



**Environmental
Protection
Authority**

Yarnima Power Station Stage 4 (Gas Reciprocating Engines)

BHP Iron Ore Pty Ltd

Report 1776

December 2024

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 Yarnima Power Station Stage 4 (Gas Reciprocating Engines) proposal by BHP Iron Ore Pty Ltd.

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

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- 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.



Darren Walsh
Chair
Environmental Protection Authority

29 November 2024

ISSN 1836-0491 (Online)
Assessment No. 2433

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Summary

Proposal

The Yarnima Power Station Stage 4 (Gas Reciprocating Engines) is a proposal to increase capacity of the existing Yarnima Power Station. The proposal is located two kilometres from Newman in the Pilbara region of Western Australia.

The proponent for the proposal is BHP Iron Ore Pty Ltd (BHP). The proposal comprises a development envelope of 47 hectares (ha) and is to increase the installed firm power generation capacity at the Yarnima Power Station from 154 megawatts (MW) up to 239 MW via installation and operation of gas reciprocating engines (GREs) and associated infrastructure, which would displace higher emission diesel generation. The GREs would be installed in stages up to a maximum of 120 MW (nominal).

No clearing is proposed as part of this proposal as the 4 ha of clearing required for construction of the proposal is authorised under an existing Native Vegetation Clearing Permit (NVCP) (CPS 5617/5).

Assessment of key environmental factors

The EPA has assessed the key environmental factor for consistency with the EPA environmental factor objective.

Environmental Factor: Greenhouse Gas Emissions	
Residual impact on key value	Assessment finding/environmental outcome
<p>Cumulative greenhouse gas (GHG) emissions contribute to climate change, which impacts on WA's environment.</p> <p>Scope 1 GHG emissions of up to 480,030 CO₂-e tonnes per annum (tpa), 11,820,870 t CO₂-e over life of the proposal.</p> <p>Savings of up to 3,096,200 t CO₂-e of scope 1 GHG emissions over the life of the proposal with proponent commitments to a net zero trajectory by 2050.</p> <p>There are no scope 2 GHG emissions associated with this proposal.</p>	<p>Avoidance and minimisation measures to reduce scope 1 emissions by 2030: The proponent has adopted some upfront avoidance and mitigation measures to reduce GHG emissions from proposal commencement. Benchmarking against other power stations in the Pilbara region indicate that emissions intensities are best practice for such facilities.</p> <p>Trajectory from 2030 to net zero by 2050: The proponent has proposed a linear trajectory of emissions reductions to net zero by 2050, to align with the Commonwealth's Safeguard Mechanism. Proposal's regulated under the Safeguard Mechanism are required to take actions to reduce emissions to ensure Australian emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050 are achieved.</p> <p>The EPA considers these emission reductions are reasonably achievable with a combination of new and emerging technology and offsets. In consideration of this, the EPA is of the view that emissions reductions required under the Safeguard Mechanism represent an as far as practicable reduction of the proposal's scope 1 GHG emissions, and therefore the likely environmental effects of the proposal can be mitigated to achieve consistency with the environmental factor objective for GHG emissions.</p>

<p>Scope 3 GHG emissions of up to 37,260 t CO₂-e per annum, equal to 917,450 t CO₂-e over life of the proposal.</p>	<p>Scope 3 emissions: The scope 3 emissions arise due to the supply of gas and diesel to the proposal (to the GREs and back up diesel generators). The EPA notes that the proposal's scope 3 emissions are 37,260 t CO₂-e per annum and has not considered them any further as they are below 100,000 t CO₂-e per annum.</p> <p>Offsets: The proponent has identified, after application of the mitigation hierarchy, that offsets will be used to ensure that net emissions reduce to its trajectory of zero emissions by 2050. Proposed offsets include Australian Carbon Credit Units and/or offsets registered in an internationally recognised standard such as the Verified Carbon Standard and the Gold Standard program. The EPA considers that offsets are likely to be reasonably available and any offsets utilised will be required to meet requirements of the Safeguard Mechanism, to ensure the offsets have integrity.</p>
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Units and abbreviations

CO₂-e: carbon dioxide equivalent

Holistic assessment

The EPA considered the connections and interactions between greenhouse gas emissions and the greater environment 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
- residual impact, emissions and effects in relation to key environmental factors, separately and holistically (this has included considering cumulative impacts of GHG emissions)
- likely environmental outcomes (and taking into account the EPA's recommended conditions), and the 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.

1 Proposal

The Yarnima Power Station Stage 4 (Gas Reciprocating Engines) (the proposal) is a proposal to increase power generation capacity at the existing Yarnima Power Station by installing and operating gas reciprocating engines (GREs) (BHP 2024a). The proposal is adjacent to the existing Newman Power Station operated by Alinta, and is located approximately two kilometres (km) north-west of Newman in the Pilbara region of Western Australia (see Figure 1). The proponent for the proposal is BHP Iron Ore Pty Ltd (BHP). Yarnima Power Station supplies electricity to BHP's central and eastern mining hubs through the BHP Iron Ore Inland Power Grid (Inland Power Grid) and the town of Newman.

Currently the Yarnima Power Station has a firm capacity of 154 megawatts (MW) and comprises of:

- three 32 MW Combined Cycle Gas Turbines (CCGTs), connected to three Heat Steam Recovery Generators (HRSGs)
- two 40 MW steam turbine generators powered by the HRSGs
- one 35 MW temporary diesel fired power station
- three black start diesel generators
- two 800 kilolitre diesel storage tanks
- transmission lines, switch rooms, switch gear
- stormwater treatment and drainage system.

In addition to the Yarnima Power Station, the Inland Power Grid is supported by the Mining Area C (MAC) Diesel Power Station (firm capacity of 10 MW).

The proposal is to expand the existing 154 MW capacity up to 239 MW. The proposal will displace the temporary diesel fired power generation and MAC Diesel Power Station (removing up to 35 MW of capacity, but with back up diesel generators remaining) through the installation of GREs, which will increase capacity by up to 120 MW. The increase in power generation is required as part of BHP's plans for decarbonisation, to support electrification of rail and mining fleet, including iron ore production in the proponent's central and eastern mining hubs (BHP 2024a). BHP has stated that the flexible nature of the GREs is required to support the integration of renewable power into the BHP Iron Ore Inland Power Grid. GREs can ramp up power generation and respond much quicker than the existing CCGTs to intermittency, for example in response to cloudy days (KPMG 2023). Renewable energy initiatives are not included in this proposal, however through its regional decarbonisation strategy, BHP plans to replace this proposal with renewable energy (KPMG 2023). Currently, the existing power station does not have sufficient capacity to provide business as usual power supply to BHP's central and eastern mining operations in addition to the increased electricity requirements to support electrification activities.

BHP referred the proposal to the Environmental Protection Authority (EPA) on 2 April 2024. The referral information was published on the EPA website for seven days public comment. On 24 April 2024, the EPA decided to assess the proposal at the level Referral Information.

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

Table 1: Proposal content document (BHP Iron Ore Pty Ltd 2024)

Proposal element	Location	Maximum extent or range
<i>Physical elements</i>		
Development Envelope	Figure 2	Development envelope of 47 ha* within the existing power station industrial area
<i>Operational elements</i>		
Power Generation via Gas Reciprocating Engines	Figure 2	120 MW
<i>Greenhouse Gas Emissions</i>		
Peak annual: This proposal only		
Scope 1	Power Generation	480,030 tCO ₂ -e per annum
Scope 2	None	
Scope 3	Fuel Supply	37,260 tCO ₂ -e per annum
Annual average: This proposal only		
Scope 1	Power generation	454,649 tCO ₂ -e per annum
Scope 2	None	
Scope 3	Fuel Supply	35,290 tCO ₂ -e per annum
<i>Total scope 1 emissions</i>		11,820,870 tCO ₂ -e
<i>Total scope 3 emissions</i>		917,540 tCO ₂ -e
Combined Peak Annual: This proposal and the existing Yarnima Power Station		
Scope 1	Power generation	942,000 tCO ₂ -e per annum
Scope 2	None	
Scope 3	Fuel Supply	73,120 tCO ₂ -e per annum
Combined Annual average: This proposal and the existing Yarnima Power Station		
Scope 1	Power generation	916,601 tCO ₂ -e per annum
Scope 2	None	
Scope 3	Fuel Supply	71,149 tCO ₂ -e per annum
<i>Combined Total Scope 1 emissions</i>		23,831,630 tCO ₂ -e
<i>Combined Total Scope 3 emissions</i>		1,849,870 tCO ₂ -e
<i>Timing elements</i>		

Proposal element	Location	Maximum extent or range
Maximum project life		38 years (including construction, operation, decommissioning and closure)
Construction		3 years
Operations		26 years

*4 ha of vegetation is proposed to be cleared, within the development envelope, under the existing approved Native Vegetation Clearing Permit (NVCP) CPS 5617/5. As a result this clearing is not assessed under this proposal.

