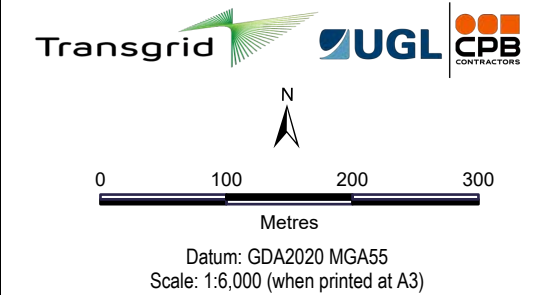
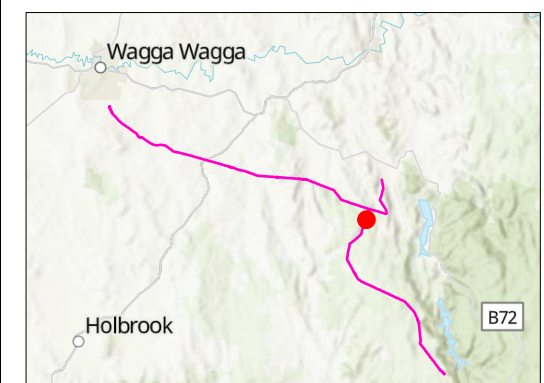


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Legend

-  HLW Tower Centres - Final Layout (Blue Text)
-  Tower Centres - EIS Approved Layout (Red Text)
-  HLW Alignment Centreline - Final Layout
-  Alignment Centreline - EIS Approved Layout
-  Subject to Consistency assessment and further update
-  HLW TCZ
-  EIS Approved TCZ
-  HLW ECZ
-  EIS Approved ECZ
-  EIS Project Footprint V13.2



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REVIEWED:	GK	
VERIFIED:	EK	
APPROVED:	AS	
REV:	L	
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DESCRIPTION:	Issued for Internal Review	
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Transgrid

UGL

CPB

CONTRACTORS

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200

300

Metres

Datum: GDA2020 MGA55

Scale: 1:6,000 (when printed at A3)

Legend

HLW TCZ

EIS Approved TCZ

HLW ECZ

EIS Project Footprint V13.2

Wagga Wagga

Holbrook

B72

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APPROVED:AS

REV:L

DATE:23/02/2026

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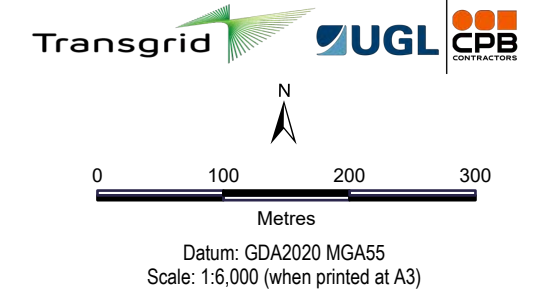
HLW Final Layout Plans

REV L

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Legend

-  Tower Centres - Final Layout (Blue Text)
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-  HLW Alignment Centreline - Final Layout
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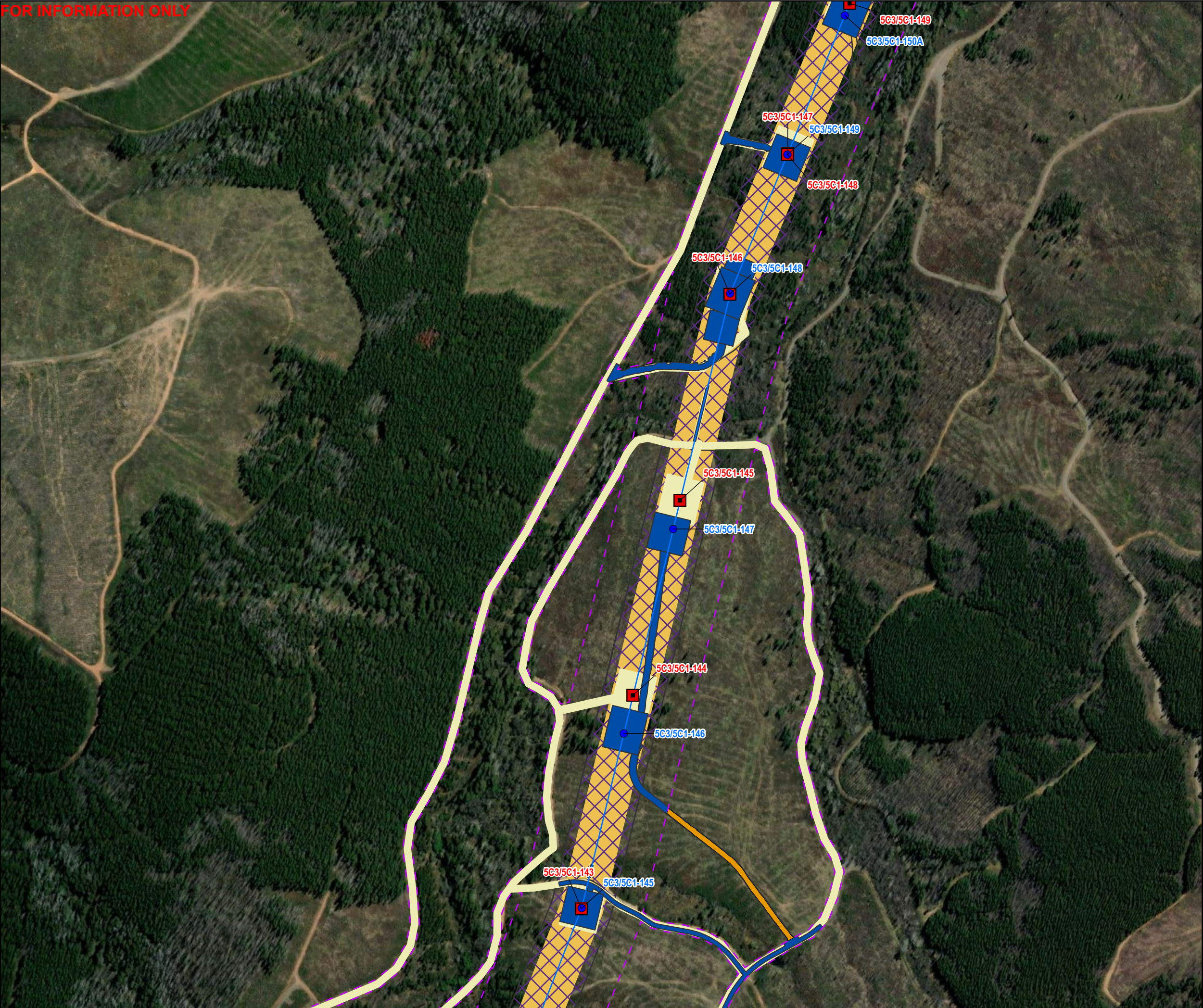


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VERIFIED:	EK	
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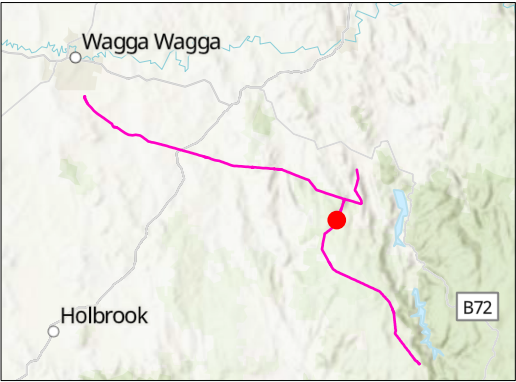
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Legend

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- HLW Alignment
Centreline - Final Layout
- Alignment Centreline -
EIS Approved Layout
- Subject to Consistency
assessment and
further update
- HLW TCZ
- EIS Approved TCZ
- HLW ECZ
- EIS Approved ECZ
- EIS Project Footprint
V13.2



Wagga Wagga

Holbrook

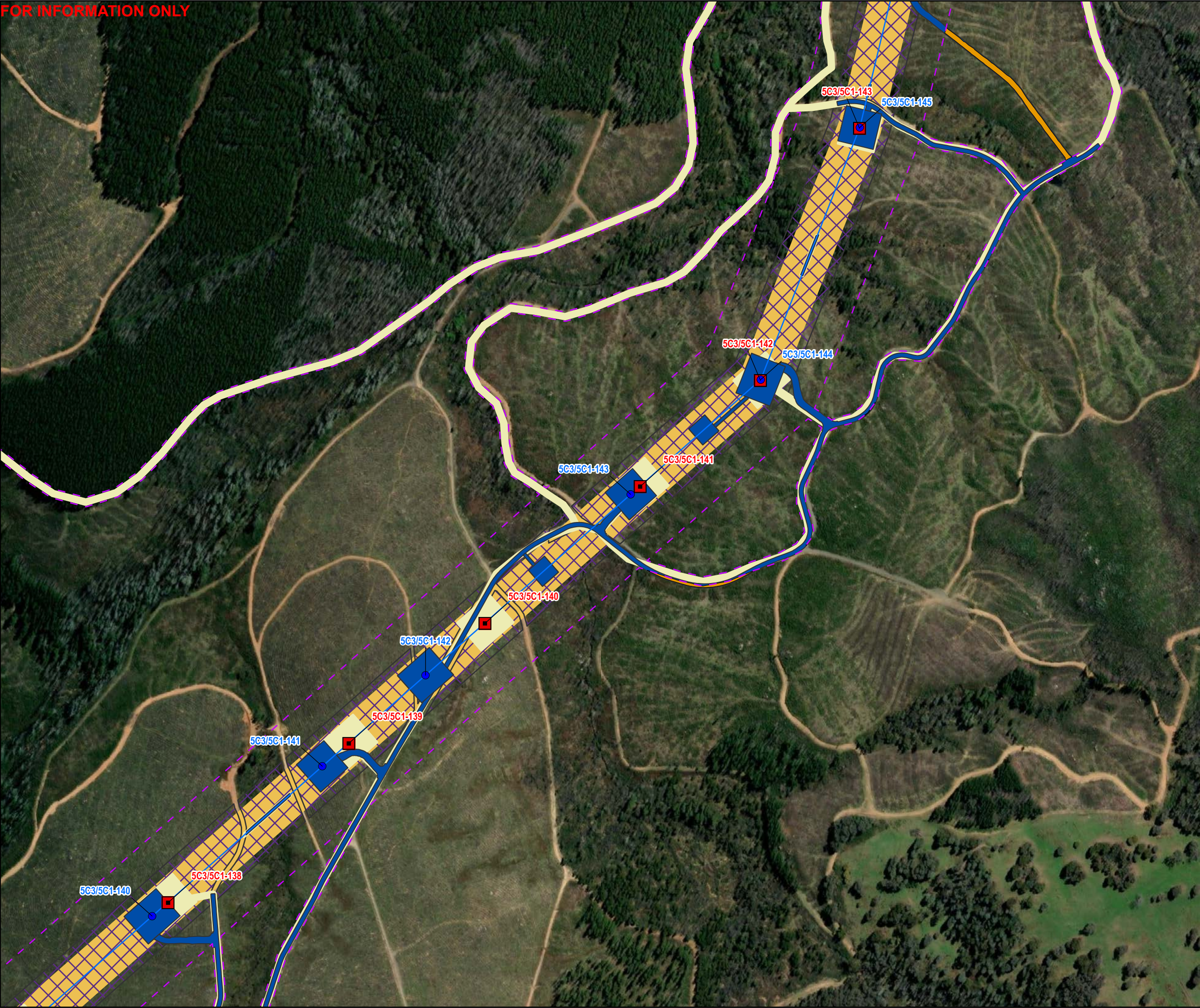
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REV:	L
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Metres

Datum: GDA2020 MGA55
Scale: 1:6,000 (when printed at A3)

Legend

 HLW Tower Centres - Final Layout (Blue Text)

 Tower Centres - EIS Approved Layout (Red Text)

 HLW Alignment Centreline - Final Layout

 Alignment Centreline - EIS Approved Layout

 Subject to Consistency assessment and further update

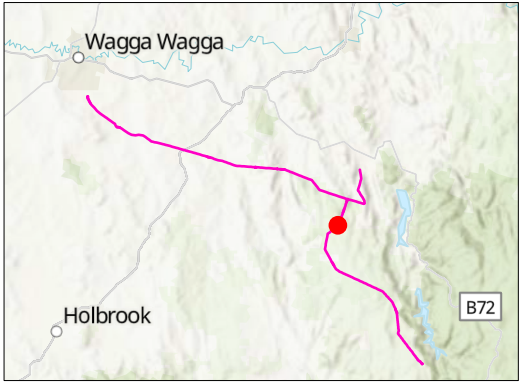
 HLW TCZ

 EIS Approved TCZ

 HLW ECZ

 EIS Approved ECZ

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Wagga Wagga

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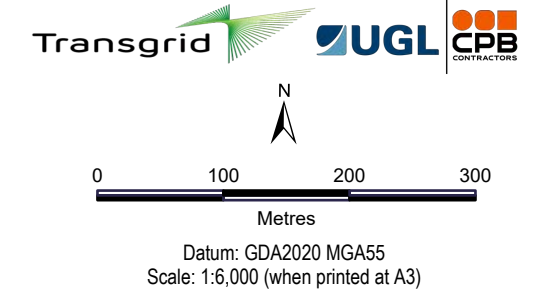
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HLW Final Layout Plans

REV L

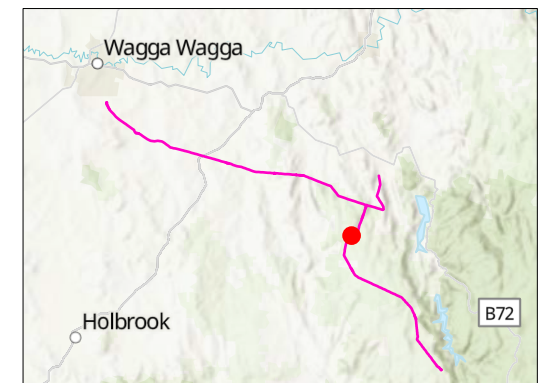
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Legend

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|---|--|---|-------------------------------------|
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|  | Tower Centres - EIS Approved Layout (Red Text) |  | HLW ECZ |
|  | HLW Alignment Centreline - Final Layout |  | HLW Hazard Tree Zone (HTZ) |
|  | Alignment Centreline - EIS Approved Layout |  | EIS Approved Hazard Tree Zone (HTZ) |
|  | Subject to Consistency assessment and further update |  | EIS Project Footprint V13.2 |



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Datum: GDA2020 MGA55
 Scale: 1:6,000 (when printed at A3)

Legend

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| | Alignment Centreline - EIS Approved Layout |  | EIS Approved ECZ |
|  | Subject to Consistency assessment and further update |  | HLW Hazard Tree Zone (HTZ) |
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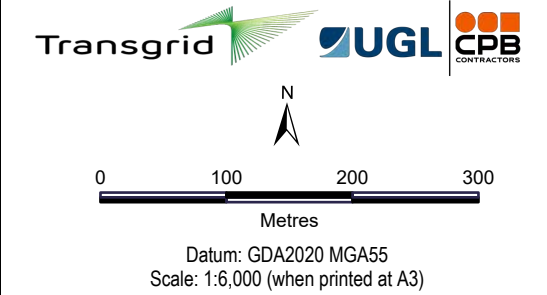
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Legend

-  HLW Tower Centres - Final Layout (Blue Text)
-  Tower Centres - EIS Approved Layout (Red Text)
-  HLW Alignment Centreline - Final Layout
-  Alignment Centreline - EIS Approved Layout
-  HLW TCZ
-  EIS Approved TCZ
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-  EIS Project Footprint V13.2



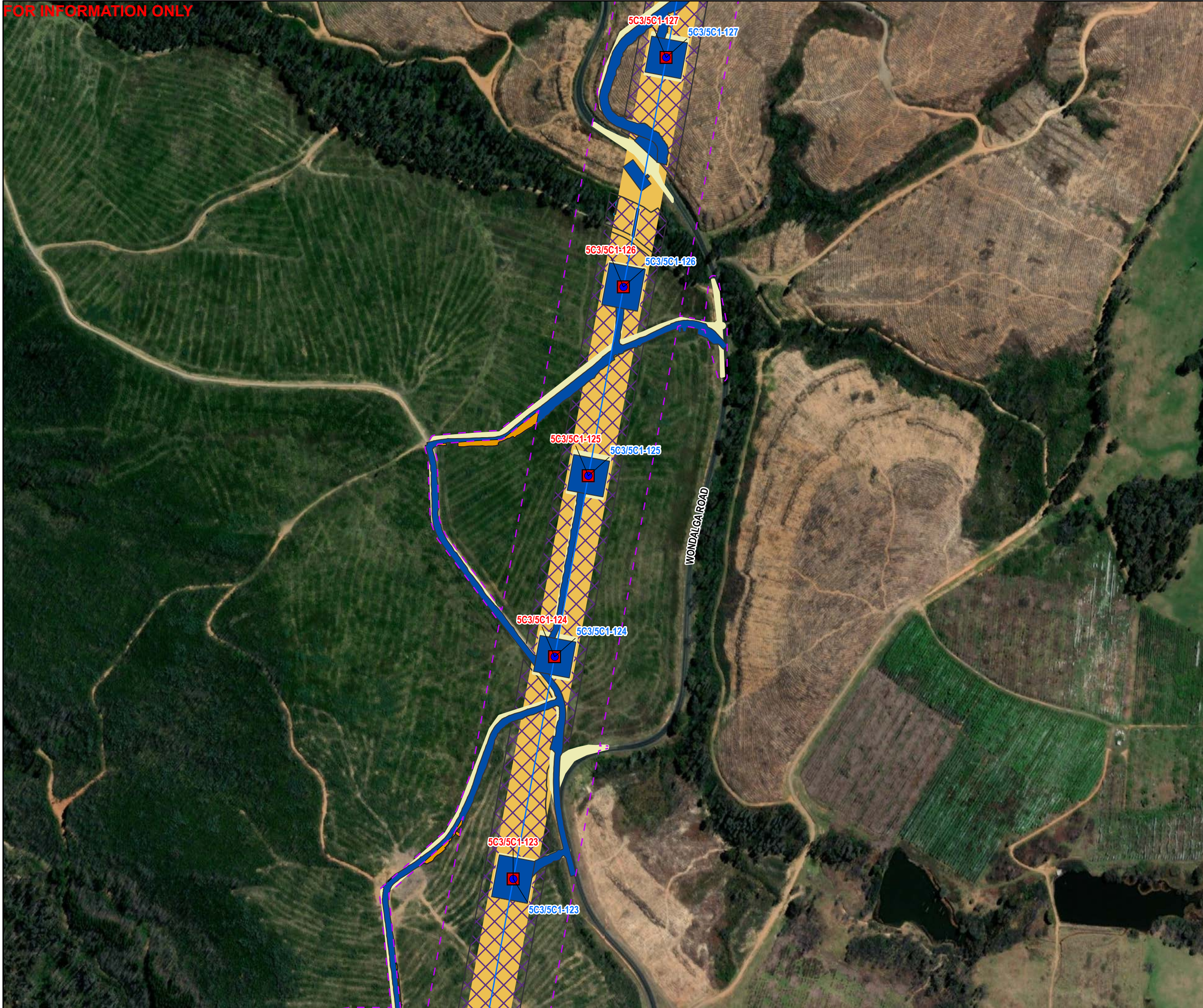
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HLW Final Layout Plans
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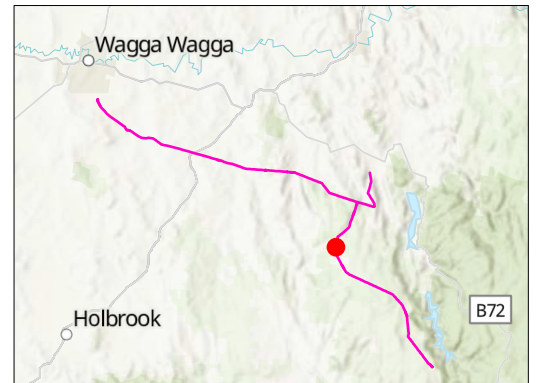

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Legend

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|  | Alignment Centreline - EIS Approved Layout |  | HLW Hazard Tree Zone (HTZ) |
|  | Subject to Consistency assessment and further update |  | EIS Approved Hazard Tree Zone (HTZ) |
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Datum: GDA2020 MGA55
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Legend

 Camps and Laydowns

 HLW TCZ

 EIS Approved TCZ

 HLW ECZ

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Wagga Wagga
Holbrook
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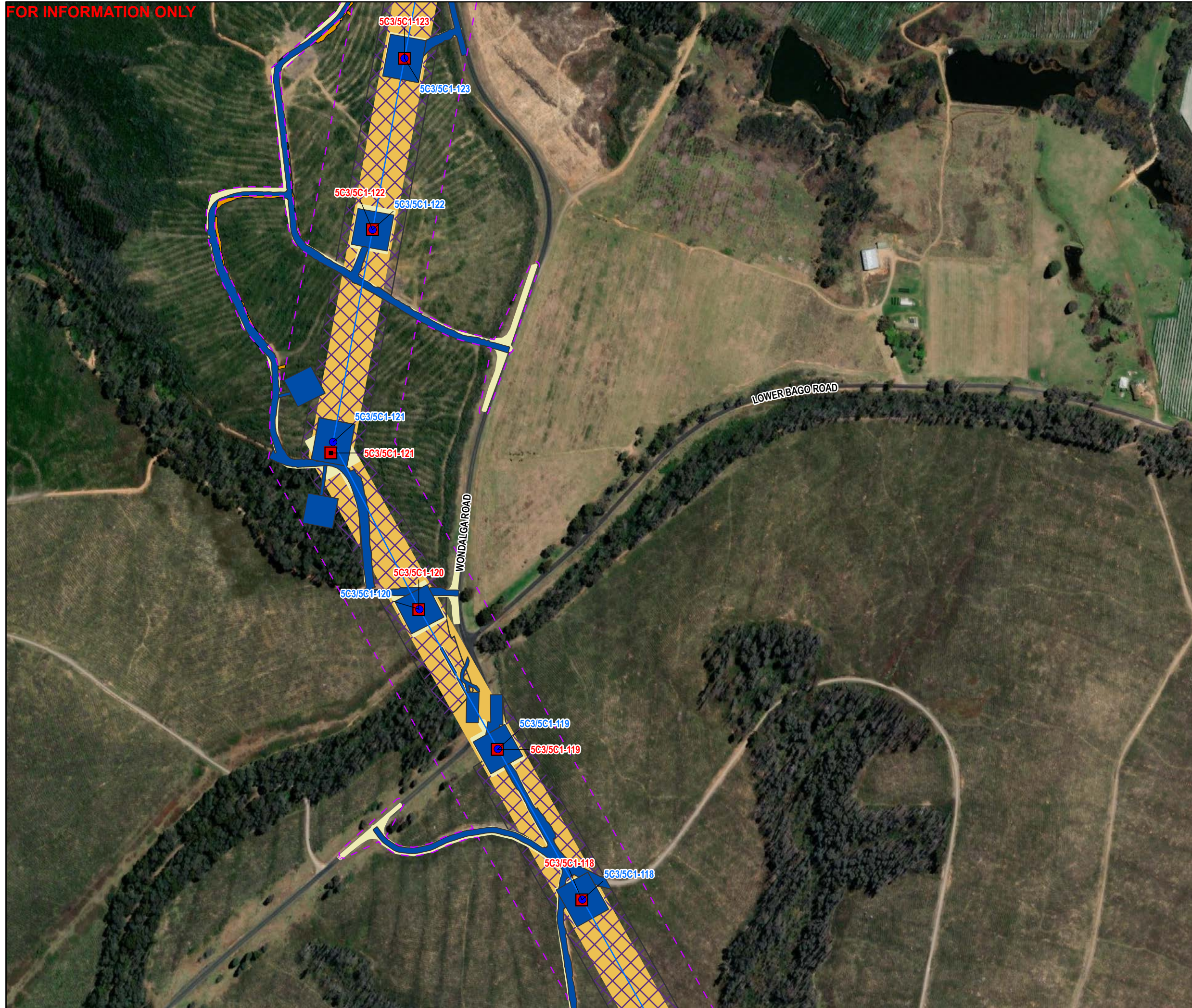
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HLW Final Layout Plans
REV L
Map 94 of 142

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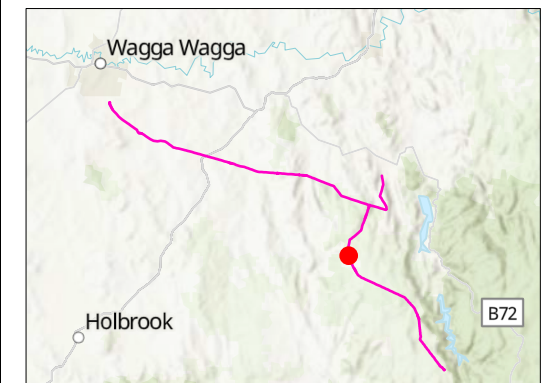




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Legend

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-  Tower Centres - EIS Approved Layout (Red Text)
-  HLW Alignment Centreline - Final Layout
-  Alignment Centreline - EIS Approved Layout
-  Subject to Consistency assessment and further update
-  HLW TCZ
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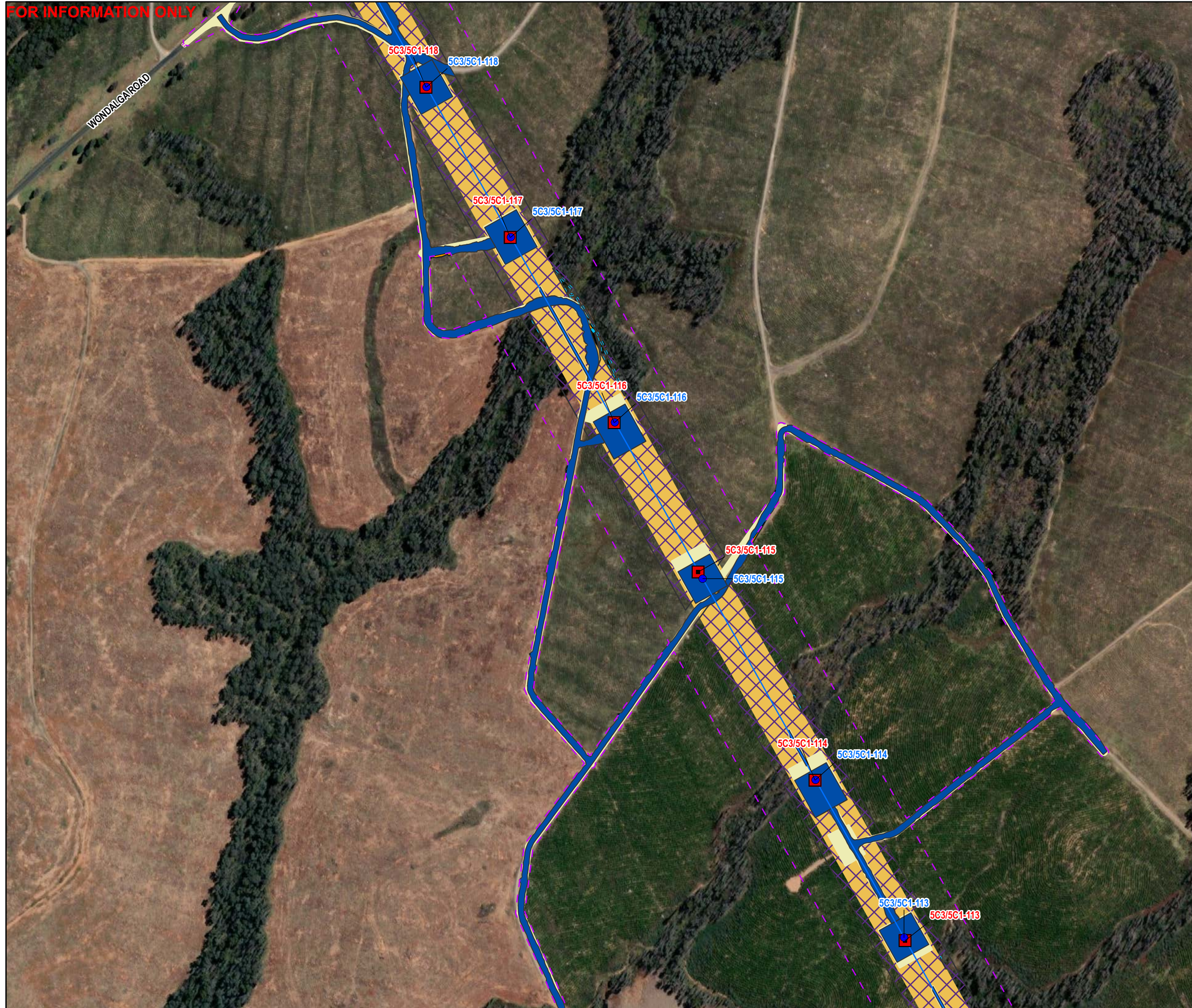
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Map 95 of 142

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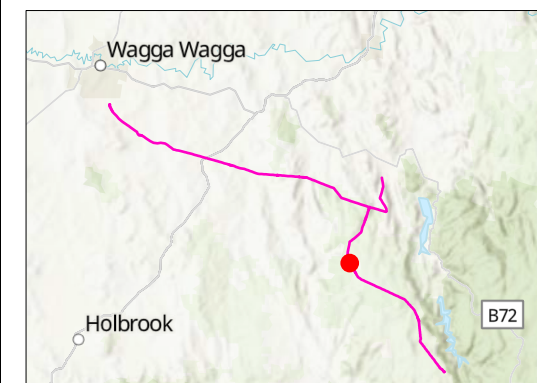
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|  | HLW Alignment Centreline - Final Layout |  | HLW ECZ |
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|  | Subject to Consistency assessment and further update |  | HLW Hazard Tree Zone (HTZ) |
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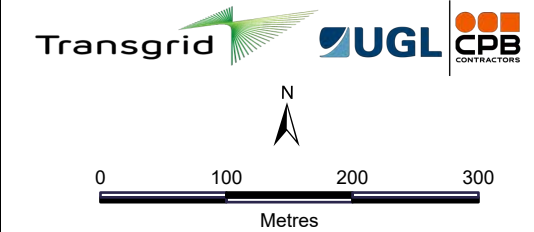


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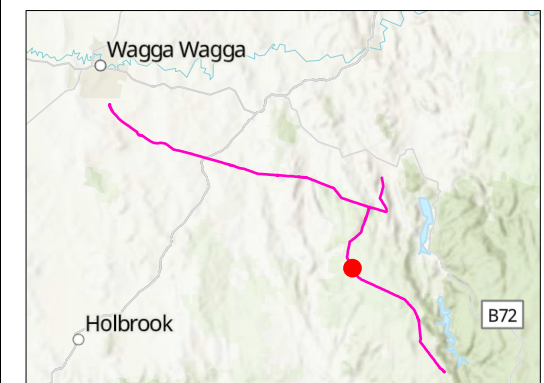
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|  Tower Centres - EIS Approved Layout (Red Text) |  EIS Approved TCZ |
| HLW Alignment Centreline - Final Layout |  HLW ECZ |
|  Alignment Centreline - EIS Approved Layout |  EIS Approved ECZ |
|  Subject to Consistency assessment and further update |  HLW Hazard Tree Zone (HTZ) |
| |  EIS Approved Hazard Tree Zone (HTZ) |
| |  EIS Project Footprint V13.2 |



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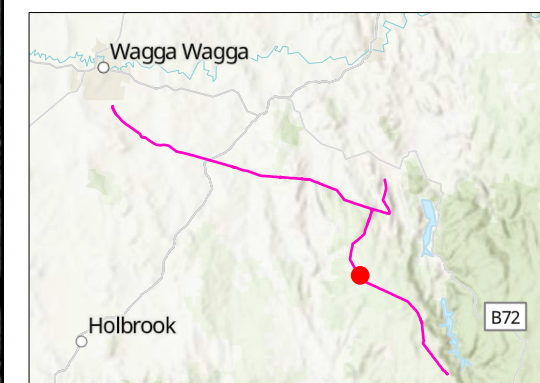
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Legend

-  HLW Tower Centres - Final Layout (Blue Text)
-  Tower Centres - EIS Approved Layout (Red Text)
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-  Alignment Centreline - EIS Approved Layout
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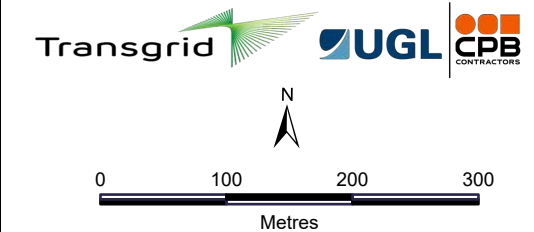


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VERIFIED:	EK	
APPROVED:	AS	
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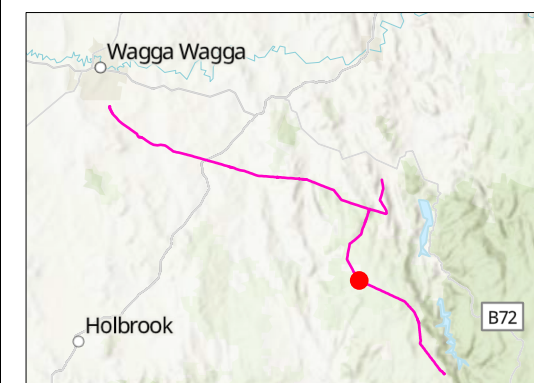
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| Tower Centres - EIS Approved Layout (Red Text) | EIS Approved TCZ |
| HLW Alignment Centreline - Final Layout | HLW ECZ |
| Alignment Centreline - EIS Approved Layout | EIS Approved ECZ |
| Subject to Consistency assessment and further update | HLW Hazard Tree Zone (HTZ) |
| | EIS Approved Hazard Tree Zone (HTZ) |
| | EIS Project Footprint V13.2 |



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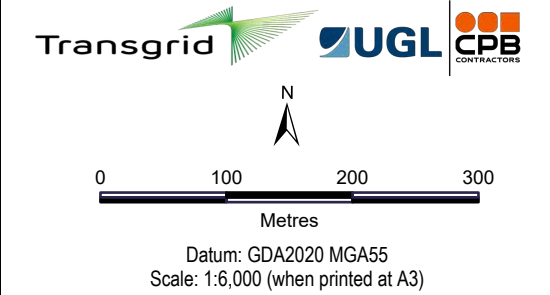
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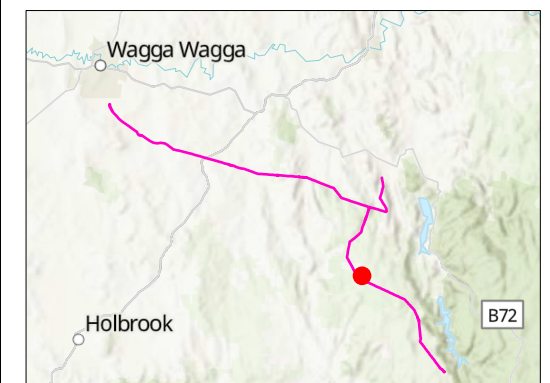
HLW Final Layout Plans
REV L
Map 99 of 142

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Legend

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|  | HLW Tower Centres - Final Layout (Blue Text) |  | HLW TCZ |
|  | Tower Centres - EIS Approved Layout (Red Text) |  | EIS Approved TCZ |
| | HLW Alignment Centreline - Final Layout |  | HLW ECZ |
| | Alignment Centreline - EIS Approved Layout |  | EIS Approved ECZ |
|  | Subject to Consistency assessment and further update |  | HLW Hazard Tree Zone (HTZ) |
| | |  | EIS Approved Hazard Tree Zone (HTZ) |
| | |  | EIS Project Footprint V13.2 |



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DATE:	23/02/2026
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DOCUMENT NO:	

HLW Final Layout Plans
REV L
Map 100 of 142

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BATLOW ROAD

5C3/5C1-101
5C3/5C1-101

5C3/5C1-100

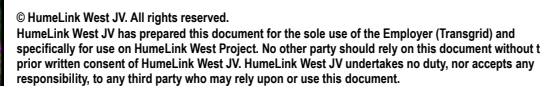
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5C3/5C1-097

5C3/5C1-96
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5C3/5C1-95
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REVIEWED:	GK	
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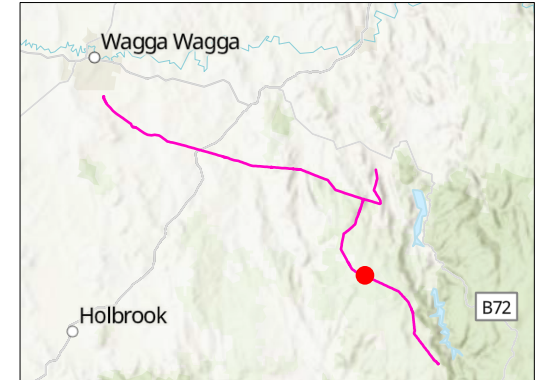
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Metres

Datum: GDA2020 MGA55
Scale: 1:6,000 (when printed at A3)

- Legend**
- HLW Tower Centres -
 - Final Layout (Blue Text)
 - Tower Centres - EIS
 - Approved Layout (Red Text)
 - HLW Alignment
 - Centreline - Final Layout
 - Alignment Centreline - EIS Approved Layout
 - Subject to Consistency assessment and further update
 - HLW TCZ
 - EIS Approved TCZ
 - HLW ECZ
 - EIS Approved ECZ
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REV L
Map 102 of 142

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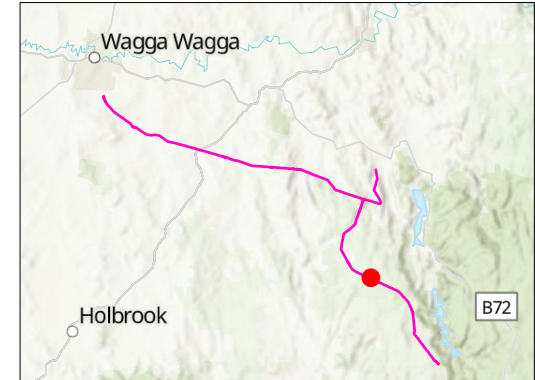
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Metres

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- Legend**
- HLW Tower Centres - Final Layout (Blue Text)
 - Tower Centres - EIS Approved Layout (Red Text)
 - HLW Alignment Centreline - Final Layout
 - Alignment Centreline - EIS Approved Layout
 - Camps and Laydowns
 - Subject to Consistency assessment and further update
 - HLW TCZ
 - EIS Approved TCZ
 - HLW ECZ
 - EIS Approved ECZ
 - EIS Project Footprint V13.2

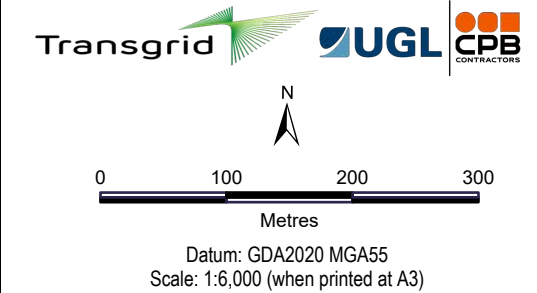


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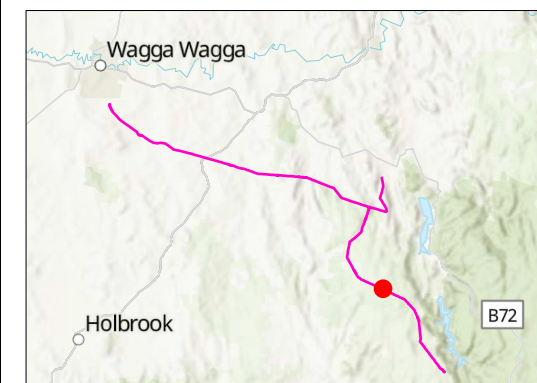
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Legend

