



# PROPOSED BROWSE TO NORTH WEST SHELF PROJECT

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ERD RESPONSE TO SUBMISSIONS

APPENDIX B.2 - Greenhouse Gas  
Management Plan

November 2023

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# 1. SUMMARY

Woodside Energy Ltd (Woodside) is Operator for and on behalf of the Browse Joint Venture (BJV) (Woodside Browse Pty Ltd, Shell Australia Pty Ltd (Shell), BP Developments Australia Pty Ltd (BP), Japan Australia LNG (MIMI Browse) Pty Ltd (MIMI), and PetroChina International Investment (Australia) Pty Ltd (PetroChina)), which proposes to develop the Brecknock, Calliance, and Torosa fields (collectively known as the Browse hydrocarbon resources) using two 1100 million standard cubic feet per day (MMscfd) (annual daily export average) Floating Production Storage and Offloading (FPSO) facilities.

The FPSO facilities will be supplied by a subsea production system and will transport gas to existing North West Shelf (NWS) Project infrastructure via a ~85 km spur line and a ~900 km proposed Browse Trunkline (BTL), which are proposed to be tied-in near the existing North Rankin Complex (NRC) in Commonwealth water (Note: The NRC is owned by the North West Shelf Joint Venture (NWSJV)).

The proposal is described in its entirety in the draft Environmental Impact Statement/Environmental Review Document (draft EIS/ERD) and is summarised in **Section 2.1** of this Greenhouse Gas Management Plan (GHGMP) for ease of reference.

The proposed Browse Project is subject to both State and Commonwealth assessment and approval; each having their own respective assessment requirements. The structure of this GHGMP reflects the jurisdictional breakdown of emissions sources and associated requirements.

This GHGMP details the measures proposed to manage the Greenhouse Gas (GHG) emissions from the proposed Browse Project. **Table 1-1** summarises the information contained in this GHGMP.

**Table 1-1 GHGMP summary table**

<b>Title of Proposal</b>	Proposed Browse Project
<b>Proponent Name</b>	Woodside Energy Ltd, as Operator for and on behalf of the Browse Joint Venture
<b>Purpose of the GHGMP</b>	<p>This GHGMP has been developed to fulfil a commitment in the draft EIS/ERD in order to:</p> <ul style="list-style-type: none"> <li>continuously review mechanisms to mitigate and manage GHG emissions</li> <li>ensure compliance with the <i>National Greenhouse and Energy Reporting Act 2007</i> (NGER Act)/Safeguard Mechanism (SGM) baseline requirements.</li> </ul>
<b>Key Provisions in the GHGMP (Management Actions – see Section 6)</b>	<p>Management of the contribution to global GHG concentrations through the implementation of the following key provisions:</p> <ul style="list-style-type: none"> <li>fuel and flare targets are set annually to drive continuous improvement</li> <li>continue to identify and adopt practicable mitigation and management measures to reduce Scope 1 GHG emissions</li> <li>routine emissions monitoring and reporting is undertaken in accordance with the <i>National Greenhouse and Energy Reporting Act 2007</i></li> <li>comply with SGM (or applicable legislation) to manage emissions within the facility baseline</li> <li>adhere to the Methane Guiding Principles</li> <li>undertake 5-yearly assessment of reasonable and practicable emission reduction equipment and technologies that could be implemented to reduce GHG emissions</li> </ul>

## 2. INTRODUCTION

### 2.1 The Proposed Browse Project

The proposed Browse Project will comprise subsea infrastructure and two Floating Production Storage and Offloading (FPSO) facilities, connected to existing NWS Project infrastructure via the ~900 km Browse Trunkline (BTL).

The key characteristics of the proposed Browse Project are presented in Table 1-1 of the draft EIS/ERD and described below:

- hydrocarbon extraction will require up to 54 wells with associated subsea infrastructure, including manifolds and flowlines
- extracted hydrocarbons will be transferred via subsea infrastructure, including wellheads, manifolds and flowlines, up to the FPSO facilities, which are located in Commonwealth Water.
- condensate stabilisation and storage will occur on the FPSO facilities prior to offtake to condensate tankers for delivery to market
- gas processing will also occur on the FPSO facilities prior to export via the inter-field spur line and BTL to existing NWS Project infrastructure.

The BTL is proposed to tie into the existing second trunkline (2TL) near NRC. The NWSJV is pursuing approvals for the NWS Project Extension Proposal; the long-term processing of third-party gas and fluids and NWSJV field resources using NWS Project infrastructure until around 2070 (EPBC 2018/8335 and EPA 2186).

Subject to all regulatory and joint venture approvals being obtained and commercial agreements, transmission of the gas from the BTL tie in point through 2TL and onshore processing of the gas by the NWSJV would be undertaken using existing NWS Project infrastructure. Activities in State waters will comprise a limited subset of infrastructure and activities. This will include developing up to an estimated 24 wells and associated subsea infrastructure, targeting the State component of the hydrocarbon resources of the Torosa reservoir.

### 2.2 Scope of the GHGMP

This GHGMP has been developed to fulfil a commitment in the draft EIS/ERD in order to:

- continuously review mechanisms to mitigate and manage GHG emissions
- ensure compliance with the *National Greenhouse and Energy Reporting Act 2007* (NGER Act)/SGM baseline requirements.

This GHGMP specifically addresses the management of BJV Scope 1 GHG emissions arising from the proposed Browse Project activities, as defined by the National Greenhouse and Energy Reporting Regulations 2008 (Cth). **Table 3-1** provides greater definition on project activities and emissions sources. This GHGMP specifically excludes emissions which are not classified as BJV Scope 1. The excluded emissions sources are summarised in **Table 2-1**.

Scope 3 emissions are not within the scope of this GHGMP. Scope 3 emissions for the proposed Browse Project would typically be Scope 1 emissions for other entities that have operational control of the emission source and are subject to regulation at the point of emission. Those other entities include customers of the proposed Browse Project products, such as electricity generators, and contractors engaged in the development of the proposed Browse Project.

Accordingly, the Browse Scope 3 emissions are anticipated to be accounted for and managed by contractors and the customers of proposed Browse Project products under their Scope 1 emissions management and reporting and obligations. Some Scope 3 emission sources will be within Australia and the majority will be in international jurisdictions.



