

Leonora Inter Modal Terminal Project, Flora and Vegetation Survey, Leonora

Revision Number 0.00



	Date	Name	Title	Signature
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Table of Contents

Table of C	Contents	2
Executive	Summary	5
1 Introc	luction	5
1.1 B	ackground	6
1.2 S	te Location	6
1.3 A	ms and Objectives	8
2 Existi	ng Environment	8
2.1 C	limate	8
2.2 G	eology, Landform and Soils	9
2.3 H	ydrology	10
2.4 V	egetation	10
2.5 H	abitat Connectivity	10
2.6 E	nvironmentally Sensitive Areas	10
2.7 H	eritage	10
3 Meth	odology	. 10
3.1 D	esktop Assessment	10
3.1.1	Flora and Vegetation	10
3.1.2	Fauna	11
3.2 Fi	eld Assessment	11
3.3 Li	mitations	12
4 Resu	lts	. 13
4.1 D	esktop Assessment	13
4.1.1	Regional Flora and Vegetation Surveys	13
4.1.2	Threatened and Priority Flora	17
4.1.3	Introduced Flora	17
4.1.4	Vegetation	. 18
4.1.5	Threatened and Priority Ecological Communities	18
4.1.6	Threatened and Priority Fauna	20
4.3 Fi	eld Survey	21
4.3.1	Flora	21
4.3.2	Threatened and Priority Flora	21
4.3.3	Introduced Flora	21
4.3.4	Vegetation Types	21
4.3.5	Threatened and Priority Ecological Communities	24
4.3.6	Vegetation Condition	24
4.3.7	Fauna	26
5 Discu	ssion	26
5.1 F	ora	26
5.2 V	egetation	27

	5.3	Threa	tened and Priority Flora and Ecological Communities	. 27
	5.4	Fauna	a	.27
	5.5	Asses	ssment against the 10 Clearing Principles	.29
6	Re	ferenc	es	. 33
7	Ap	pendic	es	. 35
Ap	penc	dix 1	Protected Matters Search Tool	. 37
Ap	penc	dix 2	Potential Conservation Significant Species Presence	. 38
Ap	penc	dix 3	Conservation Code Definitions	.43
	Table prote	e A3.1: ected	Conservation code definitions for flora and fauna as listed as Threatened or specially	, .43
	Table	e A3.2:	Conservation code definitions for flora and fauna as listed as Priority	.44
	Table	e A3.3:	Conservation code definitions for ecological communities listed as threatened (TEC).	.44
	Table	e A3.4:	Conservation code definitions for ecological communities listed as priority (PEC)	.45
Ap	penc	dix 4	Vascular Plant Taxa Recorded in the Survey Area	.46
Ap	penc	dix 5	Raw Data Recorded in Relevés	.48

Tables

Table 1:	Assessment of potential survey limitations
Table 2:	Summary of Flora, Fauna and Vegetation Surveys Previously Conducted in the Local Area
Table 3:	Threatened and Specially Protected Flora species identified in desktop assessment
Table 4:	Threatened and Specially Protected Fauna species identified in desktop assessment
Figures	
Figure 1:	Proposed Leonora Inter Modal Terminal (LIMT) Project area location
Figure 2:	Significant Ecological Community recorded within Desktop Study Area for the Proposed Leonora Inter Modal Terminal (LIMT) Project Area location.
Figure 3:	Vegetation Type and Relevé locations within the survey area for the Proposed Leonora Inter Modal Terminal (LIMT) Project.
Figure 4:	Vegetation Condition within the survey area for the Proposed Leonora Inter Modal Terminal (LIMT) Project.
Graphs	

Graph 1: Long-term Maximum and Minimum temperatures for Leonora WA (12046) and Monthly Rainfall for Leonora Aero (12241) (Bureau of Meteorology, 2024).

Appendices

Appendix 1:	Protected Matters Search Tool
Appendix 2:	Potential Conservation Significant Species Presence
Appendix 3:	Conservation Code Definitions
Appendix 4:	Vascular Plant Taxa Recorded in the Survey Area
Appendix 5:	Raw Data Recorded in Relevés

Appendices Tables

- Table A2.1:
 Potential Conservation Significant Flora
- Table A2.2:
 Potential Conservation Significant Fauna
- Table A3.1:
 Conservation code definitions for flora and fauna as listed as Threatened or specially protected
- Table A3.2:
 Conservation code definitions for flora and fauna as listed as Priority
- Table A3.3:
 Conservation code definitions for ecological communities listed as threatened (TEC)
- Table A3.4:
 Conservation code definitions for ecological communities listed as priority (PEC)

Executive Summary

Arc Infrastructure (Arc) is proposing to develop and build a new Leonora Inter Modal Terminal (LIMT) southeast of Leonora. This new IMT is required as the St Barabara / Genesis Mine project is expanding which in addition will require the removal of 6km of existing rail due to the mine expansion requirements. Arc's environment team conducted an on-ground flora and vegetation survey and basic fauna survey to identify the key flora, fauna, soil, groundwater and surface water values associated with the project area.

The flora and vegetation survey and basic fauna survey involved multiple aspects, including sampling via relevés and opportunistic collections as well as targeted significant flora searching in the project area, which was undertaken over two visits as listed below:

- 8th October 2024 (reconnaissance, fauna and targeted flora survey) (Southern Section)
- 11th and 12th February 2025 (reconnaissance, fauna and targeted flora survey) (Northern Section)

The entire site was traversed searching for potential conservation significant flora, with three relevés and two mapping/ vegetation field notes recorded within the southern portion of the project area and three relevés recorded within the northern portion of the survey area with the following parameters recorded. The majority of the survey area was recorded to be Degraded (1.86ha, 18.3%), with some areas of Good condition (1.83ha, 17.9%). The remaining (6.51ha, 63.8%) of the survey area was classified as Completely Degraded.

A total of 53 discrete vascular flora taxa were recorded in the Survey Area during these surveys, representing 19 families and 34 genera. The most well-represented families are Chenopodiaceae (12 taxa), Poaceae (8 taxa), Fabaceae (7 taxa) and Amaranthaceae (4 taxa) with six of the total taxa recorded being introduced taxa. One Vegetation Type (VT) was defined and mapped within the survey area of various condition types.

No Threatened or Priority flora species were recorded within the survey area during the surveys.

The vegetation type recorded within the survey area is not consistent with any known Threatened or Priority Ecological Communities

A desktop assessment of online databases indicated the potential for a total of 21 conservation significant species to occur within 30 km of the survey area. Of the conservation significant species potentially found within the area, it was determined that the site conditions may be suitable for six of these species.

No direct (observations) or indirect (scats, tracks, diggings) evidence of Threatened fauna species or Priority fauna species were recorded within the survey area.

1 Introduction

The Leonora Inter Modal Terminal (LIMT) Project is proposed within a single contiguous area (see Figure 1). The "Project Area" is located within the Railway reserve (Land Id Number 3122352), southeast of Leonora. The proposed removal and clearing of native vegetation is required to build an Inter Modal Terminal (IMT) to allow the loading and offloading of commodities at a new site southeast of Leonora. The area needs to be cleared and a gravel hardstand to be laid in order to allow the movement of machinery, vehicles and reach stacker loaders to lead trains as they stop at the site. At present only one area is required to be cleared, but this application covers the whole site as there will be loading and offloading of materials and laydown areas at different locations adjacent to the rail line to allow the site to be serviced properly and also to allow vehicles to drive around the site. The final area of the land use will be for an Inter Modal Terminal to be utilised by WATCO/QUBE and Arc Infrastructure.

This location has been selected due to the proximity of the use of the IMT by St. Barbara Mining / Genesis, as well as the access to and from Goldfields Highway and for access to the IMT. If another project area were chosen, additional land would need to be cleared for access to this site, therefore

this area was chosen to mitigate any further clearing and reduce the need to impact any waterways or significant vegetation in higher condition rankings.

1.1 Background

The proposed removal and clearing of native vegetation is required to build a new IMT to allow the loading and offloading of commodities at a new site in South Leonora. This new IMT is required as the St Barabara / Genesis Mine project is expanding which in addition will require the removal of the northern 6km of existing rail on the Leonora Branch Line (Line 52) due to the mine expansion requirements.

1.2 Site Location

The proposed LIMT Project area is located within the Railway reserve (Land Id Number 3122352), southeast of Leonora, on the east side of the rail crossing with Goldfields Highway as per Figure 1 project area location. This location was chosen due the proximity of the IMT by St Barbara Mining, as well as the easy access off the Goldfields Hwy for access to the IMT.





Leonora Inter Modal Terminal Project, Flora and Vegetation Survey, Leonora

Rev No. 0.00

1.3 Aims and Objectives

The aim of this survey report is to provide the following information to the Department of Water and Environment Regulations (DWER) for assessment of proposed vegetation clearing activities for the LIMT Project (Line 52, 251.055km – 252.255km). The overall objectives of the assessment were to:

- Conduct Desktop assessment of potential conservation significant values for the proposed clearing area using ArcGIS and publicly available government datasets.
- Identify and record vegetation types including vegetation communities which may be representative of any Threatened or Priority Ecological Communities
- Record the location of threatened and priority flora which may be directly impacted as well as those within 50 m of the proposed clearing area
- Record significant invasive species and other threats which are present
- Conduct flora and vegetation assessment within the survey area as per the Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority (EPA), 2016).
- Conduct basic fauna survey within the survey area as per the Technical Guidance Terrestrial vertebrate fauna surveys for environmental impact assessment (Environmental Protection Authority (EPA), 2020).
- Preparation of a report with the outcomes of the survey.
- Preparation of GIS shapefiles in the Index of Biodiversity Surveys for Assessments (IBSA) format.

2 Existing Environment

2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a climate dataset is Leonora WA (Station 12046) located approximately 4.5 km northwest of the Survey Area. The closest long-term Bureau of Meteorology (BoM) weather station with a rainfall dataset is Leonora Aero (Station 12241) located approximately 6.5 km northwest of the Survey Area. The long-term mean minimum temperature for Leonora WA weather station ranges from 6.1°C (July) to 21.8°C (January) (1949 to 2014) and the long-term mean maximum temperature ranges from 18.4°C (July) to 37°C (January) (Graph 1) (Bureau of Meteorology, 2024). The Leonora Aero weather station recorded 258.4 mm of rainfall in the 12 months for 2024, which is 21.9 mm above the long-term average of 258.4 mm (Bureau of Meteorology, 2024).



Graph 1: Long-term Maximum and Minimum temperatures for Leonora WA (12046) and Monthly Rainfall for Leonora Aero (12241) (Bureau of Meteorology, 2024).

2.2 Geology, Landform and Soils

The surface geology of Western Australia as mapped by DMIRS, 2020 at a scale of 1:250,000 indicates that one geological unit (A-f-YEG - Volcanic and volcaniclastic felsic rocks, undivided; andesite to rhyolite, minor basaltic andesite; local fragmental textures; metamorphosed) is mapped over the Project Area.

