UGL CPB Joint Venture

Annexure G

Rehabilitation Plan

HumeLink West

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Document Control

Approvals

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

Version Control

Revision	Date	Description	Approval
A	3/07/2024	Preliminary draft	Paul Dudding
B	19/08/2024	Update 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

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Abbreviations

Abbreviation	Expanded text
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BCS	Biodiversity Conservation and Science group within DCCEEW – NSW (now referred to as CPHR)
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
Cth	Commonwealth
CPHR	Conservation Programs, Heritage & Regulation Division (formerly BCS)
CWD	Coarse Woody Debris
DAWE	Commonwealth Department of Agriculture, Water and Environment (now known as DCCEEW - Cth)
DCCEEW – Cth	Commonwealth Department of Climate Change, Environment, Energy and Water
DCCEEW – NSW[1]	The NSW Department of Climate Change, Energy, the Environment and Water (formerly DPE)
DPE	Department of Planning and Environment (now known as DPHI)
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now known as NSW DCCEEW)
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999* (Cth)
GIS	Geographic Information System
GPS	Global Positioning System
HLW	The HumeLink West Stage of the HumeLink project
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)
KFH	Key Fish Habitat
KMG	Key's Matchstick Grasshopper

[1] As of the 1st January 2024 the NSW Department of Planning and Environment has split into the Department of Climate Change, Energy, the Environment and Water (NSW) and the Department of Planning, Housing and Infrastructure. DCCEEW (NSW) includes the environmental regulators (such as NSW EPA, BCS, NPWS, DPE-Water), while the Department of Planning, Housing and Infrastructure (DPHI) includes planning regulatory services.

Abbreviation	Expanded text
LWD	Large Woody Debris
MCoA	NSW Minister's Conditions of Approval
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Type
Revised BDAR	*HumeLink Biodiversity Development Assessment Report Rev 0* (Niche Environment and Heritage Pty Ltd, June 2024)
SAII	Serious and Irreversible Impact
TARP	Trigger Action Response Plan
TCZ	Total Clearing Zone
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Commission
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation
WoNS	Weeds of National Significance

1. Introduction

1.1. Context

This Rehabilitation Plan forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). This plan 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 Management Measures (UMM), and undertake its duties in accordance with the Planning Approval Documentation listed under the MCoA A2.

1.2. Purpose

The HLW project involves sites of temporary disturbance required for the construction of transmission line structures as well as construction compounds and temporary workforce accommodation facilities. Disturbance includes any temporary impacts to vegetation required during enabling works required to establish such features. Measures detailed within this plan aim to rehabilitate temporary disturbance areas to facilitate natural regeneration of suitable native species. Furthermore, this plan aims to maximise the salvage and reuse of resources within the approved disturbance area for beneficial reuse (such as fauna habitat enhancement) during the rehabilitation and revegetation of the site.

As such, this plan has been prepared based on current best practices to guide the salvage and reuse of resources, and the rehabilitation of temporarily disturbed areas during the construction of HLW. The plan aims to address relevant actions and mitigation measures outlined in the following documents:

- Updated mitigation measures B3, B9, B18 and B19 of the *Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Conditions B25, B30, B62 and B63 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).
- *Key's Matchstick Grasshopper (*Keyacris scurra*) Expert Report – HumeLink project* (Yagui, 2024).

1.3. Objective

The objective of this plan is to facilitate rehabilitation of temporarily disturbed areas to such a point that the disturbed ecosystem will have high resilience and the ability to rely on natural process to recover from any later disturbances. This includes rehabilitation of *Keyacris scurra* (Key's Matchstick Grasshopper) habitat. To achieve this, this plan:

- Identifies temporary disturbance areas associated with the enabling and construction works of HLW, including areas of Key's Matchstick Grasshopper habitat.
- Outlines pre-disturbance biodiversity conditions.
- Details rehabilitation measures including :
    - Site preparation.
    - Seed collection.
    - Salvage, storage and reuse of resources.
- Details compliance management measures and procedures through monitoring.
- Prescribes threshold triggers for the implementation of adaptive management measures.

2. Environmental requirements

2.1. Relevant documents and guidelines

The main documents and guidelines relevant to this plan include:

- Revised BDAR (Niche Environment and Heritage Pty Ltd, June 2024).
- *Rehabilitation Guidelines for the Resort Areas of Kosciuszko National Park* (DEC, 2007).
- *Conservation Advice for Keyacris scurra (Key's Matchstick Grasshopper)* (TSSC, 2022).
- *A Revegetation Guide for Temperate Grasslands* (Greening Australia, 2017).
- *Key's Matchstick Grasshopper (Keyacris scurra) Expert Report* – HumeLink project (Yagui, 2024).

Refer to Section 6 for a full list of references.

2.2. Preparation of this plan

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

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

2.3. Consultation

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

2.4. Minister's Conditions of Approval

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

Table 2-1 MCoA relevant to this plan

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 plan – 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 plan includes provisions for minimising impacts on threatened fauna populations via the salvage (Section 4.1.2) and reuse of habitat features (Section 4.3.2).
	(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 *Prasophyllum bagoense, Prasophyllum keltonii* and *Pterostylis oreophila* as mapped in the BDAR.	Not addressed in this plan – 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 plan forms part of the HLW BMP.
	(a) be prepared by a suitably qualified and experienced biodiversity expert/s;	Section 2.2.

MCoA No.	Condition Requirements	Document Reference
	(b) be prepared in consultation with CPHR and FCNSW;	Section 2.3.
	(c) be prepared generally in accordance with the Revised Biodiversity Development Assessment Report (Revision 0, dated 21 June 2024);	Section 1.2, 2.1 and Table 2-3.
	(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 plan – 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 plan includes provisions for minimising the loss of key fauna habitat via habitat salvage (Section 4.1.2), storage (Section 4.1.4) and re-use (Section 4.3.2). It also includes provisions for minimising impacts to the Key's Matchstick Grasshopper through rehabilitation of temporarily disturbed habitats (Section 4.3.3.1).
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	Not addressed in this plan – 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:	Not addressed in this plan – refer to Annexure D: Unexpected Finds

MCoA No.	Condition Requirements	Document Reference
	• all work in the associated location to stop to prevent further impact, and • 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;	Procedure of the HLW 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;	Not addressed in this plan – refer to Annexure C: Hollow and Nest Strategy & Annexure F: Connectivity Strategy of the HLW BMP.
	(vi) protecting the conservation values of McPhersons Plain and avoiding impacts to Prasophyllum bagoensis, Prasophyllum keltonni and Pterostylis oreophila;	Not addressed in this plan – refer Annexure B: Clearing Protocol of the HLW BMP.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	This plan has been prepared to address MCoA B30(vii), and forms part 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.
	(ix) maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse (such as fauna	Salvage of vegetative resources (Section 4.1.2 and 4.1.3) and soil

MCoA No.	Condition Requirements	Document Reference
	habitat enhancement) during the rehabilitation and revegetation of the site;	resources (Section 4.1.1). Reuse of vegetative resources (Section 4.3.2 and 4.3.3) and soil resources (Section 4.3.1).
	(x) collecting and propagating seed (where relevant);	Section 4.1.3 and 4.3.3.
	(xi) controlling erosion, weeds and feral pests;	This plan includes provisions for controlling erosion through soil preparation (Section 4.2.2) and the salvage (Section 4.1.1), storage (Section 4.1.4) and re-use (Section 4.3.1) of soil resources within temporary disturbance areas. It also includes provisions for weed management (Section 4.2.4) and fauna exclusion (Section 4.2.3) in such areas. Refer Annexure H: Biodiversity Monitoring Program of the HLW BMP for additional measures to address this condition.

MCoA No.	Condition Requirements	Document Reference
	(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 (SAII), including for Box Gum Woodland, Rice Flower (*Pimelea bracteata*) and Sooty Owl (Tyto tenebricosa) 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	This plan includes provisions for the rehabilitation of temporarily disturbed areas of Box Gum Woodland (Section 3.1.1.1, and Section 4).
	(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. *Note: The Biodiversity Management Plan must incorporate all relevant aspects of the development, including Enabling Works consistent with the requirements of condition B67.*	Section 2.2.
Rehabilitation		
B62	Unless the Planning Secretary agrees otherwise, within 12 months of commencing operation of the project, the Proponent must decommission and rehabilitate the accommodation camps to the satisfaction of the Planning Secretary. This rehabilitation must comply with the objectives in Table 3. **Table 3:** *Rehabilitation Objectives* **Feature** | **Objective**	This plan has been prepared to address MCoA B62.

<table>
<tr><th>MCoA No.</th><th>Condition Requirements</th><th>Document Reference</th></tr>
<tr><td></td><td>
<table>
<tr><td>Accommodation camp</td><td>• Safe, stable and non-polluting
• All infrastructure including above and below ground to be decommissioned and removed to a depth of 500 mm, unless the Planning Secretary agrees otherwise
• Restoring land capability to pre-existing productive capacity
• Ensure public safety at all times</td></tr>
</table>
</td><td></td></tr>
<tr><td>B63</td><td>Unless the Planning Secretary agrees otherwise, within 6 months of the completion of construction, upgrading or decommissioning, the Proponent must rehabilitate the areas where ancillary facilities and earthwork material sites are located. This rehabilitation must comply with the objectives in Table 4.
Table 4: Rehabilitation Objectives
<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>Ancillary facilities</td><td>• Safe, stable and non-polluting
• progressively rehabilitate the site as soon as possible following disturbance
• to be decommissioned and removed, unless the Planning Secretary agrees otherwise</td></tr>
<tr><td>Land Use</td><td>• Restore or maintain land capability to pre-existing use</td></tr>
<tr><td>Community</td><td>• Ensure public safety</td></tr>
</table>
</td><td>This plan has been prepared to address MCoA B63.</td></tr>
</table>

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

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

Table 2-2 CoMA relevant to this plan

CoMA 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.

CoMA No.	Condition Requirements	Document Reference
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.

2.6. Updated Management Measures

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

Table 2-3 UMMs relevant to this plan

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 *Technical Report 1 – Revised Biodiversity Development Assessment Report*, including:	Detailed design and construction	All locations	This plan 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 plan includes provisions for minimising impacts on threatened fauna populations via the salvage (Section 4.1.2) and reuse of habitat features

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				(Section 4.3.2).
	▪ Preparation of a fauna handling and rescue procedure to be implemented during construction and operation for the ethical handling of injured or displaced fauna. Further, the fauna handling and rescue procedure would include an incident reporting protocol for fauna relocations, rescue and rehabilitation, euthanasia and/or fatality.			Not addressed in this plan – refer Annexure 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.			
	▪ 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.			This plan includes provisions for the retention of habitat features (4.1.2). Refer the HLW BMP, including Annexure B: Clearing Protocol & Annexure F: Connectivity Strategy for additional measures to address this condition.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	▪ Proposed rehabilitation of temporary disturbance areas including management and maintenance measures.			This plan has been prepared to address this condition.
	▪ 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 plan – 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 plan – 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 plan – 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.			Not addressed in this plan – refer Annexure C: Hollow and Nest Strategy of the HLW BMP.
	▪ Details on the pre-clearing and clearing supervision process.			Section 4.1.2. Refer Annexure B: Clearing Protocol of the HLW

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				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.			Section 4.3.2.1. Refer Section 7.7 of the HLW BMP for additional measures to address this condition.
	▪ 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 plan – 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.			Section 4.3.2.1.
	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			Not addressed in this plan – refer Annexure H: Biodiversity Monitoring Program of the HLW BMP.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	▪ 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. The adaptive management measures and monitoring program will be developed to target specific species considered to be most at risk of significant impacts, as determined during the detailed design phase. The BMP will stipulate objectives for monitoring, reporting and evaluation, and how baseline data will be captured and represented.			
B9	The detailed design will consider opportunities to avoid and minimise impacts to Golden Sun Moth and Key's Matchstick Grasshopper within transmission line easements to be implemented during construction. As a part of the BMP (refer to mitigation measure B3), a rehabilitation plan would be developed for threatened insect habitat temporarily disturbed during construction. Planting specifications and requirements for post-care, including weed control, are to be outlined in the plan and would be subject to agreement of the relevant landowner.	Detailed design and construction	Within mapped habitats	Golden Sun Moth is not relevant to the HLW stage of the HumeLink Project. Refer to Section 7.2 of the HLW BMP for avoiding and minimising impacts to Key's Matchstick Grasshopper habitats. This strategy addresses the rehabilitation of temporarily disturbed Key's Matchstick

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				Grasshopper habitats (Section 4.3.3.1).
B18	All disturbed lands/areas must be managed throughout the construction work (in accordance with the relevant *Managing Urban Stormwater* (Landcom, 2004) (Blue Book) or comparable best practice guidelines, including: • vegetation removal, restoration, and management • stockpiling, erosion and sediment management • stabilisation / rehabilitation of disturbed lands/areas must be undertaken within suitable timeframes • temporary erosion and sediment controls must be maintained (and not removed) until rehabilitation measures are providing effective stabilisation of disturbed lands/areas. Disturbed areas (including areas not required for operation) will be stabilised/rehabilitated to a standard either: • as agreed with the landowner • in accordance with the relevant Managing Urban Stormwater (Blue Book) or comparable best practice guidelines.	Construction	All locations	This plan includes provisions for all components of this condition within temporarily disturbed areas.

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
B19	Logs and tree hollows that could provide fauna habitat (the total length of wood at least 10 cm in diameter and at least 0.5 m long) will be relocated to adjacent and/or suitable woodland locations where available/feasible. Opportunities to retain felled trees as habitat on-easement will be considered in select areas (ie connectivity corridors and riparian lands). The opportunity to stockpile and supply felled trees for KFH rehabilitation or improvement work will be discussed with DPI Fisheries. Trees within the boundaries of State forests, Crown Lands, Travelling Stock Reserves, public roads or within 40 m of the bank of any river will be disposed of strictly in accordance with the requirements of the appropriate authorities. These requirements will be determined by the contractors before carrying out such work.	Construction	Transmission line corridor	Section 4.1.2 and 4.3.2.
B32	Any sections of stream or waterway banks that are impacted or modified by the project will be reformed or remediated to resemble the pre-work condition and form wherever possible or alternatively to a stable design form, as appropriate following the completion of construction work. This may include revegetation to stabilise bank sediments.	Construction and operation	Transmission line corridor - access track waterway crossing	Section 4.2 & 4.3.2.1.
	Waterway banks impacted by the project will be reinstated such that bank stability at the crossing location is the same or better than prior to construction. Stabilising materials such as rock armouring, hydro mulch, jute matting, or other suitable geotextile materials may be utilised where necessary.			
	Any temporary stream crossings will be removed and rehabilitated at the completion of their operational use.			

3. Background

3.1. Temporarily disturbed areas

Annexure B: Clearing Protocol of the HLW BMP provides specified disturbance zones and their clearing methodologies, informed by the *HumeLink Vegetation Clearing Method and Management Memorandum* (Rev 1; Transgrid, 2023). Temporarily disturbed areas are associated with the Total Clearing Zone (TCZ) as follows:

1. Brake and winch sites used during construction stringing activities – typically 60 m by 80 m.
2. Construction compounds and temporary workforce accommodation facilities.
3. Access tracks that are not required for operational maintenance and that are approved for removal by the appropriate landowner.

These areas are displayed in Figure 3-1 below (note: temporarily disturbed access tracks are excluded due to ongoing consultation with relevant landowners, however would be subject to measures detailed in this plan if deemed temporary).

3.1.1. Vegetation

Rehabilitation of temporary disturbance areas is required to restore land capability to pre-existing productive capacity, facilitating natural regeneration post-construction. Vegetation within temporary disturbance areas within the TCZ (i.e., brake and winch sites, construction compounds and temporary workforce accommodation facilities) is summarised below and detailed in Table 3-1:

- 34.66 ha of native vegetation.
- 95.43 ha of non-native vegetation. Largely consistent with Category 1 (exempt land) per the *Local Land Services Act 2013*.

3.1.1.1. Threatened Ecological Communities

Three Threatened Ecological Communities (TECs) will be impacted by temporary disturbances, thereby rehabilitated as part of this plan (Table 3-1):

- Critically Endangered & entity at risk of Serious and Irreversible Impact (SAII): White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland per BC Act & EPBC Act.
- Endangered & SAII: Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions per BC Act.
- Endangered: Montane Peatlands and Swamps per BC Act & EPBC Act.

Table 3-1 Pre-clearing vegetation within temporary disturbance areas

Vegetation	TEC	Temporary disturbance area (ha)
PCT 266	Part BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered Ecological Community [CEEC] & SAII) Part EPBC Act: part White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)	0.33
PCT 268	Part BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC & SAII) Part EPBC Act: part White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)	0.09

Vegetation	TEC	Temporary disturbance area (ha)
PCT 277	Part BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC & SAII) Part EPBC Act: part White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC)	13.79
PCT 285	N/A	0.37
PCT 287	N/A	0.77
PCT 290	N/A	7.17
PCT 297	N/A	0.68
PCT 299	N/A	0.16
PCT 300	N/A	0.16
PCT 306	N/A	2.04
PCT 319	N/A	1.09
PCT 343	N/A	0.50
PCT 352	BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (CEEC & SAII)	1.33
PCT 638	N/A	0.34
PCT 679	N/A	0.62
PCT 939	BC Act: Montane Peatlands and Swamps (EEC) EPBC Act: Alpine Sphagnum Bogs and Associated Fens (EEC)	0.13
PCT 953	Part BC Act: Part Tableland Basalt Forest (EEC & SAII)	4.52
PCT 1196	N/A	0.57
TOTAL PRE-DISTURBANCE NATIVE VEGETATION		**34.66**
Non-native vegetation	N/A	95.43

3.2. Key's Matchstick Grasshopper (*Keyacris scurra*)

Species specialist reports prepared as part of the Revised BDAR (Yagui, 2024) identified that rehabilitation efforts should be considered to minimise and mitigate impacts to the Key's Matchstick Grasshopper (KMG). This species is detailed below.

3.2.1. Description and distribution

The Key's Matchstick Grasshopper is listed as Endangered under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and *Biodiversity Conservation Act 2016* (BC Act). It is a small, slender, wingless grasshopper recognised for its slanted face, splayed hind femora and ensiform antennae (TSSC, 2019). The species does not have a high dispersibility.

The species is historically distributed from Victoria to Orange in NSW, associated with the sheep/wheat belt (TSSC, 2020). Its extant distribution has been reduced by ongoing threats, including severe fragmentation of habitat, historical and inferred ongoing declined in abundance, habitat availability and quality, and poorly understood management requirements (TSSC, 2019). While

disturbance is known to contribute to species decline, there is a notable presence of KMG in disturbed areas which undergo infrequent disturbance (i.e., cemeteries, railway easements, travelling stock routes) but still contain the relevant native grasses. Disturbance appears to be an important determinant of site occupancy, and it is noted that the species is absent from sites that are disturbed at the incorrect time of the year or erratically which interrupts the short non-overlapping lifecycle (TSSC, 2022).

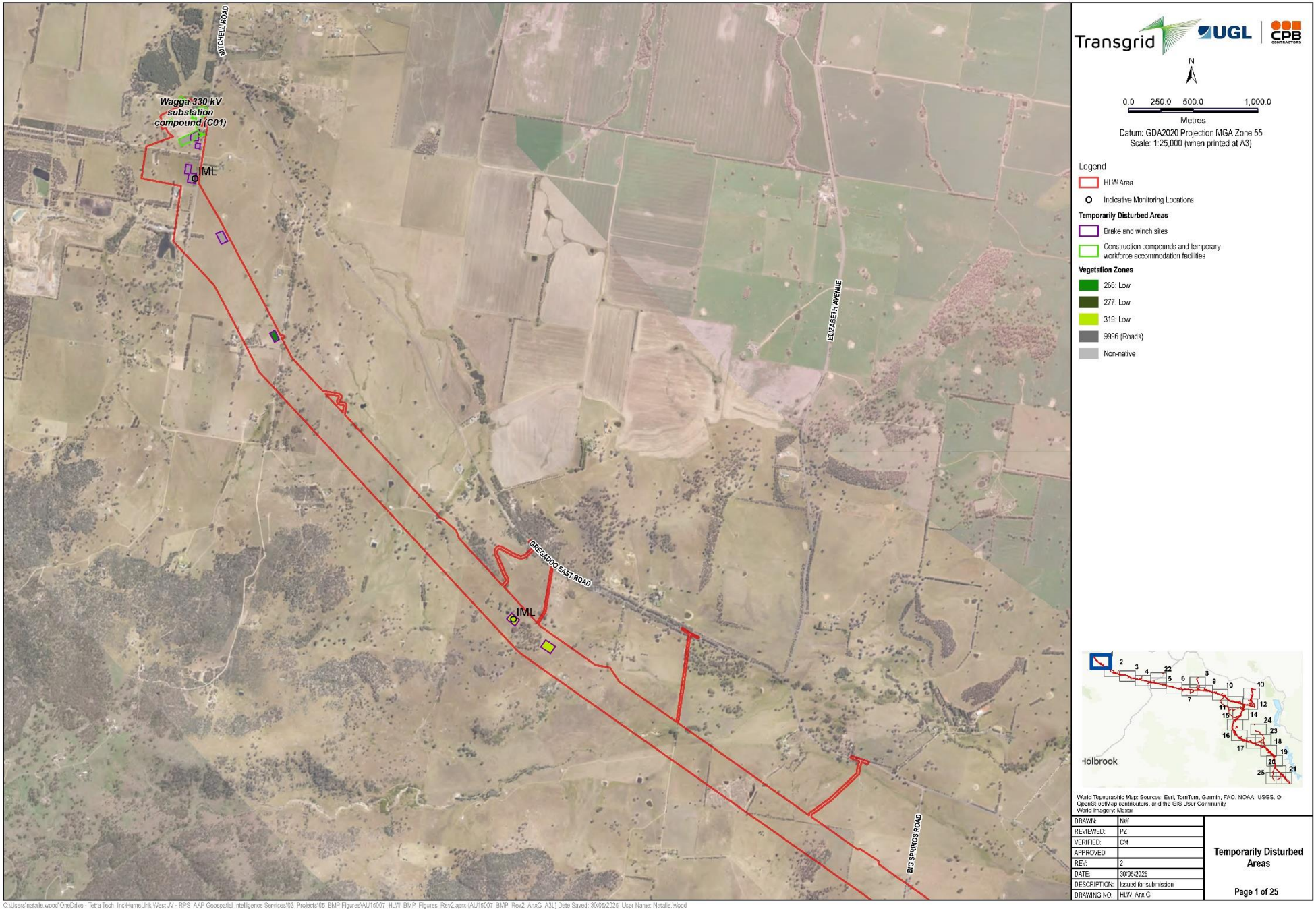
3.2.2. Habitat

Historical records of KMG are typically associated with primary and secondary native grasslands, dominated by tall stands of *Themeda triandra* (Kangaroo Grass) and species within the *Asteraceae* family (TSSC, 2020). The species has also been recorded in other vegetation types containing a native grass understory. In some reported locations there is an absence of *T. triandra* and very few or no *Asteraceae* species (TSSC, 2020).

