Helena Valley Urban Precinct

Environmental Assessment Report

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Helena Valley Urban Precinct

Environmental Assessment Report

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Status
FINAL

Prepared for:
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Internal Review

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Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of vertical and horizontal conditions in media (soil, water, air, waste or other media as described in the report) are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of media conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken, and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

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Other Limitations

This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

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Appendices

1. Introduction

1.1 Background

This Environmental Assessment Report (EAR) has been prepared to support the development of a Structure Plan for Lots 253 (330) and 254 (335) Helena Valley Road, Helena Valley, hereafter referred to as 'the Site' (Figure 1). The Site is located 15 km east-north-east of Perth Central Business District (CBD) and includes 7.29 hectares (ha) on either side of Helena Valley Road (Figure 1).

The Site forms part of the Helena Valley Urban Precinct (HVUP) in the Shire of Mundaring, which was rezoned under the Metropolitan Region Scheme (MRS) as part of MRS Amendment 1425 from 'Rural' to 'Urban' and 'Urban Deferred'. Current MRS zones and reserves are provided on Figure 2. Concurrent rezoning occurred from 'Rural Residential' to 'Development', 'Important Local Roads' and 'Rural Residential' under the Shire of Mundaring Local Planning Scheme No. 4 (LPS 4).

An EAR was previously completed by PGV Environmental (PGV; 2023) to facilitate the MRS Amendment application to rezone the Site to 'Urban'. This EAR has been completed with reference to the PGV EAR, however has been updated to support the Structure Plan. This EAR also has regard to comments received from key agencies on the MRS Amendment (Appendix A) and updates in the concept plan for the Site. The current concept structure plan is provided as Figure 3.

As shown in Figure 3, the Site is planned for residential development comprising of approximately 59 lots and three Public Open Space (POS) areas. A large portion of the Site (2.52 ha, 34.5%) is identified as POS1 which encompasses a Conservation Category Wetland (CCW) and associated wetland buffer, which form an interface with Kadina Brook which is adjacent to the north of the Site.

1.2 Purpose and Scope

This EAR has been prepared to inform the development of a Local Structure Plan, with reference to the information provided in:

- PGV (2023). Lots 5, 250, 253 and 254 Helena Valley Road, Helena Valley Environmental Assessment Report (Appendix B).
- PGV (2022). Lots 5, 250, 253 and 254 Helena Valley Road, Helena Valley Flora, Vegetation and Fauna Survey (Appendix C).
- Gambara (2025). Weed Control Program and Vegetation Condition Assessment Report (Appendix D).

Additionally, this EAR addresses relevant matters identified by the following key agencies during the MRS Amendment process:

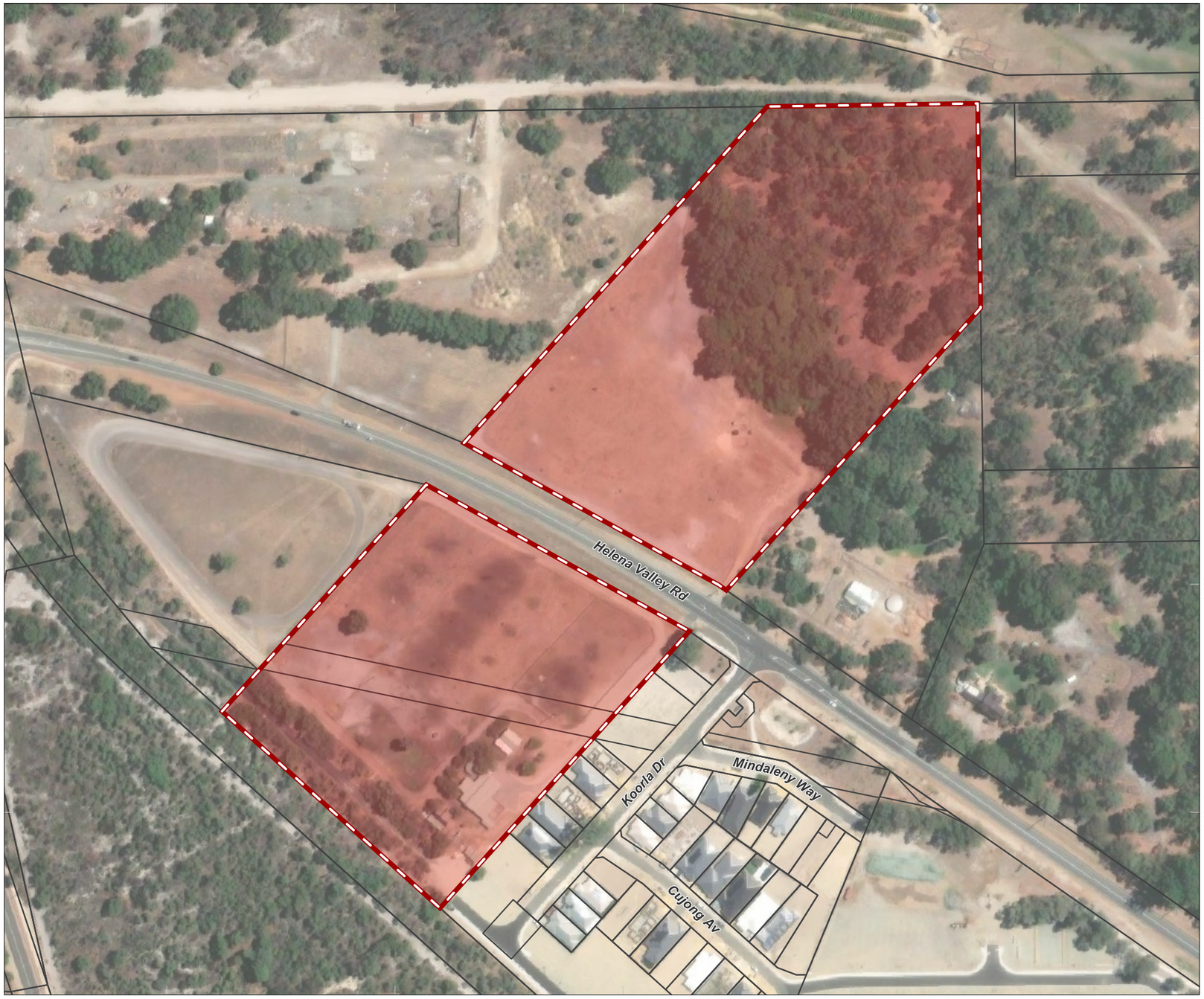
- Department of Biodiversity, Conservation and Attractions (DBCA).

- Department of Fire and Emergency Services (DFES).
- Department of Primary Industries and Regional Development (DPIRD).
- Department of Health (DoH).
- Department of Water and Environmental Regulation (DWER).
- Department of Planning Land and Heritage (DPLH) - Land Use Planning.
- Main Roads Western Australia (Main Roads WA).
- Shire of Mundaring.

This EAR provides the following:

- Overview of legislation, policies, strategies and guidance that exist at the Commonwealth, State, and local levels that apply to and must be considered by the proposed development.
- Detail of the Site's environmental context through a review of existing information relating to the Site (including publicly available datasets and government-managed databases).
- Details of identified environmental values present that may constrain development of the Site.
- Details of likely and possible environmental impacts and recommended mitigation and management measures.
- Discussion of the key relevant environmental matters identified by DBCA, DFES, DPIRD, DoH, DWER, DPLH, Main Roads WA and the Shire of Mundaring, in review of the MRS amendment application, including but not limited to:
    - The foreshore boundary associated with Kadina Brook, on Lot 254.
    - Refined areas of POS and bioretention basins.
    - Placement of roads, to reduce impacts to the foreshore reserve and reduce bushfire risk.
    - Consideration of potential direct and indirect impacts to the adjacent Bush Forever Site 213 and associated occurrences of *Banksia attenuata* woodland over species rich dense shrublands (SCP 20a).
    - Appropriate interface treatments on the boundaries of the development area, to control access to City of Swan reserves, the foreshore area and Bush Forever Site 213. This includes, where appropriate, provision of vegetated buffers, hard road edges along interfaces, adequate access control and bushfire protection zones.

- Consideration for obligations under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Consideration of separation distances from the Tallowman Rendering Facility.



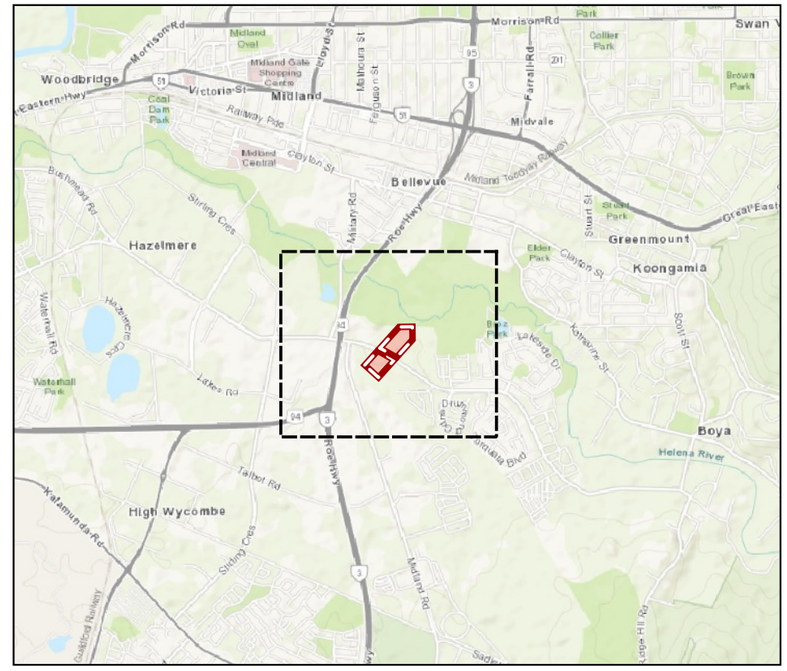


Figure 1: Site Location

N; 0 20 40 60 80 100 m		PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision	
SCALE: 1:2,500	SHEET SIZE: A3 COLOUR	CLIENT: Ingwe Helena Valley Pty Ltd	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A25.232	VERSION: 2
DATA SOURCE:		DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 10/12/2025

Legend

- Site Boundary
- Cadastre Boundary (LGATE-226)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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Figure 2: Metropolitan Region Scheme Zones and Reserves

N

0 25 50 75 100 125 m

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
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PROJECT NUMBER	A25.232
VERSION	2
DATA SOURCE	
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	11/12/2025

Legend

- Site Boundary
- Bush Forever Areas 2000 (DPLH-019)

Region Scheme - Zones and Reserves (DPLH-023)

- Primary regional roads
- Regional open space
- Rural
- Urban
- Urban deferred

No	Description	Drawn	Approved	Date
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NOTES:

Base map ESRI Imagery.

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Figure 3: Concept Structure Plan

N

0 25 50 75 100 125 m

SCALE	1:2,200
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
DATA SOURCE	

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
CLIENT	Ingwe Helena Valley Pty Ltd
PROJECT NUMBER	A25.232
VERSION	3
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	11/12/2025

Legend

- Site Boundary
- Conservation Conserved Wetland
- Conservation Conserved Wetland Buffer
- Public Open Spaces
- Residential R20
- Road Reserves
- Urban Deferred Zone

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NOTES:

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2. Environmental Legislation, Policy and Guidelines

2.1 Commonwealth

2.1.1 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and seeks to balance the protection of environmental and cultural values with societal economic and social needs. Nine Matters of National Environmental Significance (MNES) are protected under the EPBC Act, which are:

- World Heritage Properties.
- National Heritage Place.
- Wetlands of international importance (listed under the Ramsar Convention).
- Listed threatened species and ecological communities.
- Migratory species protected under international agreements.
- Commonwealth Marine Areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mines).
- Water resources, in relation to coal seam gas development and large coal mining development.

The matters relevant for this assessment are 'Listed threatened species and ecological communities'. However, due to substantial retention of environmental values within the Site and the degraded/cleared nature of the balance of the Site, future residential land use in accordance with the proposed LSP is unlikely to result in significant impacts to MNES. As a result, an EPBC referral is not planned to be submitted.

2.2 State

2.2.1 Legislation

This EAR has been prepared with reference to the following State legislation which provides for the protection and management of environmental values, heritage values, and bushfire risk associated with the Site and proposed development and seek to achieve appropriate development. These are:

- *Environmental Protection Act 1986* (EP Act).
- *Biodiversity Conservation Act 2016* (BC Act).

- *Biosecurity and Agriculture Management Act 2007* (BAM Act).
- *Aboriginal Heritage Act 1972* (AH Act).
- *Contaminated Sites Act 2003* (CS Act).
- *Contaminated Sites Regulations 2006* (CS regulations)
- *Planning and Development Act 2005* (PD Act).
- *Heritage Act 2018.*
- *Swan and Canning Rivers Management Act 2006* (SCRM).

2.2.2 State Planning Policies

State planning policies (SPP) are prepared and adopted by the Western Australian Planning Commission (WAPC) under statutory procedures set out in Part 3 of the PD Act. The SPPs relevant to the proposed development are identified below:

- State Planning Policy 2.0: Environment and natural resources policy (SPP 2.0).
- State Planning Policy 2.9: Planning for Water (SPP 2.9).
- State Planning Policy 3.0: Urban growth and settlement (SPP 3.0).
- State Planning Policy 3.7: Planning in Bushfire Prone Areas (SPP 3.7).
- State Planning Policy 2.10: Swan - Canning River System Policy (SPP 2.10).
- State Planning Policy 2.4: Basic Raw Materials Policy (SPP 2.4).
- State Planning Policy 5.1: Land Use Planning in the Vicinity of Perth Airport Policy (SPP 5.1).
- State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region (SPP 2.8).

Under the EP Act, clearing of native vegetation requires a permit from the Department of Water and Environmental Regulations (DWER) unless there is an exemption under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Proposals that have approval by means of a subdivision are exempt from requiring a clearing permit to clear native vegetation, however, conditions may apply. It is expected that any clearing of native vegetation will be undertaken through subdivision.