**Table 2-1 Sources of GHG Emissions excluded from this GHGMP**

Emissions Source/Process	Jurisdiction	Scope
Indirect GHG emissions from venting of reservoir CO <sub>2</sub> extracted from the gas exported from the FPSO and vented from the downstream NWSJV AGRU. These are addressed in the NWS GHGMP ((NWS, 2019) as updated from time to time).	State	Scope 1 (NWS JV)
Indirect emissions from combustion of hydrocarbon-based fuels at the NWSJV facilities required for processing of hydrocarbon gas prior to export. These are addressed in the NWS GHGMP ((NWS, 2019) as updated from time to time).	State	Scope 1 (NWS JV)
Scope 2 upstream emissions sources (none have been identified for the proposed Browse Project).	N/A	Scope 2
Emissions associated with activities under the operational control of third parties to carry out or support operations, installation, construction, hook up and commissioning activities etc.	State, Commonwealth and International (depending on location)	Scope 3 (contractor)
Emissions associated with the transport, distribution and consumption of products from the proposed Browse Project.	State, Commonwealth and International (depending on location)	Scope 3 (consumer)

## 2.3 Rationale and Approach

This GHGMP outlines how GHG emissions from the proposed Browse Project will be managed to meet the environmental objectives of the proposed Browse Project. This approach acknowledges that planned, continuous and occasional emissions to air from the proposed Browse Project will occur and that the impacts from these can be reduced or mitigated by implementing the measures outlined in this GHGMP.

The content of this GHGMP has been developed considering both relevant Commonwealth and State climate change initiatives and policies<sup>1</sup>, as well as Woodside’s approach to GHG emissions.

Relevant Commonwealth and State climate change initiatives and policies are discussed in **Section 1**, with the GHGMP giving greater clarity on the jurisdictional breakdown of the emissions profile. This in particular describes the nature of GHG emissions arising within the State Proposal Area, and the applicability of the WA Environmental Protection Authorities’ (EPA’s) Greenhouse Gas Emissions Environmental Factor Guideline (EPA, 2020a).

Woodside’s approach to GHG emissions is described in **Section 4**. A key component of the Framework is Woodside’s Greenhouse Gas Reduction Philosophy (**Section 4.3**) which aims to limit our net emissions based on three key activities: Design Out, Operate Out and Offset.

- Design Out: The design of the proposed Browse Project is well progressed, with key Design Out mitigations presented in the Section 7.7 of the draft EIS/ERD and repeated in **Section 5.1** for context.

<sup>1</sup> <https://www.environment.gov.au/climate-change/government>

- Operate Out: Woodside’s Management System processes facilitate continuous review of mechanisms to mitigate and manage GHG emissions, thereby optimising efficiencies in GHG emissions in the Operate Phase. These processes are described in **Section 5.2**.
- Offset: The offsetting of a component of residual GHG emissions arising from the Project, including ensuring compliance with the NGER Act/SGM baseline requirements are described in **Section 5.3**.

In order to clearly meet the commitments of this GHGMP as provided in the draft EIS/ERD and the environmental objectives of the proposed Browse Project, key management provisions have been developed and presented in **Section 6**. Noting the inherent constraints on the feasibility of measuring, monitoring and attributing direct site-specific effects on the environment from GHG emissions, the measures outlined in this GHGMP are necessarily management-based rather than outcome-based. Provisions in this GHGMP are therefore focussed on ensuring offshore facilities are optimised and continually evaluated to reduce emissions.

### 3. REGULATORY CONTEXT

#### 3.1 Jurisdictional Breakdown of Scope 1 GHG emissions

Table 3-1 shows the breakdown of Scope 1 GHG emissions by jurisdiction for the proposed Browse Project.

**Table 3-1 Browse Project Scope 1 GHG Emissions**

Description	Jurisdiction	Emissions Source/Process	Scope	Emissions Estimate (Expected Field Life)
Processing and Reservoir CO <sub>2</sub> Emissions	State	Direct GHG emissions generated in the State Proposal Area from operational activities associated with upstream processing of Browse gas.	Scope 1 (BJV)	0.01 MT <sup>1</sup>
	Commonwealth	Direct GHG emissions from venting of reservoir CO <sub>2</sub> extracted from the production stream via the FPSOs AGRUs	Scope 1 (BJV)	70 (81) MT <sup>2,3</sup>
	Commonwealth	Direct emissions from combustion of hydrocarbon-based fuels required for processing, compression of hydrocarbon gas on the FPSO prior to pipeline export and other operational activities. Also includes flaring and fugitive emissions of natural gas.	Scope 1 (BJV)	40.6 MT

<sup>1</sup> Based on Scope 1 emissions which are limited to fugitive emissions (plus any vessel movements under Woodside’s operational control) arising from subsea infrastructure in the State Proposal Area. Further detail on the breakdown of emissions in the State Proposal Area is described below. Fugitives are estimated in accordance with NGER (Measurement Determination 2008 section 3.76) Method 1 for natural gas transmission (fugitive emissions).

<sup>2</sup> Upstream reservoir emissions have been estimated based on the maximum expected case given a gas export specification target of 2.5mol% CO<sub>2</sub>. Estimates of emission implications for a 1 mol% to 2.8 mol% CO<sub>2</sub> gas export specification are presented in Table 7-7 of the draft EIS/ERD. Note the gas export specification is dependent on the outcome of final commercial arrangements.

<sup>3</sup> Bracketed emissions refer to high reservoir CO<sub>2</sub> composition scenario.

Further quantification of emissions sources, including the methodology used to develop these estimates, is provided in Section 7.7 of the draft EIS/ERD. Quantification of emissions sources from the draft EIS/ERD has been appended to this document for the reader’s convenience (**Appendix A**).

#### Commonwealth Waters

Direct (Scope 1) GHG emissions generated in Commonwealth Waters from operational activities associated with upstream processing of Browse gas, arise principally from two sources, both situated on the two FPSOs:

- the combustion of hydrocarbon-based fuel, necessary to process the gas and for power export compression as well as associated processing and utilities
- naturally occurring CO<sub>2</sub> in the hydrocarbon reservoir that must be removed prior to LNG liquefaction.

#### State Proposal Area

In order to provide further definition to the State Proposal Area emissions estimates provided in the draft EIS/ERD, **Table 3-2** presents the total GHG estimates anticipated from within the State

Proposal Area, including Scope 3 emissions. Please note that Scope 3 emissions estimates are provided for context only and are outside the scope of this GHGMP (refer **Section 2.2**).

