RioTinto

Greenhouse Gas Environmental Management Plan

Brockman Syncline Proposal

Hamersley Iron Pty Limited

August 2023

Hamersley Iron Pty Limited

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Disclaimer and Limitation

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Document Status				
Description	Prepared by	Reviewed by	Approved by	Approval Date
Draft submitted to DWER	Rio Tinto	Rio Tinto	Rio Tinto	August 2023

Corporate endorsement

I hereby certify that to the best of my knowledge, the provisions within this Brockman Syncline Proposal Greenhouse Gas Environmental Management Plan are true and correct.

Name: Daniel Benefer **Signed:** 

Designation: General Manager, Brockman 4 **Date:** **10/08/2023**

Name: Joshua Bennett **Signed:** 

Designation: General Manager, Greater Nammuldi Region **Date:** **14/08/2023**

1. EXECUTIVE SUMMARY

Proposal name	Brockman Syncline Proposal
Proponent name	Hamersley Iron Pty. Limited
Proposal description and scope	Hamersley Iron Pty. Limited (the Proponent) operates the existing Brockman Syncline 2, Nammuldi-Silvergrass and Brockman Syncline 4 operations (Brockman Hub) located approximately 60 km north-west of Tom Price in the Pilbara Region of Western Australia. The Proposal includes the extension and development of new above and below water table deposits and associated activities to extend the life of existing iron ore operations at Brockman Syncline 2, Nammuldi-Silvergrass and Brockman Syncline 4.
Purpose of the GHG EMP	The GHG EMP has been prepared with due consideration to the Western Australian Government Greenhouse Gas Emissions Policy for Major Projects (State GHG Policy) and the Western Australian Environment Protection Authority (WA EPA) Greenhouse Gas Management Plan section of the Environmental Factor Guideline: Greenhouse Gas Emissions 2023 (Guideline) which requires a GHG EMP to be developed when a Proposal exceeds 100,000 tonnes CO_2-e of Scope 1 or Scope 2 emissions in any year. The GHG EMP demonstrates the Proponent's contribution towards the Western Australia aspiration of net zero emissions by 2050, making a commitment to implement initiatives that either avoid, reduce or offset emissions.
Emissions estimates	The principal source of emissions for the Proposal includes diesel consumption (Scope 1) and electricity supplied by the Pilbara Power Generation Network (Scope 2). Total emissions for the life of the Proposal without emissions abatement, equates to 6,620,647 t CO_2-e over the ~20-year mine life with an average emissions intensity value of 0.0075 t CO_2-e/ t SOP. Emissions estimates for the Proposal include; <u>Annual average</u> • 271,683 t CO_2-e Scope 1 emissions • 43,586 t CO_2-e Scope 2 emissions • 48,288,429 t CO_2-e Scope 3 emissions <u>Total</u> • 5,705,348 t CO2-e Scope 1 emissions • 915,299 t CO2-e Scope 2 emissions • 1,014,057,013 t CO2-e Scope 3 emissions

Trajectory of emissions reductions	The Proponent proposes to align its emissions reduction targets to Rio Tinto corporate emissions reduction targets and from 2030 will reduce emissions along a linear trajectory to net zero by 2050. This is consistent with EPA expectations and results in the following emissions reductions for the Proposal; • Reduce or abate absolute emissions by 15% by 2025 (approximately 488 t CO_2-e); • Reduce or abate absolute emissions by 50% by 2030 (approximately 976,119 t CO_2-e); • Reduce or abate absolute emissions by 67% by 2035 (approximately 1,486,744 t CO_2-e); • Reduce or abate absolute emissions by 74% by 2040 (approximately 1,406,069 t CO_2-e); and • Reduce or abate absolute emissions by 56% by 2045 (approximately 308,430 t CO_2-e) Applying the mitigation hierarchy, the Proponent proposes to avoid all emissions required to meet the Proposals emissions reduction targets and will only use offsets if abatement is insufficient.
Other statutory decision-making processes which require reduction in GHG emissions	The Commonwealth of Australia regulates Scope 1 covered emissions from the Greater Brockman hub through the Safeguard Mechanism. It requires Brockman 2, Nammuldi-Silvergrass and Brockman 4 facilities to keep emissions below a baseline (that rises and falls with production) or purchase Australian Carbon Credit Units (ACCUs) in the event of baseline exceedances. The Safeguard Mechanism baselines for both facilities are now set on a combination of site-specific emissions intensity and the default industry average emissions intensity. The weighting towards the default industry average emissions intensity increases annually, rising to 100% in 2030. Concurrently, baselines also decline 4.9% year on year lowering the facility baseline each year. A facility can reduce Scope 1 covered emissions (e.g. diesel reductions) at the facility to avoid baseline exceedances or are required to purchase ACCUs. The Greater Brockman hub obtains power from the Pilbara Power Network which is subject to Commonwealth of Australia's Renewable Energy Target (RET). The RET is designed to reduce emissions of greenhouse gases in the electricity sector by encouraging additional generation of electricity from sustainable and renewable sources. Renewable Energy Certificates (RECs) must be surrendered based on the amount of electricity generated minus exemptions (e.g. electricity generated from renewables) multiplied by the Renewable Power Percentage (RPP) for the year. The 2023 RPP is 18.96%.
Key components in the GHG EMP	To achieve net zero by 2050, emission abatement projects could be implemented locally at the Greater Brockman hub or throughout the Pilbara. This is focussed on displacement of gas in electricity generation throughout the Pilbara Power Network with renewable energy sources, including solar, wind and battery energy storage, along with energy efficiency opportunities, alternative fuels and technologies to reduce or replace diesel in mobile fleet (e.g. battery electric solutions). Future improvements in technology will be monitored and assessed for feasibility over the life of the Proposal.

	The Proponent expects that abatement will be sufficient to meet interim and long-term targets. If and where abatement is insufficient against the Proposal targets, the Proponent proposes to offset GHG emissions by retiring high integrity offset units on an annual basis to meet cumulative 5 yearly targets. Scope 3 emissions from steel making are the largest contribution to total emissions due to activities by customers outside of the Western Australia jurisdiction. Currently there is no proven process route at an industrial scale to produce primary net zero steel today however the industry is developing and scaling a range of new technologies. Through the dedicated steel decarbonisation team within the Commercial team, Rio Tinto is advancing numerous projects in partnership with over 30 customers, universities, researcher institutes, and other industry stakeholders, to build options with the aim of net zero by 2050.
GHG EMP reviews and reporting	The Ministerial Statement Annual Compliance Assessment Report will include annual Proposal emissions, tonnes of iron ore produced and the emissions intensity. A summary report of performance against the Proposal targets will be detailed in the Ministerial Statement Annual Compliance Assessment Report every five years, with the first report taking place in the 2025 Report. Where either the five yearly review cycle is triggered, or if a significant change to either the facility, activity, or material risk is identified, a revised GHG EMP will be submitted to the WA EPA.
Proposed construction date	2025
GHG EMP required pre-construction?	Yes ☒ No ☐
Proposed project end of life/decommissioning date	2045

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Abbreviations and Definitions

Table 1-1 Abbreviations and Definitions

Abbreviation	Term
ANFO	Ammonium Nitrate and Fuel Oil
AWT	Above water table
BWT	Below water table
BESS	Battery Energy Storage System
Brockman Hub	Refers to the entire Greater Brockman operations and associated infrastructure, including Brockman Syncline 2, Nammuldi-Silvergrass and Brockman 4 Syncline.
CH_4	Methane
CER	Clean Energy Regulator
CO_2	Carbon dioxide
CO_2-e	Carbon dioxide equivalent
Credible Offset Units	Offset units that meet offset integrity standards and principles outlined in ICROA's Technical Specification
CRI	Commercial Readiness Index
DMAs	Decision-making authorities
DRI	Direct reduced iron
EP Act	*Environmental Protection Act 1986*
EFH	Effective flat haul
GHG	Greenhouse gas
GHG EMP	Greenhouse Gas Environmental Management Plan
GWP	Global warming potential
Ha	Hectares
HME	Heavy Mobile Equipment
HVO	Hydrotreated Vegetable Oil
ICROA	International Carbon Reduction and Offset Alliance
IPCC	Intergovernmental Panel on Climate Change
MG	Muntulgura Guruma
Mtpa	Million tonnes per annum
MWh	Megawatt hour
NbS	Nature-based Solutions
NGER	National Greenhouse and Energy Reporting
NGER Determination	*National Greenhouse and Energy Reporting (Measurement) Determination 2008*
N_2O	Nitrous oxide
PKKP AC	Puutu Kunti Kurrama and Pinikura Aboriginal Corporation
Proponent	Hamersley Iron Pty. Limited
Proposal	The Proposal is the significant amendment to the Approved Proposals and includes the extension and development of new above and below water table deposits and associated activities to extend the life of the Existing Operations.
REC	Renewable Energy Certificate
RET	Renewable Energy Target
RTIO	Rio Tinto Iron Ore

Abbreviation	Term
Safeguard Mechanism	*National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015*
Scope 1	Emissions released into the atmosphere as a direct result of an activity, or series of activities, at a facility
Scope 2	Indirect emissions released into the atmosphere from the consumption of purchased energy
Scope 3	All other indirect GHG emissions (not included in Scope 2) that occur in the Company's value chain
SOP	Saleable ore product
State GHG Policy	*Greenhouse Gas Emissions Policy for Major Projects*
t CO_2-e	Tonnes of carbon dioxide equivalent
The Guideline	*Environmental Factor Guideline Greenhouse Gas Emissions 2023*
TMM	Total Material Movement
TRL	Technology Readiness Level
WA EPA	Western Australian Environment Protection Authority
WI	Work Index

2. CONTEXT, SCOPE AND PURPOSE

The Proponent proposes that, subject to approval of the Proposal, a new consolidated Ministerial Statement (MS) for the amended Proposal will be published with implementation conditions that supersede, consolidate and modernise those currently applicable to the existing operations. Existing operations at Brockman are included within the Greenhouse Gas Environmental Management Plan (GHG EMP) for reference, however are not included in the proposed five yearly emissions reduction commitments.

2.1. Proposal description and scope

The Brockman Syncline Proposal (the Proposal) includes the extension and development of new above and below water table deposits and associated activities to extend the life of the existing operations at the Greater Brockman hub. Hamersley Iron Pty. Limited (the Proponent) operates the existing Brockman Syncline 2, Nammuldi-Silvergrass, and Brockman Syncline 4 (Greater Brockman hub) iron ore mines which are located approximately 60 kilometres north-west of the Tom Price township in the Pilbara Region of Western Australia (Figure 2-1).

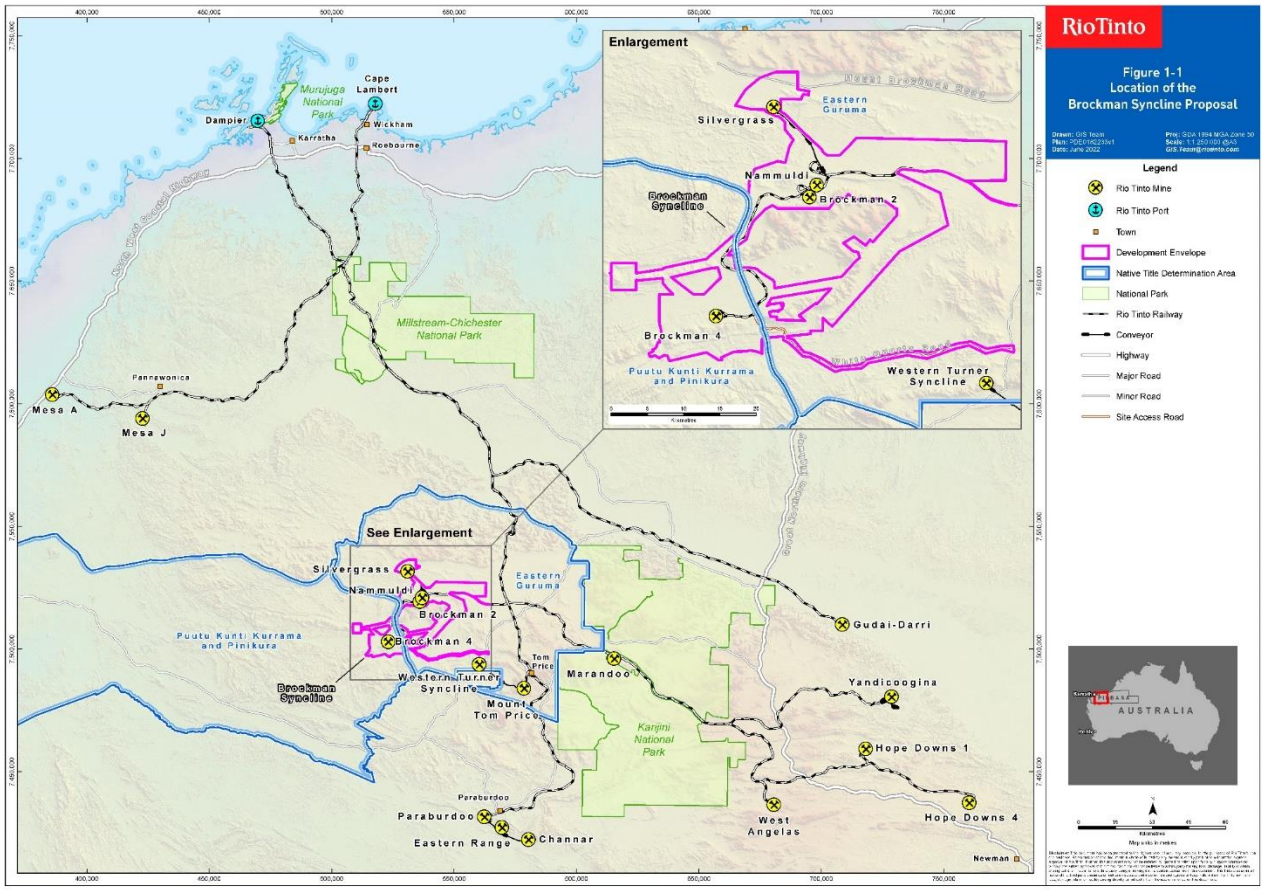

Figure 2-1 Location of the Brockman Syncline Proposal

This Proposal is an integral part of the Rio Tinto Group's (Rio Tinto) integrated network of iron ore mines in the Pilbara. Current indicative layout of the key components of the Proposal are depicted in Figure 2-2, including the new proposed development envelope consisting of the Brockman Hub existing operations and the new deposits, as per the Proposal.