2.2.3 Environmental Protection Authority (EPA) Guidance

This assessment has given consideration to the recommendations of EPA regulatory guidance as listed below:

- Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016).
- Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment (EPA, 2020).
- Guidance Statement No. 33: Environmental Guidance for Planning and Development (EPA, 2008).

2.3 Local Government

The Shire of Mundaring's LPS 4is supported by a suite of local planning policies, strategies and guidance, intended to support the long-term planning directions of the Shire.

3. Existing Environment

3.1 Land use

3.1.1 Current Land Use

The Site comprises 7.29 ha across two lots within the Helena Valley area. The two lots are divided by Helena Valley Road with Lot 253 in the south and Lot 254 in the north. Lot 253 is bounded by vacant lots on the east and west sides and Bush Forever Site (No. 213) to the south. Lot 254 is bounded by a private road to the north and vegetation associated with Kadina Brook. The adjacent lot on the east appears to have historically been used for material or waste storage, which has been decommissioned in recent years, now containing remnant native vegetation and areas of cleared land. The adjacent lot to the west is predominantly dense remnant native vegetation with two dwellings. Roe Highway is located approximately 350 m to the west, separated from the Site by Midland Road and native vegetation.

The Site is predominantly cleared, with some scattered native vegetation along the southern boundary and a permanent dwelling in the south-east corner. North of Helena Valley Road, the Site includes a section of cleared land, and dense vegetation in the north associated with the Kadina Brook interface.

3.1.2 Historic Land Use

Historical aerial photographs (Landgate, n.d) of the Site and its surrounds were reviewed as part of this assessment as well as within the pre-existing surveys. The aerial imagery dated 30/10 to 27/11/1953 shows the Site was predominantly clear with sparse native vegetation throughout (Plate 1). Minor development of intersecting roads can be seen through both lots.

Over the following two decades there was limited further development, and native vegetation increased in density, particularly in the northern most area of the Site associated with Kadina Brook (Plate 2). By 1995 the Site has predominantly been cleared, particularly in the south. The north is cleared with exception for the vegetation associated Kadina brook and isolated trees which appear to be dead, or lacking canopy (Plate 3).

The imagery dated 2007 to 2008 shows the development of a permanent dwelling structure in the south and vehicular tracks in the north. The most recent imagery shows the south of the Site has remained mostly cleared with the dwelling remaining, and two isolated trees (Plate 4). The north is also cleared, with a distinct delineation of the creek vegetation which has substantially increased in density.

Plate 1: Aerial imagery of the Site in 1953 (Landgate, 2025).

Plate 2: Aerial imagery of the Site dated 10/07-06/09/1974 (Landgate, 2025).

Plate 3: Aerial imagery of the Site dated 11/01-06/02/1995 (Landgate, 2025).

Plate 4: Aerial imagery dated 05-16/02/2025 (Landgate, 2025).

3.1.3 Surrounding Land Use

A review of current aerial imagery identified the following current land uses surrounding the Site (Figure 4 and Figure 4):

- North - The land is zoned as ‘Regional Open Space’ (ROS) under the MRS and is not zoned under LPS 4. This area is associated with Kadina Brook.
- East - Remnant native vegetation and a rural residential lot both zoned as 'Rural' and 'Urban' under the MRS, the former also zoned as ROS. Under the LPS 4 the zoning is 'Rural Residential' and 'Development'.
- South - Remnant native vegetation is present, which is included within Bush Forever Site 213.
- West - Predominantly cleared land, zoned as 'Rural' under the MRS and 'Rural Residential' under LMS No 4 and City of Swan Scheme No. 17, with sparse vegetation which is intersected by Midland Road and Roe Highway.

Figure 4: Surrounding Land Use and Zoning

N

0 25 50 75 100 125 m

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SCALE	1:2,200
SHEET SIZE	A3 COLOUR
CLIENT	Ingwe Helena Valley Pty Ltd
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A25.232
VERSION	2
DATA SOURCE	
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

- Site Boundary
- Local Government Authority Boundaries (LGATE-233)

Local Planning Scheme - Zones and Reserves (DPLH-071)

- Development
- Important local roads
- Industrial development
- Other local roads
- Residential
- Rural residential

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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3.2 Topography, Geology and Soils

3.2.1 Topography

The elevation of the Site is gently undulating ranging between 10 metres (m) Australian Height Datum (AHD) to 20 m AHD (DPIRD-072) (Figure 5). Lot 253 is generally flat with an elevation of 18 m that increases to 20 m in the south-east corner. Lot 254 has a continuous decline from 18 m at Helena Valley Road to 14 m where the Kadina Brook vegetation is located in the north. The downward slope continues to an incised valley associated with Kadina Brook,with an AHD of 10 m (PGV, 2022).

3.2.2 Geology and Soils

The Site is mapped under the soil landscape zone Pinjarra Zone 213 by DPIRD. This zone is described as alluvial deposits (early Pleistocene to Recent) between the Bassendean Dunes Zone and the Darling Scarp, colluvial and shelf deposits adjacent to the Darling Scarp and clayey to sandy alluvial soils with wet areas (DPIRD-017).

The soil landscape mapping system of the Site is registered as the Pinjarra System described by DPIRD to be a poorly drained coastal plain with variable alluvial and aeolian soils. The vegetation is variable and includes dominant species such as Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Wandoo (*Eucalyptus wandoo*), Paperbark (*Melaleuca sp*), Sheoaks (*Casuarina sp*) and Flooded gum (*Eucalyptus rudis*) (DPIRD-064).

There are three subsoil systems across the Site mapped in the DPIRD Soil Landscape Mapping - Best Available dataset (Figure 5) (DPIRD-027). The details of the land degradation risks associated with each subsystem are described in Table 3-1 and the description of each system is described below:

- Pinjarra phase Gf5 (213Pj_Gf5), described as incised drainage channels with poorly drained gradational mottled yellow earths with shrubland of *Melaleuca*'s and other low lying shrubs.
- Pinjarra phase Gf7 (213Pj_Gf7), described as minor rises with deep rapidly drained brownish, siliceous or bleached sands underlain by mottled yellow clay. Low woodland of Acorn Banksia (*Banksia prionotes*) and some tall Marri's with Flooded Gums along streamlines.
- Pinjarra phase Gf9 (213Pj_gf9), described as minor sandy rises (aeolian deposits) with moderately deep well drained sands overlying gravelly mottled clay

Table 3-1: Land degradation risks of the soil subsystems on Site

Degradation risk category	Pinjarra phase Gf5	Pinjarra phase Gf7	Pinjarra phase Gf9
Water erosion (DPIRD-013)	50-70% of map unit has a high to extreme water erosion risk	<3% of map unit has a high to extreme water erosion risk	<3% of map unit has a high to extreme water erosion risk
Wind erosion (DPIRD-016)	<3% of map unit has a high to extreme wind erosion risk	>70% of map unit has a high to extreme wind erosion risk	>70% of map unit has a high to extreme wind erosion risk

Degradation risk category	Pinjarra phase Gf5	Pinjarra phase Gf7	Pinjarra phase Gf9
Waterlogging (DPIRD-015)	>70% of map unit has a moderate to very high waterlogging risk	10-30% of map unit has a moderate to very high waterlogging risk	3-10% of map unit has a moderate to very high waterlogging risk
Flooding (DPIRD-007)	>70% of map unit has a moderate to high flood risk	<3% of map unit has a moderate to high flood risk	<3% of map unit has a moderate to high flood risk
Salinity risk (DPIRD-009)	30-50% of map unit has a moderate to high salinity risk or is presently saline	<3% of map unit has a moderate to high salinity risk or is presently saline	<3% of map unit has a moderate to high salinity risk or is presently saline

3.3 Acid Sulfate Soils

A large proportion of the Site, including the whole of the northern lot, does not have Acid Sulfate Soil (ASS) risks mapped (DWER-055). The southern portion of the Site (2.24 ha; 30.7% of Site) is mapped as having a moderate to low risk of ASS occurring within 3 m of the natural soil surface and a high risk of it occurring beyond 3 m (Figure 6).

3.4 Contamination

There are no registered contamination sites mapped within the Site with the DWER database (DWER-059). The nearest registered contaminated site is mapped adjacent to the northeast boundary of Lot 254, and is identified as 'Contaminated - remediation required' (Site No. 81371). A portion of Site 81371 has been remediated for restricted use, however adjacent to the Site, it is mapped as Contaminated - remediation required' (Figure 7).

The contaminated site (Site 81371) is associated with landfill materials such as asbestos-containing materials, metal hydrocarbons and per-and poly-fluoroalkyl substances (PFAS) present in the soils and or ground water. This area is deemed unsuitable for residential development and should remain POS (DWER, 2025a).

There are two additional registered contaminated sites to the west of the Site. One is registered as 'Remediated for restricted use' (Site No. 15957) and is located 440 m to the west of Lot 254, the other is registered as 'Contaminated - restricted use' (Site No. 12228) which is located 580 m to the north-west of Lot 254 (Figure 7).

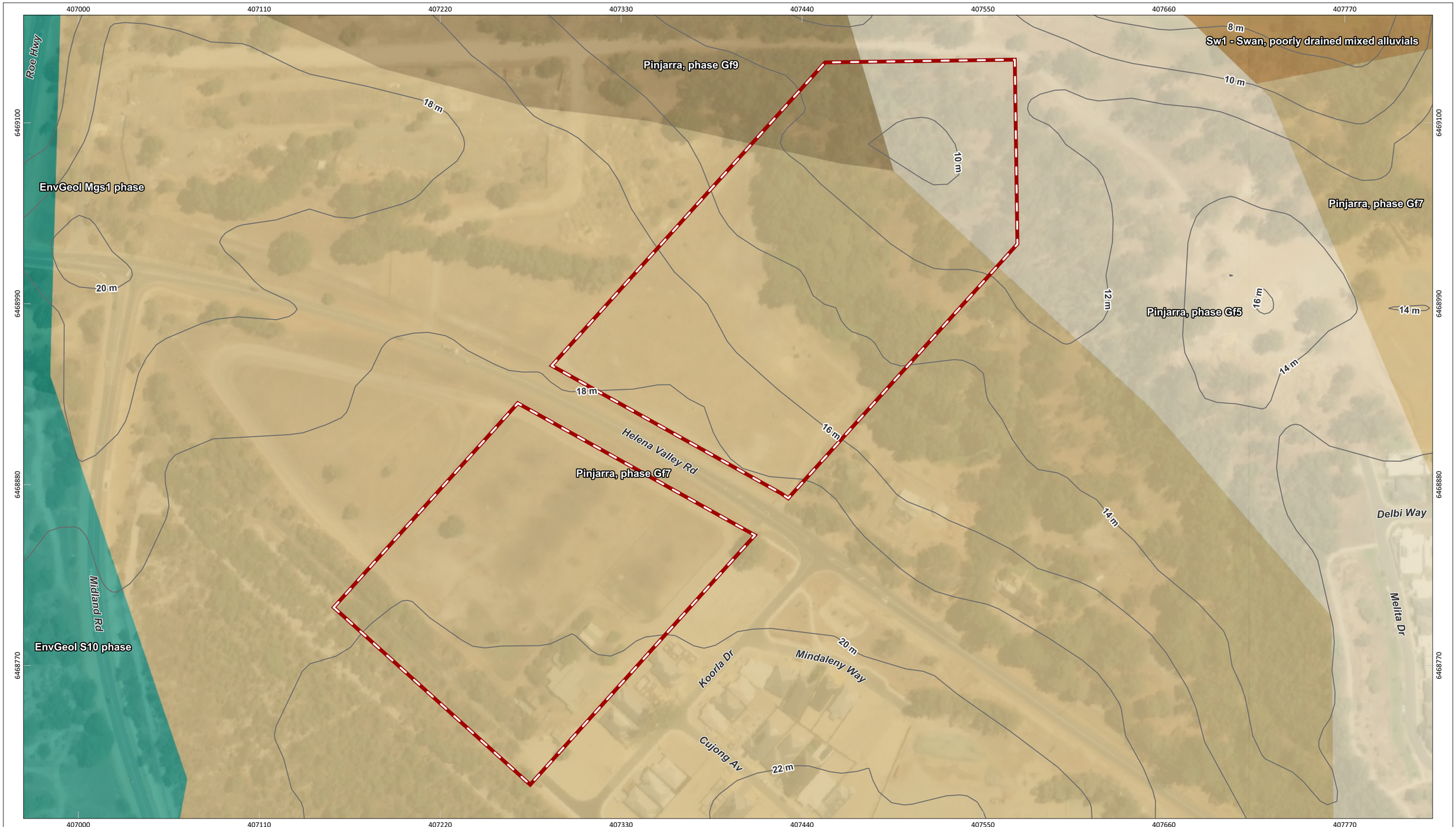

Figure 5: Surface Geology (Soils) and Topography

N

0 25 50 75 100 125 m

PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision		
SCALE: 1:2,200	SHEET SIZE: A3 COLOUR	CLIENT: Ingwe Helena Valley Pty Ltd
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A25.232	VERSION: 3
DATA SOURCE	DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 11/12/2025

Legend

- Site Boundary
- 2 metre contours (DPIRD-072)

Soil Landscape Mapping - Best Available (DPIRD-027)

- EnvGeol Mgs1 phase
- EnvGeol S10 phase
- Pinjarra, phase Gf5
- Pinjarra, phase Gf7
- Pinjarra, phase Gf9
- Sw1 - Swan, poorly drained mixed alluvials

No	Description	Drawn	Approved	Date
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NOTES:

Base map ESRI Imagery.

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Figure 6: Acid Sulfate Soils Risk

N

0 25 50 75 100 125 m

SCALE: 1:2,200	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	
DATA SOURCE:	

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DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 10/12/2025	

Legend

Site Boundary

Acid Sulfate Soil Risk Map (DWER-055)

2 – Moderate to low risk of ASS occurring within 3m of natural soil surface but high to moderate risk of ASS beyond 3m of natural soil surface

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NOTES:

Base map ESRI Imagery.