**Table 3-2 Proposed Browse Project State Proposal GHG emissions**

GHG Emissions Source/Process	Scope	GHG Emissions (Expected field life – 31 years)	GHG Emissions (Annual average over Expected field life - 31 years)
Fugitive emissions from subsea infrastructure	Scope 1 (BJV)	0.008MT (7,500 t)	0.00024MT (240 t)*
Construction, installation and well unloading	Scope 3	0.30 MT (306,000 t)	0.012MT** (11,600 t)
Operations (Subsea Inspection, Maintenance, Monitoring and Repair)	Scope 3	0.03MT (30,000 t)	0.001MT (950 t)
Total	Scope 1 - 3	0.35MT (343,500 t)	0.013MT (12,900 t)

\*Estimated in accordance with NGER (Measurement Determination 2008 section 3.76) Method 1 for natural gas transmission (fugitive emissions)

\*\*Construction/installation due to drilling sequence will occur progressively. It is expected that drilling may occur over approximately 10 years of the overall 31 year expected field life.

Direct GHG emissions anticipated to be generated in the State Proposal Area from operational activities associated with upstream processing of Browse gas are limited to activities under Woodside’s operational control. Typically, vessels and drilling rigs associated with both the construction and operation of proposed Browse facilities are not expected to be under Woodside’s operational control, and therefore emissions from these sources are expected to be classified as Scope 3 emissions. Scope 3 emissions from installation in the State Proposal Area was estimated in the draft EIS/ERD to be less than 0.4 MT over the expect life of the proposal.

Scope 1 GHG emissions may also include any fugitive emissions associated with the subsea infrastructure (i.e. wellheads, jumper cables, manifolds and flowlines). Fugitive emissions have been estimated (in accordance with NGER (Measurement Determination 2008 section 3.76) to be <1kT per annum.

### 3.2 Commonwealth Regulatory Context

#### 3.2.1 Relevant Matters of National Environmental Significance

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), a proposed action which may adversely affect Matters of National Environmental Significance (MNES) requires approval under the Act. The controlling provisions related to MNES relevant to the proposed Browse Project have been identified in the draft EIS/ERD.

GHG emissions from the proposed Browse Project will contribute to net global emissions. Natural gas from the proposed Browse Project has the potential to support an overall reduction in net global atmospheric concentration by displacing more emissions-intensive fuels such as coal and heavy oils. The potential environmental impact of GHG emissions from the proposed Browse Project has been assessed in Chapter 7 of the draft EIS/ERD.

Use of Browse products such as LNG and condensate by third party customers results in GHG emissions (Scope 3 emissions) which are beyond the control of Woodside as operator of the proposed Browse Project and the scope of this GHGMP. Note that the BJV participants may equity

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lift (i.e. individually sell) products produced through the NWS Joint Venture facilities under proposed commercial arrangements, and so the markets into which these products are sold are beyond the operational control of Woodside as operator. Emissions associated with the extraction of Browse feedgas, production of offshore condensate and transportation of feedgas to NWS Project infrastructure for processing will be within the control of the BJV and are the subject to the provisions of this GHGMP. The GHGMP considers and references applicable Commonwealth laws, policies and programs where relevant.

### 3.2.2 Environmental Values Potentially Affected by Global GHG Emissions

While it is not feasible to directly correlate the potential impact of the proposed Browse Project GHG emissions on receptors (be that impact negative or positive in the case of replacing higher carbon fuels), it is possible to predict the likely effects of climate change on the Australian environment. In a study by CSIRO (2015) into the 'Implications of Climate Change for Australia's Biodiversity', modelling indicated that temperatures will increase across Australia, rainfall patterns will change significantly and extreme events such as droughts, floods and wildfires will become more common. These changes are likely to impact on individual species, ecosystems and ecosystem services such as food and water availability. Within decades, environments across Australia may be substantially different. Biodiversity will be affected by climate change in a variety of ways and there will be much spatial variation in ecological change.

The International Energy Agency (IEA, 2019) has highlighted the role of natural gas in enabling the energy transition, reporting that “global energy-related CO<sub>2</sub> emissions flattened in 2019 following two years of increases. This resulted mainly from a sharp decline in CO<sub>2</sub> emissions from the power sector in advanced economies, thanks to the expanding role of renewable sources (mainly wind and solar PV), fuel switching from coal to natural gas, and higher nuclear power output”. This demonstrates the contribution gas is making to lowering net global GHG emissions and net atmospheric concentrations by providing a dispatchable, transportable energy source to replace higher carbon-intensive fuels, such as coal, and supporting cheap renewables. As Australia’s Chief Scientist has noted, “natural gas is already making it possible for nations to transition to a reliable, and relatively low emissions, electricity supply”<sup>2</sup>.

It should also be noted that the growth of renewables may also be constrained by the need to ensure grid stability; that is, grids need to be maintained at the correct frequency during fluctuations in demand. This can be readily done with readily dispatchable energy sources such as gas but more difficult with renewable sources such as solar and wind. The role of gas will increasingly be to supplement domestically produced renewables. In doing so, it will compete with other transportable, dispatchable fossil fuels such as oil and coal, which along with competing sources of natural gas are therefore the appropriate comparators when considering alternative energy sources to gas from the proposed Browse Project.

LNG supplied into Asian markets, and the pipeline natural gas for WA, contributes to lower life cycle atmospheric contributions of GHG than would otherwise be the case. The Browse Joint Venture is committed to maximising this outcome by lowering the Browse Project’s direct net Scope 1 emissions through plant design, efficient operations, and offsets.

## 3.3 State Regulatory Context

### 3.3.1 Key Environmental Factors

In the EPA’s determination that the proposed Browse Project requires assessment under the *Environmental Protection Act 1986* (EP Act), the EPA identified air quality from the emissions of

<sup>2</sup> [https://www.chiefscientist.gov.au/sites/default/files/2020-02/National%20Press%20Club%20address%202020%20web\\_0.pdf](https://www.chiefscientist.gov.au/sites/default/files/2020-02/National%20Press%20Club%20address%202020%20web_0.pdf)

gases during well drilling and construction in the State Proposal Area as a key preliminary environmental factor. In the recent update to the WA EPA’s Statement of Environmental Principles, Factors and Objectives (Version 3.0) (EPA, 2020b), GHG Emissions has been covered as a separate factor.

