found in the development envelope will remain intact within the known local area.

The proponent has prepared a Rehabilitation Management Plan outlining proposed rehabilitation activities to be implemented post-construction. The implementation of this Plan will aid in the mitigation of potential direct and indirect impacts through the re-establishment of habitat to support threatened, priority and other conservation significant flora species. The Rehabilitation Management Plan does not explicitly refer to rehabilitation undertaken as part of future decommissioning and closure and requires update to include closure rehabilitation and monitoring that will be required following the completion of operations.

The EPA acknowledges that the proposal will have the effect of reducing the known local extent for some priority flora species. Cumulatively, the impacts to flora and

vegetation are considered limited to a relatively small extent in comparison to the remaining extent of their known regional occurrence and available potential habitat. The EPA considers the environmental outcomes are likely to be consistent with the EPA's objective for flora and vegetation, considering the recommended conditions A1 'Limitations and Extent of Proposal', B1 'Flora and Vegetation', B3 'Environmental Offsets' and B4 'Rehabilitation'. Regulation by other Decision-Making Authorities will require additional actions to further mitigate potential significant impacts to flora and vegetation.

Table 5: Cumulative impacts to conservation significant flora individuals

Species	West Erregulla 2, 4 and 5	Ocean Hill Seismic Survey	Natta Seismic Survey	Raven Seismic Survey	Dongara Titanium Minerals	Northern Goldfield Interconnect Pipeline	Waitsia Gas Project Stage 2	Cervantes-01	Eneabba Mineral Sands	West Eregulla Processing Plant and Pipeline	Total impacted before proposal	West Eregulla Field Development Program	Total cumulative impact	Known extent in region	Cumulative percentage impact
Threatened flora															
Paracaleana dixonii										1	1	4	5	473	1.06%
Priority 1															
Micromyrtus rogeri	70									129	199	458	657	21,998	2.99%
Stylidium carnosum subsp. Narrow leaves (J.A Wege 490)					2						2	4	6	30	20%
Priority 2															
Schoenus badius											0	0	0	177	0%
Priority 3															
Comesperma rhadinocarpum											0	19	19	104	18.27%
Haemodorum loratum											0	9	9	184	4.89%
Hemiandra sp. *Eneabba* (H. Demarz 3687)			20		249					6	275	14	289	634	45.58%

Species	West Erregulla 2, 4 and 5	Ocean Hill Seismic Survey	Natta Seismic Survey	Raven Seismic Survey	Dongara Titanium Minerals	Northern Goldfield Interconnect Pipeline	Waitsia Gas Project Stage 2	Cervantes-01	Eneabba Mineral Sands	West Eregulla Processing Plant and Pipeline	Total impacted before proposal	West Eregulla Field Development Program	Total cumulative impact	Known extent in region	Cumulative percentage impact
Mesomelaena stygia subsp. *deflexa*	289		3,463							1,737	5,489	2,402	7,891	43,202	18.27%
Persoonia filiformis					367						367	140	507	878	57.74%
Persoonia rudis					33						33	2	35	100	35.00%
Stylidium drummondianum	135									12	147	2,881	3,028	19,190	15.78%
Synaphea oulopha	60										60	455	515	2,283	22.59%
Priority 4															
Banksia scabrella	29		4,237		27					5,015	9,308	3,429	12,737	35,415	35.96%
Schoenus griffinianus												6,908	6,908	26,142	26.42%

2.1.10 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on flora and vegetation environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 6.

- The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix C) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

Table 6: Summary of assessment for flora and vegetation

Residual impact or risk to environmental value		Assessment finding or environmental outcome	Recommended conditions and DMA regulation
1.	Clearing of up to 38.46 ha of native vegetation in mainly 'pristine' condition. Loss of four individuals of threatened flora species *Paracaleana dixonii.* Loss of habitat for threatened flora species *Paracaleana dixonii, Thelymitra stellata* and *Daviesia speciosa.* Loss of individuals of 13 priority flora species and direct impact to priority flora habitat including *Micromyrtus rogeri* (P1) and *Stylidium carnosum* subsp. Narrow leaves (J.A Wege 490) (P1).	The proposal will result in the loss of vegetation, including individuals of threatened and priority listed flora. The proponent has prepared a Rehabilitation Management Plan to rehabilitate approximately 30 ha of the disturbance footprint with native vegetation including impacted threatened and priority flora listed species. The proponent has prepared an Offset Strategy to offset the residual impacts to significant flora habitat. The EPA advises that subject to the recommended conditions to limit the extent of clearing and the requirement for rehabilitation and offsets, the significant residual impact can be managed and counterbalanced so that the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.	**Condition A1 (Limitations and extent of proposal)** Limit on the extent of the proposal including the development envelope and clearing extent. **Condition B1 (Flora and Vegetation)** Disturbance limits to clearing of individuals of threatened flora species *Paracaleana dixonii*, and priority flora *Micromyrtus rogeri* (P1) and *Stylidium carnosum* subsp. Narrow leaves (J.A Wege 490) (P1) and habitat that supports *Paracaleana dixonii, Thelymitra stellata, Daviesia speciosa* and priority listed flora. **Condition B4 (Rehabilitation)** Requirement to rehabilitate the disturbance footprint in accordance with an adequate Rehabilitation Management Plan.

Residual impact or risk to environmental value		Assessment finding or environmental outcome	Recommended conditions and DMA regulation
			Condition B3 (Environmental Offsets) Requirement for an adequate updated offset strategy. **DMA legislation** The proponent will need to obtain Ministerial authorisation under BC Act to take or disturb threatened flora. All ground disturbance, construction and operational activities are regulated through plans required under the PGER Act.
2.	Indirect impact to flora and vegetation associated with dust deposition, spread of weeds and dieback and fire risk.	The EPA advises there is unlikely to be significant residual impacts from the spread of weeds, introduction of dieback, dust deposition or fire. The proponent has proposed management measures in the Dieback and Weed Hygiene Management Plan to minimise indirect impacts to flora and vegetation to the greatest extent possible. The EPA considers that, subject to the recommended outcome and requirement for active weed and dieback management and the management of dust, the environmental outcome is likely to be consistent with the EPA objective for flora and vegetation.	**Condition A1 (Limitations and extent of proposal)** Limit on the extent of the proposal including the development envelope and clearing extent. **Condition B1 (Flora and Vegetation)** Environmental outcomes ensuring there are no project attributable adverse impacts from the spread of weeds, introduction of dieback or dust deposition.

2.2 Terrestrial Fauna

2.2.1 Environmental objective

The EPA environmental objective for terrestrial fauna is *to protect terrestrial fauna so that biological diversity and ecological integrity are maintained* (EPA 2016c).

2.2.2 Investigations and surveys

The EPA advises the following surveys were used to inform the assessment of the potential impacts to terrestrial fauna:

- West Erregulla Exploration Program, Warrego Energy 3D Seismic Survey – Level 1 Fauna Assessment (Coffey 2013)
- Review of Key Potential Flora, Vegetation and Fauna values on the proposed flowline/trunkline for Strike Energy near Dongara (Mattiske Consulting 2020)
- Strike Energy West Erregulla gas field project – Level 1 Fauna Assessment (Bamford Consulting Ecologists 2021) (Appendix D of the ERD)
- West Erregulla Pipeline Flora and Fauna Survey (Ecological 2020)
- Molecular identification of a mygalomorph spider (Idiosoma sp.) from near Arrowsmith, Western Australia (Western Australian Museum 2022) (Appendix D of the ERD).

The surveys were not consistent with the *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020a). The EPA notes that the survey dated 2013 was undertaken prior to contemporary EPA (2020a) guidance, however, is provided for context to the environmental values that are proposed to be impacted.

The EPA is aware that only desktop surveys and minimal opportunistic searches (no detailed on-ground surveys) were completed for short-range endemics (SREs) which is not consistent with the *Technical Guidance – Sampling of short range endemic invertebrate fauna* (EPA 2016d). The EPA decided it would proceed with its assessment given the risk of significant impacts is likely to be low based on the linear nature of the disturbance footprint and continuity of potential SRE habitats with equivalent habitats outside of the development envelope.

The EPA expects the proponent to undertake terrestrial fauna assessments consistent with *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020a) and SRE surveys consistent with *Technical Guidance – Sampling of short-range endemic invertebrate fauna* (EPA 2016d) for any future assessments.

2.2.3 Assessment context: existing environment

Fauna habitat

The proposal is located within the Geraldton Sandplains IBRA region and Lesueur Sandplain subregion. Fauna surveys undertaken by the proponent identified three

fauna habitat types or Vegetation and Substrate Associations (VSA's) within the development envelope as follows:

- VSA 1: Heathland on lateritic breakaways – mixed low shrubs of *Allocasuarina, Acacia*, low percentage Proteaceous to 2 metres, most 0.5 metres. This VSA is equivalent to vegetation types 7a, 7b and 8, comprises less than 2% of the development envelope and is well represented in the region.
- VSA 2: Low heath on white-grey sand – isolated *Banksia attenuata* shrub form to 0.75 metres and *Xylomelum angistifolia* to 3 metres. This VSA is equivalent to vegetation types 13a and 14, comprises 60-70% of the development envelope and is well represented in the region.
- VSA 3: Low heath on yellow sand – very low burnt Hakea, understorey to 300 mm, and yellow sand low heath with band of *Allocasuarina campestris* to 2.5 metres and mallee Eucalypts of less than 150 mm diameter at breast height (DBH). This VSA is equivalent to vegetation types 10, 11 and 13b, comprises less than 30-40% of the development envelope and is well represented in the region.

The majority of the development envelope was affected by a fire in 2019. The proponent has considered the vegetation types identified prior to the fire and has aligned the VSA's with these and the fauna habitats previously identified in the 2013 survey undertaken by Coffey.

No wetland or drainage areas were identified within the development envelope and approximately 25% is cleared with existing infrastructure and therefore, does not have any fauna habitat value. The remaining native vegetation within the development envelope is in pristine condition.

Short range endemic fauna habitat

Most of the habitat types within the development envelope were identified as being of low suitability for SRE invertebrate fauna due to the lack of preferred microhabitats which include higher moisture content, bark, leaf litter beds, large debris and south-facing slopes. Habitat type VSA 1, which comprises less than 2% of the development envelope, was identified as having the greatest potential to support SREs due to the exposed lateritic outcropping. Habitat types VSA 2 and VSA 3 occur extensively in the development envelope and surrounding areas of intact native vegetation and may support potential SRE invertebrates (Strategen-JBS&G, 2022a).

Significant fauna

A total of six vertebrate species listed as conservation significant were identified as potentially occurring within the development envelope including:

- Carnaby's black cockatoo (*Zanda latirostris*) – listed as Endangered under the EPBC Act and BC Act
- malleefowl (*Leipoa ocellata*) – listed as Vulnerable under the EPBC Act and the BC Act
- fork-tailed swift (*Apus pacificus*) – listed as Migratory under the EPBC Act and the BC Act

- peregrine falcon (*Falco peregrinus*) – listed as Other specially protected fauna under the BC Act
- western black-striped snake (*Neelaps calonotos*) – listed as Priority 3 under the BC Act
- brush wallaby (*Notamacropus irma*) – listed as Priority 4 under the BC Act.

Carnaby's black cockatoo

The development envelope is located within the mapped distribution of Carnaby's black cockatoo and the nearest known record for this species is 8 km southwest of the development envelope. The development envelope provides moderate quality foraging habitat for Carnaby's black cockatoo and is situated at the northern-most extent of the mapped breeding range. Within the development envelope breeding is considered unlikely given the lack of suitable large trees and no roosting habitat was identified (Strategen-JBS&G 2023).

While the proponent stated there are no records of individuals of Carnaby's black cockatoo within the development envelope, it is likely the fire that occurred in 2019 has decreased the utilisation of the development envelope by the species in the short term.

The Carnaby's black cockatoo is recognised as MNES under the EPBC Act and is further discussed in section 5.

Malleefowl

The proponent reported no evidence of Malleefowl in the development envelope, with no indication of a resident breeding population found during site visits, nor in the surrounding areas during previous surveys (Strategen-JBS&G 2022a). The proponent stated that the species has been occasionally recorded in the general area and the WA Museum had reported breeding mounds in the general region, but details were not available. It was considered that much of the vegetation in the development envelope may be too low to support habitat, given malleefowl usually occurs in woodlands and tall shrublands. This species was therefore considered unlikely to occur in the development envelope and no further assessment was undertaken.

Invertebrate/Short range endemic fauna

Desktop studies identified 3 listed SRE species and 3 listed invertebrate species of conservation significance with the potential to occur in the development envelope:

- Geraldton sandplain shield-backed trapdoor spider (*Idiosoma arenaceum*) listed as Priority 3 under the BC Act
- kwongan heath shield-backed trapdoor spider (*Idiosoma kwongan*) listed as Priority 3 under the BC Act
- a bothriembryontid land snail (Moore River) (*Bothriembryon perobesus*) listed as Priority 3 under the BC Act

- thorny bush katydid (Moora) (*Hemisaga vepreculae*) listed as Priority 2 under the BC Act
- woolybush bee (*Hylaeus globuliferus*) listed as Priority 3 under the BC Act
- springtime corroboree stick katydid (Eneabba) (*Phasmodes jeeba*) listed as Priority 3 under the BC Act.

The Kwongan heath shield-backed trapdoor spider is considered a resident to the area. The other SRE species are considered to have the potential to occur having previously been recorded within 50 km of the development envelope; however, there is limited information available regarding the habitat preference and distribution of these species (Strategen-JBS&G 2022a).

Five trapdoor spider burrows were recorded within a narrow band of unburnt *Allocasuarina campestris*, associated with VSA 1 fauna habitat type during opportunistic observations undertaken by the proponent. It is considered possible that the trapdoor spider may occur throughout the entire development envelope given vegetation which contains *Allocasuarina* species comprises approximately 82% of the development envelope (Strategen-JBS&G 2022a).

2.2.4 Consultation

Matters raised during stakeholder consultation and the proponent's responses are provided in the Response to Submissions document (Strategen-JBS&G 2023). Key issues raised during public consultation on the proposal included impacts to threatened fauna habitat, particularly the clearing of over 38.46 hectares of native vegetation that is known or likely moderate quality foraging habitat for the Carnaby's black cockatoo.