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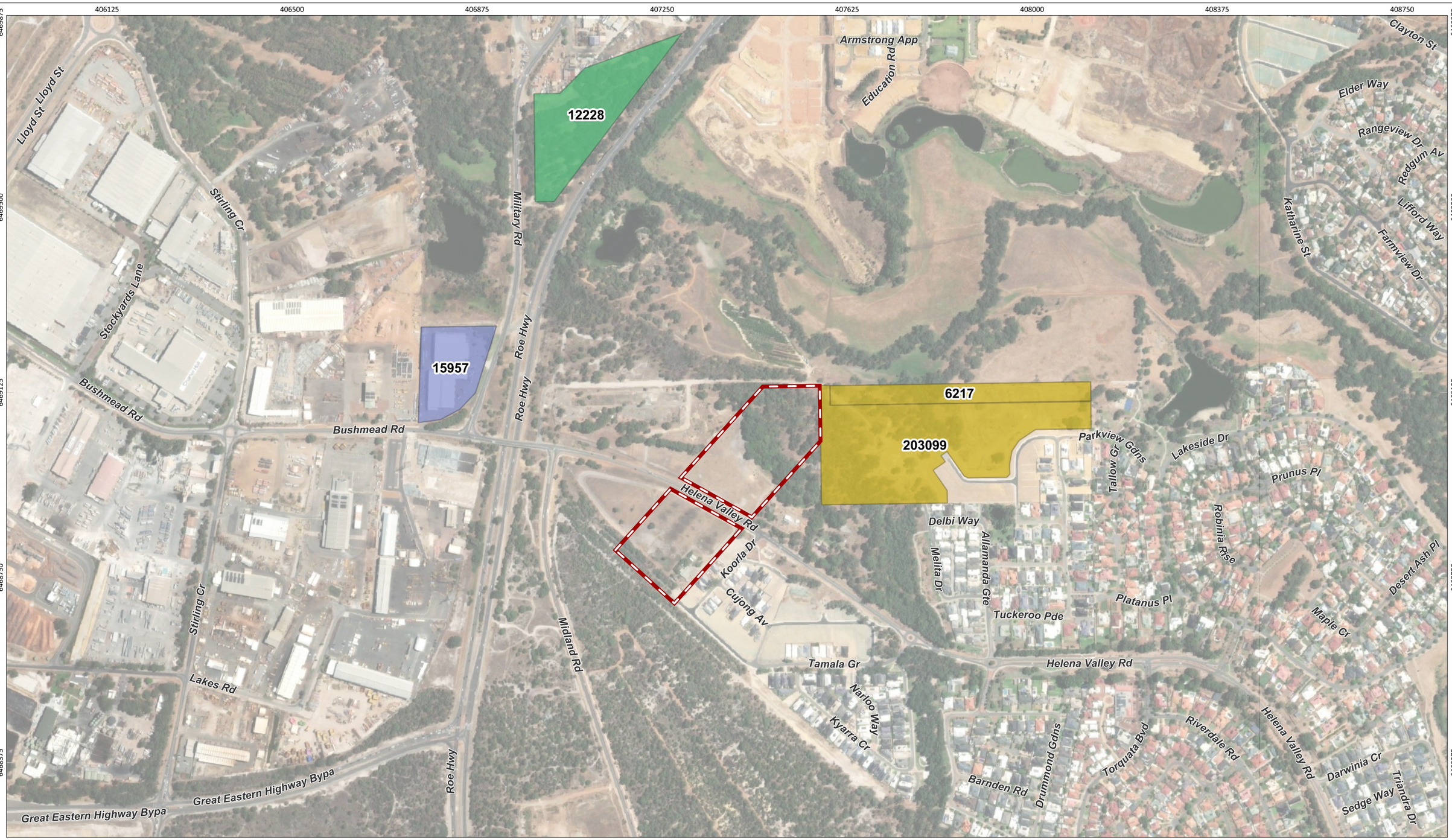

Figure 7: Known and Potential Contamination Risk

N

0 50 100 150 200 250 m

PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision		
SCALE: 1:7,500	SHEET SIZE: A3 COLOUR	CLIENT: Ingwe Helena Valley Pty Ltd
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A25.232	VERSION: 2
DATA SOURCE	DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 11/12/2025

Legend

- Site Boundary

Contaminated Sites Database (DWER-059)

- Contaminated - remediation required
- Contaminated - restricted use
- Remediated for restricted use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	11/12/2025

NOTES:

Base map ESRI Imagery.

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3.5 Hydrology

3.5.1 Groundwater

Groundwater contour mapping available over the Site indicates that the water table is situated at a maximum of 19 m AHD in the east and reduces to 17m AHD in the west, with a minimum of 17 m AHD in the west and 16 m AHD in the east (DWER-100 and DWER-099, respectively). The minimum depth to groundwater in the north of the Site is approximately 1 m AHD, increasing to 2 m AHD near Helena Valley Road (DWER-095). The minimum depth to ground water in the south of the Site is 2 m AHD near Helena Valley Road, increasing to 3 m AHD in the south-east corner (Figure 8). The maximum depth to ground water in the north of the Site ranges between 1 m AHD and 3 m AHD, and between 3 m AHD and 5 m AHD in the south (DWER-096).

3.5.2 Surface water

In the northern-most corner of the Site there is a drainage line mapped (DWER-031) in association with Kadina Brook (Figure 7). There are no surface waterbodies observed in the aerial imagery, however there are two waterbodies mapped immediately adjacent the Site on the east and west (Crossman & Li, 2015).

The small waterbody on the west is an earth dam (ID: 152431), and that on the east is a small lake (ID: 48157). Surrounding the Site, there are a further 11 waterbodies within a 1 km radius, described in Table 3-2.

Table 3-2: Surface waterbodies with 1 km of the Site (Crossman & Li, 2015)

Object ID	Type	Name	Distance to Site
152431	Earth Dam	NA	20 m west
48157	Lake	NA	40 m east
85185	Lake	NA (Associated with Helena River)	400 m northwest
212180	Lake	NA (Associated with Helena River)	620 m northwest
57079	Earth Dam	NA	890m northwest
19932	Earth Dam	NA	970m northwest
201543	Pool	NA (Associated with Helena River)	730m north
261301	Lake	Wangalla Brook	520m north
119885	Lake	Wangalla Brook	610m m north
207491	Lake	Wangalla Brook	680 m northeast
230983	Lake	Wangalla Brook	840 m northeast
15500	Lake	NA (associated with Broz Park)	740 m east
169581	Earth Dam	NA	170 m east

A designated flood event floodplain area (UFI: 327) is mapped 50 m north of the Site, however does not intersect the Site boundary (DWER-020). A 1 in 100 Annual Exceedance Probability (AEP) Floodplain Development Control Area (UFI: 9) is mapped by DWER (DWER-003) across the north of the Site (Figure 9).

3.5.3 Wetlands

One geomorphic wetland is mapped across the north of the Site; which is a CCW associated with Kadina Brook (UFI: 15440) (DBCA-019). This wetland is mapped as a flat floodplain, and connects to a broader suite of wetlands that form part of Helena River, to the north of the Site (Figure 9).

There are four Resource Enhancement Wetlands (REWs) mapped within 1 km of the Site, mostly located to the north and east of the Site. One of these (UFI: 15885) is located adjacent to the north-east of the Site. Five Multiple Use Wetlands (MUWs) are also located in the area surrounding the Site. Wetlands located within 1 km of the Site are described in Table 3-3.

Table 3-3: Wetlands within and surrounding the Site

UFI No.	Management category	Wetland type	Area (ha)	Distance to Site
15440	Conservation	Floodplain	50.68	Intersects Northern point
15885	Resource Enhancement	Floodplain	1.38	Borders northeast boundary
14427	Resource Enhancement	Floodplain	3.74	170 m
14230	Resource Enhancement	Floodplain	53.5	30 m
16187	Resource Enhancement	Sumpland	3.11	950 m
15884	Multiple Use	Floodplain	1.00	83 m
13630	Multiple Use	Floodplain	2.65	435 m
15266	Multiple Use	Palusplain	210.02	345 m
16186	Multiple Use	Sumpland	0.98	806 m

3.5.4 Public Drinking Water

There are no Public Drinking Water Source Areas (PDWSA) mapped within the Site, or within a 2 km radius of the Site boundary (DWER-033). The nearest PDWSAs are within the Middle Helena Catchment Area, comprising a Priority 1 (UFI: 936), Priority 2 (UFI: 938), and Priority 3 (UFI: 937) area. These are located 5.6 km, 5.9 km, and 5.7 km to the east of the Site, respectively.

Figure 8: Groundwater Contours

N

0 25 50 75 100 125 m

SCALE	1:2,200
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
DATA SOURCE	

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
CLIENT	Ingwe Helena Valley Pty Ltd
PROJECT NUMBER	A25.232
VERSION	2
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

- Site Boundary
- Gnangara Jandakot Water Table Elevation (DWER-100)
- Gnangara Jandakot Depth to Groundwater (DWER-095)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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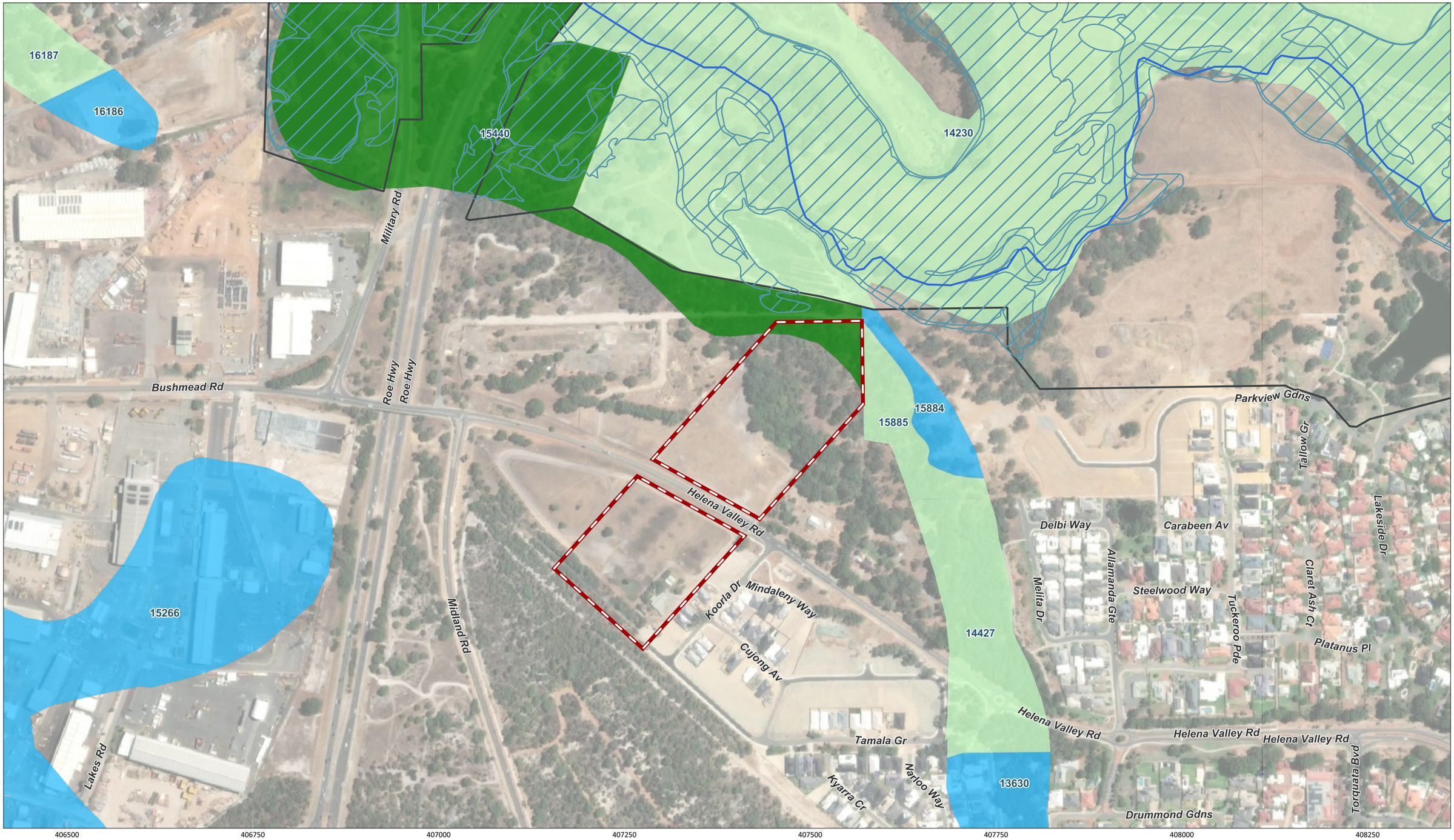

Figure 9: Surface Water Features and Geomorphic Wetlands

N

0 50 100 150 200 250 m

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
SCALE	1:5,000
SHEET SIZE	A3 COLOUR
CLIENT	Ingwe Helena Valley Pty Ltd
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A25.232
VERSION	2
DATA SOURCE	
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

- Site Boundary
- Swan and Canning Rive Development Control Area (DBCA-028)
- FPM Floodplain Area (DWER-020)
- Hydrography Linear Hierarchy (DWER-031)

Geomorphic Wetlands Swan Coastal Plain (DBCA-019)

- Conservation
- Resource Enhancement
- Multiple Use

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

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3.6 Flora and Vegetation

3.6.1 Pre-European Vegetation

Vegetation Associations

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in Western Australia at a scale of 1:250 000 in the south-west and at a scale of 1:1,000,000 in less developed areas (Beard, 1981).