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|---|--|---|--|
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Final Layout (Blue
Text) |  | HLW TCZ |
|  | Tower Centres - EIS
Approved Layout (Red
Text) |  | EIS Approved TCZ |
|  | HLW Alignment
Centreline - Final
Layout |  | HLW ECZ |
|  | Alignment Centreline -
EIS Approved Layout |  | EIS Approved ECZ |
|  | Camps and Laydowns |  | HLW Hazard Tree
Zone (HTZ) |
| | |  | EIS Approved Hazard
Tree Zone (HTZ) |
| | |  | EIS Project Footprint
V13.2 |

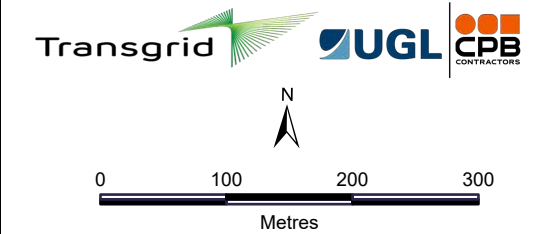


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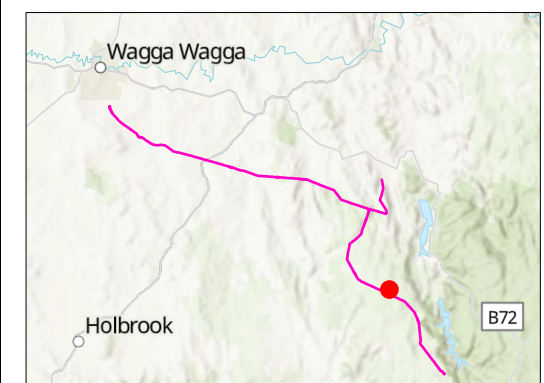
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|  | Tower Centres - EIS Approved Layout (Red Text) |  | EIS Approved TCZ |
| | |  | HLW ECZ |
| | |  | EIS Approved ECZ |
|  | HLW Alignment Centreline - Final Layout |  | HLW Hazard Tree Zone (HTZ) |
|  | Alignment Centreline - EIS Approved Layout |  | EIS Approved Hazard Tree Zone (HTZ) |
|  | Subject to Consistency assessment and further update |  | EIS Project Footprint V13.2 |



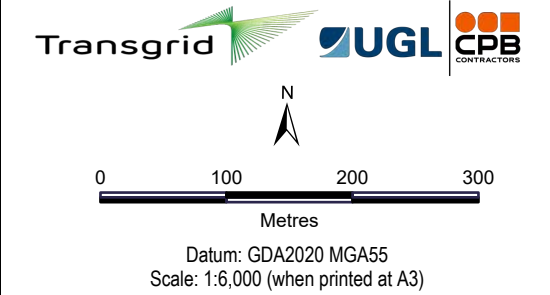
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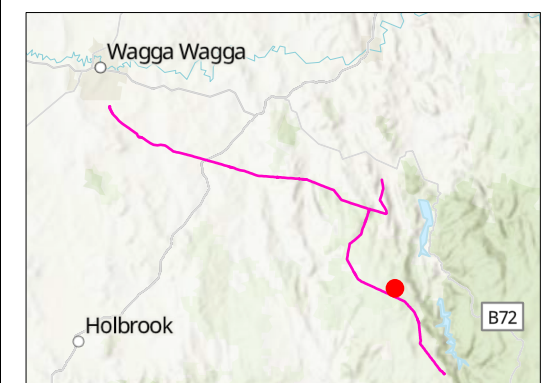
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REV L
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Legend

-  HLW TCZ
 EIS Approved TCZ
 HLW ECZ
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Metres

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Legend

 HLW TCZ

 EIS Approved TCZ

 HLW ECZ

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Map 107 of 142

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Metres

Datum: GDA2020 MGA55

Scale: 1:6,000 (when printed at A3)

Legend

HLW TCZ

EIS Approved TCZ

HLW ECZ

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Wagga Wagga

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Map 108 of 142

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HLW TCZ

EIS Approved TCZ

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Map 109 of 142

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Legend

HLW TCZ

HLW ECZ

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Wagga Wagga

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Map 110 of 142

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Map 111 of 142

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Legend

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World Hillshade: Esri, USGS

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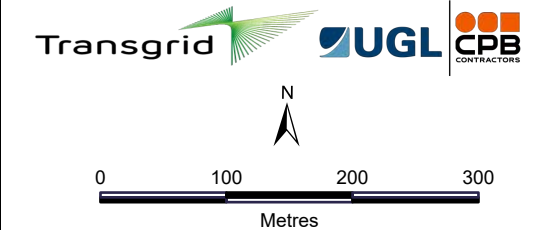
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Map 113 of 142

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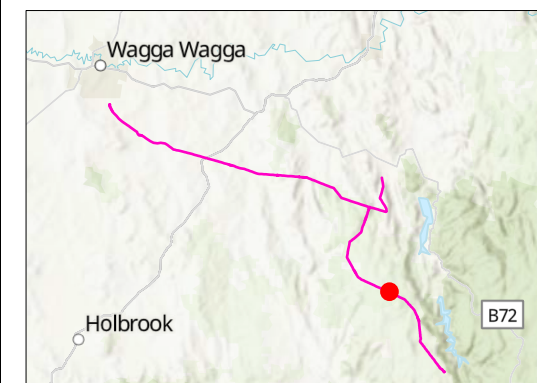
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Approved Layout (Red
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|  | HLW Alignment
Centreline - Final
Layout |  | EIS Approved TCZ |
|  | Alignment Centreline -
EIS Approved Layout |  | HLW Hazard Tree
Zone (HTZ) |
|  | Subject to Consistency
assessment and
further update |  | EIS Approved Hazard
Tree Zone (HTZ) |
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REV L
Map 114 of 142

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Metres

Datum: GDA2020 MGA55
Scale: 1:6,000 (when printed at A3)

- Legend
- HLW Tower Centres - Final Layout (Blue Text)

Tower Centres - EIS Approved Layout (Red Text)

HLW Alignment Centreline - Final Layout

Alignment Centreline - EIS Approved Layout

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HLW TCZ

EIS Approved TCZ

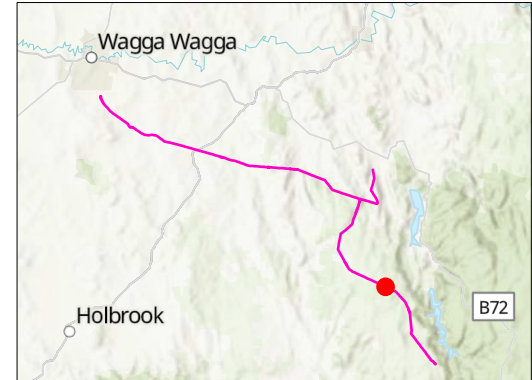
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HLW Hazard Tree Zone (HTZ)

EIS Approved Hazard Tree Zone (HTZ)

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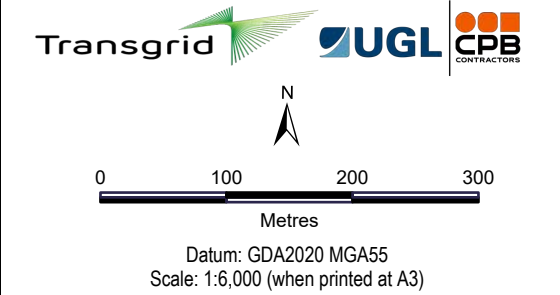
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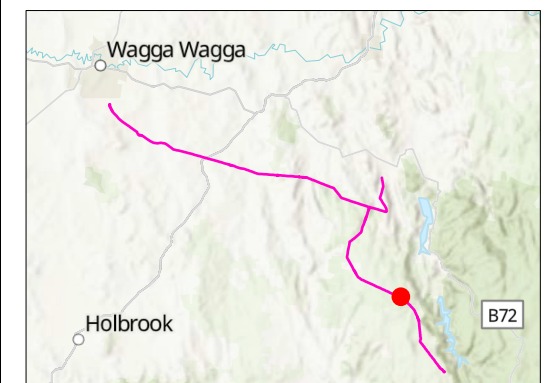
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REV L
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Legend

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| HLW Tower Centres - Final Layout (Blue Text) | HLW TCZ |
| Tower Centres - EIS Approved Layout (Red Text) | EIS Approved TCZ |
| HLW Alignment Centreline - Final Layout | HLW ECZ |
| Alignment Centreline - EIS Approved Layout | EIS Approved ECZ |
| Subject to Consistency assessment and further update | HLW Hazard Tree Zone (HTZ) |
| | EIS Approved Hazard Tree Zone (HTZ) |
| | EIS Project Footprint V13.2 |



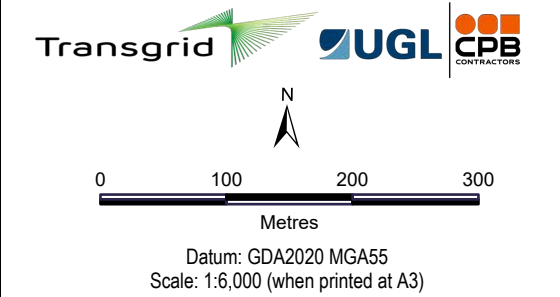
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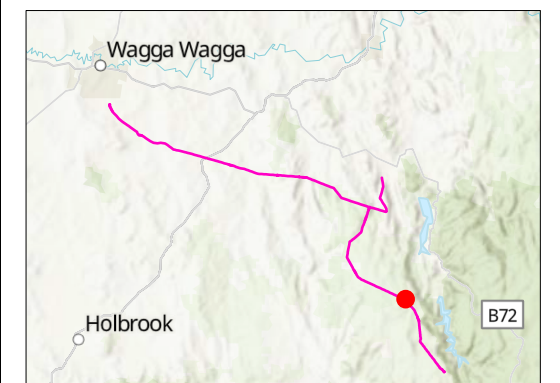
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Legend

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|  | Tower Centres - EIS Approved Layout (Red Text) |  | EIS Approved TCZ |
| | HLW Alignment Centreline - Final Layout |  | HLW ECZ |
| | Alignment Centreline - EIS Approved Layout |  | EIS Approved ECZ |
|  | Subject to Consistency assessment and further update |  | HLW Hazard Tree Zone (HTZ) |
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5C3/5C1-065

5C3/5C1-64

5C3/5C1-064

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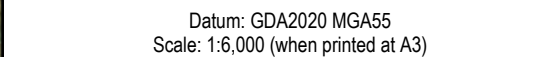
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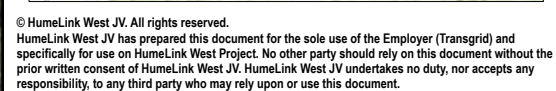
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	Alignment Centreline - EIS Approved Layout		EIS Approved ECZ
	Subject to Consistency assessment and further update		HLW Hazard Tree Zone (HTZ)
			EIS Approved Hazard Tree Zone (HTZ)
			EIS Project Footprint V13.2



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Tower Centres - EIS Approved Layout (Red Text)

HLW Alignment Centreline - Final Layout

Alignment Centreline - EIS Approved Layout

Subject to Consistency assessment and further update

HLW TCZ

EIS Approved TCZ

HLW ECZ

EIS Approved ECZ

HLW Hazard Tree Zone (HTZ)

EIS Approved Hazard Tree Zone (HTZ)

EIS Project Footprint V13.2

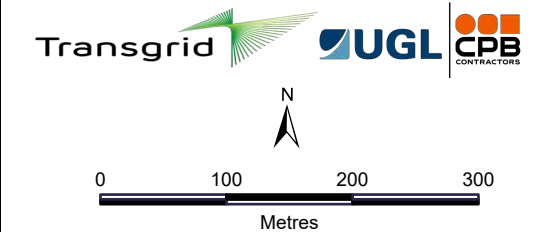
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| | Alignment Centreline - EIS Approved Layout |  | EIS Approved ECZ |
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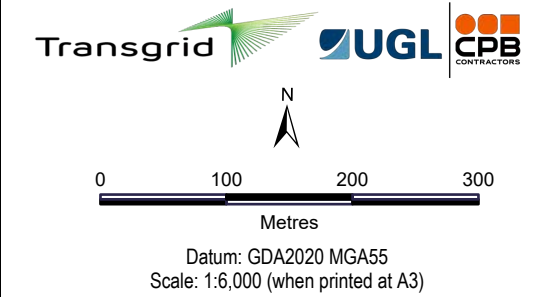
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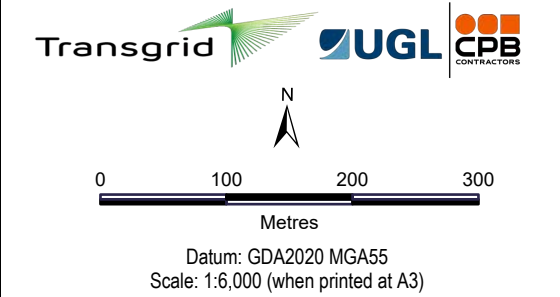


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-  HLW Alignment Centreline - Final Layout
-  Alignment Centreline - EIS Approved Layout
-  HLW TCZ
-  EIS Approved TCZ
-  HLW ECZ
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-  Orchid Zones
-  EIS Project Footprint V13.2

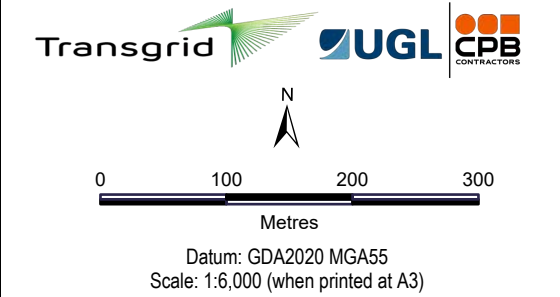


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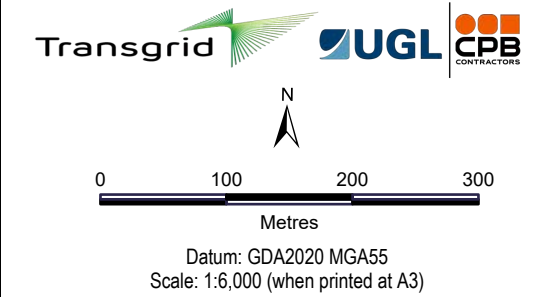


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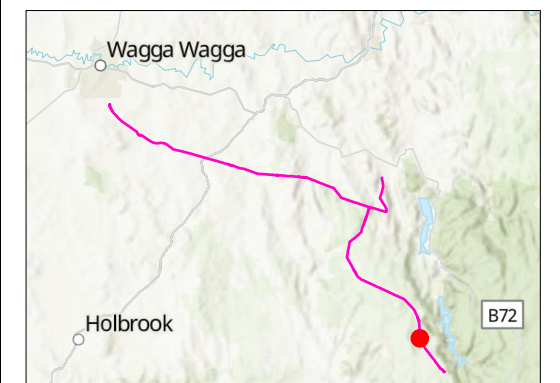
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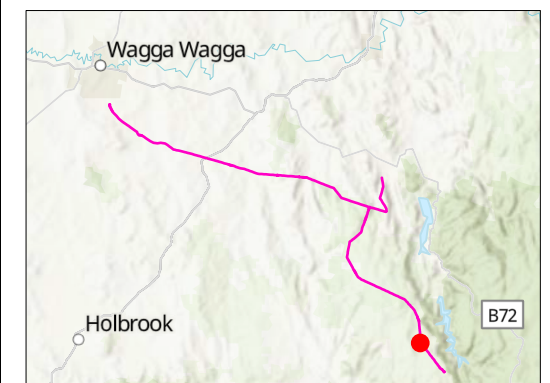
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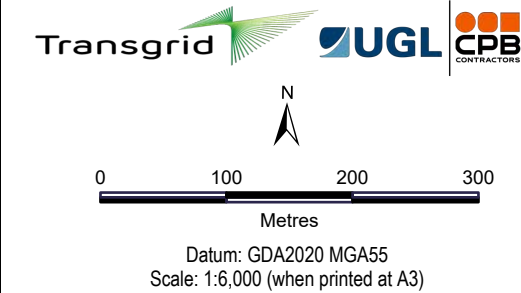
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 HLW ECZ

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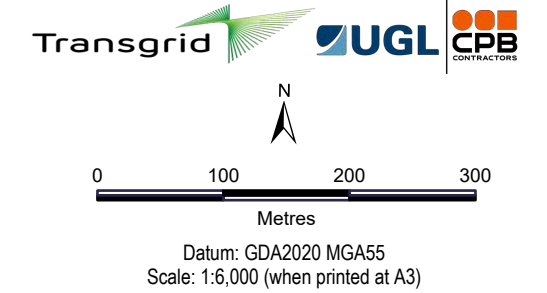


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Wagga Wagga

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Wagga Wagga

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Legend

HLW TCZ

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HLW ECZ

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Wagga Wagga

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HLW TCZ

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Wagga Wagga

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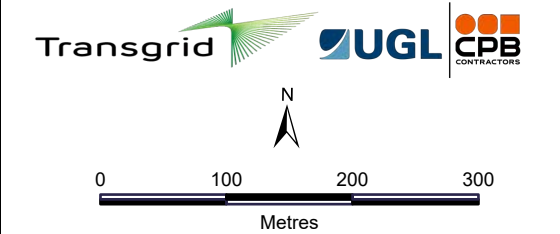
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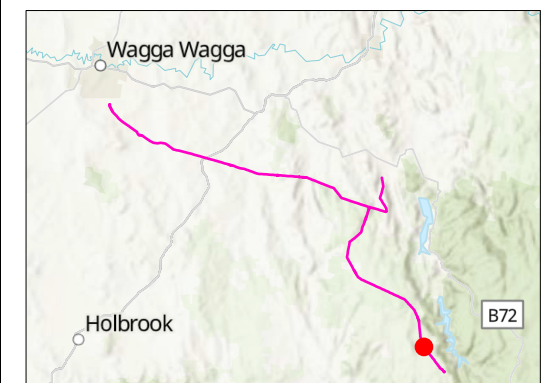
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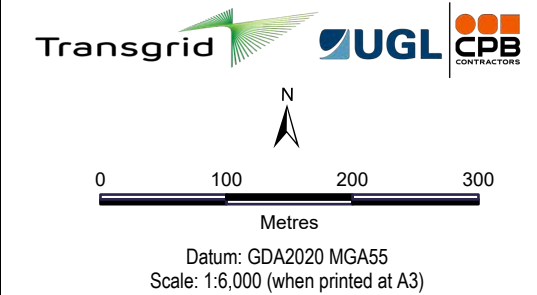


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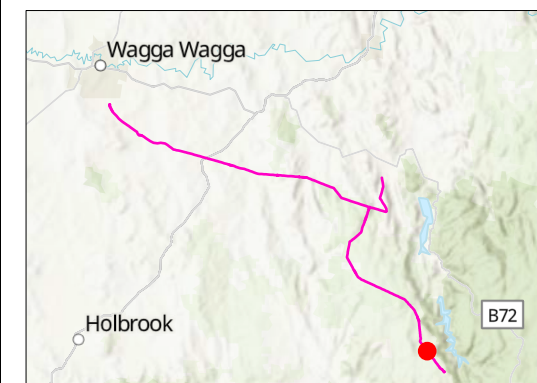
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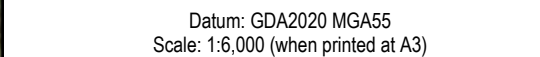
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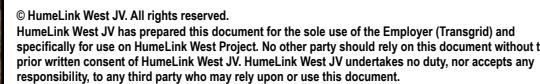
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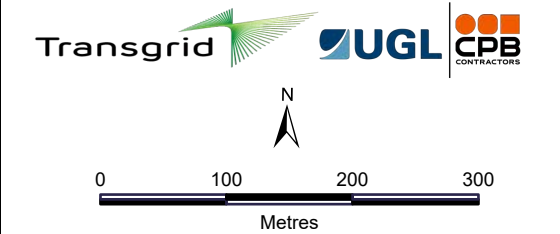
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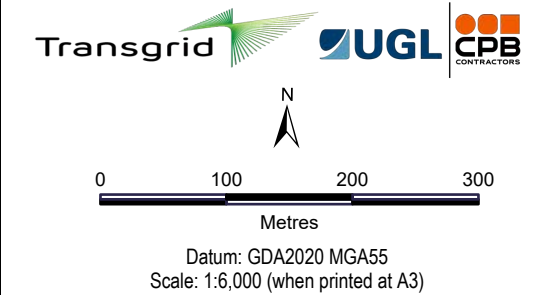


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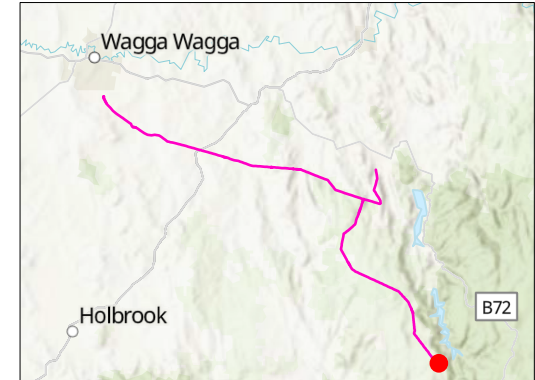
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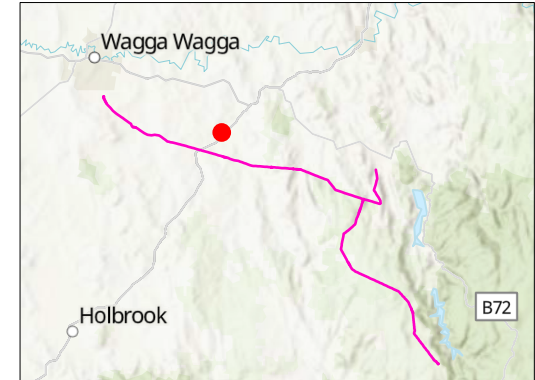
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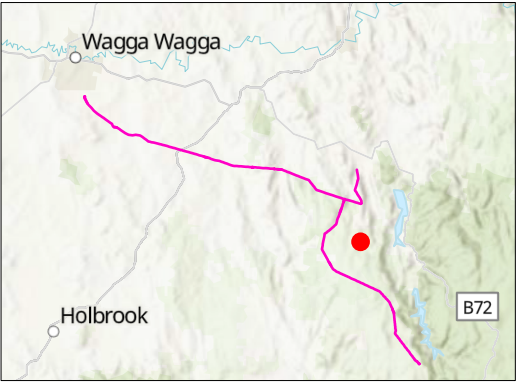
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Annexure B

Clearing Protocol

HumeLink West

Document Number: HLW-HLJV-PRW-ENM-PLN-000001B

Revision: 5

TransGrid
Date 03/09/2025

Document Control

Approvals

Title	HumeLink West Clearing Protocol
Endorsed by Environment Representative	Derek Low (Wolfpeak Ltd Pty)
Approved on behalf of HLWJV by	Tim Burns
Signed	
Dated	

Version Control

Revision	Date	Description	Approval
A	30/05/2024	Initial Draft for TG Review	Jim Maniord
B	3/07/2024	Updates following receipt of UMMs and HLW mapping files	Paul Dudding
C	19/08/2024	Updates following TG review comments	Paul Dudding
D	3/09/2024	Updates following TG review comments v2	Tim Burns
1	20/12/2024	Updates following receipt of final MCoAs and draft CoMA	Tim Burns
2	4/06/2025	Amendments following TG, ER, FCNSW & CPHR review	Tim Burns
3	28/07/2025	Amendments following ER & CPHR review	Tim Burns
4	08/08/2025	Amendments following CPHR comments	Tim Burns
5	3/09/2025	Amendments following DPHI review	Tim Burns

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Attachments

- Attachment 1 Pre-clearing scoping assessment checklist
- Attachment 2 Final pre-clearing checklist
- Attachment 3 Fauna handling record sheet

1. Introduction

1.1. Context

This Clearing Protocol (the protocol) forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). The protocol has been prepared to outline and describe how the UGL Limited and CPB Contractors Joint Venture (HLWJV), during the construction of HLW, will comply with the Minister's Conditions of Approval (MCoA), the Updated Environmental Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under MCoA A2.

1.2. Purpose and objective

This protocol describes the HLWJV protocol for clearing works during construction of HLW to reduce the immediate impact of habitat loss caused to flora and fauna. The strategy aims to address relevant actions and mitigation measures outlined in the following documents:

- Updated mitigation measures B1, B3, B4, B13, B20, B21, B33, B34 and B35 of the *HumeLink Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Minister's Conditions of Approval (MCoA) A2.
- Federal Minister for Water and Environment Condition of Ministerial Approval.

1.3. Permits and licences

The permits and licences relevant to this protocol include:

- All Project Ecologists must, at a minimum, hold a Scientific Licence under Part 2 of the *Biodiversity Conservation Act 2016* (including Animal Ethics Approval) for fauna handling, rescue and all additional survey works.
- Where rescued fauna requires rehabilitation and care, only wildlife rehabilitation centres authorised under Part 2 of the *Biodiversity Conservation Act 2016* may be utilised.
- Clearing works to be managed and monitored using internal HLWJV Clearing Permits.

1.4. Consultation

Consultation undertaken in preparation of this protocol is summarised in Annexure J: Consultation Summary and Section 4 of the HLW BMP. If consultation with relevant stakeholders or regulators is required to assess the efficacy of mitigation strategies detailed in this protocol, these will be undertaken in accordance with Section 8.3 of the HLW BMP.

2. Preparation

2.1. Key Fish Habitat Assessment

In the event that any further or alternative waterway crossings are required in areas mapped as Key Fish Habitat (KFH) or indicative threatened species distribution mapping, a KFH Assessment will be undertaken at the proposed crossing location. The assessment approach will be consistent with that used for the EIS and will address any potential impacts to threatened aquatic species or KFH. This assessment may be desktop based if suitable levels of information are available but may also recommend a field inspection if threatened aquatic species or sensitive aquatic habitat features are considered to have a moderate or higher likelihood of occurring, in order to guide micro-siting and design/mitigation measures to minimise impacts to aquatic environments.

Aquatic biodiversity surveys will be conducted at Class 1 crossing locations and Key Fish Habitat prior to construction commencing (pending landowner approval). Data obtained during pre-construction aquatic surveys will assess habitat quality and health of the aquatic and riparian environment, including:

- Channel morphology and general habitat value.
- Type and condition of riparian vegetation.
- Presence, type and condition of aquatic macrophytes.
- Flow types (pools, riffles, runs).
- Type of riverbed substrate and presence of bars.
- Bed and bank stability.
- Count and description of habitat features such as snags, woody debris, vegetation and undercuts.
- Visible signs of habitat disturbance.
- Presence/absence of exotic or pest flora.

An Aquatic Biodiversity Survey Report will be completed following pre-construction surveys. Data obtained during the consultation and pre-construction survey period will be utilised to identify the potential for threatened species to be present within impacted waterways and mitigate impacts where possible.

The report will include at minimum:

- Findings of the pre-construction aquatic biodiversity surveys, including aquatic habitat quality and waterway health
- A summary of the likelihood threatened aquatic entities potentially occurring at each site (flora, fauna and Threatened Ecological Communities).
- Completion of an updated 7-part test or Significant Impact Assessment, as relevant.
- Appropriate timing recommendations for works to occur to avoid breeding seasons of threatened aquatic species (where possible).
- Recommendations for the requirement for an Ecologist to undertake supervision or dam dewatering works (if necessary).
- Recommendations on temporary installations to mitigate disruptions in habitat connectivity. Examples include fish passages or other structures to facilitate the movement of aquatic species through waterway diversion.
- Recommendations as to micro-siting and design in order to minimize potential impacts to threatened aquatic entities.

The report will be supplied to DPI Fisheries, DCCEEW – Cwth (where required) and FCNSW (for

works on their land) for consultation and consideration, with any recommendations associated with KFH crossing design to be incorporated where relevant.

2.2. Pre-clearing Scoping Assessment

To ensure pre-clearing procedures are risk-based and efficient, a Pre-clearing Scoping Assessment will be undertaken by the Project Ecologist prior to pre-clearing surveys. This desktop process will identify areas of ecological sensitivity, assess recent bushfire history and determine relevant threatened species including their status on-site (i.e., assumed or known) to a minimum distance of 100 m (or to the outer boundary of the HTZ). The scoping assessment will form the foundation for specialist pre-clearing methods that will be required at a specific clearing permit area (or smaller survey area).

Clearing permit areas (or smaller survey areas) relevant to each scoping assessment will be assigned unique identifiers such as HLW line and tower centres, for example: L1, 5C3/5C1-1 to 5C3/5C1-30. Clearing permit areas will include all proposed disturbance sites including the Total Clearing Zone (TCZ), Easement Clearing Zone (ECZ) and Hazard Tree Zone (HTZ), further detailed in Section 4.1.

The Project Ecologist will overlay the relevant clearing permit area with up-to-date spatial data, environmental datasets and previous survey findings including:

- BioNet species records (previous 20 years).
- Revised BDAR data:
 - o Threatened flora and fauna species polygons, including assumed vs. known status.
 - o Identified threatened species records.
 - o Hollow-bearing tree mapping.
 - o Karst and cave mapping.
 - o Weed points and polygons.
 - o Connectivity corridors.
 - o Severely burnt lands.
- Superseding data arising from supplementary surveys, including that obtained in pre-clearing and clearing procedures of adjoining clearing permit areas.

Considerations for the Pre-clearing Scoping Assessment are provided in Attachment 1 Pre-clearing scoping assessment checklist, and will inform pre-clearing survey methods within a clearing permit area. Species-specific pre-clearing methods are further detailed in Section 3.1, however additional methods may be deemed necessary by the Project Ecologist following this scoping assessment.

2.3. Boundary delineation protocol

Unique identifying colours for boundary delineation will be finalised prior to enabling works and communicated to all relevant employees, contractors and utility staff, including sub-contractors (in accordance with Section 7.4 of the HLW BMP). Boundary delineation methods are provided in Table 2-1 to help ecological and construction teams ensure that clearing is confined to approved areas, exclusion zones are visible and consistently marked, and inadvertent impacts to fauna as a result of entanglement with flagging is minimised.

Routine inspections and maintenance of all delineations will occur as follows:

- Daily visual checks – inspect markers/flagging along active work fronts, particularly clearing limits, no-go zones, and threatened fauna and flora buffers.
- Weekly (or after major weather events) alignment walkover – traverse active or upcoming work zones to inspect condition of all boundaries.

- Replacement/repair of damaged markers, flagging and/or signage as necessary.

Table 2-1 Boundary delineation protocol

Zone	Purpose	Delineation method and material
Clearing limit boundary	Defines the final disturbance footprint while permitting safe movement of fauna.	Continuous flagging tape along the outer edge of the final clearing envelope (as per final GIS layout). High visibility flagging tape would allow animals to pass/break through, while restricting human access. Signage will be installed adjoining Threatened Ecological Communities (TECs), specifying the area is a TEC to prevent disturbance outside the clearing limit.
Disturbance zones	Defines different disturbance zones (i.e., Total Clearing Zone, Easement Clearing Zone, Hazard Tree Zone) and their relevant clearing methodologies. Permits safe movement of fauna.	Marker posts at incremental distances (line of sight or maximum distance of 20 m) between disturbance zones. Markers may involve star pickets or any other post material, coloured either side to distinguish between disturbance zones, while allowing safe movement of fauna, machinery and personnel.
No-go zones	Protects sensitive areas (e.g., Threatened Ecological Communities, threatened orchids) from disturbance without prohibiting movement of fauna through the landscape.	Nearby an active work front = fencing constructed by continuous flagging tape or two-strand wire along the outer edge of the no-go zone (as per final GIS layout). This construction method using star pickets would allow animals to pass/break through. After construction ceases in the area = marker posts at incremental distances (maximum distance of 10 m) along the outer edge of the no-go zone. Allows safe movement of fauna and prevents entanglement. Signage will be clear and simple in nature, for example 'Environmentally Sensitive Area – No Entry', and adequately sized so it can be seen from a distance of at least 20 m.
Threatened fauna and flora buffers	Protect fauna breeding habitats and threatened flora from disturbance while permitting safe movement of fauna.	Marker posts at incremental distances (maximum distance of 10 m) along the outer edge of the temporary buffer (minimal disturbance zone). Allows safe movement of fauna and prevents entanglement.
Connectivity corridors	Maintain permanent fauna movement in accordance with Annexure F: Connectivity Strategy of the HLW BMP while permitting safe movement of fauna.	Tall marker posts at incremental distances (line of sight or maximum distance of 20 m) along the outer edge, as determined by the Project Ecologist. Allows safe movement of fauna and prevents entanglement while controlling inadvertent impacts from construction. Signage will be clear and simple in nature, for example 'Connectivity Corridor', and adequately sized so it can be seen from a distance of at least 20 m.

Zone	Purpose	Delineation method and material
Daily clearing limits	Sets daily work front limits to assist with final pre-clearing checks.	Rope. Moved daily to define clearing limits. If works are extending over a weekend/period of non-work, ropes are to be removed and re-installed once daily works resume to prevent fauna entanglement.

3. Pre-clearing surveys

Following boundary delineation in a clearing permit area (refer Section 2.3) and within 4 weeks of clearing works commencing, an experienced Project Ecologist will undertake pre-clearing surveys to a minimum distance of 100 m (or to the outer boundary of the HTZ). The pre-clearing survey will involve the following:

- Identify and mark, with flagging or other suitable visible item, threatened flora habitat (known and assumed) with the partial clearing zones (Easement Clearing Zone & Hazard Tree Zone). Any threatened flora individuals recorded would be marked with GPS coordinates recorded.
- Identify, mark (with flag or other suitable visible item) and record GPS coordinates of key habitat features that are suspected to accommodate fauna for Stage 2 clearing. These features may include:
 - o Nests, including platform nests.
 - o Hollow-bearing trees (including those containing crevices).
 - o Karst roosting habitat for bats.
 - o Fallen logs, hollow-bearing tree stumps, rock piles/outcrops (i.e., exposed rock as opposed to surface rock layer) and woody debris.
 - o Termite mounds.
 - o Dense understorey shrubs.
 - o Burrows below groundcover vegetation, runaways and other established fauna routes.
 - o Other habitat features for local fauna as determined by the ecologist.
- Formal habitat tree assessment per Annexure C: Hollow and Nest Strategy of the HLW BMP: visual inspection using binoculars or spotting scope to scan tree canopy for visible hollows.

A tree is considered to contain a hollow if each of the following apply:

- o The entrance can be seen,
- o The hollow appears to have depth (i.e., end of hollow is not visible), and
- o The hollow is at least 1 m above the ground.

For each hollow bearing tree identified, the following information will be recorded:

- o Tree species.
- o Condition (live or stag).
- o Approximate height.
- o Approximate Diameter at Breast Height (DBH).
- o Location (i.e., limb, trunk, or both).
- o Number of each hollow class (small <5 cm, medium 5-20 cm, large 20-50 cm and extra-large >50 cm).
- o Approximate height of the hollow from the ground.
- o Suitability and/or evidence of fauna and species identification if possible.

Each habitat tree is to be mapped using a hand-held GPS unit and physically demarcated using a tree tag and number and/or spray paint and flagging tape for future identification.

- Identify and mark any hollows suitable for salvage/relocation as per Annexure C: Hollow and Nest Strategy of the HLW BMP.
- Identify and mark any hollow logs, tree stumps, fallen timber, boulders, or other potential fauna habitats (as deemed by the Project Ecologist) for appropriate salvage and reuse in rehabilitation efforts per Annexure G: Rehabilitation Plan of the HLW BMP.
- Undertake species-specific survey methods in accordance with Section 3.1 below.

- Identify suitable fauna release locations outside of the HLW Area in accordance with the Fauna Handling and Rescue Procedure provided in Section 5. Identify at least 2-3 release sites per clearing permit area, considering the following criteria for target species:
 - o Habitat suitability – same vegetation type or PCT is preferred; presence of key habitat features; water availability (if relevant for the species).
 - o Proximity – within 500 m to 1 km of the clearing site to minimise stress; avoid crossing major barriers (e.g., roads, rivers, cleared land).
 - o Safety from threats/competition – low risk of predation, especially from feral animals; avoid areas with recent burns, active machinery or high human activity; no known territorial individuals of the same species that may exhibit aggression; no over-releasing to the same site with related species (intra/interspecific competition).
- Confirm boundaries, no-go zones and connectivity corridors are clearly delineated prior to clearing (refer Section 2.3).

Where gaps in ecological survey data exist (i.e., Revised BDAR or BAVR data is lacking) due to site access, severely burnt lands or other reasons, the full suite of mitigation measures outlined in this protocol will be applied, particularly in areas of high and very high ecological constraint (per Section 6.1 of the HLW BMP). This includes Pre-clearing Scoping Assessments, Pre-clearing Surveys and species-specific survey methods detailed within this protocol.

3.1. Species-specific methods

In areas of assumed or known threatened species presence (as determined during the Pre-clearing Scoping Assessment detailed in Section 2.2), species-specific pre-clearing methods and mitigation measures will be implemented as necessary for a clearing permit area (or smaller survey area) per Table 3-1. Surveys are to occur within 4 weeks of clearing commencing and are to extend to a minimum distance of 100 m (or to the outer boundary of the HTZ) from applicable locations. CPHR must be notified within three (3) days of any observations of breeding threatened species.

Table 3-1 Species-specific pre-clearing methods and associated mitigation measures

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
Amphibians		
- Booroolong Frog. - Sloane's Froglet. - Yellow-spotted Tree Frog.	Threatened frog habitats will be delineated in known or assumed habitats.	- Threatened frog habitat will be clearly identified on construction planning maps. - Project Ecologist to supervise installation of waterway crossings to relocate any individuals present per Section 4.3.
Cockatoos		
- Gang-gang Cockatoo (breeding season = Oct-Jan). - South-eastern Glossy Black-Cockatoo (breeding season = Apr-Aug).	Identification of suitable roost (i.e., hollow-bearing) trees will occur in known or assumed habitat. Hollow identification will include endoscopic cameras (or similar) to confirm large or greater hollows that may provide nesting habitat for threatened cockatoos. Where potential nest trees are identified, the species will be monitored during the breeding season (see left) to confirm the presence of any actual nest trees on site via diurnal bird surveys:	- Potential roost trees will be clearly identified on construction planning maps. - If actual nest trees (i.e., trees that birds of the species are known to have used for nesting) are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individuals (adults and chicks) have left the hollow. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed outside of the breeding season. - Activity in the buffer would be limited to low impact works such as use of existing tracks.

