Gorgon Gas Development and Jansz Feed Gas Pipeline

Terrestrial and Subterranean Environment Protection Plan

State: Ministerial Statement 769 and MS 800.
Commonwealth EPBC Reference: 2003/1294 and 2008/4178

Document ID:	**G1-NT-PLNX0000294**
Revision ID:	**4.0**
Revision Date:	**8 December 2023**
Next Revision Due	**8 December 2033**
Information Sensitivity:	**Public**

Contents

Tables

Figures

1 Executive summary

Table 1-1: Terrestrial and Subterranean Environment Protection Plan summary table

Aspect	Summary
Proposal name	Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve
Proponent name	Chevron Australia Pty Ltd (CAPL)
Approval number/s	State: • Ministerial Statement (MS) 769 • MS 800 Commonwealth: • EPBC Reference: 2003/1294 • EPBC Reference: 2008/4178
Proposal description and scope	The construction of facilities for the development of the Greater Gorgon Gas Fields on the North West Shelf, and the processing and export of the gas at a liquefied natural gas (LNG) plant to be constructed on Barrow Island, as more generally described in the Draft Environmental Impact Statement / Environmental Review and Management Programme for the Proposed Gorgon Development, the Final Environmental Impact Statement/ Response to Submissions on the Environmental Review and Management Programme; as amended under Section 45C; and as expanded and revised in the Public Environmental Review for the Gorgon Gas Development Revised and Expanded Proposal and the Response to Submissions: Gorgon Gas Development Revised and Expanded Proposal, Public Environmental Review.
Purpose of the EMP	The purpose of the Terrestrial and Subterranean Environment Protection Plan (TSEPP) is to satisfy the requirements of Condition 7 of MS 800 and MS 769 and Condition 6 of EPBC Reference: 2003/1294 and 2008/4178
Key objectives	The stated objectives of this Plan in Condition 7.4 of MS 800 and MS 769 are: i. To reduce the adverse impacts from the construction and operation of the terrestrial facilities (within the Terrestrial Disturbance Footprint) as far as practicable; and ii. To ensure that construction and operation of the terrestrial facilities does not cause Material or Serious Environmental Harm outside and below the Terrestrial Disturbance Footprint The stated objectives of this Plan in Condition 6.4 of EPBC Reference: 2003/1294 and 2008/4178 are to: i. To reduce the adverse impacts from the construction and operation of the terrestrial facilities listed in condition 5.2, as far as practicable; and ii. To ensure that construction and operation of the terrestrial facilities listed in condition 5.2 does not cause Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint, including below the surface of the land
Key environmental factors	Flora and vegetation Landforms (referred to as Soil and Landform within the Plan) Subterranean fauna Terrestrial environmental quality Terrestrial fauna Inland waters (referred to as Surface and Groundwater within the Plan) Air Quality
Approval Condition clauses	Conditions 7.4, 7.5, 7.6 and 7.7 of MS 800 and MS 769 Conditions 3.2, 6.4, 6.5, 6.6, 6.7, 22, 23, 24 and 25 of EPBC Reference: 2003/1294 and 2008/4178
Proposed operation dates	Through to Financial Year 2066

2 Introduction

2.1 Proponent

Chevron Australia Pty Ltd (CAPL) is the proponent and the person taking the action for the Gorgon Gas Development on behalf of the following companies (collectively known as the Gorgon Joint Venturers):

- CAPL
- Shell Australia Pty Ltd
- Mobil Australia Resources Company Pty Limited
- Osaka Gas Gorgon Pty Ltd
- Tokyo Gas Gorgon Pty Ltd
- JERA Gorgon Pty Ltd.

2.2 Project

CAPL has developed the gas reserves of the Greater Gorgon Area for processing in the Gorgon Gas Treatment Plant (GTP) on Barrow Island, which is located off the Pilbara coast 85 km north-north-east of Onslow in Western Australia (WA) (Figure 2-1).

Subsea gathering systems and pipelines deliver feed gas from the Gorgon and Jansz–Io gas fields to the west coast of Barrow Island. The underground feed gas pipeline system then traverses Barrow Island to the east coast where the GTP is located. The GTP includes natural gas trains that produce liquefied natural gas (LNG) as well as condensate and domestic gas. Carbon dioxide (CO_2), which occurs naturally in the feed gas, is separated during the production process and injected into deep rock formations below Barrow Island. The LNG and condensate are loaded onto tankers from a jetty and then transported to international markets. Gas for domestic use is exported by pipeline from Barrow Island to the domestic gas collection and distribution network on the WA mainland.

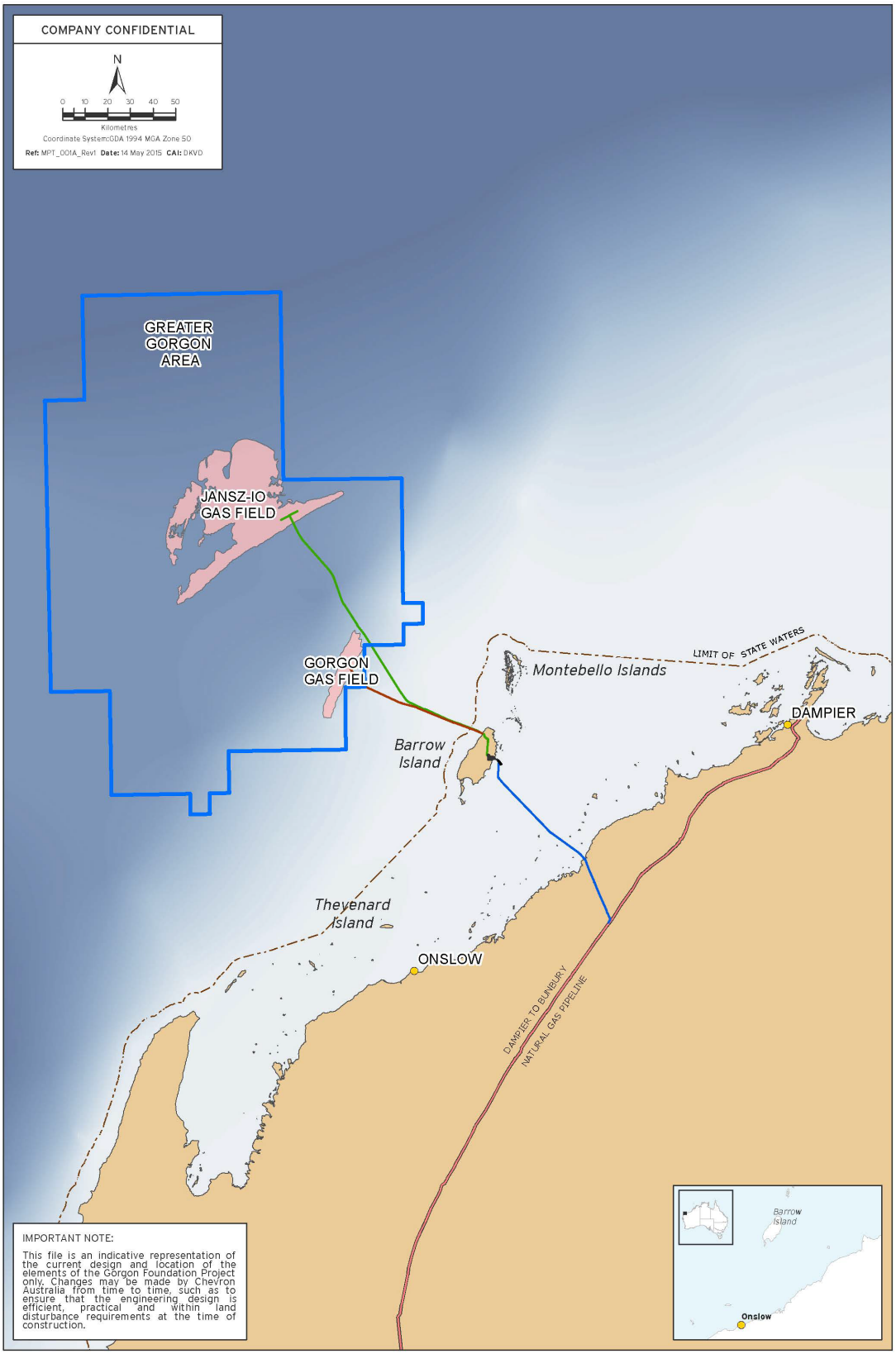

Figure 2-1: Location of Barrow Island and the Greater Gorgon Area

2.3 Environmental approvals

Table 2-1 describes State (WA) and Commonwealth approvals for the components of the Gorgon Gas Development.

These approvals, and projects as approved under these approvals, have been and may continue to be amended (or replaced) from time to time.

Table 2-1: State and Commonwealth approvals

Project approval stage	State	Commonwealth
Jansz Feed Gas Pipeline	MS 769 (Ref. 1) 28 May 2008	EPBC Reference: 2005/2184 (Ref. 2). 22 March 2006
Initial Gorgon Gas Development (2 LNG Trains)	Initial Gorgon Gas Development comprising two LNG Trains – MS 748 (Ref. 3). This was superseded by MS 800 (Ref. 4). 6 September 2007	Initial Gorgon Gas Development comprising two LNG Trains – EPBC Reference: 2003/1294 (Ref. 6). 3 October 2007
Revised and Expanded Gorgon Gas Development (3 LNG Trains)	MS 800 (Ref. 4) provides approval for both the initial Gorgon Gas Development and the Revised and Expanded Gorgon Gas Development (compromising three LNG Trains), which together are known as the Gorgon Gas Development. This statement supersedes MS 748. 10 August 2009	The Revised and Expanded Gorgon Gas Development (EPBC Reference: 2008/4178 [Ref. 5]) was approved, and the conditions for the initial Gorgon Gas Development (EPBC Reference: 2003/1294 [Ref. 6]) were varied. 26 August 2009
Dredging Amendment	MS 865 (Ref. 7) provides approval to establish a restart mechanism in the event of a project-attributable coral health management trigger. This statement is an amendment to Conditions 18, 20, and 21 of MS 800. 8 June 2011	Not applicable (N/A)
Additional Support Area	MS 965 (Ref. 8) applies the conditions of MS 800 to an Additional Support Area. 2 April 2014	The conditions for the initial Gorgon Gas Development (EPBC Reference: 2003/1294 [Ref. 6]).and for the Revised and Expanded Gorgon Gas Development (EPBC Reference: 2008/4178 [Ref. 5]) were varied. 15 April 2014
Fourth Train Expansion [1]	MS 1002 (Ref. 9) applies the conditions of MS 800 to the Fourth Train Expansion, and has additional conditions. 30 April 2015	EPBC Reference: 2011/5942 (Ref. 10). 12 May 2016
Greenhouse Gas Condition Amendment	MS 1198 (Ref. 61) amends Conditions 5, 26, and 27 of MS 800. 20 October 2022	Not applicable (N/A)
Trenching earthworks for the terrestrial section of the three new electrical umbilical lines within the existing	Not applicable (N/A)	Conditions 3 and 6 of EPBC Reference: 2003/1294 (Ref. 6), EPBC Reference: 2008/4178 (Ref. 5) and EPBC Reference: 2011/5942 (Ref. 10) were varied. 7 August 2023

[1]. At this stage CAPL has not progressed with the Fourth Train Expansion. If this expansion proceeds, this plan would be updated.

Project approval stage	State	Commonwealth
disturbance footprint of the Barrow Island pipeline right of way between North Whites Beach and the Gas Treatment Plant GTP		

2.4 Purpose of this Plan

2.4.1 Requirement for this Plan

2.4.1.1 State environmental approval requirement

This Plan is required under Condition 7.1 of MS 800 and MS 769:

> *Prior to commencement of construction of any of the terrestrial facilities identified in Condition 6.3, the Proponent shall submit a Terrestrial and Subterranean Environment Protection Plan (the Plan) that meets the objectives identified in Condition 7.4 and the requirements of Condition 7.5 as determined by the Minister, unless otherwise allowed by Condition 7.2.*

2.4.1.2 Commonwealth environmental approval requirement

This Plan satisfies the requirements of Condition 6.1 of EPBC Reference: 2003/1294 and 2008/4178:

> *Prior to commencement of construction of any of the terrestrial facilities identified in Condition 5.2, the person taking the action shall submit a Terrestrial and Subterranean Environment Protection Plan (the Plan) that meets the objectives identified in Condition 6.4 and the requirements of Condition 6.5 as determined by the Minister, unless otherwise allowed by Condition 6.2.*

2.4.2 Objectives of this Plan

The stated objectives of this Plan in Condition 7.4 of MS 800 and MS 769 are:

i. *To reduce the adverse impacts from the construction and operation of the terrestrial facilities (within the Terrestrial Disturbance Footprint) as far as practicable; and*

ii. *To ensure that construction and operation of the terrestrial facilities does not cause Material or Serious Environmental Harm outside and below the Terrestrial Disturbance Footprint*

The stated objectives of this Plan in Condition 6.4 of EPBC Reference: 2003/1294 and 2008/4178 are to:

i. *To reduce the adverse impacts from the construction and operation of the terrestrial facilities listed in condition 5.2, as far as practicable; and*

ii. *To ensure that construction and operation of the terrestrial facilities listed in condition 5.2 does not cause Material or Serious*

Environmental Harm outside the Terrestrial Disturbance Footprint, including below the surface of the land

2.4.3 Contents of this Plan

Table 2-2 lists the State and Commonwealth Condition requirements of this Plan and the sections in this Plan that fulfil them.

Note: This requirements text is based on MS 800. Additional words in these requirements from MS 769 are contained in [square brackets]; additional words in the requirements from EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178 are contained in (parentheses), except when they are abbreviations.

Table 2-2: Condition requirements addressed in this Plan

Approval Decision	Condition No.	Condition Requirement	Section in this Plan
	The objectives of the Plan are:		
MS 800 MS 769	7.4 i	To reduce the adverse impacts from the construction and operation of the terrestrial facilities (within the Terrestrial Disturbance Footprint) (listed in condition 5.2), as far as practicable; and	Section 2.4.2
EPBC Reference: 2003/1294 and 2008/4178	6.4 I		
MS 800 MS 769	7.4 ii	To ensure that construction and operation of the terrestrial facilities listed in Condition 5.2 does not cause Material or Serious Environmental Harm outside and below the Terrestrial Disturbance Footprint (including below the surface of the land).	Section 2.4.2
EPBC Reference: 2003/1294 and 2008/4178	6.4 II		
	The Plan shall (must) include the following:		
MS 800 MS 769	7.5 i	Management measures to reduce the adverse impacts (including from light and noise) from the construction and operation of the terrestrial facilities listed in Condition 6.3 (5.2) as far as practicable; and	Section 5
EPBC Reference: 2003/1294 and 2008/4178	6.5 I		
MS 800 MS 769	7.5 ii	Management measures to ensure that construction and operation of the terrestrial facilities (listed in 5.2) does (do) not cause Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint, including below the surface of the land.	Section 5
EPBC Reference: 2003/1294 and 2008/4178	6.5 II		
	The measures required by 7.5.i. and ii. (6.5 I and ii) shall address but not be limited to:		
MS 800 MS 769	7.6 i	Vegetation Clearing Audit Procedures to determine the extent of clearing and rehabilitation on an annual basis;	Section 5.2 Appendix E: Vegetation Clearing and Audit Common User Procedure (Ref. 25)
EPBC Reference: 2003/1294 and 2008/4178	6.6 I		
MS 800 MS 769	7.6 ii	Procedures in relation to and protocols for capturing, relocating, handling, housing, caring for and reporting to the DEC [now DBCA] threatened or listed fauna found within the Terrestrial Disturbance Footprint that are not required by DEC [now DBCA] for translocation;	Section 5.5 Appendix C: Fauna Handling and Management Common User Procedure (Ref. 24)
EPBC Reference: 2003/1294 and 2008/4178	6.6 II		
MS 800	7.6 iii		Section 5.5

Approval Decision	Condition No.	Condition Requirement	Section in this Plan
MS 769		Procedures to avoid secondary impacts to fauna as a consequence of risks such as animals being trapped in construction trenches or subject to vehicle strike;	Appendix C: Fauna Handling and Management Common User Procedure (Ref. 24) Appendix D: Traffic Management Common User Procedure (Ref. 26)
EPBC Reference: 2003/1294 and 2008/4178	6.6 III		
MS 800 MS 769	7.6 iv	Measures including detailed drainage and containment designs for all works and infrastructure that control stormwater run-off outside the Terrestrial Disturbance Footprint with the aim of ensuring that runoff is consistent with the pre-development runoff regime as far as practicable, and any recharge does not cause pollution; and	Section 5.3
EPBC Reference: 2003/1294 and 2008/4178	6.6 IV		
MS 800 MS 769	7.6 v	Performance Standards against which achievement of the objectives of this condition can be determined.	Section 5
EPBC Reference: 2003/1294 and 2008/4178	6.6 V		
EPBC Reference: 2003/1294 and 2008/4178	6.6A	(To ensure that the Plan adopts best practice environmental management to protect EPBC listed matters, the person taking the action must submit to the department for the Minister's approval, a revised version of the Plan which addresses the potential impacts of PFAS on EPBC listed matters, specifies the measures that will be taken to avoid and mitigate such impacts, and meets the requirements of the PFAS NEMP (2020) and the Environmental Management Plan Guidelines by 1 November 2023.)	This Plan
MS 800 MS 769	7.7	The Proponent shall report any Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint to the DEC [now DWER] and DEWHA [now DCCEEW] within 48 hours of detection.	Section 6.8.2
EPBC Reference: 2003/1294 and 2008/4178	3.2	All plans, reports, programs or systems (however described) required under this approval must include the following elements:	
EPBC Reference: 2003/1294 and 2008/4178	3.2.1	a description of the EPBC listed species and their habitat likely to be impacted by the components of the action which are the subject of that plan, report, program or system (however described);	Appendix A
EPBC Reference: 2003/1294 and 2008/4178	3.2.2	an assessment of the risk to these species from the components of the action the subject of that plan, relevant to that plan, report, program or system (however described);	Appendix A
EPBC Reference: 2003/1294 and 2008/4178	3.2.3	details of the management measures proposed in relation to these species if it is a requirement of the condition requiring that plan, report, program or system (however described);	Section 5

Approval Decision	Condition No.	Condition Requirement	Section in this Plan
EPBC Reference: 2003/1294 and 2008/4178	3.2.5	performance standards in relation to that species if it is a requirement of the condition requiring that plan, report, program or system (however described);	Section 5
EPBC Reference: 2003/1294 and 2008/4178	3.2.7	protocols for reporting to the Department, impacts detected by the monitoring programs described in 3.2.4, on EPBC listed species, whether or not the impact is caused by the action.	Section 6.8.2
EPBC Reference: 2003/1294 and 2008/4178	3.2A	To ensure that all plans required under this approval adopt best practice environmental management to protect EPBC listed species, the person taking the action must, by 30 June 2024, and again by the tenth anniversary of 30 June 2024 and each multiple of the tenth anniversary of 30 June 2024, submit to the department for the Minister's approval, a revised version of each plan required under the conditions attached to this approval. Each revised version of each plan so submitted must be prepared in accordance with the Environmental Management Plan Guidelines.	Section 6.9
MS 800 MS 769	35 [20]	Management plans, reports, systems, and programs referred to in the following conditions shall be made publicly available as determined by the Minister: 5.1, 5.3, 6.1, 7.1, 8.1, 10.1, 11.1, 12.1, 13.1, 14.2, 16.1, 17.1, 20.1, 22.1, 23.1, 23A.1, 24.3, 25.1, 26.3, 27.1, 28.1, 29.1, 30.1, 31.1, 32.1, 33.1 and 34.1.	Section 2.6.1
EPBC Reference: 2003/1294 and 2008/4178	22	Management plans, reports, systems and programs (however described) referred to in these conditions of approval must be made publicly available as determined by the Minister.	Section 2.6.1
EPBC Reference: 2003/1294 and 2008/4178	23	Upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Section 6.7
EPBC Reference: 2003/1294 and 2008/4178	24	The person taking the action must maintain accurate records of activities associated with or relevant to the above conditions of approval, and make them available on request by the Department. Such documents may be subject to audit by the Department and used to verify compliance with the conditions of approval.	Section 6.7
EPBC Reference: 2003/1294 and 2008/4178	25	If the person taking the action wishes to carry out an action otherwise than in accordance with any plan, report, program or system (however described) approved in relation to this approval, they may submit a revised plan, report, program or system (however described) for the Minister's approval. If the Minister approves a revised plan, report, program or system (however described)	Section 6.9

Approval Decision	Condition No.	Condition Requirement	Section in this Plan
		the person taking the action must implement that plan, report, program or system (however described) instead of the plan, report, program or system (however described) as originally approved.	

Common User Procedures have been developed to meet the requirements of Conditions 7.6 i-iii of MS 800 and MS 769 and Conditions 6.6 I-III of EPBC Reference: 2003/1294 and 2008/4178 and hence have a direct contribution to meeting the TSEPP conditions. As outlined in the table above, these Procedures are included as appendices to this document. In accordance with Condition 3.2A of EPBC Reference: 2003/1294 and 2008/4178 a revised version of these Procedures shall be submitted to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for the Minister's approval, by 30 June 2024.

Any matter specified in this Plan is relevant to the Gorgon Gas Development or Jansz Feed Gas Pipeline only if that matter relates to the specific activities or facilities associated with that particular development.

The sections in this Plan listed in Table 2-2 to meet the conditions of EPBC Reference: 2003/1294 and 2008/4178 shall be read and interpreted as only requiring implementation under EPBC Reference: 2003/1294 and 2008/4178 for managing the impacts of the Gorgon Gas Development on, or protecting, EPBC Act matters (see Appendix A). The implementation of matters required only to meet the requirements of MS 800 and MS 769 are not the subject of the EPBC Reference: 2003/1294 and 2008/4178.

2.4.4 Related Ministerial approval plans – Terrestrial

This Plan should be read in conjunction with the Terrestrial and Subterranean Baseline State and Environmental Impact Report (TSBSEIR) (Ref. 13) and the Terrestrial and Subterranean Environment Monitoring Program (TSEMP) (Ref. 22).

The baseline environmental state for areas potentially affected by construction and operations of terrestrial facilities of the Gorgon Gas Development is described in detail in the TSBSEIR, as required by Condition 6 of MS 800 and MS 769 and Condition 5 of EPBC Reference: 2003/1294 and 2008/4178. The TSBSEIR also provides the results of qualitative ecological risk assessment of impacts from the Terrestrial Facilities on the relevant ecological elements and defines the Terrestrial Disturbance Footprint (TDF).

In accordance with Condition 8 of MS 800 and MS 769 and Condition 7 of EPBC Reference: 2003/1294 and 2008/4178, the TSEMP outlines the ecological monitoring program to detect any Material or Serious Environmental Harm to the ecological elements outside the TDF. The TSEMP (Ref. 22) defines management trigger values, response actions and external reporting protocols for the ecological monitoring programs.

In addition to the above, the conditions set out in MS 800 and MS 769 and EPBC Reference: 2003/1294 and 2008/4178 require a number of specific subject matter plans which result in a number of instances where the objectives of this Plan are covered, or partly covered, by Plans required under separate conditions. Where these other Plans provide more detail on a specific aspect and the associated management measures to reduce adverse impacts from the construction and

operation of the terrestrial facilities, the Plans have been referred out to, rather than duplicating the content in this Plan.

Refer to Table 2-3 and Figure 2-2 which outline Plans required under MS 800, MS 769 and EPBC Reference: 2003/1294 and 2008/4178 that also relate to managing impacts from the construction and operation of the terrestrial facilities.

Table 2-3: Summary of terrestrial related plans under other approval conditions

Plan[1]	Condition	Plan Objective	Status
Terrestrial and Subterranean Baseline State and Environmental Impact Report (Ref. 13)	Condition 6 of MS 800 and MS 769 Condition 5 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	The purposes of the Report are to: i. Define and map the pre-development baseline state for the ecological elements within the areas that are expected to, or may be at risk of Material or Serious Environmental Harm due to any works associated with the terrestrial facilities listed in Condition 6.3; ii. Define and map the ecological elements within the Terrestrial Disturbance Footprint; and iii. Define and map the ecological elements of reference sites to be used as part of Condition 8, which are not at risk of Material or Serious Environmental Harm due to construction or operation of the terrestrial facilities listed in Condition 6.3.	Approved[1]
Terrestrial and Subterranean Environment Monitoring Program (Ref. 22)	Conditions 8 and 26 of MS 800 Condition 8 of MS 769 Conditions 7 and 19 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	The objective of this Program is to establish a statistically valid ecological monitoring program to detect any Material or Serious Environmental Harm to the ecological elements outside the Terrestrial Disturbance Footprint and monitoring of any seepage of injected carbon dioxide to the surface or near surface environments, including those which may support subterranean fauna, including the blind gudgeon *Milyeringa verita.*	Approved[1]
Terrestrial and Marine Quarantine Management System (QMS) (Ref. 37), including the Weed Hygiene Procedure (Ref. 38)	Condition 10 of MS 800 and MS 769 Condition 8 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	The overall aim of the QMS is that the Proponent shall not introduce or proliferate Non-indigenous Terrestrial Species and Marine Pests to or within Barrow Island or the water surrounding Barrow Island, as a consequence of the Proposal. The specific objectives of the QMS are: i. To prevent the introduction of Non-indigenous Terrestrial Species and Marine Pests; ii. To detect Non-indigenous Terrestrial Species (including weed introduction and/or proliferation) and Marine Pests; iii. To control and, unless otherwise determined by the Minister, eradicate detected Non-indigenous Terrestrial Species (including weeds) and Marine Pests; and iv. Mitigate adverse impacts of any control and eradication actions on indigenous species taken against detected Non-indigenous Terrestrial Species (including weeds) and Marine Pests.	Approved
Short-Range Endemics and Subterranean Fauna Monitoring Plan (Ref. 23)	Condition 11 of MS 800	Further survey and identification of those short-range endemics and subterranean fauna species which have previously only been located on the Gas Treatment Plant site.	Approved
Fire Management Plan (Ref. 17)	Condition 12 of MS 800	The objectives of the Plan are to ensure that:	Approved[1]

Plan[1]	Condition	Plan Objective	Status
	Condition 11 of MS 769 Condition 9 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	i. The Proposal does not cause Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint due to fire; and ii. Fire risk reduction measures are built into the design of the facilities to protect the Proponent's assets from the impact from fire on Barrow Island.	
Long-Term Marine Turtle Management Plan (LTMTMP) (Ref. 19)	Condition 16 of MS 800 Condition 12 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	The objectives of the Plan are to: i. Address the long-term management of the marine turtles that utilise the east coast beaches and waters where there are Proposal related stressors to marine turtles. ii. Establish baseline information on the populations of marine turtles that utilise the beaches adjacent to the east coast facilities identified in Conditions 6.3 and 14.3; iii. Establish a monitoring program to measure and detect changes to the flatback turtle population in accordance with Condition 16.4ii; and iv. Specify design features, management measures and operating controls to manage, and where practicable, avoid adverse impacts to marine turtles, with specific reference to reducing light and noise emissions as far as practicable.	Approved[1]
Horizontal Directional Drilling Management and Monitoring Plan (HDDMMP) (Ref. 20)	Condition 22 of MS 800 Condition 13 of MS 769 Condition 15 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	The objectives of the Plan are to: i. Reduce the impacts of HDD activities on the Terrestrial and Marine Disturbance Footprints, associated with those activities as far as practicable; and ii. Ensure that HDD activities do not cause Material or Serious Environmental Harm outside the Terrestrial and Marine Disturbance Footprints associated with those activities or exceed the coral loss limit in Condition 22.6.	Approved[1]
Air Quality Management Plan (Ref. 21)	Condition 29 of MS 800	The objectives of the Plan are to: i. Ensure air quality meets appropriate standards for human health in the workplace; and ii. Ensure air emissions from the GTP operations do not pose a risk of Material or Serious Environmental Harm to the flora, vegetation communities, fauna, and subterranean fauna of Barrow Island.	Approved
Solid and Liquid Waste Management Plan (SLWMP; Ref. 14)	Condition 30 of MS 800 Condition 16 of MS 769 Condition 20 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	The objectives of the Plan are to: i. Ensure all Proposal-related solid and liquid wastes are either removed from Barrow Island or, if not, that all practicable means are used to ensure that waste disposal does not cause Material or Serious Environmental Harm to Barrow Island and its surrounding waters;	Approved[1]

Plan[1]	Condition	Plan Objective	Status
		ii. Ensure discharges from any waste water treatment plant, reverse osmosis plant, or other process water are disposed of via deep well injection, unless otherwise authorised by the Minister; and iii. Ensure any deep well injection of Proposal-related liquid wastes is conducted in a manner that will not cause Material or Serious Environmental Harm to subterranean fauna and their habitats on Barrow Island.	
Aboriginal and Cultural Heritage Management Plan (Ref. 39)	Condition 31 of MS 800 Condition 17 of MS 769	The Plan shall include: i. Surveys for potential cultural heritage sites within the Terrestrial Disturbance Footprint; and ii. Provisions for the lawful retrieval and relocation of any heritage material which lies within the Terrestrial Disturbance Footprint in consultation with the Indigenous stakeholders.	Approved
Post-Construction Rehabilitation Plan (Ref. 18)	Condition 32 of MS 800 Condition 18 of MS 769	The objectives of the Plan are to: i. Ensure that the rehabilitation of terrestrial areas following construction is properly planned in a manner which promotes self-sustaining ecosystems able to be managed as part of their surroundings consistent with the conservation objectives of a class 'A' Nature Reserve; ii. Design rehabilitation of native vegetation to ultimately develop into viable ecological systems which are comparable and compatible with surrounding native vegetation and its land uses, and restores as closely as practicable the pre-disturbance biodiversity and ecosystem functional values; iii. Ensure planning, implementation, monitoring and reporting on rehabilitation is carried out consistent with industry best practice; iv. Ensure management of rehabilitation continues until affected areas are self sustaining; and v. Better inform any on-going rehabilitation and post-closure rehabilitation.	Approved
Project Site Rehabilitation Plan	Condition 33 of MS 800	The objectives of the plan are to: i. ensure that the rehabilitation of terrestrial facilities following decommissioning is properly planned in a manner that promotes self-sustaining ecosystems able to be managed as part of their surroundings, consistent with the conservation objectives of a class 'A' Nature Reserve and that restores the pre-disturbance biodiversity and ecosystem functional values; ii. design rehabilitation of native vegetation to ultimately develop into sustainable ecological systems which are comparable	Draft (submitted to DWER July 2023)

Plan[1]	Condition	Plan Objective	Status
		and compatible with surrounding native vegetation and its land uses, and restores as closely as practicable the pre-disturbance biodiversity and functional values. iii. ensure planning implementation and reporting on rehabilitation is carried out in a manner consistent with industry best practice iv. ensure management of rehabilitation continues until affected areas are self-sustaining	
Decommissioning and Closure Plan	Condition 34 of MS 800 Condition 19 of MS 769 Condition 21 of EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178	The objectives of the plan are to ensure that: i. unless otherwise agreed with the Minister, the area occupied by the terrestrial (and marine) infrastructure facilities is returned to its undisturbed state; and ii. unless otherwise agreed with the Minister, the site does not pose a risk to wildlife or personnel greater than surrounding undisturbed areas.	Not yet developed

Notes:

[1] In accordance with Condition 3.2A of EPBC Reference: 2003/1294 and 2008/4178 a revised version of this plan shall be submitted to DCCEEW for the Minister's approval, by 30 June 2024.

2.4.5 Other related approvals

In addition to the Ministerial conditions of approval under Statement No. 800 and Statement No. 769 and under EPBC Reference: 2003/1294, 2008/4178 and 2005/2184, there are a number of other approvals, such as Environment Plans and licences, that are related to the operation of the terrestrial facilities. Table 2-4 lists related approvals under other legislation.

Table 2-4: Summary of terrestrial related approvals under other legislation

Approval	Legislative Requirement	Scope	Status
Part V Licence L9102/2017/1 (Ref. 57)	*Environmental Protection Act 1986* (WA) (EP Act)	Facilities: GTP, Waste Transfer Station (WTS), Wastewater Treatment Plants, Concrete Batching, Liquid Waste Facility and Produced Water Disposal Wells. Discharges to air, surface water management, discharges to land (including stormwater and downhole disposal) and waste.	In Force
Dangerous Goods Site Licence DGS021356	*Dangerous Goods Safety Act 2004* (WA) Dangerous Goods (Storage and Handling of Non-explosives) Regulations 2007 (WA)	Storage and handling of dangerous goods.	In Force
Authorisation to Take or Disturb Threatened Species TFA 2022-0027	*Biodiversity Conservation Act 2016* (WA)	Handling of threatened species including record keeping and reporting of all fauna handling activities.	In Force

Approval	Legislative Requirement	Scope	Status
Fauna Taking (Relocation) Licence FR28000275	Biodiversity Conservation Regulations 2018 (WA)	Handling of fauna including record keeping and reporting of all fauna handling activities.	In Force
Gorgon Project Carbon Dioxide Disposal Management Plan (CDMP; Ref. 40)	Section 13 *Barrow Island Act 2003* (WA)	The Gorgon Joint Ventures (GJV) must comply with the conditions of the approval obtained under the *Barrow Island Act 2003* (WA), Section 13 Approval to Dispose of Carbon Dioxide by Injection into a Subsurface Formation, referred to as the Section 13 Approval. This approval is referred to as the Section 13 Approval from here on in. Condition 5 of the Section 13 Approval requires the GJV to comply with the approved CO_2 Disposal Management Plan (approved by the Barrow Island Act Minister; Ref. 40). The CO_2 Disposal Management Plan identifies subsurface risks; management options that may be applied to deal with these risks; and also contains a monitoring program for the injected CO_2.	Approved
Gorgon Project Carbon Dioxide Injection System Pipeline and Wells Operations Environment Management Plan (Ref. 41)	Petroleum Pipelines (Environment) Regulations 2012	Provides for the operation of the CO_2 injection systems wells and pipeline.	Approved
Gorgon Project Carbon Dioxide Injection System Well Maintenance Environment Plan (Ref. 42)	Petroleum Pipelines (Environment) Regulations 2012	Provides for the maintenance of the CO_2 injection, pressure management wells and reservoir surveillance wells.	Approved
Gorgon Major Hazard Facility Safety Report (Ref. 43)	*Dangerous Goods Safety Act 2004* (WA) and Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007 (WA)	Facilities: GTP, Utilities, Dangerous Goods Storage Areas. Aspects: Dangerous Goods, Fire and Gas, Loss of Containment, Emergency Response.	Approved

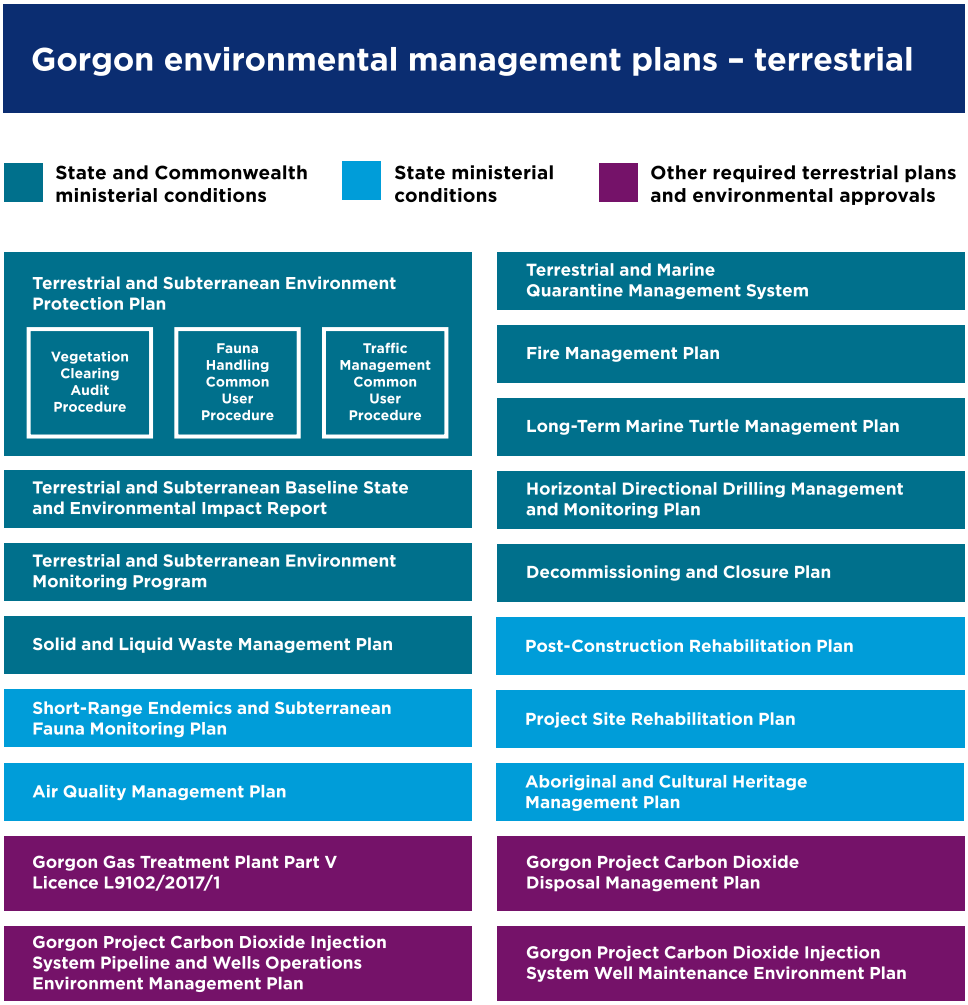

Figure 2-2: Plans and licences that manage potential impacts from the construction and operation of the Gorgon terrestrial facilities.

2.5 Land management

2.5.1 Barrow Island Act 2003

The *Barrow Island Act 2003* (BWI Act) (WA) authorises the implementation of the Gorgon Gas Processing and Infrastructure Project Agreement (Schedule 1 to the Act); an agreement between the GJV and the WA Government for a gas processing project on Barrow Island.

The BWI Act makes provisions for land on Barrow Island (no more than 332 ha of uncleared land) to be used under the *Land Administration Act 1997* (LAA) (WA) for a gas processing project purpose. The GJV has been granted LAA tenure (licences, easements and leases) for its gas processing operations on Barrow Island (BWI).

The GJV must comply with the conditions of the approval obtained under the BWI Act, Section 13 Approval to Dispose of CO_2 by Injection into a Subsurface Formation, referred to as the Section 13 Approval. This approval is referred to as the Section 13 Approval from here on in. Condition 5 of the Section 13 Approval requires the GJV to comply with the approved CO_2 Disposal Management Plan (approved by the Barrow Island Act Minister; Ref. 40). The CO_2 Disposal Management Plan identifies subsurface risks; management options that may be applied to deal with these risks; and also contains a monitoring program for the injected CO_2.

2.5.2 Barrow Island Joint Venture Project (WA Oil)

CAPL is the proponent and nominated operator of the Barrow Island oilfield (known as WA Oil) on behalf of the Barrow Island Joint Venture (BWIJV) partners. The other non-operating joint venture partners are Santos Offshore Pty Ltd and Mobil Australia Resources Company Pty Ltd. The petroleum related activities occur within the petroleum titles on Barrow Island, Middle Island, Boodie Island and surrounding waters.

The Barrow Island oil field has been operational since the 1960s and is now approaching planned end of life. WA Oil is expected to cease production from 2025, with ongoing decommissioning and rehabilitation activities currently conducted as required.

This TSEPP does not apply to WA Oil facilities (including the BWI Airport) and activities undertaken on Barrow Island as part of WA Oil. WA Oil facilities and activities are subject to their own approvals and regulatory requirements.

2.5.3 Barrow Island Nature Reserve

Under the Conservation and Land Management Act 1984 (WA) Barrow Island is designated as a Class A nature reserve (Reserve 11648) for the purposes of ‘Conservation of Flora and Fauna’. The BWI Act and related State Agreement allows for the implementation of the Gorgon Gas Development and makes provision for land on Barrow Island to be used for gas processing purposes.

Barrow Island Nature Reserve covers an area of 23,483 hectares. BWI was originally gazetted as a Class C reserve in 1908 to protect its flora and fauna. It was upgraded to a Class A reserve in 1910 and in 1979 it was classified as a nature reserve. Boodie, Double and Middle Islands Nature Reserve (Reserve 38728, other than Class A) cover an area of 586.7 hectares. Boodie, Double and Middle Islands Nature Reserve was gazetted in 1984. Both reserves are collectively referred to as the Barrow Group Nature Reserves.

2.5.4 Barrow Island Marine Park

Except for the area defined by the Port of Barrow Island, the waters around BWI are part of the Montebello/Barrow Island Marine Conservation Reserve. Most of the conservation area is zoned as a Marine Management Area, inclusive of the Western Barrow Island Sanctuary Zone. The conservation reserves also comprise the Barrow Island Marine Park and Bandicoot Bay Conservation Area, located adjacent to the west and south coasts of Barrow Island, respectively. The BWI marine area is listed on both the State Register of Heritage Places and the Commonwealth Register of the National Estate.

A large area off the east coast of BWI is a designated port, the Port of BWI, which was created under the *Shipping and Pilotage Act 1967* (WA) and is vested under the *Marine and Harbours Act 1981* (WA) in the Minister for Transport. The marine facilities on the eastern side of BWI are contained entirely within the Port area.

2.6 Stakeholder consultation

Regular consultation with stakeholders has been undertaken by CAPL throughout the development of the environmental impact assessment management documentation for the Gorgon Gas Development and Jansz Feed Gas Pipeline and since the commencement of operations.

Stakeholder consultation has included engagement with the community, government departments, industry operators, and contractors to CAPL via planning workshops, risk assessments, meetings, teleconferences, and the Public Environmental Review (PER) (Ref. 12), Environmental Impact Statement (EIS)/ Environmental Review and Management Programme (ERMP) (Ref. 11) and Environmental Review (Chevron Australia 2013) formal approval processes.

Under Condition 7.3 of Statement No. 800, Condition 7.3 of Statement No. 769 and Condition 6.3 of EPBC Reference: 2003/1294 and 2008/4178, CAPL was required to consult with the then Western Australian (WA) Department of Parks and Wildlife (DPaW) (now Department of Biodiversity, Conservation and Attractions (DBCA)), the Commonwealth Department of Environment (DotE) (now DCCEEW) and other relevant WA government agencies during preparation of this Plan.

This Plan was prepared with input from:

- The former Western Australian Department of Environment and Conservation (DEC) (now DBCA and Department of Water and Environmental Regulation (DWER)): Workshops and meetings were held involving the DEC and CAPL personnel to discuss the scope and content of this Plan during its development. The DEC reviewed draft revisions of this Plan along with the feedback of the independent reviewers. The DEC's comments were incorporated or otherwise resolved.
- The former Commonwealth Department of Environment, Water, Heritage and the Arts (DEWHA) (now DCCEEW): The DEWHA reviewed draft revisions of this Plan along with the feedback of the independent reviewers. The DEWHA's comments were incorporated or otherwise resolved.
- Dr Owen Nichols, Environmental Management and Research Consultants. Dr Nichols reviewed Revision 0 of this Plan and his comments were incorporated or otherwise resolved.
- Dr Eddie van Etten School of Natural Sciences, Edith Cowan University. Dr van Etten reviewed Revision 0 of this Plan and his comments were incorporated or otherwise resolved.
- Mr Brenton Knott, Faculty of Natural and Agricultural Sciences–Animal Biology, University of Western Australia: Mr Knott reviewed Revision 0 of this Plan and his comments were incorporated or otherwise resolved.
- Dr Andrew Burbidge, Consultant Conservation Biologist. Dr Burbidge reviewed Revision 0 of this Plan and his comments were incorporated or otherwise resolved.

2.6.1 Ongoing consultation

CAPL will continue to provide updates regarding Gorgon Operations (as required) at regular informal interface meetings with these stakeholders.

DCCEEW and DWER continue to receive annual updates on Gorgon status and environmental performance via existing regulatory defined avenues such as annual performance reporting, annual compliance reporting and incident notifications.

For other interested stakeholders, annual performance reports and annual compliance reports are publicly available on the CAPL website (https://www.chevronaustralia.com/our-businesses/gorgon/environmental-approvals). In accordance with Condition 35 of MS800, Condition 20 of MS769 and Condition 22 of EPBC Reference: 2003/1294 and 2008/4178 the approved TSEPP will be made publicly available on the CAPL website.

A Memorandum of Understanding has been established between DBCA and CAPL formalising communication arrangements, ensuring DBCA are kept informed of Gorgon related activities.

3 Relevant facilities and activities

This Plan sets out management of potential environmental impacts to the terrestrial and subterranean environment from construction and operational activities associated with the terrestrial facilities falling under MS 800, MS 769, and EPBC Reference: 2003/1294 and 2008/4178 environmental approvals.

3.1 Terrestrial disturbance footprint

In accordance with Condition 6.4 of MS 800 and MS 769 and Condition 5.4 of EPBC Reference: 2003/1294 and 2008/4178, the TDF is defined in the section 6 of the Terrestrial and Subterranean Baseline State and Environment Impact Report (Ref. 13) (TSBEIR), as amended from time to time. The TDF includes the Gorgon Gas Development and Jansz Feed Gas Pipeline Footprints and a zone beyond them that contains the area that may be disturbed by construction or operations activities associated with the Terrestrial Facilities. The TSBEIR is the source document for the TDF and provides the methodology for delineating the TDF and the resulting dimensions. Given the TSBEIR needs to remain the primary information source for the TDF, details are not duplicated in this Plan. To provide context for this Plan, Figure 3-1 and Figure 3-2 are included. These figures are indicative only of the TDF. In the case of any inconsistencies between the TSEPP and TSBEIR, the TSBEIR takes precedence.

The stated objectives of this TSEPP are as per Condition 7.4 of MS 800, CAPL will aim to reduce adverse impacts from the construction and operation of the Terrestrial Facilities as far as practicable. As required under Condition 7.4 of MS 769, CAPL will also aim to reduce Material and Serious Environmental Harm from the construction and operation of the Terrestrial Facilities as far as practicable inside the TDF (excluding the Gorgon Gas Development Footprint), noting that CAPL shall not cause or allow Material or Serious Environmental Harm outside the TDF (in accordance with Condition 6.6 of MS 800).

Given the above objectives of this Plan, the Section 5 Environmental Risk Assessment, Environmental Performance Objectives, Management Measures, Environmental Performance Standards and Environmental Performance Measurement Criteria are specific to reducing impacts within the TDF and ensuring there is no Material or Serious Environmental Harm outside of the TDF.

3.2 Terrestrial facilities

This Plan applies to the Terrestrial Facilities of the Gorgon Gas Development and the Terrestrial Facilities of the Jansz Feed Gas Pipeline, which are shown in Figure 3-3Figure 3-3. Figure 3-4 provides an overview of the location of the GTP in the context of the broader landforms of BWI. The Gorgon Gas Development Terrestrial Facilities are defined in Condition 6.3 of MS 800 and Condition 5.2 of EPBC Reference: 2003/1294 and 2008/4178 as the:

- GTP
- Carbon Dioxide Injection system
- Associated Terrestrial Infrastructure forming part of the proposal
- Areas impacted for seismic data acquisition
- Onshore Feed Gas Pipeline System and terrestrial component of the shore crossing.

Terrestrial Facilities also include those defined in Condition 6.3 of MS 769 (the Onshore Feed Gas Pipeline System and terrestrial component of the Shore Crossing) and those defined in Schedule 1 of MS 965 (the Additional Support Area) (Ref. 8).

The Domestic Gas Pipeline extends from the end of the Barrow Island jetty (specifically the tie-in weld at the top of the jetty riser) to the mainland. The mainland shore-crossing is approximately 90 km north-east of Onslow and 120 km south-east of Karratha. The pipeline then extends from the low water mark approximately 30 km to an onshore meter station and another 2 km until it ties in to the Dampier to Bunbury Natural Gas Pipeline. Noting the pipeline does not extend across Barrow Island and that it is not a Terrestrial Facility defined under Condition 6.3 of MS 800 and MS 769 and Condition 5.2 of EPBC Reference: 2003/1294 and 2008/4178, it is out of scope of this Plan.

3.2.1 Gas Treatment Plant

The GTP is located near Town Point, on the east coast of Barrow Island. The GTP and related infrastructure includes, but is not limited to:

- LNG trains: 3 × 5 MTPA (nominal)
- Gas Processing Drivers: 6 × 80 MW (nominal) gas turbines fitted with dry low NOx (DLN) burners
- Power Generation: 5 × 116 MW (nominal) conventional gas turbines fitted with DLN burners
- Flares: Ground flare for the main plant flare; boil-off gas elevated flare in storage and loading area
- LNG Tanks: 2 × 180 000 m3 (nominal)
- Condensate Tanks: 4 × 35 000 m3 (nominal).
- Dangerous Goods Storage Yards and Mercury Management Facilities.

The GTP produces three main products for export from Barrow Island:

- LNG for international export
- domestic gas for use on the Australian mainland
- hydrocarbon condensate (light oil).

Typical GTP processes are described in Chapter 6 of the Draft EIS/ERMP (Ref. 11). Figure 3-5 and Figure 3-6Figure 3-6 provide an overview of the layout of key infrastructure on the GTP.

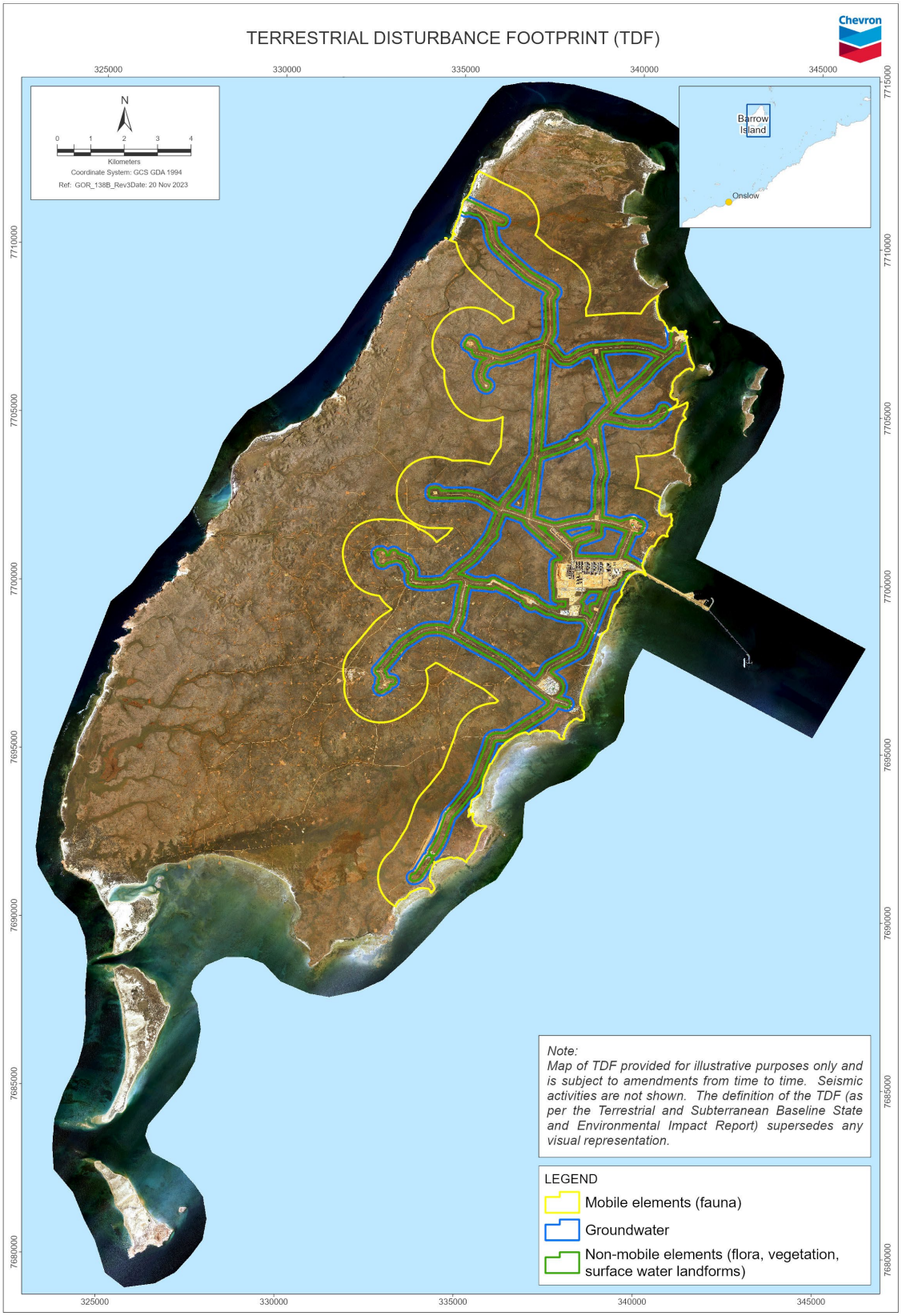

Figure 3-1: Gorgon Indicative TDF

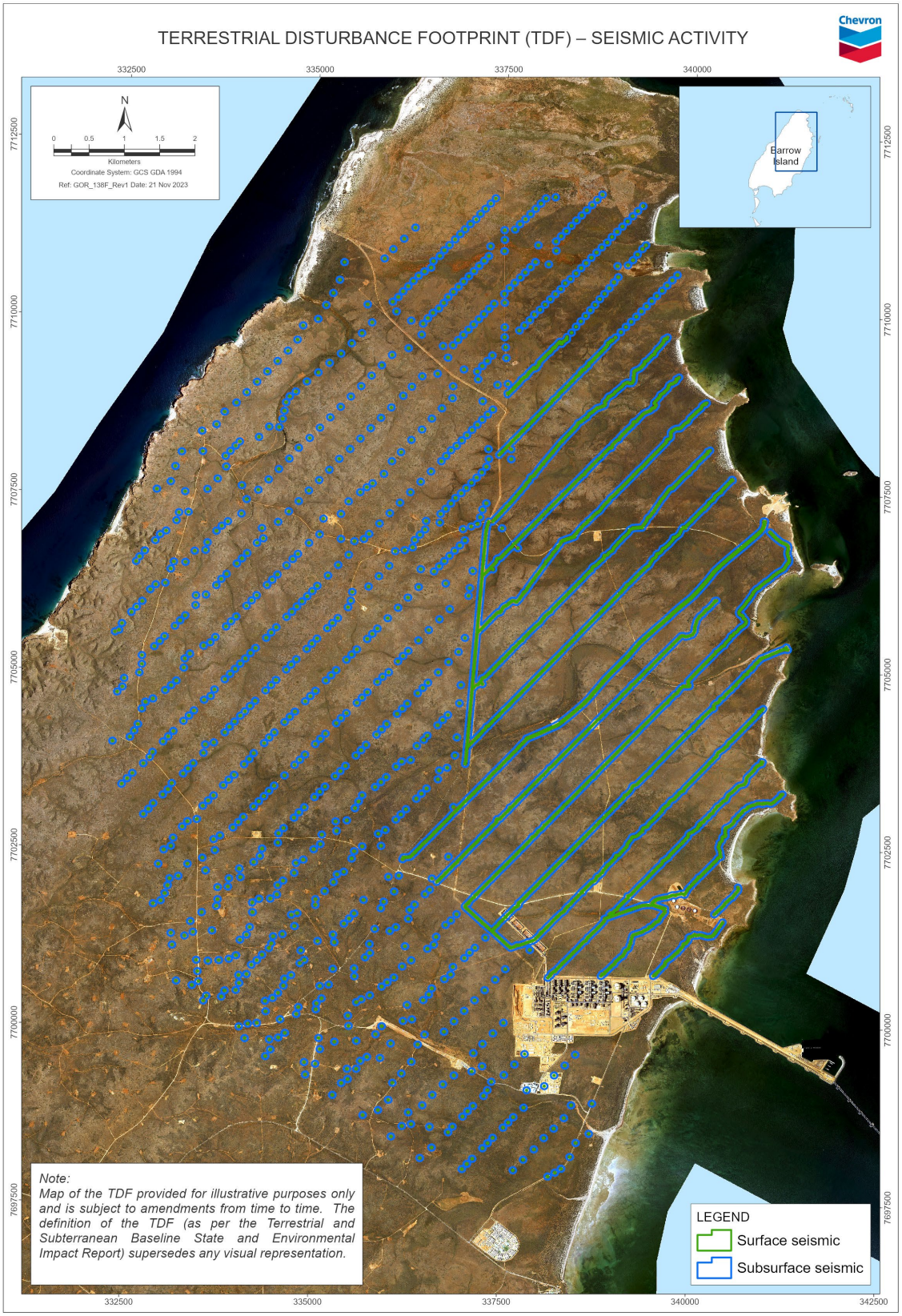

Figure 3-2: Gorgon Indicative TDF – Seismic Activity

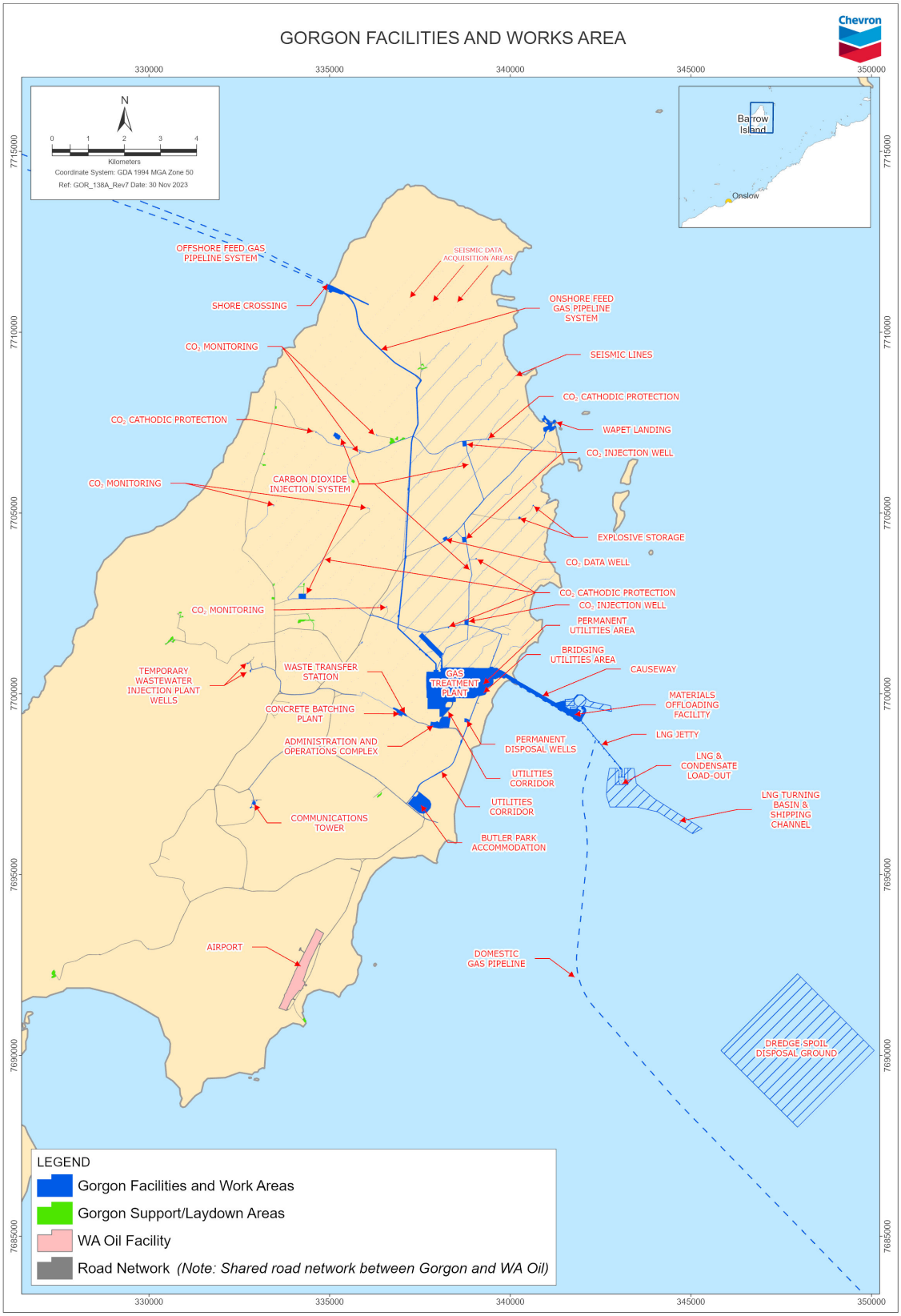

Figure 3-3: Gorgon Gas Development facilities on Barrow Island

Figure 3-4: Barrow Island Landforms

Figure 3-5: Gorgon GTP Layout – Aerial View

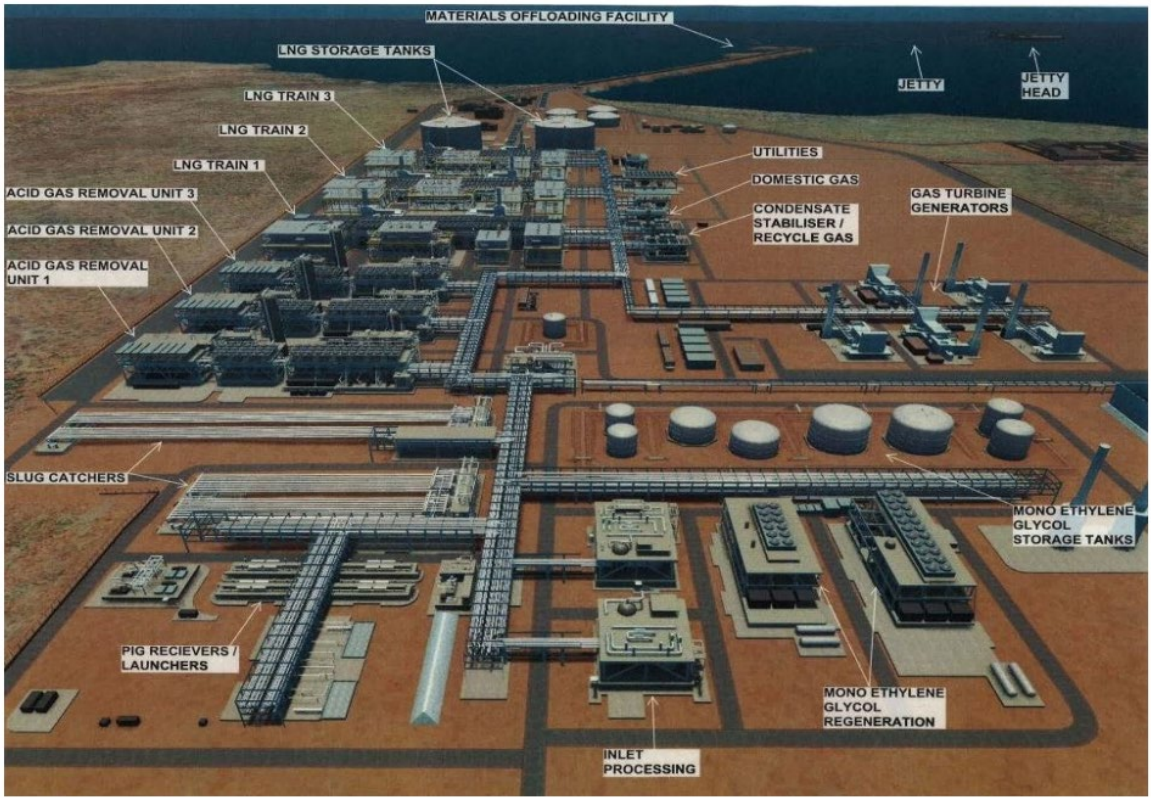

Figure 3-6: Gorgon GTP Layout – Overview of Key Infrastructure

3.2.2 Carbon Dioxide Injection System

Reservoir CO_2 is disposed of by injection into the Dupuy Formation more than 2000 m below Barrow Island. The CO_2 Injection System includes mechanical components for injection of reservoir CO_2 and managing the performance integrity of the injection facilities and the Dupuy Formation. These include, but are not limited to:

- CO_2 compression facilities located within the GTP boundary
- Below ground CO_2 pipeline between the GTP and the CO_2 injection drill centres
- CO_2 injection wells directionally drilled from the CO_2 injection drill centres
- Observation wells for monitoring the subsurface spread of the CO_2 plume
- Pressure management water production wells and associated facilities, required to manage pressure in the Dupuy Formation
- Pressure management water injection wells and associated facilities for the reinjection of produced water into the Barrow Group
- Shallow drilled anode wells are required for all well types associated with the CO_2 injection system for the purposes of cathodic protection.