Units and abbreviations

ha – hectare

tCO₂-e – tonnes of carbon dioxide equivalent

MW – megawatts

Proposal alternatives and context

The proposal is located within the existing power station area, adjacent to the Newman Power Station, owned and operated by Alinta Energy. The existing Yarnima Power Station supplies power to BHP's local mining operations and to the Newman township (BHP 2024b).

Yarnima Power Station was initially constructed and operated via a Works Approval and Licence (L8803/2013/1) under Part V of the *Environment Protection Act 1986* (EP Act) in November 2011 and February 2014 respectively, with a single open cycle gas turbine. In 2012, Yarnima Power Station was expanded with a derated capacity of 38 MW. This expansion proposal (Stage 2) was referred to the EPA on 5 April 2012 for assessment under Part IV of the EP Act, however on 7 May 2012 the proponent was advised that the EPA would not assess Stage 2 as the impacts were not so significant to require assessment by the EPA.

An application to construct Stage 2 via a Works Approval was granted in 2012, and the Yarnima Power station was expanded by installing two new gas turbines, three heat recovery steam generators and two steam turbines. The Licence (L8803/2013/1) was amended in 2015 (BHP 2024b).

Section 2.5 of the proponent's Environmental Review Document (ERD) (BHP 2024b) describes the alternatives considered for the proposal. The proponent considered two alternatives to the current proposal; a renewable energy option and a diesel generation option.

BHP considered solar and wind renewable energy sources, however they were not deemed viable (BHP 2024b). Solar and wind are intermittent power generation sources; solar is unable to generate electricity at night and wind is not a steady source. BHP also considered battery storage to provide peaking and firming support to the Inland Power Grid, however current battery storage options are unable to provide sufficient baseload power to meet demand. BHP considered that other technological solutions were not viable for use in the Pilbara or would take a long time to construct (i.e. large scale storage and long-duration energy storage) (BHP 2024b). As the current Inland Power Grid is islanded, it is not supported by a

connected stabilising grid that is able to provide firming support to electricity demand as renewables are introduced.

BHP explored other sources of power generation with lower emissions, such as Concentrated Solar Thermal (CST) or Green Hydrogen. CST is in development in Australia, with five existing projects in the country each at 3MW or less. Green Hydrogen projects across the country, including the Pilbara, are currently at the assessment or feasibility stage, and production and transport of green hydrogen at the scale required is a challenge and economically difficult. The existing Yarnima gas transmission system does have capacity to transport a limited volume of hydrogen through blending for use in CCGTs or GREs, however this has not been included in this proposal.

Rather than introducing renewables on a project-by-project basis, BHP's regional decarbonisation strategy is for all BHP Iron Ore operations within the Pilbara region, which this proposal forms a part of. In addition, the development of renewable energy generation sources will need to be staged in line with the uptake of fleet electrification. BHP has not yet identified suitable locations for placement of renewable generation, as they need to be evaluated based on prevailing weather conditions and proximity to the Inland Power Grid and mining operations. The current proposal allows the proponent to take advantage of existing infrastructure and minimise the need for additional development and clearing outside of the power station development envelope.

Diesel generation was identified as another alternative option instead of renewable energy sources or GREs, to contribute to the existing CCGTs capacity to meet the peak power demand of 239 MW. BHP commissioned a detailed GHG emissions calculation report to understand the differences in GHG emissions (GHD 2023) between this option and the proposal.

The alternative diesel generation was assessed with combined power generation from:

- Yarnima Power Station's CCGTs (119 MW capacity)
- diesel-fired temporary power station (35 MW capacity)
- MAC diesel power station (10 MW capacity)
- new GREs (incremental generation of 75 MW).

In addition to the existing Yarnima Power Station emissions, the alternative diesel generation option would produce up to 28,386,000 tCO₂-e scope 1 emissions over the life of the proposal, or a peak annual average of up to 1,062,000 tCO₂-e per year (GHD 2023). In comparison, the chosen option for this proposal to utilise GREs would produce up to 25,290,000 scope 1 emissions over the life of the proposal, or a peak annual average of up to 942,000 tCO₂-e per year. This is a difference of 3,096,200 tCO₂-e of scope 1 emissions over the life of the proposal, or an emissions reduction of up to 120,000 tCO₂-e per year (GHD 2023). The proponent deemed this option inadequate due to the higher GHG emissions associated with diesel power generation, compared to the proposed GREs.

Overall, GREs were preferred as they would enable BHP to provide firm baseload power, rapid responses to intermittence issues associated with future renewable energy sources, and to support the planned electrification of mining and rail operations. The proposal would be a step to enable the future development and integration of renewable energy sources (external to this proposal but part of the regional decarbonisation strategy) into the BHP Inland Power grid.

Consultation

The EPA published the proponent's referral information for the proposal on its website for seven days public comment from 2 April 2024 to 9 April 2024. The EPA considered the comments received during this public consultation period in its assessment.