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
	- Dawn and dusk visual observations for cockatoos entering/exiting over at least 2 days, OR - Endoscopic camera to detect nest contents.	
Forest Owls		
- Barking Owl (breeding season = Oct-Jan). - Masked Owl (breeding season = Apr-Nov). - Powerful Owl (breeding season = May-Oct). - Sooty Owl (breeding season = Mar-Sep).	Identification of suitable roost (i.e., hollow-bearing) trees will occur in known or assumed habitat. Where potential nest trees are identified, the species will be monitored during the breeding season (see left) to confirm the presence of any actual nest trees on-site. Monitoring is only required if clearing is proposed in the breeding season and would involve: - Songmeters will be placed at maximum 200 m spacing, set to record at night. - If potential nest trees are identified based on songmeter data or other physical signs of tree use (i.e., observed entrance, whitewash, pellets, feathers), nocturnal stag watching and call playback will occur to confirm nest trees.	- Potential roost trees will be clearly identified on construction planning maps. - If actual nest trees (i.e., trees that birds of the species are known to have used for nesting) are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individuals (adults and chicks) have left the hollow. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed outside of the breeding season. - Activity in the buffer would be limited to low impact works such as use of existing tracks.
Parrots		
Superb Parrot (breeding season = Sep-Nov).	Identification of suitable roosts (hollow-bearing) trees will occur in known or assumed habitat. Where potential nest trees are identified (refer to Annexure C: Hollow and Nest Strategy for survey methods), this species will be monitored during the breeding season (see left) to confirm the presence of any actual nest trees on site via	- Potential roost trees will be clearly identified on construction planning maps. - If actual nest trees (i.e., trees that birds of the species are known to have used for nesting) are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individuals (adults and chicks) have left

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
	diurnal bird surveys.	the hollow. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed outside of the breeding season. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Raptors		
- Little Eagle (breeding period = Aug-Oct). - Square-tailed Kite (breeding period = Sep-Dec). - White-bellied Sea-eagle (breeding period = Jul-Dec).	Pre-clearing surveys will identify trees with large stick nests or any adult with nesting material in known or assumed habitat. Where trees with stick nests are identified on-site, diurnal nest watching will occur during the breeding season (see left) to confirm presence of breeding activity (eggs or chicks).	- Nest trees will be clearly identified on construction planning maps. - If breeding activity is recorded on-site during construction, a 100 m temporary buffer (minimal disturbance zone) will be established around the active nest until follow up surveys confirm the individual (adults and chicks) have left the nest. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed once chicks have fledged. - Activity in the buffer would be limited to low impact works such as use of existing tracks.
Passerines and ground-dwellers		
- Australian Painted Snipe. - Black-chinned Honeyeater (eastern subspecies). - Bush-stone Curlew. - Diamond Firetail. - Dusky Woodswallow.	Pre-clearing surveys will occur per Section 3 to record nests in known or assumed habitat.	- Potential nest trees or relevant ground-dwelling species mounds will be clearly identified on construction planning maps. - If utilised nests are identified on-site, the Project Ecologist will determine a suitable buffer relevant to the identified species; to be established until follow up surveys confirm the individuals (adults and chicks) have left the nest. The purpose of the buffer is to minimise construction impacts to breeding

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
• Flame Robin. • Freckled Duck. • Gilbert's Whistler. • Grey-crowned Babbler. • Hooded Robin. • Malleefowl. • Olive Whistler. • Painted Honeyeater. • Pink Robin. • Scarlet Robin. • Speckled Warbler. • Varied Sittella.		pairs and their chicks. The buffer can be removed once chicks have fledged. • Activity in the buffer would be limited to low impact works such as use of existing tracks.
Arboreal mammals		
Koala.	Per Section 3.3, final pre-clearing checks will occur in known or assumed habitat within 24 hours of clearing commencing to check for individuals in trees.	• If individuals are recorded on-site during pre-clearing surveys or construction, a 50 m temporary buffer (minimal disturbance zone) is to be established around the individual until follow up surveys confirm the individual has relocated. The purpose of the buffer is to allow for safe egress of the individual from the construction site. • Activity in the buffer would be limited to low impact works such as use of existing tracks. • Construction involving clearing or moving plant / earthworks within 50 m of Koalas traversing the site (on the ground) will be ceased until the Koala has safely left the area.

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
		- Ground corridors will be established per Annexure F: Connectivity Strategy to allow safe Koala movement. - CHPR are to be notified of Koala observations within 3 days of detection.
Hollow-dependent arboreal mammals		
- Brush-tailed Phascogale (breeding period = Dec-Jun). - Eastern Pygmy-possum (breeding period = Oct-Apr). - Squirrel Glider (breeding period = Jun-Jan). - Southern Greater Glider (breeding period = Mar-May). - Yellow-bellied Glider (breeding period = Aug-Dec).	Identification of suitable nest or sap feed trees will occur in known or assumed habitat. Hollow identification will include endoscopic cameras (or similar) to confirm large or greater hollows that may provide nesting habitat for these mammals. Where potential nest trees are identified, nocturnal surveys (stag watching) would commence following Stage 1 clearing during the appropriate breeding periods (if clearing during target species' breeding period cannot be avoided). Further details on Pre-clearing Scoping Assessment can be found in Section 4.1 of the HLW BMP Annexure C.	- Potential nest trees will be clearly identified on construction planning maps. - If actual nest trees (i.e., trees that the species are known to have used for nesting) are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the individual (adults and joeys) have left the hollow. The purpose of the buffer is to minimise construction impacts to breeding individuals and their young. The buffer can be removed outside of the breeding season. - Activity in the buffer would be limited to low impact works such as use of existing tracks.
Terrestrial mammals		
- Broad-toothed Rat. - Smoky Mouse. - Spotted-tailed Quoll	Surveys in known or assumed habitat will record observations of burrow systems (Smoky Mouse); potential ground nests and distinctive scats (Broad-toothed Rat); and fallen logs, other animal burrows, small caves and rock outcrops (Spotted-tailed Quoll).	- Rock outcrops will be retained within partial clearing zones. - Hand clearing will occur within 50 m buffer of recorded burrows/nests/dens unless camera surveys confirm burrows are not from target species. - Link confirmed burrow/nests/den sites in the ECZ or HTZ to adjoining vegetation on each side of the

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
	Motion cameras (IR white-light cameras) will be used over 5 survey nights to confirm suspected burrows/nests/dens.	disturbance zone by ground corridors consisting of a hand clearing zone and retention of ground refugia over a minimum 20 m width.
Microbats		
- Corben's Long-eared Bat. - Eastern False Pipistrelle. - Greater Broad-nosed Bat. - Little Pied Bat. - Large Bent-winged Bat. - Large-eared Pied Bat. - Southern Myotis. - Yellow-bellied Sheath-tail-bat.	- Pre-clearing surveys in known or assumed habitat will identify hollow-bearing trees or known roost trees. - Inspection of existing culverts, bridges or other structures near waterways for known or assumed Southern Myotis (or other bat) roosts prior to demolition or modification. Inspection will utilise thermal detectors to confirm presence/absence.	- A 50 m temporary buffer (minimal disturbance zone) is to be established around any individuals identified. - Evidence of bats in culverts or other structures will trigger adaptive response – if structures are to be retained, maintain a 50 m temporary disturbance buffer around them; if they are to be removed or modified, provision of new roosting substrates will be required, as per Transport for NSW guidelines and in consultation with CPHR.
Reptiles		
Alpine She-oak Skink.	Pre-clearing surveys in known or assumed habitat will target beneath litter, rocks, logs, other ground debris, and within grass tussocks.	- Rock outcrops will be retained within partial clearing zones. - In areas of known or assumed habitat, the Project Ecologist will supervise all vegetation clearing activities as this species preferring tree-less or very lightly treed areas that contain tussock grasses, low heath or a combination of both. - Works are to cease if individuals are observed until they are confirmed to have relocated or fled by the Project Ecologist.

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
Pink-tailed Legless Lizard.	Pre-clearing surveys in known or assumed rocky habitat will include turning over suitably sized rocks (300 mm wide and 50 mm deep).	- Rock outcrops will be retained within partial clearing zones. - If the species is confirmed to be present in a rocky outcrop within the TCZ that cannot be avoided, a relocation plan is to be prepared in consultation with CPHR. The plan should identify how individuals will be relocated to other areas of suitable habitat with rocky outcrops, including location of recipient site, capture and transport protocols and name and qualifications of the individuals to complete the relocation. - If the species is confirmed to be present in a rocky outcrop within the ECZ, a 50 m temporary buffer (minimal disturbance zone) around the areas of habitat is to be established and clearly delineated. Any vegetation clearing within the buffer must be completed by hand with heavy machinery excluded.
Striped Legless Lizard.	Pre-clearing surveys in known or assumed habitat will include active searches of individuals on the ground surface, under partially imbedded rocks, ground debris, soil cracks and within grass tussocks.	- In areas of known or assumed habitat, the Project Ecologist will supervise all vegetation clearing activities as this species prefers grasslands. - Works are to cease if individuals are observed until they are confirmed to have relocated or fled by the Project Ecologist.
Rosenberg's Goanna (breeding period = Nov-Mar).	Pre-clearing surveys will include the demarcation of termite mounds suspected of breeding.	- Termite mounds will be retained within partial clearing zones. - Potential breeding termite mounds will be clearly identified on construction planning maps. - If nest termite mounds are identified, a 100 m temporary buffer (minimal disturbance zone) will be established until follow-up surveys confirm the

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
		hatchlings have left the mound. The purpose of the buffer is to minimise construction impacts to hatchlings. The buffer can be removed outside of the breeding season. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Insects		
Key's Matchstick Grasshopper	Pre-clearing surveys will identify areas of assumed or known habitats for rehabilitation, to be demarcated by the Project Ecologist	- In areas of known or assumed habitat, the Project Ecologist will supervise all vegetation clearing activities as this species prefers grasslands. - Ecologists to sweep grasslands in such areas with nets to capture any potential individuals. Works are to cease if individuals are observed until they are captured and relocated by the Project Ecologist.
Flora		
<i>Acacia ausfeldii</i>. <i>Ammobium craspedioides</i>. <i>Bossiaea fragrans</i>. <i>Caesia parviflora</i> var. <i>minor</i>. <i>Caladenia concolor</i>. <i>Caladenia montana</i>. <i>Calotis glandulosa</i>. <i>Calotis pubescens</i>. <i>Cullen parvum</i>. <i>Diuris tricolor</i>. <i>Glycine latrobeana</i>. <i>Grevillea wilkinsonii</i>.	Individuals will be identified within known or assumed habitats subject to partial clearing (i.e., ECZ/HTZ), including those detected during Revised BDAR and Biodiversity Assessment Verification surveys.	- Known threatened flora locations will be clearly identified on construction planning maps. - A 30 m buffer to be delineated around known records of threatened flora in partial clearing zones (i.e., ECZ/HTZ), with vegetation clearing works limited to hand clearing with no machinery/vehicle movement permitted outside of existing tracks. - Avoid impacts of trampling associated with use of large mobile plant (e.g., excavators).

Species	Pre-clearing survey method (if species is assumed or known in a clearing permit area)	Mitigation measures
• <i>Leucochrysum albicans</i> subsp. <i>tricolor</i>. • <i>Persoonia marginata</i>. • <i>Pimelea bracteata</i>. • <i>Pomaderris cotoneaster</i>. • <i>Prasophyllum bagoense</i>. • <i>Prasophyllum innubum</i>. • <i>Prasophyllum keltonii</i>. • <i>Prasophyllum petilum</i>. • <i>Pterostylis alpina</i>. • <i>Pterostylis foliata</i>. • <i>Pterostylis oreophila</i>. • <i>Pultenaea humilis</i>. • <i>Senecio garlandii</i>. • <i>Swainsona recta</i>. • <i>Swainsona sericea</i>. • <i>Thelymitra alpicola</i>. • <i>Thesium australe</i>. • <i>Xerochrysum palustre</i>.		

3.2. Pre-clearing report

At the completion of pre-clearing surveys for a clearing permit area (or smaller survey area), a Pre-clearing Report will be compiled with all pre-clearing survey data and activities. This will be provided to CPHR prior to commencement of clearing at that location. This will also be issued to FCNSW for works in their land. The report will include (at a minimum):

- Name and qualifications of Project Ecologists involved.
- Dates and survey extents (i.e., clearing permit area, survey area).
- Maps of assumed and known threatened species habitats (i.e., species polygons).
- Confirmation of clearing zone, no-go zone and connectivity corridor delineation
- Details of survey method and effort carried out at each location.
- Results of pre-clearing surveys, including maps, temporary buffers established and demarcation techniques for:
 - o Known records from BioNet (DCCEEWS NSW - 2025), Revised BDAR and results of Biodiversity Assessment Verification Reporting.
 - o Threatened fauna habitats.
 - o Threatened flora within partial clearing zones.
 - o Hollows suitable for salvage/relocation.
 - o Priority weeds, including areas of high weed density.
- Recommended mitigation measures per Table 3-1.
- Recommendations on staged clearing (refer Section 4.2).
- Recommendations for unexpected or incidental finds and protection requirements for threatened fauna breeding habitat (if detected).
- Suitable locations for fauna release during clearing works.
- Target species, and estimate the size, type, number and Hollow Replacement Zones per Annexure C: Hollow and Nest Strategy of the HLW BMP (Section 4.1.2).
- Assessment of connectivity corridor establishment in accordance with Annexure F: Connectivity Strategy.
- Any additional recommendations for minimising impacts during clearing works (including noise, vibration, trampling, edge effects, weed incursions, where appropriate timeframes for installation of connectivity poles, reduced connectivity & vehicle strike) which may be deemed necessary.
- Where the area of a post clearing report includes a Glider connectivity corridor an additional report will be provided within 1 month with details of the glider corridors specifications.

3.3. Final pre-clearing checks

All clearing areas (whether containing habitat features/threatened flora or not) will be subject to final pre-clearing checks. Final pre-clearing checks will be undertaken by the Project Ecologist within 24 hours of clearing commencing within the daily clearing limits, using the checklist provided in Attachment 2. Final pre-clearing checks will be repeated daily prior to clearing in a new area and will confirm the staged vegetation clearing methodology detailed in Section 4.2. This will include the following:

- Re-confirm boundaries for clearing zones, daily clearing limits, no-go zones and connectivity corridors are in place. Ensure delineation methods (Table 2-1) have been communicated to construction crews.

- Inspect vegetation within 10 m of the previous day's outer clearing boundary for signs of over-clearing or mechanical damage; recording PCT/species affected, severity of damage and approximate extent (m² or % foliage).
- Obtain up to date information on fauna and flora habitat that is present, including:
 - o Visual (binoculars or similar) inspection of habitat features for evidence of fauna habitation since pre-clearing surveys.
 - o Delineate any newly identified habitats.
- Confirm habitat features, threatened flora and temporary buffers have been adequately demarcated.
- Collect and record data on any newly identified threatened species in the area.
- Conduct active searches for Koalas in trees of assumed or known habitats.
- Confirm that nest boxes are in place where required per Annexure C: Supplementary Hollow and Nest Strategy of the HLW BMP.
- Follow-up check of fauna release sites from previous day to ensure animal has fled.

4. Clearing

4.1. Specified disturbance zone clearing methodology

The *HumeLink Vegetation Clearing Method and Management Memorandum* (Rev 1; Transgrid, 2023) was prepared to describe the vegetation clearing methodology proposed for the construction and operation of HLW, as replicated below. Tree protection will be in accordance with the Australian Standard for Protection of Trees on Development Sites (AS4970), where practicable.

The HLWJV protocol has been developed to consider several 'disturbance zones' to accommodate the various specific clearing requirements of the construction and operational maintenance phases. These zones are described with respect to construction clearing/management requirements and methodology. The zones are summarised below and detailed in Table 4-1. with indicative displays provided in Plate 4-1 through Plate 4-4.

1. **Total Clearing Zone (TCZ)** – complete clearing of vegetation. Includes transmission line structures, access tracks, substations and telecommunications connections and construction ancillary facilities. Includes the following:
 - a. Trees and shrubs removed/managed by excavator-mulcher.
 - b. Removal of vegetation and root balls.
 - c. Topsoil will be stripped and stockpiled for re-use. Topsoils from intact-moderate condition low weed cover areas to be translocated to analogous receiver sites.
 - d. Tree barrels with habitat features (such as hollows) will be removed and retained in select areas.
2. **Easement Clearing Zone (ECZ)** – partial clearing of vegetation to accommodate 500 kV transmission lines at maximum line operating conditions. This includes:
 - a. Clearing of all trees (i.e., live and dead trees of a sufficient height which, if they were to fall, would strike the overhead conductors or the transmission line structures, or come close enough to result in electrical flashover).
 - b. Retention of dead trees that are below a sufficient height which, if they were to fall, would strike the overhead conductors or the transmission line structures, or come close enough to result in electrical flashover).
 - c. Retention of mid and understorey vegetation (excluding trees) with a mature height up to 5.6 m.
 - d. Manual methods may be used in areas of very high ecological sensitivity (e.g., where endangered orchids are present).
3. **Hazard Tree Zone (HTZ)** – partial clearing. Removal of trees outside of the easement which, if they were to fall, would strike the overhead conductors or the transmission line structures or come close enough to cause electrical flashover and infringe on the VCR at maximum conductor sag. These hazard trees pose a potential bushfire risk, risk to the asset, and require management/removal as part of construction. Clearing works will be managed to minimise impacts to mid and understorey vegetation.

Clearing methods will involve the clearing of the TCZ and ECZ to the requirements of the ECZ (the least impacted disturbance zone). Once tall growing vegetation is removed and visibility improves, boundaries of finalised disturbance zones will be clearly marked on-site by a surveyor to protect partial clearing zones in accordance with Section 2.3. Off-easement hazard trees (within the HTZ) will be inspected by a suitably qualified arborist. Trees identified as posing a risk of failure by the arborist will be removed/trimmed. Hazard trees in good condition and dead trees/stags with limited risk of failure and encroachment on the vegetation clearance requirement may be retained subject to arborist assessment. Rock outcrops will be clearly marked during pre-clearing surveys (refer Section 3) and retained within partial clearing zones.

Works for clearing and construction of access tracks will be carried out in such a manner that the least practicable disturbance to actual ground cover and contours is caused. Trees will be removed as close as possible to ground level and root balls will be left in situ wherever practicable.

Areas of particular focus for minimising ground disturbance include the following:

- Steep or Highly Erodible lands where slopes are in excess of 18 degrees from the horizontal.
- Protected Riparian Land defined as land within 20 m of the bed or bank of a prescribed stream. Generally, named watercourses are classed as protected riparian land; however, some unnamed watercourses may be classed as protected riparian land.
- Waterfront land (40 m from the top of bank).
- In areas where large rock outcrops are prevalent on the easement.

Protocols listed in Annexure G: Rehabilitation Plan of the HLW BMP will be implemented across all disturbance zones to maximise opportunities for salvage and reuse of biological and habitat resources.

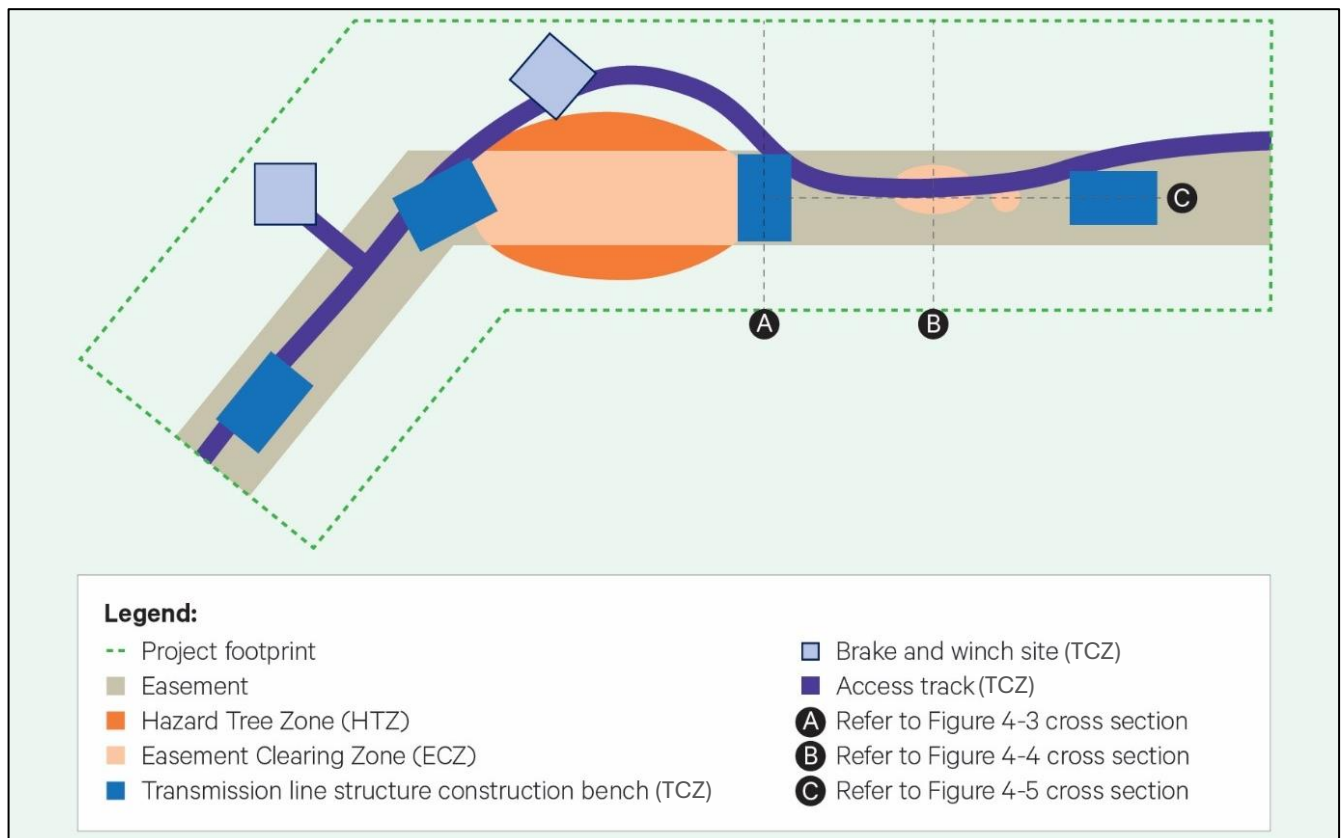


Plate 4-1 Indicative disturbance zones

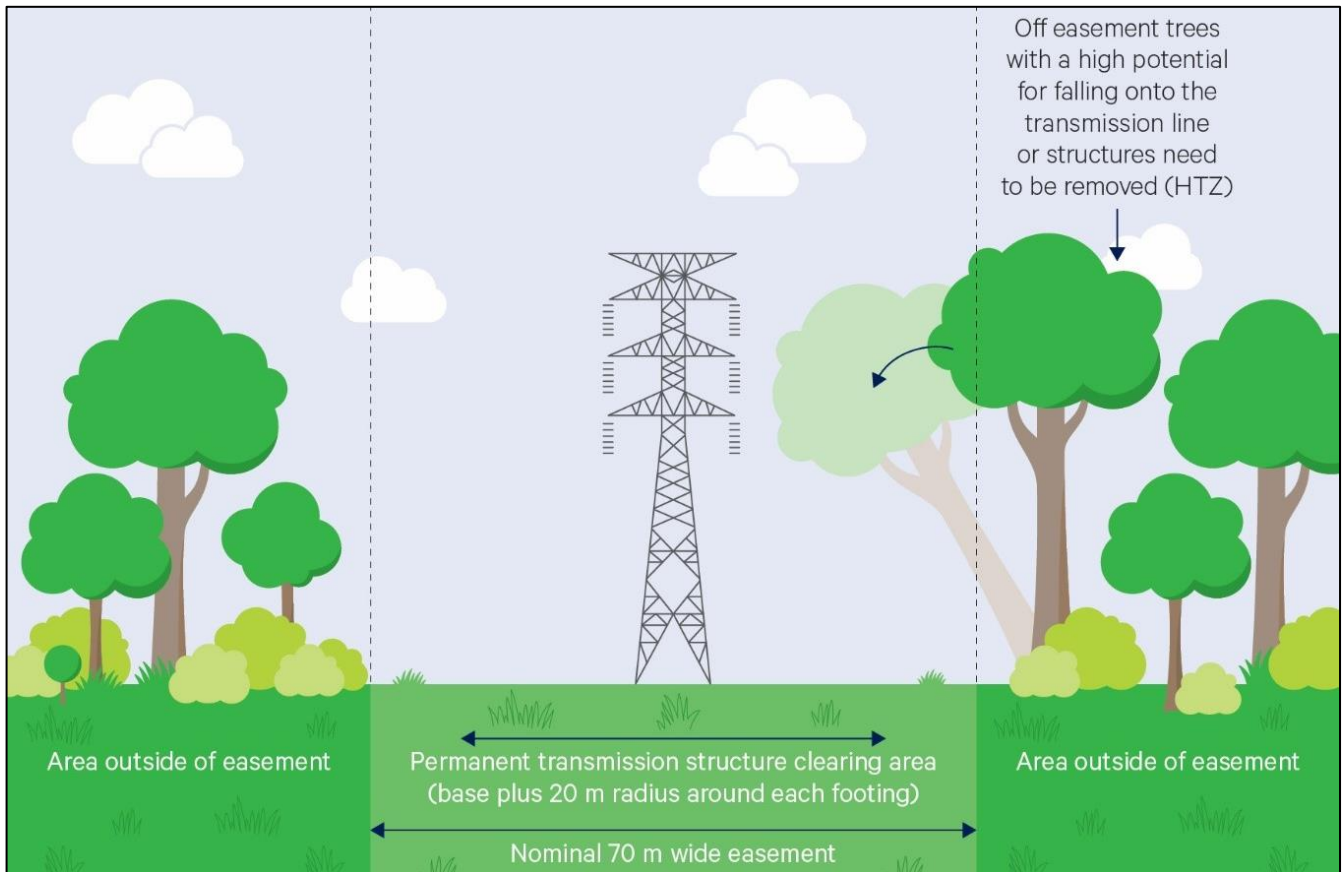


Plate 4-2 Indicative vegetation clearing around a typical transmission line structure

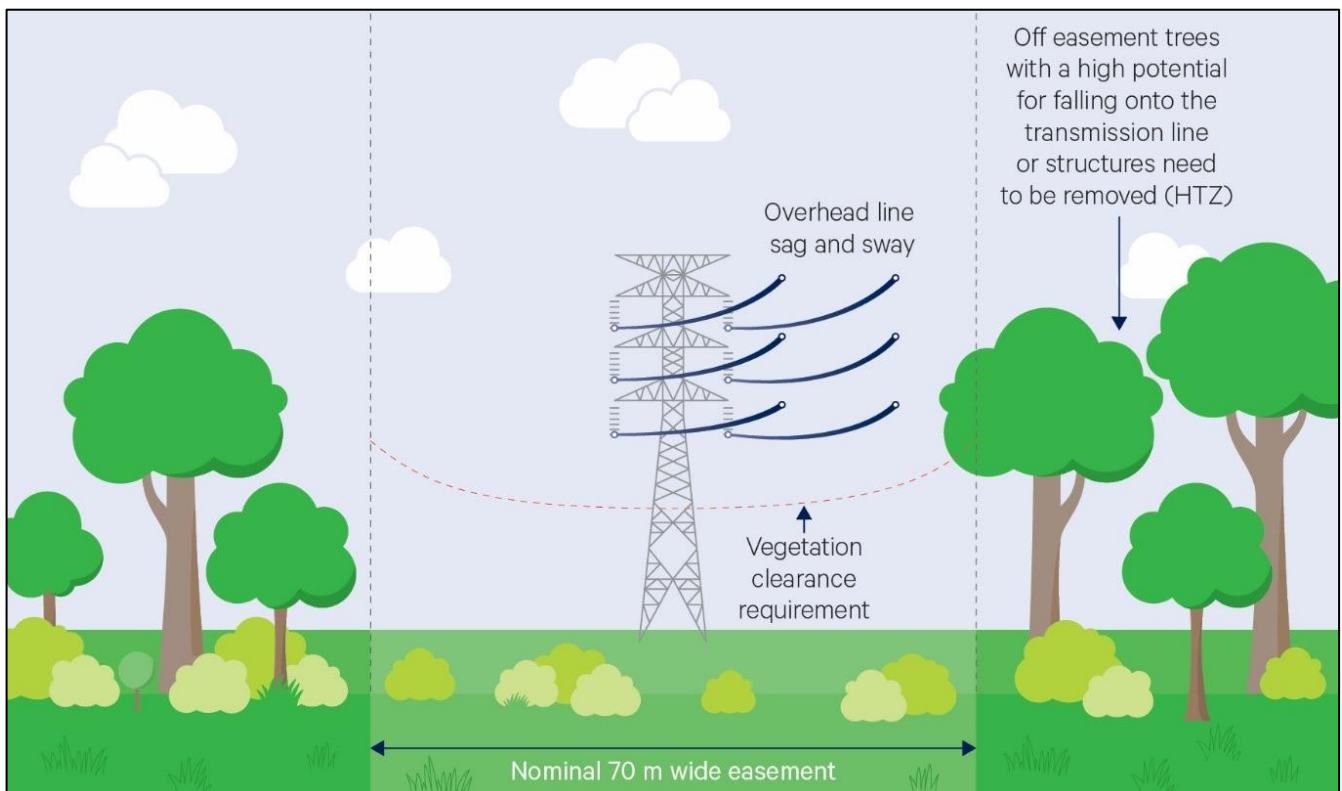


Plate 4-3 Indicative vegetation clearing within the easement

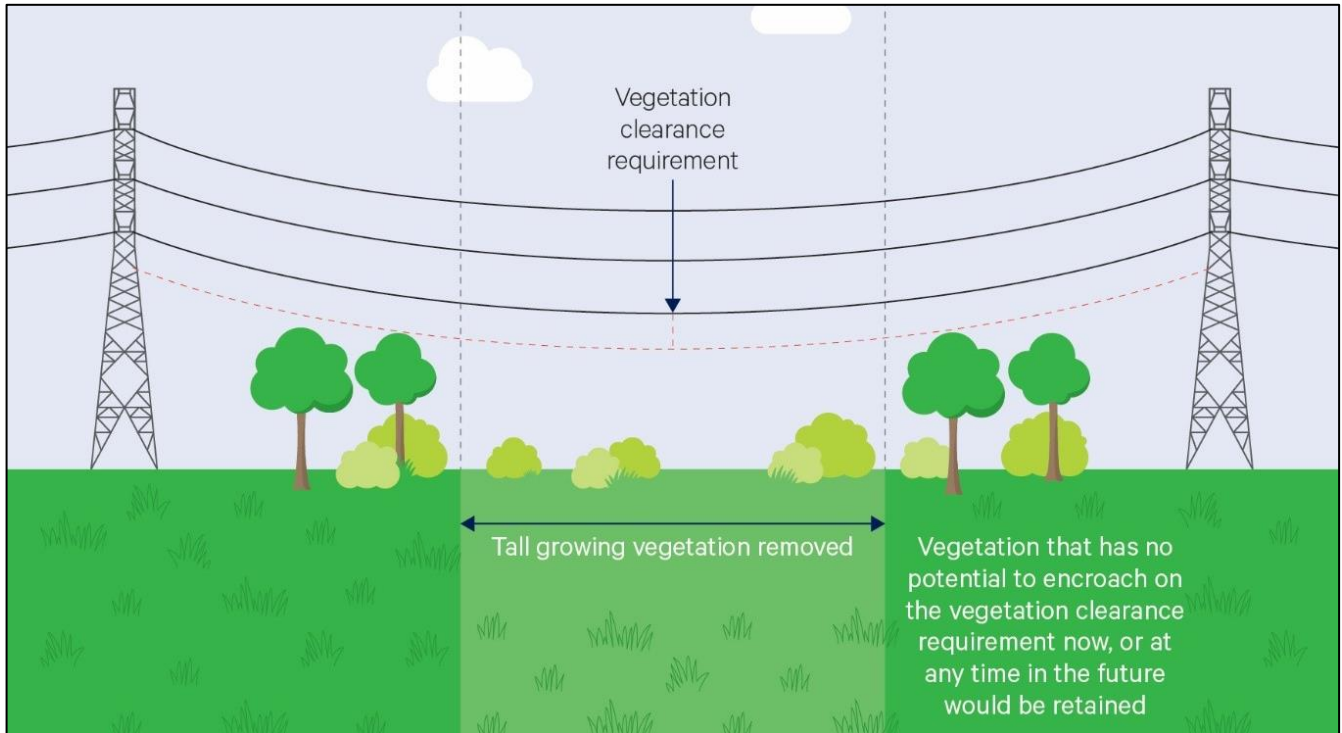


Plate 4-4 Indicative vegetation clearing mid-span

Table 4-1 Summary of vegetation clearing, impact and debris management during construction (per *HumeLink Vegetation Clearing Method and Management Memorandum* [Rev 1; TransGrid, 2023]).

Disturbance zone	Vegetation clearing method (in order of task)	Impact	Debris management	Minimum mitigation measures
Transmission line structure zone – <u>within</u> civil works areas/construction benches	Trees/ shrubs removed/ managed by excavator-mulcher. Removal of vegetation and root balls. Topsoil will be stripped and stockpiled for re-use. Topsoils from intact-moderate condition low weed cover areas to be translocated to analogous receiver sites. Tree barrels with habitat features (such as hollows) will be removed and retained in select areas.	Complete clearing and loss of habitat.	Vegetation debris would be managed in accordance with Transgrid's <i>Transmission Line Construction Manual – Major New Build 2020</i> which stipulates relocating suitable fauna habitat to adjacent woodland where available/ feasible and offering useful timber to landowners for reuse. Mulch debris will either be windrowed or stockpiled for later re-spreading. Material will be tub ground and re-used for erosion /sediment control and rehabilitation. Mulched material will be evenly spread within previously forested areas to avoid suppression of germination and regeneration of native flora, care will be taken to avoid excess debris build up/smothering of existing	Removal of root balls/ root stock will be limited to civil/ construction areas. Assessment of ecological/ habitat values for trees. Staged clearing process. Spreading of mulch on bare earth to stabilise prior to rehabilitation. Relocation of hollow tree barrels as habitat in select areas. Relocation of any fauna by a suitably qualified ecologist. Reinstatement with ground cover (native seed).

Disturbance zone	Vegetation clearing method (in order of task)	Impact	Debris management	Minimum mitigation measures
			vegetation.	
Transmission line structure zone – <u>outside</u> civil works areas / construction benches / access tracks	As for Easement Clearing Zone (refer below).	During the removal of the tall growing trees, there would be disturbance of the grass/ ground cover and shrubs caused by the movement of the tree felling/ clearing machinery. Whilst the shrubs would not be targeted for removal, some damage may also occur from the movement of tree clearing machinery. There is a potential for mulched material being left on the ground surface, with a mulch layer that is greater than 100 mm, which may impede the ability for plant regeneration/recruitment. However, it is considered that a mulch layer of <50 mm in depth would not limit/ restrict the survival / germination / regeneration of retained native vegetation. The retention of some mulch within the easement will also assist in	As for Easement Clearing Zone (refer below).	As for Easement Clearing Zone (refer below).

Disturbance zone	Vegetation clearing method (in order of task)	Impact	Debris management	Minimum mitigation measures
		minimising soil erosion in any areas affected by the use of the clearing machinery. Whilst there will be areas which will not be subject to civil works as described in the transmission line structure zone for the purpose of the Revised BDAR, it has been assumed that this area would be subject to complete clearing and vegetation loss.		
Access track zone	As for transmission line structure zone (refer above).	Assumed complete clearing and loss of habitat within the full ~8 m wide corridor for white tracks, ~10 m wide corridor for green and blue tracks. Complete clearing up to 20 m wide will also be contemplated in some locations to account for steep terrain and the need to construct batters.	As for transmission line structure zone (refer above).	As for transmission line structure zone (refer above).
Substation zone	As for transmission line structure zone (refer above). Outside civil/construction	Complete clearing and loss of habitat.	Material will be tub ground and re-used for erosion/sediment control and rehabilitation.	As for transmission line structure zone (refer above).

Disturbance zone	Vegetation clearing method (in order of task)	Impact	Debris management	Minimum mitigation measures
	areas smaller trees / shrubs may be removed/ managed. Topsoil will be stripped and stockpiled for re-use. Topsoils from intact-moderate condition low weed cover areas to be placed in analogous receiver sites.		Mulch debris will either be windrowed or stockpiled for later re-spreading.	
Easement Clearing Zone (ECZ) – machine accessible	Removal of trees and vegetation by mechanical methods. Manual methods may be used in areas of very high ecological sensitivity (e.g., where endangered orchids are present). Tree barrels with habitat features (such as hollows) will be removed and retained in select areas. Tree barrels may be relocated to locations identified in consultation with Asset Management.	During the removal of the trees and vegetation, there would be trampling of the grass/ ground cover and shrubs caused by the movement of machinery. Whilst the shrubs would not be targeted for removal, some damage may also occur from the movement of tree clearing machinery.	As for transmission line structure zone (refer above).	Assessment of ecological /habitat values for trees. Site access planning, field identification and communication, to avoid unnecessary impacts to native vegetation. Minimisation of impacts via: appropriate machinery selection; planning/minimisation of access paths. Use of non-lethal temporary, and targeted lethal vegetation removal where practicable. Staged clearing process. Engagement of specialist bush regeneration service

Disturbance zone	Vegetation clearing method (in order of task)	Impact	Debris management	Minimum mitigation measures
				provider to facilitate recovery and rehabilitation of native mid- and understorey vegetation to target condition as specified in the BMP. Mulched material to be spread in a way that minimises suppression of germination and regeneration of native flora from the soil seed bank, as well as existing native groundcover. The retention of some mulch will also assist in minimising soil erosion in any areas affected by the use of the clearing machinery. Relocation of hollow tree barrels as habitat in select areas. The easement would be monitored post completion of construction to measure vegetation integrity attribute scores. Easement attribute scores will be compared to target / predicted future attribute

Disturbance zone	Vegetation clearing method (in order of task)	Impact	Debris management	Minimum mitigation measures
				scores (as defined in the Revised BDAR) and the operational plan reviewed as required.
Easement Clearing Zone (ECZ) – steep / constrained areas	Hand felling of trees will be the preferred method where terrain (or other constraints) preclude management by machine.	Potential trampling and tree fall impacts to understory vegetation during felling; however minimal long-term impact on the integrity of the shrub and grass/ground cover layer is expected.	Felled vegetation will be left in-situ with tree crowns cut/docked and laid flat. Note that some areas within the easement clearing zone may require tree debris to be moved once felled to avoid bushfire and safety risks.	Assessment of ecological /habitat values for trees. Staged clearing process. Timing of clearing to minimise breeding impacts.
Hazard tree zone (HTZ)	Most hazard tree removal would be done by machine. Hand felling of trees would be used where terrain (or other constraints) preclude management by machine.	Partial loss of habitat and vegetation integrity caused from the individual removal/pruning of identified hazard trees. Mid- and understorey would be retained to the extent practicable.	Removed/felled vegetation will be left in-situ with tree crowns cut/docked and laid flat.	Pre-clearance inspections. Where habitat features are identified pruning will be the preferred approach, unless unsafe to do so
Construction compounds and temporary workforce accommodation facilities	As for transmission line structure zone (refer above).	Complete clearing and loss of habitat.	Mulched material will be evenly spread on bare disturbed areas to assist with the protection of the soil. Spread of mulched material to a depth of >50 millimetres will be avoided	As for transmission line structure zone (refer above). Upon completion of construction, all construction facilities are temporary. They would be

Disturbance zone	Vegetation clearing method (in order of task)	Impact	Debris management	Minimum mitigation measures
			where practicable.	removed, and the site appropriately stabilised and rehabilitated to pre-existing conditions or as agreed with the landowner.
Other ancillary facilities	As for substation zone (refer above).	Complete clearing and loss of habitat.	As for substation zone (refer above).	As for transmission line structure zone (refer above).

4.2. Staged vegetation clearing

Vegetation clearing may be undertaken in stages, depending on whether habitat features are identified within the daily clearing limit. Vegetation clearing requirements may also therefore be different for each day's clearing works and will be determined by the findings and confirmation of the Project Ecologist during the Pre-clearing Scoping Assessment (Section 2.2), Pre-clearing Surveys (Section 3) and associated Pre-clearing Report (Section 3.2).

4.2.1. Stage 1 - Initial vegetation clearance (non-habitat vegetation)

Stage 1 requires that only non-habitat vegetation to be removed. Any habitat features (including specialist fauna habitats detailed in Table 3-1) that are identified in pre-clearing surveys will be retained until the final stage of clearing. This allows respite between the initial disturbance and final removal of habitat. Respite periods should occur for a minimum of 24 hours following the removal of non-habitat vegetation, prior to Stage 2 clearing works detailed below. The Project Ecologists must be on standby (preferably present on-site) in case of any unexpected ecological finds in accordance with Annexure D: Unexpected Finds Procedure of the HLW BMP.