Monitoring activities, including the acquisition of seismic data will be undertaken as part of ongoing reservoir performance management.

3.2.3 Associated terrestrial infrastructure

The Gorgon Gas Development associated terrestrial infrastructure (Figure 3-3) includes, but is not limited to:

- Terrestrial component of the Barge (WAPET) Landing
- Butler Park (Accommodation Village)
- Administration and Operations Complex
- Bridging and Permanent Utilities Area located within the GTP
- Onshore water supply infrastructure, consisting of seawater demineralisation (reverse osmosis) plants and associated treated water and brine storage tanks
- Downhole disposal wells (Permanent Wastewater Disposal (PWD) wells and Temporary Wastewater Injection Plant (TWIP) disposal wells)
- WTS for the handling and storage of waste, prior to offsite disposal.
- Concrete batching plant
- Utilities Corridors between the GTP, Butler Park and Administration and Operations Complex
- Communications, including a microwave communications tower

Airport modifications, as described in Schedule 1 of MS 800, had not been undertaken at the time of publishing this Plan.

3.2.4 Onshore Feed Gas Pipeline System and terrestrial component of the shore crossing

The Onshore Feed Gas Pipeline System, terrestrial component of the shore crossing and related infrastructure includes, but is not limited to:

- Onshore Feed Gas Pipeline System located within a right-of-way ~14 km long from the west coast at North Whites Beach to the GTP.
- Terrestrial component of the Shore Crossing consisting of infrastructure for Horizontally Directionally Drilled (HDD) holes from the shore to an exit point ~500 m offshore, and installation of pipelines and umbilicals into these holes.

3.3 Nature of current and future activities

MS 800 and MS 769 and EPBC Reference: 2003/1294 and 2008/4178 define the end of construction and commencement of operations as the date on which the Gorgon Joint Venture participants issue a notice of acceptance of work under the Engineering, Procurement and Construction Management contract. Accordingly, the Gorgon Gas Development transitioned from Construction Phase to Operations Phase in 2016.

Whilst in Operations Phase, various types of activities will continue to occur, including, but not limited to:

- Ongoing operation of terrestrial facilities
- Major maintenance / turnaround (TAR) activities
- Construction and infrastructure projects, ranging from minor technical projects through to major capital projects (MCP)

- Rehabilitation of areas that are not required for the future construction and operation of the Proposal

The potential interactions, or environmental aspects, associated with the above activities that interact with the environment of Barrow Island and could pose adverse impacts (including impacts to Matters of National Environmental Significance (MNES)) include:

- Clearing and earthworks
- Surface water
- Hazardous materials
- Physical presence and interaction
- Atmospheric emissions
- Artificial lighting
- Noise and vibration
- Unplanned subsurface CO_2 migration
- Fire
- Solid and liquid waste disposal
- Quarantine

As outlined in Section 2.4.4 the conditions set out in MS 800 and MS 769 and EPBC Reference: 2003/1294 and 2008/4178 require a number of specific subject matter plans which deal with a specific aspect. As such, the environmental aspects of fire, solid and liquid waste disposal and quarantine are not dealt with in this Plan.

3.4 Contaminated sites background

3.4.1.1 Overview

The Gorgon GTP site (and an associated buffer around the site) has been reported to DWER, under the *Contaminated Sites Act 2003* (CS Act), as a potentially contaminated site resulting from contaminants of concern (including Per- and polyfluoroalkyl substances (PFAS)) in soil, surface water drainage and groundwater above background concentrations.

At this stage, specific areas of the Gorgon GTP have been assessed for PFAS (and other sources of potential contaminants), and include soil, drainage and groundwater to the north-east of the GTP (within the vicinity of the Part V licensed discharge point) and areas of soil investigation throughout the GTP. In addition, areas of the Gorgon Gas Development land footprint across Barrow Island have undergone some early assessment to support soil reuse activities. Preliminary Conceptual Site Models (PCSMs) and subsequent contamination risk assessment indicate that the levels of PFAS present do not represent an unacceptable risk to human health, the environment or environmental values based on the current and proposed land use (Ref. 46). As part of the review undertaken by the Contaminated Sites Auditor, it was also noted that although further assessment is required to support this conclusion, specifically in relation to indirect exposure and bioaccumulation, the Auditor has supported the designation of risk (Ref. 46).

CAPL has actively been managing the risks associated with PFAS for many years, in line with the growing concerns over the potential health and environmental impacts of PFAS in the broader industry and community. Efforts have focussed on removing potential sources of PFAS by changing out firefighting foams to less harmful and fluorine free options, as suitable replacements have become available. Methods to decontaminate existing foam systems and fire trucks have also been trialled.

Whilst further work is required to comprehensively map potential sources of historical PFAS contamination across the Gorgon Gas Development, the key areas currently determined are:

- Areas impacted by historical testing or application of foam from firefighting foam skids. The Gorgon GTP has five firefighting foam skids which previously contained firefighting foam impacted by PFAS. Figure 3-3 below shows the location of the foam skids and associated monitors on the GTP.
- In December 2021 low levels of PFAS were detected in the soil stockpile on the GTP (refer Figure 3-5). A soil stockpile has existed on the Gorgon GTP footprint since the early stages of construction and has been the main area for storing material reclaimed from Gorgon civil activities across BWI which was then blended, graded and reused. In 2016, the stockpile was relocated from its original location in the northwest of the GTP to its current location on the western boundary of the plant. The current surveyed volume of the stockpile is approximately 242,713m^3. Given the historical movement of soil across the Gorgon Gas Development tenure for construction and operational requirements, CAPL is currently applying a conservative assumption that all previously disturbed soils for the Gorgon Gas Development may have been impacted by PFAS and is the subject of ongoing investigation to support reuse activities.

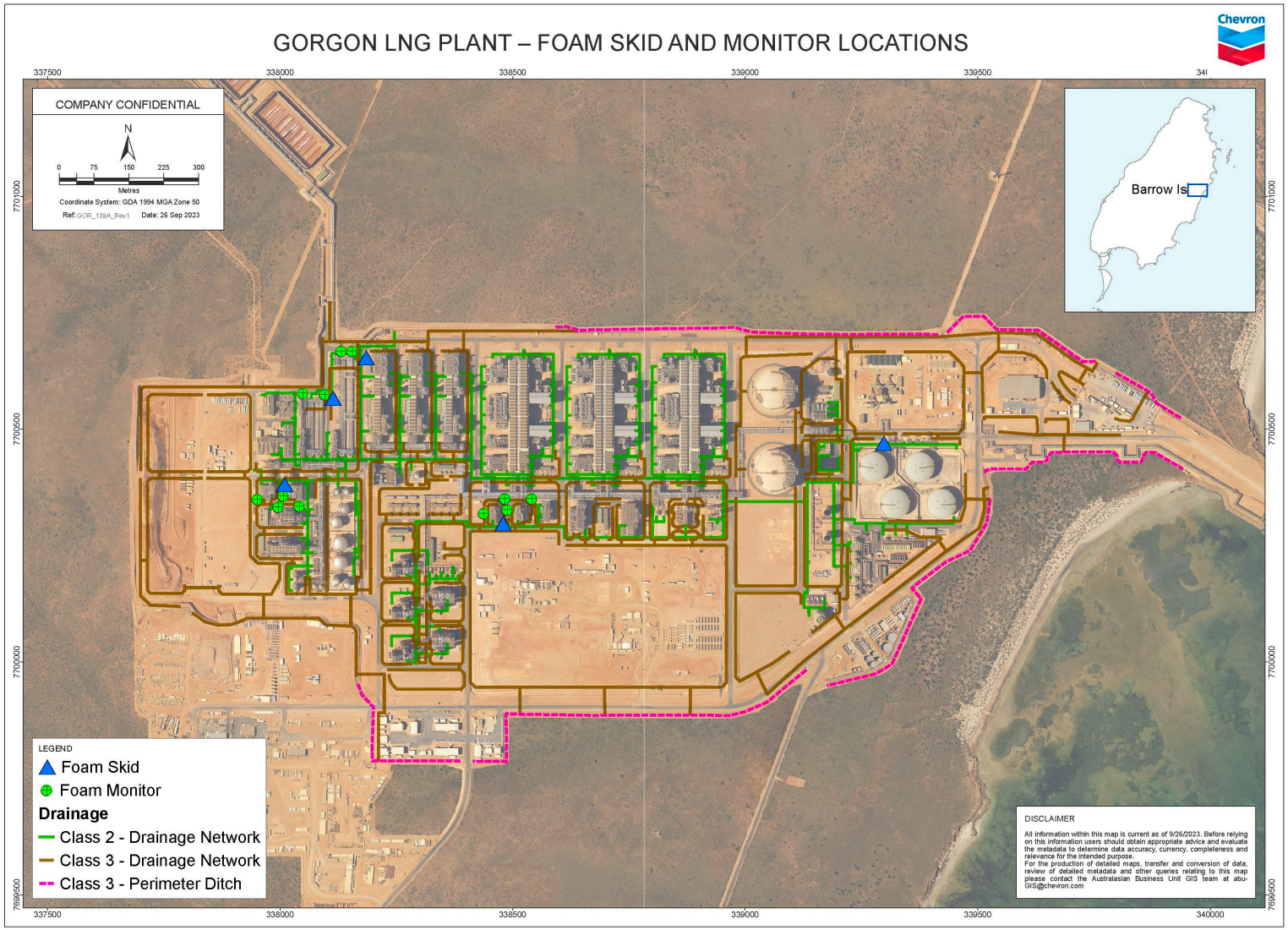

Figure 3-7: Location of firefighting foam skids on the GTP

3.4.1.2 Contaminated Sites Management Process

CAPL assesses and manages contaminated sites within the existing legislative framework of the CS Act, Contaminated Sites Regulations 2006, DWER Contaminated Sites Guidelines, the national site assessment framework provided in the National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM) as amended in May 2013 and the PFAS National Environmental Management Plan (NEMP) Version 2.0 (Ref. 45).

In the context of this Plan the Contaminated Sites Management Process constitutes a management measure that may be triggered as a result of impacts associated with contamination from the following aspects:

- Clearing and earthworks
- Surface water
- Hazardous materials

Details on the process and associated Environmental Performance Objectives, Management Measures, Environmental Performance Standards and Environmental Performance Measurement Criteria are provided in the clearing and earthworks section (Section 5.2) and are not repeated in other specific environmental aspect sections.

4 Environmental risk assessment methodology

The risk assessment for this Plan was undertaken in accordance with the *ABU Operational Excellence (OE) Risk Management Process* (Ref. 27) using Chevron Corporation's Integrated Risk Prioritization Matrix (Appendix B). This approach generally aligns with the processes outlined in ISO 31000:2018 Risk Management – Principles and Guidelines (Ref. 44) and Handbook 203:2012 *Managing Environment-related Risk* (Ref. 62).

Numerous risk assessments have been undertaken for the scope of the TSEPP, from initial environmental assessment and approval stage through to current operations. The risk assessment was revised and revalidated during the current revision of this Plan, considering the nature of current and future activities. The risk assessment process and evaluation involved numerous consultations and workshops with environmental, health, safety, project and engineering personnel.

Risks considered and covered in this Plan were identified and informed by:

- experience gained during previous stages of the Project
- mapping and monitoring studies undertaken for the Project
- review of historical significant environmental incidents
- expertise and experience of CAPL personnel
- stakeholder engagement (Section 2.6).

RISK: The *ABU OE Risk Management Process* (Ref. 27) defines risk as a measure of human injury or illness, environmental damage, or business impact in terms of both the likelihood and the magnitude of the injury, damage, or impact. A simplified version of this relationship expresses risk as the product of the likelihood and the consequences.

4.1 Identification of relevant environmental aspects

ASPECT: CAPL defines environmental aspects as the elements of Chevron's activities that interact with the environment. These interactions may result in direct or indirect environmental, community health, and/or social impacts.

These potential interactions, or environmental aspects, were categorised for use in the risk assessment for this Plan:

- Surface water
- Clearing and earthworks
- Atmospheric emissions
- Artificial lighting
- Noise and vibration
- Physical Presence / interaction
- Hazardous materials
- Unplanned subsurface CO_2 migration

These potential interactions, or environmental aspects, have not been included within the Plan, noting that they are the subject of specific subject matter plans which deal with the specific aspect:

- Fire
- Liquid and solid waste disposal
- Quarantine

The term “environmental aspect” is considered analogous to the term “threat” which is referenced in the DCCEEW Environmental Management Plan Guidelines (Ref 60).

4.2 Identification of relevant environmental hazards

HAZARD: The *ABU OE Risk Management Process* (Ref. 27) defines a hazard as a chemical, biological or physical condition with the potential for causing harm to people, environment or property.

The aspects identified were used in the scoping process to determine environmental hazards associated with the construction and operation of the terrestrial facilities that had the potential to cause environmental damage. The results of this assessment are included in Table 5-1. This information was then used to undertake the environmental risk assessment.

4.3 Evaluation of consequence and risk

4.3.1 Consequence

CONSEQUENCE: The *ABU OE Risk Management Process* (Ref. 27) defines consequence as the possible effect of an event, accident scenario, or ongoing condition in terms of human impact, environmental impact, or economic impact to the company or stakeholders.

After identifying the potential hazards, the potential consequences were assessed and evaluated. Consequence is defined using Chevron Corporation’s Integrated Risk Prioritization Matrix (Appendix B) and is assessed and evaluated without any management measures in place. Consequences are also analysed independently of the event’s likelihood of occurrence. The level of consequence is determined by the potential level of impact based on:

- the spatial scale or extent of potential hazards of the environmental aspect within the receiving environment
- the nature of the receiving environment (within the spatial extent), including proximity to sensitive receptors, relative importance, and sensitivity or resilience to change
- the impact mechanisms (cause and effect) of the environmental hazard within the receiving environment (e.g. persistence, toxicity, mobility, bioaccumulation potential)
- the duration and frequency of potential effects and time for recovery
- the potential degree of change relative to the existing environment or to criteria of acceptability.

The consequence definitions are summarised in the Integrated Risk Prioritization Matrix (Appendix B).

The term “consequence” is considered analogous to the term “impact” which is referenced in the DCCEEW Environmental Management Plan Guidelines (Ref 60).

4.3.2 Quantification of the level of risk

The Integrated Risk Prioritization Matrix (Appendix B) was then applied to quantify the level of risk. This matrix uses consequence and likelihood rankings of 1 to 6, which when combined, result in a risk level between 1 (highest risk) and 10 (lowest risk). Risk assessment outcomes are based solely on risk assessment to the environment. Risk to company reputation, regulatory compliance, stakeholder expectations, or community relationships were considered but not risk assessed. The level of risk is based on the worse-case credible risk across each environmental factor/environmental aspect combination.

4.3.3 Management measures and likelihood

Following quantification of the level of risk, management measures were then identified for each hazard. Measures to reduce adverse impacts associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline were initially defined in the Draft EIS/ERMP (Ref. 11) and have been developed over time through secondary approvals processes, additional risk assessments and experience gained through both the construction and operations phases of the Development. The measures outlined in Section 5 meet the objectives set out in Condition 7.4 of MS 800 and MS 769, and Condition 6.4 of EPBC Reference: 2003/1294 and 2008/4178, and address the matters set out in Conditions 7.5 and 7.6 of MS 800 and MS 769, and Conditions 6.5 and 6.6 of EPBC Reference: 2003/1294 and 2008/4178. The measures include the measures required in respect of the MNES) listed in the TSBSEIR (Ref. 13), as required by EPBC Reference: 2003/1294 and 2008/4178.

Management measures are either described or referenced to the relevant documentation; aspects that are assessed and managed via other approved management documents (Sections 2.4.4 and 2.4.5) are not duplicated in the assessment.

The term “management measure” is considered analogous to the terms “mitigation actions”, “management actions”, “management activities” and “controls” which are referenced in the DCCEEW Environmental Management Plan Guidelines (Ref. 60). These terms are also considered analogous to the term ‘safeguard’ which is the term used in Chevron’s *ABU OE Risk Management Process* (Ref. 27).

The likelihood (probability) of a defined consequence occurring was then determined, taking into account confirmed management measures in place. The likelihood of a particular consequence occurring was identified using one of the six likelihood categories shown in Integrated Risk Prioritization Matrix (Appendix B).

4.3.4 Residual Risk

Once the consequence and likelihood were determined, the Residual Risk score (on a scale of 1 to 10; where 1 is the highest and 10 the lowest) was identified using the Integrated Risk Prioritization Matrix. These scores were then assigned as either a High, Medium or Low, based on the following groupings:

- High - 1 to 4
- Medium - 5 to 6
- Low - 7 to 10

This grouping provides a clear indication as to the remaining residual risk from the different environmental aspects.

4.4 Environmental performance objectives, management measures, performance standards, and environmental performance measurement criteria

Environmental performance objectives, management measures, environmental performance standards, and environmental performance measurement criteria were defined to address the potential environmental impacts and risks identified during the risk assessment.

CAPL is committed to conducting activities in an environmentally responsible manner and aims to implement best practice environmental management as part of a program of continual improvement to reduce potential impacts and risks to As Low As Reasonably Practicable (ALARP). CAPL defines environmental performance objectives, management measures, environmental performance standards, and environmental performance measurement criteria that relate to managing the identified environmental risks as:

- Environmental Performance Objectives (EPOs): the level of performance in managing the potential environmental impacts and environmental risks. As defined by Conditions 7.4(i) and 7.4(ii) of MS 800 and MS 769 and Conditions 6.4(I) and 6.4(II) of EPBC Reference: 2003/1294 and 2008/4178, the objectives of this TSEPP are to reduce the adverse impacts from the construction and operation of the terrestrial facilities (within the Terrestrial Disturbance Footprint) as far as practicable; and to ensure that construction and operation of the terrestrial facilities does not cause Material or Serious Environmental Harm outside and below the Terrestrial Disturbance Footprint. EPOs defined within this Plan are aligned with these objectives.
- Management measures: are identified measures/actions/procedures to be implemented to meet environmental performance objectives. Management measures are analogous to management actions as defined in the DWER guidance on preparing EP Act Part IV Environmental Management Plans (Ref. 59). Management measures are also analogous to the following terms used in the DCCEEW Environmental Management Plan Guidelines (Ref. 60); mitigation actions, management actions, management activities, control measures, and management measures. In addition, the identification of management measures addresses the requirements of Conditions 7.5(i), 7.5(ii) and 7.6(i-iv) of MS 800 and MS 769 and Conditions 6.5(I), 6.5(II) and 6.6(I-IV) of EPBC Reference: 2003/1294 and 2008/4178.
- Environmental Performance Standards: defined in accordance with Schedule 2 of MS 800, MS 769 and EPBC Reference: 2003/1294 and 2008/4178 are ‘matters which are developed for assessing performance, not compliance, and are quantitative targets or where that is demonstrated to be not practicable, qualitative targets, against which progress towards achievement of the objectives of conditions can be measured’. The environmental performance standards have been developed specifically for assessing performance, not compliance. Failure to meet the standards does not represent failure to implement this Plan; rather, it indicates that a performance objective may not have been met and management action or a review of the environmental performance objectives and standards may be needed. Performance Standards are analogous to the term ‘management targets’ as defined in the DWER guidance on preparing EP Act Part IV Environmental Management Plans (Ref. 59) and ‘performance targets’ referenced in the DCCEEW Environmental Management Plan Guidelines (Ref. 60). In addition, the identification of performance standards addresses the

requirements of Condition 7.6(v) of MS 800 and MS 769 and Condition 6.6(V) of EPBC Reference: 2003/1294 and 2008/4178.

- Environmental Performance Measurement Criteria: the proposed processes for measurement of performance to ensure that environmental management measures are meeting environmental performance standards, including testing, monitoring, data analysis, inspections, audits, and/or other means of verification. If no practicable quantitative target exists, a qualitative criterion is set. If alternative compliance and assurance records are identified that better demonstrate that Environmental Performance Standards have been achieved, measurement criteria may be altered over the duration of this Plan to ensure the best records are used to demonstrate compliance. Measurement Criteria are analogous to the term 'monitoring of progress towards management targets' as referenced in the DWER guidance on preparing EP Act Part IV Environmental Management Plans (Ref. 59) and 'monitoring activities' referenced in the DCCEEW Environmental Management Plan Guidelines (Ref. 60).

4.5 Risk to Matters of National Environmental Significance

Condition 3.2.1 of EPBC Reference: 2003/1294 and 2008/4178 requires a description of the EPBC Act listed species likely to be impacted by the components of the action that is the subject of this Plan. That description is provided in the Identification of Terrestrial and Subterranean MNES and their Habitat, as amended from time to time (Ref. 28; Appendix A).

A detailed definition and description of the significant ecological elements on Barrow Island, which include relevant MNES, is contained in the TSBSEIR (Ref. 13) and the Draft EIS/ERMP (Ref. 11).

Condition 3.2.2 of EPBC Reference: 2003/1294 and 2008/4178 requires an assessment of the risk to EPBC Act listed species from the components of the action. The risks identified through Section 5 include the risks to the listed species in Ref. 28; Appendix A.

Terrestrial and subterranean EPBC Act listed species identified on Barrow Island include:

- 19 listed threatened species (10 birds, 7 mammals, 1 reptile and 1 fish) that are MNES.
- 26 migratory bird species (marine, terrestrial or wetland) that are MNES, of which some are also listed under the threatened species category.
- three listed sea bird species that are classified as Other Matters Protected by the EPBC Act (the White-bellied Sea Eagle, Silver Gull and Lesser Crested Tern).

Of the species identified as being present on Barrow Island, the following species were identified as being potentially impacted by from the construction and operation of the terrestrial facilities:

- Sea birds – Wedge tailed shearwater, Bridled tern
- Land birds – White-winged fairy wren
- Raptors – Spotted harrier, Brahminy kite, Osprey, White-bellied sea eagle, Australian kestrel

- Mammals – Burrowing bettong/ Boodie, Golden bandicoot, Spectacled hare-wallaby, Barrow Island euro
- Fish – Barrow cave gudgeon, Blind eel

In addition to EPBC Act listed species, other matters of MNES identified include the following habitats:

- Boodie warrens
- Raptor nests
- Termite mounds

Table 4-1 summarises the environmental aspects identified as potentially interacting with various MNES and the associated level of residual risk.

Table 4-1: Environmental aspects and associated level of residual risk for each MNES identified as potentially impacted

MNES	Environmental Aspect	Associated Level of Residual Risk
Sea Birds: Wedge-tailed shearwater Bridled tern	Artificial lighting Physical presence and interaction Quarantine	Low
Land birds: White-winged fairy wren	Physical presence and interaction Clearing and earthworks Noise and vibration Fire Hazardous materials Atmospheric emissions Quarantine	Low
Raptors (including raptor nest habitat): Spotted harrier Brahminy kite Osprey White-bellied sea eagle Australian kestrel	Physical presence and interaction Clearing and earthworks Fire Quarantine	Low
Mammals: Burrowing bettong/ Boodie (including Boodie warren habitat) Golden bandicoot Spectacled hare-wallaby Barrow Island euro	Physical presence and interaction	Medium
	Fire Surface water Hazardous materials Atmospheric emissions Clearing and earthworks Quarantine	Low
Fish: Barrow cave gudgeon Blind eel	Surface water Hazardous materials Clearing and earthworks Noise and vibration Unplanned subsurface CO_2 migration to the near surface/ surface environment	Low

MNES	Environmental Aspect	Associated Level of Residual Risk
Termite Mound Habitat	Clearing and earthworks	Low

5 Environmental risk assessment and management strategy

5.1 Overview

This Section evaluates the impacts and risks associated with the construction and operation of the terrestrial facilities, and details the environmental performance objectives, standards, and measurement criteria that are used to manage the identified risks and reduce them to an acceptable level.

As outlined in Section 4, a scoping exercise of the environmental aspects associated with the construction and operation of the Terrestrial Facilities was undertaken to identify the environmental aspects with the potential to cause environmental damage to particular environmental values and sensitivities. The aspects and associated at risk environmental values and sensitivities identified by the scoping exercise for use in the risk assessment are included as Table 5-1. The scoping exercise and subsequent risk assessment were revised during the revision of this Plan, as such they reflect the nature of current and future activities.

Table 5-1: Environmental aspect/ environmental value scoping matrix

Environmental Aspect	At Risk Environmental Values and Sensitivities (Environmental Factor)						Separate Plan	Section
	Soil and Landform	Surface & Groundwater	Flora & Vegetation	Terrestrial Fauna	Subterranean Fauna	Air Quality		
Clearing & Earthworks	✓	✓	✓	✓	✓	✓		5.2
Surface Water	✓	✓	✓	✓	✓			5.35.2
Hazardous Materials	✓	✓	✓	✓	✓			5.4
Physical Presence & Interaction			✓	✓				5.5
Atmospheric Emissions			✓	✓		✓	AQMP	5.6
Artificial Lighting				✓			LTMTMP HDDMMP	5.7
Noise & Vibration				✓	✓		LTMTMP HDDMMP	5.8
Unplanned Subsurface CO_2 Migration			✓		✓		CDMP	5.9
Fire	✓	✓	✓	✓		✓	FMP	5.10
Solid & Liquid Waste Disposal	✓	✓	✓	✓	✓	✓	SLWMP	5.11
Quarantine			✓	✓			QMS	5.12

5.2 Environmental Aspect: Clearing and earthworks

5.2.1 Description of Activities

The construction and operation of Terrestrial Facilities will interact with the environment through ground disturbance activities; resulting in the environmental aspect of clearing and earthworks. Ground disturbance activities are routinely required for the ongoing operation of the Project. Activities resulting in the clearing and earthworks aspect include, but are not limited to:

- removing regrowth from previously cleared areas that are intended to be maintained clear
- clearing vegetation associated with construction and infrastructure projects
- maintaining and repairing critical below-ground services and infrastructure
- earthworks, including excavating and trenching, for the installation and maintenance of project infrastructure associated with minor civil works, routine operations and construction and infrastructure projects
- earthworks to control erosion and sedimentation, and the diversion of natural drainage channels (see Section 5.3 Surface Water)
- excavating for installation of foundation plinths and other concrete support structures
- excavating to inspect, maintain and repair pipelines
- earthworks and excavating for rehabilitation, remediation and seismic activities
- grading, excavating and maintaining roads and cleared areas
- trenching to inspect, repair, install and/or maintain pipelines or utilities
- moving soil in support of all the above activities.

5.2.2 Potential Impact/ Consequence Summary

Clearing and earthworks have the potential to:

- alter landform and/or soil profile
- remove vegetation and habitat
- cause erosion/sedimentation in areas adjacent to disturbed areas
- cause disturbance to natural drainage patterns
- disturb cultural heritage sites
- spread potential soil contamination, causing further soil, surface water and groundwater contamination and potentially impacting receptors including vegetation, fauna, troglofauna and stygofauna
- cause injury or mortality to fauna through entrapment in excavations or physical interaction between machinery and fauna
- proliferate weeds leading to changes in vegetation and ecological community structure, composition, and diversity
- result in dust generation, potentially causing localised reduction in air quality.

5.2.3 Residual Risk and Key Management Measures

5.2.3.1 Ground and Vegetation Disturbance

The clearing and earthworks required to construct and operate the Gorgon Gas Development have been assessed and approved under the EP Act and the EPBC Act, and include disturbance of up to 332 ha of uncleared land on Barrow Island as provided by the BI Act. Under section 9 of the BI Act, no more than 332 ha in total of uncleared land on Barrow Island can be the subject of a lease, licence or easement for gas processing purposes.

CAPL has an internal Ground and Vegetation Disturbance (GVD) permit system that addresses vegetation clearing for the Gorgon Gas Development, which it requires its employees and contractors to comply with. The GVD permit system ensures the appropriate measures are identified and understood before any ground disturbance and vegetation clearing takes place. The GVD process involves a series of checks to ensure ground disturbance work is only undertaken in authorised areas and all mitigation measures are in place to reduce impacts of the clearing activities. Steps include:

- survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings
- check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats
- definition of site-specific clearing methodology (e.g. depth of topsoil to be stripped, area for topsoil storage, anticipated clearing commencement date, topsoil segregation)
- determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys
- issue of permit that includes conditions for managing site-specific risks
- implementation of controls as per permit conditions
- closing out the permit.

Controls implemented to manage potential impacts of clearing activities are included in other plans approved under the Ministerial Conditions, including:

- fauna-related management actions (in the Fauna Handling Common User Procedure [Ref. 24])
- weed- and soil-related management actions (in the Post Construction Rehabilitation Plan [Ref. 18])
- weed hygiene controls and surveillance (in the Terrestrial and Marine QMS [Ref. 37])
- cultural heritage controls (in the Aboriginal Cultural Heritage Management Plan [Ref. 39]).

Experience gained during previous stages of the Gorgon Project, including the Construction phase when the scale of clearing and earthworks activities was significant, indicates that fauna impacts due to clearing and earthworks activities occur at an individual level, with negligible potential to result in discernible population impacts. No impacts to the populations of monitored fauna, that are attributable to the Project, have been detected through the fauna monitoring programs conducted since Project commencement (Ref. 47; Ref. 57). As a result,

existing fauna related management measures for clearing and earthworks are considered appropriate. Ongoing monitoring, undertaken in accordance with the TSEMP, will continue to inform CAPL's understanding of risk to fauna populations on Barrow Island.

Implementation of terrestrial non-indigenous species (NIS) surveillance programs, and the audit and inspection schedule, undertaken as per the requirements of the approved Terrestrial and Marine QMS (Ref. 37), has not detected any establishment of new weed species or proliferation of existing weed species attributable to the Gorgon Gas Development to date (2009–2021). As such, the existing weed related management measures for clearing and earthworks are considered appropriate.

5.2.3.2 Contaminated Sites Management Process

Areas identified as a potentially contaminated site resulting from contaminants of concern (including PFAS) in soil, surface water drainage and groundwater above background concentrations are managed in accordance with the existing legislative framework for contaminated sites management, as outlined in Section 3.4.1.2.

5.2.3.2.1 Site assessment

Contaminated sites management is an iterative process which reflects the required stepwise assessment process, working to develop and improve the Conceptual Site Model (CSM) for the contamination process for the land area in question. The CSM is used to define risks to human health, the environment and environmental values, and identify uncertainties or critical data gaps that need to be addressed in subsequent stages of assessment.

An initial CSM is developed in the first stage of site assessment, which is known as a Preliminary Site Investigation (PSI), and is revised and improved through subsequent Detailed Site Investigation (DSI). A PSI can include a desktop study, site inspection and interviews with relevant personnel, to assess if a site and/or activity has the potential to cause contamination and warrants completion of further DSI activities. A PSI may also include limited sampling and analysis. The DSI will confirm and delineate potential or actual impacts through comprehensive soil, water and groundwater sampling. The sampling programs are systematically planned through the preparation of a Sampling and Analysis Quality Plan (SAQP) for each stage of work, in accordance with the DWER Contaminated Sites Guidelines.

Site assessment activities are completed using experienced third-party contaminated site practitioners. At all stages of contaminated sites management, consultation on sampling plans and review of reporting is completed with a DWER Accredited Contaminated Site Auditor. Information is communicated to the DWER's Contaminated Sites Branch through Mandatory Audit Reports (MAR) presented by the Auditor, at annual presentation updates by CAPL to the Branch and in response to any request for information by the Branch. Information is also provided to the DCCEEW, where relevant to MNES.

5.2.3.2.2 Remediation actions

If the site assessments identify unacceptable risk to human health, the environment and/or environmental values, remediation in the form of clean-up and/or site management will be undertaken to mitigate the risk in accordance with the requirements of the CS Act and the DWER Contaminated Sites Guidelines. In

addition, any required remediation related to PFAS contamination will be in accordance with the requirements of the PFAS NEMP Revision 2.0. The method of remediation is site specific, selected through evaluation in consultation with DWER's Contaminated Sites Branch, the Contaminated Site Auditor as well as the owners and occupiers of the site, to ensure that the remediation methodology can meet the remediation objectives and presents greater benefit to the environment than the adverse effect of performing it. Remediation options are evaluated through the preparation of a Remedial Action Plan (RAP). The RAP defines the specific objectives of the remediation needed, documents the evaluation of remediation options and specifies how the remediation will be carried out and validated.

If clean-up remedial activities are undertaken, the works are documented with site validation information in a Site Remediation and Validation (SRV) report. Long-term monitoring and assessment of residual contamination may then be conducted in accordance with an Auditor approved site-specific Site Management Plan (SMP) and may include the sampling and analysis of groundwater, water and/or soils. SMPs may be updated should contamination status of the site change. SRV reports and ongoing monitoring reports, completed to meet the requirements of the SMP, document that residual contaminant concentrations have been managed appropriately and that remediation objectives have been met. These reports are submitted to Contaminated Site Auditor and to the DWER Contaminated Site Branch and DCCEEW upon request.

A site will only progress in classification from site assessment and remediation phases when:

a) Site assessment activities conclude that there is no unacceptable risk to human health, the environment and environmental values.

b) Remediation activities have been completed to a point where contamination risks can be managed.

c) Options (a) and (b) are exhausted and there is no environmental benefit, or a risk attached to further remediation activities.

5.2.3.3 Soil Re-use

As noted in Section 3.3, given the historical movement of soil across the Gorgon Gas Development tenure for construction and operational requirements, CAPL is currently applying a conservative assumption that all previously disturbed soils for the Gorgon Gas Development may have been impacted by PFAS. Therefore, controls on earthworks and soil movement activities are applied across all previously disturbed areas. CAPL has an internal Soil Disturbance Procedure that applies to ground disturbance or earthworks activities that have the potential to disturb contaminated or, potentially contaminated, soils. The procedure manages the risk of spreading contaminated soil materials by controlling the movement of soil identified as potentially contaminated (including by PFAS) and has been developed in accordance with the requirements of the PFAS NEMP Version 2.0 (Ref. 45). The procedure stipulates:

- Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes
- Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use

- No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use
- Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used
- Maintaining records of soil movements, including the source of stockpiled materials; and
- Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators.

5.2.3.4 Erosion and sedimentation

Clearing, earthworks and the presence of cleared areas have the potential to result in elevated levels of suspended solids in run-off. Civil works will be planned, executed and inspected to ensure any sediment carryover is minimised. Where necessary, measures to manage sediment carryover will be implemented, depending on the nature of the area and the surface water likely to be received; these may include:

- using erosion barriers, flow diversion devices and sedimentation sumps. If installing sediment sumps is not feasible, sediment flowing off the construction site will be controlled using an alternative method (e.g. silt fencing, geotextile fabric)
- installing contour banks to intercept and disperse run-off on steep disturbed slopes
- planning and managing clearing earthworks to minimise land clearing requirements and limit the area of exposed topsoil to the minimum required for safely conducting activities.

Surface drainage associated with areas of rehabilitation also has the potential to result in elevated levels of suspended solids in run-off. Specific management measures for managing surface drainage from rehabilitation are described in the Post Construction Rehabilitation Plan (Ref. 18).

Monitoring of surface water landforms, undertaken in accordance with the TSEMP (Ref. 22), has not detected any adverse impact (attributable to the Gorgon Gas Development) to surface water landforms to date (Ref. 47). Experience gained during previous stages of the Gorgon Project, including the Construction phase when the scale of clearing and earthworks was significant, indicates that impacts due to erosion and sediment carryover are localised and short term and that existing management measures are appropriate.

5.2.3.5 Fauna

Excavation activities present additional risk to fauna (e.g. if an excavation is left open overnight, there is a potential for fauna to be attracted to the excavation for shelter and fauna entrapment, injury, or increased predation resulting in mortality could occur). Excavations are managed via the Permit to Work (PTW) system, which requires a risk assessment to identify risks associated with onshore excavation activities. Specific management measures required for managing risks to fauna from excavation, such as excavation inspections and fauna exclusion or fauna exit structures, are outlined in detail in the Fauna Handling Common User Procedure (Ref. 24).

Experience gained during previous stages of the Gorgon Project, including the Construction phase when the scale of excavation activities was significant, indicates that fauna impacts due to excavation activities occur at an individual level, with negligible potential to result in discernible population impacts. No impacts to the populations of monitored fauna, that are attributable to the Project, have been detected through the fauna monitoring programs conducted since Project commencement (Ref. 47; Ref. 57). As a result, existing fauna related management measures for excavations are considered appropriate. Ongoing monitoring, undertaken in accordance with the TSEMP, will continue to inform CAPL's understanding of risk to fauna populations on Barrow Island.

5.2.3.6 Dust

Clearing and earthworks activities also have the potential to generate dust. Dust was identified during the environmental impact assessment process as an aspect that may have an indirect impact on vegetation and was previously a monitoring program included within the TSEMP (Ref. 22). After 5 years of monitoring dust impact to vegetation on Barrow Island (2009–2014), it was concluded that there was no significant relationship between measures of plant stress and dust load scores (Ref. 56). Plant health consistently displayed a distinct decline during monitoring undertaken after prolonged dry periods, with marked improvements in health recorded during surveys following rainfall. The strong correlation between rainfall and plant health indicates that rainfall is most likely the main driver affecting the health of plants. The monitoring of dust impact to vegetation ceased in 2015, following consultation with DBCA and the WA Office of the Environmental Protection Authority (OEPA).

The consequence of localised reduction in air quality from dust generation related to clearing and earthworks activities is considered negligible and managed from an employee exposure / nuisance impact, rather than due to potential environmental risk.

5.2.4 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from clearing and earthworks is provided in Table 5-2.

Table 5-2: Risk assessment summary –clearing and earthworks

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Soil and Landform	Clearing and earthworks	• Changes in landform • Erosion, caused by wind, water • Sedimentation	Operations Construction/ Infrastructure Projects	• Clearing vegetation • Earthworks, excavation and trenching activities • Presence of cleared areas impacting surface drainage	Reduce the risk of erosion and sediment carryover within the TDF and prevent impacts from erosion and sediment carryover outside the TDF.	The Planning, execution and inspection of civil works shall include management measures to reduce soil erosion and sedimentation such as: • Civil works will include measures to minimise sediment carryover where risk of sediment carryover is identified, including erosion barriers, flow diversion devices, sedimentation sumps, silt fencing, geotextile fabric, contour banks. • Planning of clearing and earthworks will be managed to minimise land clearing requirements and limit the area of exposed topsoil to the minimum required for safe execution of activities.	3[2]	4	M
			Rehabilitation	• Rehabilitation activities	Reduce the risk of erosion and sediment carryover within the TDF and prevent impacts from erosion and sediment carryover outside the TDF.	As detailed in the Post Construction Rehabilitation Plan, rehabilitation design and monitoring shall include management measures to reduce soil erosion and sedimentation such as: • Rehabilitation design will include establishing surface profile with properties that exhibit similar infiltration and water-retention characteristics for the targeted vegetation outcome to analogue sites. • Rehabilitation design will include installing banks or other appropriate earthworks, if required, to direct and control surface water flow at a local scale discharging onto undisturbed stable ground where practicable. • Rehabilitation monitoring will include use of Landscape Functional Analysis or similar to measure water infiltration and retention.			
		• Soil contamination	Operations Construction/ Infrastructure Projects Rehabilitation	• Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks	Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the movement of contaminated soil within the TDF and prevent material or serious environmental harm outside the TDF.	Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning); • Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act. To reduce the risk of environmental impacts from the movement of contaminated soil, the Soil Disturbance Procedure shall be implemented, including:			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						• Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes; • Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use; • No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use; • Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used; • Maintaining records of soil movements, including the source of stockpiled materials; and • Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators.			
Surface and Groundwater	Clearing and earthworks	• Sedimentation of natural drainage systems • Disturbance to natural drainage patterns	Operations Project Activities Rehabilitation	• Presence of cleared areas impacting surface drainage • Rehabilitation activities	Reduce the risk of erosion and sediment carryover within the TDF and prevent impacts from erosion and sediment carryover outside the TDF.	The Planning, execution and inspection of civil works shall include management measures to reduce soil erosion and sedimentation such as: • Civil works will include measures to minimise sediment carryover where risk of sediment carryover is identified, including erosion barriers, flow diversion devices, sedimentation sumps, silt fencing, geotextile fabric, contour banks. • Planning of clearing and earthworks will be managed to minimise land clearing requirements and limit the area of exposed topsoil to the minimum required for safe execution of activities.	3[2]	4	M
		• Surface water and groundwater contamination	Operations Project Activities Rehabilitation	• Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks	Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the movement of contaminated soil within the TDF and prevent material or serious environmental harm outside the TDF.	Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning); • Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						management actions and options, in accordance with the guidelines under the CS Act. To reduce the risk of environmental impacts from the movement of contaminated soil, the Soil Disturbance Procedure shall be implemented, including: • Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes; • Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use; • No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use; • Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used; • Maintaining records of soil movements, including the source of stockpiled materials; and • Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators.			
Air Quality	Clearing and earthworks	• Localised reduction in air quality	Operations Project Activities Rehabilitation	• Clearing vegetation • Earthworks, excavation and trenching activities • Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks • Presence of unsealed cleared areas • Rehabilitation activities	NA	NA - Standard management measures required for managing employee exposure/ nuisance impacts.	6	2	L

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Flora and Vegetation Communities	Clearing and earthworks	• Loss and/or disturbance to restricted flora and vegetation species and communities • Erosion or removal of topsoil and seed bank • Proliferation of weed species • Changes in vegetation and ecological community structure, composition, and diversity • Localised loss of vegetation outside the disturbance footprint • Reduced plant growth	Operations Project Activities Rehabilitation	• Clearing vegetation • Earthworks, excavation and trenching activities • Presence of cleared areas impacting surface drainage • Rehabilitation activities	Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from clearing and earthworks within the TDF and prevent material or serious environmental harm to flora and vegetation communities from clearing and earthworks outside the TDF.	To ensure clearing activities are managed effectively, the Ground and Vegetation Disturbance Form, required under the PTW system, includes: • survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings. • check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats. • definition of site-specific clearing methodology. • determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys. • issue of permit that includes conditions for managing site-specific risks. • implementation of controls as per permit conditions. To reduce the risk of proliferation of an existing weed species, weed management measures as outlined in the QMS include: • weed hygiene procedures for activities in areas where high-risk weeds or seed banks are known to occur. • quarantine response protocols triggered by the detection of a new weed species or proliferation of an existing weed species.	4	4	L
		• Loss and/or disturbance to restricted flora and vegetation species and communities • Accumulation of contamination by plants • Reduced plant growth • Changes in vegetation and ecological community structure, composition, and diversity	Operations Project Activities Rehabilitation	• Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks	Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the movement of contaminated soil within the TDF and prevent material or serious environmental harm outside the TDF.	Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning); • Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act. To reduce the risk of environmental impacts from the movement of contaminated soil, the Soil Disturbance Procedure shall be implemented, including: • Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes; • Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use; • No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use; • Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used; • Maintaining records of soil movements, including the source of stockpiled materials; and • Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators.			
Terrestrial Fauna	Clearing and earthworks	• Direct displacement or loss of individuals • Increased resource competition in adjacent areas • Localised habitat fragmentation and/or loss	Operations Project Activities	• Clearing vegetation • Earthworks, excavation and trenching activities • Presence of cleared areas impacting surface drainage	Reduce the risk of injury or mortality to protected terrestrial fauna species as a result of clearing and earthworks within the TDF and prevent material or serious environmental harm to protected terrestrial fauna populations outside the TDF.	To ensure clearing activities are managed effectively, the Ground and Vegetation Disturbance Form, required under the PTW system, includes: • survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings. • check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats. • definition of site-specific clearing methodology. • determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys. • issue of permit that includes conditions for managing site-specific risks. • implementation of controls as per permit conditions. To ensure excavations are managed effectively, management measures will include those outlined in the Fauna Handling Common User Procedure (FHCUP) and controls under the PTW system, including: • site assessment prior to commencement, including consideration of potential environmental impacts. • risk assessment prior to commencement. To reduce risk of injury or mortality to fauna, fauna handling will be undertaken in accordance with the requirements detailed in the FHCUP.	4	4	L
		• Chronic toxicity to sensitive habitat and/or fauna	Operations Project Activities	• Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks	Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the movement of contaminated soil within the TDF and prevent material or serious environmental harm outside the TDF.	Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning);			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						• Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act. To reduce the risk of environmental impacts from the movement of contaminated soil, the Soil Disturbance Procedure shall be implemented, including: • Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes; • Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use; • No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use; • Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used; • Maintaining records of soil movements, including the source of stockpiled materials; and • Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators			
Subterranean Fauna	Clearing and earthworks	• Direct loss of troglofaunal and habitat within GTP Footprint • Sedimentation of aquifer • Localised loss of stygofauna • Potential contamination of subterranean habitat	Operations Project Activities	• Clearing vegetation • Earthworks, excavation and trenching activities • Presence of cleared areas impacting surface drainage	Reduce the risk of injury or mortality to protected subterranean fauna species as a result of clearing and earthworks and prevent material or serious environmental harm to subterranean fauna populations outside the TDF.	The planning, execution and inspection of civil works shall include management measures to reduce soil erosion and sedimentation such as: • Measures to minimise sediment carryover where risk of sediment carryover is identified, including erosion barriers, flow diversion devices, sedimentation sumps, silt fencing, geotextile fabric, contour banks. • Planning of clearing and earthworks to minimise land clearing requirements and limit the area of exposed topsoil to the minimum required for safe execution of activities. To ensure clearing activities are managed effectively, the Ground and Vegetation Disturbance Form, required under the PTW system, includes:	4	4	L

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						• survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings. • check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats. • definition of site-specific clearing methodology • determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys. • issue of permit that includes conditions for managing site-specific risks. • implementation of controls as per permit conditions			
		• Direct loss of troglofaunal and habitat within GTP Footprint • Localised loss of stygofauna • Potential contamination of subterranean habitat	Operations Project Activities	• Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks	Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the movement of contaminated soil within the TDF and prevent material or serious environmental harm outside the TDF.	Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning); • Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act. To reduce the risk of environmental impacts from the movement of contaminated soil, the Soil Disturbance Procedure shall be implemented, including: • Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes; • Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use; • No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use; • Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used; • Maintaining records of soil movements, including the source of stockpiled materials; and			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						• Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators.			

Notes:

[1]L = Low, M = Medium, H = High

[2] Through consultation with DCCEEW on the revisions to the TSEPP, consequence ranking has been amended from 4 to 3. DCCEEW takes the position given the persistent nature of PFAS the Chevron consequence definition of 3 more appropriately reflects the risk.

5.2.5 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from clearing and earthworks are summarised in Table 5-3.

Table 5-3: Environmental performance objectives, management measures, performance standards and measurement criteria –clearing and earthworks

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of erosion and sediment carryover within the TDF and prevent impacts from erosion and sediment carryover outside the TDF.	Operations Construction/ Infrastructure Projects	The Planning, execution and inspection of civil works shall include management measures to reduce soil erosion and sedimentation such as: • Civil works will include measures to minimise sediment carryover where risk of sediment carryover is identified, including erosion barriers, flow diversion devices, sedimentation sumps, silt fencing, geotextile fabric, contour banks. • Planning of clearing and earthworks will be managed to minimise land clearing requirements and limit the area of exposed topsoil to the minimum required for safe execution of activities.	Civil works are planned, executed and inspected utilizing the proposed management measures or similar environmentally appropriate options to reduce erosion and sediment carryover within the TDF and to prevent erosion and sediment carryover impacts outside the TDF.	Periodic visual inspections of civil works undertaken in accordance with the ABU OE Assurance Plan (Level 2) confirm that requirements outlined in the management measures have been met. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from erosion and sediment carryover.
	Rehabilitation	As detailed in the Post Construction Rehabilitation Plan, rehabilitation design and monitoring shall include management measures to reduce soil erosion and sedimentation such as • Rehabilitation design will include establishing surface profile with properties that exhibit similar infiltration and water-retention characteristics for the targeted vegetation outcome to analogue sites. • Rehabilitation design will include installing banks or other appropriate earthworks, if required, to direct and control surface water flow at a local scale discharging onto undisturbed stable ground where practicable • Rehabilitation monitoring will include use of Landscape Functional Analysis or similar to measure water infiltration and retention.	Rehabilitation design and monitoring are undertaken in accordance with the Post Construction Rehabilitation Plan and utilizes the proposed management measures or similar environmentally appropriate options to reduce erosion and sediment carryover within the TDF and to prevent erosion and sediment carryover impacts outside the TDF.	Results of rehabilitation monitoring (undertaken in accordance with Post Construction Rehabilitation Plan) confirm that the design and monitoring requirements outlined in the Management Measures have been met.
Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the movement of contaminated soil within the TDF and prevent material or serious	Operations Construction/ Infrastructure Projects Rehabilitation	Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning);	Contaminated sites management processes are implemented in accordance with the proposed management measures to reduce risk of impacts from contaminated soil within the TDF and prevent impacts outside the TDF.	Information communicated to the DWER's Contaminated Sites Branch through Mandatory Audit Reports (MAR), and/ or via annual presentation updates by CAPL to the CSB confirm that the requirements outlined in the management measures have been met. ABU OE Assurance Plan (Level 2) records confirm that obligations and management processes under the WA

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
environmental harm outside the TDF.		• Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act. To reduce the risk of environmental impacts from the movement of contaminated soil, the Soil Disturbance Procedure shall be implemented, including: • Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes; • Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use; • No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use; • Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used; • Maintaining records of soil movements, including the source of stockpiled materials; and • Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators.	All ground disturbance and earthworks that have the potential to disturb contaminated or potentially contaminated soil are subject to the proposed management measures to reduce the risks of causing impacts within the TDF and preventing impacts outside the TDF.	Contaminated Sites Act are fulfilled, including requirements outlined in the management measures. ABU OE Assurance Plan (Level 2) records confirm that the Soil Disturbance Procedure requirements outlined in the management measures have been met. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from contaminated soil.
Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from clearing and earthworks within the TDF and prevent material or serious environmental harm to flora and vegetation communities from clearing and earthworks outside the TDF.	Operations Construction/ Infrastructure Projects Rehabilitation	To ensure clearing activities are managed effectively, the Ground and Vegetation Disturbance Form, required under the PTW system, includes: • survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings • check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats • definition of site-specific clearing methodology • determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys • issue of permit that includes conditions for managing site-specific risks • implementation of controls as per permit conditions To reduce the risk of proliferation of an existing weed species, weed management measures as outlined in the QMS include: • weed hygiene procedures for activities in areas where high-risk weeds or seed banks are known to occur,	GVD Forms completed for all clearing activities to reduce risk of impact to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from clearing within the TDF and prevent impacts outside the TDF. Clearing and earthworks activities are undertaken in accordance with weed hygiene requirements outlined in the QMS (including the weed hygiene procedure) to reduce the risk of causing impacts to flora and vegetation communities inside the TDF or serious environmental harm to flora and vegetation communities from clearing and earthworks outside the TDF. Weed management measures outlined in the QMS are implemented to reduce the risk of causing impacts to flora and vegetation communities inside the TDF or serious environmental harm to flora and vegetation	ABU OE Assurance Plan (Level 2) records confirm that GVD has been completed and is available for all clearing activities and requirements outlined in management measures have been met. Results of Vegetation Clearing Audit annual extent of clearing and rehabilitation, determined in accordance with Vegetation Clearing and Audit Common User Procedure (Ref. 25) confirm compliance with the area of uncleared land that can be cleared for the Gorgon Project. ABU OE Assurance Plan (Level 2) records confirm that the Weed Hygiene requirements outlined in management measures have been met. Results of Terrestrial Plant Non-Indigenous Species (Weed) monitoring program undertaken in accordance with QMS confirm status of weed species and therefore effectiveness of requirements outlined in management measures.

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
		• quarantine response protocols triggered by the detection of a new weed species or proliferation of an existing weed species.	communities from clearing and earthworks outside the TDF.	
Reduce the risk of injury or mortality to protected terrestrial fauna species as a result of clearing and earthworks within the TDF and prevent material or serious environmental harm to protected terrestrial fauna populations outside the TDF.	Operations Construction/ Infrastructure Projects Rehabilitation	To ensure clearing activities are managed effectively, the Ground and Vegetation Disturbance Form, required under the PTW system, includes: • survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings • check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats • definition of site-specific clearing methodology • determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys • issue of permit that includes conditions for managing site-specific risks • implementation of controls as per permit conditions To ensure excavations are managed effectively, management measures will include those outlined in the Fauna Handling Common User Procedure (FHCUP) and controls under the PTW system, including: • site assessment prior to commencement, including consideration of potential environmental impacts • risk assessment prior to commencement To reduce risk of injury or mortality to fauna, fauna handling will be undertaken in accordance with the requirements detailed in the FHCUP.	GVD Forms completed for all clearing activities to reduce risk of impact to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from clearing within the TDF and prevent impacts outside the TDF. Fauna management measures for excavations outlined in the FHCUP are implemented to reduce the risk of causing impacts to protected terrestrial fauna species inside the TDF. All fauna handling is undertaken in accordance with the relevant management measures outlined in the FHCUP to reduce the risk of causing impacts to protected terrestrial fauna species inside the TDF.	ABU OE Assurance Plan (Level 2) records confirm that GVD has been completed and is available for all clearing activities and requirements outlined in management measures have been met. ABU OE Assurance Plan (Level 2) records confirm that PTW excavation requirements outlined in management measures have been met. ABU OE Assurance Plan (Level 2) records confirm that management measures outlined in FHCUP have been met. Wildlife management database records confirm that all handling of live or injured fauna is conducted by trained fauna handlers. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from clearing and earthworks.
Reduce the risk of injury or mortality to protected subterranean fauna species as a result of clearing and earthworks and prevent material or serious environmental harm to subterranean fauna populations outside the TDF.	Operations Construction/ Infrastructure Projects Rehabilitation	The planning, execution and inspection of civil works shall include management measures to reduce soil erosion and sedimentation such as: • measures to minimise sediment carryover where risk of sediment carryover is identified, including erosion barriers, flow diversion devices, sedimentation sumps, silt fencing, geotextile fabric, contour banks • Planning of clearing and earthworks to minimise land clearing requirements and limit the area of exposed topsoil to the minimum required for safe execution of activities. To ensure clearing activities are managed effectively, the Ground and Vegetation Disturbance Form, required under the PTW system, includes: • survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings • check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats • definition of site-specific clearing methodology • determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys • issue of permit that includes conditions for managing site-specific risks • implementation of controls as per permit conditions	Civil works are planned, executed and inspected utilizing the management measures or similar environmentally appropriate options to reduce impacts to subterranean fauna species. GVD Forms completed for all clearing activities to reduce risk of impact to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from clearing within the TDF and prevent impacts outside the TDF.	Periodic visual inspections of civil works undertaken in accordance with the ABU OE Assurance Plan (Level 2) confirm that requirements outlined in the management measures have been met. ABU OE Assurance Plan (Level 2) records confirm that GVD has been completed and is available for all clearing activities and requirements outlined in management measures have been met.

5.3 Environmental Aspect: Surface water

5.3.1 Description of Activities

The presence and operation of this Project will interact with the environment resulting in the environmental aspect of surface water.

Activities resulting in the surface water aspect include, but are not limited to, the presence and operation of the following:

- Tiered stormwater drainage system (i.e. Class 1 to 4) at the GTP and remote facilities
- Class 1 (contaminated stormwater) and Class 2 (potentially contaminated stormwater) piping
- Oily Water Sump (Class 1)
- Stormwater Holding Pond (Class 2)
- Discharges from Class 2 to Class 3
- Class 3 (uncontaminated stormwater) and Class 4 (natural drainage channels)
- Paved areas with the GTP and remote facilities
- Bunding for hazardous storage materials

5.3.2 Potential Impact/ Consequence Summary

Surface water management has the potential to:

- alter the natural hydrological regime of the existing environment
- cause erosion/sedimentation in areas adjacent to disturbed areas through discharge
- become contaminated with hydrocarbons, hazardous chemicals and wastes, potentially leading to:
- soil, surface water and groundwater contamination and potentially reaching the marine environment
- impacts to vegetation, fauna, troglofauna and stygofauna.

In addition, management of stormwater surrounding bunds and rainwater within bunds has the potential to result in contaminated stormwater if it is not managed appropriately.

Injury or mortality to fauna through entrapment in drainage related infrastructure (e.g. pits, sumps, ponds, trenches, and drains) is included in Section 5.5.2.1.

As noted in Section 3.4, the Gorgon GTP site (and an associated buffer around the site) has been reported to DWER, under the CS Act, as a potentially contaminated site resulting from contaminants of concern (including PFAS) in soil, surface water drainage and groundwater above background concentrations. CAPL is applying a conservative approach to the management of the drainage system across the GTP and associated facilities including restrictions on discharges to the Class 3 drainage system (i.e. there is currently no discharge from the Stormwater Holding Pond (SWHP) to Class 3 drains) and discharges from potentially contaminated bunds with PFAS from fire fighting foams. Further details are provided in the Risk and Uncertainty Management sections.

5.3.3 Residual Risk and Key Management Measures

5.3.3.1 Stormwater and surface run-off system design

The design of the surface water drainage systems (referred to as Stormwater Drainage System i.e. the drainage system) has the following key design principles and considerations to minimise environmental impact:

- mirror as closely as reasonably practicable the natural hydrological regime of the existing environment.
- minimise[2] contamination of surface and ground water of the surrounding environment.
- maximise infiltration of clean stormwater, where practicable, to minimise environmental impact to stygofauna.

In relation to mirroring the natural hydrological regime, the drainage system is designed to collect uncontaminated stormwater and redistribute it to the groundwater aquifer and to the surrounding terrestrial environment in a manner that minimises channelisation and erosion. Infiltration to the groundwater table beneath the GTP and other facilities is facilitated by maximising unpaved areas, where practicable, and by integrating special design features in the uncontaminated stormwater and surface water run-off drain systems.

In relation to contamination, the Stormwater drainage system is designed to segregate, intercept, treat, and/or dispose of streams of potential contamination from the GTP. The specific systems for management were outlined in detail in the GTP Works Approval application and are subject to ongoing regulation via the Gorgon LNG Project Part V licence (Part V Licence) (L9102/2017/1) (Ref. 58) under the EP Act.

The Stormwater drainage system is separate to the Process drainage system which includes drains from vessels (e.g. amine drain drum and monoethylene glycol (MEG) drain drums). These process stream drains are collected in the above ground produced water header and transferred to either the Disposal Water Tanks and managed in accordance with the Part V Licence or the Solid and Liquid Waste Management Plan (SLWMP; Ref. 14) for offsite disposal. As per the SLWMP, these solids are disposed of at a CAPL third party approved and DWER licensed facility. Prior to transport off-island the waste is stored in an appropriate waste receptacle to contain the waste. During transport the wastes are securely stored and contained.

As identified above, the Stormwater drainage system has been designed as a segregated system depending on the level of contamination or origin of the intercepted surface water. Treatment and/ or disposal is provided commensurate to the level of contamination. The system includes (see Figure 5-1):

Class 1:

- Designed for run-off from areas of the GTP or associated terrestrial infrastructure, which are deemed to be always or frequently contaminated, primarily with free oil. Examples include stormwater from the lube oil skid baseplates, catchment areas around equipment likely to be contaminated and

[2] *Minimise* is consistent with the design principles of the Project (as identified in TSEPP, Rev 3) that were applied for construction of the Project. Future expansions and Projects will adopt the design principle to *prevent contamination of surface and ground water of the surrounding environment*.

chemical package bunds. Potential contaminants include hydrocarbons and chemicals (e.g. amine and MEG).

- Contaminated run-off from the Class 1 catchment area in the GTP is transferred via a closed piping system to the Oily Water Sump (OWS) and then piped to a Corrugated Plate Interceptor (CPI) for oil/water separation. Oil and sludge accumulate in the CPI and is periodically removed and disposed of in line with the requirements of the SLWMP (Ref. 14). As per the SLWMP waste disposal hierarchy, the CPI sludge is treated as hazardous waste and disposed of at a CAPL third party approved and DWER licensed facility. Prior to transport off-island the waste is stored in an appropriate waste receptacle to contain the waste. During transport the wastes are securely stored and contained. The treated wastewater effluent from the CPI is piped to the Disposal Water Tanks and disposed of via the PWD wells. Some infrequent, small flows of contaminated process waters will also be drained into the Class 1 contaminated drainage system.

Downhole disposal via the PWD and TWIP wells is regulated under Part V of the EP Act as per the Part V Licence and also under the SLWMP (Ref. 14). Given the cross over with the objectives of the SLWMP, assessment of environmental impacts associated with the downhole disposal of stormwater are not assessed further in this Plan. However, a summary of downhole disposal is included to provide context. Liquid wastes are injected into the Barrow Group geological formation through the PWD wells or the TWIP disposal wells. The liquid waste is injected to a depth of more than 1000 m beneath Barrow Island, which is substantially below the lower limit of the stygofauna habitat in the superficial aquifer, which is approximately 50 m below ground level. This formation is geologically isolated from much shallower surface formations and the watertable that contains the subterranean fauna and their habitats. To prevent infrastructure failure resulting in an emission to the surface or near-surface groundwater where stygofauna are known to be present, the wells are designed to ensure mechanical integrity is maintained and failures are identified. In accordance with the Part V Licence, the liquid wastes disposed downhole are monitored for pH, Total Suspended Solids (TSS), and Total Petroleum Hydrocarbons (TPH) on a monthly basis. In addition, monitoring of annulus and flow line pressures (continuous for PWD and daily for TWIP) occurs to ensure the correct and efficient operation of the injection wells.

Class 2:

- Designed for potentially contaminated (with free oil or soluble chemicals) run-off from areas of the GTP or associated terrestrial infrastructure and uncontaminated process water (e.g. demineralised water, potable water, service water and condensed water). Potential contaminants include hydrocarbons and chemicals (e.g. amine and MEG). Class 2 drainage consists of areas that have been designated to have a lower likelihood of being contaminated, compared to areas in the Class 1 drainage system. Class 2 drainage is collected and closed-piped to the SWHP.
- The water in the SWHP is tested, and if found to meet appropriate environmental discharge criteria, discharged to the clean stormwater system (Class 3 Drainage System). Discharge to the Class 3 Drainage System is regulated under the Part V Licence. As per the Part V Licence, prior to discharge to Class 3, sampling and analysis for Total Recoverable Hydrocarbons (TRH), pH, TSS and electrical conductivity (EC). If the water quality is found to exceed the environmental discharge criteria (TRH – 10

mg/L; pH – 6 to 9; TSS – 500 mg/L and EC – 18,000 µs/cm), the collected run-off is disposed via the downhole disposal wells. Given the potential for PFAS impacts in the SWHP, there is currently no discharge from the SWHP to the Class 3 drains.