The species feeds on a range of native and introduced species, preferring small ephemeral plants to the larger perennial species, such as *Asteraceae* species, *Helichrysum apiculatum* (Common Everlasting), *Podolepis jaceoides* (Showy Copper-wire Daisy) and *Craspedia uniflora* (TSSC, 2020). The relationship to *T. triandra* is considered only for shelter from predators or climactic stressors and it is not part of the species' food requirements.

3.2.2.1. Temporarily disturbed areas

Per UMM B9, a rehabilitation plan would be developed for threatened insect habitat temporarily disturbed during construction. Key's Matchstick Grasshopper has been assumed present via the *Key's Matchstick Grasshopper (*Keyacris scurra*) Expert Report – HumeLink project* (Yagui, 2024). Only one patch of this species' polygon intersects with the Easement Clearing Zone, which may experience collateral temporary impacts to suitable habitat for this species (displayed in Figure 3-1 below).



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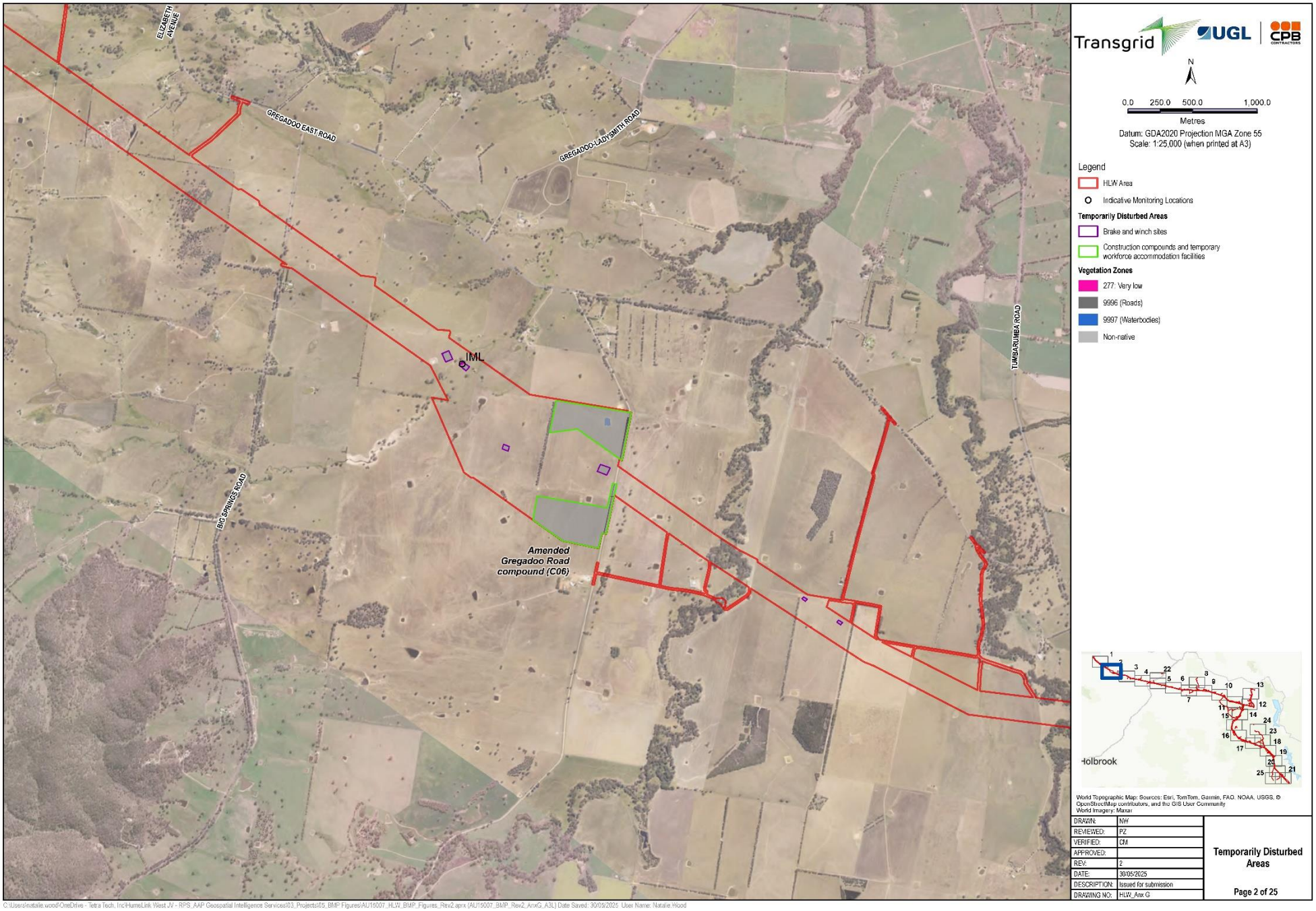

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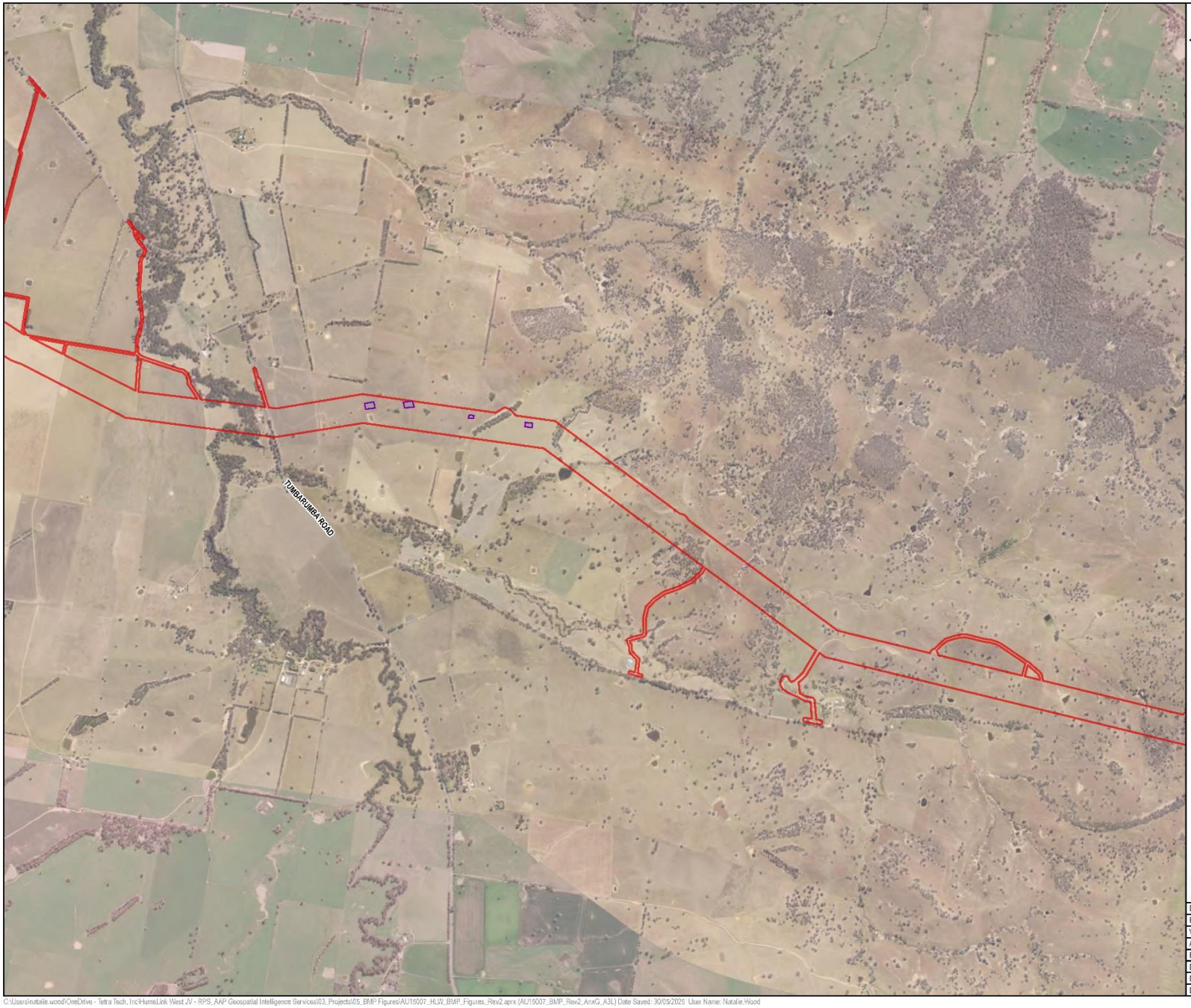

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Metres

Datum: GDA2020 Projection MGA Zone 55
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Legend

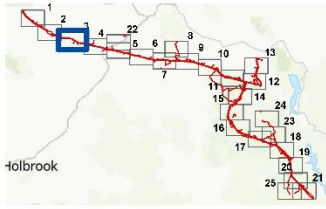
HLW Area

Temporarily Disturbed Areas

Brake and winch sites

Vegetation Zones

Non-native



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World Topographic Map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

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Temporarily Disturbed Areas

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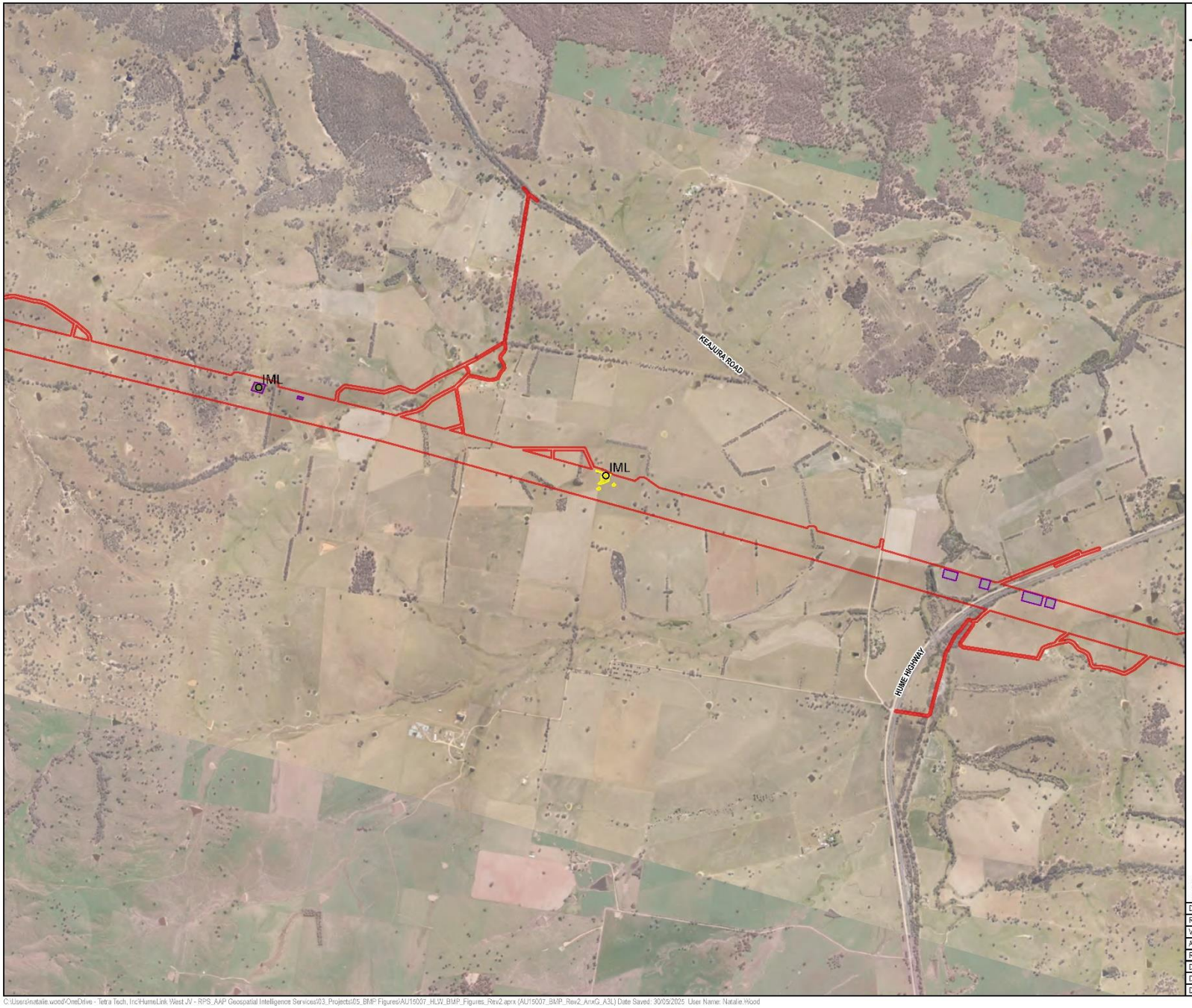

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Legend

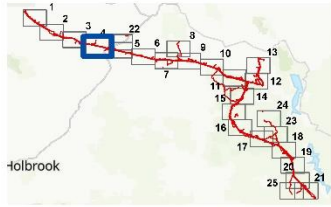
- HLW Area
- Indicative Monitoring Locations
- Key's Matchstick Grasshopper Habitat

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 277: Low
- 343: Moderate
- 343: Very low
- 9996 (Roads)
- Non-native



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Temporarily Disturbed Areas

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Metres

Datum: GDA2020 Projection MGA Zone 55
Scale: 1:25,000 (when printed at A3)

Legend

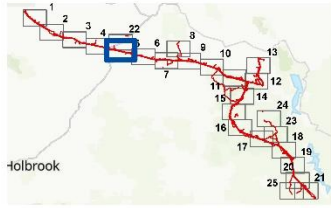
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 277: Low
- 277: Very low
- Non-native



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Temporarily Disturbed Areas

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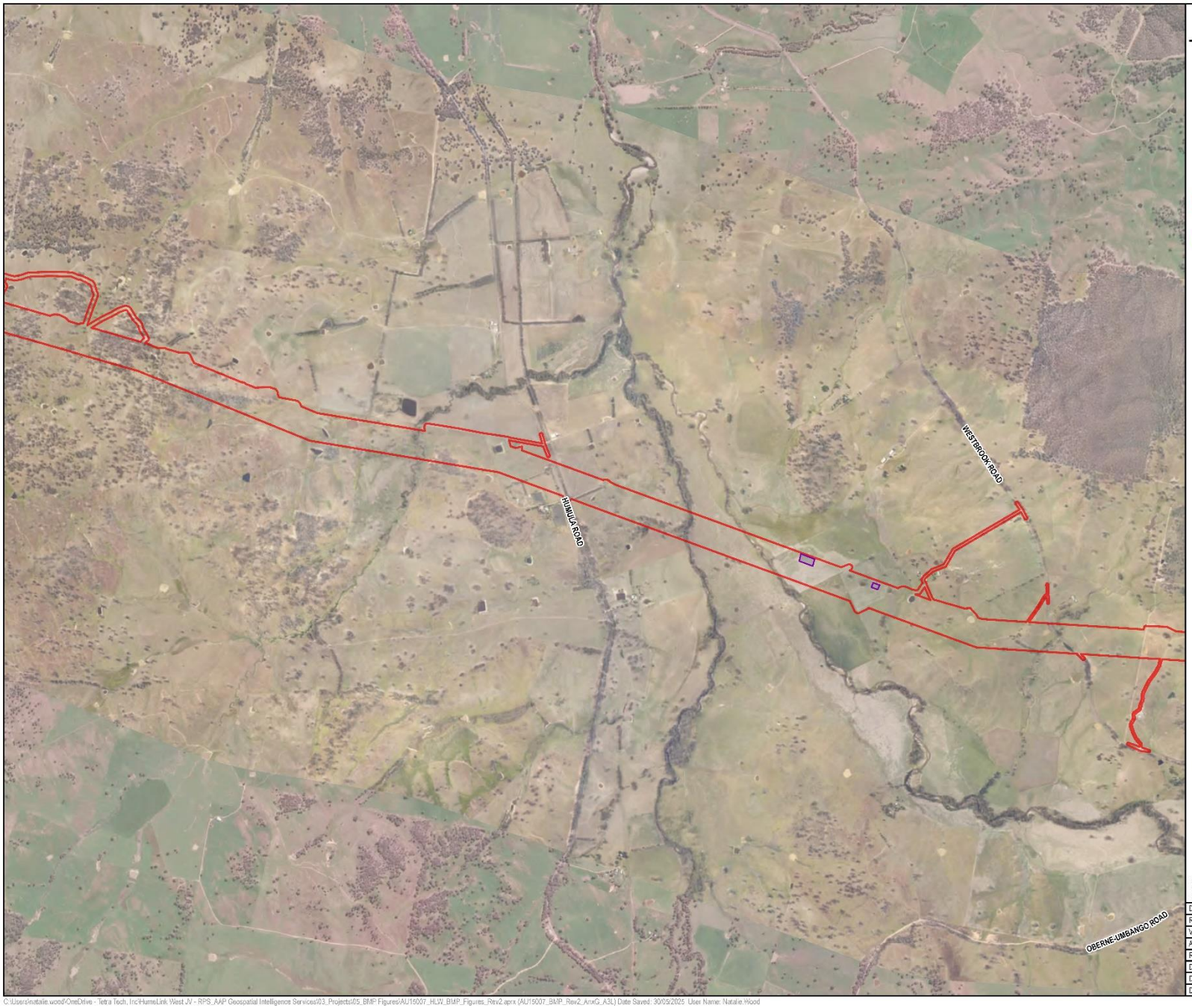

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Metres

Datum: GDA2020 Projection MGA Zone 55
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Legend

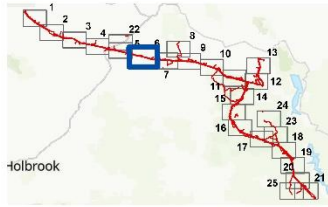
- HLW Area

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- Non-native



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Temporarily Disturbed Areas

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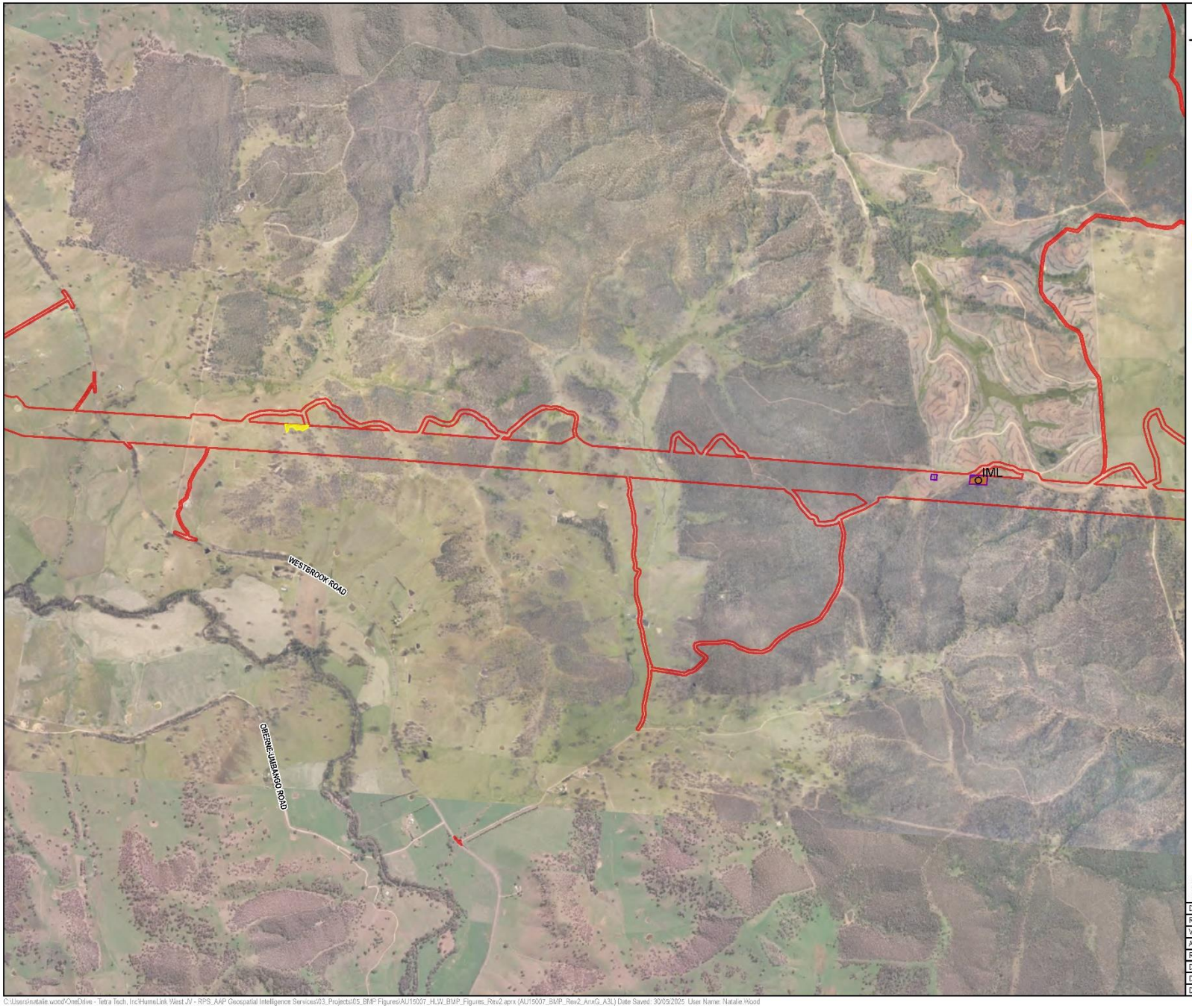

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Metres

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Legend

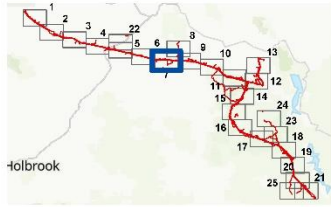
- HLW Area
- Indicative Monitoring Locations
- Key's Matchstick Grasshopper Habitat

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 290: Very low
- 297: Moderate
- 9996 (Roads)
- Non-native