How these issues have been considered in the assessment are described in the sections below (sections 2.2.7, 2.2.8 and 2.2.9).

2.2.5 Potential impacts from the proposal

The proposal has the potential to significantly impact on terrestrial fauna from:

- loss of 0.77 ha of heathland on lateritic breakaways (fauna habitat VSA 1) which is considered foraging habitat for Carnaby's cockatoo and potential SRE habitat
- loss of 10.82 ha of low heath on white-grey sand (fauna habitat VSA 2) which is considered potential foraging habitat for Carnaby's cockatoo
- loss of 26.87 ha of low heath on yellow sand (fauna habitat VSA 3) which is considered potential foraging habitat for Carnaby's cockatoo
- injury, mortality or displacement during construction and operation
- indirect impacts including:
    - fragmentation of fauna habitat
    - a decline in health and/or change in habitat composition arising from dust deposition, introduction/spread of weeds and dieback, and altered fire regimes
    - increased feral animal activity

- light overspill and noise.

2.2.6 Avoidance measures

The proponent has stated that clearing of fauna habitat cannot be avoided in implementing the proposal, therefore avoidance measures have not been proposed.

2.2.7 Minimisation measures (including regulation by other DMAs)

The proponent has proposed the following measures to minimise impacts to terrestrial fauna:

- locating the development envelope within previously cleared areas where possible to minimise the clearing of fauna habitat
- implementing vehicle speed limits and restricting movements to designated or existing roads and tracks
- undertaking construction activities during daylight hours only
- daily trench inspections and implementing measures such as fauna egress from water storage ponds and trenches, fauna shelters and ramps
- implementing dust management measures
- using screening or sheeting material over the well site and access road during construction activities
- ensuring all machinery and vehicles undertaking clearing activities have fire extinguishers
- monitoring DFES alerts regarding fire bans during high-risk activities
- undertaking all ground disturbance, construction and operational activities in accordance with a DMIRS Environment Plan as required under the PGER Act and associated regulations.

2.2.8 Rehabilitation measures

The proponent has proposed that an area of at least 30 ha which is not required for ongoing operation will be rehabilitated following completion of construction, estimated to commence in June 2024. The proponent has indicated that the rehabilitation areas will be re-contoured to match the surrounding landforms, erosion controls implemented where necessary and re-establishing suitable foraging species for Carnaby's cockatoo to provide fauna habitat.

The EPA notes that the proponent has prepared a Rehabilitation Management Plan outlining proposed activities post-construction but does not explicitly refer to rehabilitation undertaken as part of future decommissioning and closure.

2.2.9 Assessment of impacts to environmental values

The EPA considers that the key environmental value for terrestrial fauna likely to be impacted by the proposal is foraging habitat for Carnaby's black cockatoo.

In assessing this proposal, the EPA has had regard to the combined and cumulative effect that surrounding approved and proposed projects may have on terrestrial fauna, in particular the associated West Erregulla Processing Plant and Pipeline proposal.

Carnaby's black cockatoo foraging habitat

Implementation of the proposal will require clearing of up to 38.46 ha of moderate quality foraging habitat for Carnaby's black cockatoo, listed as endangered under the EPBC Act and BC Act. There is the potential for indirect impact of up to 13.42 ha of moderate quality foraging habitat due to impacts within five metres either side of the disturbance footprint, such as dust or minor vehicle deviations from the designated access tracks.

The residual impact to Carnaby's black cockatoo may exacerbate some of the threatening processes as outlined in the Recovery Plan for the species (Department of Parks and Wildlife 2013).

The EPA notes that the proponent has prepared a Rehabilitation Management Plan to re-establish up to 30 ha of habitat for Carnaby's black cockatoo within the disturbance footprint following construction activities, which will reflect the foraging habitat composition that was present pre-disturbance.

The EPA has assessed the residual impact to Carnaby's black cockatoo to be significant. This is consistent with the WA Environmental Offsets Guidelines (Government of Western Australia 2014) and EPBC Act Environmental Offsets Policy definition of significant residual impact. The EPA considers that the offset proposed by the proponent, as described and assessed in section 4 (Offsets), is likely to adequately counterbalance this significant residual impact.

The EPA advises that the significant residual impact is likely to be able to be regulated through recommended conditions A1 'Limitations and Extent of Proposal', B2 'Terrestrial Fauna', 'B3 'Environmental Offsets' and B4 'Rehabilitation' so that the Carnaby's black cockatoo is protected, and the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.

Fauna mortality or injury

The proposal may result in impacts to conservation significant fauna during construction activities due to vehicle and machinery movements, being trapped in open trenches or water storage ponds, or coming into contact with drilling chemicals. The proponent has committed to a range of mitigation and management measures to minimise these risks to fauna.

The EPA considers that through recommended condition B2 'Terrestrial Fauna' to manage construction activities and trenching, the proposal can be managed to minimise adverse impacts on individuals of significant fauna and be consistent with the EPA objective for terrestrial fauna.

Indirect impact to terrestrial fauna

The EPA has assessed likely residual impacts on terrestrial fauna from indirect impacts to be:

- fragmentation of fauna habitat
- a decline in health and/or change in habitat composition arising from dust deposition, introduction/spread of weeds and dieback, and altered fire regimes
- increased feral animal activity
- light overspill and noise.

The potential indirect impacts need to be actively managed to ensure the biological diversity and ecological integrity of the terrestrial fauna in the local area is not adversely impacted by the implementation of the proposal. The EPA notes that the proponent has prepared a Dieback and Weed Hygiene Management Plan to manage potential indirect impacts to critical vegetation that provides habitat.

The EPA considers that in accordance with the proponent's proposed management and mitigation measures and implementation of recommended condition B2 'Terrestrial Fauna', these potential indirect impacts can be managed such that the proposal can be implemented to be consistent with the EPA objective for terrestrial fauna.

Cumulative Impacts

The proponent has considered the existing and reasonably foreseeable cumulative impacts to terrestrial fauna in the vicinity of the proposal in the Lesueur Sandplain subregion. There are 13 other proposals that will cumulatively impact on terrestrial fauna resulting in the loss of 4,046.46 ha of potential habitat directly impacted (Response to Submissions Table 8-8) (Strategen-JBS&G 2023).

The proposal will contribute to regional cumulative impacts to fauna habitats and species which are present in the development envelope. The potential impacts to priority fauna and SREs are considered unlikely to be material given the linear nature of the proposal, relatively small amount of vegetation clearing, limited microhabitat suitable for supporting SREs within the development envelope, the presence of similar habitat available outside the development envelope and the proponent's minimisation and rehabilitation measures.

The EPA notes that cumulatively, the associated West Erregulla Processing Plant and Pipeline proposal would result in the direct loss of an additional 37.7 ha of Carnaby's black cockatoo foraging habitat from within the Lesueur Sandplain subregion, resulting in a total impact of both West Erregulla proposals of 76.16 ha.

It is acknowledged that Carnaby's black cockatoo will be affected by cumulative impacts in the wider Midwest region as the species utilises various habitats and flora species for foraging. Given the context of cumulative impacts and pressures on Carnaby's black cockatoo, the EPA considers that replacement of habitat through rehabilitation is necessary to ensure impacts are counterbalanced. The proponent is

proposing to rehabilitate 30 ha of the disturbance footprint, post-construction activities, with vegetation that will reflect the foraging habitat composition present in the pre-disturbed habitat type.

The EPA advises that the significant residual impacts to foraging habitat can be regulated through recommended conditions A1 'Limitations and Extent of Proposal', B2 'Terrestrial Fauna' and B4 'Rehabilitation' and counterbalanced by offsets (condition B3 'Environmental Offsets') so that Carnaby's cockatoo habitat is protected, and the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.

2.2.10 Summary of key factor assessment and recommended regulation

The EPA has considered the likely residual impacts of the proposal on terrestrial fauna environmental values. In doing so, the EPA has considered whether reasonable conditions could be imposed, or other decision-making processes can ensure consistency with the EPA factor objective. The EPA assessment findings are presented in Table 7.

The EPA has also considered the principles of the *Environmental Protection Act 1986* (see Appendix C) in assessing whether the residual impacts will be consistent with its environmental factor objective and whether reasonable conditions can be imposed (see Appendix A).

Table 7: Summary of assessment for terrestrial fauna

Residual impact or risk to environmental value		Assessment finding or environmental outcome	Recommended conditions and DMA regulation
1.	Loss of 38.46 ha of foraging habitat for Carnaby's black cockatoo.	The proposal will result in the loss of moderate value foraging habitat for Carnaby's black cockatoo. The proponent has prepared a Rehabilitation Management Plan to rehabilitate approximately 30 ha of the disturbance footprint with native vegetation which will reflect the foraging habitat composition present in the pre-disturbed habitat type. The proponent has prepared an Offset Strategy to offset the residual impacts to significant fauna habitat. The EPA advises that subject to the recommended conditions to limit the extent of clearing and the requirement for rehabilitation and offsets, the significant residual impact can be managed and counterbalanced so that the	**Condition A1 (Limitations and extent on proposal)** Limit on the extent of the proposal including the development envelope and clearing extent. **Condition B2 (Terrestrial Fauna)** Disturbance limits to clearing of habitat that supports Carnaby's black cockatoo. **Condition B4 (Rehabilitation)** Requirement to rehabilitate the disturbance footprint in accordance with an adequate Rehabilitation Management Plan.

Residual impact or risk to environmental value		Assessment finding or environmental outcome	Recommended conditions and DMA regulation
		environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.	**Condition B3 (Environmental Offsets)** Requirement for an adequate Offset Strategy and Management Plan.
2.	Fauna mortality or injury during construction due to vehicle and machinery movements and being trapped in open trenches or water storage ponds or coming into contact with drilling chemicals.	The EPA advises that subject to the recommended conditions to minimise the risk of physical injury or mortality, behavioural changes and health impacts, and setting trench construction requirements, the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.	**Condition B2 (Terrestrial Fauna)** Set trench construction requirements and minimise the risk of indirect impacts to terrestrial fauna. **DMA legislation** All ground disturbance, construction and operational activities are regulated through plans required under the PGER Act.
3.	Indirect impact to terrestrial fauna associated with fragmentation of habitat, dust deposition, increased feral animal activity, light overspill, noise and altered fire regimes.	The EPA advises that subject to the recommended outcome and requirement to minimise the risk of adverse impacts and limit indirect disturbance to terrestrial fauna, the environmental outcome is likely to be consistent with the EPA objective for terrestrial fauna.	**Condition A1 (Limitations and extent of proposal)** Limit on the extent of the proposal including the development envelope and clearing extent. **Condition B2 (Terrestrial Fauna)** Requirement for management of indirect impacts on terrestrial fauna. **DMA legislation** All ground disturbance, construction and operational activities are regulated through plans required under the PGER Act.

3 Holistic Assessment

While the EPA assessed the impacts of the proposal against the key environmental factors and environmental values individually in the key factor assessments above, given the link between flora, vegetation and terrestrial fauna, the EPA also considered connections and interactions between them to inform a holistic view of impacts to the whole environment.

Figure 3 illustrates the connections and interactions between the key environmental factors, and greenhouse gas emissions described in Appendix D, to inform the EPA's holistic assessment.

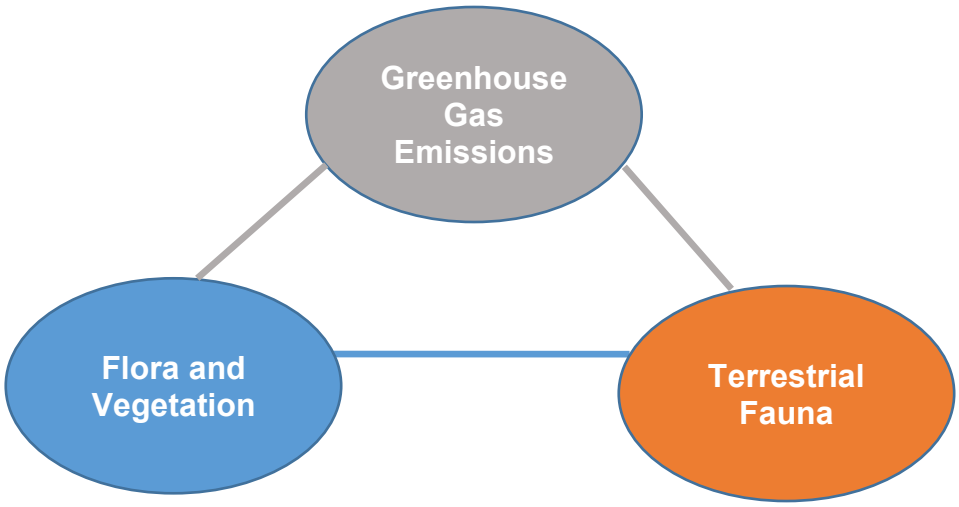

Figure 3: Intrinsic interactions between environmental factors

Flora and Vegetation – Terrestrial Fauna

There is a high degree of connectivity between the environmental factors of flora, vegetation and terrestrial fauna. Terrestrial fauna has a key reliance on flora and vegetation for habitat. The 38.46 ha of native vegetation proposed to be cleared within the Lesueur Sandplain subregion, is largely in pristine condition, of high floristic diversity, and provides foraging habitat for threatened fauna including Carnaby's black cockatoo.

The EPA is aware of the number of other proposals in the wider Midwest region and has considered the proposal in the context of its cumulative impact. The EPA notes that on a bioregional scale, implementation of this proposal would contribute to cumulative impacts through loss of conservation significant flora and fauna habitat. However, the impacts are not to a level that would alter the likely outcomes of any mitigation measure, rehabilitation or offset implemented as part of this proposal.

The EPA considers that the proposed mitigation and management measures and recommended conditions for impacts to flora, vegetation and terrestrial fauna, including rehabilitation and the provision of offsets to counterbalance impacts, will likely be consistent with the EPA environmental factor objectives.

Greenhouse Gas Emissions

There is an established link between greenhouse gas (GHG) emissions and the risk of climate change. The EPA recognises that climate change will impact Western Australia's environment and environmental values.

The EPA has considered GHG emissions associated with this proposal, which are estimated to be 25,581 tonnes CO_2-e per annum scope 1 emissions during construction; and the related West Erregulla Processing Plant and Pipeline proposal, which are estimated to be 96,319 tonnes CO_2-e per annum scope 1 emissions (optimised).