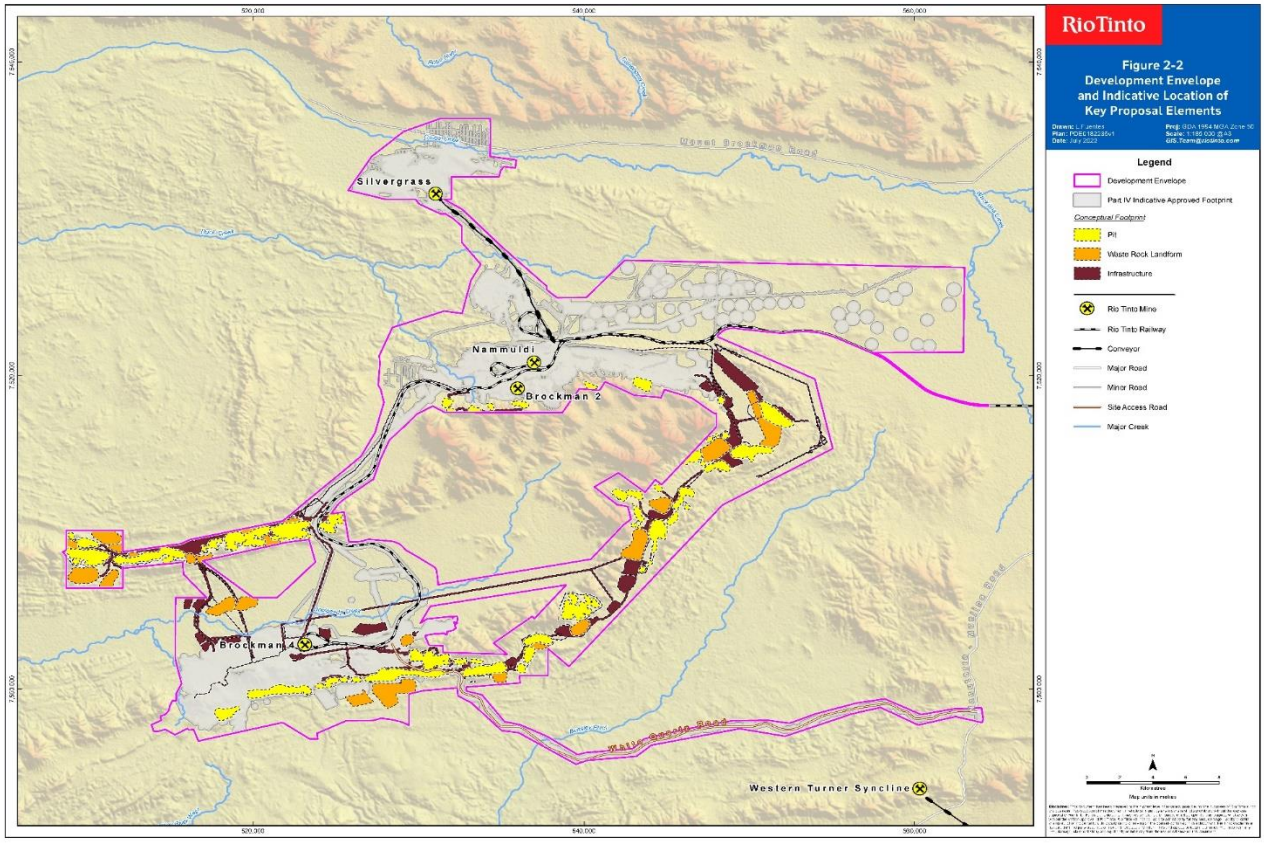

Figure 2-2 Development envelope and indicative location of key proposal elements

The Proposal includes, but is not limited to the following:

- Development of new deposits and extensions of existing operations, including above water table and below water table mining
- Ore processing, transport and handling infrastructure
- Ore, topsoil and subsoil stockpiles
- Mineral waste management, including but not limited to:
    - Waste rock dumps
    - Storage of waste fines
    - Land bridges
    - Low-grade ore dumps
- Surface water management infrastructure, including but not limited to:
    - Diversion drains
    - Levees
    - Culverts
    - Infrastructure for groundwater abstraction and utilisation
- Dewatering and surplus water management, including but not limited to:
    - Use in ore processing
    - On-site use, including discharge to disused pits
    - Use at the Nammuldi irrigated agriculture project
    - Infiltration to the aquifer
    - Provision to other users
    - Discharge to creek lines
- Other associated mine infrastructure and support facilities and upgrades, including but not limited to:
    - Accommodation Camps
    - Workshops
    - Hydrocarbon and ANFO storage

    - Laydown areas, offices and accommodation facilities
- Linear infrastructure including but not limited to:
    - Heavy and light vehicle access roads
    - Crushing and conveying systems
    - Pipe and power lines (including sub-stations)
    - Utilities and communications distribution networks
    - Rail and associated infrastructure
    - Renewable energy infrastructure.

It excludes activities that are part of, or required for, continuation of the existing mining operations at Brockman Hub. This includes but is not limited to:

- Low impact activities required to inform Part IV assessment of the Proposal, including drilling and associated activities for resource evaluation, geotechnical assessment and hydrogeological investigations. These activities will be subject to relevant provisions under Part V of the EP Act and the Rights in Water and Irrigation Act 1914 (RiWI Act)
- Activities that are part of, or required for continuation of, the existing mining operations at BS2, BS4 and Nammuldi-Silvergrass (as approved under MS 131, MS 867, MS 1000 and MS 925)
- Construction camp and associated activities (currently authorised under Clearing Permits issued under Part V of the EP Act)
- Environmental, heritage and other studies/ investigations involving fieldwork.

The scope of this GHG EMP is the Proposal as defined in the Environmental Review Document (ERD. Rio Tinto, 2023). This GHG EMP applies to emissions from activities associated with the additional above and below water table deposits as outlined in the Proposal that are within the operational control of the Proponent (as defined under the National Greenhouse and Energy Reporting Act 2007 (NGER Act)). However, to provide context and where relevant, information is provided for the entire Greater Brockman hub.

2.2. Purpose of the GHG EMP

The purpose of this GHG EMP is to demonstrate:

- The interim and long-term emissions reductions targets the Proposal aims to achieve throughout the project
- The best practice design, technology, management and reasonable practicable alternatives and measures appropriate to avoid, reduce or offset Scope 1 and 2 emissions from this proposal
- The partnerships and arrangements with third parties considered to reduce Scope 3 emissions
- How the proposal is consistent with achieving corporate emissions reduction targets
- The other legal and policy instruments that require GHG emissions reductions from the proposal to meet the EPA's objectives.

A summary of key assumptions and uncertainties of the GHG EMP are presented in Table 2-1.

Table 2-1 Key assumptions and uncertainties of the Brockman Syncline GHG EMP

Key Assumption / Uncertainty	Justification / Explanation
Production and mine strategy may be amended in the future, resulting in a change to the emissions.	Production and mine strategy are market driven and may result in changes. Pilbara facilities are operated as a vertically integrated system, potentially resulting in higher or lower emissions from the Proposal.
Alternative and/or innovative sources of energy may become available in the future that can avoid or minimise GHG emissions from the Proposal.	Rio Tinto has robust study and development processes that ensure innovation and new technology developments are sought, assessed and developed where applicable. Rio Tinto will investigate relevant alternative and/or innovative energy sources when they become viable in the future.
GHG policy and approaches continue to evolve at State and Commonwealth levels	State and Commonwealth Government policies continue to evolve. Key uncertainties include: • State's contribution to Commonwealth targets versus other states; • Setting of sector specific targets for industry versus other sectors (e.g. power, transport, agriculture, buildings).
Market price (carbon)	Whilst Australia has no formal carbon price in place large emitters over 100 kt CO_2-e per year have an emission cap in place, called the Safeguard Mechanism. If a project exceeds this emission cap they are required to obtain Australian Carbon Credit Units (ACCUs) for the gap. Declines to this emission cap are now in place, which will create a cap and trade system aligned with current practice in Europe and other carbon markets. This will in effect place a price on carbon for these large emitters. Rio Tinto will continue to assess opportunities for future capital expenditure to avoid and/or reduce emissions. Internally, Rio Tinto uses a carbon price mechanism such that all capital projects are financially assessed for their carbon impacts.
Cost of technology for renewable energy	Cost of renewables has changed significantly over the last ten years, and further downward trends are expected.
Existing capital expenditure and life of asset	Significant investment has occurred in fixed infrastructure and mobile fleet, therefore asset life is a consideration when assessing and implementing abatement opportunities to avoid or reduce emissions.

3. GHG EMP COMPONENTS

3.1. Emissions estimates

A summary of estimated annual average, peak and total Scope 1, 2 & 3 emissions over an estimated 20-year life of the Proposal is presented in Table 3-1. A summary of estimate annual average, peak and total Scope 1, 2 & 3 emissions over the life of the mine for the Greater Brockman hub (including the Proposal) is presented in Table 3-2.

Nameplate capacity for the Brockman hub is 90 Mtpa, however expected operational throughput throughout the life of the mine for the Greater Brockman hub is expected to be less than nameplate (~70 Mtpa). Operational throughput estimates account for plant maintenance shutdowns, downtime, other operational inefficiencies and are based on historical experience. Of the three processing facilities in the Brockman Hub, operating hours vary between approximately 6,500 to 7,400 hours per year.

The emissions forecast has therefore been generated from the expected operational throughputs rather than nameplate capacity to more accurately reflect the emissions associated with planned future mining at the Greater Brockman hub.

Table 3-1 Estimate of peak, annual and total Scope 1, 2 & 3 emissions for the Proposal

	Peak emissions (t CO_2-e)	Annual average emissions (t CO_2-e)	Total Emissions (t CO_2-e)
Scope 1	497,046 (2029)	271,683	**5,705,348**
Scope 2	84,080 (2035)	43,586	**915,299**
Scope 3	85,671,032 (2035)	48,288,429	**1,014,057,013**

Table 3-2 Estimate of peak, annual and total Scope 1, 2 & 3 emissions for the Greater Brockman hub (including the Proposal)

	Peak emissions (t CO_2-e)	Annual average emissions (t CO_2-e)	Total Emissions (t CO_2-e)
Scope 1	847,815 (2028)	424,201	**11,029,239**
Scope 2	116,723 (2028)	67,932	**1,766,219**
Scope 3	114,136,552 (2024)	68,182,548	**1,772,746,254**

3.1.1. Historic emissions

The Brockman Syncline 2, Nammuldi and Silvergrass iron ore mine was opened in 1992 with production from the Brockman Syncline 2 deposits. Annual production capacity at this time was 10 Mtpa until the Nammuldi deposits opened in 2006 added an additional 6.6 Mtpa capacity. Brockman 4 opened in 2010 with an initial capacity of 20 Mtpa before expanding to 45 Mtpa. The Silvergrass iron ore mine was opened in 2017 which added a total of 45 Mtpa capacity to the Brockman Syncline 2, Nammuldi and Silvergrass iron ore mine. Therefore the current nameplate capacity of the Brockman Hub is 90 Mtpa.

Emissions (Scope 1 & 2) were first reported in 1993 and increased with the expansion of both the Brockman 2, Nammuldi and Silvergrass iron ore mine and the commencement of the Brockman 4 iron ore mine, Figure 3-1.

