

GOLD VALLEY WILUNA WEST PTY LTD

WILUNA WEST PROJECT

SUPPORTING DOCUMENT FOR CLEARING PERMIT APPLICATION

C3, C4, & BOWERBIRD IRON ORE DEPOSITS EAGLE-EMU GOLD DEPOSITS

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TABLE OF ACRONYMS

Acronym	Description
BIF	Banded Iron Formation
BOM	Bureau of Meteorology
CLA	Clark Lindbeck & Associates Pty Ltd
CPS	Clearing Permit
DAWE	Department of Agriculture, Water and Environment (Commonwealth)
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water (formerly DAWE)
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DRF	Declared Rare Flora
EPBC Act 1999	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
GVW	Gold Valley (Wiluna) Pty Ltd
GWR	GWR Group Limited
ha	hectare
IBRA	Interim Biogeographic Regionalisation for Australia
KLA	Keith Lindbeck and Associates
MCP	Mine Closure Plan
PEC	Priority Ecological Community
ROM	Run of Mine (pad)
SRE	Short Range Endemics
TEC	Threatened Ecological Community
WRD	Waste Rock Dumps

1.0 INTRODUCTION

1.1 BACKGROUND

The Wiluna West Project has been owned by GWR Group Limited (GWR) since 2004 and comprises iron ore deposits over two Banded Iron Formation (BIF) ridges (referred to Ridges B and C). Gold deposits are known to occur in the swales between the BIF ridges.

GWR recently sold the Project to Gold Valley Wiluna West Pty Ltd (GVW) with the sale completed in Q1 2024. The gold rights at the Project are owned by Western Gold Resources Limited.

GWR has mining approval and three existing clearing (purpose) permits at the Project:

- CPS 4006/3 for development of the JWD iron ore deposit and the Golden Monarch gold deposit - 102 ha
- CPS 6726/2 for development of the Bowerbird, C3 and C4 iron ore deposits; and the Eagle-Emu gold deposits – 1,290 ha.
- CPS 8915/2 for construction of a haul road between the C4 deposit and Goldfields Highway – 65 ha.

With transfer of the Wiluna West tenements from GWR to GVW, GVW is aware that these clearing (purpose) permits can not be transferred and as mining development of the deposits is to continue, intends to have the existing clearing permits reissued in their name over the same area to ensure continuity of mining development.

This submission is to replace CPS 6726/2 for clearing of vegetation at the Bowerbird, C3 and C4 deposits with the application in GVW's name to ensure a valid permit is in place when the tenement transfer is completed by DEMIRS. The approved permit is for 1,290 ha but as 161.75 ha of clearing has taken place under this permit, GVW intends to apply for the remaining amount for this application of 1,128.25 ha.

GWR submitted a referral to the EPA in December 2012 for a large scale 10Mtpa Project (disturbance 2,600 ha), which included the Bowerbird, C3 and C4 disturbance footprint and disturbance envelope. The Project was assessed as 'Not Assessed – Public Advice Given' on 22 April 2013. GVW does not intend to make a referral to the EPA as no new impacts are expected from that assessed by EPA in the previous referral.

GWR referred the Project, comprising Eagle-Emu, C4 development and haul road (EPBC 2020/8696), to the Commonwealth Department of Agriculture, Water and Environment (DAWE - now Department of Climate Change, Energy, the Environment and Water) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC) in 2020. On the 30 July 2020 DAWE deemed that the Project was 'Not a controlled action' and no further assessment under the EPBC Act was required.

1.2 PURPOSE

This document is to complement the application relating to the clearing of 1,128.25 ha of native vegetation at the Wiluna West Project for the Bowerbird, C3 and C4 iron ore deposits; Eagle-Emu gold deposits and associated haul roads. This permit is to replace the approved CPS 6726/2 to be in GVW's name.

As required by the DEMIRS, the ten clearing principles and background information has been provided in this document relating to the site location, ownership, hydrology, vegetation, fauna and land degradation issues.

To assist in the DEMIRS's assessment of this clearing permit application, a summary of the relevant environmental information for the Project area has been included in this document in addition to the biological survey reports. The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

For the purpose of this document, reference to 'Clearing area' in this document refers specifically to the larger footprint within which clearing of 1,128.25 ha will occur i.e. CPS application area.

1.3 LOCATION

The Project is located approximately 700 kilometres northeast of Perth and 40 kilometres southwest of Wiluna in the north-eastern Goldfields of Western Australia (Figure 1).

1.4 OWNERSHIP AND LAND TENURE

The proposed clearing area is located on M53/1016, M53/1017, M53/1018, M53/1087 and L53/148 which have been sold by GWR to GVW (Figure 2). While the sale has been completed, it is expected the tenement transfer will take several months to be processed.

A Letter of Authority from GWR, confirming the situation and providing approval for submission of the application, is provided as Appendix 1.

The Project is located on Lake Way Pastoral Lease within the Shire of Wiluna.

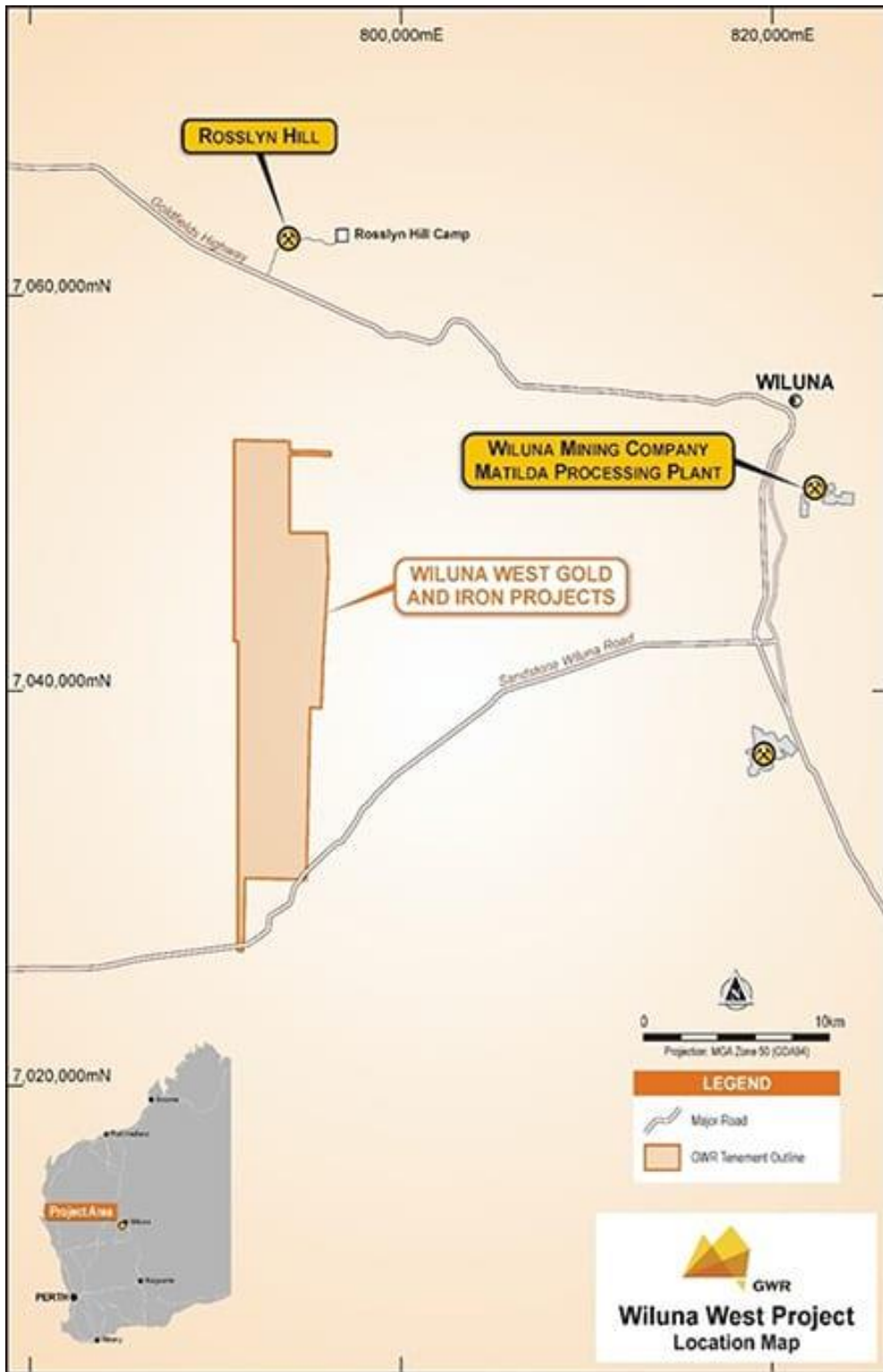


Figure 1: Location of the Project

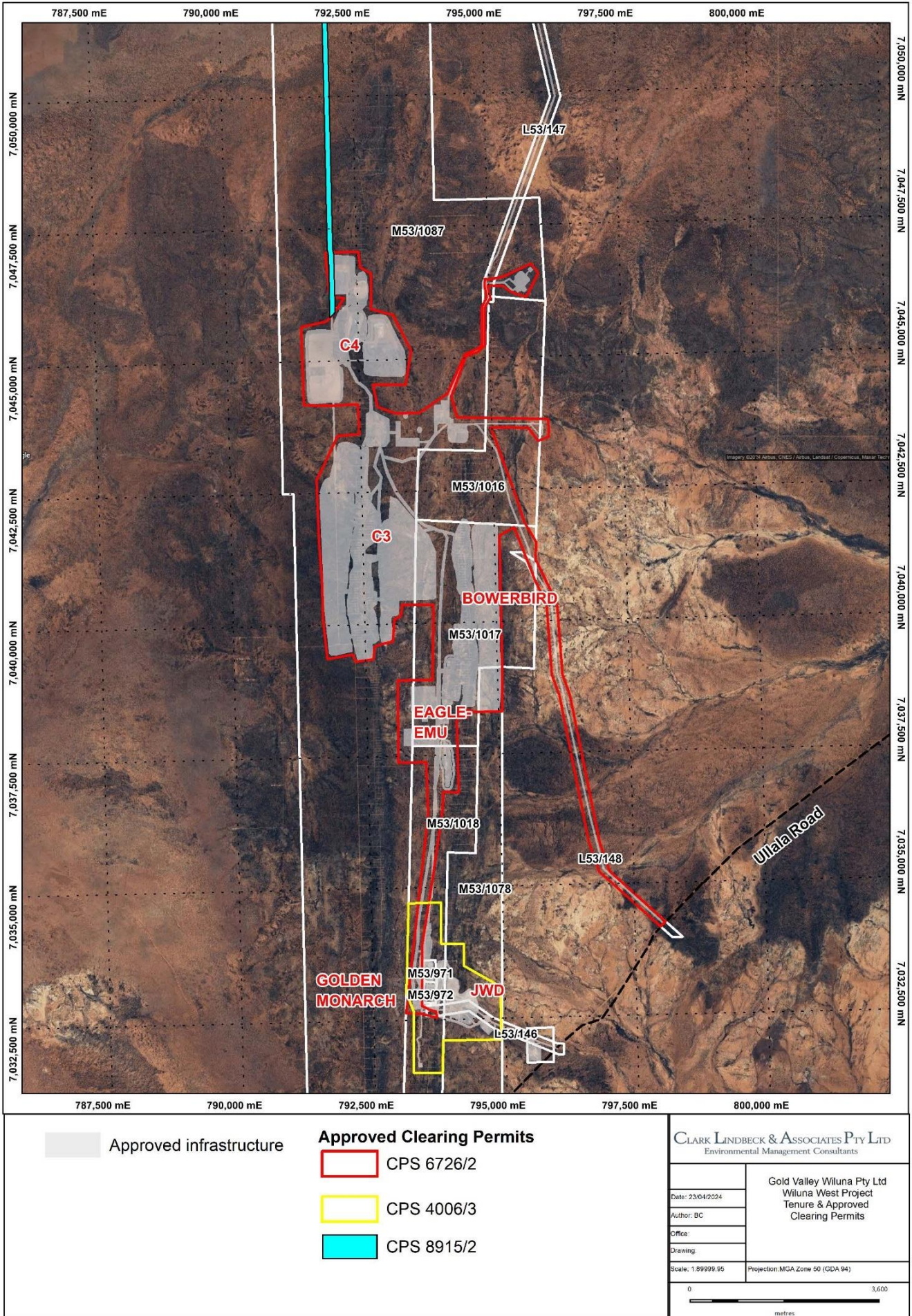


Figure 2: Project tenements and approved CPS areas

2.0 PROPOSED CLEARING

2.1 EXISTING CLEARING PERMIT (CPS 6726/2)

The approved clearing permit (CPS 6726/2), for which this application is being submitted to replace, is for the clearing of up to 1,290 ha of native vegetation within the nominated clearing area of 2,528 ha as shown in Figure 3, with restricted clearing of 126 ha within the red shaded area (Figure 3, Table 1).

Condition 9 of CPS 6726/2 requires development and submission of a Malleefowl Management Plan.

A Malleefowl Management was submitted with the original clearing permit application and an updated Plan produced by GWR and approved by DMIRS on 27 August 2020.

Table 1: Approved clearing under CPS 6726/2

AREA	FINAL CLEARING AREAS (ha)
Clearing of Native Vegetation required	1290
CPS Application Area (Clearing Area)	2528

2.2 NEW CLEARING PERMIT

GVW intend to apply for clearing of 1,128.25 ha of native vegetation within an " (CPS application area) of 2,524 ha (Figure 4). This takes into account the clearing of 161.75 ha of native vegetation undertaken at the C4 deposit (based on 2022-2023 CPS report). Mining at C3, Bowerbird, Eagle and Emu has not commenced. The 'Area approved to clear is slightly smaller than the approved CPS as an area of M53/1087 has been partially surrendered since the previous application.

As per the CPS 6726 applications, this clearing of native vegetation is for:

- Bowerbird, C3 and C4 iron ore deposits and associated mine infrastructure;
- Eagle-Emu gold deposits and associated mine infrastructure
- Haul road from Bowerbird to JWD
- Haul road on L53/148 to Ullala (Sandstone-Wiluna) Road (Figure 4).

The intent is that the total clearing in the application area is consistent that approved in CPS 6726/2.

Consistent with the approved CPS 6726/2, GVW has developed a Malleefowl Management Plan and this is discussed further in Section 3.8.

Table 2: Clearing proposed by GVW in this application

AREA	FINAL CLEARING AREAS (ha)
Clearing of Native Vegetation required	1128.25*
CPS Application Area (Clearing Area)	2524**