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Temporarily Disturbed Areas

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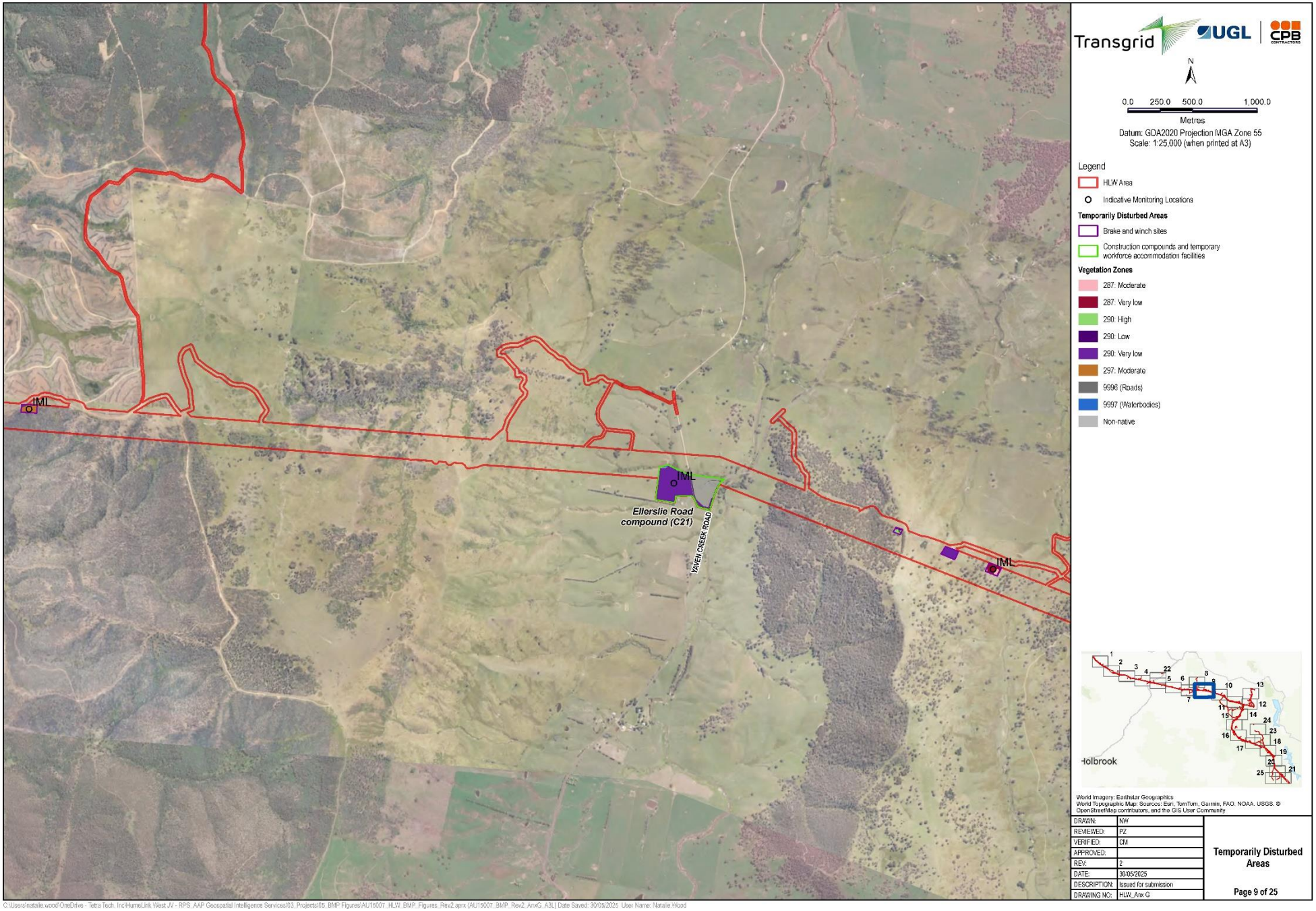

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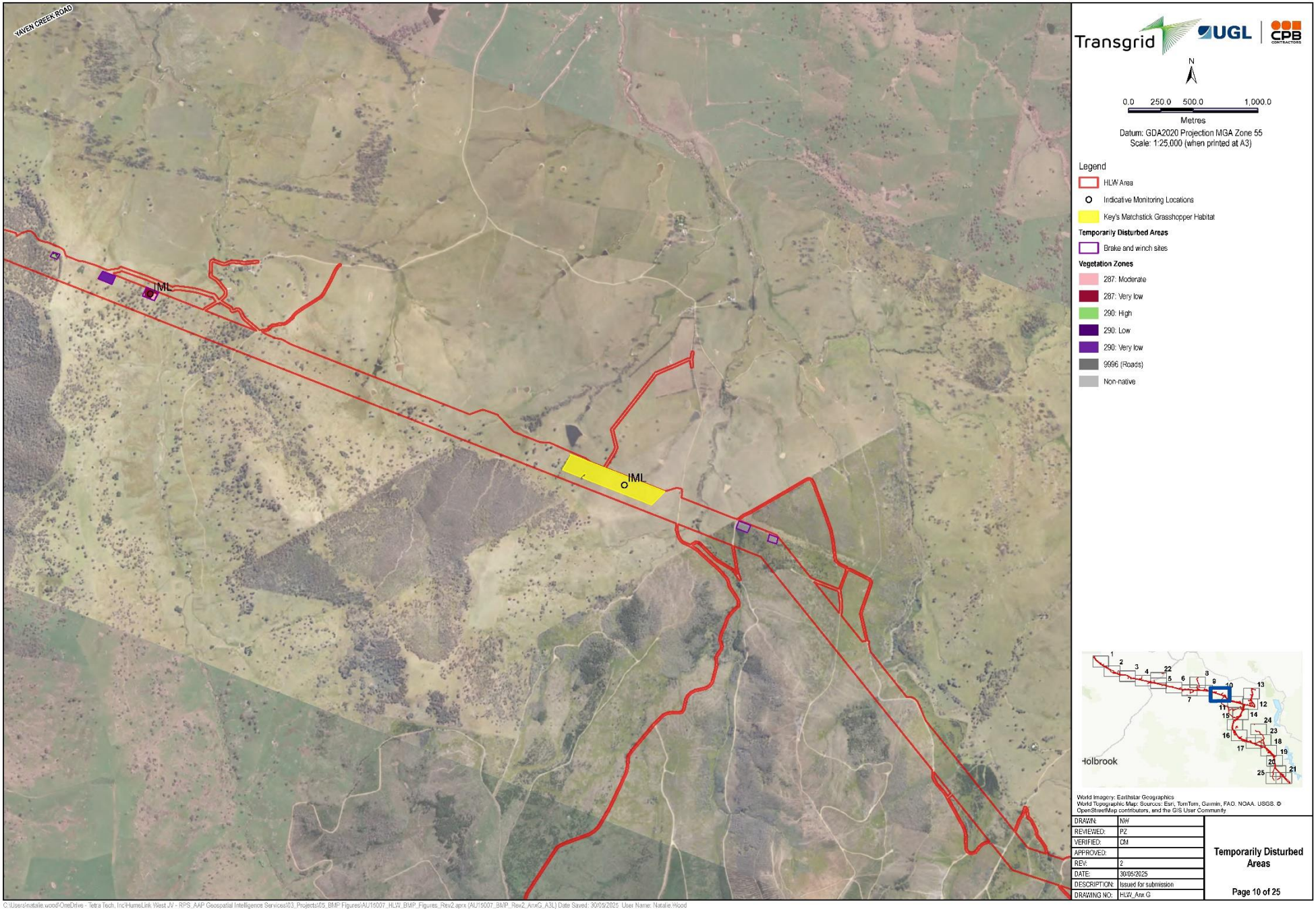

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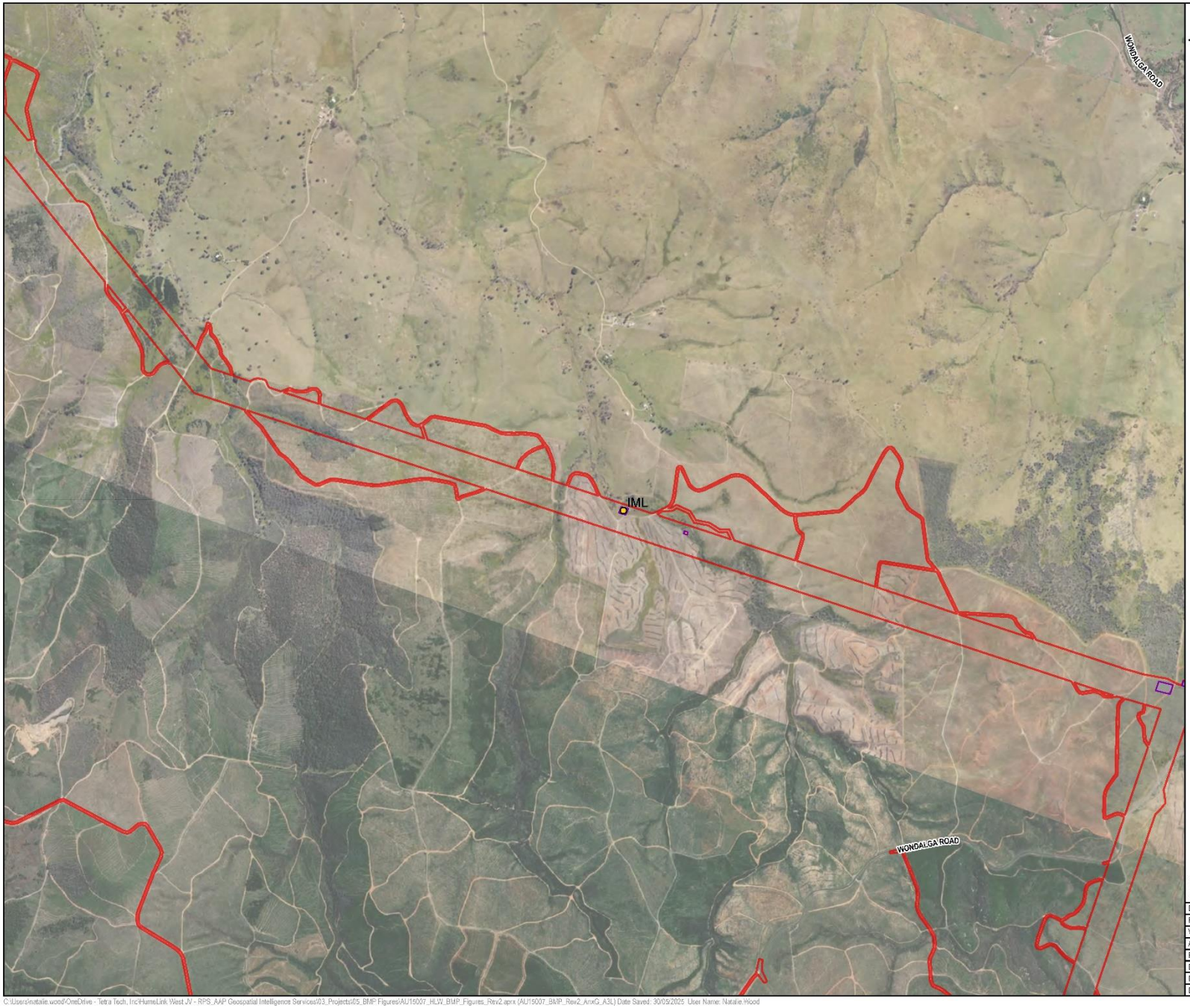

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Metres

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

Legend

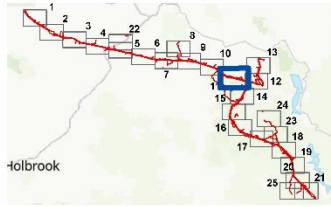
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 285: Low
- 9996 (Roads)
- Non-native



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Temporarily Disturbed Areas

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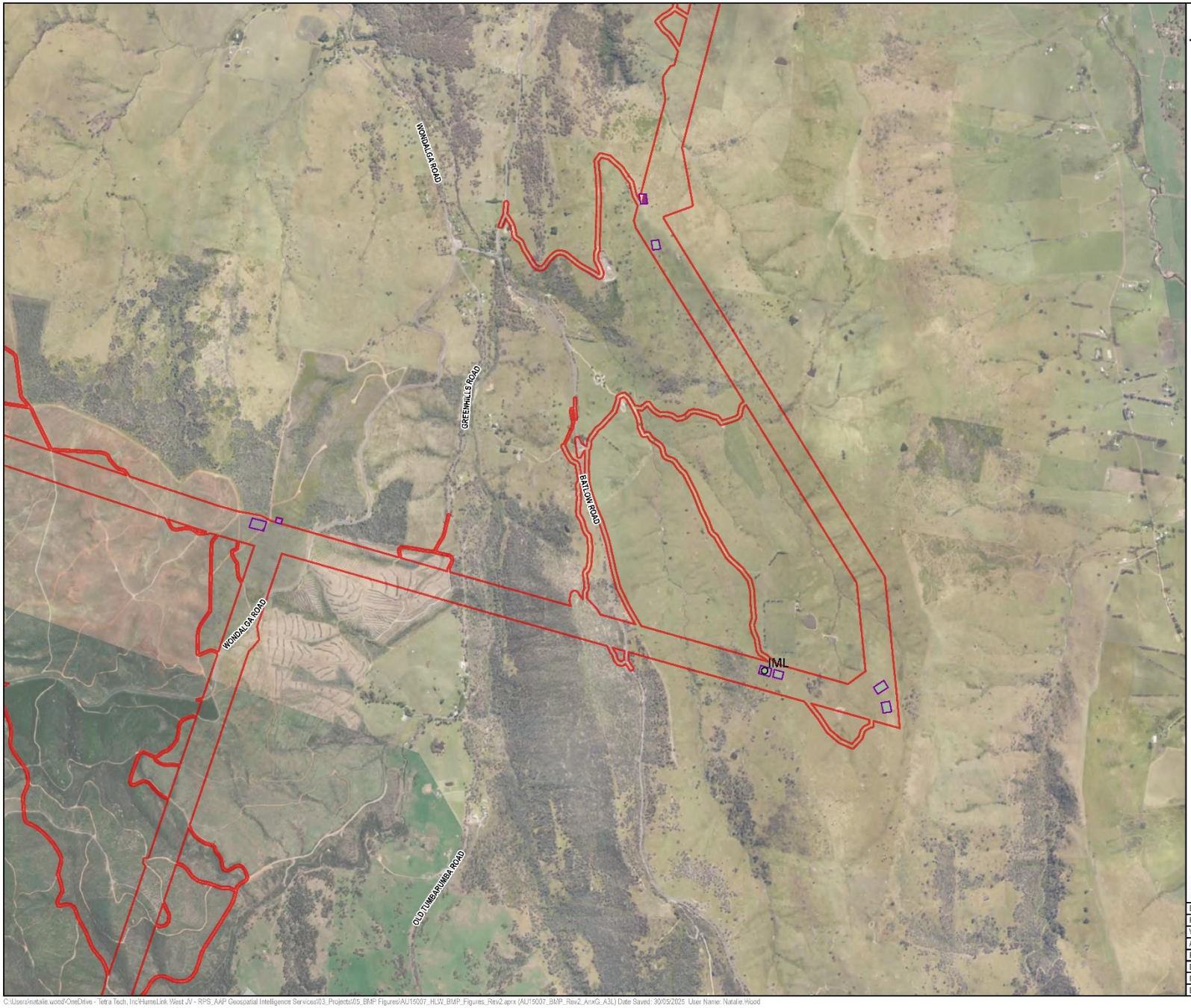

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N

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Metres

Datum: GDA2020 Projection MGA Zone 55
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Legend

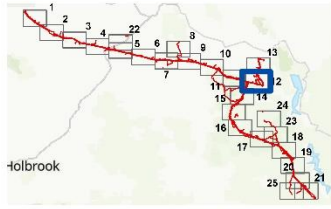
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 287: Very low
- 306: Very low
- 352: Low
- 352: Very low
- 9996 (Roads)
- Non-native



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Temporarily Disturbed Areas

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Metres

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Legend

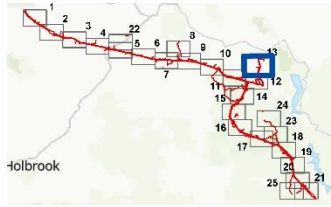
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 277: Very low
- 352: Low
- 352: Very low
- 9996 (Roads)



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Metres

Datum: GDA2020 Projection MGA Zone 55
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Legend

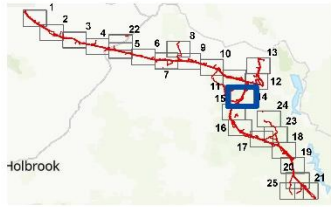
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites
- Construction compounds and temporary workforce accommodation facilities

Vegetation Zones

- 285: High
- 285: Very high
- 9996 (Roads)
- Non-native



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Temporarily Disturbed Areas

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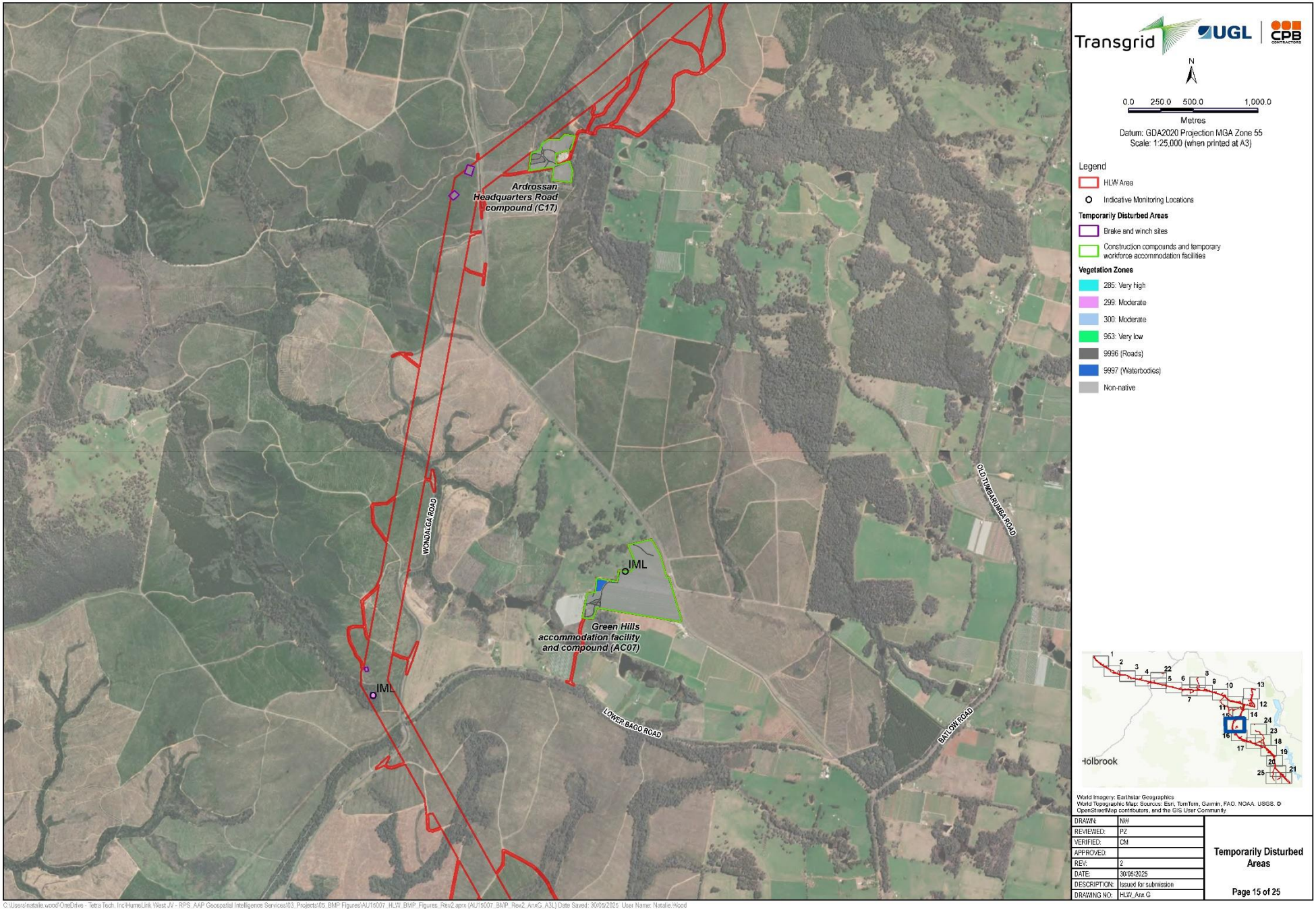

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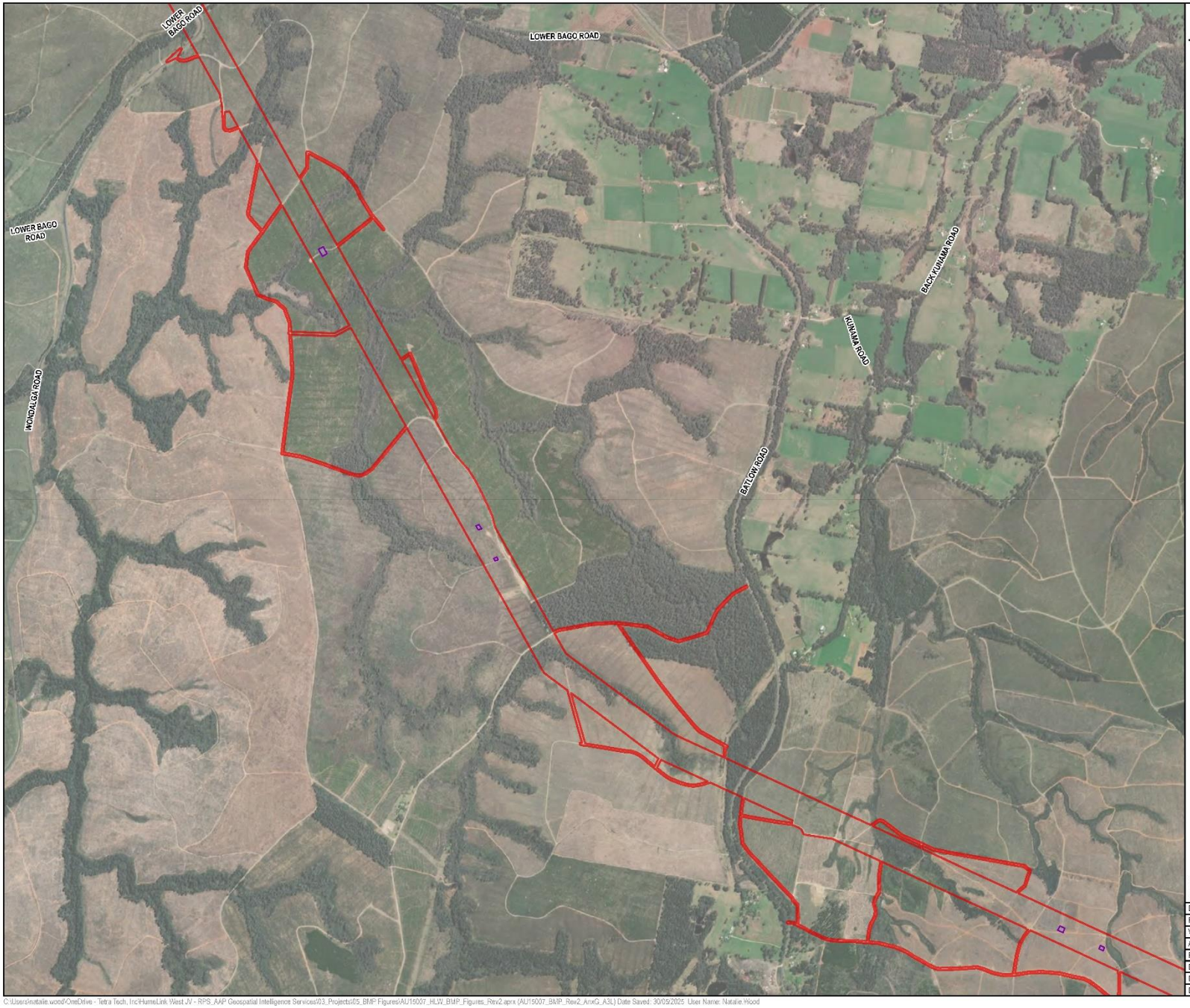