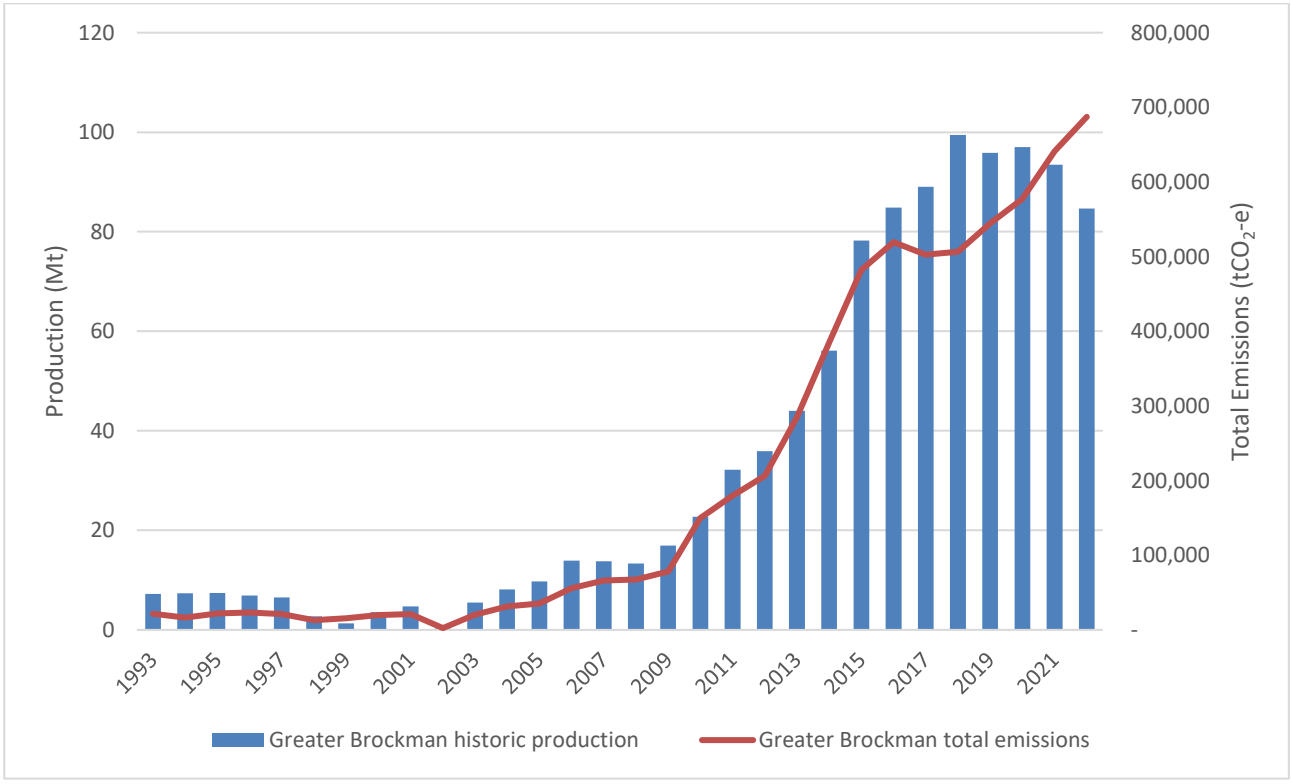

Figure 3-1 Greater Brockman historic production and emissions (Scope 1 & 2)

3.1.2. Proposed emissions baseline

The proposed emissions baseline scenario used to calculate baseline emissions is the continuation of current technologies and practices involved at the Greater Brockman hub mining operations. This scenario includes a diesel mining fleet and electricity generated from gas-fired power stations for the life of the project, using the most recent diesel, land clearing, production and electricity forecast data available.

The diesel forecast uses Total Material Moved (TMM) and Effective Flat Haul (EFH) to calculate a Work Index (WI). EFH accounts for the distance from the mining area to the destination (e.g. crusher) and the change in elevation. An average fuel driver was calculated from actual diesel usage (total site usage which includes all heavy mining equipment through to light vehicles and generators) and WI from the prior three years. The average fuel driver is multiplied by WI in future years to calculate the annual diesel forecast.

The electricity forecast uses the prior three years of historic electricity usage and throughputs to calculate a MWh/t SOP factor for both Brockman 2-Nammuldi-Silvergrass and Brockman 4. This assumes no additional changes to plant infrastructure is planned which is currently the case. These electricity factors are applied to future scheduled production to provide the electricity forecast.

Emissions are then calculated using appropriate factors in a similar method to how emissions are reported in the mining industry under the NGER framework. Due to the uncertainty on timing of large-scale diesel replacement technologies and the quantity of renewables in the Pilbara integrated power system, these abatement projects have not been included in the emissions baseline.

There are other methods to calculate emissions that have not been used, including;

- Fleet plans (using historic fuel burn rates)
    - A bottom-up calculation of diesel usage by individual fleet required based on the fleet plan generated from the mine plan. A current fleet plan for the Proposal is not available at the time of preparing this plan due to the Proposal covering a range of deposits at different study levels and hence detail and availability of fleet plans. A fleet plan covers the majority of diesel usage however does not include diesel usage such as light vehicle fleet and generators for dewatering bores. Given the unavailability of a fleet plan covering the Proposal in its entirety and the need for additional calculations to calculate full diesel usage, this method has not been chosen.
- Historic emissions intensity factor
    - Using a historic emissions intensity factor on future production is less accurate compared with the proposed emissions baseline. This is due to increasing haul distances (e.g. deeper mines and/or new deposits further from existing infrastructure) as the mine develops resulting in emissions intensities generally increasing over time. This has been factored into the forecast in the proposed method (by using EFH). Therefore using a historic emissions intensity for future years of operation could result in an under-estimation of emissions and not best represent the emissions generated from the Proposal.

3.1.3. Breakdown of emissions by source

The principal sources of emissions include:

- Stationary, mobile and transport diesel combustion (Scope 1);
- Land clearing (Scope 1) and
- Consumption of electricity from the Pilbara Power Generation Network (Scope 2).

It should be noted that no fugitive emissions are expected for the Proposal.

A summary of estimated peak[1], annual average[2] and total emissions over an estimated ~20-year life of the Proposal by source and scope is presented in Table 3-3. A summary of the estimated peak, annual average and total emissions from the Brockman Hub (including the Proposal) is presented in Table 3-4.

Table 3-3 Proposal Operational Peak, Annual Average and Total GHG Emissions by Source and Scope

Source	Scope 1 Emissions (t CO_2-e pa)	Scope 2 Emissions (t CO_2-e pa)
Diesel – Peak (2029)	490,163	-
Land Clearing – Peak (2029)	2,206	-
Electricity – Peak (2029)	-	61,631
Total (Scope 1 + Scope 2) – Peak (2029)	**558,677**	
Diesel – Annual Average Life of Proposal	269,713	-
Land clearing – Annual Average Life of Proposal	1,970	-
Electricity – Annual Average Life of Proposal	-	43,586
Total (Scope 1 + Scope 2) – Annual Average Life of Proposal	**315,269**	
Diesel – Total	5,663,972	-
Land Clearing – Total	41,375	-
Electricity – Total	-	915,299
Total (Scope 1 + Scope 2) – Life of Proposal	**6,620,647**	

Table 3-4 Brockman Hub (including the Proposal) Operational Peak, Annual Average and Total GHG Emissions

Source	Scope 1 Emissions (tCO_2-e pa)	Scope 2 Emissions (tCO_2-e pa)
Diesel – Brockman Hub (including Proposal - 2028)	845,609	-
Land Clearing – Brockman Hub (including Proposal - 2028)	2,206	-
Electricity – Brockman Hub (including Proposal 2028)	-	116,723
Total (Scope 1 + Scope 2) – Peak (2028)	**964,538**	
Diesel – Annual Average Life of Brockman Hub (including Proposal)	422,610	-
Land clearing – Annual Average Life of Life of Brockman Hub (including Proposal)	1,591	-
Electricity – Annual Average Life of Brockman Hub (including Proposal)	-	67,932
Total (Scope 1 + Scope 2) – Annual Average Life of Brockman Hub (including Proposal)	**492,133**	
Diesel – Total	10,987,864	**-**
Land Clearing – Total	41,375	**-**
Electricity – Total	**-**	1,766,219
Total (Scope 1 + Scope 2) – Life of Mine	**12,795,458**	

[1] Peak emissions for diesel, land clearing and electricity consumption occur in different years however peak emissions across the asset occurs in 2029 which are the numbers reported.

[2] Annual average life of Proposal diesel and electricity emissions are from 2025 to 2045

3.1.4. Type of GHG's emitted and Global Warming Potential

The major emission types from the Proposal are ~99% carbon dioxide (CO_2) along with minor amounts of methane (CH_4) and nitrogen oxide (N_2O). The Global Warming Potential (GWP) 100-year values for these three GHGs, according to the IPCC Fifth Assessment Report (AR5)[3], are;

- Carbon dioxide – 1
- Methane – 28
- Nitrous oxide – 265

3.1.5. Emissions baseline methodology and scope boundaries

The emissions baseline for diesel and electricity emissions has been calculated using methods and criteria in the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (DoEE, 2008) (NGER Determination). The Australian Government's National Carbon Accounting methodology (FullCAM) has been used to determine emissions from land clearing.

Once calculated, emissions from the diesel forecast are calculated using the Clean Energy Regulator's Method 1 for emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases; from the National Greenhouse Accounts national methodology. This is achieved by multiplying a (physical) quantity of fuel combusted by a fuel-specific energy content factor and a fuel-specific emission factor for each relevant greenhouse gas (in this case, carbon dioxide, methane and nitrous oxide)[4]. This methodology has a carbon dioxide emission factor uncertainty level of 2%.

Emissions associated with the forecast electricity usage is calculated using the CER Method 2 for emissions of carbon dioxide from the combustion of gaseous fuels. This allows a more accurate facility level calculation of emissions by sampling and analysing fuels for qualities that affect emissions levels when the fuel is combusted[5]. This methodology has a carbon dioxide emission factor uncertainty level of 4.3-4.5% across the Pilbara Power Network generators.

The boundary for the Proposal emissions inventory has been defined using an operational control approach consistent with the NGER Act. The following sources of Scope 1 and 2 emissions occur within the boundary of the Proposal:

- Development and operation of new deposits and associated infrastructure to sustain production from the Brockman Hub; and
- Existing mining operations including overland conveyors, central processing plant, train load out facilities and mining operations support infrastructure to the extent utilised for the purpose of the proposed new mining operations.

No boundary has been set for the calculation of Scope 3 emissions as they occur nationally and internationally outside the Proposal boundary, are not reportable under the NGER framework and are included in the assessment but not the mid or long-term targets.

The following sources of emissions are excluded from the emissions forecast:

[3] https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter08_FINAL.pdf

[4] https://www.cleanenergyregulator.gov.au/DocumentAssets/Documents/Estimating%20emissions%20and%20energy%20from%20fuel%20combustion%20guideline.pdf

[5] https://www.cleanenergyregulator.gov.au/DocumentAssets/Documents/Estimating%20emissions%20and%20energy%20from%20fuel%20combustion%20guideline.pdf

- Rail and port export facilities: these facilities are approved under other ministerial statements, support several operations in the area and are outside the Proposal boundary;
- Switchyard and high voltage transformers: network services several sites (i.e. not exclusive to Brockman Hub and the Proposal and therefore excluded);
- Transmission and distribution emissions of electricity imported to site, these are outside the Proposal boundary; and
- Emissions associated with landfill waste and wastewater effluent from the wastewater treatment plants are excluded as they are not reportable under the NGER framework and not material.

3.2. Trajectory of emissions reductions

3.2.1. Scope 1 & 2 emissions trajectory

The estimated proposal Scope 1 and 2 emissions baselines (without abatement), displayed separately, is shown in Figure 3-2. This shows Scope 1 emissions above the 100,000 tonnes of CO_2-e emissions in any year threshold requiring assessment by the EPA. The combined Scope 1 and 2 emissions baseline (without abatement), is shown in Figure 3-3.

Rio Tinto has ambitious corporate emissions reductions targets, 15% reduction of absolute emissions by 2025 and 50% reduction of absolute emissions by 2030 (further detail in Section 3.7.1) and net zero by 2050. The Proposal emissions reduction targets are consistent with these targets and as per EPA expectations, from 2030 will reduce emissions along a linear trajectory to net zero by 2050.

The proposed annual emissions reduction targets required to meet the above targets is shown in Figure 3-3. The Proposal estimated annual and total Scope 1 & 2 emissions (without abatement) with 5 yearly cumulative totals and reduction commitments is shown in Figure 3-4 and Table 3-5.

The Proposal aims to achieve its emissions reduction targets fully through avoidance measures (Figure 3-5), with abatement projects implemented from the Pilbara wide abatement pathway applied against emissions from the Proposal. Specific abatement initiatives (Section 3.4.1) implemented in Rio Tinto's Pilbara Power Generation Network, connected to the Proposal will be applied to achieve Scope 1 & 2 interim emissions targets. The long-term emissions reduction target is anticipated to be achieved through implementation of a range of existing or potential future GHG abatement opportunities.

The Proposal estimated annual and total Scope 1 & 2 emissions (without abatement) with 5 yearly cumulative totals and reduction commitments in a tabular form is in Table 3-6.