*takes into account existing clearing of native vegetation

**Section of M53/1087 surrendered has been removed

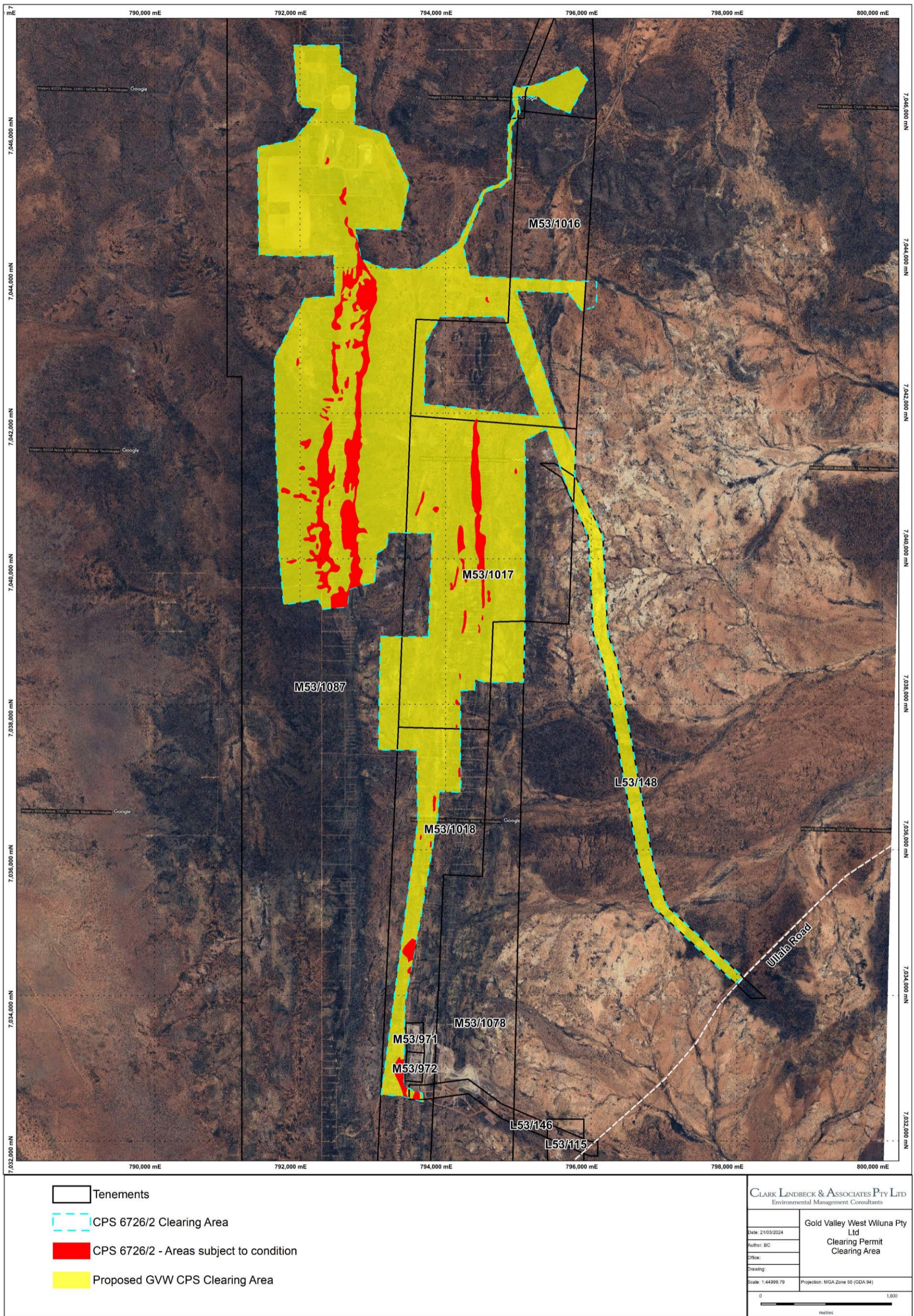


Figure 3: Approved CPS6726/2 plan showing overall and restricted clearing areas

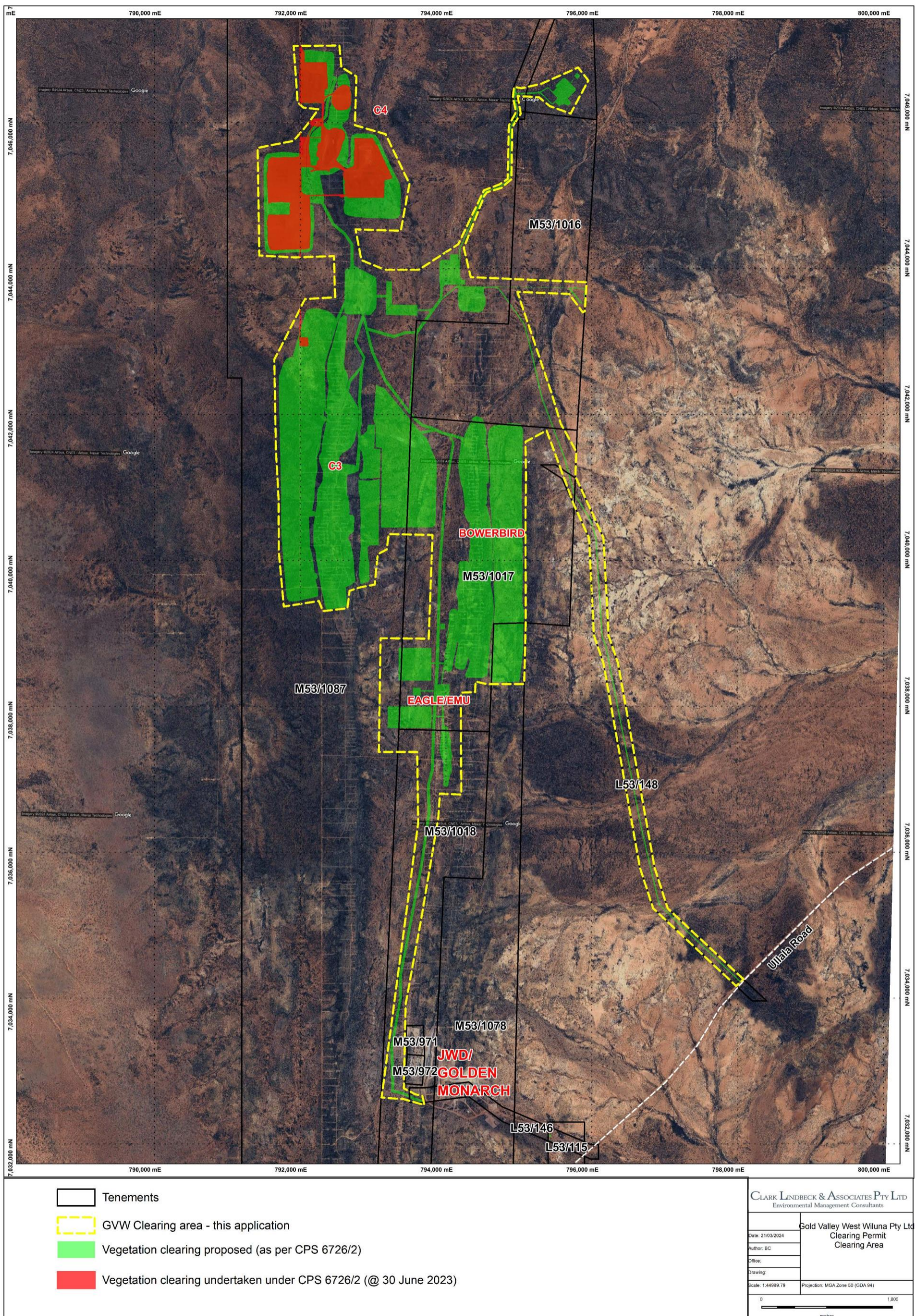


Figure 4: Clearing for GW permit

3.0 SITE OVERVIEW

The environmental information presented in these sections, including impact assessment, is consistent with that assessed for CPS 6726/2 (for which this permit replaces). However, information is provided for completeness of this application.

3.1 CLIMATE

The Project area is located within the Murchison region which exhibits an arid climate characterised by hot dry summers and mild dry winters (Cowan,2001).

The nearest official meteorological station is located at Wiluna, approximately 40 km northeast of the project area (Wiluna Station 013012). Recordings of the local climatic conditions commenced at Wiluna in 1898 (Bureau of Meteorology, 2023). Relevant temperature, rainfall, wind, evaporation and humidity data for Wiluna is summarised in Table 2.

Mean annual maximum temperature is 29.2°C and mean annual minimum 14.3°C. Daily maxima above 35°C are common from December to February. Diurnal temperature variations are commonly high throughout the year.

The area is semi-arid and has an average annual rainfall of 260.4 mm. Most of the rain falls from January to March but the amount varies greatly both seasonally and annually. The highest daily rainfall recorded is 124 mm in February 1995.

The average wind speeds at Wiluna vary throughout the year from 8.1–12.9 km/h in the morning to 8.5-13.2 km/h in the afternoon (Figure 5 and Figure 6).

Evaporation is high and the average mean daily evaporation rate is 6.6 mm (annual rate 2,409 mm).

Humidity levels vary considerably both daily and yearly. The mean monthly 9.00 am relative humidity varies from a low of 30% in November and December to a high of 65% in July. The mean monthly 3.00 pm relative humidity varies from a low of 19% in October, November and December to a high of 42% in June.

9 am
21362 Total Observations

Calm 5%

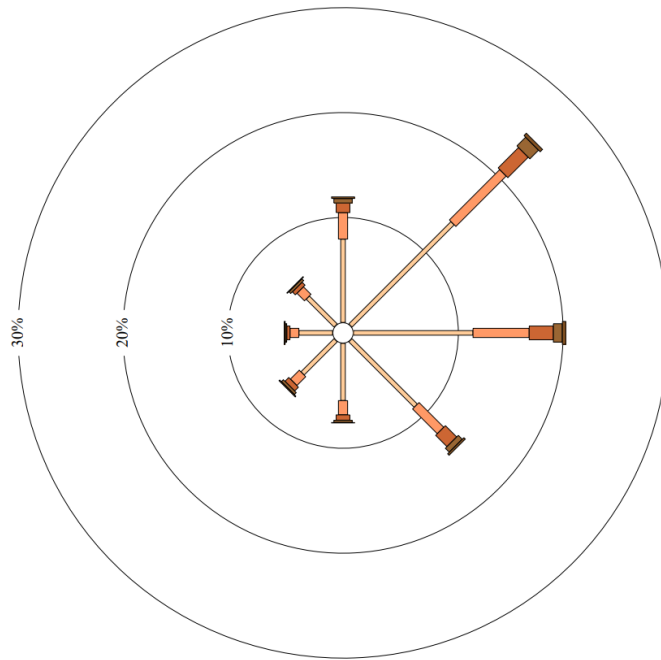


Figure 5: Wiluna annual 9am wind roses (BOM 2023)

9 am
21362 Total Observations

Calm 5%

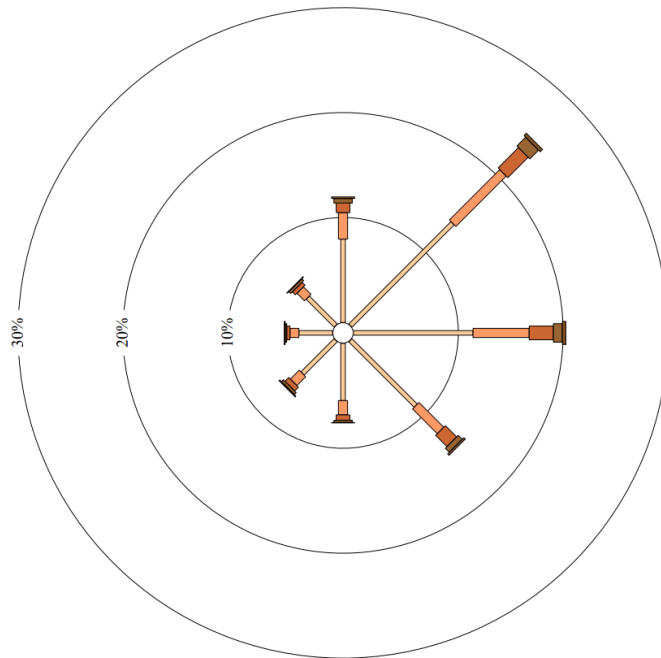


Figure 6: Wiluna annual 3pm wind roses (BOM 2023)

Table 3: Meteorological data for Wiluna (Station Number 013012) (BOM 2023)

Statistic Element	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (°C)	38	36.6	34	29.3	23.9	19.9	19.5	22	26.4	30.5	34	36.9	29.2
Mean minimum temperature (°C)	23	22.2	19.7	15.2	10	6.7	5.4	6.8	10	13.9	17.9	21.1	14.3
Mean rainfall (mm)	37.2	38.7	36.9	28.6	25.1	23.6	14.7	9.9	5	7.3	12.1	22.3	261.7
Decile 5 (median) rainfall (mm)	19	22.1	14.8	13.8	15.2	11.8	9	4.5	1.6	1.9	5	13.7	229.1
Mean number of days of rain \geq 1 mm	3.3	3.4	3.3	2.7	2.8	3.2	2.5	1.7	1	1.1	2	2.6	29.6
Highest daily rainfall (mm)	100.2	124.6	76.2	68.2	69.2	68.3	73.5	42.4	25.6	78.2	40.3	112.8	124.6
Mean number of days of rain \geq 1 mm	3.3	3.4	3.3	2.7	2.8	3.2	2.5	1.7	1	1.1	2	2.6	29.6
Mean number of clear days	13.4	11.4	13.5	11.6	14.8	14.4	17.3	19.5	20.6	19.9	15.9	15	187.3
Mean number of cloudy days	5.2	6.9	6.4	7.2	6.8	6.5	5.8	3.5	2.2	2.6	3.3	4	60.4
Mean 9am temperature (°C)	30	28.6	26.1	21.7	16.4	12.6	11.7	14	18.3	22.4	26.4	29.2	21.5
Mean 9am relative humidity (%)	35	40	41	47	55	65	63	52	40	33	30	30	44
Mean 9am wind speed (km/h)	12.4	11.8	10.7	9.6	8.7	8.1	8.5	10.5	12.4	12.9	12.7	12	10.9
Mean 3pm temperature (°C)	36.5	35.3	32.9	28.3	22.9	19	18.5	21	25.4	29.2	32.7	35.4	28.1
Mean 3pm relative humidity (%)	23	26	26	30	35	42	38	31	24	19	19	19	28
Mean 3pm wind speed (km/h)	10.9	10.6	9.3	8.5	9	9.9	9.9	11.2	13.2	12.7	12.3	10.5	10.7
Mean daily evaporation (mm)	11	9.5	7.8	5.6	3.7	2.5	2.6	3.7	5.7	7.9	9.3	10.1	6.6

3.2 LANDFORM AND SOILS

3.2.1 Landform

The Interim Biogeographic Regionalisation for Australia (IBRA) divides the Australian continent into 89 bioregions and 419 subregions. The clearing area is located within the Murchison bioregion and the Eastern Murchison (MUR1) subregion of the IBRA (Thackway and Cresswell, 1995).

The East Murchison subregion lies on the Yilgarn Craton's "Eastern Goldfields" and "Southern Cross" Terrains.

The East Murchison bioregion is characterised by Mulga Woodlands often rich in ephemerals, hummock grasslands, saltbush shrublands and *Halosarcia* shrubland (Cowan 2001). The area is characterised by:

- internal drainage;
- extensive areas of elevated red desert sandplains with minimal dune development;
- salt lake systems that are associated with the occluded Palaeodrainage system; and
- broad plains of red-brown soils and breakaway complexes as well as red sandplains (Cowan 2001).

The overall Project is located within an inland plateau, which is characterised by low relief with elevations ranging from 550 to 600m above sea level. Granitoid rocks form low outcrops with Archaean greenstones providing low hills. The prominent BIF ridges form rugged hills (approximately 15 m) above the surrounding greenstones. An east trending scarp in the northern part of the Project area marks the boundary between the Archaean and Proterozoic rocks (Rockwater 2020).

The Project area extends over the Joyners Find Greenstone Belt, a narrow (5 km to 10 km) north-south striking greenstone belt comprising low ridges of Banded Iron Formation (BIF) (in the central and eastern portion) intercalated with mafic and ultramafic schists with minor chert and clastic sediment horizons.

There are three main BIF units which form ridges within the project area (Units A, B and C). The mapped areas of BIF outcrops at the Project are presented in Figure 7.

3.2.2 Land Systems

The Wiluna-Meekatharra area, covering 25,000 square miles, has been mapped and described in 48 land systems, based on recurring patterns of topography, soils and vegetation (Mabbut *et al.*, 1963).

The clearing area is located within six land systems as described by Mabbut *et al.* (1963) and almost entirely within the Gabanintha land system (Figure 7, Table 4).

Table 4: Descriptions of Land Systems occurring at the Project

System	Land System Description
Glengarry	Sandstone plateaux, summits and hillslopes supporting mainly dense mulga and other acacia shrublands, spinifex, and numerous low shrubs.
Dural	Strongly undulating terrain on weathered mudstone and basalt supporting open mulga shrublands with mallee and spinifex.
Sherwood	Breakaways, kaolinised footslopes and extensive gently sloping plains on granite supporting mulga shrublands and minor halophytic shrublands.
Gabinantha	Greenstone ridges, hills and footslopes supporting sparse acacia and other mainly non-halophytic shrublands.
Fisher	Undulating terrain with low ridges and crests, shallow valleys and alluvial fans supporting mulga shrublands with spinifex and groved mulga and other acacia shrublands.
Violet	Gently undulating gravelly plains on greenstone, laterite and hardpan, with low stony rises and minor saline plains; supporting groved mulga and bowgada shrublands and occasionally chenopod shrublands.

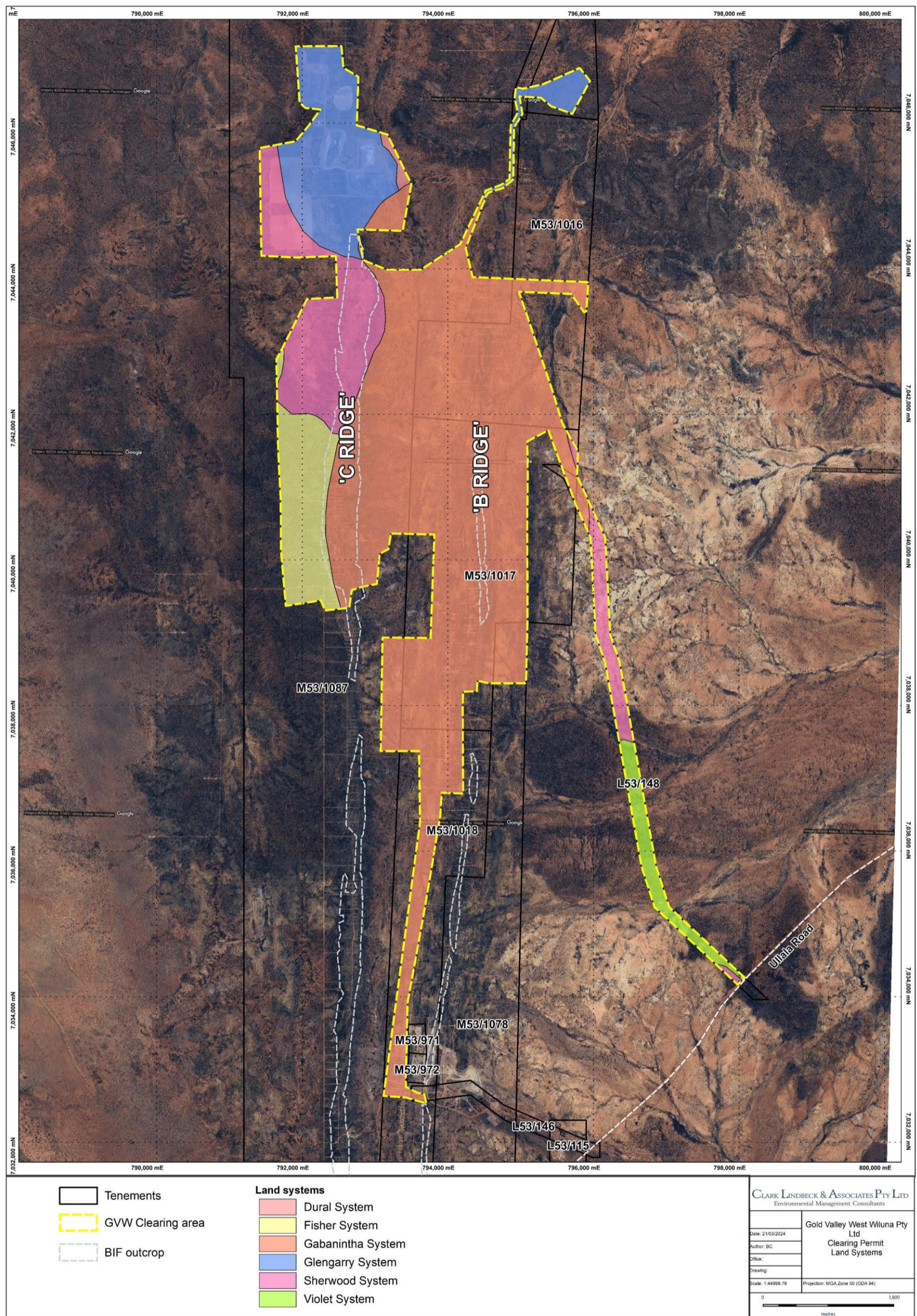


Figure 7: Land systems of the Project (according to Mabbut et al., 1963)

3.2.3 Soils

The clearing area is located within Salinaland Plains soil-landscape zone of the Murchison Province (Tille 2006). This zone which encompasses 132,450 km² comprises sandplains (with hardpan wash plains and some mesas, stony plains and salt lakes) on granitic rocks (and some greenstone) of the Yilgarn Craton. This zone is comprised of red sandy earths, red deep sands, red shallow loams and red loamy earths with some red-brown hardpan shallow loams; salt lake soils and red shallow sandy duplexes.

The soils in the Project area consist of red earthy sands, natural red earths and shallow earthy loams, shallow earthy loams underlain by red-brown hardpan and shallow stony earthy loams.

In accordance with the Atlas of Australian Soils (Northcote *et al.*, 1960-1968), the majority of the clearing area is located entirely within Soil Unit Fa8, with little soil cover on the top of the ridges (Table 5). The areas off the ridges, at C4 and the southern part of L53/148 are located on Soil Unit BE2 and breakaways are located in the mid-section of L53/148.

Table 5: Soil units in Project area

SOIL UNIT	DESCRIPTION
BE2	Generally undulating terrain on granites with rocky granitic hills, bosses, and tors, some breakaways, and a surface stone mantle: chief soils seem to be shallow earthy loams (Um5.3) underlain by a red-brown hardpan. Associated are shallow (Uc5.21, Uc5.22) soils both underlain by a red-brown hardpan; some (Gn2.1) soils underlain by a red-brown hardpan; and shallow (Uc1.43) and (Um5.41) soils on the hills (no hardpan). The red-brown hardpan is often exposed in eroded sites, and elsewhere is present between 8 and 40 in.
Fa8	Steep ranges comprising fine-grained sedimentary rocks along with basic dykes; extensive portions of this unit are without soil cover: chief soils are shallow stony earthy loams (Um5.51) on the steep slopes, while shallow stony (Uc1.43) and (Uc5.11) soils occur in similar situations. Associated are a variety of soils including (Dr2.32, Dr2.33) on dissected pediments and small areas.