This GHGMP considers the WA EPA’s Greenhouse Gas Emissions Environmental Factor (EPA, 2020a), which has the following objective:

*To reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change.*

Net GHG emissions are defined by the WA EPA (EPA, 2020a) as the residual (net) direct GHG emissions arising from the proposal’s activities (i.e. Scope 1 emissions). It should be noted that the Project has limited Scope 1 emissions arising within the State Proposal Area. This is further discussed in **Section 3.3.3**.

### 3.3.2 Western Australia State Government Policy

In August 2019 the WA Government released a Greenhouse Gas Policy for Major Projects (Government of Western Australia, 2019)<sup>3</sup>. The policy includes the statements outlined in **Table 3-3**, which align with the EPA’s Environmental Factor Guideline on Greenhouse Gas Emissions (EPA, 2020a). Woodside’s response to the policy is also outlined in **Table 3-3**.

**Table 3-3 Response to WA State Greenhouse Gas Policy**

State Greenhouse Gas Policy on Contents of the Plan (Government of Western Australia, 2019)	Woodside response
<p>The policy supports the development of GHGMPs for proponents which:</p> <p>Outline strategies to avoid, reduce, mitigate and offset the project’s direct (Scope 1) emissions contributing towards the State’s aspiration of net zero by 2050</p>	<p>The proposed Browse Project is a significant opportunity for Western Australia that will enable the development of further natural gas resources and the potential use of established processing infrastructure for decades to come.</p> <p>This gas is subject to the WA Domestic Gas Policy and will contribute both to State energy security and to the State’s 2050 net zero target by extending access to natural gas during the transition to renewable energy sources. Natural gas is both the lowest carbon fossil fuel and also enables greater use of renewables by matching their intermittent nature with dispatchable power.</p> <p>The Western Australian Government’s Greenhouse Gas Emissions Policy for Major Projects includes an aspirational target of net zero GHG emissions by 2050 (Section 7.3.3 of the draft EIS/ERD). It should be noted that the WA aspirational target of net zero emissions by 2050 does not prohibit emissions from industrial activities; rather, the target refers to net zero emissions State-wide, via means of reduction and balancing levels of CO<sub>2</sub> emissions with carbon removal beyond natural processes, through carbon offsetting, or removing or sequestering CO<sub>2</sub> from the atmosphere to make up for emissions elsewhere.</p> <p>Strategies to avoid, reduce and offset Scope 1 emissions from the proposed Browse Project are outlined in <b>Section 1</b>. They include facility design features, improvement opportunities, and the setting of annual fuel and flare targets.</p> <p>The proposed Browse Project will export gas to existing NWS LNG liquefaction and export infrastructure, avoiding the need for the construction</p>

<sup>3</sup> <http://www.dmp.wa.gov.au/Petroleum/New-emissions-policy-25793.aspx>

State Greenhouse Gas Policy on Contents of the Plan (Government of Western Australia, 2019)	Woodside response
	<p>and operation of new LNG facilities and the associated environmental impacts and risks (i.e. disturbance footprint).</p> <p>Strategies to offset emissions are encompassed in the proposed Browse Project’s compliance with the SGM. The supporting regulations and rules of the SGM establish the framework for allowable methodologies for valid offsets.</p> <p>Woodside anticipates that additional emissions reductions may be achieved via ongoing application of the optimisation reference plan (ORP) process (refer <b>Section 5.2.2</b>).</p>
<p>Are unique to a proposal’s specific circumstances</p>	<p>The development concept of the proposed Browse Project is intended to optimise the use of existing infrastructure as far as practicable, that is, by tying in to existing offshore pipeline and onshore LNG liquefaction and export facilities, thus avoiding a significant amount of GHG emissions which might otherwise be associated with construction of new downstream facilities which were contemplated in previous development concepts.</p> <p>The proposed extension of life of the NWS facilities (refer NWSJV’s ‘North West Shelf Project Extension ERD’ (EPA 2186, EPBC 2018/8335), potentially allows the supply of natural gas fuel, which has low GHG emissions relative to coal, into domestic and international markets, enabling partnering with renewables, as a dispatchable power source that can enable their greater use.</p>
<p>Allow proponents to take account of opportunities at either facility level or across national operations</p>	<p>Opportunities to design out GHG emissions have been incorporated in the design of the Browse upstream facilities. This is described in Section 7.7 of the draft EIS/ERD and summarised in <b>Section 5.1</b> of this GHGMP.</p> <p>Furthermore, Woodside as an experienced oil and gas operator at the national level has significant experience in the efficient operation of oil and gas facilities. Key Woodside processes relevant to Operating Out carbon emissions are described in <b>Section 5.2</b> of this GHGMP.</p>
<p>Allow proponents to propose their own timeframes and targets</p>	<p>The SGM sets the limits (baselines) allowable for industrial emitters in relation to facilities that are consistent with achieving the Nationally Determined Contribution (NDC) (to 2030) under the Paris Agreement. Woodside has nevertheless set corporate targets and regular review milestones, as outlined in <b>Section 8</b>.</p>
<p>Include requirements for periodic public reporting against their targets</p>	<p>Reporting for the proposed Browse Project will be undertaken in accordance with the NGER Act. In addition, Woodside publicly releases Sustainable Development reports which report against environmental performance.</p>
<p>Account for and align with Commonwealth requirements.</p>	<p>The current Commonwealth policy requirements are included in the Federal Government’s Climate Solutions Package which sets out how Australia will meet its initial NDC, and with which Woodside complies.</p> <p>The Australia’s emissions projections 2019 report provides an indicative summary of how Australia is tracking to achieve its Nationally Determined Contribution of 26 to 28 per cent below 2005 levels in 2030. Projected emissions to 2030 from the LNG sector (direct combustion and fugitive) are included in the methodology used to underpin these projections (please refer to Section 7.6 of the draft EIS/ERD for more information).</p>
<p>Consistent with the Government’s focus on economic development and diversification, plans</p>	<p>Woodside will ensure benefits to local communities and local industry participation via the proposed Browse Project. More widely, Woodside is an active participant in multiple community projects and research initiatives aimed at reducing the global effects of climate change. These include</p>

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State Greenhouse Gas Policy on Contents of the Plan (Government of Western Australia, 2019)	Woodside response
that include undertakings to develop Western Australian expertise, carry out research, pilot new initiatives and technologies, and support local communities are encouraged.	carbon farming through the re-forestation of former agricultural land to produce high quality carbon offsets in WA, and the pioneering use of new technologies such as battery use on an offshore platform to reduce emissions associated with back-up power generation.