- The first flush (i.e. first 25 mm) of stormwater run-off from the Class 2 drainage is considered potentially contaminated and captured in the SWHP. Once the first flush is captured in the SWHP, stormwater collected in the Class 2 system then overflows to the Class 3 system and is ultimately discharged to the terrestrial environment.

Remote Facilities:

- In addition to the above infrastructure at the GTP, there are some additional facilities that have Class 1 and/or 2 drainage systems that are not directly connected to the GTP e.g. Dangerous Goods Yard, Mercury Management Facility (MMF), WTS and Concrete Batching Plant. The surface water management at these facilities is consistent with the design principles outlined in Section 5.2 i.e. mirror the natural hydrological regime, where practicable; minimise contamination of surface and groundwater; and maximise infiltration of clean stormwater, where practicable).

Class 3:

- Designed for uncontaminated stormwater from clean areas (Class 3 drainage) and overflow (post first flush volumes) from the Class 2 system at the GTP. Class 3 drains are also provided at locations outside of the GTP including the WTS, CO_2 Injection System drill centres, Accommodation Village, and the Administration and Operations Complex (collecting run off from areas such as building roofs and open areas away from equipment). Class 3 drainage is collected and diverted to the terrestrial environment in a manner that minimises sediment carryover and prevents erosion.

Class 4:

- Natural drainage channels intercepted by the physical footprint of the GTP, Accommodation Village, and Administration and Operations Complex have been diverted away from these facilities to the natural environment. This has been achieved using measures such as cut-off drains at the top of the cut batters or perimeter drains diverting water to the weired stormwater ditches of the Class 3 system.

Paved Areas:

Paving or concrete (i.e. ‘paved areas’) segregates the four drainage system classes. Paved areas include:

  - areas required to be load bearing
  - areas subject to contamination by spillages that could potentially impact the soil or groundwater or exceed site discharge criteria.

- Paving in areas where spillages may occur are sloped into the appropriate collection systems leading to one of the three segregated drainage systems (Class 1, Class 2, or Class 3) or to a closed bund or sump, thus providing a facility for removal by a vacuum truck.

- Runoff from rainwater on unpaved areas and roads is routed to the Class 3 drainage system and discharged to the surrounding terrestrial environment in a manner that minimises channelisation and erosion.

5.3.3.2 Stormwater and surface run-off system detailed overview

During the design phase of the Project a number of requirements were specified to ensure the Project was constructed, commissioned and operated in a manner that minimises any impacts from the stormwater drainage system. Prior to the commencement of commissioning and operations it was verified through a Pre-Start-up Safety Review (PSSR) process (or equivalent) that the construction of the stormwater drainage system was as per the specified design requirements. Further details on the PSSR process are provided in 6.5.4. Operation of the drainage system is also subject to ongoing regulation via the Part V licence.

Drainage Discharge

In addition, CAPL has an internal Drainage Discharge Approval (DDA) process to support management of the drainage system, which requires its employees and contractors to comply with. The DDA process ensures that the different classes of stormwater and wastewater are managed and disposed of appropriately. The process involves completing a:

- Preliminary water quality assessment to determine potential contamination and contaminants that might be present.
- Sampling and analysis where required to determine the composition of the liquid waste; and
- Determing the appropriate disposal pathway (e.g. disposal via the PWD wells, or off island)in accordance with the Part V Licence (Ref. 58) and the SLWMP (Ref. 14).

Drainage Maintenance

There are also operational controls in place to maintain the stormwater drainage system in a safe and operable state and reduce any potential environmental impacts. These activities are completed as per the scheduled maintenance regime in the Computerised Maintenance Management System (CMMS) and include:

- Visual inspections and additional inspections during rainfall periods, where required.
- Removal of sediment build-up and repairs of damaged elements of the drainage system, where required as part of the maintenance regime to maintain functionality.

Further details on the CMMS are provided in Section 6.5.4. In summary, CAPL uses a CMMS to support asset integrity management and reliability management through a rigorous, detailed register of inspection and maintenance tasks and data records, including maintenance planning and scheduling.

Monitoring of surface water landforms, undertaken in accordance with the TSEMP (Ref. 22), has not detected any adverse impact (attributable to the Gorgon Gas Development) to surface water landforms to date (Ref. 47). Experience gained during previous stages of the Gorgon Project, including the Construction phase when the scale of clearing and earthworks was significant, indicates that impacts due to erosion and sediment carryover are localised and short term and that existing management measures for erosion and sediment carryover are appropriate.

Class 1 Drainage

The following requirements are intended to be met by the Class 1 drainage.

- An appropriate specification as per the ABU Class 1 Drain Piping Material Class - 1 01PD009 (GOR-0000-PIP-STD-WOP-00006) (Ref. 66) is applied to all piping design to minimise the risk of leakage to the environment and contamination of soil and groundwater.
- Drainage system components transporting contaminated run-off will be managed to ensure adequate leak detection.
- Incorporate a water trap or similar device that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.
- Run-off within the GTP will be piped to an OWS and will pass through a CPI to separate the dispersed oil fraction prior to disposal via down hole disposal.
- The OWS is equipped with adequate containment (i.e. constructed of concrete with a 2 mm High Density Polythylene (HDPE) liner) and a leak detection system.
- Remote Class 1 run-off will be collected and disposed of via a vacuum truck to the OWS or other appropriate tie in to the system.
- A closed drain system for the GTP to ensure that hydrocarbon liquids drained from vessels (e.g. during maintenance activities) are collected in a safe and environmentally responsible manner so as to reduce fugitive emissions of volatile hydrocarbons to the atmosphere and avoid flammable hazards. Where feasible, hydrocarbon liquids collected in the closed drain system will be recovered to process, or to the condensate storage system. Where hydrocarbon liquids cannot practicably be recovered to process or to the condensate storage system, they will be managed in line with the SLWMP (Ref. 14) which includes disposal at a CAPL third party approved and DWER licensed facility. Prior to transport off-island the waste is stored in an appropriate waste receptacle to contain the waste. During transport the wastes are securely stored and contained.

Noting the clear cross over with the objectives of the SLWMP, assessment of the risk related to the downhole disposal of liquid waste causing environmental impact to the terrestrial and subterranean environment has not been assessed further in this Plan. A description of the downhole disposal is provided in Section 5.3.1.1.

Class 2 Drainage

The following requirements are intended to be met by the Class 2 drainage system:

- An appropriate specification as per the ABU Class 2 Drain Piping Material Class - 1 01PD007 (G1-TE-X-0000-SPC4116-W01) (Ref. 67) applied to all piping design to minimise the risk of leakage to the environment and contamination of soil and groundwater to as low as reasonably practicable.
- Drainage system components transporting potentially contaminated run-off will be managed to ensure adequate leak detection.
- Incorporate a water trap or similar device that will form a barrier to hydrocarbon vapours and liquids, including LNG, entering the drainage system.

- Drainage trenches surrounding process equipment that is capable of spilling flammable liquids, including LNG or refrigerant, is segregated into fire zones through the use of separation barriers extending up half the depth of the trench such that volumes of LNG or refrigerant exceeding the capacity of that section of trench will flow into the next section of trench rather than overflowing to adjacent unpaved areas. Each section of trench incorporates a water trap connection to the Class 2 drainage system header.
- Firewater from the Class 2 catchment areas will be collected until volumes exceed the capacity of the SWHP, at which point firewater will be diverted to the Class 3 drains (the SWHP and associated Class 2 piping can hold the equivalent volume of firewater used in a four-hour firefighting event associated with a major fire within the GTP, before the water requires diversion).
- The SWHP is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HPDE liner) and a leak detection system.
- Management of the SWHP will allow sediment to settle and hydrocarbons skimmed as required.
- As per the basis of design, sampling and analysis (via the DDA process) of the Class 2 drainage collected in the SWHP and, if found to meet appropriate environmental discharge criteria (TRH – 10 mg/L; pH – 6 to 9; TSS – 500 mg/L and EC – 18,000 µs/cm) as per the Part V Licence, it is discharged to the Class 3 drainage system. If the water quality is found to exceed the environmental discharge criteria, it is disposed via the downhole disposal wells. Current management of the SWHP is discussed further below.
- Facilities with remote Class 2 drains or sumps that operate independently of the GTP Class 2 drainage network are managed in the same way i.e. stormwater is tested and if it meets appropriate environmental discharge criteria, as per the DDA Process, discharged to the nearby Class 3 drainage system. If not, the stormwater is vacuum trucked out for transfer into the OWS for downhole disposal.

Class 2 Drainage – Risk and Uncertainty Management

As noted in Section 3.3, the Gorgon GTP site (and an associated buffer around the site) has been reported to DWER, under the CS Act, as a potentially contaminated site resulting from contaminants of concern (including PFAS) in soil, surface water drainage and groundwater above background concentrations.

CAPL is applying a conservative approach to the management of the drainage system across the GTP and associated facilities. There are restrictions on discharges of collected stormwater where there is potential for PFAS contamination from firefighting foams, including:

- SWHP to the Class 3 drainage system discharge point (regulated under Part V Licence) (further details below).
- Remote Class 2 drains or sumps into the Class 3 drainage system.

In these scenarios, all collected stormwater is managed via the DDA process for downhole disposal. If the downhole disposal criteria is met, the stormwater is removed and disposed downhole. The disposal criteria for downhole disposal are based on the specified water quality targets predefined within the Part V Licence DWER Decision Report (Ref. 68) for TPH – 200 ppm, pH (6 to 9) and TSS – 100 ppm). If the criteria is not met then it is disposed off island in accordance with

the SLWMP (Ref. 14) at a CAPL third party approved and DWER licensed facility. Prior to transport off-island the waste is stored in an appropriate waste receptacle to contain the waste. During transport the wastes are securely stored and contained.

Discharge will not be reinstated from the SWHP to the Class 3 drainage until such time that the water quality within the SWHP does not exceed the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the discharge into the Class 3 drainage has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Report, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-instatement.

Class 3 Drainage

The following requirements are intended to be met by the Class 3 drainage system:

- Minimise suspended sediment discharge to the environment.
- Mirror the natural hydrological cycle as close as reasonably practicable by:
- Minimising erosion and sediment carryover within the GTP, Accommodation Village, and the Administration and Operations Complex sites, and at discharge points to the environment through the use of erosion control measures including vegetation cover, jute mesh or geotextile, rip-rap or stone pitching, gabions and grout-filled mattresses, concrete or concrete-filled bags, drop structures and chutes, pipes, ‘D’ base channels, weirs, ripping or ‘moonscaping’.
- Redistributing stormwater collected within the Class 3 drains (post collection of first 25 mm) via infiltration drains to ensure groundwater recharge; and redistribution trenches to prevent redistribution through channels or point sources.
- Accept overflow post collection of the first flush from the Class 2 and Class 4 systems.
- Size, cross-sectional shape, and gradient of channels designed to avoid scouring and sudden changes in velocity. Channels with high velocities are intended to be lined, while drop structures will be constructed where slopes are steep.

Class 4 Drainage

The following requirements are intended to be met by the Class 4 drainage system:

- Size, cross-sectional shape, and gradient of the channel will be designed to avoid scouring and sudden changes in velocity. Channels with velocities sufficient to cause significant scour are intended be lined, while drop structures intended to be constructed where slopes are steep.
- Mirror the natural hydrological cycle as close as reasonably practicable by:
    - diverting and redistributing run-off high in the catchment
    - minimising sediment carryover to the environment

- using vegetation cover to ensure that any collection and redistribution of flow minimises erosion. Where there is insufficient vegetation cover, alternatives may include the use of jute mesh or geotextile, rip-rap or stone pitching, gabions and grout-filled mattresses, concrete or concrete-filled bags, drop structures and chutes, pipes, base channels, weirs, ripping or 'moonscaping'.

5.3.3.3 Bunding

Bunding is provided around hazardous liquid material storage, including in chemical, hydrocarbon, and hazardous waste storage areas and areas where spills of hazardous liquids could occur.

Within the GTP permanent bunds are graded to a sump and drained by gravity via a normally closed valve (or similar device) to the relevant class drainage system as identified in Figure 5-1. Where gravity drainage is not practicable, liquid will be pumped to the relevant class drainage system. Operating procedures require bund drain valves to be closed at all times, including during a rainfall event.

Operating procedures also specify water quality testing requirements prior to discharge, as per the above noted DDA process. If the criteria is not met then it is disposed off island in accordance with the SLWMP (Ref. 14) at a CAPL third party approved facility. Prior to transport off-island the waste is stored in an appropriate waste receptacle to contain the waste. During transport the wastes are securely stored and contained.

Remote permanent bunds (where hard connections to the appropriate drainage system are not possible) will have an appropriate connection for a vacuum truck or mobile pump system to empty accumulated run-off or stormwater.

As noted above, CAPL has an internal DDA process that includes the management of stormwater (including within temporary and permanent bunds) following a rainfall event which requires its employees and contractors to comply with. The process involves completing a preliminary water quality assessment and sampling and analysis where required to ensure the water is managed and disposed of appropriately. If the criteria is not met then it is disposed off island in accordance with the SLWMP (Ref. 14), at a CAPL third party approved and DWER licensed facility. Prior to transport off-island the waste is stored in appropriate waste receptacles to contain the liquid waste. During transport the wastes are securely stored and contained.

5.3.3.4 Stormwater in Bunds – Risk & Uncertainty Management

As noted in Section 3.3, the Gorgon GTP site (and an associated buffer around the site) has been reported to DWER, under the CS Act, as a potentially contaminated site resulting from contaminants of concern (including PFAS) in soil, surface water drainage and groundwater above background concentrations.

CAPL is applying a conservative approach to the management of the drainage system across the GTP and associated facilities. These include restrictions on the discharges of collected stormwater in bunds to the Class 3 drainage system where there is potential for PFAS contamination from firefighting foams. In these scenarios, collected stormwater is managed via the DDA process for downhole disposal. If the downhole disposal criteria are met the stormwater is removed and disposed downhole. The disposal criteria are based on the specified water quality targets as per the Part V Licence DWER (Ref. 68) for TPH (200 ppm), pH (6 to 9) and TSS (100 ppm). If the criteria is not met then it is disposed off island in

accordance with the SLWMP (Ref. 14) at a CAPL third party approved and DWER licensed facility. Prior to transport off-island the waste is stored in appropriate waste receptacles to contain the waste. During transport the wastes are securely stored and contained.

Further details on hazardous material storage and bunding is provided in Section 5.4.

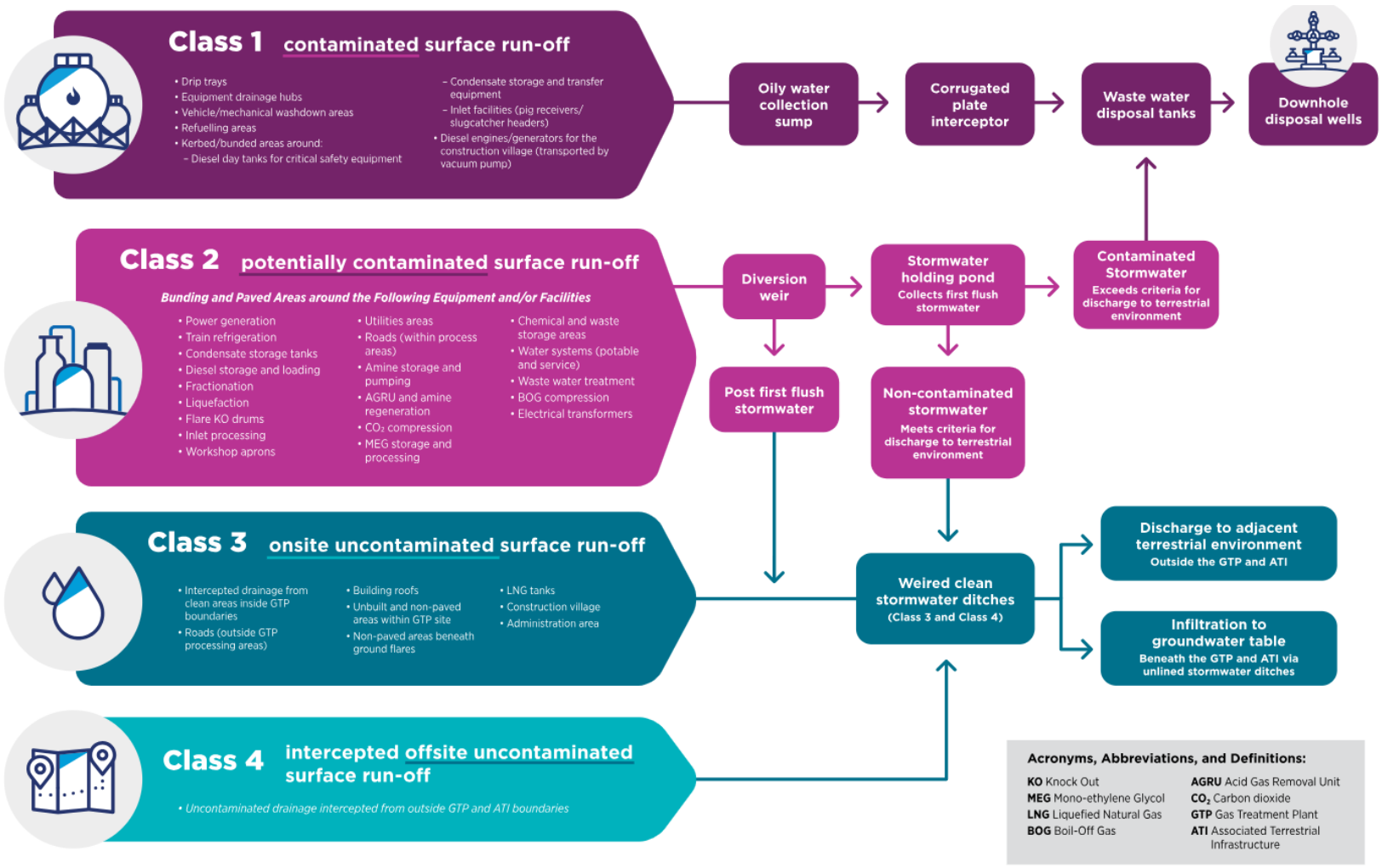

Figure 5-1: Overview of the Gorgon GTP Stormwater drainage system basis of design

5.3.4 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from surface water is provided in Table 5-4.

Table 5-4: Risk assessment summary – surface water

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Soil and Landform	Surface Water	• Erosion and sedimentation • Sedimentation of natural drainage systems	Construction/Infrastructure Projects	• Physical presence of sealed/hardstand areas associated with the Stormwater Drainage System • Discharges from the Class 3 drainage system into the environment	Reduce the risk of erosion and sediment carryover and erosion within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system includes control measures to reduce soil erosion and sedimentation such as: • Size, cross-sectional shape and gradient of channels designed to avoid scouring and sudden changes in velocity. • Lining of channels with velocities sufficient to cause significant scour and drop structures constructed where slopes are steep. • Vegetation cover to ensure any collection and redistribution of flow minimises erosion. • Where there is insufficient vegetation cover, alternatives may include the use of jute mesh or geo-textile, rip-rap or stone pitching, gabions and grout-filled mattresses, concrete or concrete-filled bags, drop structures and chutes, pipes, base channels, weirs, ripping or 'moonscaping'.	5	4	L
				• Stormwater drainage system not inspected or maintained leading to blockages and uncontrolled discharge	Reduce the risk of erosion and sediment carryover and erosion within the TDF and prevent impacts outside the TDF.	To ensure the ongoing effective operation of the stormwater drainage system, asset maintenance includes activities such as: • Inspections of the drainage system as per the CMMS, and additional inspections during rainfall periods, where required. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as part of the maintenance regime to maintain functionality.			
Soil and Landform	Surface Water	• Altered natural hydrogeological regime	Construction/Infrastructure Projects	• Physical presence of sealed/hardstand areas associated with the Stormwater Drainage System	Reduce the risk of alteration of the hydrological regime of the existing environment within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system includes control measures to reduce the risk of alteration of the existing hydrological regime, such as: • Maximising unpaved areas (where practicable) • Diverting and redistributing run-off high in the catchment • Minimising sediment carryover to the environment • Redistributing clean stormwater collected within the Class 3 drains via infiltration drains to ensure groundwater recharge. • Redistribution trenches to prevent runoff through channels or point sources • Repairs of damaged elements of the drain system to maintain functionality.	5	4	L
			Operations	• Physical presence of sealed/hardstand areas	Reduce the risk of alteration of the hydrological regime of the existing environment within	To ensure the ongoing effective operation of the stormwater drainage system, asset maintenance includes activities such as:			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
				associated with the Stormwater Drainage System	the TDF and prevent impacts outside the TDF.	• Inspections of the drainage system as per the CMMS, and additional inspections during rainfall periods, where required. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as part of the maintenance regime to maintain functionality.			
Soil and Landform	Surface Water	• Soil contamination	Construction/Infrastructure Projects	• Discharges from the storm water drainage system into the environment	Reduce the risk of causing contaminated stormwater impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system and stormwater segregation control measures: • Stormwater drainage system has been designed in accordance with the Gorgon Project Environmental Basis of Design (Ref. 70) to be a segregated system depending on the level of contamination or origin of intercepted surface water. • Class 1 – Contaminated Stormwater/Runoff. Sources expected to be contaminated, primarily with free oil. • Class 2 – Potentially Contaminated Stormwater/Runoff. Sources which have the potential to be contaminated with free oil or soluble chemicals. • Class 3 – Uncontaminated Stormwater/Runoff and overflow post first flush volumes. • Class 4 – Intercepted off-site uncontaminated runoff.	3	3	M
Soil and Landform	Surface Water	• Soil contamination	Operations Project Activities	• Discharges from the storm water drainage system into the environment	Reduce the risk of causing contaminated stormwater impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the Class 1 drainage system within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system (Class 1) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as. • Class 1 drainage system has been designed and will be maintained to ensure no direct Class 1 stormwater discharge into the environment. • Contaminated run-off from the Class 1 catchment area at the GTP is transferred via a closed piping system to the OWS and then piped to a CPI for oil/water separation. • Paving in areas of the GTP where spillages may occur and sloping into the appropriate collection systems or to a closed bund or sump. • An appropriate specification as per the ABU Operations Class 1 Drain Piping Material Class - 1 01PD009 will be applied to piping design. • Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system. Operations and Maintenance of stormwater drainage system (Class 1) to reduce the risk of causing contaminated stormwater impacts includes: • Remote Class 1 run-off will be collected and disposed of via a vacuum truck (or equivalent) to the Disposal Water Tanks, OWS or other appropriate tie in to the system. • Underground drainage system components transporting contaminated run-off will be managed to ensure adequate leak detection. • OWS is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						• Inspections of the drainage system as per the CMMS. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.			

					Reduce the risk of causing contaminated stormwater impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the Class 2 drainage system within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system (Class 2) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as.
						• An appropriate specification as per the ABU Operations Class 2 Drain Piping Material Class - 1 01PD007 will be applied to piping design.
						• Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.
						
						Operations and maintenance of the stormwater drainage system (Class 2) to reduce the risk of causing contaminated stormwater impacts includes:
						• Management of Class 2 stormwater in accordance with the DDA process.
						  ○ Class 2 stormwater in the SWHP is sampled and is disposed downhole if it meets the specified DDA discharge criteria:
						  ○ Class 2 stormwater collected outside of the SWHP is discharged to Class 3 drainage system only where there is no potential for PFAS contamination from firefighting foams and meets the DDA discharge criteria.
						• Underground drainage system components transporting potentially contaminated run-off will be managed as per the CMMS to ensure adequate leak detection.
						• SWHP is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.
						• Inspections of the drainage system as per the CMMS.
						• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
						
						Monitoring of stormwater drainage system (Class 2) to ensure appropriate management of the drainage system includes:
						• Biannual sampling and analysis of Class 2 stormwater within the SWHP.			

					Reduce the risk of causing contaminated stormwater impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the Class 3 drainage system within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system (Class 3) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as: • Designed for uncontaminated stormwater from clean areas (Class 3 drainage) and overflow (post first flush volumes) from the Class 2 system at the GTP.			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						Operations and maintenance of the stormwater drainage system (Class 3) to reduce the risk of causing contaminated stormwater impacts includes: • Inspections of the drainage system as per the CMMS. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality. Monitoring of stormwater drainage system (Class 3) to ensure appropriate management of the drainage system includes: • Periodic sampling of the Class 3 drainage system including during periods when the first flush occurs.			
Surface and Groundwater	Surface Water	• Surface and groundwater contamination • Contamination reaching the marine environment	Operations Project Activities	• Discharges of contaminated stormwater from the stormwater drainage system into the environment • Leakage from Class 1 drainage system or OWS	Reduce the risk of causing contaminated stormwater impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the Class 1 drainage system within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system (Class 1) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as: • Class 1 drainage system has been designed and will be maintained to ensure no direct Class 1 stormwater discharge into the environment. • Contaminated run-off from the Class 1 catchment area at the GTP is transferred via a closed piping system to the OWS and then piped to a CPI for oil/water separation. • Paving in areas of the GTP where spillages may occur and sloping into the appropriate collection systems or to a closed bund or sump. • An appropriate specification as per the ABU Operations Class 1 Drain Piping Material Class - 1 01PD009 will be applied to piping design. • Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system. Operations and Maintenance of stormwater drainage system (Class 1) to reduce the risk of causing contaminated stormwater impacts includes: • Remote Class 1 run-off will be collected and disposed of via a vacuum truck (or equivalent) to the Disposal Water Tanks, OWS or other appropriate tie in to the system. • Underground drainage system components transporting contaminated run-off will be managed to ensure adequate leak detection. • OWS is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS. • Inspections of the drainage system as per the CMMS. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.	3	3	M
Surface and Groundwater	Surface Water	• Surface and groundwater contamination	Operations Project Activities	• Discharges of contaminated stormwater from the stormwater	Reduce the risk of causing contaminated stormwater impacts to vegetation, surface water, groundwater, terrestrial	The design of the stormwater drainage system (Class 2) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as:	4	2	M

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]

		• Contamination reaching the marine environment		drainage system into the environment
				• Releases of contaminated stormwater from bunded areas into the Class 3 drainage system
				• Leakage from Class 2 drainage system or SWHP
					fauna, and subterranean fauna from the Class 2 drainage system within the TDF and prevent impacts outside the TDF.	• An appropriate specification as per the ABU Operations Class 2 Drain Piping Material Class - 1 01PD007 will be applied to piping design.
						• Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.
						
						Operations and maintenance of the stormwater drainage system (Class 2) to reduce the risk of causing contaminated stormwater impacts includes:
						• Management of Class 2 stormwater in accordance with the DDA process.
						  ○ Class 2 stormwater in the SWHP is sampled and is disposed downhole if it meets the specified DDA discharge criteria.
						  ○ Class 2 stormwater collected outside of the SWHP is discharged to Class 3 drainage system only where there is no potential for PFAS contamination from firefighting foams and meets the DDA discharge criteria.
						• Underground drainage system components transporting potentially contaminated run-off will be managed as per the CMMS to ensure adequate leak detection.
						• SWHP is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.
						• Inspections of the drainage system as per the CMMS.
						• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
						
						Management of bunds drain valves and stormwater in bunds to reduce the risk of causing contaminated stormwater impacts includes:
						• Bund drain valves are maintained normally closed as per operating procedures.
						• Accumulated run-off or stormwater from bunds is managed as per the DDA process.
						  ○ A preliminary water quality assessment is completed to determine potential for contamination. Where there is a risk of contamination sampling occurs to determine the appropriate disposal pathway.
						  ○ Where there is potential for contamination with PFAS from fire-fighting foams there is no discharge to the Class 3 drainage system.
						
						Monitoring of stormwater drainage system (Class 2) to ensure appropriate management of the drainage system includes:
						• Biannual sampling and analysis of Class 2 stormwater within the SWHP.			

Surface and Groundwater	Surface Water	• Surface and groundwater contamination	Operations Project Activities	• Discharges of contaminated stormwater	Reduce the risk of causing contaminated stormwater impacts to vegetation,	The design of the stormwater drainage system (Class 3) includes control measures to reduce the risk of causing contaminated stormwater impacts includes, such as:	3	3	M

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
		• Contamination reaching the marine environment		from the stormwater drainage system into the environment	surface water, groundwater, terrestrial fauna, and subterranean fauna from the Class 3 drainage system within the TDF and prevent impacts outside the TDF	• Designed for uncontaminated stormwater from clean areas (Class 3 drainage) and overflow (post first flush volumes) from the Class 2 system at the GTP. Operations and maintenance of the stormwater drainage system (Class 3) to reduce the risk of causing contaminated stormwater impacts includes: • Inspections of the drainage system as per the CMMS. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality. Monitoring of stormwater drainage system (Class 3) to ensure appropriate management of the drainage system includes: • Periodic sampling of the Class 3 drainage system including during periods when the first flush occurs. Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning); • Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act.			
Subterranean Fauna	Surface Water	• Direct loss of troglofauna and habitat within GTP Footprint • Potential contamination of subterranean habitat • Reduced groundwater recharge under the GTP affecting humidity and groundwater in subterranean environment where surface water is diverted to drains.	Operations Project Activities	• Discharges of contaminated stormwater from the Class 3 drainage system into the environment • Releases of contaminated stormwater from bunded areas into Class 3 drainage system • Leakage from drainage system and	Reduce the risk of causing contaminated stormwater impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF.	The design of the stormwater drainage system (Class 1) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as: • Class 1 drainage system has been designed and will be maintained to ensure no direct Class 1 stormwater discharge into the environment. • Contaminated run-off from the Class 1 catchment area at the GTP is transferred via a closed piping system to the OWS and then piped to a CPI for oil/water separation. • Paving in areas of the GTP where spillages may occur and sloping into the appropriate collection systems or to a closed bund or sump. • An appropriate specification as per the ABU Operations Class 1 Drain Piping Material Class - 1 01PD009 will be applied to piping design. • Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.	4	4	L

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]

				holding ponds/sumps
				• Physical presence of sealed/hardstand areas associated with the Stormwater Drainage System
						Operations and Maintenance of stormwater drainage system (Class 1) to reduce the risk of causing contaminated stormwater impacts includes:
						• Remote Class 1 run-off will be collected and disposed of via a vacuum truck (or equivalent) to the Disposal Water Tanks, OWS or other appropriate tie in to the system.
						• Underground drainage system components transporting contaminated run-off will be managed to ensure adequate leak detection.
						• OWS is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.
						• Inspections of the drainage system as per the CMMS.
						• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
						
						The design of the stormwater drainage system (Class 2) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as.
						• An appropriate specification as per the ABU Operations Class 2 Drain Piping Material Class - 1 01PD007 will be applied to piping design.
						• Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.
						
						Operations and maintenance of the stormwater drainage system (Class 2) to reduce the risk of causing contaminated stormwater impacts includes:
						• Management of Class 2 stormwater in accordance with the DDA process.
						  ○ Class 2 stormwater in the SWHP is sampled and is disposed downhole if it meets the specified DDA discharge criteria:
						  ○ Class 2 stormwater collected outside of the SWHP is discharged to Class 3 drainage system only where there is no potential for PFAS contamination from firefighting foams and meets the DDA discharge criteria.
						• Underground drainage system components transporting potentially contaminated run-off will be managed as per the CMMS to ensure adequate leak detection.
						• SWHP is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.
						• Inspections of the drainage system as per the CMMS.
						• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
						
						Monitoring of stormwater drainage system (Class 2) to ensure appropriate management of the drainage system includes:			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]

						• Biannual sampling and analysis of Class 2 stormwater within the SWHP.
						
						The design of the stormwater drainage system (Class 3) includes control measures to reduce the risk of causing contaminated stormwater impacts, such as:
						• Designed for uncontaminated stormwater from clean areas (Class 3 drainage) and overflow (post first flush volumes) from the Class 2 system at the GTP.
						
						Operations and maintenance of the stormwater drainage system (Class 3) to reduce the risk of causing contaminated stormwater impacts includes:
						• Inspections of the drainage system as per the CMMS.
						• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
						
						Management of bunds drain valves and stormwater in bunds to reduce the risk of causing contaminated stormwater impacts includes:
						• Bund drain valves are maintained normally closed as per operating procedures.
						• Accumulated run-off or stormwater from bunds is managed as per the DDA process.
						  ○ A preliminary water quality assessment is completed to determine potential for contamination. Where there is a risk of contamination sampling occurs to determine the appropriate disposal pathway.
						  ○ Where there is potential for contamination with PFAS from firefighting foams there is no discharge to the Class 3 drainage system.
						
						Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include:
						• Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning);
						• Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners;
						• Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and
						• Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act..
						
						Monitoring of stormwater drainage system (Class 3) to ensure appropriate management of the drainage system includes:			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	EPOs	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						• Periodic sampling of the Class 3 drainage system, including during periods when the first flush occurs.			

Notes:

[1] L = Low, M = Medium, H = High

5.3.5 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from surface water management are summarised in Table 5-5.

Table 5-5: Environmental performance objectives, management measures, performance standards and measurement criteria –surface water

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of erosion and sediment carryover and erosion within the TDF and prevent impacts outside the TDF.	Operations Construction/ Infrastructure Projects	The design of the stormwater drainage system includes control measures to reduce soil erosion and sedimentation, such as: • Size, cross-sectional shape and gradient of channels designed to avoid scouring and sudden changes in velocity. • Lining of channels with velocities sufficient to cause significant scour and drop structures be constructed where slopes are steep. • Vegetation cover to ensure any collection and redistribution of flow minimises erosion. • Where there is insufficient vegetation cover, alternatives may include the use of jute mesh or geo-textile, rip-rap or stone pitching, gabions and grout-filled mattresses, concrete or concrete-filled bags, drop structures and chutes, pipes, base channels, weirs, ripping or 'moonscaping'. To ensure the ongoing effective operation of the stormwater drainage system, asset maintenance activities , such as: • Inspections of the drainage system as per the CMMS, and additional inspections during rainfall periods, where required. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as part of the maintenance regime to maintain functionality.	Stormwater drainage system is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce erosion and sediment carryover within the TDF and prevent impacts outside the TDF. Stormwater drainage system inspections and maintenance is completed as per the CMMS to reduce erosion and sediment carryover within the TDF and prevent impacts outside the TDF.	Pre-Start Up Safety Reviews (PSSR) (or equivalent) prior to handover to Operations, confirm that the design requirements outlined in the Management Measures have been met. Review of CMMS as per the ABU OE Assurance Plan (Level 2) to confirm visual inspections of the drainage system, removal of sediment and any repairs required as per the scheduled maintenance regime in the CMMS Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from erosion and sediment carryover.
Reduce the risk of alteration of the hydrological regime of the existing environment within the TDF and prevent impacts outside the TDF.	Operations Construction/ Infrastructure Projects	The design of the stormwater drainage system include control measures to reduce the risk of alteration of the existing hydrological regime, such as. • Maximising unpaved areas (where practicable) • Diverting and redistributing run-off high in the catchment • Minimising sediment carryover to the environment • Redistributing clean stormwater collected within the Class 3 drains via infiltration drains to ensure groundwater recharge. • Redistribution trenches to prevent runoff through channels or point sources • Repairs of damaged elements of the drain system to maintain functionality.	Stormwater drainage system is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk of alteration of the hydrological regime of the existing environment within the TDF and prevent impacts outside the TDF Stormwater drainage system inspections and maintenance is completed as per the CMMS to reduce the risk of alteration of the hydrological regime of the existing environment within the TDF and prevent impacts outside the TDF	PSSR (or equivalent) prior to handover top Operations, confirm that the design requirements outlined in the Management Measures have been met. Review of CMMS as per the ABU OE Assurance Plan (Level 2) to confirm visual inspections of the drainage system, removal of sediment and any repairs required as per the scheduled maintenance regime in the CMMS

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF.	Construction/ Infrastructure Projects	The design of the stormwater drainage system and stormwater segregation control measures: • Stormwater drainage system has been designed in accordance with the Gorgon Project Environmental Basis of Design (Ref. 70) to be a segregated system depending on the level of contamination or origin of intercepted surface water. • Class 1 – Contaminated Stormwater/Runoff. Sources expected to be contaminated, primarily with free oil. • Class 2 – Potentially Contaminated Stormwater/Runoff. Sources which have the potential to be contaminated with free oil or soluble chemicals. • Class 3 – Uncontaminated Stormwater/Runoff and overflow post first flush volumes. • Class 4 – Intercepted off-site uncontaminated runoff.	Stormwater drainage system is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF	PSSR (or equivalent) prior to handover to Operations, confirm that the design requirements outlined in the Management Measures have been met.
Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the Class 1 drainage system within the TDF and prevent impacts outside the TDF.	Operations Construction/ Infrastructure Projects	The design of the stormwater drainage system (Class 1) include control measures to reduce the risk of causing contaminated stormwater impacts, such as. • Class 1 drainage system has been designed and will be maintained to ensure no direct Class 1 stormwater discharge into the environment. • Contaminated run-off from the Class 1 catchment area at the GTP is transferred via a closed piping system to the OWS and then piped to a CPI for oil/water separation. • Paving in areas of the GTP where spillages may occur and sloping into the appropriate collection systems or to a closed bund or sump. • An appropriate specification as per the ABU Operations Class 1 Drain Piping Material Class - 1 01PD009 will be applied to piping design. • Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system. Operations and Maintenance of stormwater drainage system (Class 1) to reduce the risk of causing contaminated stormwater impacts includes: • Remote Class 1 run-off will be collected and disposed of via a vacuum truck (or equivalent) to the Disposal Water Tanks, OWS or other appropriate tie in to the system. • Underground drainage system components transporting contaminated run-off will be managed to ensure adequate leak detection. • OWS is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS. • Inspections of the drainage system as per the CMMS. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.	Stormwater drainage system (Class 1) is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF Stormwater drainage system inspections and maintenance is completed as per the CMMS to reduce the risk of to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF	PSSR (or equivalent) prior to handover to Operations, to confirm that the design requirements outlined in the Management Measures have been met. Review of DDA records as per as per the ABU OE Assurance Plan (Level 2).DDA confirm that management of remote Class 1 run-off is disposed of in the appropriate Class 1 disposal system or tie in to the system. Review of CMMS as per the ABU OE Assurance Plan (Level 2) to confirm visual inspections of the drainage system, removal of sediment and any repairs required as per the scheduled maintenance regime in the CMMS. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from contaminated stormwater.
Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial	Operations Construction/ Infrastructure Projects	The design of the stormwater drainage system (Class 2) include control measures to reduce the risk of causing contaminated stormwater impacts, such as:	Stormwater drainage system (Class 2) is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk	PSSR (or equivalent) prior to handover to Operations, to confirm that the design requirements outlined in the Management Measures have been met.

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria

fauna, and subterranean fauna from the Class 2 drainage system within the TDF and prevent impacts outside the TDF.		• An appropriate specification as per the ABU Operations Class 2 Drain Piping Material Class - 1 01PD007 will be applied to piping design.
		• Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.
		
		Operations and Maintenance of stormwater drainage system (Class 2) to reduce the risk of causing contaminated stormwater impacts includes:
		• Management of Class 2 stormwater in accordance with the DDA process.
		  ○ Class 2 stormwater in the SWHP is sampled and is disposed downhole if it meets the specified DDA discharge criteria:
		  ○ Class 2 stormwater collected outside of the SWHP is discharged to Class 3 drainage system only where there is no potential for PFAS contamination from firefighting foams and meets the DDA discharge criteria.
		• Underground drainage system components transporting potentially contaminated run-off will be managed as per the CMMS to ensure adequate leak detection.
		• SWHP is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.
		• Inspections of the drainage system as per the CMMS.
		• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
		
		Monitoring of stormwater drainage system (Class 2) to ensure appropriate management of the drainage system includes:
		• Biannual sampling and analysis of Class 2 stormwater within the SWHP.
			causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF
			
			Stormwater drainage system operation, inspections and maintenance is completed as per the CMMS to reduce the risk of to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF.
			
			Stormwater drainage system monitoring is completed as per the CMMS to reduce the risk of to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF.
				Review of DDA records as per as per the ABU OE Assurance Plan (Level 2).DDA confirm that management of Class 2 stormwater in accordance with the DDA process.
				
				Review of CMMS as per the ABU OE Assurance Plan (Level 2) to confirm visual inspections of the drainage system, removal of sediment and any repairs required as per the scheduled maintenance regime in the CMMS.
				
				ABU OE Assurance Plan (Level 2).records confirm monitoring as of the stormwater drainage system as outlined in the Management Measures is completed.
				
				Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from contaminated stormwater.

Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the Class 3 drainage system within the TDF and prevent impacts outside the TDF.	Operations Construction/ Infrastructure Projects	The design of the stormwater drainage system (Class 3) include control measures to reduce the risk of causing contaminated stormwater impacts such as: • Designed for uncontaminated stormwater from clean areas (Class 3 drainage) and overflow (post first flush volumes) from the Class 2 system at the GTP. Operations and maintenance of the stormwater drainage system (Class 3) to reduce the risk of causing contaminated stormwater impacts includes: • Inspections of the drainage system as per the CMMS. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality. Monitoring of stormwater drainage system (Class 3) to ensure appropriate management of the drainage system includes: Periodic sampling of the Class 3 drainage system including during periods when the first flush occurs.	Stormwater drainage system (Class 3) is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF. Stormwater drainage system operation, inspections and maintenance is completed as per the CMMS to reduce the risk of to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF. Stormwater drainage system monitoring is completed as per the CMMS to reduce the risk of to reduce the risk causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the stormwater drainage system within the TDF and prevent impacts outside the TDF.	PSSR (or equivalent) prior to handover to Operations, to confirm that the design requirements outlined in the Management Measures have been met. Review of DDA records as per as per the ABU OE Assurance Plan (Level 2). DDA confirm that management of Class 2 stormwater in accordance with the DDA process. Review of CMMS as per the ABU OE Assurance Plan (Level 2) to confirm visual inspections of the drainage system, removal of sediment and any repairs required as per the scheduled maintenance regime in the CMMS. ABU OE Assurance Plan (Level 2).records confirm monitoring as of the stormwater drainage system as outlined in the Management Measures is completed. ABU OE Assurance Plan (Level 2) records confirm that obligations and management processes under the WA Contaminated Sites Act

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
		Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning); • Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act.	Contaminated sites management processes are implemented in accordance with the proposed management measures to reduce risk of impacts from contaminated soil within the TDF and prevent impacts outside the TDF.	are fulfilled, including requirements outlined in the management measures. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from contaminated stormwater.

5.4 Environmental Aspect: Hazardous materials

5.4.1 Description of Activities

The presence and operation of this Project will interact with the environment resulting in the environmental aspect of hazardous materials.

Activities resulting in the hazardous materials aspect include, but are not limited to selection, storage, handling and incident response:

- Storage tanks for hydrocarbons and other process chemicals
- Concrete Batching Plant and WTS
- Dangerous Goods Storage areas and Mercury Management facilities
- Stormwater drainage and bunds around storage tanks (refer to Section 5.3)
- Bridging and Permanent WWTP and Reverse Osmosis Plant (refer to Section 5.11)

At the GTP, various types and quantities of hazardous materials are stored onsite including hydrocarbons (condensate and refrigerants) and other process chemicals. Large quantities of hazardous materials located at the GTP are described in Table 5-6 below.

Table 5-6: Hazardous materials – type and quantity – stored at the GTP

Material Description	Quantity
Condensate tanks	4 x 38,000 m^3
LNG tanks	2 x 180,000 m^3
MEG (lean) tanks	4 x 2,403 m^3
MEG (rich) tanks	4 x 4,719 m^3 rich-MEG
aMDEA tank	2,792 m^3
HCl tank	319 m^3
NaOH tank	319 m^3
Ethane tank	602 m^3
Propane tank	2,443 m^3
Diesel tanks	7 x 110 m^3 2 x 160 m^3 tanks

Hazardous materials are routinely transferred, stored and used for a range of activities and are stored in areas designed to prevent loss of containment to the environment.

The bridging and permanent WWTP contains tanks for the storage and treatment of sewage. These include treatment trains consisting of equaliser tanks, anoxic and aerobic treatment tanks, membrane bioreactor tanks, aerobic digester tanks and chemical dosing tanks. Dangerous Goods (DG) are detailed in the current DG Site Licence DGS021356. Risk assessments relating to the storage, handling and processing of DG at the Gorgon MHF are prepared, reviewed and revised in accordance with the requirements of the Dangerous Goods (Storage and Handling of Non-explosives) Regulations 2007.

The WTS receives, stores and handles liquid wastes including hydrocarbons, paints, resins, acids, alkalis and other chemicals. These waste streams are usually received in small containers and stored in concrete or temporary bunds. The Part V Licence includes conditions on the storage of hazardous wastes to minimise any potential impacts to the environment. These conditions require hazardous wastes at the WTS to be stored within enclosed vessels and clearly labelled.

Beyond the GTP and WTS, hazardous materials are also routinely transferred, stored and used for a range of activities, including (but not limited to):

- Operation of vehicles and equipment
- Operation of the CO_2 Injection System
- Waste collection, storage and management
- Well and pipeline maintenance activities.

5.4.2 Potential Impact/ Consequence Summary

There is no abstraction of groundwater from, or injecting liquids into, the superficial aquifer on Barrow Island. Therefore, the potential pathways reasonably foreseeable for impacts to groundwater are via either spills or leaks.

Spills and/ or leaks from the storage of hazardous materials and pipework may result in hazardous materials entering the environment and potentially lead to:

- soil, surface water and groundwater contamination and potentially reaching the marine environment.
- impacts to vegetation, fauna, troglofauna and stygofauna.

Incident data for unplanned spills/releases of liquid hazardous materials since completion of the main construction phase, shows that the majority of these events have been minor in nature. Eleven events have been recorded since the completion of construction which were classified above a level 1 incident (based on spill volume), all of which occurred within the GTP. Of these events, six were to secondary containment, three were to the class 2 drainage system and two were to open ground. All eleven events were investigated, with appropriate corrective actions identified.

Impacts to surface water regimes and management measures are outlined in Section 5.3. Impacts to fauna and management measures are outlined in Section 5.5.2.1.

5.4.3 Residual Risk and Key Management Measures

5.4.3.1 Bunding

Bunding is provided around hazardous liquid material storage, including in chemical, hydrocarbon, and hazardous waste storage areas and areas where spills of hazardous liquids may occur.

The following is a summary of the key design requirements for temporary and permanent bunds. Prior to the commencement of operations it was verified that the below design requirements were met:

- All hazardous liquids will be stored within secondary containment.

- Permanent and temporary bunds will be constructed using waterproof reinforced concrete, steel, or an alternative material, which is deemed to be appropriate for the specific application.
- All components of bunds will be impervious and chemically resistant to the liquid contained. Bunds with the potential to collect flammable and combustible substances will be constructed of fire-resistant materials.
- Tanks containing hazardous liquid will incorporate an adequate leak detection system designed to the American Petroleum Institute (API) Standard Welded Steel Tanks for Oil Storage (Ref. 15).

Bunding and curbing design is intended to incorporate the requirements of the following standards, where relevant and practicable:

- AS 1940:2017: The Storage and Handling of Flammable and Combustible Liquids (Ref. 16)
- API 650: Welded Steel Tanks for Oil Storage (Ref. 15).

5.4.3.2 Material selection

CAPL's Hazardous Materials Management Procedure (Ref. 63) outlines the process for Health, Safety and Environment (HSE) assessment and approval of hazardous materials. Hazardous materials include those classified as 'hazardous substances' or 'dangerous goods'.

The Hazardous Materials Management Procedure is designed to:

- assess hazardous materials requested for procurement for their HSE risks.
- ensure that appropriate controls are identified for using procured hazardous materials and that these controls are communicated to the requestors of the materials and end users at locations within CAPL's operations.
- ensure no product includes CAPL prohibited ingredients.
- ensure substitutes were considered if a product contains CAPL restricted ingredients (e.g. fire fighting foams containing PFAS).
- wherever practicable, non-hazardous (or least hazardous) materials will be selected for use on site.

The chemical selection process ensures impacts and risks associated with chemical discharge are reduced to levels that are ALARP and acceptable, while meeting operational performance requirements.

CAPL has been actively managing the risks associated with PFAS for many years. Efforts have focused on removing potential sources of PFAS by changing out firefighting foams to less harmful and fluorine free options, as suitable replacements have become available.

5.4.3.3 Storage, handling and training

In addition to the measures outlined above, management of potential impacts from hazardous materials, where reasonably practicable, include the additional measures listed in the subsection below.

- Tanks and machinery equipped with appropriate spill and leak protection devices in accordance with applicable design standards and specifications.

- Bulk transfer lines fitted with dry break couplings. These will be fit-for-purpose, not outside design life limits and regularly checked for damage to prevent leaks.
- Legal requirements pertaining to hazardous materials and substances adhered to for packaging, segregating, storing, transporting, transferring, and handling.
- An inventory of hazardous materials stored at work sites is maintained.
- Major maintenance of vehicles and equipment is conducted at designated maintenance areas.
- Personnel are trained in their roles, functions and responsibilities, including emergency response, prior to refuelling or fuel transfer.

5.4.3.4 Unplanned releases

In the event of an unplanned release, management of potential impacts include the measures below:

- Sufficient and appropriate equipment, materials, and resources are available and maintained, to respond to a spill incident.
- Upon detection of a spill or leak, the person shall report the incident in accordance with the Chevron Incident Investigation and Reporting Process (Ref. 33).
- Spills are contained and cleaned up immediately and product Safety Data Sheets (SDSs) consulted as applicable to guide clean-up actions.

Where the release from hazardous materials has the potential for significant environmental impacts, then the incident would be managed as per the ABU Emergency Management Standardized OE Process (Ref. 34) outlined in Section 6.4.

5.4.4 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from hazardous materials is provided in Table 5-7.

Table 5-7: Risk assessment summary –hazardous materials

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]

Soil & Landform
Surface water & Groundwater
Subterranean Fauna
	Hazardous Materials	• Soil contamination
		• Surface water and groundwater contamination
		• Contamination reaching the marine environment
		• Local loss of stygofauna
		• Potential contamination of subterranean habitat
		• Acute toxicity to troglofaunal and/or stygofauna
			Operations
			Construction/ Infrastructure Projects
				• Spill during storage and transport of fuel or hazardous material
				• Spill or leak during waste storage and disposal
				• Failure of plant, equipment, or pipelines
				• Leakage of storage tanks and bunds
					Reduce the risk of causing impacts to soil, vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the storage and handling of hazardous materials within the TDF and prevent impacts outside the TDF.	Hazardous material storage is designed and constructed to reduce risks of spills and releases, and include:
						• Permanent and temporary bunds:
						  ○ Constructed using waterproof reinforced concrete, steel, or an alternative material, which is deemed to be appropriate for the specific application.
						  ○ Impervious and chemically resistant to the liquid contained. Bunds with the potential to collect flammable and combustible substances will be constructed of fire-resistant materials.
						• Bunding and curbing design is intended to incorporate the requirements of the following standards, where relevant and practicable:
						  ○ AS 1940:2017: The Storage and Handling of Flammable and Combustible Liquids (Ref. 16)
						  ○ API 650: Welded Steel Tanks for Oil Storage (Ref. 15).
						To ensure the ongoing effective storage and handling of hazardous materials, operational procedures shall include:
						• Routine inspection to confirm that hazardous liquids are stored within secondary containment.
						• Bulk transfer lines fitted with dry break couplings. These will be fit-for-purpose, not outside design life limits, and regularly checked for damage to prevent leaks.
						• Chemicals selected and assessed in accordance with the ABU Hazardous Materials Management Procedure (Ref. 63)
							4	4	L

					Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna associated with any unplanned releases of hazardous materials within the TDF and prevent impacts outside the TDF.	To reduce the risks of spills and releases of hazardous materials to soil, surface and groundwater and subterranean fauna from unplanned releases, management measures , such as: • All spills will be recorded as per Chevron Incident Investigation and Reporting Process (Ref. 33) • Sufficient and appropriate equipment, materials, are available and maintained, to respond to a spill incident • Spill response will be conducted in accordance with the Procedure for Use of Spill Kits Located in Gorgon Operation Areas (Ref. 64) or equivalent procedure.			

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						• Personnel responsible for refuelling or fuel transfer will be trained in their roles, functions and responsibilities.			

Fauna and Vegetation	Hazardous Materials	• Localised loss of vegetation
		• Reduced plant growth
		• Soil contamination affecting regrowth
		• Altered vegetation association
		• Smothering or acute toxicity to habitat and/or fauna
		• Chronic toxicity to sensitive habitat and/or fauna
			Operations
			Construction/ Infrastructure Projects
				• Spill during storage and transport of fuel or hazardous material
				• Spill or leak during waste storage and disposal
				• Failure of plant, equipment, or pipelines
				• Leakage of storage tanks and bunds
					Reduce the risk of causing impacts to soil, vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the storage and handling of hazardous materials within the TDF and prevent impacts outside the TDF.	Hazardous material storage is designed and constructed to reduce risks of spills and releases, and include:
						• Permanent and temporary bunds:
						  ○ Constructed using waterproof reinforced concrete, steel, or an alternative material, which is deemed to be appropriate for the specific application.
						  ○ Impervious and chemically resistant to the liquid contained. Bunds with the potential to collect flammable and combustible substances will be constructed of fire-resistant materials.
						• Bunding and curbing design is intended to incorporate the requirements of the following standards, where relevant and practicable:
						  ○ AS 1940:2017: The Storage and Handling of Flammable and Combustible Liquids (Ref. 16)
						  ○ API 650: Welded Steel Tanks for Oil Storage (Ref. 15).
						To ensure the ongoing effective storage and handling of hazardous materials, operational procedures shall include:
						• Routine inspection to confirm that hazardous liquids are stored within secondary containment.
						• Bulk transfer lines fitted with dry break couplings. These will be fit-for-purpose, not outside design life limits, and regularly checked for damage to prevent leaks.
						• Chemicals selected and assessed in accordance with the ABU Hazardous Materials Management Procedure (Ref. 63)
							4	4	L

					Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna associated with any unplanned releases of hazardous materials within the TDF and prevent impacts outside the TDF.	To reduce the risks of spills and releases of hazardous materials to soil, surface and groundwater and subterranean fauna from unplanned releases, management measures such as: • All spills will be recorded as per Chevron Incident Investigation and Reporting Process (Ref. 33) • Sufficient and appropriate equipment, materials, are available and maintained, to respond to a spill incident • Spill response will be conducted in accordance with the Procedure for Use of Spill Kits Located in Gorgon Operation Areas (Ref. 64) or equivalent procedure. • Personnel responsible for refuelling or fuel transfer will be trained in their roles, functions and responsibilities.			

Notes:

1 L = Low, M = Medium, H = High

5.4.5 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from hazardous materials are summarised in Table 5-8.

Table 5-8: Environmental performance objectives, management measures, performance standards and measurement criteria –hazardous materials

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria

Reduce the risk of causing impacts to soil, vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the storage and handling of hazardous materials within the TDF and prevent impacts outside the TDF.	Operations
	Construction/ Infrastructure Projects
		Hazardous material storage is designed and constructed to reduce risks of spills and releases, and include:
		• Permanent and temporary bunds:
		  ○ Constructed using waterproof reinforced concrete, steel, or an alternative material, which is deemed to be appropriate for the specific application.
		  ○ Impervious and chemically resistant to the liquid contained. Bunds with the potential to collect flammable and combustible substances will be constructed of fire-resistant materials.
		• Bunding and curbing design is intended to incorporate the requirements of the following standards, where relevant and practicable:
		  ○ AS 1940:2017: The Storage and Handling of Flammable and Combustible Liquids (Ref. 16)
		  ○ API 650: Welded Steel Tanks for Oil Storage (Ref. 15).
		To ensure the ongoing effective storage and handling of hazardous materials, operational procedures shall include:
		• Routine inspection to confirm that hazardous liquids are stored within secondary containment.
		• Bulk transfer lines fitted with dry break couplings. These will be fit-for-purpose, not outside design life limits, and regularly checked for damage to prevent leaks.
		• Chemicals selected and assessed in accordance with the ABU Hazardous Materials Management Procedure (Ref. 63)
			Hazardous material storage is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk of causing impacts to soil, vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the storage and handling of hazardous materials within the TDF and prevent impacts outside the TDF.
			
			Storage and handling of hazardous materials is is managed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk of causing impacts to soil, vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from the storage and handling of hazardous materials within the TDF and prevent impacts outside the TDF.
				Pre-Start Up Safety Reviews (PSSR) (or equivalent) prior to handover to Operations, confirm that the design and construction requirements outlined in the Management Measures have been met.
				
				Review of CMMS as per the ABU OE Assurance Plan (Level 2) to confirm visual inspections of bulk transfer lines.
				
				ABU OE Assurance Plan (Level 2) confirms inspections completed of hazardous materials storage.
				
				ABU OE Assurance Plan (Level 2) confirms chemicals used have been selected and assessed in accordance with the ABU Hazardous Materials Management Procedure (Ref. 63)

Reduce the risk of causing impacts to vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna associated with any unplanned releases of hazardous materials within the TDF and prevent impacts outside the TDF.	Operations Construction/ Infrastructure Projects	To reduce the risks of spills and releases of hazardous materials to soil, surface and groundwater and subterranean fauna from unplanned releases, management measures such as: • All spills will be recorded as per Chevron Incident Investigation and Reporting Process (Ref. 33) • Sufficient and appropriate equipment, materials, are available and maintained, to respond to a spill incident • Spill response will be conducted in accordance with the Procedure for Use of Spill Kits Located in Gorgon Operation Areas (Ref. 64) or equivalent procedure. • Personnel responsible for refuelling or fuel transfer will be trained in their roles, functions and responsibilities.	Storage and handling of hazardous materials is designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk of causing impacts to soil, vegetation, surface water, groundwater, terrestrial fauna, and subterranean fauna from unplanned releases of hazardous materials within the TDF and prevent impacts outside the TDF.	ABU OE Assurance Plan (Level 2) confirms recording of incidents as per Chevron Incident Investigation and Reporting Process (Ref. 33). ABU OE Assurance Plan (Level 2) confirms that spill response is conducted in accordance with the Procedure for Use of Spill Kits Located in Gorgon Operation Areas (Ref. 64) or equivalent procedure. ABU OE Assurance Plan (Level 2) confirms sufficient and appropriate spill response equipment and availability. Training records confirm relevant refuelling and fuel transfer training completed by relevant personnel.

5.5 Environmental Aspect: Physical presence and interaction

5.5.1 Description of Activities

The physical presence of the Terrestrial Facilities and associated equipment and personnel will interact with the environment and result in the environmental aspect of physical presence and interaction. Activities resulting in the physical presence and interaction aspect include, but are not limited to:

- Vehicle movements on road network and terrestrial facilities
- Operation of equipment and machinery
- Workforce activities/ personnel interactions
- Presence of infrastructure and cleared areas
- Light emissions. Further details are included in Section 5.7.

5.5.2 Potential Impact/ Consequence Summary

Physical presence and interactions have the potential to:

- cause injury or mortality to fauna through physical interaction between machinery, vehicles and personnel
- cause injury of mortality to fauna through entrapment in or collision with infrastructure
- cause behavioural disturbance or obstruction of fauna movements
- result in dust generation, potentially causing localised reduction in air quality
- cause erosion/sedimentation in areas adjacent to disturbed areas (assessed under Clearing and Earthworks and Surface Water Management sections [Sections 5.2 and 5.3]; not discussed further here)
- cause disturbance to natural drainage patterns (assessed under Clearing and Earthworks and Surface Water Management sections [Sections 5.2 and 5.3]; not discussed further here).

5.5.3 Residual Risk and Key Management Measures

5.5.3.1 Fauna

These impacts can have consequences on the fitness and/or survivability of individual animals, or on local populations if important behaviours are interrupted over an extended period.

Barrow Island provides areas of significant fauna habitat (as described in the TSBSEIR [Ref. 13]) and mobile fauna (including conservation-significant mammal, bird, or reptile species) also have the potential to be encountered across the facility.

Infrastructure associated with Terrestrial Facilities may provide shade, shelter or food and water sources which attract fauna and then present a risk of injury or mortality (e.g. due to entrapment or collision), disturb normal behavioural patterns or cause illness (e.g. due to consumption of human food).

Risks of fauna strike as a result of movement of vehicles and equipment on the road network are greatest to mammal species between dusk and dawn when

these species are most active and visibility is low (Ref. 48). Bird and reptile species may also forage or bask on the road network during daylight hours and so may also be vulnerable, particularly if they are slow-moving (Ref. 48), although these species are more likely to be visible in daylight and therefore easier to avoid.

In general, fauna mortalities caused by physical interaction are not expected to exert significant pressure on fauna at a population level (Ref. 48). Event data for fauna deaths within the TDF captured since completion of the main construction phase, show that the predominant cause of death for EPBC species in the TDF is vehicle strike, accounting on average (between 2015 and 2023) for ~85% of deaths. The second most common cause of death for EPBC species is interaction related causes such as entrapment or collision, accounting for ~10% of deaths. The mortality counts for the four main fauna species (Golden Bandicoot, Barrow Island Spectacled Hare-wallaby, Barrow Island Boodie, and Barrow Island Euro) represent only a small proportion of estimated Barrow Island abundance for these species (Ref. 47). Fauna monitoring undertaken since Project commencement supports the expectation that impacts to fauna as a result of physical presence and interaction are more likely at an individual level than at a population level. No impacts to the populations of monitored fauna, that are attributable to the Project, have been detected through the fauna monitoring programs conducted since Project commencement (Ref. 47; Ref. 57). Ongoing monitoring, undertaken in accordance with the TSEMP, will continue to inform CAPL's understanding of risk to fauna populations on Barrow Island.

Management measures to reduce fauna access and entrapment will be assessed for each situation and will depend on the site conditions and the nature of the facility/ infrastructure. Management measures may include, but are not limited to, fauna exclusion through lids, covers or fencing, fauna exit structures such as ramps, ladders or mats, installation of bird deterrents (e.g. above the GTP SWHP) and regular inspections of open pits, drains and ponds. Site protocols, communicated through awareness campaigns, shall include measure to reduce fauna attraction to terrestrial facilities, such as restrictions on where food can be consumed, awareness on the need for keeping doors to buildings and containers shut, ensuring waste receptacles that may attract fauna are covered or closed and minimising availability of, or access to, persistent water sources.

The management of traffic in relation to fauna is required under Condition 7.6.iii of MS 800 and MS 769, and Condition 6.6.iii of EPBC Reference: 2003/1294 and 2008/4178, and is described in detail in the Traffic Management Common User Procedure (Ref. 26).

Management of fauna handling and other secondary impacts to fauna are required under Condition 7.6.ii and 7.6.iii of MS 800 and MS 769, and Condition 6.6.ii and 6.6.iii of EPBC Reference: 2003/1294 and 2008/4178, and are described in detail in the Fauna Handling and Management Common User Procedure (Ref. 24).

5.5.3.2 Dust

Activities such as vehicle movements and presence of cleared areas have the potential to generate dust. Dust was identified during the environmental impact assessment process as an aspect that may have an indirect impact on vegetation and was previously a monitoring program included within the TSEMP (Ref. 22). After 5 years of monitoring dust impact to vegetation on Barrow Island (2009–2014), it was concluded that there was no significant relationship between

measures of plant stress and dust load scores (Ref. 56). Plant health consistently displayed a distinct decline during monitoring undertaken after prolonged dry periods, with marked improvements in health recorded during surveys following rainfall. The strong correlation between rainfall and plant health indicates that rainfall is most likely the main driver affecting the health of plants. The monitoring of dust impact to vegetation ceased in 2015, following consultation with DBCA and the OEPA.

