

# **Yara Pilbara Fertilisers Pty Ltd**

Ammonia Plant, Burrup Peninsula - Renewable Hydrogen  
Project

Impact Reconciliation Procedure

November 2022

## Summary

This Impact Reconciliation Procedure (IRP) has been prepared to support the construction of a Renewable Hydrogen Plant and associated infrastructure at the existing Ammonia Plant project located on Murujuga (Burrup Peninsula), 11 km north-west of Karratha in the Pilbara region of Western Australia.

The following table summarises the purpose and context of the IRP within the context of the EPA environmental objectives.

Summary of the Proposal	
Proposal title	Ammonia Plant, Murujuga (Burrup Peninsula), Renewable Hydrogen Project
Proponent name	Yara Pilbara Fertilisers Pty Ltd (YPF)
Ministerial Statement Number	1194
Purpose of the IRP	To meet the requirements of Condition 4 (Offsets) of MS 1194 as set out in Condition 4-5.
Key environmental factors and objectives	Flora and vegetation – <i>To protect flora and vegetation so that biological diversity and ecological integrity are maintained.</i> Terrestrial fauna – <i>To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.</i>
Condition clauses	<i>The proponent must prepare and submit a Yara Pilbara Fertilisers Pty Ltd Impact Reconciliation Procedure to the CEO prior to the ground disturbing activities which must:</i> <i>1. spatially define the environmental value(s) identified in condition 4-1;</i> <i>2. spatially define the areas in respect of which offsets required by condition 4-1 are to be calculated;</i> <i>3. include a methodology to calculate the amount of clearing undertaken during each year of the biennial reporting period for each of the environmental values identified in condition 4-3(1);</i> <i>4. state that the clearing calculation for the first biennial reporting period will commence from the first date of ground disturbing activities in accordance with condition 4-2 and end on the second 30 June following the commencement of ground disturbing activities;</i> <i>5. state that clearing calculations for each subsequent biennial reporting period will commence on 1 July of the required reporting period, unless otherwise agreed by the CEO;</i> <i>6. indicate the timing and content of the Impact Reconciliation Reports; and</i> <i>7. be prepared in accordance with Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports (or any subsequent revisions).</i>
Key Provisions	Management based provisions that align with established industry practices to avoid and minimise potential environmental and heritage impacts.
Proposed construction date	November 2022
EMP required pre-construction?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

## Revision History

Revision	Date	Description	Author
0	22/07/2020	For submission to Environmental Protection Authority (EPA)	GHD
1	28/06/2021	Revised following feedback from EPA Services Directorate (EAPSD) of the Department of Water and Environmental Regulation (DWER) following public review period	YPF
2	20/12/2021	Revised following further feedback from EPASD	YPF
3	08/04/2022	Revised for reduced Proposal Footprint	YPF
4	07/11/2022	Revised to meet requirements of Ministerial Statement 1194 and correct administrative errors	YPF

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## Acronyms and abbreviations

BC Act	<i>Biodiversity Conservation Act 2016 (WA)</i>
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of Section 48 of the <i>Environmental Protection Act 1986</i> , or the CEO's delegate.
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EPBC Act	<i>Environment Protection and Biodiversity Protection Act 1999 (Cth)</i>
EPA	Environmental Protection Authority
ha	Hectare
IRP	Impact Reconciliation Report
IRR	Impact Reconciliation Procedure
km	kilometre
MS	Ministerial Statement
PEC	Priority Ecological Community
PV	photovoltaic
WA	Western Australia
YPF	Yara Pilbara Fertiliser Pty Ltd

# 1. Introduction

## 1.1 Purpose of this document

This Impact Reconciliation Procedure (IRP) is prepared to support Yara Pilbara Fertilisers Pty Ltd (YPF; the Proponent) develop the proposed Ammonia Plant, Murujuga (Burrup Peninsula) – Renewable Hydrogen Project (the Proposal).