Figure 1: Project location

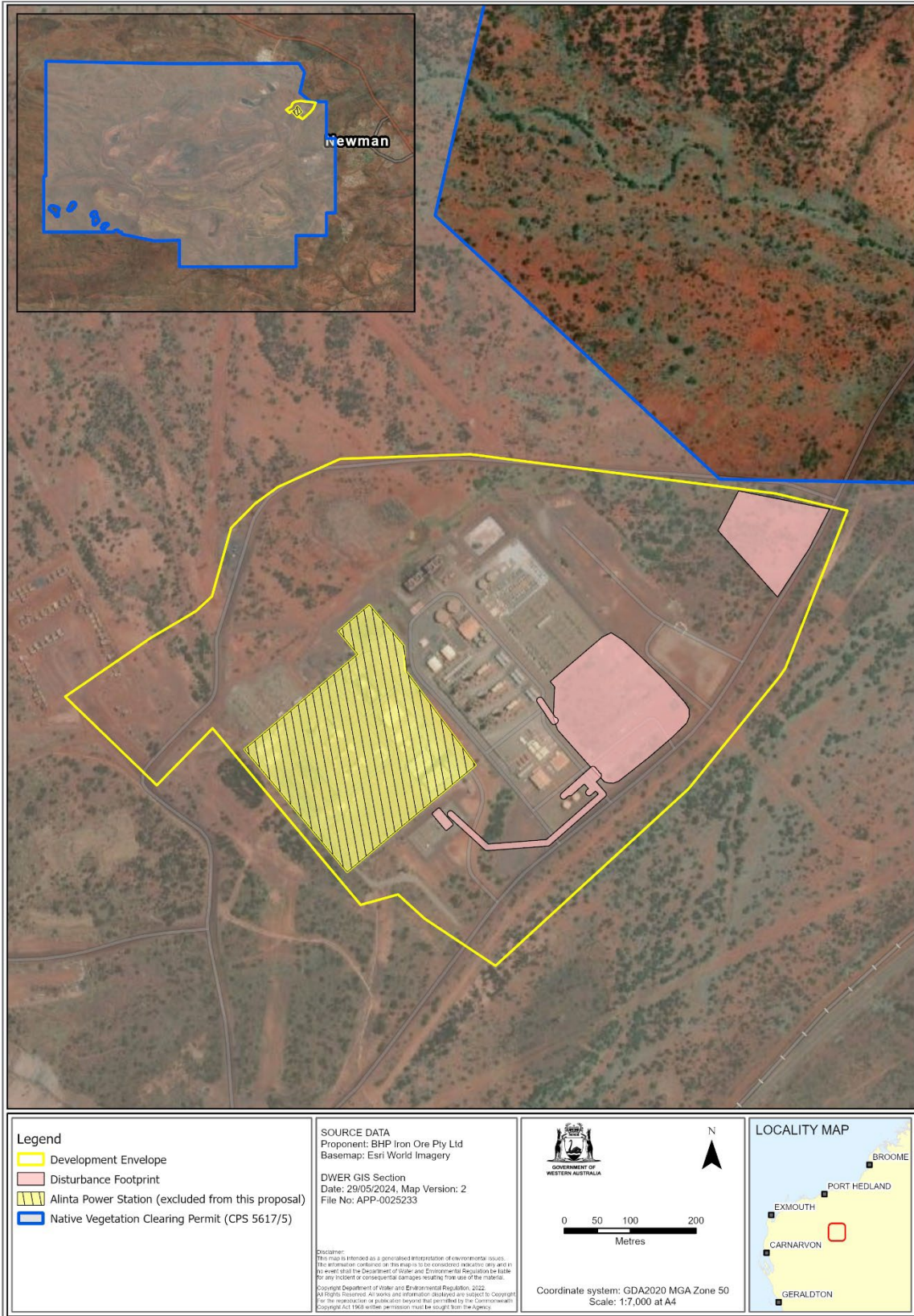


Figure 2: Development envelope and disturbance footprint

2 Assessment of key environmental factors

This section reports the outcome of the EPA's assessment of the key environmental factors against its environmental objectives, and its recommendations on conditions the proposal should be subject to if it is implemented.

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.

The EPA 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 Greenhouse Gas Emissions

2.2.1 Environmental objective

The EPA environmental objective for greenhouse gas (GHG) emissions is *to minimise the risk of environmental harm associated with climate change by reducing net greenhouse gas emissions as far as practicable.*

The EPA recognises that the proponent has prepared its information relating to this factor in accordance with the 2023 version of the Environmental Factor Guideline – Greenhouse Gas Emissions (EPA 2023). However, the EPA considers it has adequate information to have due regard to its recently updated Environmental Factor Guideline – Greenhouse Gas Emissions (EPA 2024) in its assessment of the proposal's greenhouse gas emissions.

The proponent submitted a GHG Management Plan (GHGMP; Pilbara Regional Greenhouse Gas Management Plan) with the proposal referral submission.

Key Environmental values and context

GHG emissions from a cumulative range of sources have an impact on Western Australia's environment, even if the specific impact of a particular proposal's emissions may not be known with certainty. This is because there is an established link between GHG emissions and the risk of climate change. The EPA recognises that climate change will have an impact on Western Australia's environment and environmental values. For example, climate change has already caused a significant drying of the state's south-west, which in turn places significant additional pressures on water resources, flora and fauna, marine environmental quality, and social surroundings.

There is also an established correlation between global temperature rise and greenhouse gas emissions. The EPA advises that for every 1,000 billion (G) tonnes (t) CO₂ emitted by human activity, global surface temperature rises by 0.45°C, as a best estimate, with a likely range from 0.27°C to 0.63°C (IPCC 2023).

The EPA therefore usually assesses proposals where GHG emissions are reasonably likely to exceed 100,000 t of scope 1 or scope 2 emissions in any year measured in t CO₂-e.

Power demand at BHP's West Australian operations is currently approximately 150 MW, and the proponent forecasts this will increase to around 1 gigawatt by 2040. The proponent states that the power increase is required for decarbonisation of iron ore productions, such as electrification of rail and mining fleet. Decarbonisation projects are predicted to significantly increase power demand for BHP operations in the Pilbara region of Western Australia while the proponent transitions to renewable energy sources. BHP's decarbonisation strategy for Pilbara operations focuses on two main areas; increasing renewable power availability and rail and fleet electrification. BHP plans to source the additional power increase from predominantly renewable sources, to achieve net zero emissions across Pilbara operations by 2050, as outlined in the BHP Regional Greenhouse Gas Management Plan (GHGMP).

In FY2023, BHP West Australian Iron Ore (WAIO) scope 1 and scope 2 emissions for Pilbara operations totalled 2,370,000 t CO₂-e. The emissions for the existing Yarnima power station (scope 1 and scope 2) for FY2023 were 336,000 t CO₂-e, approximately 15% of total BHP WAIO operations in the Pilbara. The Yarnima Power Station utilised gas and diesel to generate electricity during this period, in future this percentage will change. In the absence of any emissions reductions, a collective total of 26,927,830 t CO₂-e scope 1 emissions would be expected over the operating lifespan of the Yarnima Power Station, in addition to the existing operations. In comparative terms, Western Australia's yearly scope 1 emissions based on 2022 levels were 82.5 million tonnes (Mt) CO₂-e (DCCEEW 2024) and national emissions were 463.9 Mt CO₂-e for 2022 (DCCEEW 2023b).

In the absence of any emissions reductions, a collective total of 3,415,720 t CO₂-e scope 3 emissions (in combination with existing operations) would be expected over the lifespan of the operation. Scope 2 emissions were not included in the proposal as all electricity required would be generated by the proposal and captured in scope 1 emissions.

Scope 3 proposal emissions which are emitted in Western Australia will also become an increased percentage of the State's scope 1 emissions over time as Western Australia begins its trajectory to net zero emissions by 2050 and might become a material contribution to the State's emissions at the end of proposal life.

Impacts from the proposal	Assessment finding, environmental outcome and recommended conditions																																
GHG emissions estimates																																	
<p>The proponent estimated the unmitigated GHG emissions from the operation of the proposal to be (t CO₂-e):</p> <table border="1" data-bbox="206 507 927 746"> <thead> <tr> <th></th> <th><i>Annual Average</i></th> <th><i>Peak Average</i></th> <th><i>Life of Proposal</i></th> </tr> </thead> <tbody> <tr> <td>Scope 1</td> <td>573,734</td> <td>600,370</td> <td>14,917,070</td> </tr> <tr> <td>Scope 2</td> <td colspan="3">N/A</td> </tr> <tr> <td>Scope 3</td> <td>95,515</td> <td>98,120</td> <td>2,483,390</td> </tr> </tbody> </table> <p>Combined unmitigated emissions from the proposal, in addition to the existing Yarnima Power Station, per year were estimated to be (tCO₂-e):</p> <table border="1" data-bbox="206 865 927 1104"> <thead> <tr> <th></th> <th><i>Annual Average</i></th> <th><i>Peak Average</i></th> <th><i>Life of Proposal</i></th> </tr> </thead> <tbody> <tr> <td>Scope 1</td> <td>916,601</td> <td>1,062,340</td> <td>26,927,830</td> </tr> <tr> <td>Scope 2</td> <td colspan="3">N/A</td> </tr> <tr> <td>Scope 3</td> <td>131,374</td> <td>133,980</td> <td>3,415,720</td> </tr> </tbody> </table>		<i>Annual Average</i>	<i>Peak Average</i>	<i>Life of Proposal</i>	Scope 1	573,734	600,370	14,917,070	Scope 2	N/A			Scope 3	95,515	98,120	2,483,390		<i>Annual Average</i>	<i>Peak Average</i>	<i>Life of Proposal</i>	Scope 1	916,601	1,062,340	26,927,830	Scope 2	N/A			Scope 3	131,374	133,980	3,415,720	<p>A GHG emissions calculations report was prepared for the proposal by GHD (2023), setting out the methodology, assumptions, inputs and results of the forecast scope 1 and scope 3 emissions calculation completed for BHP’s Yarnima Power Station Stage 4 (Gas Reciprocating Engines) proposal.</p> <p>A GHG review for the proposal by KPMG (2023) involved reviewing the GHGMP and assessed emissions reduction measures proposed (with industry best practice), the forecast of scope 1, 2, and 3 emissions and the overall emissions intensity of the proposal, and the integrity of the carbon offsets strategy for the proposal.</p> <p>The EPA considers the proponent’s GHG emissions are a reliable basis for the assessment.</p>
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Baseline emissions avoidance and minimisation, including best practice review and benchmarking																																	
<p>GHG emission avoidance strategies applied during the design phase that result in the avoidance and reduction of emissions are set out in section 7.5 of the ERD and in the GHGMP.</p>	<p>The EPA understands that to meet future forecast energy requirements, BHP considered an array of energy production sources, including expanding energy production through renewable sources (solar, wind or battery), maintaining diesel-fired generators with additional GREs, or</p>																																

Material emissions reductions have been achieved from the proposed implementation of GREs, displacing the diesel powered MAC Power Station and Temporary Power Station, saving up to 120,340 t CO₂-e of scope 1 emissions per annum and up to 60,860 t CO₂-e of scope 3 emissions per annum.