More detailed measures for supporting these policy goals are presented in **Section 4**.

### 3.3.3 Consideration of WA EPA GHG Emissions EF Guideline

In developing this GHGMP, Woodside has also considered the following from the Greenhouse Gas Emissions Environmental Factor Guideline (EPA, 2020a):

- application of the mitigation hierarchy to avoid, reduce and offset emissions
- the interim and long-term emissions reduction targets the proponent proposes to achieve
- the adoption of best practice design, technology and management appropriate to mitigate GHG emissions
- whether proposed mitigation is plausible, timely, achievable, verifiable and is all that is reasonable and practicable.

Woodside has also considered the following from the Guideline (EPA, 2020a):

*The EPA will require proponents to develop a Greenhouse Gas Management Plan as part of the assessment process that demonstrates their contribution towards the aspiration of net zero emissions by 2050. The EPA notes that both the Paris Agreement and the IPCC’s 1.5 report recommends net zero emissions by 2050.*

The EPA Greenhouse Gas Emissions Factor Guideline notes that generally, GHG emissions from a proposal will be assessed where they exceed 100,000 tonnes of Scope 1 emissions each year measured in CO<sub>2</sub>-e. This is currently the same as the threshold criteria for designation of a large facility under the Australian Government’s Safeguard Mechanism.

At a minimum, a GHGMP should outline (EPA, 2020a):

- intended reductions in Scope 1 emissions over the life of the proposal
- regular interim and long-term targets that reflect an incremental reduction in Scope 1 emissions over the life of the proposal
- strategies which demonstrate that all reasonable and practicable measures have been applied to avoid, reduce and offset a proposal’s Scope 1 emissions over the life of the proposal.

Direct (Scope 1) GHG emissions generated in the State Proposal Area from operational activities associated with upstream processing of Browse gas are limited to operational activities under Woodside’s operational control. Typically, vessels and drilling rigs associated with both the construction and operation of Browse facilities are not expected to be under Woodside’s operational control, and therefore emissions from these sources are expected to be classified as Scope 3 emissions. Scope 1 GHG emissions may also include any fugitive emissions associated with the subsea infrastructure (i.e. wellheads, jumper cables, manifolds and flowlines). It is therefore considered unlikely that the proposed Browse Project activities in State Jurisdiction will routinely

exceed 100,000 tCO<sub>2</sub>-e per annum of Scope 1 emissions within the State Proposal Area throughout the life of the field.

As the vast majority of the Scope 1 GHG emissions associated with the upstream proposed Browse Project occur on the two FPSOs (in Commonwealth Waters), GHG mitigation focusses on these emissions sources. For further information on the approach to these emissions sources, including incorporated mitigation opportunities, please refer to **Section 1**.

Given the estimated scale of the Scope 1 Project emissions (significantly less than 100,000t CO<sub>2</sub>-e per annum) and the nature of Scope 1 GHG emissions in the State Proposal Area (ie limited to fugitive emissions from subsea infrastructure and any vessel movements under Woodside's operational control), the environmental impact assessment considerations as described in the EPA's Greenhouse Gas Emissions Environmental Factor Guideline (EPA, 2020a) are not considered relevant to Woodside's Scope 1 emissions in the State Proposal Area.

### 3.3.4 Regulatory Requirements

The proposed Browse Project is currently being assessed by the EPA and the Department of Agriculture, Water and the Environment (DAWE), therefore Ministerial Statements are yet to be issued.

Should the proposed Browse Project be approved for implementation, regulatory requirements relating to GHG management will be included in this section and updated from time to time.



## 4. WOODSIDE'S APPROACH TO GHG EMISSIONS

Woodside is the Operator for and on behalf of the BJV. Woodside and the BJV supports the global effort to reduce GHG emissions and accepts it has a responsibility to minimise the GHG impact of its own operations. Woodside's key priority is to reduce GHG emissions at source, either through energy efficiency improvements or technological solutions.

### 4.1 Woodside Management System

The Woodside Management System (WMS) defines how Woodside delivers business objectives and the boundaries within which all Woodside employees and contractors are expected to work. Environmental management is one of the components of the overall WMS. The overall direction for Environment is set through Woodside's Corporate Health Safety, Environment and Quality (HSEQ) Policy. The policy provides a public statement of Woodside's commitment to minimising adverse effects on the environment from its activities and to improving environmental performance. It sets out the principles for achieving the objectives for the environment and how these are to be applied. The policy is applied to all Woodside's activities, and employees, contractors and BJV partners engaging in activities under Woodside's operational control.

Woodside's Climate Change Policy outlines that Woodside recognises the scientific consensus on climate change and the challenge of providing safe, clean, affordable and reliable energy whilst reducing emissions. A key principle of this policy states that Woodside will set and publish targets to encourage innovation and drive reductions in Woodside's carbon footprint and energy use.

### 4.2 Environmental Performance

Environmental performance requirements are applicable to all Woodside developments and production assets with projected GHG emissions in excess of 25,000 tonnes of CO<sub>2</sub>-e per annum. In general, environmental performance requirements consider:

- design and operation to minimise GHG emissions and energy intensity
- monitoring of GHG emission sources and estimating GHG emissions
- consideration of carbon price in development/production asset economics in the identification, assessment and implementation of opportunities to reduce GHG emissions and energy intensity.

Further information on key requirements of the WMS during the Operate Phase, and how these relate to the mitigation of Browse GHG emissions is discussed in **Section 5.2**.

### 4.3 Woodside's GHG Reduction Philosophy

Woodside aims to reduce Scope 1 GHG emissions from the proposed Browse Project in accordance with our GHG Reduction Philosophy. The GHG Reduction Philosophy applies three key steps to minimise GHG emissions: Design Out, Operate Out and Offset.

First during the Design phase, **Design Out** GHG emissions sources to reduce expected emissions to 'as low as reasonably practicable' (ALARP). This occurs through incorporating energy efficiency and emissions reductions measures into the design of the facility's processing and utility equipment.

Throughout the Operate phase, continuously identify opportunities to **Operate Out** GHG emissions through improving energy performance. This occurs through a structured approach in accordance with the requirements of the WMS.

Once emissions sources have been Designed and Operated Out, **Offset** a portion of the residual GHG emissions (i.e. those that cannot be Designed Out or Operated Out) to meet statutory requirements applicable to a specific facility and to meet Woodside's corporate-level voluntary targets as set and reviewed periodically across Woodside's equity portfolio.