The consequence of localised reduction in air quality from dust generation related to physical presence and interaction is considered negligible and managed from an employee exposure / nuisance impact, rather than due to potential environmental risk.

5.5.4 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from physical presence and interaction is provided in Table 5-9.

Table 5-9: Risk assessment summary –physical presence and interaction

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Terrestrial Fauna	Physical Presence and Interaction	• Direct behavioural disturbance • Injury or fatality (i.e. road kill, fauna entrapment) • Possible obstruction of fauna movements • Habitat fragmentation and habitat loss	All	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Workforce activities / personnel interaction with fauna • Presence of infrastructure, including sources of entrapment (e.g. open pits, trenches, bins) • Presence of infrastructure causing obstruction to movement • Presence of infrastructure, including anthropogenic food sources, shade and shelter	Reduce the risk of injury or mortality to protected terrestrial fauna species as a result of physical presence and interaction within the TDF and prevent population impacts to protected terrestrial fauna species as a result of physical presence and interaction outside the TDF	To reduce impacts from vehicle movements the Traffic Management Common User Procedure (Ref. 26) shall be implemented, including: • Personnel can only drive if they hold a current and valid driver's licence (or equivalent) and have completed driver training and awareness • Monitoring and management of light vehicle speeds via the In-vehicle Monitoring System (IVMS) • Speed limits are restricted to 60 km/h during the day and 40 km/h between dusk and dawn hours. Fauna handling is undertaken in accordance with Fauna Handling Common User Procedure, including: • All worksite personnel and visitors are to be inducted regarding proper response to wildlife encounters (including physical interaction with fauna, littering, feeding, approaching and unexpected fauna encounters). • Fauna handling undertaken by personnel trained in handling, treating and/or euthanising fauna. • Records shall be kept of dead, injured, captured, entrapped, stranded, or entangled fauna. To ensure identification of appropriate fauna management measures, Incident Investigation	2	4	M

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
						and Reporting procedures shall include: • Investigation of fauna incidents deemed significant. • Identification of appropriate corrective actions and/or additional management measures.			
			Operations Construction/ Infrastructure Projects	• Presence of infrastructure, including sources of entrapment (e.g. open pits, trenches, bins) • Presence of infrastructure causing obstruction to movement • Presence of infrastructure, including anthropogenic food sources, shade and shelter		Infrastructure presenting a risk of entrapment (e.g. pits, sumps, gutters, trenches and drains) shall include fauna exclusion methods (such as lids, covers, doors or fencing, bird deterrents) and/or fauna exit structures (such as ramps, ladders or mats) as relevant to the nature of the infrastructure and entrapment risk. To reduce fauna attraction to terrestrial facilities, site protocols shall include: • Restrictions on where food can be consumed • Controls on availability and/or access to persistent water sources • Waste receptacles that may attract fauna or generate windblown rubbish will be covered or closed			
Air Quality	Physical Presence and Interaction	• Localised reduction in air quality	Operations Construction/ Infrastructure Projects Rehabilitation	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Presence of unsealed cleared areas	NA	NA - Standard management measures required for managing employee exposure/ nuisance impacts.	6	2	L

Notes:

[1] L = Low, M = Medium, H = High

5.5.5 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from physical presence and interaction are summarised in Table 5-10.

Table 5-10: Environmental performance objectives, management measures, performance standards and measurement criteria –physical presence and interaction

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of injury or mortality to protected terrestrial fauna species as a result of physical presence and interaction within the TDF and prevent population impacts to protected terrestrial fauna species as a result of physical presence and interaction outside the TDF	All	To reduce impacts from vehicle movements the Traffic Management Common User Procedure (Ref. 26) shall be implemented, including: • Personnel can only drive if they hold a current and valid driver's licence (or equivalent) and have completed driver training and awareness • Monitoring and management of light vehicle speeds via the In-vehicle Monitoring System (IVMS) • Speed limits are restricted to 60 km/h during the day and 40 km/h between dusk and dawn hours.	Vehicle and equipment movements are undertaken in accordance with the relevant management measures outlined in the TMCUP to reduce the risk of causing impacts to protected terrestrial fauna species inside the TDF.	Records of personnel who are approved to drive on Barrow Island are available and confirm valid driver's licence in place and completion of driver training. IVMS data demonstrates that vehicle speeds are being tracked and managed. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from physical presence and interaction.
	All	Fauna handling is undertaken in accordance with Fauna Handling Common User Procedure, including: • All worksite personnel and visitors are to be inducted regarding proper response to wildlife encounters (including physical interaction with fauna, littering, feeding, approaching and unexpected fauna encounters). • Fauna handling undertaken by personnel trained in handling, treating and/or euthanising fauna. • Records shall be kept of dead, injured, captured, entrapped, stranded, or entangled fauna.	All fauna handling is undertaken in accordance with the relevant management measures outlined in the FHCUP to reduce the risk of causing impacts to protected terrestrial fauna species inside the TDF.	Training records confirm that all personnel have completed a site induction that contains information on proper response to wildlife. Wildlife management database records confirm that all handling of live or injured fauna is conducted by trained fauna handlers. ABU OE Assurance Plan (Level 2) records confirm that management measures outlined in FHCUP have been met. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from physical presence and interaction.
	All	To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.	All fauna incidents or observations deemed significant are investigated and appropriate corrective actions and/or additional management measures identified.	Records from Company Incident Management System available and confirm all significant fauna incidents or observations were investigated.
	Operations Construction/ Infrastructure Projects	Infrastructure presenting a risk of entrapment (e.g. pits, sumps, gutters, trenches and drains) shall include fauna exclusion methods (such as lids, covers, doors or fencing, bird deterrents) and/or fauna exit structures (such as ramps, ladders or mats) as relevant to the nature of the infrastructure and entrapment risk.	All infrastructure presenting a risk of entrapment utilizes the proposed management measures or similar environmentally appropriate options to reduce risk of injury or mortality to protected terrestrial fauna species.	Periodic visual inspections of civil works undertaken in accordance with the ABU OE Assurance Plan (Level 2) confirm appropriate management measures in place on infrastructure presenting a risk of entrapment. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from physical presence and interaction.

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
	Operations Construction/ Infrastructure Projects	To reduce fauna attraction to terrestrial facilities, site protocols shall include: • Restrictions on where food can be consumed • Controls on availability and/or access to persistent water sources • Waste receptacles that may attract fauna or generate windblown rubbish will be covered or closed	Site protocols are implemented utilising the proposed management measures or similar environmentally appropriate options to reduce fauna attraction to terrestrial facilities, thereby reducing risk of injury or mortality to protected terrestrial fauna species within the TDF.	Periodic visual inspections of civil works undertaken in accordance with the ABU OE Assurance Plan (Level 2) confirm that requirements for reducing fauna attraction to terrestrial facilities outlined in management measures have been met.

5.6 Environmental Aspect: Atmospheric emissions

5.6.1 Out of Scope Activities

An Air Quality Management Plan (Ref. 21) is required under Condition 29 of MS 800. The objectives of this Plan, as stated in Condition 29.2 of MS 800 are to:

i ensure air quality meets appropriate standards for human health in the workplace

ii ensure air emissions from the GTP operations do not pose a risk of Material or Serious Environmental Harm to the flora, vegetation communities, fauna, and subterranean fauna of Barrow Island

Noting the clear cross over with the objectives of this Plan, assessment of the risk related to air emissions from the GTP causing impact to the terrestrial and subterranean environment has not been assessed further in this Plan.

Concrete crushing activities are regulated under Part V of the EP Act, as such management measures will be managed in accordance with permits received from DWER and have not been considered further in this Plan.

5.6.2 Description of Activities

The presence and operation of this Project will interact with the environment resulting in the environmental aspect of atmospheric emisisons. Other than the out of scope activities outlined above, activities resulting in the atmospheric emissions aspect include, but are not limited to, the presence and operation of the following:

- Operation and maintenance of CO_2 injection system
- Unplanned releases from CO_2 injection system
- Moving vehicles and equipment on the road network and on terrestrial facilities
- Wind erosion from roads and cleared areas

5.6.3 Potential Impact/ Consequence Summary

Impacts from air emissions can be indirect or direct, and include:

- adverse impacts on the health of flora and fauna through dust deposition and inhalation
- localised and temporary reduction in air quality
- localised asphyxiation hazard to terrestrial fauna in the event that an unplanned CO_2 release settles temporarily in low-lying areas
- acute impacts to birds if they are exposed to a CO_2 plume from an unplanned release from the CO_2 Injection System.

5.6.4 Residual Risk and Key Management Measures

5.6.4.1 CO_2 Injection System

Potential air emissions from the CO_2 injection system included planned and unplanned venting of hydrocarbon gas from pressure management wells and

unplanned releases such as leaks from pipeline/ well defects or a loss of well control.

Planned venting of hydrocarbon gas is not continuous, only required under circumstances such as start-up, well ramp ups or ramp downs and during upset or non-routine conditions. The worst case monthly volume of gas vented is expected to be in the order of ~8,000 m^3 (~135 tonnes CO_2-e) per Pressure Management Drill Centre. Modelling conducted to verify the behaviour of the hydrocarbon gas plume indicates that upon release, the dispersion of the hydrocarbon into the atmosphere is so rapid (Ref. 49) that any environmental impacts would be directly correlated and restricted to the release location. Design elements such as height of vent stacks and inclusion of a vent restriction orifice at the annulus vent line optimise dispersion and control the rate of any planned venting. Given the design controls, and that low volumes of hydrocarbon gas will be vented over short periods of time, reduction in air quality from planned venting will be temporary and localised and any potential impacts to sensitive receptors are expected to be incidental.

Both a leak from a pipeline or well defect and a loss of well control (LOWC) event are considered highly unlikely during routine operations. If an above-ground release occurs in an open environment, the CO_2 is generally expected to undergo rapid mixing with the surrounding air and dispersion by the wind. However, in the absence of wind, the CO_2 gas, which is denser than air, has the potential to settle at ground level in low-lying areas, depressions, and burrows (Ref. 50; Ref. 51), where it may persist for a short period until effective mixing and dispersion occurs. CO_2 concentrations in air greater than 5% have the potential to cause respiratory problems if fauna are exposed for longer than five minutes, and 25–30% concentrations can lead to a loss of consciousness within a few breaths, with fatality soon after (Ref. 52; Ref. 53; Ref. 54; Ref. 55). Therefore, even during calm (no wind) conditions, which are not common on Barrow Island, the worst-case impact is the potential for individual/small numbers of fauna to suffer temporary respiratory issues. Asphyxiation by CO_2 settling at ground level in low-lying areas, depressions, and burrows close to the release is not expected given rapid dispersion and the physical environment associated with Barrow Island.

Management measures such as inspection, maintenance and repair programs in place and the leak detection system (LDS) which alerts the central control room to enable remote shut-in of the CO_2 injection system, further mitigate any risk associated with unplanned releases from the CO_2 Injection System.

5.6.4.2 Fugitive Emissions

CAPL tracks diesel fuel use for vehicles and equipment for all Gorgon Gas Development operations and reports amalgamated figures annually in accordance with *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and National Pollutant Inventory requirements.

Given diesel consumption for vehicle and equipment movements during the operations phase is orders of magnitude less than those observed during the construction phase, impacts from fugitive emissions associated with diesel use are not considered credible and have not been included or assessed further.

5.6.4.3 Dust

Dust generation from vehicle movements, wind erosion and earthworks may occur, however are not expected to generate discernible increases in dust above natural variability. Monitoring of dust impact to vegetation was undertaken over

five years during the construction-phase of the Gorgon Project, where significantly higher volumes of vehicles (heavy and light) and earthworks were present. Results indicate that no adverse impacts occurred to plant health or vegetation communities as a result of construction dust loads (Ref. 56). Dust monitoring has subsequently been removed from the TSEMP (Ref. 22). Given dust generated by vehicle and equipment movements during the operations phase will be infrequent and orders of magnitude less than the activities observed during the construction phase, impacts from dust are not considered credible and have not been included or assessed further.

5.6.5 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from atmospheric emissions is provided in Table 5-11.

Table 5-11: Risk assessment summary – atmospheric emissions

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Flora and Vegetation Communities	Atmospheric emissions	• Physiological effects of deposition of pollutants on flora and vegetation • Localised change in taxon dominance due to nitrogen enrichment and soil acidity • Alteration of community composition • Reduced growth due to soil acidity or CO_2 • Increased growth due to uptake of nitrogen or CO_2	Operations	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system	Reduce the risk of impacts to sensitive receptors from venting hydrocarbon gas from CO_2 Pressure Management Wells.	Design of pressure management wells shall include: • a vent restriction orifice at the annulus vent line to control the rate of hydrocarbon gas being vented.	5	4	L
					Reduce the risk of unplanned releases to the terrestrial environment resulting from defects to the CO_2 Pipeline and Wells causing impacts within the TDF and prevent material or serious environmental harm outside the TDF.	To ensure the ongoing effective operation of the CO_2 Pipeline and Wells, operational systems and procedures shall include: • Procedures for inspection, monitoring, and maintenance of the CO_2 Pipeline ROW and drill centres • An in place and functional leak detection system • Procedures for shutdown and venting of the CO_2 system following detection of a leak.			
		• Physiological effects of deposition of pollutants on flora and vegetation	All	• Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas	NA	NA - Standard management measures required for managing employee exposure/ nuisance impacts.			
			Construction/ Infrastructure Projects	• Concrete/ rock crushing and screening activities	NA	NA - Standard management measures required for managing employee exposure/ nuisance impacts.			
Terrestrial Fauna	Atmospheric emissions	• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water	Operations	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system	Reduce the risk of impacts to sensitive receptors from venting hydrocarbon gas from CO_2 Pressure Management Wells.	Design of pressure management wells shall include: • a vent restriction orifice at the annulus vent line to control the rate of hydrocarbon gas being vented	5	4	L

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
		• Potential direct toxic effect on fauna from non-routine emission of H_2S or BTEX • Localised asphyxiation hazard to terrestrial fauna if CO_2 settles temporarily in low-lying areas.			Reduce the risk of unplanned releases to the terrestrial environment resulting from defects to the CO_2 Pipeline and Wells causing impacts within the TDF and prevent material or serious environmental harm outside the TDF.	To ensure the ongoing effective operation of the CO_2 Pipeline and Wells, operational systems and procedures shall include: • Procedures for inspection, monitoring, and maintenance of the CO2 Pipeline ROW and drill centres • An in place and functional leak detection system • Procedures for shutdown and venting of the CO_2 system following detection of a leak.			
		• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water	All	• Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas	NA	NA - Standard management measures required for managing employee exposure/ nuisance impacts			
		• Construction/ Infrastructure Projects	Construction/ Infrastructure Projects	• Concrete/ rock crushing and screening activities	NA	NA - Standard management measures required for managing employee exposure/ nuisance impacts.			

Notes:

[1] L = Low, M = Medium, H = High

5.6.6 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from atmospheric emissions are summarised in Table 5-12.

Table 5-12: Environmental performance objectives, management measures, performance standards and measurement criteria –atmospheric emissions

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of impacts to sensitive receptors from venting hydrocarbon gas from CO_2 Pressure Management Wells within the TDF and prevent material or serious environmental harm outside the TDF.	Operations Construction/ Infrastructure Projects	Design of pressure management wells shall include: - a vent restriction orifice at the annulus vent line to control the rate of hydrocarbon gas being vented	The pressure management wells are designed and constructed to control the rate of hydrocarbon gas being vented utilizing the proposed management measures or similar environmentally appropriate options to reduce impacts within the TDF and prevent impacts outside the TDF.	Pre-Start Up Safety Reviews (PSSR) (or equivalent) are undertaken prior to handover to Operations and confirm that the design requirements outlined in the Management Measures has been met. Monitoring of hydrocarbon venting, undertaken in accordance with the Carbon Dioxide Injection System Pipeline and Wells Operations Environment Management Plan, confirms gas venting rates are tracked and reported.
Reduce the risk of unplanned releases to the terrestrial environment resulting from defects to the CO_2 Pipeline and Wells causing impacts within the TDF and prevent material or serious environmental harm outside the TDF.	Operations	To ensure the ongoing effective operation of the CO_2 Pipeline and Wells, operational systems and procedures shall include: • Procedures for inspection, monitoring, and maintenance of the CO_2 Pipeline ROW and drill centres • An in place and functional leak detection system • Procedures for shutdown and venting of the CO_2 system following detection of a leak.	The CO_2 Pipeline and Wells are operated utilizing the proposed management measures to reduce the risk of unplanned releases causing impacts within the TDF and prevent impacts outside the TDF.	ABU OE Assurance Plan (Level 2) records confirm that procedures outlined in the Management Measures are in place and operational. Review of CMMS as per the ABU OE Assurance Plan (Level 2) confirms LDS in place and maintained in accordance with scheduled maintenance regime. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF related to impacts from unplanned releases from the CO_2 Pipeline and Wells.

5.7 Environmental Aspect: Artificial lighting

5.7.1 Description of Activities

The presence and operation of this Project will interact with the environment resulting in the environmental aspect of artificial lighting. Activities resulting in the artificial lighting aspect include, but are not limited to:

- Lighting of terrestrial facilities
- Flaring from the GTP ground flare and the boil-off gas flares
- Task lighting required to support safe night-time works (e.g. associated with maintenance and project activities).

5.7.2 Potential Impact/ Consequence Summary

Artificial light may potentially provide an attractant or repellent to fauna, interrupt natural behaviours, expose individuals to higher predation levels, and disrupt navigational abilities. Whilst most Barrow Island mammals and a significant proportion of reptiles are nocturnal, the top-level predators (the varanids and raptors) are not.

5.7.3 Residual Risk and Key Management Measures

Particular values and sensitivities identified to be potentially affected by artificial light emissions include Wedge-tailed Shearwater and marine turtles. The closest shearwater nesting sites are at Double Island (~5 km from the GTP), thereby reducing the potential for impact. The TSEMP (Ref. 22) outlines requirements to monitor impacts to the Wedge-tailed Shearwater abundance and demographics. Monitoring of Wedge-tailed Shearwaters to date (2009–2021) has identified no impacts attributable to the Gorgon Gas Development (Ref. 47; Ref. 57).

Flatback Turtle nesting is considered at greatest risk of exposure given the proximity of nesting beaches along the eastern coast of Barrow Island. A LTMTMP (Ref. 19) is required under Condition 16 of MS 800 and Condition 12 of EPBC Reference: 2003/1294 and 2008/4178. One of the objectives of this Plan, as stated in these Conditions is to:

v. Specify design features, management measures and operating controls to manage, and where practicable, avoid adverse impacts to marine turtles, with specific reference to reducing light and noise emissions as far as practicable.

Management and monitoring of light, including principles for lighting design and management measures / operating controls to manage light emissions, is described in the LTMTMP (Ref. 19). The measures included within the LTMTMP encompass all Terrestrial Facilities; not just those that affect coastal areas.

A Horizontal Directional Drilling Management and Monitoring Plan is required under Condition 22 of MS 800, Condition 13 of MS 769 and Condition 15 of EPBC Reference: 2003/1294 and 2008/4178. The objectives of this Plan, as stated in these Conditions are to:

i Reduce the impacts of HDD activities on the Terrestrial and Marine Disturbance Footprints associated with those activities as far as practicable; and

ii Ensure that HDD activities do not cause Material or Serious Environmental Harm outside the Terrestrial or Marine Disturbance Footprints associated with those activities.

Measures to manage artificial lighting associated with drilling and other construction activities at the HDD site are described in the HDDMMP (Ref. 20) and associated Addendum (Ref. 91).

5.7.4 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from artificial lighting is provided in Table 5-13.

Table 5-13: Risk assessment summary – artificial lighting

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Terrestrial Fauna (including seabirds)	Artificial Lighting	• Direct behavioural disturbance • Increased predation	Operations Construction/ Infrastructure Projects	• Lighting of terrestrial facilities • Flaring • Task lighting required to support safe night-time works	Reduce the risk of behavioural disturbance to fauna from light emissions causing impacts to protected terrestrial fauna species within the TDF and prevent material or serious environmental harm to protected terrestrial fauna species outside the TDF.	Installation of new permanent lighting, or the maintenance or alteration of existing permanent lighting at Terrestrial Facilities is consistent with the common lighting design principles described in Section 5.1.1 of the LTMTMP. Lighting associated with drilling and other construction activities at the HDD site is managed in accordance with the HDDMMP and associated Addendum to reduce behavioural disturbance to fauna, including: • Lights directed solely onto work areas (i.e. use of spotlights instead of flood lights), mounted as low as practicable, shielded light fittings and/or downward-facing lights used where practicable • Parking areas/roadways located in such a way as to prevent vehicle headlights from illuminating beach areas • Light types that are least disruptive to marine turtles used in areas where they may be seen by turtles. To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.	5	4	L

Notes:

[1] L = Low, M = Medium, H = High

5.7.5 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from artificial lighting are summarised in Table 5-14.

Table 5-14: Environmental performance objectives, management measures, performance standards and measurement criteria –artificial lighting

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of behavioural disturbance to fauna from light emissions causing impacts to protected terrestrial fauna species within the TDF and prevent material or serious environmental harm to protected terrestrial fauna species outside the TDF.	Operations Construction/ Infrastructure Projects	Installation of new permanent lighting, or the maintenance or alteration of existing permanent lighting at Terrestrial Facilities is consistent with the common lighting design principles described in Section 5.1.1 of the LTMTMP.	Lighting of Terrestrial Facilities is designed and maintained utilising the proposed management measures or similar environmentally appropriate options to reduce behavioural disturbance to fauna within the TDF and prevent impacts outside the TDF.	Lighting inspections of worksites, undertaken as outlined in the LTMTMP. Annual lighting effectiveness review, undertaken in accordance with LTMTMP. Pre-Start Up Safety Reviews (PSSR) (or equivalent) are undertaken prior to handover to Operations and confirm that the lighting design requirements outlined in the Management Measures have been met. Management of Change is undertaken prior to alteration of existing permanent lighting and confirm that the lighting design requirements outlined in the Management Measures have been met. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF, related to impacts from artificial lighting. Results of ecological monitoring (undertaken in accordance with the LTMTMP) confirm no detected change in flatback turtle populations related to impacts from artificial lighting.
		Lighting associated with drilling and other construction night time activities at the HDD site is managed in accordance with section 5.4 of the HDDMMP Addendum to reduce behavioural disturbance to fauna.	Lighting associated with drilling and other construction night time activities at the HDD site utilizes the proposed management measures or similar environmentally appropriate options to reduce behavioural disturbance to fauna within the TDF and prevent impacts outside the TDF.	Lighting inspections of worksites will be undertaken as outlined in the HDDMP Addendum and contractor Lighting Management Procedure.
		To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.	All fauna incidents or observations deemed significant are investigated and appropriate corrective actions and/or additional management measures identified.	Records from Company Incident Management System available and confirm all significant fauna incidents or observations were investigated.

5.8 Environmental Aspect: Noise and vibration

5.8.1 Description of Activities

The presence and operation of this Project will interact with the environment resulting in the environmental aspect of noise and vibration.

Activities resulting in the noise and vibration aspect include, but are not limited to:

- Operation of the GTP
- Operation of machinery, plant and equipment associated with routine operations, maintenance activities, drilling and project/ construction activities
- Vehicle movements
- Seismic data acquisition
- Venting of gases (e.g. from CO_2 Injection System)
- Release of high-pressure air during flooding, gauging and testing of pipelines
- Emergency sirens and alarms.

5.8.2 Potential Impact/ Consequence Summary

Impacts from noise and vibration on fauna can be indirect or direct, and include:

- Minor physiological effects on fauna in immediate area
- Short term behavioural responses, including startle and/or avoidance of noise/ vibration sources and interruption of acoustic communications
- indirect impacts on predators with fixed foraging ranges if prey species avoid an area
- temporary shifts in an animal's hearing ability
- acoustic trauma, e.g. damage to hearing organs
- physical impact on habitats such as burrows from vibration.

5.8.3 Residual Risk and Key Management Measures

Impacts from noise and vibration can have consequences on the fitness and/or survivability of individual animals, or on local populations if important behaviours are interrupted over an extended period. Irregular loud noise and percussion is expected to have a short-term behavioural impact on animals in the local area. Fauna are expected to be alarmed by sudden loud noises and temporarily vacate the immediate area, returning to normal behaviour when the noise has stopped.

The TSBSEIR (Ref. 13) determined that no significant fauna on Barrow Island are thought to have a critical reliance on hearing to either avoid predators, or to locate and hunt prey. It also determined that the species most susceptible to noise impacts is the White-winged Fairy-wren (Barrow Island), which relies on calling to establish and maintain territories, and to attract mates. However, White-winged Fairy-wren are widespread across Barrow Island and the number of this (or other species) within areas sufficiently close to noise generating activities to be adversely affected is expected to be low. Monitoring of White-winged Fairy-wren (and other fauna) on Barrow Island to date (2009–2021) has identified no impacts attributable to the Gorgon Gas Development, including from noise and vibration (Ref. 47; Ref. 57). In addition, monitoring undertaken to date indicated noise and

vibration levels on east coast beaches were not detectable above ambient conditions (Ref. 56).

CAPL applies noise and vibration design criteria to its facilities as documented in the Environmental Basis of Design (Ref. 70) and Specification for Noise Control of Equipment & Acoustic Enclosures (Ref. 71). The criteria for the GTP and Utilities Areas were based on human health/worker exposure criteria, stipulated in relevant legislation and standards. A variety of features were incorporated into the GTP infrastructure to reduce noise and vibration emissions, including:

- air inlet silencers and acoustic enclosures on gas turbines, and silencers for exhaust stacks
- acoustic blankets and/or motor enclosures on selected pumps
- exhaust gas silencer on the diesel engine for firewater pumps
- thermal insulation (which helps reduce noise) on Heating Medium Heaters
- exhaust gas silencer for the bypass stacks of the Waste Heat Recovery Units
- acoustic enclosure and exhaust gas silencer for the diesel engine in the Emergency Diesel Generator Package
- acoustic insulation on the compressor suction/discharge/recycle piping, LNG/Mixed Refrigerant expander suction/discharge piping, large pump suction/discharge/recycle piping, and high-pressure drop valves and piping
- vibration isolation between piping and pipe supports
- acoustic insulation on selected supporting structures for piping.

The design of the onshore seismic program is based on using an energy source (surface vibroseis) that generates limited lateral vibration transmission and, if required, downhole (shothole) charge detonations. The charges are relatively small and detonated at depth within the shothole (near the watertable where practicable), minimising potential noise emissions. Given the low noise levels and infrequent execution of seismic activities, the risk of noise related impacts from onshore seismic activities is expected to be low.

Measures to manage noise associated with drilling and other construction activities at the HDD site are described in the HDDMMP (Ref. 20) and associated Addendum (Ref. 91).

5.8.4 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from noise and vibration is provided in Table 5-16.

Table 5-15: Risk assessment summary –noise and vibration

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Terrestrial Fauna	Noise and vibration	• Physiological impacts to fauna • Short-term behavioural changes	Operations Construction/ Infrastructure Projects	• Operation of the GTP • Operation of machinery, plant and equipment • Vehicle movements • Release of high-pressure air during flooding, gauging and testing of pipelines • Seismic data acquisition	Reduce the risk of behavioural disturbance to fauna from noise and vibration emissions causing impacts to protected terrestrial fauna species within the TDF and prevent material or serious environmental harm to protected terrestrial fauna species outside the TDF.	The Environmental Basis of Design (Ref. 70) and Specification for Noise Control of Equipment & Acoustic Enclosures (Ref. 71) shall be applied to design of terrestrial facilities to reduce noise and vibration emissions.	5	4	L
						To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.			
				• Venting of gases (e.g. from CO_2 Injection System)	Reduce the risk of impacts to sensitive receptors from venting hydrocarbon gas from CO_2 Pressure Management Wells.	Design of pressure management wells shall include: • a vent restriction orifice at the annulus vent line to control the rate of hydrocarbon gas being vented.			
Subterranean Fauna	Noise and vibration	• Direct loss of habitat or rupture of subsurface karst lenses • Vibration effects (sedimentation/partial collapse of karstic formations) • Local loss of troglofauna and stygofauna	Operations Construction/ Infrastructure Projects	• Operation of the GTP • Operation of machinery, plant and equipment associated with routine operations, maintenance activities, drilling and project/ construction activities • Vehicle movements • Seismic data acquisition	Reduce the risk of behavioural disturbance to fauna from noise and vibration emissions causing impacts to protected terrestrial fauna species within the TDF and prevent material or serious environmental harm to protected terrestrial fauna species outside the TDF.	The Environmental Basis of Design (Ref. 70) and Specification for Noise Control of Equipment & Acoustic Enclosures (Ref. 71) shall be applied to design of terrestrial facilities to reduce noise and vibration emissions.	5	4	L

Notes:

[1] L = Low, M = Medium, H = High

5.8.5 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from noise and vibration are summarised in Table 5-16.

Table 5-16: Environmental performance objectives, management measures, performance standards and measurement criteria – noise and vibration

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of behavioural disturbance to fauna from noise and vibration emissions causing impacts to protected terrestrial fauna species within the TDF and prevent material or serious environmental harm to protected terrestrial fauna species outside the TDF.	Operations Construction/ Infrastructure Projects	The Environmental Basis of Design (Ref. 70) and Specification for Noise Control of Equipment & Acoustic Enclosures (Ref. 71) shall be applied to design of terrestrial facilities to reduce noise and vibration emissions.	Terrestrial facilities are designed and constructed utilising the proposed management measures or similar environmentally appropriate options to reduce the risk of noise and vibration emissions causing impacts within the TDF and to prevent impacts outside the TDF.	Pre-Start Up Safety Reviews (PSSR) (or equivalent) are undertaken prior to handover to Operations and confirm that the design requirements outlined in the Management Measures have been met. Results of ecological monitoring (undertaken in accordance with the TSEMP) confirm no material or serious environmental harm detected to the ecological elements outside the TDF, related to impacts from noise and vibration emissions. Results of ecological monitoring (undertaken in accordance with the LTMTMP) confirm no detected change in flatback turtle populations related to impacts from noise and vibration emissions.
		To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.	All fauna incidents or observations deemed significant are investigated and appropriate corrective actions and/or additional management measures identified.	Records from Company Incident Management System available and confirm all significant fauna incidents or observations were investigated.
Reduce the risk of unplanned releases to the terrestrial environment resulting from defects to the CO_2 Pipeline and Wells causing impacts within the TDF and prevent material or serious environmental harm outside the TDF.	Operations	To ensure the ongoing effective operation of the CO_2 Pipeline and Wells, operational systems and procedures shall include: • Procedures for inspection, monitoring, and maintenance of the CO_2 Pipeline ROW and drill centres • An in place and functional leak detection system • Procedures for shutdown and venting of the CO_2 system following detection of a leak.	The CO_2 Pipeline and Wells are operated using the proposed management measures to reduce the risk of unplanned releases causing impacts within the TDF and prevent impacts outside the TDF.	ABU OE Assurance Plan (Level 2) records confirm that procedures outlined in the Management Measures are in place and operational. Review of CMMS as per the ABU OE Assurance Plan (Level 2) confirms LDS in place and maintained in accordance with scheduled maintenance regime.

5.9 Environmental Aspect: Unplanned subsurface CO_2 migration

5.9.1 Description of Activities

The Carbon Dioxide Injection System has been developed to inject naturally occurring CO2 separated during the production of liquified natural gas into geological substrates below Barrow Island. The potential risk of unplanned migration or release of injected CO_2 to the surface or near surface environment is documented and managed in the BI Act approved Carbon Dioxide Disposal Management Plan (CDMP). Should unplanned migration or release of injected CO_2 occur, it would interact with the environment and therefore result in the environmental aspect of unplanned subsurface CO_2 migration. The unplanned subsurface CO_2 migration aspect could occur as a result of:

- CO_2 migration up existing wells penetrating the CO_2 injection zone (Dupuy Formation)
- CO_2 migration via faults or fractures through the primary seal and other seals/ barriers.

5.9.2 Potential Impact/ Consequence Summary

Unplanned subsurface CO_2 migration or release to the surface/ near surface environment has the potential to result in below-ground impacts such as:

- localised plant stress impacts from increases in soil CO_2 concentrations
- change the physical properties of subsurface formations resulting in impacts to subterranean communities.

5.9.3 Residual Risk and Key Management Measures

The approval to dispose of CO_2 by injection under the BI Act requires the development and approval of a CDMP (Ref. 40). The CDMP was approved by the WA Minister for State Development in 2009 and revisions to the CDMP have been approved by the Minister in consultation with relevant Government agencies, including the former Commonwealth agency Department of Industry, Science, Energy and Resources, currently the DCCEEW.

In accordance with Condition 5 of the Section 13 Approval, the CDMP outlines the management options that may be applied to address unplanned migration of injected CO_2 out of the Dupuy Formation (injection zone). The CDMP also has a monitoring program that provides for the early detection of unexpected migration of injected CO_2 outside the injection zone.

5.9.4 Risk Assessment and Management Measures Summary

A summary of the risk assessment, including associated management measures, for potential impacts from unplanned subsurface CO_2 migration is provided in Table 5-17.

Table 5-17: Risk assessment summary – unplanned subsurface CO_2 migration

Environmental Factor	Environmental Aspect	Potential Impacts	Activity Type	Causes	Environmental Performance Objectives	Management Measure	Residual Risk		
							Consequence	Likelihood	Residual Risk[1]
Terrestrial Flora	Unplanned subsurface CO_2 migration to the near surface/ surface environment	• Localised plant stress impacts from increases in soil CO_2 concentrations	Operations	• CO_2 migration up existing wells penetrating the CO_2 injection zone (Dupuy Formation) • CO_2 migration via faults or fractures through the primary seal and other seals/barriers	Reduce the risk of migration of CO_2 from the Dupuy formation to the surface/near surface causing impacts within the TDF and prevent material or serious environmental harm outside the TDF.	To address unplanned migration of injected CO_2, implement the CDMP, including: • management options that may be applied to address unplanned migration of injected CO2 out of the Dupuy Formation (injection zone) • monitoring program that provides for the early detection of unexpected migration of injected CO2 outside the injection zone, prevents the fracture of injection formation, as well as monitoring the CO2 plume (including well monitoring and surface seismic activities).	5	4	L
Subterranean Fauna	Unplanned subsurface CO_2 migration to the near surface/ surface environment	• Change the physical properties of subsurface formations resulting in impacts to subterranean communities.	Operations	• CO_2 migration up existing wells penetrating the CO_2 injection zone (Dupuy Formation) • CO_2 migration via faults or fractures through the primary seal and other seals/barriers	Reduce the risk of migration of CO_2 from the Dupuy formation to the surface/near surface causing impacts within the TDF and prevent material or serious environmental harm outside the TDF.	To address unplanned migration of injected CO_2, implement the CDMP, including: • management options that may be applied to address unplanned migration of injected CO2 out of the Dupuy Formation (injection zone) • monitoring program that provides for the early detection of unexpected migration of injected CO2 outside the injection zone, prevents the fracture of injection formation, as well as monitoring the CO2 plume (including well monitoring and surface seismic activities).	4	4	L

Notes:

[1] L = Low, M = Medium, H = High

5.9.5 Environmental Performance Standards Summary

The environmental performance objectives, management measures, performance standards and measurement criteria for potential impacts from unplanned subsurface CO_2 migration are summarised in Table 5-18.

Table 5-18: Environmental performance objectives, management measures, performance standards and measurement criteria – unplanned subsurface CO_2 migration

Environmental Performance Objectives	Activity Type	Management Measures	Environmental Performance Standard	Environmental Performance Measurement Criteria
Reduce the risk of migration of CO_2 from the Dupuy formation to the surface/near surface causing impacts within the TDF and prevent material or serious environmental harm outside the TDF.	Operations	To address unplanned migration of injected CO_2, implement the CDMP, including: • management options that may be applied to address unplanned migration of injected CO_2 out of the Dupuy Formation (injection zone) • monitoring program that provides for the early detection of unexpected migration of injected CO_2 outside the injection zone, prevents the fracture of injection formation, as well as monitoring the CO_2 plume (including well monitoring and surface seismic activities).	The CDMP is implemented to reduce the risk of migration of CO2 from the Dupuy formation to the surface/near surface causing impacts within the TDF and prevent impacts outside the TDF.	Results of monitoring (undertaken in accordance with CDMP) confirms whether unplanned migration of injected carbon dioxide has been detected outside of the injection zone. Results of ecological monitoring (undertaken in accordance with the TSEMP) in the event that CO_2 migration detected through the CDMP monitoring program indicates an increased risk to the surface or near-surface environment.

5.10 Environmental Aspect: Fire

A Fire Management Plan (Ref. 17) is required under Condition 12 of MS 800, Condition 11 of MS 769, and Condition 9 of EPBC Reference: 2003/1294 and 2008/4178. Specifically, the objectives of this Plan, as stated in Condition 12.4 of MS 800, Condition 11.4 of MS 769, and Condition 9.4 of EPBC Reference: 2003/1294 and 2008/4178 are to ensure that:

i. The Proposal does not cause Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint due to fire; and

ii. Fire risk reduction measures are built into the design of the facilities to protect the Proponent's assets from the impact from fire on Barrow Island.

Noting the clear cross over with the objectives of this Plan, assessment of the risk related to fire causing environmental impact to the terrestrial and subterranean environment has not been assessed further in this Plan.

Measures to manage planned fires (e.g. for vegetation clearing purposes) and respond to incidents involving fires are detailed in the Fire Management Plan (Ref. 17). Any fauna injured during planned fire activities will be managed by measures detailed in the Fauna Handling and Management Common User Procedure (Ref. 24). Management measures relating to rehabilitation of those areas requiring rehabilitation following burning are addressed within the Post-Construction Rehabilitation Plan (Ref. 18).

5.11 Environmental Aspect: Solid and liquid waste disposal

A Solid and Liquid Waste Management Plan (SLWMP; Ref. 14) is required under Condition 30.1 of MS 800, Condition 16.1 of MS 769, and Condition 20 of EPBC Reference: 2003/1294 and 2008/4178. Specifically, the objectives of the SLWMP, as stated in Condition 30.2 of MS 800, Condition 16.1 of MS 769, Condition 8(b)(iv) of EPBC Reference: 2003/1294 and Condition 20.2 of EPBC Reference: 2008/4178 are to:

i. Ensure all Proposal-related solid and liquid wastes are either removed from Barrow Island or, if not, that all practicable means are used to ensure that waste disposal does not cause Material or Serious Environmental Harm to Barrow Island and its surrounding waters;

ii. Ensure discharges from any waste water treatment plant, reverse osmosis plant, or other process water are disposed of via deep well injection, unless otherwise authorised by the Minister; and

iii. Ensure any deep well injection of Proposal-related liquid wastes is conducted in a manner that will not cause Material or Serious Environmental Harm to subterranean fauna and their habitats on Barrow Island.

Noting the clear cross over with the objectives of this Plan, assessment of the risk related to solid and liquid waste management causing environmental impact to the terrestrial and subterranean environment has not been assessed further in this Plan, with the exception of risk related to waste associated with drainage and stormwater management within the Class 1, 2 and 3 drainage systems, which has been assessed under Section 5.2.

5.12 Environmental Aspect: Quarantine

A Quarantine Management System (QMS; Ref. 37) is required under Condition 10.1 of MS 800 and MS 769, and Condition 8.1 of EPBC Reference: 2003/1294 and 2008/4178. The overall aim of the QMS, as stated in Condition 10.3 of MS 800 and MS 769 and Condition 8.3 of EPBC Reference: 2003/1294 and 2008/4178 is to prevent the introduction or proliferation of Non-indigenous Terrestrial Species and Marine Pests to or within Barrow Island or the water surrounding Barrow Island, as a consequence of the Proposal.

Noting the aim and objectives of the QMS, assessment of the risk related to the introduction or proliferation of Non-indigenous Terrestrial Species and Marine Pests to or within Barrow Island or the water surrounding Barrow Island causing environmental impact to the terrestrial and subterranean environment has not been assessed further in this Plan.

6 Implementation

6.1 Operational Excellence Management System

CAPL's operations are managed in accordance with the Operational Excellence Management System (OEMS), which is a comprehensive management framework that supports the corporate commitment to protect the safety and health of people and the environment. The OEMS aligns with ISO 14001:2015 *Environmental management systems – Requirements with guidance for use* (Ref. 29).

OE systematically manages workforce safety and health, process safety, reliability, and integrity, environment, efficiency, security, and stakeholders to meet the OE objectives and ensure safe operations of CAPL facilities and projects. The OEMS comprises the following key components (Figure 6-1):

- leadership and OE culture through the OEMS, CAPL leaders engage employees and contractors to build and sustain the OE culture and deliver OE performance
- management system cycle (MSC)—by applying the MSC, CAPL leaders make risk-based and data-driven decisions, prioritise activities, and direct improvements
- focus areas and OE expectations (including common expectations) focus areas are categories of OE risks and include workforce safety and health, process safety reliability and integrity, environment, efficiency, security, and stakeholder engagement; OE expectations guide the design, management, and assurance of the presence and effectiveness of safeguards.

The OEMS outlines the process for identifying, establishing, and maintaining safeguards, and to provide assurance that they are in place, functioning as intended, and comply with legal and OE requirements.

The ABU OE Risk Management Process (Ref. 27) assesses and identifies safeguards, which are the hardware and human actions designed to directly prevent or mitigate an incident or impact. The ABU OE Assurance Process (Ref. 30) provides the verification and validation that the safeguards are in place and functioning as intended.

An overview of the Chevron Corporation OEMS is shown in Figure 6-1.

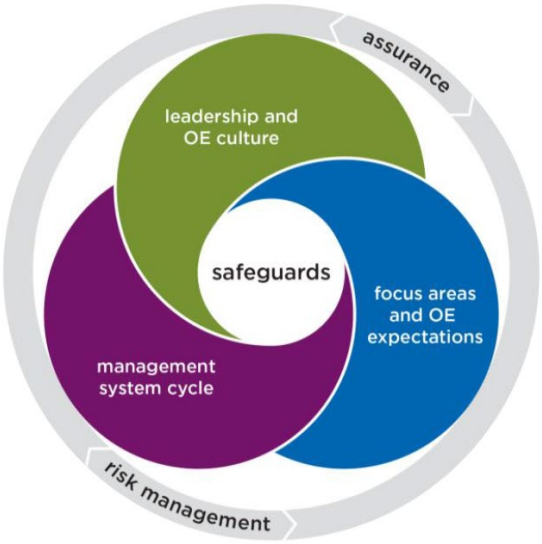

Figure 6-1: Overview of Chevron Corporation's OEMS

6.2 OE roles and responsibilities

CAPL leaders are responsible for:

- providing clear direction on OE roles
- confirming people are equipped with the technical, functional, and OE leadership competencies and skills to execute their OE roles
- monitoring, coaching, and holding people accountable on their OE roles
- providing resources to effectively and efficiently execute the OEMS
- directing and monitoring compliance with legal requirements
- building partnerships, creating OE alignment, and accessing functional expertise.

Operational Excellence Leadership Teams (OELTs) steward the MSC for their organisation and confirm that the full scope of the OEMS is effective.

The roles and accountability within the OEMS extend beyond leadership to the workforce in general, which contributes to the OE culture and performance. As such, the entire workforce is responsible for:

- maintaining a sense of vulnerability
- understanding the hazards and risks of the work being undertaken
- ensuring safeguards are in place and functioning
- following required practices and procedures
- applying the Tenets of Operation
- performing start-work checks
- exercising stop-work responsibility.

The roles and responsibilities of personnel in charge of the environmental management of the Project are detailed in Table 6-1.

Table 6-1: Roles and responsibilities – environmental management

Roles	Responsibilities
Barrow Island Operations Manager	• Accountable for implementation and adherence to legislative requirements, permits and approvals, including commitments in this Plan • Manage the Operations team, including developing the desired workforce culture that aligns with The Chevron Way (which explains who we are, what we believe, how we achieve, and where we aspire to go) • Lead the implementation of OE in Operations • Provide leadership and strategic direction and ensure resources are in place to meet business goals • Ensure delivery of high-quality and reliable hydrocarbon products in a safe, efficient, and cost-effective manner
Gorgon Production Manager	• Manage the day-to-day operations on Barrow Island, ensuring work is executed in a manner that complies with all relevant environmental procedures and adheres to legislative requirements, permits and approvals, including commitments in this Plan • Manage Operations in alignment with CAPL OEMS Processes • Implement effective management for emergency response on Barrow Island
Barrow Island HSE Manager	• Support implementation of, and monitor compliance with, the OEMS • Lead the Gorgon HSE team • Ensure all personnel are made aware of HSE requirements relevant to their role
Gorgon Maintenance and Reliability Manager	• Lead and reinforce HSE requirements in support of OEMS in all aspects of maintenance, reliability, and turnarounds • Ensure the Surface Equipment Reliability and Integrity Process (SERIP) is followed. • Lead the team responsible for the Gorgon CMMS. • Actively support the IIR process • Plan, manage, and direct all incident-free maintenance activities
Supply Chain Operations Manager	• Lead the Gorgon Supply Chain Team • Responsible for the safe transportation and storage of all goods and materials to and from BWI • Responsible for site services on BWI, including operation of accommodation village and waste management services
ABU Environment Manager	• Ensure environmental monitoring and reporting requirements are completed in accordance with legislative requirements, permits and approvals • Ensure environmental plans are implemented and updated to ensure compliance with applicable environmental regulations, permits and approvals.
Major Capital Project Manager	• Ensure required environmental approvals, permits and licences are in place for project scope • Ensure environmental requirements are addressed in project execution plans, including within Contractor procedures and plans • Provide adequate HSE resource to support delivery of the project scope
All personnel	• Comply with all HSE requirements outlined in inductions, procedures, and other work authorisations • Ensure that all incidents are reported to CAPL

6.3 Training and competency

All personnel (including contractors and subcontractors) are required to attend Health, Safety and Environmental inductions relevant to their role on the Gorgon Gas Development. Training and induction programs facilitate the understanding personnel have of their environmental responsibilities, and increase their awareness of the management and protection measures required to reduce potential impacts on the environment.

The *ABU Competency Assurance and Development Process* (Ref. 36) details the systematic, consistent, and structured framework to ensure organisational capability, and individual competency, in support of CAPL's business objectives, assurance expectations, and regulatory commitment, for OE-critical roles.

6.3.1 Contractor competency management

Contractors are required to meet the training and competency requirements documented in each scope of work and the ABU Contractor Training Matrix (Ref. 65) and contract. Contractors are required to join MyPass and provide evidence of required training prior to mobilisation to site. The MyPass training records will be available for the Business Owner, Contractor Personnel and Site to validate required training has taken place. Both the CAPL Business Owner and Contractor are responsible for validating training compliance prior to mobilisation.

6.3.2 Inductions

Personnel working on the Gorgon Gas Development, as well as any visitors, must undertake an induction. Inductions advise employees and visitors of any hazards they may encounter and describe the associated HSE management procedures intended to minimise the risk to people and the environment.

This induction fosters environmental stewardship amongst all personnel and ensures that they are aware of the management measures implemented to minimise the potential impact on the environment. The induction includes:

- an overview of environmental sensitivities of Barrow Island
- quarantine requirements
- fauna awareness and restrictions on handling fauna
- waste management and hazardous materials housekeeping requirements
- incident reporting requirements.

6.4 Emergency management

CAPL's emergency management arrangements outline a systematic approach for preventing, planning, responding to, and recovering from emergency events and are intended to provide a standardised corporate management and response structure that details emergency management documentation, Emergency Response Organisation (ERO), facilities and equipment, and training and exercises.

The ERO provides a standardised management and response structure for any emergency. Personnel filling roles within this structure may include full-time professionals, but most will be part-time volunteers drawn from across the workforce.

The system used to organise CAPL's emergency management teams (EMTs) is based on the Incident Command System and provides a standardised approach to the coordination of an emergency response. This program is compatible with the Australasian Inter-service Incident Management System (AIIMS).

6.4.1 Emergency management process

The ABU Emergency Management Standardized OE Process (Ref. 34) is CAPL's system for emergency management. The process ensures CAPL is prepared to respond immediately and effectively to all emergencies involving contractor- or CAPL-owned or operated assets as defined in their scope of work.

The Process comprises the following elements:

- emergency scenarios, including worst case, have been identified; these scenarios are based on the findings from risk assessments of significant safety, health and environmental hazards and other sources (e.g., historical incidents)
- emergency response plans (ERPs) are developed and maintained to address emergency scenarios
- a reliability program for inspection, testing and preventative maintenance of critical emergency response equipment and systems supporting emergency response plans
- an incident management system (IMS) is in place capable of immediately and effectively managing all emergencies
- a training and exercise program, including minimum training and exercise requirements to establish and maintain emergency response capability
- crisis management plans to address a potential crisis or significant events.

6.4.2 Roles and responsibilities for emergency response

Figure 6-2 outlines the organisational chart of the On-site Response Teams (ORTs) and EMTs. The Crisis Management Teams (CMTs), which focus on the business implications of incidents and events, are further described in the ABU Crisis Management Plan (Ref. 35).

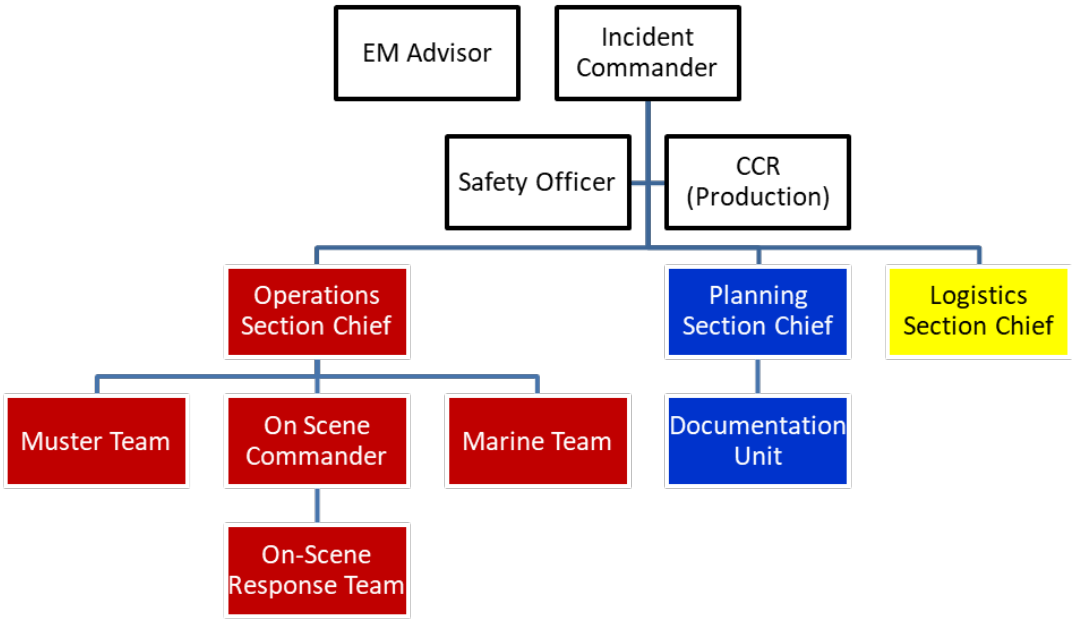

Figure 6-2: EMT organisation chart

As the incident escalates and the workload of each function increases, it may be necessary to delegate specific roles to additional people within each section. These roles may lead a team of people to fulfil the tasks under their control.

Table 6-2 provides additional information about the structure of these teams and individual roles and responsibilities during emergency response.

Table 6-2: Roles and responsibilities – emergency events and response

Role	Responsibilities
On-Site Response Team (ORT)	
On-Scene Commander (OC)	• Organises and manages the ORT response operations in a safe and effective manner • Keeps the EMT informed about the nature and status of the incident and on-site tactical response operations
Site Safety Officer	• Ensures that appropriate actions are taken to protect the safety and health of ORT response personnel
Task Leader	• Carries out their assignment safely and in a manner consistent with directions received from the OC, branch director, division, or group supervisor
Emergency Management Team (EMT)	
Incident Commander (IC)	• Provides overall management of emergency response operations and ensures that they are carried out safely, effectively, and efficiently • Establishes a direct line of communications with the OC • Mobilises the EMT and assigns additional support from other response teams (as appropriate to the incident) for Level 2 and 3 incidents that require support beyond the ORT
Operations Section Chief	• Provides strategic direction and support to the OC and muster and/or shelter area manager(s) • Receives information regarding the nature and status of the ORT and for mustering and/or shelter-in-place operations • Provides information to the IC and other members of the EMT

Role	Responsibilities
Planning Section Chief	• Focuses on incident potential by compiling and displaying information about the nature and status of an incident and emergency response operations • Helps the IC define strategic objectives • Helps the IC provide information to the Level 3 EMT • Compiles and retains documentation
Logistics Section Chief	• Obtains personnel, equipment, materials, and supplies needed to mount and sustain emergency response operations • Provides services necessary to ensure that emergency response operations are carried out safely and efficiently

6.5 Asset Integrity

The objectives of Asset Integrity Management (AIM) are to maintain the integrity of equipment, structures, and protection devices for preventing and mitigating potential incidents; analyse failure modes and effects; and complete necessary inspection and testing programs.

The ABU Surface Equipment Reliability and Integrity Process (SERIP) (Ref. 69) is CAPL's standardised approach to reliability and integrity activities and applies across all CAPL facilities. It is designed to implement recognised best practices and improve equipment performance and organisational effectiveness. SERIP applies to:

- Fixed equipment
- Pipeline systems
- Rotating equipment
- Instrumented protective systems
- Instrument and electrical system
- Subsea systems
- Floating systems
- Response and egress systems
- Structural systems.

AIM focuses on the assurance of Integrity Critical Elements (ICE), which includes environmental components. ICEs are managed in accordance with Performance Standards (PS), which set out the performance requirements for Integrity Critical Asset (ICA) to meet their objectives in terms of controlling potential Major Incident Events (MIE).

Asset integrity plans within AIM include integrity critical tasks (i.e. tasks performed to confirm and/or to sustain the safeguarding functionality of an ICA, such as inspections, tests, and preventive maintenance). These are also known as assurance tasks in the Operational Performance Standards (OPS). The asset integrity plans also include frequencies assigned to these tasks to confirm that ICAs remain suitable for their intended application throughout their service life.

CAPL is planning a structured transition from SERIP (Ref. 69) to the Corporate Standard for Facilities Integrity and Reliability Management Process (FIRM 01000; FIRM Process; Ref. 75) for completion by 2024. The FIRM Process will apply to

CAPL facilities. The transition will be subject to appropriate change management processes.

6.5.1 Computerised Maintenance Management System

CAPL uses a CMMS to support asset integrity management and reliability management through a rigorous, detailed register of inspection and maintenance tasks and data records, including maintenance planning and scheduling. Each item (down to component level) is assessed, has a criticality assigned based on importance, performance standards (including those based on manufacturers' specifications or similar), and a start date and frequency for inspections and maintenance. Items of high criticality are to be completed on time, or adequately managed under the deviation process.

CAPL uses the CMMS to ensure the facilities and, specifically, Integrity Critical Assets (ICAs), are inspected and maintained in accordance with Operational Performance Standards and legislative requirements, commensurate with good industry practice and appropriate risk management. The underlying philosophy is to manage inspection and preventive maintenance to meet integrity and serviceability requirements.

As an example, for the stormwater drainage system the infrastructure is managed as per the above i.e. assigned a criticality as per AIM and the applicable performance standard. The CMMS is then used to schedule the required Work Orders to meet the identified Management Measures and Environmental Performance Standards. i.e. the work order task identifies the activity defined in the Management Measures and Environmental Performance Standard. The CMMS also provides reference to the work instruction that is applicable to the particular activity being completed (e.g. inspection of the Class 2 drainage system). Labour routes are included within the work order to ensure all required tasks are completed as per the work instructions. Post completion of the work order, details of the outcomes are provided in the CMMS and any followup required. For example if the work order was to complete an inspection of the Class 2 drainage system, the results from the inspection are documented in the CMMS and any maintenance or corrective action required. In such situations a separate corrective work order would then be generated in CMMS, scheduled and completed and records captured.

6.5.2 Work Management Sub-Process

The Work Management Sub-process helps prioritise, plan, schedule, and complete the necessary maintenance for structures, equipment, and protective devices. The Sub-process is supported by the CMMS.

ICAs are components, structures, or equipment with a function that contributes to an ICE. ICAs are identified through Equipment Criticality Assessments (ECAs), which consider safety, environmental and regulatory aspects.

All ICAs and their associated PSs are identified in the CMMS and have mandatory inspection or planned maintenance activities associated with them at appropriate frequencies. Inspection and maintenance tasks not conducted within the specified time frames are managed through technical deviation management (see below).

The ABU Asset Integrity Program (Ref. 76) describes the roles and responsibilities to implement and maintain the AIM program, and details the measurement and verification activities designed to monitor asset integrity and to promote continual improvement.

6.5.3 Deviation Management

The ABU Deviation Management Procedure (Ref. 77) addresses any integrity critical tasks on ICAs that will not be performed by the due date, and any ICAs that have failed to meet the safeguarding functionality defined in the relevant OPS. This procedure applies to all ICAs within the CAPL AIM program.

The Deviation Management Procedure (Ref. 77) describes a method for establishing a forward-looking process and tracking completion of asset integrity plans so that integrity critical tasks are performed by the scheduled due date. If it is anticipated that an asset integrity plan task will not be completed by the scheduled due date, or such a task is already overdue, an appropriate analysis will be performed, and appropriate level of management involvement and approval obtained to authorise an extension of the scheduled due date.

The Deviation Management Procedure also details how to address operating without the assurance of safeguarding functions (i.e. deficiencies against OPSs). If structures or equipment are planned to be operated without the assurance of safeguarding functions (i.e. outstanding deficiencies), an appropriate analysis and level of management involvement and approval must be obtained before placing the equipment back into operation. Interim measures will be considered, if available and appropriate.

6.5.4 Operational Readiness

Operational readiness reviews are conducted before start-up for all new and modified facilities, including:

- A review to confirm adherence to standards and the suitability for start-up; when change has occurred or as an operational check sometime after the Pre–Start-up Safety Review (PSSR).
- A PSSR to confirm compliance with applicable Technical Codes and Standards and that applicable process safety systems are in place, equipment is in safe condition, and people are competent to execute a safe start-up.

PSSRs are conducted in accordance with the ABU Facilities Engineering Pre-Start-up Safety Review Guideline (Ref. 78). This Guideline specifies the objectives, the process, and the roles and responsibilities for completing PSSR, and provides guidance on the scope and timing of the PSSR. In brief, a PSSR is required when:

- Permanent or temporary changes occur that are covered by the MOC F&O Process (Ref. 79).
- An intrusive inspection or major repair has been conducted.
- A mothballed system is being restarted.
- A new complex system is being put into operation for the first time.

6.6 Information Management

The *ABU OE Information Management (OEIM) Process* (OE-03.02.01) defines the requirements for properly maintaining critical OE information throughout its lifecycle. The Process is supported by:

- ABU Records Management Standard (OE-03.02.125) which provides a framework for the management of CAPL Company records throughout the information lifecycle and ensures records are correctly identified, captured,

protected, retained and destroyed in accordance with Chevron Policy 566 - Information Retention, compliance with state, national and international legislation, government regulations, and Chevron, ABU and joint venture partner business controls and facilitates efficient search and retrieval to aid business operation and decision making and support information requirements in the event of audit, litigation or divestment.

- ABU Records Retention Schedule (OE-03.02.113) defines the retention schedule for each record retention category.

In accordance with Condition 24 of EPBC Reference: 2003/1294 and 2008/4178, CAPL shall maintain accurate records of activities associated with the TSEPP and make them available on request by the DCCEEW. Such documents may be subject to audit by DCCEEW and used to verify compliance with the conditions of approval.

6.7 Assurance

Within the OEMS, assurance is a common expectation that supports the OE objective of each focus area. The ABU OE Assurance Process (Ref. 30) enables CAPL to deliver assurance that safeguards are established and functioning; it details:

- a framework for managing verification activities that assure that CAPL complies with applicable legal, regulatory and OEMS requirements
- a process to identify, report and resolve non-compliance
- the minimum qualifications and organisational capability to execute this process.

To support the implementation of the ABU OE Assurance Process, CAPL have developed an ABU integrated assurance system (Figure 6-3), which integrates and leverages assurance activities across the various levels of CAPL business through to the corporate level—to provide confidence that safeguards are in place and functioning as intended. This integrated assurance system includes:

- Level 1 – Monitoring, testing and frontline assurance: ongoing, routine, planned verifications of safeguards specific for the asset/facility (e.g. inspections, preventive maintenance, emergency drills and exercises).
- Level 2 – OE assurance: OE assurance activities (e.g. assessments, reviews, audits, inspections) that verify safeguards are in place and functioning, and validate that L1 assurance is effective. These assurance activities monitor weaknesses in the management system and compliance with regulatory requirements, and input learnings into the management system cycle.
- Level 3 – Corporate and functional assurance: Assurance activities undertaken by Chevron, CAPL's functional groups (e.g. HSE, Drilling and Completions, base business) or third parties. These assurance activities test effectiveness of the focus area's complete assurance system and how associated safeguards are being sustained.

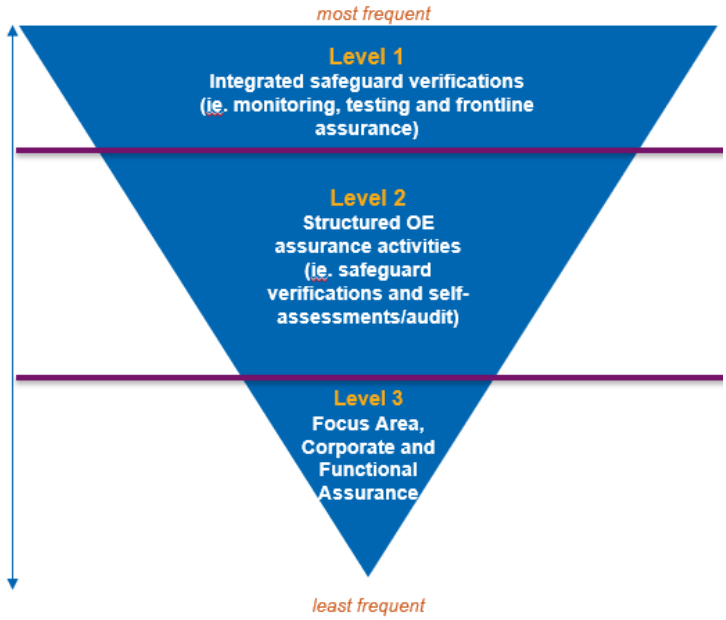

Figure 6-3: ABU integrated assurance system

The ABU OE Assurance Plan (Ref. 31) documents the CAPL ABU integrated assurance system and associated assurance activities. The ABU OE Assurance Plan is reviewed and approved annually and identifies OE assurance priorities based on risk, providing a framework for the scheduling of assurance activities across assets and projects.

Assurance activities focus on in-field activities and administrative processes, depending on the activities being undertaken and assurance priorities, in order to provide sufficient demonstration that environmental performance outcomes and environmental performance standards have been met. A record of assurance activities undertaken, and the outcomes, are maintained and applicable actions are tracked until closure.

In accordance with Conditions 4.1 and 4.2 of Statement No. 800 and Statement No. 769, CAPL maintains a Compliance Assessment Plan (CAP; Ref. 32) which outlines the approach and timing of compliance assessments and the retention of compliance assessments. The approach outlined in the CAP is aligned with the ABU OE Assurance Process described above.