Commonwealth of Australia, (2021) has identified two geological features occurring within the project area, these include:

- mafic intrusive rocks 74263: Mafic intrusive rocks, medium to coarse-grained; layered mafic to ultramafic intrusions - dolerite, gabbro, olivine gabbro, peridotite, pyroxenite, leucogabbro, quartz dolerite, quartz gabbro, gabbronorite
- colluvium 38491: Colluvium and/or residual deposits, sheetwash, talus, scree; boulder, gravel, sand; may include minor alluvial or sand plain deposits, local calcrete and reworked laterite.

The Eastern Murchison comprises the northern parts of the 'Southern Cross' and 'Eastern Goldfields' Terrains of the Yilgarn Craton. The occluded Paleodrainage system generates Salt Lake systems. Other features include broad plains of red-brown soils, breakaway complexes, and red sandplains (CALM 2002).

The Project area is situated within the Gundockerta soil-landscape system described as extensive, gently undulating calcareous stony plains supporting bluebush with abundant stony mantles, and less extensive lower alluvial plains with narrow central zones receiving more concentrated run-on, relief usually less than 15 metres. Saline plains and adjacent alluvial tracts area are susceptible to water erosion where the stony mantle is absent and/or vegetation cover is reduced (DPIRD, 2019). The vegetation of this land system is highly preferred for grazing by introduced and native mammals, rendering it susceptible to overgrazing and consequent degradation (Pringle et al, 1994).

2.3 Hydrology

The project survey area falls within the Goldfields groundwater area, as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). No major rivers, minor drainage lines, surface water areas or Public Drinking Water Sources intersect with the project survey area.

2.4 Vegetation

The project survey area is located within the Eastern Murchison IBRA subregion (MUR01) which totals over 7 million hectares (CALM, 2002). The Eastern Murchison subregion is characterised by extensive areas of elevated red desert sandplains with minimal dune development and internal drainage. (CALM 2002). The vegetation of the Eastern Murchison botanical subregion consists of Mulga woodlands often rich in ephemerals. Vegetation is dominated by hummock grasslands, saltbush and Tecticornia shrublands (CALM, 2002).

Two Pre-European vegetation types have been mapped over the project area (Government of Western Australia, 2019). these being:

- Laverton_28: Low woodland, open woodland or sparse woodland of Mulga Acacia aneura and associated species with a current extent of 131,531.31 hectares which is 98.35 % remaining and
- Laverton _676: Samphire of Tecticornia spp. Communities in saline areas which is 221,809.04 hectares which is 99.97% remaining.

2.5 Habitat Connectivity

The project area occurs within the Murchison Bioregion just south of Leonora, approximately 235 kilometres north of Kalgoorlie, with much of the region intact but used for grazing of native pastures. The project area which is located within the rail reserve is adjoined on the north and south side by Reserve 7521 which is vested with the Department of Planning, Lands and Heritage (DPLH) with a common use and comprise of an area of 15,182.75 hectares (Ha) (WALIA, 2025). The rail reserve joins a much larger landscape containing remnant vegetation and hence is linked to a broader reserve system in the Leonora area.

2.6 Environmentally Sensitive Areas

No known or recorded Department of Water and Environmental Regulation (DWER) or Arc Infrastructure registered Environmentally Sensitive Areas (ESA's) are known to occur within or nearby or have buffers that extend into the project area.

2.7 Heritage

No known or recorded Aboriginal or European Heritage sites are known to occur within or nearby or have buffers that extend into the project area.

3 Methodology

3.1 Desktop Assessment

3.1.1 Flora and Vegetation

Prior to commencement of the field surveys, a review of all publicly available flora and vegetation data relevant to the Desktop Study Area (30km buffer around the project area) was undertaken. This included obtaining and reviewing copies of reports of previous biological surveys carried out within the vicinity of the Survey Area (where available) (including interrogation of the Index of Biodiversity Surveys for Assessments (IBSA) website) and interrogation of relevant databases and other sources as listed below:

 Protected Matters Search Tool (Department of Climate Change, Energy the Environment and Water (DCCEEW), 2024)

- DBCA Database searches for Threatened and Priority Flora (DBCA, 2024a).
- DBCA Database searches for Threatened and Priority Ecological Communities (DBCA, 2024b).
- DBCA Database searches for Western Australian Herbarium Specimens (DBCA, 2024c).
- Geoscience Australia, NationalMap (Commonwealth of Australia, 2021)
- 2018 Statewide Vegetation Statistics (Government of Western Australia, 2019).
- Native Vegetation Solutions (2022)
- Spectrum Ecology and Spatial (2022)

3.1.2 Fauna

A desktop survey assessment of conservation significant fauna species known to occur within 30 km of the project area was undertaken using the following databases and other sources as listed below:

- Protected Matters Search Tool (DCCEEW), 2024).
- DBCA Database search for Threatened and Priority Fauna (DBCA, 2024d)
- Spectrum Ecology and Spatial (2022)

3.2 Field Assessment

An on-ground flora and vegetation survey and basic fauna survey were undertaken by Arc's Botanist Kim Kershaw (Flora Collecting Licence: FB62000054-2) and Coordinator Environment Ngaire Mullholland on the 8th October 2024, with further survey works undertaken on the 11th and 12th February 2025 by Arc's Ecologist / Lead Environment and Heritage Sharon Hynes (Flora Collecting Licence: FB62000489) and Arc's Heritage Specialist Craig Deetlefs. The entire site was traversed searching for potential conservation significant flora, with three relevés and two mapping/ vegetation field notes recorded within the southern portion of the project area and three relevés recorded within the northern portion of the survey area with the following parameters recorded:

- Recorders (personnel);
- Site number;
- Date of survey;
- Site type;
- GPS (Global Positioning System) location of site;
- Site photograph;
- Landform (including slope class and aspect);
- Soil colour and type (including the presence of any rock outcropping and bare ground);
- Vegetation condition (EPA 2016);
- Approximate time since fire;
- Hydrology (presence of waterways or surface hydrology);
- Presence and type of disturbance (if any);
- Vegetation Description (EPA 2016);
- Dominant taxa in vegetation strata;
- Percentage foliage cover (for each vascular plant taxon cover within the site);
- Height (m) (average for each taxon, excluding climbers/aerial shrubs); and
- Additional flora taxa present immediately outside of the site.
- Fauna observations (fauna habitat, opportunistic fauna sightings or evidence of fauna presence e.g. scats, tracks, calls, visual sitings, bones and burrows) (EPA 2020).

3.3 Limitations

An assessment of potential limitations was undertaken in accordance with the EPA (2016) *Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment* (Table 1).

Table 1: Assessment of poten	tial survey limitations
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Potential Limitation	Comment
Availability of contextual Information	Nil – Publicly available contextual information is readily available for the region.
Experience of personnel	Nil – Kim Kershaw has over 30 years' experience conducting targeted, reconnaissance and detailed flora surveys within Western Australia, and is competent in taxonomic identification and assessment of vegetation in these areas. Sharon Hynes has over 14 years' experience conducting targeted, reconnaissance and detailed flora surveys and fauna habitat assessments within Western Australia and is competent in taxonomic identification and assessment of vegetation in these areas.
Proportion of flora identified	Nil – All flora on site was identified at the time of the survey. A low species diversity was found within the survey area due to the degraded nature of most of the site with higher diversity in the surrounding area outside of the rail corridor.
Access Restrictions	Nil – No access issues were encountered during the surveys. The survey area is relatively small, and the entire area was traversed.
Survey Timing	At Variance – The Arc reconnaissance flora and vegetation surveys were conducted in early October and mid-February which are outside the recommended optimal survey time to observe native flora in the Eremaean Botanical Region (March to June / 6-8 weeks post wet season) (EPA 2016). However, of the five conservation significant flora species identified during the desktop assessment, none have the potential to occur within the survey area due to unsuitable habitat type and therefore these are considered highly unlikely to occur on site as the habitat and landform identified within the survey area is not consistent with those required by this species. Additionally, the high level of degradation and disturbance recorded within the survey area is not conducive to the survival of native species with specialised habitat requirements.
Disturbances that may affect results	Nil –No recent disturbances have occurred within the survey area which could have affected the results of the survey. All disturbances within the area are historical and continuous, relating to the safety, construction and maintenance of the rail line and access roads in the rail corridor, and are unlikely to have created any limitations in detection of species during the survey period.
Fauna habitat survey	Minor – Surveying for Reptiles in the Eremaean is between September and April when higher temperatures are experienced and therefore surveys coincide with peak activity for reptile activity. Surveys were not conducted immediately after significant or rain events for amphibian or bird surveys and due to the small size of the survey area, survey duration on site was short with limited sampling effort. However, site was surveyed for other signs of presence including feathers, signs of foraging, tracks, burrows and scats.

4 **Results**

4.1 Desktop Assessment

4.1.1 Regional Flora and Vegetation Surveys

A number of flora, fauna and vegetation surveys and desktop assessments that are publicly available or available from stakeholders have been undertaken within the Desktop Study Area, the results of which are summarised in Table 2. Those surveys with study areas that overlap the Survey Area are shaded in green.

Report Title and Author	Location	Scope	Key Surv	rey Findings
			•	The survey and site visit identified 13 ecological communities within the Survey Area
	F			
Leonora Operations /	Ine areas surveyed		•	Field survey was conducted in spring from 16 to 19 November 2021.
Flora & Vegetation Site	include four	A comprehensive desktop	•	No conservation significant vertebrate fauna species were recorded
Visit & Basic Terrestrial	distinct mining	assessment of the flora &		during the survey.
Fauna Assessment	areas Gwalia,	vegetation, and terrestrial fauna	•	One Priority Ecological Community (PEC) intersects the Survey Area at
Prepared for: Talis	Tower Hill,	(vertebrate and SRE invertebrate		both Gwalia and Tower Hill: This being the Melita calcrete
Consultants St Barbara	Harbour Lights.	fauna) values of the Survey Area: a		proundwater assemblage type on Raeside palaeodrainage on Melita
l imited by Spectrum	lashers and two	hasic failing sum/av/, and a flora site		broundered accountings type on machine paracountings on month
Ecology and spatial	proposed railway	VISIC	•	Irapdoor spider burrows recorded appeared to have the distinctive
(February 2022)	corridors			'moustache-like' arrangement of twigs that the genus Idiosoma have.
				Further targeted surveys that include the collection of specimens are
				required to determine their identification to species level.
			•	16 vegetation groups were identified during this survey.
			•	Field survey was conducted in spring from 12 to 16 September 2022.
	-		•	201 species were recorded within the survey area from 42 families
Detailed Flora and	Ine Leonora	Conduct desktop study which		and 95 genera.
Vegetation survey of the	Project expansion	includes a literature review and a	•	No Threatened or Driority Flora recorded during the survey
Leonora Project	consists of three	search of the relevant databases;		
Prepared for: Talis	distinct areas:	Reconnaissance survey of the	•	No threatened Ecological Communities (TEC) were recorded.
Concultante Ct Barbara	Gualia (2 015 ha)	subject area to verify the deckton	•	One Priority One PEC intersects the Survey Area at both Gwalia and
				Tower Hill: The Melita calcrete groundwater assemblage type on
		survey, under take betailed survey		Raeside palaeodrainage on Melita (Sons of Gwalia) Station (P1).
	ria) ariu maribour Lishte (Ann he)	and replication of plots in vegetation	•	18 introduced weed species were detected with three of these
	LIBIILS (400 IId).	UIIID		considered Declared Pests, Cylindropuntia imbricata- s22(2) C3
				Restricted. <i>Opuntia stricta</i> - s22(2) C3 Restricted and <i>Rumex</i>
				vesicarius- Prohibited s12 C1 Prohibited (DPIRD, 2023).
Basic Vertebrate Fauna	The Leonora	Conduct desktop study which	•	Field survey was conducted in spring from 12 to 17 September 2022.
Reconnaissance Survey	Project expansion	includes a literature review and a	•	Five broad fauna habitats identified in the project area.
and Risk Assessment	consists of three	search of the relevant databases;	•	Tracks of Malleefowl were recorded at three locations in the project
Prepared for: Native	distinct areas:	Reconnaissance survey of the		area.
Vegetation Solutions St	Gwalia (2.015 ha).	subject area to verify the desktop	•	The nronoced nroject is unlikely to significantly impact on a
Barbara Limited by	Tower Hill (1.143	survey and risk assessment	•	me proposed project is unincit to significantly impact on a concernation cignificant species