The EPA considers that implementation of this proposal alone will not cause significant impact and that the proposed mitigation conditions to regulate GHG emissions for the combined West Erregulla proposals will also mean that the impacts to other factors and values of the environment including the values associated with flora and vegetation and terrestrial fauna are likely to be consistent with the EPA environmental factor objectives.

Summary of holistic assessment

When the separate environmental factors and values affected by the proposal were considered together in a holistic assessment, the EPA formed the view that the impacts from the proposal would not alter the EPA's views about consistency with the EPA factor objectives as assessed in section 2.

4 Offsets

Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual impacts of a proposal.

Consistent with the *WA Environmental Offsets Guidelines* (Government of Western Australia 2014), the EPA may consider the application of environmental offsets to a proposal where it determines that the residual impacts of a proposal are significant, after avoidance, minimisation and rehabilitation have been pursued.

In the case of this proposal, likely (and potential) significant impacts are:

- loss of 38.46 ha of pristine quality native vegetation
- loss of 4 individuals of threatened flora *Paracaleana dixonii*
- loss of 14.77 ha of habitat for *Paracaleana dixonii*
- loss of 10.29 ha of habitat for threatened flora *Daviesia speciosa*
- loss of 21.44 ha of habitat for threatened flora *Thelymitra stellata*
- loss of 38.46 ha of Carnaby's black cockatoo (*Zanda latirostris*) moderate quality foraging habitat.

Environmental offsets are not appropriate in all cases. In this case the EPA considers offsets are appropriate for flora and vegetation and terrestrial fauna values given:

- the proponent's application of the mitigation hierarchy to reduce potential impacts (principle 1 of the WA Environmental Offsets Policy)
- the magnitude of the likely significant residual impacts on environmental biodiversity values facing increasing pressures, such as threatened flora and fauna habitat (principle 2 of the WA Environmental Offsets Policy)
- the residual impacts can be counterbalanced by the provision of significant additional offsets that are likely to have a long-term strategic benefit and demonstrated environmental benefit (principle 6 of the WA Environmental Offsets Policy).

Proposed offsets

The proponent has proposed the following offsets, as detailed in their Offset Strategy (Strategen-JBS&G 2022b):

- acquisition and on-ground management of a 350 ha portion of a property at Lots 10106 and 10107, 2087 Yandanooka West Road, Mount Adams located approximately 1.5 km to the northwest of the development envelope at its closest point (Figure 4) via the application of a conservation covenant
- contribution to research opportunities to increase the knowledge and understanding of *Paracaleana dixonii* to align with the recovery and threat abatement actions to support recovery of this species.

Direct offset – land acquisition

The proponent has identified a 350 ha portion of land as a suitable offset site to fully counterbalance the significant residual impacts of the proposal to Carnaby's black cockatoo habitat and provide habitat for conservation significant flora species.

In assessing the suitability of this offset, the EPA notes that the offset site contains the same vegetation types to that present within the disturbance footprint and comprises potential habitat for the three threatened flora and 13 priority flora species impacted by the proposal. The majority of the vegetation at the offset site was reported to be in pristine condition with a smaller area considered to be in very good to excellent condition (Strategen-JBS&G 2021b).

The EPA notes that all significant flora species have either been previously recorded in the offset site or have the potential to occur. Seven priority listed species were also recorded in the offset site across both surveys, three of which have been recorded within the disturbance footprint (Strategen-JBS&G 2021b). The broader area was subject to fire in 2019, as a result the vegetation was noted to still be recovering.

The EPA notes that the offset site has been mapped as low to moderate quality Carnaby's black cockatoo foraging habitat, which is comparable to the foraging habitat that will be impacted by implementation of the proposal.

The EPA considers that the values of the offset site are relevant to the environmental values being impacted.

The EPA notes that the offset site represents a significant area of remnant native vegetation in a region that has predominantly been cleared for agriculture and is directly adjacent to unallocated crown land in proximity to the proposal. The proponent proposes to secure and protect the offset site through a conservation covenant. Mitigation and management measures are proposed to be undertaken, such as fencing, rubbish removal, weed and feral animal control to improve and maintain the quality of the offset site.

The EPA has considered whether the proposed offsets are likely to counterbalance significant residual impacts. The EPA's view is that the protection and conservation of significant flora and vegetation habitat and terrestrial fauna habitat though the provision and implementation of offsets is likely to be consistent with the EPA's objective for terrestrial fauna and flora and vegetation.

The EPA recommends condition B3 be imposed, requiring the proponent to implement offset measures to counterbalance the significant residual impact of direct and indirect impacts to flora and vegetation and terrestrial fauna habitat. Condition B3-3 sets out the requirements to review and revise the Offset Strategy including management measures, completion criteria and contingency to demonstrate that the objective to counterbalance the significant residual impacts will be met.

Indirect offset – research opportunities

The proponent has proposed additional measures to support the recovery of the threatened flora species, *Paracaleana dixonii,* for which there is currently limited knowledge and understanding. The proponent commits to investigations and contribution to research opportunities with research institutions, including funding or other in-kind support. The research opportunities are intended to align with the recovery and threat abatement actions to support the recovery of *Paracaleana dixonii.*

Consistent with the WA Offset Policy, the EPA advises that research should be considered to add value to the outcomes of on-ground management and scientific understanding of the environmental value being offset. In this case, the EPA considers that *Paracaleana dixonii* research would contribute to counterbalancing the significant residual impacts of the proposal by addressing knowledge gaps and providing valuable information to support the certainty of long-term environmental outcomes for the species. The EPA advises that combining the long-term environmental outcomes of research with the short to longer-term outcomes of land acquisition, revegetation and on-ground management is the preferred approach as this would likely provide a more holistic counterbalance of impacts.

The EPA recommends condition B3-5 be imposed, requiring the proponent to undertake indirect offset measures to counterbalance the significant residual impact to *Paracaleana dixonii*.

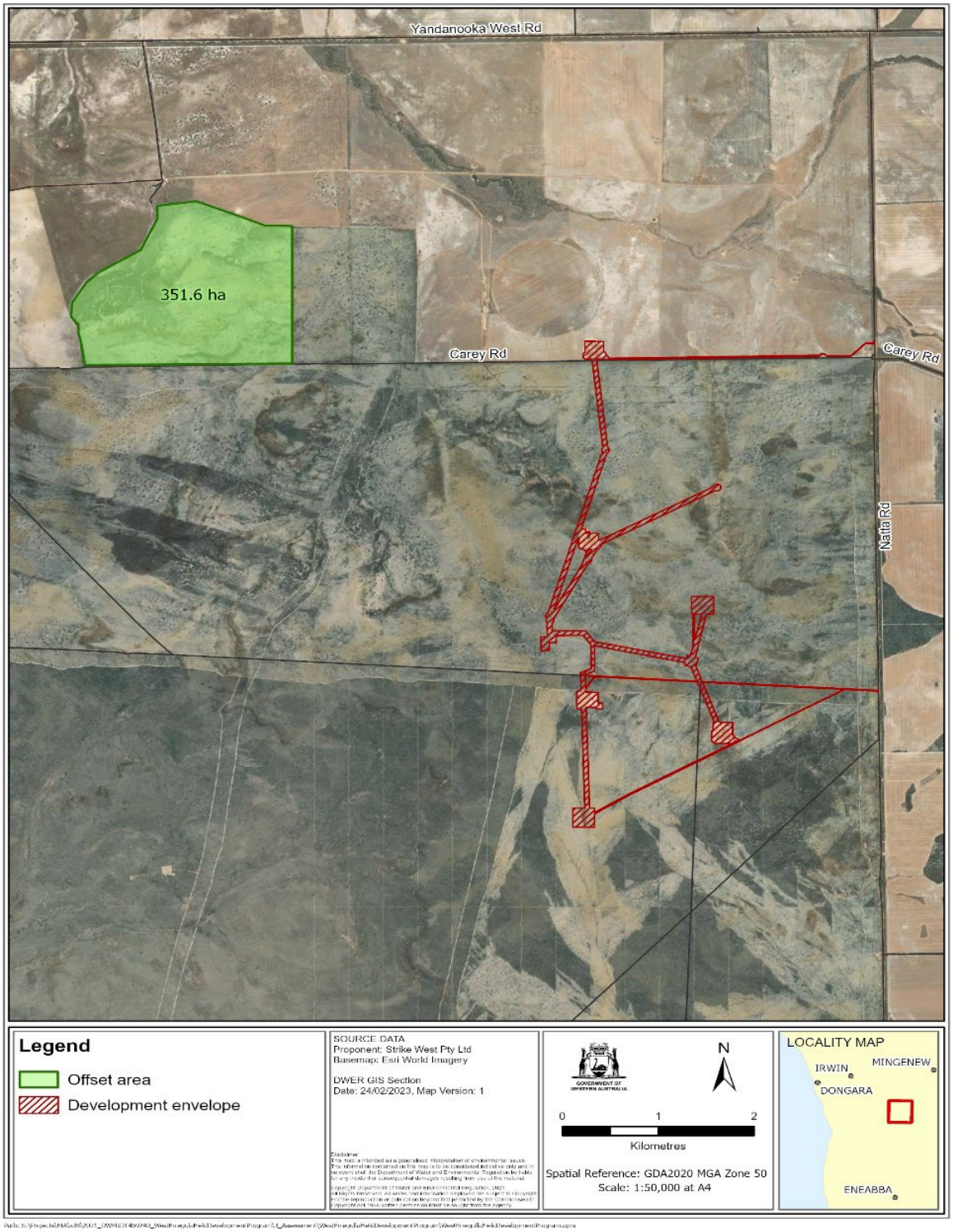

Figure 4: Offset site location

5 Matters of national environmental significance

The Commonwealth Minister for the Environment has determined that the proposal is a controlled action under the EPBC Act (EPBC 2021/8991) as it is likely to have a significant impact on one or more matters of national environmental significance (MNES). It was determined that the proposed action is likely to have a significant impact on the following matters protected by the EPBC Act:

- Listed threatened species and communities (section 18 and 18A).

The EPA has assessed the controlled action on behalf of the Commonwealth as an accredited assessment under the EPBC Act.

This assessment report is provided to the Commonwealth Minister for Environment who will decide whether or not to approve the proposal under the EPBC Act. This is separate from any Western Australian approval that may be required.

Commonwealth policy and guidance

The EPA had regard to the following relevant Commonwealth guidelines, policies and plans during its assessment:

- *Approved Conservation Advice for* Paracaleana dixonii Hopper & A.P.Br. nom. inval. (Sandplain Duck Orchid) (Department of the Environment, Water, Heritage and the Arts 2008)
- *Approved Conservation Advice for* Thelymitra stellata (Star Sun-orchid) (Department of the Environment, Water, Heritage and the Arts 2008)
- *Approved Conservation Advice for* Daviesia speciosa (Beautiful Daviesia) (Department of the Environment, Water, Heritage and the Arts 2008)
- *Carnaby's Cockatoo* (Calyptorhynchus latirostris) *Recovery Plan* (Department of Parks and Wildlife 2013)
- Commonwealth EPBC Act Environmental Offsets Policy (Commonwealth of Australia 2012)
- *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy (Department of Sustainability, Environment, Water, Population and Communities 2012)
- Referral guideline for three WA threatened black cockatoo species: Carnaby's Cockatoo (Zanda latirostris), Baudin's Cockatoo (Zanda baudinii) and the Forest Red-tailed Black cockatoo (Calyptorhynchus banksia naso) (Commonwealth of Australia 2022)
- *Threat abatement plan for disease in natural ecosystems caused by* Phytophthora cinnamomi (Department of the Environment and Energy 2018).

The EPA considers that the approach taken by the proponent generally aligns with the requirements of the recovery plans and policies.

EPA assessment

Impacts to the environment relating to MNES are also covered under the key environmental factors flora and vegetation (section 2.1 of this report) and terrestrial fauna (section 2.2 of this report).

Listed threatened species and communities (sections 18 and 18A)

Paracaleana dixonii (Sandplain duck orchid)

Paracaleana dixonii is listed as Endangered under the EPBC Act and Vulnerable under the BC Act. This species will be impacted through the loss of up to 4 known individuals and the clearing of up to 14.77 ha of potential habitat. *Paracaleana dixonii* may also be indirectly impacted through fragmentation of native vegetation, dust deposition, spread of weeds, introduction of dieback and altered fire regimes. There are no species-specific referral guidelines or recovery plans in place for *Paracaleana dixonii.*

The EPA has assessed the direct and indirect impacts of the proposal to this species and considers that there will be a significant residual impact from the clearing of known individuals and potential habitat for *Paracaleana dixonii*. The EPA has recommended condition A1 to limit the location and extent of the proposal, B1 to manage direct and indirect impacts to flora and vegetation, rehabilitation condition B4 and offset condition B3 (see section 4) which takes into account the significant residual impact to this species.

Thelymitra stellata (Star sun orchid)

Thelymitra stellata is listed as Endangered under the EPBC Act and the BC Act. This species will be impacted through clearing of up to 21.44 ha of potential habitat. A total of nine individuals of *Thelymitra stellata* were recorded from within the development envelope; however, none will be cleared as a result of the proposal. The species may also be indirectly impacted through fragmentation of native vegetation, dust deposition, spread of weeds, introduction of dieback and altered fire regimes. There are no species-specific referral guidelines or recovery plans in place for *Thelymitra stellata.*

The EPA has assessed the direct and indirect impacts of the proposal to this species and considers that there will be a significant residual impact from the clearing of potential habitat for *Thelymitra stellata*. The EPA has recommended condition A1 to limit the location and extent of the proposal, B1 to manage direct and indirect impacts to flora and vegetation, rehabilitation condition B4 and offset condition B3 (see section 4) which takes into account the significant residual impact to this species.