The proponent used data available from the Clean Energy Regulator under the *National Greenhouse Gas and Energy Reporting Act 2007* (NGER Act) for benchmarking and comparisons of emission intensities.

A GHGMP review was completed for the proposal by KPMG (2023).

through decommissioning existing diesel-fired generators and replacement with GREs (this proposal).

BHP examined the potential to increase power generation via renewable options and battery storage, however deemed that the existing technology was not able to provide sufficient peaking and firming support to electrify the mine and rail fleet at this time.

To minimise GHG emissions the option to replace diesel-fired generators with GREs was selected. The GREs also provide logistical value to the proposal as they are able to rapidly turn on and off as demand requires and respond quicker to intermittency during future renewable electricity generation, than a CCGT is able to.

The EPA notes that over the life of the proposal, scope 1 emissions would be reduced by 3,096,200 t CO₂-e compared to the diesel-fired generator option.

Modelling of emissions for the proposal shows natural gas power generation emits 51.4 kg of CO₂-e per gigajoule (kg CO₂-e/GJ) of energy produced. In comparison, diesel-fired power generation produces 69.9 kg CO₂-e/GJ of emissions, as per the Australian National Greenhouse Accounts Factors (DCCEE 2023a).

Under proposed operational conditions, the Yarnima Stage 4 GREs are predicted to run at an efficiency of 39.6% (9.1 GJ of energy produced for every megawatt-hour (GJ/MWh) in operation). In comparison, the existing Yarnima Power Station operates at 41.9% efficiency (8.6 GJ/MWh) at full capacity (119 MW) with three CCGTs, three heat recovery steam generators and two steam turbines. However, should the Yarnima Power Station ever need to drop generating capacity of the CCGTs (for example in the case of renewable energy sources coming online) the station has a minimum operating load of 55 MW, and this also results in longer start up times. In addition, reducing output of the CCGTs to 55 MW decreases efficiency to 39.6% (9.1GJ/MWh).

The emissions intensity of this proposal is predicted to be 0.46 tCO₂-e/MWh (continuous with the current Yarnima Power Station emissions

intensity), and the Safeguard Mechanism Industry Average for all gas fired power stations within Western Australia is 0.59 tCO₂-e/MWh (CRE, 2024). By comparison, the average emissions intensity of all gas fired power stations across Australia is 0.63 tCO₂-e/MWh (CRE, 2024), and the MAC Diesel Power Station and temporary diesel power stations both each have emissions intensities of 0.68 tCO₂-e/MWh.

The average mining emissions intensity of BHP's Pilbara iron ore operations in FY2023 was 8.6 kilograms of CO₂-e per tonne of iron ore (kg/CO₂-e/t). Currently, diesel combustion accounts for approximately 75% of BHP's Pilbara scope 1 and scope 2 emissions. The expansion of the Yarnima Power Station by installing 120 MW of GREs will support the electrification of haul trucks and locomotives, displacing a portion of diesel usage. BHP has estimated that by replacing diesel trucks with electric trucks, emissions may be reduced by 35-50%, with the electricity generation emissions intensity of 0.46 tCO₂-e/MWh. In addition to the 120 MW expansion, but outside of this proposal, BHP intends to install a further 500 MW of renewable power generation to continue to reduce GHG emissions intensity of Pilbara operations.

BHP's decarbonisation strategy is reliant upon the ability to electrify mine and fleet operations with battery electric technology, which is the base for BHP's target to reach net zero emissions by 2050.

BHP has stated in the GHGMP that the organisation is committed to supporting the Commonwealth Government to reduce Australia's GHG emissions by 43% by 2030, and the Western Australian Government's target of net zero emissions by 2050.

With regards to BHP's regional Pilbara operations, as an islanded power grid, the Inland Power Grid will likely be prone to energy fluctuations in supply and demand. The Inland Power Grid is not connected to an external stabilisation power grid to mitigate fluctuations in renewable power generation sources.

In the context of this proposal, the proponent requires the ability to quickly ramp up and down electricity generation to respond to future renewable

	<p>energy sources (i.e. ramp down the GREs during the daytime when solar sources generate electricity and then ramp up overnight).</p> <p>GREs are a more efficient option to generate electricity when demand is variable. The operation of 119 MW of CCGTs and up to 120 MW of GREs allows the proponent to match demand and turn on and off the GREs as required. In addition, GRE efficiency is less impacted by higher ambient air temperatures compared to CCGTs.</p> <p>Overall, the GREs would provide an increase to existing power generation, thereby supporting decarbonisation efforts to electrify the fleet (external to this proposal) and provide a stable power source whilst the proponent develops alternative renewable power sources. The EPA considers the use of renewable sources for electricity generation to be best practice, however due to the considerations outlined above regarding the need for firm supply and islanded power requirements and the proponent’s decarbonisation strategy, the EPA considers the proponent’s approach to be reasonable.</p> <p>The EPA advises that the estimated baseline emissions provided by the proponent have appropriately considered avoidance and minimisation, through the exploration of alternatives and use of efficient technology compared to industry benchmarks.</p>								
<p>Emissions trajectory to 2050</p>									
<p>The proponent has proposed a linear trajectory of emissions reductions to net zero by 2050 (Figure 3).</p> <p>Separate to this proposal, but part of the proponent’s regional decarbonisation strategy for Pilbara operations, the proponent expects to construct an additional 500 MW of renewable energy generation and storage by 2030. In the longer term, BHP plans to replace power provided by the Yarnima Power Station with renewable energy sources (such as wind, solar and battery storage), which will be utilised by the proponent in achieving the emissions reductions below. The proponent is</p>	<p>The EPA notes the proposed emissions reduction trajectory will mitigate approximately 3,096,200 t CO₂-e of scope 1 emissions compared to the baseline emissions for the life of the proposal.</p> <p>Under the proposed avoidance and mitigation methods for this proposal, mitigated emissions from the proposal, per year, were estimated to be (tCO₂-e):</p> <table border="1" data-bbox="1055 1241 1671 1377"> <thead> <tr> <th></th> <th><i>Annual Average</i></th> <th><i>Peak Average</i></th> <th><i>Life of Proposal</i></th> </tr> </thead> <tbody> <tr> <td><i>Scope 1</i></td> <td>454,649</td> <td>480,030</td> <td>11,820,870</td> </tr> </tbody> </table>		<i>Annual Average</i>	<i>Peak Average</i>	<i>Life of Proposal</i>	<i>Scope 1</i>	454,649	480,030	11,820,870
	<i>Annual Average</i>	<i>Peak Average</i>	<i>Life of Proposal</i>						
<i>Scope 1</i>	454,649	480,030	11,820,870						

likely to need to adopt additional major projects to implement the required array of renewable energy sources.

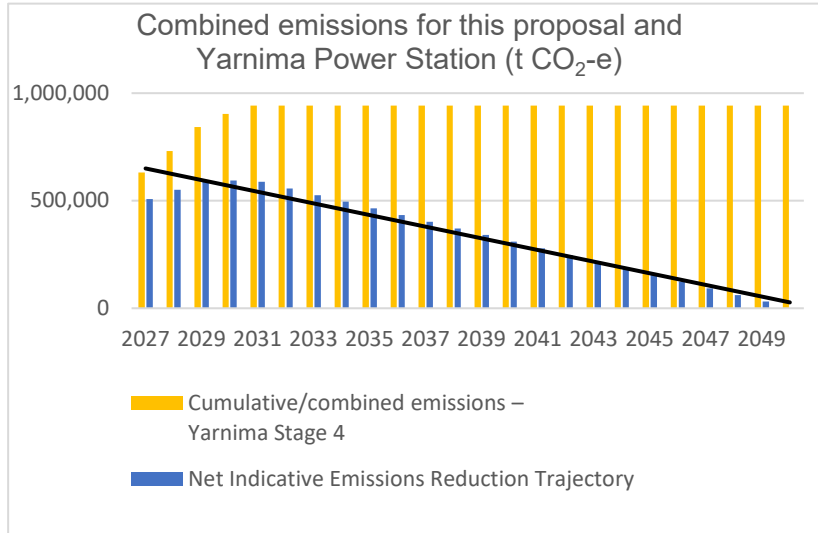


Figure 3: Annual emissions with proposed reduction targets

Scope 2	N/A		
Scope 3	35,290	37,260	917,540

Mitigated emissions from the proposal, in addition to the existing Yarnima Power Station, per year were estimated to be (tCO₂-e):

	Annual Average	Peak Average	Life of Proposal
Scope 1	916,601	942,000	23,831,630
Scope 2	N/A		
Scope 3	71,149	73,120	1,849,870

The EPA considers these reductions are reasonably achievable through the use of offsets, and gradual implementation of other renewable energy sources.