Assurance activities to assess implementation and effectiveness of this Plan will be undertaken in accordance with the ABU OE Assurance Process (Ref. 30) and the Gorgon CAP.

In accordance with Condition 23 of EPBC Reference: 2003/1294 and 2008/4178, CAPL shall, upon the direction of the Minister, ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.

In accordance with Condition 24 of EPBC Reference: 2003/1294 and 2008/4178, CAPL shall maintain accurate records of activities associated with the TSEPP, and make them available on request by the DCCEEW. Such documents may be subject to audit by DCCEEW and used to verify compliance with the conditions of approval.

6.8 Environmental Performance Review, Reporting, Adaptive Management and Plan Review

6.8.1 Environmental Performance Review

CAPL applies a number of processes to routinely review environmental performance. These include the MSC, Asset Review and Annual Reporting Cycle.

6.8.1.1 MSC

As outlined in section 6.1, the MSC is a key element of the OEMS. The MSC is a systematic approach to set and align objectives; identify, prioritize and close gaps; strengthen safeguards and improve OE results. The MSC is managed by OELTs who have the authority and the accountability to execute the OEMS effectively. The MSC is coordinated at various levels in the company for effective and efficient management of OE risks, including environment. The MSC comprises of three steps:

- Establish or validate objectives
- Conduct assessment to assess current performance and identify and gaps
- Develop plan to address any identified gaps.

Execution and review of the MSC is considered an ongoing activity; OELTs direct scope, frequency and rigour based on risk. Whilst it is an ongoing activity, there is a dedicated review cycle which includes targeted focus on environmental performance at an ABU level as well for each Asset. This performance review identifies any new environmental risks and where appropriate a plan to address these risks is developed. Progress against this plan is then monitored by the OELT.

6.8.1.2 Asset Review

In addition to the above, there is a more tactical review of Environmental Performance at an Asset level through the annual identification of metrics and the routine capture and review of metrics, KPIs, incidents and incident investigations outcomes. Section 6.8.2.5 provides further details on incident investigation. This Asset level review enables trends and focus areas for improvement to be identified.

6.8.1.3 Annual Environmental Reporting Cycle

As outlined in Sections 6.8.2.1 and 6.8.2.2 below, the annual reporting cycle provides another mechanism for review of environmental performance. This reporting cycle supports a thorough review and assessment of performance in relation to both compliance and results of ecological monitoring programs. Outcomes of the annual reporting cycle are also fed into the MSC.

6.8.2 Reporting

6.8.2.1 Compliance reporting

Condition 4 of MS 800 and MS 769 and Condition 2 of EPBC Reference: 2003/1294 and 2008/4178 requires CAPL to submit a Compliance Assessment Report annually to address the previous 12-month period. In accordance with Conditions 2-1 and 2-2 of MS 965, compliance assessment and compliance reporting will be carried out on a joint basis with MS 800.

In accordance with Condition 4.5 of MS 800 and MS 769, any non-compliance with approval conditions will be reported to the Chief Executive Officer (CEO) of DWER as soon as practicable. Non-compliances with provisions in the Plan that do not affect the meeting of the Plan's objectives are reported annually in the Compliance Assessment Report, along with any corrective and preventative actions taken.

6.8.2.2 Environmental performance reporting

Condition 5.1 of MS 800 and MS 769, and Condition 4 of EPBC Reference: 2003/1294 and 2008/4178 require that CAPL submits an annual Environmental Performance Report (EPR) to the Western Australian Minister for the Environment and to the DCCEEW respectively, for the previous 12-month period.

In addition, under Condition 5.3 of MS 800 and MS 769, and Condition 4.2 for EPBC Reference: 2003/1294 and 2008/4178 every five years from the date of the first annual Report, CAPL shall submit to the Western Australian Minister for the Environment an EPR covering the previous five-year period. In accordance with Conditions 2-1 and 2-2 of MS 965, performance reporting will be carried out on a joint basis with MS 800.

Specific details on the content of the EPR are defined in Condition 5.2 and Schedule 3 of MS 800, Condition 5.2 of MS 769, and Schedule 3 of EPBC Reference: 2003/1294 and 2008/4178. The content of the EPR includes the results of the monitoring undertaken as per the TSEMP (Ref. 22) including where applicable any measurable impacts on the terrestrial and subterranean environment state from the Project, changes from baseline or mitigation measures applied.

MS 800 Schedule 3 Condition 6 (iii) and EPBC Reference: 2003/1294 and 2008/4178 Schedule 3 Condition 5 (iii) requires the Annual Performance Report to contain information on the results of environmental monitoring and identified Material or Serious Environmental Harm, if any, resulting from the seepage of injected CO_2 to the surface or near surface environments including those which may support subterranean fauna (including the Blind Gudgeon (*Milyeringa verita*).

6.8.2.3 Vegetation clearing and audit reporting

Results of the annual audit of clearing of vegetation and rehabilitation will be provided to DBCA and DWER in accordance with the Vegetation Clearing and Audit Common User Procedure (Ref. 25).

6.8.2.4 Reporting under contaminated sites legislative framework

Reporting under Contaminated Sites processes will be undertaken as outlined in Section 3.1.4.

6.8.2.5 Incident reporting

Incident investigation and reporting (IIR) expectations are to identify, report, record and investigate incidents, analyse trends, correct deficiencies, and share and adopt relevant lessons learned.

The IIR Execution Manual (Ref. 33) defines the requirements to report, classify, record, and investigate incidents and near misses, including but not limited to injury, occupational illness, environmental impact, compliance, reliability, business disruption, and community concern.

The IIR process includes these requirements:

- training for employees and contractors to recognise and report events
- internal and external notification of events
- investigating incidents at the probable level of consequence, with the rigor of investigation based upon learning opportunity and incident severity
- allocating an incident management sponsor for selected investigations
- sharing alerts, lessons learned, and bulletins
- tracking recommended actions to closure
- analysing event trends.

Table 6-3 lists the environmental incident reporting requirements, including timing, specific to this Plan.

Table 6-3: Incident reporting requirements

Incident	Reporting to	Timing
Threatened or listed fauna cared for, injured, or killed within the Terrestrial Disturbance Footprint	DWER	Annual Environmental Performance Report
Material or Serious Environmental Harm outside the Terrestrial Disturbance Footprint (attributable to the Gorgon Gas Development)	DWER/DCCEEW	Within 48 hours of detection[1]
Significant impacts detected by the monitoring program for matters of National Environmental Significance	DCCEEW	Within 48 hours of detection[1]
Harm or mortality to EPBC Act Listed terrestrial fauna attributable to the Gorgon Gas Development	DCCEEW	Monthly reporting (with report submitted not later than 14 days after the end of the reporting period)
Non-compliance with approval conditions	DWER	As soon as practicable

1 Detection of ecological change may only become apparent following receipt of monitoring data analysis.

6.9 Adaptive management and plan revision

CAPL is committed to conducting activities in an environmentally responsible manner and aims to implement reviews of its environmental management actions as part of a program of continuous improvement. This commitment to continuous improvement means that CAPL will apply an adaptive management approach by routinely reviewing matters such as the overall design and effectiveness of the Plan, progress in environmental performance, changes in environmental risks, changes in business conditions, and any relevant emerging environmental issues. Changes may also be identified through the EPR reporting process (Section 6.8.2.2), the ecological monitoring management trigger process (Section 5), or the incident response process (Section 6.8.2.3).

If the Plan no longer meets the aims, objectives or requirements of the Plan, if works are not appropriately covered by the Plan, or measures are identified to improve the Plan, CAPL will submit an amendment or addendum to the Plan to the State Minister for Environment for approval under Condition 36.2 of MS 800, Condition 21 of MS 769 and Condition 25 of EPBC Reference: 2003/1294 and 2008/4178.

In addition to any updates as a result of adaptive management reviews, outlined above, this Plan will be reviewed and updated every ten years as a minimum as required by Condition 3.2A of EPBC Reference 2003/1294 and 2008/4178 or as directed by either the Western Australian Minister for the Environment or the Commonwealth Minister for the Environment in accordance with Condition 36.2 of MS 800 and Condition 21 of MS 769 or Condition 25 of EPBC Reference: 2003/1294 and 2008/4178, respectively.

7 Acronyms and abbreviations

Table 7-1 defines the acronyms and abbreviations used in this document.

Table 7-1: Acronyms and abbreviations

Acronym / Abbreviation	Definition
ABU	Australian Business Unit
Additional Support Area	Gorgon Gas Development Additional Construction, Laydown and Operations Support Area
AIM	Asset Integrity Management
AIIMS	Australasian Inter-service Incident Management System
ALARP	As Low As Reasonably Practicable Defined as a level of risk that is not intolerable, and cannot be reduced further without the expenditure of costs that are grossly disproportionate to the benefit gained.
API	American Petroleum Institute
AS	Australian Standard
AS/NZS	Australian Standard/New Zealand Standard
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
At risk	Being at risk of Material Environmental Harm or Serious Environmental Harm and/or, for the purposes of relevant EPBC Act relevant listed threatened species and threatened ecological communities and listed migratory species, at risk of Material Environmental Harm or Serious Environmental Harm.
BBGS	Basal Barrow Group Shale
BI Act	*Barrow Island Act 2003* (WA)
BTEX	Benzene, toluene, ethylbenzene and xylene aromatic hydrocarbon compounds present in petroleum; may be primary pollutants of soils and groundwater associated with petroleum products.
Bund	An area of containment, such as a dam, wall, or other artificial embankment.
CAPL	Chevron Australia Pty Ltd
Carbon Dioxide (CO_2) Injection System	The mechanical components required to be constructed to enable the injection of reservoir carbon dioxide, including but not limited to compressors, pipelines and wells.
CDMP	Carbon Dioxide Disposal Management Plan
CEO	Chief Executive Officer
CH_4	Methane
CMMS	Computerised Maintenance Management System
CMT	Crisis Management Team
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2 Seismic Baseline Survey Program	The CO_2 Seismic Baseline Survey Program as described in the CO_2 Seismic Environmental Management Plan
CO_2 Seismic Survey Program	The program of seismic surveys to be undertaken over the life of the CO_2 Injection Project to monitor injected CO_2 in accordance with the Section 13 Approval.
CO_2-e	Carbon dioxide equivalent

Acronym / Abbreviation	Definition
Construction	Construction includes any Proposal-related (or action-related) construction and commissioning activities within the Terrestrial and Marine Disturbance Footprints, excluding investigatory works such as, but not limited to, geotechnical, geophysical, biological and cultural heritage surveys, baseline monitoring surveys and technology trials.
Construction Period	The period from the date on which the Gorgon Joint Venturers first commence construction of the Proposal until the date on which the Gorgon Joint Venturers issue a notice of acceptance of work under the Engineering, Procurement and Construction Management contract, or equivalent contract entered into in respect of the second LNG train of the GTP.
CPI	Corrugated Plate Interceptor
CS Act	*Contaminated Sites Act 2003* (WA)
CSM	Conceptual Site Model
Cth	Commonwealth of Australia
Cut Batters	Cut earthen walls with a sloping face
DBCA	Western Australian Department of Biodiversity, Conservation, and Attractions (from 1 July 2017; formerly Department of Parks and Wildlife) (DBCA dates: from 1 Jul 2017 to [ongoing])
DCCEEW	Climate Change, Energy, the Environment and Water [DCCEEW] (from 1 July 2022; incorporates environment functions from the former Department of the Environment and Energy)
DDA	Drainage Discharge Approval
DEC	Former Western Australian Department of Environment and Conservation, then split into Department of Environment Regulation and Department of Parks and Wildlife. Now Department of Biodiversity, Conservation, and Attractions (DBCA; from 1 July 2017) and Department of Water and Environmental Regulation (DWER; from 1 July 2017). (DEC dates: 1 Jul 2006 to 30 Jun 2013; was an amalgamation of the former Department of the Environment and the Department of Conservation and Land Management)
DEWHA	Former Commonwealth Department of the Environment, Water, Heritage and the Arts (now DCCEEW) (DEWHA dates: from 3 Dec 2007 to 14 Sep 2010)
DotE	Former Commonwealth Department of the Environment (now DCCEW) (DotE dates: from Oct 1997 to Oct 1998; then from 18 Sep 2013 to 19 Jul 2016)
DotEE	Former Commonwealth Department of the Environment and Energy (formerly Department of the Environment and Water [DEW]; Department of the Environment, Water, Heritage and the Arts [DEWHA]; and Department of Sustainability, Environment, Water, Population and Communities; and Department of the Environment [DotE]) (DotEE dates: from 19 Jul 2016 to 31 Jan 2020) (Energy functions split from this department and incorporated into the new Department of Industry, Science, Energy and Resources 1 Feb 2020) (Environment functions split from this department in incorporated into the new Department of Climate Change, Energy, the Environment and Water [DCCEEW] 1 July 2022–ongoing)
DPaW	Former Western Australian Department of Parks and Wildlife (now DBCA)
DSI	Detailed Site Investigations
DWER	Western Australian Department of Water and Environmental Regulation (formerly Department of Environment Regulation and Office of the Environmental Protection Authority (from 1 July 2017 to [ongoing])
EC	Electrical Conductivity

Acronym / Abbreviation	Definition
Ecological Element	Element listed in Condition 6.1 of MS 800 and MS 769 and Condition 5.1 EPBC Act Reference: 2003/1294 and 2008/4178.
EIS/ERMP	Environmental Impact Statement/Environmental Review and Management Programme (for the Proposed Gorgon Development dated September 2005) as amended or supplemented from time to time.
EMT	Emergency Management Team
Environmental Harm	Has the meaning given by Part 3A of the *Environmental Protection Act 1986* (WA).
EP Act	Western Australian *Environmental Protection Act 1986*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPBC Reference: 2003/1294	Commonwealth Ministerial Approval (for the Gorgon Gas Development) as amended or replaced from time to time.
EPBC Reference: 2005/2184	Commonwealth Ministerial Approval (for the Jansz Feed Gas Pipeline) as amended or replaced from time to time.
EPBC Reference: 2008/4178	Commonwealth Ministerial Approval (for the Revised Gorgon Gas Development) as amended or replaced from time to time.
EPBC Reference: 2011/5942	Commonwealth Ministerial Approval (for the Fourth Train Expansion Proposal) as amended or replaced from time to time.
ERO	Emergency Response Organisation
ERP	Emergency Response Plan
Feed Gas Pipeline System	Means pipelines, electrical cables, hydraulic, and fibre-optic connections between the offshore fields and the GTP on Barrow Island that have an onshore section buried in the pipeline easement between North White's Beach and the GTP.
FHCUP	Fauna Handling Common User Procedure
FIRM	Facilities Integrity and Reliability Management
GIS	Geographic Information System
GJV	Gorgon Joint Venture
Gorgon Gas Development	The Gorgon Gas Development as approved under Statement Nos. 800 and 965, and EPBC References: 2003/1294 and 2008/4178 (as varied by the Commonwealth Environment Minister), as amended or replaced from time to time.
Gorgon Gas Development Footprint	Consists of the cleared areas and uncleared areas approved to be cleared on Barrow Island used for the construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline.
GTP	Gas Treatment Plant
GVD	Ground and Vegetation Disturbance
H_2S	Hydrogen sulfide
Ha	Hectare
HDD	Horizontally Directionally Drilled
HDPE	High Density Polyethylene
HSE	Health, Safety and Environment
IC	Incident Commander
ICA	Integrity Critical Assets are those components, systems, structures or equipment items (e.g. individual gas detector) with a function that contributes to

Acronym / Abbreviation	Definition
	a layer of protection against any event which occurs to prevent that event from becoming a Major Accident Event (MAE) or Major Incident Event (MIE).
ICE	Integrity Critical Elements are those parts of a facility identified as safeguards, (any component, system, structure or equipment item), whose failure could cause or contribute substantially to a major incident, or that are used to prevent, detect, control or mitigate the effects of a major incident. They are the higher-level systems (e.g. fire and gas detection system) making up the barriers identified as safeguards. An ICE can be made up of a number of different ICA types.
IFC	Issued for Construction
IMS	Incident Management System
ISO	International Organization for Standardization
Jansz Feed Gas Pipeline	The Jansz Feed Gas Pipeline as approved in MS 769 and EPBC Reference: 2005/2184 as amended or replaced from time to time.
Karst	An area of irregular limestone in which erosion has produced fissures, sinkholes, underground streams, and caverns.
kL	Kilolitre
km	Kilometre
LAA	*Land Administration Act 1997* (WA)
LDS	Leak Detection System
LNG	Liquefied Natural Gas
LOWC	Loss of Well Control
LTMTMP	Long-term Marine Turtle Management Plan
m	Metre
MCP	Major Capital Project
Management Triggers	Are quantitative, or where this is demonstrated to be not practicable, qualitative matters above or below whichever relevant additional management measures must be considered.
MAR	Mandatory Auditors Report
Material Environmental Harm	Environmental Harm that is neither trivial nor negligible.
MIE	Major Incident Event
MNES	Matters of Nationl Environmental Significance
MEG	Monoethylene glycol
MGA 50, GDA 94	Map Grid of Australia Zone 50 (WA); projection based on the Geocentric Datum of Australia 1994
mm	Millimetre
MS	Ministerial Statement (WA)
MS 1002	Western Australian Ministerial Statement 1002, issued for the Gorgon Gas Development Fourth Train Expansion Proposal, as amended from time to time.
MS 748	Western Australian Ministerial Statement No. 748 (for the Gorgon Gas Development) as amended from time to time [superseded by MS 800].
MS 769	Western Australian Ministerial Statement No. 769 (for the Jansz Feed Gas Pipeline) as amended from time to time.
MS 800	Western Australian Ministerial Statement No.800, issued for the Revised and Expanded Gas Development, as amended from time to time. MS 800

Acronym / Abbreviation	Definition
	supersedes the Gorgon Gas Development as originally approved by MS 748. The conditions of MS 800 also apply to the Additional Support Area under MS 965.
MS 865	Western Australian Ministerial Statement No. 865 (for the Gorgon Gas Development).
MS 965	Western Australian Ministerial Statement No. 965, issued for the Additional Support Area, as amended from time to time. Statement No.965 applies the conditions of MS 800 to the Additional Support Area."
MSC	Management System Cycle
N/A	Not Applicable
NES	[Matters of] National Environmental Significance, as defined in Part 3, Division 1 of the EPBC Act (Cth).
NIS	Non-indigenous Species
NO_x	Nitrogen oxides (NO and NO_2)
OC	On-Scene Commander
OE	Operational Excellence
OELT	Operational Excellence Leadership Team
OEMS	Operational Excellence Management System
OEPA	Office of the Environmental Protection Authority
Operations (Gorgon Gas Development)	In relation to MS 800 and EPBC Reference: 2003/1294 and 2008/4178, for the respective LNG trains, this is the period from the date on which the Gorgon Joint Venturers issue a notice of acceptance of work under the Engineering, Procurement and Construction Management contract, or equivalent contract entered into in respect of that LNG train of the GTP; until the date on which the Gorgon Joint Venturers commence decommissioning of that LNG train.
Operations (Jansz Feed Gas Pipeline)	In relation to MS 769, for the pipeline, this is the period from the date on which the Proponent issues a notice of acceptance of work under the Engineering, Procurement and Construction Management contract, or equivalent contract entered into in respect of that pipeline; until the date on which the Proponent commences decommissioning of that pipeline.
ORT	Onsite Response Team
OWS	Oily Water Sump
PCSM	Preliminary Conceptual Site Model
PER	Public Environmental Review for the Gorgon Gas Development Revised and Expanded Proposal dated September 2008, as amended or supplemented from time to time.
Performance Standards	Defined, in accordance with Schedule 2 of MS 800, as "matters which are developed for assessing performance, not compliance, and are quantitative targets or where that is demonstrated to be not practicable, qualitative targets, against which progress towards achievement of the objectives of conditions can be measured".
PFAS	per- and poly-fluoroalkyl substances
PFAS NEMP	PFAS National Environmental Management Plan Version 2.0
Practicable, 'as far as practicable', 'where practicable'	Practicable means reasonably practicable having regard to, among other things, local conditions and circumstances (including costs) and to the current state of technical knowledge. For the purposes of EPBC Reference: 2003/1294 and 2008/2178, which include the term 'practicable', when considering whether the draft plan meets the requirements of these conditions, the Commonwealth Minister will determine

Acronym / Abbreviation	Definition
	what is 'practicable' having regard to local conditions and circumstances including but not limited to personnel safety, weather or geographical conditions, costs, environmental benefit and the current state of scientific and technical knowledge.
PSI	Preliminary Site Investigation
PSSR	Pre-Start-up Safety Review
PWD	Permanent Wastewater Disposal
PTW	Permit to Work
QMS	Quarantine Management System
RAP	Remedial Action Plan
SAQP	Sampling and Analysis Quality Plan
SDS	Safety Data Sheet
Section 13 Approval	The document dated 14 September 2009 setting out the conditions and restrictions of the *Barrow Island Act 2003* Minister's approval granted to the Gorgon Joint Venturers under Section 13 of that Act to inject carbon dioxide into the Dupuy Formation beneath Barrow Island as varied, added to or substituted for in accordance with condition 19 of that document.
Serious Environmental Harm	Environmental harm that is: • irreversible, of a high impact or on a wide scale; or • significant or in an area of high conservation value or special significance and is neither trivial nor negligible.
SERIP	Surface Equipment Reliability and Integrity Process
Significant Fauna	Fauna identified as significant ecological elements in the Terrestrial and Subterranean Baseline State and Environmental Impact Report.
Significant Impact	An impact on a Matter of National Environmental Significance, relevant to EPBC Reference: 2003/1294, 2005/2185, and 2008/4178 that is important, notable or of consequence having regard to its context or intensity.
SLWMP	Solid and Liquid Waste Management Plan
SMP	Site Manaement Plan
SO_2	Sulfur dioxide
SO_x	Sulfur oxides (SO and SO_2)
SRE	Short-range Endemic; taxonomic group of invertebrates that are unique to an area, found nowhere else, and have naturally small distributions (i.e. <10 000 km^2)
Stormwater	Natural run-off of rainwater that occurs during or after storms or heavy rainfall events.
Stygofauna	Groundwater-dwelling aquatic fauna.
SRVP	Site Remediation and Validation
SWHP	Stormwater Holding Pond
TAPL	Texaco Australia Pty Ltd
TAR	Turnaround
Taxon (plural: taxa)	A taxon (plural taxa), or taxonomic unit, is a name designating an organism or a group of organisms.
TDF	*See* Terrestrial Disturbance Footprint

Acronym / Abbreviation	Definition
TEG	Triethylene glycol
Terrestrial Disturbance Footprint	The area to be disturbed by construction or operations activities associated with the Terrestrial Facilities listed in Condition 6.3 of MS 800, Condition 6.3 of MS 769, and Condition 5.2 of EPBC Reference: 2003/1294 and 2008/4178, and set out in the Terrestrial and Subterranean Baseline State and Environmental Impact Report required under Condition 6.1 of MS 800 including the Additional Support Area approved by MS 965, Condition 6.1 of MS 769, and Condition 5.1 of EPBC Reference: 2003/1294 and 2008/4178.
Terrestrial Facilities	In relation to MS 800 and EPBC Reference: 2003/1294 and 2008/4178, the Terrestrial Facilities are the: • GTP • Carbon Dioxide Injection System • Associated Terrestrial Infrastructure forming part of the Proposal • Areas impacted for seismic data acquisition • Onshore Feed Gas Pipeline System and terrestrial component of the Shore Crossing. Terrestrial Facilities also include those defined in Condition 6.3 of MS 769 (the Onshore Feed Gas pipeline system and the terrestrial component of the Shore Crossing) and Schedule 1 of MS 965 (the Additional Support Area).
Threatened Ecological Communities	Ecological communities listed as critically endangered, endangered, or vulnerable under Section 181 of the EPBC Act (Cth).
Threatened Species	Species listed as extinct, extinct in the wild, critically endangered, endangered, vulnerable, or conservation dependent under Section 178 of the EPBC Act (Cth).
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
Troglofauna	Obligate cave- or karst-dwelling terrestrial subterranean fauna occurring above the watertable.
TSBSEIR	Terrestrial and Subterranean Baseline State and Environmental Impact Report
TSEMP	Terrestrial and Subterranean Environment Monitoring Program
TSS	Total Suspended Solids
TWIP	Temporary Wastewater Injection Plant
WA	Western Australia
WTS	Waste Transfer Station

8 References

The following documentation is either directly referenced in this document or is a recommended source of background information.

Table 8-1: References

Ref. No.	Description	Document ID
1.	Government of Western Australia, Minister for the Environment, David Templeman MLA. 2008. *Statement that a Proposal may be Implemented – Jansz Feed Gas Pipeline: Barrow Island Nature Reserve (Ministerial Statement No. 769), 28 May 2008.* Perth, Western Australia. Available from: http://www.epa.wa.gov.au/sites/default/files/1MINSTAT/000748.pdf	
2.	Commonwealth Government of Australia, Assistant Secretary Environmental Assessment Branch, Anne-Marie Delahunt. 2006. *Decision to Approve the taking of an Action – Jansz Feed Gas Pipeline (EPBC Reference: 2005/2184), 22 March 2006*. Canberra, Australian Capital Territory.	
3.	Government of Western Australia, Minister for the Environment, David Templeman MLA, 2007. *Statement that a Proposal may be Implemented – Gorgon Gas Development: Barrow Island Nature Reserve (Ministerial Statement No. 748), 6 September 2007*. Perth, Western Australia. Available from: http://www.epa.wa.gov.au/sites/default/files/1MINSTAT/000748.pdf	
4.	Government of Western Australia, Minister for the Environment, Youth, Donna Faragher JP MLC. 2009. *Statement that a Proposal may be Implemented – Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve (Ministerial Statement No. 800), 10 August 2009.* Perth, Western Australia. Available from: http://www.epa.wa.gov.au/sites/default/files/1MINSTAT/00800.pdf	
5.	Commonwealth Government of Australia, Minister for the Environment, Water, Heritage and the Arts, Peter Garrett. 2009. *Approval – Gorgon Gas Development (EPBC Reference: 2008/4178), 26 August 2009*. Canberra, Australian Capital Territory. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/epbc_reference_2008_4178___2003_1294.pdf	
6.	Commonwealth Government of Australia, Minister for the Environment and Water Resources, Malcolm Turnbull. 2007. *Approval – Gorgon Gas Development (EPBC Reference: 2003/1294), 3 October 2007*. Canberra, Australian Capital Territory.	
7.	Government of Western Australia, Minister for the Environment, Water, Bill Marmion MLA. 2011. *Statement to Amend Conditions Applying to the Gorgon Gas Development Revised and Expanded Proposal Barrow Island Nature Reserve (Ministerial Statement No. 865) 7 June 2011*. Perth, Western Australia. Available from: http://www.epa.wa.gov.au/sites/default/files/Ministerial_Statement/Statement%20No.%20865_0.pdf	
8.	Government of Western Australia, Minister for the Environment; Heritage. Albert P. Jacob JP MLA. 2014. *Statement that a Proposal may be Implemented – Gorgon Gas Development Additional Construction Laydown and Operations Support Area (Ministerial Statement 965)*. Perth, Western Australia. Available from: http://www.epa.wa.gov.au/sites/default/files/1MINSTAT/Statement%20No.%20965.pdf	
9.	Government of Western Australia, Minister for the Environment; Heritage. Albert Jacob MLA. 2015. *Statement that a Proposal may be Implemented – Gorgon Gas Development Fourth Train Expansion Proposal (Ministerial Statement 1002), 30 April 2015*. Perth, Western Australia. Available from: http://www.epa.wa.gov.au/sites/default/files/1MINSTAT/Statement%20No.%201002.pdf	
10.	Commonwealth Government of Australia, 2016. Assistant Secretary Assessment (WA, SA, NT) and Air Branch. *Approval – Gorgon Gas Development – Fourth*	

Ref. No.	Description	Document ID
	Train Expansion (EPBC 2011/5942), 12 May 2016. Canberra, Australian Capital Territory	
11.	Chevron Australia. 2005. *Draft Environmental Impact Statement/Environmental Review and Management Programme for the Proposed Gorgon Gas Development*. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/Draft-EIS-ERMP_full-report.pdf	
12.	Chevron Australia. 2008. *Gorgon Gas Development Revised and Expanded Proposal Public Environmental Review*. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/gorgon_revised_proposal_per_final_main_report_20080909.pdf	
13.	Chevron Australia. 2014. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Baseline State and Environmental Impact Report.* Rev. 3, Amendment 1. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/gorgon-emp-terrestrial-and-subterranean-baseline-state-and-environmental-impact-report.pdf	G1-TE-H-0000-REPX027
14.	Chevron Australia. 2016. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Solid and Liquid Waste Management Plan*. Rev. 1.0. Chevron Australia, Perth, Western Australia.	GOR-COP-01286
15.	American Petroleum Institute. 2013. *API Standard 650*, *Welded Tanks for Oil Storage*. American Petroleum Institute, Washington DC.	
16.	Standards Australia. 2017. *AS 1940:2017 The storage and handling of flammable and combustible liquids*. Sydney, Australia.	
17.	Chevron Australia. 2015. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Fire Management Plan*. Rev. 1.0. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/gorgon-emp-fire-management-plan.pdf	GOR-COP-01238
18.	Chevron Australia. 2019. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Post-Construction Rehabilitation Plan.* Rev. 3.0. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/gorgon-emp-post-construction-rehabilitation-plan.pdf	G1-NT-PLNX0000303
19.	Chevron Australia. 2018. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Long-term Marine Turtle Management Plan.* Rev. 1.0. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/gorgon-emp-long-term-marine-turtle-management-plan.pdf	GOR-COP-01728
20.	Chevron Australia. 2011. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Horizontal Directional Drilling Management and Monitoring Plan*. Rev. 2. Chevron Australia, Perth, Western Australia.	G1-NT-PLNX0000299
21.	Chevron Australia. 2020. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Air Quality Management Plan*. Rev. 3. Chevron Australia, Perth, Western Australia	G1-NT-PLNX0000301
22.	Chevron Australia. 2020. *Gorgon Project: Terrestrial and Subterranean Environment Monitoring Program.* Rev. 2.0. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/gorgon-terrestrial-and-subterranean-environment-monitoring-program.pdf	GOR-COP-01696
23.	Chevron Australia. 2019. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Short-Range Endemics and Subterranean Fauna Monitoring Plan*. Rev. 4. Chevron Australia, Perth, Western Australia. Available from: https://australia.chevron.com/-/media/australia/our-businesses/documents/gorgon-emp-short-range-endemics-and-subterranean-fauna-monitoring-plan.pdf	G1-NT-PLNX0000295

Ref. No.	Description	Document ID
24.	Chevron Australia. 2014. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Fauna Handling and Management Common User Procedure*. Chevron Australia, Perth, Western Australia.	G1-PP-HES-PRC-0009
25.	Chevron Australia. 2014. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Vegetation Clearing and Audit Common User Procedure.* Rev. 3. Chevron Australia, Perth, Western Australia.	G1-PP-HES-PRC-0012
26.	Chevron Australia. 2014. *Gorgon Gas Development and Jansz Feed Gas Pipeline Traffic Management Common User Procedure.* Rev. 3. Chevron Australia, Perth, Western Australia.	G1-PP-HES-PRC-0010
27.	Chevron Australia. 2018. *ABU OE Risk Management Process.* Rev. 12.0. Chevron Australia, Perth, Western Australia.	OE-03.01.01
28.	Chevron Australia. 2010. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Appendix: Identification of Terrestrial and Subterranean Matters of National Environmental Significance (NES) and their Habitat.* Perth, Western Australia.	G1-NT-REPX0002886
29.	Standards Australia/Standards New Zealand. 2004. *ISO 14001:2004 Environmental Management Systems – Requirements with Guidance for Use*. Standards Australia/Standards New Zealand, Sydney/Wellington.	
30.	Chevron Australia. 2018. A*BU OE Assurance Process* Rev. 3.0. Chevron Australia, Perth, Western Australia.	OE-12.01.01
31.	Chevron Australia. 2022. *ABU OE Assurance Plan.* Chevron Australia, Perth, Western Australia.	ABU161100798
32.	Chevron Australia. 2018. *Gorgon Compliance Assessment Plan*. Rev. 4.0. Chevron Australia, Perth, Western Australia.	ABU171001656
33.	Chevron Australia. 2022. *II&R Execution Manual ABU Incident Investigation and Reporting.* Rev. 20.0. Chevron Australia, Perth, Western Australia.	OE-09.00.01
34.	Chevron Australia. 2018. *ABU Emergency Management Standardized OE Process.* Rev. 7.0. Chevron Australia, Perth, Western Australia.	OE-11.01.01
35.	Chevron Australia. 2019. *ABU Crisis Management Plan.* Rev. 20.0. Chevron Australia, Perth, Western Australia.	OE-11.01.10
36.	Chevron Australia. 2023. *ABU Competency Development and Assurance – ABU Standardised OE Process.* Rev. 9.0. Chevron Australia, Perth, Western Australia.	OE-03.13.01
37.	Chevron Australia. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Marine Quarantine Management System.* Perth, Western Australia.	OE-07.08.0001
38.	Chevron Australia. *Barrow Island Weed Procedure*. Perth, Western Australia.	OE-07.08.1003
39.	Chevron Australia. 2014. *Aboriginal and Cultural Heritage Management Plan.* Perth, Western Australia.	G1-NT-REPX0000207
40.	Chevron Australia. *Gorgon Project Carbon Dioxide Disposal Management Plan*. Perth, Western Australia.	G1-NT-REPX0001721
41.	Chevron Australia. *Gorgon Project Carbon Dioxide Injection System Pipeline and Wells Operations Environment Management Plan*. Perth, Western Australia.	GOR-COP-01489
42.	Chevron Australia. *Gorgon Project Carbon Dioxide Injection System Well Maintenance Environment Plan*. Perth, Western Australia.	GOR-COP-02232
43.	Chevron Australia. *Gorgon Major Hazard Facility Safety Report*. Perth, Western Australia.	G1-NT-REPX0004799
44.	Standards Australia/Standards New Zealand. 2009. *ISO 31000:2018 Risk Management – Principles and Guidelines*. Sydney, Australia.	
45.	HEPA. 2020. *PFAS National Environmental Management Plan Version 2.0*. Developed by the National Chemicals Working Group of the Heads of EPAs (HEP) Australia and New Zealand	

Ref. No.	Description	Document ID
46.	Senversa. (2023). *Mandatory Auditors Report Gorgon LNG Plant, Town Point, Barrow Island*. Senversa, Perth, Western Australia.	
47.	Chevron Australia. 2020 *Gorgon Gas Development and Jansz Feed Gas Pipeline: Five-year Environmental Performance Report 2015–2020,* Rev. 1.0, Chevron Australia, Perth, Western Australia.	ABU200101038
48.	Department of Main Roads. 2000. *Fauna Sensitive Road Design, Volume 1 – Past and Existing Practices*. Brisbane, Queensland.	
49.	CAPL. 2018. *Gorgon CO2 Injection Pipeline/Wells Fire and Explosion Risk Assessment*. Unpublished Report.	
50.	Intergovernmental Panel on Climate Change. 2005. *Carbon dioxide capture by functionalized solid amine sorbents with simulated flue gas conditions*, 45:13. Cambridge University Press	
51.	Price, PN, Mckone, TE and Sohn, MD. 2007. *Carbon Sequestration Risks and Risk Management*. Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory. Berkeley, California.	
52.	US Environmental Protection Agency. 2002. *Carbon Dioxide as a Fire Suppressant: Examining the Risks*. US Environmental Protection Agency, Office of Air and Radiation, Stratospheric Protection Division.	
53.	National Institute for Occupational Safety and Health. 1994. *Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs) for carbon dioxide*. US Department of Health & Human Services.	
54.	National Institute for Occupational Safety and Health. 1976. *Criteria for a Recommended Standard, Occupational Exposure to Carbon Dioxide*. US Department of Health, Education, and Welfare.	
55.	Dixon, C and Hasson, M. 2007. *Calculating the Release and Dispersion of gaseous, Liquid and Supercritical* CO_2. Institute of Mechanical Engineering Seminar on Pressure Release, Fires and Explosions, London, Vol 2.	
56.	Chevron Australia. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Five-year Environmental Performance Report (August 2010–August 2015).*	G1-NT-REPX0007517
57.	Chevron Australia. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Environmental Performance Report 2022.*	ABU220700410
58.	Department of Water and Environmental Regulation. 2021. *Gorgon LNG Project Amended Licence*. L9102/2017/1 under Part V of the *Environmental Protection Act 1986*.	
59.	Environmental Protection Authority 2021, *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans*, EPA, Western Australia	
60.	Commonwealth of Australia 2014. *Environmental Management Plan Guidelines.* Canberra, Australia.	
61.	Government of Western Australia, Minister for Environment; Climate Action. Hon Reece Whitby MLA. 2022. *Statement to amend the implementation conditions applying to a proposal – Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve (Ministerial Statement 1198), 20 October 2022*. Perth, Western Australia.	
62.	Standards Australia. 2012. *Handbook 203:2012 Managing Environment-related Risk.* Sydney, Australia.	
63.	Chevron Australia. 2022. *ABU Hazardous Materials Management Procedure.* Rev. 3.0. Chevron Australia, Perth, Western Australia.	OE-03.11.1045
64.	Chevron Australia. 2017. Procedure for Use of Spill Kits Located in Gorgon Operation Areas.	GOR-COP-0097

Ref. No.	Description	Document ID
65.	Chevron Australia. ABU Contractor Training Matrix Perth, Western Australia.	ABU-COP-01503
66.	Chevron Australia. 2023. ABU Operations Class 1 Drain Piping Material Class - 1 01PD009	GOR-0000-PIP-STD-WOP-00006
67.	Chevron Australia. 2023. ABU Operations Class 2 Drain Piping Material Class - 1 01PD007	G1-TE-X-0000-SPC4116-W01
68.	Department of Water and Environmental Regulation. 2018 (30 July). Decision Report Application for Licence, Division 3, Part V *Environmental Protection Act 1986*)	DER2017/001839
69.	Chevron Australia. 2018 Surface Equipment Reliability and Integrity Process (SERIP) – ABU Standardised OE Process	OE-05.03.01
70.	Chevron Australia. 2008. Gorgon Project Environmental Basis of Design	G1-TE-H-0000-PDBX001
71.	Specification for Noise Control of Equipment & Acoustic Enclosures	G1-TE-H-0000-SPC1002
72.	Chevron Australia. 2011. ABU OEIM Upstream and Gas Standard	OE-03.02.01
73.	Chevron Australia. 2017. ABU Records Management Standard	OE-03.02.125
74.	Chevron Australia. 2021. ABU Records Retention Schedule	OE-03.02.113
75.	Corporate Standard for Facilities Integrity and Reliability Management Process	FIRM 01000
76.	Chevron Australia. 2019. ABU Asset Integrity Program - ABU Standardised OE Procedure	OE.05.03.160
77.	Chevron Australia. 2021. ABU Deviation Management Procedure	ABU-COP-0205
78.	Chevron Australia. 2021. ABU Facilities Engineering Pre-Start-up Safety Review Guideline	ABU-COP-0027
79.	Chevron Australia. 2022. ABU Management of Change for Facilities and Operations Process	OE-04.00.01
80.	Department of Climate Change, Energy, The Environment and Water. 2023. *Protected Matters Search Tool* - Barrow Island Polygon Search around the island with 0 km Buffer https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool Accessed 9 March 2023.	
81.	Chevron Australia. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Environmental Performance Report 2023.*	ABU230800217
82.	Short, J., Turner, B. and Cale, P. 1989. *The Distribution and Relative Abundance of Rare Macropods and Bandicoots on Barrow and Dorre Island*. Unpublished report by CSIRO for Australian National Parks and Wildlife Service, Sydney, New South Wales.	
83.	Pruett-Jones, S. and O'Donnell, E.O. 2004. *Land Birds on Barrow Island: Status, Population Estimates, and Responses to an Oil-field Development*. Journal of the Royal Society of Western Australia, 87: 101–108.	
84.	Larson, H.K., Foster, R., Humphreys, W.F. and Stevens, M.I. 2013. *A new species of blind cave gudgeon Milyeringa (Pisces: Gobioidei, Eleotridae) from Barrow Island, Western Australia, with a redescription of M. veritas Whitley*. Zootaxa, 3616(2): 135–150. Available from: https://www.researchgate.net/publication/261837465_A_new_species_of_the_blind_cave_gudgeon_Milyeringa_Pisces_Gobioidei_Eleotridae_from_Barrow_Island_Western_Australia_with_a_redescription_of_M_veritas_Whitley [DOI:http://doi.org/10.11646/zootaxa.3616.2.3]	
85.	Humphreys, W.F. 2001. *The Subterranean Fauna of Barrow Island (Northwestern Australia)*. Memoires de Biospeologie (International Journal of Subterranean Biology). 28 107-127.	

Ref. No.	Description	Document ID
86.	Biota Environmental Sciences. 2007. *Barrow Island Gorgon Gas Development: Summary of 2004–2006 Subterranean Fauna Surveys.* Report prepared for Gorgon Joint Venture, Perth, Western Australia.	
87.	Lewis, M.M. and Grierson, I.T. 1990. *Land Units and Soils of Barrow Island.* Unpublished report for West Australian Petroleum Pty Ltd by Roseworthy Agricultural College, South Australia.	
88.	Mattiske, E.M. and Associates. 1993. *Flora and Vegetation, Barrow Island.* Unpublished report prepared for West Australian Petroleum Pty Limited, Perth, Western Australia.	
89.	Perry, D.H. 1972. *Some Notes on the Termites (Isoptera) of Barrow Island and a Check List of Species*. Western Australian Naturalist, 12: 52–55.	
90.	Department of Climate Change, Energy, The Environment and Water. 2023. *Protected Matters Search Tool* – Onshore Domestic Gas Pipeline polygon search https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool Accessed 11 March 2023.	
91.	Chevron Australia. 2023. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Horizontal Directional Drilling Management and Monitoring Plan - Addendum*. Rev. 1. Chevron Australia, Perth, Western Australia.	GOR-COP-03018

Appendix A Identification and risk assessment of terrestrial Matters of National Environmental Significance (NES)

TSEPP: Identification of Terrestrial and Subterranean Matters of National Environmental Significance (NES) and their Habitat

Document ID:	**G1-NT-PLNX0000294**
Revision ID:	**3.7**
Revision Date:	**4 December 2023**
Next Revision Due	**N/A**
Information Sensitivity:	**Company Confidential**

Contents

Tables

1 Introduction

This Appendix provides the following information as required by approval conditions under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) Reference: 2003/1294 and 2008/4178 (Ref. 6, Ref. 5):

1. a description of the EPBC listed species and their habitat likely to be impacted by the components of the action which are the subject of that plan, report, program or system (however described)
2. an assessment of the risk to these species from the components of the action the subject of that plan, relevant to that plan, report, program or system (however described).

Species listed as Matters of National Environment Significance (NES) and species listed as Other Matters Protected by the EPBC Act are included in Table 2-1 for Barrow island, with further information provided in Section 2.1 for any species or habitat that is potentially impacted by the Gorgon Gas Development.

Species listed as Matters of NES and species listed as Other Matters Protected by the EPBC Act are included in Table 3-1 for the mainland Onshore Domestic Gas Pipeline. The Onshore Domestic Gas Pipeline is out of scope of the TSEPP, however have been included in this appendix for completeness.

Habitat was considered 'significant' in the Draft EIS/ERMP (Ref. 11) where it was identified as:

- supporting an unusually high species richness or abundance compared to other parts of Barrow Island.
- containing faunal habitats not well represented in other parts of the Island.
- containing habitat for site-restricted fauna of high conservation significance.
- being in a location where development impacts may extend beyond the boundaries of the site and the impacts may lead to the disruption of ecological processes.

Applying these criteria, the habitats identified as being significant on Barrow Island are:

- Boodie warrens – habitat for Boodies (*Bettongia lesueur*), which are fauna of high conservation significance.
- Termite mounds that support high species richness.
- Nests of raptors (birds of prey), which are not represented on the Island in high numbers, and which provide habitat for fauna of high conservation significance.

Given boodie warrens and raptor nests are specific to the associated species, these habitats have been considered as part of the species description and risk assessment.

Using the same criteria, there is no 'significant' habitat associated with the mainland areas associated with the Onshore Domestic Gas Pipeline that will be affected by the Gorgon Gas Development.

An assessment of risk to these species is presented in Section 4.

2 EPBC Act Listed Species on Barrow Island

Terrestrial and subterranean EPBC Act listed species that are identified on Barrow Island using the Department of Climate Change Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (Ref. 80) include:

- 19 listed threatened species (10 birds, 7 mammals, 1 reptile and 1 subterranean fauna) that are matters of NES.
- 26 migratory bird species (marine, terrestrial or wetland) that are matters of NES, of which some are also listed under the threatened species category.
- three listed sea bird species that are classified as Other Matters Protected by the EPBC Act (the White-bellied Sea Eagle, Silver Gull and Lesser Crested Tern).
- 16 listed marine species (marine turtles, sea snakes, cetaceans, sharks etc.) have not been included, as this Appendix refers to terrestrial and subterranean species only.

Table 2-1 provides information on the species abundance and habitat distribution of these listed EPBC species and those potentially impacted by the Gorgon Gas Development.

An additional 25 listed species, from those returned via the DCCEEW Protected Matters Search Tool, are known to occur on, or visit, Barrow Island and have been included in Table 2-1 for completeness.

Twenty-one of the species returned via the DCCEEW Protected Matters Search Tool are not known to occur on Barrow Island. These species are discussed further in Section 2.1.7 and listed in Table 2-2.

Table 2-1: EPBC Species Abundance and Habitat/Distribution on Barrow Island

	Species	Abundance on Barrow Island	Habitat / Distribution on Barrow Island	Species or Habitat Potentially Impacted
Sea Birds	Wedge Tailed Shearwater[1] Bridled Tern[3]	High	Breeding colonies on Double Islands and Boodie Island (Wedge Tailed Shearwaters)	Yes
	Silver Gull[2] Gull-billed Tern[3] Caspian Tern[1] Lesser Crested Tern[2] Crested Tern[3] Roseate Tern[1] Common Tern[3] Little Tern[1] Australian Fairy Tern[1]	Low - High	Concentrated on Barrow Island around coastal areas	No

	Species	Abundance on Barrow Island	Habitat / Distribution on Barrow Island	Species or Habitat Potentially Impacted
	White-winged Black Tern[3] Australian Pelican[3] Lesser Noddy[3]	Low	Concentrated on Barrow Island around coastal areas	No
Land Birds	White-winged Fairy- wren (Barrow Island) [1]	High	Widespread across vegetation communities	Yes
	Sacred Kingfisher[3]	Low	Restricted to mangroves / heavily vegetated creek lines	No
	Tree Martin[3]	Rare	Coastal areas (but not actual beaches) with some extension into claypan areas	No
	Welcome Swallow	High	Widespread	No
Raptors	Spotted Harrier[3] Brahminy Kite[3] Osprey[1] White-bellied Sea- eagle[2] Australian Kestrel[3]	Low	Widespread around the coastal margin of the island	Yes
Littoral Birds	Eastern Reef Egret[3] Nankeen Night Heron[3] Black-tailed Godwit[3] Whimbrel[3] Eastern Curlew[1] Common Greenshank[1] Terek Sandpiper[3] Common Sandpiper[1] Grey-tailed Tattler[3] Ruddy Turnstone[3] Great Knot[3] Red Knot[1] Sanderling Calidris[3] Red-necked Stint[3] Sharp-tailed Sandpiper [1] Curlew Sandpiper[1] Pacific Golden Plover[3] Grey Plover[3] Lesser Sand Plover[3] Greater Sand Plover[1]	High	Concentrated on Barrow Island, many around Bandicoot Bay on south coast	No

	Species	Abundance on Barrow Island	Habitat / Distribution on Barrow Island	Species or Habitat Potentially Impacted
Littoral Birds	Bar-tailed Godwit[1]	Low	Concentrated on Barrow Island around Bandicoot Bay on south coast	No
Mammals	Burrowing Bettong (Barrow and Boodie Island subspecies)[1] / Boodie Golden Bandicoot (Barrow Island) [1] Spectacled Hare-wallaby (Barrow Island) [1] Barrow Island Euro[1]	High	Widespread across landforms and vegetation communities	Yes
	Black-flanked Rock- wallaby[1]	Low	Restricted to the deeply incised valleys on the west coast of Barrow Island	No
Subterranean fauna	Barrow Cave Gudgeon[1,4]	Unknown	Subterranean aquifer	Yes
	Blind Eel[3]	Unknown	Subterranean aquifer	Yes

Notes:

1. *Matters of NES (Ref. 11)*
2. *Other Matters Protected by the EPBC Act (Ref. 11)*
3. *Listed EPBC species and believed or known to occur on Barrow Island, but not identified during the EPBC Act Protected Matters search*
4. *Pending EPBC classification*

2.1 EPBC listed species and habitats potentially impacted by the Gorgon Gas Development

2.1.1 Sea Birds (Wedge-tailed Shearwater and Bridled Tern)

Two species of Sea Birds, with nesting colonies located in relatively close proximity to the Gorgon Gas Development, have been identified as species that may be potentially impacted (Ref. 11). These are the Wedge-tailed Shearwater (*Ardenna pacifica*) and Bridled Tern (*Onychoprion anaethetus),* both listed as migratory and marine under the EPBC Act.

Both species nest on Double Islands, off the east coast of Barrow Island and 4 km from the Gas Treatment Plant site. Wedge-tailed Shearwaters also nest on Boodie Island, south of Barrow Island, and in the Lowendal and Montebello Islands to the north. Similarly, Bridled Terns nest in the Lowendal and Montebello Islands. These species also nest at other locations around Australia.

Bridled Terns are offshore fish foragers that generally nest in limestone crevices or under low bushes. Wedge-Tailed Shearwaters are offshore squid and fish foragers that excavate burrows up to 1.5 m long. These burrows may be in sand or limestone crevices.

Both Wedge-tailed Shearwaters and Bridled Terns have been monitored annually from 2008 to 2023. Results, discussion and conclusions from the monitoring program are described in the annual Gorgon Environmental Performance Report. As at November 2023, and as described in the 2023 Gorgon Environmental Performance Report (Ref. 81), key conclusions include:

- as a whole, trends in Wedge-tailed Shearwaters and Bridled Terns abundance, breeding participation and fledgling success are likely linked to regional and seasonal variability in oceanographic conditions as well as, localised variations in foraging and nesting site selection
- there is no evidence to suggest observed variations in abundance and demographics parameters are attributable to Gorgon Gas Development.

2.1.2 Mammals

2.1.2.1 Barrow Island Euro

The Barrow Island Euro (*Osphranter robustus isabellinus*) is listed as Vulnerable under the EPBC Act. The species is widespread over Barrow Island and observed in all habitats. Barrow Island Euros are more numerous in the vicinity of cliffs, roadside vegetation and infrastructure that provide shade and windbreaks.

The Barrow Island Euro has been monitored annually from 2008 to 2022. Results, discussion and conclusions from the monitoring program are described in the annual Gorgon Environmental Performance Report. A key conclusion described in the 2023 Gorgon Environmental Performance Report (Ref. 81) was that, despite variability evident in the At Risk and Reference zones, abundance estimates indicate a stable, whole of island population of Euros, with no evidence of impacts attributable to the Gorgon Gas Development.

2.1.2.2 Golden Bandicoot (Barrow Island)

The Golden Bandicoot (Barrow Island) (*Isoodon auratus barrowensis*) is listed as Vulnerable under the EPBC Act. This species is known to use the shelter of limestone crevices, spinifex tussocks and termite mounds across most of Barrow Island and is known to rapidly occupy artificial habitats.

The Golden Bandicoot (Barrow Island) has been monitored annually from 2008 to 2017, and again in 2021 with results, discussion and conclusions described in the subsequent Gorgon Environmental Performance Reports. As described in the 2022 Gorgon Environmental Performance Report (Ref.57), key conclusions included:

- The 2021 monitoring identified a marked increase in the estimated density and population size of Golden Bandicoots across Barrow Island and within both the At Risk and Reference zones when compared to all previous monitoring data.
- Increased densities in the overall population were likely to be the result of greater than average rainfall in the preceding six to seven months, despite the three years of below average annual rainfall from 2018–2020.
- There appear to be no impacts attributable to the Gorgon Gas Development on Golden Bandicoots in 2021 as the At Risk to Reference density ratio is within control limits.

2.1.2.3 Burrowing Bettong or Boodie (Barrow and Boodie Islands subspecies)

The Burrowing Bettong (Barrow and Boodie Islands subspecies) (*Bettongia Lesueur*) or Boodie is listed as Vulnerable under the EPBC Act.

Repeated surveys have been undertaken for Burrowing Bettong warrens across Barrow Island since at least 1989 (Ref. 82). The Draft EIS/ERMP documented the method for surveying for these warrens in the vicinity of the Gorgon Gas Development Footprint and the Onshore Feed Gas Pipeline route (Ref. 11).

Burrowing Bettong burrows are usually in well-drained limestone cap rock or caves, and are often associated with fig trees, which provide food. No warrens have been located in dune habitats or drainage lines in the absence of rocks, as cap rock most likely provides structural stability as well as insulation for the burrows.

The Burrowing Bettong has been monitored annually from 2008 to 2022. Results, discussion and conclusions from the monitoring program are described in the annual Gorgon Environmental Performance Report. Key conclusions described in the 2023 Gorgon Environmental Performance Report (Ref. 81) included:

- Although the number of individuals caught at each warren has varied considerably (some warrens have remained relatively stable while others have shown recent recovery), most warrens have shown a continued decline over the years of monitoring. This is reflected in a significant decline in Burrowing Bettong abundance of the monitored warrens over time in both the At Risk and Reference zones. There was a high correlation between the two zones, suggesting that the declines are likely due to similar factors acting across all warrens.
- Outcomes suggest the detected changes in the abundance of Burrowing Bettongs may be linked to more localised factors and do not appear attributable to Gorgon Gas Development. However, drivers affecting the abundance of Burrowing Bettong and correlations across both the At Risk and Reference zones will continue to be closely monitored to better understand trends.

2.1.2.4 Spectacled Hare-wallaby (Barrow Island)

The Spectacled Hare-wallaby (Barrow Island) (*Lagorchestes conspicillatus conspicillatus*) is listed as Vulnerable under the EPBC Act. This species uses a range of habitats and is widespread across landforms and vegetation communities on Barrow Island. This species uses tall spinifex as daytime refuge from both predators and heat.

The Spectacled Hare-wallaby (Barrow Island) has been monitored annually from 2008 to 2022. Results, discussion and conclusions from the monitoring program are described in the annual Gorgon Environmental Performance Report. A key conclusion described in the 2023 Gorgon Environmental Performance Report (Ref. 81) was that the whole of Island population estimate for Spectacled Hare-wallabies has varied considerably over the years, as has the ratio of density estimates. No impacts on the abundance of Spectacled Hare-wallabies appear to be attributable to the Gorgon Gas Development in 2022 - the At Risk to Reference

density ratio remained within control limits, and there were no significant trends in density estimates over time within each zone.

2.1.3 Land Birds (White-winged Fairy-wren (Barrow Island))

The White-winged Fairy-wren (Barrow Island) (*Malurus leucopterus edouardi*) is listed as Vulnerable under the EPBC Act. *Melaleuca cardiophylla* shrubland has not been included as a significant habitat although it was indicated in the Draft EIS/ERMP that it may be critical habitat for the White-winged Fairy-wren (Barrow Island) (Ref. 11). On Barrow Island this species nests in tall spinifex and a range of shrubs and occurs and breeds in many vegetation associations where *Melaleuca cardiophylla* is not present.

The White-winged Fairy Wren (Barrow Island) has been monitored annually from 2008 to 2022. Results, discussion and conclusions from the monitoring program are described in the annual Gorgon Environmental Performance Report. Key results and conclusions from the monitoring program described in the 2023 Gorgon Environmental Performance (Ref. 81) include:

- Linear modelling indicates that WWFW density has declined, generally, over time within both zones but that the declines do not differ significantly between zones. This suggests that the declines are more likely due to broad environmental conditions across Barrow Island rather than any Project-related effects in the At Risk zone.
- Overall, results indicate the variation in WWFW abundance is likely driven by variability in rainfall and other environmental conditions, with no evidence of impacts attributable to the Gorgon Gas Development.

2.1.4 Raptors

EPBC listed ‘marine’ raptors typically establish nests along the Barrow Island coastline. Of 54 raptor nests recorded in 2006, 35 nests were more than 2 km from the Gorgon Gas Development Footprint. The distribution of nests is likely to be reflected in the observed distributions of these birds with Brahminy Kites nests scattered along the coast, Osprey nests regularly spaced along the coast and White-bellied Sea-eagles as occasional visitors (and nesting pairs observed on the southern coast). (Ref. 83).

2.1.5 Subterranean Fauna

2.1.5.1 Barrow Cave Gudgeon

The Barrow Cave Gudgeon (*Milyeringa justitia*) was previously reported as the Blind Gudgeon (*Milyeringa veritas*), which is known extensively from Cape Range on the mainland, but was reclassified in 2013 (Ref. 84). The Barrow Cave Gudgeon is a Threatened species under the Western Australian *Biodiversity Conservation Act 2016*. Larson *et al*. (Ref. 84) reports that habitat suitable to support the Barrow Cave Gudgeon may extend over approximately 7,800 ha (approx. 35%) of Barrow Island, with records primarily from the central parts of the Island where the freshwater aquifer is thickest (Ref.85, Ref. 86).

The taxonomic revision of *M. veritas* has yet to be adopted under the EPBC Act. However, for the purposes of this report *M. justitia* has been included as a matter of NES consistent with *M. veritas*, which is listed as Vulnerable under the EPBC Act.

2.1.5.2 Blind Cave Eel

The blind eel (*Ophisternon* sp.) has not been identified to species level but, given the wide range of *Ophisternon candidum* in stygal ecosystems in the Pilbara, the single blind eel found on Barrow Island is taken to be *Ophisternon candidum* for the purposes of conservation status (Ref. 87). *Ophisternon candidum* is listed as Vulnerable under the EPBC Act.

2.1.6 Habitat

2.1.6.1 Termite Mounds

Termites perform an important function in the organic matter cycle, and the termite mounds provide valuable shelter for reptiles, birds and mammals on Barrow Island (Ref. 11). The potential for nutrient cycling is reflected in elevated levels of organic matter and phosphorus, iron and manganese in material collected from a termite mound on Barrow Island (Ref. 88).

Mapping indicates a distribution of approximately 6,360 termite mounds (identified in aerial imagery) over an area of 3,777 ha. The average density of termite mounds in this area was1.7 mounds per ha. There are large variations in mound density within each of the vegetation formations mapped by Mattiske (Ref. 89), ranging from 0.01 to 18.5 mounds per ha between communities, with no robust correlations evident.

Termite mounds are not distributed uniformly across Barrow Island, and, even in areas where they typically occur (such as red sand dunes and limestone ridges), they are absent over large areas (Ref. 90). Termite mounds on the island are most abundant on the flats south of the geological fault between Junction Beach and Eagles Nest Point, and north of the geological fault between Ant Point on the east coast and North Whites Beach on the west coast. The Gorgon Gas Development Footprint is therefore located in the portion of the island where termite mounds are less abundant.

2.1.7 Listed Species not known to occur on Barrow Island

Table 2-2 presents the EPBC listed species that were reported using the DCCEEW Protected Matters Search Tool, however, are not known to occur on Barrow Island.

Table 2-2: EPBC Species not known to occur on Barrow Island

	Species	Distribution
Sea Birds	Southern Giant-Petrel[1]	The extreme northern extent may include Barrow Island. Is common in the Southern Ocean.
	Streaked Shearwater[1]	Northern Australia from Exmouth to Queensland and New South Wales
	Sooty Tern[2]	Predominantly Western Australia, south of Shark Bay with scattered potential distribution across southern Australia
	Lesser Frigatebird[1]	Coastal regions of Australia from Kalbarri to Sydney
	Common Noddy[1]	In Australia, the Common Noddy occurs mainly in ocean off the Queensland coast,

	Species	Distribution
		but the species also occurs off the north-west and central Western Australia coast.
	White-tailed Tropicbird[1]	Breeds on islands throughout the tropics of the northern Indian Ocean. The species feeds close to Christmas Island, but also disperse as far as the continental shelf off northern Western Australia.
Raptors	Grey Falcon[1]	Widespread across Australia (except Tasmania)
Land Birds	Rainbow Bee-eater[2]	Widespread across Australia (except Tasmania)
Mammals	Ghost Bat[1]	Occurs throughout the Pilbara, Kimberley, Northern Territory and Queensland.
	Pilbara Leaf-nosed Bat[1]	Occurs throughout the Pilbara in cave and artificial (mine site) habitats.
Reptiles	Hamelin Ctenotus	Known only from a small area of mallee south of Shark Bay. Searches at additional sites with suitable habitat have yielded no new records. (Ref. 80).
Littoral Birds	Australian Painted Snipe[1]	All of Australia except the arid interior and parts of the southern coast and Tasmania.
	Fork-tailed Swift[1]	All states and territories of Australia (non-breeding visitor)
	Barn Swallow[1]	Northern Australia from Carnarvon to north Queensland.
	Grey Wagtail[1]	Widespread across Australia except southeastern Australia and Tasmania
	Yellow Wagtail[1]	Widespread across Australia except southwestern Australian and Tasmania
	Pectoral Sandpiper[1]	Widespread across Australia
	Oriental Plover/Dotterel[1]	Widespread across northwestern Australia, the Northern Territory down to South Australia.
	Oriental Pratincole[1]	Northwestern Australia, the Northern Territory and into parts of Queensland
	Asian Dowitcher[1]	Coastal distribution along northern Australia from Shark Bay to Brisbane
	The Northern Siberian Bar-tailed Godwit OR Russkoye Bar-tailed Godwit[1]	Coastal distribution around Western Australia

Notes:

1. *Matters of NES (Ref. 11)*
2. *Other Matters Protected by the EPBC Act (Ref. 11)*

3 EPBC Act Listed Species on the Mainland

EPBC Act listed species including matters of NES that are identified on the mainland and may occur in the vicinity of the Onshore Domestic Gas Pipeline using the Protected Matters Search Tool (Ref. 80) include:

- 16 listed threatened species (12 birds, 3 mammals, 1 reptile) that are matters of NES.
- 22 migratory bird species (marine, terrestrial or wetland) that are matters of NES, of which some are also listed under the threatened species category.
- one listed bird species, the White-bellied Sea Eagle, is classified as Other Matters Protected by the EPBC Act.
- 38 listed marine species (marine turtles, sea snakes, cetaceans, sharks etc.) have not been included, as this Appendix refers to terrestrial and subterranean species only.

Table 3-1 provides information on the species abundance and habitat distribution of these listed EPBC species occurring on the mainland. No species were identified as being potentially impacted by the Gorgon Gas Development.

