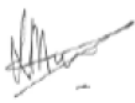

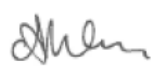




**WAL.2373-PL-HSE-0001**

**RIO TINTO IRON ORE OWNED GAS PIPELINES  
OPERATIONS ENVIRONMENT MANAGEMENT  
PLAN SUMMARY**

Version Control and Authorisation					
Rev	Date	Status	Originated/ Custodian	Checked	Approved
2.1	03/07/2025	Five yearly renewal			
		Merged with Cape Lambert & Yurralyi Maya	L. Graham	M. Jennings	A. Rawlinson
		OEMP CPL.2373-PL-HSE-0001	Environment & Heritage Business Partner	Environment and Heritage Advisor	Environment and Heritage Head

Rev	Date	Status
2.0	Jun 2019	Updated to address new pipeline alignment WAL.
1.0	Oct 2018	PGL and WAL documents merged. Aligned with 2016 Guidelines.

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# 1. Introduction

This Operations Environment Management Plan (OEMP) Summary provides an overview of the environmental management requirements for the operation of the PL67 Paraburdoo Gas Pipeline (PGL), PL97 West Angelas Gas Pipeline (WAL), PL119 West Angelas Gas Pipeline Realignment (WAL-R), PL8 PL106 Cape Lambert Pipeline (CPL) and PL78 Yurralyi Maya Pipeline (YMP) (herein referred to as 'The Pipelines').

## 1.1 Purpose and Scope

The purpose of this OEMP Summary is to provide information to the public regarding environmental considerations and management requirements.

The scope of this OEMP Summary is limited to operational works associated with The Pipelines.

## 1.2 Objectives

The overall environmental objectives of the OEMP are to:

- Minimise environmental impacts resulting from pipeline operations;
- Mitigate all identified environmental risks to a level that is As Low As Reasonably Practicable (ALARP);
- Comply with all relevant legal and regulatory environmental requirements; and
- Minimise disturbance to surrounding landholders.

## 1.3 Environment and Heritage Policy

APA is committed to responsible environmental management and believes that all environmental aspects associated with the operation of The Pipelines can be effectively managed. In addition, APA is committed to reducing all environmental risks subsequent to site based operational activities to ALARP.

All works will be conducted in accordance with the APA Environment and Heritage Policy.

All contractors and sub-contractors must comply with the OEMP. This requirement is specifically addressed within contractual arrangements. Regardless of this, APA takes full responsibility for the application and administration of the OEMP at all times.

## 1.4 Definitions

**Table 1: Definitions**

Acronym	Definition
ACH	Aboriginal Cultural Heritage
AHIS	Aboriginal Heritage Information System
ALARP	As Low as Reasonably Practicable
ASS	Acid Sulfate Soils
CPL	Cape Lambert Pipeline
CS	Compressor Station
DBCA	Department of Biodiversity Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DMPE	Department of Mines, Petroleum and Exploration
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DWER	Department of Water and Environmental Regulation
EMP	Environment Management Plan
ERA	Environmental Risk Assessment
ERP	Emergency Response Plan
GGP	Goldfields Gas Pipeline
IBRA	Interim Biogeographic Regionalisation for Australia
KP	Kilometre Point
LCP	Landholder Contact Program
LMS	Learning Management System
LOS	Line of sight
MB	Maintenance Base
NORM	Naturally occurring radioactive material
OEMP	Operations Environment Management Plan
OSCP	Oil Spill Contingency Plan
PGL	Paraburdoo Gas Pipeline
PL	Pipeline Licence
PTW	Permit to Work
ROW	Right of Way
SDS	Safety Data Sheet
TBX	Thunderbox Pipeline
TDS	Total dissolved salts
TPA	Third-Party Awareness Program
TPC	Third Party Contractor
WAL	West Angelas Gas Pipeline
WAL-R	West Angelas Realignment Gas Pipeline
WEAF	Works Environmental Assessment Form

<b>Acronym</b>	<b>Definition</b>
XIC	X-Info Connect
YMP	Yurralyi Maya Pipeline

## 2. Location

### 2.1 Paraburdoo Gas Pipeline

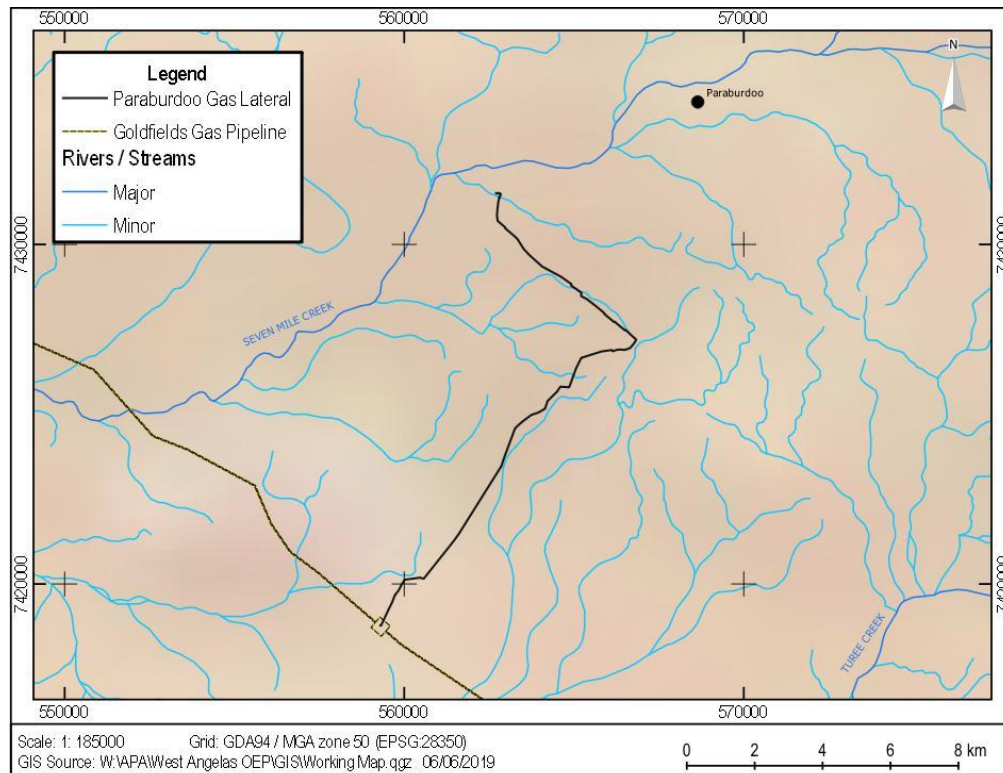
The PGL commences at the off-take facility located within the Paraburdoo Compressor Station on the Goldfields Gas Pipeline (GGP) at KP 304 (kilometre point measured from Yarraloola Compressor Station on the GGP mainline) approximately 18 km south of Paraburdoo.

The PGL is located within a Miscellaneous Licence (L4700130), which traverses Crown Land and the Mininer Pastoral Lease (LA3114/1193) as well as a number of Mineral Leases (AML70/00246, AML70/00004) and General Purpose Leases (AG70/00014, AG70/00004), all of which area held by Hamersley Iron.

Approximate commencement and termination points (GDA 94 MGA Zone 50) for the operational area of the PGL are as follows:

- PGL commencement point: -559293.6E, 7418775.2N
- PGL termination point: -562699.0E, 7431512.4N

Refer to Figure 1 for PGL locality map.



**Figure 1 Paraburdoo Gas Pipeline Locality Map**

### 2.2 West Angelas Gas Pipeline and West Angelas Gas Pipeline Realignment

The WAL commences at the off-take facility located within the Boonamichi Well CTMS site within the Shire of Meekatharra approximately 90 km east-south-east of Paraburdoo and approximately 130 km west-south west of Newman. The alignment falls within the Shire of East Pilbara and Ashburton.

In 2019, a 9.97km portion of PL 97 was relocated to allow for mine expansion. The new alignment, named the West Angelas Gas Pipeline Realignment (WAL-R) was constructed

under PL119 which bridges PL97 from KP 73.35 to KP83.32, the entire alignment is located within the Shire of East Pilbara.

WAL/WAL-R traverse Miscellaneous Licences L52/75 and L47/09. Other tenure associated with access to the land within the wider minesite includes Miscellaneous Licences L52/153 and L47/53, and Mineral Lease AML/70/148. These licences/ leases have been subject to mining exploration with the exception of the first 1.2 km which is contained within the Turee Creek Pastoral Lease.

The pipeline miscellaneous licence provides access to the pipeline for maintenance and operation.

Approximate commencement and termination points (GDA 94 MGA Zone 50) for the operational area of the WAL are as follows:

- WAL commencement point: -651444.4E; 7394583.1N
- WAL termination point: -676376.1E; 7438309.3N

Approximate commencement and termination points (GDA 94 MGA Zone 50) for the operational area of the WAL-R are as follows:

- WAL-R commencement point: 665389.38E, 7439616.24N
- WAL-R termination point: 674479.36E, 7439044.35N

Refer to Figure 2 for the WAL Locality Map

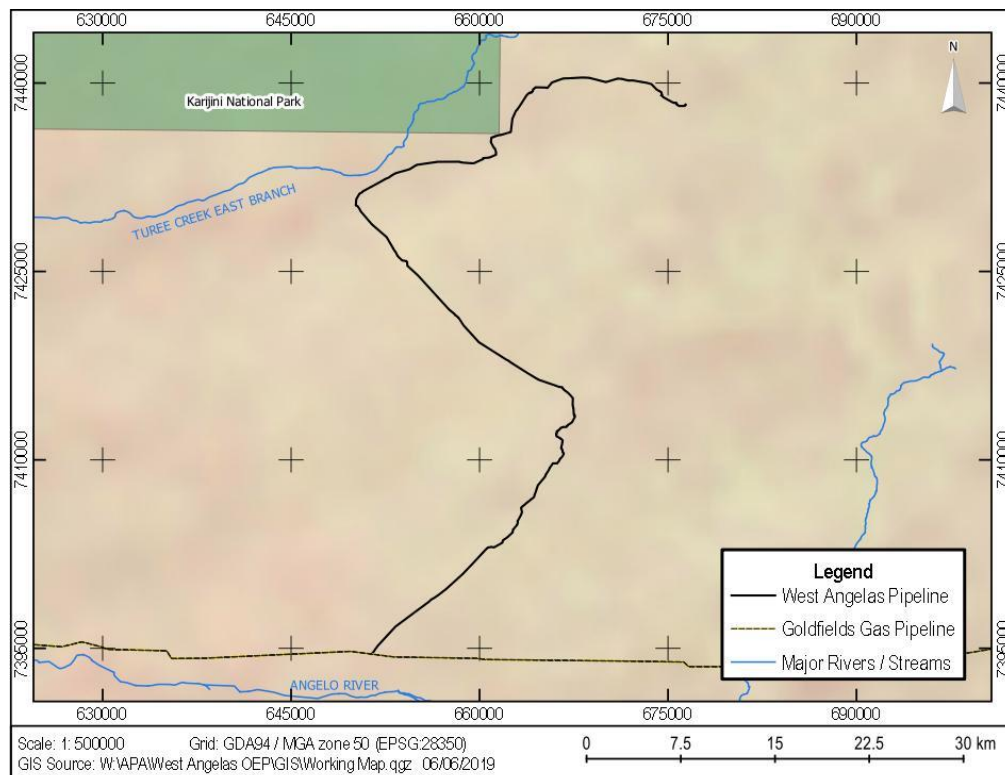


Figure 2 WAL/WAL-R Locality Map

## 2.3 Cape Lambert Pipeline

The facility area comprises the pipeline easement, valves, and facilities from the Cape Lambert off-take facility on the DBNGP to the KP49.05, and then on another 1.96 km to the new Power Station at the Cape Lambert Port Facility.

The PL 8 section of the CPL is located within a dedicated easement traversing the Karratha and Mt Welcome pastoral leases and mining tenements. The CPL pipeline easement provides access to the pipeline for maintenance and operation.


The PL106 section of CPL is also located within a dedicated easement, atop unallocated Crown land from KP0 to KP0.75. It then travels under the un-gazetted Back Beach Road and under the duplicated Rio Tinto Cape Lambert Rail Lease to KP1. The pipeline continues through undeveloped unallocated Crown land crossing two easements for power transmission until Boat Beach Road, Wickham. From KP1 to approximately KP1.4, the pipeline deviates around the Horizon Power substation, then under the gazetted Boat Beach Road. The pipeline then enters Reserve 36889 for the purposes of Quarry and Rubbish Disposal Site managed by the City of Karratha, running parallel to RTIO controlled Snake Gully Road, crossing under this road at KP1.9 to the Power Station Delivery Station.

Approximate CLP co-ordinates:

- Pipeline commencement: -20.764239°, 116.729503°
- Pipeline termination: -20.650618°; 117.143691°

Refer to Figure 3 for CPL Locality Map.