This mapping sought to describe the native vegetation presumed to occur prior to European settlement and, as such, is referred to as pre-European vegetation associations. These vegetation maps are maintained in digital form by DPIRD (DPIRD-006). Extents are updated periodically by DBCA (Government of Western Australia, 2019a).

The pre-European vegetation association identified within the Site and its pre-European and current extents within the Swan Coastal Plain (SCP) are described below in Table 3-4.

Table 3-4: Pre-European Vegetation Associations within the Site

Vegetation Association	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	Area (ha) with the Site
Bassendean_1001	Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina	52,283.54	11,394.19	21.38%	0.85 ha
Pinjarra_1009	Medium woodland; marri & river gum	6,958.2	314.27	4.52%	0.48 ha

Vegetation Complexes

One vegetation complex is mapped across the Site; the Forrestfield Complex (SMU: 29) (DBCA-046). The Forrestfield Complex is described as an open forest of Marri, Wandoo and Jarrah to an open forest that includes Common Sheoaks (*Allocasuarina fraseriana*) and *Banskia* sp. The fringing of the forest is described as a woodland with Flooded Gums in the gullies that dissect the landform. The remaining extent of the Forrestfield complex is described in Table 3-5.

Table 3-5: Extent of Pre-European Regional Vegetation Complexes within the Site

Vegetation Group	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	% Managed for Conservation
Forrestfield Complex (ID: 29)	22,812.92	2,803.36	12.29%	1.37%

3.6.2 Site Surveys and Assessments

PGV Environmental (PGV) undertook a detailed flora, vegetation and fauna survey on 9 September 2022, across the entire Site. Eight quadrats were assessed, for vegetation type, vegetation condition, the soil type and the landform. All plants within each quadrat were recorded, including their species name, height and percentage of cover, as well as their status an introduced species (PGV, 2022).

PGV followed this survey with an environmental assessment in 2023, using the data collected in 2022 and publicly available datasets (PGV, 2023). The environmental assessment outlined the environmental features recommended for consideration when planning for the development of the Site. Environmental features included were physical characteristics (landform, drainage, geography and hydrology), recent and present land uses, and database searches.

Gambara were also commissioned in 2025, to undertake a site survey and site inspection to inform the development of the structure plan (Appendix D). This included an assessment of the Kadina Brook area and adjacent vegetation, for weed load, weed species, the latest extent of native vegetation, identification of native tree species with a Diameter at Breast Height (DBH) greater than 30 cm, vegetation condition mapping and indicative revegetation zones (Gambara, 2025).

3.6.3 Vegetation Types

PGV (2022) identified eleven vegetation types within a greater survey area, eight of which were identified within the Site, characterized by the structure of the vegetation and the dominant species within each type. The eight types are described in Table 3-6 and presented in Figure 11.

Table 3-6: Vegetation types on Site (PGV, 2022)

Type	Description (PGV, 2023).	Area (ha)
Et	*Eucalyptus todtiana* trees	0.01
BmLl	Low Open Woodland dominated by *Banksia menziesii* and *Leptospermum laevigatum* - *B.menziesii trees are up to 4m high and relatively dense at 40%. Allocasuarina fraseriana is occasionally present also to 4m. Victorian Teatree (L.laevigatum) is common*.	0.11
Ll	Tall Open Scrub dominated by *L.laevigatum - Consists of the introduced Victorian Teatree which occurs up to 5m high and quite dense at 50-70%. The understorey is sparse and predominantly weed species.*	0.26
ErMr	Low Open Woodland dominated by a Flooded Gum over *Melaleuca rhaphiophylla - occur on the southern banks of Kadina Brook. Eucalyptus rudis (Flooded Gum) is up to 28m high and moderately dense (25-40%). M.rhaphiophylla trees are 4-6m high and sparse. The understorey of one stand is almost completely Kikuyu Grass with no native species. The other stand has some native shrubs (Taxandria linearifolia, Astartea affinis) and sedges (Lepidosperma tetraquetrum) and ground covers (Centella asiatica).*	0.22
Er	Woodland over weeds, the dominant species being Flooded Gum - *Most of the flat floodplain through which the Kadina Brook watercourse runs contains Flooded Gums 25-28m high. Paperbarks are almost completely absent as are smaller native shrubs, sedges and herbs. Annual Veldtgrass (Ehrharta longiflora) dominates the understorey. A few native Melaleuca*	1.34

Type	Description (PGV, 2023).	Area (ha)
	teretifolia shrubs occurred in the understorey which was predominantly weeds, including Annual Veldtgrass.	
Mr	Low Open Forest over weeds, dominated by *Melaleuca rhaphiophylla - One stand of M.rhaphiophylla Low Open Forest occurred on the southern boundary of the Kadina Brook floodplain. No Flooded Gums occurred in this area. The M.rhaphiophylla trees were up to 8m high and quite dense*	0.39
Ew	Woodland over weeds, the woodland dominated by Wandoo - *One small stand of Wandoo (Eucalyptus wandoo) occurred on a slight rise within the Kadina Brook floodplain. The Wandoo trees are mature and appear to be natural rather than planted. The understorey is all weeds with Annual Veldtgrass the most common species*	0.17
Cleared	cleared/paddock	4.82
Total area (ha)		**7.30**
Total vegetation area (ha)		**2.48**

3.6.4 Vegetation Condition

The majority of the vegetation on Site was identified by PGV (2022) as Degraded to Completely Degraded condition, per the Keighery Scale (EPA, 2016a) further described in Table 3-7 and presented in Figure 12. A single patch of vegetation type 'Er' was assessed to be in Very Good condition. The overall condition was described to be of low quality, and this was due to the high proportion of regrowth vegetation with a dense population of Victorian Tea tree (*L.laevigatum*) and other weeds within the foreshore area (PGV, 2022).

Vegetation type 'Er' is mapped to be in association with Kadina Brook and was characterized as a Low Open Woodland dominated by Flooded Gum woodland over Swamp Paperbark (*M.rhaphiophlla*) over Westcoast Astartea (*Astartea affinis*) Open Shrubland (PGV, 2022).

As part of their survey, Gambara completed an updated vegetation condition assessment within the POS1 area, as per the Keighery Scale (Gambara, 2025). The majority of vegetation within this area was identified to be in degraded condition, severely disturbed and lacking understorey. However, some natural regeneration of overstorey species was identified. The dense weed ground cover and weed load was considered an obstacle for native understorey growth. Prior to any revegetation, weed load was identified to require appropriate treatment. One pocket of Very Good condition vegetation was identified the POS1 area, with low weed load, and presence of both overstorey and understorey. The cleared land interfacing with the POS1 area was also identified to be in completely degraded condition.

The updated mapping undertaken by Gambara identified that vegetation condition between the vegetated section of POS1 and the CCW buffer had deteriorated since the PGV (2022) survey was undertaken. This included a decrease in Very Good condition vegetation from 0.16 ha to 0.06 ha, an increase in Degraded condition vegetation from 1.70 ha to 2.10 ha.

Vegetation mapping and calculated extent across the Site is presented in Table 3-7. This includes vegetation condition mapping undertaken by PGV (2022), with vegetation condition mapping undertaken by Gambara

within the POS1 area (2025) used in place of the PGV data where available, given the Gambara assessment is the most recent and therefore, considered to be the most accurate (Figure 12).

Table 3-7: Vegetation Condition Definitions (EPA, 2016a)

Condition Rating	Definition	Area (ha) within the Site
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	-
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	-
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	0.055
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	-
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	2.26
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	4.98
Total		**7.30**

3.6.5 Conservation Significant Flora

PGV (2022) undertook a search of database records held by DBCA to compile a list of conservation significant flora previously recorded within or surrounding the Site. A total of 139 species were identified as conservation significant under the BC Act, 37 of which are listed threatened, under the EPBC Act (PGV, 2022). Most species were considered Highly Unlikely or Unlikely to occur within the Site. Only six conservation flora species considered to Possibly occur (Table 3-8). The full findings are presented in Appendix C - Table 2.

During the detailed flora survey, PGV (2022) did not record any conservation or priority listed flora species within the Site.

Table 3-8: Conservation Significant Flora with a Possible likelihood of Occurrence

Species Name	Common Name	Conservation Status (WA)	Conservation Status (Commonwealth)	Habitat
Conospermum undulatum	Wavy-leaved Smokebush	Vulnerable	Vulnerable	Wavy-leaved Smokebush occurs on sand and sandy clay soils, often over laterite, on flat or gently sloping sites between the Swan and Canning Rivers with a few records from slightly swampy habitat (DEC, 2009).
Bolboschoenus fluviatilis	River Bulrush	Priority 1	Not listed	River Bulrush occurs on the margins of wetlands and rivers.
Jacksonia gracillima	-	Priority 3	Not listed	*Jacksonia gracillima* occurs in grey and brown well-drained sand.
Platysace ramosissima	-	Priority 3	Not listed	Platysace ramosissima prefers sandy soils.
Tricostularia drummondii	Drummond's Tricostilaria	Priority 3	Not listed	Drummond's Tricostularia occurs in grey sand in Banksia Woodlands
Jacksonia sericea	Waldjumi	Priority 4	Not listed	Waldjumi grows in calcareous and sandy soils.

3.6.6 Flora

The flora survey by PGV (2022) identified 89 plant species, of which 44 were native and 45 were introduced. Three declared pest species were identified, including Arum Lily (**Zantedeschia aethiopica*), Cotton Bush (**Gomphocarpus fruticosus*) and One-Leafed Cape Tulip (**Moraea flaccida* (PGV, 2022).

The updated survey in 2025 by Gambara identified nineteen significant environmental weeds within the Site, including declared pests such as Arum Lily, Narrow-leaf Cotton Bush, Madeira Vine (**Anredera cordifolia*) and Patterson's Curse (**Echium plantagineum*) (Gambara, 2025). Madeira Vine is also a Weed of National Significance (WoNS).

Gambara (2025) mapped weed load across the POS1 area in 10 m x 10 m sections, using the following scale:

- Less than 10% - Very low load.
- 11% to 25% - Low load.
- 26% to 50% - Moderate weed load.

- More than 50% - High weed load.

Gambara (2025) identified that the majority of the Site is infested with high level weed load (more than 50% cover), due to ground cover grasses and overstorey of **Schinus terebinthifolius* (Brazilian Peppertree) infestations. Mapped weed load is shown in Figure 13.

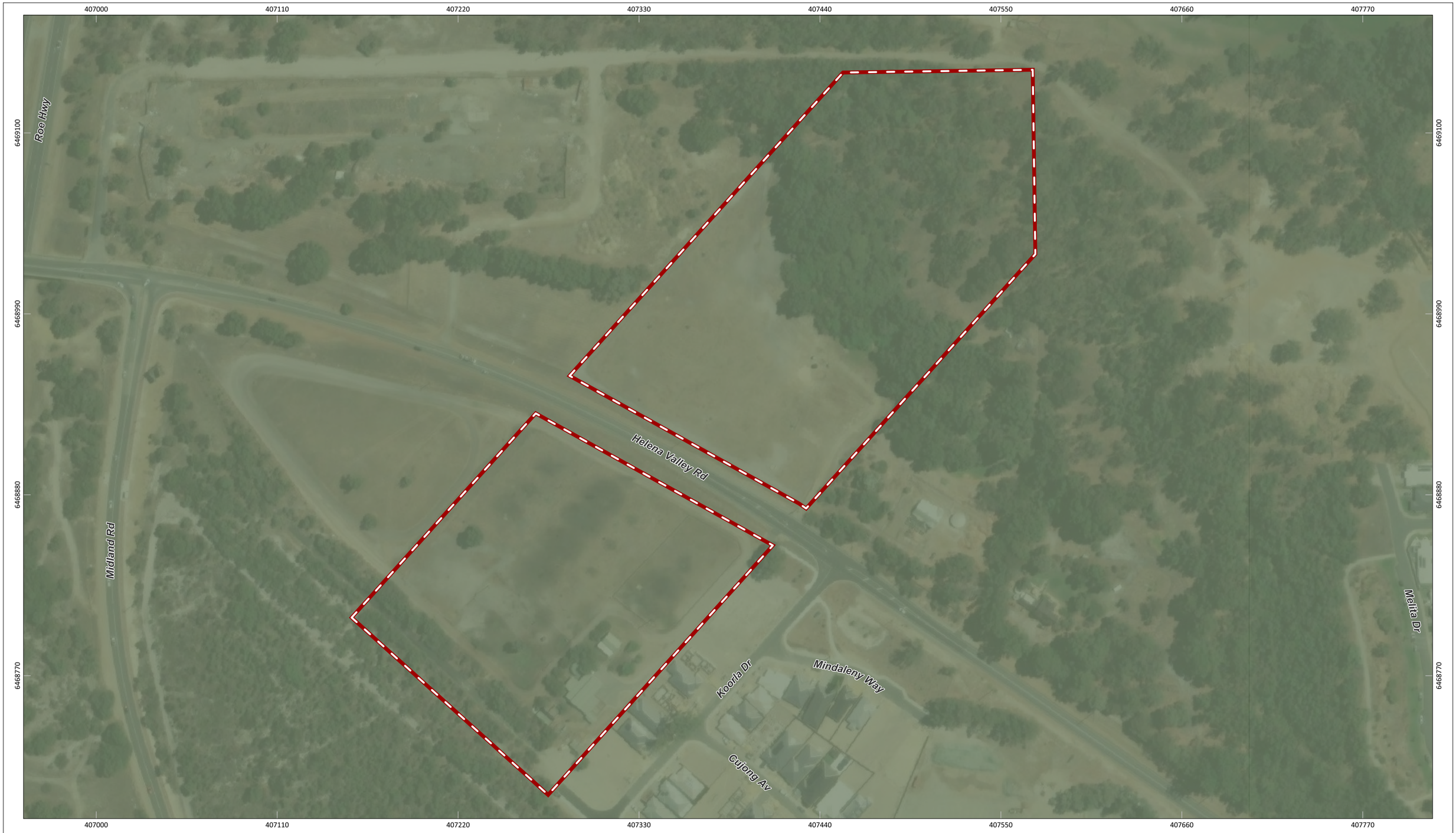

Figure 10: Vegetation Complexes

N

0 25 50 75 100 125 m

SCALE	1:2,200
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
DATA SOURCE	

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
CLIENT	Ingwe Helena Valley Pty Ltd
PROJECT NUMBER	A25.232
VERSION	2
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