Table 3-5 Interim and long-term emissions reductions targets for the Proposal

Target Year	2025	2030	2035	2040	2045	2050
Total Scope 1 & 2 Emissions (t CO_2-e)	2,988	1,952,238	2,218,833	1,894,128	552,459	-
Emission Reduction Target (t CO_2-e)	448	976,119	1,486,744	1,406,069	308,430	-
Percentage Reduction Emissions (%)	15%	50%	67%	74%	56%	-

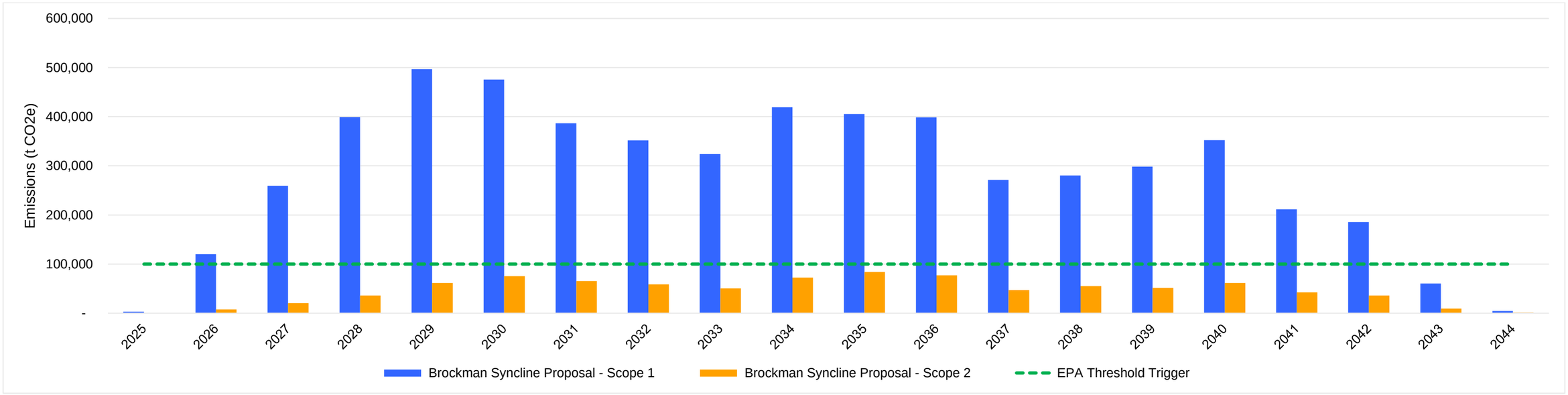

Figure 3-2 Proposal estimated annual Scope 1 & 2 (separate) baseline emissions (without abatement)

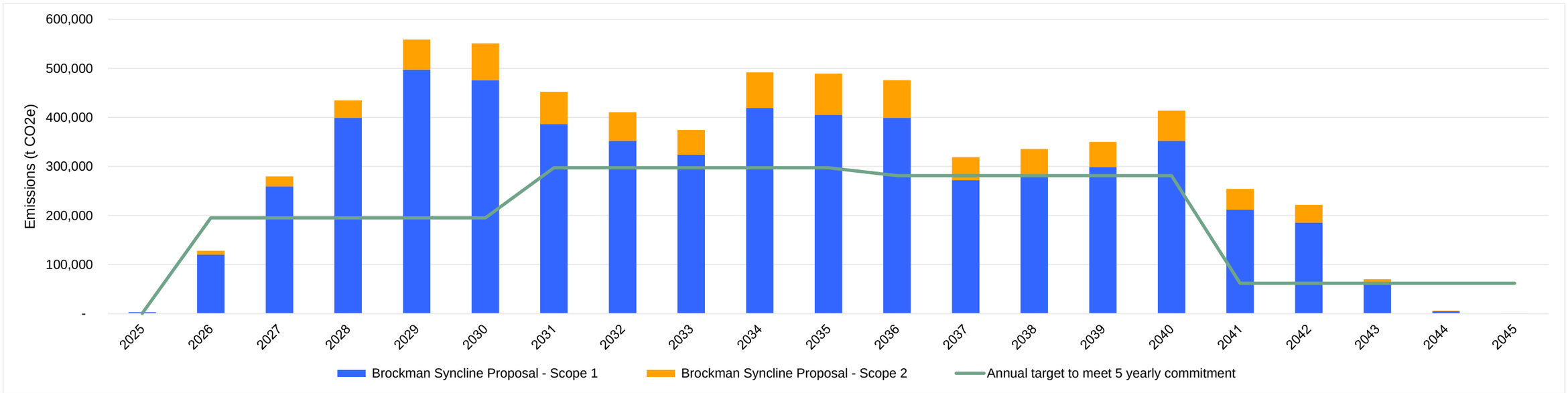

Figure 3-3 Proposal estimated annual Scope 1 & 2 (combined) baseline emissions (without abatement) with annual targets required to meet 5 yearly commitment

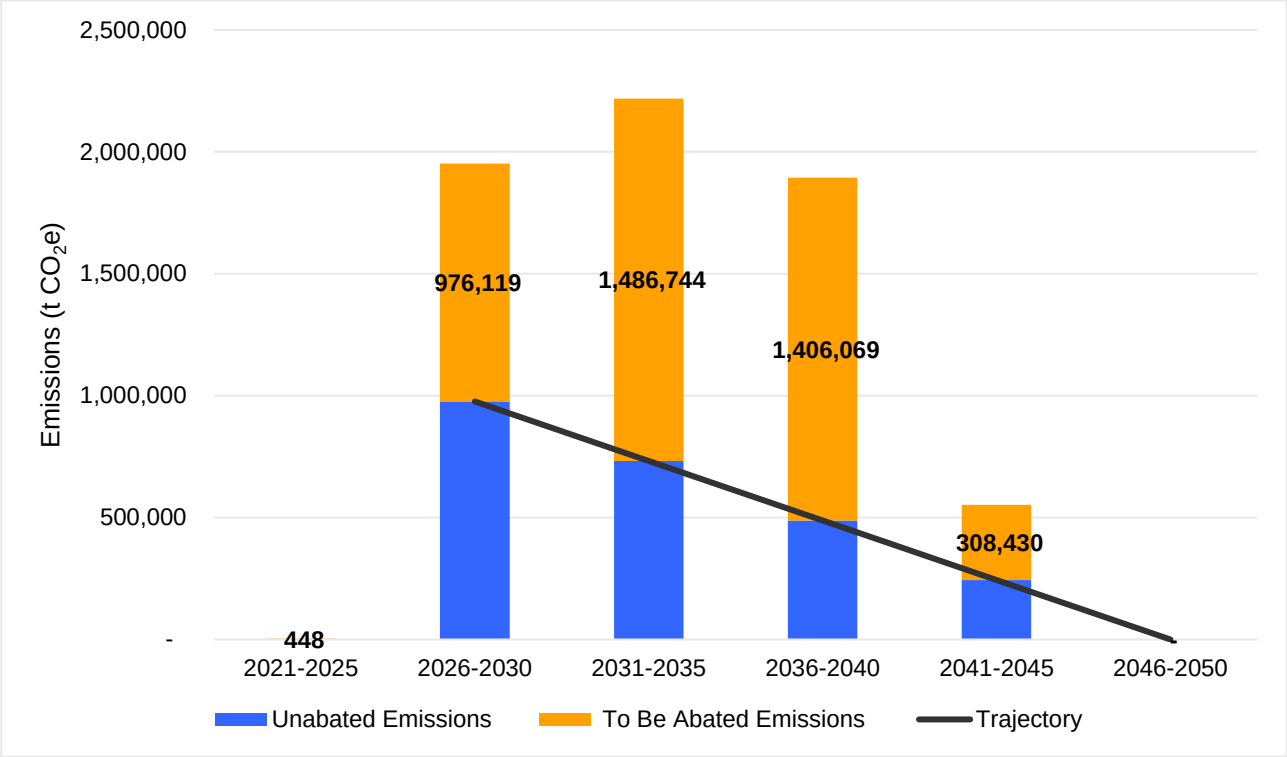

Figure 3-4 Proposal 5 yearly targets and commitments

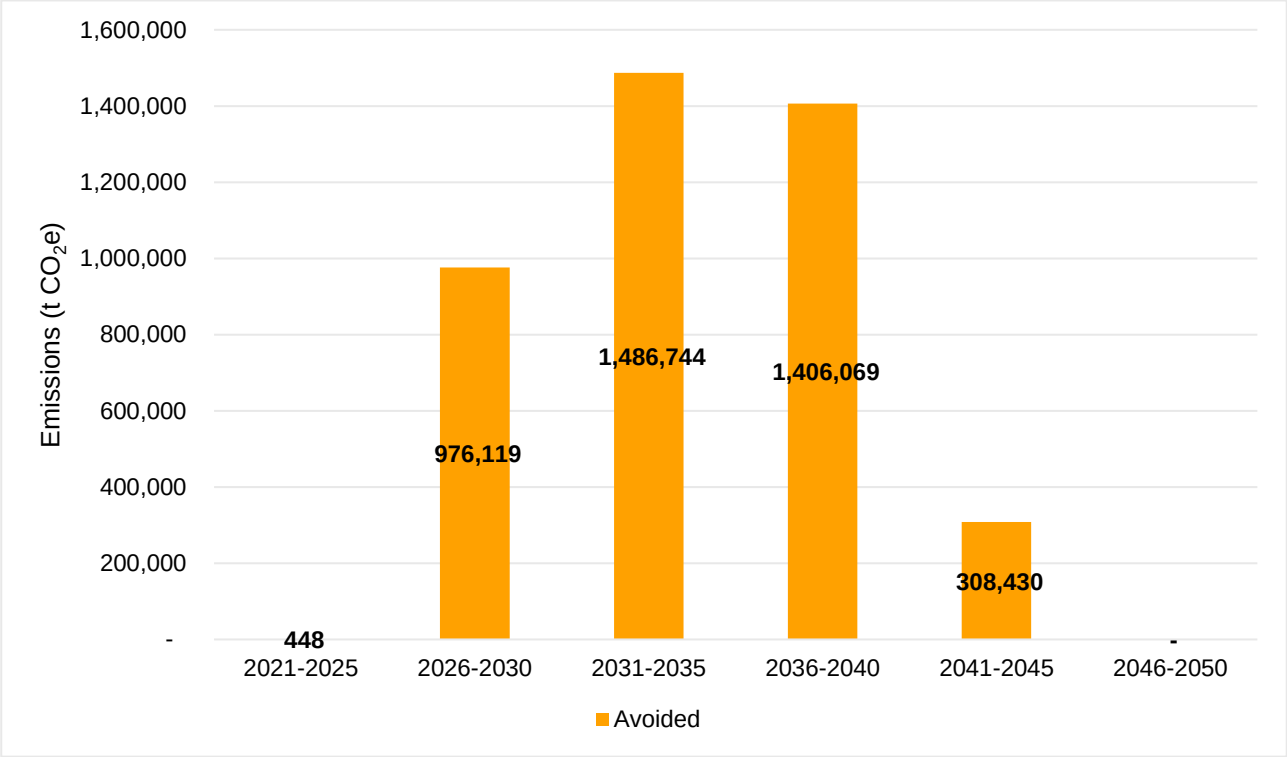

Figure 3-5 Trajectory of emissions which will be avoided, reduced and offset

Table 3-6 Proposal estimated annual and total Scope 1 & 2 emissions (without abatement) with 5 yearly cumulative totals and reduction commitments

Year	Scope 1 GHG emissions t CO_2-e	Scope 2 GHG emissions t CO_2-e	Total GHG emissions (Scope 1 & 2) t CO_2-e	Cumulative total GHG emissions 5 yearly t CO_2-e	Cumulative GHG emissions reduction commitments t CO_2-e
2025	2,988	-	2,988	2,988	448
2026	120,134	7,843	127,977	1,952,238	976,119
2027	259,343	20,379	279,721		
2028	398,887	35,933	434,821		
2029	497,046	61,631	558,677		
2030	475,779	75,262	551,041		
2031	386,487	65,569	452,056	2,218,833	1,486,744
2032	352,042	58,772	410,814		
2033	323,855	50,741	374,596		
2034	419,211	72,653	491,863		
2035	405,423	84,080	489,503		
2036	398,870	77,044	475,914	1,894,128	1,406,069
2037	271,551	47,228	318,779		
2038	280,274	55,258	335,532		
2039	298,291	51,758	350,049		
2040	352,219	61,635	413,855		
2041	211,689	42,579	254,267	552,459	308,430
2042	185,702	36,161	221,863		
2043	60,597	9,498	70,095		
2044	4,637	1,222	5,859		
2045	322	53	375		
Total	**5,705,348**	**915,299**	**6,620,647**	**6,620,647**	**4,177,809**

3.2.2. Scope 3 emissions trajectory

The estimated proposal Scope 3 emissions baseline is shown in Figure 3-6 and Table 3-7.