3.3 GROUNDWATER

The main aquifer in the Wiluna West area is the mineralised BIF, which exhibits a transmissivity of up to 1.4 m/d and forms a 'strip aquifer' of two parallel sub-vertical zones of enhanced permeability compared to surrounding mafic and ultramafic schists.

The aquifer exhibits both horizontal and vertical anisotropy, with high preferential permeability developed in the blocky BIF and differential fracturing along the BIF contacts. In addition to the BIF aquifer, several palaeochannels and palaeo-tributary channels lie in the vicinity of the Project, including the Lake Way, Ward Well, Abercromby and Carey channels. These are located outside of the clearing area.

Regional water quality mapping indicates a salinity ranging from 500-1000 mg/L in the south of the Project to 1000-3000 mg/L in the north, becoming more saline as it approaches the higher salinity palaeodrainage system (DoW, 2000).

Field salinity testing as part of an investigation in two BIF test production bores indicated a salinity of about 1000 mg/L in the BIF. Groundwater testing in two mafic/ultramafic bores revealed salinities ranging from about 700 to 2300 mg/L.

Groundwater salinity in the fractured rock in the clearing area is variable, but is generally fresh to moderately saline. Recent groundwater quality analyses at the Project has recorded:

- C4 bore - pH of 7.9 and TDS of 1,300 mg/L (brackish).
- Bowerbird bore – pH of 7.6 and TDS of 1,200 mg/L (brackish).

- Bores P and T (east of Eagle-Emu) - pH 7.5-7.7 and TDS 1,100 – 1,200 mg/L (brackish).

3.4 SURFACE WATER

There are no surface water bodies of significance, lakes or swamps in the proposed clearing area.

The Lake Way drainage system lies approximately 30 km to the east of the proposed clearing area, whilst Lake Mason is approximately 95 km south-southwest.

The Project is not located within a Surface Water Proclamation Area.

Figure 10 shows the drainage lines which are all ephemeral, largely ill-defined and only flow following heavy rainfall. For the northern half all generally flow in a northerly direction through the Project area. These Surface drainage east of M53/1087 and through L53/147-148 flows in a predominantly easterly direction.

Rockwater Pty Ltd (Rockwater) has completed several surface water assessments at the overall Wiluna Project including the following relevant to this clearing permit area:

- Bowerbird, C3 and C4 Project areas (Rockwater 2019). The deposits lie on two parallel BIF approximately 2km apart. There are two minor drainage lines between the BIF ridges, draining to the north; and a very small drainage on the western side of C4. All three drainages direct surface water flows to the north towards a broad palaeodrainage that leads to Lake Way, south-east of Wiluna (Figure 9).
- Eagle-Emu Project area (Rockwater 2020). This area is elevated above the surrounding major drainage lines and straddles a drainage divide. Drainage lines direct surface water flows to the south and east towards Lake Way, south-east of Wiluna (Rockwater 2020) (Figure 10).

The Rockwater (2019, 2020) assessments identified that flood flows in the catchments in the clearing area are relatively small, of low velocity and of short duration. No diversions or other surface water management structures are required.

Figure 9 and Figure 10 show the catchments as mapped by Rockwater and highlight the small catchment areas (2019, 2020).

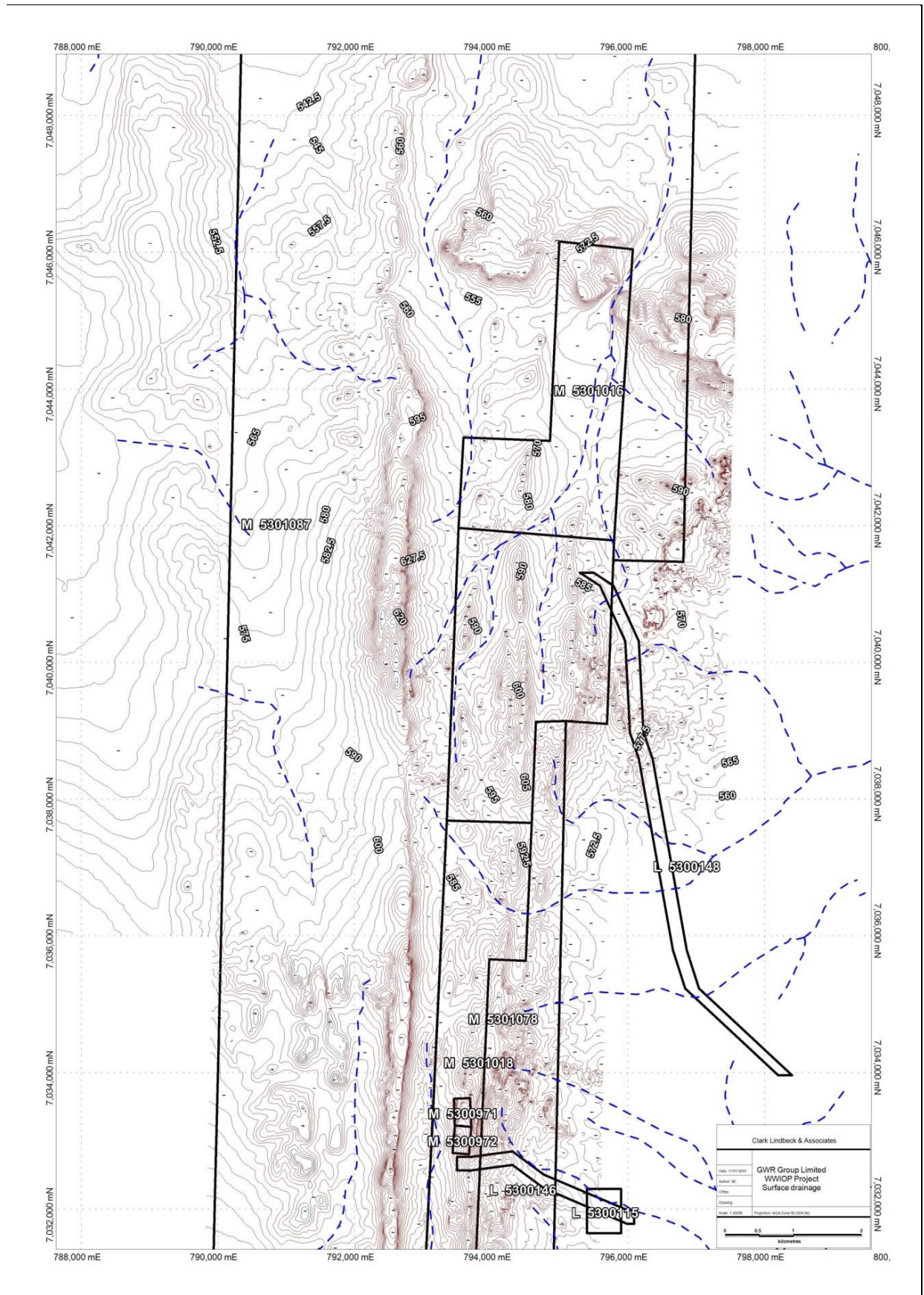


Figure 8: Surface drainage at Wiluna West project (250K topo)

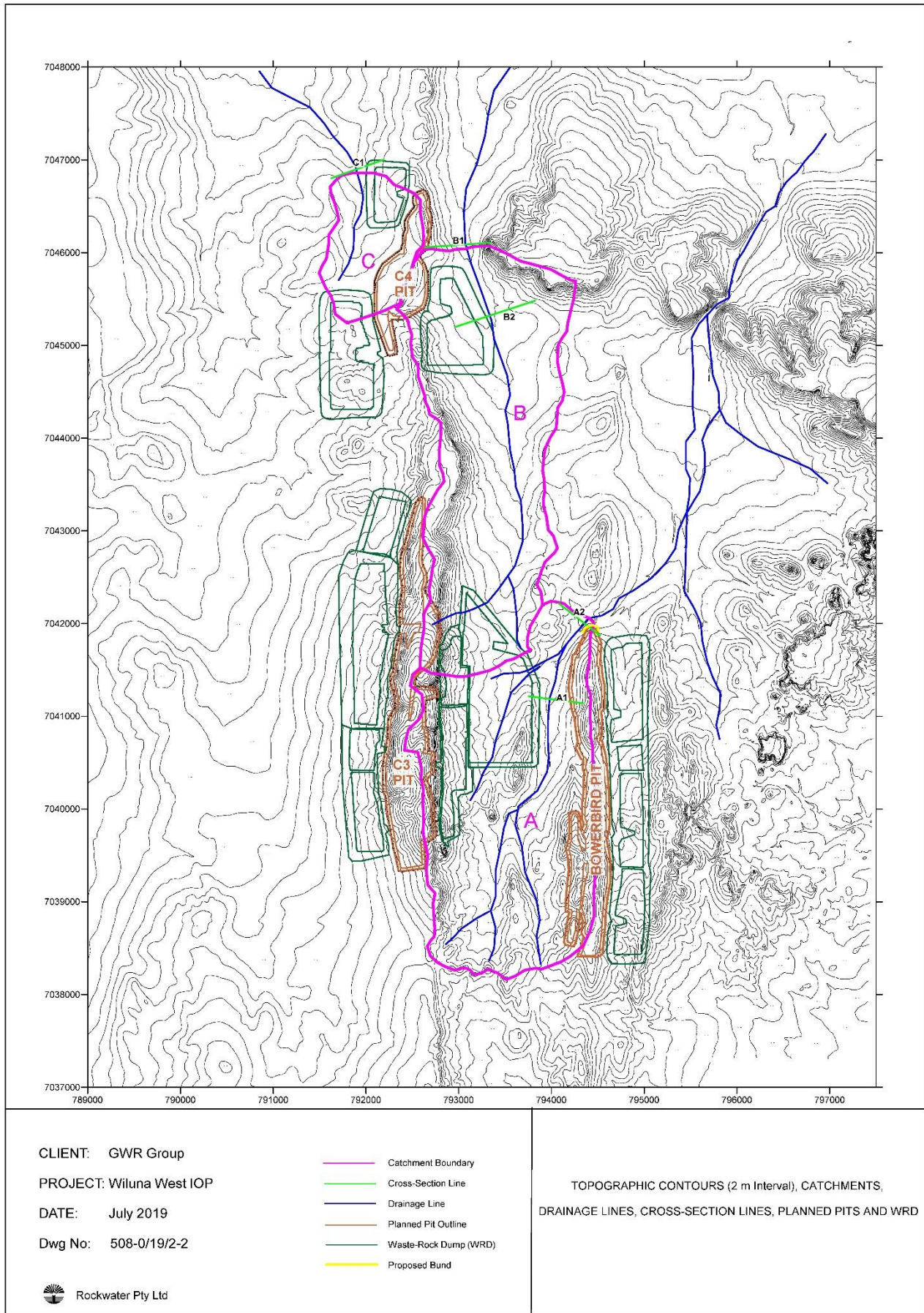


Figure 9: Anticipated surface drainage for WWIOP during operation and at completion

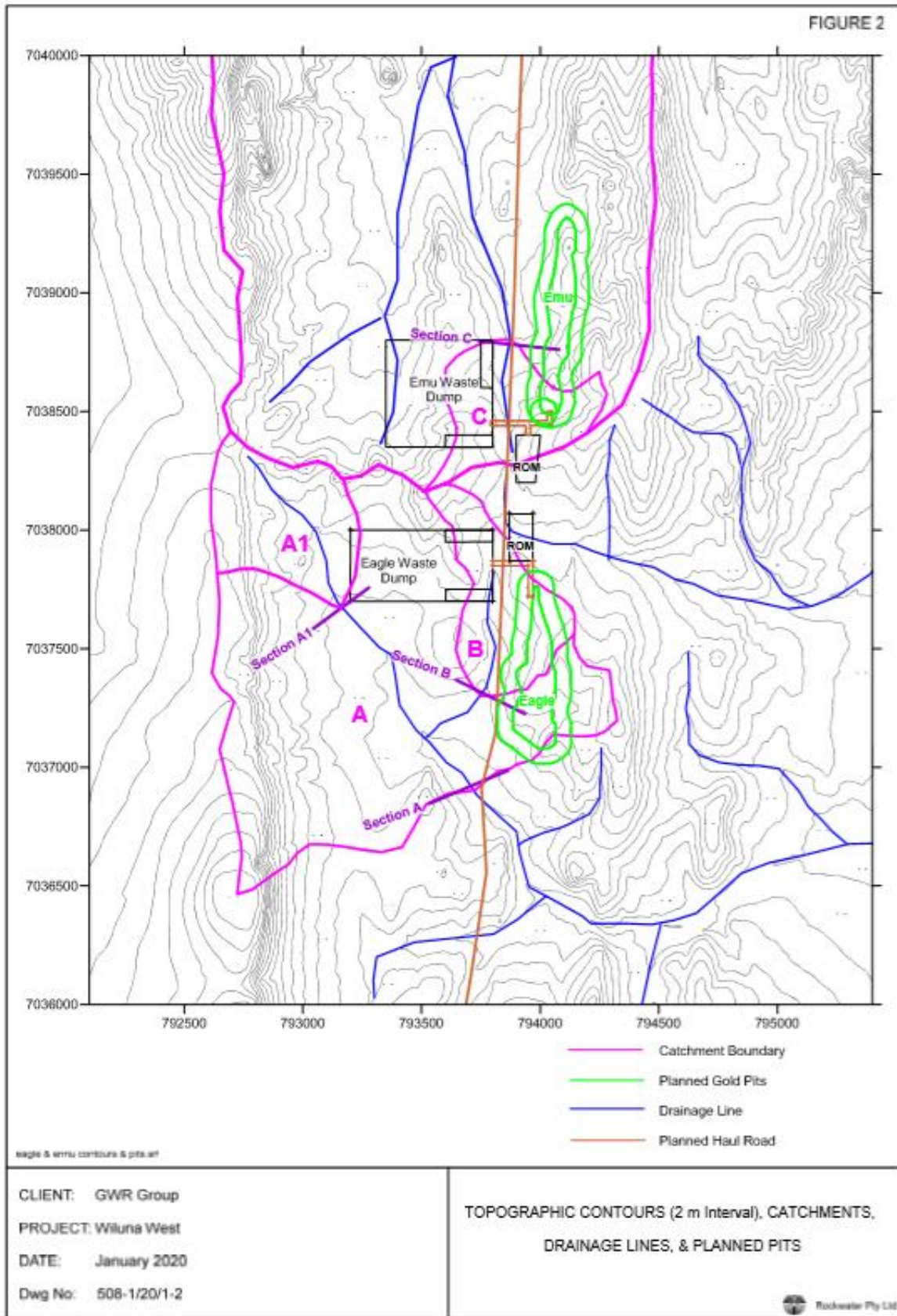


Figure 10: Surface water drainage in the Eagle-Emu clearing area (from Rockwater 2020)

3.5 VEGETATION AND FLORA

3.5.1 Regional Vegetation

The Project Area is located within the Austin Botanical District in the Eremaean Province and lies within the East Murchison IBRA sub-region which covers an area of 211,350 ha (Beard, 1990).

Vegetation throughout this area is Mulga woodlands often rich in ephemerals, hummock grasslands, saltbush shrublands and *Halosarcia* shrublands.

The vegetation associations in the clearing area, with the current extent and representation of these associations in DBCA managed lands is presented in Table 6 (Government of Western Australia, 2018).

Table 6: Extent of Beard Vegetation Associations within the clearing area

Vegetation Group	Description	Current Extent (ha)	% Original Extent Remaining	Area in DBCA Managed Lands (ha)	% in DBCA Managed Lands
18	Low mulga woodland; <i>Acacia aneura</i>	19,843,148	99.75	1,317,179	6.62
29	Sparse low woodland; mulga, discontinuous in scattered groups	7,903,973	99.94	496,367	6.28
107	Hummock grasslands, shrub steppe; mulga and <i>Eucalyptus kingsmillii</i> over hard Spinifex	2,813,995	99.95	324,942	11.54
202	Shrublands; mulga and <i>Acacia quadrimarginea</i> scrub	448,343	99.96	102,759	22.91

3.5.2 DEC quadrat survey

The DEC (now DBCA) (Markey and Dillon, 2009) undertook a study of the flora and vegetation communities at the Project (referred to as 'Herbert Lukin Range') in August 2006. They established 50 20m x 20m quadrats and recorded a total of 192 flora taxa of which only two were introduced weed species.

The study identified six community types that were correlated with topographic position, slope and substrate type:

TYPE 1: found on crests and steeper upper slopes; described as a sparse open tall shrubland of *Acacia aneura* cf. var. *microcarpa*, *Grevillea berryana* and less commonly, *Acacia quadrimarginea* over *Eremophila latrobei* subsp. *latrobei*, *Prostanthera campbellii*, above *Ptilotus obovatus*, *Sida* sp. Golden *calyces glabrous*, *Sida* sp. *Excedentifolia*, *Ptilotus schwartzii*, *Cheilanthes brownii*, with *Eriachne helmsii*, *E. mucronata*, and *Monachather paradoxus*.

TYPE 2: located on flat summit surfaces on ridge tops, and on the undulating pediments and valley floors off the main ridges. It encompasses mosaics of *Acacia* over *Triodia* grasslands or low myrtaceous-*Eremophila* shrublands, with isolated mallees of *Eucalyptus kingsmillii* subsp. *kingsmillii*.

TYPE 3: usually found on pediments, lower slopes and slightly low outcrops of weathered BIF and other metasediments, quartz and ultramafic lithologies, usually obscured by colluvium. It consists of *Acacia aneura*, and less frequently *Acacia balsamea* and *A. cuthbertsonii* subsp. *cuthbertsonii* tall open shrublands over shrubs including *Scaevola spinescens*, *Senna artemisioides* subsp. *helmsii*, *Eremophila flabellata*, and scattered *Maireana convexa*, *M. georgei*, and *Ptilotus obovatus*.

TYPE 4: consists of a tall open shrubland of *Acacia aneura* and *A. tetragonophylla*, occasionally with isolated emergent trees of *Acacia pruinocarpa*, over a mosaic of shrubland and chenopods.

TYPE 5: found on lower slopes, pediments and valley flats. It is a tall *Acacia aneura* shrubland often with a canopy of *A. pruinocarpa* over *Eremophila forrestii*, *E. latrobei*, *Senna* spp., *Eremophila flabellata*, *Rhagodia eremaea*, *Sida ectogama*, *Ptilotus obovatus*, with *P. schwartzii*, *Sida* sp. *Excedentifolia* and *Monachather paradoxa*.