Daviesia speciosa (Beautiful daviesia)

Daviesia speciosa is listed as Endangered under the EPBC Act and the BC Act. This species will be impacted through the clearing of up to 10.29 ha of potential habitat. No individuals of *Daviesia speciosa* have been recorded within the development envelope. The species may also be indirectly impacted through fragmentation of native vegetation, dust deposition, spread of weeds, introduction of dieback and

altered fire regimes. There are no species-specific referral guidelines or recovery plans in place for *Daviesia speciosa.*

The EPA has assessed the direct and indirect impacts of the proposal to this species and considers that there will be a significant residual impact from the clearing of potential habitat for *Daviesia speciosa*. The EPA has recommended condition A1 to limit the location and extent of the proposal, B1 to manage direct and indirect impacts to flora and vegetation, rehabilitation condition B4 and offset condition B3 (see section 4) which takes into account the significant residual impact to this species.

Zanda latirostris (Carnaby's black cockatoo)

Carnaby's black cockatoo is listed as Endangered under the EPBC Act and BC Act. Potential impacts to Carnaby's black cockatoo have been considered in the context of the Carnaby's Cockatoo Recovery Plan (Department of Parks and Wildlife 2013). Carnaby's black cockatoo will be impacted by the clearing of up to 38.46 ha of moderate value foraging habitat. There have been no records of individuals of Carnaby's from within the development envelope and there are no breeding or roosting trees. The species may also be indirectly impacted through fragmentation of fauna habitat, vehicle/machinery strike, a decline in health and/or change in habitat composition arising from dust deposition, introduction/spread of weeds and dieback, and altered fire regimes, increased feral animal activity, and light overspill and noise.

The EPA has assessed the direct and indirect impacts of the proposal to this species and considers that there will be a significant residual impact from the clearing of potential habitat for Carnaby's black cockatoo. The EPA has recommended condition A1 to limit the location and extent of the proposal, B2 to manage direct and indirect impacts to terrestrial fauna, rehabilitation condition B4 and offset condition B3 (see section 4) which takes into account the significant residual impact to this species.

Summary

The EPA recommends the following environmental conditions to minimise impacts on MNES:

- condition A1 (Limitations and Extent of Proposal) – limits on the location and authorised extent of the clearing of vegetation to 38.46 ha
- condition B1 (Flora and Vegetation) – limits on clearing of flora and vegetation MNES values and requirements to avoid indirect impacts from disease, weeds and dust emissions
- condition B2 (Terrestrial Fauna) – limits on clearing of Carnaby's black cockatoo foraging habitat and requirements to avoid or minimise potential indirect impacts to fauna during construction
- condition B3 (Environmental Offsets) – requires implementation of an offset to counterbalance the significant residual impacts to MNES including loss of Carnaby's cockatoo foraging habitat and the loss of individuals and potential habitat for threatened flora species

- condition B4 (Rehabilitation) – requires implementation of rehabilitation activities to counterbalance the significant residual impacts to flora, vegetation and terrestrial fauna MNES values.

The EPA's view is that the impacts from the proposal on the above-listed MNES are therefore not expected to result in an unacceptable or unsustainable impact on the listed threatened species and communities.

6 Recommendations

The EPA has taken the following into account in its assessment of the proposal:

- environmental values which may be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely environmental outcomes which can be achieved with the imposition of conditions
- consistency of environmental outcomes with the EPA objectives for the key environmental factors
- EPA's confidence in the proponents proposed mitigation measures
- whether other statutory decision-making processes can mitigate the potential impacts of the proposal on the environment
- principles of the EP Act.

The EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix A.

7 Other advice

The EPA may, if it sees fit, include other information, advice or recommendations relevant to the environment in its assessment reports, even if that information has not been taken into account by the EPA in its assessment of a proposal.

It is noted that environmental survey data provided by the proponent was limited in extent and varied from the relevant EPA technical guidance. The EPA determined it could proceed with its assessment with the available qualitative contextual information to support its assessment. It is noted that for future impact assessment in this region, the EPA expects the proponent to provide information that is consistent with the relevant technical guidelines and to provide quantitative local and regional information to support a thorough impact assessment for flora and vegetation and terrestrial fauna.

The EPA provides the following information for consideration by the Minister.

The EPA notes that onshore petroleum development activity associated with the proposal will be subject to the *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act) and associated regulations, administered by the Department of Mines, Industry Regulation and Safety (DMIRS). The *Petroleum Pipelines Act 1969* will apply to petroleum flowline/trunklines on land within the State. These Acts will apply further statutory requirements to limit potential impacts from the construction, operation and decommissioning of the proposal on the environment.

The DWER administers the *Rights in Water and Irrigation Act 1914* (RiWI Act) that provides for the granting of licences and permits to abstract groundwater and surface water. The EPA notes that abstraction of groundwater from the Yarragadee aquifer required for this proposal will be managed by DWER under the proponent's existing groundwater licence, which contains conditions to ensure that drawdown is monitored and impacts on nearby groundwater users are controlled. Further statutory requirements to limit potential impacts to groundwater from gas well operation will be subject to further regulation by DMIRS under the PGER Act.

The EPA notes there are several existing and new proposals for gas extraction and processing in the Mid West region. The EPA considers there is a need for infrastructure planning in the region to avoid increased environmental impacts from clearing from multiple plants, fragmentation of habitat from multiple pipelines, decreased ability to take advantage of emissions efficiencies and reductions which are only available at scale and planning for offsets to deliver environmental protection at a local and regional scale. In meantime, the EPA advises proponents to consider cumulative effects and avoid separate referral of co-dependent proposals which may undermine the EPA's ability to assess and the Minister's ability to make decisions about proposals.

While the potential greenhouse gas emissions from this proposal have not been assessed as significant, the EPA has considered the cumulative impacts on greenhouse gas emissions from this proposal and the connected AGIO West Erregulla Processing Plant and Pipeline proposal. It is noted that AGIO has

considered the combined emissions for the processing plant and pipeline (West Erregulla Processing Plant and Pipeline proposal) and this proposal (West Erregulla Field Development Program) to assist in the cumulative impact assessment, and has prepared a Greenhouse Gas Environmental Management Plan which has been assessed by the EPA and will be subject to conditions associated with implementation of that proposal.

Consultation with the Department of Planning, Lands and Heritage recommended that the proponent establish a Cultural Heritage Management Plan with the Yamatji Nation Indigenous Land Use Agreement through the Yamatji Southern Regional Corporation, to address Aboriginal cultural heritage matters and manage the disturbance of any potential Aboriginal heritage sites in accordance with the requirements of the *Aboriginal Heritage Act 1972*.

The EPA notes there is community concern regarding this proposal and associated West Erregulla Processing Plant and Pipeline proposal, and their potential impact on the environment. The EPA recommends ongoing consultation between the proponent and the community as the project progresses.

Appendix A: Recommended conditions

Section 44(2)(b) of *Environmental Protection Act 1986* specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This appendix contains the EPA's recommended conditions and procedures.

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
***(Environmental Protection Act 1986*)**

WEST ERREGULLA FIELD DEVELOPMENT PROGRAM

Proposal:	The proposal will involve the construction and operation of a gathering system to connect the West Erregulla Gas Field and convey the extracted gas to an upstream separating facility, collectively known as the West Erregulla Field Development Program (the Proposal). The proposal will supply gas to a third party operated gas processing facility.
Proponent:	Strike West Pty Ltd Australian Company Number 625 161 846
Proponent address:	Level 1, 40 Kings Park Road West Perth, WA, 6005
Assessment number:	2308

Report of the Environmental Protection Authority: 1748

Introduction: Pursuant to section 45 of the *Environmental Protection Act 1986,* it has been agreed that the proposal entitled West Erregulla Field Development Program described in the 'Proposal Content Document' attachment of the referral of 23 June 2021 as amended by the change to proposal approved under s. 43A on 7 January 2022, may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

Conditions and procedures

Part A: Proposal extent

Part B: Environmental outcomes, prescriptions and objectives

Part C: Environmental management plans and monitoring

Part D: Compliance and other conditions

PART A: PROPOSAL EXTENT

A1 Limitations and Extent of Proposal

A1-1 The proponent must ensure that the proposal is implemented in such a manner that the following limitations or maximum extents / capacities / ranges are not exceeded:

Proposal element	Location	Maximum extent
Physical elements		
Development envelope and disturbance footprint	Figure 2	No more than 65.66 **ha** within a 93.97 **ha** development envelope
Direct disturbance of native vegetation	Figure 2	No more than 38.46 **ha** within a 93.97 **ha** development envelope
Timing elements		
Project life		20 years

PART B – ENVIRONMENTAL OUTCOMES, PRESCRIPTIONS AND OBJECTIVES

B1 Flora and Vegetation

B1-1 The proponent must ensure the implementation of the proposal achieves the following **outcomes**:

(1) **disturbance** or **adverse impact** to no more than:

(a) four (4) individuals of the Sandplain Duck Orchid (*Paracaleana dixonii*);

(b) 14.77 **ha** of potential habitat (**VT** 7b, 10 and 13a) for the Sandplain Duck Orchid (*Paracaleana dixonii*)*;*

(c) 21.44 **ha** of potential habitat (**VT** 7a, 7b, 8, 11 and 13a) for the Star Sun Orchid (*Thelymitra stellata*);

(d) 10.29 **ha** of potential habitat (**VT** 7a, 7b and 8) for the Beautiful Daviesia (*Daviesia speciosa*);

(e) 458 individuals of *Micromyrtus rogeri*; and

(f) four (4) individuals of *Stylidium carnosum* subsp. Narrow leaves (J.A. Wedge 490).

(2) no **adverse indirect impacts** to native vegetation within twenty (20) metres outside the development envelope.

B1-2 The proponent shall undertake the following actions during **construction** and **operation** activities to meet the following environmental **objectives**:

(1) implement **management actions** to ensure that there are no **adverse impacts** to flora and vegetation occurring within or directly adjacent to the development envelope from the introduction or spread of **environmental weeds** and/or **dieback** compared with pre-construction condition;

(2) implement **management actions** to ensure that there are no **adverse impacts** to flora and vegetation occurring within or directly adjacent to the development envelope from **dust emissions**; and

(3) implement **management actions** to ensure the use of existing access tracks and other **cleared** areas where possible to minimise **adverse impacts** to flora and vegetation.

B1-3 The proponent must review and revise the Perth Basin Dieback and Weed Hygiene Management Plan (WAO-HSE-PLN-012, Revision 0, June 2021) so

that it satisfies the requirements of C5-1 and demonstrates the flora and vegetation environmental **objectives** in condition B1-2 are achieved.

B2 Terrestrial Fauna

B2-1 The proponent must ensure the implementation of the proposal achieves the following environmental **outcomes**:

(1) **disturb** no more than:

(a) 38.46 **ha** of moderate value **foraging habitat** for Carnaby's black cockatoo (*Zanda latirostris*); and

(2) no **disturbance** of **conservation significant fauna** or fauna habitat within twenty (20) metres outside of the development envelope.

B2-2 The proponent must implement the proposal and the prescriptive measures in condition B2-3 to meet the following environmental **objectives**:

(1) minimise the risk of **adverse impacts** and **indirect disturbance** to native fauna including physical injury or mortality, behavioural changes and health impacts vehicle strike, noise, fire, dust and light impacts from **construction activities**.

Fauna trenching/trapped fauna

B2-3 The proponent shall undertake the following actions during **construction activities**:

(1) visually inspect open trenches for the presence of vertebrate fauna and, where required, clear trapped vertebrate fauna from within open **trenches**, using a suitably trained and licensed **fauna handler**:

(a) at least twice daily, with the first daily inspection to be completed no later than three (3) hours after sunrise and the second inspection to be completed between the hours of 3:00 pm and 6:00 pm of that same day, unless otherwise agreed to by the **CEO**; and

(b) within one (1) hour prior to backfilling of **trenches**;

(2) ensure open **trench** lengths shall not exceed a length capable of being inspected and cleared by the requirements set out in condition B2-3(3);

(3) ensure ramps providing egress points and/or fauna refuges providing suitable shelter from the sun and predators for trapped vertebrate fauna are to be placed in the **trench** at intervals not exceeding fifty (50) metres;

(4) in the event of substantial rainfall, and following the clearing of vertebrate fauna from the **trench**, pump out any pooled water in the open **trench** and discharge it to adjacent vegetated areas in a manner that does not cause erosion;

(5) produce and provide a report on fauna management no later than sixty (60) days after the completion of **construction activities** to the **CEO**. The report shall include the following:

(a) details of fauna inspections;

(b) the number and type of fauna cleared from **trenches** and actions taken; and

(c) vertebrate fauna mortalities.

B3 Environmental Offsets

B3-1 The proponent must implement offsets to counterbalance the significant residual impacts of the proposal on the following **environmental values**:

(1) Carnaby's black cockatoo (*Zanda latirostris*) **foraging habitat**;

(2) potential habitat for the following species:

(a) Sandplain Duck Orchid (*Paracaleana dixonii*);

(b) Star Sun Orchid (*Thelymitra stellata*); and

(c) Beautiful Daviesia (*Daviesia speciosa*).

B3-2 The proponent must ensure the implementation of the offsets achieves the following environmental **outcomes** and **objectives**:

(1) counterbalance the significant residual impacts listed in condition B3-1;

(2) measurable and **tangible improvement** of habitat quality for Carnaby's Black Cockatoo (*Zanda latirostris*), Sandplain Duck Orchid (*Paracaleana dixonii*), Beautiful Daviesia (*Daviesia speciosa*) and Star Sun Orchid (*Thelymitra stellata*) which is **acquired** or rehabilitated as part of the Offset Strategy (Environmental Management Plan);

(3) ensure a net-gain in habitat managed for conservation purposes for Carnaby's Black Cockatoo (*Zanda latirostris*), Sandplain Duck Orchid (*Paracaleana dixonii*), Star Sun Orchid (*Thelymitra stellata*) and Beautiful Daviesia (*Daviesia speciosa*) within forty (40) kilometres of the development envelope;

(4) ensure a **strategic conservation benefit** is achieved for Carnaby's Black Cockatoo (*Zanda latirostris*), Sandplain Duck Orchid (*Paracaleana*

dixonii), Beautiful Daviesia (*Daviesia speciosa*) and Star Sun Orchid (*Thelymitra stellata*); and

(5) contribute to key knowledge gaps about Sandplain Duck Orchid (*Paracaleana dixonii*) to enable it to be managed consistent with the Approved Conservation Advice (16 December 2008).