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**PROJECT:** Cape Lambert Pipeline  
**TITLE:** Location Map  
**SUBTITLE:**  
**DATE:** 5/10/2018

**DATA SOURCE:**  
 Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community  
 Geoscience Australia 2016 Locations and Roads  
 LPI State Forest and LGA


**LEGEND:**  
 ● Offtake and Delivery Station selection  
 ▲ Populated Places  
 — Cape Lambert Lateral  
 — Other Pipelines


**CLASS**  
 — Dual Carriageway  
 — Principal Road  
 — Secondary Road  
 — Minor Road

**SERIAL NUMBER:** MIDAS\_NUMBER  
**DOCUMENT NUMBER:** Uncontrolled

Revision	Description	Drawn	Checked	QC	Approved	Date
0.1	DRAFT					05/10/18

**SCALE:** 1:217,824 @ A3 GCS GDA 1994



**LOCATION DIAGRAM**  


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Figure 3 CPL Locality Map

## 2.4 Yurralyi Maya Pipeline

The YMP is located within a miscellaneous license (L47/221), situated entirely within the Karratha pastoral lease owned by RTIO. The miscellaneous licence provides for access to the pipeline for maintenance and operation.

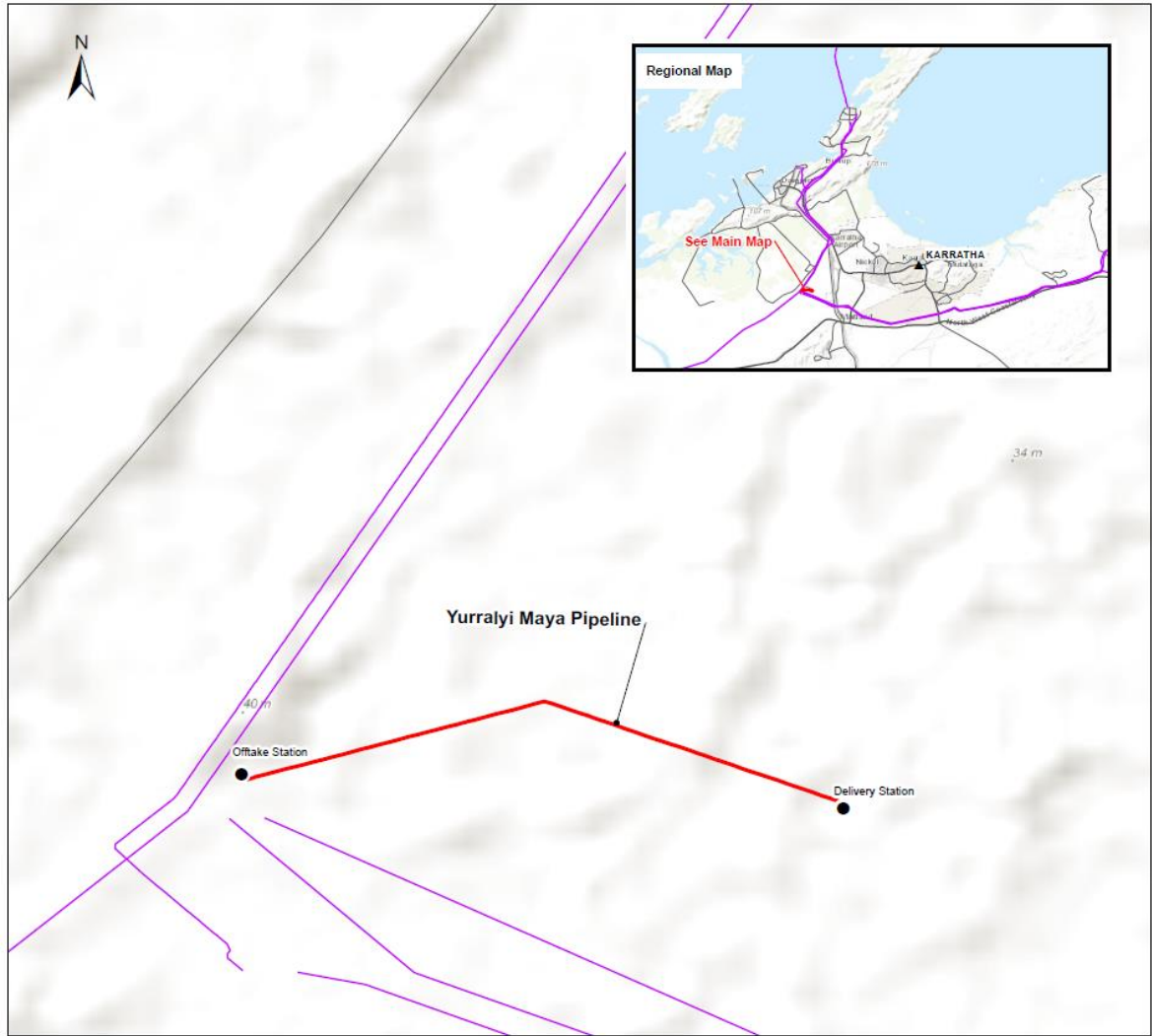
YMP located within the City of Karratha; the nearest town is the Karratha, located approximately 11.4 km northeast of the YMP.


The pipeline and facility piping assemblies are designed for a service life of at least 40 years.

Approximate YMP co-ordinates:

- Pipeline commencement: -20.763388°, 116.730275°
- Pipeline termination: -20.764005°, 116.740927°

Please refer to Figure 4 for the YMP Locality Map.





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PROJECT: Yurralyi Maya Pipeline  
 TITLE: Location Map  
 SUBTITLE:  
 DATE: 5/10/2018

**DATA SOURCE:**  
 Service Layer Credits: Sources: Esri, HERE DeLorme, Intermap, Increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap


**LEGEND:**  
 ● Offtake and Delivery Station  
 ▲ HELM\_PROD.SDE populatedplaces  
 — Yurralyi\_Maya\_Lateral  
 — Other Pipelines

**CLASS**  
 — Dual Carriageway  
 — Principal Road  
 — Secondary Road  
 — Minor Road

**SERIAL NUMBER:** MIDAS\_NUMBER  
**DOCUMENT NUMBER:** Uncontrolled

Revision	Description	Drawn	Checked	QC	Approved	Date
1.0	ISSUED FOR USE	AT	SA	LG	LD	05/08/18
0.1	DRAFT	AT	SA	CC	DD	01/08/18

**SCALE:** 1:7,374 @ A3 GCS GDA 1994  
 0 0.075 0.15 0.3 Km

**LOCATION DIAGRAM**  


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Figure 4 YMP Locality Map

### 3. Activity Description

The PGL and WAL are managed as part of the APA Pilbara South Field Services Region and the Maintenance Base is Newman Maintenance Base.

The CPL and YMP are managed as part of the APA Karratha Field Services Region and the Maintenance Base is Karratha Maintenance Base.

Work activities carried out will be monitored and controlled as per the requirements of the Permit to Work (PTW) System.

Routine maintenance activities occur seven days per week. Works occur between 06:00 – 18:00, excluding any activity associated with emergency / critical situations.

#### 3.1 General Equipment, Easement and Facility Maintenance

General equipment, easement and facility maintenance includes the following:

- Servicing and overhauls of machinery and equipment;
- Equipment inspections and testing;
- Monitoring;
- Erosion management and remediation (inclusive of import of fill);
- Modification of fencing, include minor concreting for footings;
- Maintenance of temporary site offices, ablutions, laydown, and parking areas;
- Filter inspections and replacement;
- Odorant tank swap out / injection; and
- Small scale facility works.

The above activities involve various mechanical and electrical tasks which are undertaken by appropriately qualified Technicians.

Filter inspections are undertaken at regular intervals and filters replaced as required. Filter replacement involves filter removal, wash down with water and transfer to a secure container for transfer to appropriate offsite disposal facilities.

Pipeline warning signs are in accordance with AS2885. Signs are placed so as to be inter-visible and may require replacement.

Erosion and subsidence management requiring the import of fill, ground/surface compaction and the mobilisation of earth-moving machinery, may be required intermittently to ensure ongoing pipeline integrity. Fill will be clean of weeds and disease and sourced locally, where possible.

Small scale upgrades are required intermittently to allow for increased services or changes in pipeline requirements. Works may include minor concreting for footings, maintenance of temporary site offices, ablutions, laydown and parking areas to facilitate the small-scale installations. Works will be restricted to the pipeline licence area.

Water Bath Heater's (WHB) consists of electric elements that get hot when electricity passes through them. The WBH's contain water which is treated with biocide or a corrosion inhibitor. These chemicals are stored at the MB and brought to site when required. Demineralised water, rainwater or mains water is used. WBH water is sampled and analyses on a three monthly basis and is treated based on the results as required. Water is treated by draining approximately 10L of water into a bucket, adding the chemical and then topping up the WBH (manual process). The water is changed in line with the pressure

equipment inspection. This is done via isolating the WHB and draining the water into a bunded IBC. The water is then either reused or disposed of by a licensed waste carrier.

During emergency/critical situations, night works and additional lighting may be required.

### **3.2 Pipeline Excavation**

Pipeline excavations are undertaken periodically typically for pipeline repairs. The scales of excavations are generally single defect dig-ups (3m x 3m).

Dewatering is sometimes required where the water table is present at less than a few metres from the ground surface, however this is rare (once every 5-10 years).

Abrasive blasting and coating activities may be conducted on an ad-hoc basis (likely once every ten years, based on similar APA pipelines).

The excavations are usually backfilled on the same day. Occasionally, if the repairs cannot be completed in one day, the excavation may be left open overnight. In FY24, across all APA WA assets, only five excavations were left overnight.

### **3.3 Venting**

Venting of gas is undertaken to purge pipelines or facilities for maintenance or emergency response purposes. The Integrated Operations Centre Controller assists to monitor and respond to any unplanned/uncontrolled venting or gas release incidents via information provided on the on the operator interface.

### **3.4 Pigging**

#### **3.4.1 Cleaning Pigging**

Pigs are run between pipeline scraper stations containing pig launching and receiving facilities. Particulate matter separated from the gas stream is a common by-product of pigging (removal of which is the goal in the case of a cleaning pig run), these are caught in the pig receiver trap along with the recovered pig and contained for appropriate offsite disposal.

#### **3.4.2 Intelligent Pigging**

Intelligent pigging is completed in accordance with the requirements of AS2885.3 Section 6 – Pipeline Structural Integrity. Currently it is APA's policy to run In Line Inspection (ILI) pigging every 5 years. Pigging programs involve thorough planning involving specialist Engineering, Operations and Safety personnel.

### **3.5 Easement inspections**

Pipeline easement inspections are conducted as aerial or vehicle patrols. Scope of these patrols aim to identify:

- Third party encroachments;
- Vegetation growth;
- Indicators of gas leaks;
- Line of sight;
- Presence of weed infestation greater than land immediately adjoining the corridor;
- Erosion;
- Exposed pipe; and

- Condition of signage and aerial markers.

Regular easement inspections are conducted.

The vehicle patrol is conducted from light vehicles and managed through MAXIMO with WOs being generated for completion. Any issues identified are documented and where necessary additional WO raised for corrective action to be completed.

The aerial patrol is undertaken via a contractor and any issues / occurrences that are recorded during the flight are uploaded into Field Maps directly by the contractor for APA to action.

Any changes to the above frequencies will go through a Management of Change process via Maximo prior to the change being in effect.

### **3.6 Hot Tapping**

Hot Tapping is the process of safely drilling a hole into an operating gas pipeline to allow a connection to be made. Excavations are within the previously disturbed boundaries.

### **3.7 Vegetation clearing**

The PPA requires upstream and downstream pipeline warning markers to be visible (line of sight). In some areas, plant regrowth obscures line of sight between pipeline warning markers and inhibits vehicle access for maintenance purposes and emergency response. In these instances, vegetation mulching becomes necessary. The activity does not disturb soils and vegetative root stock and soil quality is maintained.

Vegetation disturbance may also be required to facilitate minor excavations/dig-ups.

Vegetation mulching on The Pipelines may be classified as prescribed clearing (s.51C) (clearing: low impact petroleum activities). This shall be assessed during the APA Works Environment Assessment Form (WEAF) due diligence process.

If the clearing is not classified as prescribed clearing (s.51C), then a native vegetation clearing permit in line with Environmental Protection (Clearing of Native Vegetation) Regulations 2004 shall be sought. This is the responsibility of the Pipeline Owner.

### **3.8 Pipeline Protection**

Pipeline protection is required at crossings to ensure continued integrity of the pipeline is maintained. Pipeline protection by slabbing is a common practice. HDPE (high density polyethylene plastic) or concrete (either poured in situ or prefabricated) slabs can be laid over and/or under the pipeline underground at the crossing to protect the asset from external interference. Hydro-testing may also be required as part of this activity. Generally hydrotest water will be potable water.

### **3.9 Waste Management**

#### **3.9.1 General Waste**

No general waste is stored on The Pipelines. All waste is removed from site and stored at MB or CS.

#### **3.9.2 Contaminated Waste**

Hydrocarbon waste includes oily rags, hydraulic hoses, filters, oil absorbent pads, oil absorbent material including soil, empty oil containers and miscellaneous oily waste.

No contaminated waste is stored on The Pipelines. All waste is removed from site and stored at CS or MB.

Hydrocarbon bins are located at CSs or MBs. Hydrocarbon bins are collected by licenced controlled waste carriers. Tracking receipts maintained.

### **3.9.3 Controlled Waste**

Controlled waste produced during the activity include:

- Filter change wash water;
- Pigging wash water;
- WBH wastewater; and
- Used lead acid batteries.