4.2.2. Stage 2 - Final clearing

During Stage 2, habitat clearing works (including impacts caused by vegetation trimming) will be supervised by the Project Ecologist who will remain on-site during all clearing activities. Supervised clearing will involve the following:

- Relevant mitigation measures listed in Table 3-1 will be followed (as detailed in the Pre-clearing Report), including any necessary temporary buffers and hand clearing requirements.
- All hollows accessible from the ground will be inspected immediately prior to clearing (e.g., binoculars, extendable poles with cameras).
- Demarcated habitat features will be mechanically shaken or 'nudged' prior to felling to encourage any remaining animals to either leave, or attempt to leave and therefore become visible to the Project Ecologist. Fauna will be safely captured in accordance with the fauna handling and rescue procedures outlined in Section 5 below.
- The removal of habitat trees will be undertaken using the following methods (where safe to do so):
 - o Soft felling = Habitat trees < 130 cm Diameter at Breast Height (DBH). Gently controlled felling using a forestry harvester. Reduces impact shock that could injure resident fauna and allows for post-felling inspection of intact hollows.
 - o Limb by limb felling = Habitat trees ≥ 130 cm DBH. Manual assisted technique using rope access or elevated work platforms. The tree is dismantled incrementally (from the top down), with each limb carefully lowered to the ground via ropes or cranes. Avoids injury to any resident fauna or collapse of hollows, allowing for real-time inspection of limbs/hollows. If no hollows or cavities are present, the limb may be dropped without careful lowering.
- In any habitat removal process, a Project Ecologist with experience in fauna handling should capture any animal that emerges, inspect it for injuries and, if uninjured, relocate it to predetermined fauna release areas. Should any eggs or juveniles be encountered that cannot flee, these will be taken to the nearest wildlife rescue organisation, to be identified by the contractor prior to pre-clearance initiation.
- Ensure that injured wildlife is transported to veterinarian or wildlife carer.
- If fauna cannot be safely extracted from hollows prior to or during hollow removal, the hollows will be blocked to prevent the animal escaping until the hollow is relocated outside of the transmission alignment, allowing safe exit. Further inspection by the Project Ecologist will verify

no fauna is present.

- Where simple nests (not stick nests) can be reasonably relocated outside of the easement, locations are to be determined by the Project Ecologist.
- All felled habitat trees should be left for 48 hours to allow hollow-dependant fauna to flee (predominantly nocturnal species) before stacking or mulching, unless the Project Ecologist has confirmed there are no evidence of occupancy or hollows concealing fauna. Tree hollows and other fallen logs will then be retained and relocated to other areas in accordance with Annexure G: Rehabilitation Plan of the HLW BMP).
- Coarse woody debris and logs will be gently dismantled or rolled by machinery operators under instruction of the Project Ecologist.
- Weed-free vegetation will be retained and mulched on-site for use as groundcover, erosion/sediment controls or stockpiled for later reuse in rehabilitation efforts (refer Annexure G Rehabilitation Plan of the HLW BMP).
- Mulched material will not be applied in depths >50 mm, and over 50% of the application area, to avoid smothering of ground covers, suppression of native vegetation germination and regeneration.

4.2.3. Post-clearing Report

A Post-clearing Report will be prepared following vegetation clearing works to detail both single and second stage clearing (where applicable). Progressive clearing reports will be prepared biannually and a final report will be prepared at the completion of clearing. These will be provided to CPHR as soon as it is available, and FCNSW for works in their land. Reports are to include (at a minimum):

- The name and qualifications of the Project Ecologist present during clearing supervision works.
- Information on habitat assessment methods, clearing operations, dates, procedures, areas.
- Records of all fauna rescue events, including locations to where fauna have been relocated. GPS coordinates will be provided for such events.
- An assessment of the habitat and handling of fauna.
- Live animal sightings, captures, any releases or injured / shocked wildlife (including GPS coordinates).
- Any dead animals located.
- Photographs of rescued fauna.
- Extent of clearing works including disturbance type (full/partial) and impact area (ha) on PCTs and threatened species habitats, measured against approved clearing limits provided in Section 6.2 of the HLW BMP.
- Relevant spatial files (in ArcGIS compatible format), such as locations of threatened species sightings, or fauna release areas.
- Confirmation of all hollows cleared, hollow size and remaining artificial hollow requirements per Annexure C: Hollow and Nest Strategy of the HLW BMP.
- Where gaps in ecological survey data exist (i.e., Revised BDAR or BAVR data is lacking) due to site access, severely burnt lands or other reasons, demonstrated minimisation of impacts to hollow-bearing trees and threatened species will be reported (i.e., against biodiversity conditions MCoA 25 and 30).

All Post-clearing Reports will be summarised and collated in the annual BMP Monitoring Report as detailed in the HLW BMP, including all GIS data collected (GPX files, shapefiles). Ongoing monitoring of the success of release events will be undertaken in accordance with Annexure H Biodiversity Monitoring Plan of the HLW BMP.

4.3. Aquatic works

In addition to standard erosion and sediment control measures per the HLW Soil and Water Management Plan, the following procedures and considerations will be incorporated into construction methodologies for waterway crossings, where practicable:

- Relocation of any impacted aquatic or riparian-dependant species as per Section 5.
- Opportunities to retain felled trees as habitat on-easement will be considered in select areas (i.e., connectivity corridors and riparian lands). The opportunity to stockpile and supply felled trees for waterway rehabilitation or improvement work will be discussed with DPI Fisheries.
- Silt curtains or coffer dams will be deployed around instream work sites where required, to protect against any impacts to water quality or indirect impacts to retained vegetation. These measures will be situated so to avoid blocking fish passage wherever practical and removed as soon as they are no longer required.
- Appropriate erosion and sediment controls that take into account potentially flood prone areas will be employed to manage water quality impacts and indirect impacts to retained vegetation.
- Plant refuelling will occur as far away from streams as possible and appropriate spill prevention measures (such as diversion bunds/cut off drains upslope and drip trays and spill kits) will be implemented when refuelling.

4.3.1. Procedures for stockpiling habitat

Boulders, woody debris and deadwood (aquatic habitat) will be salvaged from waterways where reasonably practicable and stockpiled for future reuse. Following the completion of construction, salvaged aquatic habitat can be re-used within the same area as it was salvaged, at locations where scour risk can be avoided.

Salvaged aquatic habitat will be stockpiled in a designated stockpile area that has previously been assessed for potential impacts by HLW activities. Waterway bed and bank material excavated during construction will be stockpiled outside of the active channel and avoid riparian vegetation.

Any material excavated from the bed of waterways will be stockpiled separately from other materials (i.e. contaminated soil, road-base) and returned to the waterway bed following the completion of construction work.

5. Fauna handling and rescue procedure

This fauna handling and rescue procedure is applicable to the handling of any fauna (threatened or otherwise) which has potential to occur onsite. Handling of fauna may be necessary when they are encountered and need to be relocated or if injured, taken to a vet or wildlife carer. Fauna handling will be undertaken either by the Project Ecologist or a person skilled in handling the species of fauna encountered. Should any threatened species be identified, the Unexpected Threatened Species Find Procedure (Annexure D of the HLW BMP) would be implemented in conjunction with this procedure.

Records must be maintained of all fauna interactions per Attachment 3: Fauna handling record sheet.

5.1. Rescue procedure

If wildlife is discovered in the HLW Area during construction that may harm the animal or pose risk to site personnel, the following steps will be taken.

1. Stop all work in the vicinity of the animal and immediately notify the Site Supervisor who is then to notify the Project Ecologist and/or Site Environmental Advisor.
2. Preferably allow the animal to leave the area without intervention, particularly if it is not injured or in shock, and if safe to do so for the animal (i.e., no machinery in the immediate vicinity). Passive relocation techniques can be used for this, such as isolating the area overnight, apply an egress feature such as a plank, or using diversion or exclusion features to isolate the animal from the works.
3. Use a qualified ecologist or wildlife carer with specific animal handling experience to carry out any fauna handling.
4. Where necessary to minimise stress to the animal and/or remove the risk of further injury before the Project Ecologist or wildlife handler arrives on site, the Site Environmental Advisor may implement the Handling Procedures detailed below.
5. If the animal cannot be handled (i.e., venomous reptiles, raptors, bats), exclude all personnel from the vicinity with barricading and/or signage and record the exact location of the animal(s) to be provided to the Project Ecologist or appropriate wildlife handler.
6. Call the Project Ecologist or appropriate wildlife handler, refer to contact details provided in Table 5-1, and follow any advice provided. Once the Project Ecologist or wildlife handler arrives on site, they are responsible for the animal and any decisions regarding the care of the animal will be made by that person.
7. In the event that wildlife carers, and/or local veterinary services cannot be contacted, the injured animal shall be kept in a quiet, warm and dark place in accordance with the below Handling Procedure, until it can be transferred to a wildlife carer or vet.
8. If any fauna is to be euthanised, it will be undertaken using a suitable technique (e.g., cervical dislocation for small mammals) by a trained and competent person(s) (i.e., suitably qualified Project Ecologist or wildlife handler); or will be taken to a veterinarian for euthanasia. Identified pest species onsite will also be humanely euthanised. The Project Ecologist will consider methods that are humane, painless and rapid.
9. If the fauna is to be released, suitable fauna release locations within or near the HLW Area will be used, the locations for which are best identified during pre-clearing surveys. Suitable release locations should be identified before commencement of activities that may displace fauna (such as for habitat removal like hollow logs or rocky outcrops).
10. Details of captured and relocated fauna (including injury or death) must be recorded on the

Fauna Handling Record Sheet provided in Attachment 3.

Table 5-1 Wildlife carer and vet contact details

Role	Organisation	Location	Contact details
Wildlife carers	WIRES	National service utilising local volunteers	1300 094 734
Vet	Wagga Wagga Veterinary Hospital	132 Urana St, Turvey Park NSW 2650	02 6926 0900
Vet	Adelong Veterinary Clinic	107 Tumut St, Adelong NSW 2729	02 6946 2704
Vet	Tumut Veterinary Clinic	78 Adelong Rd, Tumut NSW 2720	02 6947 3122
Vet	Tumbarumba Veterinary Clinic	3 The Parade, Tumbarumba NSW 2653	02 6948 2100

5.2. General handling procedures

Fauna located in hollows may be extracted by hand, which may require opening of the hollow by chainsaw. If using power tools, including handsaws, while opening the hollow it is advised that a barrier is placed between the area of work and fauna to be salvaged. Suitable material includes towels, cloth capture bags or any other materials that would not put undue pressure on the fauna and could dampen noise and vibration.

Only extract an animal when it can occur without resistance. If an animal is confined to a tree hollow/crevice:

1. Leave for 24 hrs before felling tree. If tree is already felled, leave in hollow, notify workers and allow to flee before processing the tree.
2. If large trees are being cleared limb by limb – block the entrance, cut limb in sections to avoid harm to animals during cutting, safely lower and relocate limb with animal contained.

If nocturnal fauna are required to be kept during the day, they will be kept in either standard pet carrying cages, ventilated cardboard/plastic animal boxes or cloth capture bags. Captive fauna will generally be kept at a cool or ambient temperature and shaded conditions to avoid any heat stress. Water will be provided if necessary. A range of 25 – 27°C is appropriate for most species and ages, unless specified in the specific fauna handling procedures in Table 5-2. Injured fauna may require external heat. The Project Ecologist is to regularly monitor captive fauna.

All relevant PPE and fauna handling equipment must be utilised for each rescue. At a minimum this would require gators, gloves, safety glasses, cloth capture bags, pet carriers and ventilated boxes, however may include additional instruments (i.e., snake sticks, frog hygiene kits). Project Ecologists that handle fauna will have relevant vaccinations required to do so. Further details on fauna handling equipment are provided in Table 5-2 below.

In the event that fauna are injured during construction, the animal should initially be assessed and first aid rendered by the Project Ecologist and subsequently taken to a Veterinarian for further assessment and treatment, and if necessary, euthanasia. In the event that local wildlife carers are not available, the national WIRES contact number can be used to identify other local qualified wildlife carers. Contact details are provided in Table 5-1.

5.3. Specific handling procedures

Fauna handling and rescue procedures specific to fauna groups are detailed in Table 5-2 below.

Table 5-2 Specific fauna handling and rescue procedures

Fauna group		Rescue approach
Birds		- Where possible and safe to do so, gain access to nests using elevated platform/ladder. Capture and remove any nestlings. - Place nestlings in cotton capture bags and assess for injuries. Store bags in a pet carrying cage or ventilated cardboard box. Birds should generally be kept at a cool or ambient temperature and shaded conditions to avoid any heat stress. Water will be provided, if necessary. The animal container will be covered to reduce stress on the bird. - Deliver to specialist wildlife carer - If adult birds are captured (uninjured), they will be released away from construction activities.
Terrestrial mammals	Echidna	- If Echidnas are encountered during vegetation clearing works, they will need to be captured and relocated. - Carefully dig Echidna out by hand or shovel on the side of the Echidna. Position hand(s) beneath the Echidna and grasp a hind leg(s), lifting the Echidna from the soil. - Place in a dig-proof container, such as a ventilated plastic box. Captive Echidnas will be kept in a cool, well-ventilated location, out of direct sun. 21 °C is considered appropriate for echidnas. - Uninjured Echidnas will be translocated and released as soon as possible. Injured Echidnas will be delivered to a specialist wildlife carer.

Fauna group		Rescue approach
	Native rodents (i.e., Antechinus, mice, rats)	• Capture rodents using a hand net. • Once captured, rodents will be placed into a cloth capture bag, assessed and if not injured, retained until dusk and then released into appropriate habitat outside of the construction area, as far away as practicable.
	Macropods (i.e., kangaroos, wallabies)	• If a macropod is encountered during vegetation clearing works, activities in the area which may impact the macropod may need to cease until the individual has self-relocated. HLW environmental staff are to be notified. • In the event that a juvenile macropod is displaced (i.e., thrown from a pouch) and cannot be re-united with its parent, capture the joey gently in a cloth fauna handling bag. 31°C is appropriate for unfurred joeys, and between 25 – 27°C is appropriate for other ages. Joeys will be deposited with an authorised wildlife shelter within the region for hand rearing.

Fauna group		Rescue approach
	Wombats	• If a wombat is encountered during vegetation clearing works, activities in the area which may impact the wombat should cease until the individual has self-relocated. HLW environmental staff are to be notified. • Do not attempt to remove wombats from burrows as they can cause significant injury by crushing hands against the burrow wall. Leave wombat and re-assess for self-relocation. • If necessary, wombat rescue should be undertaken with a minimum of two Project Ecologists. Throw a blanket over it to cover its head and usher into a transport container. Alternatively, the handler can approach the wombat from behind and grasp it around the chest, just behind the front legs. Lift the animal off the ground and hold the wombat firmly against the handler's chest. Place it into a sturdy transport container as soon as possible. • Dependent joeys are commonly rescued due to the injury or death of the mother or may be found apparently abandoned. The pouch of dead adult female wombats should be checked thoroughly and both nipples examined. If the joey cannot be manipulated off the teat by applying gentle pressure to the sides of the mouth, do not make further effort to do so. Instead, if the mother is dead, the teat can be cut, as close to the mother's body as possible, and the joey removed with the teat. Once out of the pouch, place a large safety pin into the teat to ensure the joey does not swallow it, and place the joey into an artificial pouch. • Wombats should be transported in sturdy, secure transport containers such as purpose-built wooden crates or large dog crates. To reduce stress, the transport container should be covered to prevent the wombat from seeing out of the container. Transport containers should be well-ventilated, and ambient temperatures must be maintained and regularly monitored during transport (<25°C for adults, 28-30°C for joeys).

Fauna group	Rescue approach
Reptiles	- Snakes will be captured by the Project Ecologist (strictly limited to those with snake handling training) or with a person who has skills and experience in snake handling. Snakes disturbed by the development will only be captured and relocated if they present a potential threat to construction personnel or are likely to be harmed by the works. In most cases, snakes will attempt to move away from a disturbed area. - Catch the snake using appropriate equipment (i.e., snake hook, extendable pole, PPE) and place into catch bags suitable for venomous snakes (i.e. dead corners with tabs, suitable size, clean & sterilised black cotton material). Place bag into a storage contained, clearly labelled 'Caution: venomous snake' for transport. Release snake at an identified suitable release site. - Small reptiles, such as small dragons, skinks, legless lizards and geckos can be captured by hand. For animals smaller than an average hand, it is recommended that gloves are not used due to the significant reduction in dexterity and sensitivity. When capturing these reptiles, it is ideal to grip the animal at the base of the neck/upper back with pressure sufficient to restrain the animal. Avoid handling the tail of skink and gecko species as they will drop tails to escape. Once caught, the animal is to be placed in a cloth fauna bag large enough to be tied off. The bag is to be placed in a suitable cool, dark container for holding if immediate release is not possible. - Large reptiles, such as goannas and monitors require additional force due to the strength of the animal. Depending on the size of the animal, capture of large reptiles may be a two-person task. Monitors can be caught by taking hold of the base of tail whilst wearing elbow length welder's gloves. Once the animal is under some control, a towel or fauna handling bag is to be used to cover the head, allowing the handler to take hold of the neck. Place in a suitable cool, dark crate for holding if immediate release is not possible - All reptiles will be released as soon as possible after capture into suitable habitat outside of the construction zone, as far away as practicable.

Fauna group	Rescue approach
Frogs	- Frog searches are to be conducted by the Project Ecologist prior to any excavation/construction activities. - The capture and relocation of frogs require specific attention to avoid disease transmission. The following hygiene protocol applies: - Wear disposable, non-powdered gloves when handling amphibians. - Use new gloves or a new bag for handling each individual amphibian. - Wear well-rinsed (with water) vinyl gloves when handling tadpoles. - If gloves are not available, wash hands with 70% alcohol between handling each animal. Make sure hands are dry before handling amphibians as alcohol exposure may be toxic to them. Rinse hands with potable water (if available) after disinfecting. - Keep individual amphibians in separate containers. - Dispose of containers after use. - Where possible, keep tadpoles in separate containers. If necessary, tadpoles from the same pond or stream section can be grouped in one container but avoid overcrowding. - Never mix amphibians from different sites. - Amphibians should be released where they were captured. 21°C is considered appropriate for frogs. - Follow hygiene protocols outlined in Hygiene guidelines Protocols to protect priority biodiversity areas in NSW from <i>Phytophthora cinnamomi</i>, myrtle rust, amphibian chytrid fungus and invasive plants (DPIE 2020).

Fauna group	Rescue approach
Arboreal mammals (i.e., gliders, possums)	• The Project Ecologist will be onsite to inspect trees for arboreal mammals that may need to be relocated. • The Project Ecologist will determine if capture and relocation is warranted, otherwise awaiting self-relocation is an option. • Arboreal mammals will be captured either by hand or net and placed into a suitable cage or cloth capture bag. • Captured arboreal mammals will be released at a location deemed suitable by the Project Ecologist, with monitoring to occur in accordance with Annexure H: Biodiversity Monitoring Program of the HLW BMP. • In the event that juvenile arboreal mammals are displaced and cannot be re-united their mother, they will be taken to an authorized wildlife shelter within the region.
Microbats	• There is potential for microbats to carry Lyssavirus, a disease potentially fatal to humans. To reduce the risk of infection, only experienced and vaccinated Project Ecologists will be authorised to handle microbats. • The Project Ecologist is to be on site during the removal of vegetation and to inspect trees for microbats that may need to be relocated. • Microbats will be captured by hand using protective gloves. • Captured microbats must immediately be placed into a cloth bag hung vertically in a quiet, cool, dark place until released. • All captured microbats will be relocated into adjacent suitable habitat. • In the event that a juvenile microbat is displaced and cannot be re-united with its parent, orphaned microbats must be deposited with an authorised wildlife shelter within the region.

Attachment 1 Pre-clearing scoping assessment checklist

Pre-clearing Scoping Assessment date:			
Project Ecologist(s):			
#	Consideration	Response	Resulting pre-clearing method
1	What threatened species have known or assumed habitat?		
2	Are there any habitat constraints associated with these species (e.g., hollow-bearing trees, karsts, rock outcrops) that need confirmation/identification on-site for the adequate implementation of mitigation measures?		
3	Will clearing occur during breeding periods for sensitive species (e.g., nesting birds, owls)?		
4	Are there any areas that were assessed as severely burnt lands which may have resulted in limitations to Revised BDAR and/or Biodiversity Assessment Verification surveys?		
5	Are there any unsurveyed areas (being areas that have not been subject to Revised BDAR or supplementary surveys)?		
6	Are any connectivity corridors present which may require protection per Annexure F: Connectivity Strategy of the HLW BMP?		

#	Consideration	Response	Resulting pre-clearing method
7	Are there any Class 1 Key Fish Habitat (KFH) crossings that require mitigation measures per the KFH Assessment (refer Section 2.1 of this protocol)?		
8	Are threatened frog habitats mapped which may require pre-construction monitoring per Annexure H: Biodiversity Monitoring Program?		
9	Are Key's Matchstick Grasshopper habitats mapped within the clearing area that will require rehabilitation per Annexure G: Rehabilitation Plan of the HLW BMP?		
Environmental Advisor Name		Signature	
Project Ecologist Name		Signature	

Attachment 2 Final pre-clearing checklist

Inspection date:		Time:		
Project Ecologist(s):				
#	Control Measure	Status (Y / N / N/A)	Comments / Corrective Action	Verification / Record
1	Has the final pre-clearing check been completed for the daily clearing limit within 24hrs of works commencing?			
2	Are boundaries and relevant signage of clearing zones, no-go zones and connectivity corridors in place?			
3	Has the ecologist completed all relevant species-specific surveys?			
4	Has all fauna encountered been relocated outside the proposed impact footprint?			
5	Have workers been shown the limit of clearing, advised of fauna handling procedures, and any other controls?			
6	Have habitat features been demarcated?			
7	Has the Project Ecologist marked threatened fauna and flora buffers using a recognised delineation protocol?			
8	Have hollow bearing trees been checked for resident animals? Record any species found and action taken.			
9	Has vegetation to be salvaged for re-use been identified per Annexure G: Rehabilitation Plan of the HLW BMP?			
10	Have baseline weed surveys been completed per Annexure E: Biosecurity Management Plan of the HLW BMP?			
11	Have suitable fauna release areas been identified?			

#	Control Measure	Status (Y / N / N/A)	Comments / Corrective Action	Verification / Record
12	Are replacement hollows in place where required per Annexure C Supplementary Hollow and Nest Strategy of the HLW BMP?			
13	Has all equipment been inspected for weed hygiene and cleaned to remove materials and debris prior to entering site?			
14	Have environmental control measures, including erosion and sediment controls, been erected to prevent downstream biodiversity impacts?			
15	Is a suitably qualified person present when necessary to supervise clearing works and relocate or rescue fauna as required?			
16	Have CPHR been contacted and notified about any unexpected finds?			
17	Any other comments/issues?			
Environmental Advisor Name		Signature		Date
Project Ecologist Name		Signature		Date

Attachment 3 Fauna handling record sheet

Item	Detail
Date and time fauna located	
Photos captured?	
Weather (temperature, wind, cloud cover, precipitation)	
Location (Coordinates and description e.g. in tree hollow; under stockpile, open area etc)	
Fauna type (mammal, bird, reptile etc.)	
Species (if known) and number of individuals	
Observed behaviour	
Condition, general health signs, description of injuries, note if a dead specimen	
Is the fauna injured? (YES/NO)	
If YES - complete Section A. If NO – complete Section B	
Section A: Injured fauna reporting	
What time was a fauna specialist (qualified ecologist or wildlife handler) called?	
What time did the fauna specialist arrive?	
What was the outcome? (e.g. animal euthanized; animal in care; animal taken to vet; treated and relocated)	
Section B: Non-injured fauna reporting	
Where was the fauna relocated? (Coordinates and description) <i>Note: only qualified fauna ecologist/wildlife handler to relocate fauna</i>	
Time the fauna was relocated	
Name and qualification of fauna handler	
Observed behaviour on release	
Condition (general health signs) on release	
General	
Name	
Date	
Signature	

Annexure C

Hollow and Nest Strategy

HumeLink West

Document Number: HLW-HLJV-PRW-ENM-PLN-000001C

Revision: 4

TransGrid
Date 12/08/2025

Document Control

Approvals

Title	HumeLink West Hollow and Nestbox Strategy
Endorsed by Environment Representative	Derek Low (Wolfpeak Ltd PTY)
Approved on behalf of TransGrid by	Tim Burns
Signed	
Dated	

Version Control

Revision	Date	Description	Approval
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B	3/07/2024	Updates following receipt of UMMs and HLW mapping files	Paul Dudding
C	19/08/2024	Updates following TG review	Paul Dudding
1	20/12/2024	Updates following receipt of final MCoAs and draft CoMA	Tim Burns
2	4/06/2025	Updates following ER, FCNSW & CPHR review	Tim Burns
3	28/07/2025	Updates following ER & CPHR review	Tim Burns
4	12/08/2025	Updates following CPHR comments	Tim Burns

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Abbreviations

Abbreviation	Expanded text
BC Act	<i>Biodiversity Conservation Act 2016</i> (NSW)
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Sub-plan
CEMP	Construction Environmental Management Plan
CoMA	Commonwealth Conditions of Ministerial Approval
DoE	Department of the Environment
DPE	Department of Planning and Environment (now known as DCCEEW - NSW)
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now known as DCCEEW - NSW)
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Cth)
GIS	Geographic Information System
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)
HLE	The HumeLink East Stage of the HumeLink project
HLW	The HumeLink West Stage of the HumeLink project
HLW Area	Approved disturbance footprint of the HumeLink West Stage of the HumeLink project
IBRA	Interim Biogeographic Regionalisation for Australia
KTP	Key Threatening Process
MCoA	NSW Minister's Conditions of Approval
Revised BDAR	<i>HumeLink Biodiversity Development Assessment Report Rev 0</i> (Niche Environment and Heritage Pty Ltd, June 2024)
PCT	Plant Community Type
TARP	Trigger Action Response Plan
TBD	To Be Determined
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation

1. Introduction

1.1. Context

This Hollow and Nest Strategy (the strategy) forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). This strategy has been prepared to outline and describe how the UGL Limited and CPB Contractors Joint Venture (HLWJV), during the construction of HLW, will comply with the Minister's Conditions of Approval (MCoA), the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA), the Updated Environmental Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under the MCoA.

1.2. Purpose

This strategy has been prepared based on current best practices to minimise and mitigate the impacts on hollow and nest habitats associated with HLW. The strategy aims to address relevant actions and mitigation measures outlined in the following documents:

- Mitigation measure B3 and B12 of the *HumeLink Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Conditions B25 and B30 of the Minister's Conditions of Approval (MCoA) A2.
- Condition 2 and 7 of the Federal Minister for Water and Environment Condition of Ministerial Approval (CoMA).

1.3. Objective

The objective of this strategy is to assist in mitigating the impacts of clearing required for HLW by identifying target species and prescribing the necessary processes required to manage nests and install/manage fauna habitats (artificial hollows) for threatened species. The scope of this strategy is to identify threatened fauna species that are likely to be adversely impacted by the removal of hollow-bearing trees and nests, and to provide methods for the following:

- Identifying hollow-bearing trees and nests, including characterisation of such habitat resources.
- Identifying hollows suitable for salvage and re-installation.
- Identifying target locations for nest box, hollow hog or salvaged hollow installation.
- Identifying number, type, size and location of artificial hollows (specific to each target species) for compensatory installation.
- Nest box installation, hollow salvage installation and hollow hogs.
- Approach to relocation of nests by suitably qualified ecologist where found within construction work sites.
- Monitoring program to assess the efficacy of hollow replacement.

2. Environmental requirements

2.1. Relevant documents and guidelines

The main documents and guidelines relevant to this strategy include:

- Revised BDAR (Niche Environment and Heritage Pty Ltd, June 2024).
- *Nest boxes for wildlife: A practical guide* (Franks & Franks, 2011).
- *Guideline for Artificial Hollows for Private Land Conservation Agreements* (BCT, 2020).
- *Tree and Hollow Replacement Guidelines* (TfNSW, 2023).

Refer to Section 6 for a full list of references.

2.2. Permits and licences

The permits and licences relevant to this strategy include:

- All Project Ecologists must, at a minimum, hold a Scientific Licence under Part 2 of the *Biodiversity Conservation Act 2016* (including Animal Ethics Approval) for pre-clearing scoping assessments, pre-clearing surveys and fauna handling/rescue during clearing works. The Project Ecologist will demonstrate that they hold appropriate qualifications and all licenses relevant to the work being undertaken, in addition to specific experience with working in environmentally sensitive areas of a similar nature to HLW. All Project Ecologists must be supervised by a suitably qualified ecologist (i.e., minimum two-years' experience). The Project Ecologist will be reviewed and approved by Transgrid, including their role, qualifications and responsibilities.
- Where rescued fauna requires rehabilitation and care, only wildlife rehabilitation centres authorised under Part 2 of the *Biodiversity Conservation Act 2016* may be utilised.
- Clearing works to be managed and monitored using internal HLWJV Clearing Permits.

Prior to commencing works associated with this strategy, a Pre-clearing Scoping Assessment must precede Pre-clearing Surveys conducted by the Project Ecologist in accordance with Annexure B: Clearing Protocol of the HLW BMP.

2.3. Preparation of this strategy

In accordance with MCoA B30a, this strategy has been prepared by suitably qualified and experienced biodiversity experts of RPS AAP Consulting Pty Ltd:

- Polina Zadorojnaya (BSc; BAM Accredited Assessor BAAS 23014).
- Joe Baird (BSc).
- Chelsea Tiller (BSc).
- Heather Duff (BScHons Geology; BSc).

2.4. Consultation

Consultation undertaken in preparation of this strategy is provided in Annexure J: Consultation Report the HLW BMP. If consultation with relevant stakeholders or regulators is required to assess the efficacy of mitigation strategies detailed in this report, these will be undertaken in accordance with Section 8.3 of the HLW BMP.

2.5. Minister's Conditions of Approval

The MCoA relevant to this strategy are listed in Table 2-1. A cross reference is also included to indicate where and how the conditions are addressed in this strategy or other HLW management documents.

Table 2-1 MCoA relevant to this strategy

MCoA No.	Condition Requirements	Document Reference
Restrictions of Clearing and Habitat		
B25	Unless otherwise agreed with the Planning Secretary, the Proponent must: (a) ensure that the vegetation and habitat clearing limits specified in Table 2-1, Table 2-2 and Table 2-3 of Appendix 2 are not exceeded; and	Not addressed in this strategy – refer to the HLW BMP, including Annexure B: Clearing Protocol.
	(b) minimise: (i) The impacts of the development on hollow-bearing trees. (ii) The impacts of the development on threatened flora and fauna populations. (iii) The clearing of native vegetation and key habitat.	This strategy includes provisions for minimising impacts on threatened fauna populations via replacement of impacted hollows (Section 4.2) and nest impact management (Section 4.3).
	(c) not undertake any works that result in ground disturbance within a minimum setback distance of 50 metres from PCT 637 – Alpine and sub-alpine peatlands, damp herbfields and fens, South Eastern Highlands Bioregion and Australian Alps Bioregion and 30 metres from known locations of <i>Prasophyllum bagoense</i> , <i>Prasophyllum keltonii</i> and <i>Pterostylis oreophila</i> as mapped in the BDAR.	Not addressed in this strategy – refer to the HLW BMP, including Annexure B: Clearing Protocol.
Biodiversity Management Plan		
B30	Prior to carrying out any development (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64) that could impact biodiversity values that require offsetting, the Proponent must prepare a Biodiversity Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	This strategy forms part of the HLW BMP.

MCoA No.	Condition Requirements	Document Reference
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s;	Section 2.3.
	(b) be prepared in consultation with CPHR and FCNSW;	Section 2.4.
	(c) be prepared generally in accordance with the <i>Revised Biodiversity Development Assessment Report</i> (Revision 0, dated 21 June 2024);	Section 1 and 2.
	(d) include a description of the measures that would be implemented for: (i) meeting the biodiversity mitigation requirements in condition B25 and as required by condition B29;	Not addressed in this strategy – refer to HLW BMP.
	(ii) minimising: - the amount of vegetation clearing on site; - the loss of key fauna habitat (including tree hollows); - the impacts of fauna on site, including undertaking pre-clearance surveys; and - potential indirect impacts on threatened flora and fauna species;	This strategy includes provisions for minimising direct and indirect impacts to fauna on site via replacement of impacted hollows (Section 4.2) and nest impact management (Section 4.3).
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	Not addressed in this strategy – refer Annexure B: Clearing Protocol of the HLW BMP.
	(iv) protocols for unexpected finds of threatened species and threatened ecological communities within the disturbance footprint including the requirements for: all work in the associated location to stop to prevent further impact, and	Not addressed in this strategy – refer to Annexure D: Unexpected Finds Procedure of the HLW

MCoA No.	Condition Requirements	Document Reference
	- notification to the Planning Secretary and CPHR (and AG DCCEEW where relevant) in writing on any additional mitigation measures to be implemented; and - relevant agencies to be consulted and the Planning Secretary to endorse recommencement of work;	BMP.
	(v) connectivity strategy for the potentially impacted species identified in the Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024) and a Supplementary Hollow and Nest Strategy;	Refer to Annexure F: Connectivity Strategy of the HLW BMP. This strategy addresses the requirement for a Supplementary Hollow and Nest Strategy.
	(vi) protecting the conservation values of McPhersons Plain and avoiding impacts to <i>Prasophyllum bagoensis</i> , <i>Prasophyllum keltonii</i> and <i>Pterostylis oreophila</i> ;	Not addressed in this strategy – refer Annexure B: Clearing Protocol of the HLW BMP.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	Not addressed in this strategy – refer Annexure G: Rehabilitation Plan of the HLW BMP.
	(viii) progressively monitoring the areas of partial clearance following the commencement of construction and provision of a verification report every three months during construction to confirm the assumptions made in the BDAR regarding partial clearance within the Easement Clearing Zone and whether any changes are required to this plan;	Not addressed in this strategy – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.

MCoA No.	Condition Requirements	Document Reference
	(ix) maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse (such as fauna habitat enhancement) during the rehabilitation and revegetation of the site;	This strategy includes provisions for salvaging hollows (Section 4.1) and their reuse (Section 4.2.1).
	(x) collecting and propagating seed (where relevant);	Not addressed in this strategy – refer to Annexure G: Rehabilitation Plan of the HLW BMP.
	(xi) controlling erosion, weeds and feral pests;	Not addressed in this strategy – refer to Annexure E: Biosecurity Management Plan of the HLW BMP.
	(xii) bushfire management;	Not addressed in this strategy – refer to Section 7.6 of the HLW BMP.
	(xiii) minimising impacts on entities at risk of a serious and irreversible impact (SAIL), including for Box Gum Woodland, Rice Flower (<i>Pimelea bracteata</i>) and Sooty Owl (<i>Tyto tenebriosa</i>) and other entities that are identified as requiring mitigation measures in the Biodiversity Assessment Verification Report required by condition B29 and the additional mitigation measures outlined in the additional information (Transgrid proposal dated 2 September 2024) within three years of the date of the Project Approval (over and above the relevant credit obligations); and	Not addressed in this strategy. The additional measures for the entities at risk of SAIL will be delivered by Transgrid as per the Transgrid proposal dated 2 September 2024. Refer Section 6.14 of the HLW

MCoA No.	Condition Requirements	Document Reference
		BMP.
	(e) include a program to monitor, evaluate and publicly report on the effectiveness of these measures.	Section 5.
	Following the Planning Secretary's approval, the Proponent must implement the Biodiversity Management Plan. <i>Note: The Biodiversity Management Plan must incorporate all relevant aspects of the development, including Enabling Works consistent with the requirements of condition B67.</i>	Section 2.3.

2.6. Federal Minister for Water and Environment Condition of Ministerial Approval

The CoMA relevant to this strategy are listed in Table 2-2. A cross reference is also included to indicate where and how the conditions are addressed in this strategy or other HLW management documents.

Table 2-2 CoMA relevant to this strategy

EPBC Condition No.	Condition Requirements	Document Reference
Clearing Limits		
2	To avoid and mitigate harm to protected matters, the approval holder must comply with condition B25 of the NSW approval to the extent that it relates to protected matters.	Refer Table 2-1.
Biodiversity Management Plan		
7	The approval holder must comply with condition B30 of the NSW Approval. The Biodiversity Management Plan must be prepared in accordance with the Environmental Management Plan Guidelines and condition B30 of the NSW Approval.	Refer Table 2-1.

2.7. Updated Environmental Management Measures

UMMs relevant to this strategy are listed in Table 2-3 below. A cross reference is also included to indicate where and how the conditions are addressed in this strategy or other HLW management documents.