Offset Strategy (Environmental Management Plan)

B3-3 The proponent must in consultation with the **DBCA**, review and revise the Offset Strategy (Rev 4, 19 December 2022) (Environmental Management Plan), that satisfies the requirements of condition C4-1 and demonstrates how the environmental **outcomes** in condition B3-2 will be achieved and submit to the **CEO**.

B3-4 The Offset Strategy (Rev 4, 19 December 2022) (Environmental Management Plan) must include the implementation of the offset measures to the extent and at the locations as set out and described in Table 1.

Table 1: Environmental values, locations and extent and type of offset measures required to meet condition B3-1

Environmental value	Offset locations	Extent of area to receive offset measures (hectares)	Type of offset measures
Carnaby's black Cockatoo (*Zanda latirostris*) **foraging habitat** of moderate quality; Sandplain Duck Orchid (*Paracaleana dixonii*); Star Sun Orchid (*Thelymitra stellata*) habitat; Beautiful Daviesia (*Daviesia speciosa*) habitat.	Lots 10106 and 10107, 2087 Yandanooka West Road	350	- land acquisition - **on-ground management**
Sandplain Duck Orchid *(Paracaleana dixonii)*			research to inform an update of the Conservation Guidance

B3-5 The Offset Strategy (Environmental Management Plan) must:

(1) demonstrate that the environmental **outcomes** in condition B3-2 will be met;

(2) describe how the offset measures will be implemented consistent with condition B3-4;

(3) be prepared in consultation with **DBCA;**

(4) spatially identify the areas (**Proposed Offset Conservation Areas**) in condition B3-4 and any other areas proposed as:

(a) **acquired** lands offset areas to receive **on-ground management** offset measures;

(b) offset areas or lands to receive **on-ground management** offset measures;

(5) demonstrate how the **environmental values** within the **Proposed Offset Conservation Areas** will be maintained and improved in order to counterbalance the significant residual impact to the **environmental values** in condition B3-1 and achieve the environmental objectives in condition B3-2;

(6) demonstrate application of the principles of the WA Environmental Offsets Policy, the *WA Environmental Offsets Metric* and the WA Offsets Template, as described in the *WA Environmental Offsets Guidelines,* and *the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy Assessment Guide*, or any subsequent revisions of these documents;

(7) identify how the ongoing performance of the offset measures, and whether they are achieving the **outcomes** in condition B3-2, will periodically be made publicly available;

(8) for the land acquisition offsets identified in condition B3-4:

(a) demonstrate that the **Proposed Offset Conservation Areas** contain the minimum extents of the **environmental values** identified in condition B3-1;

(b) identify how the **Proposed Offset Conservation Areas** will be protected, being either the sites are ceded to the Crown for the purpose of management for conservation, or the sites are managed under other suitable mechanism for the purpose of conservation as agreed by the **CEO** by notice in writing;

(c) specify the quantum of works associated with establishing the **Proposed Offset Conservation Areas**; and

(d) identify the **relevant management body** for the on-going management of the **Proposed Offset Conservation Areas**, including its role, and the role of the proponent, and confirmation in writing that the **relevant management body** accepts responsibility for its role.

(9) For **on-ground management** offsets identified in condition B3-4:

(a) state the targets for each **environmental value** to be achieved by the **on-ground management**, including completion criteria, which will result in a **tangible improvement** to the **environmental values** being offset;

(b) demonstrate the consistency of the targets with the environmental **outcomes** and **objectives** in condition B3-2 and the objectives of any relevant guidance, including but not limited to, recovery plans or area management plans;

(c) detail the **on-ground management** actions, with associated timeframes for implementation and completion, to achieve the targets identified in condition B3-5(9)(a); and

(d) detail the monitoring, reporting and evaluation mechanisms for the targets and actions identified under condition B3-5(9)(a).

(10) For **research offset** identified in condition B3-4 prepare a research program that**:**

(a) identifies the **objectives** and intended **outcomes**, and specifies the deliverables and completion criteria;

(b) identifies how the research will result in a positive conservation **outcome**, and will either improve management and protection or address priority knowledge gaps that have been identified as a research priority needed to improve management and protection, for the **environmental values** identified in condition B3-1(2);

(c) demonstrate the consistency of the objectives in condition B3-5(10)(a) with any relevant guidance, including but not limited to, recovery plans or area management plans, the principles of the *WA Environmental Offsets Policy*, the *WA Environmental Offsets Guidelines,* or any subsequent revisions of these documents;

(d) identifies and justifies the how the research will support land **acquired** and/or **on-ground management** in achieving a positive conservation **outcome**;

(e) provides an implementation and reporting schedule, including an outline of key activities, all deliverables, stages of implementation, reporting of research results (including interim results), reporting on implementation status, and milestones towards completion criteria;

(f) identifies the governance arrangements including responsibilities for implementing, and oversight of, the research program, agreements with government agencies, agreements with any third parties, and **contingency measures**;

(g) identify how a research program summary, and the results (including interim results) of the research program will be communicated and/or published in an open access format; and

(h) identifies the third party to carry out the work required to meet the **outcomes** of condition B3-5(10)(a), who is satisfactory for the role to the **CEO**. In applying to the **CEO** for endorsement of the selected third parties, the proponent shall provide:

(i) demonstration of the track record, experience, qualifications and competencies of the proposed third party to carry out the work and achieve the **outcomes**.

Contingency offsets

B3-6 If, after receiving the ongoing performance review of the offsets and monitoring, reporting and evaluation required by condition B3-5(7) and B3-5(9)(d), the **CEO** in consultation with **DBCA**, determines that the proposal has not met the environmental **outcome** in condition B3-2 and after notifying the proponent in writing, the proponent must undertake an additional offset to counterbalance the significant residual impact that is not counterbalanced to Carnaby's Black Cockatoo (*Zanda latirostris*), Sandplain Duck Orchid (*Paracaleana dixonii)*, Beautiful Daviesia (*Daviesia speciosa)* and Star Sun Orchid (*Thelymitra stellata)* listed in B3-1.

B3-7 Within twelve (12) months of receiving notice in writing from the **CEO** that an additional offset is required under condition B3-6 the proponent must update the Offset Strategy (Environmental Management Plan) required by condition B3-3 to include acquiring additional offsets to counterbalance the significant residual impacts to Carnaby's Black Cockatoo (*Zanda latirostris*), Sandplain Duck Orchid (*Paracaleana dixonii)*, Beautiful Daviesia (*Daviesia speciosa)* and Star Sun Orchid (*Thelymitra stellata)* listed in B3-1.

B4 Rehabilitation

B4-1 The proponent must implement the proposal to ensure the following environmental **outcomes** are achieved:

(1) all **cleared** areas are to be progressively rehabilitated (post-construction and post-operational activities);

(2) rehabilitated areas are capable of sustaining achievement of the other environmental **outcomes** in this Part B after the life of the proposal;

(3) rehabilitated landforms are stable and do not cause **adverse impacts** to adjacent areas, cause pollution or environmental harm;

(4) rehabilitated vegetation is self-sustaining, including not **adversely impacted** by **environmental weeds** or **dieback**; and

(5) rehabilitated areas are consistent with the species diversity and abundance of native vegetation within comparative analogue or reference sites.

B4-2 The proponent must revegetate all areas of native vegetation **cleared** but not reasonably expected to be required for ongoing operations, with a minimum of thirty (30) hectares, within twelve (12) months of completion of **construction activities** until the re-vegetation achieves an '**excellent'** quality of vegetation for the remainder of the life of the proposal.

B4-3 The proponent must update and implement the Rehabilitation Management Plan (WER-HSE-PLN-010, 20 Sept 22), in consultation with **DBCA**, to satisfy the requirements of condition C4 and demonstrate how achievement of the Rehabilitation environmental **outcomes** in condition B4-1 will be monitored and substantiated, and submit it to the CEO.

B4-4 The proponent must ensure that the rehabilitation process includes:

(1) retaining the vegetative material and topsoil removed by **clearing** and stockpiling the vegetative material and topsoil within the development envelope; and

(2) ripping the ground on the contour to remove soil compaction.

PART C – ENVIRONMENTAL MANAGEMENT PLANS AND MONITORING

C1 Environmental Management Plans: Conditions Related to Commencement of Implementation of the Proposal

C1-1 The proponent must not undertake:

(1) **ground disturbing activities** until the **CEO** has **confirmed** in writing that the environmental management plan required by condition B1-3 and condition B3-3 meets the requirements of those conditions and condition C5; and

(2) **construction activities** until the **CEO** has **confirmed** in writing that the environmental management plan required by condition B4-3 meets the requirements of that condition and condition C4.

C2 Environmental Management Plans: Conditions Relating to Approval, Implementation, Review and Publication

C2-1 Upon being required to implement an environmental management plan under Part B, or after receiving notice in writing from the **CEO** under condition C1-1 that the environmental management plan(s) required in Part B satisfies the relevant requirements, the proponent must:

(1) implement the most recent version of the **confirmed** environmental management plan; and

(2) continue to implement the **confirmed** environmental management plan referred to in condition C2-1(1), other than for any period which the **CEO** confirms by notice in writing that it has been demonstrated that the relevant requirements for the environmental management plan have been met, or are able to be met under another statutory decision-making process, in which case the implementation of the environmental management plan is no longer required for that period.

C2-2 The proponent:

(1) may review and revise a **confirmed** environmental management plan provided it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan;

(2) must review and revise a **confirmed** environmental management plan and ensure it meets the relevant requirements of that environmental management plan, including any consultation that may be required when preparing the environmental management plan, as and when directed by the **CEO;** and

(3) must revise and submit to the **CEO** the **confirmed** environmental management plan if there is a material risk that the **outcomes** or **objectives** it is required to achieve will not be complied with, including but not limited to as a result of a change to the proposal.

C2-3 Despite condition C2-1, but subject to conditions C2-4 and C2-5, the proponent may implement minor revisions to an environmental management plan if the revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, **outcomes** or objectives which the environmental management plan is required to achieve.

C2-4 If the proponent is to implement minor revisions to an environmental management plan under condition C2-3, the proponent must provide the **CEO**, **DBCA** with the following at least twenty (20) business days before it implements the revisions:

(1) the revised environmental management plan clearly showing the minor revisions;

(2) an explanation of and justification for the minor revisions; and

(3) an explanation of why the minor revisions will not result in new or increased **adverse impacts** to the environment or result in a risk to the achievement of the limits, **outcomes** or **objectives** which the environmental management plan is required to achieve.

C2-5 The proponent must cease to implement any revisions which the **CEO** notifies the proponent (at any time) in writing may not be implemented.

C2-6 **Confirmed** environmental management plans, and any revised environmental management plans under condition C2-4(1), must be published on the proponent's website and provided to the **CEO** in electronic form suitable for on-line publication by the Department of Water and Environmental Regulation within twenty (20) business days of being implemented, or being required to be implemented (whichever is earlier).

C3 Conditions Related to Monitoring

C3-1 The proponent must undertake monitoring capable of:

(1) substantiating whether the proposal limitations and extents in Part A are exceeded; and

(2) **detecting** and substantiating whether the environmental **outcomes** identified in Part B are achieved (excluding any environmental **outcomes** in Part B where an environmental management plan is expressly required to monitor achievement of that **outcome**).

C3-2 The proponent must submit as part of the Compliance Assessment Report required by condition D2, a compliance monitoring report that:

(1) outlines the monitoring that was undertaken during the implementation of the proposal;

(2) identifies why the monitoring was capable of substantiating whether the proposal limitation and extents in Part A are exceeded;

(3) for any environmental **outcomes** to which condition C3-1(2) applies, identifies why the monitoring was scientifically robust and capable of **detecting** whether the environmental **outcomes** in Part B are met;

(4) outlines the results of the monitoring;

(5) reports whether the proposal limitations and extents in Part A were exceeded and (for any environmental outcomes to which condition C3-1 (2) applies) whether the environmental **outcomes** in Part B were achieved, based on analysis of the results of the monitoring; and

(6) reports any actions taken by the proponent to remediate any potential non-compliance.

C4 Environmental Management Plans: Conditions Relating to Monitoring and Adaptive Management for Outcomes Based Conditions

C4-1 The environmental management plan required under condition B4-3 must contain provisions which enable the substantiation of whether the relevant **outcomes** of those conditions are met, and must include:

(1) **threshold criteria** that provide a limit beyond which the environmental **outcomes** are not achieved;

(2) **trigger criteria** that will provide an early warning that the environmental **outcomes** are not likely to be met;

(3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure **threshold criteria** and **trigger criteria**. Include methodology for determining alternate monitoring sites as a **contingency measure** if proposed sites are not suitable in the future;

(4) baseline data;

(5) data collection and analysis methodologies;

(6) adaptive management methodology;

(7) **contingency measures** which will be implemented if **threshold criteria** or **trigger criteria** are not met; and

(8) reporting requirements.

C4-2 Without limiting condition C3-1, failure to achieve an environmental **outcome**, or the exceedance of a **threshold criteria**, regardless of whether threshold **contingency measures** have been or are being implemented, represents a non-compliance with these conditions.

C5 Environmental Management Plans: Conditions Related to Management Actions and Targets for Objective Based Conditions

C5-1 The environmental management plans required under condition B1-3, condition B3-3 and condition B4-3 must contain provisions which enable the achievement of the relevant objectives of those conditions and substantiation of whether the objectives are reasonably likely to be met, and must include:

(1) **management actions**;

(2) **management targets**;

(3) **contingency measures** if **management targets** are not met; and

(4) reporting requirements.

C5-2 Without limiting condition C2-1, the failure to achieve an environmental objective, or implement a **management action**, regardless of whether **contingency measures** have been or are being implemented, represents a non-compliance with these conditions.

PART D – COMPLIANCE, TIME LIMITS, AUDITS AND OTHER CONDITIONS

D1 Non-compliance Reporting

D1-1 If the proponent becomes aware of a potential non-compliance, the proponent must:

(1) report this to the **CEO** within seven (7) days;

(2) implement **contingency measures**;

(3) investigate the cause;

(4) investigate environmental impacts;

(5) advise rectification measures to be implemented;

(6) advise any other measures to be implemented to ensure no further impact; and

(7) provide a report to the **CEO** within twenty-one (21) days of being aware of the potential non-compliance, detailing the measures required in conditions D1-1(1) to D1-1(6) above.