The EPA recognises that the Commonwealth Safeguard Mechanism requires the proponent to take actions to reduce scope 1 GHG emissions through decline rates to achieve net zero emissions by 2050, discussed further below.

Overall, with regulation under the safeguard mechanism, the proposal is estimated to emit an additional 8,126,791 t CO₂-e of scope 1 emissions by 2050.

Scope 2 emissions

As the proposal is producing its own electricity for operations, there are no scope 2 emissions associated with this proposal.

Scope 3 emissions

Yarnima Power Station

The proponent has stated that scope 3 emissions are associated with the supply and transportation of fuels for power

The EPA encourages the proponent to take all measures it can reasonably take to reduce scope 3 emissions. However, the EPA notes that the estimated scope 3 emissions of 37,260 t CO₂-e per annum are

<p>generation, including the supply of natural gas via pipeline and the supply of diesel for power generation. Diesel generation is only proposed to remain for contingency measures during emergency and maintenance campaigns, such as for black starts (BHP 2024b).</p> <p>Calculations of scope 3 emissions for this proposal have not included steel making, as the generation of electricity (from the Yarnima Power Station) is consumed at the mine, thereby ending the electricity production chain.</p> <p>BHP WAIO – Regional Management of GHG Emissions</p> <p>This proposal refers to expansion of electricity production at Yarnima Power Station with GREs, however BHP propose to manage all GHG emissions on a Pilbara wide scale, encompassing all WAIO operations within the region, with the GHGMP.</p> <p>Scope 3 emissions associated with BHP’s Pilbara regional WAIO operations include emissions generated by steel making and international shipping.</p> <p>WAIO scope 3 emissions attributable to steel-making for FY2023 was estimated by BHP to be 333,000,000 t CO₂-e (of this, processing of iron ore contributed an approximate 290 million tonnes of CO₂-e).</p> <p>Following this, estimated scope 3 emissions for this proposal (approximately 71,149 t CO₂-e) as a portion of regional WAIO scope 3 emissions, is 0.022%. Of this, 0.011% is attributable directly to the GREs themselves (estimated annual scope 3 emissions 35,290 t CO₂-e).</p>	<p>less than 100,000 t CO₂-e per annum and therefore has not considered these emissions any further in its assessment.</p>
<p>Offsets</p>	
<p>The proponent has advised that where structural abatement of emissions and application of the mitigation hierarchy is insufficient to meet the proposal’s emission reduction targets, it</p>	<p>The EPA considers it highly likely that the proponent will use offsets to meet the emissions reduction trajectory, whilst future renewable energy</p>

will propose to meet its emission reduction trajectory through offsets.

This is consistent with offsets only being used as a last resort.

The proponent has committed to investing in offsets that meet national offset standards, including Australian Carbon Credit Units (ACCUs) under the *Carbon Credits (Carbon Farming Initiative) Act 2011*, and/or offsets registered in an internationally recognised standard such as the Verified Carbon Standard and the Gold Standard program. BHP has recognised that the State Government of WA prefers locally generated offsets to be used.

KPMG (2023) has estimated that to achieve net emissions reduction targets through ACCUs, the following amount of ACCU's would be required.

Period	Annual average ACCU demand assumed (rounded)
FY27-30	220,000
FY31-35	420,000
FY36-40	570,000
FY41-45	730,000
FY46-50	880,000
FY51-52	940,000

ACCU market supply to 2030 is estimated to be 51-95 million ACCUs (KPMG 2023).

KMPG estimate that post FY2030, the proposal's offset ACCU annual demand volume would be more than 2.5% of total ACCU supply. However, it should be noted that there is little public information regarding projected ACCU market position

sources are developed for the proponent's Inland Power Grid to reduce reliance on gas for electricity generation.

The EPA advises that any carbon offsets which may be surrendered should demonstrate they meet offset integrity principles, and be based on clear, enforceable, and accountable methods.

ACCUs are administered by the Clean Energy Regulator and assured by the Emissions Reduction Assurance Committee (ERAC), an independent statutory committee which assesses ACCUs compliance against the Offsets Integrity Standards set out in section 113 of the *Carbon Credits (Carbon Farming Initiative) Act 2011*. The EPA considers that by the time any offsets are required to be surrendered, there is likely to be sufficient assurance that ACCUs meet the legislated Offsets Integrity Standards.

<p>beyond FY2030 as the Safeguard Mechanism has not set clear guiderails past this time.</p>	
<p>Other decision-making processes, including Commonwealth Safeguard Mechanism</p>	
<p><u>Commonwealth Safeguard Mechanism</u></p> <p>The existing Yarnima Power Station is covered by the Commonwealth Safeguard Mechanism.</p> <p>The existing baseline recorded for the Yarnima Power Station under the NGER Act by the Clean Energy Regulator was 333,116 t CO₂-e of emissions (Clean Energy Regulator (CER) 2021).</p> <p>In the 2022-2023 financial year the Yarnima Power Station emitted 336,179 t CO₂-e of scope 1 emissions and this produced 782,093 megawatt hours (MWh), at an intensity of 0.43 t CO₂-e/MWh (CER 2024).</p> <p>The proponent predicts the emissions intensity for this proposal to be 0.46 t CO₂-e/MWh (BHP 2024b).</p>	<p>The Commonwealth Safeguard Mechanism applies to this proposal as scope 1 emissions are greater than 100,000 t CO₂-e per annum.</p> <p>The EPA recognises that the significantly strengthened Safeguard Mechanism requires the proponent to take actions to reduce GHG emissions, including imposing annual baseline decline rates to ensure Australian emission reduction targets of 43% below 2005 levels by 2030 and net zero by 2050 are achieved.</p> <p>In consideration of this, the EPA is of the view that emissions reductions required under the Safeguard Mechanism represent an as far as practicable reduction of the proposal's scope 1 GHG emissions, and therefore the likely environmental effects of the proposal can be mitigated to achieve consistency with the environmental factor objective for GHG emissions. Consistent with the Greenhouse Gas Emissions Policy for Major Projects 2024, the EPA has recommended a condition that requires the proponent to notify the State of a substantial change to its obligations under the Safeguard Mechanism (recommended condition B1).</p>

2.2.2 Summary of assessment – GHG emissions

In summary, the EPA considers that the emissions avoidance, minimisation and offsets proposed by the proponent are generally consistent with the EPA's factor objective *to minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable*.

With scope 1 emissions reductions proposed by the proponent to 2050, emissions reduction actions regulated through the Safeguard Mechanism will mitigate approximately 3,096,200 t CO₂-e of scope 1 emissions over the life of the proposal.

The proposal, in isolation from BHP's decarbonisation strategy, would require the purchase and use of offsets to align with a trajectory to net zero by 2050, as structural abatement measures to reduce emissions of gas fired electricity generation are limited. However, as part of its assessment the EPA has decided to take into consideration BHP's Pilbara-wide commitment to net zero emissions. This includes BHP's intention to use the GREs to support electrification of diesel-powered haul trucks and locomotives, which will further offset emissions. The EPA has also taken into consideration BHP's commitment to integrate a further 500 MW renewable electricity sources by 2030 to support decarbonisation activities to reach net zero by 2050.

In consideration of this, the EPA is of the view that emissions reductions required under the Safeguard Mechanism represent an as far as practicable reduction of the proposal's scope 1 GHG emissions, and therefore the likely environmental effects of the proposal can be mitigated to achieve consistency with the environmental factor objective for GHG emissions.

3 Holistic assessment

While the EPA assessed the impacts of the proposal against the key environmental factor and environmental values individually in the key factor assessment above, given the link between the key environmental factor and other environmental factors described in Appendix D, the EPA also considered connections and interactions between them to inform a holistic view of impacts to the whole environment.