Table 2: Summary of Flora, Fauna and Vegetation Surveys Previously Conducted in the Local Area

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Report Title and Author	Location	Scope	Key Surv	ey Findings
Terrestrial Ecosystems (February 2023)	ha) and Harbour Lights (400 ha).			
St Barbara Leonora Province Expansion Short Range Endemic (SRE) Fauna Assessment Prepared for: Terrestrial Ecosystems by Bennelongia Environmental Consultants (January 2023)	The Leonora Project expansion consists of four distinct areas: Gwalia, Tower Hill, Harbour Lights and Jaspers.	Conduct desktop study which includes a comprehensive review of literature and invertebrate fauna databases and included a review of habitat types within and surrounding the proposed project	• • •	The desktop study identified 157 records of animals from SRE Groups attributable to 45 known species collected within the desktop search area. None of the species identified had sufficient taxonomic certainty and representation in collections to be classified as Confirmed SREs No listed threatened or priority terrestrial invertebrate fauna species were identified as having previously been collected in the desktop search area
Leonora Rail Yard Expansion Project, Level 1 Flora and Vegetation Survey Prepared for: Australia Western Railroad – Aurizon Holdings Limited (Aurizon) by Western Botanical (February 2013) 2013) 2013) Leonora Rail Track Flora, Vegetation and Fauna Survey Prepared for Arc Infrastructure Pty Ltd (Arc) by Eco Logical Australia (June 2021)	Expansion of the existing rail yard located approximately 2 km north of the Leonora Township Site adjacent to existing rail tracks in the south end of Leonora	Undertake a level 1 flora and vegetation survey of the 7.66 ha area to meet the requirements of a clearing permit Undertake a single-phase in-season Detailed flora and vegetation survey and Basic fauna survey	• • • • • • • • • •	A total of 59 taxa, representing 19 families and 32 genera were recorded from within the Rail yard expansion project site. Seven introduced flora (weed) species were located within the rail yard expansion project area, with none being listed as Declared Weeds. No Priority or Threatened Flora was identified during the survey. One vegetation association was recorded across the rail yard expansion project area. Vegetation condition in the area was considered to be in Good to Degraded condition. Field survey was conducted on the 20 th of April 2021. A total of four quadrats were established across the survey area. No Priority or Threatened Flora was identified during the survey were recorded within the survey area. No Priority or Threatened Flora was identified across the survey area. The introduced taxa (weeds) were recorded in the survey area. No Priority or Threatened Flora was identified during the survey area. Most of the vegetation community was delineated and mapped within the survey area. One intact native vegetation community was delineated and mapped within the survey area.

Report Title and Author	Location	Scope	Key Sun	vey Findings
			•	A total of eight vertebrate fauna species were recorded during the Basic fauna surviver commissing four birds and four mammals (#head
				basic radia survey, comprising rour birds and rour manimus (mice introduced).
			•	No direct or indirect evidence of Threatened or Priority fauna species
				were recorded within the survey area.
			•	The reconnaissance flora and vegetation survey and basic terrestrial
				vertebrate fauna survey was undertaken on 24th June 2021.
			•	A total of four relevés were established within the Survey Area.
			•	A total of 43 taxa from 15 families across 25 genera were recorded.
	Dortion of Lot E1 on	Undertake a desktop assessment	•	No Priority or Threatened Flora was identified during the survey.
Leonora (Lot 51, Mt Ida		and a biological survey and	•	One introduced flora species, *Cenchrus ciliaris, was recorded during
Road) Biological Survey	at Mt Ida Road	assessment (reconnaissance flora		the survey.
prepared for Horizon	Leonora, located	and vegetation survey, targeted flora	•	Two vegetation types were described and mapped within the Survey
Power by 360	200 m southeast of	survey and basic terrestrial		Area.
Environmental (October	the Leonora	vertebrate fauna survey) and	•	No vegetation representative of any Commonwealth or State listed
2021)	Airnort	address requirements for native		TECs or PECs were recorded within the Survey Area.
		vegetation clearing permit	•	Vegetation condition within the Survey Area ranged from Very Good
				to Good
			•	The field survey recorded two terrestrial vertebrate fauna species,
				comprising of one native bird and one introduced mammal species,
				none of which were of conservation significance.

4.1.2 Threatened and Priority Flora

A desktop assessment of online databases indicated the potential for a total of 5 conservation significant species to occur within 30 km of the project survey area (Table 2). A review of the PMST (DCCEEW, 2023) indicated that no Threatened flora species listed under the Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) as potentially occurring within a 30 km radius of the survey area (Appendix 1). A review of the DBCA (2024a & c) Threatened and Priority flora and WA Herbarium specimen databases indicated that five Priority flora species have been recorded within 30 km of the project survey area.

Of these conservation significant species potentially found within the area, it was determined that the site conditions (soil type, drainage, location) are not suitable for any of these species (Table 2). An analysis of the likelihood determination for each species is presented in Appendix 2. Conservation code definitions are provided in Appendix 3.

Table 3: Threatened and Specially Protected Flora species identified in desktop assessment

Species	Cons. Code	PMST	DBCA
Acacia sp. Marshall Pool (G. Cockerton 3024)	Priority 3		Х
Angianthus prostratus	Priority 3		Х
Calytrix praecipua	Priority 3		X
Nicotiana salina	Priority 1		Х
Triglochin protuberans	Priority 3		Х

4.1.3 Introduced Flora

A total of 30 introduced taxa are known from the Desktop study Area (DBCA 2024c) and from Flora and Vegetation surveys conducted within the local area (Western Botanical 2013, 360 2021, Ecological 2021, Native Vegetation Solutions 2023). Of these, six are Declared Pests listed under the *Biosecurity and Agriculture Management Act 2007* (BAM Act 2007) (DPIRD 2025) and also Weeds of National Significance (WoNs) (AWC 2025).

The full list of introduced flora taxa known from within the Desktop Study Area and Local Area is presented below:

- Aloe vera
- Asphodelus fistulosus
- Carrichtera annua
- Cenchrus ciliaris
- Centaurea melitensis
- Citrullus amarus
- Citrullus lanatus
- Conyza bonariensis
- Cuscuta planiflora
- Cylindropuntia fulgida var. mamillata (s22(2) C3 Restricted, Declared Pests (DPIRD, 2025)), (AWC 2025)
- Cylindropuntia imbricata (s22(2) C3 Restricted, Declared Pests (DPIRD, 2025)), (AWC 2025)
- Cynodon dactylon
- Eragrostis curvula
- Lysimachia arvensis
- Medicago laciniata
- Medicago minima
- Monoculus monstrosus
- Opuntia elata (s22(2) C3 Restricted, Declared Pests (DPIRD, 2025)), (AWC 2025)

- Opuntia microdasys (s22(2) C3 Restricted, Declared Pests (DPIRD, 2025)), (AWC 2025)
- Opuntia monacantha (s22(2) C3 Restricted, Declared Pests (DPIRD, 2025)), (AWC 2025)
- Opuntia stricta (s22(2) C3 Restricted, Declared Pests (DPIRD, 2025)), (AWC 2025)
- Polypogon maritimus
- Portulaca oleracea
- Rumex vesicarius
- Salvia verbenaca
- Schinus molle var. areira
- Sisymbrium erysimoides
- Sisymbrium irio
- Solanum nigrum
- Sonchus oleraceus

The BAM Act 2007 Definitions and Control Categories for Declared Pests are below for the listed species in the desktop:

- Declared Pest s22(2) Declared pests must satisfy any applicable import requirements when imported and may be subject to an import permit if they are potential carriers of highrisk organisms. They may also be subject to control and keeping requirements once within Western Australia (DPIRD, 2025).
- C3 Management Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism (DPIRD, 2025).

4.1.4 Vegetation

The project survey area is located within the Eastern Murchison IBRA subregion (MUR01) which totals over 7 million hectares (CALM, 2002). The Eastern Murchison subregion is characterised by extensive areas of elevated red desert sandplains with minimal dune development and internal drainage. (CALM 2002). The vegetation of the Eastern Murchison botanical subregion consists of Mulga woodlands often rich in ephemerals. Vegetation is dominated by hummock grasslands, saltbush and Tecticornia shrublands (CALM, 2002).

Two Pre-European vegetation types have been mapped over the project survey area (Government of Western Australia, 2019). these being:

- Laverton_28: Low woodland, open woodland or sparse woodland of Mulga Acacia aneura and associated species with a current extent of 131,531.31 hectares which is 98.35 % remaining and
- Laverton _676: Samphire of Tecticornia spp. Communities in saline areas which is 221,809.04 hectares which is 99.97% remaining.

4.1.5 Threatened and Priority Ecological Communities

The interrogation of the DBCA TEC and PEC Database (DBCA 2024b) and Department of Climate Change, Energy, the Environment and Water SPRAT Database (DCCEEW 2024) indicated that no Threatened Ecological Communities listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) as potentially occurring within a 30 km radius of the survey area (Appendix 1). Further desktop assessment utilising Arc Internal TEC and PEC Database provided by DBCA indicate that the Priority 1 Ecological Community: Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita Station (Sons of Gwalia) with unique assemblages of invertebrates has been identified in the groundwater calcretes approximately 4.7km to the west of project survey area (DBCA 2024b) (Figure 2). This is the only conservation significant ecological community that has been identified within the 30km desktop study area.

19 of 59



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4.1.6 Threatened and Priority Fauna

A desktop assessment of online databases indicated the potential for a total of 21 conservation significant species to occur within 30 km of the survey area (Table 3). A review of the PMST (DCCEEW, 2024) indicated 18 significant fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) as potentially occurring within a 30 km radius of the survey area (Appendix 1). A review of the DBCA (2024d) Threatened and Priority fauna database indicated that nine species have been recorded within 30 km of the survey area.