Table 3-1: EPBC Species Abundance and Habitat/Distribution on Mainland

	Species	Abundance and/or Distribution in Australia	Species or Habitat Potentially Impacted
Seabirds	Streaked Shearwater[1] Australian Fairy Tern[1] Little Tern[1] Australian Pelican[1] Least Frigatebird[1] White-tailed Topicbird[1] Indian Yellow-nosed Albatross[1] Common Noddy[1] Southern Giant-Petrel[1]	Widespread along coastal areas and occasional inland water bodies	No
Land Birds	Rainbow Bee- eater[1]	All of Australia except Tasmania	No
	Pallid Cuckoo[1]	Widespread throughout, except Nullarbor Plain.	No
	Black-eared Cuckoo[1]	Widespread	No
	Richard's Pipit[1]	Widespread	No
	Night Parrot[1]	Occurs across all Australia States except Tasmania.	No

	Species	Abundance and/or Distribution in Australia	Species or Habitat Potentially Impacted
Raptors	Nankeen Kestrel[1]	Abundant and widespread in Australia	No
	Osprey[1]	Common and distributed along Australian coastlines	No
	Brahminy Kite [1] Grey Falcon[1] Red Goshawk[1] White-bellied Sea Eagle[2]	Widespread, and common to abundant in northern Australia.	No
Littoral Birds	Eastern Reef Egret[1] Red Knot[1] Curlew Sandpiper[1] Greater Sand Plover[1] Northern Siberian Bar-tailed Godwit[1] Australian painted Snipe[1] Fork-tailed Swift[1] Barn Swallow[1] Grey Wagtail[1] Yellow Wagtail[1] Common Sandpiper[1] Sharp-tailed Sandpiper[1] Pectoral Sandpiper[1] Oriental Plover[1] Oriental Pratincole[1] Asian Dowitcher[1] Bar-tailed Godwit[1] Whimbrel[1] Eastern Curlew[1] Common Greenshank[1] Cattle Egret[1]	Widespread along coastal areas and occasional inland water bodies	No
Mammals	Northern Quoll[1]	Occurs throughout the Pilbara, Kimberley, Northern Territory and Queensland.	No
	Ghost Bat[1]	Occurs throughout the Pilbara, Kimberley, Northern Territory and Queensland.	No
	Pilbara Leaf-nosed Bat[1]	Occurs throughout the Pilbara	No
Reptiles	Olive Python (Pilbara subspecies)[1]	Occurs throughout the Pilbara	No

Notes:

1. *Matters of NES (Ref. 11)*
2. *Other Matters Protected by the EPBC Act (Ref. 11)*

4 Risk Assessment

4.1 Overview

The risk assessment for this Plan was undertaken in accordance with the ABU OE Risk Management Process (Ref. 27) using Chevron Corporation's Integrated Risk Prioritization Matrix (Appendix B). This approach generally aligns with the processes outlined in ISO 31000:2018 Risk Management – Principles and Guidelines (Ref. 44) and Handbook 203:2012 Managing Environment-related Risk (Ref. 62)

Numerous risk assessments have been undertaken for the scope of the TSEPP, from initial environmental assessment and approval stage through to current operations. The risk assessment was revised and revalidated during the current revision of this Plan, considering the nature of current and future activities. The risk assessment process and evaluation involved numerous consultations and workshops with environmental, health, safety, project and engineering personnel. Risks considered and covered in this Plan were identified and informed by:

• experience gained during previous stages of the Project

• mapping and monitoring studies undertaken for the Project

• review of historical significant environmental incidents

• expertise and experience of CAPL personnel

• stakeholder engagement (Section 2.6)

4.2 Potential Impacts and Residual Risks

The potential impacts associated with the Gorgon Gas Development are described in detail in the Draft EIS/ERMP (Ref. 11). The major additional environmental issues investigated during the environmental assessment process for the Revised Proposal included cumulative air, light and noise emissions impacts. In the Draft EIS/ERMP, the cumulative risk for the terrestrial environment on Barrow Island was ranked as Medium (with mitigation safeguards in place when assessing consequence) (Ref. 11). This risk level was related to the remote likelihood of a combination of threats that together are critical threats (i.e. widespread, long-term impact on population or extinction of Barrow Island race of a listed species) to terrestrial fauna and flora on Barrow Island.

The cumulative risk for the subterranean environment on Barrow Island was also ranked as Medium (with mitigation safeguards in place when assessing consequence) (Ref. 11). This risk level was related to the remote likelihood of a critical threat to a subterranean fauna population such as through a catastrophic release of CO_2 into the superficial aquifer, leading to the loss of local populations of listed fauna.

The conclusions of the risk assessment completed for the current revision of the Terrestrial and Subterranean Environmental Protection Plan (TSEPP) have been summarised along with the residual risk levels in Table 4-1. The risk assessment presents the risks for each terrestrial and subterranean MNES related to the environmental aspects within the scope of the TSEPP. These aspects are:

- Clearing and earthworks
- Surface water

- Hazardous materials
- Physical presence and interaction
- Atmospheric emissions
- Artificial lighting
- Noise and vibration
- Unplanned subsurface CO_2 migration.

Risk assessment for environmental aspects outside the scope of the TSEPP are included in the respective scope specific management plan e.g. risk assessment for each terrestrial and subterranean MNES related to the environmental aspect of fire is/will be included within an appendix to the Gorgon Fire Management Plan and risk assessment for each terrestrial and subterranean MNES related to the environmental aspect of quarantine is/will be included within an appendix to the Gorgon Quarantine Management System.

As documented in the Terrestrial and Subterranean Baseline State and Environmental Impact Report (Ref. 13), investigations of the environmental impacts of the Onshore Domestic Gas Pipeline indicated that risks are generally low due to the degraded environment along the pipeline easement. The Onshore Domestic Gas Pipeline route runs directly to the Dampier–Bunbury Natural Gas Pipeline and is located adjacent to an existing gas pipeline, which reduces the potential for significant environmental impacts.

Table 4-1: Residual Risks Associated with Terrestrial and Subterranean Matters of NES

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
Wedge-tailed Shearwaters	Artificial Lighting	• Lighting of terrestrial facilities • Flaring • Task lighting required to support safe night-time works	• Direct behavioural disturbance • Increased predation	Installation of new permanent lighting, or the maintenance or alteration of existing permanent lighting at Terrestrial Facilities is consistent with the common lighting design principles described in Section 5.1.1 of the LTMTMP. To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.	L
	Physical Presence and Interaction	• Presence of infrastructure causing obstruction to movement	• Direct behavioural disturbance • Injury or fatality • Possible obstruction of movements	Fauna handling is undertaken in accordance with Fauna Handling Common User Procedure, including: • All worksite personnel and visitors are to be inducted regarding proper response to wildlife encounters (including physical interaction with fauna, littering, feeding, approaching and unexpected fauna encounters). • Fauna handling undertaken by personnel trained in handling, treating and/or euthanising fauna. • Records shall be kept of dead, injured, captured, entrapped, stranded, or entangled fauna. To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.	L
Barrow Island Euro	Physical Presence and Interaction	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Workforce activities / personnel interaction with fauna • Presence of infrastructure, including sources of entrapment (e.g. open pits, trenches, bins) • Presence of infrastructure causing obstruction to movement • Presence of infrastructure, including anthropogenic food sources, shade and shelter	• Direct behavioural disturbance • Injury or fatality (i.e. road kill, entrapment) • Possible obstruction of movements • Habitat fragmentation and habitat loss	To reduce impacts from vehicle movements the Traffic Management Common User Procedure (Ref. 26) shall be implemented, including: • Personnel can only drive if they hold a current and valid driver's licence (or equivalent) and have completed driver training and awareness • Monitoring and management of light vehicle speeds via the In-vehicle Monitoring System (IVMS) • Speed limits are restricted to 60 km/h during the day and 40 km/h between dusk and dawn hours. Fauna handling is undertaken in accordance with Fauna Handling Common User Procedure, including: • All worksite personnel and visitors are to be inducted regarding proper response to wildlife encounters (including physical interaction with fauna, littering, feeding, approaching and unexpected fauna encounters). • Fauna handling undertaken by personnel trained in handling, treating and/or euthanising fauna. • Records shall be kept of dead, injured, captured, entrapped, stranded, or entangled fauna. To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures. Infrastructure presenting a risk of entrapment (e.g. pits, sumps, gutters, trenches and drains) shall include fauna exclusion methods (such as lids, covers, doors or fencing, bird deterrents) and/or fauna exit structures (such as ramps, ladders or mats) as relevant to the nature of the infrastructure and entrapment risk. To reduce fauna attraction to terrestrial facilities, site protocols shall include: • Restrictions on where food can be consumed • Controls on availability and/or access to persistent water sources • Waste receptacles that may attract fauna or generate windblown rubbish will be covered or closed	M
	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities associated with ongoing operations and project work	• Direct displacement or loss of individuals • Increased resource competition in adjacent areas	Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning);	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
		• Presence of cleared areas impacting surface drainage • Rehabilitation activities • Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks	• Localised habitat fragmentation and/or loss • Chronic toxicity to sensitive habitat and/or affected individuals	• Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act. To reduce the risk of environmental impacts from the movement of contaminated soil, the Soil Disturbance Procedure shall be implemented, including: • Identification of risk for potentially contaminated soils through formal Preliminary Site Investigation (PSI) processes; • Where risk is identified, sampling and analysis to characterise the contamination extent and level within areas associated with the re-use; • No re-use of soil on Barrow Island that exceeds the guideline trigger values within the PFAS NEMP Version 2.0, unless a site-specific ecological risk assessment of the soil movement activity has been undertaken and management strategies identified that deal with any associated unacceptable risk. This will be documented in an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators, prior to re-use; • Assessment of reuse options for PFAS-contaminated materials based on the principles that reuse must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used; • Maintaining records of soil movements, including the source of stockpiled materials; and • Storage of excavated soil material contaminated with PFAS according to the requirements of chapter 10 of the PFAS NEMP or in accordance with alternate strategies defined within an Auditor endorsed Soil Reuse Management Plan, and subsequently consulted with State and Commonwealth (where relevant to a MNES) regulators. To ensure clearing activities are managed effectively, the Ground and Vegetation Disturbance Form, required under the PTW system, includes: • survey of the proposed clearing area checked against a land tenure database and relevant Issued for Construction (IFC) work plans and drawings • check of surveyed area for proximity to weed hygiene zones, conservation significant vegetation and fauna habitats • definition of site-specific clearing methodology • determination of requirements for cultural heritage and additional pre-clearing weed, vegetation and fauna surveys • issue of permit that includes conditions for managing site-specific risks • implementation of controls as per permit conditions To reduce the risk of proliferation of an existing weed species, weed management measures as outlined in the QMS include: • weed hygiene procedures for activities in areas where high-risk weeds or seed banks are known to occur, • quarantine response protocols triggered by the detection of a new weed species or proliferation of an existing weed species To ensure excavations are managed effectively, management measures will include those outlined in the Fauna Handling Common User Procedure (FHCUP) and controls under the PTW system, including: • site assessment prior to commencement, including consideration of potential environmental impacts • risk assessment prior to commencement To reduce risk of injury or mortality to fauna, fauna handling will be undertaken in accordance with the requirements detailed in the FHCUP.	

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]

	Hazardous Materials	• Spill during storage and transport of fuel or hazardous material
		• Spill or leak during waste storage and disposal
		• Failure of plant, equipment, or pipelines
		• Leakage of storage tanks and bunds
			• Smothering or acute toxicity to habitat and/or fauna
			• Chronic toxicity to sensitive habitat and/or fauna
				Hazardous material storage is designed and constructed to reduce risks of spills and releases, and include:
				• Permanent and temporary bunds:
				  ○ Constructed using waterproof reinforced concrete, steel, or an alternative material, which is deemed to be appropriate for the specific application.
				  ○ Impervious and chemically resistant to the liquid contained. Bunds with the potential to collect flammable and combustible substances will be constructed of fire-resistant materials.
				• Bunding and curbing design is intended to incorporate the requirements of the following standards, where relevant and practicable:
				  ○ AS 1940:2017: The Storage and Handling of Flammable and Combustible Liquids (Ref. 16)
				  ○ API 650: Welded Steel Tanks for Oil Storage (Ref. 15).
				To ensure the ongoing effective storage and handling of hazardous materials, operational procedures shall include:
				• Routine inspection to confirm that hazardous liquids are stored within secondary containment.
				• Bulk transfer lines fitted with dry break couplings. These will be fit-for-purpose, not outside design life limits, and regularly checked for damage to prevent leaks.
				• Chemicals selected and assessed in accordance with the ABU Hazardous Materials Management Procedure (Ref. 63)
				
				To reduce the risks of spills and releases of hazardous materials to soil, surface and groundwater and subterranean fauna from unplanned releases, management measures such as:
				• All spills will be recorded as per Chevron Incident Investigation and Reporting Process (Ref. 33)
				• Sufficient and appropriate equipment, materials, are available and maintained, to respond to a spill incident
				• Spill response will be conducted in accordance with the Procedure for Use of Spill Kits Located in Gorgon Operation Areas (Ref. 64) or equivalent procedure.
				• Personnel responsible for refuelling or fuel transfer will be trained in their roles, functions and responsibilities.
					L

	Atmospheric emissions	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system • Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas • Concrete/ rock crushing and screening activities	• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water • Potential direct toxic effect on individuals from non-routine emission of H_2S or BTEX • Localised asphyxiation hazard to individuals if CO_2 settles temporarily in low-lying areas • Minor physiological effects on individuals in immediate area	Design of pressure management wells shall include: • a vent restriction orifice at the annulus vent line to control the rate of hydrocarbon gas being vented To ensure the ongoing effective operation of the CO2 Pipeline and Wells, operational systems and procedures shall include: • Procedures for inspection, monitoring, and maintenance of the CO2 Pipeline ROW and drill centres • An in place and functional leak detection system • Procedures for shutdown and venting of the CO2 system following detection of a leak.	L
	Noise and vibration	• Operation of the GTP • Operation of machinery, plant and equipment • Vehicle movements • Release of high-pressure air during flooding, gauging and testing of pipelines • Seismic data acquisition	• Physiological impacts to individuals in immediate vicinity due to blast overpressure • Short-term behavioural changes	The Environmental Basis of Design (Ref. 70) and Specification for Noise Control of Equipment & Acoustic Enclosures (Ref. 71) shall be applied to design of terrestrial facilities to reduce noise and vibration emissions. To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant • Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures. To ensure the ongoing effective operation of the CO2 Pipeline and Wells, operational systems and procedures shall include: • Procedures for inspection, monitoring, and maintenance of the CO2 Pipeline ROW and drill centres • An in place and functional leak detection system • Procedures for shutdown and venting of the CO2 system following detection of a leak.	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
	Surface Water	• Discharges from the storm water drainage system into the environment	• Surface water contamination • Soil contamination • Erosion, caused by water and sedimentation • Sedimentation of natural drainage systems	The design of the stormwater drainage system includes control measures to reduce soil erosion and sedimentation, such as: • Size, cross-sectional shape and gradient of channels designed to avoid scouring and sudden changes in velocity. • Lining of channels with velocities sufficient to cause significant scour and drop structures be constructed where slopes are steep. • Vegetation cover to ensure any collection and redistribution of flow minimises erosion. • Where there is insufficient vegetation cover, alternatives may include the use of jute mesh or geo-textile, rip-rap or stone pitching, gabions and grout-filled mattresses, concrete or concrete-filled bags, drop structures and chutes, pipes, base channels, weirs, ripping or 'moonscaping'. To ensure the ongoing effective operation of the stormwater drainage system, asset maintenance activities , such as: • Inspections of the drainage system as per the CMMS, and additional inspections during rainfall periods, where required. • Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as part of the maintenance regime to maintain functionality. The design of the stormwater drainage system include control measures to reduce the risk of alteration of the existing hydrological regime, such as. • Maximising unpaved areas (where practicable) • Diverting and redistributing run-off high in the catchment • Minimising sediment carryover to the environment • Redistributing clean stormwater collected within the Class 3 drains via infiltration drains to ensure groundwater recharge. • Redistribution trenches to prevent runoff through channels or point sources • Repairs of damaged elements of the drain system to maintain functionality. The design of the stormwater drainage system and stormwater segregation control measures: • Stormwater drainage system has been designed in accordance with the Gorgon Project Environmental Basis of Design (Ref. 70) to be a segregated system depending on the level of contamination or origin of intercepted surface water. • Class 1 – Contaminated Stormwater/Runoff. Sources expected to be contaminated, primarily with free oil. • Class 2 – Potentially Contaminated Stormwater/Runoff. Sources which have the potential to be contaminated with free oil or soluble chemicals. • Class 3 – Uncontaminated Stormwater/Runoff and overflow post first flush volumes. • Class 4 – Intercepted off-site uncontaminated runoff. The design of the stormwater drainage system (Class 1) include control measures to reduce the risk of causing contaminated stormwater impacts, such as. • Class 1 drainage system has been designed and will be maintained to ensure no direct Class 1 stormwater discharge into the environment. • Contaminated run-off from the Class 1 catchment area at the GTP is transferred via a closed piping system to the OWS and then piped to a CPI for oil/water separation. • Paving in areas of the GTP where spillages may occur and sloping into the appropriate collection systems or to a closed bund or sump. • An appropriate specification as per the ABU Operations Class 1 Drain Piping Material Class - 1 01PD009 will be applied to piping design. • Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]

				Operations and Maintenance of stormwater drainage system (Class 1) to reduce the risk of causing contaminated stormwater impacts includes:
				• Remote Class 1 run-off will be collected and disposed of via a vacuum truck (or equivalent) to the Disposal Water Tanks, OWS or other appropriate tie in to the system.
				• Underground drainage system components transporting contaminated run-off will be managed to ensure adequate leak detection.
				• OWS is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.
				• Inspections of the drainage system as per the CMMS.
				• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
				
				The design of the stormwater drainage system (Class 2) include control measures to reduce the risk of causing contaminated stormwater impacts, such as:
				• An appropriate specification as per the ABU Operations Class 2 Drain Piping Material Class - 1 01PD007 will be applied to piping design.
				• Incorporate a water trap that will form a barrier to hydrocarbon vapour and liquids, including LNG, entering the drainage system.
				
				Operations and Maintenance of stormwater drainage system (Class 2) to reduce the risk of causing contaminated stormwater impacts includes:
				• Management of Class 2 stormwater in accordance with the DDA process.
				  ○ Class 2 stormwater in the SWHP is sampled and is disposed downhole if it meets the specified DDA discharge criteria:
				  ○ Class 2 stormwater collected outside of the SWHP is discharged to Class 3 drainage system only where there is no potential for PFAS contamination from firefighting foams and meets the DDA discharge criteria.
				• Underground drainage system components transporting potentially contaminated run-off will be managed as per the CMMS to ensure adequate leak detection.
				• SWHP is equipped with adequate containment (i.e. constructed of concrete with a 2 mm HDPE liner) and a leak detection system and is maintained in good working order as per the CMMS.
				• Inspections of the drainage system as per the CMMS.
				• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
				
				Monitoring of stormwater drainage system (Class 2) to ensure appropriate management of the drainage system includes:
				• Biannual sampling and analysis of Class 2 stormwater within the SWHP.
				
				The design of the stormwater drainage system (Class 3) include control measures to reduce the risk of causing contaminated stormwater impacts such as:
				• Designed for uncontaminated stormwater from clean areas (Class 3 drainage) and overflow (post first flush volumes) from the Class 2 system at the GTP.
				
				Operations and maintenance of the stormwater drainage system (Class 3) to reduce the risk of causing contaminated stormwater impacts includes:
				• Inspections of the drainage system as per the CMMS.
				• Removal of sediment build-up and repairs of damaged elements of the drainage systems, where required as per the CMMS to maintain functionality.
				
				Monitoring of stormwater drainage system (Class 3) to ensure appropriate management of the drainage system includes:
				• Periodic sampling of the Class 3 drainage system.	

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
				Obligations and management processes under the WA Contaminated Sites Act are fulfilled to identify and manage ecological risk associated with contaminated soil, which include: • Implementation of actions in accordance with guidelines associated with the ASC NEPM, CS Act WA and PFAS NEMP (including investigation, risk assessment [including PFAS specific risks], and remediation action planning); • Site assessment and remediation activities, where required, completed using experienced third-party contaminated site practitioners; • Consultation on all sampling plans, review of reporting and completion of periodic mandatory audit by DWER Accredited Contaminated Site Auditor; and • Consultation with all relevant stakeholders (including DWER and DCCEEW) regarding contamination management actions and options, in accordance with the guidelines under the CS Act..	
Golden Bandicoot (Barrow Island)	Physical Presence and Interaction	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Workforce activities / personnel interaction with fauna • Presence of infrastructure, including sources of entrapment (e.g. open pits, trenches, bins) • Presence of infrastructure causing obstruction to movement • Presence of infrastructure, including anthropogenic food sources, shade and shelter	• Direct behavioural disturbance • Injury or fatality (i.e. road kill, entrapment) • Possible obstruction of movements • Habitat fragmentation and habitat loss	Refer to management measures identified for Barrow Island Euro	L
	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities associated with ongoing operations and project work • Presence of cleared areas impacting surface drainage • Rehabilitation activities • Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks	• Direct displacement or loss of individuals • Increased resource competition in adjacent areas • Localised habitat fragmentation and/or loss • Chronic toxicity to sensitive habitat and/or affected individuals	Refer to management measures identified for Barrow Island Euro	L
	Hazardous Materials	• Spill during storage and transport of fuel or hazardous material • Spill or leak during waste storage and disposal • Failure of plant, equipment, or pipelines • Leakage of storage tanks and bunds	• Smothering or acute toxicity to habitat and/or fauna • Chronic toxicity to sensitive habitat and/or fauna	Refer to management measures identified for Barrow Island Euro	L
	Atmospheric emissions	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system • Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas	• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water • Potential direct toxic effect on individuals from non-routine emission of H_2S or BTEX • Localised asphyxiation hazard to individuals if CO_2 settles temporarily in low-lying areas • Minor physiological effects on	Refer to management measures identified for Barrow Island Euro	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
		• Concrete/ rock crushing and screening activities	individuals in immediate area		
	Noise and vibration	• Operation of the GTP • Operation of machinery, plant and equipment • Vehicle movements • Release of high-pressure air during flooding, gauging and testing of pipelines • Seismic data acquisition	• Physiological impacts to individuals in immediate vicinity due to blast overpressure • Short-term behavioural changes	Refer to management measures identified for Barrow Island Euro	L
	Surface Water	• Discharges from the storm water drainage system into the environment	• Surface water contamination • Soil contamination • Erosion, caused by water and sedimentation • Sedimentation of natural drainage systems	Refer to management measures identified for Barrow Island Euro	L
Burrowing Bettong or Boodie (Barrow and Boodie Islands subspecies)	Physical Presence and Interaction	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Workforce activities / personnel interaction with fauna • Presence of infrastructure, including sources of entrapment (e.g. open pits, trenches, bins) • Presence of infrastructure causing obstruction to movements • Presence of infrastructure, including anthropogenic food sources, shade and shelter	• Direct behavioural disturbance • Injury or fatality (i.e. road kill, entrapment) • Possible obstruction of movements • Habitat fragmentation and habitat loss	Refer to management measures identified for Barrow Island Euro	M
	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities • Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks • Rehabilitation activities	• Direct displacement or loss of individuals • Increased resource competition in adjacent areas • Localised habitat fragmentation and/or loss • Chronic toxicity to sensitive habitat and/or affected individuals	Refer to management measures identified for Barrow Island Euro	L
	Hazardous Materials	• Spill during storage and transport of fuel or hazardous material • Spill or leak during waste storage and disposal • Failure of plant, equipment, or pipelines • Leakage of storage tanks and bunds	• Smothering or acute toxicity to habitat and/or affected individuals • Chronic toxicity to sensitive habitat and/or affected individuals	Refer to management measures identified for Barrow Island Euro	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
	Atmospheric emissions	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system • Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas • Concrete/ rock crushing and screening activities	• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water • Potential direct toxic effect on individuals from non-routine emission of H_2S or BTEX • Localised asphyxiation hazard to individuals if CO_2 settles temporarily in low-lying areas (i.e. warrens/ burrows)	Refer to management measures identified for Barrow Island Euro	L
	Noise and vibration	• Operation of the GTP • Operation of machinery, plant and equipment • Vehicle movements • Seismic data acquisition • Venting of gases (e.g. from CO_2 Injection System) • Release of high-pressure air during flooding, gauging and testing of pipelines	• Physiological impacts to individuals • Short-term behavioural changes	Refer to management measures identified for Barrow Island Euro	L
	Surface Water	• Discharges from the storm water drainage system into the environment	• Surface water contamination • Soil contamination • Erosion, caused by water and sedimentation • Sedimentation of natural drainage systems	Refer to management measures identified for Barrow Island Euro	L
Spectacled Hare-wallaby (Barrow Island)	Physical Presence and Interaction	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Workforce activities / personnel interaction with fauna • Presence of infrastructure, including sources of entrapment (e.g. open pits, trenches, bins) • Presence of infrastructure causing obstruction to movement • Presence of infrastructure, including anthropogenic food sources, shade and shelter	• Direct behavioural disturbance • Injury or fatality (i.e. road kill, entrapment) • Possible obstruction of movements • Habitat fragmentation and habitat loss	Refer to management measures identified for Barrow Island Euro	L
	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities • Presence of cleared areas impacting surface drainage • Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks • Rehabilitation activities	• Direct displacement or loss of individuals • Increased resource competition in adjacent areas • Localised habitat fragmentation and/or loss • Chronic toxicity to sensitive habitat and/or affected individuals	Refer to management measures identified for Barrow Island Euro	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
	Hazardous Materials	• Spill during storage and transport of fuel or hazardous material • Spill or leak during waste storage and disposal • Failure of plant, equipment, or pipelines • Leakage of storage tanks and bunds	• Smothering or acute toxicity to habitat and/or affected individuals • Chronic toxicity to sensitive habitat and/or affected individuals	Refer to management measures identified for Barrow Island Euro	L
	Atmospheric emissions	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system • Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas • Concrete/ rock crushing and screening activities	• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water • Potential direct toxic effect on individuals from non-routine emission of H_2S or BTEX • Localised asphyxiation hazard to individuals if CO_2 settles temporarily in low-lying areas.	Refer to management measures identified for Barrow Island Euro	L
	Noise and vibration	• Operation of the GTP • Operation of machinery, plant and equipment • Vehicle movements • Seismic data acquisition • Venting of gases (e.g. from CO_2 Injection System) • Release of high-pressure air during flooding, gauging and testing of pipelines	• Physiological impacts to individuals • Short-term behavioural changes	Refer to management measures identified for Barrow Island Euro	L
	Surface Water	• Discharges from the storm water drainage system into the environment	• Surface water contamination • Soil contamination • Erosion, caused by water and sedimentation • Sedimentation of natural drainage systems	Refer to management measures identified for Barrow Island Euro	L
White-winged Fairy-wren (Barrow Island)	Physical Presence and Interaction	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Workforce activities / personnel interaction with fauna • Presence of infrastructure causing obstruction to movement • Presence of infrastructure, including anthropogenic food sources, shade and shelter • Heat from power generators, air, coolers, turbines, flare etc. Feed gas pipeline at ambient temperature.	• Direct behavioural disturbance • Injury or fatality (i.e. road kill, entrapment) • Possible obstruction of movements	Refer to management measures identified for Barrow Island Euro	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities associated with ongoing operations and project work	• Direct displacement or loss of individuals • Localised habitat fragmentation and/or loss	Refer to management measures identified for Barrow Island Euro	L
	Hazardous Materials	• Spill during storage and transport of fuel or hazardous material • Spill or leak during waste storage and disposal • Failure of plant, equipment, or pipelines • Leakage of storage tanks and bunds	• Smothering or acute toxicity to habitat and/or affected individuals • Chronic toxicity to sensitive habitat and/or affected individuals • Drowning and/or other mortality	Refer to management measures identified for Barrow Island Euro	L
	Atmospheric emissions	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system • Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas • Concrete/ rock crushing and screening activities	• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water • Potential direct toxic effect on individuals from non-routine emission of H_2S or BTEX • Localised asphyxiation hazard to individuals if CO_2 settles temporarily in low-lying areas	Refer to management measures identified for Barrow Island Euro	L
	Noise and vibration	• Operation of the GTP • Operation of machinery, plant and equipment associated with routine operations, maintenance activities, drilling and project/ construction activities • Vehicle movements • Seismic data acquisition • Venting of gases (e.g. from CO_2 Injection System) • Release of high-pressure air during flooding, gauging and testing of pipelines	• Physiological impacts to individuals • Short-term behavioural changes	Refer to management measures identified for Barrow Island Euro	L
	Surface Water	• Discharges from the storm water drainage system into the environment	• Surface water contamination • Soil contamination • Erosion, caused by water and sedimentation • Sedimentation of natural drainage systems	Refer to management measures identified for Barrow Island Euro	L
Raptors: Australian Kestrel Brahminy Kite Osprey Spotted Harrier	Physical presence and interaction	• Vehicle movements on road network and terrestrial facilities • Operation of equipment and machinery • Workforce activities / personnel interaction with fauna • Presence of infrastructure causing obstruction to movement	• Direct behavioural disturbance • Injury or fatality (i.e. road kill, entrapment) • Possible obstruction of movements • Habitat fragmentation and habitat loss	Fauna handling is undertaken in accordance with Fauna Handling Common User Procedure, including: • All worksite personnel and visitors are to be inducted regarding proper response to wildlife encounters (including physical interaction with fauna, littering, feeding, approaching and unexpected fauna encounters). • Fauna handling undertaken by personnel trained in handling, treating and/or euthanising fauna. • Records shall be kept of dead, injured, captured, entrapped, stranded, or entangled fauna. To ensure identification of appropriate fauna management measures, Incident Investigation and Reporting procedures shall include: • Investigation of fauna incidents deemed significant	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
White-bellied Sea-eagle		• Presence of infrastructure, including anthropogenic food sources, shade and shelter • Heat from power generators, air, coolers, turbines, flare etc. Feed gas pipeline at ambient temperature.		• Investigation of observations of environmental occurrences (e.g. mass aggregations of fauna) deemed significant • Identification of appropriate corrective actions and/or additional management measures.	
	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities associated with ongoing operations and project work • Presence of cleared areas impacting surface drainage • Rehabilitation activities	• Direct displacement or loss of individuals • Increased resource competition in adjacent areas • Localised habitat fragmentation and/or loss	Refer to management measures identified for Barrow Island Euro	L
	Hazardous Materials	• Spill during storage and transport of fuel or hazardous material • Spill or leak during waste storage and disposal • Failure of plant, equipment, or pipelines • Leakage of storage tanks and bunds	• Smothering or acute toxicity to habitat and/or affected individuals • Chronic toxicity to sensitive habitat and/or affected individuals • Drowning and/or other mortality	Refer to management measures identified for Barrow Island Euro	L
	Atmospheric emissions	• Operation and maintenance of CO_2 injection system • Unplanned releases from CO_2 injection system • Movement of vehicles and equipment on the road network and on terrestrial facilities • Wind erosion from roads and cleared areas • Concrete/ rock crushing and screening activities	• Sub-lethal effect from inhalation of pollutants • Sub-lethal effect from ingestion of pollutant on vegetation or in water • Potential direct toxic effect on individuals from non-routine emission of H_2S or BTEX	Refer to management measures identified for Barrow Island Euro	L
	Surface Water	• Discharges from the storm water drainage system into the environment	• Surface water contamination • Soil contamination • Erosion, caused by water and sedimentation • Sedimentation of natural drainage systems	Refer to management measures identified for Barrow Island Euro	L
Subterranean Fauna: Barrow Cave Gudgeon Blind Cave Eel	Surface Water	• Discharges of contaminated stormwater from the Class 3 drainage system into the environment • Releases of contaminated stormwater from bunded areas into Class 3 drainage system • Leakage from drainage system and holding ponds/sumps • Physical presence of sealed/hardstand areas associated with the Stormwater Drainage System	• Potential contamination of subterranean habitat • Reduced groundwater recharge under the GTP affecting humidity and groundwater in subterranean environment where surface water is diverted to drains.	Refer to management measures identified for Barrow Island Euro	L

Terrestrial/ Subterranean MNES	Management Aspect	Causes	Potential Impacts	Management Measures	Residual Risk[1]
	Hazardous Materials	• Spill during storage and transport of fuel or hazardous material • Spill or leak during waste storage and disposal • Failure of plant, equipment, or pipelines • Leakage of storage tanks and bunds	• Potential contamination of subterranean habitat • Acute toxicity to stygofauna	Refer to management measures identified for Barrow Island Euro	L
	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities associated with ongoing operations and project work • Moving contaminated soil (including soil impacted by PFAS) associated with clearing and earthworks • Presence of cleared areas impacting surface drainage	• Run-off during construction causing sedimentation of aquifer • Localised loss of stygofauna • Potential contamination of subterranean habitat	Refer to management measures identified for Barrow Island Euro	L
	Noise and vibration	• Operation of the GTP • Operation of machinery, plant and equipment associated with routine operations, maintenance activities, drilling and project/ construction activities • Vehicle movements • Seismic data acquisition	• Direct loss of habitat or rupture of subsurface karst lenses • Vibration effects (sedimentation/partial collapse of karstic formations) • Local loss of stygofauna	Refer to management measures identified for Barrow Island Euro	L
	Unplanned subsurface CO_2 migration to the near surface/ surface environment	• CO_2 migration up existing wells penetrating the CO_2 injection zone (Dupuy Formation) • CO_2 migration via faults or fractures through the primary seal and other seals/barriers	• Change the physical properties of subsurface formations resulting in impacts to subterranean communities.	Refer to management measures identified for Barrow Island Euro	L
Habitat: Termite mounds	Clearing and earthworks	• Clearing vegetation • Earthworks, excavation and trenching activities	• Changes in landform • Erosion, caused by wind, water, and sedimentation • Soil contamination •	Refer to management measures identified for Barrow Island Euro	L

Note: Bridled Tern has not been included within the above table, noting that no credible risk from the in-scope management aspects was identified.

Appendix B Chevron Integrated Risk Prioritisation Matrix

Chevron Integrated Risk Prioritization Matrix
2022 Revision

Likelihood Descriptions & Index			Legend (Where Likelihood is with confirmed and verified safeguards. Consequence is without safeguards)	Risk Levels 1-4: Elevated Risk. Risk reduction required. Risk Level 5: Risk reduction is required. If risk reduction action cannot be reasonably taken, BU management approval must be obtained. Risk Levels 6-10: Manage confirmed and verified safeguards. Further risk reduction unless unreasonable.					
Likelihood Descriptions	Likelihood Indices								
Expected to occur	1	Likely	Decreasing Likelihood	6	5	4	3	2	1
Conditions may allow to occur	2	Occasional		7	6	5	4	3	2
Exceptional conditions may allow to occur	3	Seldom		8	7	6	5	4	3
Reasonable to expect will not occur	4	Unlikely		9	8	7	6	5	4
Has occurred once or twice in the industry	5	Remote		10	9	8	7	6	5
Rare or unheard of	6	Rare		10	10	9	8	7	6

Consequence Descriptions & Index (without safeguards)	Consequence Indices		Decreasing Consequence/Impact					
			6	5	4	3	2	1
			Incidental	Minor	Moderate	Major	Severe	Catastrophic
	Consequence Descriptions	Workforce Health & Safety	One or more illnesses or injuries resulting in limited treatment	One or more illnesses or injuries requiring treatment but not severe	One or more severe illnesses or injuries	One to four illnesses with significant life shortening effects or fatalities	Multiple illnesses resulting in significant life shortening effects or multiple fatalities (5-50)	Multiple illnesses resulting in significant life shortening effects or multiple fatalities (>50)
		Public Health & Safety	One or more illnesses or injuries not resulting in treatment	One or more illnesses or injuries resulting in limited treatment	One or more illnesses or injuries requiring treatment but not severe	One or more severe illnesses or injuries	One to ten illnesses with significant life shortening effects or one to ten fatalities	Multiple illnesses resulting in significant life shortening effects or multiple fatalities (>10)
		Environment	Limited impact	Localized, short-term impact	Localized, long-term impact or widespread, short-term impact	Localized, persistent impact or widespread, long-term impact	Widespread, persistent impact or landscape-scale, long-term impact	Landscape-scale, persistent impact

The above legend applies to HSE risks. For risks that may result in regulatory impacts, facility damage, business interruption, loss of product, the "Business & Reputation" and "Asset" categories below should be used. Asset risk reduction is at the discretion of management. Business & Reputation risk reduction is performed as per the Stakeholder Engagement & Issues Management (SEIM) process. Under no circumstances may a direct or indirect translation of Asset or Business & Reputation loss to HSE consequences, or between any discrete categories of HSE consequences be inferred.

Consequence Descriptions & Index (without safeguards)	Consequence Indices		6	5	4	3	2	1
			Incidental	Minor	Moderate	Major	Severe	Catastrophic
	Consequence Descriptions	Asset (Facility damage, Facility Downtime, Loss of Product, Lost Production Opportunity, Clean-up and Remedial Costs)	Minimal damage. Negligible downtime, remediation cost or asset loss. Cost <$100,000	Some asset loss, damage, remediation cost and/or downtime. Cost $100,000 to <$1 Million	Serious asset loss, damage to facility, remediation cost and/or downtime. Cost $1 Million to <$10 Million	Major asset loss, damage to facility, remediation cost and/or downtime. Cost $10 Million to <$100 Million	Severe asset loss or damage to facility. Significant downtime or remediation with appreciable economic impact. Cost $100 Million to <$1 Billion	Total destruction or damage. Potential for permanent loss of production or extensive remediation. Cost >$1 Billion
		Business & Reputation (Social impacts or business impacts related to obtaining or maintaining permits or approvals, regulatory changes or orders, reputational issues, stakeholder challenges, or legal actions)	Minimal social, business, or reputation impacts	Social, business, or reputation impacts but does not present longer term issues	Moderate social, business, or reputation impacts	Major social, business, or reputation impacts	Severe social, business or reputation impacts. Short-term suspension of operations by regulator.	Impact on ability to operate longer term. Corporate level impacts to business or reputation.

This matrix is endorsed for use across the Company.
It is not a substitute for, and does not override any relevant legal obligations.
Under no circumstances should any part of this matrix be changed or modified, adapted or customized.
This matrix identifies health, safety, environmental, asset, business & reputation risks and is to be used only by qualified and competent personnel.
Where applicable it is to be used within the RiskMan structure and governance of an OE Risk Management Process. If applied outside of these Processes, it is also mandatory to reduce identified elevated risks and to manage risk with appropriate safeguards and management systems.

Appendix C Fauna Handling and Management Common User Procedure

Gorgon Gas Development and Jansz Feed Gas Pipeline

Fauna Handling Common User Procedure

Document No:	G1-PP-HES-PRC-0009	Revision:	3
Revision Date:	15 April 2014	Copy No:	
IP Security:	Public		

Table of Contents

List of Tables

List of Figures

Terms, Definitions and Abbreviations

Terms, definitions and abbreviations used in this document are listed below. These align with the terms, definitions and abbreviations defined in Schedule 2 of the Western Australian Gorgon Gas Development and Jansz Feed Gas Pipeline Ministerial Implementation Statements No. 800 and No. 769 respectively (Statement No. 800 and 769) and the Commonwealth Gorgon Gas Development and Jansz Feed Gas Pipeline Ministerial Approvals (EPBC Reference: 2003/1294, 2008/4178, and 2005/2184).

ABU	Australasia Business Unit
Additional Support Area	Gorgon Gas Development Additional Construction, Laydown, and Operations Support Area
ASBU	Australasia Strategic Business Unit
Bell Hole	An excavation to facilitate directional drilling. A creek or road crossing will need a bell hole on each side of the crossing. Also occurs in onshore pipelines where two strings of pipe are tied in to facilitate a weld.
Bund	An area of containment, such as a dam, wall, or other artificial embankment.
CALM Act	Western Australian *Conservation and Land Management Act 1984*
Construction	Construction includes any Proposal-related (or action-related) construction and commissioning activities within the Terrestrial and Marine Disturbance Footprints, excluding investigatory works such as, but not limited to, geotechnical, geophysical, biological and cultural heritage surveys, baseline monitoring surveys and technology trials.
Cth	Commonwealth of Australia
CUP	Common User Procedure
DEC	Former Western Australian Department of Environment and Conservation (now DPaW and/or Department of Environment Regulation [DER])
DNA	Deoxyribonucleic acid
DotE	Commonwealth Department of the Environment (formerly SEWPaC)
DPaW	Western Australian Department of Parks and Wildlife (formerly DEC)
Ecological Element	Element listed in Condition 6.1 of Statement No. 800 and Statement No. 769 and Condition 5.1 of EPBC Reference: 2003/1294 and 2008/4178.
Egress	A means or place of going out; an exit.

Envenomation	The event of injection of venom in to the human body
EPA	Western Australian Environmental Protection Authority
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPBC Reference: 2003/1294	Commonwealth Ministerial Approval (for the Gorgon Gas Development) as amended or replaced from time to time.
EPBC Reference: 2005/2184	Commonwealth Ministerial Approval (for the Jansz Feed Gas Pipeline) as amended or replaced from time to time.
EPBC Reference: 2008/4178	Commonwealth Ministerial Approval (for the Revised Gorgon Gas Development) as amended or replaced from time to time.
EPCM	Engineering, Procurement and Construction Management
Excavation	A hole or cavity made by digging. This term applies to all excavations other than trenches associated with onshore construction activities that remain open overnight including (but not limited to) drilling pits, turkey nests, bell holes, bores, and foundations greater than one cubic metre in volume.
Fauna Exit Ramp	A single or double sided angled feature, fabricated from wood, metal, plastic or excavated earth materials.
Fauna Handler	Person trained in handling, treating and/or euthanising fauna. Fauna handlers may be professionally qualified, or experienced based on past work exposure. Handlers may be trained in particular areas (e.g. snake handling).
FHMCUP	Fauna Handling and Management Common User Procedure.
Fire Pit	A pit constructed with suitable fire breaks for the purpose of burning cleared vegetation under controlled circumstances.
GIS	Geographic Information System
Gorgon Gas Development	The Gorgon Gas Development as approved under Statement Nos. 800 and 965, and EPBC References: 2003/1294 and 2008/4178 (as varied by the Commonwealth Environment Minister), as amended or replaced from time to time.
Habitat	The area or areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (e.g. substrate and topography) and the biotic factors.
Hog Out	Deep, wide trenches i.e. several metres across. These are excavated in sections, are generally wide enough for heavy vehicles to drive into; they may be several hundred metres long.
Ingress	The act of going in or entering; an entrance.

Interaction	Relating to fauna, recognises the physical (planned or unplanned) interaction that may occur between wildlife and people on Barrow Island (e.g. road collision, handling)
Jansz Feed Gas Pipeline	The Jansz Feed Gas Pipeline as approved in Statement No. 769 and EPBC Reference: 2005/2184 as amended or replaced from time to time.
Marine Disturbance Footprint	The area of the seabed to be disturbed by construction or operations activities associated with the Marine Facilities listed in Condition 14.3 of Statement No. 800, Condition 12.3 of Statement No. 769 and Condition 11.3 in EPBC Reference: 2003/1294 and 2008/4178 (excepting that area of the seabed to be disturbed by the generation of turbidity and sedimentation from dredging and dredge spoil disposal) as set out in the Coastal and Marine Baseline State Report required under Condition 14.2 of Statement No. 800, Condition 12.2 of Statement No. 769 and Condition 11.2 of EPBC Reference: 2003/1294 and 2008/4178.
Marine Facilities	In relation to Statement No. 800 and EPBC Reference: 2003/1294 and 2008/4178, the Marine facilities are the: • Materials Offloading Facility (MOF) • LNG Jetty • Dredge Spoil Disposal Ground • Offshore Feed Gas Pipeline System and marine component of the shore crossing • Domestic Gas Pipeline For the purposes of Statement No. 800, Marine Facilities also include: • Marine upgrade of the existing WAPET landing. In relation to Statement No. 769, Marine Facilities are the Offshore Feed Gas Pipeline System and marine component of the shore crossing.
MEG	Monoethylene Glycol
MGA 50, GDA 94	Map Grid of Australia Zone 50 (WA); projection based on the Geocentric Datum of Australia 1994.
MOF	Materials Offloading Facility
Native	Species that are native to (naturally occurring in) a region.
NES	[Matters of] National Environmental Significance, as defined in Part 3, Division 1 of the EPBC Act (Cth).
NHMRC	National Health and Medical Research Council

Operations (Gorgon Gas Development)	In relation to Statement No. 800 and EPBC Reference: 2003/1294 and 2008/4178, for the respective LNG trains, this is the period from the date on which the Gorgon Joint Venturers issue a notice of acceptance of work under the Engineering, Procurement and Construction Management (EPCM) contract, or equivalent contract entered into in respect of that LNG train of the Gas Treatment Plant; until the date on which the Gorgon Joint Venturers commence decommissioning of that LNG train.
Operations (Jansz Feed Gas Pipeline)	In relation to Statement No. 769, for the pipeline, this is the period from the date on which the Proponent issues a notice of acceptance of work under the Engineering, Procurement and Construction Management (EPCM) contract, or equivalent contract entered into in respect of that pipeline; until the date on which the Proponent commences decommissioning of that pipeline.
PPE	Personal Protective Equipment
Practicable	Practicable means reasonably practicable having regard to, among other things, local conditions and circumstances (including costs) and to the current state of technical knowledge. For the purposes of the conditions of EPBC Reference: 2003/1294 and 2008/4178 which include the term "practicable", when considering whether the draft plan meets the requirements of these conditions, the Commonwealth Minister will determine what is 'practicable' having regard to local conditions and circumstances including but not limited to personnel safety, weather or geographical conditions, costs, environmental benefit and the current state of scientific and technical knowledge.
PVC	Polyvinylchloride
Relocation	The release of fauna from work areas to elsewhere on Barrow Island.
Scramble Mat	A structure that allows fauna to escape from trenches or excavations, e.g. a ramp with matting or wire mesh.
SEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now DotE)
Significant Fauna	Fauna identified as significant ecological elements in the Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012a).
Statement No. 748	Western Australian Ministerial Implementation Statement No. 748 (for the Gorgon Gas Development) as amended from time to time [superseded by Statement No. 800].
Statement No. 769	Western Australian Ministerial Implementation Statement No. 769 (for the Jansz Feed Gas Pipeline) as amended from time to time.

Statement No. 800	Western Australian Ministerial Implementation Statement No.800, issued for the Revised and Expanded Gas Development, as amended from time to time. Statement No. 800 supersedes the Gorgon Gas Development as originally approved by Statement No 748. The conditions of Statement No.800 also apply to the Additional Support Area under Statement 965.
Statement No. 865	Western Australian Ministerial Implementation Statement No. 865 (for the Gorgon Gas Development) as amended from time to time.
Statement No. 965	Western Australian Ministerial Implementation Statement No. 965 (for the Additional Support Area) as amended from time to time. Statement No.965 applies the conditions of Statement 800 to the Additional Support Area.
Taxon (plural: taxa)	A taxon (plural taxa), or taxonomic unit, is a name designating an organism or a group of organisms.
TCFs	Temporary Construction Facilities
Terrestrial Disturbance Footprint	The area to be disturbed by construction or operations activities associated with the Terrestrial Facilities listed in Condition 6.3 of Statement No. 800, Condition 6.3 of Statement No. 769, and Condition 5.2 of EPBC Reference: 2003/1294 and 2008/4178, and set out in the Terrestrial and Subterranean Baseline State and Environmental Impact Report required under Condition 6.1 of Statement No. 800, Condition 6.1 of Statement No. 769 and Condition 5.1 of EPBC Reference: 2003/1294 and 2008/4178.
Translocation	The release of fauna from Barrow Island (including work areas) to a site off the Island.
Turkey Nest	Small excavation used to contain water or other liquids, or for settling slurries/liquids with high sediment load, e.g. concrete washout, drilling fluids, stormwater.
Voucher Specimen	A whole animal (usually a cadaver) or a part thereof, that serves as a basis of study and is retained as a reference.
Vouchering	The collection, preservation, and storage of Voucher Specimens.
WA	Western Australia
WAM	Western Australian Museum
WC Act	Western Australian *Wildlife Conservation Act 1950*
WHZ	Weed Hygiene Zone. An area within which non-indigenous plant species, assessed to be high risk species, have established weed populations and/or where a seed bank of a high risk species is present.

Windrow	A long, narrow row of vegetation, debris, and some soil created during site preparation and clearing operations.
Zoonotics	Diseases that affect both animals and humans.

1.0 Introduction

1.1 Background

The initial Gorgon Gas Development was approved by the Western Australian State Minister for the Environment on 6 September 2007 by way of Ministerial Implementation Statement No. 748 (Statement No. 748) and the Commonwealth Minister for the Environment and Water Resources on 3 October 2007 (EPBC Reference: 2003/1294).

The Revised and Expanded Gorgon Gas Development was approved by the Western Australian State Minister for the Environment on 10 August 2009 by way of Ministerial Implementation Statement No. 800 (Statement No. 800). Statement No. 800 also superseded Statement No. 748 as the approval for the initial Gorgon Gas Development. Statement No. 800 therefore provides approval for both the initial Gorgon Gas Development and the Revised and Expanded Gorgon Gas Development, which together are known as the Gorgon Gas Development.

Amendments to Statement No. 800 Conditions 18, 20 and 21 under section 46 of the EP Act were approved by the Western Australian State Minister for the Environment on 7 June 2011 by way of Ministerial Implementation Statement No. 865 (Statement No. 865). Therefore, implementation of the Gorgon Gas Development will be in accordance with Statement No. 800 (as amended by Statement No. 865).

Use of an additional 32 ha of uncleared land for the Gorgon Gas Development Additional Construction, Laydown, and Operations Support Area (Additional Support Area) was approved by the Western Australian State Minister for Environment on 965 by way of Ministerial Implementation Statement No. 965 and by Variation issued by the Commonwealth Minister for the Environment. Statement No.965 applies the conditions of Statement No.800 to the Additional Support Area and requires all implementation, management, monitoring, compliance assessment and reporting, environmental performance reporting, protocol setting and record keeping requirements applicable to the Additional Support Area under Statement No.800 to be carried out on a joint basis with the Gorgon Gas Development.

The Jansz Feed Gas Pipeline was approved by the Western Australian State Minister for the Environment on 28 May 2008 by way of Ministerial Implementation Statement No. 769 (Statement No. 769) and the Commonwealth Minister for the Environment and Water Resources on 22 March 2006 (EPBC Reference: 2005/2184).

This Procedure covers the Gorgon Gas Development as approved under Statement No. 800 and as approved by EPBC Reference: 2003/1294 and 2008/4178, and including the Additional Support Area as approved by Statement No. 965 and as varied by the Commonwealth Minister for the Environment. In addition, this Procedure covers the Jansz Feed Gas Pipeline as approved by Statement No. 769 and EPBC Reference: 2005/2184.

This Procedure satisfies the requirements of the following Western Australian and Commonwealth Ministerial approval conditions.

Conditions 7.6 (ii) and 7.6 (iii) of Statement No. 769 and 800 require:

> *7.6 (ii) Procedures in relation to and protocols for capturing, relocating, handling, housing, caring for and reporting to the DEC threatened or listed fauna found within the Terrestrial Disturbance Footprint that are not required by DEC for translocation;*
>
> *7.6 (iii) Procedures to avoid secondary impacts to fauna as a consequence of risks such as animals being trapped in construction trenches or subject to vehicle strike;*

Conditions 6.6 (ii) and 6.6 (iii) of EPBC Reference: 2003/1294 and 2008/4178 require practicable measures for:

> *6.6 (ii) Procedures in relation to and protocols for capturing, relocating, handling, housing, caring for and reporting to the DEC threatened or listed fauna found within the Terrestrial Disturbance Footprint that are not required by DEC for translocation;*

6.6 (iii) Procedures to avoid secondary impacts to fauna as a consequence of risks such as animals being trapped in construction trenches or subject to vehicle strike;

Matters related to the risks of vehicle collisions with fauna are addressed in the Traffic Management Common User Procedure (CUP) (Chevron Australia 2012b).

Common User Procedures have been prepared to support a number of the plans required by Western Australian and Commonwealth Ministerial approval conditions; in particular, the Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010a). These procedures provide the detail on specific environmental issues identified in Ministerial plans/reports.

In respect of the Carbon Dioxide Seismic Baseline Survey Works Program, which comprises the only works approved under Statement No. 748 before it was superseded, and under EPBC Reference: 2003/1294 before the Minister approved a variation to it on 26 August 2009, note that under Condition 1A.1 of Statement No. 800 and Condition 1.4 of EPBC Reference: 2003/1294 and 2008/4178 this Program is authorised to continue for six months subject to the existing approved plans, reports, programs and systems for the Program, and the works under the Program are not the subject of this Procedure.

1.2 Scope

This Procedure applies to the handling and management of vertebrate fauna during activities associated with construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline. Specifically, this Procedure applies to fauna handling on Barrow Island and surrounding waters, and includes fauna listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This document describes procedures for activities that are likely to result in artificial interaction with vertebrate fauna (including terrestrial and marine mammals, birds, amphibians and reptiles, but excluding invertebrates), including instructions for the initial response to sick, injured, orphaned, entangled, stranded, or dead animals, and directions for obtaining further guidance and/or information. This document currently applies to activities associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline; however, in time it will aim to supersede the Management of Orphaned or Injured Animals Procedure (Chevron Australia 2006).

Whilst Condition 7.6 (iii) of Statement No. 800 and Statement No. 769 and Condition 6.6 (iii) of EPBC Reference: 2003/1294 and 2008/4178 require that Chevron Australia manages impacts to Significant Fauna, which includes invertebrates, this Procedure does not include invertebrates because:

- the Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012a) indicates that of the terrestrial Significant Fauna, invertebrates are at lower risk of impact from the Gorgon Gas Development and Jansz Feed Gas Pipeline than vertebrates
- there is no intention to relocate invertebrates that are Significant Fauna, due to the low risk to those fauna at a population level from impacts associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline
- it is not reasonably practicable, or consistent with industry standards, to manage vehicle strikes or entrapments in excavations or trenches for invertebrates
- impacts to subterranean invertebrates will be managed through groundwater monitoring and management protocols.

Any matter specified in this Procedure is relevant to the Gorgon Gas Development or Jansz Feed Gas Pipeline only if that matter relates to the specific activities or facilities associated with that particular development.

This Procedure, which meets the conditions of EPBC Reference: 2003/1294 and 2008/4178, shall be read and interpreted as only requiring implementation under EPBC Reference: 2003/1294 and 2008/4178 for managing the impacts of the Gorgon Gas Development on, or protecting the EPBC Act matter listed in Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012a). The implementation of matters required only to meet the requirements of Statement No. 800 (and No. 769) are not the subject of EPBC Reference: 2003/1294 and 2008/4178.

Statement No.965 requires the implementation of this plan, in respect of the Additional Support Area and the Gorgon Gas Development, to be carried out on a joint basis.

1.3 Objectives

The objectives of this Procedure are to:

- minimise stress, injury, and death to vertebrate fauna
- maximise consistency of data collection
- optimise robustness of data collected
- provide guidance to relevant personnel on fauna management
- provide guidance to qualified field staff on fauna handling and decisions for treatment or euthanasia
- ensure compliance with relevant State and Commonwealth legislation, policies, and permits.

1.4 Relevant Documentation

Relevant legislation and regulations that were taken into account during the development of this Procedure include:

- *Animal Welfare Act 2002* (WA)
- *Conservation and Land Management Act 1984* (CALM Act) (WA)
- *Wildlife Conservation Act 1950* (WC Act) (WA)
- Wildlife Conservation Regulations 1970 (WA)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cth).

These standards and guidelines were taken into account during the development of this Procedure:

- Western Australian Environmental Protection Authority (EPA) Guidance Statement No. 56 – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA 2004)
- Minimum Standards for Wildlife Rehabilitation in Western Australia 2008 (Department of Environment and Conservation [DEC] 2008).

These Chevron Australia Gorgon Gas Development and Jansz Feed Gas Pipeline documents relate to this Procedure:

- Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012a)
- Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010a)

- Terrestrial and Subterranean Environment Monitoring Program (Chevron Australia 2013a)
- Fire Management Plan (Chevron Australia 2009a)
- Barrow Island Weed Hygiene Common User Procedure (Chevron Australia 2012c)
- Vegetation Clearing and Audit Common User Procedure (Chevron Australia 2012d)
- Prescribed Fire Plan
- Traffic Management Common User Procedure (Chevron Australia 2012b)
- Ecological Monitoring Common User Procedure (Chevron Australia 2009b)
- Aboriginal Cultural Heritage Management Plan (Chevron Australia 2009c)
- Post-Construction Rehabilitation Plan (Chevron Australia 2009d).

2.0 Fauna Management

2.1 Land Clearing

Clearing (whether by fire or mechanical actions) will aim to limit the total loss of terrestrial fauna. Chevron Australia internally requires that any clearing required for the construction or operation of the Gorgon Gas Development or Jansz Feed Gas Pipeline be undertaken in accordance with an internally approved (Chevron Australia) Permit. Clearing not included within Statement No. 800, Statement No. 769, Statement No. 965, EPBC Reference: 2003/1294 and 2008/4178 and as varied by the Commonwealth Minister for the Environment will require additional approval.

Where fire is used to clear vegetation, this will be done in accordance with the Prescribed Fire Plan to reduce mortality of terrestrial fauna.

Known active warrens occupied by Boodies are to be trapped by the Department of Parks and Wildlife (DPaW) (if animals are required for translocation) or Chevron Australia within one week prior to clearing, so as to remove individuals that occupy the warren and relocate them elsewhere (under licence) as agreed between Chevron Australia and the DPaW. Contractors will advise Chevron Australia of the clearing schedule prior to any trapping events; Chevron Australia will in turn advise the DPaW. Trapping will continue until it is reasonable to consider that no Boodies reside within the warren (based on trap success and obvious activity such as tracks) or further captures from occupants of the warren are unlikely. Cessation of trapping will occur after consultation with the DPaW. The entrances of warrens deemed unoccupied will be collapsed or otherwise physically blocked to prevent re-entry.

Targeted searches for fauna in shelters such as wood, nests, and/or termite mounds, will be undertaken immediately prior to clearing operations by Chevron Australia. Animals caught during these searches will be relocated, or will be used by DPaW to support their translocation requirements. During these searches, termite mounds will be disturbed/broken up, and microhabitat/shelters will be broken up or removed to the degree practicable, to initiate egress of fauna living within them and to reduce the available habitat within the site to be cleared.

Mechanical clearing will progress in a systematic manner, slowly progressing so as not to confuse or trap evacuating fauna. Clearing will (where reasonably practicable) progress to an undisturbed area that will not be impacted by roads and construction facilities. It is important not to create habitat islands by leaving isolated pockets uncleared or by stockpiling vegetation within the area of disturbance for later works. Double handling of vegetation stockpiles and windrows will be avoided, where reasonably practicable.

Actions for the management of fauna during clearing are summarised in Table 2-1. Table 2-1 includes management actions required in respect of the matters of National Environmental Significance (NES) listed in the Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012a), as required by Condition 3.2.1 of EPBC Reference: 2003/1294 and 2008/4178.

Table 2-1 Management Actions for Clearing

Issue	Action	Timing	Responsibility
Induction	All worksite personnel and visitors are to be inducted regarding proper response to wildlife encounters (including physical interaction with fauna, littering, feeding, approaching, and unexpected fauna encounters).	During inductions	Chevron Australia and Contractor

Issue	Action	Timing	Responsibility
Delineation of area to be cleared	Proposed areas of clearing are to be surveyed, pegged and clearly designated in accordance with Chevron Australia's approved internal procedures.	Prior to clearing commencing	Contractor
Active Boodie warrens within sites to be cleared	Trapping is to be undertaken around occupied Boodie warrens until it is reasonable to assume no individuals reside within the warren (based on trap success and obvious activity such as tracks) or that further captures of occupants from the warren are unlikely. The warren may then be deemed unoccupied.	Within 5 days of clearing commencing	Chevron Australia and DPaW
	The entrances of warrens deemed unoccupied will be collapsed or otherwise physically blocked to prevent re-entry.	Once Boodie warren is deemed unoccupied	Chevron Australia and DPaW
Initiation of fauna egress from sites to be cleared	Termite mounds will be disturbed/broken up, and microhabitat/shelter will be broken up or removed as practicable, to initiate egress of fauna living within them and to reduce the available habitat within the site to be cleared.	Immediately in advance of clearing operations	Contractor
Fauna searches or trapping	Targeted foraging and spotlighting by fauna handlers in areas to be cleared or during clearing for species with vouchering or translocation requirements.	Within 5 days prior to clearing commencing or during clearing operations, as required	Chevron Australia
	Fauna will be flushed opportunistically immediately prior to and during clearing of vegetation.	Immediately prior to clearing commencing and ongoing during clearing	Contractor
	Inspections of cleared areas will be made immediately after clearing, and fauna handlers will be called in if displaced or injured animals are found. Any displaced or orphaned animals should be assessed for injury by a fauna handler, and considered for euthanasia, vouchering or relocation (refer to Section 3.0).	Immediately following clearing	Contractor Chevron Australia and DPaW
	If required, the DPaW may select vertebrate species to trap and translocate.	Prior to clearing commencing	DPaW
Clearing methodology	Where practicable and safe to do so, clearing is to take place in a manner such that 'habitat islands' (refugia that fauna can hide within) are not left within the area of disturbance. This would allow fauna within the disturbed area to move out of the area of their own accord.	During clearing	Contractor
	For sites that are cleared in progressive stages, fauna searches should be undertaken at each stage of clearance.	During clearing	Contractor

Issue	Action	Timing	Responsibility
	Clearing via burning shall be conducted in accordance with the Fire Management Plan (Chevron Australia 2009a) and the Prescribed Fire Plan.	During clearing	Contractor
	Vegetation that has been stockpiled for burning is to be checked for fauna, and attempts should be made to flush any fauna present prior to ignition of the stockpile. Where windrows are burnt, they will be burnt slowly and into the wind. This will provide maximum opportunity for fauna that have sought refuge in the windrows to escape before the fire front reaches them.	Prior to stockpile ignition	Contractor

2.2 Excavations (Excluding Trenches)

2.2.1 Fauna Exclusion

The majority of large excavations will take place within cleared areas, therefore reducing the likelihood of fauna interacting with these excavations.

Fauna exclusion methods will be considered on a case-by-case basis for excavations deeper than 500 mm or those deemed likely to cause potential entrapment for fauna. The methods used to exclude fauna from excavations will depend on factors such as the type of activity, soil type, fauna at risk, and health and safety requirements.

Where excavations are to be left open for longer than 24 hours without activity, a fauna exclusion barrier will be placed to enclose the perimeter of the excavation if fauna ramps, mats, ladders, or other adequate egress for fauna is not practicable.

Artificial open water bodies or excavations containing mud or other liquids/slurries (e.g. drilling muds/fluids) will include, but not be limited to, stormwater ponds, bunded storage areas and mixing tanks. Management measures will be assessed for each situation, and will depend on the site conditions and facilities.

Management measures to reduce fauna access and entrapment to open water and mud will include, but are not limited to:

- fauna exclusion fencing (Sections 2.3.3 and 2.3.4)
- fauna exit ramps or fauna ladders (Section 2.2.2)
- regular inspections of open drains and stormwater ponds at the Gas Treatment Plant site
- lids on tanks where design permits (can be solid or mesh, with appropriate mesh sizing for ease of handling)
- sides will be sloped to allow fauna to egress where practicable.

Fencing is not required for dry turkey nests and sumps where fauna exit/escape structures are provided.

2.2.1.1 Turtle Exclusion Fencing

Deep excavations associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline, located within 300 m of turtle nesting beaches that will be open during the turtle nesting and hatchling season, and that are accessible to turtles, are to be barricaded using suitable materials considered appropriate for the turtle species likely to interact with the excavations and

appropriate for the site conditions. These barricades are to be placed such that they are effective but do not unnecessarily diminish turtle access to nesting areas.