There is an established link between GHG emissions and the risk of climate change. The EPA recognises that climate change will impact on Western Australia's environment and environmental values. GHG emissions have the potential to impact on all other environmental factors through the effects of climate change. The EPA considers that the Commonwealth Safeguard Mechanism and the proposed conditions relating to GHG emissions will ensure that the impacts to other factors and values of the environment are likely to be consistent with the EPA environmental factor objectives.

4 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 EP Act.

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

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

Regulation through Part V of the Environment Protection Act 1986

The EPA recognises that DWER has historically managed potential environmental impacts associated with the operation of the Yarnima Power Station through the existing Works Approval and Licence (L8803/2013/1). This is through the regulation of emissions and discharges associated with activities that are prescribed under Part V of the EP Act; such as Category Number 53 Electrical Power Generation, and the regulation of clearing via Native Vegetation Clearing Permit (CPS 5617/5).

The EPA notes that the following aspects of the proposal can be regulated through Part V of the EP Act through:

- the clearing of vegetation
- the licensing of emissions and discharges from prescribed premises including noise and air (point source and fugitive, including odour)
- spills and leaks associated with containment infrastructure.

Regulation through the Contaminated Sites Act 2003

The EPA notes that the Yarnima Power Station and adjacent areas have been classified as '*contaminated – remediation required*' under the *Contaminated Sites Act 2003*. The site will continue to be managed in accordance with the *Contaminated Sites Act 2003*. The risk assessment under Part V of the EP Act will include existing contaminated soil and groundwater and specify conditions on a works approval where required.

Consideration of Strategic Management

The EPA has had regard to the proponent's Pilbara Expansion Strategic Proposal, approved under Ministerial Statement (MS) 1105 during the assessment of this proposal. The EPA notes that this proposal was not referred as a request to be considered a derived proposal, as the proposal is not an identified element in Schedule 1 of MS 1105. However, the EPA has considered BHP's intention to manage GHG emissions on a Pilbara-wide regional scale, through a regional GHGMP.

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.

Recommended Environmental Conditions

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

YARNIMA POWER STATION STAGE 4 (GAS RECIPROCATING ENGINES)

Proposal: The Proposal is to increase power generation at the existing Yarnima Power Station, through the installation and operation of gas reciprocating engines, approximately 2 kilometres north-west of Newman in the Pilbara.

Proponent: BHP Iron Ore Pty Ltd
Australian Company Number 008 700 981

Proponent address: 125 St Georges Terrace
Perth WA 6000

Assessment number: 2433

Report of the Environmental Protection Authority: 1776

Introduction: Pursuant to section 45 of the *Environmental Protection Act 1986*, it has been agreed that the proposal entitled Yarnima Power Station Stage 4 described in the 'Proposal Content Document' attachment of the referral of 29 April 2024, 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: Other conditions

(a) **PART A: PROPOSAL EXTENT**

(b) **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		
Overall extent of the Proposal	Within the development envelope shown in Figure 1	47 ha development envelope within the existing power station industrial area
Operational Elements		
Power Generation via Gas Reciprocating Engines	Within the development envelope shown in Figure 1	120 MW
Timing elements		
Proposal time	Maximum project life	Up to 38 years
	Construction	Up to 3 years
	Operations	Up to 26 years

(c) **PART B – ENVIRONMENTAL OUTCOMES, PRESCRIPTIONS AND OBJECTIVES**

(d) **B1 Greenhouse Gas Emissions**

- B1-1 The proponent must notify the CEO in writing within one month of it becoming aware that implementation of the proposal will not be or is not expected to be regulated under the **Safeguard Legislation** as a designated large facility (the **notifiable event**) and such notice must briefly describe the reasons for and expected duration of the notifiable event.
- B1-2 The proponent must, if requested in writing by the CEO, provide the CEO with a report on the implications for the proposal of any amendment or proposed amendment to the **Safeguard Legislation**, or a decision or proposed decision made under the **Safeguard Legislation** that is specified in the CEO's request.
- B1-3 The report required by condition B1-2 must:
- (1) be submitted to the CEO within three months of the date of the CEO's request or such longer period as the CEO agrees to in writing; and
 - (2) explain the implications that the specified amendment or decision has had or is expected to have on:
 - (a) the obligation to reduce net Scope 1 greenhouse gas emissions from implementation of the proposal under the **Safeguard Legislation**; and
 - (b) the quantity of actual and net Scope 1 greenhouse gas emissions likely to result from the future implementation of the proposal.

(e) **PART C – OTHER CONDITIONS**

(f)

(g) **C1 Contact Details**

C1-1 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.

(h) **C2 Time Limit for Proposal Implementation**

C2-1 The proposal must be **substantially commenced** within five (5) years from the date of this Statement.

C2-2 The proponent must provide to the **CEO** documentary evidence demonstrating that they have complied with condition C2-1 no later than fourteen (14) days after the expiration of period specified in condition C2-1.

C2-3 If the proposal has not been **substantially commenced** within the period specified in condition C2-1, implementation of the proposal must not be commenced or continued after the expiration of that period.

(i) **Table 1: Abbreviations and definitions**

Acronym or abbreviation	Definition or term
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the Environmental Protection Act 1986, or the CEO's delegate.
GHG emissions	Greenhouse gas emissions expressed in tonnes of carbon dioxide equivalent (CO ₂ -e) as calculated in accordance with the definition of 'carbon dioxide equivalence' in Section 7 of the National Greenhouse and Energy Reporting Act 2007 (Cth), or, if that definition is amended or repealed, the meaning set out in an Act, regulation or instrument concerning greenhouse gases as specified by the Minister.
ha	Hectare(s)
Operations / Commencement of operations	Operation of the plant infrastructure for the proposal and includes pre-commissioning, commissioning, start-up and operation of the plant infrastructure for the proposal.
Proposal GHG emissions	Scope 1 GHG Emissions released to the atmosphere as a direct result of an activity or series of activities that comprise/s or form/s part of the proposal, calculated in accordance with: (j) the National Greenhouse and Energy Reporting Act 2007 (Cth) and its subsidiary legislation; or if that Act or the relevant subsidiary legislation is amended or repealed such that it does not provide a mechanism for calculating the Proposal Emissions, any other Act, regulation or instrument concerning greenhouse gases as specified by the CEO.
Safeguard Legislation	The Commonwealth National Greenhouse and Energy Reporting Act 2007 and associated National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015
Scope 1 emissions	Scope 1 emissions of greenhouse gas, in relation to a facility, means the release of greenhouse gas into the atmosphere as a direct result of one or more activities, which are part of the proposal, that generate greenhouse gas emissions.
Substantially commenced	Physical construction activities for, and progress of an important or essential element or elements of the Proposal scope

Figure (attached)

Figure 1 Development envelope (This map is a representation of the co-ordinates referenced in Schedule 1)