The Proposal is located approximately 11 km northwest of Karratha, in the Pilbara region of Western Australia (WA). The Proposal is a significant amendment to the existing Ammonia Plant, which was referred to the Environmental Protection Authority (EPA) in 2001 and approved in February 2002 subject to conditions set out in Ministerial statement 586 (MS 586). On 4 August 2022, the Minister for Environment agreed that the Proposal may be implemented subject to conditions set out in Ministerial Statement 1194 (MS 1194).

This IRP has been prepared in accordance with EPA *Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports* (or any subsequent revisions).

## 2. The Proposal and condition requirements

### 2.1 The Proposal

The Ammonia Plant, Murujuga (Burrup Peninsula) – Renewable Hydrogen Project (the Proposal) is a significant amendment to the existing Proposal (existing Ammonia Plant) located approximately 11 km northwest of Karratha, in the Pilbara region of Western Australia. The existing Ammonia Plant was referred to the Environmental Protection Authority (EPA) in 2001 and approved subject to conditions set out in Ministerial Statement 586 (MS 586) in February 2002.

The Proposal includes an electrolysis plant and a dedicated solar photovoltaic (PV) farm. Energy from the PV farm will be used in the electrolysis plant to split water into hydrogen and oxygen. The hydrogen will be piped to the adjacent Ammonia Plant. The Proposal will produce about 640 tonnes of 'green hydrogen' per annum for the Ammonia Plant. This is about 0.4% of the hydrogen required by the Ammonia Plant and is the commercial demonstration (Phase 0, pilot project) for a future longer-term, larger-scale renewable (green) hydrogen proposal.

The Proponent for the Proposal is Yara Pilbara Fertilisers Pty Ltd (YPF).

On 5 August 2022, the Minister for Environment agreed that the Proposal may be implemented subject to conditions set out in Ministerial Statement 1194 (MS 1194). The elements of the Proposal which have been subject to the EPA's assessment are included in Table 2.1 below.

Table 2.1: Location and proposed extent of Proposal elements

Proposal element	Approved Proposal (MS 586) (Ammonia Plant)	Proposal (significant amendment) (Renewable Hydrogen Project)	Combined Proposal (Ammonia Plant and Renewable Hydrogen Project)
<i>Physical elements</i>			
<ul style="list-style-type: none"> <li>Ammonia plant</li> <li>Laydown area</li> <li>Desalination plant</li> <li>Access road and product pipeline to plant</li> </ul> <b>PV solar plant, hydrogen production plant, site tracks, and associated infrastructure.</b>	Clearing of no more than 29 ha within a 73 ha development envelope	<b>Increase in disturbance of 22.94 ha</b>	Clearing of no more than <b>51.94</b> ha within a 73 ha development envelope
<i>Operational elements</i>			
<b>Oxygen emissions</b>	-	<b>Approximately 14,400 kg/day</b>	<b>Approximately 14,400 kg/day</b>

### 2.2 Condition requirements

The condition requirements relevant to the preparation of this IRP are detailed in Table 2.2.

Table 2.2: Condition requirements

#	Condition Requirement	Plan Section
4-5	The proponent must prepare and submit a Yara Pilbara Fertilisers Pty Ltd Impact Reconciliation Procedure to the CEO prior to the ground disturbing activities which must:	-
	1. spatially define the environmental value(s) identified in condition 4-1;	Section 3.1
	2. spatially define the areas in respect of which offsets required by condition 4-1 are to be calculated;	Section 3.1
	3. include a methodology to calculate the amount of clearing undertaken during each year of the biennial reporting period for each of the environmental values identified in condition 4-3(1);	Section 3.2
	4. state that the clearing calculation for the first biennial reporting period will commence from the first date of ground disturbing activities in accordance with condition 4-2 and end on the second 30 June following the commencement of ground disturbing activities;	Section 4.1
	5. state that clearing calculations for each subsequent biennial reporting period will commence on 1 July of the required reporting period, unless otherwise agreed by the CEO;	Section 4.1
	6. indicate the timing and content of the Impact Reconciliation Reports; and	Section 4.1
	7. be prepared in accordance with Instructions on how to prepare Environmental Protection Act 1986 Part IV Impact Reconciliation Procedures and Impact Reconciliation Reports (or any subsequent revisions).	Section 1.1