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Metres

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Legend

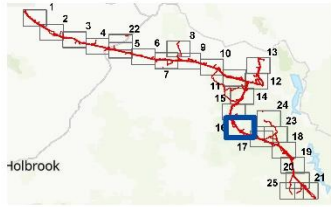
- HLW Area

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- Non-native



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Temporarily Disturbed Areas

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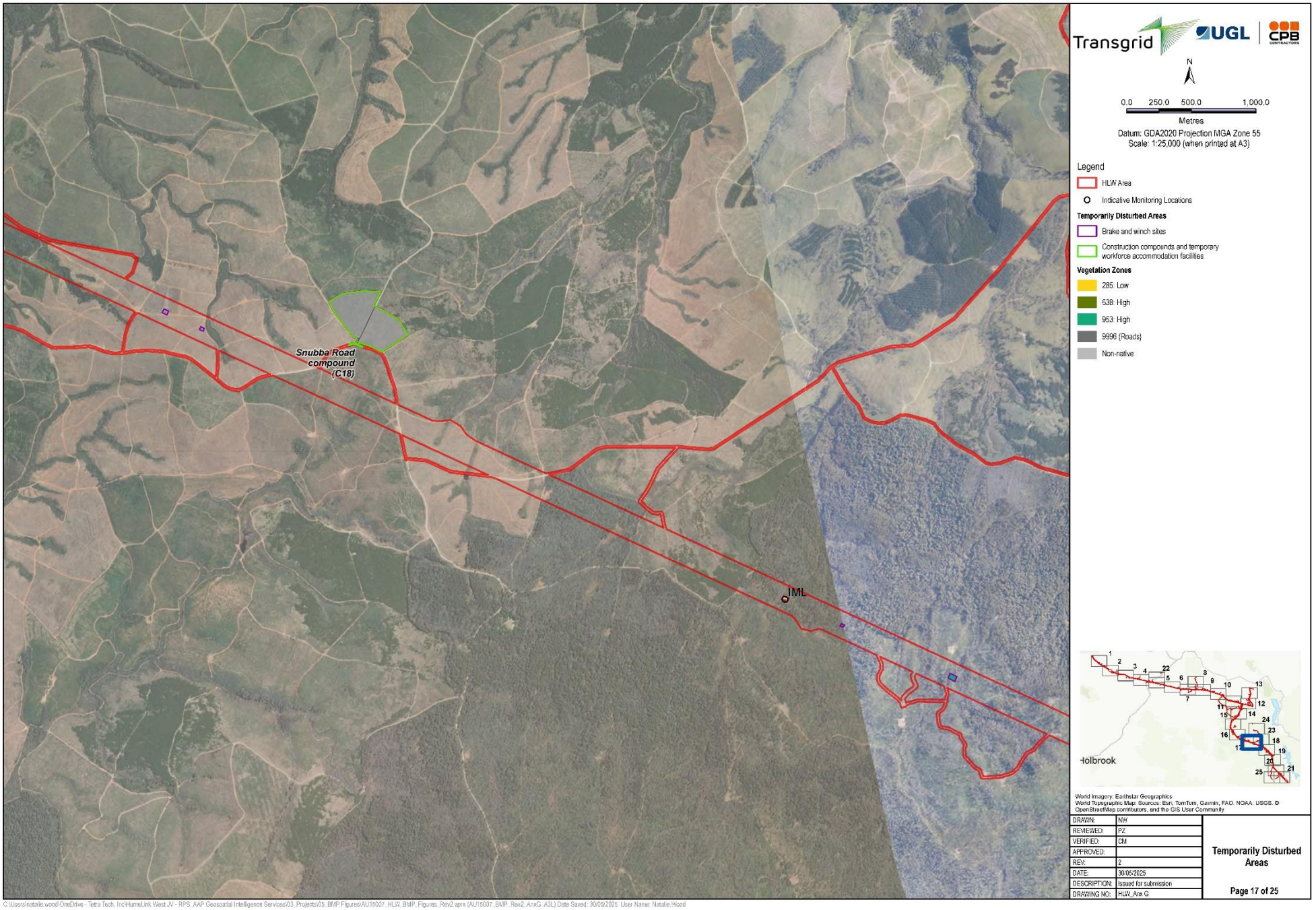

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Metres

Datum: GDA2020 Projection MGA Zone 55
Scale: 1:25,000 (when printed at A3)

Legend

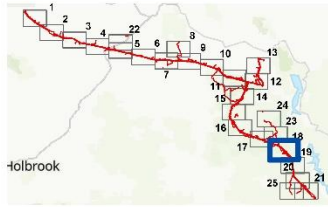
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 638: High
- 939: High
- 953: High



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DATE:	30/05/2025
DESCRIPTION:	Issued for submission
DRAWING NO:	HLW_Anx G

Temporarily Disturbed Areas

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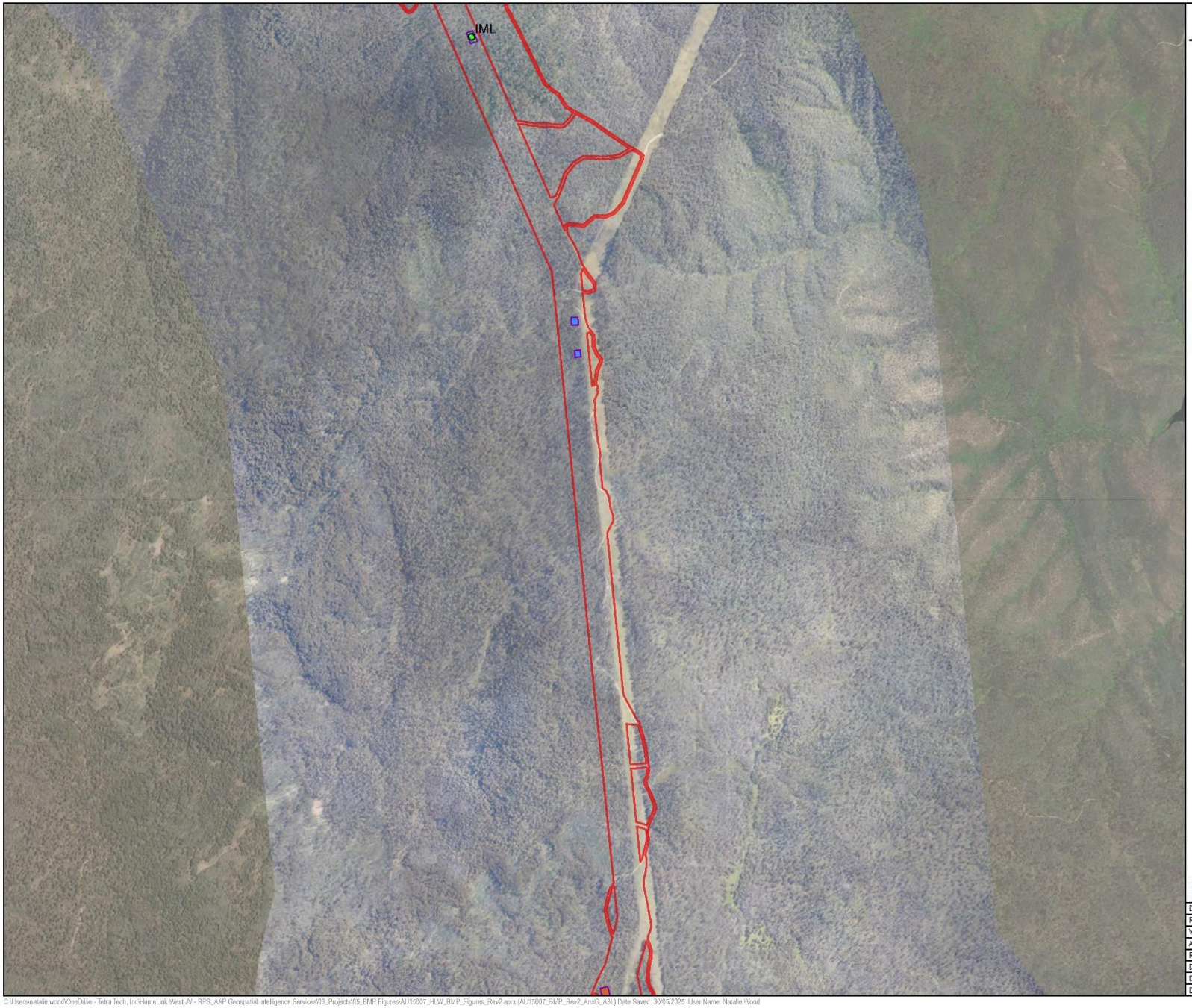

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Metres

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Legend

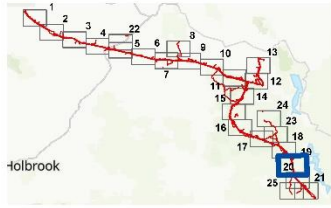
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 1196: High
- 939: High
- 953: High
- 953: Very high



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World Topographic Map: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

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Temporarily Disturbed Areas

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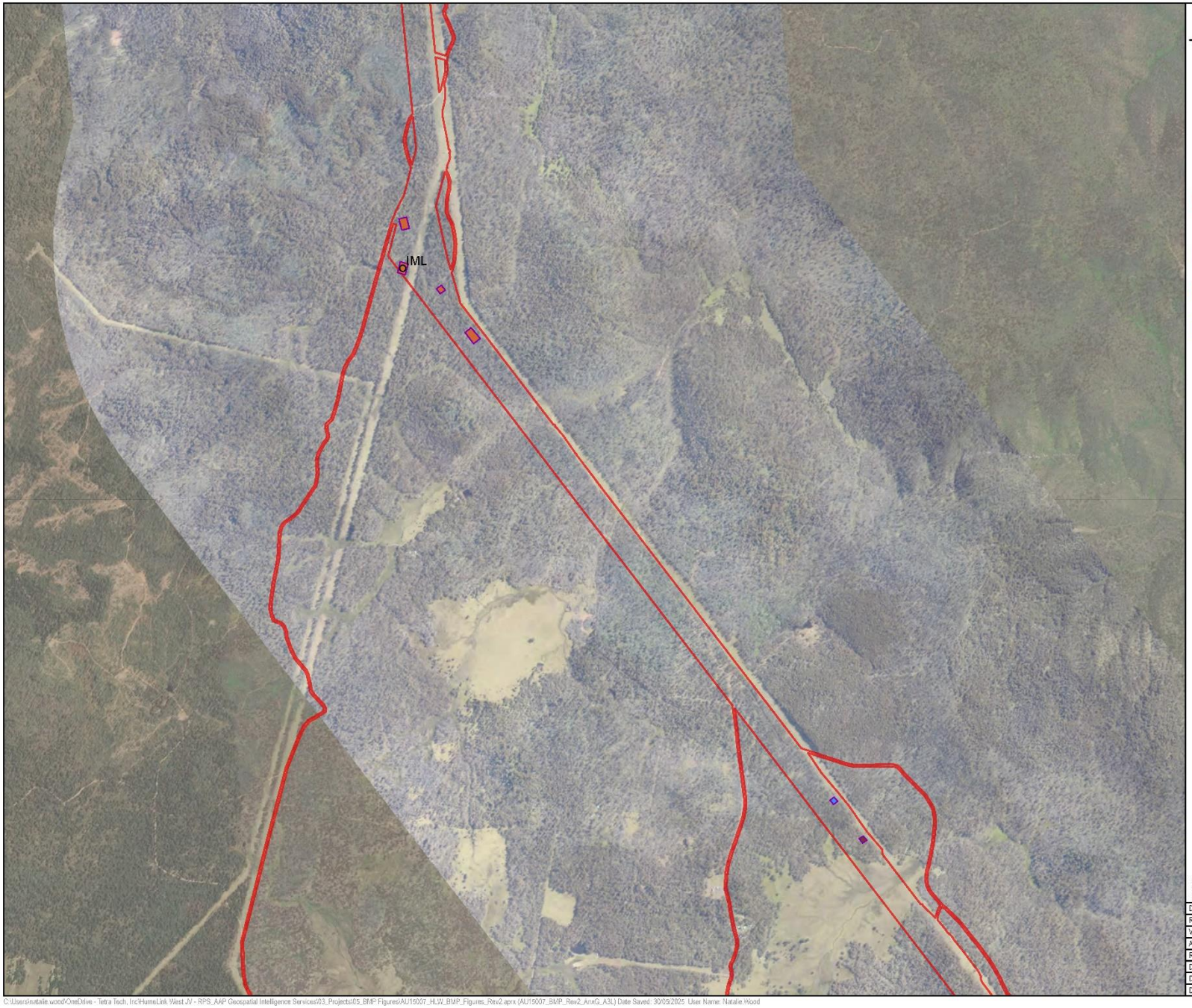

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Metres

Datum: GDA2020 Projection MGA Zone 55
Scale: 1:25,000 (when printed at A3)

Legend

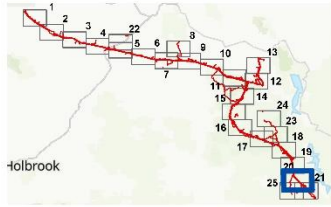
- HLW Area
- Indicative Monitoring Locations

Temporarily Disturbed Areas

- Brake and winch sites

Vegetation Zones

- 1196: High
- 679: High
- 953: Very high
- 9996 (Roads)



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Temporarily Disturbed Areas

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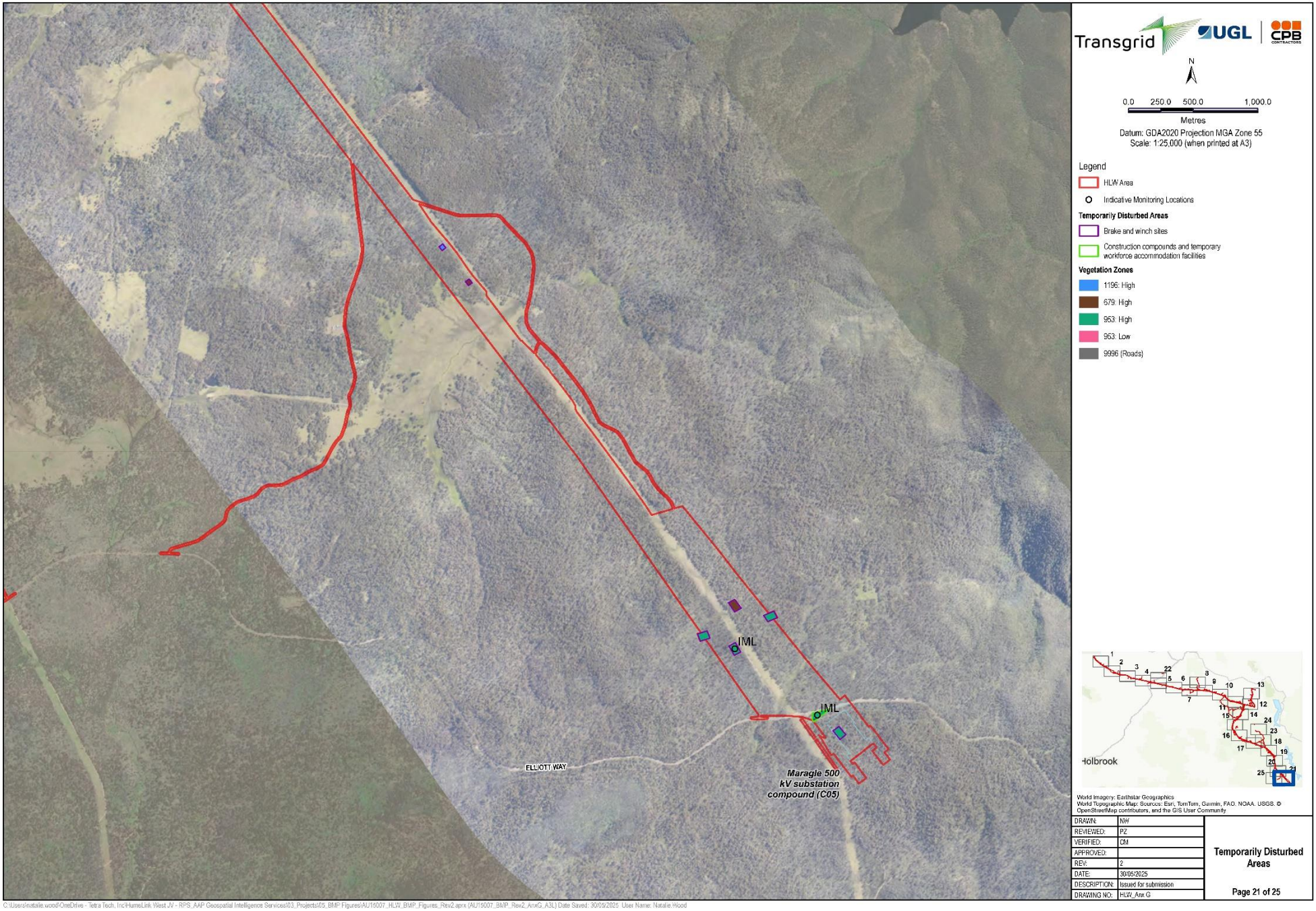

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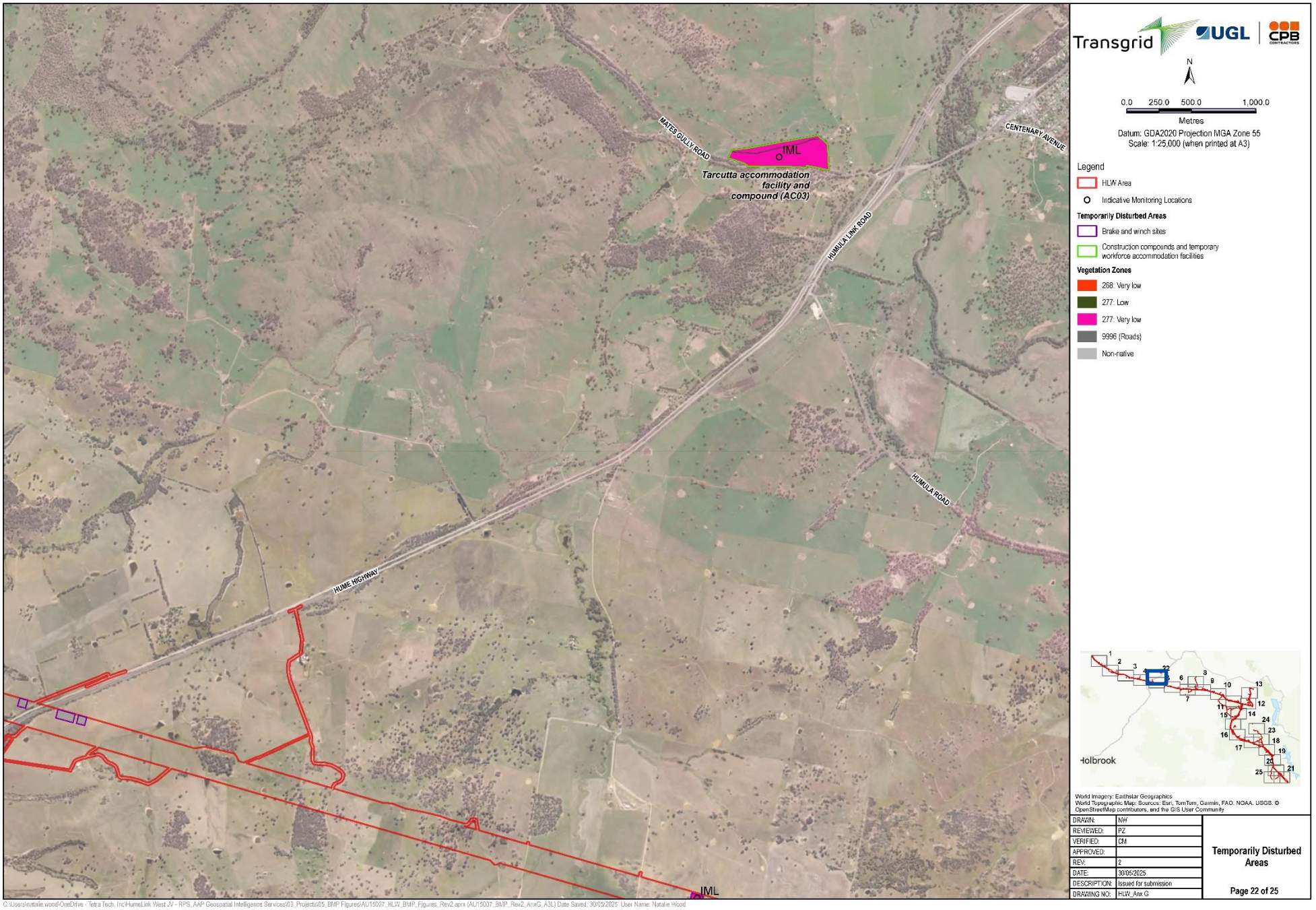

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4. Rehabilitation measures

Natural regeneration is the process by which native vegetation recovers in an area after disturbance or clearing without human intervention. It's a natural process relying on seeds or vegetative parts remaining in the ground to re-establish themselves. This is more likely to occur in areas of high resilience through biotic and abiotic factors such as soil health and the presence of a native seed bank. As such, this plan outlines measures to ensure temporarily disturbed areas are rehabilitated to a point of high resilience providing the ability to rely on natural process to recover from any later disturbances.