Table 2-3 UMMs relevant to this strategy

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
Biodiversity				
B3	A Biodiversity Management Plan (BMP) will be prepared in consultation with NSW DCCEEW Environment and Heritage and approved by DPHI prior to construction. The BMP will be prepared by a qualified ecologist and include a plan for implementing, evaluating and reporting on the effectiveness of all mitigation measures outlined in <i>Technical Report 1 – Revised Biodiversity Development Assessment Report</i> , including:	Detailed design and construction	All locations	This strategy forms part of the HLW BMP.
	Measures to minimise impacts to biodiversity, including measures to reduce disturbance to sensitive flora and fauna procedures for clearing of vegetation, including pre-clearing inspections and procedures for the relocation of flora and fauna.			This strategy includes provisions for minimising impacts on threatened fauna populations via replacement of impacted hollows (Section 4.2) and nest impact management (Section 4.3).
	Preparation of a fauna handling and rescue procedure to be implemented during construction and operation for the ethical handling of injured or displaced fauna.			Not addressed in this strategy – refer Annexure

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Further, the fauna handling and rescue procedure would include an incident reporting protocol for fauna relocations, rescue and rehabilitation, euthanasia and/or fatality.			B: Clearing Protocol of the HLW BMP.
	Procedures for the demarcation and protection of retained vegetation, including vegetation adjacent to construction areas and during weed management.			Not addressed in this strategy – refer Annexure G: Rehabilitation Plan, Annexure B: Clearing Protocol & Annexure F: Connectivity Strategy of the HLW BMP.
	Vegetation clearing procedures for a two staged habitat removal process required for removal of key habitat features (hollow-bearing trees, habitat trees, and bushrock) identified in Technical Report 1 – Revised Biodiversity Development Assessment Report and/or pre-clearing inspection. Including procedures to record the effort and outcomes of the habitat removal process.			
	Retention of habitat features such as rocky outcrops, surface rock, dead wood, logs, wherever practicable.			
	Proposed rehabilitation of temporary disturbance areas including management and maintenance measures.			Not addressed in this strategy – refer Annexure G: Rehabilitation Plan of the HLW BMP.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Unexpected species finds protocol to be implemented if threatened ecological communities, flora and fauna species, not assessed in Technical Report 1 – Revised Biodiversity Development Assessment Report, are encountered during pre-clearing inspections.			Not addressed in this strategy – refer Annexure D: Unexpected Finds Procedure of the HLW BMP.
	A description of biosecurity protocols for plant and equipment movement between sites, including species specific measures.			Not addressed in this strategy – refer Annexure E: Biosecurity Management Plan of the HLW BMP.
	Education of construction teams regarding the presence of native fauna and risks of vehicle collision, particularly early in the morning and late in the afternoon/at night; implementation of speed limits on sealed and unsealed tracks and roads.			Not addressed in this strategy – refer Section 7.4 of the HLW BMP.
	Outline monitoring and compliance management requirements.			Section 5
	Approach to relocation of nests by suitably qualified ecologist where found within construction work sites (ie nests found in hazardous areas will be translocated to nearby safe areas, direct handling of eggs and chicks will be avoided where possible). This could include potentially new poles/nest platforms.			Section 4.3
	Details on the pre-clearing and clearing supervision process.			Section 4.1. Refer to Annexure B: Clearing of

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				the HLW BMP for additional measures to address this condition.
	Procedures for consultation with DPI Fisheries and pre-construction survey (where required) for threatened aquatic species should be established (and Commonwealth DCCEEW for Riek's Crayfish, as required), along with processes for reporting and consideration of recommendations into design and construction methods, as relevant.			Not addressed in this strategy – refer Section 7.7 of the HLW BMP.
	Procedures for reporting the outcomes of pre-construction aquatic biodiversity surveys (where required under mitigation measure B33) at CLASS 1 crossing locations (new and upgraded tracks) potentially supporting threatened aquatic species and any management measures to be implemented (eg timing construction outside of breeding seasons, crossing type, micro siting).			Not addressed in this strategy – refer Section 7.7 of the HLW BMP.
	Procedures for the stockpiling and supply of felled trees for KFH rehabilitation or improvement works, including procedures for consultation with DPI Fisheries.			Not addressed in this strategy – refer Annexure G: Rehabilitation Plan of the HLW BMP.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	The BMP will include adaptive management measures for uncertain/ indirect/ prescribed impacts and a biodiversity monitoring program. The adaptive management measures would detail procedures for uncertain impacts, risk associated with potential failure of mitigation, circumstances where avoidance may not be achievable and prescribed impacts. The adaptive management measures would be underpinned by monitoring programs, to provide early warning of ineffective measures and/or uncertain impacts occurring. The adaptive management measures would include: • performance criteria to guide monitoring • measurable thresholds to identify when remedial action is triggered • adaptive management response/actions • a trigger for additional credit obligations and/or conservation measures for uncertain, indirect or prescribed impacts, where these impacts cannot be adaptively managed • reporting requirements			Not addressed in this plan – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.
B12	Develop and implement a Supplementary Hollow and Nest Strategy to provide alternative roosting and/or nesting habitat for threatened fauna displaced during clearing. The strategy should address measures such as nest boxes, hollow re-use / creation, re-use of timber/logs as habitat within the transmission line easement where practicable. The strategy would be captured in the BMP (as per mitigation measure B3) and will address the following requirements:	Construction	All locations where hollow bearing trees are being removed	This strategy has been prepared to address UMM B12, and forms part of the HLW BMP.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	nest boxes and other supplementary measures (such as hollow hogs) to be installed as close to the cleared area as possible (subject to landowner agreement and suitable trees being present)			Section 4.2.4.
	survey of tree hollows and nests within the proposed clearing extents			Section 4.1.
	identify the target species, size, type, number and suitable location of nest boxes/hollows required based on the results of the ecological surveys and active hollow resources in adjacent areas			Target species (Section 3.4). Size (Section 4.2.2.4). Type (Section 4.2). Number (Section 4.1 & 4.2.4). Location (Section 4.1 & 4.2.4).
	the installation of appropriate nest boxes or hollow replacements will be undertaken as early as practicable prior to clearing activities to prevent the use of the nest boxes or hollow replacements by invasive or non-targeted species			Section 4.2.4.1.
	nest boxes can also include the re-use of existing hollows salvaged prior to or during clearing where practicable			Section 4.2.1.
	record the type, height, orientation and location of nest boxes installed and provide as spatial data to Transgrid			Section 5.4.3.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	an annual monitoring program to assess the efficacy of supplementary habitat measures throughout the construction phase.			Section 5.4.4.
	Post construction monitoring and replacement of damaged nest boxes will form part of discussions with individual landowners.			Section 5.4.4.

3. Existing environment

3.1. Hollows

In NSW, at least 46 mammals, 81 birds, 31 reptiles and 16 frogs depend upon the availability of natural hollows for shelter and breeding (BCT, 2020). Hollow-dependent fauna are species that are reliant upon hollows as a key component of their habitat either on a daily or seasonal basis for survival and long-term population viability. This can be either as part of a critical life history component (i.e., breeding events) or as an important component of their natural ecology, behaviour, and ongoing presence within associated and/or preferred habitat such as for intermittent shelter and roosting activities. Hollows as a resource provide shelter and refuge from environmental factors such as exposure to predators and the elements. For several species, the availability of hollows that provide security and protection during periods of vulnerability (e.g., physiological adaptation such hibernation, or bouts of torpor) are crucial for survival (Goldingay, 2009). Many species of fauna require hollows for breeding (e.g., parrots, microbats, and owls) and populations are often limited by the availability of hollows in an area. It is assumed that any decrease in the number of hollows in an area creates the potential to impact on populations of hollow-dependent species.

Natural hollows take a long time to form. As trees experience damage over time, larger, older trees tend to have more hollows per tree, and a greater range of different sized hollows (Whitford, 2002; Goldingay, 2011). Large hollows are particularly rare and occur mostly in trees over 220 years old (Gibbons and Lindenmayer, 2000). As a result, the loss of hollow bearing trees is listed as a Key Threatening Process (KTP) under the *Biodiversity Conservation Act 2016* (BC Act). Valuable hollows for wildlife are generally found in mature and dead trees. This strategy refers to hollows in the following size classes:

- Small hollows: <5 cm (typically used by microbats, small birds and small arboreal mammals).
- Medium hollows: 5-20 cm (typically used by small to medium parrots and medium to large arboreal mammals).
- Large hollows: >20-40 cm (typically used by medium to large parrots, small owls and large arboreal mammals).
- Extra-large hollows: >40 cm (typically used by owls and large arboreal mammals).

A total of 407 hollows were previously recorded within the disturbance footprint of HLW during preparation of the Revised BDAR (Table 3-1; Figure 4-4), including a total of:

- 149 small hollows.
- 153 medium hollows.
- 67 large hollows.
- 38 extra-large hollows.

Hollow-bearing tree removal will be involved during HLW, and will therefore result in direct and indirect impacts to 43 threatened fauna species (see Section 3.4):

- Direct impacts:
 - o Removal of roosting, denning and breeding resources.
- Potential indirect impacts:
 - o Increased competition for roosting, denning and breeding resources.
 - o Displacement or local extinction of hollow-dependent species (e.g., gliders, owls, bats).
 - o Disruption of predator–prey relationships and food webs.
 - o Reduced recruitment of future hollows due to loss of older trees.
 - o Long-term habitat bottlenecks as new hollows take over a century to form.

- o Increased use of suboptimal or artificial shelter, raising predation and stress risks.
- o Loss of ecological connectivity for arboreal species, limiting movement and gene flow.
- o Increased predation due to reduced shelter resources.
- o Reduced breeding rates for hollow-dependent species resulting in decreased species richness.

Table 3-1 Recorded hollows (per Revised BDAR [Niche, 2024]) within HLW disturbance areas

Size class	Diameter (cm)	Total
Small (<5 cm)	0 to 5	149
Medium (5-20 cm)	6 to 10	62
	11 to 15	58
	16 to 20	33
Large (>20-40 cm)	20 to 39	67
Extra Large (>40 cm)	>40	38
Total		407

3.2. Nests

Fauna, particularly birds, rely on nest building for breeding and raising young. Nests are highly varied and can be comprised of burrows, stick nests, woven nests, mud nests and nests within tree hollows. Nests also vary in location, with many species laying nests on the ground while others build high in the tree canopy. Many species of nest building birds will construct new nests in a different location each year, others such as raptors, egrets, and herons construct large platform nests that they may either reuse each year or rotate use with two or three alternative nests site over multiple years.

Within the HLW Area, a range of nest resources may be encountered and may include:

- Platform nests - typical of many raptors, ravens, magpies, herons, egrets, ibises, and large honeyeaters.
- Simple nests - typical of babblers, fairywrens, grass wrens, and finches found in a range of woodland habitats.

Fauna utilisation of these resources can be categorised as either primary use, directly used by the species constructing the nest, or secondary use which involves opportunistic use of a nest by a different species.

3.3. Vegetation

The HLW Area traverses a range of landscapes which have varying degrees of fauna habitat values. Twenty-seven Plant Community Types (PCTs) have been identified within the HLW Area with potential to provide hollow and nest resources for a variety of threatened fauna species listed in Table 3-2 below.

Table 3-2 PCTs with potential to provide hollow and nest resources

PCT	Hollow-dependent species	Nest-dependent species
5	Superb Parrot, Turquoise Parrot, Barking Owl, Gang-gang Cockatoo, Little Pied Bat, Powerful Owl, Southern Myotis, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Sheath-tail-bat, Little Lorikeet, Purple-crowned Lorikeet	Black Falcon, Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Gilbert's Whistler, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Spotted Harrier, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
266	Superb Parrot, Turquoise Parrot, Corben's Long-eared Bat, Gang-gang Cockatoo, Glossy Black-Cockatoo, Masked Owl, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Sheath-tail-bat, Brown Treecreeper (eastern subspecies, Little Lorikeet, Purple-crowned Lorikeet	Black Falcon, Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Grey-crowned Babbler, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Spotted Harrier, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
268	Turquoise Parrot, Barking Owl, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Spotted-tailed Quoll, Squirrel Glider, Brown Treecreeper (eastern subspecies)	Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Square-tailed Kite, Varied Sittella
277	Superb Parrot, Turquoise Parrot, Barking Owl, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Masked Owl, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Sheath-tail-bat, Brown Treecreeper (eastern subspecies), Little Lorikeet	Black Falcon, Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Grey-crowned Babbler, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Spotted Harrier, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
278	Superb Parrot, Turquoise Parrot, Barking Owl, Eastern False Pipistrelle, Gang-gang Cockatoo, Little Pied Bat, Spotted-tailed Quoll, Squirrel Glider, Brown Treecreeper (eastern subspecies)	Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Grey-crowned Babbler, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Spotted Harrier, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
280	Superb Parrot, Turquoise Parrot, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Masked Owl, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Sheath-tail-bat, Brown Treecreeper (eastern subspecies), Little Lorikeet	Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle

PCT	Hollow-dependent species	Nest-dependent species
285	Eastern False Pipistrelle, Eastern Pygmy-possum, Spotted-tailed Quoll	Diamond Firetail, Dusky Woodswallow, Flame Robin, Little Eagle, Scarlet Robin, Varied Sittella
287	Turquoise Parrot, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Powerful Owl, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Sheath-tail-bat, Brown Treecreeper (eastern subspecies), Little Lorikeet	Black Falcon, Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Grey-crowned Babbler, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
290	Turquoise Parrot, Barking Owl, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Glossy Black-Cockatoo, Masked Owl, Powerful Owl, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Sheath-tail-bat, Brown Treecreeper (eastern subspecies), Little Lorikeet	Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
295	Barking Owl, Eastern False Pipistrelle, Eastern Pygmy-possum, Powerful Owl, Spotted-tailed Quoll	Diamond Firetail, Dusky Woodswallow, Flame Robin, Little Eagle, Scarlet Robin, Varied Sittella
297	Eastern False Pipistrelle, Eastern Pygmy-possum, Spotted-tailed Quoll	Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Scarlet Robin, Speckled Warbler, Varied Sittella
299	Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Southern Greater Glider, Southern Myotis, Spotted-tailed Quoll, Yellow-bellied Glider	Dusky Woodswallow, Flame Robin, Little Eagle, Olive Whistler, Pink Robin, Scarlet Robin, Varied Sittella, White-bellied Sea-eagle
300	Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Powerful Owl, Southern Greater Glider, Spotted-tailed Quoll, Yellow-bellied Glider	Dusky Woodswallow, Flame Robin, Little Eagle, Olive Whistler, Pink Robin, Scarlet Robin, Varied Sittella
306	Eastern False Pipistrelle, Large Bent-winged Bat, Spotted-tailed Quoll, Brown Treecreeper (eastern subspecies)	Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Scarlet Robin, Varied Sittella
314	Barking Owl, Eastern Pygmy-possum, Gang-gang Cockatoo, Powerful Owl, Spotted-tailed Quoll, Squirrel Glider, Brown Treecreeper (eastern subspecies)	Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Scarlet Robin, Varied Sittella, White-bellied Sea-eagle

PCT	Hollow-dependent species	Nest-dependent species
316	Eastern False Pipistrelle, Gang-gang Cockatoo, Southern Greater Glider, Spotted-tailed Quoll, Squirrel Glider, Brown Treecreeper (eastern subspecies)	Dusky Woodswallow, Hooded Robin, Little Eagle, Scarlet Robin, Varied Sittella, White-bellied Sea-eagle
319	Turquoise Parrot, Little Lorikeet	Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Grey-crowned Babbler, Hooded Robin, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Varied Sittella
343	Superb Parrot, Turquoise Parrot, Barking Owl, Eastern False Pipistrelle, Gang-gang Cockatoo, Glossy Black-Cockatoo, Spotted-tailed Quoll, Squirrel Glider, Brown Treecreeper (eastern subspecies), Little Lorikeet	Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Varied Sittella
352	Superb Parrot, Turquoise Parrot, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Powerful Owl, Southern Myotis, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Sheath-tail-bat, Brown Treecreeper (eastern subspecies), Little Lorikeet	Black Falcon, Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
637	N/A	Dusky Woodswallow, Olive Whistler
638	Barking Owl, Brush-tailed Phascogale, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Masked Owl, Powerful Owl, Sooty Owl, Southern Greater Glider, Spotted-tailed Quoll, Yellow-bellied Glider	Dusky Woodswallow, Flame Robin, Little Eagle, Olive Whistler, Pink Robin, Scarlet Robin, Varied Sittella
679	Eastern False Pipistrelle, Gang-gang Cockatoo, Spotted-tailed Quoll	Dusky Woodswallow, Flame Robin, Little Eagle, Pink Robin, Scarlet Robin, Varied Sittella, White-bellied Sea-eagle
731	Turquoise Parrot, Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Glossy Black-Cockatoo, Greater Broad-nosed Bat, Powerful Owl, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Glider, Yellow-bellied Sheath-tail-bat, Brown Treecreeper (eastern subspecies), Little Lorikeet	Black-chinned Honeyeater (eastern subspecies), Diamond Firetail, Dusky Woodswallow, Flame Robin, Hooded Robin, Little Eagle, Painted Honeyeater, Scarlet Robin, Speckled Warbler, Square-tailed Kite, Varied Sittella

PCT	Hollow-dependent species	Nest-dependent species
939	Eastern False Pipistrelle, Spotted-tailed Quoll	Dusky Woodswallow, Flame Robin, Little Eagle, Olive Whistler, Scarlet Robin, Spotted Harrier
953	Barking Owl, Brush-tailed Phascogale, Eastern False Pipistrelle, Gang-gang Cockatoo, Masked Owl, Powerful Owl, Southern Greater Glider, Spotted-tailed Quoll, Squirrel Glider, Yellow-bellied Glider	Dusky Woodswallow, Flame Robin, Little Eagle, Pink Robin, Scarlet Robin, Square-tailed Kite, Varied Sittella, White-bellied Sea-eagle
1196	Eastern False Pipistrelle, Eastern Pygmy-possum, Gang-gang Cockatoo, Southern Greater Glider, Spotted-tailed Quoll, Yellow-bellied Glider	Dusky Woodswallow, Flame Robin, Little Eagle, Pink Robin, Scarlet Robin, Varied Sittella
1224	N/A	Dusky Woodswallow, Flame Robin, Spotted Harrier

3.4. Target species

A total of 25 hollow-dependent species and 18 nest-dependent species listed under the BC Act and/or EPBC Act have been identified for HLW. These species are included as target species in this strategy as a proxy for all fauna with potential to be impacted during clearing works. Hollow use is dependent on variables such as size of entrance, maximum internal space, thermal properties, and distance of entrance from the internal cavity. Size of entrance can be used as an indicator of the dependent species. These have been assessed per hollow size class and nest type in Table 3-3 below.

Hollow-dependent species of different sizes may use medium and large sized hollows (e.g., Cockatoos, Parrots), and so the guidance outlined is indicative only in its categorisation of different species. Similarly, microbats can be included in all hollow size classes discussed. Colonies of microbats are included as a large hollow-dependant species as they may utilise large hollows (with small access holes or holes orientated that prevent use by other hollow-dependant species, i.e., vertical entrance) as larger breeding sites and overwintering roost sites where cavities provide suitable microclimates. During the summer months, colonies may disperse with animals utilising smaller hollow resources throughout the landscape.

Table 3-3 Target species and their preferred hollow size

Hollow class	Indicative target species
Small hollows <5 cm (typically used by microbats, small birds and small arboreal mammals)	- Brown Treecreeper (eastern subspecies; <i>Climacteris picumnus victoriae</i>). - Little Lorikeet (<i>Glossopsitta pusilla</i>). - Purple-crowned Lorikeet (<i>Glossopsitta porphyrocephala</i>). - Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>). - Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>). - Eastern False Pipistrelle (<i>Falsistrellus tasmaniensis</i>). - Eastern Coastal Free-tailed Bat (<i>Micronomus norfolkensis</i>)

Hollow class	Indicative target species
	• Eastern Pygmy-possum (<i>Cercartetus nanus</i>). • Greater Broad-nosed Bat (<i>Scoteanax rueppellii</i>). • Little Pied Bat (<i>Chalinolobus picatus</i>). • Southern Myotis (<i>Myotis macropus</i>). • Yellow-bellied Sheath-tail-bat (<i>Saccolaimus flaviventris</i>).
Medium hollows 5-20 cm (typically used by small to medium parrots and medium arboreal mammals)	• Superb Parrot (<i>Polytelis swainsonii</i>). • Turquoise Parrot (<i>Neophema pulchella</i>). • Squirrel Glider (<i>Petaurus norfolcensis</i>).
Large hollows >20-40 cm (typically used by medium to large parrots, small owls and large arboreal mammals)	• Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>). • Glossy Black-Cockatoo (<i>Calyptorhynchus lathami lathami</i>). • Spotted-tailed Quoll (<i>Dasyurus maculatus</i>).
Extra-large hollows >40 cm (typically used by owls and large arboreal mammals)	• Southern Greater Glider (<i>Petauroides volans</i>). • Yellow-bellied Glider (<i>Petaurus australis</i>). • Barking Owl (<i>Ninox connivens</i>). • Powerful Owl (<i>Ninox strenua</i>). • Masked Owl (<i>Tyto novaehollandiae</i>). • Sooty Owl (<i>Tyto tenebricosa</i>).
Platform nests Platform of sticks of various sizes lined with leaves on select nest trees (typical of raptors and water birds)	• Black Falcon (<i>Falco subniger</i>) – uses abandoned stick nests of other birds. • Little Eagle (<i>Hieraaetus morphnoides</i>). • Spotted Harrier (<i>Circus assimilis</i>). • Square-tailed Kite (<i>Lophoictinia isura</i>). • White-bellied Sea-eagle (<i>Haliaeetus leucogaster</i>).

Hollow class	Indicative target species
Simple nests Cup or dome nests built within trees, usually in canopy or in forks of branches (typical of woodland birds)	• Black-chinned Honeyeater (eastern subspecies; <i>Melithreptus gularis gularis</i>). • Diamond Firetail (<i>Stagonopleura guttata</i>). • Dusky Woodswallow (<i>Artamus cyanopterus cyanopterus</i>). • Flame Robin (<i>Petroica phoenicea</i>). • Gilbert's Whistler (<i>Pachycephala inornata</i>). • Grey-crowned Babbler (<i>Pomatostomus temporalis temporalis</i>). • Hooded Robin (<i>Melanodryas cucullata cucullata</i>). • Olive Whistler (<i>Pachycephala olivacea</i>). • Painted Honeyeater (<i>Grantiella picta</i>). • Pink Robin (<i>Petroica rodinogaster</i>). • Scarlet Robin (<i>Petroica boodang</i>). • Speckled Warbler (<i>Chthonicola sagittata</i>). • Varied Sittella (<i>Daphoenositta chrysoptera</i>).

4. Hollow and nest strategy measures

This strategy will be carried out during pre-construction, construction, post-construction and throughout the operational phases of HLW as follows:

1. Pre-construction (Pre-clearing Scoping Assessment & Pre-clearing Surveys per Annexure B: Clearing Protocol of the HLW BMP):
 - a. Identification of target fauna species, size, type, number and suitable location of artificial hollows required.
 - b. Identification of suitable hollows for salvage.
 - c. Sourcing of artificial replacement hollows as necessary.
 - d. Identification of nests and/or stick nest platforms and potential relocation sites.
2. Construction:
 - a. Vegetation clearing per Annexure B: Clearing Protocol of the HLW BMP.
 - b. Installation of artificial hollows.
 - c. Installation of any stick nest platforms.
3. Post-construction:
 - a. Monitoring.
4. Operation:
 - a. Ongoing monitoring and maintenance; to be detailed in Transgrid's Operational Biodiversity Management Plan, guided by this strategy.

4.1. Pre-clearing

4.1.1. Pre-clearing Scoping Assessment

To ensure pre-clearing procedures are risk-based and efficient, a Pre-clearing Scoping Assessment will be undertaken by the Project Ecologist prior to Pre-Clearing Surveys (in accordance with Annexure B: Clearing Protocol of the HLW BMP). This desktop process will overlay a relevant clearing permit area with up-to-date spatial data, environmental datasets and previous survey findings including:

- BioNet species records (previous 20 years).
- Revised BDAR data:
 - o Threatened flora and fauna species polygons, including assumed vs. known status.
 - o Identified threatened species records.
 - o Hollow-bearing tree mapping.
 - o Constraints mapping of PCTs, Threatened Ecological Communities and threatened species suitable habitat.
- Superseding data arising from supplementary surveys, including that obtained in pre-clearing and clearing procedures of adjoining clearing permit areas.

This scoping assessment will inform pre-clearing survey methods within a clearing permit area to ensure hollow and nest-dependent species are accurately captured and mitigated for. Pre-clearing survey methodologies are further detailed below.

4.1.2. Pre-clearing survey

Pre-clearing surveys will be conducted in accordance with Annexure B: Clearing Protocol of the HLW BMP. The surveys will involve the identification of all hollow-bearing trees and nests within the HLW Area, collectively referred to as habitat trees. Habitat trees are defined as those trees that have at least one hollow and/or one nest. A tree is considered to contain a hollow if each of the following apply:

- The entrance can be seen, and
- The hollow appears to have depth (i.e., end of hollow is not visible).

For each hollow bearing tree identified, the following information will be recorded:

- Hollow bearing tree details:
 - o Tree species.
 - o Condition (live or stag).
 - o Approximate height.
 - o Approximate Diameter at Breast Height (DBH).
- Hollow details:
 - o Location (i.e., limb, trunk, or both).
 - o Number of each hollow class (small <5 cm, medium 5-20 cm, large 20-40 cm and extra-large >40 cm).
 - o Depth of hollow.
 - o Approximate height of the hollow from the ground.
 - o Suitability and/or evidence of fauna and species identification if possible.

Each habitat tree is to be mapped using a hand-held GPS unit and physically demarcated using a tree tag and number and/or spray paint and flagging tape for future identification. Pre-clearing surveys will also include species-specific methods to target areas of assumed or known threatened species presence (as determined during the Pre-clearing Scoping Assessment detailed in Section 4.1), including hollow and nest dependent species.

Results from the Pre-clearing Scoping Assessment and Pre-clearing Surveys will be consolidated and prepared into a Pre-clearing Survey Report to document the target species, and estimate the size, type, number and suitable location of replacement hollows required. This will be used to prepare a preliminary estimate of number of hollows lost and identify hollows appropriate for salvage and reuse.

Given the limitation of assessing hollows from the ground during pre-clearing surveys, the total number and size of hollows to be cleared will be confirmed following clearing supervision and specified the relevant Post-clearing Reports (detailed in Annexure B of the HLW BMP). Any hollows that were not initially recorded during the pre-clearing surveys, and identified during/after the tree is felled, should be treated the same as known hollows and included in the hollow removal count, and offset respectively. Similarly, potential hollows recorded during the pre-clearing survey that are determined not to be hollows after felling (i.e., showing no signs of occupancy following felling) will be removed from the hollow removal and offset count. The replacement commitment is limited to hollows 1:1 that show evidence of occupancy. Hollows in fallen trees will be thoroughly inspected for signs of use, including scratch marks, chewed bark, scats, fur, feathers, nesting material, eggs or eggshells, and the presence of young. Any tree containing hollows with evidence of past or current occupation must be replaced. Where evidence is inconclusive, the precautionary principle should apply and the hollow replaced.

Suitable locations will be considered as Hollow Replacement Zones, further detailed in Section 4.2.4.

4.2. Artificial hollow design and installation

Artificial hollows will be implemented within the HLW project following a clear hierarchy of habitat replacement methods, prioritising long-term ecological benefit and species-specific suitability. Data obtained in the pre-clearing and post-clearing surveys will be used to determine the number and type of artificial hollows required at a replacement ratio of 1:1 for all hollows showing evidence of occupation or fauna use. Salvaged hollows will be used as first preference. In the instance that the hollow cannot be salvaged and re-used, 3D-printed nest boxes would be used for certain species (particularly extra-large hollow-dwelling fauna), followed by hollow hogs and wooden nest boxes, as

summarised in Table 4-1.

Table 4-1 Hierarchy of artificial hollow installation

Priority	Method	When preferred
1	Salvaged hollows	Existing natural hollows present and viable. Always the preferred habitat option.
2	3D-printed Nest Boxes	Where replacing hollows for certain species. Provides durability, species-specific designs and improved thermal performance.
3	Hollow Hog Hollows	Long-term habitat needed in healthy standing trees; high thermal stability or canopy placement required. Note: no hollow hog use is permitted within NSW Forestry lands.
4	Nest Boxes	Trees unsuitable for modification; short-term habitat needed; low canopy; temporary offsets; inspection access required.

4.2.1. Salvaged hollows

Felled timber with naturally formed hollows provides a ready-made alternative to standard nest boxes. As natural hollows, they are more likely to produce favourable conditions for target species and provide more suitable habitat with better thermal properties when installed in the host tree compared to manufactured nest boxes (BCT, 2020). However, challenges associated with this method include labour requirement, operational risks, attachment methods and limitations associated with access, weight, etc.

4.2.1.1. Design

Ideally, a salvaged hollow will include a pre-formed entrance and can be cut above and below the hollow to provide a natural lid and base. It is important to retain the functional length of a cut limb to ensure it provides the required architecture for the target species; limbs cut too short are unlikely to be suitable. However, many natural hollows would simply provide the 'shell' and require a cap to be installed at either end or an entrance hole to be created (BCT, 2020). Any requirements to modify the salvaged hollows should incorporate design specifications for target species provided in Table 4-2. As per nest boxes, salvaged hollows should be hardwood of an appropriate thickness (>25 mm). Any capping requirements should use marine grade plywood as a minimum and be sealed with waterproofing to reduce warping and splitting, following the design considerations provided in Table 4-3.

4.2.1.2. Installation

The Project Ecologist will determine the potential for relocation of salvaged hollows in consultation with a suitably qualified arborist. This technique is to only be used following an assessment of associated environmental constraints, safety risks, and on a case-by-case basis. It is recommended that a suspension system similar to the Habisure System® is utilised (refer Section 4.2.2.5). More elaborate mechanisms may be required for larger hollows (i.e., galvanised strapping or cables/turnbuckles), however this is not recommended for this project due to operational risks and potential impacts on host-trees.

If the hollow is not suitable for re-installation, it will be replaced by an artificial structure to compensate for the loss. Additionally, salvaged hollows may be placed on the ground to create habitat for ground-dwelling fauna, and this will be determined by the Project Ecologist. All salvaged hollows will be marked with a unique identification number for ongoing monitoring.

4.2.2. Nest boxes

4.2.2.1. Best practice implementation

Effective nest box programs must be underpinned by scientifically validated design principles to ensure high levels of habitat suitability, thermal regulation, and occupancy by target species. Best practice implementation requires that nest boxes are designed to mimic the natural structural and thermal characteristics of tree hollows, including internal dimensions, entrance orientation, and placement height.

The Office of Environment and Heritage (OEH, 2017) recommends tailoring box design to the specific requirements of threatened fauna, particularly hollow-dependent birds and mammals. For example, gliders require insulated, deep cavities to retain heat, while parrots and cockatoos need larger entrance diameters and vertical depth for safe nesting.

Placement is critical: boxes should be positioned at heights and orientations that reduce exposure to direct sunlight in summer (typically south- or southeast-facing in NSW), while maximising structural stability and predator avoidance (Goldingay et al., 2020). It is also recommended to install boxes on mature trees in areas with confirmed or suitable foraging habitat nearby (OEH, 2017).

Internal thermal buffering should be achieved through the use of thicker walls (minimum 20 mm timber), or advanced construction materials. Incorrect box placement and design can expose wildlife to lethal temperatures, or result in low occupancy rates, even where habitat quality is otherwise suitable (Rowland et al., 2020).

4.2.2.2. Thermal performance

Research highlights the importance of thermal dynamics in nest box success. Ridley et al. (2022) investigated thermal performance under extreme temperatures and concluded that insulation materials, box wall thickness, shading, and ventilation all contribute significantly to survivability, particularly for hollow-roosting mammals like gliders and microbats.

Their findings reinforce that standard timber boxes may not be adequate under projected climate extremes. Nest boxes with internal insulation layers, ventilation slits, and reflective roofing materials are more effective at preventing heat stress, which is especially important for arboreal marsupials in NSW's hotter inland regions.

4.2.2.3. 3D-Printed hollows

Innovative artificial nesting solutions such as 3D-printed hollows are emerging as promising tools for conservation. These hollows can be custom designed using ecological and engineering inputs to better replicate natural hollow microclimates, offering superior thermal stability and weather resistance.

Projects such as the Powerful Owl conservation program have trialled prosthetic hollows developed by the University of Melbourne (2023), showing promising results in terms of both occupancy and structural integrity. These 3D hollows mimic natural tree cavities but are lighter, more durable, and easier to install in targeted locations.

Charles Sturt University (2024) has also contributed to this field by studying the applications of additive manufacturing in wildlife conservation. Their research suggests that 3D-printed hollows are particularly beneficial in post-fire landscapes, where dead or unstable trees limit traditional nest box placement. 3D designs can be rapidly adapted and mass-produced to meet specific dimensions and entrance requirements of hollow-dependent species.

These systems are already available through commercial suppliers and could be integrated as part of this strategy (Inland Rail, 2025). Currently, the leading provider for 3D-printed nest boxes is Habitat Innovation & Management based out of Orange NSW, developing modular plastic nest boxes up to four units per configuration. Consultation with this provider will occur early in HLW construction to organise bulk supply and recommended models. Use of 3D-printed nest boxes will be considered for

the following species:

- Eastern Pygmy-possum.
- Squirrel Glider.
- Brush-tailed Phascogale.
- Gang-gang Cockatoo.
- Superb Parrot.
- Greater Glider.
- Yellow-bellied Glider.
- Owls.

4.2.2.4. Selection and design

Nest boxes are to be specifically designed and selected for the target fauna species/groups identified in Section 3.4. Species specific nest box design considerations are provided in Table 4-2 below. Although consideration has targeted threatened species associated with HLW, the target species groups allow for the concurrent consideration of non-threatened native species that provide similar biodiversity values.

Key design components and considerations for artificial nest boxes, tailored to specific target species groups are outlined in Table 4-3. Specifications for features, box access and internal furnishing, materials for thermoregulation, and weatherproofing ensuring nest boxes are functional, species-appropriate, and durable, with emphasis on reducing non-target use, maintaining internal microclimates, and minimising tree damage during installation.

Table 4-2 Species-specific nest box design

Hollow class	Species	Artificial hollow description	Recommended specifications			References
			Dimensions (cm)	Entrance size (cm)	Installation height (m)	
Small hollows <5 cm (typically used by microbats, small birds and small arboreal mammals)	Brown Treecreeper (<i>Climacteris picumnus victoriae</i>)	Vertical timber box with sloped roof, mimicking tree fork hollows; mounted on trunks in dry woodlands.	15 x 15 x 20	3 (oval)	1.5–2	Gibbons & Lindenmayer, 2002; OEH, 2017
	Little Lorikeet (<i>Glossopsitta pusilla</i>)	Small parrot-style box with recessed floor and drainage holes; placed in canopy eucalypts.	15 x 15 x 25	3 (round)	>3	Higgins, 1999; OEH, 2017
	Purple-crowned Lorikeet (<i>Glossopsitta porphyrocephala</i>)	Compact parrot nest box with narrow interior and top opening for inspection; suitable for dry open forests.	12 x 12 x 20	2.5–3	>3	Higgins, 1999
	Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>)	Narrow arboreal mammal box with entry tunnel and hinged lid for inspection; mounted on tree limbs.	15 x 15 x 30	3	>4	Soderquist, 1995; OEH, 2017
	Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>)	Crevice-style bat roost box with multiple narrow chambers; rear entry to avoid predators.	40 x 25 x 8	1.5–2 (slits)	>4	Churchill, 2008; DECC, 2007
	Eastern False Pipistrelle (<i>Falsistrellus</i>)	Vertical timber box with internal baffles for roosting; painted for	35 x 20 x 10	1.5–2	>4	Churchill, 2008

Hollow class	Species	Artificial hollow description	Recommended specifications			References
			Dimensions (cm)	Entrance size (cm)	Installation height (m)	
	<i>tasmaniensis</i>)	thermal control.				
	Eastern Coastal Free-tailed Bat (<i>Micronomus norfolkensis</i>)	High-mounted multi-chamber bat box, placed in riparian zones; mimics bark roosting structures.	40 x 30 x 10	2	>5	Churchill, 2008
	Eastern Pygmy-possum (<i>Cercartetus nanus</i>)	Hollow log mimic box with insulation; entrance tube to deter predators; placed in dense shrub layer.	15 x 15 x 15	5 (tube)	1–2	Turner, 1984; OEH, 2017
	Greater Broad-nosed Bat (<i>Scoteanax rueppellii</i>)	Wide bat box with multiple vertical slits; roughened interior for grip; placed on mature eucalypts.	45 x 25 x 10	1.5	>4	Churchill, 2008
	Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>)	Large bat roost module replicating cave crevices; installed in shaded areas near water.	Module	Crevice	>5	DECC, 2007
	Little Pied Bat (<i>Chalinolobus picatus</i>)	Crevice-style roost box with internal temperature buffering; placed in warm woodland zones.	40 x 30 x 10	1.5–2	>3	Churchill, 2008
	Southern Myotis (<i>Myotis macropus</i>)	Water-adjacent bat box with moisture-resistant material and shaded installation site.	35 x 20 x 10	1.5–2	>2	Churchill, 2008

Hollow class	Species	Artificial hollow description	Recommended specifications			References
			Dimensions (cm)	Entrance size (cm)	Installation height (m)	
	Yellow-bellied Sheath-tail-bat (<i>Saccolaimus flaviventris</i>)	Tall vertical box with high thermal mass; wide entry for gliding species; mounted on tall trees.	40 x 25 x 12	3–4	>4	Churchill, 2008
Medium hollows 5–20 cm (typically used by small to medium parrots and medium to large arboreal mammals)	Superb Parrot (<i>Polytelis swainsonii</i>)	Habitech 3D printed modular box.	20 x 20 x 60	6–8	>4	DECC, 2008
	Turquoise Parrot (<i>Neophema pulchella</i>)	Medium-sized parrot box with metal-lined entrance to prevent chew damage; installed in open woodland.	15 x 15 x 30	5	>3	OEH, 2017; Higgins, 1999
	Squirrel Glider (<i>Petaurus norfolcensis</i>)	Glider-specific den box with secure lid, rear ventilation, and internal ledge; rope bridge connectivity preferred.	20 x 20 x 30	4–5	>4	Van der Ree & Bennett, 2003; OEH, 2017
Large hollows >20–40 cm (typically used by medium to large parrots, small owls and large arboreal mammals)	Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>)	Cockatoo nest tube with ladder entrance, rear clean-out door, and thick timber walls for insulation.	25 x 25 x 60	8–10	>4	OEH, 2017; Higgins, 1999
	Glossy Black-Cockatoo (<i>Calyptrorhynchus lathami lathami</i>)	Large vertical deep nest box replicating natural eucalypt hollows. Preference for large stags with hollows ~20 m high with minimal surrounding	30 x 30 x 100	10–12	>4	Courtney & Marchant, 1979; OEH, 2017

Hollow class	Species	Artificial hollow description	Recommended specifications			References
			Dimensions (cm)	Entrance size (cm)	Installation height (m)	
		canopy.				
	Spotted-tailed Quoll (<i>Dasyurus maculatus</i>)	Ground-based tunnel box with dual chambers and predator-resistant entrance; placed under log cover.	50 x 50 x 100	Tunnel	Ground	Belcher, 2000
	Southern Greater Glider (<i>Petauroides volans</i>)	Large glider den box with insulation, rear access lid, and positioned in mature canopy trees. Cockatoo nest tube with ladder entrance, rear clean-out door, and thick timber walls for insulation. Habitech 3D printed modular box.	30 x 30 x 60	10–12	>8	OEH, 2017; Lindenmayer et al., 1991
	Yellow-bellied Glider (<i>Petaurus australis</i>)	Horizontal glider box with waterproof lid and deep nesting chamber; entry hole shielded from wind.	30 x 30 x 60	10	>8	Goldingay et al., 2004
	Barking Owl (<i>Ninox connivens</i>)	Owl box with perch, drainage, and thermal mass; positioned on tall, isolated trees near open	30 x 30 x 80	12	>6	OEH, 2017

Hollow class	Species	Artificial hollow description	Recommended specifications			References
			Dimensions (cm)	Entrance size (cm)	Installation height (m)	
		habitat.				
	Powerful Owl (<i>Ninox strenua</i>)	Large vertical owl nest box, tall internal chamber and restricted entrance; located near prey-rich gullies. Habitech 3D printed modular box.	30 x 30 x 100	12–15	>6	OEH, 2017; Higgins, 1999
	Masked Owl (<i>Tyto novaehollandiae</i>)	Timber nest box with large overhang and thermal lining; installed in dense woodland habitat.	35 x 35 x 90	12–15	>6	OEH, 2017
	Sooty Owl (<i>Tyto tenebricosa</i>)	Owl-specific deep cavity box with rear access and predator guard; installed in tall forest stands.	30 x 30 x 100	12–15	>6	OEH, 2017; Higgins, 1999

Table 4-3 Nest box design considerations

Design	Component	Applicable target species group	Considerations
Entrance holes	Size	All	The entrance hole should be no larger than that required for the target species to reduce the unwanted species use.
	Location	Arboreal mammals	Rear/side entrances should be used adjacent to trunk/branch to encourage target species.
		Microbats	Entrance gap located at bottom of box to avoid competition with other species. Gap size applied to include/exclude target microbat species.
Box access	Exterior	All	Design to include grips for target animal access (i.e., grooves).
	Interior	All	Design to include grips for target animal egress (i.e., grooves or mesh).
Furnishing	Interior	All	Padding may be included dependent on target species (i.e., wood chips, shavings, sawdust).
	Interior	Microbats	Hanging support installed (i.e., shade cloth, grooves).
Thermoregulation	Roof/lid	All	No use of metal lids or plates.
	Material	All	Milled timber 25 mm thick (minimum) or exterior grade plywood 18 mm thick (minimum).
	Microclimate	All	To promote microclimate stability, the following is to be incorporated into internal box design: • Small nest box – minimum of 2 compartments. • Medium nest box – minimum of 3 compartments. • Large nest box – minimum of 4 compartments. • Extra-large nest box – minimum of 5 compartments or internal false walls.
General	Roof/lid	All	Lid to overhang all sides of box by 25 mm (minimum) to prevent water damage. Consideration should be given to a built-in overhanging lip on the outer roof layer to drip water off before reaching the seams or insulation.
	Joinery	All	Joints sealed to reduce drafts and provide structural stability. Screws/nails should be inert and/or exterior grade.