### 3. Procedure

#### 3.1 Identification of the biodiversity values requiring offsets

##### 3.1.1 Flora and Vegetation

A detailed flora and vegetation and targeted flora survey of areas within and adjacent to the YPF lease boundary (the survey area) was undertaken in March 2020 (GHD 2020). The purpose of the flora and vegetation survey was to identify and record key flora and vegetation values including vegetation types, condition, the presence of significant ecological communities and flora, and compile an inventory of flora species recorded during the survey.

The flora and vegetation survey identified seven vegetation types, with five types occurring within the Disturbance Footprint (Table 3.1). The vegetation condition ranged from Excellent to Completely Degraded, with the majority considered to be in Excellent or Very Good to Excellent condition (Table 3.2). The survey recorded one Priority Ecological Community (PEC), the Burrup Peninsula Rock Pile Communities (Priority 1). The entirety of this PEC was excluded from the Disturbance Footprint.

The survey recorded three Priority flora species within the surveyed areas, including *Terminalia supranitifolia* (Priority 3), *Vigna triodiophila* (Priority 3) and *Rhynchosia bungarensis* (Priority 4). Only *Terminalia supranitifolia* occurs within the Disturbance Footprint.

Implementation of the Proposal will result in the loss of 21.23 ha of native vegetation and one individual of *Terminalia supranitifolia* (Priority 3). Given the extent of locally and regionally located high quality vegetation, and the implementation of flora and vegetation mitigation measures, it is considered that the construction and operation of the Proposal are unlikely to have a significant affect or long-term impact on flora and vegetation. While there are no significant impacts to Flora and Vegetation values, YPF will offset all the 21.23 ha of native vegetation that will be cleared. This includes 20.42 ha of native vegetation in Good to Excellent condition.

Appendix A provides figures of native vegetation (vegetation type and condition) that will be offset (Figure 1 and Figure 2).

Table 3.1: Vegetation types

Table Vegetation type	Extent within the survey area (ha)	Extent within the Development Envelope (ha)	Extent in the DisturbanceFootprint (ha)
<i>Grevillea/Acacia</i> openshrubland (VT01)	9.38	9.38	7.90
<i>Terminalia</i> scattered lowtrees (VT02)*	2.09	2.09	0.00
<i>Triodia</i> hummock grassland(VT03)	16.17	16.17	10.95
<i>Triodia</i> closed hummockgrassland (VT04)	1.24	1.24	0.47
<i>Tecticornia</i> scattered to open low shrubland (VT05)	18.3	6.21	1.07
<i>Cenchrus</i> tussockgrassland (VT06)	12.14	0.69	0.00
<i>Acacia</i> high shrubland(VT07)	1.96	1.96	0.84
<b>Sub-total (native vegetation)</b>	<b>72.18</b>	<b>37.74</b>	<b>21.23</b>
Seasonally inundated	5.45	4.69	<0.001
Cleared	29.41	29.31	1.71
<b>Total</b>	<b>96.14</b>	<b>71.75</b>	<b>22.94</b>

\* Represents the Burrup Peninsula Rock Pile Communities PEC

**Table 3.2: Vegetation condition**

Vegetation condition	Extent within the survey area (ha)	Extent within the Development Envelope (ha)	Extent in the Disturbance Footprint (ha)
Excellent	22.31	22.31	13.66
Excellent-Very Good	3.00	3.00	2.93
Very Good	15.20	4.59	1.76
Very Good-Good	1.48	-	-
Good	5.19	5.19	2.07
Poor	1.85	1.85	0.72
Degraded	0.13	0.13	0.08
Completely Degraded	12.14	0.69	-
<b>Sub-total</b>	<b>61.30</b>	<b>37.74</b>	<b>21.23</b>
No condition (cleared/open water)	34.86	34.01	1.71
<b>Total</b>	<b>96.16</b>	<b>71.75</b>	<b>22.94</b>