A large proportion of temporary disturbance areas occur on historically disturbed non-native vegetation with low resilience, consistent with Category 1 (exempt land) that will remain as agricultural and private lands. As such, rehabilitation measures detailed below prioritise areas of native vegetation pre-disturbance as displayed in Figure 3-1.

Rehabilitation efforts must be completed within 6 months of the completion of construction, upgrading or decommissioning of HLW. If for any reason rehabilitation cannot be achieved as per this plan (e.g. rejection by relevant land holder), evidence will be supplied and reasoning detailed per Section 5.2.

Due to potential safety and bushfire risks, all works must be undertaken in accordance with the HLW Bush Fire Emergency Management and Evacuation Plan as a priority. To ensure minimal indirect impacts to adjoining land, all works must be undertaken in accordance with:

- *Managing Urban Stormwater: Soils and construction - Volume 1* (the 'Blue Book'; Landcom 2004).
- HLW Erosion and Sediment Control Sub-Plan.
- HLW Soil and Water Management Sub-Plan.
- Relevant property management plans.

4.1. Salvage of resources

4.1.1. Soil

Soil management differs for areas of native vegetation and non-native vegetation (Category 1 exempt land), such as agricultural land. As detailed in Section 3.1.1, over 95 ha of temporarily disturbed land contains non-native vegetation at pre-disturbance conditions (accounting for 73% of temporarily disturbed areas). Topsoil stripping is not necessary for rehabilitation in such areas as they generally lack a native seedbank, however may be completed as required for earthworks/levelling.

The remaining 34.66 ha of temporarily disturbed areas contain native vegetation at pre-disturbance conditions and will require topsoil preservation or stripping and reuse to facilitate natural regeneration. Areas of temporary disturbance (such as some brake and winch sites) may undergo topsoil protection via geofabric or protective matting, thereby retaining soil seedbank, microbes and root balls. Topsoil stripping zones will be clearly marked prior to works commencing, with priority given to topsoil and root ball retention where practicable.

Native topsoil stripping will be undertaken in all areas of temporary disturbance, unless topsoil protection is undertaken as per above. This will involve the salvage of the top 10 cm of soil, including leaf litter and humus. This depth typically captures the seed bank and organic-rich layer without digging into the sterile subsoil. In wooded areas with thick leaf litter, collect the litter layer separately (for use as mulch later), then strip the underlying topsoil. Retaining the upper layer's integrity maximises the viability of seed and soil biota.

Stripping will be undertaken when soils are moist (i.e. not dry and susceptible to erosion, nor saturated and susceptible to runoff). If prolonged dry weather precedes stripping, light watering may be applied to achieve a workable moisture content, and conversely, wait for soils to drain after heavy rains. Soils will be removed in layers so that they may be returned in sequential order as part of rehabilitation,

ensuring separate handling of topsoil and subsoil (NSW RR, 2021).

Whenever possible, directly reuse stripped topsoil onto adjacent areas that are ready for rehabilitation, instead of stockpiling long-term. Direct transfer (i.e., strip and place) preserves seed viability and soil microbes by minimising storage time. If possible, coordinate construction scheduling so that restoration of one segment can occur soon after stripping, using the freshly stripped topsoil for the next segment. If direct placement is not feasible, proceed to proper stockpiling (refer Section 4.1.4 below).

4.1.2. Habitat features

Prior to the commencement of any works that would require vegetation removal, ground disturbance or stream crossing works (including during enabling works), the presence of materials that may be used in future rehabilitation efforts would be identified and marked by a suitable ecologist to maximise opportunities for salvage of biological and habitat resources (NSW RR, 2021). These efforts will be undertaken during pre-clearing surveys as detailed in Annexure B: Clearing Protocol of the HLW BMP. The salvage of hollow-bearing trees, hollow logs, tree stumps, fallen timber or boulders will be undertaken during the clearing process. Material that has not been marked during this process may also be salvaged for rehabilitation during any construction stage of HLW. Cleared logs and tree hollows that could provide fauna habitat include those where the total length of wood at least 10 cm in diameter and at least 0.5 m long. Opportunities to retain habitat features on-easement will be prioritised, particularly within connectivity corridors per Annexure F: Connectivity Strategy of the HLW BMP.

4.1.3. Seed

Local seed collection involves gathering seeds from native plants within the proximate healthy bushland areas. Collecting seeds locally ensures that the plants used during the rehabilitation process are well adapted to the local environment and the genetic diversity of local native plant populations are preserved, aiding in habitat restoration and promoting biodiversity for areas where native vegetation has been historically cleared, fragmented or heavily degraded.

Seed collection for HLW rehabilitation may be deemed necessary by suitably qualified specialists, such as for large temporary disturbance areas with pre-construction native vegetation (i.e., construction compounds and temporary workforce accommodation facilities; refer Figure 3-1). Only appropriate seed collection contractors will be utilised for such works, such as [TBD].

Standard seed collection methodology will be followed, including (OEH, 2011):

- Do not collect more than 20% of seed from any one plant.
- Avoid unnecessary damage (i.e., trampling of understory plants).
- Ensure nesting sites, tree hollows or other animal habitats are not disturbed.
- Do not remove more than 20% of the fruit from any one plant.
- Do not take more than 10% of plant material from any one plant.
- Avoid bringing weeds into the collection site.
- Take particular care when collecting from rare or threatened plants.

At minimum, seeds would be collected with the date, location and taxonomy recorded with samples.

The two most abundant PCTs required for rehabilitation constitute over 60% of temporary disturbance areas: PCT 277 & 290. While collection may be required from other communities listed in Table 3-1, seed collection from these two PCTs are considered likely to form the bulk of collection requirements.

Where possible, initial priority species for collection will consist of canopy and mid storey species, particularly slower growing species and species not commonly held in existing commercial seed banks. Collection of ground covers will also commence, however since the lead time for propagation of grasses and sedges is shorter, collection of this material will be a lower priority at the early stages of collection. The impact of recent bushfires will determine the availability of seed for collection. Grass

and forb species are expected to proliferate following the recent bushfire and this opportunity for collection should be maximised. A seed collection schedule is provided in Attachment 1 as guidance.

Seed collection may occur in any HLW Area prior to clearing. Given the relatively limited extent of the enabling works and subsequent rehabilitation, collection and propagation of seed will not be undertaken during enabling works.

4.1.4. Storage of materials

Adequate storage of salvaged materials is imperative for ensuring temporary disturbance areas will facilitate natural regeneration post-construction. Soil stockpiles will be designated in advance, away from traffic areas and at an appropriate distance from watercourses, on land that is level or gently sloping to minimise the potential for erosion and soil loss. Prioritisation of soil storage will be given to areas that are adjacent to the target community to preserve potential soil seed composition. Preference will be given to storing materials where those same materials will be used directly for rehabilitation at that location, eliminating the need for storage and re-handling, and maximising the viability of seed bank and topsoil biota (NSW RR, 2021).

Each stockpile will be kept as small and low as practicable, ideally no more than ~2 m high. Long, low windrows are preferred over tall mounds as they maximise surface area exposed to air and rainfall, sustaining aerobic microbes and allowing some seeds to germinate to the surface (NSW RR, 2020). If subsoil is also excavated for the project, stockpiles for topsoil and subsoil will be kept separately and clearly marked to avoid confusion during reuse. Erosion and sediment control will be implemented around soil stockpiles in line with the HLW Erosion and Sediment Control Sub-Plan. Compaction of the stockpiles will be avoided, and ongoing weed monitoring will occur per Annexure E: Biosecurity Plan of the HLW BMP.

If stockpiles will remain unused for >10 days, or if they are stored adjacent to any areas that have the potential to contaminate materials with exotic flora species by seed or other (i.e., agricultural lands), stockpiles will be stabilised via one of the following:

- Organic cover – spreading mulch or baled straw (certified weed-free straw/mulch) over the stockpile to help reduce erosion, insulate against extreme heat and retain moisture.
- Vegetative cover – seeding the stockpile with a quick-growing cover crop (e.g., sterile cereal grass, local native grass mix) to reduce wind/water erosion and maintain microbial activity.
- Geofabric – best for shorter-term coverage, using light coloured (heat reflecting) jute mating or geotextile fabric to prevent erosion and weed colonization.

The storage of woody debris and leaf litter within the area of disturbance or adjacent to construction sites may not be appropriate, given the potential increase of bushfire hazard by the storage of flammable material. The location of woody debris storage will be prioritised on sites that are not adjacent to native or planted vegetation, or adjacent to construction sites. The location of storage will be nominated prior to vegetation clearance.

Collected seeds will be stored in a controlled environment to maintain viability until they are required for propagation or direct seeding. Where necessary, pre-treatment methods such as soaking will be applied to improve germination rates. Selected species will be propagated at [TBD] with seedlings grown to an appropriate stage for out-planting. Nursery stock will be monitored for health, and planting will be aligned with optimal seasonal conditions to maximise survival rates.

4.2. Site preparation

4.2.1. Decommissioning

The restoration of land to pre-existing condition will occur progressively following completion of construction works at a temporary disturbance site. This would include the removal/remediation of the construction compounds and camp sites; removal of temporary facilities, site buildings and temporary environmental controls in accordance with the HLW Erosion and Sediment Control Sub-Plan and

landowner agreements. Works will be undertaken to:

- Decommission and remove all infrastructure including above and below ground to a depth of 500 mm.
- Restore fences, gates, etc., which may have been damaged during construction.
- Reform or remediate any sections of stream or waterway banks that are impacted or modified during construction works to resemble the pre-work condition and form wherever possible.
- Reinstate waterway banks impacted during construction such that bank stability at the crossing location is the same or better than prior to construction. Stabilising materials such as rock armouring, hydro mulch, jute matting, or other suitable geotextile materials may be utilised where necessary.

Construction access tracks and access points will be retained for operational access, where required and practicable, in consultation with the relevant landowner.

4.2.2. Soil preparation

Soil preparation may be required in areas with overly compacted soil or high runoff. Soil preparation increases the likelihood of seeds germinating and preventing wash out from rainfall events. Types of soil preparation may include (GVA, 2003):

- Mounding in areas that are waterlogged and require drainage improvements.
- Grading of soils for water harvesting in regions with low rainfall.
- Furrow lining to improve water retention and reduce erosion.

Soil preparation will not be undertaken in any areas with established biodiversity values, such as patches of native grass (BCT, 2019). Soil preparation will not be undertaken in any areas with sandy or loamy soils that are susceptible to erosion. Soil preparation is not necessary in areas of non-native vegetation pre-disturbance (refer to Figure 3-1).

4.2.3. Fauna exclusion

Fauna exclusion fencing (including livestock exclusion fencing where practical) will be temporarily installed in line with relevant guidelines (BCT, 2019; BCT, 2021; BCT, 2024) following decommissioning at native rehabilitation sites (Figure 3-1), pending landowner approval. Fencing will reduce excessive disturbance and control pest animals from grazing on recovering vegetation (BCT, 2019). Fencing will remain installed until the ground cover and grass species populations are considered stable and resilient, as determined by the Project Ecologist.

4.2.4. Weed management

Temporarily disturbed areas will undergo weed management as detailed in Annexure E: Biosecurity Plan of the HLW BMP. Weed management across the disturbed areas would comprise identification of Weeds of National Significance (WoNS), Priority Weeds and invasive species, followed by weed control. Weed control may be required in areas of pre-disturbance non-native vegetation as agreed upon via relevant Property Management Plans.

4.3. Reuse of materials

4.3.1. Soil

Reusing topsoil is a critical component of rehabilitation as it preserves the native seed bank, soil microbial communities and organic matter necessary to facilitate natural regeneration. For reuse within pre-disturbance native vegetation areas (refer to Figure 3-1), topsoil must:

- Be adequately covered for a short period of time (<12 months).
- Be stockpiled proximal to the impact site (e.g., <1 km distance).

- Contain <10% high threat weed cover, and
- Contain no known or suspected pathogens.

Topsoil will be spread to a uniform depth of 50 mm for optimal seed germination. Only topsoil in dry or slightly moist conditions will be spread to prevent clumping, compaction or rutting. Machinery may involve a tracked excavator, backhoe or loader with a tilt bucket for gentle placement; avoiding driving heavy machinery directly over placed topsoil once spread. Topsoil reuse will ensure complete and uniform coverage of the temporarily disturbed area. After respreading, the soil will be scarified / roughened to create shallow furrows along the contour; promoting water infiltration, preventing runoff and creating microsites for seed to lodge and germinate.

Following application, erosion protective measures may be required on sloped/exposed areas. This may include light jute mesh, coir blanket, or salvaged mulch (<50 mm depth & <50% coverage of target area; refer Section 4.3.2). Sediment fencing will be installed and maintained around rehabilitated areas.

In areas of non-native vegetation (Figure 3-1), land will be returned to pre-disturbance conditions in accordance with the relevant Property Management Plan. This may include the following:

- Regrading and stabilising soil.
- Allowing natural return to pasture or cropping unless otherwise agreed with landowner.

4.3.2. Habitat features

Reuse of terrestrial resources will be prioritised within designated connectivity corridors per Annexure F: Connectivity Strategy of the HLW BMP. However, such resources will also be distributed through areas of partial impact (i.e., Easement Clearing Zone, Hazard Tree Zone) and rehabilitated temporary disturbance areas to maximise rehabilitation efforts. Placement should prioritise areas immediately adjacent to that where collected, with similar suitable breeding habitat present. Placement must have regard for relevant HLW bushfire controls (refer Section 7.6 of the HLW BMP). Mulch will be a by-product of vegetation clearing activities. Where practicable, this material will be reused in the progressive rehabilitation works following replacement of topsoil. Guidelines for reuse of terrestrial resources is provided below.

Large Woody Debris (LWD; diameter >5 cm):

- Objective = provide shelter, basing and foraging habitat for ground-dwelling fauna.
- Reuse LWD to the maximum extent possible, in line with relevant HLW bushfire controls (refer Section 7.6 of the HLW BMP).
- Place LWD partially embedded in soil to mimic natural fall.
- Orient east-west to create microclimate variations.
- Place in clusters (not regular rows) across different microhabitats.
- Avoid full burial or excessive coverage with mulch.
- GPS and photo-document all installed features
- Trees within the boundaries of State forests, Crown Lands, Travelling Stock Reserves, public roads or within 40 m of the bank of any river will be disposed of strictly in accordance with the requirements of the appropriate authorities (e.g., Forestry HumeLink License and landowner conditions). These requirements will be determined by the contractors prior to carrying out such works. Recommendations for placement of terrestrial microhabitats are detailed below.

Course Woody Debris (CWD; diameter <5 cm) & Mulch:

- Objective = promote nutrient cycling and microhabitat structure.
- Distribute thinly (<50 mm depth) and do not cover over 50% of the application area to avoid smothering of seedlings.

Rock refugia:

- Objective = provide shelter for reptiles, small mammals and invertebrates.
- Reuse rock refugia to the maximum extent possible.
- Layer rocks with air gaps and irregular cavities.
- Ideally place on north-facing slopes or sunlit areas.
- Create inset refuges at the base of native shrub clusters of riparian zones.
- GPS and photo-document all installed features

4.3.2.1. Aquatic habitats

Areas where crossing upgrades/in-stream works are required in Key Fish Habitat, the following rehabilitation efforts will be undertaken:

- Remediation of aquatic habitat that have been impacted or modified by HLW construction, to the condition prior to construction (or as close as practicable).
- Remediation of bank stability at waterway locations that have been impacted or modified by HLW construction, to condition equal or greater than prior construction.
- Installation of rocks, hydro mulch, jute matting or other suitable materials to stabilise banks where necessary.
- Return of excavated bed material to waterways (where practicable).
- Redeployment of aquatic habitat (CWD, LWD, boulders) within the waterway.

Placement of salvaged aquatic materials will be undertaken with guidance by the Project Ecologist. General guidance for in-stream placement of aquatic habitat features include:

- All works within Key Fish Habitat must be approved by DPI Fisheries.
- Placement must not obstruct fish passage, unless a natural barrier already exists.
- Install features once final grading, erosion controls and sediment removal are complete.
- Avoid in-stream works during fish breeding season (generally September-January for NSW inland rivers).

Rehabilitation will be undertaken with consideration of numerous target species habitat requirements and the character of the stream prior to disturbance, as detailed in Section 7.6.2 of the BMP. Consultation with NSW DPI Fisheries will occur as part of this process regarding crossing designs and the potential occurrence of threatened aquatic species. Consultation will also confirm the appropriate method for storage and installation of aquatic habitat following the completion of construction.

Considerations may include incorporation of larger or smaller habitat features distributed in a way that mimics a natural distribution. Logs, trees or larger stumps (if used) may be cabled into position to reduce future erosion and loss of habitat features during flooding periods. Logs and woody vegetation debris may also be placed within the riparian zone to maintain channel structure.

The habitat requirements of specific aquatic species predicted to be associated with any one area should be used to further guide the placement of habitat features, as described in Section 7.6.2. of the BMP.

Where sufficient aquatic habitat is not able to be salvaged prior to construction, felled trees will be used to restore the waterway. Felled trees material may be acquired from HLW Areas where removal of vegetation has previously occurred, with a preference for vegetation sources from similar vegetation types that is present at each waterway crossing.

Care will be taken during rehabilitation to avoid creating physical or hydraulic barriers that would impede fish movement. Where in-stream or near-bank structures (i.e., erosion control devices, log placement or sediment traps) are installed, they will be assessed for their potential impact on fish passage. Structures will be designed to allow for continuous longitudinal movement of aquatic fauna, particularly during base flow conditions.

4.3.3. Seeding

Direct seeding involves sowing seed directly into the ground rather than transplanting already established seedlings. The benefits of direct seeding include its ability to generate large amounts of vegetation across large areas in a relatively short timeframe. It is also easy to customise the seed mix to suit local conditions and conservation outcomes (BCT, 2019).

Seeds may be sourced from local nurseries or obtained through seed collection detailed in Section 4.1.3. If necessary, a seed collection schedule provided in Attachment 1.

The following will be implemented during seeding:

- Seed mixture is to comprise a mix of flora species listed in Attachment 1. Optimal seeding times and climatic conditions should be considered and prioritised for each species.
- Preparation of soils will be completed (refer Section 4.2.2).
- On reasonably flat slopes, apply 15-20 g/m^2 of seed.
- On steep slopes, much higher rates would be required. Utilise mulch mat or straw mulch secured with jute matting to protect the seed and soil.
- Watering must be conducted immediately after seeding, followed by daily watering until establishment. Watering activities may be paused in wet weather conditions.
- Inspection of fauna exclusion fencing prior to seeding to ensure fence lines are stock proof.

If required, seeding in areas of non-native vegetation pre-disturbance will be completed in accordance with the relevant Property Management Plan. Areas of temporary disturbance within easement will be limited to seeding of groundcovers and low-lying shrubs (if needed) to maintain maximum line operating conditions.

4.3.3.1. KMG habitat

Direct seeding will be used in temporarily disturbed areas that are associated with KMG habitats (Figure 3-1). Flora species selected for direct seeding will provide a diverse range of grasses able to establish a native ground cover. Seed composition will be comprised of at a minimum the relevant flora species summarised in Table 4-1.

Table 4-1 Flora species selection for direct seeding in KMG habitats

Target species	Flora species selection
Key's Matchstick Grasshopper	*Acaena ovina* *Bulbine bulbosa* *Chrysocephalum apiculatum* & *Trifolium* sp.[2] *Lomandra filiformis* subsp. *coriacea* *Podolepis jaceoides* *Poranthera microphylla* *Ranunculus lappaceus* *Themeda triandra* *Wurmbea dioica*

It is noted that whilst KMG is a generalist feeder that will use native and exotic species, it does not feed on *Themeda triandra* (TSSC, 2020). Revegetation efforts are to include *T. triandra* in combination with other selected food species (such as *Acaena ovina*).

[2] A common native pioneer species and readily available fodder crop that is suitable for direct seeding (Greening Australia, 2014). This species is not associated with targeted PCTs, therefore, this species should only be used if efforts to source seeds has been unsuccessful, or revegetation efforts have failed for the other listed species.

4.3.3.2. Timing

Where possible, seeding should occur in October, November and autumn months. This timing allows for adequate establishment/root growth before the heavy summer rainfall period but also allows the plants to go through a growth period soon after planting resulting in quicker establishment. Re-planting will be undertaken by a suitably qualified and experienced contractor who will be able to assess the site and develop a site-specific approach.

4.3.4. Maintenance

Areas of native topsoil reuse and/or seeding will require maintenance by suitably qualified specialists to achieve the objectives of this plan (refer Section 5.3). Maintenance activities include:

- Watering must be conducted immediately after application, followed by routine watering until establishment. Watering activities may be paused in wet weather conditions.
- Regular irrigation during warmer months to meet the recommended moisture level for the particular area, with consideration of the species present. The irrigation method and amount may vary between sites.
- Ongoing weed maintenance as per Annexure E: Biosecurity Plan of the HLW BMP.
- Inspection of fauna exclusion fencing to ensure fence lines are stock proof.
- Inspection of regenerating flora for signs of grazing/browsing and implement pest control as required.

4.4. Summary of rehabilitation measures

Rehabilitation measures outlined in this plan have been summarised in Table 4-2 below. These will be implemented to minimise construction 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 requirements of applicable legislation, the MCoA, the CoMA, the UMM and all Planning Approval Documentation, particularly the Revised BDAR.

Table 4-2 Rehabilitation measures

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP35	Topsoil stripping zones will be clearly marked prior to works commencing at a temporary disturbance site, with priority given to topsoil and root ball retention where practicable. If deemed necessary, seed collection will occur. Storage of salvaged soil and seeds will follow guidelines provided in this plan.	Pre-construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	Environmental Control Map Erosion and Sediment Control Plan
BMP36	Habitat features such as rocky outcrops, surface rock, dead wood, logs and course woody debris will be salvaged and relocated to adjacent and/or suitable woodland locations, pending consultation with the Project Ecologist. Relocation will prioritise areas of connectivity corridors per Annexure F: Connectivity Strategy of the HLW BMP, then areas of partial impact (i.e., Easement Clearing Zone, Hazard Tree Zone) and rehabilitated temporary disturbance areas. Placement will have regard for relevant bushfire controls.	Pre-construction and construction	Environmental Manager Construction Manager Project Ecologist	MCoA B25, B30, B62, B63 CoMA 2, 7 UMM B3, B18, B19	Pre-clearing Reports BMP Monitoring Report
BMP37	The restoration of land to pre-existing use will occur progressively following completion of constructions works at a location. This would include works within waterways, the removal/remediation of the construction compounds and camp sites, removal of temporary facilities and site buildings and temporary environmental controls.	Construction	Environmental Manager Construction Manager	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	BMP Monitoring Report

ID	Measure/Requirement	When to implement	Responsibility	Reference	Evidence
BMP38	Soil preparation, fauna exclusion fencing and weed management must be completed within 6 months of the completion of construction, upgrading or decommissioning of HLW.	Construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	BMP Monitoring Report
BMP39	Rehabilitation is to include the reuse of natural resources including topsoil and mulch as well as seed collection (where relevant). This will be followed by maintenance such as watering and weeding to achieve targets listed in Table 5-2.	Construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30, B62, B63 CoMA 7 UMM B3, B18	BMP Monitoring Report
BMP40	Direct seeding will be used in temporarily disturbed areas that are associated with Keys Matchstick Grasshopper habitats (Figure 3-1). Seeding will be followed by maintenance to achieve appropriate survival rates.	Construction	Environmental Manager Construction Manager Suitably qualified specialists	MCoA B30 CoMA 7 UMM B3, B9	BMP Monitoring Report

5. Compliance management

5.1. Monitoring

Given the staged construction and decommissioning of HLW, monitoring and reporting of vegetation changes may be required during construction activities to ensure rehabilitation efforts in temporary disturbance areas facilitate natural regeneration of suitable native species. Any longer-term monitoring (post-construction) would be detailed within the Transgrid Operational Environmental Management Plan and should incorporate components of monitoring detailed below.