Of the conservation significant species potentially found within the area, it was determined that the site conditions may be suitable for six (highlighted green) of these species (Table 3). An analysis of the likelihood determination for each species is presented in Appendix 2. Conservation code definitions are provided in Appendix 3.

Table 4: Threatened and Specially Protected Fauna species identified in desktop assessment

Species	Cons. Code	PMST	DBCA
Bird	S		
Actitis hypoleucos	MI	Х	Х
Aphelocephala leucopsis	VU	Х	
Apus pacificus	MI	Х	
Calidris acuminata	VU	Х	Х
Calidris melanotos	MI	Х	
Chalcites osculans as Chrysococcyx osculans	MI	Х	
Charadrius veredus	MI	Х	
Falco hypoleucos	VU	Х	
Falco peregrinus	OS	Х	Х
Leipoa ocellata	VU	Х	Х
Merops ornatus	MI	Х	
Motacilla cinerea	MI	Х	
Motacilla flava	MI	Х	
Pezoporus occidentalis	EN	Х	
Pluvialis fulva	MI		Х
Polytelis alexandrae	VU	Х	
Thinornis cucullatus	P4	Х	Х
Tringa glareola	MI		X
Tringa nebularia	EN	Х	Х
Mamm	als		
Bettongia lesueur graii	EX		Х
Dasyurus geoffroii	VU	Х	

4.3 Field Survey

4.3.1 Flora

A total of 53 discrete vascular flora taxa were recorded in the Survey Area during these surveys, representing 19 families and 34 genera. The most well-represented families are Chenopodiaceae (12 taxa), Poaceae (8 taxa), Fabaceae (7 taxa) and Amaranthaceae (4 taxa) with six of the total taxa recorded being introduced taxa (see Section 4.2.3). The number of flora species recorded within the survey area is potentially lower than expected from the surrounding area due to a number of potential reasons which include that, the surveys were conducted outside the recommended optimal survey time to observe native flora in the Eremaean Botanical Region, the survey area occurs adjacent to the railway line and access tracks creating an area which is fragmented and degraded from historical and ongoing infrastructure maintenance activities.

The recording of *Portulaca oleracea* (Purslane) in the Leonora area is a locality hole between collections from Kalgoorlie and Leinster and has been considered to be native and endemic to the Leonora area, although can be considered an introduced or naturalised introduced weed species in other parts of the state.

The recording of the introduced species **Citrullus colocynthis* in the Leonora area is a locality hole between collections from the Kalgoorlie and Leinster area.

The recording of the introduced species **Mesembryanthemum nodiflorum* (Slender Iceplant) in the Leonora area is a northeastern range extension of approximately 250 kilometres from previous collections in Kalgoorlie area and southeast of the Mount Manning Nature Reserve Area.

A full list of taxa is presented in Appendix 4, with raw releve' data and parameters presented in Appendix 5.

4.3.2 Threatened and Priority Flora

No Threatened or Priority flora species were recorded within the survey area during the surveys.

4.3.3 Introduced Flora

Summary of introduced flora results - weeds of national significance and declared pest assessment.

Of a total of 53 discrete vascular flora taxa that were recorded in the Survey Area, a total of six introduced taxa were recorded with none of these species being listed as a Weed of National Significance (AWC 2025) or Declared Pest (DPIRD 2025), these being:

- *Cenchrus ciliaris (Buffel Grass)
- *Citrullus colocynthis
- **Euphorbia drummondii* (Caustic Weed)
- *Malvastrum americanum (Spiked Malvastrum)
- *Mesembryanthemum nodiflorum (Slender Iceplant)
- *Sonchus oleraceus (Common Sowthistle)

4.3.4 Vegetation Types

Vegetation Type descriptions have been adapted from the National Vegetation Information System (NVIS) Australian Vegetation Attribute Manual Version 6.0 (Executive Steering Committee for Australian Vegetation Information (ESCAVI) 2003), as stipulated by EPA (2016). A total of six relevés were established within the survey area, which identified the presence of one main vegetation type. The vegetation descriptions associated with each of these relevé sites are presented in Appendix 5 and are variations in structure of this one main vegetation type based on vegetation condition ranking and associated levels of impact from previous clearing, railway and vehicle access track maintenance activities and grazing from livestock and introduced pest species. The one main vegetation type description for the survey area was:

• Isolated Tall Shrubs to Tall Shrubland of *Acacia aptaneura* with *Acacia caesaneura*, *Acacia incurvaneura* and *Acacia tetragonophylla* over Mid Isolated Shrubs to Mid Sparse Shrubland of *Eremophylla platycalyx* over Low Open Shrubland of *Ptilotus polystachyus* and *Sida calyxhymenia* over Low Isolated Shrubs to Low Open Chenopod Shrubland of *Atriplex semilunaris*, *Enchylaena tomentosa*, *Sclerolaena cuneata*, *Sclerolaena lanicuspis* and other mixed species over Low Isolated Tussock Grasses to Low Tussock Grassland of *Cymbopogon obtectus*, *Enneapogon caerulescens*, *Eragrostis dielsii*, *Eragrostis falcata* and *Eriachne flaccida*

Rev No. 0.00

23 of 59





4.3.5 Threatened and Priority Ecological Communities

The vegetation type recorded within the survey area is not consistent with any known Threatened or Priority Ecological Communities (DBCA, 2023a & b). In addition, the survey area is not identified as occurring within or associated with the Priority 1 Ecological Community: Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita Station (Sons of Gwalia) - unique assemblages of invertebrates identified in the groundwater calcretes, which is approximately 4.7km to the west of the survey area (as presented in Figure 2).

4.3.6 Vegetation Condition

Vegetation condition (EPA 2016; scale presented in Appendix A) was assessed and recorded throughout the survey area. The majority of the survey area was recorded to be Degraded (1.86ha, 18.3%), with some areas of Good condition (1.83ha, 17.9%). The remaining (6.51ha, 63.8%) of the survey area was classified as Completely Degraded, as it was bare ground associated with line of site clearing for safety requirements for the rail crossing at the intersection with Goldfields Highway. Vegetation condition throughout the survey area is presented in Figure 4.

As the Survey Area occurs adjacent to the railway line and associated access tracks which also provide access to other infrastructure sources such as power and pipelines, there is a previous history of disturbance in the survey area associated with the regular railway, access track and other infrastructure maintenance activities. These previous and current ongoing maintenance activities as well as the impacts of livestock grazing and introduced pests such as rabbits have lowered the condition ranking of the vegetation in this area compared to the surrounding vegetation.



Figure 4: Vegetation Condition within the survey area for the Proposed Leonora Inter Modal Terminal (LIMT) Project.

Rev No. 0.00

25 of 59

4.3.7 Fauna

One fauna habitat which was primarily Isolated Tall Shrubs to Tall Shrubland of *Acacia aptaneura* and other Acacia spp. over Mid Isolated Shrubs to Mid Sparse Shrubland of *Eremophylla platycalyx* over Low Open Shrubland of *Ptilotus polystachyus* and *Sida calyxhymenia* over ow Isolated Shrubs to Low Open Chenopod Shrubland of mixed species over Low Isolated Tussock Grasses to Low Tussock Grassland of mixed species (Section 4.2.4), was recorded within the survey area, covering approximately 36.2% (3.69 ha) of the survey area (Figure 4). Cleared or Completely Degraded areas covered 63.8% (6.51 ha) of the survey area.

As outlined in Section 4.2.6, the overall condition of the fauna habitat recorded varied from cleared to Completely Degraded areas to areas of intact native vegetation in Degraded to Good condition. Disturbances in the survey area included line of site clearing for railway crossing associated with Goldfields Highway, vehicle access tracks, previous historical clearing, ongoing maintenance activities associated with the railway line and adjoining vehicle access tracks, grazing impacts from cattle and rabbits and introduced weed species, which has decreased the quality of habitat for vertebrate fauna species.

A total of three vertebrate fauna species were recorded as occurring within the survey area, comprising of three birds (Appendix 5), these were:

- Whistling Kite (*Haliastur sphenurus*)
- Hooded Robin (*Melanodryas cucullata*)
- Crested Pigeon (Ocyphaps lophotes)

All of these are common species which are native to Australia and are found widely throughout mainland Australia.

No direct (observations) or indirect (scats, tracks, diggings) evidence of Threatened fauna species listed under the EPBC Act or the BC Act, or Priority fauna species as listed by DBCA were recorded within the survey area.

Of the 21 conservation significant fauna species identified from the desktop assessment, six were identified as possibly occurring within the survey area. Following the field survey, it was assessed that all species are considered unlikely to occur or do not occur within the survey area, based on lack of suitable habitat for these species and proximity of previous records (Appendix 2).

Two introduced fauna species were recorded within the survey area, namely European cattle (*Bos primigenius taurus*) and Rabbit (*Oryctolagus cuniculus*). All species were observed from secondary signs (scats).

5 **Discussion**

5.1 Flora

A total of 53 discrete vascular flora taxa, representing 19 families and 34 genera were recorded within the survey area from both relevé data and opportunistic collections. Of the total of 53 discrete vascular flora taxa that were recorded in the Survey Area, a total of six introduced taxa were recorded with none of these species being listed as a Weed of National Significance (AWC 2025) or Declared Pest (DPIRD 2025). The number of flora species recorded within the survey area is potentially lower than expected from the surrounding area due to a number of potential reasons which include that the surveys were conducted outside the recommended optimal survey time to observe native flora in the Eremaean Botanical Region, the Survey Area occurs adjacent to the railway line and access tracks creating an area which is fragmented and degraded from historical and ongoing infrastructure maintenance activities.

No conservation significant flora species identified from the desktop assessment and No Threatened flora species listed under the EPBC Act or the BC Act, nor Priority flora species listed by DBCA were recorded within the Survey Area.

5.2 Vegetation

One intact vegetation type was delineated and mapped within the survey area, this being: Isolated Tall Shrubs to Tall Shrubland of *Acacia aptaneura* with *Acacia caesaneura*, *Acacia incurvaneura* and *Acacia tetragonophylla* over Mid Isolated Shrubs to Mid Sparse Shrubland of *Eremophylla platycalyx* over Low Open Shrubland of *Ptilotus polystachyus* and *Sida calyxhymenia* over Low Isolated Shrubs to Low Open Chenopod Shrubland of *Atriplex semilunaris*, *Enchylaena tomentosa*, *Sclerolaena cuneata*, *Sclerolaena lanicuspis* and other mixed species over Low Isolated Tussock Grasses to Low Tussock Grassland of *Cymbopogon obtectus*, *Enneapogon caerulescens*, *Eragrostis dielsii*, *Eragrostis falcata* and *Eriachne flaccida*.

This vegetation type covers 100% 10.2 ha of the survey area, with Completely Degraded areas associated with line of site clearing for railway crossing at Goldfields Highway or cleared areas associated with access tracks covering the remainder. The vegetation within the survey area is very fragmented due to the presence of the railway line and associated vehicle access tracks and previous historical and ongoing railway and vehicle access track maintenance activities and varies in condition ranking scales from being Completely Degraded to Good condition on the condition scale adapted from Trudgen (EPA 2016).