The application of Woodside's GHG Reduction Philosophy to the proposed Browse Project is described in **Section 1**.

## 5. BROWSE PROJECT GHG MITIGATION

The three key steps of Woodside’s GHG Reduction Philosophy are applicable to all emissions sources in the proposed Browse Project within scope of this GHGMP. In particular, the processes described under ‘Operate Out’ and the purchase of ACCUs under ‘Offset’ can be applied to emissions arising from activities in both the Commonwealth and State jurisdictions.

Given the jurisdictional breakdown of the proposed Browse Project’s GHG emissions, the key Scope 1 emissions sources (i.e. fuel gas emissions) occur within Commonwealth Waters. As a result, it is expected that opportunities identified during Operate Out will focus on emissions occurring within Commonwealth Waters, commensurate with the jurisdictional breakdown. This is also reflected in ‘Design Out’, where the key mitigations incorporated in the design focus on the emissions sources in Commonwealth Waters.

### 5.1 Design Out

Section 7.7 of the draft EIS/ERD presents key information regarding the design of the Browse upstream facilities to mitigate GHG emissions. The below information is replicated from the draft EIS/ERD, to provide context in the GHGMP.

Energy efficiency measures have been incorporated into the design of the facilities; these are listed below with an estimate of the annual emissions saving:

- waste heat recovery units on gas turbines, avoiding the combustion of additional gas for heating purposes (0.70 MT CO<sub>2</sub>-e/annum saving)
- active heating system used to prevent hydrate formation in flowlines avoiding the requirement for an energy intensive MEG regeneration plant (0.20 MT CO<sub>2</sub>-e/annum saving)
- batteries for spinning reserve, avoiding an additional turbine from providing the spinning reserve (0.10 MT CO<sub>2</sub>-e/annum saving)
- efficient aero derivative gas turbines (0.02 MT CO<sub>2</sub>-e/annum saving)
- use of nitrogen to purge the flare stack rather than hydrocarbon gas (expected less than <0.1 MT CO<sub>2</sub>-e/annum saving).

By saving approximately up to 1 MT of CO<sub>2</sub>-e on average per year, this has reduced the expected average annual net Scope 1 Project emissions from up to 5.8 MT CO<sub>2</sub>-e to 4.8 MT CO<sub>2</sub>-e per year and saved 31 MT CO<sub>2</sub>-e of Scope 1 emissions over the expected life of the proposed Browse Project. It should also be noted that atmospheric emissions from the proposed Browse Project as a whole are less than or similar to the two former development concepts, as described in Section 3.8 of the draft EIS/ERD.

Further, Figure 7-4 of the draft EIS/ERD provides benchmarking between the processing emissions for the proposed Browse FPSOs and identified comparable facilities in Australia, to demonstrate the effectiveness of the upstream design in consuming energy to process the gas stream and pressurise it for export.

### 5.2 Operate Out

Energy efficiency measures will be continually identified and implemented through the life of the proposed Browse Project through the means discussed below. The means of achieving these improvements include the Woodside Energy Management Framework and Procedure, and the Production Optimisation and Opportunity Management Procedure.

### 5.2.1 Energy Management Framework

Woodside's Energy Management Framework, applicable to all Woodside developments and production assets, aims to improve energy efficiency across Woodside's operations in order to:

- add significant value and maximise shareholder returns
- minimise environmental impacts through reduced GHG emissions which contribute to climate change
- enhance our reputation as a partner of choice.

The Energy Management Procedure defines the minimum mandatory requirements for energy management at Woodside assets to deliver continuous improvement in energy performance. The Energy Management Framework requires that an Energy Management Plan is established, implemented and maintained for each operating asset (including the proposed Browse Project) or group of assets which are required to measure, analyse and communicate energy performance. Opportunities to improve energy performance are to be identified and captured in accordance with the Production Optimisation and Opportunity Management Procedure (refer to **Section 5.2.2**), such that energy opportunities are considered alongside other opportunities and constraints.

### 5.2.2 Production Optimisation Process

In accordance with the Production Optimisation and Opportunity Management Procedure, the proposed Browse Project will prepare an Optimisation Reference Plan (ORP) which identifies and implements opportunities to improve production and energy efficiency whilst reducing emissions. The ORP recognises that any reduction in emissions is also identified as a production opportunity, as gas that can be diverted from fuel or flare streams can potentially be turned into a saleable product.

The ORP delivers a ranked list of opportunities used to justify further study/implementation of each opportunity listed. Results are then incorporated into relevant plans to ensure consideration for funding / resourcing. Consideration of opportunities is based on a number of economic and environmental factors:

- opportunities are prioritised based upon net present value (NPV), their contribution to Woodside corporate initiatives for GHG reduction, and the confidence of return (CoR) to ensure efficient capital allocation. The CoR is estimated based upon maturity, complexity, technology novelty and ease of implementation.
- production enhancing opportunities need to meet set criteria to be considered economic and reviewed for recommendation. Opportunities may not be recommended if economics are marginal and there is low probability of success, however opportunities that include significant environmental/strategic merit (e.g. emissions reduction benefit) may continue to be considered even where economic criteria have not been met.

### 5.2.3 Methane Guiding Principles

In 2018, Woodside became a signatory to the Methane Guiding Principles, an initiative to reduce methane emissions across the natural gas value chain . Woodside will continually look for ways to minimise methane emissions from the plant operations.

## 5.3 Emissions Offsets

### 5.3.1 Compliance Requirements (as at May 2020)

Australia's nationally determined contribution to global emissions reductions under the Paris Agreement sets a national emissions reduction target, of 26-28% emissions reductions from 2005

levels, by 2030. The Australian Government has introduced a number of initiatives in order to deliver national emissions reductions and these include the Emissions Reduction Fund and SGM.

- The Emissions Reduction Fund, enacted through the *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act), is a voluntary scheme that aims to provide incentives for a range of organisations to adopt new practices and technologies to reduce their emissions.
- The SGM, enacted through the NGER Act, is designed to ensure that emission reductions implemented through the Emissions Reduction Fund are not offset or exceeded by increases in GHG emissions (above ‘business-as-usual levels’). It achieves this by placing a legislated obligation on emitters to keep net emissions below their emissions limit (or baseline).