Site Boundary

Vegetation Complexes Swan Coastal Plain (DBCA-046)

OPEN FOREST AND FRINGING WOODLAND

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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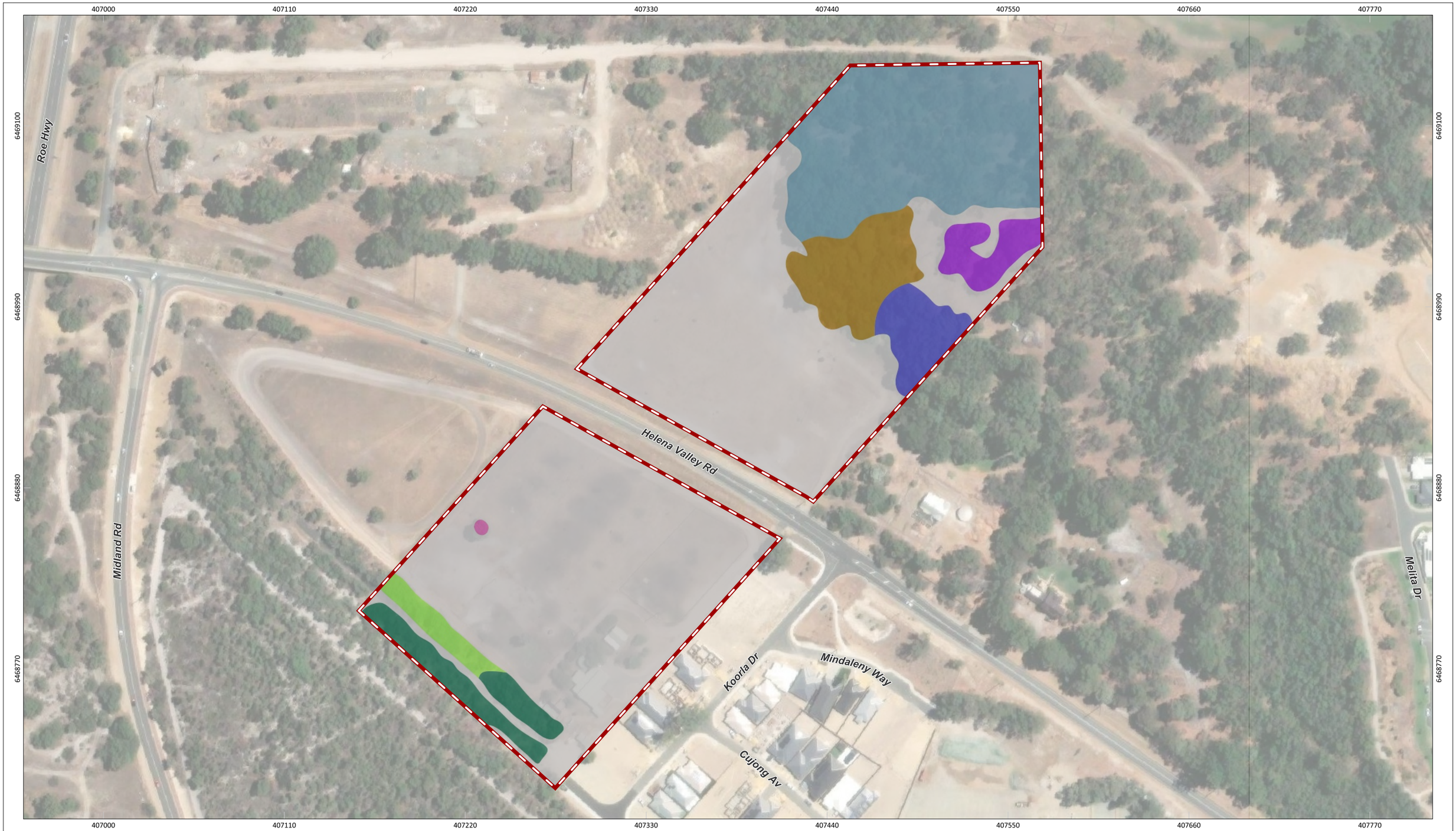

Figure 11: Vegetation Types

N; 0 25 50 75 100 125 m	PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision		
SCALE: 1:2,200	SHEET SIZE: A3 COLOUR	CLIENT: Ingwe Helena Valley Pty Ltd	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A25.232	VERSION: 2
DATA SOURCE:		DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 10/12/2025

Legend

- Site Boundary

Vegetation Types

- Cleared
- BmLl
- Er
- ErMr
- Et
- Ew
- Ll
- Mr

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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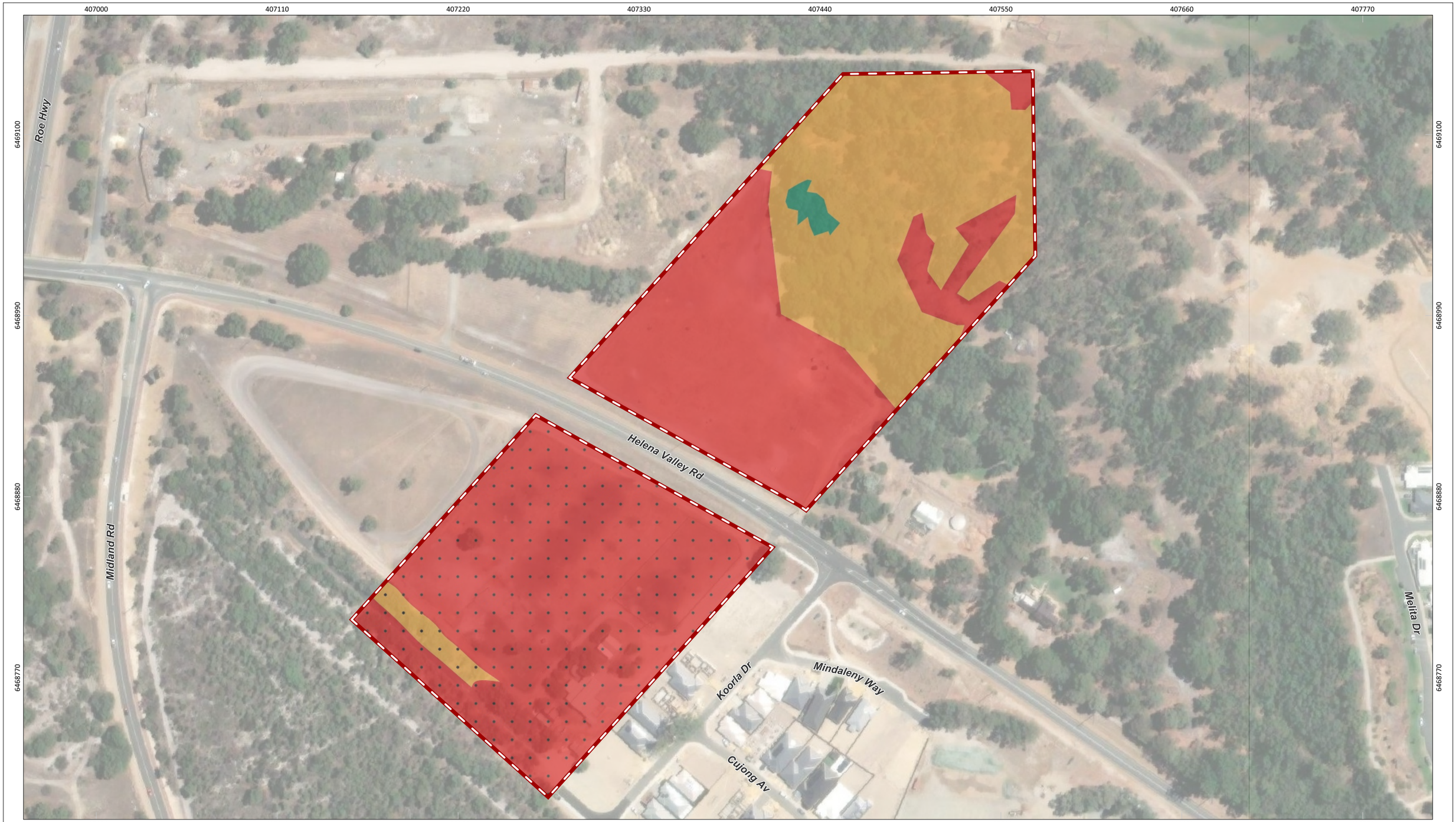

Figure 12: Vegetation Conditions

N 0 25 50 75 100 125 m	PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision		
SCALE: 1:2,200	SHEET SIZE: A3 COLOUR	CLIENT: Ingwe Helena Valley Pty Ltd	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A25.232	VERSION: 2
DATA SOURCE		DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 11/12/2025

Legend

Site Boundary

Vegetation Condition (PGV 2022)

- Completely Degraded
- Degraded

Vegetation Condition (Gambara 2025)

- Completely Degraded
- Degraded
- Very Good

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	11/12/2025

NOTES:

Base map ESRI Imagery.

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Figure 13: Weed Load within the Foreshore Area (Gambara, 2025)

N

0 25 50 75 100 125 m

SCALE: 1:2,200	SHEET SIZE: A3 COLOUR	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		
DATA SOURCE:		

PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision		
CLIENT: Ingwe Helena Valley Pty Ltd		
PROJECT NUMBER: A25.232	VERSION: 1	
DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 10/12/2025	

Legend

Site Boundary

Weed Load

0
1
2
3
5

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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3.6.7 Conservation Significant Ecological Communities

PGV (2022) undertook a search of database records held by DBCA to compile a list of Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC) previously recorded within a 10 km radius of the Site. The communities identified in the database search are listed in Table 3-9.

Table 3-9: TECs and PECs Recorded within 10 km of the Site (PGV 2022)

Floristic Number	Description	Conservation Status (WA)	Conservation Status (Commonwealth)
SCP3a	*Corymbia calophylla - Kingia australis* woodlands on heavy soils, Swan Coastal Plain (floristic community type 3a as originally described in Gibson et al. (1994))	Critically Endangered	Endangered
SCP20a	Shrublands and woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20c as originally described in in Gibson et al. (1994))	Critically Endangered	Endangered as part of the Banksia WL SCP
SCP02	Southern wet shrublands, Swan Coastal Plain (floristic community type 2 as originally described in Gibson et al. (1994))	Endangered	Not listed
SCP20a	*Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. (1994))	Endangered	Endangered
SCP20b	*Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20b as originally described in Gibson et al. (1994))	Endangered	Endangered as part of the Banksia WL SCP
SCP08	Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. (1994))	Vulnerable	Critically Endangered
SCP21c	Low lying *Banksia attenuata* woodlands or shrublands	Priority 3	Endangered as part of the Banksia WL SCP
Coastal Marsh	Subtropical and Temperate Coastal Saltmarsh	Priority 3	Vulnerable
Banksia WL SCP	Banksia Woodlands of the Swan Coastal Plain ecological community	Priority 3	Endangered
Central Granite Shrublands (Com 5, Markey)	Central Northern Darling Scarp Granite Shrubland Community	Priority 4	Not listed

Banksia Woodlands of the Swan Coastal Plain (Banksia Woodland TEC/PEC)

Banksia Woodland TEC/PEC is an ecological community associated with the Swan Coastal Plain in the south-west of Western Australia, which is listed as endangered under the EPBC Act (DEE, 2016). The Site survey carried out by PGV (2022) in September of 2022 identified one vegetation type (BmLl) (Figure 11) in the south of the Site to contain several species representative of this TEC. The survey report describes the condition of

the vegetation to be degraded and therefore not meeting the criteria required to be considered TEC (PGV, 2022).

Banksia attenuata woodlands over a species rich dense shrubland (SCP20a)

As per the comments from the DBCA in the MRS Addendum (Appendix A), an area of *Banksia attenuata* woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994) listed as a TEC under the BC Act, occurs to the south of the Site. As per DBCA comments, vegetation within the Site does not require statistical analysis to identify whether it is representative of SCP 20a or any other State listed TECs, as there is insufficient flora diversity to meet the criteria or assign a floristic community type (FCT).

3.6.8 Foreshore Delineation

Previous Foreshore Delineation

As part of the EAR prepared for the previous MRS Amendment, PGV (2023) undertook a biophysical assessment to determine an appropriate foreshore reserve for the southern extent of Kadina Brook, within the Site. This was developed with reference to relevant guidance documents, including:

- Operation Policy 4.3: Identifying and establishing waterways foreshore areas (DoW, 2012)
- Guidance Note 6: Identifying and establishing waterways foreshore areas (DoW, 2013).
- Water Note 23: Determining foreshore reserves (WRC, 2001).

The biophysical assessment undertaken by PGV (2023) is summarised below in Table 3-10.