The majority of the survey area was recorded to be Completely Degraded (6.51 ha, 63.8%), as it was bare ground associated with line of site clearing for safety requirements for the rail crossing at the intersection with Goldfields Highway or maintenance access tracks or historical clearing associated with the railway maintenance. A portion of the survey area was in Good condition (1.83 ha, 17.9%) with intact overstorey and fairly intact understorey strata layers. The remaining (1.86 ha, 18.3%) of the survey area was classified as Degraded, with sparse vegetation and sparse understory.

The vegetation type and associated flora species recorded within the survey area are considered to be typical of the local area and broader region in general. The Murchison bioregion, in which the survey area is located, is known to be dominated by mulga (Acacia aneura and associated species) woodlands, along with hummock grasslands, saltbush shrublands and Tecticornia shrublands (CALM 2002). The vegetation association covering the survey area (Laverton 28) comprises mulga open woodland, low open woodland or sparse woodland. This vegetation association has a very high proportion (97%) of its total pre-European extent remaining within the East Murchison sub-region (DPIRD 2019).

5.3 Threatened and Priority Flora and Ecological Communities

The vegetation type recorded within the survey area is not consistent with any known Threatened or Priority Ecological Communities (DBCA, 2023a & b). In addition, the survey area is not identified as occurring within or associated with the Priority 1 Ecological Community: Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita Station (Sons of Gwalia) - unique assemblages of invertebrates identified in the groundwater calcretes, which is approximately 4.7km to the west of the survey area.

No Threatened or Priority Ecological Communities listed under the EPBC Act or the BC Act were recorded within the Survey Area.

5.4 Fauna

A total of three vertebrate fauna species were recorded during the Basic fauna survey, comprising three birds, with two introduced mammal species, namely European cattle (*Bos primigenius taurus*) and Rabbit (*Oryctolagus cuniculus*) observed from secondary signs (scats). The species recorded represent a brief view of the fauna occurring within the survey area, and it is therefore likely that more species occur than were observed during the survey.

No direct (observations) or indirect (scats, tracks, diggings) evidence of Threatened fauna species listed under the EPBC Act or the BC Act, or Priority fauna species listed by DBCA were recorded within the survey area. Of the 21 conservation significant fauna species identified from the desktop assessment, six were identified as possibly occurring within the survey area. Following the field

survey, it was assessed that all species are considered unlikely to occur or do not occur within the survey area, based on lack of suitable habitat for these species and proximity of previous records

One fauna habitat primarily consisting of a Tall *Acacia aptaneura* shrubland of varying densities of vegetation cover was recorded within the survey area. The overall condition of the intact native vegetation forming the fauna habitat varied from Degraded areas to areas in Good condition. Completely Degraded areas associated with line of site clearing for the railway crossing at Goldfields Highway or Cleared Areas associated with access tracks covered the remainder of the survey area. Whilst the Cleared areas do not comprise a fauna habitat as such, they do provide some value to fauna as a 'stepping stone' for movement between areas of bushland, especially in areas that provide extra cover such as isolated trees/shrubs, rocks or logs. Disturbances noted within the survey area include railway and vehicle access track maintenance activities, previous historical clearing, impacts from cattle and rabbit grazing and introduced weed species have decreased the quality of vegetation for vertebrate fauna species.

5.5 Assessment Against the 10 Clearing Principles

Principle (a): "Native vegetation should not be cleared if it comprises a high level of biological diversity."

Variance Level: Not likely to be at variance

A total of 53 discrete vascular flora taxa were recorded in the application area, representing 19 families and 34 genera. The most well-represented families are Chenopodiaceae (12 taxa), Poaceae (8 taxa), Fabaceae (7 taxa) and Amaranthaceae (4 taxa) with six of the total taxa recorded being introduced taxa. The number of flora species recorded within the application area is likely to be lower than expected from the surrounding area due to a number of potential reasons which include that, the surveys were conducted outside the recommended optimal survey time to observe native flora in the Eremaean Botanical Region and the application area having multiple disturbances lowering the condition ranking for the area. The proposed application area occurs adjacent to the railway line and access tracks creating an area which is fragmented and degraded from historical and ongoing infrastructure maintenance activities. The vegetation type identified within the application area was generally representative of existing broad scale vegetation types associated with the Eastern Murchison botanical subregion which consists primarily of Mulga (Acacia aneura) woodlands with the application area adjoining an expansive tract of native vegetation.

One intact vegetation type was delineated and mapped within the application area, this being: Isolated Tall Shrubs to Tall Shrubland of *Acacia aptaneura* with *Acacia caesaneura*, *Acacia incurvaneura* and *Acacia tetragonophylla* over Mid Isolated Shrubs to Mid Sparse Shrubland of *Eremophylla platycalyx* over Low Open Shrubland of *Ptilotus polystachyus* and *Sida calyxhymenia* over Low Isolated Shrubs to Low Open Chenopod Shrubland of *Atriplex semilunaris*, *Enchylaena tomentosa*, *Sclerolaena cuneata*, *Sclerolaena lanicuspis* and other mixed species over Low Isolated Tussock Grasses to Low Tussock Grassland of *Cymbopogon obtectus*, *Enneapogon caerulescens*, *Eragrostis dielsii*, *Eragrostis falcata* and *Eriachne flaccida*.

The majority of the vegetation condition within the application area was recorded to be Degraded, with some areas of Good condition. The remaining of the application area was classified as Completely Degraded, as it was either bare ground associated with line of site clearing for safety requirements for the rail crossing at the intersection with Goldfields Highway or associated vehicle access tracks for access to the railway line or other infrastructure assets (e.g. powerlines). These previous and current ongoing maintenance activities as well as the impacts of livestock grazing and introduced pests such as rabbits have lowered the condition ranking of the vegetation in this area compared to the surrounding vegetation. A total of six introduced taxa were recorded with none of these species being listed as a Weed of National Significance (AWC 2025) or Declared Pest (DPIRD 2025).

No threatened or priority flora taxa were recorded within the application area during the biological surveys with the vegetation within the application area unlikely to comprise significant habitat for the species identified within the desktop study area (30km radius).

The desktop assessment identified that no Threatened Ecological Communities (TECs) have been recorded within the local area, and none are likely to occur. The nearest mapped conservation significant ecological community is the 'Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita (Sons of Gwalia) Station, a Priority one, Priority Ecological Community (PEC) mapped approximately 4.7 kilometres west from the survey area. This community is characterised as unique assemblages of invertebrates identified in groundwater calcretes (DBCA, 2023a). Noting this PEC is associated with groundwater environments and the absence of a watercourse in the application area, the proposed clearing is not likely to impact this community.

A total of three common vertebrate fauna species were recorded during the Basic fauna survey, comprising three birds these being Whistling Kite (*Haliastur sphenurus*), Hooded Robin (*Melanodryas cucullata*) and Crested Pigeon (*Ocyphaps lophotes*) with two introduced mammal species, namely European cattle (*Bos primigenius taurus*) and Rabbit (*Oryctolagus cuniculus*) observed from secondary signs (scats).

Six conservation significant fauna species were identified in the desktop as potentially occurring within the application area, primarily comprising of avian species however, no significant fauna species were recorded within the application area.

Principle (b): "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia."

Variance Level: Not likely to be at variance

One fauna habitat primarily consisting of a Tall *Acacia aptaneura* shrubland of varying densities of vegetation cover was recorded within the application area. The overall condition of the intact native vegetation forming the fauna habitat varied from Degraded areas to areas in Good condition. Completely Degraded areas associated with line of site clearing for the railway crossing at Goldfields Highway or Cleared Areas associated with railway line and access tracks covered the remainder of the application area.

A total of three common vertebrate fauna species were recorded during the Basic fauna survey, comprising three birds these being Whistling Kite (*Haliastur sphenurus*), Hooded Robin (*Melanodryas cucullata*) and Crested Pigeon (*Ocyphaps lophotes*) with two introduced mammal species, namely European cattle (*Bos primigenius taurus*) and Rabbit (*Oryctolagus cuniculus*) observed from secondary signs (scats).

Six conservation significant fauna species were identified in the desktop assessment as potentially occurring within the application area, primarily comprising of avian species however, no significant fauna species were recorded within the application area. Some of these species may be transient visitors to the application area however, due to the degraded nature of the vegetation, lack of foraging, roosting and breeding habitat which would be considered critical significant habitat for conservation significant fauna and that the application area is located adjacent to multiple linear transport infrastructure with associated noise and vibration, these visitations and use of the habitat associated with the application area are considered very low.

The potential clearing of the native vegetation within the application area is unlikely to impact on the survival of any conservation significant species due to their distribution, wide range of habitat preference and high mobility. Vegetation of similar or higher habitat condition and value is present adjacent within the local area.

Principle (c) – "Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora."

Variance Level: Not likely to be at variance

No threatened or priority flora taxa were recorded within the application area during the biological surveys. Desktop reviews of available databases indicated that no threatened flora, and five priority flora taxa have been recorded within the desktop study area (30-kilometre radius). None of these taxa were recorded within the survey area as these potential species were unlikely to occur due to different soil and vegetation type to that mapped within the application area. Given the habitat preferences, the locality information for the flora records and the historical clearing, ongoing maintenance disturbances and grazing impacts from livestock and introduced mammal species, the application area is not likely to comprise significant habitat for these potential species.

Principle (d) – "Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community."

Variance Level: Not likely to be at variance

The desktop assessment has identified that no Threatened Ecological Communities (TECs) have been recorded within the desktop study area and local area and that none are likely to occur. The nearest mapped conservation significant ecological community is the Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita (Sons of Gwalia) Station, a Priority one, Priority Ecological Community (PEC) mapped approximately 4.7 kilometres west from the application area. This community is characterised as unique assemblage es of invertebrates identified in groundwater calcretes (DBCA, 2023a). Noting that this PEC is associated with groundwater environments and the absence of a watercourse in the survey area that the proposed clearing is not likely to impact this community.

Principle (e) – "Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared."

Variance Level: Not likely to be at variance

The extent of the mapped vegetation type and native vegetation in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). The vegetation mapped within the application area and local area retain more than 98 per cent of the original vegetation cover (Government of Western Australia, 2019). The vegetation proposed to be cleared is not considered to be or part of a significant ecological linkage in the local area.

Principle (f) – "Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."

Variance Level: Not likely to be at variance

The application area is located within the Raeside-Ponton Salt Lake basin sub-catchment. A minor non-perennial type 2 watercourse is evident approximately 110 metres to the east of the application area. Given no other watercourses and wetlands are identified within the application area, the proposed clearing is unlikely to impact on or off-site hydrology and water quality and will not involve the clearing of riparian vegetation growing within, or in association with, a wetland or watercourse as it is unlikely that the application area can support riparian vegetation.

Principle (g) – "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."

Variance Level: May be at variance

The application area is situated within the Gundockerta soil-landscape system described as extensive, gently undulating calcareous stony plains supporting bluebush with abundant stony mantles, and less extensive lower alluvial plains with narrow central zones receiving more concentrated run-on, relief usually less than 15 metres. Saline plains and adjacent alluvial tracts area are susceptible to water erosion where the stony mantle is absent and/or vegetation cover is reduced (DPIRD, 2019).