Design	Component	Applicable target species group	Considerations
	Finishing	All	No sharp edges or exposed screws/nails.
	Material	All	Timber is the preferred material; durable hardwood (preferably recycled or sustainably sourced plantation timber). Exterior grade plywood may be used (preferably with FSC certification) No MDF or chipboard used.
	Weather proofing	All	Exterior paint (if used) is non-toxic, neutral coloured, exterior grade water based acrylic paint. Do not use dark colours as these increase temperatures. Interior left natural (i.e., not painted or treated with oil).
	Drainage	All	Drain holes to be installed at base.
	Identification	All	A unique nest box identification number will be placed on the nest box (stamped on the side or bottom of the nest box).
Installation	Mounting	All	Installation to minimise damage/impact to host tree. Method of installation should be one that allows for growth of tree. Nest box must be mounted in a way that allows for the removal of the nest box for maintenance and/or replacement as required without subsequent damage/impact to host tree.
Pests	Management	All	Anti-pest devices (i.e., buffalo fly ear tags, artificial grass) installed to deter European Honeybees in areas where they could become a problem

4.2.2.5. Installation

The Habisure System ® is the preferred method for nest box installation. This method allows for tree growth, minimises impacts to the host tree and is very durable. A length of plastic-coated soft wire is passed through the holes of the nest box and around the tree trunk/branch. The wire is bent in a zigzag shape for the first 200-300 mm then runs straight afterwards, allowing for the growth of the tree. Where the wire is in contact with the tree trunk/branch, it is threaded through a length of garden hose to protect the tree. The garden hose section is not required for trees that are not in early growth stages (i.e., immature, DBH generally <15 cm, lacks typical woody structure) and where the expected increase in trunk diameter is unlikely to result in any constriction of the trunk on which the wire is installed. Refer to Figure 4-1 for an illustration of this method.

Additional requirements for nest box installation include:

- Nest box dimensions will be designed for the target fauna species/groups as detailed in Table 4-2 reflecting the size class distribution of impacted hollows. The ratio of nest box size classes

and types should be determined by Pre-clearing and Post-clearing Reports (e.g., if 50% of the hollows removed are 50 mm - then 50% of the nest boxes to be installed will be 50 mm entrance diameter).

- The ratio of target species/hollow dimension to be installed will reflect the results of Pre-clearing and Post-clearing Reports (replacement ratio of 1:1 for all hollows showing evidence of occupation or fauna use).
- Nest boxes should be installed as early as practically possible prior to clearing activities, with at least 30% installed prior to clearing.
- All remaining required artificial hollows to be installed within 2 months of clearing at a particular location.
- Nest boxes should be installed on trees with an opposing branch to support the installation attachments (as displayed in Figure 4-1).
- Nest boxes for birds are to be orientated between north-west and east of tree trunks to avoid hot afternoon sun and dominant direction of severe storms.
- Nest boxes for bats are to be placed in a variety of orientations which should comprise of some shaded boxes and some sun-exposed boxes to generate a variety of thermal conditions, allowing for use as both summer and winter roosts.
- Nest boxes should be installed at the recommended heights for target species/nest box type detailed in Table 4-2.
- Installation of each nest box will include ensuring the box is labelled with a unique identifier to aid in monitoring.

A summary of this information will be included in the Nest Box Installation Report (further detailed in Section 5.4). Subject to landowner agreement and suitable existing trees being present, compensatory nest boxes will be installed no less than two weeks prior to clearing.

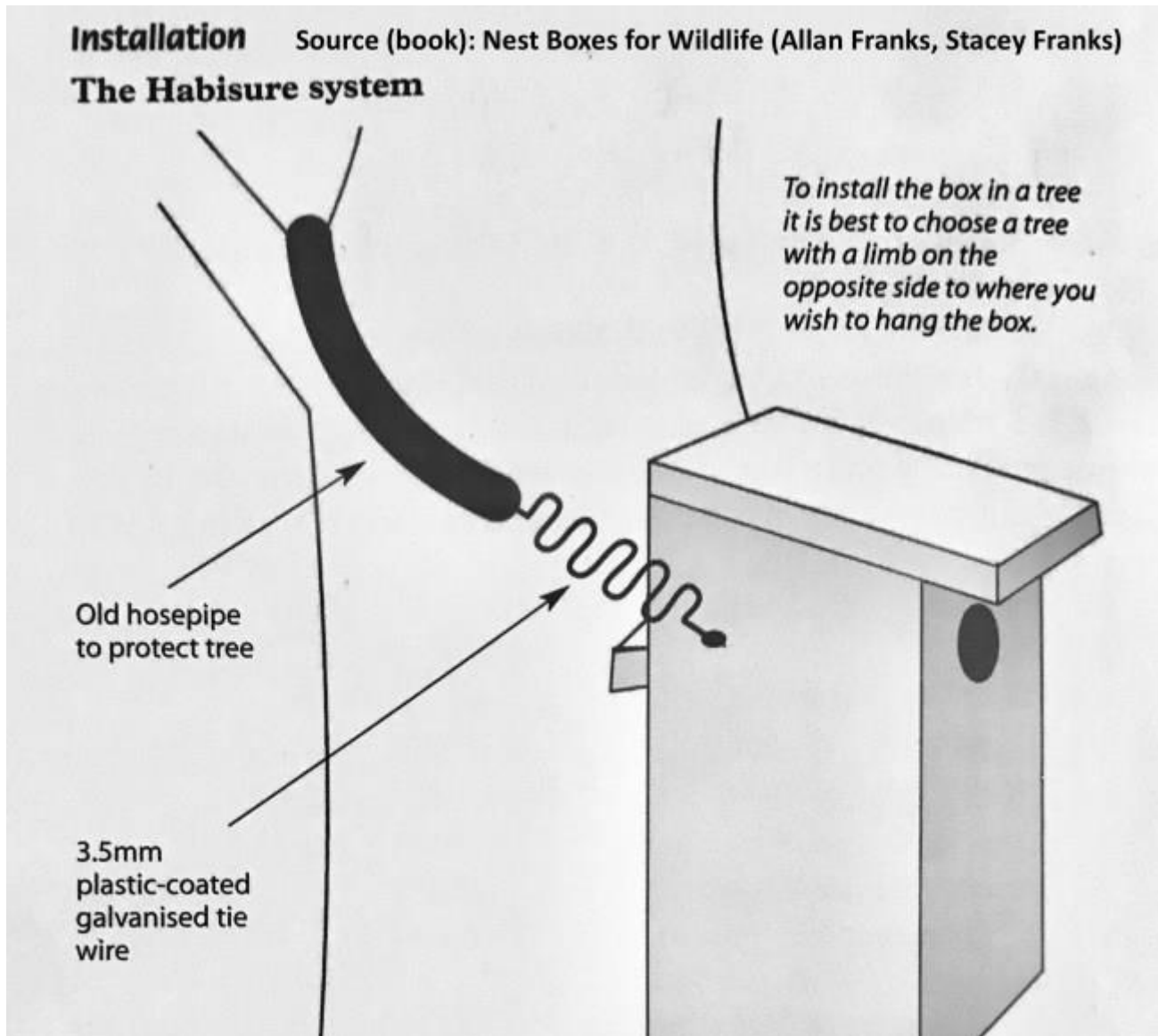


Figure 4-1 Habisure System © illustration (Franks and Franks, 2011)

4.2.3. Hollow Hog Technology

Historically, “chainsaw hollows” have been created in living trees by arborists using conventional tools. However, best practice has shifted toward the use of specialised equipment such as the “Hollow Hog” system, which allows for more precise, repeatable, and less damaging creation of artificial hollows.

Hollow Hog is an Australian-designed arborist tool developed by biologist Matt Stephens to create internal artificial hollows within living or dead trees. These hollows are designed to replicate the nesting and denning functions of natural tree cavities, which can take over 100 years to form (Biodiversity Conservation Trust, 2020). The tool is powered by an angle grinder and used to carve out a concealed hollow chamber via a small external entry hole, typically around 50 mm in diameter (Hollowhog, 2024).

Ecologists can be trained and certified to use Hollow Hog equipment, allowing them to create hollows themselves, rather than relying solely on arborists. This ensures greater integration with habitat assessments and monitoring programs.

4.2.3.1. Design

Hollow Hog cavities are most appropriate for targeting small to medium-sized hollow-dependent species such as gliders, microbats, and small parrots (e.g. lorikeets and rosellas), particularly where long-term, thermally stable habitat is required. Unlike traditional nest boxes, Hollow Hog hollows are mechanically carved into standing, healthy trees using a rotary tool, enabling the creation of internal cavities without the need for external materials or box structures.

The Project Ecologist should advise on cavity dimensions and entry size to suit the target species, while the Project Arborist must assess tree health and suitability to ensure structural integrity is not compromised during installation. Entry hole modifiers (e.g., Tec-Spouts) may be used to maintain appropriate access dimensions over time. Trees selected for this method should allow for vertical or side-entry hollows at suitable heights, consistent with known species requirements outlined in Table 4-2 (Biodiversity Conservation Trust, 2020; Treetec, 2023). Hollow Hog installation aligns with best practice guidance for artificial hollow creation in NSW, providing a durable and low-maintenance alternative to fabricated nest boxes.



Figure 4-2 Hollow Hog installation (Treetec, 2023)

4.2.3.2. Installation

To prevent tree failures and ensure safe working conditions, hollow hogs are only to be created by adequately qualified arborists (AQF Level 5 or equivalent) or ecologists trained in Hollow Hog creation, with only mature or dead trees >40 cm DBH suitable as host-trees.

4.2.4. Location (Hollow Replacement Zones)

Artificial hollow installation locations will be determined by the Project Ecologist following Pre-clearing Surveys and surveys of available nearby habitat. Should there be no suitable areas adjacent to the HLW Area, artificial hollows can be installed at the nearest suitable area pending landowner approval. Once confirmed, location of hollow replacement zones will be presented as spatial data to CPHR as part of the Pre-clearing Survey Report for approval. This information will also be provided to and agreed with the appropriate landowners before artificial hollow installation can occur.

It is acknowledged that no hollow hog installation will occur on NSW Forestry Estate, with all replacement hollows limited to salvaged hollows (preferred), 3D-printed nestboxes, and finally

traditional nest boxes. Refer Annexure J: Consultation Report the HLW BMP for details on consultation with NSW Forestry Estate.

The density and quantity of each nest box type should reflect the proportion of tree hollow types being removed, the proportion of tree hollow types to be retained in adjacent habitat, the availability of adjacent food resources and the assemblage of hollow-dependant fauna known or likely to occur in the project locality.

To strategically identify locations where artificial hollows should be installed to offset the loss of natural hollows during vegetation clearing, Pre-clearing Reports will designate final Hollow Replacement Zones. Desktop data obtained during the Pre-clearing Scoping Assessment will be combined with field-based Pre-clearing Survey results and documented in Pre-clearing Reports. This will include advice on recommended installation e.g. tree attachment, suitable height, density, location, aspect and timing of artificial hollow installation (refer to Section 5.4 for more details). Locations for potential installation areas will be considered in order of preference:

1. Within the outer edge of the easement.
2. Adjacent to the HLW Area on private property, with landowner agreement to access installation and ongoing monitoring.

Final Hollow Replacement Zones will consider the following (Figure 4-3):

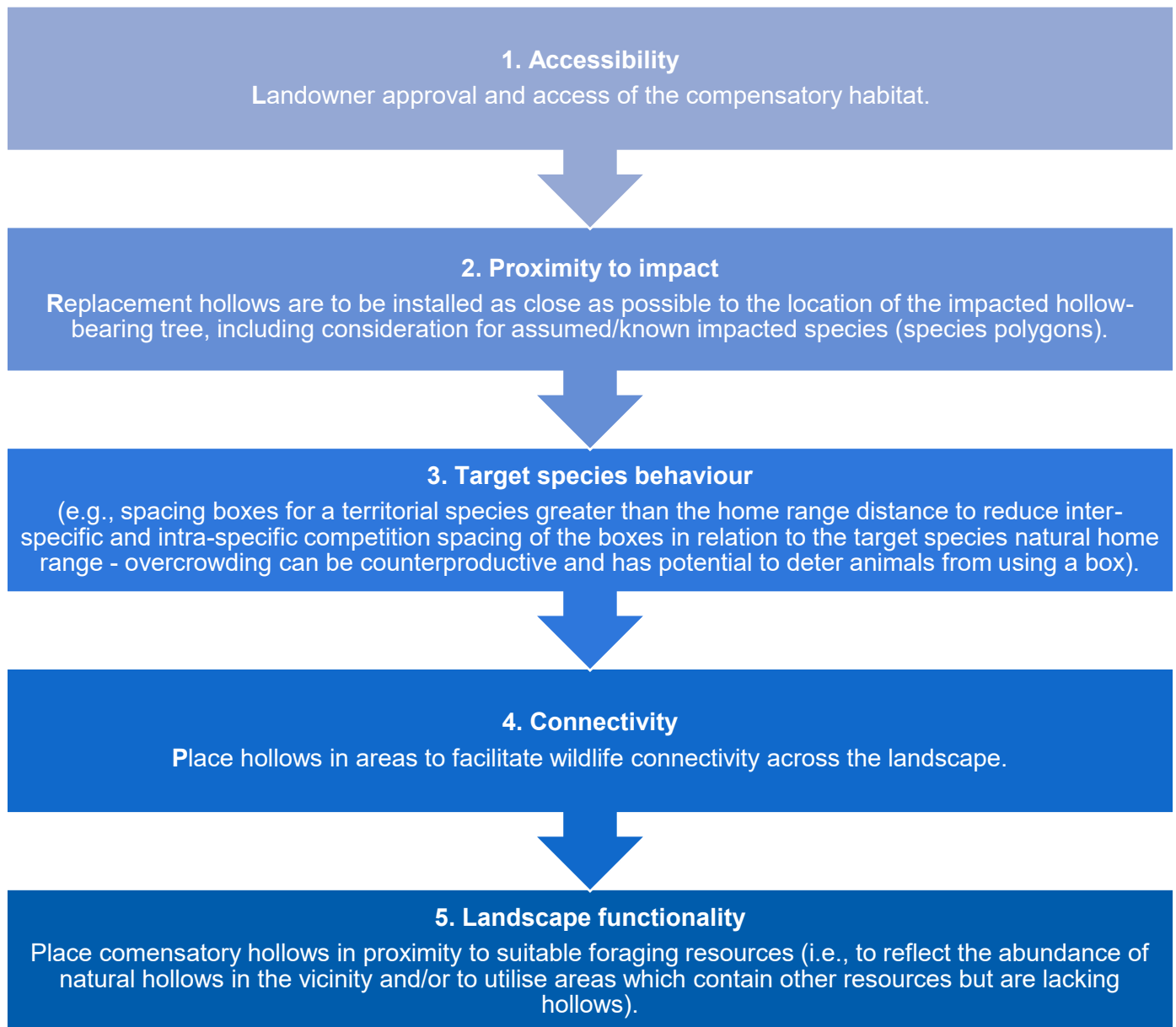


Figure 4-3 Hollow-replacement zone decision making key

4.2.4.1. Indicative Hollow Replacement Zones

Indicative Hollow Replacement Zones have been prepared as part of this Strategy, as displayed in Figure 4-4. Indicative Hollow Replacement Zones have been organised by hollow-classes and target species, mapped to replace impacted hollow-bearing trees per the Revised BDAR in adjacent and continuous habitats (i.e., same vegetation zones). All disturbance zones relevant to HLW would involve tree clearing for the project. Therefore, hollow-bearing tree data obtained in the Revised BDAR was analysed within the disturbance footprint for HLW to provide preliminary artificial (replacement) hollow calculations in Table 4-4, assuming a replacement ratio of 1:1.

Note: Hollow Replacement Zones and associated replacement hollow calculations are indicative only. These have been identified prepared based on Revised BDAR data only, particularly hollow-bearing tree data, vegetation zone mapping and fauna species polygons. Final Hollow Replacement Zones will require formal assessment during the pre-clearing process, including input of any post-BDAR survey data (i.e., Biodiversity Assessment Verification Report surveys, pre-clearing survey results).

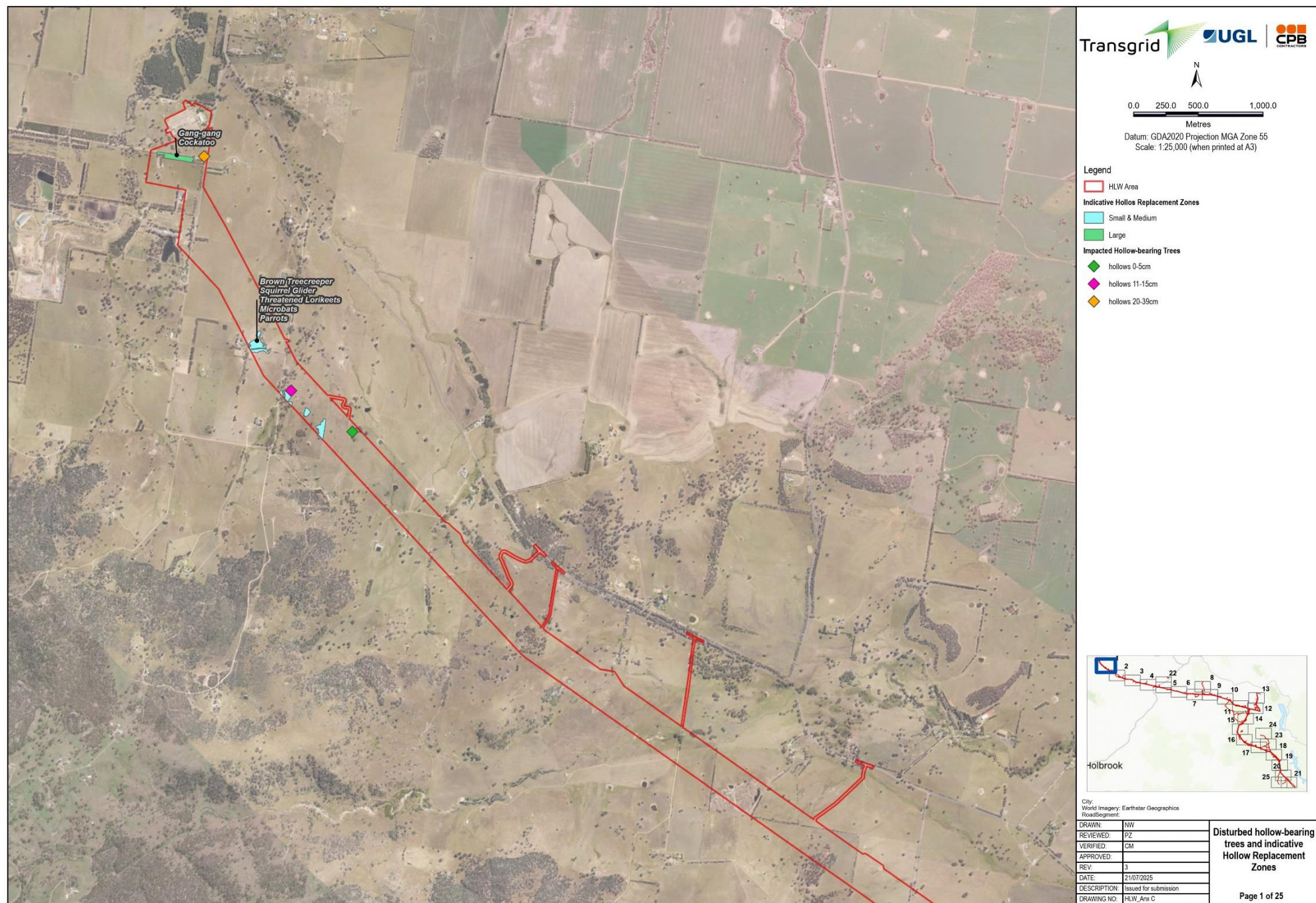
Table 4-4 Indicative Hollow Replacement Zone estimates (based on Revised BDAR vegetation zone, hollow-bearing tree and species polygon data)

Hollow Replacement Zone PCT	Hollow class and target species*							
	S	Target species	M	Target species	L	Target species	XL	Target species
5	9	• Little Lorikeet. • Purple-crowned Lorikeet. • Little Pied Bat. • Southern Myotis. • Yellow-bellied Sheath-tail-bat.	2	• Superb Parrot. • Turquoise Parrot. • Squirrel Glider.	-	-	-	-
266	5	• Little Lorikeet. • Purple-crowned Lorikeet. • Brown Treecreeper (eastern subspecies). • Corben's Long-eared Bat. • Yellow-bellied Sheath-tail-bat.	1	• Superb Parrot. • Turquoise Parrot. • Squirrel Glider.	-	-	-	-
268	7	• Brown Treecreeper (eastern subspecies). • Eastern False Pipistrelle. • Yellow-bellied Sheath-tail-bat. • Eastern Pygmy Possum.	13	• Turquoise Parrot. • Squirrel Glider.	1	• Gang-gang Cockatoo.	-	-

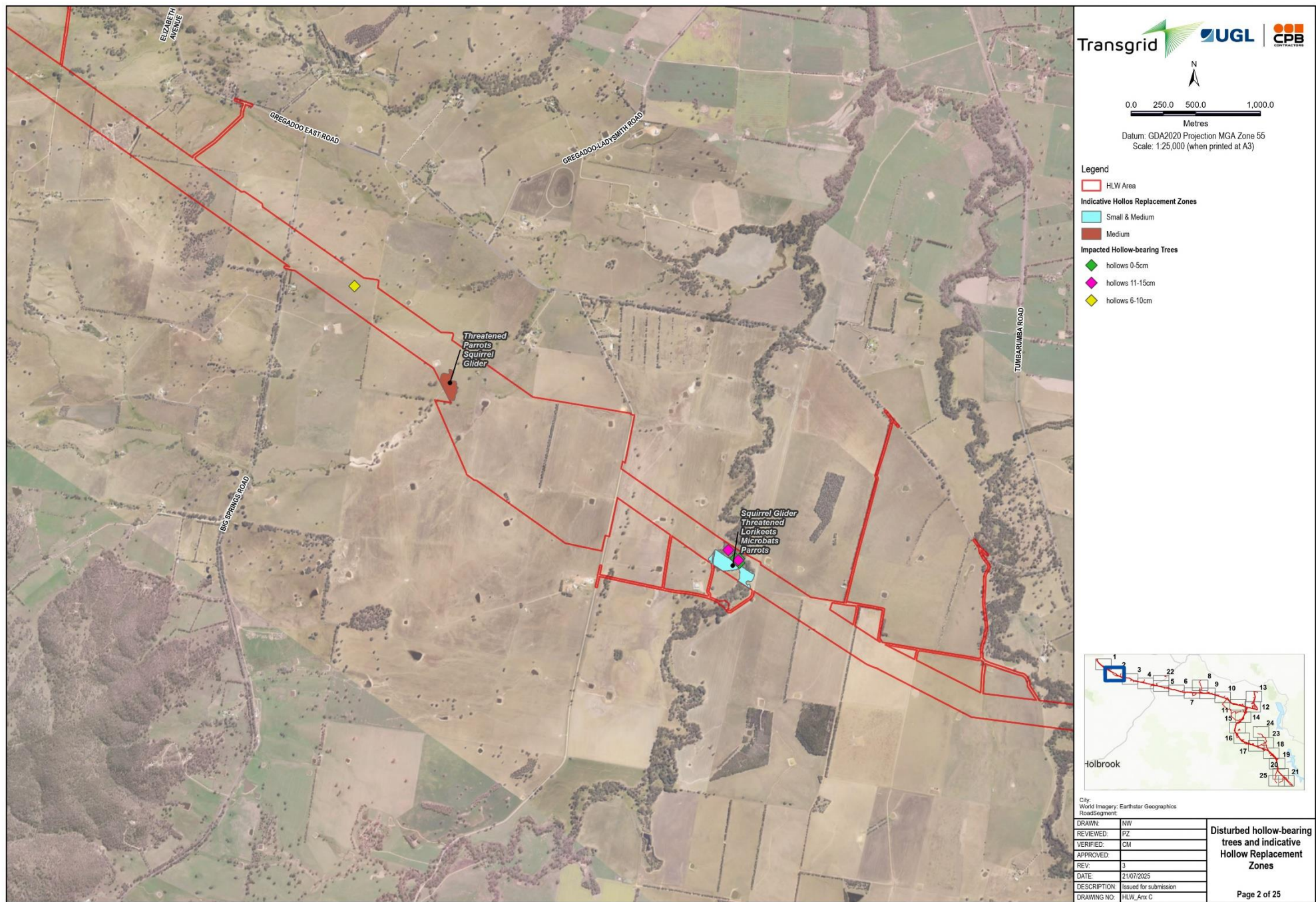
Hollow Replacement Zone PCT	Hollow class and target species*							
	S	Target species	M	Target species	L	Target species	XL	Target species
277	18	• Little Lorikeet. • Eastern False Pipistrelle. • Yellow-bellied Sheathtail-bat.	27	• Superb Parrot. • Turquoise Parrot. • Squirrel Glider.	2	• Gang-gang Cockatoo.	-	-
299	-	-	0	N/A – no mapped or associated medium hollow dwelling species	-	-	0	N/A – no mapped or associated extra-large hollow dwelling species
300	3	• Eastern Pygmy-possum.	0	N/A – no mapped or associated medium hollow dwelling species	4	• Gang-gang Cockatoo. • Spotted-tailed Quoll.	1	• Powerful Owl. • Southern Greater Glider. • Yellow-bellied Glider.
343	-	-	6	• Superb Parrot. • Turquoise Parrot • Squirrel Glider.	-	-	-	-
638	3	• Brush-tailed Phascogale. • Eastern False Pipistrelle. • Eastern Pygmy-possum.	16	• Squirrel Glider.	1	• Gang-gang Cockatoo. • Spotted-tailed Quoll.	3	• Barking Owl. • Masked Owl. • Powerful Owl. • Sooty Owl. • Southern Greater Glider. • Yellow-bellied Glider.

Hollow Replacement Zone PCT	Hollow class and target species*							
	S	Target species	M	Target species	L	Target species	XL	Target species
679	-	-	-	-	6	- Gang-gang Cockatoo. - Spotted-tailed Quoll.	-	-
953	60	- Brush-tailed Phascogale. - Eastern False Pipistrelle.	69	Squirrel Glider.	21	- Gang-gang Cockatoo. - Spotted-tailed Quoll.	23	- Barking Owl. - Masked Owl. - Powerful Owl. - Southern Greater Glider. - Yellow-bellied Glider.
1196	25	- Eastern False Pipistrelle. - Eastern Pygmy-possum.	0	N/A – no mapped or associated medium hollow dwelling species	18	- Gang-gang Cockatoo. - Spotted-tailed Quoll.	8	- Southern Greater Glider - Yellow-bellied Glider.
Total estimates	130 small hollow-class replacements		134 medium hollow-class replacements		53 large hollow-class replacements		35 extra-large hollow-class replacements	

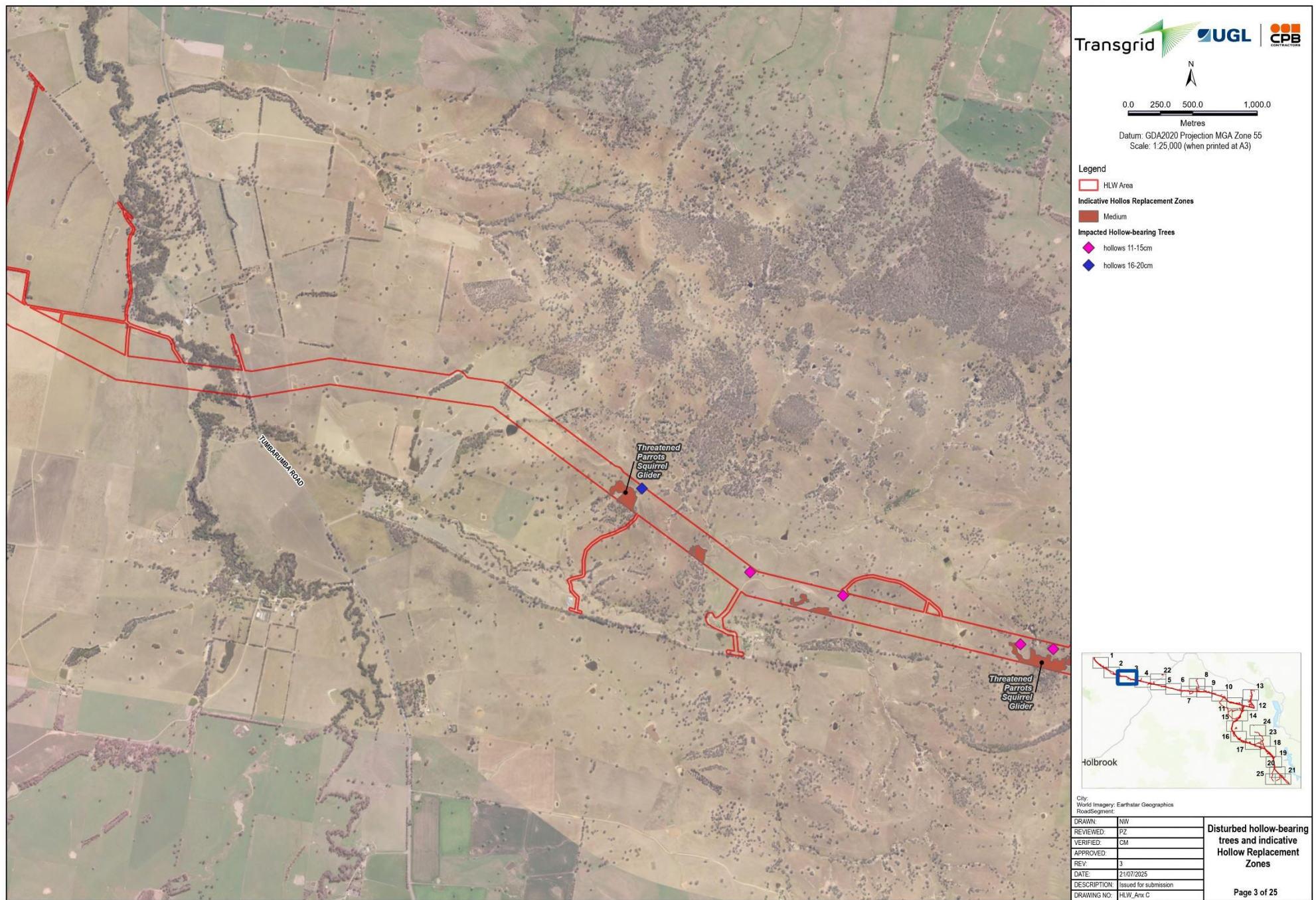
* S = small; M = medium; L = large; XL = extra-large

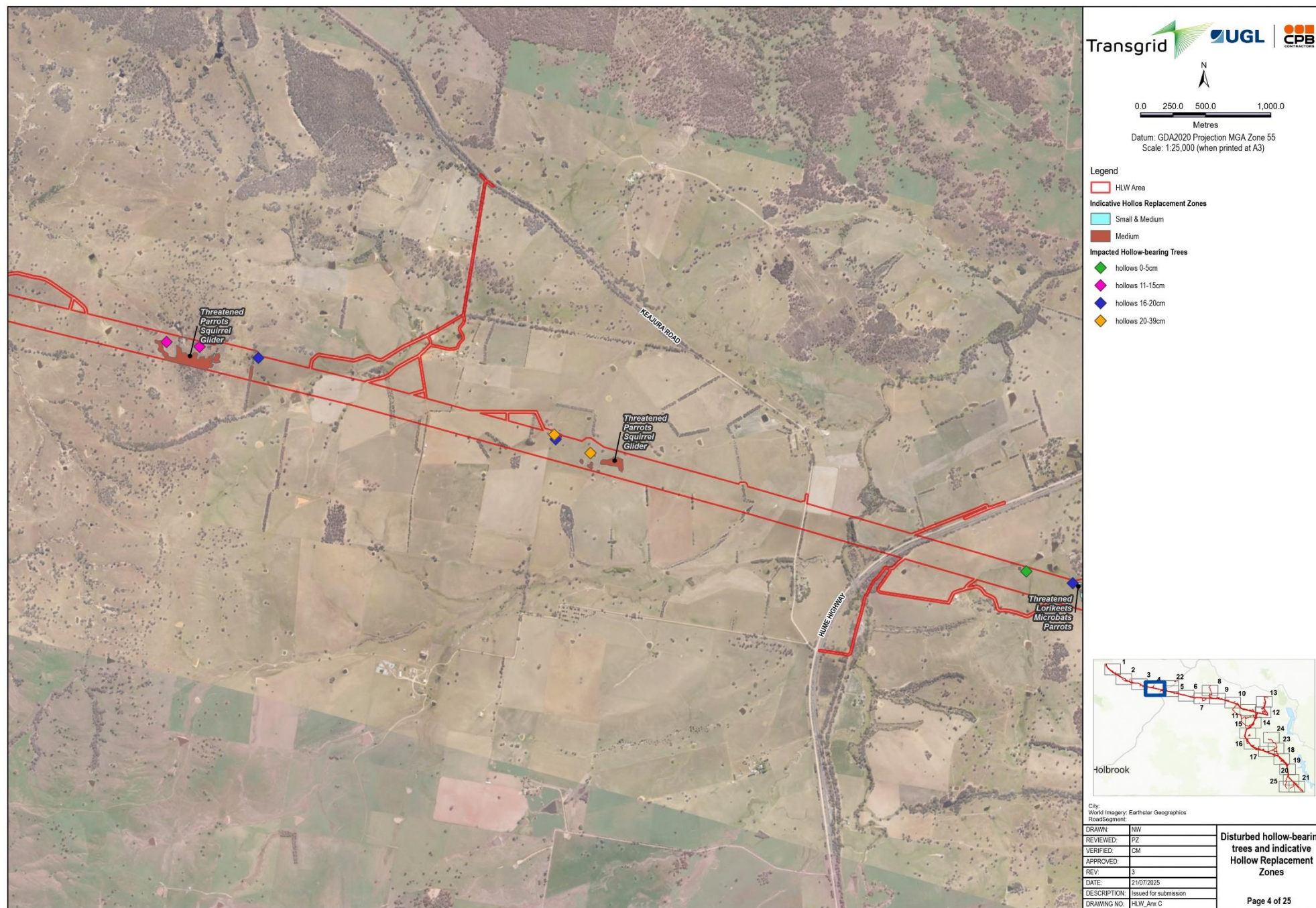


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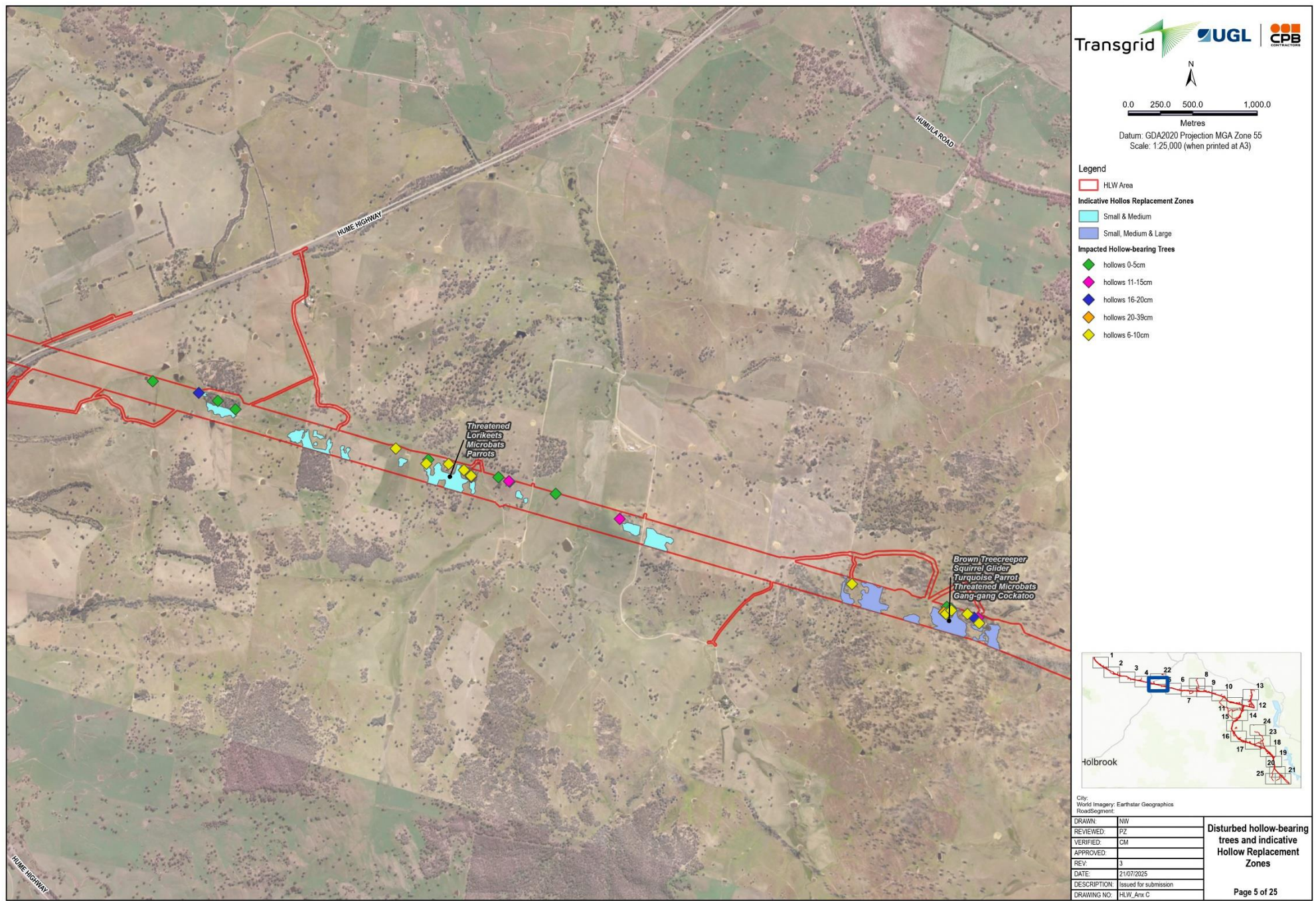