TYPE 6: generally located mid-slope, associated with massive haematite-enriched outcrops; it can be summarized as consisting of *Acacia aneura* cf. var. *microcarpa* and occasionally *A. pruinocarpa* over *Eremophila latrobei* subsp. *latrobei*, *Dodonaea petiolaris*, *Eremophila flabellata*, *Sida* sp. Wiluna, (Markey and Dillon 4126) [*Sida picklesiana* (ms) (Markey et al. 2011) and less frequently *Ptilotus rotundifolius*, *Eremophila jucunda* subsp. *jucunda*, *Harnieria kempeana* subsp. *muelleri*.

The DEC survey focused more on the Ridges and uplands in the area (14 quadrats on Community Type 1; 14 quadrats on Community Type 2), than the plains between the ridges (Community Type 4 with two quadrats).

3.5.3 Surveys completed

A large number of vegetation and flora surveys have been undertaken at the overall Wiluna West Project. These include:

- Vegetation & flora survey undertaken on M53/1016 and L53/148 – Jim’s Seeds, Weeds & Trees (now Botanica Consulting), September 2005 (Appendix 2).
- Vegetation and flora survey of the haul road from the project site to the Northern Goldfields Highway – Jim’s Seeds, Weeds & Trees (now Botanica Consulting), December 2006.
- Vegetation & flora survey of 92 20 m x 20 m quadrats on Units A, B & C – Botanica Consulting, July 2006.
- Vegetation & flora survey of 50 20 m x 20 m quadrats on Units A, B & C – DEC, August 2006. DEC (Department of Environment and Conservation – now DBCA) established 50 20m x 20m quadrats and recorded a total of 192 flora taxa of which only two were introduced weed species.
- Vegetation and flora survey of the Bowerbird project and related haul road – Botanica Consulting, March-April 2007.
- Flora and Vegetation Survey of Four Proposed Gravel Pits (no longer to be utilised) – on M53/1087 and at intersection of L53/148 and Ullalla Road - Botanica Consulting, April 2007.
- Flora survey and mapping of vegetation on Ridges A, B & C – Botanica Consulting, 24 February- 1 March 2008.
- Vegetation survey of Wiluna West Project (largely to map native vegetation communities of project area -12,647 ha) – Recon Environmental, March-June 2009 (Herbert Lukin Ridge & Surrounds Vegetation Survey - Recon Environmental, May 2010 - Appendix 3).
- Targeted regional searches for *Sida picklesiana* (formerly *Sida* sp. Wiluna (A Markey and S Dillon 4126)) - Keith Lindbeck & Associates (in conjunction with WA Herbarium), August 2010.
- Variety of targeted Priority flora surveys for proposed exploration within M53/971, M53/972, M53/1016, M53/1017, M53/1018, M53/1078, M53/1087) – Botanica Consulting, Keith Lindbeck & Associates, Recon Environmental 2007 to 2011, Native Vegetation Solutions 2014 to 2023.
- Targeted Priority flora survey of the three deposits that will be mined in the first 10 years of operations (Bowerbird, C3 and C4) - Native Vegetation Solutions, November 2011 (Appendix 4).
- Targeted Threatened Flora survey at Golden Monarch – Native Vegetation Solutions (NVS), 2-3 August 2018.

- Targeted *Sida picklesiana* survey for wider population outside of Golden Monarch – (NVS 2018), September 2018 (Appendix 5).
- Targeted Threatened Flora Survey at Eagle and Emu prospects #1 – Native Vegetation Solutions (NVS), 10 September 2019 (Appendix 6).
- Targeted Threatened Flora Survey at Eagle and Emu prospects #2 – Native Vegetation Solutions (NVS), 23 January 2020 (Appendix 7).

The results of the surveys undertaken prior to 2009 were utilised (and largely superseded) in the vegetation survey undertaken by Recon Environmental 2009 survey.

3.5.4 Project Vegetation

The Recon Environmental (Recon 2010) survey covered an area of 12,647 ha and identified 29 vegetation communities within the wider Project area (Table 7; Figure 11; Appendix 3). This survey did not include the full length of L53/148 which is located away from the BIF, however, this area was surveyed by JSWT in September 2005 and by NVS as part of the regional *Sida picklesiana* survey (NVS 2018).

The 18 vegetation communities identified on the BIF were grouped into six main types following the DEC's (now DBCA) descriptions of the communities (based on floristic composition) at the Project. The remaining 11 vegetation communities/habitats identified by Recon (2009) tend to be found downslope from the hills and ridges on the surrounding plains which were not surveyed by the DEC (Recon 2010).

The survey did not record any Threatened Ecological Communities (TEC's) as defined by the EPBC Act (1999) or the DBCA (Recon, 2010).

The clearing area comprises 26 vegetation communities, and does not include the sandplain vegetation units (SAMA, SAMU and SASP) (Table 7, Figure 11).

The proposed haul road on L53/148, outside of the Recon (2010) survey area was surveyed in September 2005 by JSWT and recorded three vegetation groups (Appendix 1):

- Mulga woodland
- Mulga creekline
- Rocky Breakaway (JSWT 2006) (Figure 12).

The 'Mulga creekline' vegetation group mapped by JSWT does not contain riparian species. These are ephemeral drainage areas that only flow following heavy rainfall.

A copy of the survey report is attached as Appendix 1. GWR is cognisant that this survey was undertaken many years ago but considers the vegetation groups identified are still applicable. This area was surveyed more recently by NVS (2018) as part of the targeted *Sida picklesiana* survey which also recorded any Priority flora encountered (Appendix 5).

Table 7: Vegetation Communities recorded at Project

Veg Unit	Recon Vegetation Type (Recon 2010)	Vegetation Description	DBCA - Markey & Dillon (2009) Community
SIMS-B	Stony Ironstone Mulga Shrublands on rocky slopes and crests, frequently on BIF	SIMS-B can be described as an <i>Acacia aneura</i> var. <i>microcarpa</i> shrubland with <i>Grevillea berryana</i> occurring on rocky outcrops usually on banded iron formation (BIF).	TYPE 1: found on crests and steeper upper slopes; described as a sparse open tall shrubland of <i>Acacia aneura</i> cf. var. <i>microcarpa</i> , <i>Grevillea berryana</i> and less commonly, <i>Acacia quadrimarginea</i> over <i>Eremophila latrobei</i> subsp. <i>latrobei</i> , <i>Prostanthera campbellii</i> , above <i>Ptilotus obovatus</i> , <i>Sida</i> sp. Golden calyces glabrous, <i>Sida</i> sp. <i>Excedentifolia</i> , <i>Ptilotus schwartzii</i> , <i>Cheilanthes brownii</i> , with <i>Eriachne helmsii</i> , <i>E. mucronata</i> , and <i>Monachather paradoxus</i> .
ASET	<i>Acacia</i> shrubland over <i>Eremophila</i> and <i>Triodia</i>	ASET is a mixed <i>Acacia</i> shrubland generally comprised of <i>Acacia aneura</i> over mid to low shrubs including <i>Eremophila punctata</i> , <i>E. latrobei</i> , <i>E. forrestii</i> , over <i>Triodia melvillei</i> .	TYPE 2: located on flat summit surfaces on ridge tops, and on the undulating pediments and valley floors off the main ridges. It encompasses mosaics of <i>Acacia</i> over <i>Triodia</i> grasslands or low myrtaceous- <i>Eremophila</i> shrublands, with isolated mallees of <i>Eucalyptus kingsmillii</i> subsp. <i>kingsmillii</i> .
LOMS	Low Open Myrtaceae Shrubland	LOMS is a low open shrubland, usually dominated by <i>Aluta maisonneuvei</i> subsp. <i>auriculata</i> , and tending to have very sharp boundaries with the surrounding <i>Acacia</i> shrublands.	
SIMS-C	Stony Ironstone Mulga Shrublands on rocky slopes and crests	SIMS-C is a commonly occurring upland habitat associated with ironstone or laterite; dominated by <i>Acacia aneura</i> var. <i>microcarpa</i> .	
UAET	Undulating lateritic slopes of <i>Acacia</i> over low <i>Eremophila</i> and <i>Triodia</i>	Low shrubland occurring on undulating lateritic low hills dominated by <i>Eremophila jucunda</i> subsp. <i>jucunda</i> and <i>Triodia melvillei</i> with scattered tall shrubs of <i>Acacia aneura</i> .	
SUAE	Stony undulating slopes of <i>Acacia rhodophloia</i> over <i>Eremophila</i> and low shrubs	Shrubland dominated by <i>Acacia rhodophloia</i> frequently over <i>Eremophila jucunda</i> subsp. <i>jucunda</i> with <i>E. latrobei</i> subsp. <i>latrobei</i> and <i>E. punctata</i> , and also <i>Aluta maisonneuvei</i> subsp. <i>auriculata</i>	
SAEC	Stony <i>Acacia rhodophloia</i> and <i>Eremophila congesta</i> (P1) Shrubland occurring on crests	It is a shrubland dominated by <i>Acacia rhodophloia</i> over <i>Eremophila congesta</i> (P1) with <i>E. latrobei</i> subsp. <i>latrobei</i> and <i>E. punctata</i> , and on occasion <i>Triodia melvillei</i> only occurring on the crests of hills	
OALS	Open <i>Acacia</i> Shrubland on ironstone or laterite over low scattered shrubs	OALS is a varying habitat generally dominated by <i>Acacia quadrimarginea</i> and/or <i>A. balsamea</i> (P4) and frequently occurs on lateritic low rises; low outcrops of weathered BIF; rough quartz slopes; and upper breakaway surfaces.	
OALS-S	Open <i>Acacia</i> Shrubland on ironstone or laterite over low scattered shrubs – southern C Ridge	Generally dominated by <i>Acacia quadrimarginea</i> with <i>Acacia aneura</i> over <i>Scaevola spinescens</i> , <i>Eremophila latrobei</i> subsp. <i>latrobei</i> , <i>Ptilotus obovatus</i> and <i>E. flabellata</i>	
SXSS	Scattered Mixed Shrubland on Low Stony Rises	SXSS is an open, scattered shrubland dominated by <i>Acacia</i> species occurring on stony ironstone.	TYPE 3: usually found on pediments, lower slopes and slightly low outcrops of weathered BIF and other metasediments, quartz and ultramafic lithologies, usually obscured by colluvium. It consists of <i>Acacia aneura</i> , and less frequently <i>Acacia balsamea</i> and <i>A. cuthbertsonii</i> subsp. <i>cuthbertsonii</i> tall open shrublands over shrubs including <i>Scaevola spinescens</i> , <i>Senna artemisioides</i> subsp. <i>helmsii</i> , <i>Eremophila flabellata</i> , and scattered <i>Maireana convexa</i> , <i>M. georgei</i> , and <i>Ptilotus obovatus</i> .

Veg Unit	Recon Vegetation Type (Recon 2010)	Vegetation Description	DBCA - Markey & Dillon (2009) Community
AXSI	Acacia Mixed Shrubland on Stony Ironstone Slopes	Generally dominated by <i>A. balsamea</i> (P4) with <i>Acacia cuthbertsonii</i> subsp. <i>cuthbertsonii</i> and <i>A. aneura</i> above <i>Scaevola spinescens</i> , <i>Eremophila latrobei</i> subsp. <i>latrobei</i> , <i>Ptilotus obovatus</i> and <i>Senna artemisioides</i> subsp. <i>helmsii</i>	
USCS	Upland Chenopod Shrubland Small Species	Open <i>Acacia aneura</i> shrubland on stony red earth over scattered <i>Ptilotus obovatus</i> , <i>Maireana</i> spp., <i>Sclerolaena</i> spp., and <i>Tecticornia</i> spp.	TYPE 4: consists of a tall open shrubland of <i>Acacia aneura</i> and <i>A. tetragonophylla</i> , occasionally with isolated emergent trees of <i>Acacia pruinocarpa</i> , over a mosaic of shrubland and chenopods.
SAES	Stony <i>Acacia Eremophila</i> Shrubland	An open <i>Acacia aneura</i> shrubland on stony red earth over scattered <i>Eremophila</i> spp., <i>Sida ectogama</i> , <i>Ptilotus obovatus</i> , and <i>P. schwartzii</i>	
DRAS	Drainage Tract <i>Acacia</i> Shrubland	Scattered to close tall shrubland, sometimes woodland with understorey development inversely related to upper storey cover	
SIME	Stony Ironstone Mulga with <i>Eremophila forrestii</i> Shrubland	Commonly occurring mulga shrubland dominated by <i>Acacia aneura</i> var. <i>microcarpa</i> , above <i>Eremophila forrestii</i> often with <i>E. punctata</i> , <i>E. flabellata</i> and <i>E. jucunda</i> subsp. <i>jucunda</i>	
SMEC	Stony Slopes Mulga <i>Eremophila congesta</i> (P1) Shrubland	Occurs along the lower slopes of hills in the north and east of the survey area and is dominated by <i>Acacia aneura</i> var. <i>microcarpa</i> above <i>Eremophila congesta</i> (P1), often with emergent <i>Acacia pruinocarpa</i>	TYPE 5: found on lower slopes, pediments and valley flats. It is a tall <i>Acacia aneura</i> shrubland often with a canopy of <i>A. pruinocarpa</i> over <i>Eremophila forrestii</i> , <i>E. latrobei</i> , <i>Senna</i> spp., <i>Eremophila flabellata</i> , <i>Rhagodia eremaea</i> , <i>Sida ectogama</i> , <i>Ptilotus obovatus</i> , with <i>P. schwartzii</i> , <i>Sida</i> sp. <i>Excedentifolia</i> and <i>Monachather paradoxa</i> .
MSET	Mulga Shrubland over <i>Eremophila forrestii</i> and <i>Triodia</i>	MSET occurs on the lateritic soils, it is dominated by <i>Acacia aneura</i> var. <i>microcarpa</i> , above <i>Eremophila forrestii</i> often with <i>E. jucunda</i> subsp. <i>jucunda</i> over <i>Triodia melvillei</i>	
SIMS-M	Stony Ironstone Mid-slope Mulga Shrubland	Mid-slope habitat associated with iron rich outcrops. It consists of <i>Acacia aneura</i> var. <i>microcarpa</i> , with scattered <i>A. pruinocarpa</i> above <i>Eremophila latrobei</i> subsp. <i>latrobei</i> , <i>Dodonaea petiolaris</i> , <i>Harnieria kempeana</i> subsp. <i>muelleri</i> , <i>Eremophila flabellata</i> , with <i>E. jucunda</i> subsp. <i>jucunda</i> , and <i>Ptilotus rotundifolius</i> .	
BCLS	Breakaway Footslope Low <i>Chenopod</i> Shrubland	Generally comprised of a low scattered shrubland generally dominated by chenopod species	Not on BIF – not surveyed by DBCA.
BRXS	Breakaway Shrublands Mixed	<i>Acacia</i> species shrubland above <i>Eremophila</i> species, <i>Ptilotus obovatus</i> , with <i>Scaevola spinescens</i> , and often with emergent <i>Eucalyptus carnei</i> near the footslope edges of the breakaway scarp; it has also been recorded as a moderately close tall to mid shrubland	

Veg Unit	Recon Vegetation Type (Recon 2010)	Vegetation Description	DBCA - Markey & Dillon (2009) Community
CBKW	Creek Bank Woodland or Shrubland	Creek beds are characteristically between 20 and 50m wide and up to 4m deep, incised into hardpan. The vegetation fringing the creeklines often consists of a moderately close mulga woodland or tall shrubland	Not on BIF – not surveyed by DBCA.
MUWA	Mulga Wanderrie Grassy Shrubland	MUWA is generally a scattered mulga shrubland over wanderrie grasses	
HPMD	Hardpan Plain Mulga Woodland - Drainage	Mulga woodland with a poorly developed low and mid shrub strata occupying the lowest part of the landscape	
HPMS	Hardpan Plain Mulga Shrubland	Usually a scattered to moderately close tall mulga shrubland with a well developed low and mid shrub strata	
MUBW	Hardpan Plain Mulga & Bowgada Shrubland	Scattered to moderately close tall shrubland (<i>Acacia 113 ramulosa</i>), but it is occasionally dominated by mid shrub (<i>Acacia 113 ramulosa</i> , with <i>Eremophila forrestii</i>) or tree strata	
GRMU	Hardpan Plain Mulga Grove	Mulga groves are often moderately close to closed tall shrublands, or less frequently low woodlands	
SAMA*	Sandplain Mallee Spinifex Hummock Grasslands	SAMA occurs on deep red sandy soils and consists of <i>Triodia</i> grasslands interspersed with mallee	
SAMU*	Sandplain Mulga Spinifex Hummock Grassland	SAMU occurs as a scattered tall mulga shrubland over a hummock grass (<i>Triodia</i>) stratum	
SASP*	Sandplain Spinifex Hummock Grassland	SASP consists of a <i>Triodia</i> grassland, where the hummock grass layer generally dominates in terms of projected foliar cover and biomass	