APA controlled waste transport is managed in accordance with WA Controlled Waste Transport Management Plan which is inline with the Environmental Protection (Controlled Waste) Regulations 2004. All controlled waste is transported by a licenced controlled waste carrier and controlled waste tracking receipts are maintained.

#### **Filter and pigging wash water**

Spent filters may spontaneously combust due to presence of pyrophoric dust. To avoid spontaneous combustion, during filter changes, spent filters are immediately dispensed in a drum of water.

The pyrophoric dust collected on the used pigs may spontaneously combust. To avoid spontaneous combustion, during pigging, the pig is captured and dispensed in a container of water.

Filter and pigging wash water is potentially NORM. The waste is tested and transported in accordance with the APA WA Radiation Management Plan (RMP). If the laboratory analysis confirms it is not NORM waste, then it is classified as controlled waste and managed in accordance with WA Controlled Waste Transport Management Plan.

The wash water is transported to CS or MB for storage in bunded area for collection and disposal by a controlled waste carrier or in accordance with RMP (if it is confirmed NORM).

### **3.9.4 NORM Waste**

Potential NORM waste generated during pipeline operations (for example filter changes) is contained and tested (by trained personnel) on site using a handheld radiation meter. Where initial site testing indicates NORM may potentially be present, a sample is taken and sent to a laboratory for analysis. Potentially NORM contaminated materials (e.g. wastes generated from filter maintenance activities) may be temporarily stored in situ while awaiting for laboratory results and arranging for suitable transportation or disposal options.

Once laboratory analysis has confirmed NORMs waste, it is stored at APA's facilities (licenced by WARC).

### **3.10 Vehicle Access**

Vehicle activity predominantly comprises of light vehicles and occasional heavy vehicles for excavations, LOS clearing and associated maintenance activities. All access is restricted to the ROW and existing roads and tracks.

### **3.11 Planning for Closure**

The Pipeline Owner (RTIO) is responsible for decommissioning and rehabilitation commitments.

All pipeline and above ground facilities are currently in use and expected to continue operating in the foreseeable future (beyond five years).

RTIO shall develop a separate environment plan for the decommissioning and rehabilitation of The Pipelines which will be submitted to DMPE for review and approval prior to any work commencing for this activity.

Rehabilitation of the pipeline easement will be back to safe, stable and non-polluting form consistent with existing land use.

## 4. Receiving Environment

### 4.1 Climate

The Pipelines are located in the Pilbara Region. Seasonal and annual rainfall variability in the Pilbara Region is very high, however it generally experiences an arid-tropical climate characterised by a hot, relatively wet summer (October to April) and a mild dry winter (May to September). Rainfall is mainly associated with tropical cyclones and thunderstorms in mid to late summer with associated heavy rainfall, though the region also receives some winter rain.

Refer to Table 2 for mean monthly rainfall data (BOM 2018) and Table 3 for the mean monthly maximum and minimum temperatures (BOM 2018).

**Table 2 Mean Monthly Rainfall Data (Paraburdoo Aero; Site 007185; mm)**

J	F	M	A	M	J	J	A	S	O	N	D	Annual
55.4	75.2	49.9	24.8	18.1	24.0	14.2	10.4	3.5	4.1	8.3	26.9	324.2

**Table 3 Mean Monthly Maximum and Minimum Temperature (Port Hedland Airport; Site 004032; °C)**

	J	F	M	A	M	J	J	A	S	O	N	D
Max	40.6	38.7	36.8	33.7	29.0	25.1	24.8	27.7	31.3	36.0	38.4	40.4
Min	25.9	25.0	23.4	19.8	14.7	11.3	9.8	11.0	13.6	18.3	21.5	24.6

### 4.2 Physical Environment

#### 4.2.1 Topography

##### Paraburdoo Gas Pipeline

The PGL traverses the Hamersley Plateaux Zone of the Fortescue Province of Tille (2006). This zone comprises an area of 44,450 km<sup>2</sup> in the south of the Fortescue Province and includes the towns of Panawonica, Paraburdoo and Newman. The topography of the Hamersley Plateaux Zone consists largely of hills and dissected plateaux. Rugged hills and ridges are found on the basalt, banded iron formation and sandstone of the Hamersley Basin – most notably the Chichester and Hamersley Ranges. Hills tors and domes with minor sandy or stony plains are also a feature of this granitic terrain.

The main landform features of the Fortescue Province comprise rocky hills and stony plains. Rugged hills, ridges, dissected plateaux and mountains are also found on the basalt and sandstone of the Hamersley region. Over geological time sedimentary surfaces have eroded forming mesas and buttes while granite has remained forming hills and ridges in the area surrounding Newman. The main topographical features of the Fortescue Province include the Ashburton valley and the Ashburton river floodplains (Tille, 2006).

##### West Angelas Lateral

The WAL off take falls within the Ashburton Provinces of Tille (2006), however the pipeline itself is predominantly within the Fortescue Province. The Ashburton Province comprises an area of approximately 188,375 km<sup>2</sup> overlying the southern Pilbara and north-west Gascoyne Regions of WA, is based on the Capricorn Orogen tectonic unit of Tyler and Hocking (2001) and is closely aligned with the Ashburton botanical district of Beard (1990).

The Ashburton Province developed over a number of sedimentary basins that form the suture line between the Pilbara and Yilgarn Cratons. Landform features of the Ashburton

Province comprise primarily a mosaic of hilly terrain and stony plains. Rugged ranges, hills, ridges and plateaux are also found on the sedimentary rocks of the Ashburton Basin (Tille, 2006).

The off take facility and first part of the pipeline alignment is located in the far east of the Ashburton Valley (soil landscape) Zone of the Ashburton Province nearing the boundary to the Bulloo Plains and Hills (soil landscape) Zone of Tille (2006). The Ashburton Valley Zone is located along the Ashburton River between Nanutarra, Paraburdoo and Turee Creek Station. Primary features include hills and ranges with some floodplains and stony plains. Geology of the Ashburton Plains Zone is dominated by sandstone, shale and conglomerate of the Ashburton Basin.

Local topography is mainly low to moderate relief hills, ridges and scree slopes separated by Quaternary alluvial sheet-wash plains (Ecologia, 1998).

### **Cape Lambert and Yurralyi Maya Pipelines**

The Pipelines are both located within the Fortescue Soil-Landscape Province of Tille (2006).

Topographical features of the Fortescue Province include; rocky hills, stony and alluvial plains, the latter with a mixture of sandy surfaces and Gilgai flats. Bare tidal mudflats in coastal areas are backed by low dunes, behind which lie extensive alluvial plains that are bisected by a number of active floodplains. Broad sandy plains are also common in coastal areas.

## **4.3 Geology and Soils**

### **Paraburdoo Gas Pipeline**

The PGL traverses the Pilbara Craton, characterised by Archean and Proterozoic rock formations such as banded iron formations (BIF), granites, and metavolcanic rocks (Geological Survey of Western Australia, 2023). According to Tille (2006), soils in this area are generally shallow and stony, with loamy or sandy textures, often exhibiting a reddish hue due to high iron oxide content. These soils typically support sparse vegetation and are prone to erosion in disturbed areas.

### **West Angelas Gas Pipeline**

This pipeline passes through the Hamersley Range, which features Hamersley Group geological formations, including BIF, dolerite intrusions, and chert layers (Department of Mines, Industry Regulation and Safety, 2023). Tille (2006) describes the region's soils as predominantly red-brown, sandy or loamy, and gravelly, reflecting the arid conditions and high iron content of the parent material. These soils also have low fertility and are highly susceptible to compaction and surface crusting.

### **Cape Lambert Gas Pipeline**

The Cape Lambert Gas Pipeline lies along the Pilbara coastal plains, an area dominated by sedimentary formations with extensive alluvial and aeolian deposits (Geoscience Australia, 2023). Tille (2006) identifies the soils here as coastal sands and loamy soils, with saline and sodic characteristics often present in tidal flats and estuarine environments. These soils are subject to wind erosion and salinity issues in disturbed areas.

### **Yurralyi Maya Pipeline**

The YMP is located in an area underlain by Archean and Proterozoic rock sequences, including granitic terrains and metamorphosed sedimentary rocks (Department of Water and Environmental Regulation, 2023). According to Tille (2006), the soils are typically red, sandy or loamy, and gravelly, overlying weathered bedrock. These soils are nutrient-poor, prone to erosion, and have low water-holding capacity, making them a challenge for revegetation efforts.

### 4.3.1 Hydrology

Stream flows in the Pilbara Region are largely a direct response to rainfall and as such are seasonal and highly variable. Watercourses are predominantly ephemeral, many of which can be dry for a number of years between flows. Most major rivers in the Pilbara have extensive floodplains that periodically become inundated; and extreme floods can be experienced due to the influence of tropical cyclones. Evaporation rates are very high and generally exceed mean annual rainfall (Ruprecht and Ivanescu, 2000).

Water quality of rivers in the Pilbara is typically good with low salinity and nutrient loads. Stream salinities tend to decrease with increasing flows. Turbidity of water is generally low except during flood events when extremely high turbidity levels are observed (Ruprecht and Ivanescu, 2000).

#### **Paraburdoo Gas Pipeline**

The PGL crosses a flood plain area with minor creeks. Major rainfall events tend to concentrate flows in the Seven Mile Creek to the North-West of the pipeline route and the Turee Creek to the South-East of the pipeline route.

#### **West Angelas Gas Pipeline**

The WAL lies within the Turee Creek catchment, which is a fifth order sub catchment of the Ashburton River System or catchment area. The Ashburton is a parallel river system with short streams ending on the alluvial plain of the Ashburton River in coalescing outwash fans (KT-OSD, 2012).

There are three main drainage systems which flow to Turee Creek (East) denoted as north, central and southern, which rise in the east and flow to the west where they join near the southern end of the existing airstrip (KT-OSD, 2012).

Flows in all creek systems in the West Angelas and Turee area are ephemeral and there are no permanent surface water resources or springs (KT-OSD, 2012).

Groundwater elevation typically fluctuates seasonally in the WAL area and is responsive to rainfall recharge and the Turee Creek when it flows or floods (KT-OSD, 2012). Monitoring at West Angelas indicates that the water table in the area is 668 mRL.

#### **Cape Lambert Gas Pipeline**

The CPL is located within the Coastal Plain geographical formation of the Pilbara Region. Rivers of the Coastal Plain generally flow in a northerly direction discharging to the ocean via direct ocean outlets or dispersal through marshy flats. Freshwater flows are ephemeral, characterised by short periods of high flow coinciding with major rainfall events. Rivers crossing the coastal plain have extensive floodplains and contribute to significant groundwater resources (Ruprecht & Ivanescu, 2000).

Groundwater in the region occurs in the basement rocks, sedimentary basins and superficial deposits. Groundwater is highly localised with little regional flow. Recharge is directly related to rainfall (Ruprecht & Ivanescu, 2000). Quality of both surface and groundwater on the Coastal Plain is generally good containing low levels of salinity, contamination and nutrient loads (Ruprecht & Ivanescu, 2000).

The PL8 alignment crosses numerous ephemeral drainage lines.

The PL106 alignment intersects an intertidal creek at KP 0.04. This creek was subject to the *Rights in Water and Irrigation Act 1914* during construction and a Section 17 permit to interfere with the bed or banks of watercourses was sought for the construction crossing. There are no ongoing commitments from this RTIO permit.

With the exception of the intertidal creek at KP 0.04, PL106 does not intersect any major streams or catchment systems (Monadelphous 2015).

Site investigations across the Cape Lambert operations indicate that depth to groundwater varies from 2 m to 9 m below ground level (WRC, 2003). The groundwater occurs in superficial deposits and fractured basalt and flows westward towards the Indian Ocean. In the southern area of Cape Lambert, the groundwater flows in a south-west direction (Monadelphous 2015).

### **Yurralyi Maya Pipeline**

The YMP alignment does not dissect any major drainage lines (OSD 2009).

Drainage lines in the area run towards the Dampier Salt evaporation ponds to the west of the pipeline alignment (OSD 2009).

Detailed groundwater information for the YMP area is not available. However, time series data from a bore in the nearby 7-Mile rail yard indicates ground water levels are variable, ranging from 3-6 m below ground level (OSD 2009).