D1-2 Failure to comply with the requirements of a condition, or with the content of an environmental management plan required under a condition, constitutes a non-compliance with these conditions, regardless of whether the **contingency measures**, rectification or other measures in condition D1-1 above have been or are being implemented.

D2 Compliance Reporting

D2-1 The proponent must provide an annual Compliance Assessment Report to the **CEO** for the purpose of determining whether the implementation conditions are being complied with.

D2-2 Unless a different date or frequency is approved by the **CEO**, the first annual Compliance Assessment Report must be submitted within fifteen (15) months of the date of this Statement, and subsequent reports must be submitted annually from that date.

D2-3 Each annual Compliance Assessment Report must be endorsed by the proponent's Chief Executive Officer, or a person approved by proponent's Chief Executive Officer to be delegated to sign on the Chief Executive Officer's behalf.

D2-4 Each annual Compliance Assessment Report must:

(1) state whether each condition of this Statement has been complied with, including:

(a) exceedance of any proposal limits and extents;

(b) achievement of environmental **outcomes**;

(c) achievement of environmental **objectives**;

(d) requirements to implement the content of environmental management plans;

(e) monitoring requirements;

(f) implement **contingency measures**;

(g) requirements to implement adaptive management; and

(h) reporting requirements;

(2) include the results of any monitoring (inclusive of any raw data) that has been required under Part C in order to demonstrate that the limits in Part A, and any **outcomes** or any objectives are being met;

(3) provide evidence to substantiate statements of compliance, or details of where there has been a non-compliance;

(4) include the corrective, remedial and preventative actions taken in response to any potential non-compliance;

(5) be provided in a form suitable for publication on the proponent's website and online by the Department of Water and Environmental Regulation; and

(6) be prepared and published consistent with the latest version of the Compliance Assessment Plan required by condition D2-5 which the **CEO** has **confirmed** by notice in writing satisfies the relevant requirements of Part C and Part D.

D2-5 The proponent must prepare a Compliance Assessment Plan which is submitted to the **CEO** at least six (6) months prior to the first Compliance Assessment Report required by condition D2-2, or prior to implementation of the proposal, whichever is sooner.

D2-6 The Compliance Assessment Plan must include:

(1) what, when and how information will be collected and recorded to assess compliance;

(2) the methods which will be used to assess compliance;

(3) the methods which will be used to validate the adequacy of the compliance assessment to determine whether the implementation conditions are being complied with;

(4) the retention of compliance assessments;

(5) the table of contents of Compliance Assessment Reports, including audit tables; and

(6) how and when Compliance Assessment Reports will be made publicly available, including being published on the proponent's website within sixty (60) days of being provided to the **CEO**.

D3 Contact Details

D3-1 The proponent must notify the **CEO** of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

D4 Time Limit for Proposal Implementation

D4-1 The proposal must be substantially commenced within five (5) years from the date of this Statement.

D4-2 The proponent must provide to the **CEO** documentary evidence demonstrating that they have complied with condition D4-1 no later than fourteen (14) days after the expiration of period specified in condition D4-1.

D4-3 If the proposal has not been substantially commenced within the period specified in condition D4-1, implementation of the proposal must not be commenced or continued after the expiration of that period.

D5 Public Availability of Data

D5-1 Subject to condition D5-2, within a reasonable time period approved by the **CEO** upon the issue of this Statement and for the remainder of the life of the proposal, the proponent must make publicly available, in a manner approved by the **CEO**, all validated environmental data collected before and after the date of this Statement relevant to the proposal (including sampling design, sampling methodologies, monitoring and other empirical data and derived information products (e.g. maps)), environmental management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

D5-2 If:

(1) any data referred to in condition D5-1 contains trade secrets; or

(2) any data referred to in condition D5-1 contains particulars of confidential information (other than trade secrets) that has commercial value to a person that would be, or could reasonably be expected to be, destroyed or diminished if the confidential information were published,

the proponent may submit a request for approval from the **CEO** to not make this data publicly available and the **CEO** may agree to such a request if the **CEO** is satisfied that the data meets the above criteria.

D5-3 In making such a request the proponent must provide the **CEO** with an explanation and reasons why the data should not be made publicly available.

D6 Independent Audit

D6-1 The proponent must arrange for an independent audit of compliance with the conditions of this statement, including achievement of the environmental **outcomes** and/or the environmental **objectives** and/ or environmental performance with the conditions of this statement, as and when directed by the **CEO**.

D6-2 The independent audit must be carried out by a person with appropriate qualifications who is nominated or approved by the **CEO** to undertake the audit under condition D6-1.

D6-3 The proponent must submit the independent audit report with the Compliance Assessment Report required by condition D2, or at any time as and when directed in writing by the **CEO**. The audit report is to be supported by credible evidence to substantiate its findings.

D6-4 The independent audit report required by condition D6-1 is to be made publicly available in the same timeframe, manner and form as a Compliance Assessment Report, or as otherwise directed by the **CEO**.

Table 2: Abbreviations and definitions

Acronym or abbreviation	Definition or term
Adverse impact/ adversely impacted	Negative change that is neither trivial nor negligible that could result in a reduction in health, diversity or abundance of the receptor/s being impacted, or a reduction in environmental value. Adverse impacts can arise from direct or indirect disturbance, or other impacts from the proposal such as (but not limited to) hydrological change, spread or introduction of environmental weeds, altered fire regimes, introduction or spread of disease, changes in erosion/deposition/accretion and edge effects.
Acquired	The protection of environmental values on an area of initially unprotected land for the purpose of conversation through improved security of tenure or restricting the use of land (e.g. ceding land to the Crown or perpetual conservation covenants). This includes upfront costs of establishing the offset site and the ongoing management of costs of maintaining the offset for the long-term (20 years).
CEO	The Chief Executive Officer of the Department of Public Services of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or his/her delegate
Cleared/Clearing	Has the same meaning as in section 51A of the *Environmental Protection Act 1986.*
Confirmed	In relation to a plan required to be made and submitted to the **CEO**, means, at the relevant time, the plan that the **CEO** confirmed, by notice in writing, meets the requirements of the relevant condition. In relation to a plan required to be implemented without the need to be first submitted to the **CEO**, means that plan until it is revised, and then means, at the relevant time, the plan that the **CEO** confirmed, by notice in writing, meets the requirements of the relevant condition.
Conservation significant fauna	Threatened fauna species listed under the Environment Protection and *Biodiversity Conservation Act 1999* and *Biodiversity Conservation Act 2016.*
Construction activities	Activities that are associated with the substantial implementation of a proposal including but not limited to, earthmoving, vegetation clearing, grading or construction of right of way. Construction activities do not include Geotechnical investigations (including potholing for services and the installation of piezometers) and other preconstruction activities where no clearing of vegetation is required.

Contingency measures	Planned actions for implementation if it is identified that an environmental outcome, environmental objective, threshold criteria or management target are likely to be, or are being, exceeded. Contingency measures include changes to operations or reductions in disturbance to reduce impacts and must be decisive actions that will quickly bring the impact to below any relevant threshold, management target and to ensure that the environmental outcome and/or objective can be met.
DBCA	Department of Biodiversity, Conservation and Attractions.
Detecting/Detectable	The smallest statistically discernible effect size that can be achieved with a monitoring strategy designed to achieve a statistical power value of at least 0.8 or an alternative value as determined by the **CEO**.
Dieback	A plant disease of native ecosystems. The main species responsible, *Phytophthora cinnamomi*, is a microscopic and soil-borne organism that was introduced into Western Australia.
Disturb / Disturbance	Means directly has or materially contributes to the disturbance effect on health, diversity or abundance of the receptor/s being impacted or on an environmental value. In relation to flora, vegetation or fauna habitat, includes to result in the death, destruction, removal, severing or doing substantial damage to In relation to fauna, includes to have the effect of altering the natural behaviour of fauna to its detriment.
Dust Emissions	Airborne particulate matter from the erosion of soil, sand and rock.
Environmental value(s)	A beneficial use, or ecosystem health condition.
Environmental Weeds	Any plant declared under section 22(2) of the Biosecurity and Agriculture Management Act 2007, any plant listed on the Weeds of National Significance List and any weeds listed on the Department of Biodiversity, Conservation and Attractions Southwest Region Impact and Invasiveness Ratings list, as amended or replaced from time to time.
Excellent	The condition of native vegetation rated in accordance with the Technical guidance – Flora and vegetation surveys for environmental impact assessment (EPA 2016) including any revision to this technical guidance.
Fauna handler	A person who is qualified and licenced under section 40 of the *Biodiversity Conservation Act 2016.*
Foraging habitat	Plant species known to support foraging within the range of each of the species. Native shrubland, kwongan heathland and woodland on seeds, flowers and nectar of native

	proteaceous plant species (Banksia spp., Hakea spp. and Grevillea spp.), as well as Callistemon spp. and Marri.
Ground disturbing activity	Any activity undertaken in the implementation of the proposal, including any clearing, civil works or construction.
Ha	Hectare
Indirect impacts/ disturbance	Any potential impacts outside the development envelope as a result of the clearing and disturbance authorised in this Statement. This includes but is not limited to: hydrological change, spread or introduction of environmental weeds, altered fire regimes, introduction or spread of disease, changes in erosion/deposition/accretion and edge effects.
Management action	The identified actions implemented with the intent of to achieving the environmental objective.
Management target	A type of indicator to evaluate whether an environmental objective is being achieved
On-ground management	This includes revegetation (re-establishment of native vegetation in degraded areas) and rehabilitation (repair of ecosystem processes and management of weeds, disease or feral animals) with the objective to achieve a tangible improvement to the environmental values in the offset area.
Objective(s)	An objective is the proposal-specific desired state for an environmental factor/s to be achieved from the implementation of management actions.
Operation activity / Operational activities	Operation of infrastructure for the proposal.
Outcome(s)	A proposal-specific result to be achieved when implementing the proposal.
Proposed Offset Conservation Area	The area of land identified in condition B3-5(4).
Relevant management body	A party or parties that has a role in the establishment and/or on-going management of the Proposed Offset Conservation Area. Note: This includes the role of the proponent.
Research offset	A program or study that must be reasonably related to the impact and is designed to result in a positive conservation outcome. It may include improving the management and protection of existing conservation estate, adding to existing State Government initiatives, policies or strategies, or addressing priority knowledge gaps.
Strategic conservation benefit	Overall or long-term improvements in ecological resilience and/or function.
Tangible Improvement	A perceptible, measurable and definable improvement that provides additional ecological benefit and/or value.

Trench /Trenches	Any excavation that is of sufficient depth that would cause vertebrate fauna to be become trapped and unable to escape and would include, but not be limited to, trenches or pits for utilities, pipelines, dewatering pits or bell holes.
Trigger criteria	Indicators that have been selected for monitoring to provide a warning that if exceeded the environmental outcome may not be achieved. They are intended to forewarn of the approach of the threshold criteria and trigger response actions.
Threshold criteria	The indicators that have been selected to represent limits of impact beyond which the environmental outcome is not being met.
VT	Vegetation type.

Figures (attached)

Figure 1: West Erregulla Field Development Program regional location

Figure 2: West Erregulla Field Development Program development envelope and disturbance footprint