*not recorded in proposed clearing area

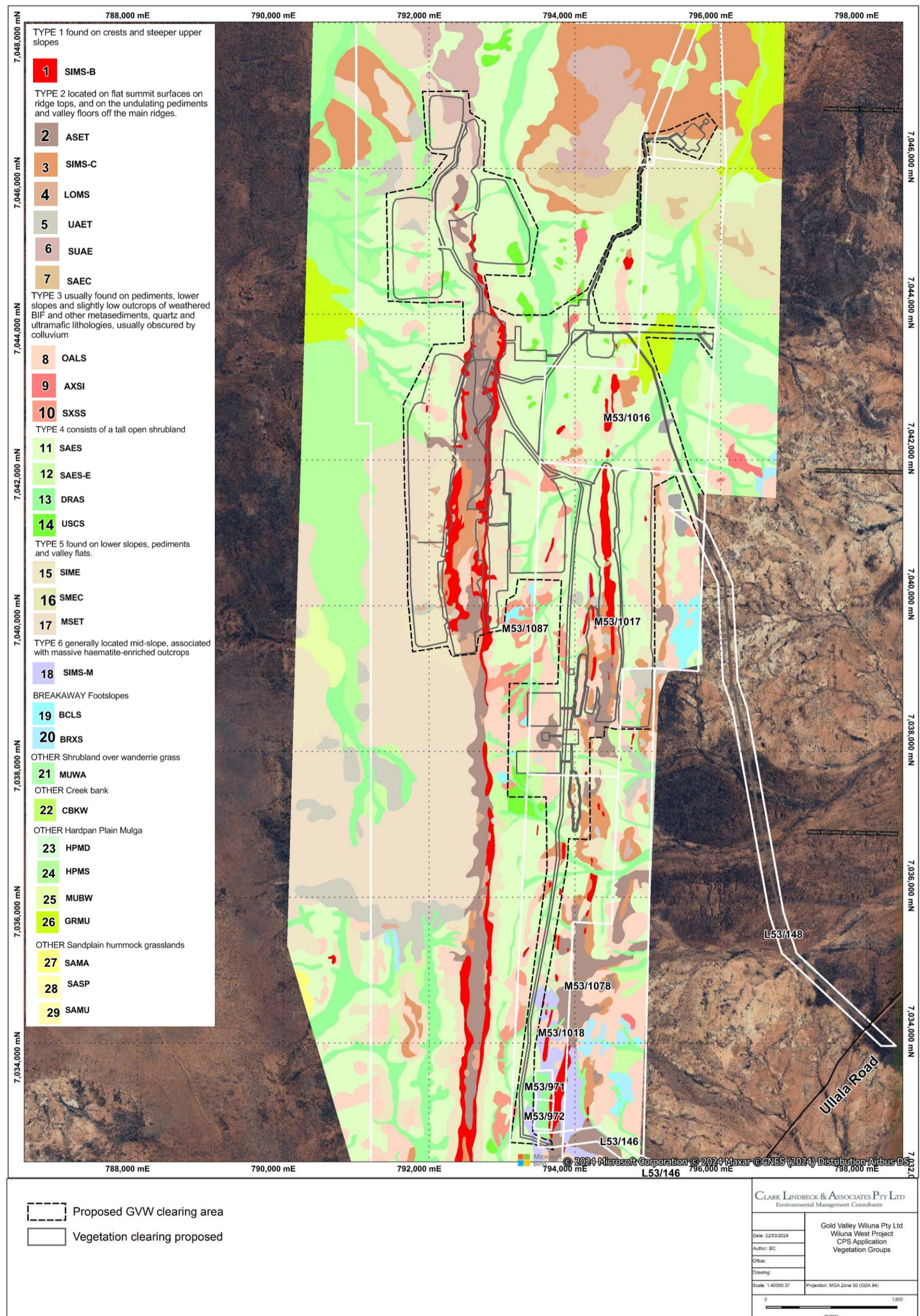
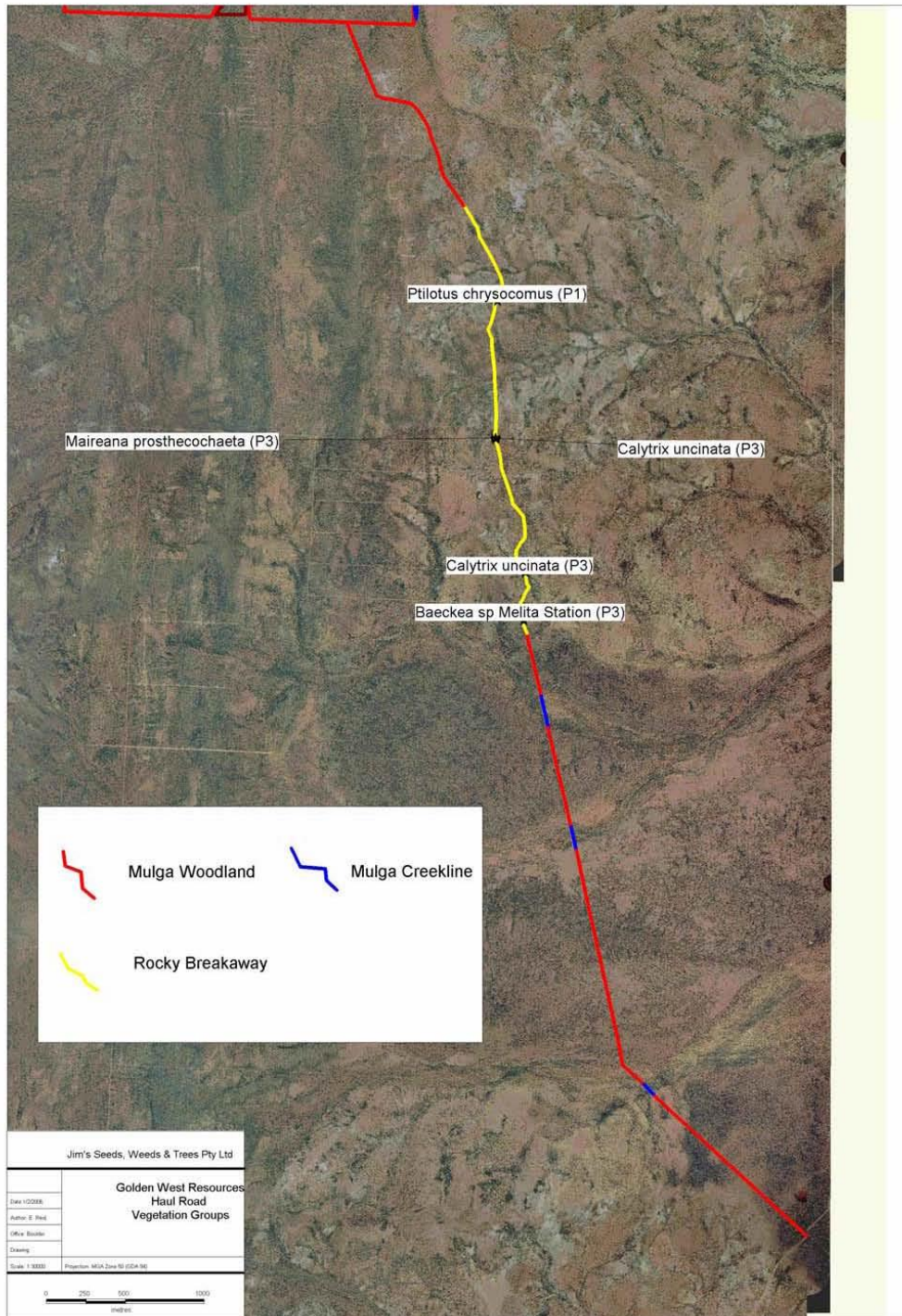


Figure 11: Vegetation groups within the clearing area (excluding L53/148)



**Baeckea sp Melita Station* is no longer a Priority flora species

Figure 12: L53/148 vegetation mapping (JSWT 2005)

3.5.5 Vegetation Condition

The condition of the all vegetation in the area was rated from Pristine to Excellent (Keighery 1994) for undisturbed areas through to degraded. The degraded vegetation is a result of previous mining activity and exploration.

3.5.6 Flora

A total of 279 native taxa from 120 genera and 41 families have been recorded in the overall Wiluna West Project area to date (Recon 2010).

No Threatened taxa, listed under the State Biodiversity Conservation Act 2016 (BC Act) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), have been identified at the Project to date.

A total of 13 Priority flora species have been recorded at the overall Wiluna West Project to date based on work undertaken by Botanica, KLA, Recon and NVS (Section 3.5.2). GWR is not aware of any new Threatened flora listings or DBCA records at the Project since the 2020 surveys.

Eight Priority flora species are located in the GVW clearing area (Recon 2010; NVS 2012, 2018, 2019, 2020; JSWT 2005):

- *Eremophila congesta* (P1)
- *Ptilotus chrysocomus* (P1)
- *Eremophila arachnoides subsp. arachnoides* (P3)
- *Calytrix uncinata* (P3)
- *Homalocalyx echinulatus* (P3)
- *Maireana prosthocochaeta* (P3).
- *Prostanthera ferricola* (P3)
- *Sida picklesiana* (P3) (Table 8).

An assessment of the impact on these Priority flora species is presented in Table 8. The impact calculation as presented in NVS (2012 – Appendix 4) was based on the original proposed location of mining infrastructure. The original plan has since been modified to eliminate the high impact areas to an insignificant level (i.e. *Ptilotus chrysocomus*).

All of these species are well represented outside of the clearing area (Figure 11).

Table 8: Priority flora recorded during targeted Priority surveys in the clearing area

Name	DBCA Conservation Status	# individuals recorded	# individuals to be impacted	Local and/or Regional Population
BOWEBIRD, C3 & C4 (NVS 2012)				
<i>Eremophila congesta</i>	P1	35	35	7665* (local area)
<i>Ptilotus chrysocomus</i>	P1	657	657	At least 1000
<i>Homalocalyx echinulatus</i>	P3	1522**	1522**	>2000**
<i>Prostanthera ferricola</i>	P3	5	5	400
<i>Calytrix uncinata</i>	P3	13	13	>2000
<i>Sida picklesiana</i>	P3	1077	1077	31,312*** (>33,780 regionally)
EAGLE-EMU (NVS 2019, 2020)				
<i>Ptilotus chrysocomus</i>	P1	73	3	At least 1000
<i>Eremophila arachnoides subsp. arachnoides</i>	P3	202	150	At least 5000
<i>Homalocalyx echinulatus</i>	P3	30	Nil	At least 1000
<i>Maireana prosthocochaeta</i>	P3	25	1	At least 1000
<i>Sida picklesiana</i>	P3	15	15	31,312*** (>33,780 regionally)
L53/148 HAUL ROAD (JSWT 2005; NVS 2018)				
<i>Ptilotus chrysocomus</i>	P1	5	Nil	At least 1000
<i>Calytrix uncinata</i>	P3	60	Nil	>2000
<i>Maireana prosthocochaeta</i>	P3	300	Nil	At least 1000
<i>Sida picklesiana</i>	P3	665	Nil	31,312*** (>33,780 regionally)

* - estimate from NVS (2022)

** - GWR records have ~>19,000 plants recorded, thus the impact on the recorded population at Wiluna West is estimated at ~8%

*** - this number only includes those recorded in surveys commissioned by GWR. Since the original surveys were completed where the extent of this species was not well known, it has a far wider distribution.

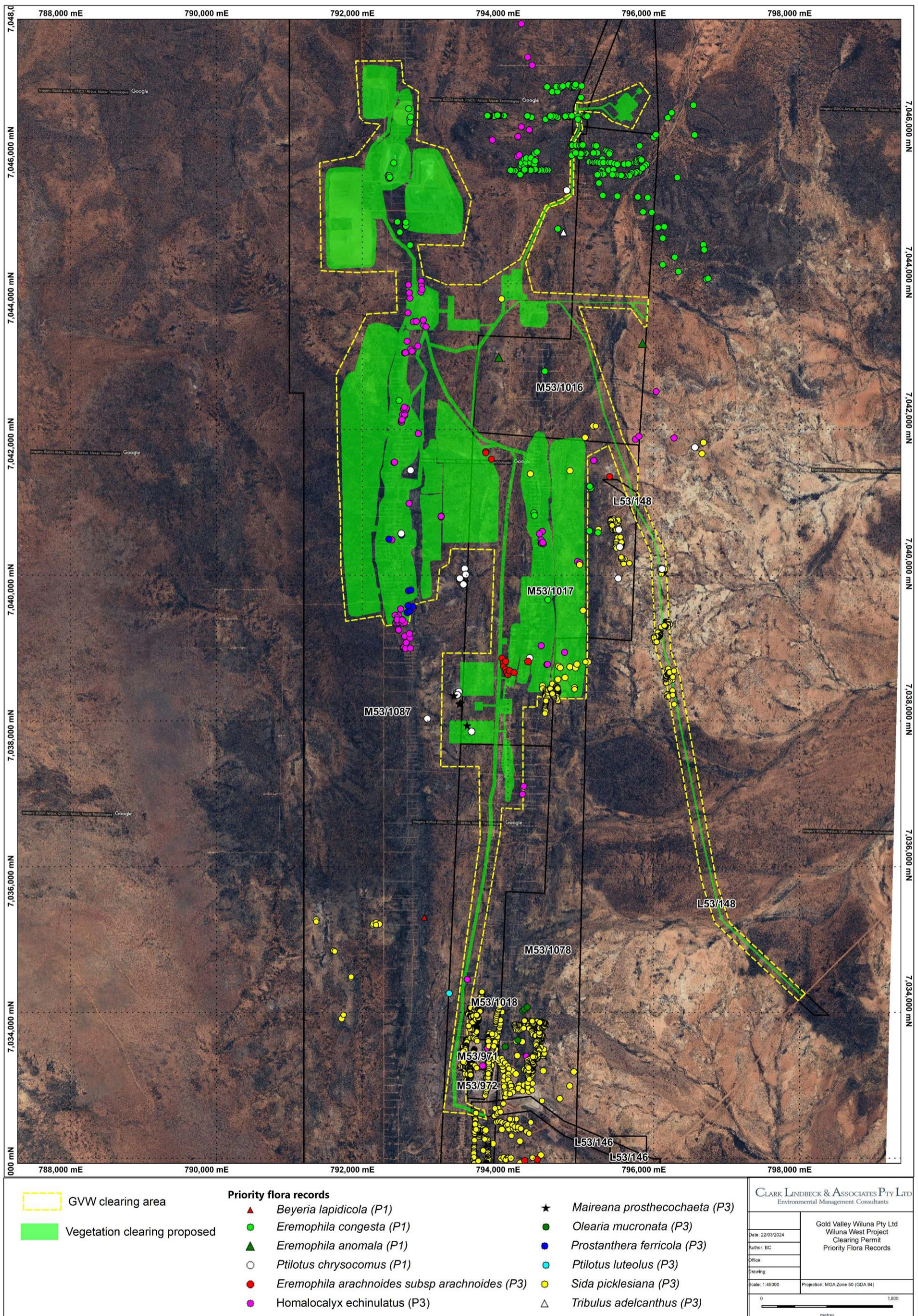


Figure 13: Priority flora records at the Project and in the clearing area

3.5.7 Weeds

Six introduced weed species have been recorded across the Wiluna West Project to date:

- *Portulaca oleracea** (pigweed, purslane). Located in the DRAS habitat.
- *Tribulus terrestris** (caltrop) One record of this species in the SAES habitat.
- *Anagallis arvensis* var. *caerulea** (blue pimpernel). Recorded in the SAES habitat.
- *Cuscuta epithymum** (lesser dodder). Recorded by Botanica in earlier surveys of the Joyners Find area.
- *Citrullus amarus** (afghan melon, pie melon). One record of this species on adjacent to a main access track near an abandoned water point and at northern end of the C4 haul road (L53/147).
- *Bidens bipinnata** (beggar's tick). Located in drainage lines and floodplains in the current; occurring extensively in parts of the HPMD habitat and often found in the DRAS habitat and at northern end of C4 haul road.
- *Rumex vesicarius* (Ruby Dock) – recorded along C4 haul road (outside of clearing area) and in around old gold workings on the 'B' ridge. All individual plants encountered have been removed from site before they set seed and the areas reassessed.

No species listed as 'Declared Pests', by the Department of Primary Industries and Regional Development (2018) in accordance with Section 22 of the *Biosecurity and Agriculture Management Act 2007* have been recorded at the Project.

No weeds were recorded during the NVS (2019; 2020) targeted surveys of the Eagle-Emu clearing area.

3.6 FAUNA

3.6.1 Terrestrial Fauna

Four Level 2 fauna surveys and numerous targeted searches have been completed at the Wiluna West Project that have encompassed the fauna habitats present in the clearing area (Figure 14):

- 31 October – 9 November 2005 - Survey of M53/1016 and L53/148 (Ninox 2005).
- 15 – 24 September 2006 – Survey covering the B ridge from Joyners Find (JWD) deposit to Bowerbird deposit (Ninox 2006)
- 23 – 31 October 2007 – Survey of the 'C' Ridge (Ninox 2008)
- Mulgara survey for the Wiluna West Project – E53/1119 (northern part of M53/1087) (GWR 2009);
- 9 – 18 November 2011 – Level 2 fauna, fauna habitat assessment and SRE survey focusing on Bowerbird, C3 and C4 deposits (KLA 2012) (Appendix 9).
- 20 – 24 September 2019 – Targeted Fauna Survey for the Eagle-Emu Deposits (Western Ecological 2019) (Appendix 10).
- 15-18 June 2020 - Haul Road Targeted Fauna Assessment; Addendum Report – C4 haul road (Western Ecological 2020). The southern half of the haul road comprises fauna habitat consistent with that present at C4 of 'Mulga shrubland'.

The KLA (2012) report includes the results of the three Ninox fauna surveys (2005-2007).

A total of 71 bird, 27 mammal, two frog and 40 reptile species have been recorded at the overall Project during the Level 2 surveys (Ninox Wildlife Consulting, 2006, 2007, 2008; KLA, 2012; Western Ecological 2019; Western Ecological 2020).

While the some of the surveys are dated, GVW is of the belief that they have been comprehensive in identifying the fauna occurring at site.

Four fauna species of conservation significance have been recorded at Wiluna West to date (Figure 15):

- Malleefowl (*Leipoa ocellata*);
- Brush-tailed Mulgara (*Dasycercus cristicauda/blythii*);
- Long-tailed Dunnart (*Sminthopsis longicaudata*); and
- Peregrine Falcon (*Falco peregrinus*).

Records of the Malleefowl and Long-tailed Dunnart have been recorded in the clearing area. Malleefowl is described further in Section 3.6.2.

The Long-tailed Dunnart was recorded by KLA (2012) in the clearing area (KLA 2012), and there is some suitable habitat in the clearing area (rocky outcrops), though population densities may be low due to limited food resources. No evidence of the occurrence Long-tailed Dunnarts were recorded on camera traps at Eagle-Emu during the Western Ecological (2019) survey, and no signs (burrows, tracks or scats) were observed.

A gecko *Diplodactylus squarrosus* was recorded on L53/148 during the 2005 fauna survey. A very similar gecko has been captured from Lorna Glen Station, 160 km north-west of Wiluna, and while various individuals consider the species recorded to be *Diplodactylus stenodactylus*, there are others who consider that it may be a genetically distinct form of *Diplodactylus squarrosus* (Ninox Wildlife Consulting, 2006). The record of this species was associated with Breakaways which will be avoided during road construction on this tenement.

The Ninox surveys also recorded secondary signs of the Boodie/Burrowing Bettong (*Bettonia lesuergraii*). The inland species is presumed extinct on the mainland and prefers sandy or loamy soils (often calcareous) that were deep enough to construct its burrow.

While GVW can not comment directly on the identification of these secondary signs, the current records on mainland are a result of DBCA translocating individuals from offshore islands (other subspecies) to Matuwa (Lorna Glen), which is located 200 km northeast of the Project. Regardless, these are not located in the clearing area.

A review of the EPBC Act threatened fauna list, DBCA Threatened Fauna Database and Priority List, unpublished reports and scientific publications (reviewed as part of the desktop assessment completed in the most recent Western Ecological surveys) identified a number of specially protected, migratory or priority fauna species with the potential to occur within, or in the vicinity of the clearing area, and is presented in Table 9. The only new listing since the previous database searches completed by Western Ecological (2019) is Southern Whiteface (*Aphelocephala leucopsis*) under the EPBC Act.

The species listed have a wide distribution and/or their preferred habitat is not present or limited to the proposed mining area and are further considered in Section 4.0.