Table 3-10: Biophysical Criteria and Assessment (PGV, 2023)

Biophysical Factor	Assessment of Factor	Spatial Implications for Setback
Vegetation	The vegetation types in the area to the south of Kadina Brook include the following: • ErMr *Eucalyptus rudis* Woodland over *Melaleuca rhaphiophylla* Low Open Woodland. • Er *Eucalyptus rudis* Woodland • over weeds. • Mr *Melaleuca rhaphiophylla* Low Open Forest over weeds. • Ew *Eucalyptus wandoo* Woodland over weeds	The native vegetation types provide fauna habitat, erosion control and are part of a linkage along the Kadina Brook waterway. The understorey consists mostly of grassy weeds.
Hydrology	Kadina Brook is an ephemeral creekline that connects to the Helena River, a short distance to the north-west. On the site the brook contains a narrow, shallowly incised central creekline with a flat, broad floodplain that is partially waterlogged and inundated in winter/spring.	The floodplain is partially waterlogged/inundated in winter/spring which would limit public recreational amenity. Some drier areas occur under the native Flooded Gum and Wandoo and may be suitable for POS

Biophysical Factor	Assessment of Factor	Spatial Implications for Setback
Topography	The floodplain is flat close to Kadina Brook and then gently slopes up to the south. One short section at the eastern boundary on Lot 254 is steeper but not more than a 10% slope.	The foreshore setback does not need to be wide to protect any topographic features such as cliffs or valleys.
Soil Type	The soils associated with Kadina Brook are Pinjarra, Phase GF5 (213Pj_Gf5) which are associated with incised drainage channels with poorly drained gradational mottled yellow earths.	No spatial implications.
Erosion	The narrow, shallowly incised central creekline and broad flat floodplain with heavy soils have a low potential for erosion to occur. The steeper parts of the site at the eastern boundary may be subject to erosion in large rainfall events	Native vegetation should be retained on the steeper parts of the site to prevent erosion.
Function	Function of Kadina Brook is flood conveyance to Helena River.	Water conveyancer function not impacted by foreshore setback width.
Habitat	Part of an ecological fauna corridor along the Brook	The native vegetation in the area assessed is part of an ecological linkage along the Kadina Brook waterway,
Land Use	The area under the native trees and the dryland area to the south used to agist horses.	The future function of the foreshore area will likely include some passive recreational value such as a pathway parallel with the southern boundary of the wetland and potentially some small grassed public use areas.

Following the completed biophysical assessment, PGV (2023) determined that the appropriate foreshore reserve was considered to be the outer extent of the native vegetation, which is displayed in Figure 14. This included a total foreshore area of 2.35 ha.

Agency comments on the MRS amendment recommended that stormwater and groundwater management systems be located outside of the foreshore reserve, and that weed control be undertaken in a staged approach. A list of species proposed for revegetation, methodology and densities of planting were requested, with a foreshore management plan requested to be prepared at later stages.

As part of this MRS amendment assessment process, DBCA, in its referral role, recommended that the foreshore area associated with Kadina Brook in the northern portion of the Site be clearly delineated and rezoned to 'Regional Open Space' to provide a formal foreshore reserve. The WAPC ultimately did not support this recommendation and instead zoned this land, including the CCW and its buffer, 'Urban'.

In this context, the previously described 'foreshore reserve' associated with Kadina Brook does not have a Regional Open Space reservation under the MRS. For the purposes of this Structure Plan, the land is therefore treated as part of the urban zoned area and is identified and managed as POS1 as part of the structure plan, while still recognising and responding to its underlying foreshore and wetland values.

Updated Kadina Brook Interface Mapping

Updated vegetation extent mapping was undertaken by Gambara (2025), as part of their site assessment. This information is shown in Figure 14. A total extent of 2.51 ha of native vegetation was mapped by Gambara. The vegetation extent remains the same, however the condition values vary. Gambara found an increased distribution of Degraded vegetation by 0.4 ha, with a reduced distribution of Completely Degraded vegetation by 0.3 ha, and of Very Good vegetation by 0.1 ha (Appendix D).

Figure 14: Previous and Proposed Foreshore Area

N

0 25 50 75 100 125 m

SCALE	1:2,200
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
DATA SOURCE	
PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
CLIENT	Ingwe Helena Valley Pty Ltd
PROJECT NUMBER	A25.232
VERSION	1
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

- Site Boundary
- Initial PGV Foreshore Boundary
- Drip Line

Proposed Foreshore Interface

- TBB CCW
- TBB FILL POS
- TBB POLYGONS POS

Tree Species

- Eucalyptus rudis
- Melaleuca preissi
- Melaleuca rhaphiophylla

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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3.7 Fauna

3.7.1 Site Surveys and Assessments

PGV (2022) undertook a detailed flora, vegetation and fauna survey on 9 September 2022, across the entire Site. This included a basic fauna survey undertaken in accordance with EPA Technical Guidance *Fauna Surveys for Environmental Impact Assessment* (EPA, 2020), and included desktop database searches, a review of studies undertaken in the vicinity of the Site, a description of fauna habitats based on field survey data and an assessment of the significance of the site for conservation significant species. A black cockatoo habitat assessment was also undertaken, which described habitat values for black cockatoos, determined the potential impact of development of the site to black cockatoos, and the potential significance of this impact.

3.7.2 Fauna Habitat

Fauna habitat was assessed using various factors including the size of the habitat, the level of habitat connectivity, availability of specific resources (such as hollows) and the quality, or condition, of the vegetation (PGV, 2023). Habitat condition categories as defined in Table 3-11.

PGV identified four fauna habitat types within the survey area. All fauna habitat was mapped in a 'highly degraded' condition and was described as having almost no understory with an abundance of weeds, vehicular damage and areas which are completely cleared (PGV, 2023). For this reason, the associated quality of fauna habitat is also 'highly degraded' throughout the majority of the Site. However, due to the connectivity of the open woodland habitat to Kadina Brook, the quality of this is considered 'good fauna habitat'.

Table 3-11: Fauna Habitat Condition Categories (PGV, 2023)

Category	Definition
High Quality Fauna Habitat	These areas closely approximate the vegetation mix and quality that would have been in the area prior to any disturbance. The habitat has connectivity with other habitats and is likely to contain the most natural vertebrate fauna assemblage.
Very Good Fauna Habitat	These areas show minimal signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) and generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be minimally affected by disturbance.
Good Fauna Habitat	These areas showed signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be affected by disturbance.
Disturbed Fauna Habitat	These areas showed signs of significant disturbance. Many of the trees, shrubs and undergrowth are cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain weeds or have been damaged by vehicle or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred.

Category	Definition
Highly Degraded Fauna Habitat	These areas often have a significant loss of vegetation, an abundance of weeds, and a large number of vehicle tracks or are completely cleared. Limited or no fauna habitat connectivity. Faunal assemblages in these areas are likely to be significantly different to what might have been in the area pre-disturbance. (Coffey Environments, 2009).

Table 3-12: Fauna Habitat Types (PGV, 2023)

Type	Description
Woodland Habitat	Dominated by Banksia species
Open Woodland Habitat	Open parkland cleared areas associated with the Kadina brook floodplain.
Creekline Habitat	Kadina Brook
Cleared Habitat	Open paddock areas

3.7.3 Conservation Significant Fauna

Desktop database searches of DBCA records, Atlas of Living Australia Species Report, and the Commonwealth Protected Matters Search Tool (PMST) search carried out by PGV (2023) identified 80 conservation listed fauna species (excluding marine and pelagic species) reported within a 10 km radius of the Site (Appendix C - Table 9). The preferred habitat of each species was cross-referenced with the habitat on site to assign a likelihood of occurrence rating of either, likely to occur, possible visitor, unlikely, highly unlikely, no - habitat not present. Of those, only five species with a likely or possible occurrence rating were identified. These details have been extracted from the PGV report (2023) and presented in Table 3-13.

Table 3-13: Conservation Fauna with a Possible or Likely Occurrence on Site (PGV, 2023)

Species Name	Conservations Status (WA)	Conservation Status (Commonwealth)	Preferred Habitat	Likelihood of Occurrence
Baudin's Black Cockatoo (*Zanda baudinii*)	EN	EN	Mainly occurs in eucalypt forests, predominantly Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), also Karri (*Eucalyptus diversicolor*) forest, often feeding in the understorey on proteaceous trees and shrubs, especially Banksias (SEWPaC, 2012).	Possible vagrant visitor to the site
Carnaby's Black Cockatoo (*Zanda latirostris*)	EN	EN	Found in the south-west of Australia from Kalbarri through to Ravensthorpe. It prefers feeding on the seeds of *Banksia, Hakea, Eucalypt, Grevillea, Pinus* and *Allocasuarina spp*. It is nomadic often moving toward the coast after breeding. Nesting mostly occurs in smoothbarked trees (e.g. Salmon Gum, Wandoo, Red Morrell) (SEWPaC, 2012).	Likely to occur intermittently on the site
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	VU	VU	Frequents the humid to sub-humid south-west of Western Australia from Gingin in the north, to Albany in the south and west to Cape Leeuwin and Bunbury (SEWPaC, 2012). It nests in tree hollows with a depth of 1-5m, that are predominately Marri, Jarrah, and Karri and it feeds primarily on the seeds of Marri	Likely to be an intermittent visitor
Rainbow Bee eater (*Merops ornatus*)	Not listed	MI	Populations of the Rainbow Bee-eater that breed in northern Australia are considered to be resident, and in many northern localities the Rainbow Bee-eater is present throughout the year. The Rainbow Bee-eater nests in a burrow dug in the ground. It is found across the better-watered parts of WA including islands preferring lightly wooded, sandy country near water.	Possible intermittent visitor
Southern Brown Bandicoot, Quenda (*Isoodon fusciventer*)	Priority 4	Not listed	Southern Brown Bandicoots are small grey marsupials that prefer dense scrub (up to one metre high). Their diet includes invertebrates (including earthworms, adult beetles and their larvae), underground fungi, subterranean plant material, and very occasionally, small vertebrates (DEC, 2012).	Possibly intermittently present on the site

Rainbow Bee-eater

The rainbow bee-eater a listed under the commonwealth EPBC Act as a Marine Migratory (MI) species, it is not listed within the WA state register to be threatened or a priority The rainbow bee eater is not likely to depend on the Site for survival, but may intermittently occur within the Site. It is considered highly unlikely that development within the Site will have a direct impact on the species, given that the majority of potential habitat will be retained within POS1, CCW and the CCW buffer.

Quenda

The quenda is state listed threatened species Priority 4, it is not listed under the commonwealth EPBC Act. This species is a small marsupial that prefers dense scrub up to one meter high and feeds on invertebrates, fungi and subterranean plant material (PGV, 2022). Vegetation associated with Kadina Brook, and vegetation adjacent to the south of the Site are potentially suitable habitat for the species. However, the majority of the suitable habitat will be retained within the Site. Any impacts to the species habitat are considered unlikely to be significant. Trapping for the species is recommended prior to any vegetation clearing occurring.

3.7.4 Black Cockatoos

The Site is within the mapped distribution of Carnaby's black cockatoo (listed as Endangered under the EPBC Act and BC Act) and Forestred-tailed black cockatoo (listed as Vulnerable under the EPBC Act and BC Act). The Site is located outside of the modelled distribution for Baudin's black cockatoo, however the species is considered a potential vagrant to the Site.

Carnaby's Black Cockatoo

Carnaby's black cockatoo (*Zanda latirostris*) forage primarily on the flowers and nectar of proteaceous flora species including *Banksia* spp., *Hakea* spp., and *Grevillea* spp. (DAWE, 2022). The species also feeds on the fruit and seeds of many native eucalypt species, most importantly marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*), pricklybark (*E. todtiana*), flooded gum (*E. rudis*) and wandoo (*E. wandoo*). The species roosts generally in or near riparian environments near to permanent water sources within tall eucalypt trees. The species breeds in natural and artificial hollows within eucalypt trees of a suitable size and species to develop nesting hollows, including salmon gum, wandoo, tuart, jarrah, flooded gum, York gum, powderbark, karri, and marri (DAWE, 2022).

Forest red-tailed Black Cockatoo

Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) forage primarily on the seeds of marri and jarrah, as well as on wandoo, blackbutt, and *Allocasuarina fraseriana* cones (DAWE, 2022). The species roosts generally in or near riparian environments near to permanent water sources within tall eucalypt trees. The species breeds in natural and artificial hollows within eucalypt trees of a suitable size and species to develop nesting hollows, particularly salmon gum, wandoo, tuart, jarrah, flooded gum, York gum, powderbark, karri, and marri (DAWE, 2022).

Baudins Black Cockatoo

Baudins black cockatoo *(Zanda baudinii*) forage primarily on the seeds of marri, and seeds of native proteaceous plant species such as Banksia and Hakea. (DAWE, 2022). The species also feeds on the seeds, flowers, nectar of many native, such as *Banksia* spp, *Hakea* spp and the pith of the Kangaroo paw (*Anigozanthos flavidus*) (DAWE, 2022). The species roosts generally in or near riparian environments near to permanent water sources within tall eucalypt trees. The species breeds in natural and artificial hollows within eucalypt tree species, particularly, marri, wandoo, jarrah, tuart, karri (*E.divsersicolor*) and Bullich (*E.megacarpa*) (DAWE, 2022).

Breeding Habitat Assessment

Breeding habitat is defined as that which contains known, suitable or potential nesting trees (DAWE, 2022). Breeding typically occurs in native eucalypt species particularly marri, jarrah, wandoo and tuart, however many species of eucalypt including non-endemic species may develop suitable hollows for breeding (DAWE, 2022). Breeding habitat terminology is defined in Table 3-14 and a summary of suitable nesting hollow characteristics for the three species is provided below in Table 3-15.

Table 3-14: Breeding Habitat Terminology (DAWE, 2022)

Breeding Habitat Term	Definition (DCCEEW, 2022)
Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use.
Suitable nesting hollows	Any hollow with dimensions suitable for use for nesting by black cockatoos.
Potential nesting trees	Trees that have a suitable Diameter at Brest Height (DBH) to develop a nest hollow, but do not currently have hollows. For most species of trees, suitable nest hollows are only found in live trees with a DBH of at least 50 cm.

Table 3-15: Black Cockatoo Nesting Hollow Characteristics

Species	Baudin's Black cockatoo	Carnaby's Black cockatoo	Forest Red-tailed Black cockatoo
Tree species and hollow characteristic	Nesting in mainly karri, jarrah wandoo, bullich and tuart. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep. Hollow depth ranges from 0.1 to 2.5+ m (Johnstone and Kirkby 2011).	Nesting mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep	Nesting mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart Utilise hollow from 12-150 cm diameter (average 34 cm) and >1 m depth
Sources	Johnstone and Kirkby,2011.	DAWE, 2022, Saunders et al., 1982.	DAWE, 2022, Johnstone et al., 2013.