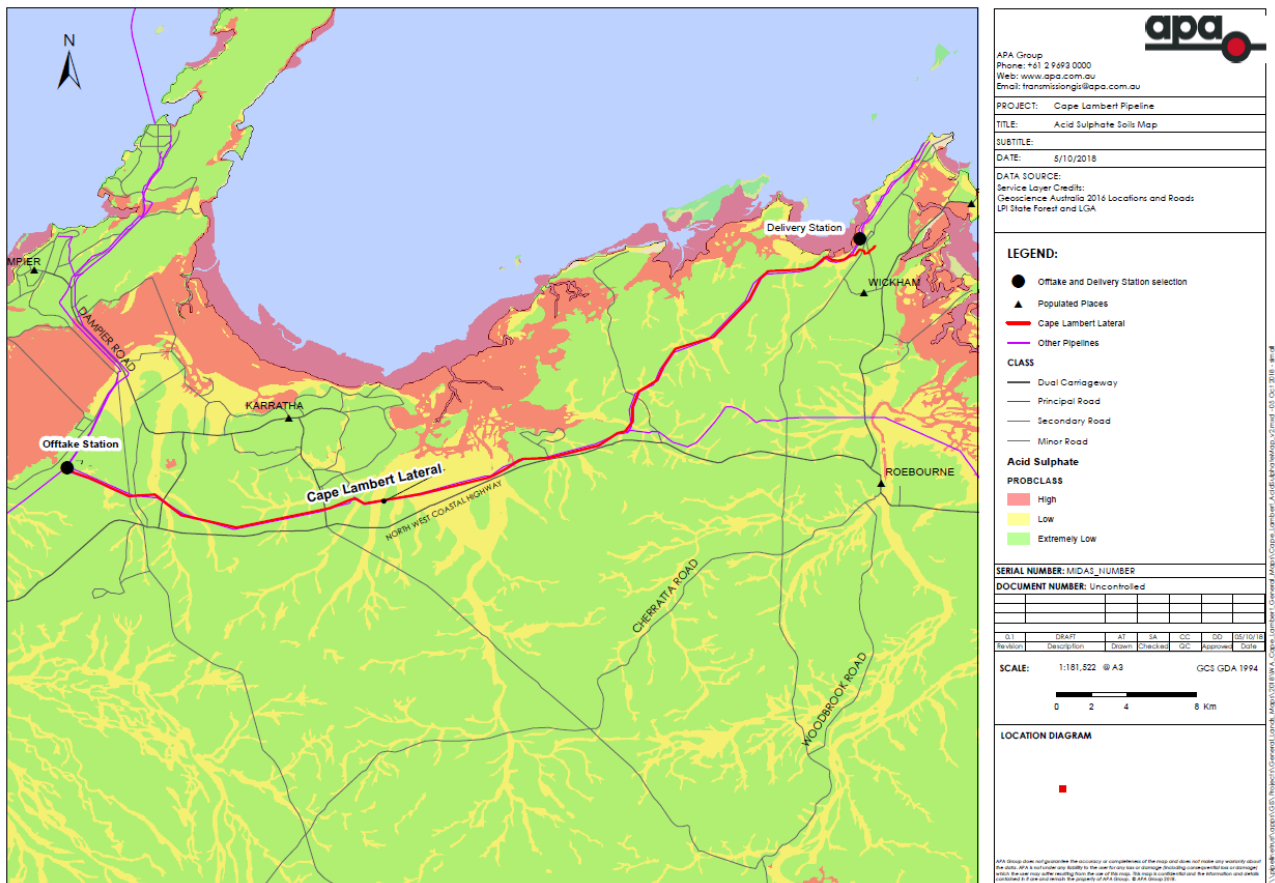
#### **4.3.2 Acid Sulfate Soils**

Acid sulfate soils (ASS) are naturally occurring soils and sediments containing sulfide minerals, predominantly pyrite (an iron sulfide). In an undisturbed state below the water table, these soils are benign and not acidic. However, if the soils are drained, excavated or exposed by lowering of the water table, the sulfides will react with oxygen to form sulfuric acid. Flushing of acidic leachate to groundwater and surface waters can cause off site impacts including impacts to aquatic and riparian ecosystems, agriculture and contamination of groundwater.

ASS are not expected to be an issue along the PGL, WAL and YMP. As per the Atlas of Australian Acid Sulfate Soils, the pipelines are located in an area of extremely low probability (1-5%) and low probability (6-70%) of ASS.

A review of the Atlas of Australian Acid Sulfate Soils (accessed: September 2018), indicated that the vast majority of the Cape Lambert Gas Lateral is situated within soils which have either an extremely low probability (1-5%) or low probability (6-70%) occurrence of ASS. However, a small sections of the pipeline towards the coast skirt the edges of soil types which have a high probability (>70%) of ASS.

Refer to Figure 5 for CPL ASS map.



**Figure 5 CPL Acid Sulfate Soil**

**4.3.3 Contaminated Sites**

The Pipelines do not intersect any registered contaminated sites.

**4.4 Biological environment**

**4.4.1 Flora and Vegetation**

**Paraburdoo Gas Pipeline**

Various vegetation types were identified by Biota Environmental during studies conducted between 2003 (spring survey), 2004 and 2005 along the PGL pipeline route, reflecting the range of habitats (from a broad clayey plain in the southern section to stony plains and hills in the northern section). In general, the families and genera recorded were typical of those that dominate the flora of this section of the Pilbara (e.g. wattles – *Acacia* spp., emu-flowers – *Eremophila* spp., mulla-mullas – *Ptilotus* spp., cassias – *Senna* spp.; grasses – Poaceae family and daisies – Asteraceae family). The list of Chenopodiaceae (bluebushes etc.) was larger than would typically be recorded on a survey of this size, a reflection of the large area of clayey plain habitat occurring within the corridor. Eucalypts (*Eucalyptus* and *Corymbia* spp.) were conspicuously absent.

Refer to Table 4 for IBRA vegetation community summaries for the PGL.

No Declared Rare Flora (DRF) were found along the PGL pipeline route.

A single Priority flora species was recorded. *Ptilotus trichocephalus* (Priority 4) is known from only a few populations, most of which are in the adjacent Ashburton District, however there is a previous record from the “Paraburdoo mine flats”. This small annual herb was recorded from eight locations on the broad clayey plain. These records comprised small patches of up to 25 individuals. The typical vegetation in this area comprised scattered Snakewood *Acacia xiphophylla* shrubs over scattered low shrubs dominated by *Maireana villosa*, *Senna hamersleyensis* and *Sclerolaena* spp. Small stands of *P. trichocephalus* are

likely to occur sporadically throughout the clayey plain sections (southern section of the pipeline).

Hamersley Iron has consulted with DBCA regarding the *Ptilotus trichocephalus*, particularly in relation to the collection and distribution of seed.

**Table 4 Vegetation Communities of the PGL and WAL**

IBRA Region	Vegetation Communities Present
Pilbara	<ul style="list-style-type: none"> <li>• Mulga low woodland over bunch grasses on fine textured soils;</li> <li>• Salt marsh, Mulga bunch grass and short grass communities on alluvial plains;</li> <li>• Shrub steppe characterised by <i>Acacia pyrifolia</i> over <i>Triodia pungens</i> hummock grasses over archaean granite and basalt plains;</li> <li>• Snappy gum tree steppes on ranges;</li> <li>• Grass savannah of mixed bunch and hummock grasses over quaternary alluvial plains;</li> <li>• Dwarf shrub steppe of <i>Acacia translucens</i> over <i>Triodia pungens</i> over quaternary alluvial plains; and</li> <li>• <i>Samphire Sprobolus</i> and <i>Mangal</i> on marine alluvial flats.</li> </ul>
Gascoyne	<ul style="list-style-type: none"> <li>• Open Mulga woodlands on shallow earthy loams over hardpan on plains;</li> <li>• Mulga scrub and Eremophila shrub lands on shallow stony loams of the ranges; and</li> <li>• Salt lake features supporting succulent steppes in the east.</li> </ul>

### West Angelas Gas Pipeline

The WAL lies within the Hamersley Plateau of the Fortescue Botanical District of the Eremaean Botanical Province, as defined by Beard (1975). The vegetation of this region is typically tree steppe of scattered Snappy Gum (*Eucalyptus leucophloia*) with a general hummock grassland cover of *Triodia wiseana* (Biota, 2010b).

The Project area intersects four of Beard’s mapping units:

- Hamersley 82: Scattered Snappy Gum (*Eucalyptus leucophloia* subsp. *Leucophloia*) trees over hard Spinifex (*Triodia wiseana*) hummock grasslands.
- Hamersley 18: Low woodland of Mulga (*Acacia aneura*).
- Hamersley 169: Shrublands of Mulga and minniritchi scrub.
- Kumarina Hills 29: Sparse low woodland of Mulga, discontinuous in scattered groups.

In general, the families and genera in the area are typical of those that dominate the flora of this section of the Pilbara (e.g. wattles – *Acacia* spp., emu-flowers – *Eremophila* spp., mulla-mullas – *Ptilotus* spp., cassias – *Senna* spp.; grasses – *Poaceae* family and daisies – *Asteraceae* family).

Refer to Table 4 for IBRA vegetation community summaries for the WAL.

No Threatened Ecological Communities (TECs) are known to occur in or adjacent to the WAL/WAL-R area (KT-OSD, 2012: Biota 2018).

One Priority Ecological Community (PEC) is known to occur on cracking clay habitats adjacent to the West Angelas mine site (KT-OSD, 2012). The WAL-R area intersects the buffer zone of the Priority 1 PEC West Angelas Cracking Clays (Biota, 2010b). This community is described as:

“Open tussock grassland of *Astrebla pectinata*, *A. elymoides*, *Aristida latifolia* in combination with *Astrebla squarrosa* and low scattered shrubs of *Sida fibulifera*, on basalt derived cracking-clay loam depressions and flow lines” (DEC, 2013).

Threats to the community include the increasing footprint of the mine and related infrastructure and activities (DEC, 2013). Weed proliferation and changes to natural fire regimes in disturbed areas are also threat (DEC, 2013).

One of the vegetation units within the WAL realignment area surveyed by Biota is considered to represent the PEC; the vegetation unit covers a small percentage (0.3%) of the surveyed area. A second vegetation unit covering 0.7% of the surveyed area is considered to have a close association with the PEC and a third community covering 1.8% of the surveyed area is considered to have a minor association (Biota 2018).

Three mulga ecosystems of conservation interest were noted in flora studies, however land systems mapping and field observations suggest that these communities may be common and widespread in the locality (Biota, 2010b).

Two surveys were undertaken prior to WAL construction to identify flora of conservation significance in the vicinity of the Project using both desktop and field survey assessment.

- A Flora and Vegetation Survey of the Proposed West Angelas Gas Station and Pipeline Corridor (Biota 2010a)
- Flora, Vegetation and Fauna Assessment of the Re-aligned Gas Pipeline Corridor at West Angelas (RTIO-HSE-0131727).

Prior to the WAL realignment in 2019, two vegetation, flora and fauna assessments of the realignment area were undertaken, along with a desktop review of the realignment area (Biota 2018). The review considered regional information, previous biological surveys in the locality, and the results of database searches. Five priority species were identified during field and desktop surveys of the area:

- *Aristida lazaridis*, *Eremophila pusilliflora*, and *Isotropis parviflora* (Priority 2).
- *Rhagodiasp.* Hamersley (M. Trudgen 17794) and *Themedasp.* Hamersley Station (M.E. Trudgen 11431) (Priority 3).

No DRF species under the *Biodiversity Conservation Act 2016* were recorded in preconstruction surveys.

None of the Species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were recorded in the pipeline area (KT-OSD, 2012).

Suitable habitat for *Lepidium catapycnon* (Priority 4) does exist within the pipeline area; however it was not identified despite extensive ground traverses and quadrat coverage of the pipeline area within preconstruction studies (KT-OSD, 2012).

### **Cape Lambert – PL8**

In March 2008, Pilbara Iron commissioned Biota Environmental Sciences (Biota) to undertake a biological assessment of a proposed Electricity Transmission Line from the 7-mile power station to Cape Lambert. The study area included the PL6 area.

There were no records of Declared Rare Flora (DRF) recorded during the 2008 survey by Biota. In 2008 only two DRF were listed for the Pilbara (*Thryptomene wittweri* and *Lepidium catapycnon*), and neither would be expected to occur on the basis of their known distributions and habitat preferences (Biota 2008).

One Priority species was recorded during the 2008 survey: *Hibiscus brachysiphonius* (Biota 2008). However, this has since been reclassified as Not Threatened.

### **Cape Lambert – PL8**

During PL106 construction, an assessment of all biological surveys undertaken by consultants and RTIO Botanists providing extensive flora, vegetation and fauna data for the PL106 area and locality were consulted in lieu of a botanical survey (Biota 2008d).

Based on a review past botanical surveys, 15 intact vegetation units were identified within the PL106 Project Area and a significant area of disturbed ground. The condition of the vegetation ranges from poor to excellent (OSD 2015).

The vegetation of this province is typically open, and frequently dominated by spinifex, acacias and occasional eucalypts (OSD 2015). On the seaward margin of the granite plain, the alluvia are mainly sandy. There are extensive sandplains characterised by dwarf-shrub steppe covered by the hummock grass *Triodia epactia/pungens* and interspersed by numerous low spreading shrubs of *Acacia stellaticeps* (OSD 2015). These sandplains are mostly devoid of taller shrubs or trees, but there may sometimes be scattered tall shrubs of *Acacia inaequilatera*, *A. pachycarpa*, *A. colei* var. *colei*, *A. tumida* and *Hakea loreal/chordophylla* (OSD 2015).

The granite plain is broken by numerous stony rises, low hills, basic dykes, large granite outcrops, and small ranges of hard, resistant Archaean rock. Stony rises and low hills are mainly characterised by the replacement of *Triodia epactia/pungens* with *Triodia wiseana*, *T. longiceps* or *T. angusta* (OSD 2015).

Floristic composition and structure of these vegetation types are relatively common to this coastal region, and are well represented outside the study area (Table 5). The diversity of vegetation types and landforms within the study was within expected ranges for a study area of this size (OSD 2015).

Secondary coastal dune habitat within the PL106 area has been identified as potential *Lerista neviniae* (EN fauna as listed under the Wildlife Conservation Act 1950; EN fauna as listed under the *Environment Protection and Biodiversity Conservation Act 1999*) habitat (OSD 2015).

*Lerista neviniae* habitat is recorded as exclusion zones within RTIO and APA GIS layer.