Monitoring will be completed by the Project Ecologist annually (spring) during construction works and will be compared against performance indicators listed in Section 5.3. This will involve two methods: plots and photo monitoring points, further detailed below. Monitoring locations are to be established and demarcated during the initial monitoring visit at each vegetation site via corner stakes, marked with GPS and flagging tape, to ensure repetition of monitoring events. Indicative monitoring locations are provided in Figure 3-1, targeting the following minimum monitoring locations:

- 1 monitoring location is required within the patch of rehabilitated KMG habitat.
- 1 monitoring location is required at each accommodation camp/ancillary facility.
- 1 monitoring location every 10 linear km of the alignment for all other temporary disturbance areas (i.e., brake and winch sites, rehabilitated temporary access tracks).

5.1.1. Plot-based monitoring

Plot-based monitoring must follow the methods outlined in the *Biodiversity Assessment Method* (BAM; DPIE 2020a). Established 20 m x 20 m plots (or 400 m^2 equivalent for linear areas) must be assessed with the information outlined in Table 5-1 recorded.

Table 5-1 Survey data required for plot-based monitoring (modified from the BAM [DPIE 2020a])

Attribute	Survey requirement
Growth form	Growth form for each recorded native species
Species name	Scientific name of each native and exotic species
Cover	Estimate the foliage cover of each native and exotic species within the boundaries of the plot including all attached plant material, alive or dead, rooted in or overhanging the plot. Cover should be recorded: • In decimals if less than 1% (e.g. 0.1, 0.2). • In whole numbers up to 5% (e.g. 1, 2, 3). • To the nearest 5% if >5% cover (e.g. 5, 10, 15, 20, 25).
Abundance rating	Count (when ≤10) or estimate (when >10) the number of individuals of each native and exotic species rooted within the plot. Record abundance as: • Counts of 1, 2, 3… • Estimates of 10, 20, 30… • 100, 200, 300… • 1000, 2000, 3000.
Erosion	Visual assessment of soil stability; record presence/absence and dimensions (length × width × depth) of: • Rills or gullies. • Exposed subsoil. • Sediment plumes downslope.

5.1.2. Photo monitoring points

Photo monitoring points will provide an indication of the success or failure of any areas of rehabilitation conducted. The quadrat used for Photo Monitoring Points is diagrammatically shown in Plate 5-1.

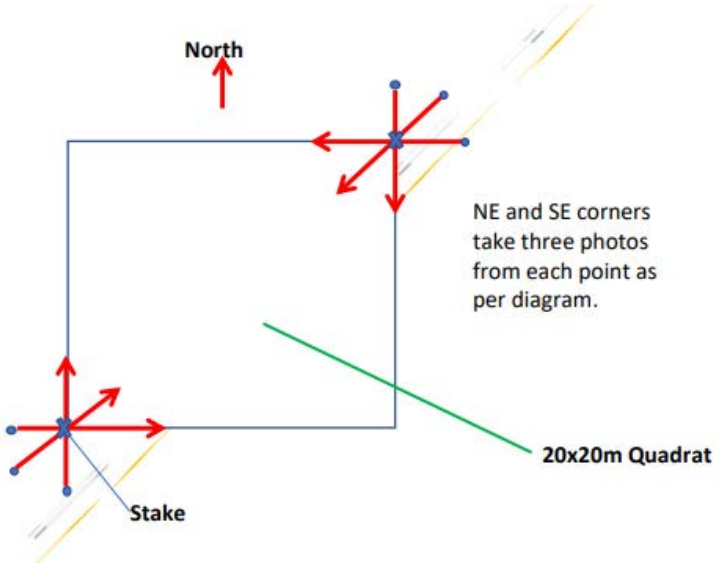

Plate 5-1 Photo monitoring point setup

5.2. Reporting

Following the completion of monitoring, all data will be collated and presented within the annual BMP Monitoring Report (refer to Section 8.6 of the HLW BMP). The report will include the following:

- Details of monitoring methods per Section 5.1.
- Assessment of rehabilitation success by annual plot data and reporting, with reference to performance indicators provided in Table 5-2. Photographic evidence of condition by photo points.
- Comparison of annual monitoring with previous year (if construction monitoring extends 2-years), as well as Revised BDAR data.
- Assessment of incidents and non-compliances based on the Trigger Action Response Plan in Table 5-2.
- Recommendations for future rehabilitation and/or corrective efforts (if necessary).
- If for any reason rehabilitation cannot be achieved as per this plan, evidence will be supplied and reasoning detailed within.

5.3. Incidents and non-compliances

Non-conformances, incident reporting and subsequent investigation associated with this rehabilitation plan will be undertaken as required in accordance with the Trigger Action Response Plan (TARP) provided in Table 5-2 below. HLWJV will promptly advise Transgrid on events that are non-conforming with this plan.

Table 5-2 Rehabilitation Plan TARP

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
Rehabilitated KMG habitats	Maintain 85% survival rate of target seedings. Maintain ≤10% cover of High Threat Weeds and ≤20% total weed cover.	Seedlings germinate at required rate. ≥85% survivorship of plantings.	Vegetation plots and photo monitoring points.	Annually	>15% target seedling mortality. >10% High Threat Weeds OR >20% total weed cover.	Implement supplementary seeding. Increase frequency of weed control per Annexure E: Biosecurity Plan of the HLW BMP. Reassess weed source pathways (e.g., vehicles, stockpiles) and address any barriers
Soil stability	Maintain a stable, non-eroding soil surface across rehabilitated temporary disturbance areas.	No rill or gully erosion >5 cm deep or 1 m long in >95% of the site.	Vegetation plots and photo monitoring points.	Annually	Visible rill/gully erosion in >5% of the site area.	Install/repair erosion controls (e.g., jute matting, coir logs). Regrade of contour site to slow runoff. Reapply topsoil or mulch as needed.
Groundcover re-establishment	Re-establish ≥80% total groundcover of which ≥80% is native.	Measured cover of live vegetation and abundance of native species.	Vegetation plots and photo monitoring points.	Annually	<70% native groundcover after 18 months OR total live vegetation cover <80%.	Infill with native mulch or topsoil. Targeted seeding with native grasses and forbs. Maintain fauna exclusion fencing and exclude human traffic.
Native	Facilitate recruitment	Number and	Vegetation plots	Annually	<5 native species	Evaluate seedbank condition.

Objective	Target	Performance indicator	Method of monitoring	Frequency	Trigger	Action/response plan
species regeneration	of ≥5 native species, including at least 2 functional groups (e.g., grass, forb, shrub).	diversity of naturally regenerating native species.	and photo monitoring points.		detected after 2 growing seasons.	Targeted seeding with native species. Consider soil inoculation or scarification.
Weed suppression	Maintain ≤10% cover of High Threat Weeds and ≤20% total weed cover.	Weed cover and abundance.	Vegetation plots and photo monitoring points.	Annually	>10% High Threat Weeds OR >20% total weed cover.	Increase frequency of weed control per Annexure E: Biosecurity Plan of the HLW BMP. Reassess weed source pathways (e.g., vehicles, stockpiles) and address any barriers.
Self-sustainability	Rehabilitated sites are stable and trending towards natural regeneration without further intervention.	No active management required beyond routine monitoring.	Vegetation plots and photo monitoring points.	Annually	Any site requiring re-intervention after year 2.	Reassess ecological function and soil-health. Implement secondary rehabilitation (e.g., deep ripping, re-mulching, seeding). Consider active revegetation. Extend monitoring and maintenance timeline.

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Attachment 1 Indicative seed collection schedule

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Acacia dealbata	x										x	x
Acacia kettlewelliae	x											x
Acacia melanoxylon	x											x
Acacia rubida	x										x	x
Acaena novae-zelandiae											x	x
Acrotriche serrulata											x	x
Aristida ramosa	x											
Asperula scoparia	x											x
Austrodanthonia eriantha	x											x
Austrostipa bigeniculata	x	x	x							x	x	x
Austrostipa scabra subsp. scabra	x											x
Austrostipa verticillata	x	x								x	x	x
Bothriochloa macra			x	x								
Brachyloma daphnoides											x	x
Brachyloma daphnoides subsp. daphnoides											x	x
Carex appressa	x											x
Cassinia aculeata		x	x									

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Cassinia longifolia	x	x										
Cassinia uncata		x	x									
Daviesia latifolia												x
Dillwynia phylicoides	x	x								x	x	x
Echinopogon ovatus											x	x
Eucalyptus albens	x	x	x	x	x	x	x	x	x	x	x	x
Eucalyptus blakelyi	x	x										
Eucalyptus bridgesiana	x	x										x
Eucalyptus camphora subsp. *humeana*	x	x										
Eucalyptus dalrympleana subsp. *dalrympleana*	x	x	x	x	x							x
Eucalyptus dives											x	x
Eucalyptus goniocalyx	x	x	x	x	x	x	x	x	x	x	x	x
Eucalyptus macrorhyncha	x	x	x	x	x	x	x	x	x	x	x	x
Eucalyptus melliodora			x	x								
Eucalyptus microcarpa	x	x	x	x	x						x	x
Eucalyptus pauciflora			x	x								
Eucalyptus polyanthemos						x	x	x	x	x	x	
Eucalyptus robertsonii subsp. *robertsonii*			x									
Eucalyptus rossii			x									
Eucalyptus stellulata	x	x										x

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Eucalyptus viminalis			x									
Exocarpos strictus			x									
Geranium solanderi var. solanderi	x	x										x
Glycine clandestina			x									
Gonocarpus tetragynus			x									
Goodenia hederacea subsp. hederacea	x	x								x	x	x
Hibbertia obtusifolia			x									
Hovea linearis										x	x	x
Juncus holoschoenus			x									
Lagenifera stipitata			x									
Leptospermum continentale	x	x	x	x	x	x	x	x	x	x	x	x
Lomandra filiformis subsp. *coriacea*			x									
Lomandra filiformis subsp. *filiformis*	x	x	x									
Lomandra longifolia			x									
Lomatia myricoides							x					
Microlaena stipoides var. *stipoides*						x	x	x				
Mirbelia oxylobioides						x	x	x				
Panicum effusum	x	x	x									
Persoonia chamaepitys						x	x	x				

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Phragmites australis					x	x	x					
Platylobium formosum subsp. *formosum*												x
Poa induta	x	x								x	x	x
Poa meionectes	x	x								x	x	x
Poa sieberiana	x	x								x	x	x
Poa sieberiana var. *sieberiana*	x	x								x	x	x
Polystichum proliferum						x	x	x	x	x		
Pteridium esculentum		x	x									
Rubus parvifolius	x	x										x
Senecio bathurstianus	x	x										x
Stellaria pungens						x	x	x	x			
Stypandra glauca											x	
Themeda australis	x											x
Xanthorrhoea glauca subsp. *angustifolia*				x								

Annexure H Biodiversity Monitoring Program

Annexure H

Biodiversity Monitoring Program

HumeLink West

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

Revision: 3

TransGrid
Date 28/07/2025

Document Control

Approvals

Title	HumeLink West Biodiversity Monitoring Program
Endorsed by Environment Representative	Derek Low (Wolfpeak Group Ltd Pty)
Approved on behalf of HLWJV by	Tim Burns
Signed	
Dated	

Version Control

Revision	Date	Description	Approval
A	3/07/2024	Preliminary draft	Paul Dudding
B	19/08/2024	Update following TG review	Paul Dudding
1	20/12/2024	Updates following receipt of final MCoA & 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

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Contents

Tables

Figures

Abbreviations

Abbreviation	Expanded text
BACI	Before-After-Control-Impact
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BCS	Biodiversity Conservation and Science group within DCCEEW – NSW (now referred to as CPHR)
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BMP	Biodiversity Management Sub-plan
BAVR	Biodiversity Assessment Verification Report
CEMP	Construction Environmental Management Plan
CoMA	Commonwealth Conditions of Ministerial Approval
Cth	Commonwealth of Australia
CPHR	Conservation Programs, Heritage & Regulation Division (formerly BCS)
DCCEEW - Cth	The Commonwealth Department of Climate Change, Energy, the Environment and Water
DCCEEW – NSW[1]	The NSW Department of Climate Change, Energy, the Environment and Water (formerly DPE)
DPE	Department of Planning and Environment (now known as NSW DCCEEW)
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now known as NSW DCCEEW)
DPHI	Department of Planning, Housing and Infrastructure
ECZ	Easement Clearing Zone
EHNV	Epizootic Haematopoietic Necrosis Virus
EIS	Environmental Impact Statement
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999* (Cth)
FCNSW	Forestry Corporation New South Wales
FPM	Faecal Pellet Monitoring
GPS	Global Positioning System
HLW	The HumeLink West Stage of the HumeLink project
HLWJV	HumeLink West Joint Venture (UGL Limited and CPB Contractors)

[1] As of the 1st January 2024 the NSW Department of Planning and Environment has split into the Department of Climate Change, Energy, the Environment and Water (NSW) and the Department of Planning, Housing and Infrastructure. DCCEEW (NSW) includes the environmental regulators (such as NSW EPA, CPHR, NPWS, DPE-Water), while the Department of Planning, Housing and Infrastructure (DPHI) includes planning regulatory services.

Abbreviation	Expanded text
HLW Area	Approved disturbance footprint of the HumeLink West Stage of the HumeLink project
HTZ	Hazard Tree Zone
KFH	Key Fish Habitat
MCoA	NSW Minister's Conditions of Approval
NPWS	National Parks and Wildlife Service
NSW	New South Wales
PCT	Plant Community Type
PCVR	Partial Clearing Validation Report
RAA	Rapid Aquatic Assessment
RCMS	Remote Camera Monitoring Sites
Revised BDAR	*HumeLink Biodiversity Development Assessment Report Rev 0* (Niche Environment and Heritage Pty Ltd, June 2024)
RPS	RPS AAP Consulting Pty Ltd
SAII	Serious And Irreversible Impact
SAT	Spot Assessment Technique
SBAS	Supplementary Biodiversity Strategy
SWMP	Soil and Water Management Plans
TARP	Trigger Action Response Plan
TCZ	Total Clearing Zone
TEC	Threatened Ecological Community
UMM	Updated Environmental Management Measure as outlined in the Planning Approvals Documentation

1. Introduction

1.1. Context

This Biodiversity Monitoring Program forms part of the Biodiversity Management Sub-plan (BMP) of the HumeLink West project (HLW) Construction Environmental Management Plan (CEMP). The program 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 A2.

1.2. Purpose

The purpose of this program is to detail the biodiversity monitoring requirements which are to be implemented during construction of HLW. Specifically, this program details the monitoring activities that shall be undertaken to track indirect and prescribed impacts of project construction activities. Monitoring will provide feedback on the efficacy of the implemented environmental management measures at mitigating indirect biodiversity impacts of construction.

This program describes the HLWJV program for monitoring during construction in order to minimise potential indirect and prescribed impacts on threatened species and their habitats. The program aims to address relevant actions and mitigation measures outlined in the following documents:

- Mitigation measures B3, B8, B12 and B22 of the HumeLink Biodiversity Development Assessment Report Rev 0 (BDAR; Niche Environment and Heritage Pty Ltd, June 2024).
- Condition B25, B28, B29 and B30 of the Minister's Conditions of Approval (MCoA) A2.
- Condition 6 and 7 of the Federal Minister for Water and Environment Condition of Ministerial Approval.

1.3. Objective

The objective of this program is to provide early warning of ineffective measures and/or uncertain impacts that may compromise the mitigation measures and threaten exceedance of the predicted impacts of HLW construction. The scope includes the following:

- Identify entities that require monitoring during construction.
- Specify the existing extent of monitoring entities.
- Detail the monitoring methods including performance criteria.
- Provide measurable thresholds to identify when remedial action is triggered.
- Provide adaptive management response/actions.

2. Environmental requirements

2.1. Relevant documents and guidelines

The main document relevant to this program is the *HumeLink Biodiversity Development Assessment Report Rev 0* (Revised BDAR; Niche Environment and Heritage Pty Ltd, June 2024). Refer to Section 5 for a full list of referenced documents and research articles.

Results of the Supplementary Biodiversity Strategy (SBAS) & Biodiversity Assessment Verification Report (BAVR) will be incorporated as an addendum to this program within three months (as necessary).

2.2. Permits and licences

The permits and licences relevant to this program 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 monitoring/survey works.

2.3. Preparation of this program

In accordance with MCoA B30a, this program 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).

2.4. Consultation

Consultation undertaken in preparation of this program is summarised in Section 4 and Annexure J: Consultation Report of the HLW BMP. If consultation with relevant stakeholders or regulators is required to assess the efficacy of mitigation strategies detailed in this program, 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 program are listed in Table 2-1. A cross reference is also included to indicate where and how the conditions are addressed in this program or other HLW management documents.

Table 2-1 MCoA relevant to this program

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	This program includes monitoring of partial clearing zones (Section 4.2) and PCT 637 (Section 4.6) to ensure clearing limits are not exceeded. Refer to the HLW BMP, including Annexure B: Clearing Protocol for additional measures to address this condition.
	(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 plan includes provisions for monitoring impacts in partial clearing zones (i.e., native vegetation; Section 4.2), flora (Section 4.3), fauna (Section 4.4 through 4.5) and Threatened Ecological Communities (Section 4.6) to ensure impacts are minimised per this condition.
	(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 *Prasophyllum bagoense, Prasophyllum*	This program includes monitoring of threatened orchids (Section 4.3) and PCT 637 no-go zones

MCoA No.	Condition Requirements	Document Reference
	keltonii and *Pterostylis oreophila* as mapped in the BDAR.	(Section 4.6) to ensure impacts are avoided to these entities. Refer to the HLW BMP, including Annexure B: Clearing Protocol for additional measures to address this condition.
Supplementary Biodiversity Strategy		
B28	Prior to carrying out any development that would impact on the relevant biodiversity values (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64), the Proponent must prepare a Supplementary Biodiversity Strategy as committed to in the EIS, in consultation with CPHR and to the satisfaction of the Planning Secretary. Unless otherwise agreed by the Planning Secretary, the Strategy must:	Results of Supplementary Biodiversity Strategy will be incorporated into this program as relevant (Section 2.1).
	(a) be peer reviewed by a suitably qualified, experienced and independent biodiversity consultant with *Biodiversity Assessment Method* (2020) (BAM) Accreditation whose appointment has been endorsed by the Planning Secretary;	
	(b) detail survey methods for all entities to be targeted by the Strategy, in accordance with the *Biodiversity Assessment Method* (2020) and any other guidance document that is relevant and applicable at the time surveys were undertaken or the BDAR was prepared, including but not limited to: (i) surveys within unsurveyed areas of the development area identified in the EIS where a reduction in credit liability for the relevant biodiversity value assumed present is being sought;	

MCoA No.	Condition Requirements	Document Reference
	(ii) surveys for the following serious and irreversible impact (SAII) entities: ▪ *Prasophyllum bagoense* ▪ *Pterostylis oreophila* ▪ *Caladenia concolor* ▪ *Genoplesium superburn* ▪ *Pomaderris delicatat* ▪ *Litoria castanea* ▪ *Prasophyllum innubum* ▪ *Solanum armourense* ▪ *Calotis glandulosa* ▪ *Grevillea iaspicula* ▪ *Pomaderris pallida* ▪ *Mixophyes balbus* ▪ *Prasophyllum keltonii* ▪ *Bossiae fragrans* ▪ *Eucalyptus robertsonii* subsp*, hemisphaerica* ▪ *Grevillea wilkinsonii* ▪ *Chalinolobus dwyeri* ▪ *Pseudomy fumeus* ▪ *Pimelea bracteata* ▪ *Tyto tenebricosa*	
Biodiversity Assessment Verification Report		
B29	Unless otherwise agreed by the Planning Secretary, prior to carrying out any development that would impact on the relevant biodiversity values subject to survey in the Supplementary Biodiversity Strategy in condition B28 (excluding Enabling Works, if the relevant requirements of this condition are adequately addressed in the Enabling Works Management Plan of condition B64), the Proponent must prepare a Biodiversity Assessment Verification Report in consultation with CPHR and to the satisfaction of the Planning Secretary. The Report must:	Results of Biodiversity Assessment Verification Report will be incorporated into this program as relevant (Section 2.1).