### 3.1.2 Terrestrial Fauna

A single season Level 2 fauna survey of areas within and adjacent to the YPF lease boundary (the survey area) was undertaken in March 2020 (GHD 2020). The purpose of the survey was to identify and describe the dominant fauna habitat types present, assess habitats for significant fauna, assess habitat connectivity, and identify and record fauna species through a trapping program and opportunistically.

The survey identified six fauna habitats (Table 3.3). Of the habitats identified, the rocky outcropping area was determined to have the greatest value to terrestrial fauna and was therefore excluded from the Disturbance Footprint. Specifically, the rocky outcropping habitat was identified as being core habitat for the Pilbara Olive Python. The Pilbara Olive Python is listed as Vulnerable under both the BC Act and EPBC Act.

Of the remaining habitat types that will be affected by the Proposal, the minor drainage line was identified as being used seasonally by the Pilbara Olive Python for dispersal purposes.

The Proposal includes the clearing of 1.06 ha of Minor drainage line habitat which may be used by Pilbara Olive Python. The disturbance to the Minor drainage habitat has been minimised with less than 15% of the habitat in the survey area that will be cleared.

The clearing of 1.06 ha of Minor drainage line habitat for the Pilbara Olive Python is the only residual impact requiring an offset. However, YPF will offset all the 21.23 ha of terrestrial fauna habitat that will be cleared.

Appendix A provides a figure of the terrestrial fauna habitat to be offset (Figure 3).



Table 3.3: Fauna habitat types

Habitat type and description	Extent within the survey area (ha)	Extent within the Development Envelope (ha)	Extent in the Disturbance Footprint (ha)
<p><b>Rocky outcropping</b></p> <p><u>Description:</u> Areas dominated by Triodia hummock grassland interspersed with hills with extensive rock outcropping or boulder piles.</p> <p><u>Value:</u> High habitat value overall and high habitat value for fauna species of conservation significance.</p> <p>The area is a core habitat for the Pilbara Olive Python, and foraging habitat for the Peregrine Falcon and North-western Free-tail Bat.</p>	3.74	3.74	-
<p><b>Foothills</b></p> <p><u>Description:</u> Triodia hummock grassland adjacent to rocky hills or below boulder piles. Also contains low hills with rock substrates.</p> <p><u>Value:</u> Moderate to high value overall and habitat value for fauna species of conservation significance.</p> <p>Supportive habitat for species foraging and dispersal particularly the Pilbara Olive Python.</p>	23.38	23.38	18.56
<p><b>Minor drainage line</b></p> <p><u>Description:</u> limited to the linear drainage systems which flow amongst the hills or on the foothills. Primarily consists of a thin, linear corridor of vegetation which drains into the intertidal mudflats and coastline. Contains Triodia hummock grasslands and small shrubs.</p> <p><u>Value:</u> High habitat value overall and high habitat value for fauna species of conservation significance.</p> <p>Due to existing presence of YPF the habitat does not connect to water/ floodplain habitats and is not a fauna corridor</p>	9.38	1.34	1.06
<p><b>Sand plain</b></p> <p><u>Description:</u> present between the rocky hills between Hearson Cove and YPF and YPN. Comprises mixed shrublands over Triodia and Buffel on sand plain with scattered shrubs.</p> <p><u>Value:</u> Low to moderate value overall and Habitat value for fauna species of conservation significance.</p> <p>This habitat provides potential hunting and foraging opportunities for the Peregrine Falcon.</p>	4.98	0.69	0.00
<p><b>Water/water body</b></p> <p><u>Description:</u> lie on the southern side of the YPF and YPN and are present due to modification of the existing floodplain and drainage lines in the area. Seasonally filled with water and flanked by chenopod species.</p> <p><u>Value:</u> High habitat value overall and high habitat value for fauna species of conservation significance.</p> <p>Five conservation significant species were recorded in this habitat type and include Caspian Tern, Gull-billed Tern, Common Sandpiper, Red-necked Stint and Common Greenshank. Other migratory species may also utilise the habitat opportunistically. Due to the amount of bird activity, it is also possible Pilbara Olive Pythons may forage and reside in the rock wall on the northern side of the water body. Foraging habitat for the North-western Free-tail Bat. The Peregrine Falcon (<i>Falco peregrinus</i>) may also utilise the area for foraging only</p>	9.69	9.69	1.45
<p><b>Floodplain</b></p> <p><u>Description:</u> Linking King Bay and Hearson Cove is a series of tidal drainage lines and floodplain. When the high tide retracts to several small pools and a minor drainage line during the low period. Vegetation was generally sparse and scattered however in areas clustered to form low samphire shrublands.</p> <p><u>Value:</u> Moderate to high value overall and habitat value for fauna species of conservation significance.</p> <p>Foraging habitat for migratory birds, North-western Free-tail Bat and Peregrine Falcon.</p>	14.75	3.13	0.16
<b>Cleared</b>	29.24	29.24	1.71
<b>Total</b>	<b>95.16</b>	<b>71.21</b>	<b>22.94</b>