Table 9: Conservation significant terrestrial fauna potentially occurring in the clearing area

Species	Common Name	Conservation Status		Recorded at overall Wiluna West Project
		EPBC	DBCA	
Reptiles				
<i>Liopholis kintorei</i>	Great Desert Skink	Vulnerable	Vulnerable	No
Avifauna				
<i>Amytornis striatus subsp striatus</i>	Striated Grasswren		P4	No
<i>Falco hypoleucos</i>	Grey Falcon		Vulnerable	
<i>Falco peregrinus</i>	Peregrine Falcon		Schedule 7	Yes
<i>Leipoa ocellata</i>	Malleefowl	Vulnerable	Vulnerable	Yes

<i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> * ¹	Masked Owl (southwest)		P3	No
<i>Polytelis alexandrae</i>	Princess Parrot	Vulnerable	P4	No
<i>Pezoporos occidentalis</i>	Night Parrot	Endangered	Critically Endangered	No
<i>Apus pacificus</i>	Fork-tailed swift	Migratory/Marine	Schedule 5 (Migratory)	No
<i>Motacilla cinerea</i>	Grey Wagtail	Migratory/Marine	Schedule 5 (Migratory)	No
<i>Motacilla flava</i>	Yellow Wagtail	Migratory/Marine	Schedule 5 (Migratory)	No
<i>Actitis hypoleucos</i>	Common Sandpiper	Migratory/Marine		No
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Migratory/Marine		No
<i>Calidris melanotos</i>	Pectoral Sandpiper	Migratory/Marine		No
<i>Charadrius veredus</i>	Oriental Plover, Oriental Dotterel	Migratory/Marine	Schedule 5 (Migratory)	No
<i>Ardea alba</i>	Great Egret	Marine		No
<i>Chrysococcyx osculans</i>	Black-eared Cuckoo	Marine		No
<i>Merops ornatus</i>	Rainbow Bee-eater	Marine		No
<i>Aphelocephala leucopsis</i>	Southern Whiteface	Vulnerable		No
Mammals				
<i>Bettongia lesuer graii</i>	Boodie/Burrowing Bettong	Extinct	Extinct (Schedule 4)	
<i>Dasyercus blythii</i> *	Brush-tailed Mulgara		P4	Yes - in spinifex sandplain >4km north of C4
<i>Macrotis lagotis</i>	Bilby	Vulnerable	Vulnerable	No
<i>Sminthopsis longicaudata</i>	Long-Tailed Dunnart		P4	Yes – within CPS area

*¹ Considered an error as this species is only recorded in the south-west of WA

* Mulgara recorded at GWR was at that time identified as *D.cristicauda*, given the taxonomic confusion with *D.blythii*/*D.cristicauda*, DBCA records list the species as *D.blythii*

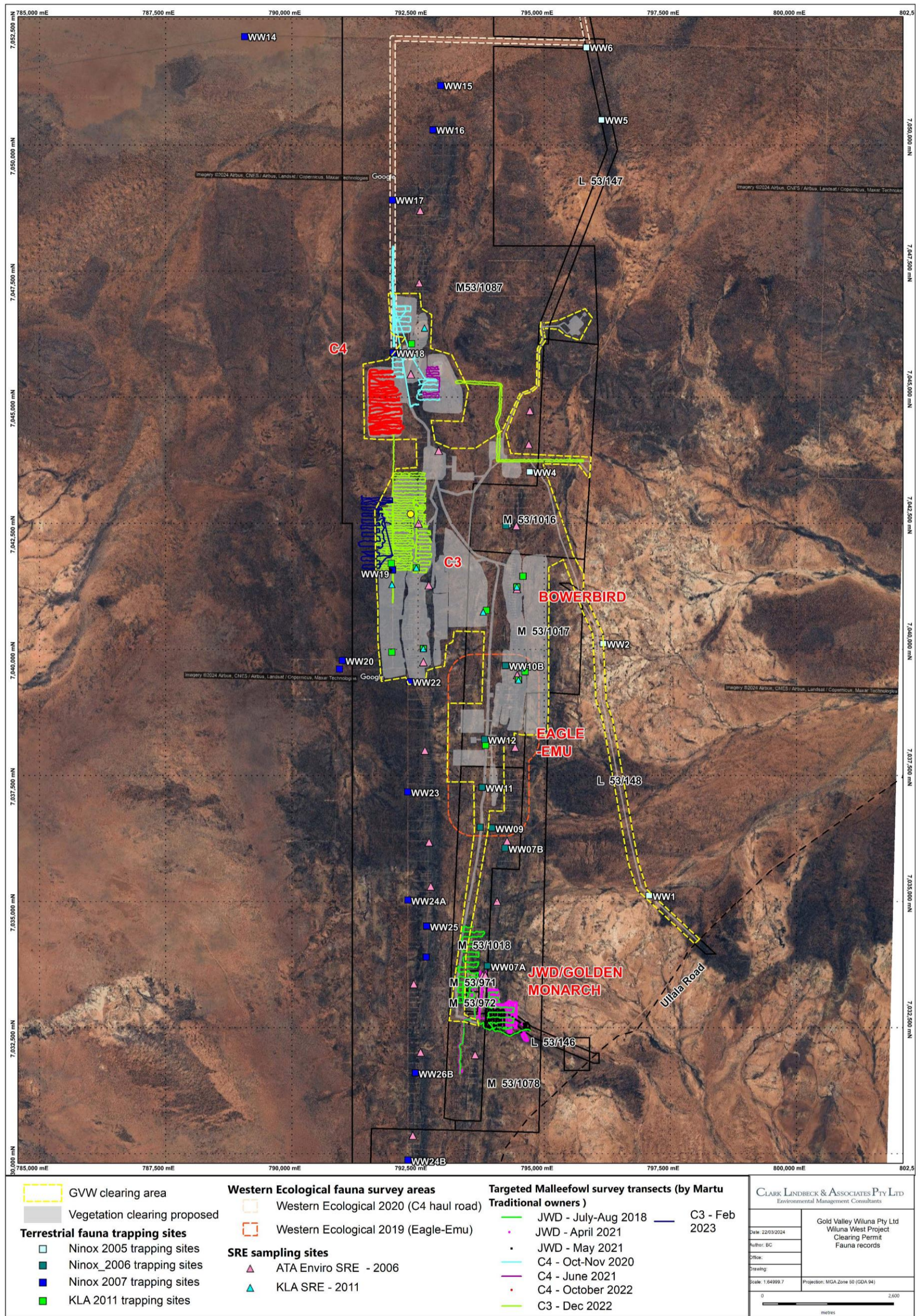


Figure 14: Location of fauna trapping site completed at the overall Wiluna West Project to date

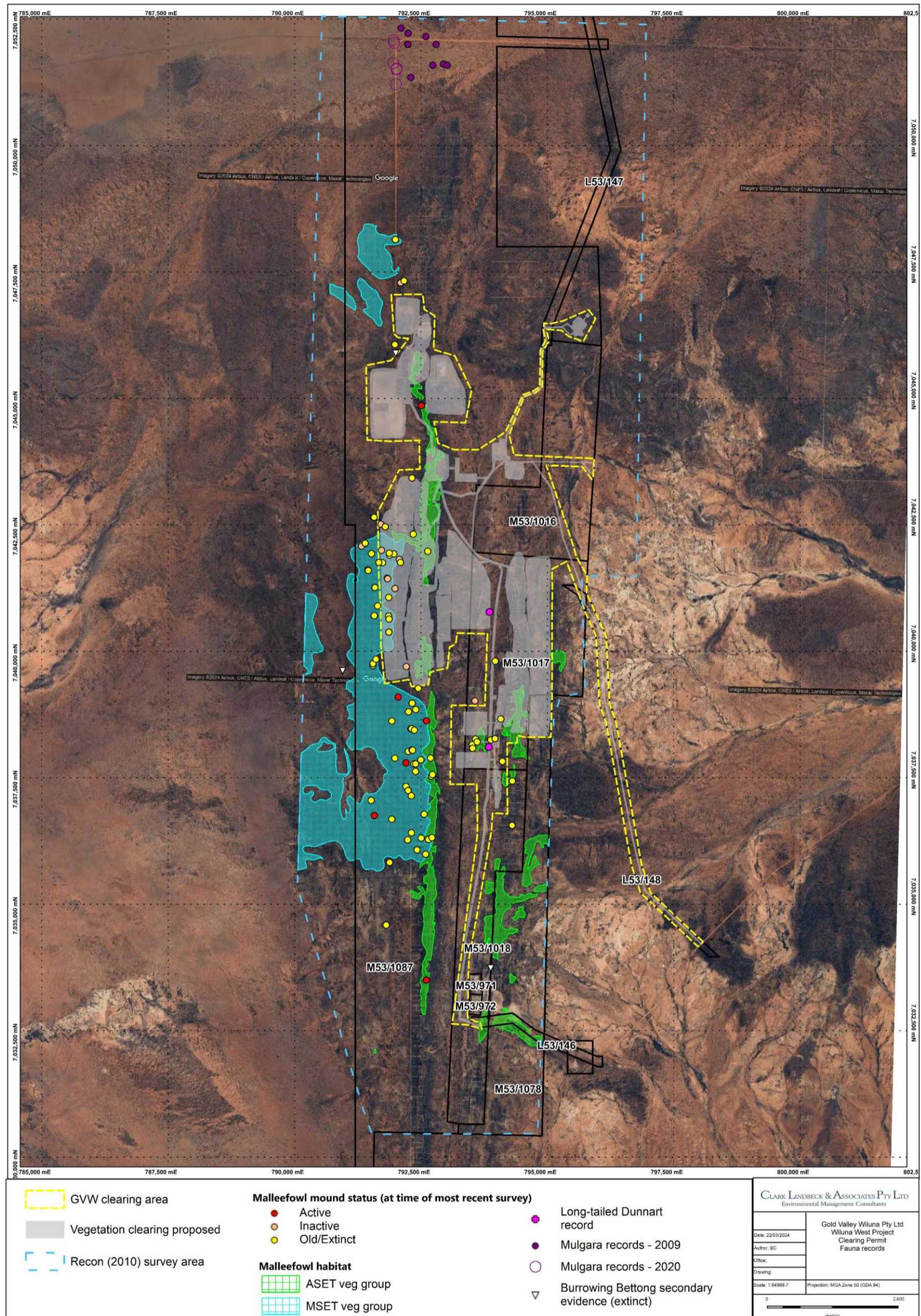


Figure 15: Conservation significant fauna records at the Project

3.6.2 Malleefowl

Malleefowl were first recorded at the Wiluna West Project in 2007, with the greatest occurrence, based on survey completed to date, on the 'C' ridge south of C3 as shown in Figure 15 (Ninox 2007, 2008; KLA 2012, GWR 2019). Table 10 lists the survey work and targeted assessments relevant to Malleefowl. This includes targeted Malleefowl surveys completed by the Martu traditional owners prior to clearing activities for which no formal reports were prepared (Martu traditional owners approved as 'fauna specialists').

To date a total of 91 Malleefowl mounds have been located at the overall Wiluna West project through targeted surveys which includes, based on their status at time of their most recent survey (Figure 15):

- 6 active mounds
- 10 inactive mounds; and
- 75 old, near-extinct to extinct mounds.

Of these, 23 mounds are located in the vegetation areas to be cleared at C3 and Eagle-Emu (Figure 15):

- 6 inactive mounds (C3)
- 17 old, near-extinct to extinct mounds (C3 and Eagle-Emu).

Photos of the mounds recently assessed at C3 and Eagle-Emu are shown in Table 11, and show examples of the different mound status (inactive, old, extinct).

The habitat at Eagle-Emu was considered by Western Ecological (2019) to be suboptimal for Malleefowl breeding, due to low shrub diversity, below average rainfall and higher abundance of rocky material.

An assessment of the occurrence of Malleefowl mounds with vegetation communities recorded at the overall Wiluna West Project indicates that this species prefer the MSET (Mulga Shrubland over *Eremophila forrestii* and *Triodia* on lateritic soils) and ASET (Acacia shrubland over *Eremophila* and *Triodia*) vegetation communities as defined by Recon (2010) (Figure 15). Figure 15 shows the extent of the vegetation survey and it is expected these communities extend outside of the area surveyed.

Detailed targeted assessments have not been completed specifically in these vegetation communities (outside of the clearing area) and it expected additional mounds are located south of C3 in this preferred habitat and where the majority of the active mounds have been recorded.

GVW proposes to clear a maximum of 207 ha of the MSET and ASET vegetation communities in the clearing area which represents 14 % of the total extent mapped at the Project (1,465 ha). It is expected these communities, and suitable habitat extends well outside of the Project area.

In accordance with Condition 9 of CPS 6726/2 (which this application is replacing), GWR developed a Malleefowl Management Plan (CLA 2020) and GVW has prepared their own Plan which is attached as Appendix 11. The GVW Malleefowl Management Plan is consistent with the Plan approved by DMIRS for CPS 6726/2. Appendix 1 of this Plan contains a detailed list of the mounds recorded.

Table 10: Fauna assessments for Malleefowl conducted at the Wiluna West Project




Survey consultant and survey dates	Survey Type and extent	Description and findings
Ninox 2006 31 October – 9 November 2005	A Vertebrate Fauna Survey of the Wiluna West Project Area, Western Australia	Level 2 Fauna Survey of M53/1016 and L53/148. No evidence of Malleefowl recorded.
Ninox 2007 15-24 September 2006	A Vertebrate Fauna Survey of the Wiluna West Project Area #2, Western Australia.	Level 2 Fauna Survey covering the B ridge from Joyners Find (JWD) deposit to Bowerbird deposit. Malleefowl footprints were recorded west of the B ridge. No evidence of Malleefowl being present or breeding in the survey area.
Ninox 2008 23-31 October 2007	A Vertebrate Fauna Survey of the Wiluna West Project Area #3, Western Australia.	Level 2 Fauna Survey and targeted search for Malleefowl on the C Ridge. One active mound, numerous old inactive and old mounds and tracks were recorded at various locations.
May 2008 GWR Group Limited Martu Women and Men	Targeted search along the C ridge	Recorded one active mound, numerous old mounds and tracks at various locations along C ridge.
KLA 2012 9-18 November 2011	Level 2 fauna assessment spring 2011 for the Wiluna West Iron Ore Project.	Level 2 Fauna Survey and audit of status of known Malleefowl mounds in the C3, C4 and Bowerbird areas – 1 active mound and 22 inactive mounds recorded (old – not recently active).
2012 GWR Group Limited Martu Women and Men	Targeted search along the B and C ridges at grid spacings of 100m.	5 active mounds, 54 inactive mounds (recorded as very old-old).
2014 Australasian Ecological Services	Reassessment survey (audit) of known Malleefowl mounds within and in close proximity to the Bowerbird, C3 and C4 deposits	A total of 24 Malleefowl mounds were assessed: <ul style="list-style-type: none"> • 2 active mounds surveyed (one being located within the proposed C3 disturbance footprint). • 4 mounds were surveyed as inactive. • 15 mounds were described as either extinct or near-extinct. • 1 mound was unable to be located. This has occurred where mounds have been misidentified (i.e. not a Malleefowl mound).
GWR Group Limited 2018 Martu Women	Targeted Malleefowl Survey at the JWD Project	Targeted search for Malleefowl within the JWD footprint. Malleefowl was not recorded and the habitat was deemed not suitable.
GWR Group Limited 2019 Martu Women	Targeted Malleefowl Survey at the Golden Monarch/JWD Project	Targeted search for Malleefowl within the Golden Monarch footprint. Malleefowl was not recorded and the habitat was deemed not suitable.
Western Ecological 2019	Targeted Fauna Survey at the Eagle-Emu Deposits	Targeted search for Malleefowl and a habitat assessment in the Eagle-Emu footprint and surrounds. Evidence of Malleefowl was recorded – one inactive and four old mounds and tracks.
Senior Martu Women May 2020	Targeted Malleefowl survey in the vicinity of the C4 deposit and sections of the proposed 18.6km haul road.	No evidence of Malleefowl was recorded. Completion of survey work was impacted by the COVID-19 restrictions. Further survey work completed by Western Ecological (2020) to complete the area.
Western Ecological June 2020	Completion of May 2020 Targeted fauna survey along the proposed C4 haul road corridor	No evidence of Malleefowl was recorded and their presence in the survey area is highly unlikely, given their conspicuous nature.
GWR Group Limited Martu Women and Men April – May 2021	Pre-clearing targeted Malleefowl survey at JWD in accordance with CPS 4006/3 and Malleefowl Management Plan.	No evidence of Malleefowl identified.




Survey consultant and survey dates	Survey Type and extent	Description and findings
GWR Group Limited Martu Women and Men Oct-Nov 2020 June 2021	Pre-clearing targeted Malleefowl survey at C4 in accordance with CPS 6726/2 and Malleefowl Management Plan.	No evidence of Malleefowl identified.
GWR Group Limited Traditional Owners September 2021	Audit to confirm status of recorded Malleefowl mounds	No new active mounds recorded.
GWR Group Limited Martu Women and Men October 2022	Pre-clearing targeted Malleefowl survey for C4 WRD (west) in accordance with CPS 6726/2 and Malleefowl Management Plan	No evidence of Malleefowl identified.
GWR Group Limited Martu Women and Men December 2022, February 2023	Targeted Malleefowl survey in the vicinity of the C3 deposit (Stage 1) including areas west of proposed clearing.	18 new Malleefowl mounds identified - 4 inactive; 14 old/near extinct/extinct.
Western Ecological March 2023	Targeted Malleefowl survey to confirm Malleefowl mounds identified as inactive.	Status of four mounds at C3 confirmed as 'Inactive'. Survey restricted by rain.




Table 11: Photos of Malleefowl mounds recorded at C3 and Eagle-Emu showing different mound status



Mound	Easting	Northing	Status	Photo
C3 (Photos from May 2023)				
3	792071.9	7041820	Active 2012- 2013 Inactive- 2023	
21	791862	7041067	Extinct	
30	791987	7041243	Inactive	

Mound	Easting	Northing	Status	Photo
85	792323.2	7043429	Extinct	 A photograph showing a cleared area with red soil and sparse vegetation. The ground is covered with dry, brownish vegetation and some small green plants. The background shows a line of trees under a clear blue sky.
87	792346.5	7042319	Very old	 A photograph showing a cleared area with red soil and sparse vegetation. The ground is covered with dry, brownish vegetation and some small green plants. The background shows a line of trees under a clear blue sky.
90	792093	7041758	Extinct	 A photograph showing a cleared area with red soil and sparse vegetation. The ground is covered with dry, brownish vegetation and some small green plants. The background shows a line of trees under a clear blue sky.

Mound	Easting	Northing	Status	Photo
91	791878.5	7041901	Old	
92	791962.8	7041927	Extinct	
93	791873	7041944	Old	

Mound	Easting	Northing	Status	Photo
94	791719.1	7041998	Inactive	
95	791706.2	7042515	Inactive	
96	792633.7	7041979	Extinct	

Mound	Easting	Northing	Status	Photo
103	791792.3	7042463	Extinct	
108	791736.6	7041750	Very Old	
EAGLE/EMU (photos taken in 2019)				
79	793964	7038276	Old (and inactive)	

Mound	Easting	Northing	Status	Photo
80	794078	7038663	Old (and inactive)	
76	793883	7038251	Old	

3.6.3 Short Range Endemics

Two short-range endemics invertebrate surveys have been undertaken at the Project, comprising habitat located in proposed clearing area and which are summarised below.