2.2.1.2 Capping of Bores

All bores, which include production, exploration and purpose-drilled monitoring bores are to be sealed or capped appropriately to prevent ingress of fauna. Bores requiring temporary removal of headwork are to be sealed with a concrete plug that contains a metal component, so as to facilitate relocation with a metal detector. The plug will be buried if access to the bore is not required again.

2.2.2 Fauna Exit Structures

2.2.2.1 Fauna Ladders and Scramble Mats

Where fauna exclusion is unachievable, fauna ladders, where excavation design permits, can be used in place of ramps for small excavations. Fauna ladders are structures that give purchase to allow small vertebrates to climb out of the excavation to the surface, and include planks of wood with rungs or steps, planks wrapped with rope or netting, scramble mats, or rope/matting. These ladders are primarily effective for arboreal and semi arboreal species, so fauna exclusion is the preferred strategy.

Fauna ladders and scramble mats may be installed in turkey nests or large open water bodies where larger vertebrates are commonly lured to water. Where used, scramble mats are to be installed at each corner, and approximately every 25 m around sumps and turkey nests.

2.2.2.2 Fauna Exit Ramps

Fauna exit ramps can include, but are not limited to, a single- or double-sided angled feature, fabricated from wood, metal, plastic, or excavated earth materials. In normal circumstances and where any dimensional or access limitations are present within trenches, these would be placed on one side of the trench where there is potential for fauna entrapment. The interval spacing, dimension, and location of these features will be appropriate to the trench design and its potential for fauna entrapment.

Where exit ramps are not feasible, other mitigation techniques must be considered; these can include, but are not limited to:

- fauna exclusion fences (Sections 2.3.3 and 2.3.4)
- fauna ladders and scramble nets (Section 2.2.2.1)
- tightly fitting foam plugs (to cap excavations).

2.2.3 Excavation Inspections

It is recognised that fauna may be trapped or seek shelter in excavations. The chance of fauna encountering excavations increases with the length of the open trench. Therefore, inspections will be carried out as specified in Table 2-2.

Table 2-2 Excavation Inspection Requirements (excluding trenches)

Issue	Action	Timing	Responsibility
Entrapment in excavations	The walls and floors of all excavations are to be inspected for fauna before lowering of pipes or cables and prior to backfilling.	No more than 2 hours prior to activity	Contractor

Issue	Action	Timing	Responsibility
	All major open excavations >500 mm deep are to be inspected daily for trapped fauna, unless agreed otherwise with DPaW. Depending on the number and frequency of vertebrate fauna observed in the excavations, and the number and frequency of vertebrate fauna requiring retrieval from the excavations, inspection frequency may be reduced (in consultation with DPaW).	Twice daily unless agreed otherwise with DPaW Inspections are to be undertaken as follows: • No later than three hours after sunrise and again in the afternoon, no earlier than four hours before sunset • During the day as required	Contractor
	Structures placed inside open excavations to enable fauna to shelter or escape, such as exit ramps and ladders, will be inspected for fauna sheltering on or under the structures. Depending on the number and frequency of vertebrate fauna observed in the excavations, and the number and frequency of vertebrate fauna requiring retrieval from the excavations, inspection frequency may be reduced (in consultation with DPaW).	Daily and immediately prior to removal of structures unless agreed otherwise with DPaW	Contractor
	Foam or other appropriate plugs used to block excavations will be inspected for small gaps or holes (that may be accessible to fauna) while the plugs are being used.	Daily	Contractor
	Open excavations containing water, mud, or other liquids/slurries (e.g. drilling muds/fluids) will be inspected for trapped fauna.	At least twice daily The frequency of inspections may be increased on a case-by-case basis.	Contractor

2.3 Trenching

2.3.1 Construction Management

When laying and installing production, Monoethylene Glycol [MEG], and utility pipelines (no more than 2000 m of continuous single pipeline trench will be open at the same time and trenches will be closed as soon as practicable to reduce the amount of time they are open.

2.3.2 Fauna Shelter

Shelter for fauna is to be provided within open trenches at regular intervals, as agreed with Chevron Australia. Shelter materials are to be approved by Chevron Australia; they may include hessian sacks, shaded polyvinylchloride (PVC) pipes, cardboard boxes, or other materials that provide shade or shelter from predators. Shelters deployed should provide both small and large recesses and/or features to allow smaller animals refuge and protection from larger predators.

Trenches should be backfilled as soon as practicable after pipes or cables are laid to limit impacts such as animals being attracted under these features.

2.3.3 Temporary Fencing

Temporary fencing or similar measures will, where practicable, be used for deep trenches ≥1.5 m to reduce the entrapment of larger fauna on Barrow Island. Such fencing acts to guide large fauna away from trenches, or along the fence and away from the risk of entrapment. Considerations for temporary fencing include the type of fence (e.g. flexible plastic fencing), and the method of keeping the fence upright (e.g. by stakes or, where the ground remains impenetrable to stakes, posts held up by base weights). The ends of the trench fencing shall be closed each evening at the cessation of work to prevent fauna entering the trench.

2.3.4 Permanent Fencing

Where permanent fauna exclusion fences are considered, these are to take into account the purpose of the fence (total fauna exclusion or only exclusion of large animals).

Permanent fauna exclusion fences are to be (typically) >1.2 m high, and the lower section (typically 800 mm) of fence should incorporate a smooth unscaleable surface buried or anchored at the base of the fence, where possible (depending on site conditions), to prevent fauna burrowing through the fence. Where permanent fencing is buried below ground, this should, where practicable and where site conditions permit, incorporate a 'skirt' i.e. approximately 90° return away from the fence to prevent fauna burrowing down and beneath the fence . Materials for permanent fencing should be suitable to the fauna species that are likely to interact with the site and should be appropriate to site conditions. Materials can include, but are not limited to, smooth unscaleable surfaces such as sheet plastic or other corrosion-durable material. Provision should be made for fauna exit/escape structures in any open pits, sumps, etc.

Fauna exclusion fences are not to be barbed.

2.3.5 Trench Inspections

At the start of each day, no later than three hours after sunrise, no earlier than four hours before sunset, and prior to work commencing, fauna handlers or appropriately inducted and/or trained fauna observers will be required to inspect trenches for fauna. Only trained fauna handlers will remove entrapped fauna. Further opportunistic trench inspections for fauna may be undertaken by work personnel or appropriately inducted and/or trained fauna observers; fauna handlers will be notified to remove any fauna that are found entrapped. Where fauna exclusion safeguards (such as fauna exclusion fences) have been implemented, fauna handlers should still inspect for (and remove) animals that may bypass or climb over the safeguard.

Only fauna handlers are to handle fauna or (where required, permitted, and safe to do so) are allowed to enter trenches for the purpose of fauna management. Depending on the structure of the trench (see Section 2.2), fauna handling teams will generally consist of a minimum of two people, with one person on each side of the trench to ensure inspection of the entire surface of the trench, and to allow immobilisation of animals that may be difficult to catch. Inspections will be undertaken only if the inspection does not compromise the health and safety of personnel.

For safety reasons, fauna handling teams are not generally permitted inside trenches and should make all attempts to remove fauna without entry into trenches. If access to the trench is

required to remove fauna, authorisation should be sought in accordance with confined space entry procedures.

At least one person in each fauna handling team must have demonstrable relevant experience, as outlined in Section 3.2. Trench inspection requirements are detailed in Table 2-3.

Fauna handlers or fauna handling teams will carry with them all the tools and equipment required for safely capturing, handling, identifying, and recording fauna as they walk and inspect the trench.

Table 2-3 Trench Inspection Requirements

Issue	Action	Timing	Responsibility
Entrapment in trenches	Open trench lengths are not to exceed a length capable of being inspected by staff, and cleared by a fauna handling team, within the required time limits. With the exception of the umbilical trench, no more than 2000 m of continuous single pipeline trench will be open at the same time.	-	Contractor
	Fauna handlers or appropriately inducted and/or trained fauna observers are to inspect and clear open trenches daily.	Twice daily when trenches remain open. Inspections are to be undertaken as follows: • No later than 3 hours after sunrise • No earlier than 4 hours before sunset • During the day, where practicable • Nocturnally, if required for further studies undertaken at night (Section 2.3.7)	Contractor
	Fauna shelters are to be placed in open trenches at the end of each shift or on days when there is no work taking place. Shelter structures are to be placed at regular intervals as agreed with Chevron Australia.	At all times when trenches remain open	Contractor
	Open trenches are to be inspected for fauna prior to lowering in of pipes, pipeline bedding/padding, and backfilling activities.	No more than 2 hours prior to activity	Contractor

Issue	Action	Timing	Responsibility
Entrapment in pipe	Pipes are to be inspected for vertebrate fauna that may be sheltering inside, prior to fit-up for welding and lowering-in of the pipe. Fauna present in pipes are to be removed by fauna handlers, or should be allowed to escape of their own accord. Welded pipe strings are to have end caps fitted to prevent fauna entering the pipe strings.	Prior to use of pipes	Contractor
	Personnel are not to enter pipes or pipe strings to remove fauna.	At all times	Contractor

2.3.6 Management Measures and Exemptions for Specific Excavation Features

Where management measures for specific excavation features are impracticable, the management measures and exemptions listed in Table 2-4 will be followed for these features. These measures will be implemented through consultation and agreement between Barrow Island DPaW staff , Chevron Australia, and the Engineering, Procurement and Construction Management (EPCM) contractor.

Table 2-4 Management Measures and Exemptions for Specific Excavation Features

Excavation Feature Description	Management Measures (exemptions from Fauna Handling and Management Common User Procedure [FHMCUP])*
Service Trenches Typical trenches (deep and narrow for plumbing, electrical, communications, temporary construction facilities [TCFs] etc.)	Fauna mitigation measures in place in accordance with FHMCUP, no dispensation requested
Class 2 drainage trenches and open pits Deep, wide trenches with at least one gently-sloping side to facilitate egress, including hog outs and fire pits. These are undertaken in sections, and are generally wide enough for heavy vehicles to drive into; they may be several hundred metres long	• Fauna exclusion barriers not required • Twice-daily targeted fauna inspections not required • Fauna shelters not required • Temporary fencing not required
Perimeter bund low points Trench-like formations formed by drainage bund and final grade (generally 45 degree battered slopes over long distances located at the boundary).	• Fauna exclusion barriers not required • Twice-daily targeted fauna inspections not required • Fauna shelters not required • Temporary fencing not required

** The agreed management measures will be applied to other trench/excavations with similar descriptions to those listed above*

2.3.7 Further Studies

2.3.7.1 Vertebrate Fauna Peak Activity Entrapment Levels

Chevron Australia will consider undertaking studies to investigate nocturnal vertebrate fauna peak activity entrapment levels within the main feed gas pipeline trench on Barrow Island. This information can allow subsequent clearance efforts to be implemented for peak entrapment periods.

2.3.7.2 Vertebrate Fauna Mark and Recapture Program

Chevron Australia will consider, in consultation with DPaW, undertaking studies to investigate the loss of body condition and survivorship of vertebrate fauna that become entrapped in trenches over consecutive nights. Vertebrate fauna recovered from the feed gas pipeline trench excavation can be marked with a non-toxic dye prior to release to aid in recapture identity. The objective of this program is to mark all entrapped vertebrate fauna and record all subsequent captures of marked fauna, and identify any incremental loss of body condition during consecutive recaptures.

2.3.8 Management of Contingencies and Adverse Weather Conditions

While every effort will be made to minimise risks of injury or death to fauna, zero mortality is considered impracticable.

General contingency actions are summarised in Table 2-5. Requirements for contingency management, and actions to address specific adverse outcomes such as high predation events or increased fauna mortality due to entrapment, will be developed on a case-by-case basis in consultation with DPaW.

Whilst every effort will be made to reduce the mortality of fauna due to predation events or heat, it is expected that predation events (raptors, ground-dwelling predators) and extreme temperatures will occur from time to time. Predation or heat exhaustion will be assessed by analysing mortality information collected in the field. Contingency actions to mitigate risks of predation events will be implemented based on this data (Table 2-5). The contingency action will depend on the type of predation/weather event, and how it may be managed and further reduced.

Table 2-5 Contingency Actions for Trenching

Issue	Action	Timing	Responsibility
Mortality attributed to predation	If predation remains consistent, different types of shelters are to be considered for trial. Shelters are to be placed at key locations in the trench at the end of each day, and inspected and removed if required.	Ongoing during construction	Chevron Australia and Contractor
	If high predation is attributed to individual predators routinely patrolling the trench, these predators may be relocated away from open trenches by fauna handlers, in consultation with DPaW.	Ongoing during construction	Chevron Australia and Contractor
Mortality attributed to heat exhaustion	If fauna mortality is observed to be occurring due to high temperatures, additional management measures will be implemented to reduce fauna mortality, such as additional shelters or fauna escape/refuge structures within trenches or excavations, as required.	Ongoing during construction	Contractor

Issue	Action	Timing	Responsibility
	If fauna mortality attributed to heat exhaustion increases dramatically or is considered excessive, trenches will be cleared by fauna handlers within two hours after sunrise, and during the day, as required. Note: Due to the depth and orientation of the Gorgon Gas Development feed gas pipeline system trenches, the bottom of trench will be in shade for much of the morning and afternoon.	Ongoing during construction	Contractor
Flooding in trenches	If fauna mortality is observed to be occurring due to significant rainfall from cyclones or tropical low pressure systems, additional management measures will be implemented to reduce fauna mortality, such as additional shelters or fauna escape/refuge structures within trenches or excavations, as required. The type and frequency of structures used (e.g. ladders, wide planks of wood floats) will depend on the trench characteristics (e.g. slope, length of open trench) and expected weather conditions (e.g. amount of rainfall, strength of wind). The adverse weather contingency plan, or equivalent strategy, details the procedure for managing flooding in open trenches as a result of a significant rainfall event.	Ongoing during construction	Contractor
	Following heavy rainfall, flooded trenches or major excavations are to be inspected and assessed for water pooling as soon as practicable (depending on weather conditions and safe access). A pump will be available to commence dewatering of trenches or major excavations containing pooled water; these will be cleared of any fauna as soon as practicable.	Whilst standing water remains in trench	Contractor

2.4 Aircraft and Fauna

Aircraft operations have the potential to interfere with fauna breeding cycles, migratory patterns and feeding patterns. Significant direct impacts to fauna from aircraft would be more likely to affect sea and shorebirds and would include aircraft strike of low-flying birds and birds becoming sucked into jet engines or struck by propellers upon take-off and landing. If birds become injured or disorientated, they will be managed by the measures described in Section 3.3.2, Table 3-1, Section 3.4, Section 3.6 ,and Section 3.7.3.

3.0 Fauna Handling

3.1 Overview

Personnel are not to intentionally kill, capture, disturb, or molest any fauna by any means, as such acts (including attempts and acts of assistance) are offences under the *Wildlife Conservation Act 1950* (WA) (WC Act). Personnel exempt from these conditions are those acting in accordance with the conditions of licences they personally hold such as:

- licence to take fauna for scientific purposes under Regulation 17 of the WC Act (WA)
- licence to take fauna for educational or public purposes under Section 15 of the Wildlife Conservation Regulations 1970 (WA).

A flow diagram to guide the vertebrate fauna handling actions and decision-making process is presented in Figure 3-1. This diagram details when it is necessary to contact and call out a fauna handler.

3.2 Capability of Fauna Handlers

Fauna handlers will be present on site during the construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline to ensure that the requirements of this Procedure, and animal welfare requirements, are met.

At least one fauna handler per operational fauna handling team will have experience and/or training in all of the following:

- attending to accidents involving wildlife
- inspecting trenches for fauna
- handling and capturing fauna (including venomous snakes)
- identifying fauna
- assessing injured fauna for release, euthanasia, or rehabilitation
- providing care of, or euthanising sick, injured, or abandoned, animals
- senior first aid (for human safety/health considerations).

All fauna handlers should possess an understanding of the following:

- quarantine and wildlife disease transmission issues associated with relocation/translocation (i.e. Weed Hygiene Zones [WHZ] and potential removal of fauna from Barrow Island)
- safety and health risks and implementation of preventive measures associated with working with fauna (e.g. zoonoses)
- the general ecology of the fauna likely to be encountered on Barrow Island (so that captured fauna may be suitably released back into their respective habitats)
- the roles and responsibilities other agencies have in fauna incidents on Barrow Island.

When it is considered necessary, persons caring for injured wildlife on Barrow Island are to consult with DPaW or veterinary practitioners and/or suitably qualified animal carers, as required.

Persons responsible for euthanasia should be familiar with euthanasia techniques through previous on-the-job training and/or a course.

Chevron Australia shall notify DPaW as soon as practicable of any animals that may need to be kept in captivity for short-term welfare benefits prior to release on the same day, or shortly thereafter.

A separate flow diagram explicitly for fauna handlers to assess the health, treatment, or retention of fauna is shown in Figure 3-2.

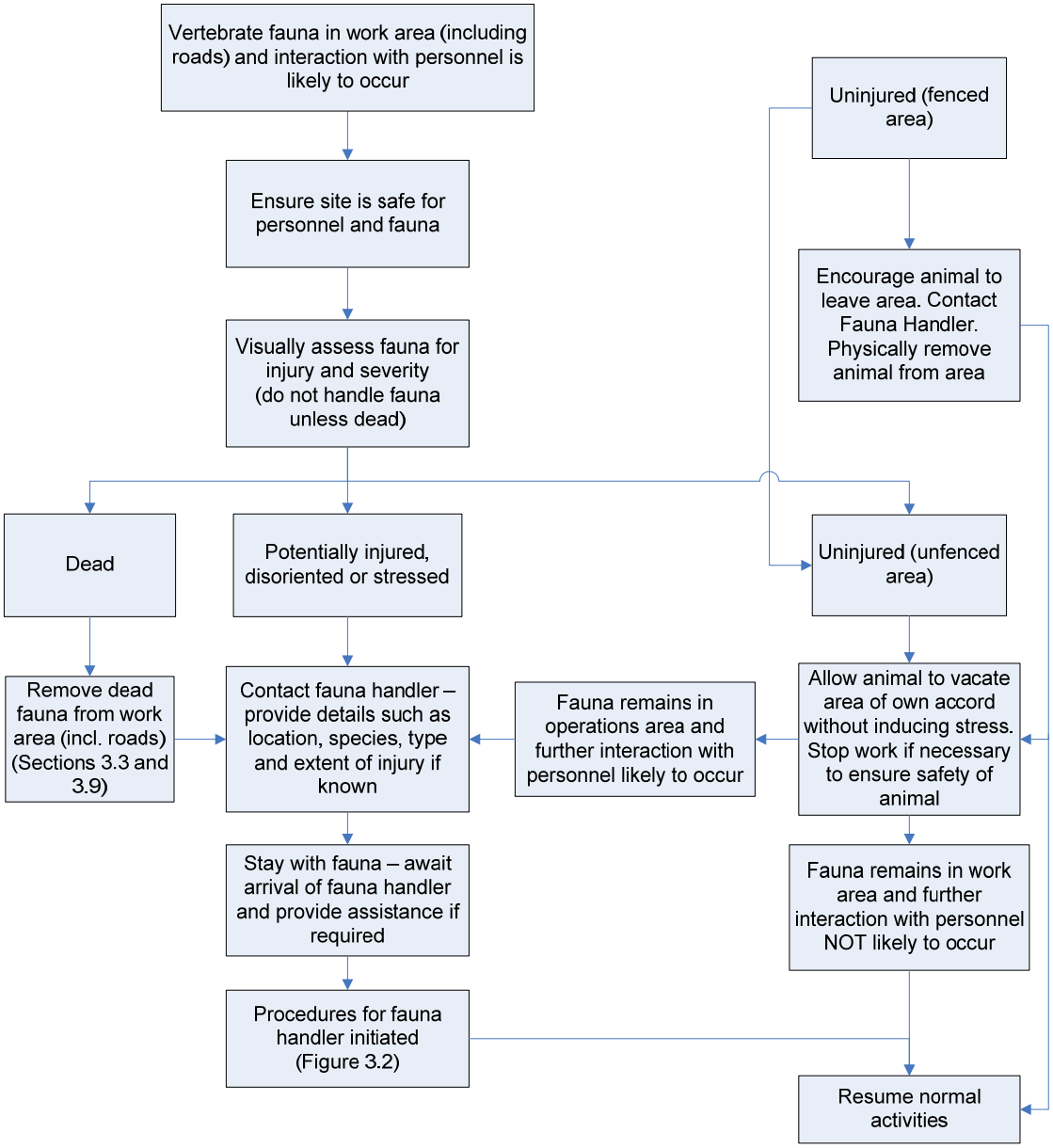

Figure 3-1 Vertebrate Fauna Handling Actions and Decision-making Process

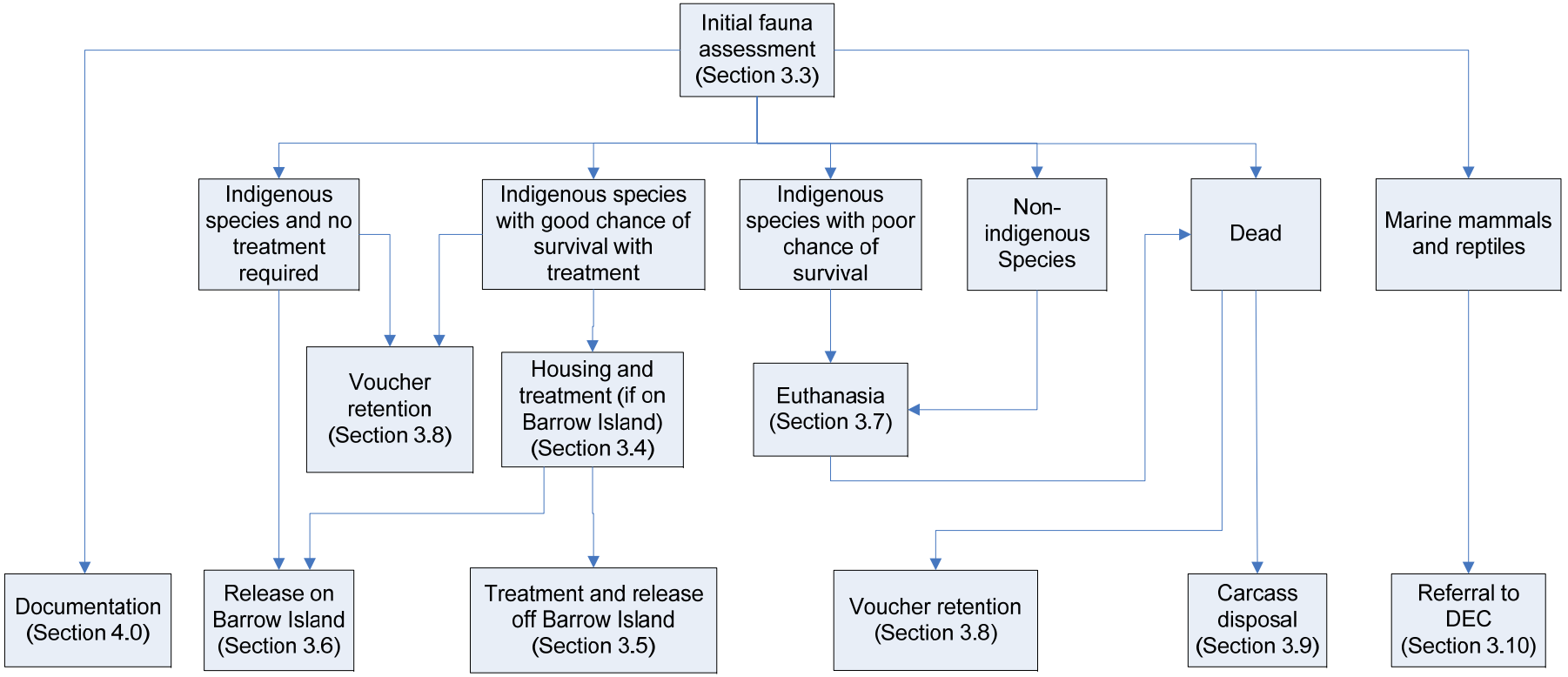

Figure 3-2 Vertebrate Fauna Handling Assessment and Action Process

3.3 Assessment

3.3.1 Initial Assessment

Upon the discovery of a sick, injured, orphaned, entangled, stranded, or dead animal the person who finds the animal should:

- seek immediate advice from a fauna handler if required
- promptly assess the condition of the animal
- check for pouch young in marsupials (as applicable)
- move dead fauna away from worksites (including roads) if appropriate and safe to do so such that other fauna that may find the carcass will not be in danger from vehicle impact and in turn become injured
- report the discovery to the on-site supervisor, as soon as practicable.

Upon the discovery of an injured, entangled, stranded, or dead marine mammal or reptile the person who finds the animal should:

- seek immediate advice from a fauna handler if required
- promptly assess the condition of the animal
- report the discovery to the on-site supervisor, as soon as practicable.

Fauna handlers, or other appropriately trained staff, should be contacted and attend to mortalities of marine mammals and reptiles and record information on a stranding form. Completed stranding forms will be submitted to Chevron Australia.

All mortalities involving fauna are to be reported to the relevant on-site supervisor and fauna handler as soon as practicable. Mortalities of marine turtles should follow the reporting procedures detailed in the Long-term Marine Turtle Management Plan (Chevron Australia 2013b).

3.3.2 Assessment of Treatment Level by Fauna Handler

Based on level of distress or injury of an injured or distressed animal, a fauna handler will undertake an assessment to determine the appropriate treatment. The assessment, if safe to perform, is to include a visual check for broken bones, signs of severe injuries, and pouch young in marsupials.

The initial assessment needs to be made as quickly as possible, as the animal may be suffering. The time taken to make an assessment can affect the recovery of any injured fauna – delays will cause stress, slow recovery, and/or death.

Extreme care must be taken when considering euthanasia if the cause of distress, injury, illness, or change in behaviour is not obvious. Appropriate first aid and observation of the animal must be undertaken before contemplating euthanasia. A guide for assessing the treatment level an animal requires is provided in Table 3-1.

Table 3-1 Assessment of Level of Treatment Required

Treatment	Symptoms
1. Animals requiring passive (husbandry) treatment	• Obviously disorientated • Incapable of fleeing due to disorientation, fatigue or injury • Shivering • Very minor injuries • Nocturnal birds (e.g. Shearwaters) that have been disorientated and appear quiet but otherwise uninjured.
2. Animals requiring medical treatment	• Obvious injuries (e.g. cuts) that do not appear terminal • Vomiting or abnormal defecation and urination • Not supporting their own weight when standing • Abandoned juveniles or pouch young of dead or severely injured marsupials (Barrow Island Euro, Spectacled Hare-wallaby, Rock-wallaby, Boodie, Planigale, *Pseudantechinus*, Golden Bandicoot, Brush-tail Possum) if: ▪ they are fully furred ▪ their eyes are open ▪ their ears are standing up ▪ they are supporting their own weight when standing.
3. Animals requiring euthanasia	• Massive trauma • Medical treatment is required and none is available within one hour • Fitting/uncontrolled twitching/involuntary movement • Altered cardiovascular and/or respiratory function • An animal kept for first aid and recovery shows signs of declining health, pain and distress, and the cause of declining health is not obvious and treatable • Blood or other unusual discharge from mouth, nose, or other orifices • Mechanism of injury known (e.g. vehicle impact, trauma, heat, crush) and perceived to be serious • An animal removed from a trench displays terminal injuries or illness and/or sustained high levels of pain (such as a large wound that first aid cannot remedy) • An animal has been injured by a vehicle or other traumatic impact and its injuries are terminal or causing sustained high levels of pain (such as a large wound or broken bones that first aid cannot remedy) • Pouch young of dead or severely injured marsupials (Barrow Island Euro, Spectacled Hare-wallaby, Rock-wallaby, Boodie, Planigale, *Pseudantechinus*, Brush-tail Possum, Golden Bandicoot) if: ▪ they are not fully furred ▪ their eyes are not open ▪ their ears are not standing up ▪ they are not supporting their own weight when standing. • Non-indigenous species • Birds with broken wings and/or legs • An animal requiring long-term care and/or that will not survive after release into the wild due to injuries or development stage (age)

3.3.3 Equipment

Appropriate Personal Protective Equipment (PPE), such as leather gloves, a blanket or similar, and recovery equipment, such as a snare or cage, are to be used when handling fauna to help protect the wearer from scratches or bites that can be received from animals in stress.

Injured fauna may be handled in, or loosely covered with, a dark-coloured heavy cotton bag, or similar, as this will give the animal a feeling of security.

A lockable and ventilated container with clearly visible safety warnings will be used for the transportation of injured or vouchered venomous snakes (Section 3.7.2.2).

Appropriately sized, ventilated PVC tubing with screw caps at both ends can be used for the transportation of Perentie and other large reptiles.

The basic principles of personal and equipment hygiene must be followed at all times to minimise the risk of exposure to disease agents and minimise the risk of spreading disease.

3.4 Housing and Treatment on Barrow Island

Small to medium-sized injured and/or abandoned fauna should be transported in a dedicated ventilated insulated box. Larger animals will be transported in a large dark-coloured cotton bag or blanket, or similar. Animals will be secured by a method that appropriately considers size, condition, and behaviour of the animal prior to transportation.

Care is to be taken during transport to ensure that the animal is not further injured and will not cause unsafe driving or injury to personnel in the vehicle.

Injured or unidentified fauna may be kept overnight for assessment and identification purposes.

Most Australian mammals are extremely difficult to care for in captivity. If the animal is believed to have a high chance of survival, hand rearing may be attempted by any personnel, with approval from on-site environmental senior management and in consultation with DPaW. However, hand rearing is only to be attempted if the correct resources (appropriate housing, food, staff time commitment) are available for the animal. Fauna should only be kept for the minimum time necessary depending on the course of action required (i.e. repatriation, relocation, translocation, euthanasia).

Details for the housing and feeding of injured or abandoned animals are provided in the DEC Minimum Standards for Wildlife Rehabilitation in Western Australia (DEC 2008). In summary, for housing and feeding of injured or abandoned fauna the following should be considered:

- appropriate materials for housing, such as containers and bedding
- size and adequate ventilation of housing containers
- environmental conditions of housing facilities
- provision of and timing of administering appropriate foodstuffs.

Advice on these matters will be sought from appropriate Chevron Australia environmental personnel who can then consult with DPaW, as required.

A number of risks may be posed to the health of individual animals and animal populations when interacting with people, such as:

- physical injury to the animal (including open wounds, which are susceptible to infection)
- transmission of infectious agents between individual animals via human hands and/or the surface of any equipment coming in contact with animals
- stress, which can increase susceptibility to disease. Stressed animals may also excrete infectious material into the environment, increasing the chances of disease transmission
- irritation of the skin, eyes, etc. from contact with residual disinfectants used on equipment.

Section 3.7.2.3 details risk management practices that address hygiene management and animal disease.

3.5 Removal of Animals from Barrow Island

Removal of fauna for the purposes of translocation to other sites may be conducted by DPaW for the purpose of re-establishing wildlife into their former range. Only under exceptional circumstances and with the written approval of DPaW will animals be removed from Barrow Island for any purpose other than wildlife conservation, vouchering, or rehabilitation requirements. Animals that are removed from Barrow Island will not be allowed to return due to the threat of disease importation.

3.6 Release on Barrow Island

If fauna need to be relocated from the worksite to other areas on Barrow Island, this relocation is to be conducted by fauna handlers.

Fauna removed from a site for the purposes of recovery or treatment following clearing are to be returned to an area near the site from which they were removed, at a time of day that does not compromise their repatriation (e.g. before 8 am or after 5 pm). Fauna are to be released into a sheltered area (bush, rock cavity, warren, etc.).

Relocation and release should be undertaken as soon as practicable to a suitable distance from the initial area of capture, as determined by a fauna handler, taking into consideration the ecological requirements of the species including behaviour and habitat e.g. suitable sheltered location such as spinifex clumps, rocky outcrops, or leaf litter.

Shorebirds are to be released at the coast late in the day, near where they were found. Shearwaters and Bridled Terns are to be released at the coast near Double Islands.

3.7 Euthanasia

3.7.1 Primary Considerations

Animal euthanasia will be undertaken in accordance with the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes (National Health and Medical Research Council [NHMRC] 2004) and Condition 5.1 (I) of the Australian Government National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (Commonwealth Government of Australia 2008).

Voucher specimens may be required by the Western Australian Museum (WAM). Voucher specimens require the specimen to remain intact and undamaged, which limits the preferred methods of euthanasia.

Other considerations include the need for techniques that are compatible with the health and safety regulations of a construction site (e.g. firearms and certain drugs would not be appropriate); that are practicable for use in a field setting; and, ideally, that preserve native fauna in a condition appropriate for use as voucher specimens for the Museum.

3.7.2 Health and Safety

3.7.2.1 Risks to Handlers

The following risks are to be managed to avoid injury or harm to fauna handlers:

- physical injuries, such as bites, scratches, and blows from animals, and cuts and abrasions from equipment. Additional handlers are to be used to assist with the handling of larger animals
- envenomation by venomous fauna (Section 3.7.2.2)
- allergies to animal material such as hair and feathers

- zoonotics, which are diseases that affect both animals and humans; zoonoses are diseases found in animals that may be transmitted to humans.

3.7.2.2 Protocol for Handling and Transporting Venomous Snakes

Snakes are only to be handled by fauna handlers with the appropriate training.

Chevron Australia implements, where reasonably practicable, an internal protocol for the transportation of venomous snakes requiring euthanasia or taken for vouchering purposes. For this process, the requirements listed below should be met:

- Following positive identification, the fauna handler will communicate the collection of the snake to all co-workers.
- The snake will be placed inside an appropriate double secured bag, and either tied with cord or tape, or clamped.
- The bagged snake will then be placed inside a suitably ventilated container with clearly visible safety warnings and locked with a padlock. The only active key will be held by the fauna handler who undertook the above process. A second key will be held in an agreed location, and used only by or in communication with this fauna handler.
- The container will be transported as soon as is practicable to a cool dry area within the holding facility (Section 3.4).
- As soon as practicable, the snake will be attended to by the fauna handler (or co-worker by agreement) who has undertaken the above process.

3.7.2.3 Hygiene

All animals are to be handled with the assumption that they carry disease, especially if they appear sick.

These risk management practices are to be applied by fauna handlers:

- Basic principles of personal and equipment hygiene must be followed at all times to minimise the risk of exposure to disease agents and minimise the risk of spreading disease.
- Maintain high levels of personal hygiene such as washing and sanitising hands before and after handling animals and before eating.
- Do not eat, drink, or smoke while handling animals.
- Keep animals, animal products, and animal waste away from food preparation and storage areas.
- Ensure appropriate PPE (including gloves, eye protection, face mask, long-sleeved shirt, and long pants) is worn when handling injured fauna for first aid or euthanasia purposes, or where blood, wastes, and other body fluids are encountered.
- Disinfect, wash, or dispose of equipment that has been used for animal euthanasia, and bags and equipment that have been in contact with animal blood, waste, and other body fluids. Ensure that any bags used to transport venomous snakes are thoroughly cleaned to eliminate potential envenomation of the fauna handler by way of absorption of venom through the open skin of any venom that may be present on the bag.

3.7.3 Techniques

It is the responsibility of a fauna handler, or other experienced person (e.g. DPaW) to euthanise an animal if this is deemed the appropriate course of action.

3.7.4 Equipment

Field equipment for performing euthanasia will be readily accessible by fauna handling teams and will generally consist of simple tools for performing one of the physical euthanasia techniques. These tools will include:

- customised heavy steel bar or other appropriate heavy, blunt object (for larger fauna)
- small steel rod (for smaller fauna)
- fauna handling equipment including hoop bags, jiggers, calico bags, hessian bags
- appropriate PPE.

3.8 Voucher Retention

3.8.1 Selection of Voucher Specimens

The relevant Department of Terrestrial Vertebrates at the Museum (Ph: 08 9212 3700) must be consulted prior to the collection of any vouchering of specimens for the purposes of expanding existing collections.

Voucher specimens are only to be collected by personnel with a valid 'Licence to Take Fauna for Educational or Public Purposes' or a 'Licence to Take Fauna for Scientific Purposes' under Regulations 15 and 17 respectively, of the Wildlife Conservation Regulations 1970 (WA) (refer to Section 3.1). Collections must also occur under a 'Licence to Take Fauna from a Nature Reserve' (under the CALM Act [WA]).

Only experienced personnel who are familiar with the ecology of the fauna will determine which animals are suitable for voucher retention under the direction of the WAM or DPaW, which have elicited a requirement to obtain voucher specimens. A mixture of adult males and females is desirable. Attention should be taken to ensure that vouchered females do not have dependent young.

Vouchering will be the responsibility of Chevron Australia and/or DPaW.

Voucher specimens may be obtained from sites to be cleared of vegetation, or from animals that have died or that have been euthanised due to injury. Voucher specimens will be lodged in appropriate public collections. For most animals this will be the WAM.

Vouchers will be collected and submitted for:

- animals that have not been previously recorded on Barrow Island
- animals whose taxonomy and genetics is poorly understood.

Voucher specimens may also be provided for research purposes, under licence. To avoid over collection of taxa and to provide the current status of all taxa vouchered, regular communication will be undertaken between Chevron Australia in Perth and Chevron Australia, EPCM Environment, and DPaW Barrow Island staff. Chevron Australia in Perth will further communicate with the Museum regarding any prospective collected specimens.

If opportunities arise, deoxyribonucleic acid (DNA) may be collected from live animals, without the requirement for the euthanasia of the animal.

3.8.2 Live Specimens

The Department of Terrestrial Vertebrates at the Museum (Ph: 08 9212 3700) must be consulted prior to the collection of any voucher specimens that are to be transported live to the Museum. This is to ensure that resources will be available to attend to the animals upon their arrival.

Transfers are to occur only where an animal is to be subsequently euthanised for a voucher specimen.

Each specimen is to be bagged individually in a clean bag inside a secure, insulated esky or container, placed within a pressurised/temperature-controlled section of the plane, and transported as soon as practicable to the Museum (along with collection records as listed in Section 4.0; for housing of live specimens refer to Section 3.4).

3.8.3 Preserved Specimens

The transportation of large numbers of live animals is undesirable from an animal welfare point of view; this approach is to be avoided wherever practicable.

Voucher specimens are to be euthanised as soon as is practicable by suitably experienced personnel. Voucher vertebrate specimens are to be anaesthetised first, and then euthanised by appropriate methods to limit any damage to the specimen.

Immediately after euthanasia, a tissue sample (liver) may be taken. Biopsy tissue is to be preserved in a material conducive to allowing genetic sampling. The remaining specimen tissue, when required for vouchering, is to be preserved based on appropriate vouchering protocols.

For marine turtle or marine mammal mortalities that occur, appropriately experienced personnel and DPaW must be notified to allow for the collection of biopsy tissue samples, if required. These samples are to be preserved as appropriate for future genetic studies. Additional information should also be collected including, but not limited to, photographs of the individual, location and date (see Section 3.3.1).

All fauna collected for voucher specimens will be the responsibility of Chevron Australia and DPaW.

3.9 Disposal of Animal Carcasses

'Road kill' carcasses are to be removed from the roads and left in the adjacent bush as far away from worksites, roads, and access tracks as possible (typically >5 to 10 m) so as to prevent further harm to carrion-feeding animals. All deceased pouched fauna are to be checked for pouch young prior to being left in the bush. If pouch young are present and fully furred, they are to be removed and decisions to foster care them are to be made in consultation with DPaW. If foster care is inappropriate, or if pouch young are present and unfurred, they are to be euthanised using appropriate procedures.

The carcasses of the following will be disposed of in an alternative manner (burial, off-Island removal, incineration) if they are not retained as voucher specimens:

- animals that are not indigenous to Barrow Island
- animals displaying symptoms of disease.

Dead animals can carry and shed infective agents so appropriate care and hygiene must be maintained at all times during the handling, storage, and transport of specimens and carcasses.

3.10 Referral to DPaW

Marine mammals and marine reptiles such as turtles, whales, dolphins, and dugongs inhabit the waters around Barrow Island and the mainland. Sightings of injured, entangled, stranded, or dead marine mammals and marine reptiles on the beaches, or in the water in the vicinity (approximately 500 m) of the terrestrial facilities listed in Condition 6.3 of Statement No. 800 and Statement No. 769 and the marine facilities listed in Condition 14.3 (i), (ii), (iii) and (vi) of Statement No. 800 and Condition 12.3 of Statement No. 769 (marine component of the shore

crossing), are to be reported by personnel to a Chevron Australia representative on Barrow Island, who will then contact the DPaW Barrow Island Field Staff or the DPaW Regional Office so that appropriate action can be taken.

For all other fauna, as described elsewhere in this Procedure, DPaW representatives are to be consulted by Chevron Australia when additional information or guidance is required to ensure appropriate fauna handling and treatment actions are taken.

If a virus, pathogen, or other disease agent is suspected in an animal population on Barrow Island, Chevron Australia will consult with DPaW regarding the appropriate management response within 48 hours.

4.0 Recording and Reporting

4.1 Recording

Detailed records of dead, injured, captured, entrapped, stranded, or entangled fauna will be kept. Records will enable analysis of any trends in fauna captures or casualties (e.g. geographic information system [GIS] reporting, frequency distributions of casualty versus species, trap success, etc.) as part of the Terrestrial and Subterranean Environment Monitoring Program (Chevron Australia 2013a). Data collected by Chevron Australia will be made available to DPaW as requested under the standard data-sharing arrangements.

Records are to be kept on an internal Chevron Australia system that includes the following details (where known, or where relevant to the incident):

- fauna species
- time and date of capture
- location (MGA 50, GDA 94)
- status (alive, alive injured, dead predated, dead heat exhaustion, dead drowned, dead hypothermia, dead other known cause, dead unknown cause)
- actions taken (euthanasia, release, relocation, none)
- euthanasia: the method of euthanasia, species of animal, cause of injury/reason for euthanasia, the fauna handler responsible for administering euthanasia
- voucher number (if voucher specimen taken)
- if fauna have been entrapped in a trench or excavation, other trench data must be recorded including the presence and number of trench ramps, the temperature, the total length of the open trench, and the presence of any water pooling
- if readily determined: age, gender, and whether pouch young are being carried
- if applicable, symptoms of a virus, pathogen, or other disease agent evident in animals held for treatment.

All voucher specimens (if required by the Museum) are to be entered into a voucher tracking system retained and managed by Chevron Australia, with the specific specimen details including:

- species
- sex, if known
- date collected
- the collector
- the location (MGA 50, GDA 94)
- unique voucher code/field code as allocated by the collector
- chemicals used in preservation
- any biopsy tissues taken (and type of tissue).

4.2 Reporting

4.2.1 Compliance Reporting

Condition 4 of Statement No. 800 and Condition 2 of EPBC Reference: 2003/1294 and 2008/4178 requires Chevron Australia to submit an annual Compliance Assessment Report to address the previous 12-month period. Condition 4 of Statement No. 769 similarly requires that Chevron Australia submit an annual Audit Compliance Report, for the previous 12-month period. A compliance reporting table is provided in Appendix 1 to assist with auditing for compliance with this Procedure for Statement No. 800, EPBC Reference: 2003/1294 and 2008/4178, and Statement No. 769. In accordance with Conditions 2-1 and 2-2 of Statement No.965, compliance assessment and compliance reporting will be carried out on a joint basis with Statement No.800.

This Procedure is not required under EPBC Reference: 2005/2184; therefore, compliance reporting is not required to meet this condition.

4.2.2 Environmental Performance Reporting

Condition 5.1 of Statement No. 800 and Statement No. 769, and Condition 4 of EPBC Reference: 2003/1294 and 2008/4178 require that Chevron Australia submits an annual Environmental Performance Report to the Western Australian Minister for the Environment and the Commonwealth Minister of the Environment (DotE), respectively, for the previous 12-month period.

In addition, under Condition 5.3 of Statement No. 800 and Statement No. 769, and Condition 4.2 for EPBC Reference: 2003/1294 and 2008/4178, every five years from the date of the first annual Report, Chevron Australia shall submit to the Western Australian Minister for the Environment an Environmental Performance Report covering the previous five-year period. In accordance with Conditions 2-1 and 2-2 of Statement No.965, performance reporting will be carried out on a joint basis with Statement No.800.

Specific details on the content of the Environmental Performance Report are defined in Condition 5.2 and Schedule 3 of Statement No. 800, Condition 5.2 of Statement No. 769, and Schedule 3 of EPBC Reference: 2003/1294 and 2008/4178.

The information in the Environmental Performance Report will also partly meet the requirements of Condition 3.7 of EPBC Reference: 2003/1294 and 2008/4178.

4.2.3 Routine Reporting

The Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010a) and Terrestrial and Subterranean Environment Monitoring Program (Chevron Australia 2013a) contain the routine reporting and documentation requirements associated with fauna incident management and fauna monitoring.

4.3 Internal Incident Reporting

Chevron Australia has prepared the Emergency Management Process (Chevron Australia 2010b) and Incident Investigation and Reporting Process (Chevron Australia 2010c), which it internally requires its employees, contractors, etc. to follow in the event of environmental incidents. These processes will also be internally applied to environmental incidents identified in this Procedure, where this is appropriate and reasonably practicable.

5.0 Review

Chevron Australia is committed to conducting activities in an environmentally responsible manner and aims to implement best practice environmental management as part of a program of continuous improvement. This commitment to continuous improvement means Chevron Australia will review this Procedure every five years and more often as required (e.g. in response to new information).

Reviews will address matters such as the overall design and effectiveness of the Procedure, progress in environmental performance, changes in environmental risks, changes in business conditions, and any relevant emerging environmental issues.

If the Procedure no longer meets the aims, objectives, or requirements of the Procedure, if works are not appropriately covered by the Procedure, or measures are identified to improve the Procedure, Chevron Australia may submit an amendment or addendum to the Procedure to the State Minister for Environment for approval under Condition 36 of Statement No. 800, Condition 21 of Statement No. 769 and Condition 2-3 of Statement No. 965. The State Minister for Environment may also direct Chevron Australia to revise the Procedure under Condition 36.2 of Statement No. 800.

If Chevron Australia wishes to carry out an activity otherwise than in accordance with the Procedure, Chevron Australia will update the Procedure and submit it for approval by the Commonwealth Minister for Environment in accordance with Condition 25 of EPBC Reference: 2003/1294 and 2008/4178. The Commonwealth Minister may also direct Chevron Australia to revise the Procedure under Condition 26 of EPBC Reference: 2003/1294 and 2008/4178.

6.0 References

Chevron Australia. 2006. *ASBU Management of Orphaned or Injured Animals Procedure.* Chevron Australia, Perth Western Australia. (OE-07.06.11)

Chevron Australia. 2009a. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Fire Management Plan*. Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000272)

Chevron Australia. 2009b. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Ecological Monitoring Common User Procedure*. Chevron Australia, Perth Western Australia. (G1-PP-HES-PRC-0017)

Chevron Australia. 2009c. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Aboriginal Cultural Heritage Management Plan.* Chevron Australia, Perth Western Australia. (G1-NT-PLNX0000207)

Chevron Australia. 2009d. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Post-Construction Rehabilitation Management Plan.* Chevron Australia, Perth Western Australia. (G1-NT-PLNX0000303)

Chevron Australia. 2010a. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Environment Protection Plan.* Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000294)

Chevron Australia. 2010b. *Emergency Management Process: ABU – Standardised OE Process*. Chevron Australia, Perth, Western Australia. (OE-11.00.01)

Chevron Australia. 2010c. *Incident Investigation and Reporting – ABU Standardised OE Process.* Chevron Australia, Perth, Western Australia. (OE-09.00.01)

Chevron Australia. 2012a. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Baseline State and Environmental Impact Report.* Chevron Australia, Perth, Western Australia. (G1-TE-H-0000-REPX027)

Chevron Australia. 2012b. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Traffic Management Common User Procedure.* Chevron Australia, Perth, Western Australia. (G1-PP-HES-PRC-0010)

Chevron Australia. 2012c. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Barrow Island Weed Hygiene Common User Procedure.* Chevron Australia, Perth, Western Australia. (G1-PP-HES-PRC-0016)

Chevron Australia. 2012d. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Vegetation Clearing and Audit Common User Procedure*. Chevron Australia, Perth, Western Australia. (G1-PP-HES-PRC-0012)

Chevron Australia. 2013a. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Environment Monitoring Program.* Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000309)

Chevron Australia. 2013b. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Long-term Marine Turtle Management Plan.* Chevron Australia, Perth, Western Australia (G1-NT-PLNX0000296).

Commonwealth Government of Australia, Assistant Secretary Environmental Assessment Branch, Anne-Marie Delahunt. 2006. *Decision to Approve the taking of an Action – Jansz Feed Gas Pipeline (EPBC Reference: 2005/2184)*, 22 March 2006. Canberra, Australian Capital Territory.

Commonwealth Government of Australia, Minister for the Environment and Water Resources, Malcolm Turnbull. 2007. *Approval – Gorgon Gas Development (EPBC Reference: 2003/1294), 3 October 2007*. Canberra, Australian Capital Territory.

Commonwealth Government of Australia, Minister for the Environment, Water, Heritage and the Arts, Peter Garrett. 2009. *Approval – Gorgon Gas Development (EPBC Reference: 2008/4178), 26 August 2009*. Canberra, Australian Capital Territory.

Commonwealth Government of Australia, Natural Resource Management Ministerial Council. 2008. *National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes*. Canberra, Australian Capital Territory

Department of Environment and Conservation. 2008. *Minimum Standards for Wildlife Rehabilitation in Western Australia.* Department of Environment and Conservation, Perth, Western Australia.

Environmental Protection Authority. 2004. *Guidance for the Assessment of Environmental Factors Western Australia (in accordance with the Environmental Protection Act 1986) – Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia, No. 56*. Environmental Protection Authority, Perth, Western Australia.

Government of Western Australia, Minister for the Environment, David Templeman MLA. 2007. *Statement that a Proposal may be Implemented – Gorgon Gas Development: Barrow Island Nature Reserve (Ministerial Statement No. 748), 6 September 2007.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, David Templeman MLA. 2008. *Statement that a Proposal may be Implemented – Jansz Feed Gas Pipeline: Barrow Island Nature Reserve (Ministerial Statement No. 769)*, 28 May 2008. Perth, Western Australia.

Government of Western Australia, Minister for the Environment, Youth, Donna Faragher JP MLC. 2009. *Statement that a Proposal may be Implemented – Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve (Ministerial Statement No. 800), 10 August 2009.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, Water, Bill Marmion MLA. 2011. *Statement to Amend Conditions Applying to the Gorgon Gas Development Revised and Expanded Proposal Barrow Island Nature Reserve (Ministerial Statement No. 865) 7 June 2011*. Perth, Western Australia.

Government of Western Australia, Minister for the Environment; Heritage. Albert P. Jacob JP MLA. 2014. *Statement that a Proposal may be implemented (pursuant to the provisions of the Environmental Protection Act 1986) (Ministerial Statement No. 965),* Perth, Western Australia.

National Health and Medical Research Council. 2004. *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes.* 7th ed. National Health and Medical Research Council, Canberra, Australian Capital Territory.

Appendix 1 Compliance Reporting Table

Section No.	Actions	Timing
2.1	Known active warrens occupied by Boodies are to be trapped by DPaW (if animals are required for translocation) or Chevron Australia within one week prior to clearing, so as to remove individuals that occupy the warren and relocate them elsewhere (under licence) as agreed between Chevron Australia and the DPaW.	Construction and Operations
2.1	Contractors will advise Chevron Australia of the clearing schedule prior to any trapping events; Chevron Australia will in turn advise DPaW.	Construction and Operations
2.1	Trapping will continue until it is reasonable to consider that no Boodies reside within the warren (based on trap success and obvious activity such as tracks) or further captures from occupants of the warren are unlikely.	Construction and Operations
2.1	Cessation of trapping will occur after consultation with the DPaW.	Construction and Operations
2.1	The entrances of warrens deemed unoccupied will be collapsed or otherwise physically blocked to prevent re-entry.	Construction and Operations
2.1	Targeted searches for fauna in shelters such as wood, nests, and/or termite mounds, will be undertaken immediately prior to clearing operations by Chevron Australia. Animals caught during these searches will be relocated, or will be used by DPaW to support their translocation requirements. During these searches, termite mounds will be disturbed/broken up, and microhabitat/shelters will be broken up or removed to the degree practicable, to initiate egress of fauna living within them and to reduce the available habitat within the site to be cleared.	Construction
2.1	Mechanical clearing will progress in a systematic manner, slowly progressing so as not to confuse or trap evacuating fauna. Clearing will (where reasonably practicable) progress to an undisturbed area that will not be impacted by roads and construction facilities.	Construction
2.1	Double handling of vegetation stockpiles and windrows will be avoided, where reasonably practicable.	Construction
Table 2-1	All worksite personnel and visitors are to be inducted regarding proper response to wildlife encounters (including physical interaction with fauna, littering, feeding, approaching and unexpected fauna encounters). Timing: During inductions	All Phases
Table 2-1	Targeted foraging and spotlighting by fauna handlers will be undertaken in areas to be cleared or during clearing for species with vouchering or translocation requirements. Timing: Within 5 days prior to clearing commencing or during clearing operations, as required	Construction
Table 2-1	Fauna will be flushed opportunistically immediately prior to and during clearing of vegetation.	Construction
Table 2-1	Inspections of cleared areas will be made immediately after clearing, and fauna handlers will be called in if displaced or injured animals are found.	Construction
Table 2-1	Any displaced or orphaned animals should be assessed for injury by a fauna handler, and considered for euthanasia, vouchering, or relocation. Timing: Immediately following clearing	Construction

Section No.	Actions	Timing
Table 2-1	Where practicable and safe to do so clearing is to take place in a manner such that 'habitat islands' (refugia that fauna can hide within) are not left within the area of disturbance. This would allow fauna within the disturbed area to move out of the area of their own accord. Timing: During clearing	Construction
Table 2-1	For sites that are cleared in progressive stages, fauna searches should be undertaken at each stage of clearance. Timing: During clearing	Construction
Table 2-1	Clearing via burning shall be conducted in accordance with the Fire Management Plan and the Prescribed Fire Plan. Timing: During clearing	Construction
Table 2-1	Vegetation that has been stockpiled for burning is to be checked for fauna and attempts should be made to flush any fauna present prior to ignition of the stockpile. Where windrows are burnt, they will be burnt slowly and into the wind. This will provide maximum opportunity for fauna that have sought refuge in the windrows to escape before the fire front reaches them. Timing: Prior to stockpile ignition	Construction
2.2.1	Fauna exclusion methods will be considered on a case-by-case basis for excavations deeper than 500 mm or those deemed likely to cause potential entrapment for fauna.	Construction
2.2.1	Where excavations are to be left open for longer than 24 hours without activity, a fauna exclusion barrier will be placed to enclose the perimeter of the excavation if fauna ramps, mats, ladders, or other adequate egress for fauna is not practicable.	Construction
2.2.1	Management measures to reduce fauna access and entrapment to open water and mud will include, but are not limited to: • fauna exclusion fencing • fauna exit ramps or fauna ladders • regular inspections of open drains and stormwater ponds at the Gas Treatment Plant site • lids on tanks where design permits (can be solid or mesh with appropriate mesh sizing for ease of handling) • sides will be sloped to allow fauna to egress where practicable.	All Phases
2.2.1.1	Deep excavations associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline, located within 300 m of turtle nesting beaches that will be open during the turtle nesting and hatchling season, and that are accessible to turtles, are to be barricaded using suitable materials considered appropriate for the turtle species likely to interact with the excavations and appropriate for the site conditions. These barricades are to be placed such that they are effective but do not unnecessarily diminish turtle access to nesting areas.	Construction
2.2.1.2	All bores, which include production, exploration and purpose-drilled monitoring bores, are to be sealed or capped appropriately to prevent ingress of fauna. Bores requiring temporary removal of headwork are to be sealed with a concrete plug that contains a metal component, so as to facilitate relocation with a metal detector. The plug will be buried if access to the bore is not required again.	All Phases

Section No.	Actions	Timing
2.2.2.2	Fauna exit ramps can include, but are not limited to a single- or double-sided angled feature, fabricated from wood, metal, plastic, or excavated earth materials. In normal circumstances and where any dimensional or access limitations are present within trenches, these would be placed on one side of the trench where there is potential for fauna entrapment. The interval spacing, dimension, and location of these features will be appropriate to the trench design and its potential for fauna entrapment.	Construction
2.2.2.2	Where exit ramps are not feasible, other mitigation techniques must be considered; these can include, but are not limited to: • fauna exclusion fences • fauna ladders and scramble nets • tightly fitting foam plugs (to cap excavations).	Construction
Table 2-2	The walls and floors of all excavations are to be inspected for fauna before lowering of pipes or cables and prior to backfilling. Timing: No more than 2 hours prior to activity	Construction
Table 2-2	All major open excavations >500 mm deep are to be inspected daily for trapped fauna, unless agreed otherwise with DPaW. Depending on the number and frequency of vertebrate fauna observed in the excavations, and the number and frequency of vertebrate fauna requiring retrieval from the excavations, inspection frequency may be reduced (in consultation with DPaW). Timing: Twice daily unless agreed otherwise with DPaW. Inspections are to be undertaken as follows: • No later than three hours after sunrise and again in the afternoon, no earlier than four hours before sunset • During the day as required.	Construction
Table 2-2	Structures placed inside open excavations to enable fauna to shelter or escape, such as exit ramps and ladders, will be inspected for fauna sheltering on or under the structures. Depending on the number and frequency of vertebrate fauna observed in the excavations, and the number and frequency of vertebrate fauna requiring retrieval from the excavations, inspection frequency may be reduced (in consultation with DPaW). Timing: Daily and immediately prior to removal of structures unless agreed otherwise with DPaW	Construction
Table 2-2	Foam or other appropriate plugs used to block excavations will be inspected for small gaps or holes (that may be accessible to fauna) while the plugs are being used. Timing: Daily	Construction
Table 2-2	Open excavations containing water, mud, or other liquids/slurries (e.g. drilling muds/fluids) will be inspected for trapped fauna. Timing: At least twice daily. The frequency of inspections may be increased on a case–by-case basis.	Construction
2.3.1	When laying and installing production, MEG, and utility pipelines (, no more than 2000 m of continuous single pipeline trench will be open at the same time and trenches will be closed as soon as practicable to reduce the amount of time they are open.	Construction
2.3.3	Temporary fencing or similar measures will, where practicable, be used for deep trenches ≥1.5 m to reduce the entrapment of larger fauna on Barrow Island.	Construction
2.3.3	The ends of the trench fencing shall be closed each evening at the cessation of work to prevent fauna entering the trench.	Construction

Section No.	Actions	Timing
2.3.4	Permanent fauna exclusion fences are to be (typically) >1.2 m high, and the lower section (typically 800 mm) of fence should incorporate a smooth unscaleable surface buried or anchored at the base of the fence where possible (depending on site conditions) to prevent fauna burrowing through the fence. Where permanent fencing is buried below ground, this should, where practicable and where site conditions permit, incorporate a 'skirt' i.e. approximately 90° return away from the fence to prevent fauna burrowing down and beneath the fence. Materials for permanent fencing should be suitable to the fauna species that are likely to interact with the site and should be appropriate to site conditions.	Construction
2.3.5	Depending on the structure of the trench, fauna handling teams will generally consist of a minimum of two people, with one person on each side of the trench to ensure inspection of the entire surface of the trench, and to allow immobilisation of animals that may be difficult to catch. Inspections will be undertaken only if the inspection does not compromise the health and safety of personnel.	Construction
2.3.5	Fauna handlers or fauna handling teams will carry with them all the tools and equipment required for safely capturing, handling, identifying, and recording fauna as they walk and inspect the trench.	Construction
Table 2-3	Open trench lengths are not to exceed a length capable of being inspected by staff and cleared by a fauna handling team within the required time limits. With the exception of the umbilical trench, no more than 2000 m of continuous single pipeline trench will be open at the same time.	Construction
Table 2-3	Fauna handlers or appropriately inducted and/or trained fauna observers are to inspect and clear open trenches daily: • No later than three hours after sunrise • No earlier than four hours before sunset • During the day, where practicable • Nocturnally, if required for further studies undertaken at night. Timing: Twice daily when trenches remain open	Construction
Table 2-3	Fauna shelters are to be placed in open trenches at the end of each shift or on days when there is no work taking place. Shelter structures are to be placed at regular intervals as agreed with Chevron Australia. Timing: At all times when trenches remain open	Construction
Table 2-3	Open trenches are to be inspected for fauna prior to lowering in of pipes, pipeline bedding/padding, and backfilling activities. Timing: No more than 2 hours prior to activity	Construction
Table 2-3	Pipes are to be inspected for vertebrate fauna that may be sheltering inside, prior to fit-up for welding and lowering-in of the pipe.	Construction
Table 2-3	Fauna present in pipes are to be removed by fauna handlers, or should be allowed to escape of their own accord.	Construction
Table 2-3	Welded pipe strings are to have end caps fitted to prevent fauna entering the pipe strings.	Construction
Table 2-3	Personnel are not to enter pipes or pipe strings to remove fauna.	Construction
2.3.6	Where management measures for specific excavation features are impracticable, the management measures and exemptions listed in Table 2-4 will be followed for these features. These measures will be implemented through consultation and agreement between Barrow Island staff of the DPaW, Chevron Australia, and the EPCM contractor.	Construction

Section No.	Actions	Timing
2.3.7.1	Chevron Australia will consider undertaking studies to investigate nocturnal vertebrate fauna peak activity entrapment levels within the main feed gas pipeline trench on Barrow Island.	Construction
2.3.7.2	Chevron Australia will consider, in consultation with DPaW, undertaking studies to investigate the loss of body condition, and survivorship of vertebrate fauna that become entrapped in trenches over consecutive nights.	Construction
2.3.8	Requirements for contingency management and actions to address specific adverse outcomes such as high predation events or increased fauna mortality due to entrapment, will be developed on a case-by-case basis in consultation with DPaW.	Construction
Table 2-5	If predation remains consistent, different types of shelters are to be considered for trial. Shelters are to be placed at key locations in the trench at the end of each day, and inspected and removed if required. Timing: Ongoing during construction	Construction
Table 2-5	If fauna mortality is observed to be occurring due to high temperatures, additional management measures will be implemented to reduce fauna mortality, such as additional shelters or fauna escape/refuge structures within trenches or excavations, as required. Timing: Ongoing during construction	Construction
Table 2-5	If fauna mortality attributed to heat exhaustion increases dramatically or is considered excessive, trenches will be cleared by fauna handlers within two hours after sunrise and during the day, as required. Timing: Ongoing during construction	Construction
Table 2-5	If fauna mortality is observed to be occurring due to significant rainfall from cyclones or tropical low pressure systems, additional management measures will be implemented to reduce fauna mortality, such as additional shelters or fauna escape/refuge structures within trenches or excavations, as required. Timing: Ongoing during construction	Construction
Table 2-5	Following heavy rainfall, flooded trenches or major excavations are to be inspected and assessed for water pooling as soon as practicable (depending on weather conditions and safe access). A pump will be available to commence dewatering of trenches or major excavations containing pooled water; these will be cleared of any fauna as soon as practicable. Timing: Whilst standing water remains in trench	Construction
3.2	Fauna handlers will be present on site during the construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline to ensure that the requirements of this Procedure, and animal welfare requirements, are met.	All Phases
3.2	At least one fauna handler per operational fauna handling team will have experience and/or training in all of the following: • attending to accidents involving wildlife • inspecting trenches for fauna • handling and capturing fauna (including venomous snakes) • identifying fauna • assessing injured fauna for release, euthanasia or rehabilitation • providing care of, or euthanising sick, injured, or abandoned, animals • senior first aid (for human safety/health considerations).	All Phases

Section No.	Actions	Timing
3.2	When it is considered necessary, persons caring for injured wildlife on Barrow Island are to consult with DPaW or veterinary practitioners and/or suitably qualified animal carers, as required.	All Phases
3.2	Chevron Australia shall notify DPaW as soon as practicable of any animals that may need to be kept in captivity for short-term welfare benefits prior to release on the same day, or shortly thereafter.	All Phases
3.3.1	All mortalities involving fauna are to be reported to the relevant on-site supervisor and fauna handler as soon as practicable.	All Phases
3.3.2	Based on level of distress or injury of an injured or distressed animal, a fauna handler will undertake an assessment to determine the appropriate treatment.	All Phases
3.3.3	A lockable and ventilated container with clearly visible safety warnings will be used for the transportation of injured or vouchered venomous snakes.	All Phases
3.4	Larger animals will be transported in a large dark-coloured cotton bag or blanket, or similar.	All Phases
3.4	Animals will be secured by a method that appropriately considers, size, condition, and behaviour of the animal prior to transportation.	All Phases
3.4	Advice on these matters will be sought from appropriate Chevron Australia environmental personnel who can then consult with DPaW, as required.	All Phases
3.5	Only under exceptional circumstances and with the written approval of DPaW will animals be removed from Barrow Island for any purpose other than wildlife conservation, vouchering, or rehabilitation requirements. Animals that are removed from Barrow Island will not be allowed to return due to the threat of disease importation.	All Phases
3.6	If fauna need to be relocated from the worksite to other areas on Barrow Island, this relocation is to be conducted by fauna handlers.	All Phases
3.6	Fauna removed from a site for the purposes of recovery or treatment following clearing, are to be returned to an area near the site from which they were removed, at a time of day that does not compromise their repatriation (e.g. before 8 am or after 5 pm).	All Phases
3.7.1	Animal euthanasia will be undertaken in accordance with the Australian Code of Practice for the Care and Use of Animals for Scientific Purposes (National Health and Medical Research Council [NHMRC] 2004) and Condition 5.1 (l) of the Australian Commonwealth Government National Code of Practice for the Humane Shooting of Kangaroos and Wallabies for Commercial Purposes (Commonwealth Government of Australia 2008).	All Phases
3.7.4	Field equipment for performing euthanasia will be readily accessible by fauna handling teams and will generally consist of simple tools for performing one of the physical euthanasia techniques. These tools will include: • customised heavy steel bar or other appropriate heavy, blunt object (for larger fauna) • small steel rod (for smaller fauna) • fauna handling equipment including hoop bags, jiggers, calico bags, hessian bags • appropriate PPE.	All Phases

Section No.	Actions	Timing
3.8.1	Voucher specimens are only to be collected by personnel with a valid 'Licence to Take Fauna for Educational or Public Purposes' or a 'Licence to Take Fauna for Scientific Purposes' under Regulations 15 and 17 respectively, of the Wildlife Conservation Regulations 1970 (WA). Collections must also occur under a 'Licence to Take Fauna from a Nature Reserve' (under the CALM Act [WA]).	Construction and Operations
3.8.1	Only experienced personnel who are familiar with the ecology of the fauna will determine which animals are suitable for voucher retention under the direction of the WAM or DPaW, which have elicited a requirement to obtain voucher specimens.	Construction and Operations
3.8.1	Voucher specimens will be lodged in appropriate public collections. For most animals this will be the WAM.	Construction and Operations
3.8.1	Vouchers will be collected and submitted for: • animals that have not been previously recorded on Barrow Island • animals whose taxonomy and genetics is poorly understood.	Construction and Operations
3.8.1	To avoid over collection of taxa and to provide the current status of all taxa vouchered, regular communication will be undertaken between Chevron Australia in Perth and Chevron Australia, EPCM Environment, and DPaW Barrow Island staff. Chevron Australia in Perth will further communicate with the WAM regarding any prospective collected specimens.	Construction and Operations
3.8.2	The Department of Terrestrial Vertebrates at the Western Australian Museum (Ph: 08 9212 3700) must be consulted prior to the collection of any voucher specimens that are to be transported live to the Museum.	Construction and Operations
3.8.2	Transfers are to occur only where an animal is to be subsequently euthanised for a voucher specimen.	Construction and Operations
3.8.3	Voucher specimens are to be euthanised as soon as is practicable by suitably experienced personnel. Voucher vertebrate specimens are to be anaesthetised first, and then euthanised by appropriate methods to limit any damage to the specimen.	Construction and Operations
3.8.3	For marine turtle or marine mammal mortalities that occur, appropriately experienced personnel and DPaW must be notified to allow for the collection of biopsy tissue samples, if required.	Construction and Operations
3.9	All deceased pouched fauna are to be checked for pouch young prior to being left in the bush. If pouch young are present and fully furred, they are to be removed and decisions to foster care them are to be made in consultation with DPaW. If foster care is inappropriate, or if pouch young are present and unfurred, they are to be euthanised using appropriate procedures.	All Phases
3.9	The carcasses of the following will be disposed of in an alternative manner (burial, off-Island removal, incineration) if they are not retained as voucher specimens: • animals that are not indigenous to Barrow Island • animals displaying symptoms of disease.	All Phases

Section No.	Actions	Timing
3.10	Sightings of injured, entangled, stranded, or dead marine mammals and reptiles on the beaches, or in the water in the vicinity (approximately 500 m) of the terrestrial facilities listed in Condition 6.3 of Statement No. 800 and Statement No. 769 and the marine facilities listed in Condition 14.3 (i), (ii), (iii) and (vi) of Statement No. 800, Condition 12.3 of Statement No. 769 (marine component of the shore crossing), are to be reported by personnel to a Chevron Australia representative on Barrow Island, who will then contact the DPaW Barrow Island Field Staff or the DPaW Regional Office so that appropriate action can be taken.	Construction and Operations
3.10	If a virus, pathogen, or other disease agent is suspected in an animal population on Barrow Island, Chevron Australia will consult with DPaW regarding the appropriate management response within 48 hours.	Construction and Operations
4.1	Detailed records will be kept of dead, injured, captured, entrapped, stranded, or entangled fauna..	Construction and Operations
4.1	Data collected by Chevron Australia will be made available to DPaW as requested under the standard data-sharing arrangements.	Construction and Operations

Appendix D Traffic Management Common User Procedure

Gorgon Gas Development and Jansz Feed Gas Pipeline

Traffic Management Common User Procedure

Document No:	G1-PP-HES-PRC-0010	Revision:	3
Revision Date:	15 April 2014	Copy No:	
IP Security:	Public		

Table of Contents

Terminology, Definitions and Abbreviations

Terms, definitions and abbreviations used in this document are listed below. These align with the terms, definitions and abbreviations defined in Schedule 2 of the Western Australian Gorgon Gas Development and Jansz Feed Gas Pipeline Ministerial Implementation Statements No. 800 and No. 769 respectively (Statements No. 800 and 769) and the Commonwealth Gorgon Gas Development and Jansz Feed Gas Pipeline Ministerial Approvals (EPBC Reference: 2003/1294, 2008/4178 and 2005/2184).