Outside of the potential *Lerista neviniae* habitat areas, diversity of the landforms and habitats is not considered atypically high or low for a Project Area of this size based on the assessment of vegetation units mapped within the Project Area (OSD 2015). No unique or range-restricted habitats were observed within the vicinity of the Cape Lambert Power Station project area which may be important for biodiversity on a local or sub-regional scale (RTIO, 2011; OSD 2015).

**Table 5 Habitat and vegetation units recorded in the vicinity of PL106 (OSD 2015)**

Broad Habitat	Area (ha)	Vegetation Description	Condition (Report cited)
Coastal plains	0.9 ha	<i>Acacia ampliceps</i> tall shrubland over <i>Sporobolus virginicus</i> closed tussock grassland.	Very Good (Biota 2008d)
Stony lower slopes and plains	5.8 ha	<i>Acacia bivenosa</i> scattered shrubs over <i>Acacia stellaticeps</i> low open shrubland over <i>Triodia epactia</i> hummock grassland.	Good (Biota 2008a)
Stony hills	1.3 ha	<i>Acacia bivenosa</i> scattered shrubs over <i>Triodia wiseana</i> hummock grassland.	Very Good to Excellent (Biota 2008a)
Coastal dunes	0.06 ha	<i>Acacia coriacea</i> subsp. <i>coriacea</i> tall shrubland over * <i>Cenchrus ciliaris</i> tussock grassland.	Poor (Biota 2008d)
Stony plains	6.3 ha	<i>Acacia colei</i> var. <i>ileocarpa</i> , <i>A. ancistrocarpa</i> tall open shrubland over <i>A. bivenosa</i> open shrubland over <i>A. stellaticeps</i> low open shrubland over <i>Triodia wiseana</i> , <i>T. epactia</i> hummock grassland.	Very Good (Biota 2010a)
Sand plains	5.8 ha	<i>Acacia colei</i> var. <i>colei</i> , <i>Grevillea pyramidalis</i> tall open shrubland over <i>Triodia epactia</i> , <i>T. schinzii</i> closed hummock grassland.	Very Good (Biota 2008a)

Broad Habitat	Area (ha)	Vegetation Description	Condition (Report cited)
Stony slopes	2.2 ha	<i>Acacia stellaticeps</i> low open shrubland over <i>Triodia epactia</i> , <i>Triodia schinzii</i> hummock grassland.	Excellent (Biota 2008e)
Tidal inlets	13 ha	Samphires and Halophytes with <i>Cenchrus ciliaris</i> .	Good (GHD 2008)
Stony hills	0.3 ha	Hummock Grassland; <i>Triodia epactia</i> , herbs (variable) may have scattered shrubs and emergent tree species.	Good to Very Good (GHD 2008)
Minor flowlines	0.3 ha	Low Woodland (variable), Shrubland (variable), Hummock Grassland (variable); <i>Acacia colei</i> and or <i>C.hamersleyana</i> Acacia species, over Mixed Shrubs over <i>Triodia pungens</i> .	Very Good (GHD 2008)
Coastal dunes	1.3 ha	<i>Avicennia marina</i> , <i>Spinifex longifolia</i> , <i>Cajunus cinereus</i> and <i>Carnivalea rosea</i> on beaches.	Good to Very Good (GHD 2008)
Sandy plains	3.2 ha	<i>Melaleuca lasiandra</i> , <i>Acacia colei</i> var. <i>colei</i> tall shrubland over <i>Triodia epactia</i> , <i>T. schinzii</i> closed hummock grassland.	Very Good (RTIO 2010)
Coastal dunes	0.04 ha	Shrubland to tall shrubland of <i>Acacia coriacea</i> subsp. <i>coriacea</i> over open shrubland of <i>Crotalaria cunninghamii</i> , <i>Santalum lanceolatum</i> , <i>Scaevola cunninghamii</i> and <i>Rhagodia preissii</i> subsp. <i>Obovata</i> over tussock to open tussock grassland of <i>Spinifex longifolius</i> , <i>Whiteochloa airoides</i> and <i>Cenchrus ciliaris</i> .	Poor to Good (Biota 2008b)
Coastal dunes	1.4 ha	Tall shrubland of <i>Acacia coriacea</i> subsp. <i>coriacea</i> over <i>Crotalaria cunninghamii</i> , <i>Rhagodia eremaea</i> , <i>Scaevola sericophylla</i> and <i>Scaevola spinescens</i> low open shrubland over <i>Triodia epactia</i> hummock grassland and/or <i>Cenchrus ciliaris</i>	Poor or Good to Poor (Biota 2008b)
Saline interzones	1.3 ha	<i>Acacia ampliceps</i> tall shrubland, with <i>Sesbania cannabina</i> tall open herbland over <i>Sporobolus virginicus</i> tussock to closed tussock grassland.	Very Good to Excellent (Biota 2008b)
N/A	13.3 ha	Areas completely devoid of vegetation or with significant weed invasion.	N/A

No vegetation communities listed as Threatened Ecological Communities (TECs) under the EPBC Act, and no TECs or Priority Ecological Communities (PECs) listed at State level occur or would be expected to occur in the Study Area (OSD 2015).

No flora species listed under the EPBC Act were recorded within the Project Area (OSD 2015).

No Declared Rare Flora (DRF) species were recorded from the Project Area and none would be expected to occur (OSD 2015).

*Tephrosia rosea* var. Port Hedland (Priority 1 flora as listed under the *Wildlife Conservation Act 1950*) was recorded within the licence area (OSD 2015).

RTIO completed a desktop review that draws upon multiple flora and vegetation surveys. RTIO does not have records within internal Priority Flora database that suggests the species is found within the alignment. There are however records that show *Tephrosia rosea* var. Port Hedland within 500 m of the alignment.

*Tephrosia rosea* var. Port Hedland may occur on the alignment.

Prior to ground-disturbing activities an APA WEF is conducted to ensure all relevant regulatory approvals are gained prior to commencement of ground-disturbing activities.

**Yurralyi Maya**

The YMP falls within the Pilbara bioregion, within the Roebourne biological sub-region. Biota Environmental Sciences (Biota) undertook post-rain surveys in 2008 in an extended area, which include the YMP corridor.

A total of four vegetation types were identified in the study area, all of which were located on clayey plains and/or on calcareous loamy plains. Three of the vegetation types were located near the pipeline corridor area (Biota 2008c):

- *Eragrostis xerophila* tussock grassland on clay plains: This vegetation occurred in an area presently mapped as the Roebourne Plains coastal grasslands PEC (Dr Stephen van Leeuwen, Department of Environment and Conservation, pers. comm. 2008).
- *Acacia bivenosa*, *A. inaequilatera* open shrubland over *Chrysopogon fallax* very open tussock grassland and *Triodia wiseana* hummock grassland on stony clay plains
- *Acacia inaequilatera* scattered tall shrubs over *Triodia wiseana* hummock grassland on stony clay plains

Of the identified types, portions of the *Eragrostis xerophila* tussock grassland on clay plains community has been listed by DBCA as the Roebourne Plains Grassland PEC (Biota 2008c). The PEC has been previously mapped by the DBCA and identified within the envelope site, and along the construction heavy vehicle access road and water pipeline service corridors (Biota 2008c). The PEC area is generally considered to be in excellent condition (Biota 2008c).

No Priority or DRF flora species were identified in the Study Area (Biota 2008c).

No TECs were identified within the Study Area (Biota 2008c).

The YMP does not intersect any ESAs under section 51B of the EP Act.

#### 4.4.2 Weeds

##### Paraburdoo Gas Pipeline

Six weed species have been recorded during studies of the PGL area (Biota 2003, 2004, 2005):

- Ruby Dock (*Rumex vesicarius*);
- Kapok bush (*Aerva javanica*);
- Beggar's Tick (*Bidens bipinnata*);
- Buffel grass (*Cenchrus ciliaris*);
- Birdwood grass (*Cenchrus setiger*); and
- Purpletop Chloris (*Chloris barbata*).

##### West Angelas Gas Pipeline

Eight weed species were recorded within the WAL realignment area during surveys (Biota 2016):

- Buffel Grass (*Cenchrus ciliaris*)
- Native Thornapple (*Datura leichhardtii*)
- Speedy Weed (*Flaveria trinervia*)
- Spiked Malvastrum (*Malvastrum americanum*)
- Ruby Dock (*Rumex vesicarius*)
- Whorled Pigeon Grass (*Setaria verticillata*)
- Common Sowthistle (*Sonchus oleraceus*)

No Declared Weeds were recorded during the WAL Flora Surveys (Biota 2010; RTIO-HSE-0131727) and the PGL Flora Surveys (Biota 2003, 2004, 2005). None of the species recorded during the 2016 survey of the WAL were Declared Weeds.

### **Cape Lambert**

A weed survey of the CLP by Biodiversity Australia was completed in March 2024. The following weeds were identified:

- Buffle grass (*Cenchrus ciliaris*)
- Flannel Bush (*Solanum lasiophyllum*)
- Hooked Bristlegrass (*Setaria verticillata*)
- Mimosa Bush (*Vachellia farnesiana*)
- Ruby Dock (*Rumex vesicarius*)

### **Yurralyi Maya**

Four introduced (weed) species were recorded from within the Biota (2008) study area; all four species are Permitted organisms (under section 11 of the BAM Act); Kapok Bush (*Aerva javanica*), Buffel Grass (*Cenchrus ciliaris*), Ulcardo Melon (*Cucumis melo* subsp. *Agrestis*) and Purslane (*Portulaca oleracea*).

No weeds have been recorded on the CPL during corridor condition inspections over the past five years.

## **4.4.3 Fauna**

### **Paraburdoo Gas Pipeline**

A desktop fauna review of the PGL pipeline corridor was completed by Biota in 2004, prior to pipeline construction. Consultation with the DBCA prior to pipeline construction, indicated the requirement to complete a desktop assessment of fauna species potentially present along the planned construction corridor (Biota, 2004). No site visit was carried out to ground-truth or refine the assessment presented in the desktop review and no systematic sampling of fauna or detailed description of fauna habitats was carried out (Biota, 2004).

The methodology used to carry out this review included:

- the use of ArcView GIS to intersect the proposed pipeline route with spatial datasets to identify broad substrate units (digitised geological coverage (State Geology 1:500 000; Bulletin 144, GSWA 1996) and Atlas of Australian Soils data). A corridor buffered by 1 km either side of the pipeline route was used for this purpose;
- a review of other fauna and flora surveys previously completed in the locality (particularly Hamersley Iron's Southern Plains Fauna Survey (Biota 2002a), Survey of Environmentally Significant Features at Channar (Biota 2003a) and a Threatened flora and vegetation assessment of the proposed pipeline corridor completed by Biota (2003b));
- a search of the DBCA (titled Department of Conservation and Land Management at the time) Threatened Fauna Database for the area locality of the proposed gas pipeline; and
- a search of the Western Australian Museum FaunaBase to obtain a listing of specimen records from the state's collection for the locality (search area bounded by 22.8°S, 117.4°E and 23.3°S, 117.9°E).

The search of the WA Museum's collection records, during the 2004 Biota survey, yielded a total of 95 species of vertebrate fauna collected from the 0.5° block surrounding the study area (proposed pipeline corridor). This tally included 57 species of herpetofauna, comprising eight agamid species (dragons), two pythons, nine elapids (front-fanged snakes), three blind-snakes, 12 geckos, four pygopodids (legless lizards), two varanids, two

frogs and 15 skink species. The search returned 18 native mammal species and 20 bird species.

The 2004 Biota desktop fauna review indicated the following priority and conservation significant fauna may potentially occur within the PGL study area:

- Orange Leaf-nosed Bat (*Rhynonictoris aurantia*) (EPBC Status: Vulnerable, WA Status: Vulnerable). Although known from the general locality, no potential roost sites were found to occur along the gas pipeline construction corridor. Pipeline construction was deemed unlikely to have any impacts on this species.
- Pilbara Olive Python (*Liasis olivaceus barroni*) (EPBC Status: Vulnerable, WA Status: Vulnerable). The ranges near Paraburdoo are known to contain suitable habitat and a population of this species was recorded from scat material and individuals by Ninox Wildlife Consulting (1995) and in the Eastern Ranges area (Biota 2002a). The species was found to likely occur in parts of the Channar mining leases and the desktop fauna review stated the species may occasionally be present along the proposed gas pipeline construction corridor.
- The ghost bat (*Macroderma gigas*) (EPBC Status: Vulnerable, WA Status: Vulnerable). The cave environments where the ghost bat colonies are present are described as nationally and internationally significant due to the ghost bat's vulnerable status. The desktop fauna review stated no impacts on this species would be expected to arise from pipeline construction.
- Peregrine Falcon (*Falco peregrinus*); OS listed species under the *Biodiversity Conservation Act 2016*. The Peregrine Falcon was recorded during the survey of the Southern Plains area (Biota 2002b) and the species was found to likely occur in the study area as suitable prey species would be likely to be common. Given its aerial nature and wide distribution, the desktop fauna review stated this species would not be affected by the pipeline construction.
- Western pebble-mound Mouse (*Pseudomys chapmani*). Given that some stony hills occur in the northern section of the corridor route, and that 10 *Pseudomys chapmani* were recorded during the Southern Plains fauna survey (Biota 2002a), the desktop fauna review stated this species may occur in the project area.
- Northern short-tailed Mouse (*Leggadina lakedownensis*). Given the locality and the clay substrate types present, the desktop fauna review considered it likely that this species occurs in the project area.