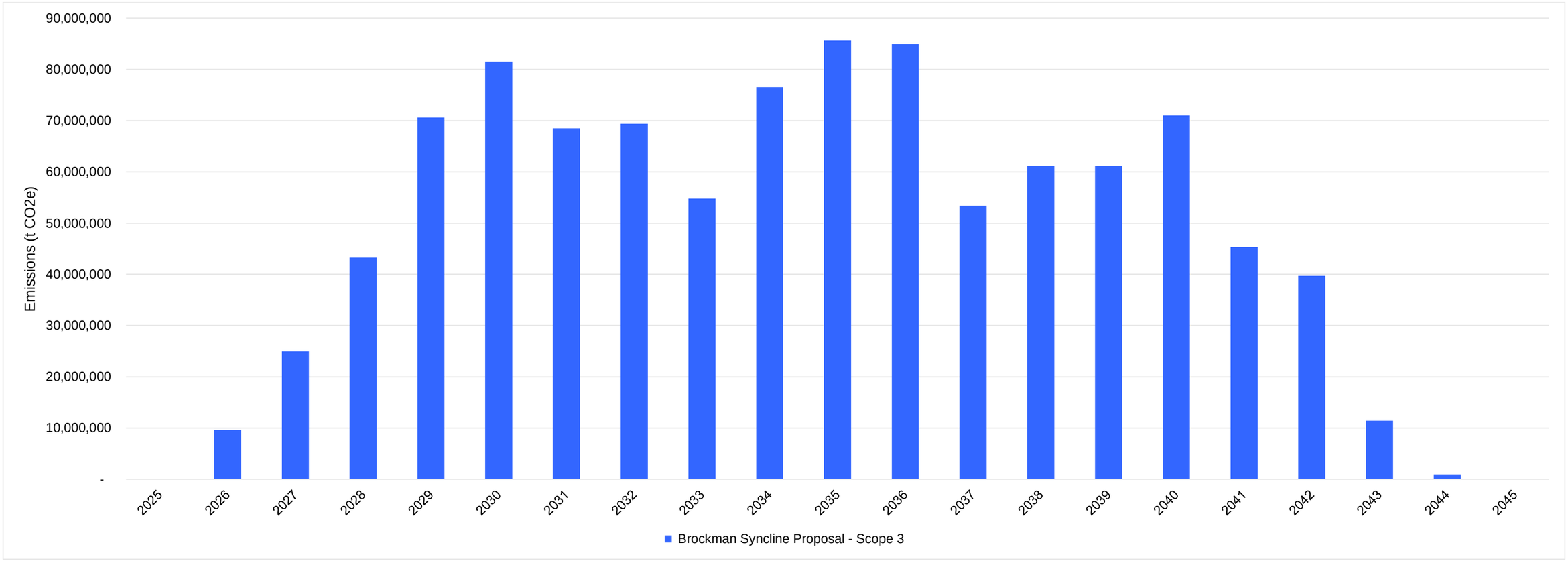

Figure 3-6 Proposal estimated annual Scope 3 emissions

Table 3-7 Proposal estimated annual and total Scope 3 emissions

Year	Scope 3 GHG Emissions t CO_2-e
2026	9,613,182
2027	24,977,318
2028	43,274,364
2029	70,606,091
2030	81,534,046
2031	68,513,073
2032	69,374,580
2033	54,772,577
2034	76,529,139
2035	85,671,032
2036	84,953,418
2037	53,380,876
2038	61,197,350
2039	61,211,773
2040	71,012,851
2041	45,339,055
2042	39,687,920
2043	11,407,090
2044	959,740
2045	41,538
Total	**1,014,057,013**

3.3. Scope 1 – Mitigation measures

3.3.1. Best practice design and operational Scope 1 emissions mitigation measures

Rio Tinto is exploring and implementing a range of short, medium and long-term low-carbon initiatives. Recently efforts have increased with the establishment of a dedicated abatement program for diesel reduction/elimination in 2022, in recognition of Rio Tinto's global diesel consumption in trucks, trains and other mobile equipment of approximately 1.3 billion litres annually, accounting for 13% of Rio Tinto emissions[6].

The solutions to transition mobile fleet from diesel to low/no emissions energy are in the early stages of research and development with limited commercial and technical viability at this stage. Rio Tinto has an

[6] https://www.riotinto.com/invest/reports/climate-change-report

aspiration of no new purchases of diesel-powered haul trucks by 2030[7] and is therefore committed to trials and pilots through partnerships to develop new technological solutions to decarbonise diesel emissions.

Battery electrification is currently the target technology to eliminate diesel emissions from mining equipment, which is expected could be mass deployed from around the mid-2030s, however it is recognised that other technologies will be important. For example, investigation of sustainable biofuels as an interim step as well as working with equipment manufacturers to introduce smaller and more energy-efficiency equipment into mine sites is ongoing.[8]

Given the current limited commercial and technical viability of diesel replacement technologies, the deployment schedule for diesel reduction/elimination technologies for Pilbara mine sites is not yet defined and is currently under investigation. Therefore, in some cases, approvals may be sought, with diesel emissions abatement projects implemented at alternative locations, to ensure maximum abatement is realised as soon as practical.

At a project specific level, the construction of an overland conveyor to transport ore from new mine pits to processing facilities will reduce haul truck diesel emissions and the ongoing optimisation of the mine layout is important to reduce haulage distances and ensure efficient haulage of materials to minimise the stop/start of mining equipment. A list of best practice design and operational measures for the project and under assessment for the Pilbara is contained in Table 3-8.

[7] https://www.riotinto.com/en/news/releases/2022/scania-and-rio-tinto-agree-to-develop-autonomous-haulage-solutions-supporting-a-pathway-to-lower-emissions-mining

[8] https://www.riotinto.com/invest/reports/climate-change-report

Table 3-8 Scope 1 mitigation projects for the Proposal and under assessment in the Pilbara

Description	Mitigation Hierarchy	Indicative Implementation Timeframe	Estimated Emissions Savings ($t CO_2$-e per annum)	Context
Project specific mitigation projects				
Construction of an Overland Conveyor	Avoid	Project Implementation	~17,000	The current base case for the BS1 deposits within the Proposal is the construction of an overland conveyor to transport ore from the new mine pits back to the existing Brockman 4 processing plant. Using an overland conveyor to transport ore will reduce haul truck diesel consumption and deliver GHG abatement. Electrification through use of conveyors is a key measure for achieving reduction of Scope 1 emissions. (Note: estimated emissions savings has already been included in the emissions baseline)
Mine Design	Reduce	Project Implementation	To be confirmed	The ongoing design and mine plan optimisation process assesses the following opportunities: • The location of crusher, mining area, pit exits, and waste dumps are optimised to reduce haul distances. • Haul road layout design – designed to smooth the truck speeds to minimise stop/start and hence improve diesel use efficiency.
Procurement fuel efficient haul trucks and dig units	Reduce	Throughout project	To be confirmed	New fleet purchases replacing older, less efficient engines with more energy efficient engines result in emissions savings. Rio Tinto will utilise Autonomous Haul Trucks throughout the Proposal which reduces emissions by ~10% compared with an operated fleet of trucks. Rio Tinto is currently upgrading its Pilbara Hitachi dig unit fleet with a new model that has an estimated fuel savings of ~10-20% for the Hitachi dig unit fleet.
Pilbara wide mitigation projects under assessment				
Energy efficiency	Reduce	TBC	To be confirmed	Reduction of diesel in existing assets makes good business sense due to fuel cost savings. A number of opportunities exist and are under investigation (e.g. utilising the engine shut of feature of autonomous fleet during certain idling instances and installing secondary power systems for dig units to be also shut off when idling) to be rollout out Pilbara wide.

Description	Mitigation Hierarchy	Indicative Implementation Timeframe	Estimated Emissions Savings (t CO_2-e per annum)	Context
Biofuels for Heavy Mining Equipment	Avoid	~2030	To be confirmed	Rio Tinto has successfully completed the full transition of its heavy machinery from fossil diesel to renewable diesel at its Boron, California operation[9] and Rio Tinto continues to investigate biofuels as an interim step. Rio Tinto has completed validation work with mining fleet engine vendors, testing engines for suitability to transition to HVO with all engines suitable to substitute diesel with HVO.
Trolley assist option	Avoid	TBC	To be confirmed	Rio Tinto is investigating the development of a viable trolley assist option for existing haul fleet to enable substantial reduction in diesel use while on trolley[10]
Zero emissions haul truck fleet	Avoid	~mid-2030s onwards	To be confirmed	In separate partnerships with Komatsu and Caterpillar, Rio Tinto is working to develop and implement battery electric haul solutions including haul trucks. Rio Tinto intends to trial the first large scale battery truck in the Pilbara in 2024-25[11] Rio Tinto and Scania have been trialling 40-tonne-payload agile autonomous haul trucks at Rio Tinto's Channar mine with options for the future transition to electric powered vehicles[12] An innovative partnership with Industry and Austmin, Rio Tinto is a founding partner in the 'Charge On Challenge', a collaboration initiative to identify and develop mobile fleet charging solutions.

[9] https://www.riotinto.com/en/news/releases/2023/rio-tinto-u_s_-borax-becomes-first-open-pit-mine-to-transition-to-renewable-diesel

[10] https://www.riotinto.com/invest/reports/climate-change-report

[11] https://www.riotinto.com/invest/reports/climate-change-report

[12] https://www.riotinto.com/en/news/releases/2022/scania-and-rio-tinto-agree-to-develop-autonomous-haulage-solutions-supporting-a-pathway-to-lower-emissions-mining

3.3.2. Best practice review process

Rio Tinto has completed and continues to assess numerous technologies to transition away from diesel powered mining equipment. Technologies are more progressed for some equipment than others with the emissions reduction/elimination pathway for each equipment type analysed. The mining equipment assessed includes;

- Haul trucks
- Excavators
- Drill rigs
- Auxiliary vehicles (loaders, bulldozers, water trucks, fuel trucks, etc)
- Generators
- Light vehicles

The current best practice alternative energy sources to power mining equipment includes (but is not limited to);

- Electric (including trailing cables, overhead catenary and/or batteries)
- Hydrogen fuel cell electric
- Renewable diesel
- LPG
- Additives
- CNG/LNG
- Biodiesel

The selection criteria used to identify best practice diesel reduction/elimination measures and their effectiveness included a Technology Readiness Level (TRL) and Commercial Readiness Index (CRI) assessment. TRL is a globally accepted benchmarking assessment for tracking technology progress from early-stage research (TRL1) through to actual system demonstration (TRL9). The Australian Renewable Energy Agency (ARENA) has developed a CRI to be used in parallel with the TRL framework. This assessment allows emerging technologies to be assessed based on Hypothetical Commercial Proposition (CRI1) through to Bankable Grade Asset Class (CR6).

Following the assignment of TRL and CRI values for each technology available and associated emissions reduction benefits for different equipment types, a multi-criteria assessment is underway to determine what Pilbara sites are appropriate for deployment of various diesel reduction/elimination technologies. This assessment includes considerations such as, current fleet replacement schedules, mine planning requirements, site infrastructure, power demand/supply, maintenance, information systems, environmental/heritage considerations, etc. to determine future deployment scenarios and timings for individual sites and technologies.

Given the assessments completed to date, battery electrification of mine equipment has been adopted as the preferred long term pathway however assessments continue for all available and future technologies as the diesel reduction/elimination pathway is likely to change and evolve over time.

3.3.3. Benchmarking Scope 1 emissions intensity review

Emissions intensity is expressed as tonnes CO_2-e (Scope 1 emissions not including emissions released directly from land management as per NGER Determination 2008) per unit of production. Production for the iron ore industry is currently defined as “tonnes of iron ore, on a wet basis, that is produced as part of carrying on the iron ore mining activity at the facility and is of saleable quality”[13].

[13] https://www.dcceew.gov.au/sites/default/files/documents/safeguard-mechanism-document-production-variable-definitions-2022.pdf

The Scope 1 emissions intensity for the Proposal was calculated from annual average emissions and production over the life of the project and is presented in Table 3-9.

Table 3-9 Proposal Scope 1 emissions intensity

Proposal	Average Scope 1 emissions (diesel only) ($t CO_2$-e)	Average emissions intensity ($t CO_2$-e / t iron ore)
Brockman Syncline Proposal	269,713	0.0075

A GHG emissions intensity benchmarking assessment was undertaken to compare emissions performance of the Proposal against other comparable open cut iron ore mining proposals located in Western Australia's Pilbara region and the default iron ore industry emissions intensity (Table 3-10 and Figure 3-7). The default iron ore industry emissions intensity value is set by the CER and defined in Schedule 2 of the Safeguard Mechanism. It represents the industry average emissions intensity of production over five years (FY2012-13 to FY2016-17).

Emissions intensity allows the comparison of different sized mining operations normalised by a relevant measure of production. Despite this normalisation, comparable benchmarking of emissions from individual mining operations is challenging, as it does not consider the site-specific circumstances which impact on GHG emissions intensity. Waste to ore ratios, grade characteristics and topography have a significant influence on GHG emissions intensity. Below water table mining requires dewatering infrastructure to be operated and a greater amount of waste material moved per tonne of iron ore.