The vegetation of this land system is highly preferred for grazing by introduced and native mammals, rendering it susceptible to overgrazing and consequent degradation (Pringle *et al*, 1994). The soil landscape within the application area, may be susceptible to wind and water erosion. Given the condition of the vegetation ranges from Completely Degraded, Degraded to Good (EPA, 2016), clearing of this vegetation may result in increased risk of wind and water erosion. To reduce increased wind and water erosion, it is considered that the impacts of the proposed clearing can be managed by applying appropriate measures to minimise and mitigate risks associated with wind and water erosion will be required as part of the conditions associated with the internal Arc Infrastructure disturbance permit process. During the proposed clearing and construction of the Inter Modal Terminal and other associated rail infrastructure, methodologies such as dust control and drainage control will ameliorate the risk of land degradation.

Principle (h) – "Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area."

Variance Level: Not at Variance

No conservation areas are mapped within the local area and given the distance to the nearest conservation area (over 30 kilometres), the proposed clearing is not likely to have an impact on the environmental values of any conservation areas.

Principle (i) – "Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water."

Variance Level: Not likely to be at variance

The application area is located within the Raeside-Ponton Salt Lake basin sub-catchment. A minor non-perennial type 2 watercourse is evident approximately 110 metres to the east of the application area. Considering that it is a minor non-perennial watercourse, the proposed clearing is unlikely to impact surface or ground water quality.

The application area falls within the Goldfields groundwater area, as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The mapped statewide groundwater salinity within the application area is >35000 milligrams per litre. Noting that there are no major rivers, surface water areas or Public Drinking Water Sources intersecting the application area and therefore is unlikely to cause deterioration in the ground water.

Principle (j) – "Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding."

Variance Level: Not likely to be at variance

The mapped soils and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding. Given no significant water courses or wetlands are recorded within the application area and the purpose of the proposed clearing for an Inter Modal Terminal to efficiently transfer freight between different modes of transportation, typically between trains and trucks, the proposed clearing is unlikely to contribute to increased incidence or waterlogging.

6 **References**

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7 Appendices



Appendix

Appendix 1 Protected Matters Search Tool



Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 20-Dec-2024

Summary Details Matters of NES Other Matters Protected by the EPBC Act Extra Information Caveat Acknowledgements

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	8
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A <u>permit</u> may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	12
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
	110110

Details

Matters of National Environmental Significance

Listed Threatened Species		[<u>Res</u>	source Information]
Status of Conservation Dependent and Ex Number is the current name ID.	xtinct are not MNES unde	r the EPBC Act.	
Scientific Name <mark>BIRD</mark>	Threatened Category	Presence Text	Buffer Status
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos			
Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Leipoa ocellata			
Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pezonorus occidentalis			
Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Polytelis alexandrae			
Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Docusign Envelope ID: 5164442E-2908-4D05-9E7B-50ACAFCAD917		[Res	source Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
<u>Motacilla flava</u>			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius veredus			
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
<u>Tringa nebularia</u>			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands	[Resource Information]
The Commonwealth area listed below may indicate the presence of Commonwer the unreliability of the data source, all proposals should be checked as to wheth Commonwealth area, before making a definitive decision. Contact the State or T department for further information.	ealth land in this vicinity. Due to er it impacts on a Ferritory government land

Commonwealth Land Name	State	Buffer Status
Unknown		

Docusign Envelop	DE 5164442E-2908-4D05-9E7B-50ACAFCAD917	State	Buffer Status
Comm	onwealth Land - [51984]	WA	In buffer area only
Comm	onwealth Land - [52197]	WA	In feature area
Comm	onwealth Land - [52213]	WA	In feature area
Comm	onwealth Land - [51796]	WA	In buffer area only
Comm	nonwealth Land - [51756]	WA	In feature area
Comm	nonwealth Land - [51754]	WA	In feature area
Comm	nonwealth Land - [51755]	WA	In feature area
Comm	nonwealth Land - [51752]	WA	In feature area
Comm	onwealth Land - [51753]	WA	In feature area
Comm	nonwealth Land - [52232]	WA	In feature area
Comm	nonwealth Land - [51058]	WA	In feature area
Comm	ionwealth Land - [51751]	WA	In feature area

Listed Marine Species		[Res	source Information
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<u>Apus pacificus</u>			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area

Docusign Envelope D: 5164442E-2908-4D05-9E7B-50ACAFCAD917	Threatened Catagory	Dracance Text	Duffor Status
	Threatened Category	Presence Text	Buller Status
Chalcites osculans as Chrysococcyx osc Black-eared Cuckoo [83425]	<u>culans</u>	Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius veredus			
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
Merops ornatus			
Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
This series according to a This series with the	0.2		
Hooded Plover, Hooded Dotterel [87735]	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Unnamed WA46847	Nature Reserve	WA	In buffer area only

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Lake Ballard	WA	In buffer area only

EPBC Act Referrals

[Resource Information]

Doci	usign Envelope ID: 5164442E-2908-4D05-9E7B-50ACAFCAD917	Reference	Referral Outcome	Assessment Status	Buffer Status
	Redcliffe Gold Project	2023/09452		Completed	In buffer area only
	Not controlled action				
	Eastern Goldfields Gas Pipeline	2014/7284	Not Controlled	Completed	In buffer area
	Construction, WA		Action		only
	Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two	2015/7522	Not Controlled Action	Completed	In feature area
	thirds of Australia				
	<u>Murrin Murrin East Nickel and Cobalt</u> <u>Mine Expansion</u>	2008/4140	Not Controlled Action	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- · some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened,
- have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales -Department of Environment and Primary Industries, Victoria -Department of Primary Industries, Parks, Water and Environment, Tasmania -Department of Environment, Water and Natural Resources, South Australia -Department of Land and Resource Management, Northern Territory -Department of Environmental and Heritage Protection, Queensland -Department of Parks and Wildlife, Western Australia -Environment and Planning Directorate, ACT -Birdlife Australia -Australian Bird and Bat Banding Scheme -Australian National Wildlife Collection -Natural history museums of Australia -Museum Victoria -Australian Museum -South Australian Museum -Queensland Museum -Online Zoological Collections of Australian Museums -Queensland Herbarium -National Herbarium of NSW -Royal Botanic Gardens and National Herbarium of Victoria -Tasmanian Herbarium -State Herbarium of South Australia -Northern Territory Herbarium -Western Australian Herbarium -Australian National Herbarium, Canberra -University of New England -Ocean Biogeographic Information System -Australian Government, Department of Defence Forestry Corporation, NSW -Geoscience Australia -CSIRO -Australian Tropical Herbarium, Cairns -eBird Australia -Australian Government – Australian Antarctic Data Centre -Museum and Art Gallery of the Northern Territory -Australian Government National Environmental Science Program -Australian Institute of Marine Science -Reef Life Survey Australia -American Museum of Natural History -Queen Victoria Museum and Art Gallery, Inveresk, Tasmania -Tasmanian Museum and Art Gallery, Hobart, Tasmania -Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix 2 Potential Conservation Significant Species Presence

A compiled list of Threatened and Priority flora species that were indicated to potentially occur within 30km of the proposed clearing footprint are listed in the table below.

Table A2.1: Potential Conservation Significant Flora

Taxon	WA Status	EPBC Status	Description	Likelihood of Occurrence	Survey Findings
Acacia sp. Marshall Pool (G. Cockerton 3024)	P3		Tree up to 7 m high, grows on serpentinite ridges.	Unlikely - habitat and soil type unsuitable	Not detected - habitat and soil type unsuitable
Angianthus prostratus	P3		Prostrate annual, herb. Fl. white-yellow, Jul to Sep. Red clay or loamy soils. Saline depressions, on gentle slopes surrounding salt lakes or clay depressions, saline and red loamy soil in Eucalyptus woodland.	Unlikely - habitat and soil type unsuitable	Not detected - habitat and soil type unsuitable
Calytrix praecipua	P3		Shrub, 0.3-0.7 m high. Fl. pink-white, Jun to Jul or Sep to Nov. Skeletal sandy soils over granite or laterite. Breakaways, outcrops.	Unlikely - habitat and soil type unsuitable	Not detected - habitat and soil type unsuitable
Nicotiana salina	P1		Saline depressions, margins of samphire flats, on flats below breakaways.	Unlikely - habitat and soil type unsuitable	Not detected - habitat and soil type unsuitable
Triglochin protuberans	P3		Annual, herb, 0.03-0.13 m high. Red loam, grey mud over clay. Winter-wet sites, claypans, near salt lakes, margins of pools.	Unlikely - habitat and soil type unsuitable	Not detected - habitat and soil type unsuitable

A compiled list of threatened and priority fauna species that were indicated to potentially occur within 30km of the proposed clearing footprint are listed in the table below.

Table A2.2: Potential Conservation Significant Fauna

Species Present	No	Ŷ	No, however, the area may be part of the species larger foraging range for insects	Ŷ	Ŷ	No
Likelihood of Occurrence	Unlikely - habitat unsuitable	Unlikely - outside of known range	Possible - within known range	Unlikely – mainland populations are now extinct	Unlikely - habitat unsuitable	Unlikely - habitat unsuitable
Habitat	Migratory and is found in coastal or inland wetlands, both saline or fresh. It is found mainly on muddy edges or rocky shores.	Known to occur across most of mainland Australia. Requires undisturbed open woodlands and shrublands with low tree densities, an understorey of grasses and/or shrubs and a herbaceous understorey litter cover.	Known to occur across most of mainland Australia as well as over settled areas, including towns, urban areas and cities	Once widespread across arid and semi-arid areas in the south, central and western parts of Australia, Burrowing Bettongs' are now only present on a small number of islands off the coast of Western Australia.	Migratory and are largely found in Australia around wetlands, preferring freshwater inland wetlands with grassy edges or tend to be seen on coastal mudflats, salt marsh and brackish lagoons and less often on similar wet fields of short grass	Migratory and prefer shallow fresh to saline wetlands
EPBC Status	IW	~	W	EX	٨IJ	IW
WA Status	IW	>	¥	EX	IW	IW
Class	Bird	Bird	Bird	Mammal	Bird	Bird
Common	Common Sandpiper	Southern Whiteface	Fork-tailed Swift	Boodie (inland), Burrowing Bettong (inland)	Sharp-tailed Sandpiper	Pectoral Sandpiper
Тахоп	Actitis hypoleucos	Aphelocephala leucopsis	Apus pacificus	Bettongia lesueur graii	Calidris acuminata	Calidris melanotos