SRE survey (ATA Environmental 2006)

A survey for Short Range Endemics (SRE) invertebrates was conducted by ATA Environmental ('ATA' – now Coffey Environments) from 2 - 6 October 2006 (Figure 14). No SRE were recorded during the survey. Ten spiders from the families Lycosidae, Miturgidae, Gnaphosidae, Zodariidae, Ctenizidae and Sparassidae were collected during the survey. The spider species recorded are common and widespread and do not have conservation significance.

A juvenile *Conothele* species, a mygalomorph spider was recorded during the survey on Ridge C (approximately one kilometre west of C4). As mature males are required for species identification, the conservation significance of this species cannot be determined. Notwithstanding this, this species has a scattered occurrence throughout favoured habitat (unlike other species which aggregate in large numbers in pockets of habitat).

SRE survey (KLA 2011)

The Level 2 Spring fauna survey conducted in November 2011 (KLA, 2012) included a targeted SRE survey (Figure 14) (Appendix 9).

A total of 24 invertebrates comprising three spiders, eight pseudoscorpions and 13 scorpions were collected during this survey and vouchered at the Western Australian Museum. Two specimens were collected from soil samples and the remainder from pitfall traps and visual searches (Table 12) (KLA, 2012).

The spiders recorded were either juvenile or female and therefore could not be identified to species, as best taxonomic features in their identification are found within the genitalia of males.

Three genera of pseudoscorpions were collected (Family: Olpiidae). Of these, *Indolpium* spp. are not likely to represent SREs, whereas the endemism of both *Autrohorus* spp. and *Beierolpium* `sp. 8/3` require systematic revision to determine their degree of endemism. (Burger *et al.*, 2012).

Thirteen scorpions were recorded, and none were identified as SREs (Volschenk, 2012).

While taxonomic changes/updates are likely to have occurred since the previous SRE work completed, the habitat supporting these potential SRE is not restricted to the clearing area and is well represented on the B and C ridges which are ~20km in length.

Table 12: SRE survey results (KLA 2011)

Order	Family	Genus	Species	Total number collected			SRE status
				Pitfall Trap	Visual searching	Soil samples	
Araneae	Zodariidae				1		no comment
	Barychelidae	<i>Aurecocyrrpta</i>	`sp female`		1		Currently not possible to say if it represents SRE
	Idiopidae	<i>Eucyrtops</i>	`sp juv`		1		Currently not possible to say if it represents SRE
Pseudoscorpiones	Olpidae	<i>Beierolpium</i>	`sp. 8/3`		3		Possibly SRE but full taxonomic revision required
		<i>Beierolpium</i>	`sp. juv.`			1	unable to determine
		<i>Indolpium</i>			2	1	unlikely to represent SRE
		<i>Austrohorus</i>			1		Currently not possible to say if it represents SRE
Scorpiones	Buthidae	<i>Ilometroides</i>	'goldfields1'	3			Not an SRE
		<i>Lychas</i>	'annulatus'	1	1		Not an SRE
			jonesae	1	3		Not an SRE
			'splendens'	3	1		Not an SRE

3.7 THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES

No Threatened Ecological Communities (TEC's) are located in the project area (based on DBCA searches).

The clearing area is located within the Wiluna West vegetation complexes (BIF) which is listed as a Priority 1 Ecological Community (PEC) by DBCA due to its vegetation complexes. The Wiluna West PEC boundary covers an estimated area of 10,670 ha with the clearing area (1,290 ha) representing 12.1% of the total PEC area (Figure 16).

In addition to the Wiluna West PEC, two additional PEC's were revealed from the DBCA TEC database as having the potential to occur in the project area:

- "Millbillillie: Bubble calcrete groundwater assemblage type on Carey palaeodrainage on Millbillillie Station" PEC (P1).
- "Bubble Well calcrete groundwater calcrete assemblage type on Carey palaeodrainage on Millbillillie Station" PEC (P1).

These communities are related to subterranean fauna communities and these palaeodrainages are which are not known to occur in the Project area.

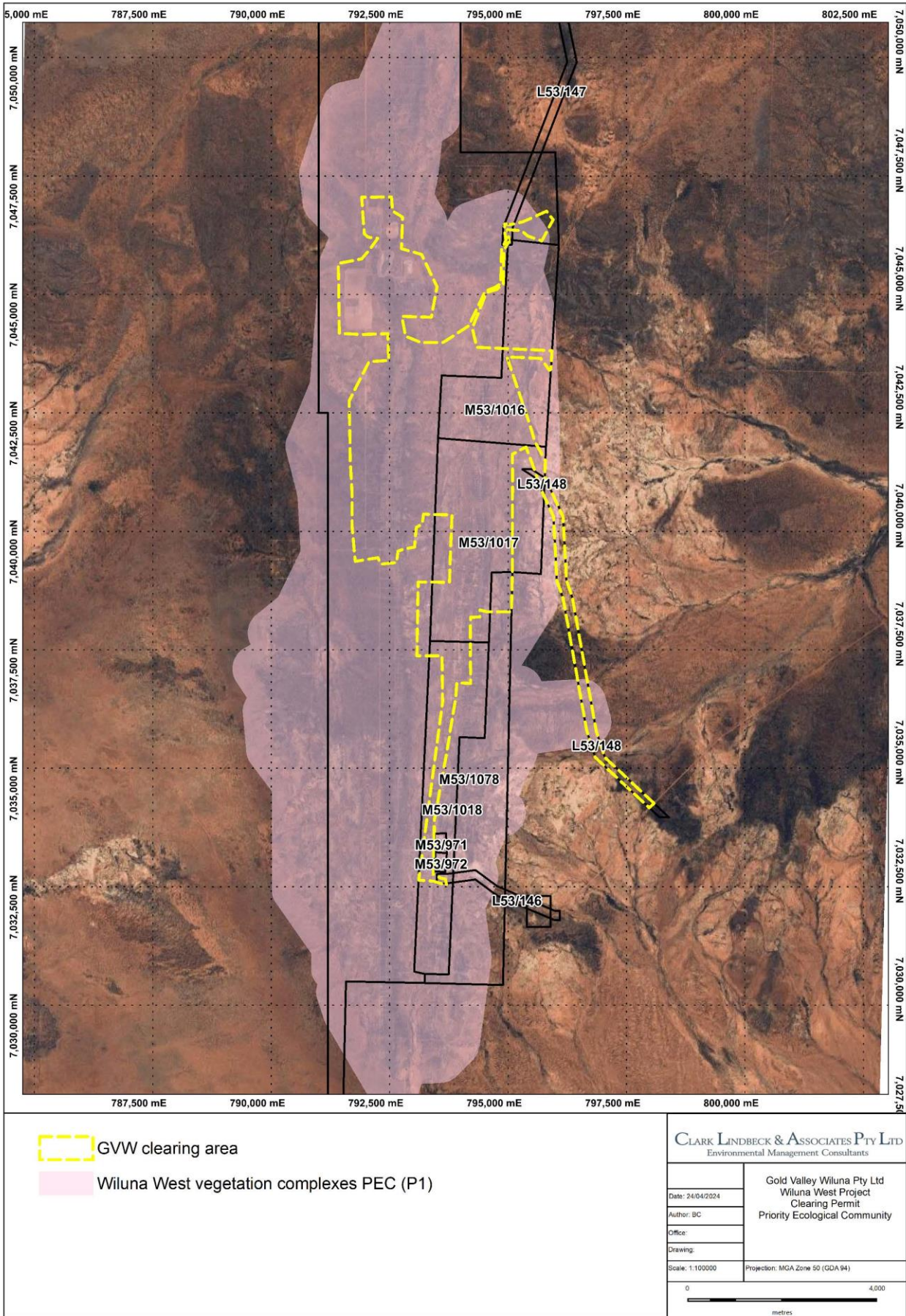


Figure 16: Wiluna West PEC

3.8 CONSERVATION AREAS IN ADJACENT AREAS

There are no conservation reserves or DBCA managed lands in the project area.

The closest nature reserve is Wanjarri Nature Reserve which is located approximately 85 kms southeast of the Project.

The nearest conservation areas are Mooloogool Station and Kaluwiri (managed by DBCA – ex-Pastoral leases) which are located approximately 40 km northwest and southeast respectively from the clearing area.

3.9 LANDUSE AND DEGRADATION

Historical gold mining has been completed on tenements within the approved clearing area and mining development has been ongoing at C4 since 2020. Exploration drilling has been completed across the Wiluna West Project.

The Project is located on Lake Way pastoral station and has been subject to grazing.

The Wiluna West Project has an approved Mine Closure Plan (MCP) which addresses the rehabilitation and closure works to return the area to its pre-mining land use of pastoral land. This MCP includes the clearing area.

3.10 ABORIGINAL HERITAGE

A Mining Agreement was executed on the 28 July 2010 between GWR and the Wiluna Martu Native Title holders. Part of the Mining Agreement included a commitment to develop a Cultural Heritage Management Plan (CHMP) to provide a clear and agreed management strategy in relation to all Cultural Heritage Values within the Wiluna West Project, including the undertaking of Aboriginal Heritage Surveys.

The CHMP was implemented on 28 October 2014 and Tarlka Matuwa Piarku Aboriginal Corporation (“TMPAC”) (Registered Native Title Body Corporate (RNTBC) for the Wiluna Native Title Holders) manage all processes.

A relationship committee has been formed that ensures all parties are informed of the status of the project and to manage the CHMP.

GVW are currently updating the CHMP to reflect their ownership of the Project and all work will continue to be monitored and managed under this plan.

4.0 CLEARING PRINCIPLES

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

The clearing area is located within the Austin botanical district in the Eremaean Province and lies within the East Murchison IBRA sub-region which covers an area of 211,350 ha. Vegetation throughout this sub-region is Mulga woodlands often rich in ephemerals, hummock grasslands, saltbush shrublands and *Halosarcia* shrublands.

While no TEC's have been identified locally, the area proposed to be cleared is located within the "Wiluna West Vegetation Complexes Banded Iron Formations PEC". The tentative Wiluna West PEC boundary as defined by DBCA covers an estimated area of 10,670 ha. The clearing will impact an 12.1% of the Wiluna West PEC.

The DEC (2007) report examining biodiversity values and conservation requirements of these BIF ranges summarises the more arid ranges surveyed by DEC in 2006 (including Robinson Range, Booylgoo Range, Wiluna West (Joyner's Find Hills), Cashmere Downs, Bulga Downs and Wolla Wolla / Gullewa) stating that preliminary results suggest while each of the systems surveyed appear floristically distinct from one other (in line with the 2005 survey results and confirming Beard's large scale mapping work), "*the ranges appear less diverse with fewer geographically restricted vegetation units than those surveyed in 2005*" (including Jack Hills, Weld Range, Koolanooka Hills, Mt Karara / Mungada Ridge/Blue Hills, Minjar / Gnows Nest, Warriedar Hill / Pinyalling, Mt Gibson).

Recon Environmental conducted a regional vegetation survey of the Wiluna West Project area and identified 29 vegetation groups over 12,310 ha. A total of 278 native taxa from 120 genera and 41 families were recorded in the overall Wiluna West Project area. Families of native species with greatest representation include Fabaceae (45 taxa), Poaceae (23 taxa), Chenopodiaceae (19 taxa), Scrophulariaceae (16 taxa) and Malvaceae (15 taxa). The most common genera were *Acacia* (23), *Eremophila* (16), *Senna* (14), *Maireana* (11) and *Ptilotus* (10).

Table 13 presents the cumulative impact at the Project including the clearing associated for CPS 4006/3. This includes clearing undertaken to allow assessment of cumulative impacts.

Recon Environmental lists vegetation group SIMS-B and SIMS-M as being closely associated with BIF, and has been recognised as important vegetation groups.

Taking into account the cumulative vegetation clearing at the Project (including CPS 4006/3) three vegetation communities (SIMS-B and LOMS and SIMS-M) will be reduced by 31-39% of their total extent within the Project area. These areas are identified as 'restricted areas of clearing' on the existing CPS 6726/2 (and CPS 4006/3) and the clearing proposed by PVW will be consistent with that previously assessed i.e. no clearing above that previously assessed.

The clearing will not reduce the extent of vegetation communities or reduce biodiversity on the BIF occurring within the region.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

Table 13: Cumulative impact on vegetation groups in the Wiluna West Project

Vegetation Unit	Vegetation Type	DEC Community	Total clearing for this CPS area	Overall Project clearing**	Total Veg group at Project (ha)	% Cumulative Impact on Veg group
SIMS-B	Stony Ironstone Mulga Shrublands on rocky slopes and crests, frequently on BIF	Type 1	84.27	100.77*	258.10	39.04
ASET	Acacia shrubland over Eremophila and Triodia	Type 2	87.93	106.08*	378.30	28.04
LOMS	Low Open Myrtaceae Shrubland		40.04	40.04*	109.40	36.60
SIMS-C	Stony Ironstone Mulga Shrublands on rocky slopes and crests		64.52	66.02	879.30	7.51
UAET	Undulating lateritic slopes of Acacia over low Eremophila and Triodia		20.35	20.35	260.60	7.81
SUAE	Stony undulating slopes of <i>Acacia rhodophloia</i> over Eremophila and low shrubs		15.96	15.96	274.50	5.81
SAEC	Stony <i>Acacia rhodophloia</i> and <i>Eremophila congesta</i> (P1) Shrubland occurring on crests		0.21	0.21	50.90	0.40
OALS	Open Acacia Shrubland on ironstone or laterite over low scattered shrubs	Type 3	122.93	130.03	736.00	17.67
AXSI	Acacia Mixed Shrubland on Stony Ironstone Slopes		2.12	2.12	53.40	3.96
SXSS	Scattered Mixed Shrubland on Low Stony Rises		9.70	9.70	92.30	10.51
SAES, SAES-E	Stony Acacia Eremophila Shrubland	Type 4	446.23	455.43	3004.70	15.16
DRAS	Drainage Tract Acacia Shrubland		54.72	69.43	830.90	8.36
USCS	Upland Small Chenopod Species Shrubland		5.82	5.82	53.60	10.85
SIME	Stony Ironstone Mulga with <i>Eremophila forrestii</i> Shrubland	Type 5	185.10	189.10	748.80	25.25
SMEC	Stony Slopes Mulga <i>Eremophila congesta</i> (P1) Shrubland		5.61	5.61	319.70	1.75
MSET	Mulga Shrubland over <i>Eremophila forrestii</i> and Triodia		120.33	120.33	1083.90	11.10
SIMS-M	Stony Ironstone Mid-slope Mulga Shrubland	Type 6	1.02	30.97*	97.80	31.66
BCLS	Breakaway Foothill Chenopod Low Shrubland	NS	0.30	0.30	43.90	0.68
BRXS	Breakaway Mixed Shrublands	NS	0.66	1.53	47.70	3.21
CBKW	Creek Bank Woodland or Shrubland	NS	0.01	0.01	42.40	0.03
MUWA	Mulga Wanderrrie Grassy Shrubland	NS	0.21	0.21	75.50	0.28
HPMS	Hardpan Plain Mulga Shrubland	NS	7.80	7.80	881.90	0.88
GRMU	Hardpan Plain Mulga Grove	NS	0.89	0.89	462.90	0.19
TOTAL CLEARING OF NATIVE VEGETATION (ha)			1290***	1396		

* Considered maximum amount of clearing for vegetation group

** includes vegetation clearing under CPS 4006/3 to allow cumulative impacts at the overall Wiluna West Project to be considered

*** this includes clearing already undertaken at C4 consistent with impacts for CPS 6726/2

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

Four Level 2 fauna surveys and numerous targeted searches have been undertaken at the overall Wiluna West Project to date and have recorded four conservation significant fauna:

- Malleefowl (*Leipoa ocellata*);
- Brush-tailed Mulgara (*Dasyercus cristicauda/blythii*);
- Long-tailed Dunnart (*Sminthopsis longicaudata*); and
- Peregrine Falcon (*Falcos peregrinus*).

Evidence of Malleefowl and Long-tailed Dunnart have been recorded in the clearing area.

The potential impact on the species previously recorded at the Project, and those that have the potential to occur based on database searches, is summarised in the following sections. This does not include any migratory/ marine species listed under the EPBC Act (predominantly waterbirds), which, have not been recorded at the Project previously, and, whose preferred habitat comprises estuaries, lakes, mudflats, saltmarshes, sandflats and beaches with shallow water edges, which are not present in the clearing area.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

CONFIRMED OCCURRENCE OF CONSERVATION SIGNIFICANCE SPECIES

- **Malleefowl (*Leipoa ocellata*)**

Of the 91 Malleefowl mounds recorded at the overall Wiluna West Project (15 show recent use), 23 mounds are located in the vegetation areas to be cleared at C3 and Eagle-Emu (Figure 15):

- 6 inactive mounds (C3)
- 17 old, near-extinct to extinct mounds (C3 and Eagle-Emu).

The habitat at Eagle-Emu was considered by Western Ecological (2019) to be suboptimal for Malleefowl breeding and foraging, due to low shrub diversity, below average rainfall and higher abundance of rocky material and suboptimal for foraging due to the low vegetation density.

Preferential breeding habitat appears to occur in the areas of denser understorey located on the C ridge and further south of C3 (outside of the clearing area) as evident from the number of Malleefowl mound records (including all active mound records) in this area.

The survey results indicate that preferred breeding habitat is within the MSET and ASET vegetation communities. GVW proposes to clear a maximum of 207 ha of the MSET and ASET vegetation communities in the clearing area which represents 14 % of the total extent mapped at the Project (1,465 ha). It is expected these communities, and suitable habitat extends well outside of the Project area. Owing to the higher vegetation density in these areas, this provides more suitable foraging habitat as well.

GVW are cognisant that Malleefowl may enter the clearing area and will continue to operate in accordance with the Project Malleefowl Management Plan, which has been updated in GVW's name, which outline the measures to be implemented to prevent significant impacts to this species (Appendix 11).

It is considered the population of Malleefowl in the local or wider Wiluna West area will not be impacted by the Project, thus, the proposed clearing will not impact this species.

Pending additional targeted Malleefowl surveys in the southern half of the C3 deposit area, GVW will consider the requirement for a referral to the DCCEEW under the EPBC Act.

- **Brush-tailed Mulgara (*Dasyercus blythii*) (Priority 4)**

Family: Dasyuridae

Distribution: The Brush-tailed Mulgara is a medium-sized (60-158 g) carnivorous marsupial that was formerly assumed to be widespread but patchy in sandy regions of arid central Australian and Western Australia (Menkhorst and Knight, 2011). In recent times, it has been found in the southern Simpson Desert where the borders on the Northern Territory, Queensland and South Australia converge, and in the Tirari and Strzelecki Deserts of South Australia (van Dyck and Strahan, 2008).