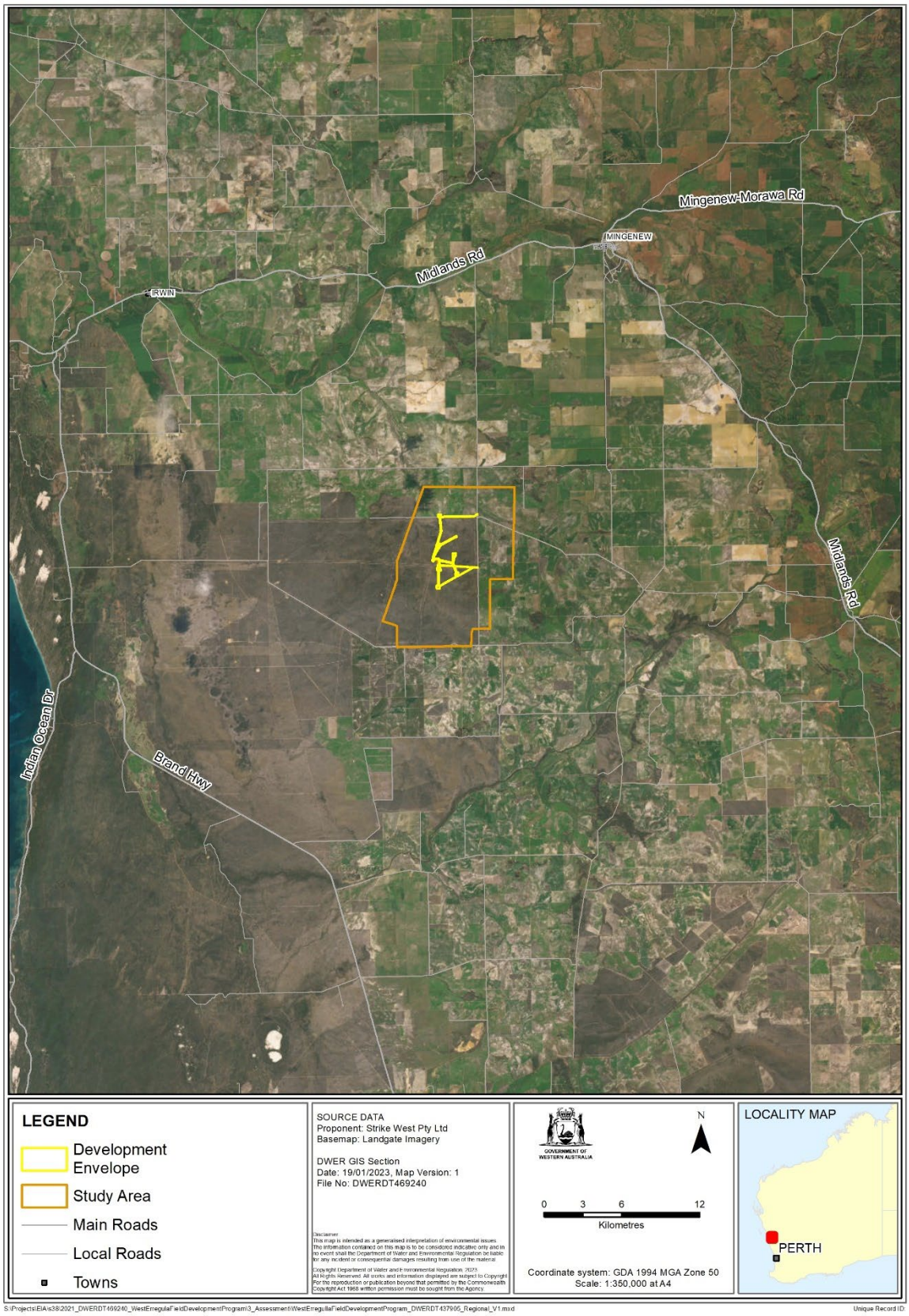

Figure 1: West Erregulla Field Development Program regional location

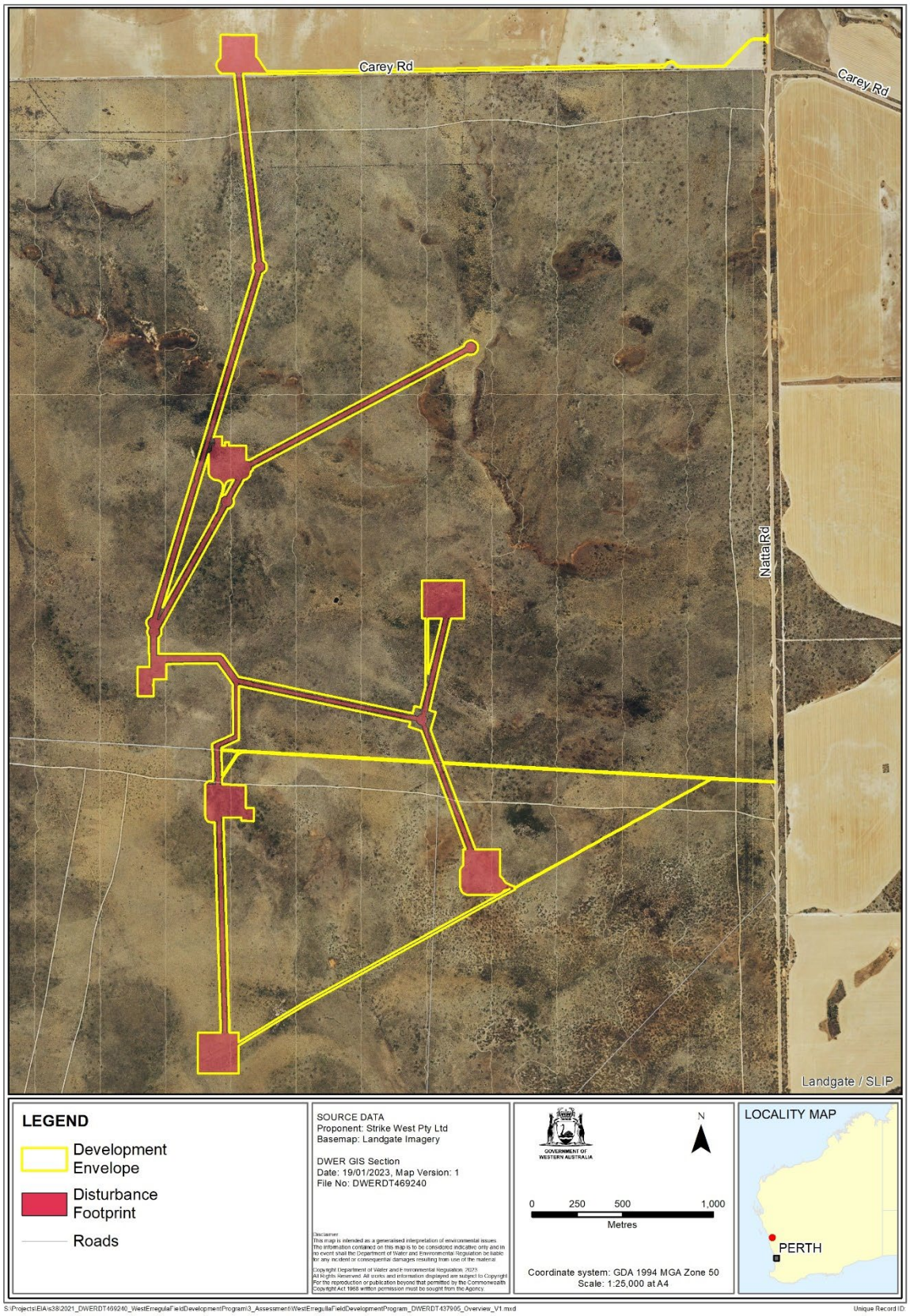

Figure 2: West Erregulla Field Development Program development envelope and disturbance footprint

Schedule 1

All co-ordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 1994 (GDA94).

Spatial data depicting the figures are held by the Department of Water and Environmental Regulation. Record no. DWERDT516900.

Appendix B: Decision-making authorities

Table B1: Identified relevant decision-making authorities for the proposal

Decision-Making Authority	Legislation (and approval)
1 Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972* - section 18 consent to impact a registered Aboriginal heritage site
2 Minister for Environment	*Biodiversity Conservation Act 2016* - section 40 authority to take or disturb threatened species
3 Minister for Lands	*Land Administration Act 1997* - section 91 licence to access crown land *Petroleum Pipelines Act 1969* - section 16 pipeline lease, licence or easement to construct and operate/inspect/maintain/repair pipeline on Crown land
4 Minister for Mines and Petroleum	*Petroleum Pipelines Act 1969* - section 10 licence for construction and operation of a pipeline
5 Minister for Water	*Rights in Water and Irrigation Act 1914* - groundwater abstraction licence
6 Chief Executive Officer, Department of Biodiversity, Conservation and Attractions	*Biodiversity Conservation Act 2016* - authority to take flora and fauna (other than threatened species)
7 Chief Dangerous Goods Officer, Department of Mines, Industry Regulation and Safety	*Dangerous Goods Safety Act 2004* - storage and handling of dangerous goods
8 Chief Executive Officer, Department of Water and Environmental Regulation	*Environmental Protection Act 1986* - part V works approval and licence
9 Chief Executive Officer, Shire of Three Springs	*Local Government Act 1995* - development approval *Health Act 1911* and Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974 *Building Act 2011* - permit for worker accommodation
10 Chief Executive Officer, Shire of Mingenew	*Local Government Act 1995* - development approval *Health Act 1911* and Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974 *Building Act 2011* - permit for worker accommodation

Appendix C: Environmental Protection Act principles

Table C1: Consideration of principles of the *Environmental Protection Act 1986*

EP Act principle	Consideration
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.* *In application of this precautionary principle, decisions should be guided by –* *(a)* careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and *(b)* an assessment of the risk-weighted consequences of various options.	The EPA has considered the precautionary principle in its assessment and has had particular regard to this principle in its assessment of flora and vegetation and terrestrial fauna. The proponent has investigated the biological and physical environment to identify environmental values of the proposal area. The EPA notes that the proponent has undertaken avoidance and mitigation measures to avoid potential serious or irreversible damage to the environment by locating the proposal to avoid ridge features which are associated with threatened flora, limiting and reducing the extent of impact to locally significant vegetation and flora species, and significant terrestrial fauna habitat. The EPA has recommended conditions to ensure that environmental outcomes are achieved, including implementation of rehabilitation activities and the requirement for offsets to ensure that the significant residual impacts for flora and vegetation and terrestrial fauna are counterbalanced. From its assessment of this proposal the EPA has concluded that there is no threat of serious or irreversible harm. In relation to offsets, the indirect offset condition – research opportunities, has been recommended to provide additional scientific certainty to support better understanding of long-term environmental outcomes associated with protection and restoration of habitat for threatened orchid species.

EP Act principle	Consideration
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	The EPA has considered the principle of intergenerational equity in its assessment and has had particular regard to this principle in its assessment of flora, vegetation and terrestrial fauna. The EPA notes that the proponent has identified measures to avoid and minimise impacts to the key environmental factors for flora, vegetation and terrestrial fauna. The EPA has considered these measures during its assessment and has recommended conditions to ensure that appropriate measures are implemented. The EPA recommends rehabilitation is undertaken and offsets imposed to ensure that the significant residual impacts for flora, vegetation and terrestrial fauna are counterbalanced. The EPA has concluded that the environmental values will be protected and that the health, diversity and productivity of the environment will be maintained for the benefit of future generations.
3. The principle of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	The EPA has considered the principle of conservation of biological diversity and ecological integrity in its assessment and has had particular regard to this principle in its assessment of flora, vegetation and terrestrial fauna. The EPA has considered to what extent the potential impacts from the proposal to flora and vegetation and terrestrial fauna can be ameliorated to ensure consistency with the principle of conservation of biological diversity and ecological, including by the provision of offsets. The EPA has concluded that given the nature of the impacts are significant (areas of vegetation and habitat for conservation significant flora and fauna species that will be cleared) that the proposed offsets are likely to counterbalance the impacts of the loss of biological diversity and ecological integrity.

EP Act principle	Consideration
4. Principles relating to improved valuation, pricing and incentive mechanisms • Environmental factors should be included in the valuation of assets and services. • The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement. • The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes. • Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.	In considering this principle, the EPA notes that the proponent will bear the costs relating to implementing the proposal to achieve environmental outcomes, and management and monitoring of environmental impacts during construction, operation and decommissioning of the proposal. The EPA has had particular regard to this principle in considering flora, vegetation and terrestrial fauna. The EPA notes that the proponent will be responsible for bearing the cost of rehabilitation and acquisition and management of the proposed offsets.
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	The EPA has considered the principle of waste minimisation in its assessment of the proposal. The EPA notes the proponent will implement appropriate management of wastes on site and will avoid and minimise discharge of emissions into the environment. The EPA notes the proponent is proposing to minimise the discharge of waste into the environment during construction, operation and closure by adopting the hierarchy of waste controls; avoid, minimise, reuse, recycle and safe disposal. Other decision-making authorities, including DMIRS, DWER and the Local Governments, require additional requirements that will further prevent impacts associated with waste management and disposal.

Appendix D: Other environmental factors

Table D1: Evaluation of other environmental factors

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Land			
Terrestrial Environmental Quality	• there is a risk of contamination of soils as a result of the drilling of wells and the storage and handling of hazardous materials (including chemicals and hydrocarbons) during construction and operational activities.	Public comments • no public comments were received. Agency comments • no agency comments were received.	Terrestrial environmental quality was identified as a preliminary key environmental factor when the EPA set the level of assessment. In considering the potential impacts to terrestrial environmental quality, the EPA had regard to the following: • the development envelope includes existing infrastructure comprising of well sites 2, 3, 4 and 5 and associated tracks. To date, there has been no incidences of spills or contamination from exploration activities • relatively small scale and nature of potential impacts resulting from an accidental loss or spill • proposed mitigation and management measures that will be regulated by DMIRS in an approved Environment Plan. Environment Plans are required to meet the form and content requirements of the Petroleum and Geothermal Energy Resources (Environment) Regulations 2012 and Petroleum Pipelines (Environment) Regulations 2012. The objectives of the Regulations are to ensure that any petroleum activity is carried out in a manner consistent with the principles of ecologically sustainable development and in accordance with the

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			Environment Plan that shows the environmental impacts and risks will be reduced to as low as reasonably practicable, appropriate environmental performance objectives and standards, and appropriate measurement criteria for determining whether those objectives and standards have been met. An Oil Spill Contingency Plan is also required as part of the Environment Plan. • preparation of an Emergency Response Plan that will be approved and regulated by DMIRS. It is not likely that the proposal will have a significant impact on terrestrial environmental quality, and the proposal is likely to be consistent with the EPA factor objective. Accordingly, the EPA did not consider terrestrial environmental quality to be a key environmental factor at the conclusion of its assessment.
Water			
Inland Waters	• potential impacts from the drawdown of the Yarragadee aquifer for water supply • alteration of surface water hydrogeological regime from the installation of infrastructure • contamination of surface water due to	<u>Public comments</u> • concerns about groundwater used for fracking • impacts on groundwater levels and quality, particularly as the Yarragadee aquifer is used for town water supplies, irrigation, livestock and other purposes, and the cumulative impacts of	Inland waters was not identified as a preliminary key environmental factor when the EPA set the level of assessment. In considering the potential impacts to inland waters, the EPA had regard to the following: • the proposal involves conventional gas extraction from the existing wells and two new proposed wells, there will be no hydraulic fracture stimulation • drilling to be undertaken by qualified drilling contractors with water-based muds used to prevent contamination of aquifers and a preparation of a Well

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	increased erosion and sedimentation • contamination of surface water and groundwater quality from drilling and hazardous materials.	groundwater use in the region • potential contamination of surface water and risk of increased salinity. <u>Agency comments</u> • no agency comments were received.	Integrity Management Plan to prevent and minimise the potential for contamination from the wells • utilisation of an existing licenced production bore for groundwater abstraction with volumes required to be within the current allocation, which will be managed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) and in accordance with DWER licence requirements to ensure drawdown is monitored and impacts on nearby groundwater users are controlled. The RIWI Act provides for the management of water resources and in particular for their sustainable use and development to meet the needs of current and future users, and for the protection of their ecosystems and the environment in which water resources are situated including by the regulation of activities detrimental to them • further statutory requirements to limit potential impacts to groundwater from gas well operation will be subject to regulation by DMIRS under the PGER Act and associated Regulations and will require an approved Environment Plan • ongoing implementation of an approved Groundwater Monitoring Plan developed in accordance with the DMIRS (2016) Guideline for Groundwater Monitoring in the Onshore Petroleum and Geothermal Industry • implementation of management measures to avoid and manage the risks of contamination from hazardous materials to groundwater • the depth to groundwater in the development envelope (approximately 70-80 metres below ground