MCoA No.	Condition Requirements	Document Reference
	(a) be prepared by a suitably qualified, experienced and independent biodiversity consultant with *Biodiversity Assessment Method* (2020) (BAM) Accreditation whose appointment has been endorsed by the Planning Secretary;	
	(b) be prepared in accordance with the *Biodiversity Assessment Method* (2020) and any other guidance document that is relevant and applicable at the time surveys were undertaken or the BDAR was prepared;	
	(c) be prepared with regard to the final layout plans for the development required under condition C8, including the location of final access routes within each clearing zone and stockpile locations;	
	(d) include: (i) detail of the outcomes of surveys undertaken in accordance with condition B28;	
	(ii) where species are found to be present following the surveys undertaken under condition B28 or that are assumed to be present, identify measures to avoid and / or mitigate the impact to those entities for inclusion in a revised version of the Biodiversity Management Plan required under condition B30;	
	(e) provide findings and recommendations relating to the matters in (d), including, but not limited to, reducing the relevant credit obligations and calculating credit obligations for unexpected finds.	
	Any required changes to biodiversity offset or mitigation measures arising from the Biodiversity Assessment Verification Report must be incorporated into an updated version of	

MCoA No.	Condition Requirements	Document Reference
	the Biodiversity Offset Package under condition B26 in consultation with CPHR and BCT and addressed in a revised version of the Biodiversity Management Plan required under condition B30, in consultation with CPHR and FCNSW, to the satisfaction of the Planning Secretary.	
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 program forms part of the BMP.
	(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 *Revised Biodiversity Development Assessment Report* (Revision 0, dated 21 June 2024);	Section 2.1 and Table 2-3
	(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;	Results of Supplementary Biodiversity Strategy and Biodiversity Assessment Verification Report will be incorporated into this program as relevant (Section 2.1).
	(ii) minimising: ▪ the amount of vegetation clearing on site; ▪ the loss of key fauna habitat (including tree hollows);	This plan includes provisions for monitoring impacts in partial clearing zones (i.e., native vegetation; Section

MCoA No.	Condition Requirements	Document Reference
	▪ the impacts of fauna on site, including undertaking pre-clearance surveys; and ▪ potential indirect impacts on threatened flora and fauna species;	4.2), flora (Section 4.3), fauna (Section 4.4 through 4.5) and Threatened Ecological Communities (Section 4.6) to ensure impacts are minimised per this condition.
	(iii) ensuring the development does not adversely affect the native vegetation and habitat outside the disturbance footprint;	This plan includes provisions for monitoring impacts Threatened Ecological Communities in no-go zones (outside of the disturbance footprint; Section 4.6). Refer to the HLW BMP, including Annexure B: Clearing Protocol for additional measures to address this condition.
	(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 ▪ 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;	Not addressed in this program – refer Annexure D: Unexpected Finds Procedure of the HLW BMP
	(v) connectivity strategy for the potentially impacted species identified in the *Revised Biodiversity Development Assessment Report* (Revision 0, dated 21 June 2024)	Not addressed in this program – refer Annexure C:

MCoA No.	Condition Requirements	Document Reference
	and a Supplementary Hollow and Nest Strategy;	Hollow and Nest Strategy & Annexure F: Connectivity Strategy of the HLW BMP
	(vi) protecting the conservation values of McPhersons Plain and avoiding impacts to *Prasophyllum bagoensis, Prasophyllum keltonni* and *Pterostylis oreophila*;	This program includes provisions for monitoring threatened orchids (Section 4.3) to ensure impacts to these species are avoided.
	(vii) rehabilitating temporary disturbance areas to facilitate natural regeneration of suitable native species;	Not addressed in this program – 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;	Section 4.2.
	(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 program includes provisions for monitoring the reuse of resources in partial clearing zones (Section 4.2). Refer Annexure F: Connectivity Strategy & Annexure G: Rehabilitation Plan of the HLW BMP for additional measures to address this condition.

MCoA No.	Condition Requirements	Document Reference
	(x) collecting and propagating seed (where relevant);	Not addressed in this program – refer Annexure G: Rehabilitation Plan of the HLW BMP
	(xi) controlling erosion, weeds and feral pests;	Not addressed in this program – refer Annexure E: Biosecurity Management Plan of the HLW BMP
	(xii) bushfire management;	Not addressed in this program – refer Section 7.6 of the HLW BMP
	(xiii) minimising impacts on entities at risk of a serious and irreversible impact (SAII), including for Box Gum Woodland, Rice Flower (*Pimelea bracteata*) and Sooty Owl (*Tyto tenebricosa*) 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	This program includes provision for monitoring indirect impacts to *Pimelea bracteata* (Section 4.3) and Sooty Owl (Section 4.4).
	(e) include a program to monitor, evaluate and publicly report on the effectiveness of these measures.	Section 3.1.
	Following the Planning Secretary's approval, the Proponent must implement the Biodiversity Management Plan. *Note: The Biodiversity Management Plan must incorporate all relevant aspects of the development, including Enabling Works consistent with the requirements of condition B67.*	Section 2.3.

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

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

Table 2-2 CoMA relevant to this program

CoMA No.	Condition Requirements	Document Reference
Field Verification Efforts		
6	The approval holder must provide to the department the Supplementary Biodiversity Strategy and Biodiversity Assessment Verification Report required under conditions B28 and B29 of the NSW approval.	Results of Supplementary Biodiversity Strategy and Biodiversity Assessment Verification Report will be incorporated into this program as relevant (Section 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 Management Measures

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

Table 2-3 UMMs relevant to this program

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 *Technical Report 1 – Revised Biodiversity Development Assessment Report*, including:	Detailed design and construction	All locations	This program forms part of the BMP to evaluate and report on the effectiveness of all mitigation measures (Section 4.1).
	• 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.			Not addressed in this program – refer Annexure B: Clearing Protocol of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	• Preparation of a fauna handling and rescue procedure to be implemented during construction and operation for the ethical handling of injured or displaced fauna. Further, the fauna handling and rescue procedure would include an incident reporting protocol for fauna relocations, rescue and rehabilitation, euthanasia and/or fatality.			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	• Procedures for the demarcation and protection of retained vegetation, including vegetation adjacent to construction areas and during weed management.			
	• 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.			Not addressed in this program – refer Annexure F: Connectivity Strategy & Annexure G: Rehabilitation Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	• Proposed rehabilitation of temporary disturbance areas including management and maintenance measures.			Not addressed in this program – refer Annexure G Rehabilitation Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	• Unexpected species finds protocol to be implemented if threatened ecological communities, flora and fauna species, not assessed in *Technical Report 1 –*			Not addressed in this program – refer Annexure D:

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Revised Biodiversity Development Assessment Report, are encountered during pre-clearing inspections.			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 program – refer Annexure E Biosecurity Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	• 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 program – refer Section 7.4 of the HLW BMP.
	• Outline monitoring and compliance management requirements.			This program includes provision for monitoring of all management requirements (Section 3.1), as well as monitoring and compliance management for partial clearing zones (Section 4.2), and indirect impacts to threatened entities (Section 4.3 through Section 4.6).
	• Approach to relocation of nests by suitably qualified ecologist where found within construction work sites (i.e. nests found in hazardous areas will be translocated to nearby safe areas, direct handling of			Not addressed in this program – refer Annexure C: Hollow & Nest Strategy of the HLW BMP. Monitoring

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	eggs and chicks will be avoided where possible). This could include potentially new poles/nest platforms.			relevant to this condition is summarised in Section 4.1.
	• Details on the pre-clearing and clearing supervision process.			Not addressed in this program – refer Annexure B: Clearing Protocol of the HLW BMP.
	• 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 program – 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 (e.g. timing construction outside of breeding seasons, crossing type, micro siting).			
	• 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 program – refer Annexure G: Rehabilitation Plan of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.

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			This program includes provisions for all components of this condition.
	• 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.			
	The adaptive management measures and monitoring program will be developed to target specific species considered to be most at risk of significant impacts, as determined during the detailed design phase. The BMP will stipulate objectives for monitoring, reporting and evaluation, and how baseline data will be captured and represented.			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
B8	Where threatened frog (including Booroolong Frog) habitats have been identified the following avoidance measures will be implemented, where practicable: • avoid installing waterway crossings • avoid disturbance within 50 m of the top of bank of the waterway (including riparian vegetation).	Detailed design and construction	Threatened frog habitats within 250 m downstream of the project footprint. Potential construction monitoring site locations have been identified at Adjungbilly Creek, Brungle Creek, Yaven Creek and Adelong Creek (Figure 13-2 of Technical Report 1 – Revised Biodiversity Development Assessment Report).	Not addressed in this program – refer Section 7.1 of the HLW BMP.
	Where avoidance is not possible: • Waterway crossing designs should avoid instream structures to minimize the potential for hydrological change, erosion and sedimentation impacts of downstream environments.			
	• Location of waterway crossings will be determined in consultation with a suitably qualified Ecologist to avoid or minimize impacts to potential habitats or ecological features.			
	• Develop site specific erosion and sedimentation control plans to ensure the potential for erosion and sedimentation impacts are minimized as far as practicable, including monitoring the success of erosion and sediment control measures.			
	• Develop and implement site-specific hygiene protocols (e.g. cleaning of plant machinery), to minimize the spread of pathogens and exotic weeds during and post-construction (in line with Hygiene protocols for the control of diseases in Australian frogs [Cth DCCEEW, 2011]).			Not addressed in this program – refer Annexure E: Biosecurity Management Plan of the HLW BMP. Monitoring relevant to this

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
				condition is summarised in Section 4.1.
	A suitably qualified ecologist will be engaged to undertake site specific monitoring surveys for the species at the proposed creek crossing sites within and adjacent to the species habitat as well as downstream receiving environments that may be subject to potential indirect impacts. The BMP (refer to mitigation measure B3) will incorporate a monitoring program for threatened frogs to be implemented during construction.			Section 4.5
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.	Construction	All locations where hollow bearing trees are being removed	Not addressed in this program – refer Annexure C: Hollow & Nest Strategy of the HLW BMP. Monitoring relevant to this condition is summarised in Section 4.1.
	The strategy would be captured in the BMP (as per mitigation measure B3) and will address the following requirements: • 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)			
	survey of tree hollows and nests within the proposed clearing extents			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	• 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			
	• 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			
	• nest boxes can also include the re-use of existing hollows salvaged prior to or during clearing where practicable			
	• record the type, height, orientation and location of nest boxes installed and provide as spatial data to Transgrid			
	• an annual monitoring program to assess the efficacy of supplementary habitat measures throughout the construction phase.			
	Post construction monitoring and replacement of damaged nest boxes will form part of discussions with individual landowners.			
B22	A Biosecurity Management Plan will be developed as a part of the BMP, to be implemented during construction. The plan will include: • Protocols for the identification of priority weed species, relevant pests and diseases of concern, mandatory reporting obligations and management of Emergency,	Detailed design and construction	All locations	Not addressed in this program – refer Annexure E: Biosecurity Management Plan of the HLW BMP. Monitoring relevant to this

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	Control and Biosecurity zones as per the NSW Biosecurity Act 2015.			condition is summarised in Section 4.1.
	• Weed and pest animal management and monitoring requirements would also be outlined within the plan where relevant.			
	• Inclusion of a Trigger Action Response Plan (TARP) for key biosecurity threats including known biosecurity threats to threatened species and populations.			
	• Locations, timing and methods for removing soil and plant matter from vehicles and machinery and sourcing clean soil and materials free of contaminants for construction work.			
	• Clean down stations (water or air, dependent on the identified biosecurity risk) will be constructed at suitable locations to clean down vehicles and employee shoes to stop the spread of weeds, pathogens (e.g. amphibian chytrid fungus, Phytophthora cinnamomi, exotic rust fungi and Epizootic Haematopoietic Necrosis Virus (EHNV) and the introduction of new species. The biosecurity plan would address any Property Management Plan requirements where relevant.			
	• Phytophthora has been detected in locations associated with the adjoining Snowy 2.0 project and in Lob's Hole (as identified in Appendix C (NSW DCCEEW Environment and Heritage detailed response) of the Submissions Report). If construction vehicles are required to move through areas of known or likely infestation, the risk of spread will be managed through			

UMM No.	Condition Requirements	HLW Stage	Applicable location(s)	Document Reference
	the implementation of suitable hygiene protocols detailed in the Biosecurity Management Plan. Transgrid would consult with relevant agencies and groups involved with pest management in order to contribute to existing or future monitoring and management programs. Consideration of potential contributions would be targeted towards areas where greatest impacts occur, particularly through relatively intact landscapes where easement introduction increases the risk of native fauna predation.			
B36	Regular monitoring/inspections of waterway crossing and access track conditions will be undertaken during operation. Consideration of the maintenance and inspection recommendations detailed in *Fish passage in streams: Fisheries guidelines for design of stream crossings* (Cotterell, 1998) to inform the monitoring/inspection details are recommended. This may include monitoring/inspections following random events, e.g. flooding. This will review: • the crossing structures, access tracks and associated erosion and sediment control measures to determine if they are continuing to operate satisfactorily • any maintenance requirements in order to prevent impacts to aquatic environments • any issues that require intervention or rehabilitation e.g. bank erosion as a result of, or in proximity to, crossing locations.	Operation	Transmission line corridor -access track waterway crossing	Not included in this program as it is limited to construction – to be detailed in Transgrid Operational Environmental Management Plan.

3. Monitoring scope

As detailed in Section 6 of the BMP, HLW may have indirect impacts (including prescribed and uncertain impacts) on threatened flora and fauna, native Plant Community Types (PCTs) within and adjacent to the HLW Area and aquatic species and their habitats.

While direct impacts are easily quantified and controlled by managing the extent of clearing within the disturbance area, indirect impacts are subject to the efficacy of the implemented environmental controls. As such, direct impacts are defined during project design, whereas indirect impacts are mitigated through the effective environmental management of construction. As a result, this program is focused on monitoring those entities which have been identified within the HLW Area with potential to experience indirect impacts during construction.

3.1. BMP monitoring

The HLW BMP includes the following annexures to ensure HLW minimises and mitigates impacts to biodiversity during construction:

- **Annexure B: Clearing Protocol** – described the clearing protocol for vegetation clearing and aquatic works during construction of HLW, in order to mitigate potential impacts caused to flora, fauna and aquatic entities.
- **Annexure C: Hollow and Nest Strategy** – mitigates the impacts of clearing required for HLW by identifying target species and prescribing the necessary processes to manage nests and install/manage fauna habitats (artificial hollows) for impacted fauna species.
- **Annexure D: Unexpected Finds Procedure** – implemented following the sighting of any known or suspected threatened entities within the HLW Area.
- **Annexure E: Biosecurity Management Plan** – describes the management of weeds, pests and pathogens throughout the construction phase of HLW.
- **Annexure F: Connectivity Strategy** – maintains connectivity in areas identified as facilitating fauna movement, particularly for target species which may be impacted by HLW.
- **Annexure G: Rehabilitation Plan** – guides the rehabilitation of temporarily disturbed areas during the construction of HLW.
- **Annexure H: Biodiversity Monitoring Program** (this document).

Monitoring and reporting requirements detailed in the HLW BMP and above listed annexures are detailed in Section 4.1. For details specific to each monitoring or reporting event, please refer to each individual document/annexure.

3.2. Justification for threatened entity monitoring

Threatened entities to be monitored through construction of HLW are derived from those detailed in Section 5 of the HLW BMP.

3.2.1. Threatened flora

Monitoring of threatened flora aims to detect and manage indirect construction-related impacts such as dust deposition, altered hydrology, edge effects, weed incursion, trampling or erosion. Monitoring activities would be targeted at threatened flora that are not subject to direct clearing or habitat disturbance, however remain ecologically sensitive to nearby construction activities within a 30 m buffer.

Flora species located within approved disturbance zones, including the Easement Clearing Zone (ECZ) and Hazard Tree Zone (HTZ), are not included in monitoring as indirect impacts have been accounted for through biodiversity offsetting. The focus of threatened flora monitoring is therefore within retained vegetation, where early detection of indirect impacts is essential in maintaining ecological function and regulatory compliance.

Thirty threatened flora species are known or are assumed to be present within the HLW Area, based on data obtained in the Revised BDAR. Monitoring of threatened flora will occur for all known species where individual have been identified within 30 m of disturbance zones. Currently, five flora species will be subject to monitoring as summarised in Table 3-1. Although no monitoring sites have been prescribed for the remaining 25 assumed present threatened flora species, monitoring sites will be added as necessary for threatened individuals identified within 30 m of disturbance zones through Biodiversity Assessment Verification Reporting or pre-clearing surveys. Monitoring methods will be consistent with that detailed in this program.

Table 3-1 Justification for threatened flora to be monitored

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Known or assumed habitat	Included in program?
Acacia ausfeldii	Ausfeld's Wattle	V	-	False	Assumed habitat	No
Ammobium craspedioides	Yass Daisy	V	V	False	Known	Yes
Bossiaea fragrans	-	CE	CE	TRUE	Assumed habitat	No
Caesia parviflora var. *minor*	Small Pale Grass-lily	E	-	False	Assumed habitat	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Known or assumed habitat	Included in program?
Caladenia concolor	Crimson Spider Orchid	E	V	TRUE	Assumed habitat	No
Caladenia montana	-	V	-	False	Assumed habitat	No
Calotis glandulosa	Mauve Burr-daisy	V	V	TRUE	Assumed habitat	No
Calotis pubescens	Max Mueller's Burr-daisy	E	-	False	Assumed habitat	No
Cullen parvum	Small Scurf-pea	E	-	False	Assumed habitat	No
Diuris tricolor	Pine Donkey Orchid	E	-	False	Assumed habitat	No
Glycine latrobeana	Clover Glycine	CE	V	TRUE	Assumed habitat	No
Grevillea wilkinsonii	Tumut Grevillea	CE	CE	TRUE	Assumed habitat	No
Leucochrysum albicans subsp. *tricolor*	Hoary Sunray	E	E	False	Assumed habitat	No
Persoonia marginata	Clandulla Geebung	V	V	False	Assumed habitat	No
Pimelea bracteata	-	CE	CE	TRUE	Known	Yes
Pomaderris cotoneaster	Cotoneaster Pomaderris	E	E	False	Assumed habitat	No
Prasophyllum bagoense	Bago Leek Orchid	CE	CE	TRUE	Known	Yes

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Known or assumed habitat	Included in program?
Prasophyllum innubum	Brandy Marys Leek-orchid	CE	CE	TRUE	Assumed habitat	No
Prasophyllum keltonii	Kelton's Leek Orchid	CE	CE	TRUE	Known	Yes
Prasophyllum petilum	Tarengo Leek Orchid	E	E	False	Assumed habitat	No
Pterostylis alpina	Alpine Greenhood	V	-	False	Assumed habitat	No
Pterostylis foliata	Slender Greenhood	V	-	False	Assumed habitat	No
Pterostylis oreophila	Blue-tongued Greenhood	CE	CE	TRUE	Assumed habitat	No
Pultenaea humilis	Dwarf Bush-pea	V	-	False	Assumed habitat	No
Senecio garlandii	Woolly Ragwort	V	-	False	Assumed habitat	No
Swainsona recta	Small Purple-pea	E	E	False	Assumed habitat	No
Swainsona sericea	Silky Swainson-pea	V	-	False	Assumed habitat	No
Thelymitra alpicola	Alpine Sun-orchid	V	-	False	Assumed habitat	No
Thesium australe	Austral Toadflax	V	V	False	Assumed habitat	No
Xerochrysum palustre	Swamp Everlasting	-	V	False	Known	Yes

V = Vulnerable; E = Endangered; CE = Critically Endangered; - = not listed

3.2.2. Threatened fauna

Monitoring of threatened fauna aims to detect and manage indirect construction-related impacts such as noise, vibration, edge effects and altered hydrology, particularly on specialist breeding habitat. Ecosystem credit species are threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. Under the *Biodiversity Assessment Method 2020* (BAM: DPIE 2020), no targeted surveys are required for ecosystem credit species. Likewise, threatened fauna considered for monitoring as part of this program have excluded ecosystem credit species associated with HLW.

Twenty-eight threatened fauna species were identified, or are assumed to be present, within the HLW Area. Table 3-2 provides an overview of these fauna, including justification for their inclusion/exclusion for monitoring as part of this program.