Boundary conditions present a further challenge to benchmarking across facilities. Some aspects of mining, processing and transport may be contracted to a third party that assumes operational control and hence ownership of a portion of a facility's emissions. The Proponent has made every effort to present a comparable benchmarking assessment with consideration of the above challenges.

The benchmarking shown in Figure 3-7 indicates that the performance of the Proposal is comparable to other recent iron ore developments in the Pilbara.

Table 3-10 Scope 1 emissions intensity benchmarking against comparable iron ore mines in the Pilbara, WA

Facility	Average annual Scope 1 emissions (diesel only) (tCO_2-e)	Average Iron Ore production (Mt/annum)	Scope 1 emissions intensity (tCO_2-e/t iron ore)
Rio Tinto – the Proposal	**269,713**	**36**	**0.0075**
Default Emission Intensity Iron Ore Mining Safeguard Mechanism	-		0.0047
FMG – Eliwana[14]	272,315	39[15]	0.0070
BHP – Western Ridge[16]	138,926	19[17]	0.0073

[14] FMG Fortescue Metals Group (2018), Eliwana Iron Ore Mine Project, Environmental Review Document, EW-RP-EN-0003-0. Table 57

[15] Back calculated from average emissions and emissions intensity

[16] https://www.epa.wa.gov.au/sites/default/files/Referral_Documentation/Appendix%2012%20-%20Western%20Ridge%20Greenhouse%20Gas%20Management%20Plan%20v1%20January%202023.pdf

[17] Back calculated from average emissions and emissions intensity

Facility	Average annual Scope 1 emissions (diesel only) (tCO_2-e)	Average Iron Ore production (Mt/annum)	Scope 1 emissions intensity (tCO_2-e/t iron ore)
Roy Hill – Roy Hill Revised Proposal	430,981	59	0.0076

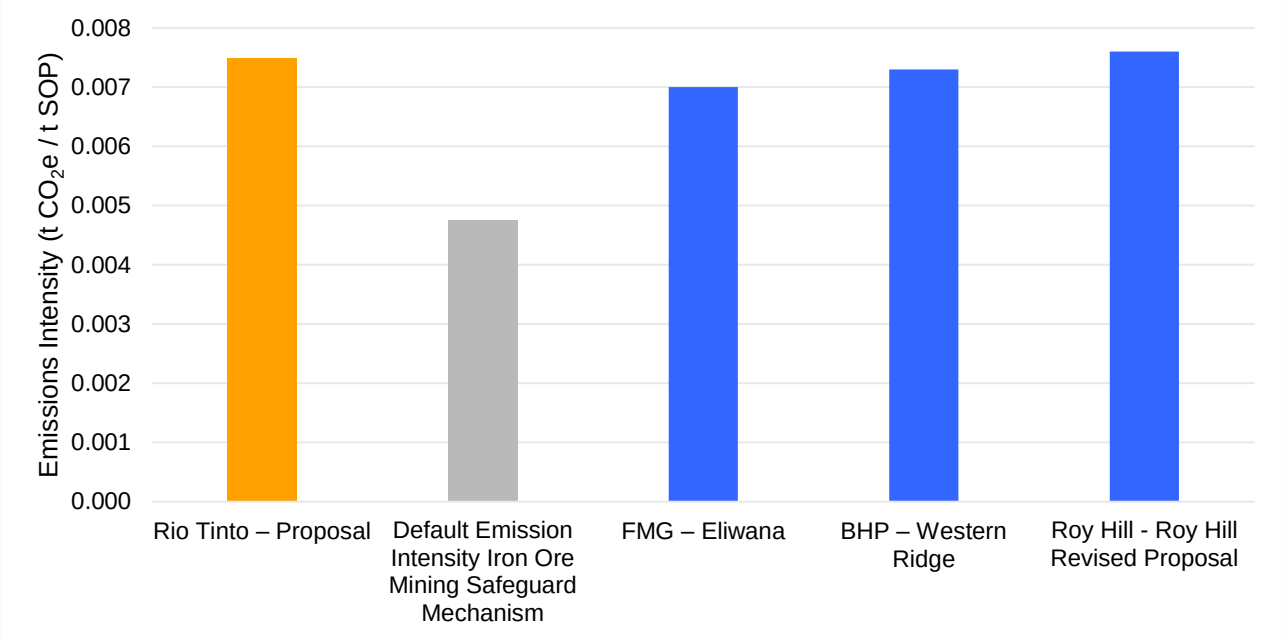

Figure 3-7 Scope 1 emissions intensity benchmarking against comparable iron ore mines in the Pilbara, WA

A similar benchmarking process against international iron ore mines was undertaken however found the data to be unreliable due to different reporting and disclosure requirements in other jurisdictions. For example, emissions intensity values were obtained for iron ore operations in Canada however were for Scope 1 and 2 emissions, as they cannot be separated, they cannot be compared against Pilbara Scope 1 emissions intensities. Brazilian iron ore emission intensity values were also aggregated with non-iron ore mining operations and presented as a single emissions intensity and include both Scope 1 and 2 emissions, also resulting in data that cannot be compared.

3.4. Scope 2 – Mitigation measures

3.4.1. Alternative energy options assessment

Rio Tinto has completed numerous studies and assessments of alternative energy options, testing a range of technologies available and suitability for implementation in the Pilbara region of Western Australia. Similar to Scope 1 mitigation technology assessment, this has included multi-criteria analysis (MCA) on various technologies, with consideration factors including economic viability (e.g. payback period), GHG emission reduction, speed of implementation, technological risk and environmental/heritage considerations.

Technologies assessed include (but not limited to);

- Solar PV
- Wind
- Battery technology for spinning reserve or standalone storage
- Pumped hydro storage
- Solar thermal plant
- Waste heat recovery
- Wave/tidal
- Geothermal

For technologies that scored well during the MCA, further development and interrogation was undertaken with more detailed consideration of locations, local climatic factors, size and scale, existing infrastructure, and conceptual network integration.

Based on these assessments, the short to medium term low-carbon transition strategy initiatives focussed on displacement of gas in electricity generation are solar, wind and battery storage solutions given economics, technological maturity and speed of deployment of these solutions. Under assessment are renewable energy studies focused on deployment of 1GW of wind and solar power, to replace natural gas power for plant and infrastructure and support early electrification of mining equipment[18]. Rio Tinto is focusing on the delivery of the Tom Price Battery Energy Storage System (BESS) to act as immediate back-up power generation, commissioning of 34MW Solar PV at Gudai-Darri and 100MW Solar PV at the Pilbara coast[19] (Table 3-11). Full decarbonisation of the Pilbara including electrification of mobile and rail equipment beyond 2030 is estimated to require up to 3GW of installed renewable energy assets[20].

Like Scope 1 emissions reductions projects implemented at alternative locations to the Proposal, Scope 2 mitigation projects will be implemented at a Pilbara system level depending on the technical constraints of the network to ensure security, reliability and stability is upheld. This Pilbara wide approach enables abatement projects to service multiple developments and is a more cost efficient / flexible approach.

Given the fast-evolving nature of renewable energy technologies, Rio Tinto is continuing to monitor numerous alternative energy options to determine suitability for implementation in the Pilbara and our interconnected electricity grid.

Table 3-11 Scope 2 mitigation projects under implementation or assessment in the Pilbara

Description	Mitigation Hierarchy	Indicative Implementation Timeframe	Estimated Emission Savings (t CO_2-e per annum)	Context
Construction				
Battery Energy Storage System (BESS)	Avoid	2023	~33,000	To support the Pilbara Power Network, the Tom Price BESS will provide spinning reserve generating capacity to support a stable and reliable network[21], reducing emissions through the direct displacement of gas that otherwise would be consumed to provide the same function
Solar PV at Gudai-Darri Mine	Avoid	2023	~50,000	Consists of approximately 90,000 solar panels made up of photovoltaic cells to convert sunlight into electricity. Solar PV reduces emissions through direct displacement of gas in electricity generation with renewable energy sources
Under assessment				
Solar PV at Pilbara Coast	Avoid	~2026	~111,000	Consists of approximately 225,000 solar panels made up of photovoltaic cells to convert sunlight into electricity. Solar PV

[18] https://www.riotinto.com/en/news/releases/2021/rio-tinto-to-strengthen-performance-decarbonise-and-grow

[19] https://www.riotinto.com/en/news/releases/2022/rio-tinto-plans-further-investment-in-renewable-energy-in-the-pilbara

[20] https://www.riotinto.com/en/news/releases/2022/rio-tinto-plans-further-investment-in-renewable-energy-in-the-pilbara

[21] https://www.riotinto.com/en/news/releases/2020/rio-tinto-to-build-first-solar-plant-in-western-australia-to-power-iron-ore-mine

Description	Mitigation Hierarchy	Indicative Implementation Timeframe	Estimated Emission Savings (t CO_2-e per annum)	Context
				reduces emissions through direct displacement of gas in electricity generation with renewable energy sources
Solar PV (TBD)	Avoid	~2027	~165,000	Solar PV reduces emissions through direct displacement of gas in electricity generation with renewable energy sources
Pilbara Renewable Energy Studies	Avoid	~ 2030	TBA	Additional renewable energy projects are in study phase to deliver substantial emissions abatement across all Pilbara assets, in many cases by 2030.

3.4.2. Scope 2 emissions regulation

Scope 2 emissions associated with the Proposal are not reported as Scope 2 emissions under NGERs and are reported under Scope 1 emissions due to Rio Tinto owning and operating its own gas-fired electricity grid. These emissions are regulated under the Renewable Energy Target (RET) with further information on this regulation provided in Section 3.6.3.

3.5. Scope 3 – Mitigation measures

Scope 3 emissions, include processing of produced iron ore to iron and steel, purchased goods, transport of materials, fuels and personnel to and from site. The steel making process is by far the largest contributor to emissions, with these emissions making up 96% of total Scope 1, 2 and 3 emissions from Rio Tinto Iron Ore (RTIO).

RTIO products from the Pilbara are processed via the Blast Furnace/BOF steelmaking route. This process uses iron ore, metallurgical coal and other additives to produce steel. The other process for producing steel sees the Electric Arc Furnace use recycled steel scrap and natural gas based direct reduced iron (DRI). Steel industry participants have announced a range of emission reduction targets. These targets vary by country and company but are largely aligned and have tiered reduction to achieve net zero by 2050.

There is no proven process route at an industrial scale to produce primary net zero steel today. The industry is developing and scaling a range of new technologies. These include hydrogen-based DRI feeding into an electric arc furnace or into a basic oxygen furnace (BOF) via an intermediary melter step, direct smelting, the use of sustainable biomass, and carbon capture and storage (CCS), as well as more speculative technologies such as electrolysis. The deployment of these new technologies will depend on technical breakthroughs, capital intensity improvements, consumer recognition of green products and government policy that encourage deployment, such as carbon prices.

In 2021, Rio Tinto established a dedicated steel decarbonisation team within our Commercial Group, to:

- Support the reduction of Rio Tinto's iron ore Scope 3 emissions to net zero by 2050.
- Protect the long-term value of Rio Tinto's iron ore through development and scale up of cost-effective technologies that utilise our iron ores in the future low-carbon steel industry.
- To position Rio Tinto to participate in the nascent green iron market.
- To provide steel decarbonisation analysis and intelligence to support decisions on Rio Tinto's future iron ore resource portfolio, product strategy, and renewable energy development.

In 2022, the Rio Tinto Steel Decarbonisation team,

- Extended collaboration with key customers including Baowu, POSCO, Nippon Steel Corporation and Shougang, with potential carbon emissions reductions of up to 30%.

- Successfully piloted the BioIron™ innovative low carbon iron making process, suitable for Pilbara iron ore.
- Collaborated with industry participants such as BlueScope and Salzgitter Flachstahl to test direct reduction of our products using green hydrogen and develop cleaner processing options.

Rio Tinto is currently advancing 49 projects in partnership with over 30 customers, universities, researcher institutes, and other industry stakeholders, to build options with the aim of net zero by 2050.

RTIO's main customers are in the Asia-Pacific region, where a significant portion of global steelmaking occurs. China is the largest producer of steel, with over half of the worlds annual production, and as a primary customer of RTIO's a significant quantity of Scope 3 emissions will be emitted in China with the balance in other Asian steelmaking hubs (e.g. Japan, Korea, India, etc). These countries are all subject to emissions reduction targets, with net zero pledges ranging from 2050 to 2070 (China has pledged a 2060 net zero target).

3.6. Other statutory decision-making processes which require reduction in GHG emissions

3.6.1. Other relevant statutory decision-making processes – Western Australia State GHG Policy

In 2019, the Western Australian Government announced its State GHG Policy to guide Government decision making for major projects that are assessed by the Western Australian Environmental Protection Authority (WA EPA). The WA EPA released an updated Guideline in April 2023. Table 3-12 details how the contents of this GHG EMP addresses the State GHG Policy.