### **West Angelas Gas Pipeline**

One Vulnerable and one priority fauna species have previously been identified in the WAL area: -

- The ghost bat (*Macroderma gigas*); Vulnerable listed species under the *Biodiversity Conservation Act 2016* and the EPBC Act. The cave environments where the ghost bat colonies are present are described as nationally and internationally significant due to the ghost bat's vulnerable status.
- Western pebble-mound Mouse (*Pseudomys chapmani*).

The Western pebble-mound mouse was identified as occurring within the pipeline area during fauna surveys prior to WAL construction (KT-OSD, 2012). No Western pebble-mound mouse habitats are known to occur on the ROW (KT-OSD, 2012). Any mounds established post-pipeline construction are not anticipated to be disturbed by pipeline operations. Evidence of Western pebble-mound mouse (presence of pebble-mounds) was identified during a 2016 survey of the WAL realignment area. The species is typically found on stony hillside with hummock grasslands (Menkhorst and Knight, 2011) and is commonly to very common in suitable habitat within the Hamersley and Chichester subregions of the Pilbara bioregion.

## **Cape Lambert Gas Pipeline**

### **PL8**

In March 2008, Pilbara Iron commissioned Biota Environmental Sciences to undertake a biological assessment of a proposed Electricity Transmission Line from the 7-mile power station to Cape Lambert. The study area included the PL6 area. The biological survey included a fauna habitat assessment at a desktop level by Biota zoologists (Biota 2008c). “Based on the results of the various database searches, several fauna species of particular conservation significance may potentially occur within the current study areas on the basis of their known distributions” (Biota 2008c). These species are listed in Table 6 below.

**Table 6 Summary of Biota Fauna Desktop Assessment of the 2008 Study Area which includes PL6**

Species	Impact on Conservation Significance (Biota 2008)
Northern Quoll <i>Dasyurus hallucatus</i> (State: EN, Federal: EN)	<p>“The Northern Quoll was originally recorded across Northern Australia from the North-west Cape in Western Australia to south-east Queensland, but has declined in recent years. Its distribution is now restricted to six main areas: the north and western top end of the Northern Territory, north of Cape York, the Atherton-Cairns area, the Carnarvon Range-Bowen area of Queensland (Menkhorst and Knight 2001), and the northwest Kimberley and Pilbara regions of Western Australia (Braithwaite and Griffiths 1994). There are numerous records of this species from the Dampier locality, mainly from the Burrup Peninsula, and occasional records from near Cape Lambert. Although the Northern Quoll may potentially occur within the area, it is unlikely due to a lack of suitable habitat. This species is most abundant in open, rocky habitat and is also commonly found in gorges and near creek lines, where breeding is successful (Strahan 2004). Major creek lines are absent from the study area, as are gorges and significant rocky habitat, resulting in sub-optimal habitat for this species.</p> <p>It is possible that the Northern Quoll may forage through the habitats encompassed by the study area“ (Biota 2008c)</p>
Mulgara <i>Dasyercus cristicauda</i> (State: VUL, Federal: VUL)	<p>“The Mulgara was formerly widespread in sandy deserts but is now rare and patchily distributed. Recent records are from the Great Victoria, Gibson, Great Sandy, Little Sandy and Tanami Deserts, the Pilbara, Gascoyne, Murchison, north-eastern Goldfields, Central Ranges region and Carnarvon basin (Kennedy Range). In the Pilbara, this species is most commonly recorded from Triodia-dominated sandy or sandy clay plains. The Mulgara has not been recorded from the Dampier area to date, and is highly unlikely to occur in the current study area.” (Biota 2008c)</p>
Banded Hare-wallaby <i>Lagostrophus fasciatus fasciatus</i> (State: Threatened; Federal: VUL)	<p>“This species was formerly more widespread through Western Australia, but is now restricted to Dorre and Bernier Islands in Shark Bay (Menkhorst and Knight 2001). Although there is a historic sighting of this species from Cossack, the Banded Hare-wallaby is now considered extinct on the mainland and would not occur within the study area.” (Biota 2008c)</p>
Pilbara Orange Leafnosed-bat <i>Rhinioncteris aurantius</i> (State: VUL, Federal: VUL)	<p>“Historically, this species has been recorded from a range of locations across the Pilbara since 1925. The perception that the species had declined was founded on the reduction in animal numbers at two mine sites previously known to contain roosting populations (Environment Australia 1999). However, widespread recent records of foraging animals and individuals caught in traps indicate that the species may not have contracted in its distribution, but actually persists across its former range. This species is more influenced by the availability of suitable roost caves than by habitat type (Churchill 1998). In the Pilbara, they are thought to be restricted to caves where at least semi-permanent water is nearby (Dr Kyle Armstrong, Kyoto University Museum, pers. comm. 2005). This species has not been recorded from the Dampier areas to date. Although it is possible that the Orange Leafnosed-bat may forage over the current study area, given the lack of any suitable roosting habitat (caves) within or immediately adjacent to the project areas, it is unlikely that the proposed clearing will have any impact on this species.” (Biota 2008c)</p>
Pilbara Olive Python <i>Liasis olivaceus barroni</i>	<p>“Regarded as a Pilbara endemic, this subspecies has a known distribution that coincides roughly with the Pilbara bioregion (Environment Australia 2000). The Pilbara Olive Python occurs in rocky areas within the Pilbara, showing a preference for rocky habitats near water, particularly rock pools. There are several records of this species from the Burrup Peninsula. Given its preference for gorges and escarpments, this species is unlikely to occur within the study area due to a lack of suitable habitat, both within the study area and in the immediate surrounds.” (Biota 2008c)</p>

(State: VUL, Federal: VUL)	
Peregrine Falcon <i>Falco peregrinus</i> (Migratory)	"The Peregrine Falcon has an almost cosmopolitan distribution, but is absent from most deserts and the Nullarbor Plain (Johnstone and Storr 1998). This species has been recorded from the Burrup Peninsula and has the potential to occur within the study area. Given the mobility of this species, its preference for riverine and breakaway habitats in the Pilbara, and the small scale of the proposed development, it is unlikely that the proposed clearing will adversely impact the conservation status of this species." (Biota 2008c)
<i>Lerista quadrivincula</i> (State: Priority 3, Federal: NA)	"This species is known from a single specimen at the Maitland River on the arid coastal plain near Karratha (Wilson and Swan 2003). As the species has not been recorded again since its first sighting, despite extensive pit-trapping in the region and targeted searches in the collection locality, its status remains uncertain. <i>L. quadrivincula</i> has not been recorded from the Dampier locality to date (see Biota 2008b and Biota 2008c)." (Biota 2008c)
Ghost Bat <i>Macroderma gigas</i> (State: VUL, Federal: VUL)	"The Ghost Bat was previously distributed across most of inland and northern Australia, but is now restricted to the tropical north of the continent (Churchill 1998). There is a single record of this species from the Burrup Peninsula. While the Ghost Bat may forage over the current study areas, no suitable roosting sites are present within or immediately adjacent to the areas. The proposed clearing is therefore unlikely to impact on the conservation status of this species." (Biota 2008c)
Western Pebble-mound Mouse <i>Pseudomys chapmani</i> (State: Priority 4, Federal: NA)	"This species is common to very common in suitable habitat within the Hamersley and Chichester subregions of the Pilbara bioregion, and is well known for its behaviour of constructing extensive mounds of small stones, typically on scree slopes and stony plains. It has been recorded from locations including Karratha, the Burrup Peninsula, Mt Anketell, Zebra Hill and Mardie prior to 1986, however it has not been recently recorded from the Dampier locality (see Biota 2008b and in Biota 2008c.). No pebble-mounds (either active or inactive) were noted in the current study area." (Biota 2008c)
Eastern Curlew <i>Numenius madagascariensis</i> (State: Critically Endangered, Federal: Critically Endangered)	"The Eastern Curlew occurs throughout coastal Western Australia, south to Bunbury (Johnstone and Storr 1998). This species breeds in northern Asia and is a summer migrant to Australia; it is moderately common in the Pilbara. The Eastern Curlew occurs mainly on tidal mudflats, and also on sandy beaches and rarely near coastal lakes (including saltfield ponds) (Johnstone and Storr 1998). This species was recorded on three occasions during the Cape Lambert Port Expansion fauna survey on tidal mudflats adjacent to mangroves (Biota 2008c), and was also observed on mudflats near the Dampier Salt saltfield (Biota 2008b). There are also two records from Nickol Bay (Appendix 6). The Eastern Curlew is unlikely to occur in the Transmission Line Corridor due to a lack of suitable habitat." (Biota 2008c)
Australian Bustard <i>Ardeotis australis</i> (State: Priority 4, Federal: NA)	"The Australian Bustard occurs over much of Western Australia, and prefers open or lightly wooded grassland including <i>Triodia</i> sandplains (Johnstone and Storr 1998). There is a record from Mardie Station from 2000 and a record from Mt Anketell in 2007 (Appendix 6). Four birds were sighted within habitats near the 7-Mile power station envelope and heavy access route (Biota 2008b), and it is probable that this species would occasionally occur in the study area. The small-scale habitat loss associated with clearing for the proposed project would not be expected to impact the conservation status of this species." (Biota 2008c)
Star Finch <i>Neochmia ruficauda subclaescens</i>	"This species is endemic to Australia, occurring from the Pilbara to south-eastern Australia. In the Pilbara, this taxon shows a preference for dense reedbeds and adjacent vegetation communities along permanent waterways. It is unlikely that this species occurs in the current study area due to a lack of suitable habitat. Given its widespread distribution and mobile nature, the proposed clearing is unlikely to alter its conservation status." (Biota 2008c)

(State: NA, Federal: Endangered)	
Rainbow Bee-eater <i>Merops ornatus</i> (Migratory)	"This species is widespread and common through the Pilbara, particularly in drainage habitats. This species was recorded once during the survey of the Cape Lambert port expansion area, from a site located on a secondary dune in <i>Acacia coriacea</i> shrubland over <i>Cenchrus ciliaris</i> tussock grassland (Biota 2008c). The Rainbow Bee-eater may occur within the Transmission Line Corridor and Mount Welcome Station study area. Given the small amount of vegetation clearing proposed for the development this would not be expected to impact on the conservation status of this species." (Biota 2008c)
<i>Lerista neviniae</i> (State: Threatened, Federal: Critically Endangered)	"The skink <i>Lerista neviniae</i> was recorded on 25 occasions from six trapping sites at Cape Lambert, all within dune habitat (Biota 2008c). This species was formally part of the <i>Lerista muelleri</i> species complex, which has recently undergone taxonomic revision (Smith and Adams 2007). Although <i>L. neviniae</i> is not currently assigned a conservation listing in either the <i>EPBC Act 1999</i> or the <i>Wildlife Conservation Act 1950-1979</i> , it should be noted that to date records of this species are known solely from Cape Lambert. It is unlikely that this species occurs in the current study area due to a lack of suitable dune habitat." (Biota 2008c)

## PL106

Prior to construction of the PL106 pipeline, a list conservation significant fauna recorded or potentially occurring in the PL106 Project Area was compiled. This list was completed by searches of the Department of Biodiversity, Conservation and Attractions (DBCA) databases, Western Australian Museum fauna databases and previous identification of fauna species in the Cape Lambert area during surveys for the Port B development (SKM, 2009; Monadelphous 2015).

Refer to Table 7 for a list of fauna species of conservation significance recorded or potentially occurring in the PL106 Project Area and an impact assessment of each species (Monadelphous 2015).