Leonora Inter Modal Terminal Project, Flora and Vegetation Survey, Leonora

Rev No. 0.00

Species Present	No, however, the area may be part of the species larger foraging range	No	No	No, however, the area may be part of the species larger foraging range	No, however, the area may be part of the species larger range although no potential roosting or nesting habitat located within the survey area
Likelihood of Occurrence	Possible - within known range	Unlikely - habitat unsuitable	Unlikely – outside of known range, habitat unsuitable	Possible - within known range,	Possible - within known range, although nesting or roosting habitat not present within survey area
Habitat	Widespread through mainland Australia and found in open woodlands and open shrublands, often with a Eucalyptus canopy including mallee with large wattles	Coastal habitats such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches or nearby reefs, or in near-coastal grasslands	Forest, mallee shrublands, woodlands and deserts, denser populations found in the Jarrah Forest in the south west of WA. They require a number of suitable dens and refuge sites (hollow logs or earth burrows	Occurs at low densities across inland Australia and frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses	Is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water
EPBC Status	MA/MI	W	٨U	٨U	
WA Status		W	٨U	٨U	S
Class	Bird	Bird	Mammal	Bird	Bird
Common	Black-eared Cuckoo	Oriental Plover	Chuditch	Grey Falcon	Peregrine Falcon
Taxon	Chalcites osculans as Chrysococcyx osculans	Charadrius veredus	Dasyurus geoffroii	Falco hypoleucos	Falco peregrinus

Docusign Envelope ID: 5164442E-2908-4D05-9E7B-50ACAFCAD917

Leonora Inter Modal Terminal Project, Flora and Vegetation Survey, Leonora

Rev No. 0.00

Species Present	No, however, the area may be part of the species larger range although no potential nesting habitat located within the survey area	No, however, the area may be part of the species larger foraging range	ON	No	ON	ON
Likelihood of Occurrence	Possible - within known range, with tracks being recorded within the local area although although nesting habitat not present within survey area	Possible - within known range	Unlikely - habitat unsuitable	Unlikely - habitat unsuitable	Unlikely - habitat unsuitable	Unlikely - habitat unsuitable
Habitat	Scrubs and thickets of Eucalyptus particularly mallees, Melaleuca uncinata and Acacia spp. and other scrublands with dense leaf litter and sandy substrate.	Widespread through mainland Australia and found in open forests and woodlands, shrublands, and in various cleared or semi- cleared habitats, including farmland and areas of human habitation	Lakes, coasts and other watery habitats	Inhabits open country near water, such as river courses and wetlands	Triodia (Spinifex) grasslands and/or chenopod shrublands in the arid and semi- arid zones	Migratory and inhabits a variety of habitats such as the mudflats, estuaries, inlets, saltmarsh, pasture and beaches. Usually not found far from the coast.
EPBC Status	ΛΛ	IM/AM	IW	W	EN	IW
WA Status	ΩΛ		IW	¥	CR	IW
Class	Bird	Bird	Bird	Bird	Bird	Bird
Common	Malleefowl	Rainbow Bee- eater	Grey Wagtail	Yellow Wagtail	Night Parrot	Pacific golden Plover
Taxon	Leipoa ocellata	Merops ornatus	Motacilla cinerea	Motacilla flava	Pezoporus occidentalis	Pluvialis fulva

Docusign Envelope ID: 5164442E-2908-4D05-9E7B-50ACAFCAD917

Leonora Inter Modal Terminal Project, Flora and Vegetation Survey, Leonora

Rev No. 0.00

41 of 59

Species Present	No	Ŷ	N	Q
Likelihood of Occurrence	Unlikely - habitat unsuitable	Unlikely - habitat unsuitable	Unlikely - habitat unsuitable	Unlikely - habitat unsuitable
Habitat	Shrubland in swales between sand dunes, with occupied sites typically having a variety of shrubs (including Grevillea, Hakea, Cassia and Eremophila species) among scattered emergent trees, with a ground-cover of spinifex Triodia species	They prefer wide beaches backed by dunes with large amounts of seaweed, creek mouths and inlet entrances, although are sometimes found around other coastal lakes and lagoons	Migratory and prefers shallow, freshwater wetlands, usually where there is grass or aquatic plants protruding above the water, and often with trees and much fallen timber.	Migratory and occur in Australia during the non-breeding season. Occurs along the coast. Forages at the edge of wetlands, in soft mud on mudflats, in channels, or within shallows around the edge of waterbodies.
EPBC Status	٨U		W	EN
WA Status	P4	P4	IW	¥
Class	Bird	Bird	Bird	Bird
Common	Princess Parrot	Hooded Plover, Hooded Dotterel	Wood Sandpiper	Common Greenshank
Тахоп	Polytelis alexandrae	Thinornis cucullatus	Tringa glareola	Tringa nebularia

Docusign Envelope ID: 5164442E-2908-4D05-9E7B-50ACAFCAD917

Leonora Inter Modal Terminal Project, Flora and Vegetation Survey, Leonora

Rev No. 0.00

Appendix 3 Conservation Code Definitions

Table A3.1: Conservation code definitions for flora and fauna as listedas Threatened or specially protected

Threat Category	Definition
Threatened – Vulnerable (V)	Facing a high risk of extinction in the wild in the medium-term future.
Threatened – Endangered (E)	Facing a very high risk of extinction in the wild in the near future.
Threatened – Critically Endangered (CR)	Facing an extremely high risk of extinction in the wild in the immediate future.
Threatened – Extinct in the Wild (EW)	Species is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form.
Threatened – Extinct (EX)	There is no reasonable doubt that the last member of the species has died.
Specially Protected Species – Migratory Species (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth. Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
Specially Protected Species – Conservation Dependent (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Specially Protected Species – Other specially protected species (OS)	Fauna otherwise in need of special protection to ensure their conservation.

Table A3.2: Conservation code definitions for flora and fauna as listedas Priority

Threat Category	Definition
Priority 1: Poorly- known species	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation.
Priority 2: Poorly- known species	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation.
Priority 3: Poorly- known species	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.
Priority 4: Rare, Near Threatened and other species in need of monitoring	a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
	(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
	(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Table A3.3: Conservation code definitions for ecological communitieslisted as threatened (TEC)

Threat Category	Definition
Presumed Totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its

Threat Category	Definition
	range or severe modification or destruction over most of its range in the near future.
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Table A3.4: Conservation code definitions for ecological communities listed as priority (PEC)

Threat Category	Definition
Priority One (P1)	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤100ha) and appear to be under immediate threat.
Priority Two (P2)	Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation.
Priority Three (P3)	(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
	(ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;
	(iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.
Priority Four (P4)	Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.
Conservation Dependent (CD)	Conservation Dependent ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Appendix 4 Vascular Plant Taxa Recorded in the Survey Area

Family	Species Name	Common Name	Introduced
Aizoaceae	Mesembryanthemum nodiflorum	Slender Iceplant	Х
Amaranthaceae	Ptilotus exaltatus	Tall Mulla Mulla	
Amaranthaceae	Ptilotus obovatus	Cotton Bush	
Amaranthaceae	Ptilotus polystachyus	Prince of Wales	
Amaranthaceae	Ptilotus roei	Feather Tall Mulla Mulla	
Anarananaceae	Leichbardtia australis		
	Brachyscome ciliaris		
Asteraceae	Gnenhosis arachnoidea		
Asiciaceae		Gnephosis	
Asteraceae	Rhodanthe charsleyae		
Asteraceae	Sonchus oleraceus	Common Sowthistle	Х
Chenopodiaceae	Atriplex amnicola	Swamp Saltbush	
Chenopodiaceae	Atriplex codonocarpa	Flat-topped Saltbush	
Chenopodiaceae	Atriplex semilunaris	Annual Saltbush	
Chenopodiaceae	Enchylaena tomentosa	Barrier Saltbush	
Chenopodiaceae	Maireana pyramidata	Sago Bush	
Chenopodiaceae	Maireana tomentosa	Felty Bluebush	
Chenopodiaceae	Maireana triptera	Threewinged Bluebush	
Chenopodiaceae	Rhagodia drummondii		
Chenopodiaceae	Salsola australis		
Chenopodiaceae	Sclerolaena cuneata	Yellow Bindii	
Chenopodiaceae	Sclerolaena eriacantha	Tall Bindii	
Chenopodiaceae	Sclerolaena lanicuspis	Spinach Burr	
Convolvulaceae	Duperreya commixta		
Cucurbitaceae	Citrillus colocynthis		Х
Euphorbiaceae	Euphorbia drummondii	Caustic Weed	Х
Fabaceae	Acacia tetragonophylla	Kurara	
Fabaceae	Acacia aptaneura		
Fabaceae	Acacia caesaneura		
Fabaceae	Acacia craspedocarpa	Hop Mulga	
Fabaceae	Acacia incurvaneura		
Fabaceae	Senna artemisioides subsp. x sturtii		
Fabaceae	Senna artemisioides subsp. filifolia		
Lauranthaceae	Amyema preissii	Wireleaf Mistletoe	
Malvaceae	Malvastrum americanum	Spiked Malvastrum	Х
Malvaceae	Sida calyxhymenia	Tall Sida	
Malvaceae	<i>Sida</i> sp. dark green fruits (S. van Leeuwen 2260)		
Montiaceae	Calandrinia pleiopetala		
Poaceae	Aristida contorta	Bunched Kerosene Grass	
Poaceae	Cenchrus ciliaris	Buffel Grass	X

Family	Species Name	Common Name	Introduced
Poaceae	Cymbopogon obtectus	Silkyheads	
Poaceae	Enneapogon polyphyllus	Leafy Nineawn	
Poaceae	Enneapogon caerulescens	Limestone Grass	
Poaceae	Eragrostis dielsii	Mallee Lovegrass	
Poaceae	Eragrostis falcata	Sickle Lovegrass	
Poaceae	Eriachne flaccida	Claypan Grass	
Portulaceae	Portulaca oleracea	Purslane	
Proteaceae	Grevillea nematophylla subsp. supraplana		
Santalaceae	Santalum lanceolatum	Northern Sandalwood	
Scrophulariaceae	Eremophila alternifolia	Poverty Bush	
Scrophulariaceae	Eremophila forrestii	Wilcox Bush	
Scrophulariaceae	Eremophila platycalyx	Granite Poverty Bush	
Solanaceae	Solanum lasiophyllum	Flannel Bush	
Zygophyllaceae	Roepera eremaea	Shrubby Twinleaf	

Appendix 5 Raw Data Recorded in Relevés

Location/Project: Leonora IMT Project			Site Name: 1	
Site Type: Relevé	Recorders: KK/NM		Photo #: GE2 (& GE1)	
Date: 8/10/2024	GPS Location:			
Landform: Plain	Slope Class/%: Flat		Aspect: Flat	
Soil Type: Clay Loam	Soil	Colour: Red	Rock Outcrop: NA	
Bare Ground: 90% +	Fire: >10yrs		Hydrology: NA	
Vegetation Condition: CD		Fauna Obs: NA		
Disturbance: Railway maintenance activities, level crossing line of sight clearing, access track				
maintenance activities, cattle, rabbits				
Comments: Area previously cleared as part of level crossing line of sight				

DOMINANT TAXA IN VEGETATION STRATA

Vegetation Description: Previously Cleared (Tall Isolated Shrubs of Acacia aptaneura over Low Isolated Chenopod Shrubs of Atriplex semilunaris, Sclerolaena cuneata and Sclerolaena lanicuspis) Upper Stratum: Acacia aptaneura Mid Stratum: Lower Stratum: Atriplex semilunaris, Sclerolaena cuneata, Sclerolaena lanicuspis