Table 3-12 Addressing State GHG policy requirements

State GHG Policy Considerations on Contents of a GHG EMP	Proponent Response
The policy supports the development of GHG EMPs for proponents which: Outline strategies to avoid, reduce, mitigate and offset the project's emissions contributing towards the State's aspiration of net zero by 2050	Rio Tinto is committed to contributing towards the State's aspiration of net zero by 2050 through achievement of interim and long-term targets. Strategies to avoid, reduce, mitigate and offset Scope 1 & 2 emissions from the Proposal are outlined in Section 3.3.1 and 3.4.1.
Are unique to a proposal's specific circumstances	The GHG EMP has been developed specifically to support the Proposal, which consists of the extension and development of new above and below water table deposits and associated activities to extend the life of existing iron ore operations at Brockman Hub. The Proposal includes: • 7,896 ha of clearing • Transport of ore to existing processing facilities within the Brockman Hub via haul and crush/convey. • Power supplied by existing 33 kV transmission lines and additional substations.
Allow proponents to take account of opportunities at either facility level or across national operations	In some cases, emission abatement projects may be implemented at alternative locations to the Proposal, depending on a range of criteria applicable both to energy supply (e.g. renewable energy facilities, topology and technical constraints) and energy demand (e.g. technology readiness, asset life and alternatives to diesel). It is anticipated that Rio Tinto will account for emissions abatement at one location to meet the abatement requirements of the Proposal. Rio Tinto's emissions reduction projects in Western Australia are outlined in Section 3.3.1 and 3.4.1. Local, national or international credible offset units may be sourced to offset Proposal emissions in order to meet targets set out in Section 3.8.
Allow proponents to propose their own timeframes and targets;	The GHG EMP includes reduction targets and abatement initiatives that either avoid, minimise or offset emissions from the Proposal (Section 3.3.1 and 3.4.1).

Include requirements for periodic public reporting against their targets; and Account for and align with Commonwealth requirements.	Rio Tinto has set an ambition to reach net zero emissions by 2050 across all its operations (applicable to Iron Ore in the Pilbara). Further detail is included in Rio Tinto's 2022 Climate Change report. Performance against the Proposal target will be reported in the Ministerial Statement Annual Compliance Assessment Report every five years, with the first review taking place in the 2025 report, as outlined in Section 5. Emissions from the Brockman Hub (including the Proposal) will also be reported annually through NGER, in accordance with the NGER Act.
Consistent with the Government's focus on economic development and diversification, plans that include undertakings to develop Western Australian expertise, carry out research, pilot new initiatives and technologies, and support local communities are encouraged.	Rio Tinto is implementing and further developing a range of abatement initiatives in Western Australia, leveraging local expertise and ensuring benefits to local communities and industry participants. In addition, the ongoing activities of the Proponent, and more broadly Rio Tinto in the Pilbara, will continue to support social and economic development projects, including: • continued education, training, employment and business opportunities for local people, including local Aboriginal people; and • continued funding for a range of organisations in the region, including sporting and cultural groups.

3.6.2. Other relevant statutory decision-making processes – Safeguard Mechanism

The National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 applies baselines to large GHG-emitting facilities, to ensure that net emissions are kept below a defined emissions limit (baseline) aligned with Australia's climate targets. It is administered by the CER and applies to facilities with Scope 1 emissions (covered emissions) of more than 100,000 t CO_2-e per year.

Baselines are calculated by multiplying the quantity of product by an emissions intensity (existing products from facilities will transition from a 'facility-specific' emissions intensity value to 'industry average' values by FY2029-30). The current iron ore industry average emissions intensity is 0.0047 t CO_2-e/t iron ore. A default decline rate of 4.9% per annum is also applied to the baselines from FY2023-24. If a facility reduces its emissions below their baseline Safeguard Mechanism Credits can be generated to be sold to other Safeguard facilities or banked for future use.[22]

Differences in the emissions baseline or reduction trajectory of the Safeguard Mechanism compared with those proposed by the EPA include;

- Baseline emissions covered under Safeguard Mechanism only apply to Scope 1 covered emissions, for Greater Brockman hub this does not include Scope 1 land clearing emissions.
- Safeguard Mechanism baselines rise and fall with production.
- Baselines decline annually due to the 4.9% annual decline and could be higher for certain facilities if they have a current production specific baseline higher than the default industry average due to the transition of all facilities to the default industry average by 2030.
- Declines continue annually until a facility reaches a baseline of 100,000 t CO_2-e.

The emissions reduction required under Safeguard Mechanism compared with that of the EPA include;

- Scope 1 emissions reduction must occur at the facility where Scope 1 emissions occur
- Baseline exceedances under Safeguard Mechanism require the purchase of Australian Carbon Credit Units (ACCUs). No other offsets are currently allowed under this scheme (e.g. international carbon credits).

22 https://www.cleanenergyregulator.gov.au/NGER/The-Safeguard-Mechanism/The-Safeguard-Mechanism-for-financial-years-commencing-on-or-after-1-July-2023

- Production productivity measures (e.g. more production for the same emissions) results in an increase in the baseline and a decrease in liability (if over baseline)

3.6.3. Other relevant statutory decision-making processes – Renewable Energy Target (RET)

As the owner-operator of the Rio Tinto Pilbara Power Network, Rio Tinto is subject to the Renewable Energy Target (RET). The RET is administered by CER and designed to reduce emissions of greenhouse gases in the electricity sector by encouraging additional generation of electricity from sustainable and renewable sources[23]. Renewable Energy Certificates must be surrendered based on the amount of electricity generated minus exemptions (e.g. electricity generated from renewables) multiplied by the Renewable Power Percentage (RPP) for the year. The 2023 RPP is 18.96%.

The RET differs to the proposed EPA reduction trajectory due to it being an incentive to add renewable electricity generation (currently legislated to 2030) rather than reduce emissions. However, the intent is by increasing renewables, electricity generated from fossil fuels should reduce along with emissions. The RPP has generally increased annually however as it is calculated annually, it is not possible to compare trajectories between the RET and the EPA proposal.

3.6.4. Monitoring and reporting requirements – National Greenhouse and Energy Reporting (NGER)

The NGER Act is a single national framework for reporting GHG emissions, energy production and energy consumption. The objectives of the NGER scheme are to:

- Inform government policy and the Australian public;
- Help meet Australia's international reporting obligations;
- Assist Commonwealth, State and Territory government programs and activities; and
- Avoid duplicating reporting requirements in the states and territories.

The methods and criteria for calculating GHG emissions and energy data under the NGER Act are detailed in the National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Department of the Environment and Energy (DoEE), 2008) (NGER Determination). Brockman Hub (including the Proposal) emissions are reported annually under the NGER Act.

Emissions from the Proposal will contribute to the Brockman 4 and Brockman 2/Nammuldi Mines NGER report inventories and be accounted against its baselines under the Safeguard Mechanism. Results of monitoring and reporting against Safeguard Mechanism baselines are made available to the public on the CER website.

3.7. Consistency with other (non-statutory) GHG reduction instruments

3.7.1. Corporate emissions reduction targets

Rio Tinto has announced its ambition to reach net zero emissions by 2050 across all operations. To support this ambition, medium-term global targets have been introduced for Scope 1 and 2 emissions, effective from 2021, to:

- Reduce absolute emissions by 15% by 2025 (approximately 4.9 Mt CO_2-e equity basis)
- Reduce absolute emissions by 50% by 2030 (approximately 16.3 Mt CO_2-e equity basis).

The target is measured against a 2018 global equity baseline, currently 32.6 Mt CO_2-e, which will be adjusted for divestments and acquisitions.

[23] https://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target

3.7.2. Industry transition strategy

Scenarios for the decarbonisation of the steel sector exist, such as the one presented in the Net-Zero Steel Sector Transition Strategy report published in October 2021 by the Net Zero Steel Initiative (NZSI). NZSI is an industry platform, part of the Mission Possible Partnership, that brings together stakeholders across the whole steel supply chain to help put the sector on a path to net zero emissions by mid-century. In this report, NZSI considers 20 technology archetypes and the decision-making process to deploy these at individual steel plants based on lowest total cost of ownership. The analysis compares two pathways that deliver net zero emissions from the steel sector by 2050 against a baseline business-as-usual scenario:

- Carbon Cost scenario: with a global carbon price (or policies equivalent to a carbon price) applied across all emissions and all geographies, rising globally from \$9/t CO_2 in 2023 to \$250/t CO_2 by 2050.
- Tech Moratorium scenario: restricting major investment decisions post-2030 to technologies that are compatible with reaching a net zero outcome by 2050.

The two scenarios result in different carbon emission pathways ranging from 15 % to 37% emissions reduction by 2030. The analysis is a useful illustration of the complexity and challenges faced by the steel industry to reach net zero by 2050. Our approach is to pursue and support a range of decarbonisation options aligned with the technology pathways highlighted by the NZSI analysis, through proactive partnerships with our customers, suppliers, universities and research institutes.

3.8. Offsets

In 2022, Rio Tinto increased investment in the Nature Solutions team in recognition that high quality offsets will play a significant role in our decarbonisation strategy this decade[24]. The Proponent expects that abatement will be sufficient to meet interim and long-term targets. If and where abatement is insufficient against the Proposal targets, the Proponent proposes to offset GHG emissions by retiring high integrity offset units on an annual basis, for example to meet Safeguard Mechanism obligations, to also meet cumulative 2025, 2030, 2035, 2040 2045 and 2050 targets.

Rio Tinto defines high integrity as projects that balance positive outcomes for people, nature and climate and take an integrated landscape perspective with the intent to secure permanent, additional carbon emissions reductions. Using an assessment criterion based on existing standards for the voluntary market and in conjunction with this high integrity definition two workstreams are underway;

- Developing Nature-based Solutions (NbS) at, or near our assets (including Australia)
- Securing high-quality carbon credits from the market

The assessment criteria in use ensures a defensible carbon baseline and accounts for real carbon reductions focusing on permanence, additionality and quantification along with the ability to deliver biodiversity and social benefits. This aligns with integrity principles of the International Carbon Reduction and Offset Alliance (ICROA) in relation to the sourcing and use of credible offset units based on the principles of real, measurable, permanent, additional, independently verified, and unique[25].

Where offsets are required, the Proponent proposes to use Australian Carbon Credit Units (ACCUs), or other similarly high integrity credits to meet any EPA commitments, that may have also been retired to meet any Safeguard Mechanism obligations. ACCUs must be surrendered in the Australia National Registry of Emissions Unit (ANREU) of which the CER is the certifying body. Rio Tinto is focused on securing high quality ‘nature-based’ ACCUs that meet our high-quality thresholds due to the potential for strong carbon, nature and

[24] https://www.riotinto.com/invest/reports/climate-change-report

[25] “Code of Best Practice for Carbon Management Services, Technical Specification”, 2021, published by ICROA, downloaded from https://www.icroa.org/resources/Documents/The%20Code/ICROA_cobp_tech_specs_2021.pdf on 9th August 2021

social benefits. Given this focus our investments prioritise the development and sourcing of ACCUs generated by methods including but not limited to;

- Environmental planting
- Savanna burning
- Human induced regeneration (to be replaced by integrated farm method Q4 2023)

Rio Tinto is ramping up commercial activities to ensure high-quality carbon credits are available in the volumes required to meet any Safeguard Mechanism obligations (ACCUs) as well as interim targets for the Proposal. A range of upstream partnership models (including long-term offtakes, co-investment, and co-development) with high-quality partners and developers is currently being explored.

As part of annual NGERs reporting (due end of October each year), CER provide a position statement of any Safeguard Mechanism exceedance and resultant liability. The Proponent has until February the following year to surrender the appropriate quantity of ACCUs in the event of a liability. This information is recorded on the CER website as evidence as part of the Safeguard Mechanism facility data. Any offsets purchased to meet Safeguard Mechanism obligations which the Proponent proposes to also use against interim targets for the Proposal will be included in the 2025 Ministerial Statement Annual Compliance Assessment Report (and five yearly post this report).

In the event of a shortfall in ACCU availability, the Proponent may also use other offset units that meet internal high integrity principles and are based on clear, enforceable and accountable standards.

3.9. Projects operating beyond 2050

The Proposal is not expected to be operating beyond 2050.

4. ADAPTIVE MANAGEMENT, CONTINUOUS IMPROVEMENT AND REVIEW OF THE GHG EMP

The GHG EMP will nominally be reviewed at least every five years, with the first review taking place at the beginning of 2026 (unless required before this date), to ensure that it reflects the current situation with regards to GHG management and monitoring. Re-submission of the most recent confirmed GHG EMP shall be included with the 2025 Ministerial Statement Annual Compliance Assessment Report by 30th April 2026.

In line with the concept of adaptive management (Table 4-1), the management actions presented in the GHG EMP shall be monitored, reviewed, evaluated and updated as required considering:

- If new abatement technology is proposed to achieve interim and long-term targets in Section 3.3.1 or 3.4.1 not already considered
- If a new process or activity is proposed to be introduced that has the potential to significantly change the emissions from the Proposal, and that was not already considered (and that is not in accordance with this GHG EMP)
- Comments from the WA EPA and other decision-making authorities (DMAs) during the Public Environmental Review (PER) approval process;
- Changes in State or Commonwealth climate change legislation or policy; and
- Material change in risk (opportunities, processes and procedures) related to climate change identified by Rio Tinto.