### 3.1.3 Summary of environmental values requiring offset

While there are no significant residual impacts to Flora and Vegetation values, YPF will offset all the 21.23 ha of native vegetation that will be cleared for the Proposal. This includes 20.42 ha of native vegetation in Good to Excellent condition.

The clearing of 1.06 ha of Minor draining line habitat for the Pilbara Olive Python is the only residual impact requiring an offset. However, YPF will offset all the 21.23 of terrestrial fauna habitat that will be cleared. This 21.23 ha of terrestrial fauna habitat completely covers the 21.23 ha of native vegetation.

A summary of the environmental values that YPF will offset for the Proposal are provided in Table 3.4.

**Table 3.4: Environmental values that requires offsets**

Environmental value	IBRA subregion
Native vegetation in the Proposal Footprint	Roebourne
Terrestrial fauna habitat in the Proposal Footprint	Roebourne

## 3.2 Methodology to determine impacts

### 3.2.1 Direct impacts - clearing

Appendix A provides figures of the native vegetation and terrestrial fauna habitat to be cleared. The total area of native vegetation and terrestrial fauna habitat to be cleared is 21.23 ha (i.e., the baseline). This area has been calculated via on ground surveys and GIS technology.

YPF will develop and implement a ground disturbance procedure for clearing for the Proposal. This procedure will include:

- Demarcating the Disturbance Footprint boundary using survey data and appropriate visual markers prior to ground disturbing activities;
- Visual inspection and approval of Disturbance Footprint boundary prior to ground disturbing activities; and
- Visual inspection and record of cleared areas to be undertaken post-clearing.

Following ground disturbing activities, YPF will utilise on-site visual inspection and aerial imagery in combination with baseline mapping shapefiles and GIS technology to determine the extent of native vegetation and terrestrial fauna habitat cleared at the end of each financial year within the reporting period.

## 4. Reporting

### 4.1 Frequency and timing

Based on the limited extent of clearing, it is anticipated that ground disturbing activities will be undertaken in one action (i.e., will not be staged). The commencement of ground disturbing activities is planned for November 2022.

The first biennial reporting period will commence from the from the first date of ground disturbing activities and will extend until the end of the 2022-2023 financial year (i.e., 30 June 2023). It is not anticipated that subsequent biennial reporting will be required.

An Impact Reconciliation Report (IRR) will be submitted in accordance with this IRP no later than four months after the conclusion of the first biennial reporting period.