ABU	Australasia Business Unit
Additional Support Area	Gorgon Gas Development Additional Construction, Laydown, and Operations Support Area
ASBU	Australasia Strategic Business Unit
Construction	Construction includes any Proposal-related (or action-related) construction and commissioning activities within the Terrestrial and Marine Disturbance Footprints, excluding investigatory works such as, but not limited to, geotechnical, geophysical, biological and cultural heritage surveys, baseline monitoring surveys and technology trials.
CUP	Common User Procedure
DotE	Commonwealth Department of the Environment (formerly SEWPaC)
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPBC Reference: 2003/1294	Commonwealth Ministerial Approval (for the Gorgon Gas Development) as amended or replaced from time to time.
EPBC Reference: 2005/2184	Commonwealth Ministerial Approval (for the Jansz Feed Gas Pipeline) as amended or replaced from time to time.
EPBC Reference: 2008/4178	Commonwealth Ministerial Approval (for the Revised Gorgon Gas Development) as amended or replaced from time to time.
EPCM	Engineering, Procurement and Construction Management
Gorgon Gas Development	The Gorgon Gas Development as approved under Statement Nos. 800 and 965, and EPBC References: 2003/1294 and 2008/4178 (as varied by the Commonwealth Environment Minister), as amended or replaced from time to time.
IVMS	In Vehicle Monitoring System
Jansz Feed Gas Pipeline	The Jansz Feed Gas Pipeline as approved in Statement No. 769 and EPBC Reference: 2005/2184 as amended or replaced from time to time.
km/h	Kilometres per hour

NES	[Matters of] National Environmental Significance, as defined in Part 3, Division 1 of the EPBC Act (Cth).
Practicable	Practicable means reasonably practicable having regard to, among other things, local conditions and circumstances (including costs) and to the current state of technical knowledge. For the purposes of the conditions of EPBC Reference: 2003/1294 and 2008/4178 which include the term 'practicable', when considering whether the plan meets the requirements of these conditions, the Commonwealth Minister will determine what is 'practicable' having regard to local conditions and circumstances including but not limited to personnel safety, weather or geographical conditions, costs, environmental benefit and the current state of scientific and technical knowledge.
SEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now DotE)
Statement No. 748	Western Australian Ministerial Implementation Statement No. 748 (for the Gorgon Gas Development) as amended or replaced from time to time [superseded by Statement No. 800].
Statement No. 769	Western Australian Ministerial Implementation Statement No. 769 (for the Jansz Feed Gas Pipeline) as amended from time to time.
Statement No. 800	Western Australian Ministerial Implementation Statement No.800, issued for the Revised and Expanded Gas Development, as amended from time to time. Statement No. 800 supersedes the Gorgon Gas Development as originally approved by Statement No 748. The conditions of Statement No.800 also apply to the Additional Support Area under Statement 965.
Statement No. 865	Western Australian Ministerial Implementation Statement No. 865 (for the Gorgon Gas Development) as amended from time to time.
Statement No. 965	Western Australian Ministerial Implementation Statement No. 965 (for the Additional Support Area) as amended from time to time. Statement No.965 applies the conditions of Statement 800 to the Additional Support Area."

1.0 Introduction

1.1 Environmental Approvals Background

The initial Gorgon Gas Development was approved by the Western Australian State Minister for the Environment on 6 September 2007 by way of Ministerial Implementation Statement No. 748 (Statement No. 748) and the Commonwealth Minister for the Environment and Water Resources on 3 October 2007 (EPBC Reference: 2003/1294).

The Revised and Expanded Gorgon Gas Development was approved by the Western Australian State Minister for the Environment on 10 August 2009 by way of Ministerial Implementation Statement No. 800 (Statement No. 800). Statement No. 800 also superseded Statement No. 748 as the approval for the initial Gorgon Gas Development. Statement No. 800 therefore provides approval for both the initial Gorgon Gas Development and the Revised and Expanded Gorgon Gas Development, which together are known as the Gorgon Gas Development. Amendments to Statement No. 800 Conditions 18, 20 and 21 under section 46 of the EP Act were approved by the Western Australian State Minister for the Environment on 7 June 2011 by way of Ministerial Implementation Statement No. 865 (Statement No. 865). Therefore, implementation of the Gorgon Gas Development will be in accordance with Statement No. 800 (as amended by Statement No. 865).

Use of an additional 32 ha of uncleared land for the Gorgon Gas Development Additional Construction, Laydown, and Operations Support Area (Additional Support Area) was approved by the Western Australian State Minister for Environment on 2 April 2014 by way of Ministerial Implementation Statement No. 965 and by Variation issued by the Commonwealth Minister for the Environment. Statement No.965 applies the conditions of Statement No.800 to the Additional Support Area and requires all implementation, management, monitoring, compliance assessment and reporting, environmental performance reporting, protocol setting and record keeping requirements applicable to the Additional Support Area under Statement No.800 to be carried out on a joint basis with the Gorgon Gas Development.

The Jansz Feed Gas Pipeline was approved by the Western Australian State Minister for the Environment on 28 May 2008 by way of Ministerial Implementation Statement No. 769 (Statement No. 769) and the Commonwealth Minister for the Environment and Water Resources on 22 March 2006 (EPBC Reference: 2005/2184).

This Procedure covers the Gorgon Gas Development as approved under Statement No. 800, and as approved by EPBC Reference: 2003/1294 and EPBC Reference: 2008/4178, and including the Additional Support Area as approved by Statement No. 965 and as varied by the Commonwealth Minister for the Environment. In addition, this Procedure covers the Jansz Feed Gas Pipeline as approved by Statement No. 769 and EPBC Reference: 2005/2184.

1.2 Purpose of this Procedure

1.2.1 Legislative Requirements

This Procedure is a requirement of Western Australian and Commonwealth Ministerial approval conditions.

1.2.1.1 State and Commonwealth Ministerial Conditions

This Procedure is required under State Ministerial Condition 7.6 (iii) of Statement No. 800 and Statement No. 769, and Commonwealth Ministerial Condition 6.6(iii) of EPBC Reference: 2003/1294 and 2008/4178, which is quoted below:

> *"Procedures to avoid secondary impacts to fauna as a consequence of risks such as animals being trapped in construction trenches or subject to vehicle strike."*

This Common User Procedure (CUP) has been prepared to support the Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010) required under

Condition 7 of Statement No. 800 and Statement No. 769, and Condition 6 of EPBC Reference: 2003/1294 and 2008/4178.

1.3 Scope

This Procedure applies to all vehicle and equipment movements undertaken on Barrow Island for the Gorgon Gas Development and Jansz Feed Gas Pipeline.

Any matter specified in this Procedure is relevant to the Gorgon Gas Development or Jansz Feed Gas Pipeline only if that matter relates to the specific activities or facilities associated with that particular development on Barrow Island. This Procedure does not apply to vehicle and equipment movements undertaken on Barrow Island that relate to WA Oil Operations. This Procedure does not apply to vehicle and equipment movements undertaken on the mainland.

For the purpose of Statement 800, this Procedure meets the State Ministerial conditions set out Section 1.2 above. For the purpose of EPBC Act approvals, this Procedure, which meets the conditions of EPBC Reference: 2003/1294 and 2008/4178, shall be read and interpreted as only requiring implementation under EPBC Reference: 2003/1294 and 2008/4178 for managing the impacts of the Gorgon Gas Development on, or protecting the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) matter listed in Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012). The implementation of matters required only to meet the requirements of Statement No. 800 (and Statement No. 769) are not the subject of the EPBC Reference: 2003/1294 and 2008/4178.

Statement No.965 requires the implementation of this plan, in respect of the Additional Support Area and the Gorgon Gas Development, to be carried out on a joint basis.

1.4 Objective

The objective of this Procedure is to:

- limit, in relation to vehicle and equipment movement undertaken on Barrow Island, injury or death of fauna from vehicle strike.

1.5 Relevant Documents

The following Chevron Australia documents relate to this Procedure:

- Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010)
- Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012)
- Terrestrial and Subterranean Environment Monitoring Program (Chevron Australia 2013)
- Fire Management Plan (Chevron Australia 2009)
- Barrow Island Weed Hygiene Common User Procedure (Chevron Australia 2011)
- Vegetation Clearing and Audit Common User Procedure (Chevron Australia 2012a)
- Fauna Handling and Management Common User Procedure (Chevron Australia 2013a)
- Post-Construction Rehabilitation Plan (Chevron Australia 2009a).

2.0 Traffic Management

The following traffic management measures will assist in reducing impacts to fauna on Barrow Island through vehicle strikes:

- Barrow Island traffic awareness through a site induction process.
- Adherence to speed limits and access restrictions on Barrow Island.

These measures are described in more detail in the sections below. These sections include measures required in respect of the matters of National Environmental Significance (NES) listed in the Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012), as required by Condition 3.2.1 of EPBC Reference: 2003/1294 and 2008/4178.

2.1 Driver Requirements

Personnel can only drive on Barrow Island if they have:

- a current and valid Western Australian driver's licence or equivalent
- completed a Chevron Australia-approved driving course
- completed the Gorgon Gas Development and Jansz Feed Gas Pipeline Project Induction (two-day induction)
- completed Barrow Island on-site driver awareness training.

Records of personnel who are approved to drive on Barrow Island will be maintained.

2.2 Vehicle Speed

The speed of light vehicles on Barrow Island is monitored and managed through the In Vehicle Monitoring System (IVMS).

It is recognised that impacts to fauna by vehicle strike are most likely to occur between dusk and dawn. The following maximum speed limits apply to vehicular travel on Barrow Island:

- 60 km/h on roads dawn until dusk*
- 40 km/h on roads dusk until dawn*
- 40 km/h on designated narrow roads and tracks
- 40 km/h in the Gas Treatment Plant site
- 20 km/h in the Construction Village at all times.

* IVMS environmental night driving speed change times are adjusted throughout the year in response to changing dawn and dusk times. IVMS speed parameters are adjusted accordingly, and compliance with speed limits by light vehicles is tracked through IVMS.

Speed is to be reduced when driving conditions are degraded or where the clear vision of an operator of any vehicle or equipment is compromised, such as in excessively dusty or wet weather conditions.

2.3 Additional Management Measures

The following conditions apply to personnel driving on roads or facilities maintained exclusively, or in part, for the purpose of the construction and/or operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline:

- Vehicles shall drive on existing roads. Off-road access is prohibited.
- Access outside the camp facilities and work sites shall be strictly controlled.
- When safe to do so, drivers shall give way to fauna within construction areas and on roads.
- Prior to any ground vegetation disturbance, personnel shall obtain an approved Ground and Vegetation Disturbance certificate.
- Remove carcasses from roads as soon as practicable to minimise the congregation of predators on roads. The Fauna Handling and Management Common User Procedure (Chevron Australia 2013a) details the requirements for handling of fauna injured or killed as a result of a vehicle strike.
- Drivers to check for fauna sheltering under a parked vehicle immediately prior to driving the vehicle. The Fauna Handling and Management Common User Procedure (Chevron Australia 2013a) details the requirements for interactions with vertebrate fauna.

3.0 Auditing and Reporting

3.1 Auditing

3.1.1 Internal Auditing

Chevron Australia has prepared the internal ABU Compliance Assurance Process (Chevron Australia 2009b) to manage compliance, and which it internally requires its employees, contractors, etc. to comply with. This Process will also be applied to assess compliance of the Gorgon Gas Development and Jansz Feed Gas Pipeline against the requirements of Statement No. 800, Statement No. 769, and EPBC Reference: 2003/1294 and 2008/4178 where this is appropriate and reasonably practicable. In accordance with Condition 2-1 of Statement No. 965, assessment of compliance will be undertaken on a joint basis.

An internal Audit Schedule has been developed and will be maintained for the Gorgon Gas Development and Jansz Feed Gas Pipeline (with input from the Engineering, Procurement and Construction Management [EPCM] Contractors) that includes audits of the Development's environmental performance and compliance with the Ministerial Conditions. A record of all internal audits and the audit outcomes is maintained. Actions arising from internal audits are tracked until their close-out.

Under EPBC Reference: 2003/1294 and 2008/4178, Condition 24 also requires that the person taking the action must maintain accurate records of activities associated with or relevant to the Conditions of approval and make them available on request by Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (now DotE). Such documents may be subject to audit by DotE and used to verify compliance with the Conditions of approval.

3.1.2 External Auditing

Audits and/or inspections undertaken by external regulators will be facilitated via the Gorgon Gas Development and Jansz Feed Gas Pipeline's Regulatory Approvals and Compliance Team. The findings of external regulatory audits will be recorded and actions and/or recommendations will be addressed and tracked. Chevron Australia may also undertake independent external auditing during the life of the Gorgon Gas Development and Jansz Feed Gas Pipeline Project.

Under EPBC Reference: 2003/1294 and 2008/4178, Condition 23 also requires that upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.

3.2 Reporting

3.2.1 Compliance Reporting

Condition 4 of Statement No. 800 and Condition 2 of EPBC Reference: 2003/1294 and 2008/4178 requires Chevron Australia to submit a Compliance Assessment Report annually to address the previous 12-month period. Condition 4 of Statement No. 769 similarly requires that Chevron Australia submit an annual Audit Compliance Report for the previous 12-month period. A compliance reporting table is provided in Appendix 1 to assist with auditing for compliance with this Procedure for Statement No. 800, EPBC Reference: 2003/1294 and 2008/4178 and Statement No. 769. In accordance with Conditions 2-1 and 2-2 of Statement No.965, compliance assessment and compliance reporting will be carried out on a joint basis with Statement No.800. This Plan is not required under EPBC Reference: 2005/2184; therefore, compliance reporting is not required to meet this condition.

3.2.2 Environmental Performance Reporting

Condition 5.1 of Statement No. 800 and Statement No. 769, and Condition 4 of EPBC Reference: 2003/1294 and 2008/4178 require that Chevron Australia submits an annual Environmental Performance Report to the Western Australian Minister for the Environment and to the Commonwealth DotE respectively, for the previous 12-month period.

In addition, under Condition 5.3 of Statement No. 800 and Statement No. 769, and Condition 4.2 for EPBC Reference: 2003/1294 and 2008/4178, every five years from the date of the first annual Report, Chevron Australia shall submit to the Western Australian Minister for the Environment an Environmental Performance Report covering the previous five-year period. In accordance with Conditions 2-1 and 2-2 of Statement No.965, performance reporting will be carried out on a joint basis with Statement No.800.

Specific details on the content of the Environmental Performance Report are defined in Condition 5.2 and Schedule 3 of Statement No. 800, Condition 5.2 of Statement No. 769, and Schedule 3 of EPBC Reference: 2003/1294 and 2008/4178.

The information in the Environmental Performance Report will also partly meet the requirements of Condition 3.7 of EPBC Reference: 2003/1294 and 2008/4178.

3.2.3 Routine Reporting

The Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010) documents the routine reporting and documentation requirements.

Records of fauna injury or mortality will be kept on an internal Chevron Australia database; further information on record keeping is provided in the Fauna Handling and Management Common User Procedure (Chevron Australia 2013a). Understanding the impacts of fauna casualties on the local (vertebrate fauna) population will be monitored as part of the mammal monitoring program under the Terrestrial and Subterranean Environment Monitoring Program (Chevron Australia 2013). Lessons learnt that may reduce further impacts to fauna by traffic can feed back into this Traffic Management Common User Procedure as required, and as part of the adaptive framework of the Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010).

For the purpose of assessing vehicle strike data, the total distance travelled by light vehicles during the construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline will be routinely reported internally.

3.2.4 Incident Reporting

Chevron Australia has prepared the ASBU Emergency Management Process (Chevron Australia 2007a) and Incident Investigation and Reporting Process (Chevron Australia 2008), which it internally requires its employees and contractors to follow in the event of environmental incidents. These processes will be internally applied to environmental incidents identified in this Procedure, where this is appropriate and reasonably practicable.

4.0 Review of this Procedure

Chevron Australia is committed to conducting activities in an environmentally responsible manner and aims to implement best practice environmental management as part of a program of continuous improvement. This commitment to continuous improvement means Chevron Australia will review this Procedure every five years and more often as required (e.g. in response to new information).

Reviews will address matters such as the overall design and effectiveness of the Procedure, progress in environmental performance, changes in environmental risks, changes in business conditions, and any relevant emerging environmental issues.

If the Procedure no longer meets the aims, objectives or requirements of the Procedure, if works are not appropriately covered by the Procedure, or measures are identified to improve the Procedure, Chevron Australia may submit an amendment or addendum to the Procedure to the Minister for approval under Condition 36 of Statement No. 800, Condition 21 of Statement No. 769 and Condition 2-3 of Statement No. 965.

If Chevron Australia wishes to carry out an activity otherwise than in accordance with the Procedure, Chevron will update the Procedure and submit it for approval by the Minister in accordance with Condition 25 of EPBC Reference: 2003/1294 and 2008/4178, and Condition 6 of EPBC Reference: 2005/2184. The Commonwealth Minister may also direct Chevron Australia to revise the Procedure under Condition 26 of EPBC Reference: 2003/1294 and 2008/4178.

5.0 References

Chevron Australia. 2007a. *ASBU Emergency Management Process.* Chevron Australia, Perth, Western Australia. (OE-11.01.01)

Chevron Australia. 2008. *Incident Investigation and Reporting.* Chevron Australia, Perth, Western Australia. (OE-09.00.01)

Chevron Australia. 2009. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Fire Management Plan*. Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000272)

Chevron Australia. 2009a. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Post-Construction Rehabilitation Management Plan.* Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000303)

Chevron Australia. 2009b. *ABU – Compliance Assurance Process*. Chevron Australia, Perth, Western Australia. (OE-12.01.01)

Chevron Australia. 2010. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Environment Protection Plan.* Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000294)

Chevron Australia. 2011. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Barrow Island Weed Hygiene Common User Procedure.* Chevron Australia, Perth, Western Australia. (G1-PP-HES-PRC-0016)

Chevron Australia. 2012. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Baseline State and Environmental Impact Report.* Chevron Australia, Perth, Western Australia. (G1-TE-H-0000-REPX027)

Chevron Australia. 2012a. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Vegetation Clearing and Audit Common User Procedure*. Chevron Australia, Perth, Western Australia. (G1-PP-HES-PRC-0012)

Chevron Australia. 2013. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Terrestrial and Subterranean Environment Monitoring Program.* Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000309)

Chevron Australia. 2013a. *Gorgon Gas Development and Jansz Feed Gas Pipeline: Fauna Handling and Management Common User Procedure*. Chevron Australia, Perth, Western Australia. (G1-PP-HES-PRC-0009)

Commonwealth Government of Australia, Assistant Secretary Environmental Assessment Branch, Anne-Marie Delahunt. 2006. *Decision to Approve the taking of an Action – Jansz Feed Gas Pipeline (EPBC Reference: 2005/2184)*, *22 March 2006*. Canberra, Australian Capital Territory.

Commonwealth Government of Australia, Minister for the Environment and Water Resources, Malcolm Turnbull, 2007. *Approval – Gorgon Gas Development (EPBC Reference: 2003/1294), 3 October 2007*. Canberra, Australian Capital Territory.

Commonwealth Government of Australia, Minister for the Environment, Water, Heritage and the Arts, Peter Garrett. 2009. *Approval – Gorgon Gas Development (EPBC Reference: 2008/4178), 26 August 2009*. Canberra, Australian Capital Territory.

Government of Western Australia, Minister for the Environment, David Templeman MLA. 2007. *Statement that a Proposal may be Implemented – Gorgon Gas Development: Barrow Island Nature Reserve (Ministerial Statement No. 748), 6 September 2007.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, David Templeman MLA. 2008. *Statement that a Proposal may be Implemented – Jansz Feed Gas Pipeline: Barrow Island Nature Reserve (Ministerial Statement No. 769), 28 May 2008.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, Youth, Donna Faragher JP MLC. 2009. *Statement that a Proposal may be Implemented – Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve (Ministerial Statement No. 800), 10 August 2009.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, Water, Bill Marmion MLA. 2011. *Statement to Amend Conditions Applying to the Gorgon Gas Development Revised and Expanded Proposal Barrow Island Nature Reserve (Ministerial Statement No. 865) 7 June 2011*. Perth, Western Australia.

Government of Western Australia, Minister for the Environment; Heritage. Albert P. Jacob JP MLA. 2014. *Statement that a Proposal may be implemented (pursuant to the Provisions of the Environmental Protection Act 1986) (Ministerial Statement No. 965),* Perth, Western Australia.

Appendix 1 Compliance Reporting Table

Section No.	Actions	Timing
2.1	Personnel can only drive on Barrow Island if they have: • a current and valid Western Australian driver's licence or equivalent • completed a Chevron Australia-approved driving course • completed the Gorgon Gas Development and Jansz Feed Gas Pipeline Project induction (two-day induction) • completed Barrow Island on-site driver awareness training.	All Phases
2.1	Records of personnel who are approved to drive on Barrow Island will be maintained.	All Phases
2.3	The following conditions apply to personnel driving on roads or facilities maintained exclusively, or in part, for the purpose of the construction and/or operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline: • Vehicles shall drive on existing roads. Off-road access is prohibited. • Access outside the camp facilities and work sites shall be strictly controlled. • When safe to do so, drivers shall give way to fauna within construction areas and on roads. • Prior to any ground vegetation disturbance, personnel shall obtain an approved Ground and Vegetation Disturbance certificate. • Remove carcasses from roads as soon as practicable to minimise the congregation of predators on roads. The Fauna Handling and Management Common User Procedure details the requirements for handling of fauna injured or killed as a result of a vehicle strike. • Drivers to check for fauna sheltering under a parked vehicle immediately prior to driving the vehicle. The Fauna Handling and Management Common User Procedure details the requirements for interactions with vertebrate fauna.	All Phases
3.1.2	The findings of external regulatory audits will be recorded and actions and/or recommendations will be addressed and tracked.	All Phases
3.2.3	Records of fauna injury or mortality will be kept on an internal Chevron Australia database.	All Phases

Appendix E Vegetation Clearing Audit Common User Procedure

Gorgon Gas Development and Jansz Feed Gas Pipeline

Vegetation Clearing and Audit Common User Procedure

Document No:	G1-PP-HES-PRC-0012	Revision:	3
Revision Date:	15 April 2014	Copy No:	
IP Security:	Public		

Table of Contents

List of Figures

Terminology, Definitions and Abbreviations

Terms, definitions and abbreviations used in this document are listed below. These align with the terms, definitions and abbreviations defined in Schedule 2 of the Western Australian Gorgon Gas Development and Jansz Feed Gas Pipeline Ministerial Implementation Statements No. 800 and No. 769 respectively (Statement No. 800 and 769) and the Commonwealth Gorgon Gas Development and Jansz Feed Gas Pipeline Ministerial Approvals (EPBC Reference: 2003/1294, 2008/4178 and 2005/2184).

ABU	Australasian Business Unit
Additional Support Area	Gorgon Gas Development Additional Construction, Laydown, and Operations Support Area
BWI	Barrow Island
Carbon Dioxide (CO_2) Injection System	The mechanical components required to be constructed to enable the injection of reservoir carbon dioxide, including but not limited to compressors, pipelines and wells.
Cleared Areas GIS Dataset	A dataset derived from GIS data that reconciles uncleared areas and cleared areas used for construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline
CO_2	Carbon dioxide
Construction	Construction includes any Proposal-related (or action-related) construction and commissioning activities within the Terrestrial and Marine Disturbance Footprints, excluding investigatory works such as, but not limited to, geotechnical, geophysical, biological and cultural heritage surveys, baseline monitoring surveys and technology trials.
Cth	Commonwealth of Australia
DEC	Former Western Australian Department of Environment and Conservation (now DPaW and/or DER)
DER	Western Australian Department of Environment Regulation (formerly DEC)
DEWHA	Former Commonwealth Department of the Environment, Water, Heritage and the Arts (now DotE)
DotE	Commonwealth Department of the Environment (formerly DEWHA and SEWPaC)
DPaW	Western Australian Department of Parks and Wildlife (formerly DEC)
EP Act	Western Australian *Environmental Protection Act 1986*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

EPBC Reference: 2003/1294	Commonwealth Ministerial Approval (for the Gorgon Gas Development) as amended or replaced from time to time.
EPBC Reference: 2005/2184	Commonwealth Ministerial Approval (for the Jansz Feed Gas Pipeline) as amended or replaced from time to time.
EPBC Reference: 2008/4178	Commonwealth Ministerial Approval (for the Revised Gorgon Gas Development) as amended or replaced from time to time.
EPCM	Engineering, Procurement and Construction Management
ESRI	Environmental Systems Research Institute
GIS	Geographic Information System
GIS Data	A collection of spatial data held in Gorgon Geographic Information System (GIS) datasets.
GJV	Gorgon Joint Venture (or Venturers)
Gorgon Gas Development	The Gorgon Gas Development as approved under Statement Nos. 800 and 965, and EPBC References: 2003/1294 and 2008/4178 (as varied by the Commonwealth Environment Minister), as amended or replaced from time to time.
Gorgon Gas Development Footprint	Consists of the cleared areas and uncleared areas approved to be cleared on Barrow Island used for the construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline.
Ground Truth	To verify the correctness of information by use of on ground techniques such as field inspection and visual appraisal.
ha	Hectare
Jansz Feed Gas Pipeline	The Jansz Feed Gas Pipeline as approved in Statement No. 769 and EPBC Reference: 2005/2184 as amended or replaced from time to time.
LNG	Liquefied Natural Gas
Native	In relation to non-indigenous species, means species that naturally occur in a region.
Native Vegetation	As defined in the EP Act and Regulations, native vegetation is ‘indigenous aquatic or terrestrial vegetation, and includes dead vegetation unless that dead vegetation is of a class declared by regulation to be excluded from this definition but does not include vegetation in a plantation’.
OE	Operational Excellence

Operations (Gorgon Gas Development)	In relation to Statement No. 800 and EPBC Reference: 2003/1294 and 2008/4178, for the respective LNG trains, this is the period from the date on which the Gorgon Joint Venturers issue a notice of acceptance of work under the Engineering, Procurement and Construction Management (EPCM) contract, or equivalent contract entered into in respect of that LNG train of the Gas Treatment Plant; until the date on which the Gorgon Joint Venturers commence decommissioning of that LNG train.
Operations (Jansz Feed Gas Pipeline)	In relation to Statement No. 769, for the pipeline, this is the period from the date on which the Proponent issues a notice of acceptance of work under the Engineering, Procurement and Construction Management (EPCM) contract, or equivalent contract entered into in respect of that pipeline; until the date on which the Proponent commences decommissioning of that pipeline.
PGPA	Policy, Government and Public Affairs
SEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now DotE)
Shape File	Environmental Systems Research Institute (ESRI) proprietary GIS format.
SME	Subject Matter Expert
Statement No. 748	Western Australian Ministerial Implementation Statement No. 748 (for the Gorgon Gas Development) as amended from time to time [superseded by Statement No. 800].
Statement No. 769	Western Australian Ministerial Implementation Statement No. 769 (for the Jansz Feed Gas Pipeline) as amended from time to time.
Statement No. 800	Western Australian Ministerial Implementation Statement No.800, issued for the Revised and Expanded Gas Development, as amended from time to time. Statement No. 800 supersedes the Gorgon Gas Development as originally approved by Statement No 748. The conditions of Statement No.800 also apply to the Additional Support Area under Statement 965.
Statement No. 865	Western Australian Ministerial Implementation Statement No. 865 (for the Gorgon Gas Development) as amended from time to time.
Statement No. 965	Western Australian Ministerial Implementation Statement No. 965 (for the Additional Support Area) as amended from time to time. Statement No.965 applies the conditions of Statement 800 to the Additional Support Area.”

Terrestrial Facilities	In relation to Statement No. 800 and EPBC Reference: 2003/1294 and 2008/4178, the Terrestrial Facilities are the: • Gas Treatment Plant • Carbon Dioxide Injection System • Associated Terrestrial Infrastructure forming part of the Proposal • Areas impacted for seismic data acquisition • Onshore Feed Gas Pipeline System and terrestrial component of the Shore Crossing. Terrestrial Facilities also include those defined in Condition 6.3 of Statement No. 769 (the Onshore Feed Gas pipeline system and the terrestrial component of the Shore Crossing) and Schedule 1 of Statement No. 965 (the Additional Support Area).
WA	Western Australia

1.0 Introduction

1.1 Environmental Approvals Background

The initial Gorgon Gas Development was approved by the Western Australian State Minister for the Environment on 6 September 2007 by way of Ministerial Implementation Statement No. 748 (Statement No. 748) and the Commonwealth Minister for the Environment and Water Resources on 3 October 2007 (EPBC Reference: 2003/1294).

The Revised and Expanded Gorgon Gas Development was approved by the Western Australian State Minister for the Environment on 10 August 2009 by way of Ministerial Implementation Statement No. 800 (Statement No. 800). Statement No. 800 also superseded Statement No. 748 as the approval for the initial Gorgon Gas Development. Statement No. 800 therefore provides approval for both the initial Gorgon Gas Development and the Revised and Expanded Gorgon Gas Development, which together are known as the Gorgon Gas Development. Amendments to Statement No. 800 Conditions 18, 20 and 21 under section 46 of the EP Act were approved by the Western Australian State Minister for the Environment on 7 June 2011 by way of Ministerial Implementation Statement No. 865 (Statement No. 865). Therefore, implementation of the Gorgon Gas Development will be in accordance with Statement No. 800 (as amended by Statement No. 865).

Use of an additional 32 ha of uncleared land for the Gorgon Gas Development Additional Construction, Laydown, and Operations Support Area (Additional Support Area) was approved by the Western Australian State Minister for Environment on 2 April 2014 by way of Ministerial Implementation Statement No. 965, and by Variation issued by the Commonwealth Minister for the Environment. Statement No.965 applies the conditions of Statement No.800 to the Additional Support Area and requires all implementation, management, monitoring, compliance assessment and reporting, environmental performance reporting, protocol setting and record keeping requirements applicable to the Additional Support Area under Statement No.800 to be carried out on a joint basis with the Gorgon Gas Development.

The Jansz Feed Gas Pipeline was approved by the Western Australian State Minister for the Environment on 28 May 2008 by way of Ministerial Implementation Statement No. 769 (Statement No. 769) and the Commonwealth Minister for the Environment and Water Resources on 22 March 2006 (EPBC Reference: 2005/2184).

This Procedure covers the Gorgon Gas Development as approved under Statement No. 800 and as approved by EPBC Reference: 2003/1294 and 2008/4178, and including the Additional Support Area as approved by Statement No. 965 and as varied by the Commonwealth Minister for the Environment. In addition, this Procedure covers the Jansz Feed Gas Pipeline as approved by Ministerial Implementation Statement No. 769 and EPBC Reference: 2005/2184.

This Procedure, which is required under the conditions of EPBC Reference: 2003/1294 and 2008/4178, shall be read and interpreted as only requiring implementation under EPBC Reference: 2003/1294 and 2008/4178 for managing the impacts of the Gorgon Gas Development on, or protecting the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) matter listed in Terrestrial and Subterranean Baseline State and Environmental Impact Report (Chevron Australia 2012).

1.2 Purpose of Procedure

This Procedure is required under Condition 7.6 (i) of Statement No. 800 and Statement No. 769, and Condition 6.6 (i) of EPBC Reference: 2003/1294 and 2008/4178, which is quoted below:

> *"Vegetation Clearing Audit Procedures to determine the extent of clearing and rehabilitation on an annual basis".*

The Common User Procedures (CUP) have been prepared to support a number of the plans required by these approvals, in particular, the Terrestrial and Subterranean Environmental Protection Plan (Chevron Australia 2010), by providing the detail on specific environmental issues identified in the Plan.

This Procedure addresses the auditing of clearing associated with the Terrestrial Facilities listed in Condition 6.3 of Statement No. 800 and Statement No. 769 including:

- Gas Treatment Plant
- Carbon Dioxide Injection System
- Associated Terrestrial Infrastructure forming part of the Proposal
- areas impacted for seismic data acquisition
- Onshore Feed Gas Pipeline System and terrestrial component of the Shore Crossing.

Terrestrial Facilities also include those defined in Condition 6.3 of Statement No. 769 (the Onshore Feed Gas pipeline system and the terrestrial component of the Shore Crossing) and Schedule 1 of Statement No. 965 (the Additional Support Area).

Any matter specified in this Procedure is relevant to the Gorgon Gas Development or Jansz Feed Gas Pipeline only if that matter relates to the specific activities or facilities associated with that particular development.

1.3 Scope

This Procedure:

- is relevant to clearing of terrestrial vegetation and rehabilitation of disturbed land associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline on Barrow Island
- determines how the area for the Gorgon Gas Development Footprint is derived
- describes a process for auditing the vegetation clearing and rehabilitation activities undertaken for the Gorgon Gas Development and Jansz Feed Gas Pipeline.

This procedure is not relevant to:

- clearing activities that take place as part of other developments on Barrow Island
- clearing of terrestrial vegetation associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline on the mainland
- vegetation clearing in the near shore marine environment. Disturbance to the sea floor is addressed in the Dredging and Spoil Disposal Management and Monitoring Plan (Chevron Australia 2011).

1.4 Objectives

Condition 7.6 (i) of Statement No. 800, Condition 7.6 (i) of Statement No. 769, and Condition 6.6 (i) of EPBC Reference: 2003/1294 and 2008/4178, require measures that shall address:

> *Vegetation Clearing Audit Procedures to determine the extent of clearing and rehabilitation on an annual basis*

The objectives of this procedure are to provide measures that:

- specify how vegetation clearing and rehabilitation data is collected and reported for the Gorgon Gas Development and Jansz Feed Gas Pipeline
- detail the frequency and form of the clearing and rehabilitation audit process.

1.5 Relevant Documents

The following documents should be read in conjunction with this Procedure:

- Post-Construction Rehabilitation Plan (Chevron Australia 2009)
- Terrestrial and Subterranean Environment Protection Plan (Chevron Australia 2010)
- Topsoil Management Plan (Chevron 2012a)
- Ground and Vegetation Disturbance Certificate Procedure (Kellogg Joint Venture 2012).

2.0 Legislative Framework

2.1 Legislation

Vegetation clearing associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline must comply with the requirements of two Western Australian Acts:

- *Environmental Protection Act 1986* (EP Act)
- *Barrow Island Act 2003* (Barrow Island Act).

2.1.1 Barrow Island Act 2003 (WA)

The *Barrow Island Act 2003* (WA) defines the total area and breakdown (distribution) of uncleared land on Barrow Island that can be used for gas processing purposes.

Under section 9 of the Barrow Island Act, no more than 332 ha in total of uncleared land on Barrow Island can be the subject of a lease, licence or easement for gas processing purposes. The Gorgon Joint Venturers (GJVs) have requested and received approval from the State Government to submit proposals that involve the use of the whole of this 332 ha for the Gorgon Gas Development and Jansz Feed Gas Pipeline under Schedule 1 section 6 (10) of the Barrow Island Act.

Uncleared land is defined in section 9 (2) of the Barrow Island Act as land that is not cleared at the time of the grant of a lease, licence or easement. The Barrow Island Act does not define cleared land.

2.1.2 Environmental Protection Act 1986 (WA)

The clearing of native vegetation is regulated under section 51C of the *Environmental Protection Act 1986* (WA) (EP Act). The EP Act requires that all clearing is undertaken in accordance with a clearing permit unless an exemption in Schedule 6 applies or the clearing is prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 and is not done in an environmentally sensitive area. Clearing of native vegetation for the Gorgon Gas Development and Jansz Feed Gas Pipeline will be undertaken in the implementation of the Gorgon Gas Development and Jansz Feed Gas Pipeline and in accordance with Ministerial approval, and is therefore exempt from the requirement to hold a clearing permit under Schedule 6 item 2 (a) of the EP Act.

3.0 Measurement of Clearing and Rehabilitation

3.1 Determination of the Gorgon Gas Development Footprint

During the construction phase, clearing of previously uncleared land and access to previously cleared land for the Gorgon Gas Development Footprint will be determined annually. An initial baseline was created in 2008 (based on aerial imagery current at that time) to determine areas classified as previously cleared or uncleared for the purpose of the Gorgon Gas Development and Jansz Feed Gas Pipeline. This baseline forms the basis for assessment of all clearing and rehabilitation undertaken by the Project from that point and will provide the initial data to form the Cleared Areas GIS Dataset which will be updated annually as the development progresses.

New aerial imagery will be collected each year during construction; the aerial imagery will assist to identify and calculate the preceding year's clearing and rehabilitation activity. Data derived from the aerial imagery will be used to reconcile the total area of uncleared land accessed by the Gorgon Gas Development and Jansz Feed Gas Pipeline and the results will be summarised in the Cleared Areas GIS Dataset within the Gorgon GIS and used to determine the Gorgon Gas Development Footprint. The Cleared Areas GIS Dataset will be the source of data for the annual audit and this dataset will be provided to the Department of Parks and Wildlife (DPaW) and Office of the Environmental Protection Authority (OEPA) each year during construction and supported by the current aerial imagery. This process is shown graphically in Figure 3-1.

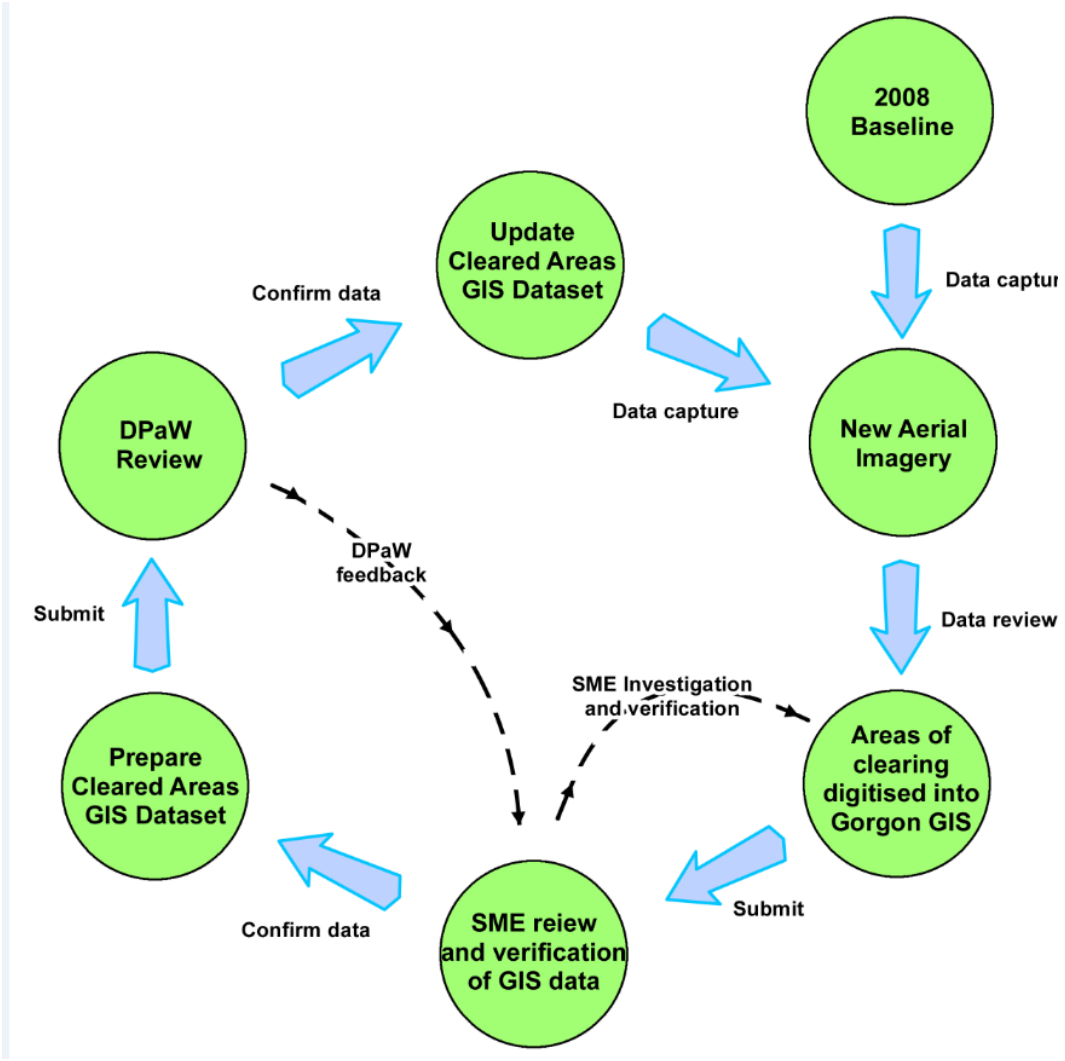

Figure 3-1 Flowchart Illustrating Vegetation Clearing Audit Process

3.2 Classification of Cleared vs. Uncleared Land

Classification of the clearing status of land on Barrow Island is based on the Western Australian Department of Environment and Conservation (DEC) (now DPaW) Guidance to Determine Cleared vs. Uncleared Land (DEC 2009). Initial assessment formed the basis of the 2008 baseline data set on which subsequent annual assessment and reconciliation is based. However, it is expected that from time to time variations to design and placement of infrastructure will require additional land to be assessed for clearing status. The baseline dataset will be updated to capture these changes. The process for assessing the cleared status on new areas of land will be based on the Guidance to Determine Cleared vs. Uncleared Land as amended from time to time using aerial imagery followed by field inspection where uncertainty exists.

3.3 Cleared Areas GIS Dataset

The areas of cleared and uncleared land used for the Gorgon Gas Development and Jansz Feed Gas Pipeline will be compiled in a Cleared Areas GIS Dataset within the Gorgon GIS to determine the Gorgon Gas Development Footprint. The Cleared Area GIS Dataset is derived from aerial imagery collected annually and flown to a minimum accuracy of ± 0.5 m. Currently photographic imagery is used for this purpose; however other remote sensing imagery may be used in the future when this technology develops to a point where it produces a comparable or better product.

The Cleared Areas GIS Dataset and supporting aerial imagery will be submitted to DPaW and OEPA annually during construction.

The Cleared Areas GIS Dataset, supporting imagery and GIS data will be maintained by Chevron Australia's Gorgon GIS Team.

3.4 Clearing of Vegetation

Chevron Australia has prepared a Ground and Vegetation Disturbance Certificate Procedure (Kellogg Joint Venture 2012) (GVD) which applies to all vegetation clearing required for the Gorgon Gas Development and Jansz Feed Gas Pipeline, and which it internally requires its employees and contractors to comply with.

Data on areas cleared under the GVD Procedure are recorded in the Gorgon GIS and will be reconciled against the most recently collected aerial imagery during the audit process.

3.5 Rehabilitation

The Post-Construction Rehabilitation Plan (Chevron Australia 2009) sets out the requirements for rehabilitation of areas of the Gorgon Gas Development and Jansz Feed Gas Pipeline no longer required for construction or operations. Data on areas rehabilitated on the Gorgon Gas Development and Jansz Feed Gas Pipeline are recorded in the Gorgon GIS. A description of rehabilitation activities and results of rehabilitation monitoring are reported in the Environmental Performance Report as required by Condition 5.2 (ix) and Schedule 3.9 (i), and (ii) of Statement No. 800. In accordance with Condition 2-2 of Statement No. 965, reporting for the Additional Support Area will be undertaken on a joint basis.

Gorgon Gas Development rehabilitation GIS data will be maintained by Chevron Australia's GIS Team.

3.6 Audit of Clearing and Rehabilitation

Chevron Australia will undertake an annual audit of clearing of vegetation and rehabilitation by the Gorgon Gas Development and Jansz Feed Gas Pipeline on Barrow Island using data collected by the Gorgon GIS Team and held in the Cleared Areas GIS Dataset. During the construction phase, it is proposed to acquire aerial imagery prior to each audit to capture the most recent clearing and rehabilitation activities. During the operations phase, audits of vegetation clearing will be conducted annually but imagery may be acquired less frequently, taking into consideration vegetation clearing or rehabilitation activities undertaken during that audit period, in which case, other GIS data will be used.

The audit will be undertaken by SMEs using the most recently acquired GIS data. The SMEs will identify and determine the extent of clearing and rehabilitation associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline. The audit process verifies the status of the land where clearing has taken place to confirm that vegetation clearing is within the areas approved to be cleared on Barrow Island for the construction and operation of the Gorgon Gas Development and Jansz Feed Gas Pipeline. Any discrepancy between areas in the GIS dataset and the imagery will be investigated and, if required, reported according to the internal incident investigation processes detailed in Section 4.2.4. The audit will verify the Cleared Areas GIS Dataset before it is submitted to DPaW and OEPA each year during construction.

4.0 Auditing and Reporting[1]

4.1 Auditing

4.1.1 Internal Auditing

Chevron Australia has prepared the internal ABU Compliance Assurance Process (Chevron Australia 2012b) to manage compliance, and which it internally requires its employees, contractors, etc. to comply with. This Process will also be applied to assess compliance of the Gorgon Gas Development and Jansz Feed Gas Pipeline against the requirements of Statement No. 800, Statement No. 769, and EPBC Reference: 2003/1294 and 2008/4178 where this is appropriate and reasonably practicable. In accordance with Condition 2-1 of Statement No. 965, assessment of compliance will be undertaken on a joint basis.

An internal Audit Schedule has been developed and will be maintained for the Gorgon Gas Development and Jansz Feed Gas Pipeline (with input from the Engineering, Procurement and Construction Management [EPCM] Contractors) that includes audits of the Development's environmental performance and compliance with the Ministerial Conditions. A record of all internal audits and the audit outcomes is maintained. Actions arising from internal audits are tracked until their close-out.

Under EPBC Reference: 2003/1294 and 2008/4178, Condition 24 also requires that the person taking the action must maintain accurate records of activities associated with or relevant to the Conditions of approval and make them available on request by the Commonwealth Department of the Environment (DotE). Such documents may be subject to audit by DotE and used to verify compliance with the Conditions of approval.

4.1.2 External Auditing

Audits and/or inspections undertaken by external regulators will be facilitated via the Gorgon Gas Development and Jansz Feed Gas Pipeline's Regulatory Approvals and Compliance Team. The findings of external regulatory audits will be recorded and actions and/or recommendations will be addressed and tracked. Chevron Australia may also undertake independent external auditing during the life of the Gorgon Gas Development and Jansz Feed Gas Pipeline Project.

Under EPBC Reference: 2003/1294 and 2008/4178, Condition 23 also requires that upon the direction of the Minister, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.

4.2 Reporting

4.2.1 Compliance Reporting

Condition 4 of Statement No. 800 and Condition 2 of EPBC Reference: 2003/1294 and 2008/4178 requires Chevron Australia to submit a Compliance Assessment Report annually to address the previous 12-month period. Condition 4 of Statement No. 769 similarly requires that Chevron Australia submit an annual Audit Compliance Report, for the previous 12-month period. A compliance reporting table audit table is provided in Appendix 1 to assist with auditing for compliance with this Procedure for Statement No. 800, EPBC Reference: 2003/1294 and 2008/4178 and Statement No. 769. In accordance with Conditions 2-1 and 2-2 of Statement

[1] This Procedure has been prepared to meet the requirements of Condition 7.6 (i) of Statement No. 800 and Statement No. 769, and Condition 6.6 (i) of EPBC Reference: 2003/1294 and 2008/4178; it is not intended to be consistent with or meet the specific requirements of Chevron Australia's OE Compliance Assurance Audit Procedures.

No.965, compliance assessment and compliance reporting will be carried out on a joint basis with Statement No.800.

4.2.2 Environmental Performance Reporting

Condition 5.1 of Statement No. 800 and Statement No. 769, and Condition 4 of EPBC Reference: 2003/1294 and 2008/4178 require that Chevron Australia submits an annual Environmental Performance Report to the Western Australian Minister for the Environment and to the DotE respectively, for the previous 12-month period.

In addition, under Condition 5.3 of Statement No. 800 and Statement No. 769, and Condition 4.2 for EPBC Reference: 2003/1294 and 2008/4178, every five years from the date of the first annual Report, Chevron Australia shall submit to the Western Australian Minister for the Environment an Environmental Performance Report covering the previous five-year period. In accordance with Conditions 2-1 and 2-2 of Statement No.965, performance reporting will be carried out on a joint basis with Statement No.800.Specific details on the content of the Environmental Performance Report are defined in Condition 5.2 and Schedule 3 of Statement No. 800, Condition 5.2 of Statement No. 769, and Schedule 3 of EPBC Reference: 2003/1294 and 2008/4178.

The information in the Environmental Performance Report will also partly meet the requirements of Condition 3.7 of EPBC Reference: 2003/1294 and 2008/4178.

4.2.3 Routine Internal Reporting

The Gorgon Gas Development and Jansz Feed Gas Pipeline will use a number of routine internal reporting formats to effectively implement the requirements of this Procedure. Routine reporting is likely to include daily, weekly and/or monthly HES reports for specific scopes of work on the Development. These reports include information on a number of relevant environmental aspects, such as details of environmental incidents (if any), environmental statistics and records, records of environmental audits and inspections undertaken, status of environmental monitoring programs, tracking of environmental performance against performance indicators, targets and criteria, etc.

4.2.4 Incident Response and Reporting

Chevron Australia has prepared the ABU Incident Investigation and Reporting Process (Chevron Australia 2010a), which it internally requires its employees, contractors, etc. to follow in the event of environmental incidents. These processes will also be applied internally to environmental incidents identified in this Procedure, where this is appropriate and reasonably practicable.

5.0 Review of this Procedure

Chevron Australia is committed to conducting activities in an environmentally responsible manner and aims to implement best practice environmental management as part of a program of continuous improvement. This commitment to continuous improvement means Chevron Australia will review this Procedure every five years and more often as required (e.g. in response to new information).

Reviews will address matters such as the overall design and effectiveness of the Procedure, progress in environmental performance, changes in environmental risks, changes in business conditions, and any relevant emerging environmental issues.

If the Procedure no longer meets the aims, objectives or requirements of the Procedure, if works are not appropriately covered by the Procedure, or measures are identified to improve the Procedure, Chevron Australia may submit an amendment or addendum to the Procedure to the State Minister for Environment for approval under Condition 36.2 of Statement No. 800, Condition 21 of Statement No. 769 and Condition 2-3 of Statement No. 965.

If Chevron Australia wishes to carry out an activity other than in accordance with the Procedure, Chevron Australia will update the Procedure and submit it to the Commonwealth Minister for Environment for approval in accordance with Condition 25 of EPBC Reference: 2003/1294 and 2008/4178, and Condition 6 of EPBC Reference: 2005/2184. The Commonwealth Minister for Environment may direct Chevron Australia to revise the Procedure under Condition 26 of EPBC Reference: 2003/1294 and 2008/4178, and Condition 7 of EPBC Reference: 2005/2184.

6.0 References

Chevron Australia. 2009. *Gorgon Gas Development and Jansz Feed Gas Pipeline Post-Construction Rehabilitation Plan*. Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000303)

Chevron Australia. 2010. *Gorgon Gas Development and Jansz Feed Gas Pipeline Terrestrial and Subterranean Environmental Protection Plan*. Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000294)

Chevron Australia. 2010a. *Incident Investigation and Reporting – ABU Standardised OE Process*. Chevron Australia, Perth, Western Australia. (OE-09.00.01)

Chevron Australia. 2011. *Gorgon Gas Development and Jansz Feed Gas Pipeline Dredging and Spoil Disposal Management and Monitoring Plan*. Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000373)

Chevron Australia. 2012. *Gorgon Gas Development and Jansz Feed Gas Pipeline Terrestrial and Subterranean Baseline State and Environmental Impact Report*. Chevron Australia, Perth, Western Australia. (G1-TE-H-0000-REPX027)

Chevron Australia. 2012a. *Gorgon Project: Topsoil Management Plan*. Chevron Australia, Perth, Western Australia. (G1-NT-PLNX0000769)

Chevron Australia. 2012b. *ABU – Compliance Assurance Process. C*hevron Australia, Perth, Western Australia. (OE-12.01.01)

Commonwealth Government of Australia, Assistant Secretary Environmental Assessment Branch, Anne-Marie Delahunt. 2006*. Decision to Approve the taking of an Action – Jansz Feed Gas Pipeline (EPBC Reference: 2005/2184), 22 March 2006*. Canberra, Australian Capital Territory.

Commonwealth Government of Australia, Minister for the Environment and Water Resources, Malcolm Turnbull. 2007. *Approval – Gorgon Gas Development (EPBC Reference: 2003/1294), 3 October 2007*. Canberra, Australian Capital Territory.

Commonwealth Government of Australia, Minister for the Environment, Water, Heritage and the Arts, Peter Garrett. 2009. *Approval – Gorgon Gas Development (EPBC Reference: 2008/4178), 26 August 2009*. Canberra, Australian Capital Territory.

Department of Environment and Conservation. 2009. *Guidance to Determine Cleared vs. Uncleared Land (Correspondence)*. Department of Environment and Conservation, Perth, Western Australia. (G1-CO-LTR-DECWH-CVXPH 0000057)

Government of Western Australia, Minister for the Environment, David Templeman MLA. 2007. *Statement that a Proposal may be Implemented – Gorgon Gas Development: Barrow Island Nature Reserve (Ministerial Statement No. 748), 6 September 2007.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, David Templeman MLA. 2008. *Statement that a Proposal may be Implemented – Jansz Feed Gas Pipeline: Barrow Island Nature Reserve (Ministerial Statement No. 769), 28 May 2008.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, Youth, Donna Faragher JP MLC. 2009. *Statement that a Proposal may be Implemented – Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve (Ministerial Statement No. 800), 10 August 2009.* Perth, Western Australia.

Government of Western Australia, Minister for the Environment, Water, Bill Marmion MLA. 2011. *Statement to Amend Conditions Applying to the Gorgon Gas Development Revised and Expanded Proposal Barrow Island Nature Reserve (Ministerial Statement No. 865) 7 June 2011*. Perth, Western Australia.

Government of Western Australia, Minister for the Environment; Heritage. Albert P. Jacob JP MLA. 2014. Statement that a Proposal may be implemented (pursuant to the provisions of the Environmental Protection Act 1986) *(Ministerial Statement No. 965),* Perth, Western Australia.

Kellogg Joint Venture. 2012. *Ground and Vegetation Disturbance Certificate Procedure*. Kellogg Joint Venture, Perth, Western Australia (G1-PP-DWN-KH1500XX).

Appendix 1 Compliance Reporting Table

Section No.	Actions	Timing
3.1	An initial baseline was created in 2008 (based on aerial imagery current at that time) to determine areas classified as previously cleared or uncleared for the purpose of the Gorgon Gas Development and Jansz Feed Gas Pipeline. This baseline forms the basis for assessment of all clearing and rehabilitation undertaken by the Project from that point and will provide the initial data to form the Cleared Areas GIS Dataset which will then be updated annually as the development progresses.	Construction
3.1	New aerial imagery will be collected each year during construction; the aerial imagery will assist to identify and calculate the preceding year's clearing and rehabilitation activity.	Construction
3.1	Data derived from the aerial imagery will be used to reconcile the total area of uncleared land accessed by the Gorgon Gas Development and Jansz Feed Gas Pipeline. The results will be summarised in the Cleared Areas GIS Dataset within the Gorgon GIS and used to determine the Gorgon Gas Development Footprint. The Cleared Areas GIS Dataset will be the source of data for the annual audit and this dataset will be provided to DPaW and OEPA each year during construction supported by the current aerial imagery.	Construction
3.2	It is expected that from time to time variations to design and placement of infrastructure will require additional land to be assessed for clearing status. The baseline dataset will be updated to capture these changes. The process for assessing the cleared status on new areas of land will be based on the DEC Clearing Guidance as amended from time to time using aerial imagery followed by field inspection where uncertainty exists.	All Phases
3.6	During the operations phase, audits of vegetation clearing will be conducted annually but imagery may be acquired less frequently, taking into consideration vegetation clearing or rehabilitation activities undertaken during that audit period, in which case, other GIS data will be used.	Operations
3.6	The audit will be undertaken by SMEs using the most recently acquired GIS data. The SMEs will identify and determine the extent of clearing and rehabilitation associated with the Gorgon Gas Development and Jansz Feed Gas Pipeline.	Construction and Operations Phases
4.1.2	The findings of external regulatory audits will be recorded and actions and/or recommendations will be addressed and tracked	All Phases
5.0	Chevron Australia will review this Procedure every five years and more often as required (e.g. in response to new information).	All Phases