Where either the five yearly review cycle is triggered, or if a significant change to either the facility, activity, or risk is identified, a revised GHG EMP will be submitted to the WA EPA.

4.1. Continuous improvement processes

4.1.1. Integrating GHG Considerations in Project Development Design

In line with the Rio Tinto's ambition to reach net zero emissions by 2050 across all operations and carbon neutral growth, internal guidelines are in place to integrate GHG considerations into design and planning of development projects.

Strategic decisions are made throughout the development of projects to ensure energy efficient lower emission solutions are prioritised where practicable. Each project, in conjunction with the Rio Tinto Study Definition Guidelines, and aligned with the State GHG Policy and Guideline, considers throughout design, construction and operational phases:

- Application of a mitigation hierarchy to avoid, reduce and offset emissions;
- Contribution to emissions reduction targets;
- Adoption of best practice design, technology and management appropriate to the mitigation measures implemented; and
- Continuous improvement to reduce emissions over the life of the project and across the Pilbara in a holistic, measured and consistent manner.

4.1.2. Integrating GHG considerations in existing operations

In accordance with Business Improvement Process, assets are required to develop optimised production improvements which identifies and implements opportunities to improve production and energy efficiency whilst minimising emissions.

The process outlines a framework for structured decision making, planning, governance and delivery approach to ensure opportunities are matured based on knowledge-based decisions, and account for uncertainty and residual risk.

Table 4-1 Adaptive management based provisions for the GHG EMP

Objective Based Management - Provisions Greenhouse Gas Emissions				
WA EPA Factor: Greenhouse Gas Emissions **Key impacts and risks:** Emissions and subsequent contribution to climate change				
Management-based provisions				
Objective: To reduce net greenhouse gas emissions to minimise the risk of environmental harm associated with climate change				
Management Actions	**Management Targets**	**Monitoring**	**Timing / Frequency**	**Reporting**
Achieve emissions reduction trajectory as defined in Figure 3-4 and Table 3-5	*Interim and Long-term Targets* Interim and long-term emissions reduction targets for the Proposal (as outlined in Section 3.2) are to: • Reduce or abate emissions by 15% by 2025 (approximately 488 t CO_2-e); • Reduce or abate absolute emissions by 50% by 2030 (approximately 976,119 t CO_2-e); • Reduce or abate absolute emissions by 67% by 2035 (approximately 1,486,744 t CO_2-e); • Reduce or abate absolute emissions by 74% by 2040 (approximately 1,406,069 t CO_2-e); and • Reduce or abate absolute emissions by 56% by 2045 (approximately 308,430 t CO_2-e) Implementation of the Pilbara emissions abatement projects in Section 3.2.1 & 3.4.1 as required to achieve interim and long-term targets described in Section 3.2.	Monitoring of Proposal emissions and quantification of realised emissions reductions in accordance with NGER Act and NGER Determination.	Five yearly with the first report taking place in the 2025 Ministerial Annual Compliance Assessment Report.	A summary report of performance against the Proposal interim and long-term emissions reduction targets in Section 3.2 will be reported in the Ministerial Statement Annual Compliance Assessment Report every five years, with the first report taking place in the 2025 Report. For details refer to Section 5. Retirement of Credible Offset Units to meet any Safeguard Mechanism offsets initially and then in relation to the Proposal for 2025, 2030, 2035, 2040, 2045 and 2050 where the abatement insufficient to reduce emissions compared to interim and long-term targets in Section 3.2. Summary of purchased and retired Credible Offset Units

Objective Based Management - Provisions Greenhouse Gas Emissions				
WA EPA Factor: Greenhouse Gas Emissions **Key impacts and risks:** Emissions and subsequent contribution to climate change				
Management-based provisions				
Objective: To reduce net greenhouse gas emissions to minimise the risk of environmental harm associated with climate change				
Management Actions	**Management Targets**	**Monitoring**	**Timing / Frequency**	**Reporting**
				over the previous 5 years will be included in the Ministerial Statement Annual Compliance Assessment Report as described in Section 5.
Continuously work towards achieving net zero emissions by 2050 for the Proposal.	Implementation of reasonable and practicable measures to avoid, reduce and offset Proposal Scope 1 & 2 GHG emission described in Section 3.2.	Review of identified reasonable and practicable measures to avoid, reduce, mitigate and offset the Proposal's direct (Scope 1) emission completed.	Five-yearly, with the first review taking place in the 2025 Ministerial Annual Compliance Assessment Report.	A summary of delivered Pilbara abatement projects will be presented in the Ministerial Statement Annual Compliance Assessment Report every five years, as described in Section 5.
Implement GHG monitoring and reporting	Monitor and report all Scope 1 and Scope 2 (if applicable) emissions	Monitoring in accordance with NGER Measurement Determination.	Annually	Annual reporting of emissions is performed in accordance with the NGER Act. Summary of Scope 1 emissions published as part of annual Safeguard Mechanism data tables by the CER.
Operate under Safeguard Mechanism to maintain net emissions at or below Brockman Hub Operations baselines	Brockman Hub Operation (including the Proposal) operate under the Safeguard Mechanism baseline.	Monitoring of net emissions performed in accordance with Safeguard Mechanism. Purchase and surrender Australian Carbon Credit Units (if required) in accordance with Safeguard Mechanism.	Annually	Summary of any surrendered Australian Carbon Credit Units published as part of annual Safeguard Mechanism data tables by the CER.

Objective Based Management - Provisions Greenhouse Gas Emissions				
WA EPA Factor: Greenhouse Gas Emissions **Key impacts and risks:** Emissions and subsequent contribution to climate change				
Management-based provisions				
Objective: To reduce net greenhouse gas emissions to minimise the risk of environmental harm associated with climate change				
Management Actions	**Management Targets**	**Monitoring**	**Timing / Frequency**	**Reporting**
Undertake review and re-submission of GHG EMP	Update GHG EMP every five years as a minimum or as required following significant changes as described in Section 5.	Review and re-submission of the GHG EMP completed every five years as a minimum or as required following significant changes.	Five-yearly, with the first review taking place in 2026. Re-submission shall be completed by 30th April 2026.	Submission of revised GHG EMP for WA EPA approval.

5. REPORTING

An annual report will be included in the Ministerial Statement Annual Compliance Assessment Report that will include the following;

- Quantity of the Proposal GHG emissions
- The number of tonnes of iron ore produced
- The emissions intensity (including calculation and calculation methodology)

A consolidated report of performance against the Proposal targets will be detailed in the Ministerial Statement Annual Compliance Assessment Report every five years (e.g. 2025, 2030, 2035, etc), with the first report taking place in the 2025 Report. The consolidated report will include the following:

- Quantity of total GHG emissions from the facility;
- Net GHG emissions
- GHG emission reduction measures, the source of these measures and the accounting methodology that has been implemented to avoid or reduce GHG emissions;
- Quantity of offsets required to meet interim targets (if required)
- Performance (emissions intensity) against benchmarking for comparable facilities;
- Statement whether interim targets have been achieved;

Actual emissions for the Proposal will be compared against targeted forecast emissions. If total actual emissions reductions for the Proposal are less than the target emission reduction in 2025, 2030, 2035, 2040, 2045 and 2050, abatement projects implemented from the Pilbara wide abatement pathway will be applied against total actual emissions from the Proposal. Rio Tinto has identified specific abatement initiatives (Table 3-11) which will be implemented in Rio Tinto's Pilbara Power Generation Network, connected to the Proposal where the abatement from these projects will be applied to achieve Scope 1 & 2 interim emissions targets. The long-term emissions reduction target is anticipated to be achieved by the implementation of a range of existing or potential future GHG abatement opportunities.

This GHG EMP will also be made publicly available on the Rio Tinto website at the following location;

- https://www.riotinto.com/Operations/australia/pilbara

6. STAKEHOLDER CONSULTATION

A summary of stakeholders and consultation outcomes to date regarding the Proposal GHG EMP is located in Table 6-1.

The opportunities for stakeholder consultation during the life of the Brockman Syncline Proposal GHG EMP is continuing to evolve and current opportunities to discuss the GHG EMP includes;

- Department of Water and Environmental Regulation – Environmental Compliance and Enforcement
    - Informal monthly meeting with Senior Environmental Officer
- Puutu Kunti Kurrama and Pinikura Aboriginal Corporation (PKKP AC)
    - Co-Management Meeting (currently piloting with frequency to be finalised)
- Muntulgura Guruma (MG)
    - Monthly board meeting (business critical items), additional engagement time currently under discussion with MG

Table 6-1 Brockman Syncline Proposal GHG EMP stakeholder consultation and outcomes

Stakeholder	Date	Topics/issues discussed	Rio Tinto response
PKKP AC	19 December 2022	While a net zero emissions target by 2050 is proposed (along a linear reduction trajectory), actions to achieve this are for the most part under investigation. As climate change impacts elements of social and ecological factors that are significant to PKKP, it is recommended that the actions taken by RTIO to manage GHG emissions are reported on via the Co-Management framework mechanisms established between RTIO and PKKP AC.	Rio Tinto has committed to stringent greenhouse gas emission reduction targets including a 15 percent reduction in scope 1 and 2 greenhouse gas emissions by 2025, and a 50 percent reduction by 2030, ultimately leading to a net zero emissions target for our operations by 2050. To achieve this, we are currently targeting multiple large scale renewable projects (wind and solar) across Western Australia. The location of these projects is dependent on suitable climatic factors, tenure availability, environmental factors and distance to power infrastructure. No projects are directly proposed at either BS1 or BS4 on PKKP Country at this stage, however investigations are ongoing and this may be pursued in future. We are also targeting energy reductions and efficiency measures across our operations, including electrification, alternate fuels, and alternate transport systems. We welcome the opportunity to keep PKKP informed of our progress in this regard. We agree to the inclusion of actions in relation to this to ensure we keep PKKP informed of our progress being included in the SCHMP.
EPA	23 March 2023	EPA provided a response to the draft submission of the ERD on 23 March 2023 with the following comments relating to the GHG EMP: “Scope 1, 2 and 3 emissions estimates (annually and life of proposal) should be provided for the approved operations, the significant amendment portion and the combined total (approved operations and the significant amendment) of the entire proposal (from clearing vegetation, mining, ore handling, transportation, processing, etc to export). These estimates should be broken down by source and the calculation methodology provided. The GHGMP should manage emissions associated with the combined total emissions.”	Rio Tinto notes the EPA comments however these requirements are based of a draft GHG Guidance factor that is yet to be published. Rio Tinto has provided a GHG EMP that meets the current guidance and will require a transition period if the draft EFG – GHG Emissions is formalised.
EPA	20 July 2023	The EPA provided a follow up response on the revised draft submission of the ERD on 20 July 2023 with the following comment relating to the GHG EMP: “The EPAS appreciate that the ERD has been updated to acknowledge the recent updates to the Greenhouse Gas Emissions Factor Guideline. Greenhouse gas (GHG) and the associated impacts to	Rio Tinto notes the EPA comments and will update the GHG EMP to align to the current EFG – GHG Emissions guidelines. Scope 1, 2 and 3 emissions estimates (annual and life of proposal) for the significant amendment portion and combined total will be included

		climate change are significant matters the EPA needs to consider and ensure are accurately represented. The ESD included the preparation of a GHG Plan however, the GHG management plan provided appears to exclude the ongoing emissions from operations currently authorised under MS 131, MS 867, MS 925, and MS 1000 as detailed in table 1-1 of the of the GHG management plan. The Brockman Syncline Proposal is a significant amendment to the above Ministerial Statements which intends to modernise and supersede the existing approvals. Consequently, this requires all ongoing emissions to be captured under a single plan for appropriate cumulative assessment of the proposal. Please review and update the GHG management plan and ERD chapter to include the total ongoing emissions of the proposal. The EPAS recommend the proponent include additional revisions and appendices so that the GHG management plan aligns with the new Environmental Factor Guideline, including independent expert reviews, to support conclusions made in the ERD and GHG management plan."	and emissions broken down by source and calculation methodology provided. Rio Tinto has commenced the independent peer review process and will include these reviews as soon as possible.

7. CHANGES TO GHG EMP

Complexity of changes	Minor revisions ☐	Moderate revisions ☐	Major revisions ☒
Date revision submitted to EPA: August 2023			
Is the change proposed to be implemented under condition C3-3? If so, the proponent must provide a copy to the CEO at least 20 days before commencing implementation Yes ☐ No ☒			
Proponent's operational requirement timeframe for approval of revision Reason for Timeframe: < One Month ☐ < Six Months ☒ > Six Months ☐ None ☐			

Item no.	GHG EMP section no.	GHG EMP page no.	Summary of change (separate track changes document to be provided)	Reason for change	New or increased adverse impacts to the environment? Risk to the achievement of limits, outcomes or objectives?
1.	All	All	New GHG EMP to align with latest Environmental Factor Guideline - GHG	New GHG EMP to align with latest Environmental Factor Guideline - GHG	Emissions forecast has been updated with total emissions increasing due to updates in the mine plan with additional material rehandle requirements. The achievement of emission reduction objectives can still be met, with a commitment for further emissions reductions, with the increase.
2.					
3.					

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