A summary of the IRR reporting period and frequency is provided in Table 4.1.

**Table 4.1: Reporting period and frequency of reporting**

Biennial Period	Action	Timing
-	Ministerial statement issued	5 August 2022
	Impacts commenced	November 2022
Period 1	First biennial reporting period	First date of ground disturbing activities to 30 June 2023
	Aerial survey/ground-truthing	By 30 June 2023
	IRR submitted to the CEO	30 October 2023

### 4.2 Impacts and reconciliation

Following the ground disturbing activities (i.e., clearing), the total area of native vegetation and terrestrial fauna habitat cleared will be 21.23 ha or less. Information to be included in the IRR will include:

- The total cleared area that has occurred during each financial year of Period 1, attributed by environmental value (i.e., Flora and Vegetation and Terrestrial Fauna habitat) and IBRA subregion (i.e., Roebourne IBRA subregion);
- Information used to validate impact areas, including aerial imagery, digitised polygons showing cleared areas, and any on-site visual inspection notes or photographs used to determine impacts for the reporting period;
- Information regarding any exemptions, other clearing approvals or reduction to contributions to the fund, where relevant; and
- Details and spatial data for historical impacts which are excluded from offset contributions, where relevant.

## 5. References

GHD PTY Ltd (2020). *Renewable Hydrogen Project, Flora and Fauna Survey*, report prepared for Yara Pilbara Fertilisers Pty Ltd.

## Appendix A Figures

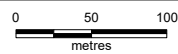


**Legend**

- Development Envelope
- Disturbance Footprint
- Vegetation mapping**
- VT01: Acacia open shrubland
- VT02: Brachychiton or Terminalia scattered low trees
- VT03: Triodia hummock grassland

- VT04: Triodia closed hummock grassland
- VT05: Tecticornia scattered to open low shrubland
- VT06: \*Cenchrus tussock grassland
- VT07: Mixed shrubland
- Seasonally inundated
- Cleared

Scale 1:5,000 at A4



Coord. Sys. GDA2020 MGA Zone 50



Job No: 61171

Client: Yara Pilbara Fertilisers Pty Ltd

Version: A

Date: 07-Apr-2022

Drawn By: cthatcher

Checked By: JB

**Renewable Hydrogen Project**

**VEGETATION TYPES**

**FIGURE 1**



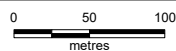


**Legend**

- Development Envelope
- Disturbance Footprint

- Vegetation condition**
- Excellent
  - Excellent - very good
  - Very good
  - Good
  - Poor
  - Degraded
  - Completely degraded
  - No condition
  - Cleared

Scale 1:5,000 at A4



Coord. Sys. GDA2020 MGA Zone 50



Job No: 61171

Client: Yara Pilbara Fertilisers Pty Ltd

Version: A

Date: 08-Apr-2022

Drawn By: cthatcher

Checked By: JB

**Renewable Hydrogen Project**

**VEGETATION CONDITION**

**FIGURE 2**





<b>Legend</b> Development Envelope Disturbance Footprint <b>Fauna habitat</b> Cleared Floodplain Foothills Minor Drainage Lines Rocky Outcropping Sand Plain Water	Scale 1:5,000 at A4		<b>Renewable Hydrogen Project</b>
	Coord. Sys. GDA2020 MGA Zone 50		<b>FAUNA HABITATS</b>
	Job No: 61171		
	Client: Yara Pilbara Fertilisers Pty Ltd		<b>FIGURE 3</b>
	Version: A	Date: 08-Apr-2022	
Drawn By: cthatcher	Checked By: JB		

File Name: \\008PMPMR004V001.jbsg.aust\JBS Perth\Projects\1)\Open\Yara Pilbara\61171 Project Yuri General Support\GIS\Maps\R01\_Rev\_A\61171\_05\_FaunaHabitats.mxd  
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