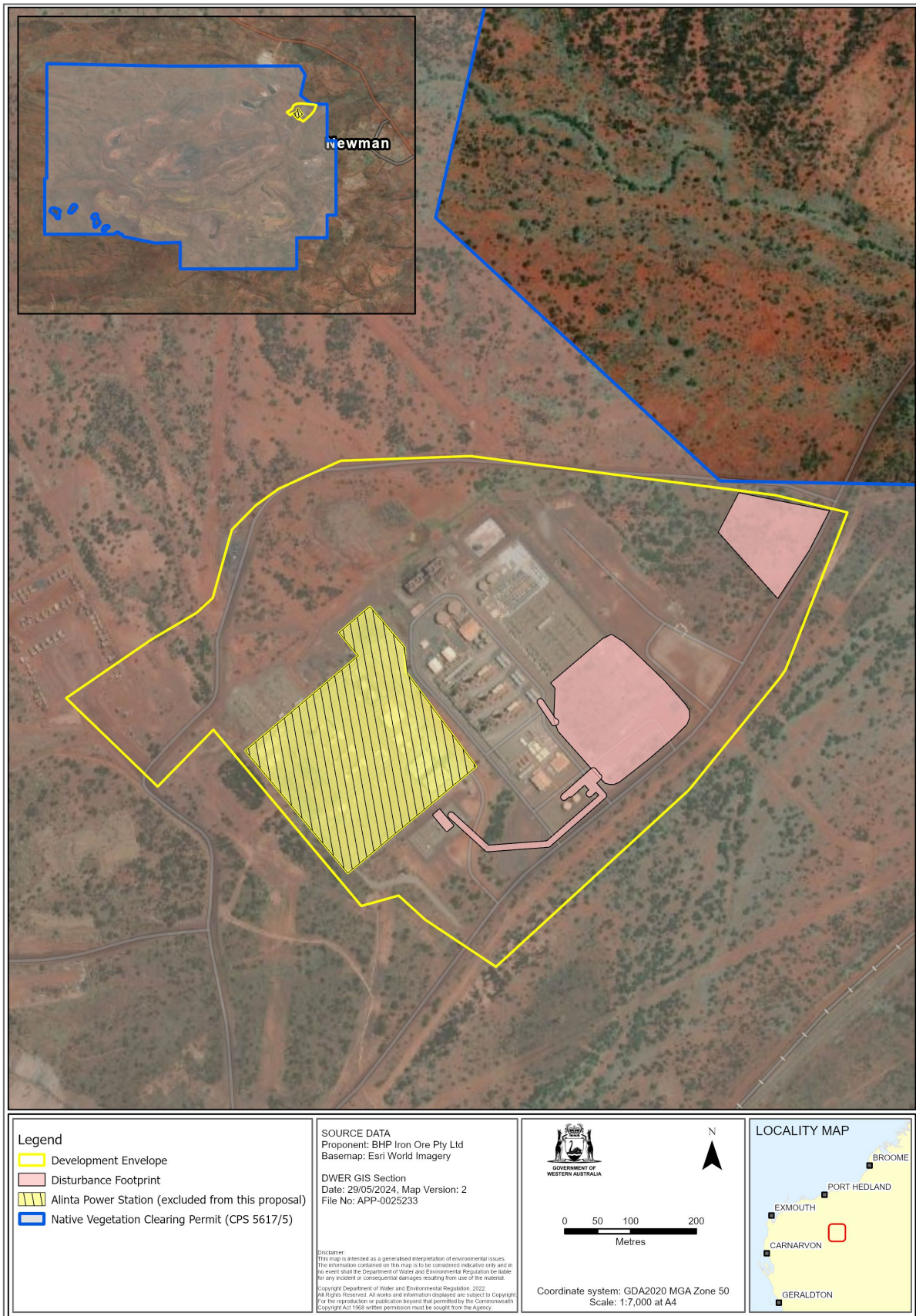


Figure 1: Development envelope and disturbance footprint for the proposal.

(k) **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 2020 (GDA 2020).

Spatial data depicting the figures are held by the Department of Water and Environmental Regulation (DWER) Environment Online.

Appendix B: Decision-making authorities

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

Decision-making process	Legislation (and approval)
1. Minister for State Development	State Agreement Acts <ul style="list-style-type: none"> - <i>Iron Ore (Mount Newman) Agreement Act 1964 (WA)</i>
2. Chief Dangerous Goods Officer	<i>Dangerous Goods Safety Act 2004</i> <ul style="list-style-type: none"> - Storage and handling of dangerous goods
3. Chief Executive Officer	<i>Environmental Protection Act 1986</i> <ul style="list-style-type: none"> - Part V works and approval licence (L8803/2013/1) that authorises the current Yarnima Power Station, will require amendment to account for this expansion of the proposal. Accounts for electric power generation and bulk storage of chemicals - Part V Native Vegetation Clearing Permit (CPS 5617/5)

Appendix C: Regulation under other statutory processes

Table C1: Identified relevant decision-making authorities for the proposal

Statutory decision-making process	Environmental outcome
<p><i>National Greenhouse and Energy Reporting Act 2007</i></p>	<p>Reduction of scope 1 GHG emissions to meet Australian emission targets of 43% below 2005 levels by 2030 and net zero by 2050.</p> <p>The potential environmental effects of the proposal associated with the emissions of scope 1 GHG emissions are likely to be mitigated to achieve consistency with the environmental factor objective for GHG emissions through the obligations required under the <i>National Greenhouse and Energy Reporting Act 2007</i> and the Safeguard Mechanism.</p>
<p><i>Contaminated Sites Act 2003</i></p>	<p>The proposal site will continue to be managed in accordance with the <i>Contaminated Sites Act 2003</i> to identify and clean up contamination, which is expected to meet the EPA objective for terrestrial environmental quality which is to maintain the quality of land and soils so that environmental values are protected.</p>
<p><i>Environmental Protection Act 1986</i></p> <ul style="list-style-type: none"> - <i>Part V, works approval and licence</i> - <i>Part V native vegetation clearing permit</i> 	<p>The works approval and licence is to regulate emissions and discharges from construction and operations to achieve the following outcomes:</p> <ol style="list-style-type: none"> 1. No adverse impacts to soil, surface water and groundwater quality 2. Maintain air quality and minimise emissions so that environmental values are protected 3. Protect sensitive receptors from dust 4. Minimise and manage noise emissions. <p>The native vegetation clearing permit (CPS 5617/5) is to regulate vegetation clearing. The latest iteration of this clearing permit is CPS 5617/6, issued on 23 November 2013 and expiring 30 November 2033. The clearing permit is for the purposes of clearing native vegetation for mineral production, mineral exploration, construction and maintenance of infrastructure and associated activities. The purpose for the clearing must occur within six (6)</p>

	months of clearing being undertaken, and standard management conditions apply (such as revegetation and rehabilitation to occur within 12 months following the land use being no longer required).
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Appendix D: Environmental Protection Act principles

Table D1: Consideration of principles of the *Environmental Protection Act 1986*

EP Act principle	Consideration
<p>1. The precautionary principle</p> <p><i>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.</i></p> <p><i>In application of this precautionary principle, decisions should be guided by –</i></p> <p>(a) <i>careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and</i></p> <p>(b) <i>an assessment of the risk-weighted consequences of various options.</i></p>	<p>The EPA has considered the precautionary principle in its assessment, and has had particular regard to this principle in its assessment of GHG emissions.</p> <p>The EPA notes that climate change as a result of cumulative GHG emissions has the potential to cause serious damage to WA’s environment. The specific impacts of any single proposal’s GHG emissions are not able to be known with certainty at this time. However, the EPA has not used this as a reason for postponing assessment of the proposal’s contribution to the State’s GHG emissions or recommending practicable conditions to reduce emissions in order to minimise the risk of environmental harm associated with climate change.</p> <p>The objective of the GHG EMP for the proposal is to avoid, reduce or mitigate 100% of scope 1 GHG emissions from the operation of the Yarnima Power Station by 2050. The proponent has committed to progressive environmental targets to the support the long-term objectives. The EPA considers the Commonwealth’s Safeguard Mechanism represents an as far as practicable reduction of the proposal’s GHG emissions. Consistent with the Greenhouse Gas Emissions Policy for Major Projects 2024, the EPA recommends a condition that requires the proponent to notify the State of a substantial change to its obligations under the Safeguard Mechanism (recommended B1).</p>
<p>2. The principle of intergenerational equity</p> <p><i>The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</i></p>	<p>The EPA has noted that GHG emissions pose a risk to future generations, however, also notes that the proponent has committed to following a linear trajectory to net zero emissions by 2050 consistent with the Paris Agreement and IPCC 1.5 report, and to use offsets should these targets not be met by continuous improvement. The EPA has recommended conditions to ensure this.</p> <p>In considering this principle, the EPA has had particular regard to the principle of intergenerational equity in its assessment of GHG emissions. The EPA considers consistency with this principle could be achieved with the implementation of the proponent’s obligation under the Safeguard Mechanism and recommended condition B1.</p>