Occurrence at Project: Mulgara were captured in 2007 at Wiluna and 2009 at Yeelerrie. However, given the taxonomic confusion, it is likely that these Mulgara were Brush-tailed Mulgara *Dasyercus blythii* rather than the Crest-tailed Mulgara. The preferred habitat for this species, spinifex sandplain is not located in the clearing area, with the Project records located 4 km north of the C4.

Potential Impacts: Mulgara habitat will not be impacted by the Project, thus, the clearing will not impact this species.

- **Long-tailed Dunnart (*Sminthopsis longicaudata*) (Priority 4)**

Family: Dasyuridae

Distribution: This species is patchily distributed but can be locally common. It is found in the Pilbara, Murchison, Northeastern Goldfields, Ashburton and Gibson Desert regions of Western Australia. It is also found in small areas in the Northern Territory (McKenzie *et al.*, 2008).

Occurrence at Project: This species was recorded in in the 2007 Ninox survey and 2011 KLA spring survey at C3 and south of Bowerbird. No evidence of this species was recorded in the Eagle-Emu assessment (Western Ecological 2020).

Potential Impacts: Surveys conducted in the Goldfields suggest that the distributional range of the Long-tailed Dunnart is far greater than previously mapped, and that they are present in low abundance over an extensive part of Western Australia, excluding the southern portion of the state (Terrestrial Ecosystems, 2011 and KLA 2012).

Further, the habitat favoured by this Dunnart is not limited to rugged rocky landscapes that support a low open woodland or shrubland of *Acacias* with an understory of spinifex hummock and (occasionally) perennial grasses and cassias (Burbidge *et al.* 2008), but that they are also found in flat open mulga woodland with a limited understory of vegetation (Terrestrial Ecosystems, 2011). The dunnarts recorded at the Wiluna West Project were captured in open *Acacia* shrubland with occasional eucalypts.

As this species habitat is widely distributed outside the clearing area, the proposed clearing is unlikely to impact the conservation status of the species or result in a change in abundance over and above normal variation in the area.

However, GWR are cognisant that the long-tailed dunnart may enter reside in the clearing area and will undertake trapping prior to land clearing and re-location of any dunnarts to a suitable alternative location to avoid and minimise impact to this species.

- **Peregrine Falcon (*Falco peregrinus*) (Schedule 7)**

Family: Falconidae

Distribution: The Peregrine Falcon is uncommon but widespread in distribution. It is moderately common in the higher aspects of the Stirling Ranges but tends to be uncommon in the hilly northwest Kimberley (Johnstone and Storr, 1998). This species inhabits cliff faces such as those along the coast, near rivers and ranges. The Peregrine Falcon can also be seen around wooded watercourses and lakes. It nests on ledges in cliffs as well as granite outcrops and quarries and also makes use of mine pits.

Occurrence at Project: This species has been recorded during fauna surveys undertaken at Wiluna West. This species can occasionally be seen in flight in this area, though based on mobility of this species and abundant suitable habitat located outside of the clearing area, there is not expected to be a significant impact to this species.

Potential Impacts: Given the mobility and range of this species, the conservation status of this species is not likely to be altered by the clearing.

POTENTIAL OCCURRENCE OF CONSERVATION SIGNIFICANCE SPECIES

- **Great Desert Skink (*Liopholis kintorei*) (Vulnerable EPBC Act)**

The Great Desert Skink is also known colloquially as the Tjakura, Warrama or Mulyamiji

Family: Scincidae

Distribution: Historically, the Great Desert Skink was recorded from widely scattered localities across the western deserts region. The current distribution consists of seven sparsely distributed, isolated populations, with three occurring in Western Australia in the Great Sandy Desert, the Gibson Desert and the Great Victoria Desert (Storr *et al.*, 1999).

The Great Desert Skink occupies a variety of habitats within the western deserts region with potentially suitable habitat extending over tens of thousands of hectares. However, sandplain vegetated by spinifex and scattered shrubs seems to be the habitat type most widely used (DoEE, 2018b).

Likelihood of occurrence: While the EPBC 1999 Protected Matters Search Tool suggests this species may occur in the survey area, the site appears to be at the southwestern extent of its range. Further, there is no preferred habitat within the clearing area. An area to the north does comprise some Spinifex sandplains, however, this area is >4km north of C4.

Potential Impacts: Given that this species is not likely to be present in the clearing area, the conservation status of the Great Desert Skink is not likely to be altered by the proposed clearing.

- ***Macrotis lagotis* Bilby, Dalgyte (Vulnerable EPBC Act)**

Family: Thylacomyidae

Distribution: The distribution of the Bilby formerly extended throughout the arid and semi-arid areas of Australia (Menkhorst and Knight, 2011). The species now occurs in two separate geographic areas: one extending from the western deserts region (Tanami, Great Sandy and Gibson) of the Northern Territory and Western Australia to the Pilbara and Kimberley regions, and the second in southwestern Queensland (Pavey, 2006). In Western Australia, the Bilby population is highly fragmented with species occurring in the Gibson Desert and Great Sandy Desert bioregions, the Dampierland bioregion and in the Central Kimberley and Ord-Victoria Plains bioregions (Pavey, 2006).

Habitat favoured by Bilbies includes mulga shrubland on stony plains, along the lower slopes of ranges, in sandplains and in sand dune systems (Pavey, 2006).

Likelihood of occurrence: The proposed clearing area appears to be southwest of the known distribution of the Bilby with the closest record located 35 km northeast. No Bilbies or evidence of their presence has been recorded during fauna survey work undertaken at the Project to date.

Potential Impacts: This species is considered unlikely to occur within the proposed clearing area, thus, no impacts are expected to this species.

- **Striated Grasswren (*Amytornis striatus striatus*) (Priority 4)**

Family: Maluridae

Distribution: The Striated Grasswren occurs across the eastern deserts of Western Australia including much of the Gibson, Great Sandy and Great Victoria deserts, with isolated populations between

Wiluna and Meekatharra, and another near Queen Victoria Spring (Johnstone and Storr, 2004). It is locally common but generally scarce.

Ecology: Like many Grasswrens, the Striated Grasswren is elusive and shy. Its preferred habitat is mainly spinifex habitat with or without low shrubs and herbage, on sandy or loamy plains and also found amongst bushy *Acacia* on sand ridges and interdunes usually with spinifex (Johnstone and Storr, 2004).

Likelihood of occurrence: The Striated Grasswren is not included in the species list from the Western Australian Museum or from Birds Australia as having been recorded from this area, nor has it been recorded during any of the fauna survey work undertaken to date. Further, as there is no preferred habitat in the proposed clearing areas, it is considered unlikely to occur.

Potential Impacts: This species is considered unlikely to occur within the clearing area, thus, no impacts are expected to this species.

- ***Falco hypoleucos* Grey Falcon (Vulnerable WA)**

Family: Falconidae

Distribution: Resident and nomadic visitor to inland parts of all mainland Australia. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions. Also occurs near wetlands where surface water attracts prey.

Ecology: The Grey Falcon utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse. Peak laying season is in late winter and early spring when two or three eggs are laid. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. The Grey Falcon is generally sedentary, and rare to very rare.

Likelihood of occurrence: As there are no watercourses in the clearing area it is considered unlikely to occur.

Potential Impacts: Given the mobility and range of this species, if it were to occur, the conservation status of this species is not likely to be altered by the clearing.

- ***Polytelis alexandrae* Princess Parrot (Vulnerable EPBC Act, Priority 4 WA)**

Family: Psittacidae

Distribution: Little is known about the Princess Parrot even to the exact extent of its geographical distribution. However, it is confined to arid regions of Western Australia, the Northern Territory, and South Australia and it is believed that the population is mainly concentrated in the Great Sandy, Gibson, Tanami and Great Victoria Deserts, and in the central ranges (DoE, 2018b).

Ecology: The Princess Parrot inhabits sand dunes and sand flats in the arid zone of western and central Australia (DoE, 2018b). It occurs in open savanna woodlands and shrublands that usually consist of scattered stands of *Eucalyptus*, *Casuarina* or *Allocasuarina* trees; an understorey of shrubs such as *Acacia* (especially *A. aneura*), *Cassia*, *Eremophila*, *Grevillea*, *Hakea* and *Senna*; and a ground cover dominated by *Triodia* species. It is also known to frequent *Eucalyptus* or *Allocasuarina* trees in riverine or littoral areas.

Likelihood of occurrence: Due to the paucity of information about this species, accurate estimates of its conservation significance and likelihood of occurrence are difficult to make. However, the Princess Parrot is not listed on the Birds Australia database for the area surveyed and has not been vouchered at the Western Australia Museum for this area. The Wiluna West Project area also appears to be south of the known distributional range of the species. Therefore, the Princess Parrot is not likely to utilise the proposed clearing area.

Potential Impacts: Based on the limited information to date on this species and lack of previous records at the Project, the conservation status is not expected to be impacted by the clearing.

- **Night Parrot (*Pezoporoua occidentalis*) (Endangered EPBC Act; Critically Endangered WA)**

Family: Psittacidae

Distribution: This species was thought possibly to be extinct until discoveries of the species in Queensland and Pilbara and then in March 2017 a confirmed record from the Murchison. Hamilton et al (2017) details a number of sightings in the Matura (Lorna Glen) and Millrose Station area in 2009, on the boundary of the Murchison/Gascoyne bioregions.

Ecology: This species is considered one of the rarest and most elusive species. DBCA (2019) state that this species “roosting and nesting sites are located in clumps of dense vegetation, primarily old and large spinifex (*Triodia*) clumps, but sometimes other vegetation types. In Queensland, night parrots have been shown to feed in areas rich in herbs including forbs, grasses and grass-like plants, and it is likely that such areas may also be important in Western Australia. *Triodia* is likely also to provide a good food resource for night parrots, in times of mass flowering and seeding, but they also rely heavily on a range of other food species. *Sclerolaena* has been shown to be a source of food and moisture”.

Likelihood of occurrence: There are no nearby records for this species, and the sighting reported at Matuwa (Lorna Glen) is located >200km northeast of the Project. The targeted surveys for this species at Eagle-Emu and the C4 haul road, which included, assessment of the occurrence of this species did not record any evidence of this species on the acoustic units (Western Ecology 2019; 2020). The habitat favoured by this species for nesting and foraging habitat (i.e. spinifex) is not located in the clearing area.

Potential Impacts: This species is considered unlikely to occur within the clearing area based on the lack of suitable habitat, thus, no impacts are expected to this species.

- **Southern Whiteface (*Aphelocephala leucopsis*) (Vulnerable EPBC Act)**

Family: Acanthizidae

Distribution: Southern Whiteface occur across most of mainland Australia south of the tropics, from the north-eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range. The northern boundary extends to about Carnarvon in the west, to the southern Northern Territory in central Australia, but is slightly further south in Queensland.

Ecology: Southern Whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains (Higgins & Peter 2002). Southern Whiteface forage almost exclusively on the ground, favouring habitat with low tree densities and an herbaceous understorey litter cover.

Likelihood of occurrence: While there are no known records of this species at the Project, it is located within the modelled distribution where ‘species habitat known or likely to occur’ (Department of Environment 2024). This distribution extends across all of Australia.

Potential Impacts: Given the mobility and range of this species, if it were to occur, the conservation status of this species is not likely to be altered by the clearing.

EXTINCT SPECIES

- **Boodie/Burrowing Bettong (*Bettongia lesuer graii*) (Extinct - Schedule 4)**

Family: Motacillidae

Distribution: The inland species was once widespread across arid and semi-arid areas in the south, central and western parts of Australia, but is now considered extinct on the mainland (Woinarski et al. 2014). DBCA reintroduced the species to the mainland by translocating individuals from offshore islands to Matuwa (Lorna Glen) located >200 km from the Project area.

Ecology: The species was known to inhabit burrows leading to complex warrens, where it spends most of the day. On the mainland the burrows were constructed in areas where the soil was deep enough (i.e. calcareous loams).

Likelihood of occurrence: The secondary records by Ninnox referred to long abandoned mounds and burrows. This species is only known from re-introduced populations of the offshore island subspecies.

Potential Impacts: N/A

SHORT RANGE ENDEMIC INVERTEBRATE HABITAT

While taxonomic changes/updates are likely to have occurred since the previous SRE work was completed, the habitat supporting these potential SRE is not restricted to the clearing area and is well represented on the B and C ridges which are ~20km in length. As such, no significant impacts are expected to SRE species.

SUMMARY

The proposed clearing is not expected to have a significant impact on, or, significantly reduce the extent of fauna or fauna habitats at the Project or in the region.

Given the above, the clearing will not be at variance to this principle.

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

No DRF are located at the Project. No plant taxa listed as Threatened pursuant to Schedule 1 of the EPBC Act (1999) have been recorded in the Wiluna West area.

Eight Priority flora species are located in the GVW clearing area (Recon 2010; NVS 2012, 2018, 2019, 2020; JSWT 2005) and the impacts presented in Table 8:

- *Eremophila congesta* (P1)
- *Ptilotus chrysocomus* (P1)
- *Eremophila arachnoides subsp. arachnoides* (P3)
- *Calytrix uncinata* (P3)
- *Homalocalyx echinulatus* (P3)
- *Maireana prosthecochaeta* (P3).
- *Prostanthera ferricola* (P3)
- *Sida picklesiana* (P3).

These species are not restricted to the clearing area or Wiluna West Project, as such, the removal of these individual plants will not have a significant impact on these species at a local or regional scale.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

In the original assessment of this clearing area, *Sida picklesiana* (P3) was thought to have a limited distribution. This species is now known “from 32 Western Australian Herbarium records, representing 19 populations that extend over a range of approximately 250 kilometres across two IBRA Bioregions, indicating that it is not locally restricted” (excerpt from DMIRS CPS 8651/1 Decision Report).

(d) Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of a Threatened Ecological Community (TEC).

No TECs are listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* or endorsed by the Western Australian Minister for the Environment for the project area. Therefore, the proposed clearing is not at variance to this principle.

The project is located within the Wiluna West Priority 1 PEC which covers an area of ha 10,670 ha. The clearing of 1,290 ha of native vegetation within the PEC boundary represents 12.1% of the total PEC.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

(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.

The clearing area is located in four Vegetation Associations 18 (Low woodland; mulga (*Acacia aneura*); 29 (Sparse low woodland, mulga); 107 (Hummock grasslands, shrub steppe mulga and *Eucalyptus kinsmillii* over hard spinifex) and 202 (Shrublands, mulga and *Acacia quadrimarginea* scrub); which are not classified as remnant vegetation.

These vegetation associations have >99% of the original extent (Table 6) remaining and cannot be considered significant as a remnant of native vegetation in an area that has been extensively cleared.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

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

The nearest water ways to the proposed clearing area is Lake Way and Lake Mason are located 30 km to the east 95 km south-southeast of the Project area respectively. The proposed clearing will not impact these lakes.

There are no water courses, wetlands or large drainage channels within the Project area. The clearing area contains broad and ill-defined ephemeral drainage lines which only flow following periods of heavy rainfall events. These are relatively common throughout the Wiluna West area and the region. There is no riparian vegetation in the clearing area.

There is, therefore, no vegetation growing in association with a water course or wetland. The clearing is not at variance to this principle.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

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

The proposed clearing is located on the BIF ridges and in the swale below the ridge which consists of shallow stony soils and alluvial plains. The vegetation is predominantly open mulga (*Acacia aneura*) with sparse shrubs and grasses. The majority of the area remains well vegetated and all cleared areas (with the exception of the open pits) will be rehabilitated at closure.

The p clearing of vegetation is not likely to lead to land degradation issues such as salinity, water logging or acidic soils and therefore is not at variance to this principle. The disturbed area (with the exception of the open pits) will be rehabilitated at completion of mining.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

(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.

There are no conservation or nature reserves within the proposed clearing area. The closest nature reserve is Wanjarri Nature Reserve which is located approximately 85 km southeast of the Project.

There are DBCA Managed ex-pastoral stations located >40km from the Project (ex-Kaluwiri and ex-Moolooroo) which will not be impacted.

The clearing, therefore, is not at variance to this principle.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

(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.

Surface water in the project area is sourced from direct precipitation and surface runoff following rainfall events. The Wiluna area often receives considerable rainfall from degenerating cyclonic depressions from the northern parts of the State. However, overall, the mean annual rainfall is only 256 mm.

Surface water drainage lines in the Wiluna area are broad and ill-defined ephemeral watercourses and drainage lines which only flow following periods of heavy rainfall events. There is no surface water of significance, large drainage lines, lakes or swamps in the clearing area.

With an average rainfall of 256 mm and a mean daily evaporation rate of 6.6 mm there is little surface flow during normal seasonal rains.

Given the low annual rainfall, high evaporation rate and size of the proposed clearing area there is expected to be little (if any) rainfall recharge that would impact the groundwater levels or the quality of groundwater in the local area or region.

The area proposed to be cleared does not fall within a Public Drinking Water Source Area (PDWSA) or PDWSA Protection Zone (www.dwer.wa.gov.au).

The clearing of native vegetation is not likely to cause deterioration in the quality of surface or groundwater and therefore, is not at variance to this principle.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

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

The proposed clearing area is surrounded by native vegetation. Annual average rainfall is only 250 mm with little surface flow during normal seasonal rains.

The catchment areas in the proposed clearing area are not large. Flood flows in these catchments of relatively small, of low velocity and of short duration (Rockwater 2019, 2020).

The clearing of native vegetation is not likely to cause or exacerbate the incidence or intensity of flooding. The proposed clearing is not at variance to this principle.

The impacts are consistent with that previously assessed for CPS 6726/1 and 6726/2.

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Appendix list

APPENDICES

Appendix 1: Letter of Authority from GWR Group Limited

Appendix 2: Vegetation Survey of Tenements M53/1016 and L53/148 (Haul Road) for GWR (JSWT 2005)

Appendix 3: Herbert Lukin Ridge & Surrounds Vegetation Survey (Recon Environmental 2010)

Appendix 4: Targeted Priority flora survey of the three deposits that will be mined in the first 10 years of operations (Bowerbird, C3 and C4) (NVS 2012)

Appendix 5: Targeted *Sida picklesiana* survey for wider population outside of Golden Monarch – (NVS 2018)

Appendix 6: Targeted Flora Report – Eagle/Emu #1 (NVS 2019)

Appendix 7: Targeted Flora Report – Eagle/Emu #2 (NVS 2020)

Appendix 8: Vertebrate Fauna Survey of the Wiluna West Project Area (Ninox 2005)

Appendix 9: Level 2 Terrestrial Fauna Survey (KLA 2012)

Appendix 10: Targeted Fauna Survey (Western Ecological 2019)

Appendix 11: Malleefowl Management Plan (GVW 2024)