Two vegetation types within the Site included eucalypt trees, 'Ew' *Eucalyptus wandoo* (wandoo), and 'Er' *Eucalyptus rudis* (flooded gum). Seven potential nesting trees were recorded by PGV (2022) within the Site (Figure 15). All seven are identified as wandoo with a measured DBH over the minimum requirement of 300 mm for the species, as documented in the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022). There were no flooded gums recorded to be potential nesting trees, and no hollows were observed (PGV, 2022).

Roosting Habitat Assessment

Black cockatoos are known to roost overnight in tall trees including native and introduced eucalypts and pine trees generally within a 2 km radius of a fresh water source (DAWE, 2022). The Site contains tall eucalypt trees, however no evidence of roosting was recorded during the survey (PGV, 2022).

Foraging Habitat Assessment

PGV (2022) identified a total of 0.3156 ha of cockatoo foraging habitat within the Survey Area, presenting two small polygons within the Site (see Appendix C - Figure 5). Upon review of the data and shapefiles provided, there was 1.84 ha within the Site (Figure 16).

No evidence or observations of foraging occurred during the survey.

Foraging habitat is predominantly mapped within the area of retention (Table 3-17), including seven potential nesting trees, with approximately 0.12 ha to be impacted.

As per Section 5 of the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022), the minimum area of foraging habitat which might trigger a referral is a loss of High quality foraging habitat greater than, or equal to 1 ha. As the impacted foraging habitat within the Site is less than 1 ha (0.12ha; Table 3-16), with only 0.055 ha above a Degraded condition (Table 3-17), clearance is not expected to require referral.

Table 3-16:Black Cockatoo Foraging Habitat for Retention

Location within the concept plan	Area (ha)
Conservation Category Wetland	0.48 ha
Conservation Category Wetland Buffer	0.76 ha
Public Open Space	0.48 ha
Residential R20	0.095 ha
Road Reserve	0.023 ha
Total	**1.84 ha**
Total Impacted	**0.12 ha**
Total Retained	**1.73 ha**

Table 3-17: Black Cockatoo Foraging Habitat Conditions

Vegetation Type	Condition	Area (ha)	Habitat Suitability		
			Carnaby's Black Cockatoo	Baudins Black Cockatoo	Forest red-tailed Black Cockatoo
BmLl - Low Open Woodland dominated by *Banksia menziesii* and *Leptospermum laevigatum*. *Allocasuarina fraseriana* is occasionally present	Degraded	0.11	✓	✓	✓
ErMr - Low Open Woodland dominated by *Eucalyptus rudis* over *Melaleuca rhaphiophylla* -	Degraded	0.22	-	-	✓
Er - *Eucalyptus rudis* trees	Degraded	1.28	-	-	✓
	Very Good	0.055	-	-	✓
Et - *Eucalyptus todtiana* trees	Completely Degraded	0.006	✓	✓	✓
Ew - *Eucalyptus wandoo* trees	Completely Degraded	0.17	✓	✓	✓
Total		**1.84**			

Figure 15: Potential Black Cockatoo Nesting Trees

N

0 25 50 75 100 125 m

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
SCALE	1:2,200
SHEET SIZE	A3 COLOUR
CLIENT	Ingwe Helena Valley Pty Ltd
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A25.232
VERSION	2
DATA SOURCE	
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

Site Boundary

Black Cockatoo Nesting Trees

Marri *(Corymbia calophylla)*

Wandoo *(Eucalyptus wandoo)*

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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Figure 16: Potential Black Cockatoo Foraging Habitat

N

0 25 50 75 100 125 m

SCALE: 1:2,200	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision	
		CLIENT: Ingwe Helena Valley Pty Ltd	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A25.232	VERSION: 2
DATA SOURCE		DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 10/12/2025

Legend

- Site Boundary
- Potential Black Cockatoo Foraging Habitat

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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3.7.5 Black Cockatoo Regional Context

Regional Breeding Habitat

The nearest known and registered breeding location for black cockatoos is 14 km north-east of the Site, which is outside the daily foraging range of 12 km (DBCA-063). The nearest known breeding location for Carnaby's black cockatoo is also outside the 12 km foraging range, located 13.5 km north-east (DBCA-054) (Figure 17).

Regional Roosting Habitat

The nearest confirmed roost site for Carnaby's black cockatoo is 3.5 km south-east (DBCA-050). Two confirmed roosting sites are located less than 2 km from the Site (DBCA-064) with one 1.5 km to the north-east and one 1.5 km to the south-east (Figure 17).

Regional Foraging Habitat Assessment

Assessment of the estimated foraging habitat extent within the local area was undertaken as part of this EAR, to contextualise the habitat within the Site. The estimated extent of foraging habitat was calculated for a buffer of 12 km around and including the Site. This buffer is selected as recommended in the Commonwealth referral guidelines due to black cockatoos mainly foraging within 12 km of their nest site during the breeding season and their reliance on this proximity of foraging resources to successfully raise chicks (DAWE, 2022).

The regional assessment undertaken considers Remnant Native Vegetation Extent mapping (DWER-141) and Vegetation Complexes- Swan Coastal Plain and Southwest Forest region (DBCA-046 and DBCA-047).

Analysis indicates there is approximately 16,097 ha of remnant native vegetation mapped within a 12 km buffer of the Site (DBCA-057) (Figure 18). It is expected that the majority of this vegetation would contain suitable foraging species at the same or greater rate than that present within the Site due to XX…. Much of this regional remnant native vegetation occurs within Beelu National Park (XX ha).

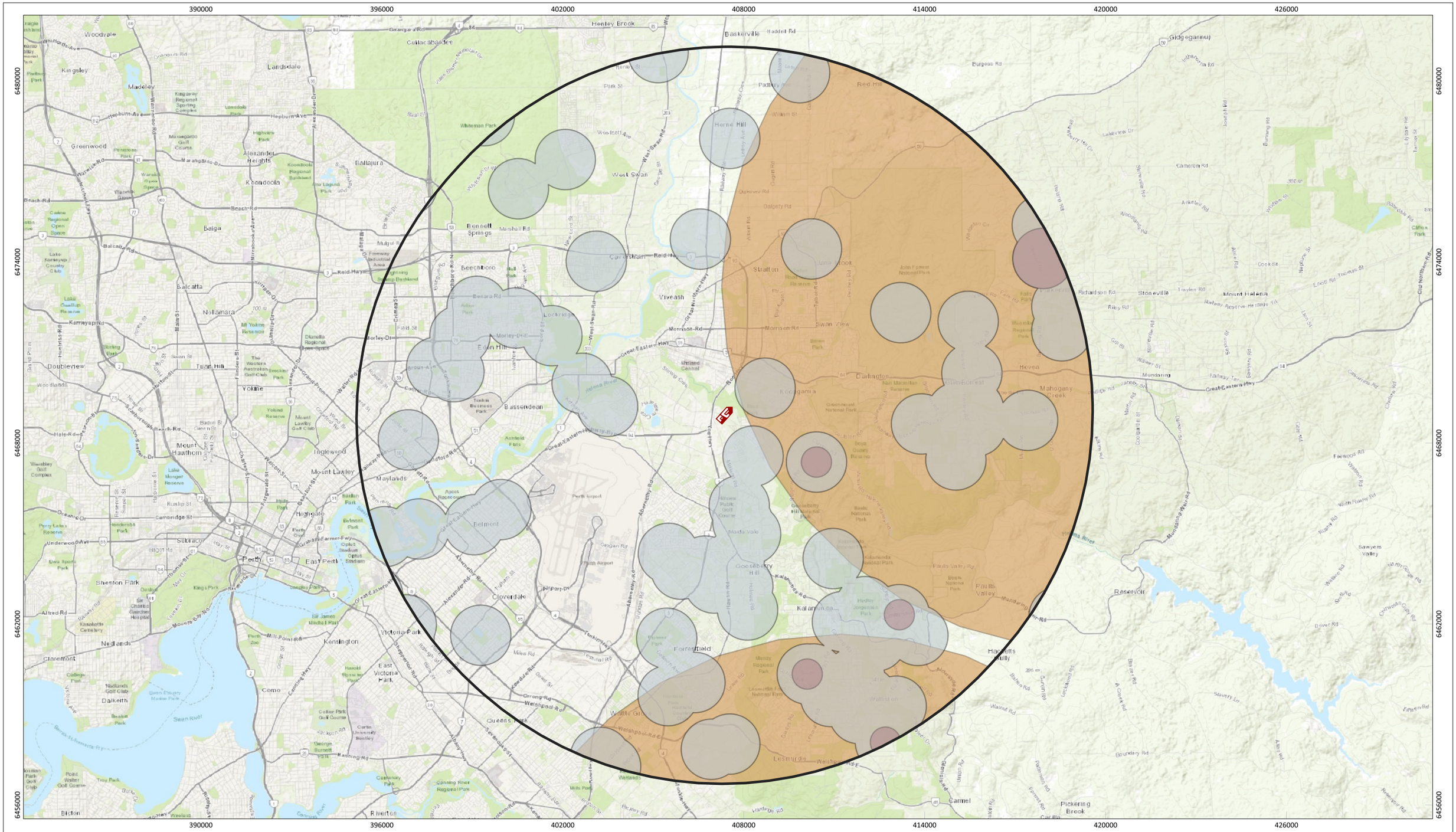

Figure 17: Known Black Cockatoo Roosting and Breeding Sites within 12km Buffer

N

0 1 2 3 4 5 km

SCALE	1:120,000
SHEET SIZE	A3 COLOUR
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
DATA SOURCE	

PROJECT/REPORT NAME: Environmental Due Diligence
Helena Valley Road Subdivision

CLIENT: Ingwe Helena Valley Pty Ltd

PROJECT NUMBER	VERSION	DRAWN BY / REVIEWED BY	DATE
A25.232	2	West GIS / Stephen Moore	9/12/2025

Legend

- Site Boundary
- 12km Buffer
- Carnabys Cockatoo Confirmed Roost Sites (DBCA-050)
- Black Cockatoo Roosting Sites (DBCA-064)
- Carnabys Cockatoo Confirmed Breeding Areas (DBCA-054)
- Black Cockatoo Breeding Sites (DBCA-063) - None Visible

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	9/12/2025

NOTES:

Base map ESRI Topographic Map.

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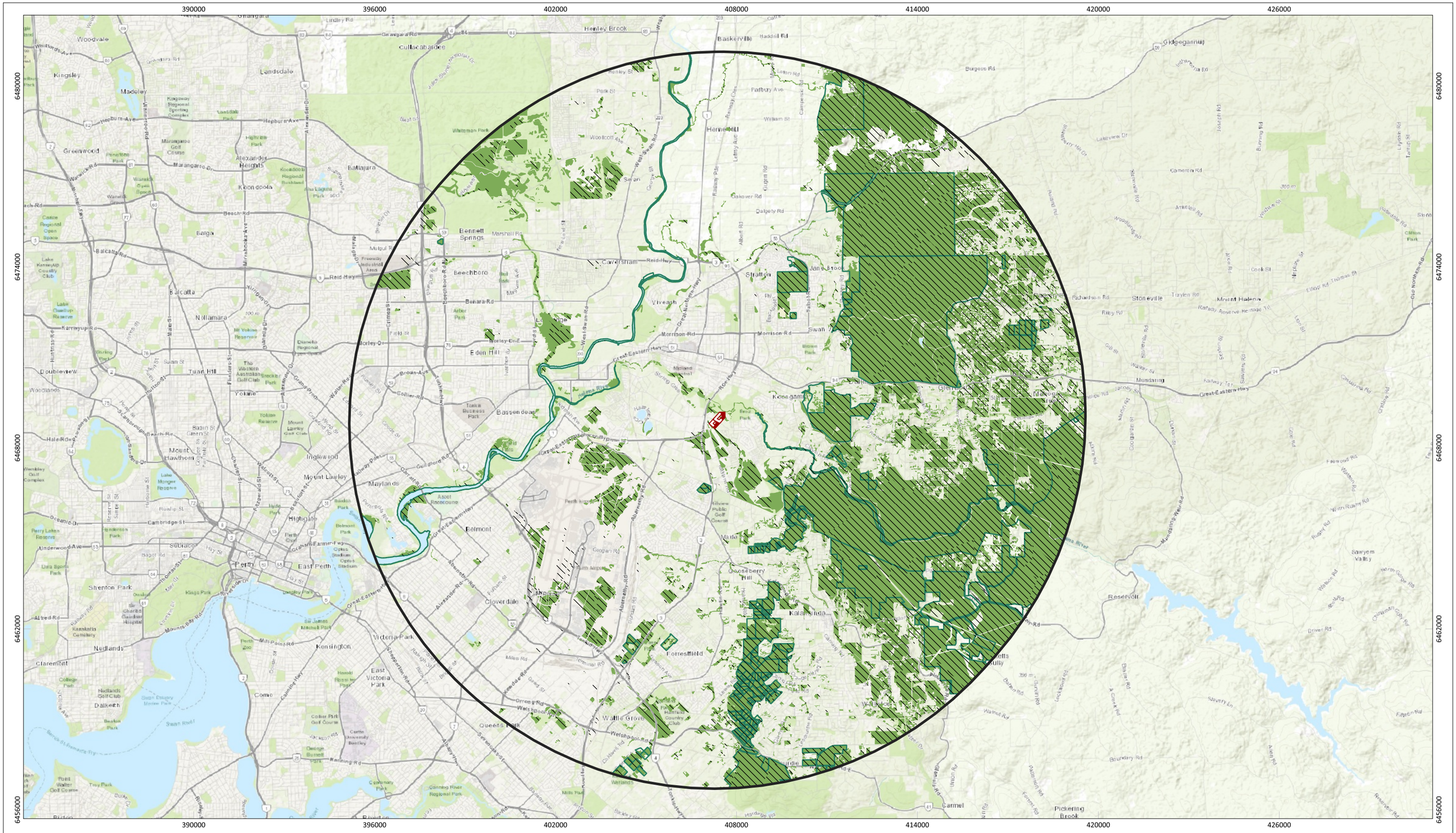

Figure 18: Black Cockatoo Foraging Habitat Extent 12 km Buffer

N

0 1 2 3 4 5 km

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
SCALE	1:120,000
SHEET SIZE	A3 COLOUR
CLIENT	Ingwe Helena Valley Pty Ltd
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A25.232
VERSION	2
DATA SOURCE	
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

- Site Boundary
- 12km Buffer
- Legislated Lands and Waters (DBCA-011)
- Carnabys Cockatoo Feeding Habitat (Requiring Investigation) (DBCA-057 and DBCA-056)
- Native Vegetation Extent (DWER-141)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Topographic Map.