Species Recorded

Taxon Name	Height (m)	% Cover
Acacia aptaneura	2	1
Atriplex semilunaris	0.2	1
Enneapogon caerulescens	0.1	0.1
Enneapogon polyphyllus	0.1	0.2
Eragrostis dielsii	0.1	0.5
Ptilotus obovatus	0.3	0.2
Salsola australis	0.2	0.3
Sclerolaena cuneata	0.2	2
Sclerolaena lanicuspis	0.2	2
Senna artemisioides subsp. x sturtii	0.6	0.2
Solanum lasiophyllum	0.3	0.3

Site Photos

Relevé Site 1 (GE2)



Photo GE1 presents area further to the west from Site 1 and clearing associated with the Level Crossing



Location/Project: Leonora IMT			Site Name: 2	
Site Type: Relevé	Reco	orders: KK/NM	Photo #: GE4	
Date: 8/10/2024	GPS Location:			
Landform: Plain	Slope Class/%: Flat		Aspect: Flat	
Soil Type: Clay loam	Soil Colour: Red		Rock Outcrop: NA	
Bare Ground: 80%+	Fire: >10yrs		Hydrology: NA	
Vegetation Condition: CD - G		Fauna Obs: NA		
Disturbance: Railway maintenance activities, previous clearing, access track maintenance				
activities, cattle, rabbits				
Comments:				

DOMINANT TAXA IN VEGETATION STRATA

Vegetation Description: Tall Sparse Shrubland of Acacia aptaneura over Low Isolated Shrubs of
mixed species and Low Isolated Chenopod Shrubs of mixed species
Upper Stratum: Acacia aptaneura
Mid Stratum:
Lower Stratum:

Species Recorded

Field / Taxon Name	Height (m)	% Cover
Acacia aptaneura	4	7
Acacia craspedocarpa	2.5	0.5
Acacia tetragonophylla	2	0.5
Atriplex amnicola	0.4	0.3
Duperreya commixta		0.1
Enchylaena tomentosa	0.3	0.1
Enneapogon polyphyllus	0.1	0.2
Gnephosis arachnoidea	0.3	0.2
Maireana tomentosa	0.2	0.2
Portulaca oleracea	0.1	0.2
Ptilotus obovatus	0.3	0.3
Ptilotus polystachyus	0.2	0.3
Rhagodia drummondii	0.3	0.3
Rhodanthe charsleyae	0.2	0.2
Roepera eremaea	0.1	0.1
Salsola australis	0.2	0.5
Sclerolaena eriacantha	0.2	0.3
Sclerolaena lanicuspis	0.2	0.3
Senna artemisioides subsp. filifolia	0.4	0.5

Site Photo



Location/Project: Leonora IMT			Site Name: 3	
Site Type: Relevé	Reco	orders: KK/NM	Photo #: GE5	
Date: 8/10/2024	GPS Location:			
Landform: Plain	Slope Class/%: Flat		Aspect: Flat	
Soil Type: Clay Loam	Soil Colour: Red		Rock Outcrop: NA	
Bare Ground: 30%+	Fire: >10yrs		Hydrology: NA	
Vegetation Condition: D		Fauna Obs: NA		
Disturbance: Railway maintenance activities, previous clearing, access track maintenance				
activities, cattle, rabbits, weeds				
Comments: Previous clearing				

DOMINANT TAXA IN VEGETATION STRATA

Vegetation Description: Tall Isolated Shrubs of *Acacia aptaneura* over Mid Isolated Shrubs of *Eremophila platycalyx* over Low Sparse Chenopod Shrubland dominated by *Atriplex semilunaris* over Low Isolated Forbs of *Rhodanthe charsleyae* over Low Open Grassland dominated by *Eragrostis dielsii*

Upper Stratum: Acacia aptaneura

Mid Stratum: Eremophila platycalyx

Lower Stratum: Atriplex semilunaris, Eragrostis dielsii, Rhodanthe charsleyae

Species Recorded

Field / Taxon Name	Height (m)	% Cover
Acacia aptaneura	3	1
Atriplex codonocarpa	0.3	0.3
Atriplex semilunaris	0.3	3
Brachyscome ciliaris	0.1	0.1
*Cenchrus ciliaris	0.3	0.5
Enchylaena tomentosa	0.2	0.3
Enneapogon caerulescens	0.1	0.3
Eragrostis dielsii	0.1	10
Eragrostis falcata	0.2	0.3
Eremophila forrestii	0.4	0.2
Eremophila platycalyx	1	1
Gnephosis arachnoidea	0.1	0.1
Maireana pyramidata	0.3	0.1
*Mesembryanthemum nodiflorum	0.1	0.1
Ptilotus obovatus	0.3	0.2
Ptilotus polystachyus	0.3	0.3
Rhodanthe charsleyae	0.2	1
Sclerolaena cuneata	0.2	0.3
Sclerolaena lanicuspis	0.2	0.2
Senna artemisioides subsp. filifolia	0.5	0.3
*Sonchus oleraceus	0.2	0.1

*: denotes introduced species

Site Photo



Location/Project: Leonora IMT Project			Site Name: LNR1	
Site Type: Relevé	Reco	orders: SH	Photo #: 2032	
Date: 11/02/2025	GPS Location:			
Landform: Plain	Slope Class/%: Flat		Aspect: Flat	
Soil Type: Clay Loam	Soil Colour: Red		Rock Outcrop: NA	
Bare Ground: 40% +	Fire: >10yrs		Hydrology: NA	
Vegetation Condition: D-G Fauna Obs: Cattle tracks a			nd scat, rabbit diggings	
Disturbance: Railway maintenance activities, level crossing line of sight clearing, access track				
maintenance activities, cattle grazing and rabbit impacts				
Comments:				

DOMINANT TAXA IN VEGETATION STRATA

Vegetation Description: Tall Open Shrubland of Acacia aptaneura over Low Sparse Chenopod Shrubland of Atriplex amnicola, Enchylaena tomentosa and Rhagodia drummondii over Low Open Shrubland of Ptilotus polystachyus over Low Sparse Tussock Grassland of Eragrostis falcata and Eriachne flaccida

Upper Stratum: Acacia aptaneura

Mid Stratum: Rhagodia drummondii

Lower Stratum: Atriplex amnicola, Enchylaena tomentosa, Eragrostis falcata, Eriachne flaccida, Ptilotus polystachyus

Species Recorded

Taxon Name	Height (m)	% Cover
Acacia aptaneura	4	15
Atriplex amnicola	0.5	1
Atriplex seminularis	0.1	0.1
Duperreya commixta	-	0.1
Enchylaena tomentosa	0.3	1
Eragrostis falcata	0.5	5
Eriachne flaccida	0.1	1
Portulaca oleracea	0.1	0.1
Ptilotus polystachyus	0.5	20
Rhagodia drummondii	1	1.5
Solanum lasiophyllum	0.1	0.1

Site Photo Relevé LNR1 (Photo No. 2032)



Location/Project: Leonora IMT Project			Site Name: LNR2	
Site Type: Relevé	Recorders: SH		Photo #: 2033	
Date: 11/02/2025	GPS Location:			
Landform: Plain	Slope Class/%: Flat		Aspect: Flat	
Soil Type: Clay loam	Soil Colour: Red		Rock Outcrop: NA	
Bare Ground: 40%+	Fire: >10yrs		Hydrology: NA	
Vegetation Condition: D Fauna Obs: Cattle scat an			d tracks, Whistling Kite	
Disturbance: Historical maintenance activities, previous clearing, access track maintenance				
activities				
Comments:				

DOMINANT TAXA IN VEGETATION STRATA

Vegetation Description: Tall Open Shrubland of Acacia aptaneura, Acacia incurvaneura and Acacia tetragonophylla over Mid Sparse Shrubland of Acacia caesaneura and Eremophila platycalyx over Low Isolated Tussock Grasses of Cymbopogon obtectus, Enneapogon caerulescens and Eragrostis falcata

Upper Stratum: Acacia aptaneura, Acacia incurvaneura, Acacia tetragonophylla

Mid Stratum: Acacia caesaneura, Eremophila platycalyx

Lower Stratum: Cymbopogon obtectus

Species Recorded

Taxon Name	Height (m)	% Cover
Acacia aptaneura	4	10
Acacia caesaneura	1.5	1
Acacia incurvaneura	2	2
Acacia tetragonophylla	3	5
Atriplex amnicola	0.3	0.1
Cymbopogon obtectus	0.5	1
Enneapogon caerulescens	0.1	0.5
Eragrostis falcata	0.5	0.5
Eremophila platycalyx	2	1.5
Ptilotus obovatus	0.5	0.1
Salsola australis	0.3	0.1
Sida calyxhymenia	0.1	0.1

Site Photo

Relevé LNR2 (Photo No. 2033)



Location/Project: Leonora IMT Project		Site Name: LNR3			
Site Type: Relevé	Recorders: SH		Photo #: 2034		
Date: 11/02/2025	GPS Location:				
Landform: Plain	Slope Class/%: Flat		Aspect: Flat		
Soil Type: Clay Loam	Soil Colour: Red		Rock Outcrop: NA		
Bare Ground: 15%+	Fire: >10yrs		Hydrology: NA		
Vegetation Condition: D-G Fau		Fauna Obs: Cattle scat, Cicada, Crested Pidgeon, Hooded			
Ro		Robin			
Disturbance: Railway maintenance activities, previous clearing, access track maintenance					
activities, cattle, rabbits, weeds					
Comments: Previous clearing					

DOMINANT TAXA IN VEGETATION STRATA

Vegetation Description: Tall Shrubland dominated by Acacia aptaneura with Acacia caesaneura and Acacia tetragonophylla over Mid Sparse Shrubland of Eremophylla platycalyx over Low Open Shrubland of Sida calyxhymenia over Low Open Chenopod Shrubland of Enchylaena tomentosa and Sclerolaena lanicuspis over Low Tussock Grassland of Cymbopogon obtectus and Eragrostis falcata

Upper Stratum: Acacia aptaneura

Mid Stratum: Eremophylla platycalyx

Lower Stratum: Enchylaena tomentosa, Eragrostis falcata, Sida calyxhymenia, Cymbopogon obtectus

Species Recorded

Taxon Name	Height (m)	% Cover
Acacia aptaneura	3.5	30
Acacia caesaneura	3.5	0.5
Acacia tetragonophylla	2	0.5
Calandrinia pleiopetala	0.1	0.5
Cymbopogon obtectus	0.5	1
Duperreya commixta	1	0.1
Enchylaena tomentosa	0.5	10
Enneapogon caerulenscens	0.1	0.1
Eragrostis falcata	0.5	60
Eremophylla platycalyx	2	2
Ptilotus polystachyus	0.1	0.1
Sclerolaena lanicuspis	0.2	1
Sida calyxhymenia	0.5	15
Solanum lasiophyllum	0.1	0.1

Site Photo Relevé LNR3 (Photo No. 2034)