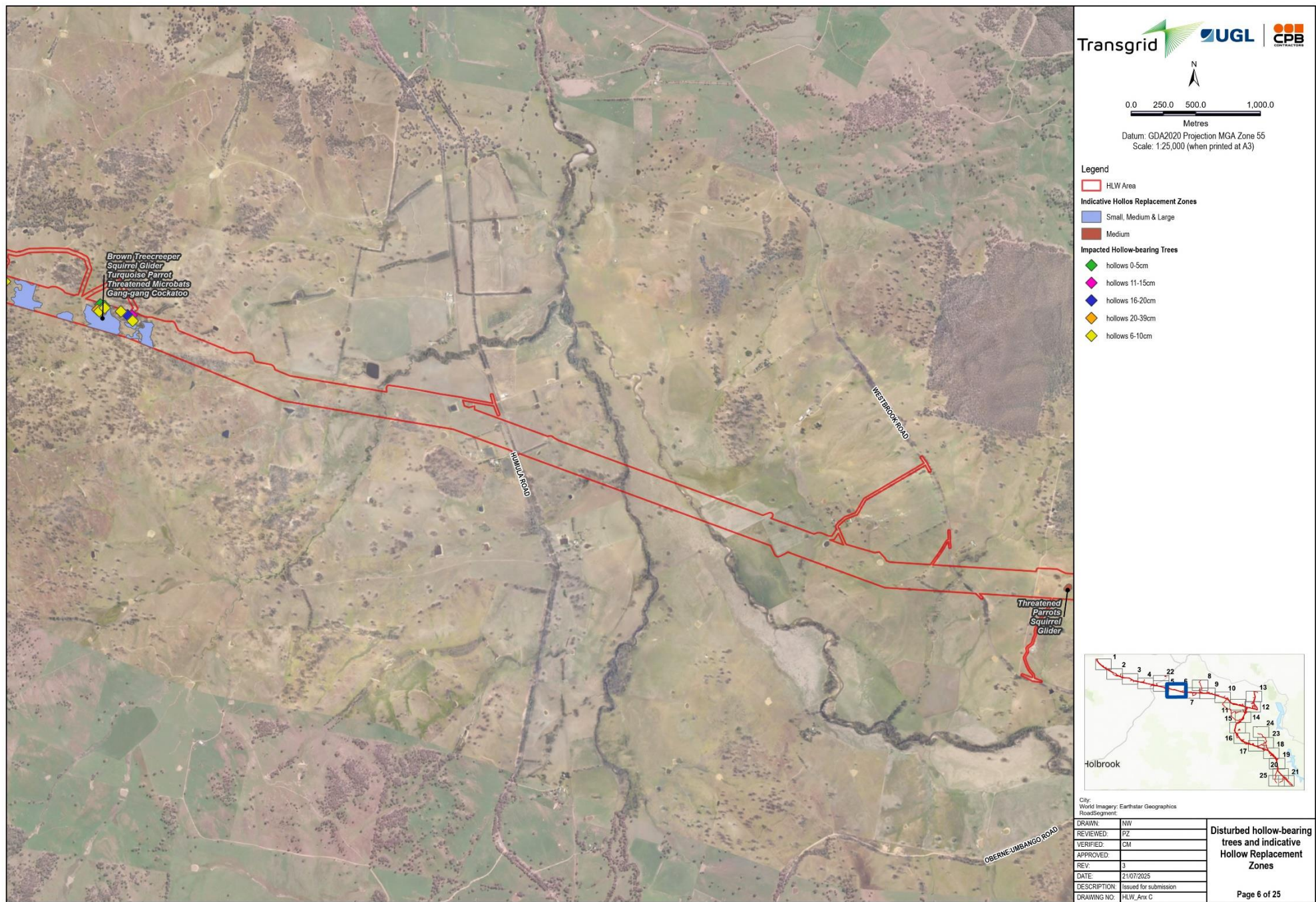
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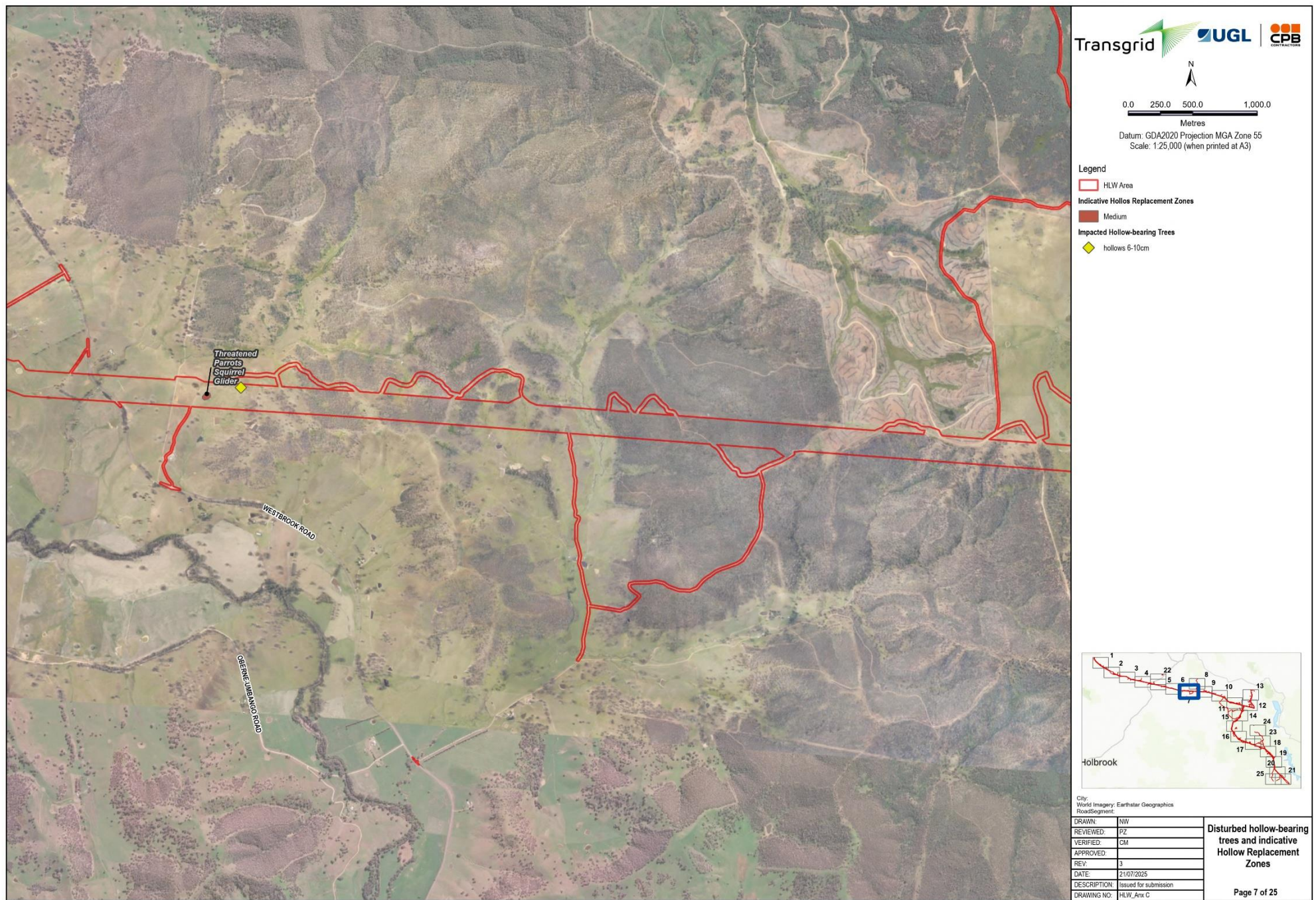


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Transgrid

UGL

CPB

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Metres

Datum: GDA2020 Projection MGA Zone 55

Scale: 1:25,000 (when printed at A3)

Legend

HLW Area

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Holbrook

City: World Imagery: Earthstar Geographics

RoadSegment:

DRAWN:	NW
REVIEWED:	PZ
VERIFIED:	CM
APPROVED:	
REV:	3
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DESCRIPTION:	Issued for submission
DRAWING NO:	HLW_Amxc

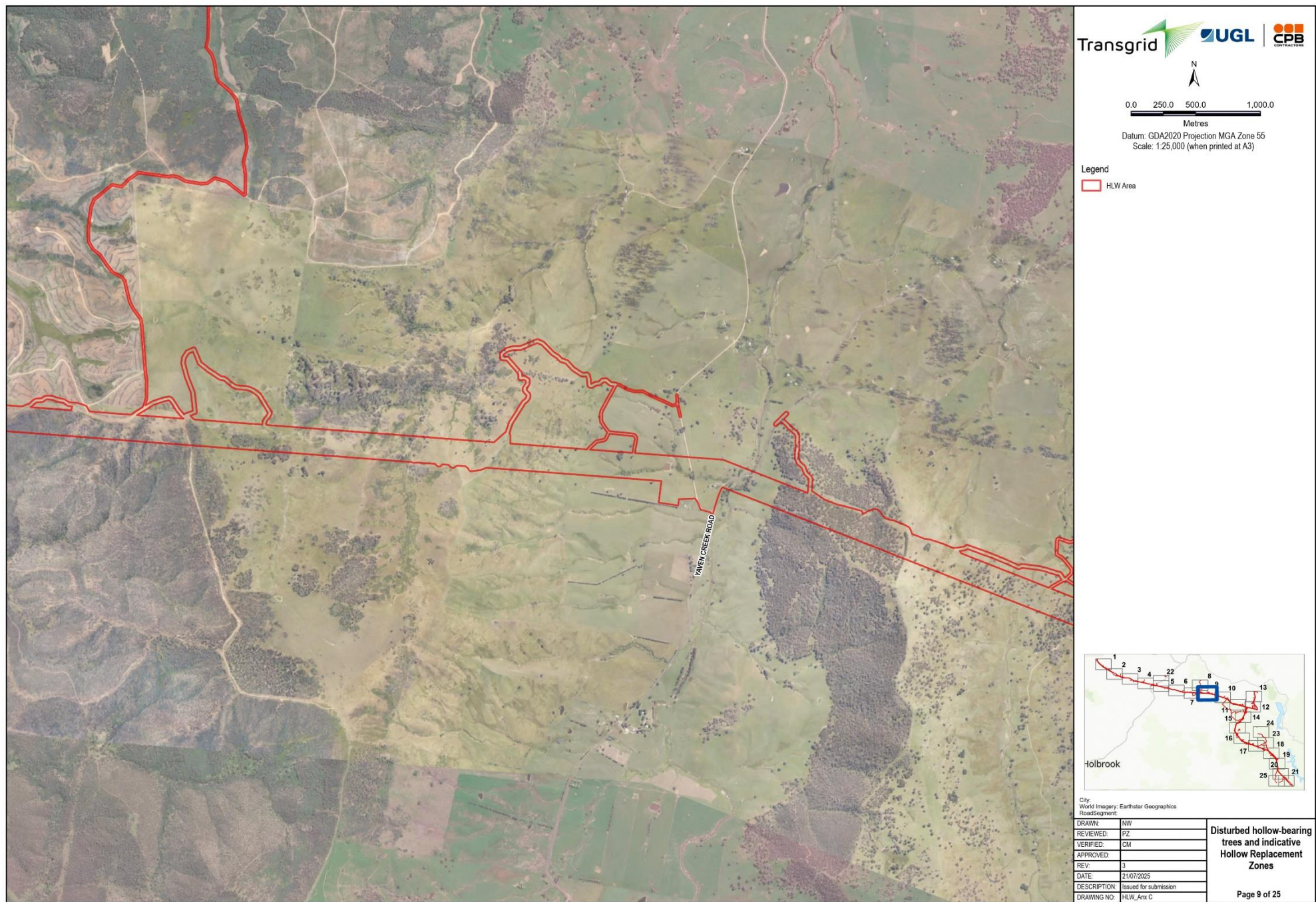
Disturbed hollow-bearing trees and indicative Hollow Replacement Zones

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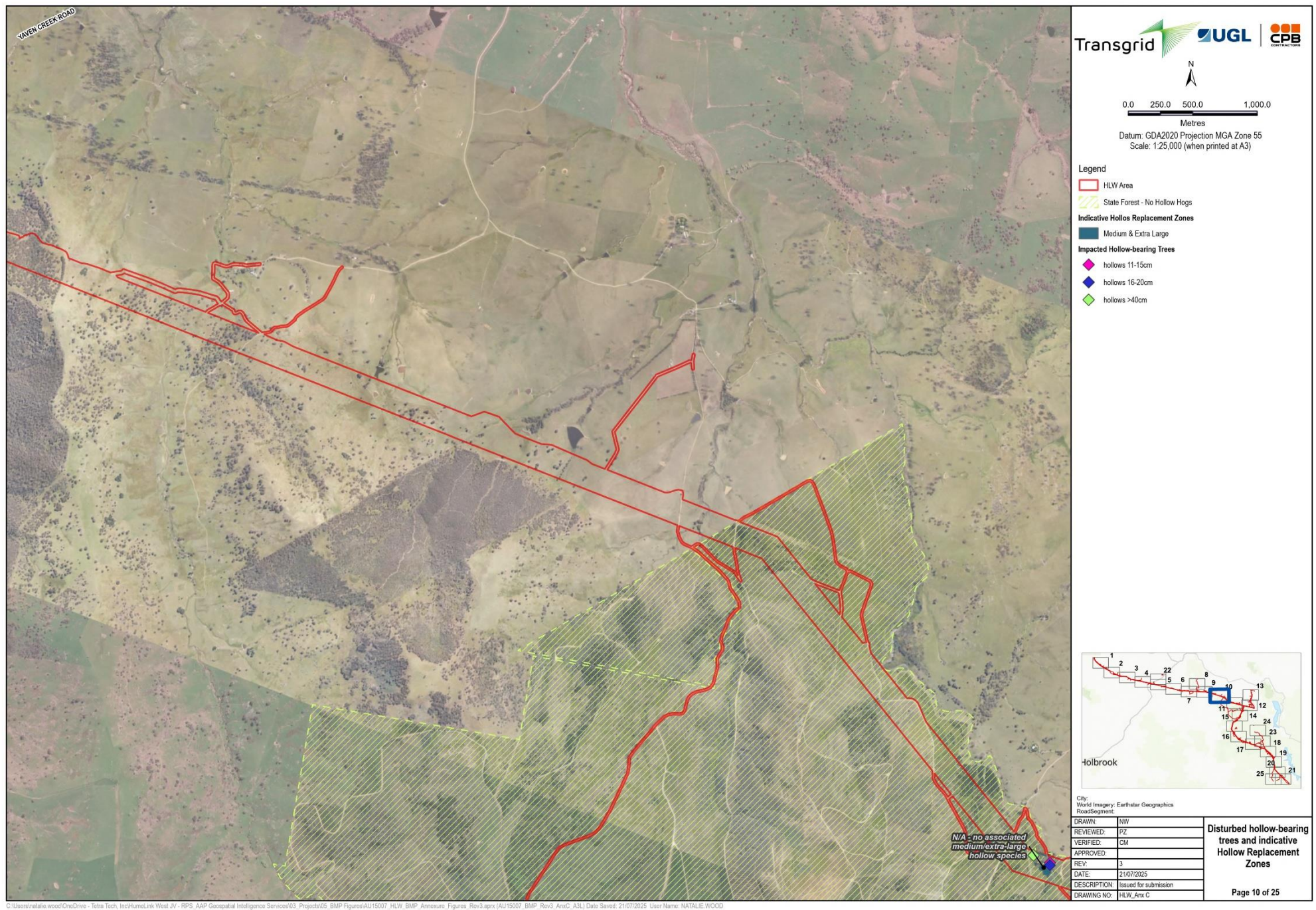
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51 | **Annexure C** | Hollow and Nest Strategy
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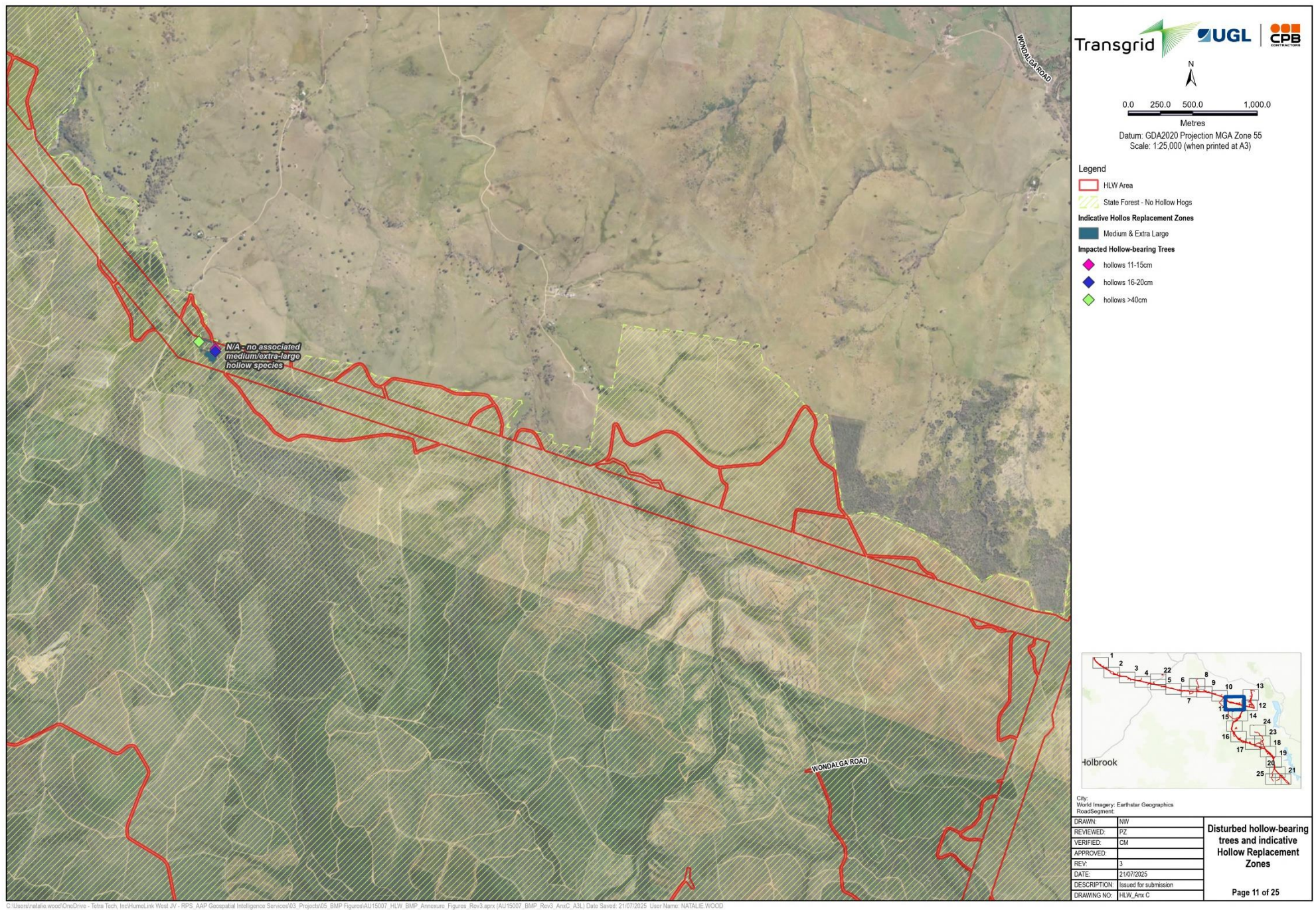
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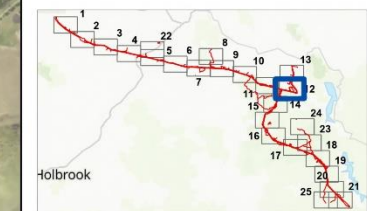


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Legend

 HLW Area
 State Forest - No Hollow Hogs



City: World Imagery: Earthstar Geographics
 RoadSegment:

DRAWN:	NW
REVIEWED:	PZ
VERIFIED:	CM
APPROVED:	
REV:	3
DATE:	21/07/2025
DESCRIPTION:	Issued for submission
DRAWING NO:	HLW_Ann C

Disturbed hollow-bearing
 trees and indicative
 Hollow Replacement
 Zones

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Transgrid

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CPB

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Metres

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Scale: 1:25,000 (when printed at A3)

Legend

HLW Area

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Holbrook

City:
World Imagery: Earthstar Geographics
RoadSegment:

DRAWN:	NW
REVIEWED:	PZ
VERIFIED:	CM
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REV:	3
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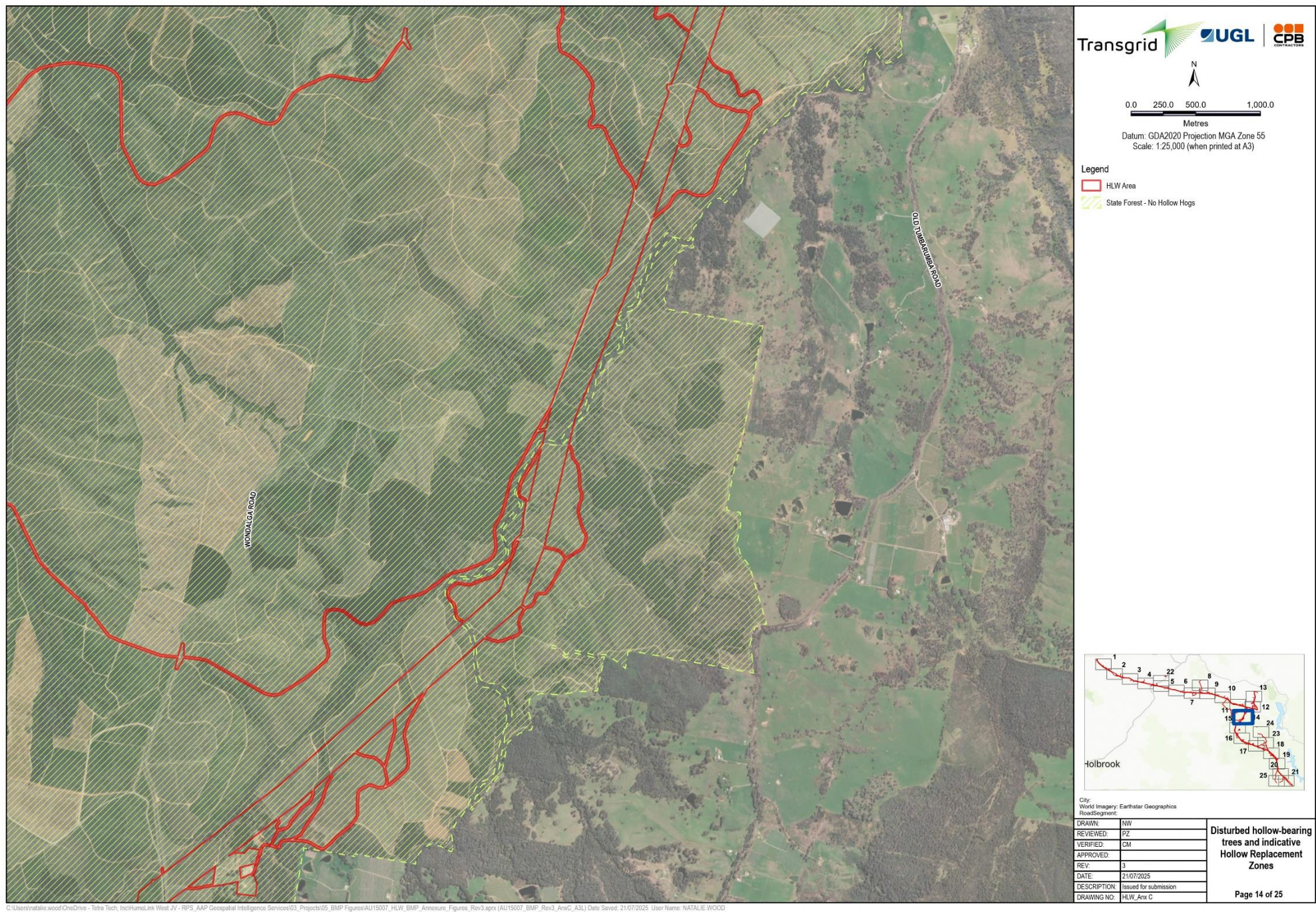
Disturbed hollow-bearing trees and indicative Hollow Replacement Zones

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56 | **Annexure C** | Hollow and Nest Strategy
Version: Rev 3
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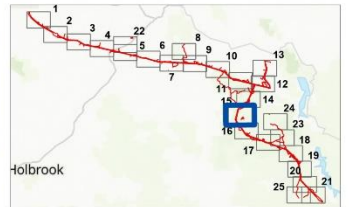







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 State Forest - No Hollow Hogs



Holbrook

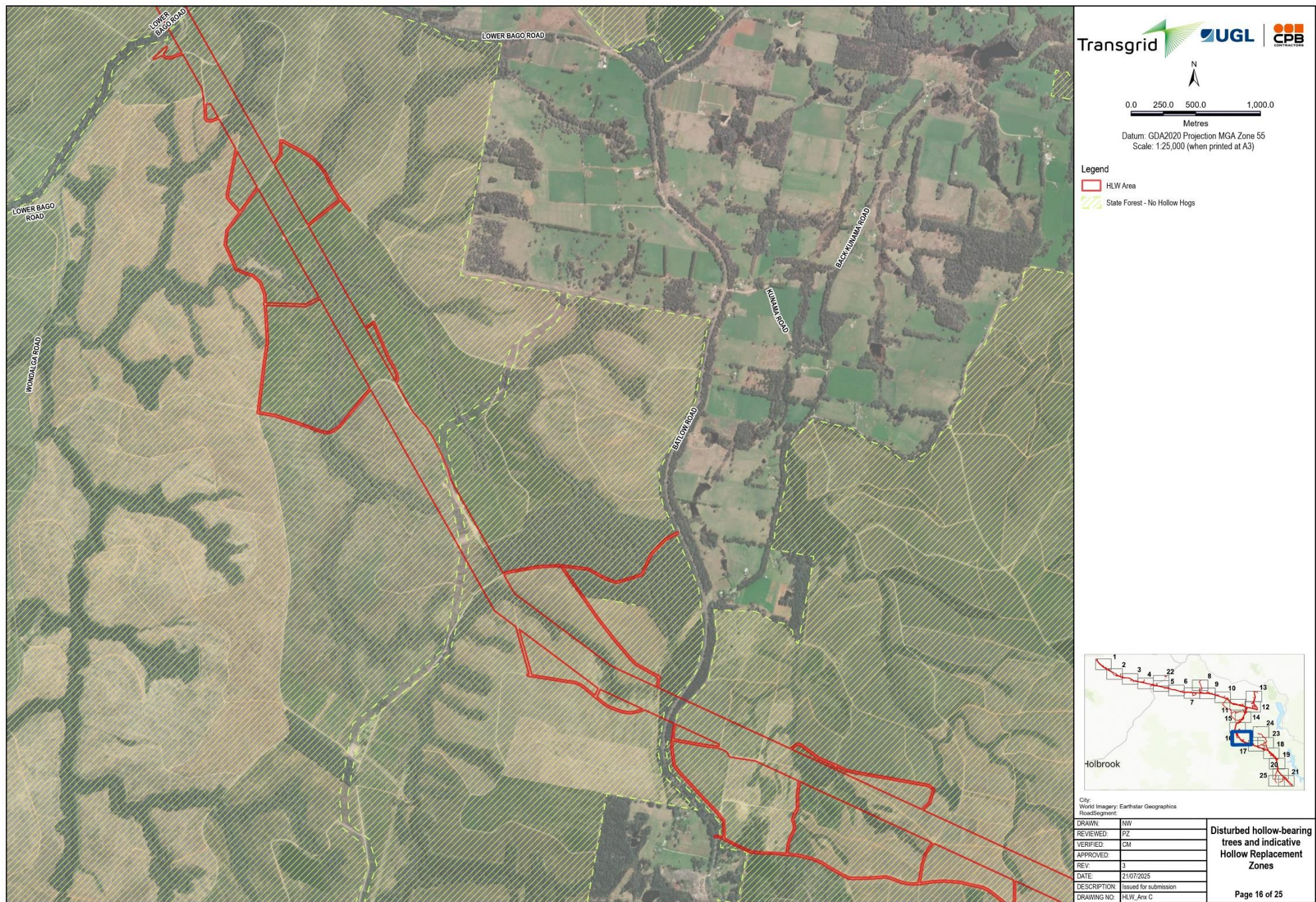
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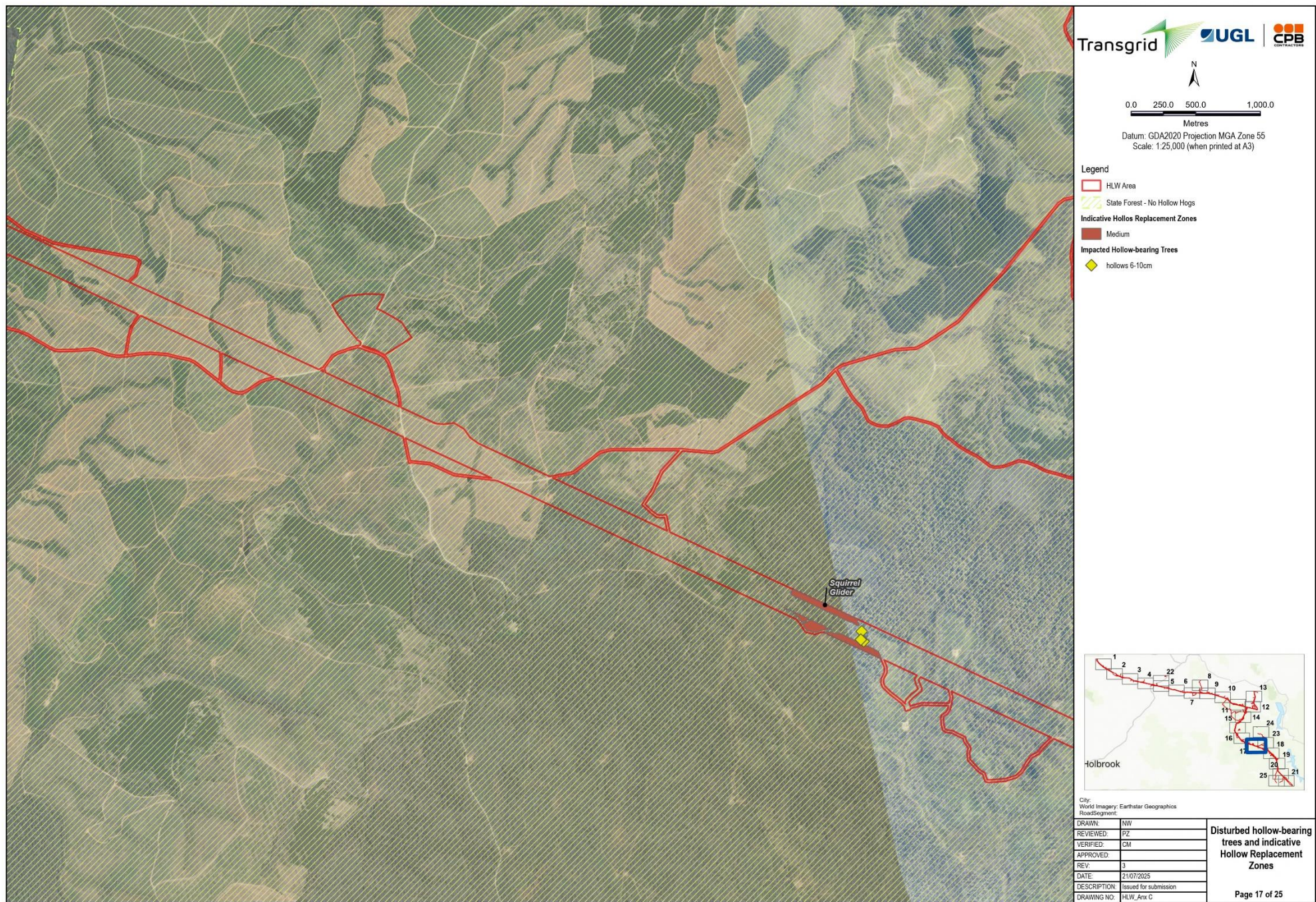
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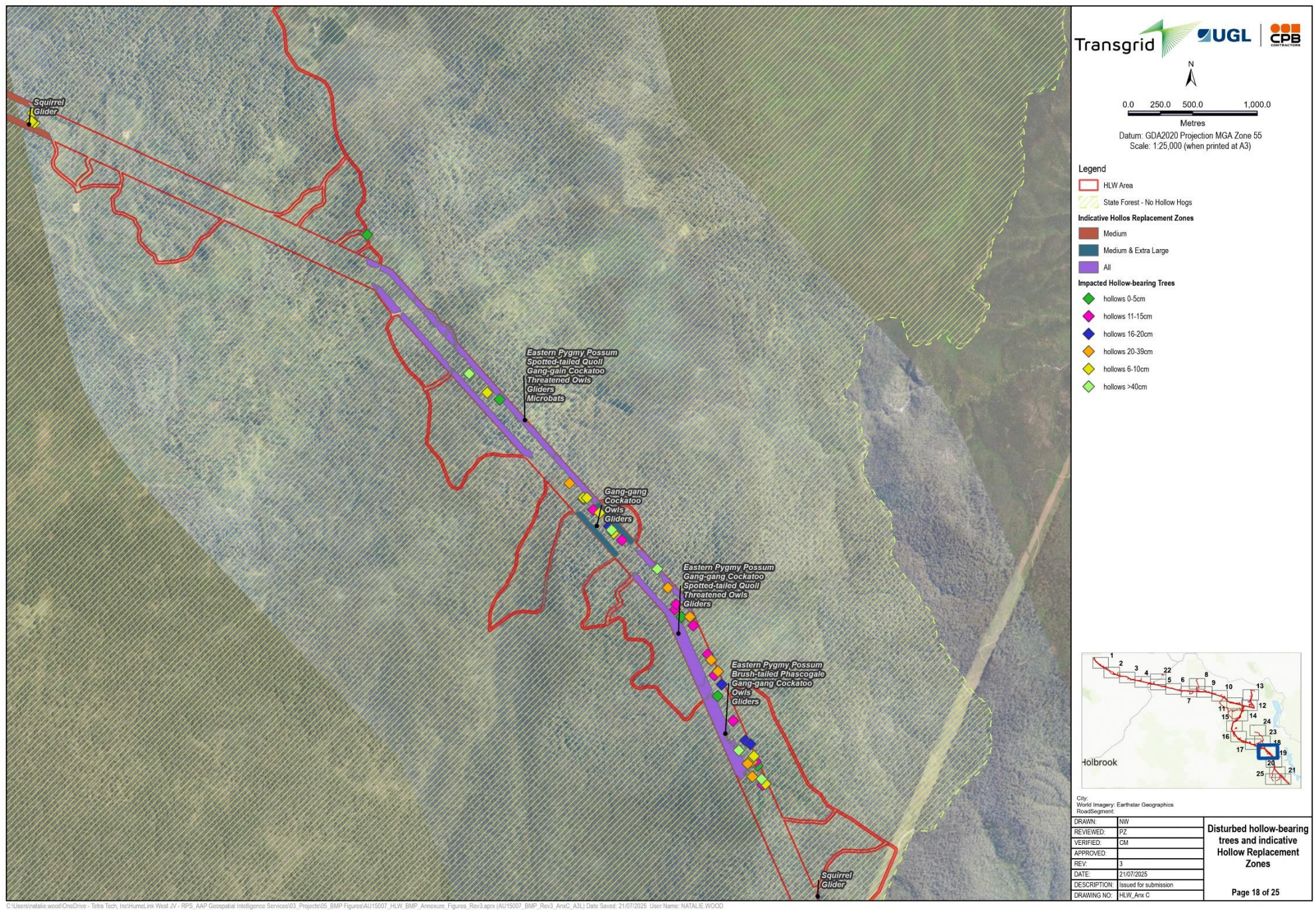
Disturbed hollow-bearing trees and indicative Hollow Replacement Zones

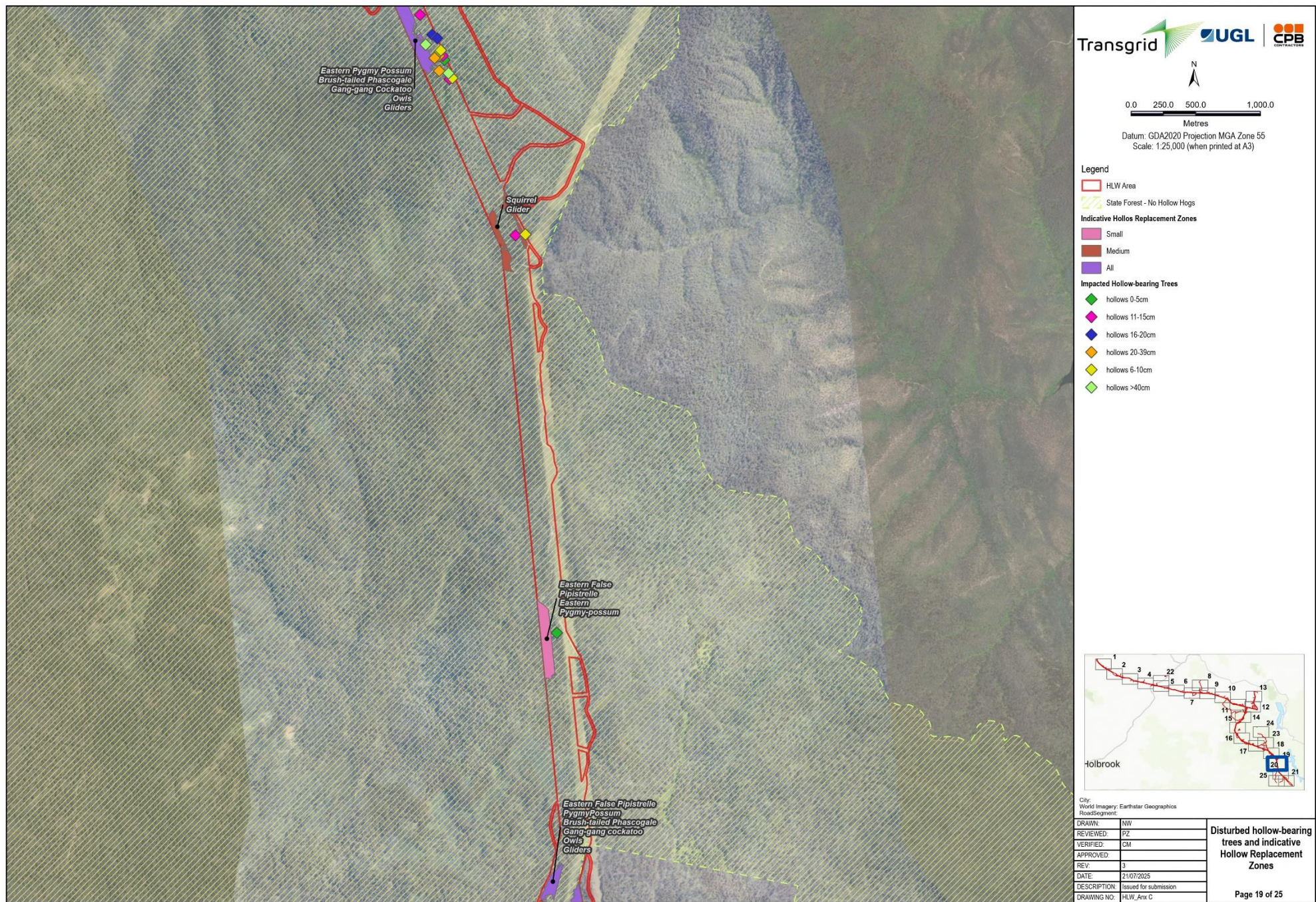
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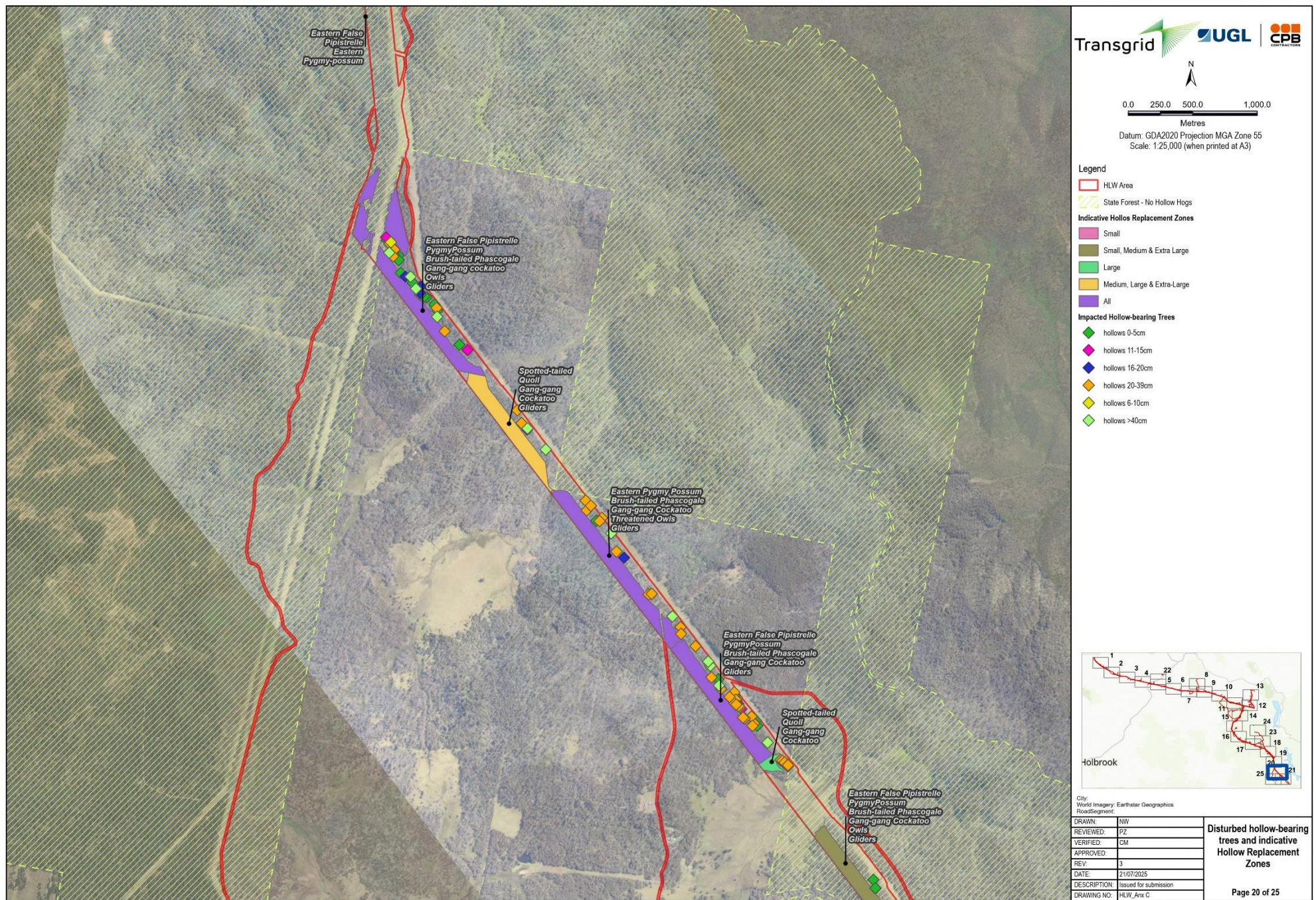