EP Act principle	Consideration
<p>3. The principles of the conservation of biological diversity and ecological integrity</p> <p><i>Conservation of biological diversity and ecological integrity should be a fundamental consideration.</i></p>	<p>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 GHG emissions.</p> <p>The EPA has considered the extent of potential impacts from the proposal to flora and vegetation and terrestrial fauna to ensure consistency with the principle of conservation of biological diversity and ecological integrity.</p> <p>As a result of proposal implementation 4 ha of vegetation will be cleared, authorised under an existing NVCP. The vegetation is already disturbed as it is immediately adjacent to the existing industrial area and roads.</p> <p>The EPA has concluded that given the nature of the impacts, the proposal is not likely to reduce the extent of any biological or ecological values with the area to a significant degree. The EPA is satisfied the proposal is not likely to be inconsistent with the EPA objectives and is consistent with the principles of the conservation of biological diversity and ecological integrity.</p>
<p>4. Principles relating to improved valuation, pricing and incentive mechanisms</p> <p>(1) <i>Environmental factors should be included in the valuation of assets and services.</i></p> <p>(2) <i>The polluter pays principle — those who generate pollution and waste should bear the cost of containment, avoidance or abatement.</i></p> <p>(3) <i>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.</i></p> <p>(4) <i>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.</i></p>	<p>In considering this principle, the EPA notes that the proponent will be responsible for bearing the costs of implementing measures to reduce and offset GHG emissions, including the costs of adopting advances in process management and other measures in the future to further reduce and offset GHG emissions to achieve net zero along a linear trajectory to net zero by 2050.</p>

EP Act principle	Consideration
<p>5. The principle of waste minimisation</p> <p><i>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</i></p>	<p>The EPA notes that waste will be minimised through the life of the proposal by adopting the hierarchy of waste controls, of avoid, reuse, recycling, recovery of energy, treatment and safe disposal. The proposal exists within an existing power station that contains sufficient waste management infrastructure to allow the above waste management hierarchy to be implemented.</p>

Appendix E: Other environmental factors

Table E1: 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			
Flora and vegetation	The development envelope would require clearing of up to 4 ha of vegetation within the development footprint. The proposal area is already highly disturbed as it is an existing industrial area.	<p><u>Public comments</u></p> <ul style="list-style-type: none"> No public comments were received. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> No agency comments were received. 	<p>The proponent has existing approval to clear vegetation under a NVCP (CPS 5617/5) that encompasses the proposal area, see Figure 2 for NVCP spatial extent.</p> <p>Accordingly, the EPA did not consider flora and vegetation to be a key environmental factor at the conclusion of its assessment.</p>
Air			
Air quality	Emissions to the air from the Yarnima Power Station Stage 4 (Gas Reciprocating Engines) expansion, including nitrogen dioxide (NO ₂).	<p><u>Public comments</u></p> <ul style="list-style-type: none"> One public comment raised generic concerns regarding air quality <p><u>Agency comments</u></p> <ul style="list-style-type: none"> No agency comments were received. 	<p>The combustion of gas for power generation by the proposal would result in nitrogen dioxide (NO₂) being released into the air. By using GREs to generate electricity rather than diesel, the proposal would avoid emissions of sulfur dioxide, carbon dioxide, and particulates (PM₁₀ and PM_{2.5}). Modelling conducted by the proponent determined that under normal operating conditions, NO₂ emissions would be below National Environment Protection (Ambient Air) Measure (NEPM) criteria. Emergency scenario modelling predicted one circumstance where NEPM criteria may be breached for less than an hour, however the proponent considers that circumstance as having a very low chance of occurring.</p> <p>The Yarnima Power Station is licenced under Part V of the EP Act (L8803/2013/1) to manage air emissions (including nitrogen oxides). To ensure air emissions are continued to be managed for this proposal, the</p>

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
			<p>proponent will be required to apply for an amendment to the existing licence.</p> <p>Accordingly, the EPA did not consider air quality to be a key environmental factor at the conclusion of its assessment.</p>
People			
Social surroundings	The proposal has the potential to impact social surroundings via noise emissions to nearby industrial and residential receptors.	<p><u>Public comments</u></p> <ul style="list-style-type: none"> No public comments were received. <p><u>Agency comments</u></p> <ul style="list-style-type: none"> No agency comments were received. 	<p>Noise from the operation of GREs has the potential to impact the people of the Newman township. Modelling by Talis Consulting (2024) analysed a worst-case modelling scenario to determine if the proposal would comply with the Environmental Protection (Noise) Regulations 1997. This modelling scenario predicted that the proposal had the potential to breach criteria for sensitive receptors during night time (10pm-7am). However, following standard noise mitigation modelling, BHP predicts the proposal will comply with regulations</p> <p>In addition, the Part V licence for the existing Yarnima Power Station (L8803/2013/1) manages noise emissions.</p> <p>Accordingly, the EPA did not consider social surroundings to be a key environmental factor at the conclusion of its assessment.</p>

Appendix F: List of submitters

7-day comment on referral

Organisations and public

- Submitter 1
- Submitter 2
- Submitter 3
- Submitter 4
- Submitter 5
- Submitter 6
- Submitter 7
- Submitter 8

Government agencies

- Department of Water and Environmental Regulation

Appendix G: Assessment timeline

Date	Progress stages	Time (weeks)
24 April 2024	EPA decided to assess – level of assessment set	
4 June 2024	EPA requested additional information	6
7 June 2024	EPA received final information for assessment	1
20 June 2024	EPA Meeting	2
18 September 2024	EPA completed its assessment (final information after EPA Meeting received)	13
3 December 2024	EPA provided report to the Minister for Environment	6
5 December 2024	EPA report published	2 days
27 December 2024	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 has not met its timeline objective to complete its assessment and provide a report to the Minister.

Appendix H: Relevant policy, guidance, procedures and references

Environmental factor guideline – Air quality (EPA 2020)

Environmental factor guideline – Flora and vegetation (EPA 2016)

Environmental factor guideline – Greenhouse gas emissions (EPA 2024)

Environmental factor guideline – Social surroundings (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)

Australian National Greenhouse Accounts Factors (Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023a).

National Greenhouse and Energy Reporting Scheme, under the National Greenhouse and Energy Reporting Act 2007 (Clean Energy Regulator 2007)

Safeguard Mechanism: Prescribed production variables and default emissions intensities (Clean Energy Regulator 2023)

BHP Iron Ore Pty Ltd (BHP) 2024a, *Yarnima Power Station Stage 4 (Gas Reciprocating Engines) – Proposal Content Document*. BHP Iron Ore Pty Ltd.

BHP 2024b, *Yarnima Power Station Stage 4 (Gas Reciprocating Engines) – Environmental Review Document*. BHP Iron Ore Pty Ltd.

BHP 2024c, *Pilbara Regional Greenhouse Gas Management Plan, Version 1*. BHP Iron Ore Pty Ltd.

Clean Energy Regulator (CER) 2024, *Electricity sector emissions and generation data 2022–23*. CER, Canberra, ACT.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023b, *National Greenhouse Gas Inventory Quarterly Update: December 2022*. DCCEEW, Canberra, ACT.

DCCEEW 2024, *State and territory greenhouse gas inventories: annual emissions*. DCCEEW, Canberra, ACT.

Department of Water and Environmental Regulation (DWER) 2017, *Clearing Permit 5617/6*, DWER, Perth, WA.

Environmental Technologies & Analytics. *Yarnima Power Station Expansion Air Quality Assessment Final Report, Version 4. Project Number 1149 (1244D) March 2024*. Environmental Technologies & Analytics.

EPA 2021, *Environmental impact assessment (Part IV Divisions 1 and 2) procedures manual*, Environmental Protection Authority, Perth, WA.

EPA 2023, *Statement of environmental principles, factors, objectives and aims of EIA*, Environmental Protection Authority, Perth, WA.

EPA 2023, *Environmental factor guideline – Greenhouse gas emissions*, Environmental Protection Authority, Perth, WA.

EPA 2024, *Environmental factor guideline – Greenhouse gas emissions*, Environmental Protection Authority, Perth, WA.

GHD Pty Ltd (GHD) 2023, *Yarnima Stage 4 (Gas Reciprocating Engines) Emissions Calculations Report – Revision 1, BHP, 08 December 2023. Project Number 12578409*. GHD Pty Ltd.

IPCC 2023. *Summary for Policymakers. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]*. IPCC, Geneva, Switzerland, pp. 1-34, doi: 10.59327/IPCC/AR6-9789291691647.001.

KPMG 2023. *Review of IPG1 Greenhouse Gas Management Plan, BHP Iron Ore Pty Ltd, 14 December 2023*. KPMG.

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*.

Talis Consultants. *Yarnima Power Station Environmental Noise Assessment, Revision 5. Project Number TB21054-1. 22 February 2023*. Talis Consultants.