The Operator of a facility that has, or is likely to, exceed its baseline can reduce the facility’s net emissions by purchasing and surrendering Australian carbon credit units (ACCUs) to offset its emissions.

### 5.3.2 Australian Carbon Credit Units

ACCUs are a type of ‘carbon credit’ which represents the removal of one tonne of carbon dioxide equivalent (tCO<sub>2</sub>-e) from the atmosphere (via an activity which results in a reduction in emissions or increase in sequestration relative to a reference case). ACCUs are tradeable financial instruments issued by a certification body (the Clean Energy Regulator) which sets rules as to the types of activities which can be recognised as removing carbon dioxide from the atmosphere and how it can be calculated.

The ACCU certification scheme, enacted by the CFI Act, provides a four-step process for the approval of offset projects and generation of ACCUs.

- Firstly, methods are made by the Minister for Energy and Emissions Reduction. The methods set out the types of activities which can be recognised as removing carbon dioxide from the atmosphere and how it can be calculated. Methods can only be made if they satisfy prescribed offsets integrity standards in the CFI Act (these ensure that abatement is genuine) and are endorsed by the Emissions Reduction Assurance Committee (an independent statutory body) as having satisfied these standards.
- Secondly, projects are declared as an eligible offsets project. The declaration is made by the Clean Energy Regulator following an application from the offset-project developer. Projects must meet additionality requirements and the project activity must occur within Australia.
- Thirdly, periodic reporting must be done on the declared project’s net amount of GHG emissions avoided or removed by the project, as calculated in accordance with the relevant method. Audits are required at prescribed intervals.
- Lastly, credits are issued by the Clean Energy Regulator on application by the offset-project developer. For emissions avoidance projects, the number of units issued equals the net abatement amount calculated in accordance with the method. By contrast, for sequestration projects, the unit entitlement is equal to the net abatement amount minus the ‘risk of reversal buffer’ (generally 5%). The issued credits are registered in the Australian National Registry of Emissions Units and can be traded or surrendered.

### 5.3.3 ACCU Markets & Sourcing

The primary source of demand for ACCUs comes from the Emissions Reduction Fund. The Emissions Reduction Fund has a purchasing scheme, whereby the Australian Government voluntarily purchases ACCUs from eligible offset projects. A secondary source of demand is the compliance market. The compliance market refers to the sale and purchase of ACCUs to meet a facility operator’s legal obligation to keep net emissions below the emissions limit prescribed by the SGM.



The Climate Change Authority (an independent statutory agency, established to provide expert advice on climate change policy) is required by the CFI Act to undertake a review every three years to assess whether the Act is working to create incentives for people to carry on offset projects.

It is planned that the BJV will source ACCUs required for compliance and surrender when required. ACCUs can be sourced through various commercial arrangements including:

- the direct development or funding of new ACCU generating projects
- purchase of existing ACCUs issued by the Clean Energy Regulator from market traders or offset-project developers
- offtake arrangements for ACCUs to be generated from new or existing projects
- spot purchase and long term purchase agreements from market traders or project-developers.

#### **5.4 Report**

The NGER Act was introduced as the national framework for reporting and disseminating company information about GHG, energy production, energy consumption and other information specified under the NGER Act. The Act sets up the NGER Scheme, which aims to:

- inform government policy and the Australian public
- help meet Australia's international reporting obligations
- assist Commonwealth, State and Territory government programs and activities
- 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 , as updated from time to time. GHG emissions from the proposed Browse Project will be reported annually under the NGER Act. Woodside will conduct routine emissions monitoring and reporting of GHG emissions from facilities in accordance with the NGER Act.

## 6. GHG MANAGEMENT PLAN PROVISIONS

This section describes the provisions of this GHGMP in the context of the objectives. Woodside has incorporated a suite of contemporary best practice management and mitigation measures (each included as Management Actions) to ensure ongoing, long term reductions in GHG emissions will be achieved. **Table 6-1** lists the management-based provisions that will be implemented with the proposed Browse Project. These provisions are applicable to all GHG emissions in the scope (**Section 2.2**) of this GHGMP. These are based on the rationale and approach described in **Section 2.3**.

Given the jurisdictional breakdown of the proposed Browse Project’s GHG emissions, the key emissions sources (i.e. vented reservoir CO<sub>2</sub> and fuel gas emissions) occur within Commonwealth Waters. As a result, it is expected that the management plan provisions, while applicable to all emissions sources, will focus on emissions sources occurring within Commonwealth Waters, commensurate with the jurisdictional breakdown.

**Table 6-1 Management-Based Provisions**

Management Actions (MA)	Targets	Monitoring	Reporting
<b>MA-1: Fuel and flare targets are set annually to drive continuous improvement.</b>	Targets will be set annually for the amount of gas to be flared and fuel to be consumed by the proposed Browse Project.	Performance against targets will be monitored. Potential sources or causes for exceedance will be explained.	Fuel and flare emissions presented in annual reporting (as described in the draft EIS/ERD).
<b>MA-2: Continue to identify and adopt practicable mitigation and management measures to reduce Scope 1 GHG emissions.</b>	Optimisation and opportunity management processes will be implemented to identify and prioritise enhancement opportunities including improving energy efficiency, reducing fuel use and intensity and minimising flaring.	Selected opportunities will be monitored in accordance with the Production Optimisation and Opportunity Management Procedure and ORP.	Reporting on the adopted practicable management and mitigation measures to reduce scope 1 GHG emissions.
<b>MA-3: Routine emissions monitoring and reporting is undertaken in accordance with the NGER Act.</b>	Direct GHG emissions (e.g. fuel, flare, fugitive and venting emissions) will be measured and reported in accordance with the NGER Act.	Scope 1 emissions will be measured in accordance with the requirements of the National Greenhouse and Energy Reporting Measurement Determination.	Estimation of emissions is performed in accordance with the NGER Act and presented in annual reporting (as described in the draft EIS/ERD).