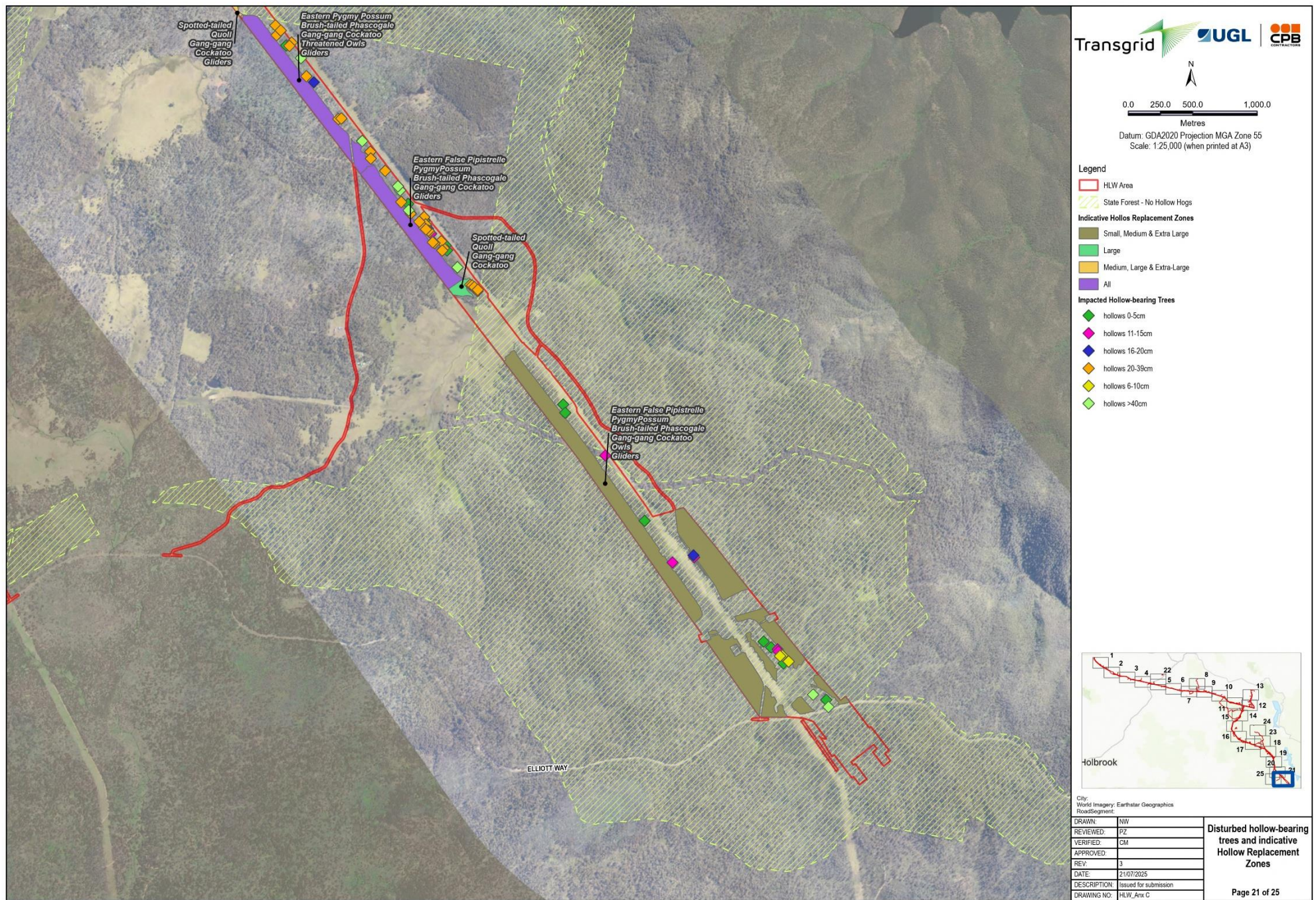




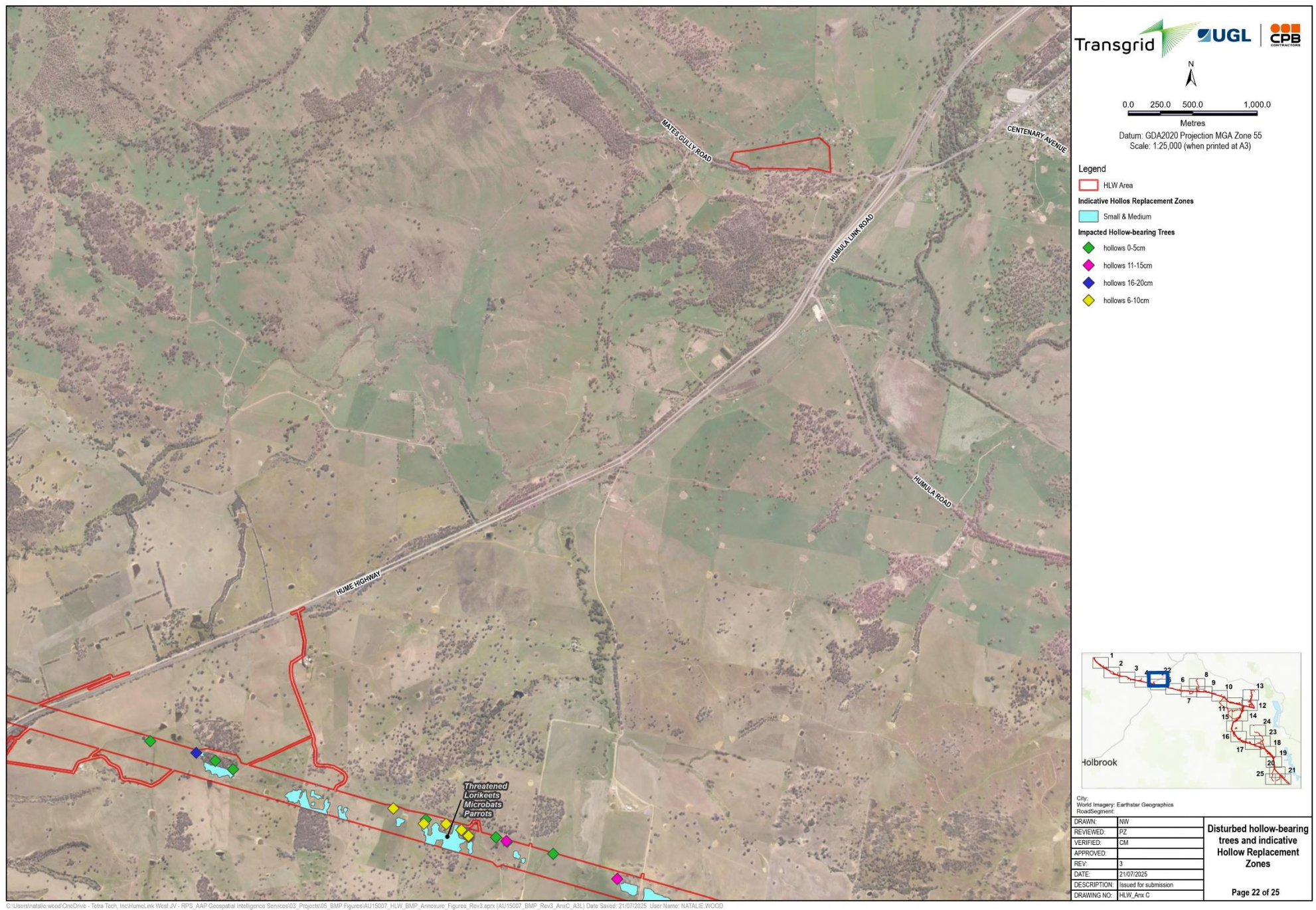
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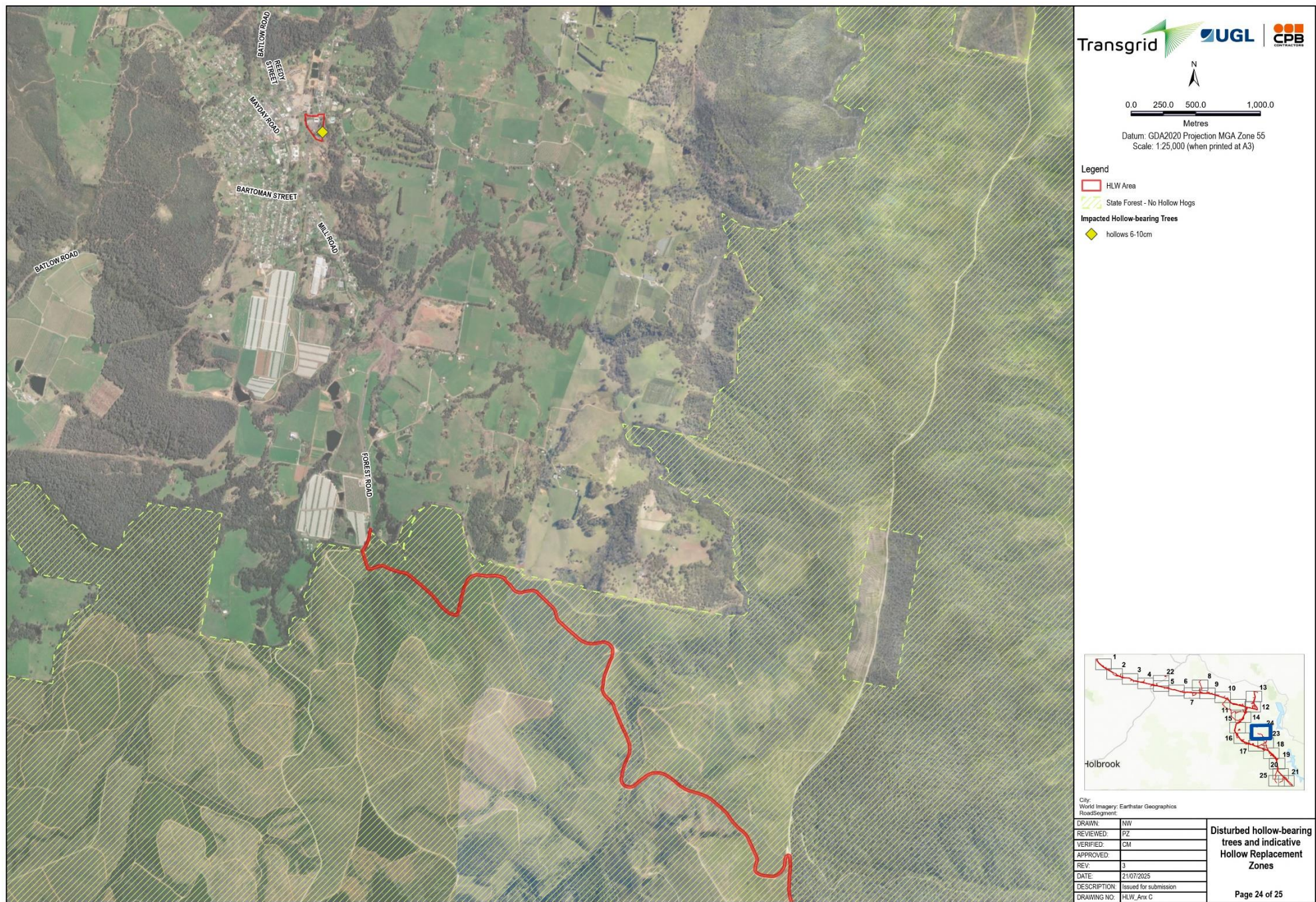


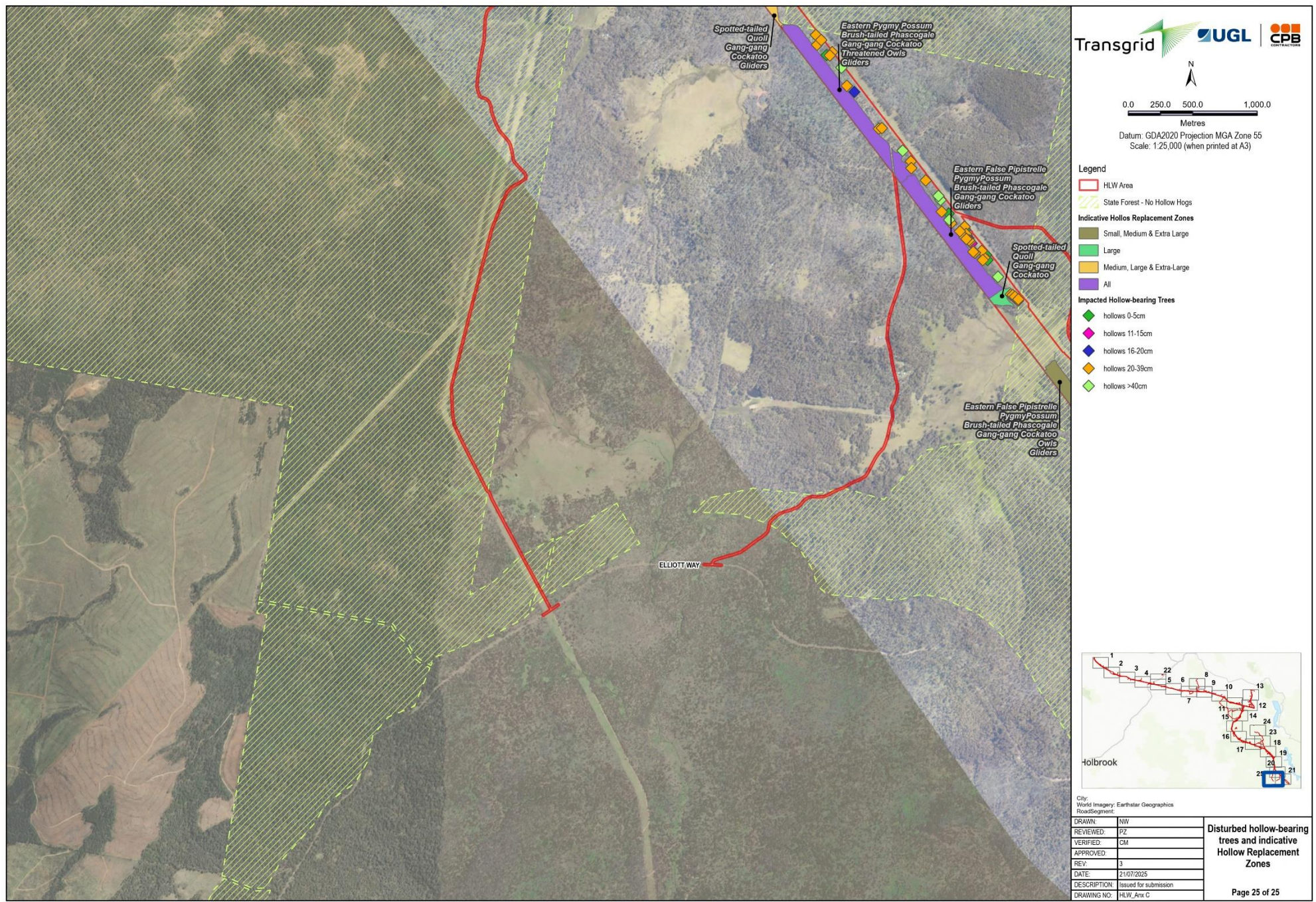
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4.2.5. Timing

Vegetation clearing works for HLW will involve a staged approach, therefore a similar approach is proposed for this artificial hollow installation. Artificial hollows will be installed in accordance with the following timeframe:

- 30% to be installed prior to clearing within a particular location, to be confirmed via Post-clearing Reports.
- All remaining to be installed within 2 months of clearing within a particular location.

4.3. Nest impact management

In developing this Hollow and Nest Strategy for the HLW Project, a key consideration is how to manage bird nests encountered during vegetation clearing works. The strategy provides for the replacement of hollows and relocation of simple nests as detailed below; however, it explicitly excludes the relocation of large stick nests such as those used by raptors. Instead, the approach for large stick nests is to dismantle/remove them (when not in-use). Rationale is provided below, focusing on safety risks and consistency with utility network guideline, while ensuring active nests are handled with care.

Attracting large birds of prey near live power infrastructure poses serious risks to both the birds and the network. High-voltage transmission lines and towers can be dangerous for big raptors like the Wedge-tailed Eagle and Little Eagle. Collision and electrocution are primary concerns: large birds may collide with overhead conductors if they fly in the corridor, and they can be electrocuted by high-voltage equipment if they attempt to perch or nest on structures. Raptors nesting on or near electrical structures are at increased risk of line strikes and shocks, especially juveniles taking their first flights. When young eagles fledge from a nest near transmission lines, their inexperience can lead to collisions with wires, while adults hunting prey around conductors can also misjudge clearances.

If a large stick nest is built on a tower or pole, it can create a fire and outage hazard (e.g., nest materials or droppings can cause shorts or fires). In addition, stick nests can be extremely bulky – sometimes up to 2 m across and 3 m deep, weighing over 400 kg. These massive structures are difficult and dangerous to move intact. Instead, HLW will dismantle large nests once they are confirmed inactive. This approach is justified by several factors, including:

- Physical practicality and success rate – Nest could easily fall apart during handling, given their size and weight. Moreover, many raptors will not continue using a nest that has been moved.
- Encouraging natural relocation away from danger – By dismantling the nest (outside breeding season), the project will discourage raptors from nesting in that exact spot near the line. This gives the birds the opportunity to select an alternate nest site farther from the transmission corridor, which is ultimately safer for them.
- Safety and reliability considerations – Raptor nesting/roosting near high-voltage lines presents ongoing risks to network reliability (through outages or equipment damage), and to human safety (through potential bushfire ignition or line drops if a collision causes conductor damage).

Clearing of habitat trees containing nests will be managed in accordance with Annexure B: Clearing Protocol of the HLW BMP. The following will be implemented to mitigate impacts on nests:

- Threatened (simple) nesting birds:
 - o Pre-clearing surveys will occur to record nests in known or assumed habitat.
 - o Potential nest trees will be clearly identified on construction planning maps.
 - o If utilised nests are identified on-site, a 100 m temporary buffer (minimal disturbance zone) will be established until follow up surveys confirm the individuals (adults and chicks) have left the nest. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed once chicks have

- fledged.
- o Buffers are to be clearly marked using a recognised delineation protocol
 - o Activity in the buffer would be limited to low impact works such as use of existing tracks.
 - Threatened stick nesting birds (raptors):
 - o Pre-clearing surveys will identify trees with large stick nests or any adult with nesting material in known or assumed habitat.
 - o Where trees with stick nests are identified on-site, diurnal nest watching will occur during the breeding season to confirm presence of breeding activity (eggs or chicks).
 - o Nest trees will be clearly identified on construction planning maps.
 - o If breeding activity is recorded on-site during construction, a 100 m temporary buffer (minimal disturbance zone) will be established around the active nest until follow up surveys confirm the individual (adults and chicks) have left the nest. The purpose of the buffer is to minimise construction impacts to breeding pairs and their chicks. The buffer can be removed once chicks have fledged.
 - o Buffers are to be clearly marked using a recognised delineation protocol
 - o Activity in the buffer would be limited to low impact works such as use of existing tracks.
 - General rescue approach for non-threatened birds:
 - o Where possible and safe to do so, gain access to nests. Capture and remove any nestlings.
 - o Place nestlings in cotton capture bags and assess for injuries. Store bags containing nestlings in a pet carrying cage or ventilated cardboard box. The animal container will be covered to reduce stress on the bird. Deliver to specialist wildlife carer.
 - o If adult birds are captured, they will be released away from construction activities.
 - Where simple nests (i.e., cup or dome nests built within trees, usually in canopy or in forks of branches) can be reasonably relocated, locations are to be determined by the Project Ecologist.
 - Following confirmation of inactivity, stick/platform nests will be dismantled under supervision of the Project Ecologist (to inspect contents after dismantling and rescue any unexpected fauna in-situ). Nest materials may be disposed of offsite if damaged or at biosecurity risk, or reused as fauna habitats on-site, ensuring re-use is limited to at least 100 m off-easement to avoid additional raptor attraction.

If any nests are rebuilt during construction of HLW, the following will be implemented:

- Surveillance and detection – any nests observed will be reported to the Environmental Manager. Routine visual inspections will occur of all towers, poles, crane arms and other elevated structures:
 - o Weekly in active construction areas.
 - o Monthly during commissioning or when structures are static.
- Assessment of nest activity – the Project Ecologist will undertake an inspection of the identified nest, recording the following:
 - o Species (if identifiable).
 - o Stage of nesting (nest construction vs. active breeding).
 - o Potential for use by threatened or protected raptors.
- Inactive/incomplete stick nests, or nests with no eggs/chicks, will be dismantled immediately.
- Active nests with eggs/chicks will have a 100 m temporary buffer established around, with the Project Ecologist monitoring until fledging.
- For persistent nest rebuilding at a location, the following will be considered and confirmed adequate by the Project Ecologist and HLWJV team:

- o Anti-perching devices (e.g., angle rods, spinning deterrents) on tower crossarms or insulators.
- o Visual deterrents (e.g., eagle silhouettes, reflective tape, raptor eye balloons).

4.4. Summary of hollow and nest strategy measures

All hollow and nest strategy measures outlined in this strategy have been summarised in Table 4-5 below. These will be implemented to minimise impacts from HLW and ensure all commitments and requirements of approval will be adhered to. These specific management and mitigation measures have been developed to address the relevant requirements of applicable legislation, the MCoA, the CoMA, the UMM and all Planning Approval Documentation, particularly the Revised BDAR.

Table 4-5 Hollow and nest management and mitigation measures

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP13	Pre-clearing surveys to include a confirmation of all hollows lost, updated artificial hollows required, and finalised Hollow Replacement Zones to be detailed in the Pre-clearing Reports.	Pre-construction	Environmental Manager Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B12	Pre-clearing Reports
BMP14	Artificial hollow installation to occur within finalised Hollow Replacement Zones at a 1:1 ratio for all hollows showing evidence of occupation or fauna use: 30% to be installed prior to clearing and all remaining to be installed within 2 months of clearing. Artificial hollows to include salvaged hollows, hollow hogs or nest boxes (including 3D-printed boxed) as applicable. No hollow hog installation to occur within State Forests.	Pre-construction and Construction	Environmental Manager Project Ecologist Construction Manager Arborist Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B12	Post-clearing Reports Nest Box Installation Report
BMP15	Nest impact management will be undertaken during Pre-clearing Surveys and Clearing Supervision, including avoidance of breeding threatened nest trees. Simple nests may be relocated during clearing procedures under direct supervision of the Project Ecologist, however raptor (stick) nests will be dismantled to minimise collision risk.	Pre-construction and Construction	Environmental Manager Project Ecologist Construction Manager Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B12	Pre-clearing Reports Post-clearing Reports
BMP16	Post-clearing Reports to confirm the type and number of additional artificial hollow replacements necessary following final hollow clearing data, and preliminary hollow replacement installations. Confirmation of all hollows cleared, hollow size, location, and final artificial hollow installation requirements is required.	Construction	Environmental Manager Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B12	Post-clearing Reports

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP17	Habisure system used for all artificial hollow installations, nest box dimensions and design considerations to be followed per this strategy. Hollow Hog installation/creation procedure to be followed per this strategy.	Construction	Environmental Manager Project Ecologist Construction Manager Arborist	MCoA B25, B30 CoMA 2, 7 UMM B3, B12	Nest Box Installation Report
BMP18	Any re-built nests will be managed in accordance with this strategy including detection, assessment of nest activity, temporary buffers and/or dismantling, and potential bird deterrent devices.	Pre-construction and Construction	Environmental Manager Project Ecologist Construction Manager Project Ecologist	MCoA B25, B30 CoMA 2, 7 UMM B3, B12	Fauna handling record sheet

5. Compliance management

5.1. Monitoring and inspection

Biannual (spring and autumn) monitoring of this strategy will occur during construction of HLW to determine the use of artificial hollows. Monitoring will be undertaken using an endoscopic camera (or similar) attached to an extendable pole to minimise disturbance of resident fauna. Monitoring must be incorporated into the Transgrid Operational Environmental Management Plan for a minimum of three-years post installation and will include the following:

- Name of observer.
- Date.
- Prevailing weather conditions.
- Unique identification number of the artificial hollow.
- Artificial hollow type (i.e., wooden or 3D-printed nest box, salvaged or hollow hogs).
- Assessment of artificial hollow and suspension system condition.
- Host-tree health and stability.
- Evidence of pest species.
- Photographic evidence of condition, fauna use and pest presence (if present).
- GPS coordinates ($\pm$ accuracy).
- Height above ground (m).
- Orientation/direction of entrance (e.g. NE, S — relevant to thermal performance and species preference).
- Evidence of fauna use.
 - Signs of breeding or roosting (e.g., presence of eggs, chicks, active nest material)
- Fauna identification (if observed)
 - Species.
 - Number of individuals.
 - Behaviour (e.g., nesting, roosting, foraging).
- Record of recent maintenance or disturbance (e.g., box repaired, relocated, noted signs of tampering/vandalism).
- Risk or safety notes (e.g., unsafe access, wasps/bees, tree instability).
- Recommendations for follow-up (e.g., replace/repair, increase monitoring frequency, install exclusion measures).

5.2. Maintenance

During the construction period, any deteriorating artificial hollows will be replaced and any fallen hollows will be reinstalled. Any longer-term maintenance and monitoring (post-construction) would be detailed within the Transgrid Operational Environmental Management Plan. Maintenance should include the following:

- Repair or replace any damaged artificial hollows (e.g., fallen, chewed, weathered).
- Remove or exclude pest species (e.g., European Honeybees) or non-target species (e.g., Myna nests).
- Re-fasten suspension system or replace if degraded.
- Replace any artificial hollows lost or rendered unusable (targeting no net loss of installed

hollows).

- Re-bore or repair hollow hogs showing signs of collapse or degradation.
- Prune or manage surrounding vegetation if access is impeded.
- Clear blocked hollow entrances (e.g., spider webs, leaf litter, debris obstructing fauna access).
- Check and maintain drainage holes and ventilation features, particularly in nest boxes, to prevent waterlogging or overheating.
- Reposition salvaged hollows if shifted or destabilised and ensure correct orientation and positioning is retained (e.g., entrance direction, height, and placement remain within design specs).
- Document all maintenance activities including date, action taken, reason, and any follow-up required.
- Plan and schedule regular inspections (e.g., re-inspect repaired structures within 3–6 months).

5.3. Incidents and non-compliances

Non-conformances, incident reporting and subsequent investigation will be undertaken as required in accordance with Trigger Action Response Plan (TARP) provided in Table 5-1 below. HLWJV will promptly advise Transgrid on events that are non-conforming with this strategy.

Table 5-1 Hollow and nest strategy TARP

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
Avoid disturbance to active nests during clearing works.	No active nests disturbed or destroyed.	Pre-clearing Surveys to confirm no active nests in clearing permit areas. Clearing records to document nest status.	Pre-clearing surveys & reports. Post-clearing surveys & reports.	Once per clearing permit area.	Active nest (e.g., raptor, woodland bird) found in proposed clearing zone.	100 m temporary buffer (minimal disturbance zone) established until follow up surveys confirm the individuals (adults and chicks) have left the nest. Activity in the buffer would be limited to low impact works such as use of existing tracks.
Avoid disturbance to breeding fauna during critical periods.	No clearing during breeding period without pre-clearing surveys.	Pre-clearing Surveys completed.	Pre-clearing Survey Report.	Once per clearing permit area.	Clearing within known breeding season without pre-clearing fauna surveys.	Halt works. Conduct immediate fauna survey. Notify Environmental Manager, Transgrid and CPHR if disturbance occurred.
Prevent unintentional nest disturbance during works.	Zero disturbance to active nests.	No incidents to active nests. Pre-clearing Surveys to confirm no active nests in clearing permit areas. Clearing records to	Incident reports. Pre-clearing surveys & reports. Post-clearing surveys & reports.	As necessary.	Disturbance or destruction of active nests.	Establish temporary buffers. Notify Project Ecologist, Environmental Manager, Transgrid and CPHR. Apply noise/vibration dampening measures.

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
		document nest status.				
Maintain safe temporary buffers around active nests.	100% of active nests with 100 m temporary buffer where applicable.	Pre-clearing surveys completed for nests within appropriate breeding seasons. 100 m temporary disturbance buffers erected until adults/chicks have left.	Pre-clearing surveys & reports.	Once per clearing permit area.	Inadequate buffer zones maintained around active nesting habitat during works. Works within buffer exceed low impact works (i.e., use of existing tracks).	Halt works. Re-establish buffer and monitor for impacts. Notify Environmental Manager, Transgrid and CPHR if any impacts are recorded. Provide toolbox talks to relevant crew.
Ensure compliance with clearing protocols.	100% of applicable trees underwent two-stage clearing.	Pre-clearing Surveys completed. Ecological clearing supervision completed.	Pre-clearing surveys & reports. Post-clearing surveys & reports.	Once per clearing permit area.	Failure to implement pre-clearing surveys or clearing protocols	Suspend clearing works. Retrain staff on appropriate procedures. Conduct retrospective ecological surveys. Update clearing schedule with compliance controls.

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
Protect important habitat features from unplanned removal.	Zero unauthorised tree actions.	Clearing permits adhered to. Final Pre-clearing Check confirm no unauthorised clearing. Clearing supervision completed for all habitat clearing works.	Clearing permit cross-checks. Final Pre-clearing Checklist. Post-clearing Report.	Once per clearing permit area.	Unapproved felling or pruning of trees with known fauna use or habitat potential.	Report and investigate impacts of unauthorised clearing. Notify Project Ecologist, Environmental Manager, Transgrid and CPHR. Retraining of staff including machinery operators.
Offset hollow loss with appropriate artificial hollows.	1:1 replacement ratio for all hollows showing evidence of occupation or fauna use.	30% of required artificial hollows installed prior to clearing at a particular location. All remaining required artificial hollows to be installed within 2 months of clearing at a particular location.	Post-clearing surveys & reports. Nest box installation & reports.	Once per clearing permit area.	<30% of required artificial hollows installed prior to clearing. Remaining hollows not installed within 2 months of clearing.	Suspend clearing in the area. Install required artificial hollows. Document locations and update tracking register.
Ensure ecological suitability and uptake of artificial hollows.	100% of installed artificial hollows meet location, design and	Artificial hollow installation completed in accordance with this strategy.	Nest Box Installation Report.	Once per installation.	Artificial hollows installed in unsuitable location. Use of	Review this strategy and conduct staff training. Rectify installation to appropriate location, design and/or species

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
	species specifications.				unapproved artificial hollow designs.	specifications.
Ensure long-term functionality and safety of installed hollows.	100% of boxes inspected within agreed timeframe.	Artificial hollow monitoring conducted of all installed hollows.	Artificial hollow monitoring report.	Biannually (spring and autumn).	Artificial hollows not inspected or maintained within required intervals.	Conduct catch-up monitoring of any hollows missing inspection. Rectify any barriers to monitoring (i.e., access, staff availability). Revise monitoring schedule if necessary.
Achieve replacement ratio for all damaged/lost hollows.	All lost/damaged hollows replaced within 30 days.	100% of installed hollows are maintained in safe and working condition in accordance with this strategy.	Artificial hollow monitoring & report.	Biannually (spring and autumn).	Failure to maintain 'no net loss' of hollow capacity.	Install replacements immediately. Notify Environmental Manager, Transgrid and CPHR of delay. Reinspect within 6 months. Increase future buffer stock.
Reduce predator access and human disturbance.	100% of installed hollows sited in low-risk habitat areas.	No hollows installed near infrastructure that increases predation risk (e.g., close to roads, poles, open areas frequented by large raptors).	Nest box installation & reports.	Once per installation.	Installation of supplementary hollows near infrastructure that increases predation risk.	Relocate hollow into appropriate Hollow Replacement Zone. Avoid future installations in risky areas.

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
Reduce collision/ electrocution risk from infrastructure attraction.	No artificial nest structures or stick nest relocation within 200 m of the alignment.	No evidence of stick nests or platforms placed near conductors. Pre-clearing surveys/clearing supervision to confirm nest removal.	Pre-clearing surveys & reports. Post-clearing surveys & reports.	Once per clearing location	Relocated raptor nest observed within 200 m of transmission line.	Remove nest outside of breeding period. Monitor for future nesting attempts. Increase education for field staff on nest strategy.
Ensure fauna incidents are reported and documented	100% of fauna incidents logged and reported within 24 hours.	Fauna handling record sheet completed, with incident reported to Environmental Manager, Transgrid and CPHR.	Incident reporting log & fauna handling record sheet.	As necessary	Failure to report fauna injury or mortality from clearing or artificial hollow failure.	Notify Environmental Manager, Transgrid and CPHR. Investigate incident and address any

5.4. Reporting

5.4.1. Pre-clearing Report

Methods for the Pre-clearing Report are detailed in Annexure B: Clearing Protocol of the HLW BMP. This will include the target species, size, type, number and suitable location of replacement hollows required. This will be used to prepare a preliminary estimate of number of hollows lost and identify hollows appropriate for salvage and reuse. Final Hollow Replacement Zones will also be summarised and documented in this report.

5.4.2. Post-clearing Report

Methods for the Post-clearing Report are detailed in Annexure B: Clearing Protocol of the HLW BMP. This will include a confirmation of all hollows cleared, hollow size and final artificial hollow installation requirements following clearing.

5.4.3. Nest Box Installation Report

The Nest Box Installation Report will detail all nest boxes or other artificial hollows installed for HLW. This report will be prepared by the Project Ecologist following the installation of necessary artificial hollows and may be prepared as multiple reports to suit the staged clearing of HLW. The following minimum requirements are to be included in the Nest Box Installation Report:

- Installer(s) (Name(s), company/organisation, relevant qualifications or permits if applicable)
- Unique nest box ID.
- Number of artificial hollows installed for HLW.
- Type of artificial hollows installed. For example, Artificial Hollow Design Specifications (Include schematic reference or construction details — especially important for verifying compliance)
- Artificial hollow height and orientation.
- Location of artificial hollows (GPS coordinates) including figures displaying their location.
- Photographic Records of Each Installation (Include photo of full nest box in situ, showing label/ID, tree context, orientation)
- Distance to Nearest Infrastructure or Clearing (To assess risk of disturbance or raptor attraction)
- Date of installation.
- Justification for site selection (E.g. proximity to impact area, availability of suitable trees, fauna records, habitat quality)
- Summary of disturbance in selected locations (Detail any clearing, previous fire, erosion, infrastructure proximity, noise/light impacts etc.)
- Plant Community Types (PTCs) present in selected locations.
- Assessment of incidents and non-compliances based on the TARP in Table 5-1.
- Host Tree Species and Condition (Species name; note if mature, senescent, storm-damaged, healthy etc.)
- Monitoring Readiness (e.g. Is the box accessible for future camera checks? Is an inspection pole usable at this location?)
- Recommendations or Follow-up Actions (E.g. re-inspection date, repair scheduled, box to be relocated)

5.4.4. Monitoring reports

Following the monitoring described in Section 5.1, monitoring data will be provided to Transgrid in the

form of Artificial Hollow Monitoring Reports, including the following:

- Name of observer.
- Date.
- Prevailing weather conditions.
- Assessment of artificial hollow and suspension system condition.
- Evidence of pest species.
- Evidence of fauna use.
- Photographic evidence of condition, fauna use and pest presence (if present).
- Recommendations on maintenance/replacement (if required).
- Unique ID of Each Artificial Hollow Monitored (Ensures traceability between installation, monitoring, and maintenance actions)
- GPS Coordinates of Each Hollow (To confirm correct location and enable future relocation)
- Type of Artificial Hollow (e.g. glider box, parrot box, salvaged hollow, 3D-printed model — important for species-specific analysis)
- Height and Orientation of Artificial Hollow (Key parameters influencing usability and thermal performance)
- Host Tree Species and Condition (Helps understand habitat context, longevity of placement, and tree safety)
- Monitoring Method Used (e.g. pole camera, direct observation, remote sensor as this affects detectability)
- Observed Fauna Species (if present) (List species observed or indirectly detected, number of individuals, behaviour e.g. roosting, breeding)
- Signs of Breeding or Reproductive Activity (E.g. eggs, chicks, nesting material as this speaks to functional use)
- Signs of Occupancy (if fauna not directly observed) (e.g. scratches, scats, feathers, fur, nest material)
- Evidence of Maintenance Actions Since Last Monitoring Round (Document any repairs, replacements, pest management etc., including date and outcome)
- Cumulative Summary of Occupancy Over Time (e.g. box has been used in 3 of the last 4 monitoring events — useful for adaptive management)
- Comparison to Previous Monitoring Rounds (Trends in occupancy, condition, pest presence etc.)
- Any Safety Issues or Access Limitations Observed (E.g. wasps, unsafe trees, blocked access paths — relevant for future monitoring)
- Details of Any Unresolved Issues (E.g. persistent pest re-occupation, box inaccessible for 2+ rounds — trigger for reassessment)
- Summary Table of Artificial Hollow Status could be beneficial (Recommended for clarity — e.g. ID | Status | Fauna use | Pest presence | Action required)
- Recommendations for Additional Monitoring or Adaptive Management (E.g. install additional boxes in under-used areas, modify design for better uptake, increase predator control)
- Assessment of incidents and non-compliances based on the TARP in Table 5-1.

Any longer-term monitoring (post-construction) would be detailed within the Transgrid Operational Environmental Management Plan, however should follow the specifications detailed in Section 5.1.

6. References

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