**Table 7 Fauna Species of Conservation Significance Recorded or Potentially Occurring in the PL106 Project Area (Monadelphous 2015)**

Species	State Level <sup>1</sup>	Federal Level <sup>2</sup>	Impact on Conservation Significance
<i>Dasyurus hallucatus</i> Northern Quoll	EN	EN	<ul style="list-style-type: none"> <li>• Prefers open rocky habitat, commonly found in gorges and near creek lines (Van Dycke and Strahan, 2008).</li> <li>• Major creeks and gorges are absent from the PL106 Project Area, as is a lack of denning and shelter habitat.</li> <li>• No suitable core habitat exists, although a minor portion of foraging habitat may be lost during construction.</li> <li>• It is considered unlikely that PL106 construction would impact the conservation status of this species.</li> </ul>
<i>Lerista neviniae</i> Nevin's Lerista	EN	EN	<ul style="list-style-type: none"> <li>• This species occurs in coastal dune habitats, typically comprising pale sands vegetated with open hummock grassland with emergent Acacia species (Biota, 2011).</li> <li>• Habitat is included in an exclusion zones that RTIO and APA maintain in their GIS database.</li> <li>• The areas of habitat identified by Biota most likely correspond with the primary and secondary dune habitats.</li> <li>• It was considered unlikely that the PL106 construction would result in any impact at either an individual or species level.</li> </ul>
<i>Liasis olivaceus barroni</i> Pilbara Olive Python	VU	VU	<ul style="list-style-type: none"> <li>• Occurs in rocky areas within the Pilbara, preferring habitats near semi-permanent water, particularly rock pools (Wilson and Knowles, 1988).</li> <li>• No suitable habitat exists within or near the study area, therefore it was considered unlikely that PL106 construction would impact the conservation status of this species.</li> </ul>
<i>Falco peregrines</i> Peregrine Falcon	OS	NA	<ul style="list-style-type: none"> <li>• This highly mobile species inhabits a wide range of habitats including forest, wetlands and mountainous summits (Johnstone and Storr, 1998).</li> <li>• The small amount of clearing required for PL106 construction meant it was considered unlikely that the construction</li> </ul>

<sup>1</sup> Biodiversity Conservation Act 2016

<sup>2</sup> Environment Protection and Biodiversity Conservation Act 1999

Species	State Level <sup>1</sup>	Federal Level <sup>2</sup>	Impact on Conservation Significance
			activities would impact the conservation status of this species due to its cosmopolitan distribution.
<i>Mormopterus loriae</i> <i>cobougiana</i> Little Northern Freetail Bat	P1	-	<ul style="list-style-type: none"> <li>This species is distributed throughout the West Australian coastal areas from Derby to the Exmouth Gulf, and is a mangrove specialist (Churchill, 1998).</li> <li>This species was recorded by Biota (2008c) in mangrove habitat within the survey area; however this was outside of the proposed impact area.</li> <li>Mangrove vegetation was unlikely impacted by PL106 construction, therefore it was considered unlikely that PL106 construction would impact the conservation status of this species.</li> </ul>
<i>Pseudomys chapmani</i> Western Pebblemound mouse	P4	-	<ul style="list-style-type: none"> <li>A small mouse well known for its ability to construct mounds of small stones (Strahan, 2004).</li> <li>No suitable habitat exists for this species to construct pebble mounds (hillcrests and slopes supporting stony hummock grasslands), therefore was considered unlikely that the PL108 construction activities would impact the conservation status of this species.</li> </ul>
<i>Leggadina lakedownensis</i> Short-tailed Mouse	P4	-	<ul style="list-style-type: none"> <li>In Western Australia, the distribution includes the Pilbara and Kimberley regions (Menkhorst and Knight, 2001).</li> <li>Primary habitat comprises areas of cracking clay and adjacent heath.</li> <li>No suitable habitat exists for this species within the study area, therefore it was considered unlikely that PL106 construction activities would impact the conservation status of this species.</li> </ul>
<i>Macroderma gigas</i> Ghost Bat	VU	VU	<ul style="list-style-type: none"> <li>The Ghost Bat, once previously widely distributed across most of inland and northern Australia, is now restricted to the tropical north of the continent (Churchill, 1998).</li> <li>A single record of this species was taken on the Burrup Peninsula in 2006.</li> <li>While the highly mobile nature of this species may enable it to potentially utilise foraging habitat within the study area, it would not be deemed "core" habitat.</li> <li>This species favours caves, mine shafts and deep rock fissures, therefore it was considered unlikely that the PL106 construction would impact the conservation status of this species.</li> </ul>
<i>Notoscincus butleri</i> Line Soil-crevice Skink	P4	-	<ul style="list-style-type: none"> <li>This species has been associated with spinifex-dominated areas near creek and river margins (Wilson and Swan, 2003).</li> <li>No moderate creeks or rivers lie within or adjacent to the study area, therefore it was considered unlikely the small amount of clearing would impact the conservation status of this species.</li> </ul>
<i>Numenius madagascariensis</i> Eastern curlew	VU & IA	CR & MI	<ul style="list-style-type: none"> <li>This species occurs throughout Australia mainly on tidal mudflats and sandy beaches (Johnstone and Storr, 1998).</li> <li>It is a summer migrant to Australia and breeds in northern Asia. It was recorded on tidal mudflats by Biota (2008c).</li> <li>The study area contains a portion of mudflat and beach habitat, of which some may be lost in the proposal.</li> </ul>

Species	State Level <sup>1</sup>	Federal Level <sup>2</sup>	Impact on Conservation Significance
			<ul style="list-style-type: none"> <li>Given the highly mobile nature of this species, and the widespread representation of this habitat within the locality, it was considered unlikely that PL106 construction would impact the conservation status of this species.</li> </ul>

Secondary coastal dune habitat within the pipeline licence area has been identified as potential *Lerista neviniae* (EN fauna as listed under the BC Act; EN fauna as listed under the EPBC Act) habitat (OSD 2015). This conservation significant habitat occurs on a small area of the PL106 corridor (OSD 2015).

### Yurralyi Maya Pipeline

Based on desktop assessment by Biota (2008a, 2008b), two fauna habitats within the power station site and service corridors (extended Project Area) were identified, both of which are well represented throughout the Dampier locality :

- Clay plains (cracking and non-cracking clay) supporting *Eragrostis xerophila* tussock grassland; and
- Stony clay plains (non-cracking clay) supporting mixed Acacia species over *Triodia wiseana* hummock grassland

Sixteen fauna species of conservation significance may occur in the development area; however while these species utilise these areas, neither the landforms nor vegetation types represent core habitat for any of these species (Biota 2008a, 2008b).

#### 4.4.4 Disease

*Phytophthora* Dieback is found in areas receiving more than 400 mm annual rainfall between Jurien and east of Esperance. *Phytophthora* Dieback is not an issue in the Pilbara or Goldfields regions, this is due to the mean annual rainfall ranging between only 250 mm and 320 mm per annum. There is also a lack of susceptible vegetation required by *Phytophthora cinnamomi* along the pipeline route.

## 4.5 Social Environment

### 4.5.1 Heritage

#### Paraburdoo Gas Pipeline and West Angelas Gas Pipeline

Indigenous Land Use and Heritage agreements are in place between RTIO and the traditional owners in the area of the mines, being the Nharnuwangga Wajarri Ngarlawangga and Yinhawangka people.

A search of the DPLH Aboriginal Cultural Heritage Inquiry System (ACHIS) was undertaken in May 2024. The PGL intersects the ACHIS publicly available boundary of four sites; all of these also fall within Hamersley Iron tenements.

No heritage sites were identified in the WAL-R construction right-of-way during surveys of the area (OSD 2019).

A search of the DPLH ACHIS was undertaken in May 2024. The WAL intersects the ACHIS publicly available boundary of one site.

Rio Tinto Iron Ore's Communities Heritage Team (RTIO Heritage), facilitates and advises on all heritage matters on behalf of Pilbara Iron. Ongoing management and site protection is conducted by RTIO in consultation with the Traditional Owners, their respective representative organisations and the DPLH.

#### Cape Lambert Gas Pipeline

The nature of the heritage sites within the broader Cape Lambert area comprises largely shell middens within the coastal sand dunes and adjacent to the tidal mudflats, several stone quarries and numerous petroglyph (rock art) sites within the rocky outcrops and

ridges, and flaked stone artefact scatters. Some of these areas are protected against disturbance and some have undergone Section 18 approval processes for disturbance under the *Aboriginal Heritage Act 1972*.

Prior to PL106 construction, heritage surveys were undertaken in the Project Area during 2010 and no sites were identified (in the PL106 section only) (Monadelphous 2015).

A search of the DPLH Aboriginal Cultural Heritage Inquiry System (ACHIS) for Register Aboriginal sites and other Heritage places was undertaken in June 2024. The search results included 28 Register Aboriginal Sites and seven Other Heritage Sites.

### **Yurralyi Maya Gas Pipeline**

Archaeological and ethnographic surveys of the YMP pipeline corridor was completed prior to pipeline construction. No heritage sites were identified (SKM 2009).

A search of the DPLH ACHIS for Register Aboriginal sites and other Heritage places was undertaken in June 2024. The search results identified no heritage sites within the search boundary.

## **4.5.2 Socio-economic**

### **Paraburdoo Gas Pipeline**

The PGL is located within the Shire of Ashburton, which also includes the towns of Tom Price, Onslow and Panawonica. The Shire of Ashburton comprises an area nearly half the size of Victoria (105,647 km<sup>2</sup>) and is sparsely populated with a total of 7,391 residents (ABS 2021a). Major industries operating within the Shire of Ashburton include oil, gas, mining, agriculture, fishing and tourism (Shire of Ashburton 2012).

The main population centre in the vicinity of the PGL area is Paraburdoo town site. Primary industry consists of mining activity, more specifically the extraction, processing and transportation of iron ore. Pastoral activity is also present and coincides with sections of the pipeline route. More specifically, the PGL is situated within the Mininer Pastoral lease and Hamersley Iron (RTIO) Mine site.

There are a range of government services in the region serving the population and industry of Paraburdoo. In addition a vibrant tourism industry exists with visitors mainly attracted by the Karijini National Park located to the north-east of Paraburdoo.

### **West Angelas Gas Pipeline**

The WAL is located within the Shires of Meekatharra, Ashburton and East Pilbara. The Shire of Meekatharra comprises an area of 100,789 km<sup>2</sup> and is sparsely populated with a total of 849 residents (ABS, 2021b). The largest town in the Shire is Meekatharra with the remaining permanently populated areas being limited to station homesteads and Indigenous Communities. Major industries operating within the Shire of Meekatharra include mining, pastoral activities and tourism (Shire of Meekatharra, 2016).

The Shire of East Pilbara has approximately 9,760 residents of which 6,456 live in Newman (ABS 2021c), the Shire's largest town. Other population centres within the Shire of East Pilbara include the towns of Marble Bar and Nullagine, in addition to numerous Indigenous Communities. Major industries operating within the Shire of East Pilbara include mining, pastoral activities and tourism. Details for the Shire of Ashburton are covered in the previous section.

The main population centre in the vicinity of the WAL area is Newman, approximately 130 km east. In addition the Paraburdoo town site is approximately 110 km to the west.

More specifically, the WAL offtake (Boonamichi CTMS) and first kilometer of pipeline is situated within the Turee Creek Pastoral lease. The majority of the pipeline falls within mining tenements associated with the West Angelas mine site.

## **Cape Lambert and Yurralyi Maya**

The CLP and YMP are located within the City of Karratha. The Shire has a population of 22,199 (ABS, 2021). The vast majority of the population reside in the City of Karratha. Other population centres within the Shire include the towns of Cossack, Wickham and Dampier. Major industries operating within the City of Karratha include mining, agriculture and tourism (Shire of Roebourne 2012). Specifically, primary industry consists of the transportation, processing and shipping of Iron ore, gas production and pastoral activity. In addition, numerous smaller businesses exist, providing services to these primary industries.

## 5. Implementation Strategy

All works will be conducted in accordance with the APA Corporate Environment and Heritage Policy. It is the responsibility of the APA WA Manager Operations and Maintenance to ensure that APA Environment and Heritage policies and commitments are observed throughout all operational activities.

The APA Health, Safety, Environment and Heritage (HSEH) Management System is called 'Safeguard' (SG). SG provides a framework by which the processes relating to APA's HSEH activities are defined, implemented and controlled. Local business unit processes and procedures operating under SG management systems, provide further instruction to workers on performing activities.

SG is supported by a database, referred to as SG+. SG+ is used for functions such as incident reporting, auditing, action tracking and reporting.

The APA business tools and system used to manage and maintain all information relating to asset operations required for the implementation of management include:

- Maximo – Asset maintenance system (Work Order / Job Plan / Work Instruction)
- SG+ - Risk, actions, auditing and incident reporting system
- XIC – Landholder Contact Program, landholder information, access conditions, stakeholder consultation
- Learning Management System (LMS) – Training system used to capture APA staff information and learning materials
- SkillPASS – Contractor training, competency and accreditation system (under LMS)

SG defines the requirements for environmental management under APA's Environmental Corporate Framework. Procedures, forms and other guidance materials for environmental management is available to all personnel via APA intranet Empower.

The RTIO assets are located in the Pilbara South and Karratha Management Regions. One ERA workshop was conducted for the Pilbara South Management Region on 17 March 2023. A separate ERA workshop was conducted for the Karratha Management Region on 23 March 2023.

The Environmental Risk Assessment is conducted in accordance with APA's 'Risk Management System – Group Procedure' which "aligns with the principles in the international risk standard ISO 31000:2018 - Risk Management".

A summary of the primary environmental hazards, control measures and mitigating factors identified for the pipelines have been provided in Table 8.

It is important to note that Table 8 is intended to be indicative of material hazards and controls only and is not comprehensive of all commitments made by APA in the OEMP.