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3.8 Conservation Areas

3.8.1 Bush Forever Site 213

Bush Forever Site (No. 213) is located to the south of the Site, however will not be impacted by future residential land use. This site will be managed by DBCA in the future for the purpose of conservation and therefore, a condition within the MRS Addendum (Appendix B) states there must be no direct or indirect impacts to the adjacent vegetation. The concept design includes a hard road interface with the Bush Forever site, which will reduce the potential for indirect impacts to this vegetation. Conservation fencing is recommended to be installed during construction, to reduce the potential for any accidental clearing or indirect impacts through vehicle or pedestrian access.

Kadina Brook

Kadina Brook is a CCW (UFI 15,440) and is associated with an Environmentally Sensitive Area (ESA) (DWER-046) which intersects the northern corner of lot 254 (DBCA-019) (Figure 19). A 50 m buffer from the wetland has been incorporated within the concept plan, to prevent impacts to wetland values. This buffer will not be utilised for POS or stormwater treatment and detention. The CCW buffer will also be revegetated, to reduce weed load and prevent further degradation of the CCW and associated Kadina Brook. Additionally, POS 1 is located adjacent to the CCW buffer, to provide further retention of vegetation and increase the setback between the residential area and Kadina Brook (Figure 19).

3.8.2 Regional Ecological Linkages

The Site intersects two regional ecological linkages (WAGA, 2004). As a result, areas of native vegetation have been prioritised for retention where possible, particularly higher quality areas.

3.8.3 EPA Redbook

The northern corner of the intersects the 1976-1991 EPA Redbook Recommended Conservations Reserve recommendation M33 - The Darling System (DBCA-029). This area of the Site is not proposed to be impacted, and will be retained within the POS and CCW buffer (Figure 19).

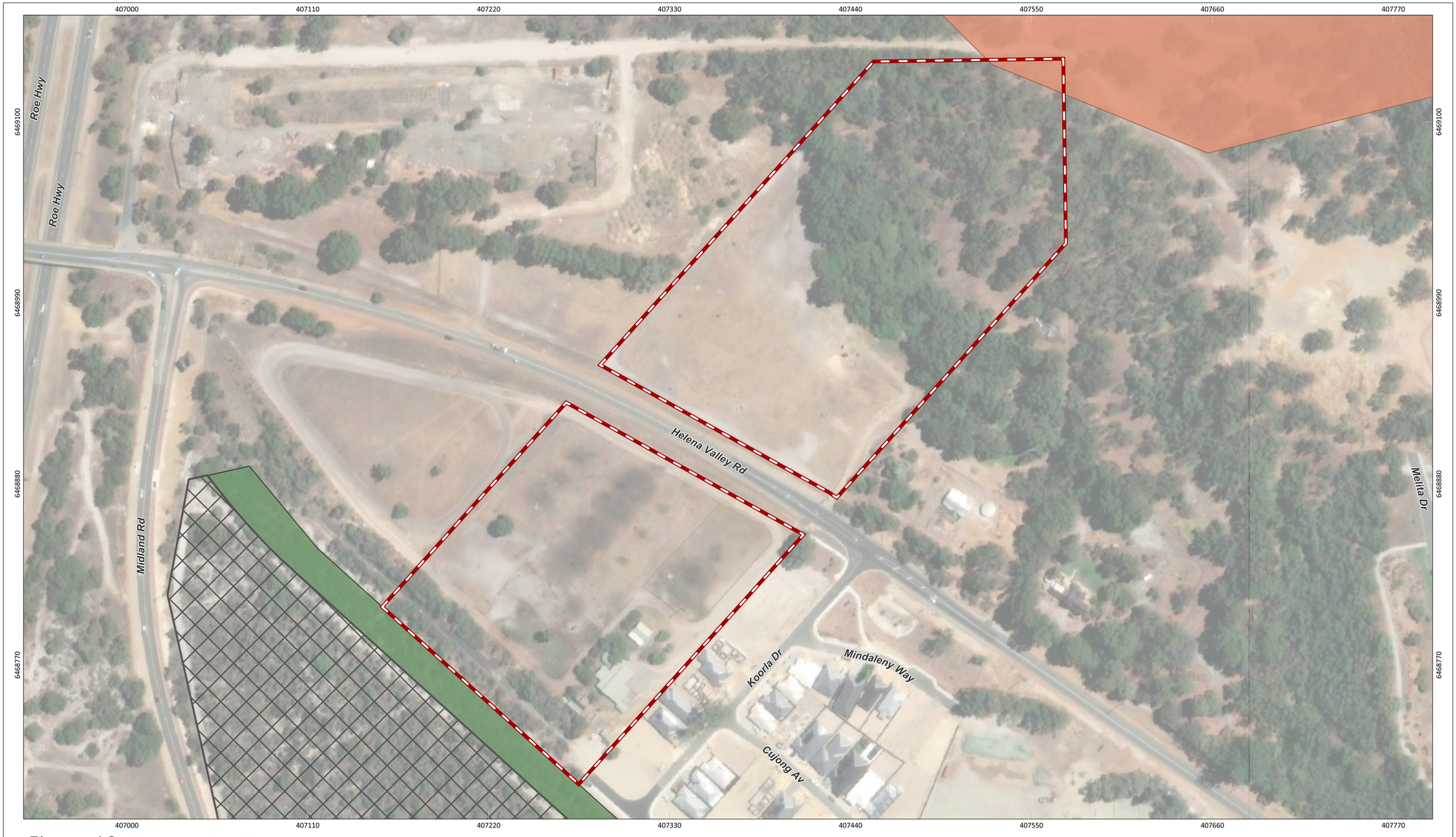

Figure 19: Conservation Areas

N

0 25 50 75 100 125 m

SCALE: 1:2,200	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Environmental Due Diligence Helena Valley Road Subdivision	
		CLIENT: Ingwe Helena Valley Pty Ltd	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50		PROJECT NUMBER: A25.232	VERSION: 2
DATA SOURCE		DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 10/12/2025

Legend

- Site Boundary
- Bush Forever Areas (DPLH-019)
- EPA Redbook (DBCA-029)
- Reserves (LGATE-227)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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3.9 Bushfire Risk

The Department of Fire and Emergency Services, Map of Bushfire Prone Areas (2024) indicates that the Site is mapped as 'Bushfire Fire Prone Area 2' (OBRM-021) (Figure 20). Bushfire planning has been undertaken to inform the LSP, and has been incorporated into the impact footprint. A separate Bushfire Management Plan (BMP) has been prepared to accompany the LSP.

3.10 Heritage

3.10.1 Native Title

The Site is located within the South West Settlement Native Title Determination Area (LGATE-066) and Whadjuk People Indigenous Land Use Agreement (ILUA) (WI2017/015) (LGATE-067).

3.10.2 Indigenous Heritage Places

A search of the Aboriginal Cultural Heritage Inquiry System (ACHIS) identified there are two registered Aboriginal Cultural Heritage (ACH) places mapped within the Site (DPLH-099) (PGV, 2023). These are summarised below in Table 3-18 and shown in Figure 21.

Table 3-18: Aboriginal Cultural Heritage Places within the Site

Site ID	Name	Type	Mapped Location
ACH-00003966	Holding paddock 1-4	Artefacts / Scatter	Through Lot 253, occupying almost a 90 m set back from the road, and an approximate area coverage of 1 ha.
ACH-00003758	Helena River	Ritual / Ceremonial; creation/ Dreaming Narrative; Repository / Storage Place	Covers the whole Site and greater surrounding area.

An Aboriginal Cultural Heritage Assessment has been commissioned by the proponent to investigate the condition and presence of the two registered Aboriginal Cultural Heritage Places, and to determine the potential direct or indirect impacts. At the time of writing this EAR, the results of this assessment are not yet available.

3.10.3 European Heritage Places

A review of Heritage Council datasets identified that there are no Heritage Agreements (DPLH-005) or European heritage places listed on the State Register (DPLH-006) within the Site.

The nearest State listed European heritage site is 0.9 km north of the Site; Belle View House and Stables, Bellevue (Place No. 3,836) (DPLH-006).

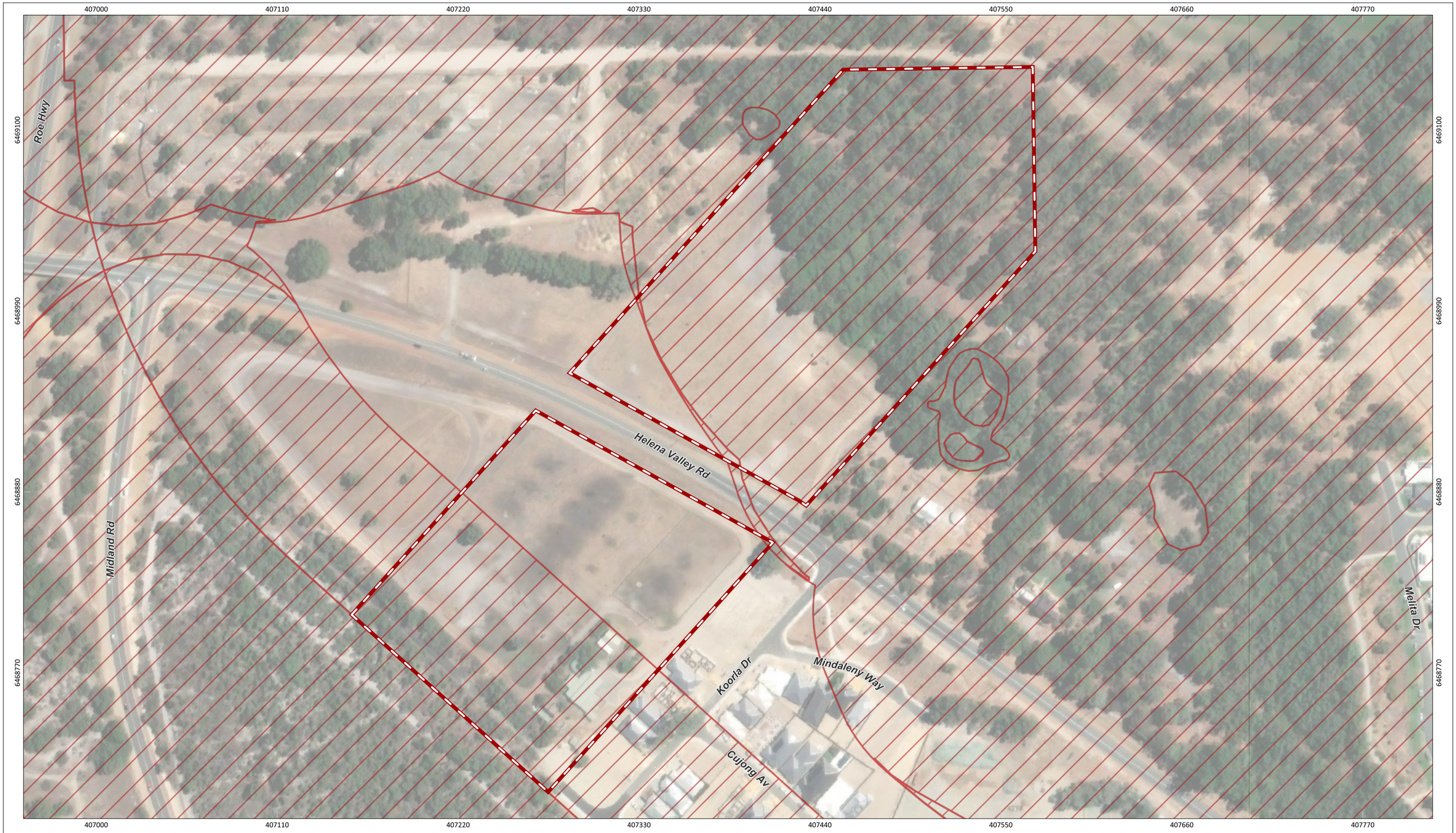

Figure 20: Bush Fire Prone Areas

N

0 25 50 75 100 125 m

PROJECT/REPORT NAME	Environmental Due Diligence Helena Valley Road Subdivision
SCALE	1:2,200
SHEET SIZE	A3 COLOUR
CLIENT	Ingwe Helena Valley Pty Ltd
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA Zone 50
PROJECT NUMBER	A25.232
VERSION	2
DATA SOURCE	
DRAWN BY / REVIEWED BY	West GIS / Stephen Moore
DATE	10/12/2025

Legend

- Site Boundary
- Bush Fire Prone Areas 2024 (OBRM-021)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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Figure 21: Aboriginal Heritage Site

N

0 25 50 75 100 125 m

SCALE: 1:2,200	SHEET SIZE: A3 COLOUR	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA Zone 50	PROJECT NUMBER: A25.232	VERSION: 2
DATA SOURCE:	DRAWN BY / REVIEWED BY: West GIS / Stephen Moore	DATE: 10/12/2025

PROJECT/REPORT NAME: Environmental Due Diligence
Helena Valley Road Subdivision

CLIENT: Ingwe Helena Valley Pty Ltd

Legend

- Site Boundary
- Aboriginal Cultural Heritage - Register (DPLH-099)

No	Description	Drawn	Approved	Date
A	Original issue	WG	SM	10/12/2025

NOTES:

Base map ESRI Imagery.

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