Management Actions (MA)	Targets	Monitoring	Reporting
<b>MA-4: Comply with Safeguard Mechanism (or applicable legislation) to manage emissions within the facility baseline</b>	Emissions will be managed to ensure net emissions are below the SGM baseline Allowable offsets will be purchased and surrendered equivalent to the amount of emissions above the baseline level.	Monitoring of net emissions performed in accordance with MA 4 Monitoring of volume of offsets required, purchased and surrendered in accordance with SGM.	Summary of purchase and surrender of allowable offsets included in annual reporting (as described in the draft EIS/ERD) and published as part of annual SGM data tables by the Clean Energy Regulator.
<b>MA-5: Adhere to the Methane Guiding Principles</b>	Management of methane emissions performed in accordance with the Methane Guiding Principles.	Methane reduction initiatives monitored through the implementation of the ORP.	Performance against the Methane Guiding Principles will be presented in annual reporting (as described in the draft EIS/ERD).
<b>MA-6: Undertake 5-yearly assessment of reasonable and practicable emission reduction equipment and technologies that could be implemented to reduce GHG emissions</b>	Assessment will identify practicable and reasonable opportunities and their feasibility of implementation to improve GHG emissions performance.	Any relevant changes or modifications will be reviewed and impact on GHG emissions generation will be assessed.	Summary of assessment will be reviewed and reported 5 yearly.

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## 7. STAKEHOLDER CONSULTATION

This GHGMP has been prepared to support the proposed Browse Project draft EIS/ERD and therefore is to be reviewed by the EPA, DAWE and key Decision-Making Authorities (DMAs). The GHGMP has factored in any comments received during the public comment period for the draft EIS/ERD. Further changes may be incorporated over time through inputs received via Woodside's ongoing stakeholder engagement processes.

## 8. ADAPTIVE MANAGEMENT AND REVIEW OF THE GHGMP

In line with the concept of adaptive management, the management actions presented in this GHGMP shall be monitored, reviewed, evaluated and updated, as required, considering:

- outcomes of any technical review of and evaluation of any routine emissions monitoring
- new and relevant data/information gained as a result of implementing this GHGMP, or from external sources
- effectiveness of internal processes and procedures to reduce and manage GHG emissions
- stakeholder input (see **Section 7**)
- changes in State or Commonwealth legislation or policy.

Relevant updates included in a revised GHGMP.

Overall technical review and evaluation of the management actions outlined in this GHGMP will be conducted every five years (if not initiated prior to that time) to ensure the management actions are adequately addressing the objectives of this GHGMP (please refer **Section 2.2**). If, as a result of any review, any significant changes are required to be made to the monitoring program or any other aspect of this GHGMP, a revised GHGMP will be provided to the regulator.

When the five-yearly review cycle is triggered, or if a significant change to either the facility, activity, or environmental impact or risk is identified, a revised GHGMP will be submitted to the regulator. When approved, the revised plan will be made publicly available.

## 9. REFERENCES

- CSIRO, 2015. Implications of climate change for Australia’s biodiversity [WWW Document]. URL <https://www.csiro.au/en/Research/LWF/Areas/Ecosystems-biodiversity/Monitoring-biodiversity/Biodiversity-and-climate-change> (accessed 6.4.19).
- EPA, 2020a. Environmental Factor Guideline - Greenhouse Gas Emissions. Western Australia.
- EPA, 2020b. Statement of Environmental Principles, Factors and Objectives. Western Australia.
- Government of Western Australia, 2019. WA GHG Emissions Policy for Major Projects.
- IEA, 2019. World Energy Outlook.
- NWS, 2019. North West Shelf Project Extension Greenhouse Gas Management Plan”, EPA 2186, EPBC 2018/8335.



## 10. TERMS

Acronym	Definition
ACCU	Australian Carbon Credit Units
AGRU	Acid Gas Removal Unit
BJV	Browse Joint Venture
BTL	Browse Trunkline
CO <sub>2</sub>	Carbon Dioxide
CoR	Confidence of Return
DAWE	Department of Agriculture, Water and the Environment
DMA	Decision Making Authorities
DoEE	Department of the Environment and Energy
Domgas	Domestic Gas
EIS	Environmental Impact Statement
ERD	Environmental Review Document
ERF	Emissions Reduction Fund
FPSO	Floating, Production, Storage and Offloading
GHG	Greenhouse Gas
GHGMP	Greenhouse Gas Management Plan
HSEQ	Health, Safety, Environment and Quality
IPCC	Intergovernmental Panel on Climate Change
LNG	Liquefied Natural Gas
MEG	Monoethylene Glycol
MT	Megatonnes (Million tonnes)
NGER	National Greenhouse and Energy Reporting Act (Cth) 2007
NPV	Net Present Value
NRC	North Rankin Complex
NWS JV	North West Shelf Joint Venture
ORP	Optimisation Reference Plan
SGM	Safeguard Mechanism
tCO <sub>2</sub> -e	Tonnes of Carbon Dioxide Equivalent
WA EPA/EPA	West Australian Environmental Protection Authority
WMS	Woodside Management System

## APPENDIX A: PROPOSED BROWSE PROJECT GHG EMISSIONS PROFILE

For convenience, proposed Browse Project upstream emissions estimates are provided in the draft EIS/ERD and are replicated in **Table A.1**. Emissions estimates were calculated based on the available level of concept definition and assumptions regarding future commercial arrangements, the feed gas (final composition) and the scale, efficiency, interaction and complexity of the extraction, processing, anticipated production and compression of the product stream. Methodologies from the NGER Act were used in calculating emissions. For further information on calculation methodology, including the emissions factors and other assumptions used, please refer to Chapter 7 of the draft EIS/ERD.

**Table A.1 Draft EIS/ERD table - forecast Scope 1 (BJV) GHG emissions summary**

CO <sub>2</sub> -e MT	Average Year	Peak Production Year	Total Expected Field Life	Total Extended Field Life
Reservoir Emissions <sup>1</sup>	2.3 (2.6) <sup>2</sup>	4.0 (4.6)	70 (81)	93 (107)
Fuel Gas	1.2	2.1	38	50
Flaring	0.14	0.14	4	6
Fugitives	0.01	0.02	0.3	0.4
<b>Upstream Total<sup>1</sup></b>	<b>3.6 (4.0)</b>	<b>6.2 (6.8)</b>	<b>112 (123)</b>	<b>149 (163)</b>

<sup>1</sup> Upstream reservoir emissions have been estimated based on the maximum expected case given a gas export specification target of 2.5mol% CO<sub>2</sub>. Estimates of emission implications for a 1 mol% to 2.8 mol% CO<sub>2</sub> gas export specification are presented in Table 7-7 of the draft EIS/ERD. Note the gas export specification is dependent on the outcome of final commercial arrangements.

<sup>2</sup> Bracketed emissions refer to high reservoir CO<sub>2</sub> composition scenario.