**Table 8: Primary Operations Environmental Hazards and Controls / Mitigating Factors**

Summary of risks and impacts	Control Measures and Mitigation Factors
Overarching	<ul style="list-style-type: none"> <li>• Regular legislation reviews</li> <li>• Toolbox talks</li> <li>• Works Environmental Assessment Process</li> <li>• Environmental audits</li> <li>• Site inspection</li> <li>• Inductions</li> <li>• Environment Procedures</li> </ul>

Summary of risks and impacts	Control Measures and Mitigation Factors
<p>Aspect: Contamination</p> <p>Activity: transport, handling, waste disposal</p> <p>Impact: Ground and water contamination</p>	<ul style="list-style-type: none"> <li>• Site inspected for leaks/spill during periodic site inspections</li> <li>• Vehicle prestart</li> <li>• OSCP testing</li> <li>• Drip trays</li> <li>• Licenced controlled waste carrier engaged for all controlled waste transport on public roads</li> <li>• Spill kits</li> <li>• Cathodic protection</li> <li>• Reportable spills reported to relevant regulator verbally within 2 hours and via report within 3 days.</li> <li>• Documented mobile plant pre-start checks completed before mobilisation</li> <li>• Regular documented light vehicle pre-start checks completed</li> <li>• Capture in place to cover ground during coating</li> <li>• Spill kit inspections conducted in accordance with Maximo regime</li> <li>• Spill response equipment appropriate to the type and amount of chemical must be available at point of use or transport</li> </ul>
<p>Aspect: Waste</p> <p>Activity: controlled, general, hydrocarbon, NORM waste storage, handling, transport and disposal</p> <p>Impact: Ground contamination, unauthorised discharge or community nuisance</p>	<ul style="list-style-type: none"> <li>• Licenced controlled waste carrier engaged for all controlled waste transport on public roads. Tracking receipts retained for seven years.</li> <li>• Abrasive blasting activities not to occur within close proximity to watercourses without sufficient capture in place.</li> <li>• Spent garnet is wrapped up and disposed of in hydrocarbon bin for Class III landfill disposal</li> <li>• Piggings waste screened for radioactivity to determine waste stream</li> <li>• Identify/label as NORM contaminated waste</li> <li>• Arrange for APA approved (licensed) NORM waste contractor for management/ disposal</li> <li>• Designated temporary concrete wash-down bay set up to contain liquid waste where significant volumes of concreting and equipment wash-down is required</li> <li>• Concrete wash-down and waste shall be captured, tested and disposed of in accordance with Landfill Waste Classification and Waste Definitions 1996</li> <li>• Concrete tanker utilised wherever possible to minimise mixing of concrete on site</li> <li>• Bags of dry concrete to be stored in a designated, dry undercover area</li> <li>• All waste to be removed from site and stored at MB</li> </ul>
<p>Aspect: Heritage</p> <p>Activity: Driving, vegetation clearing, excavation</p> <p>Impact: unauthorised impact to heritage</p>	<ul style="list-style-type: none"> <li>• Mulcher with GIS capabilities (geofencing or similar) or heritage boundaries flagged prior to clearing through heritage areas</li> <li>• Knowledge Holders and RTIO contacted prior to any ground disturbing works inside heritage areas</li> <li>• Works Environmental Assessment Form completed prior to clearing or excavation</li> <li>• Spotter/guide engaged during LOS clearing</li> <li>• If heritage values or suspected human remains are unexpectedly discovered, or suspected to exist in the activity area, the activity must immediately cease in the vicinity (10m from extent) of the heritage discovery and be reported as per current APA HSE GP 07.01 Incident Reporting</li> </ul>

Summary of risks and impacts	Control Measures and Mitigation Factors
<p>Aspect: Native Vegetation</p> <p>Activity: driving, vegetation clearing, excavation, weed spraying</p> <p>Impact: Loss of biodiversity, fire</p>	<ul style="list-style-type: none"> <li>• Spotter/guide engaged during LOS clearing</li> <li>• Fire response equipment inspections in accordance with Maximo regime</li> <li>• Fire awareness to be reinforced during toolbox meeting</li> <li>• Works Environmental Assessment Form completed prior to clearing or excavation</li> <li>• Vehicles travelling on easement must have a fire extinguisher</li> </ul>
<p>Aspect: PWD</p> <p>Activity: Driving, vegetation clearing, excavation</p> <p>Impact: Introduction of new and /or spread of PWD</p>	<ul style="list-style-type: none"> <li>• APA vehicle washdowns bay maintained in good working order</li> <li>• All vehicle washdowns recorded in Washdown Register or similar</li> <li>• Vehicles and equipment kept clean and free of weeds and seeds</li> <li>• Clearing and excavation: equipment clean upon arrival</li> </ul>
<p>Aspect: Fauna</p> <p>Activity: Driving, vegetation clearing, excavation</p> <p>Impact: Negative or unauthorised impact to biodiversity</p>	<ul style="list-style-type: none"> <li>• Ramps for excavations left overnight</li> <li>• Fauna inspections undertaken in excavations and trenches that are left open overnight prior to work commencing</li> <li>• Works Environmental Assessment Form completed prior to clearing or excavation</li> </ul>
<p>Aspect: Gas, Light and Dust</p> <p>Activity: controlled and uncontrolled gas release, rupture</p> <p>Impact: Contribution to global warming</p>	<ul style="list-style-type: none"> <li>• NGER reporting in accordance with <i>National Greenhouse and Energy Reporting Act 2007</i></li> <li>• NGI reporting in accordance with Environmental Protection (NEPM-NPI) Regulations 1998</li> <li>• ERP is triggered for significant unplanned gas emission incidents</li> <li>• Site personnel are trained in the ERP</li> </ul>
<p>Aspect: Noise, Vibration, Amenity</p> <p>Activity: facility operation</p> <p>Impact: Stakeholder nuisance</p>	<ul style="list-style-type: none"> <li>• Fire response equipment inspections in accordance with Maximo regime</li> <li>• Fire awareness to be reinforced during toolbox meeting</li> <li>• Landowner notification prior to excavation and clearing</li> <li>• PTW for hot works in hazardous area</li> <li>• Vehicles travelling on easement must have a fire extinguisher</li> </ul>

Summary of risks and impacts	Control Measures and Mitigation Factors
<p>Aspect: Soil and Watercourse</p> <p>Activity: Excavation, dewatering/discharge, vegetation clearing</p> <p>Impact: acidification, erosion, unauthorised dewatering, unauthorised impact to beds and banks</p>	<ul style="list-style-type: none"> <li>• Where ASS/PASS cannot be avoided, APA will manage in-line with DWER treatment and management of soil and water in acid sulphate landscape guidelines</li> <li>• ASS desktop assessment completed prior to excavations</li> <li>• Topsoil must be stripped and stockpiled prior to, or at the commencement of, land disturbance activities</li> <li>• Vegetation/mulch to be respread following reinstatement</li> <li>• Easement patrols completed in accordance with maintenance regime (Maximo)</li> <li>• Dewatering conducted inline with DWER Water Quality Protection Note 13</li> <li>• No disturbance to watercourse without Permit to Interfere with Beds and Banks</li> <li>• No discharge to watercourse permitted</li> <li>• Works Environmental Assessment Form completed prior to excavation and dewatering</li> </ul>

## 6. Stakeholder Consultation

Stakeholders are identified by looking at the underlying land parcel and other layers of tenure or constraints intersecting each parcel. Stakeholder consultation is managed in the APA XIC database, maintained by the Infrastructure Protection Team. XIC stores all contact details, communications, land parcel details, APA access, risk level of each parcel, requirements for access and any documentation associated with the parcel. APA completes annual updates of the parcel information stored in XIC. XIC is used in conjunction with ARGO (Assets, Resources and GIS Online) to show the geometry for each parcel.

The main form of planned ongoing stakeholder consultation for APA pipelines is via the Third-Party Awareness Program (TPA) and the Landholder Contact Program (LCP) to achieve compliance with AS2885. Consultation is also done on an ad hoc basis for maintenance programs. Table 10 below shows the main forms of consultation that APA performs.

Please refer to The following stakeholders have been identified as having an interest in The Pipelines operation:

**Table 9 Key Stakeholders for the Rio Tinto Iron Ore Owned Pipelines**

Pipeline	Stakeholder
Paraburdoo Gas Pipeline	<ul style="list-style-type: none"> <li>Mininer Station</li> <li>RTIO (mining tenure and Pipeline Owner)</li> <li>Yinhawangka Aboriginal Corporation RNTBC</li> </ul>
West Angelas Gas Pipeline	<ul style="list-style-type: none"> <li>Turee Creek Station</li> <li>RTIO (Pipeline Owner)</li> <li>Yinhawangka Aboriginal Corporation RNTBC</li> </ul>
Cape Lambert Pipeline	<ul style="list-style-type: none"> <li>Hamersley Iron (Karratha Station Owner)</li> <li>Water Corporation (water pipeline)</li> <li>DPLH (Crown Land, road reserve)</li> <li>Mt Welcome Pastoral Co (Mt Welcome Station Owner)</li> <li>RTIO (Cape Lambert Mine and Pipeline Owner)</li> <li>Ngarluma Aboriginal Corporation</li> </ul>
Yurralyi Maya Pipeline	<ul style="list-style-type: none"> <li>DPLH (DBNGP Corridor)</li> <li>Hamersley Iron (Karratha Station)</li> <li>Ngarluma Aboriginal Corporation</li> </ul>

### 6.1 Third Party Awareness Program

The TPA is used to contact relevant industry, local government and utilities. The types of consultation for the TPA is in the form of meetings, emails, materials (i.e. toolbox, engagement letters, emails, calendar), multimedia (i.e. CodeSafe and e-learning), personal (i.e. meeting, face to face group presentations, conference or industry group presentation), and promotion (i.e. advertising, text message or email message, industry event, social media post). The TPA is used for providing these stakeholders with the location of the pipeline, safety and emergency requirements and APA contact if they propose to do any works in the vicinity of the pipelines. Response from recipients is not mandatory.

## **6.2 Landholder Contact Program**

The LCP alerts landowners to the pipeline location, safety and emergency requirements, ongoing landholder contact processes and details during APA operations. Landholders are visited annually each financial year.

For rural or remote landholders, contact will be made via phone / email prior to APA travelling to them. There will be at least three attempts to contact the landholder to arrange a visit. If a face-to-face meeting is not desired by the landholder, the meeting will be conducted via phone. Recorded stored in X-Info.

LCP also conducts annual notification and APA branded promotional materials. APA does not require a response from the LCP recipients. The notifications are letter form.

## **6.3 Routine Maintenance Works**

Ad hoc consultation to notify landholders of routine works that will be carried out. APA endeavours to provide advanced notice of easement works to landholders and affected stakeholders. This is via letter or email. The notifications will outline the type, duration, date works are scheduled, APA's right of access and APA contact information. If the landholder has particular access requirements, they will also be reiterated on the notification.

Responses to these communications are not required by APA due to APA's right of access.

## **6.4 Third Party Works**

Third party works are when an external party contacts APA as they have a project that will impact an APA pipeline. These can be activities that involve excavations, vertical and horizontal boring / drilling or installation of power lines. It may also be a connection into the APA pipeline. Third party works cannot proceed until APA has completed the necessary protection works.

The main communications to the impacted stakeholders will include description, date and duration of works. Government approvals may also be required for works, APA shall arrange approvals prior to works.

If responses are required by APA, this will be noted in the correspondence with an initial period of one month to reply. For individuals (freehold landowners), that don't reply, then APA will communicate again via the same method as well as others. If there is still no response, site visits will be made to attempt to make contact with the individual. The more time from the initial contact, the more frequent the ongoing contact is made.

For companies and government departments, when there is no reply, then alternative contacts will be used. If still no response, then the client may get involved until a determination is made. As above, the timing of the contact attempts shall become more frequent overtime.

There may be times where the client takes the lead for stakeholder consultation due to wider commitments, APA will still be a part of the process. These communications shall be recorded in XIC.

## **6.5 Emergency Services**

The APA emergency management team aims to consult with the district emergency management committee biennially, where possible. This is usually via a presentation at the committee meeting. The purpose of this consultation is to increase awareness of APA assets, emergency management plans and processes.

## **6.6 Emergency Works**

Emergency works are completed when the emergency response plan is enacted.

For the consultation during an emergency, the impacted stakeholders are contacted, usually via phone with a follow up email, however APA doesn't always wait for a response. At the end of emergencies, there will be a closeout notification with the impacted parties.

**Table 10: Consultation Programs**

Program	Communication Methods / Materials	Frequency
TPA	Face to face meetings Letters Emails Phone calls Promotional materials Multimedia materials Presentations	Annual.  The frequency of each group will be determined through the AS2885 safety management study, with high-risk groups contacted annually.
LCP – Rural / Remote	Face to face meetings Letters Emails Phone calls Promotional materials	Annual contact as a minimum, however maybe more frequent if determined through the AS2885 safety management study.
Routine Works	Letters Emails Phone calls	Ad hoc basis
Third Party Works	Face to face meetings Letters Emails Phone calls Risk assessments Permits / Approvals	Ad hoc basis
Emergency Services Consultation	Committee meeting Presentation Phone call Email	Biennially
Emergency works	Emails Phone calls	Ad hoc basis

## 6.7 Five yearly EMP Renewal Consultation

Those stakeholders that manage sensitivities which The Pipelines intersect (Mine Site, Knowledge Holders) were contacted during the five-yearly renewal. This was to ensure all guidance information regarding the sensitivities were up to date.

RTIO was provided an opportunity to review the EMP in June 2024.

**Table 11: Ongoing Stakeholder Consultation**

Stakeholder	Detail	Method	Frequency
DMPE	Updates to OEMP Changes to activity Reporting as per Section 9 Clearing referrals/permit applications	Email Telephone Meetings	As required
DWER	Permits/approvals/licences Controlled waste transport / contaminated sites		As required
DPLH	Heritage assessments		As required
DPIRD	Report declared weeds		As required
Clean Energy Regulator	NGER reporting		Annual
DCCEEW	NPI reporting		Annual
Local Knowledge Holder	Contacted prior to conducting ground disturbance works in registered and other sites (all consultation through RTIO)		As required

## 7. APA Contact Details

For further queries regarding the EMP please contact the APA Asset Manager on (08) 6189 4300 or via the APA website at <https://www.apa.com.au/contact/>.

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