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
			level) and the absence of groundwater dependent ecosystems • the absence of surface water features within the development envelope and the distance to the closest creek being 1.5 km • surface water management structures proposed as part of infrastructure installation to divert rainfall, minimise erosion and transport of sediment to the surrounding environment • temporary disturbance to surface water regimes during flowline installation with trenches to be backfilled and revegetated • potential cumulative impacts associated with groundwater abstraction in the region to be managed by DWER under the RIWI Act in consideration of current licence requirements. It is not likely that the proposal will have a significant impact on inland waters, and the proposal is likely to be consistent with the EPA factor objective. Accordingly, the EPA did not consider inland waters to be a key environmental factor at the conclusion of its assessment.
Air			
Air Quality	• generation of dust emissions during construction activities can impact the amenity of nearby receptors • generation of dust emissions can have an	<u>Public comments</u> • no public comments were received. <u>Agency comments</u> • no agency comments were received.	Air quality was not identified as a preliminary key environmental factor when the EPA set the level of assessment. In considering the potential impacts to air quality, the EPA had regard to the following: • separation distance between the development envelope (from the nearest proposed well site) and

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	indirect impact on flora and vegetation and terrestrial fauna values • emissions from venting/flaring can impact local air quality.		the nearest sensitive receptor is approximately 4.6 km • management measures proposed during construction including dust suppression, screening material used over well sites and access roads, and vehicle speed restrictions • temporary nature of dust generating activities during construction • proposed use of pilot flame during well testing to ensure the flare flame is maintained. It is not likely that the proposal will have a significant impact on inland waters, and the proposal is likely to be consistent with the EPA factor objective. Accordingly, the EPA did not consider air quality to be a key environmental factor at the conclusion of its assessment.
Greenhouse Gas (GHG) Emissions	<u>Construction</u> The proponent has estimated the following GHG emissions over the one-year construction phase of the proposal: • scope 1 – 25,581 tonnes per annum (tpa) carbon dioxide equivalent (CO_2-e) associated with diesel consumption, well testing and loss of	<u>Public comments</u> • concerns that the proposal will cumulatively add to GHG emissions during a time of serious climate change and global warming • estimation of the construction phase GHG emissions are very close to 100,000 tpa CO2-e assessment cut-off value and scope 1 emissions have been included in scope 3 emissions	Greenhouse gas emissions was identified as a preliminary key environmental factor when the EPA set the level of assessment. In considering the potential impacts to greenhouse gas emissions, the EPA had regard to the following: • Environmental factor guideline – Greenhouse gas emissions (EPA 2023) which details that GHG from a proposal will be assessed where it is reasonably likely to exceed 100,000 tonnes CO_2-e of scope 1 or scope 2 emissions in any year • estimated scope 1 and scope 2 emissions from this proposal are below the 100,000 tpa CO_2-e threshold for the factor guideline

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	biomass from vegetation clearing • scope 2 – no emissions are estimated as electricity requirements will be met by on-site diesel generators, the emissions from which are accounted for in scope 1. • Scope 3 – no emissions estimated. <u>Production</u> The proponent has estimated the following GHG emissions over the 20-year production phase of the proposal: • scope 1 – 270 tpa CO_2-e from diesel consumption • scope 2 – no emissions estimated • scope 3 – 96,319 tpa CO_2-e associated with downstream processing of gas from the West Erregulla Processing Plant and Pipeline	• concerns that net zero GHG emissions will not be achieved • the cumulative impacts of total methane emissions from the Greater Erregulla proposed gas development and fugitive methane emissions from leakage and venting could release potent GHG emissions. <u>Agency comments</u> • No agency comments were received.	• consideration of the cumulative impacts from gas exploration and development of other projects in the area on GHG emissions, in particular the connected AGIO West Erregulla Processing Plant and Pipeline proposal. AGIO has considered the combined emissions for the processing plant and pipelines (West Erregulla Processing Plant and Pipeline Proposal) and this proposal (West Erregulla Field Development Program) and has prepared a Greenhouse Gas Management Plan which is being assessed separately by the EPA and will be subject to conditions associated with implementation of the proposal. The proposal is therefore likely to be consistent with the EPA factor objective. Accordingly, the EPA did not consider greenhouse gas emissions to be a key environmental factor at the conclusion of its assessment.

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	proposal referred to the EPA by AGIO.		
People			
Social Surroundings	• potential impacts to Aboriginal heritage values that may be uncovered during clearing and construction activities • amenity impacts during construction as a result of noise, dust and light overspill.	<u>Public comments</u> • the cumulative effects to local communities from existing and future developments • impacts to neighbouring farms and communities from noise and air pollution, vibration, dust and light pollution • concerns over the increase in trucks, heavy haulage and other vehicles from the construction and operation of the gas field, gas plant and pipeline. <u>Agency comments</u> • Department of Planning, Lands and Heritage (DPLH) notes that the location of the proposed development does not intersect with any Aboriginal sites or reported Aboriginal heritage places • DPLH acknowledges that an Archaeological and	Social surroundings was not identified as a preliminary key environmental factor when the EPA set the level of assessment. In considering the potential impacts to social surroundings, the EPA had regard to the following: • the absence of any registered Aboriginal sites or reported Aboriginal heritage places or heritage values within the development envelope • proposed mitigation and management measures for ground disturbance and excavation works, including engagement of Yamatji nation cultural monitors, which will be detailed in the Environment Plan to be approved by DMIRS • development of a Cultural Heritage Management Plan in consultation with the Yamatji Southern Regional Corporation • development of a Yamatji Proponent Standard Heritage Agreement between the Yamatji Nation People and Strike West Pty Ltd to be agreed and signed as part of the Production Licence application and approval process governed by DMIRS • separation distance between the development envelope (from the nearest proposed well site) and the nearest sensitive receptor is approximately 4.6 km

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
		Ethnographic site avoidance survey was undertaken in May 2021 with representatives of the Yamatji Nation Traditional Owners. It is noted that the survey aimed to record any identified sites to a standard that allows the proponent to avoid them; furthermore, it was stated that a site avoidance level recording was not comprehensive enough to thoroughly assess the site's importance and significance, and for any sites recorded at this standard, should not be submitted to the Aboriginal Cultural Material Committee (ACMC) • DPLH recommends that the proponent establish a Cultural Heritage Management Plan with the Yamatji Nation Indigenous Land Use Agreement Group through the Yamatji Southern Regional Corporation.	• management measures proposed during construction including dust suppression, screening material used over well sites and access roads, and vehicle speed restrictions • temporary nature of dust generating activities during construction. It is not likely that the proposal will have a significant impact on social surroundings, and the proposal is likely to be consistent with the EPA factor objective. Accordingly, the EPA did not consider social surroundings to be a key environmental factor at the conclusion of its assessment.

Appendix E: Relevant policy, guidance and procedures

The EPA had particular regard to the policies, guidelines and procedures listed below in the assessment of the proposal.

Environmental factor guideline – Air quality (EPA 2020)

Environmental factor guideline – Flora and vegetation (EPA 2016)

Environmental factor guideline – Greenhouse gas emissions (EPA 2023)

Environmental factor guideline – Inland waters (EPA 2018)

Environmental factor guideline – Social surroundings (EPA 2023)

Environmental factor guideline – Terrestrial environmental quality (EPA 2016)

Environmental factor guideline – Terrestrial fauna (EPA 2016)

Environmental impact assessment (Part IV Divisions 1 and 2) procedures manual (EPA 2021)

WA Environmental Offsets Policy (Government of Western Australia 2011)

WA Environmental Offsets Guidelines (Government of Western Australia 2014)

Statement of environmental principles, factors, objectives and aims of EIA (EPA 2021)

Environmental impact assessment (Part IV Divisions 1 and 2) administrative procedures 2021 (State of Western Australia 2021)

Technical guidance – Flora and vegetation surveys for environmental impact assessment (EPA 2016a)

Technical guidance – Sampling of short-range endemic invertebrate fauna (EPA 2016b)

Technical guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020).

Appendix F: List of submitters

7-day comment on referral

Organisations and public

- 3 public submissions were received from organisations
- 46 public submissions were received from individuals.

Government agencies

- None

Public review of proponent information

Organisations and public

- 2 public submissions were received from organisations
- 9 public submissions were received from individuals.

Government agencies

- Department of Biodiversity, Conservation and Attractions
- Department of Climate Change, Energy, the Environment and Water
- Department of Planning, Lands and Heritage
- Department of Water and Environmental Regulation

Appendix G: Assessment timeline

Date	Progress stages	Time (weeks)
15 September 2021	EPA decided to assess – level of assessment set	
9 November 2021 and 9 March 2022	EPA requested additional information	6
2 December 2021 and 13 April 2022	EPA received additional information	22
10 May 2022	EPA accepted additional information	4
16 May 2022	EPA released additional information for public review	1
30 May 2022	Public review period for additional information closed	2
10 July 2023	EPA received final information for assessment	58
27 July 2023	EPA completed its assessment	3
2 October 2023	EPA provided report to the Minister for Environment	9
9 October 2023	EPA report published	3 days
30 October 2023	Appeals period closed	3

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the EPA decides to assess the proposal and records the level of assessment.

In this case, the EPA did not meet its timeline objective to complete its assessment and provide a report to the Minister.

References

Bamford Consulting Ecologists 2021, *Strike Energy West Erregulla gas field project – Level 1 Fauna Assessment*, Perth, WA.

Coffey 2013, *West Erregulla Exploration Program, Warrego Energy 3D Seismic Survey – Level 1 Fauna Assessment*, Perth, WA.

Commonwealth of Australia 2012, *Commonwealth EPBC Act Environmental Offsets Policy*, Commonwealth of Australia, Canberra.

Commonwealth of Australia 2022, *Referral guideline for three WA threatened black cockatoo species: Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*) and the Forest Red-tailed Black cockatoo (*Calyptorhynchus banksia naso*).*

DAWE 2022, *Referral guideline for three WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black cockatoo,* Department of Agriculture, Water and the Environment, Canberra.

Department of the Environment and Energy 2018, *Threat abatement plan for disease in natural ecosystems caused by* Phytophthora cinnamomi.

Department of Parks and Wildlife 2013, *Carnaby's Cockatoo (*Calyptorhynchus latirostris) *Recovery Plan, Western Australian Wildlife Management Program No. 52,* Government of Western Australia.

Department of Sustainability, Environment, Water, Population and Communities 2012, *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy.

Department of the Environment, Water, Heritage and the Arts 2008, *Approved Conservation Advice for Paracaleana dixonii Hopper & A.P.Br. nom. inval. (Sandplain Duck Orchid)*.

Department of the Environment, Water, Heritage and the Arts 2008, *Approved Conservation Advice for Thelymitra stellata (Star Sun-orchid.*

Department of the Environment, Water, Heritage and the Arts 2008, *Approved Conservation Advice for Daviesia speciosa (Beautiful Daviesia).*

Ecologia 2018, *Targeted Threatened Flora Survey West Erregulla 2018*, Perth, WA

Eco Logical Australia 2020, *West Erregulla Pipeline Flora and Fauna Survey*, Perth, WA.

EPA 2016a, *Environmental factor guideline – Flora and vegetation*, Environmental Protection Authority, Western Australia.

EPA 2016b, *Technical guidance – Flora and vegetation surveys for environmental impact assessment*, Environmental Protection Authority, Western Australia.

EPA 2016c, *Environmental factor guideline – Terrestrial fauna*, Environmental Protection Authority, Western Australia.

EPA 2016d, *Technical guidance – Sampling of short-range endemic invertebrate fauna*, Environmental Protection Authority, Western Australia.

EPA 2016e, *Environmental factor guideline – Terrestrial environmental quality*, Environmental Protection Authority, Western Australia.

EPA 2018, *Environmental factor guideline – Inland waters*, Environmental Protection Authority, Western Australia.

EPA 2020a, *Technical guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment*, Environmental Protection Authority, Western Australia.

EPA 2020b, *Environmental factor guideline – Air quality*, Environmental Protection Authority, Western Australia.

EPA 2021a, *Environmental impact assessment (Part IV Divisions 1 and 2) Procedures Manual*, Environmental Protection Authority, Western Australia.

EPA 2021b, *Statement of environmental principles, factors, objectives and aims of EIA*, Environmental Protection Authority, Western Australia.

EPA 2023a, *Environmental factor guideline – Greenhouse gas emissions*, Environmental Protection Authority, Western Australia.

EPA 2023b, *Environmental factor guideline – Social surroundings*, Environmental Protection Authority, Western Australia.

Government of Western Australia 2011, *WA Environmental Offsets Policy*, Government of Western Australia, Perth, WA.

Government of Western Australia 2014, *WA Environmental Offsets Guidelines*, Government of Western Australia, Perth, WA.

Mattiske Consulting 2020*, Review of Key Potential Flora, Vegetation and Fauna Values on the Proposed Pipeline for Strike Energy Near Dongara*, Perth, WA.

State of Western Australia 2021, *Western Australia Government Gazette, No. 180*, *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2021,* 22 October 2021.

Strategen-JBS&G 2020, *West Erregulla 4 – Targeted Flora Survey and Black Cockatoo Habitat Assessment*, Perth, WA

Strategen-JBS&G 2021a, *West Erregulla Field Development Program – Section 38 Referral,* Perth, WA.

Strategen-JBS&G 2021b, *Flora and Vegetation Survey of Natta 3D Seismic Survey Area*, Perth, WA.

Strategen-JBS&G 2022a, *West Erregulla Field Development Program – Environmental Review Document (Revision 2),* Perth, WA.

Strategen-JBS&G 2022b, *West Erregulla Field Development Program – Offset Strategy (Revision 4),* Perth, WA

Strategen-JBS&G 2023, *West Erregulla Field Development Program – Response to Submissions (Revision 3)*, Perth, WA.

Western Australian Museum 2022, *Molecular identification of a mygalomorph spider (Idiosoma sp.) from near Arrowsmith, Western Australia,* Perth, WA.

Woodman Environmental Consulting 2009a*, Flora and Vegetation of the Proposed Eneabba – Moonyoonooka 330kv, Perth, WA*
Woodman Environmental Consulting 2009b, West Erregulla-2 Well Site Flora and Vegetation Assessment, Perth, WA

Woodman Environmental Consulting 2010*, Transmission Line, Supplementary Field Survey 2008, 2009 Survey Addendum, Perth, WA*

Woodman Environmental Consulting 2013, *West Erregulla Project Flora and Vegetation Assessment*, Perth, WA.

Woodman Environmental Consulting 2020a, *West Erregulla Exploration Program Wells 4 and 5 Flora and Vegetation Risk Assessment*, Perth, WA.

Woodman Environmental Consulting 2020b, *West Erregulla Exploration Program Targeted Flora Survey*, Perth, WA.