Table 3-2 Justification for threatened fauna to be monitored

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Aprasia parapulchella	Pink-tailed Legless Lizard	V	V	False	No	Pink-tailed Legless Lizard has been assumed present adjacent to disturbance zones. Habitat surveys will be undertaken for this species as part of the pre-clearing process, including provisions for buffer/exclusion zone if individuals are identified. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors for this species, which will also undergo monitoring. This species occurs in widespread habitats (open grassy and rocky areas) which will be retained throughout the ECZ, HTZ and surrounding areas. Therefore, indirect impacts are expected to have negligible effects on a potential population of Pink-tailed Legless Lizard and this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Burhinus grallarius	Bush Stone-curlew	E	-	False	No	This species has been assumed present within the HLW Area. However, the Revised BDAR considers the Bush Stone-curlew to have a low likelihood of occurrence due to low levels of woody debris within associated PCTs. Furthermore, widespread suitable habitat occurs across the locality for this species, and indirect/prescribed impacts associated with HLW are expected to have a negligible effect on a population of Bush Stone-curlew. As such, this species has been excluded from monitoring.
Callocephalon fimbriatum	Gang-gang Cockatoo	E	E	False	Yes	Two breeding hollows for the Gang-gang Cockatoo were recorded during the Revised BDAR. These occur within a 100 m buffer from disturbance zones, however will be retained. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	False	Yes	No South-eastern Glossy Black-Cockatoo individuals or breeding trees were identified within or surrounding the HLW Area. However, habitat is assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Cercartetus nanus	Eastern Pygmy-possum	V	-	False	No	Eastern Pygmy-possum has been assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Indirect impacts associated with this species will be managed through the provision of Annexure C: Hollow and Nest Strategy to replace impacted hollows, as well as Annexure F: Connectivity Strategy to maintain connectivity corridors; each of which contains monitoring of such provisions (Section 4.1). This species occurs in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath. It shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation. Such habitats are widespread throughout the HLW Area and surrounds. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Chalinolobus dwyeri	Large-eared Pied Bat	E	E	TRUE	No	No known maternity roosts or Large-eared Pied Bat records occur within HLW Area, or within a 10 km radius. Foraging habitat has been assumed within 2 km of mapped potential karst and cliff lines due to survey limitations in the Revised BDAR, however HLW would not interfere with habitat occurring within 100 m of mapped potential karst and cliff lines. Potential indirect impacts associated with powerline collisions will be mitigated through bird deterrent devices per Annexure F Connectivity Strategy of the HLW BMP. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities (refer Section 4.1). This includes the provision of buffer/exclusion zone if roosts are identified. As such, additional monitoring for this species has been excluded at this time. If additional roosts are identified, this monitoring program will be reviewed/updated per Section 2.1.
Crinia sloanei	Sloane's Froglet	E	E	False	Yes	Sloane's Froglet has been assumed present adjacent to disturbance zones. This species may be indirectly impacted by potential impacts through waterway crossings of streams. As such, this species has been included in monitoring in accordance with UMM B8.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Cyclodomorphus praealtus	Alpine She-oak Skink	E	E	False	No	Alpine She-oak Skink has been assumed present adjacent to disturbance zones due to limitations associated with survey feasibility. It has a relatively small home range and is confined to native grassland or heath habitats within a narrow altitudinal range. Based on consultation with NSW DCCEEW (documented in the Revised BDAR), the species is unlikely to occur west of Maragle at elevations less than 1200 m elevation. Given this, HLW Area is considered outside of the known range of the species. Indirect/prescribed impacts to species are considered highly unlikely in the Revised BDAR, therefore this species has been excluded from monitoring.
Delma impar	Striped Legless Lizard	V	V	False	No	Striped Legless Lizard has been assumed present adjacent to disturbance zones. Habitat surveys will be undertaken for this species as part of the pre-clearing process. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors for this species, which will also undergo monitoring. This species occurs in widespread habitats (open grassy and rocky areas) which will be retained throughout the ECZ, HTZ and surrounding areas. Therefore, indirect impacts are expected to have negligible effects on a potential population of Striped Legless Lizard and this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Haliaeetus leucogaster	White-bellied Sea Eagle	V	MAR	False	No	White-bellied Sea Eagle has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy and stick nest dismantlement per Annexure C: Hollow and Nest Strategy of the HLW BMP. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Given the prioritised dismantling of stick nests within proximity to disturbance zones (to minimise collision risk and risk to assets), this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Hieraaetus morphnoides	Little Eagle	V	-	False	No	Little Eagle has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy and stick nest dismantlement per Annexure C: Hollow and Nest Strategy of the HLW BMP. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Given the prioritised dismantling of stick nests within proximity to disturbance zones (to minimise collision risk and risk to assets), this species has been excluded from further monitoring.
Keyacris scurra	Key's Matchstick Grasshopper	E	E	False	No	Key's Matchstick Grasshopper has been assumed adjacent to disturbance zones via expert report. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors for this species & Annexure G Rehabilitation Plan to rehabilitate temporarily impacted habitat for this species; each of which contain monitoring programs (Section 4.1). This species occurs in grassland and grassy woodland which is widespread throughout the HLW Area. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Litoria booroolongensis	Booroolong Frog	E	E	False	Yes	Booroolong Frog has been assumed present adjacent to disturbance zones. This species may be indirectly impacted by potential impacts through waterway crossings of streams. As such, this species has been included in monitoring in accordance with UMM B8.
Litoria castanea	Yellow-spotted Tree Frog	CE	E	TRUE	Yes	Yellow-spotted Tree Frog has been assumed present adjacent to disturbance zones. This species may be indirectly impacted by potential impacts through waterway crossings of streams. As such, this species has been included in monitoring in accordance with UMM B8.
Lophoictinia isura	Square-tailed Kite	V	-	False	No	Square-tailed Kite has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy and stick nest dismantlement per Annexure C: Hollow and Nest Strategy of the HLW BMP. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Given the prioritised dismantling of stick nests within proximity to disturbance zones (to minimise collision risk and risk to assets), this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Mastacomys fuscus	Broad-toothed Rat	V	V	False	No	Broad-toothed Rat has been assumed present adjacent to disturbance zones. Targeted surveys will be undertaken for this species as part of the pre-clearing process, including provisions for buffer/exclusion zone if individuals are identified. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors, which contains monitoring of such provisions. This species occurs in wet alpine and subalpine heaths and woodlands which are widespread throughout the HLW Area. Therefore, this species has been excluded from additional monitoring.
Myotis macropus	Southern Myotis	V	-	False	No	Southern Myotis has been recorded adjacent to disturbance zones. It relies on waterways for all stages of its lifecycle (including breeding, roosting, and foraging). Per the Revised BDAR, no direct impacts are expected to aquatic values that would in turn impact reliant terrestrial habitat for this species, with prescribed impacts associated with water quality, waterbodies and hydrological processes considered negligent. Potential indirect impacts associated with powerline collisions will be mitigated through bird deterrent devices per Annexure F Connectivity Strategy of the HLW BMP. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities (refer Section 4.1). This includes the provision of buffer/exclusion zone if roosts are identified. As such, additional monitoring for this species has been excluded at this time. If additional roosts are identified, this monitoring program will be reviewed/updated per Section 2.1.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Ninox connivens	Barking Owl	V	-	False	Yes	Barking Owl has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Ninox strenua	Powerful Owl	V	-	False	Yes	Powerful Owl has been assumed present adjacent to disturbance zones. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.
Petauroides volans	Greater Glider	E	E	False	No	Greater Glider has been identified adjacent to disturbance zones. Potential indirect impacts associated with connectivity will be mitigated through Glider Crossing Zones per Annexure F: Connectivity Strategy of the HLW BMP, including associated baseline monitoring and ongoing monitoring (Section 4.1. Threatened fauna breeding habitat surveys will also be undertaken for this species as a part of the pre-clearing process, including the provision of buffer/exclusion zones if nest trees are identified. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Petaurus norfolcensis	Squirrel Glider	V	-	False	No	Squirrel Glider has been identified in the ECZ, HTZ and adjacent to disturbance zones. Potential indirect impacts associated with connectivity will be mitigated through Glider Crossing Zones per Annexure F: Connectivity Strategy of the HLW BMP, including associated baseline monitoring and ongoing monitoring (Section 4.1). Threatened fauna breeding habitat surveys will also be undertaken for this species as a part of the pre-clearing process, including the provision of buffer/exclusion zones if nest trees are identified. Therefore, this species has been excluded from additional monitoring.
Petroica rodinogaster	Pink Robin	V	MAR	False	No	The Pink Robin is assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. This species inhabits rainforest and tall, open eucalypt forest, forming nests in trees. Widespread suitable habitat will be retained over a variety of PCTs within and surrounding the HLW Area. Indirect impacts to connectivity will be mitigated and monitored for through Connectivity Corridors per Annexure F Connectivity Strategy of the HLW BMP. Therefore, indirect impacts are expected to have negligible effects on a potential population of Pink Robin and this species has been excluded from further monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Phascogale tapoatafa	Brush-tailed Phascogale	V	-	False	No	Brush-tailed Phascogale has been assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Indirect impacts associated with this species will be managed through the provision of Annexure C: Hollow and Nest Strategy to replace impacted hollows, as well as Annexure F: Connectivity Strategy to maintain connectivity corridors; each of which contains monitoring of such provisions. This species occurs in dry sclerophyll open forest, nest/shelter in small hollows (2.5-4 cm wide) and use many different hollows over a short time span. Such habitats are widespread throughout the HLW Area and surrounds. Therefore, this species has been excluded from additional monitoring.
Phascolarctos cinereus	Koala	E	E	False	No	The Koala was assumed present adjacent to disturbance zones based on the high number of local records and the occurrence of Koala feed tree species. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors, which contains monitoring of such provisions (refer Section 4.1). Widespread suitable habitat will be retained over a variety of PCTs within and surrounding the HLW Area. As such, this species has been excluded from monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Polytelis swainsonii	Superb Parrot	V	V	False	Yes	The Superb Parrot is assumed present adjacent to disturbance zones. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.
Pseudomys fumeus	Smoky Mouse	CE	E	TRUE	No	Smoky Mouse has been assumed present adjacent to disturbance zones. Targeted surveys will be undertaken for this species as part of the pre-clearing process, including provisions for buffer/exclusion zone if individuals are identified. Indirect impacts associated with this species will be managed through the provision of Annexure F: Connectivity Strategy to maintain connectivity corridors, which contains monitoring of such provisions. This species occurs in sclerophyll forest, heathland and open-forest, nesting in burrows, which are widespread throughout the HLW Area. Therefore, this species has been excluded from additional monitoring.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Tyto novaehollandiae	Masked Owl	V	-	False	Yes	Masked Owl has been assumed present adjacent to disturbance zones via expert report. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Tyto tenebricosa	Sooty Owl	V	-	TRUE	Yes	Sooty Owl has been assumed present adjacent to disturbance zones via expert report. Potential indirect impacts associated with collision risk will be mitigated through bird deterrent devices per Annexure F: Connectivity Strategy. Threatened fauna breeding habitat surveys will be undertaken for this species as part of the pre-clearing process. This includes the provision of buffer/exclusion zone if nest trees are identified. Potential indirect impacts to this species also include noise and vibration through potential blasting and/or crushing activities. Noise and vibration assessment for crushing and blasting will occur for this species prior to such activities. Ongoing monitoring of specialist breeding habitat has also been included as part of this monitoring program, however no monitoring sites are prescribed as this species is currently assumed present. If pre-clearing surveys or biodiversity verification reporting identify this species within 100 m of disturbance zones, monitoring will occur in those locations.

V = Vulnerable; E = Endangered; CE = Critically Endangered; - = not listed

3.2.3. Threatened Ecological Communities

Monitoring of Threatened Ecological Communities (TECs) aims to detect and manage indirect construction-related impacts such as dust deposition, altered hydrology, edge effects, weed incursion, trampling or erosion. Three BC Act listed and two EPBC Act listed TECs were identified within the HLW Area. Table 3-3 provides an overview of these TECs, including justification for their inclusion/exclusion for monitoring as part of this program.

Table 3-3 Justification for TECs to be monitored

TEC Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens	EEC	EEC	False	Yes	Plant Community Type 637 is associated with this TEC. It will be protected from indirect and prescribed impacts through no-go zones per the HLW BMP, including a 30 m buffer from mapped locations. To ensure the no-go zones are protecting this TEC, it has been included in monitoring.
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions	EEC	-	TRUE	No	This TEC is associated with parts of PCT 953. A total of 0.66 ha is proposed for impact, comprising 0.50 for partial impacts (ECZ) and only 0.16 for complete clearing (Total Clearing Zone [TCZ]). 2.62 ha occurs outside of the disturbance zones, with more expected in the landscape, all of which will be protected through clearing limits. Other indirect impacts will be mitigated through the BMP (connectivity corridors, erosion and sediment controls, rehabilitation and monitoring of temporary disturbance sites, biosecurity protocols including weed and pathogen monitoring). Prescribed impacts associated with water quality, waterways, and hydrological processes on this TEC were determined unlikely in the Revised BDAR. As such, further monitoring has been excluded for this TEC.

TEC Name	BC Act Status	EPBC Act Status	SAII?	Included in program?	Justification
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CEEC	CEEC	TRUE	No	75.64 ha of this TEC is proposed for impact, comprising 9.32 for partial impacts (ECZ & HTZ) and only 66.32 for complete clearing (TCZ). Over 520 ha occurs outside of disturbance zones, with significance occurrence in the landscape, all of which will be protected through clearing limits. Other indirect impacts will be mitigated through the BMP (connectivity corridors, erosion and sediment controls, rehabilitation and monitoring of temporary disturbance sites, biosecurity protocols including weed and pathogen monitoring). Given its widespread occurrence and existing disturbance in the landscape, further monitoring has been excluded for this TEC.

EEC = Endangered Ecological Community; CEEC = Critically Endangered Ecological Community; - = not listed

3.2.4. Partial clearing zones

This program also includes progressive monitoring of partial clearing zones per MCoA B30(d)(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.*

To minimise impacts on biodiversity, where practicable, Transgrid have opted to include a partial clearing methodology, thereby retaining vegetation beneath the easement during the operational maintenance phase of the amended project (i.e., Transgrid are not adopting full continuous clearance of the easement, which is the 'easier' maintenance option). Partial clearing defined in Table 13-1 of the Revised BDAR as the Easement Clearing Zone (ECZ) and Hazard Tree Zone (HTZ).

The ECZ includes land within the proposed transmission line easement where clearing and ongoing maintenance of tall growing vegetation would be undertaken. Earthworks and grubbing are not required within this zone except in limited circumstances.

The HTZ includes land located adjacent to the transmission line easement where selective tree removal, trimming or lopping would be undertaken to manage any risk of damage to transmission lines and structures in the event of tree fall. Earthworks and grubbing are not required within this zone except in limited circumstances.

The assumptions in the BDAR of the partial clearing in the ECZ include:

- All trees in ECZ polygons need to be removed regardless of height.
- Shrubs will be avoided to the extent possible, but the majority of clearing will be completed using machinery and there will likely be collateral impact on the existing shrub layer due to movement of machinery on site, as well as felling and removal of felled tree branches/barrels.
- Clearing will use of machinery that maximises vegetation clearance coverage/reach.
- Clearing will use machinery and tracks that minimises ground impacts.
- Machinery access paths will be consolidated/minimised.
- Machinery access will be restricted within ecologically sensitive areas (e.g., wetlands and bogs).
- Non-lethal methods of temporary vegetation removal (e.g., mulching/slashing, cutting) will be used that would allow native vegetation to re-grow.
- Where lethal vegetation control is used this would be targeted to avoid damage/death of non-target individuals (e.g., cut-stump painting of cleared woody individuals, rather than foliar spray applications).
- Hand clearing / felling will occur in areas that are not safely or practicably accessible for machine clearing.
- Hand clearing/felling may also be used in the immediate vicinity of areas of very high ecological sensitivity identified in the constraints mapping to minimise the potential for impacts. Fencing will be used to demarcate these areas.
- Felled trees will be tub ground to provide material for erosion/sediment control and rehabilitation. Mulch may be evenly spread on bare disturbed areas to assist with the protection of the soil. Spread of mulched material to a depth of >50 mm will be avoided where practicable.
- Logs may be placed on the edge of the easement in select areas where they will not impede easement access for maintenance.
- For conductor stringing purposes, all remaining shrubs within a 10-metre-wide area along the centre of the easement would need to be tied down or slashed to prevent snagging of the

conductor.

- In areas where mature trees can be retained on easement (e.g., valleys), a stringing methodology that does not require vegetation disturbance would be used.

3.3. Structure

The species/areas that will be targeted for monitoring during construction have been grouped by shared objectives and methods, as summarised in Table 3-4 below.

Table 3-4 Grouping of monitored entities

Monitoring group	Target entities
Artificial hollow monitoring Section 4.1.1	• Brown Treecreeper (eastern subspecies; *Climacteris picumnus victoriae*). • Little Lorikeet (*Glossopsitta pusilla*). • Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*). • Brush-tailed Phascogale (*Phascogale tapoatafa*). • Corben's Long-eared Bat (*Nyctophilus corbeni*). • Eastern False Pipistrelle (*Falsistrellus tasmaniensis*). • Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) • Eastern Pygmy-possum (*Cercartetus nanus*). • Greater Broad-nosed Bat (*Scoteanax rueppellii*). • Little Pied Bat (*Chalinolobus picatus*). • Southern Myotis (*Myotis macropus*). • Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*). • Superb Parrot (*Polytelis swainsonii*). • Turquoise Parrot (*Neophema pulchella*). • Squirrel Glider (*Petaurus norfolcensis*). • Gang-gang Cockatoo (*Callocephalon fimbriatum*). • Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*). • Spotted-tailed Quoll (*Dasyurus maculatus*). • Southern Greater Glider (*Petauroides volans*). • Yellow-bellied Glider (*Petaurus australis*). • Barking Owl (*Ninox connivens*). • Powerful Owl (*Ninox strenua*). • Masked Owl (*Tyto novaehollandiae*). • Sooty Owl (*Tyto tenebricosa*).
Weed and pathogen monitoring Section 4.1.2	All flora and ecological communities.

Monitoring group	Target entities
Connectivity corridor monitoring Section 4.1.3	• Eastern False Pipistrelle. • Southern Myotis. • Large-eared Pied Bat. • Broad-toothed Rat. • Brush-tailed Phascogale. • Smoky Mouse. • Koala. • Eastern Pygmy-possum. • Southern Greater Glider. • Yellow-bellied Glider. • Squirrel Glider. • Flame Robin. • Scarlet Robin. • Pink Robin. • Varied Sittella. • Alpine She-oak Skink. • Pink-tailed Legless Lizard. • Striped Legless Lizard. • Sloane's Froglet. • Booroolong Frog. • Yellow-spotted Tree Frog. • Key's Matchstick Grasshopper.
Rehabilitation monitoring Section 4.1.4	• Key's Matchstick Grasshopper habitats. • PCT 266, 268, 277, 285, 287, 290, 297, 299, 300, 306, 319, 343, 352, 638, 679, 939, 953 and 1196. • Critically Endangered & entity at risk of Serious and Irreversible Impact (SAII): White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland per BC Act & EPBC Act. • Endangered & SAII: Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions per BC Act. • Endangered: Montane Peatlands and Swamps per BC Act & EPBC Act.
Partial clearing zone monitoring and clearing limit monitoring Section 4.2	All threatened species habitats, PCTs and TECs.

Monitoring group	Target entities	
Threatened flora Section 4.3	• *Acacia ausfeldii.* • *Ammobium craspedioides.* • *Bossiaea fragrans.* • *Caesia parviflora* var. *minor.* • *Caladenia concolor.* • *Caladenia montana.* • *Calotis pubescens.* • *Cullen parvum.* • *Diuris tricolor.* • *Glycine latrobeana.* • *Grevillea wilkinsonii.* • *Persoonia marginata.* • *Pimelea bracteata.* • *Pomaderris cotoneaster.*	• *Prasophyllum bagoense.* • *Prasophyllum innubum.* • *Prasophyllum keltonii.* • *Prasophyllum petilum.* • *Pterostylis alpina.* • *Pterostylis foliata.* • *Pterostylis oreophila.* • *Pultenaea humilis.* • *Senecio garlandii.* • *Swainsona recta.* • *Swainsona sericea.* • *Thelymitra alpicola.* • *Thesium australe.* • *Xerochrysum palustre.*
Threatened owls, cockatoos and parrots Section 4.4	• Barking Owl. • Powerful Owl. • Gang-gang Cockatoo. • Superb Parrot.	• Masked Owl. • Sooty Owl. • South-eastern Glossy Black-Cockatoo.
Threatened frogs Section 4.5	• Booroolong Frog. • Sloane's Froglet.	• Yellow-spotted Tree Frog.
TECs Section 4.6	Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens	

4. Monitoring program

4.1. BMP monitoring

4.1.1. Artificial hollow monitoring

Artificial hollow monitoring is detailed in Table 4-1 below, with additional information provided in Annexure C: Hollow and Nest Strategy of the HLW BMP. Any long-term monitoring (post-construction) will be detailed within the Transgrid Operational Biodiversity Management Plan and should incorporate components of monitoring detailed herein for a minimum of 3-years post installation.

Table 4-1 Artificial hollow monitoring

Artificial Hollow Monitoring
Objective and target
Ensure artificial hollow/replacement hollows provide suitable and functioning habitat for target fauna species and remain structurally sound through construction. Targets include: • 100% of hollows in working condition. • Increasing occupancy/use by target species. • No more than 10% invaded by pest species (e.g., myna, bees).
Location and sampling unit
All Hollow Replacement Zones, in accordance with Annexure C: Hollow and Nest Strategy of the HLW BMP. Each artificial hollow (including salvaged hollows) is considered an individual monitoring unit, as georeferenced and ID'd in the Nest Box Installation Report.
Method
Monitoring will be conducted by the Project Ecologist via endoscopic camera (or similar) attached to an extendable pole to minimise disturbance of resident fauna. The following will be recorded: • Name of observer. • Date. • Prevailing weather conditions. • Unique ID of the artificial hollow. • Artificial hollow type (i.e., nest box, salvaged or hollow hogs). • Assessment of artificial hollow and suspension system condition. • Host-tree health and stability. • Evidence of pest species. • Evidence of fauna use. • Photographic evidence of condition, fauna use and pest presence (if present).
Timing, effort and frequency
Biannually during construction (spring and autumn). Any long-term monitoring (post-construction) will be detailed within the Transgrid Operational Biodiversity Management Plan and should incorporate components of monitoring detailed herein for a minimum of 3-years post installation.

Artificial Hollow Monitoring
Data analysis
Occupancy trends: • Track species-specific use over time to assess whether certain box types or placements are preferred. • Compare against target species lists (Annexure C: Hollow and Nest Strategy). Structural integrity assessment: • Identify patterns of structural failure (e.g., weather, mount type, tree decay). • Calculate integrity rate (%) per hollow type and guide replacements/adjustments. Non-target use: • Quantify invasive/non-target use and cross-reference with location and type. Performance scoring: • Develop a simple scoring system (e.g., 0-3 scale: failed, intact-unused, intact-used, target-occupied). Species response indicators: • Compare use across different Hollow Replacement Zones or vegetation types.
Reporting
Artificial Hollow Monitoring Reports will be prepared biannually, following monitoring detailed above. These will be provided to CPHR, FCNSW and DCCEEW as soon as it is available. The report will include the following: • Name of observer, survey dates and prevailing weather conditions. • Maps of Hollow Replacement Zones and replacement hollows within. • Summarise condition, use, fauna occupancy and issues for each hollow type. • Include photographic evidence (internal and external). • Tabulate percentage use, failure and presence of non-target species including pests. • Maintain spatial register (excel) with status, ID and last inspection date for each replacement hollow. • Assessment of incidents/non-compliances based on targets provided in this monitoring program. • Recommendations on adaptive management (if required) as detailed below. All Artificial Hollow Monitoring 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).
Adaptive management

Artificial Hollow Monitoring
• Repair or replace any damaged artificial hollows (e.g., fallen, chewed, weathered). • Reposition salvaged hollows if shifted or destabilized. • 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.

4.1.2. Weed and pathogen monitoring

Weed and pathogen monitoring is detailed in Table 4-2 below, with additional information provided in Annexure E: Biosecurity Management Plan of the HLW BMP.

Table 4-2 Weed and pathogen monitoring

Weed and Pathogen Monitoring
Objective and target
Detect and control weed and pathogen spread resulting from construction activities, particularly into sensitive areas such as no-go zones, threatened species habitats, TECs and SAIIs. Targets include: • No new weed species introduced. • No increase in weed cover or pathogen indicators beyond baseline levels.
Location and sampling unit
Weed monitoring locations will be set at the following intervals of the alignment, with a sampling unit at each transect: • Every 250 m in: ◦ Stockpiles. ◦ Areas with known weed infestations (per pre-clearing baseline surveys). ◦ High-conservation values (e.g., no-go zones, TECs, SAII flora species polygons). ◦ Within rehabilitation zones per Annexure G Rehabilitation Plan of the HLW BMP. • Every 1,000 m in: ◦ Cleared or low-value grazing lands. Pathogen monitoring locations will be access points, vehicle washdown stations (to ensure that hygiene measures are effective) and compounds. Several small sub-samples will be collected at each location (minimum of 5 sub-samples), collected and combined into a single representative sample for that location.
Method

Weed and Pathogen Monitoring
Weeds: Prior to the commencement of clearing, weeds will be mapped within the HLW Area during pre-clearing surveys by the Project Ecologist. Given the large area of impact associated with HLW, weed mapping may be undertaken on-foot, using drones or using binoculars to assess larger areas from a vantage point. The surveys will include the identification of weed species present, including density and location, and will include the physical demarcation of weed restricted areas. Results of baseline weed monitoring, particularly locations of weed restricted areas, will be used to confirm sensitive area maps and update HLW GIS. Weed monitoring will continue annually during construction works by the Project Ecologist to determine weed cover for the HLW Area, inform the location and extent of controls and monitor cycles of weed growth and novel weed establishment. For the first monitoring event, it is necessary to install permanent markers (e.g., star picket marked/flagged with monitoring location name) and record the coordinates of each monitoring location in order to relocate for subsequent monitoring events. Methods will involve the line-point intercept method along a 100 m transect: • At each interval, the cover of weed species will be measured, using a straight rod. Any intercepts or “hits” of a weed species on the rod will be recorded as present (with one being the upper limit for each stratum at each point). No intercepts of weed species at each stratum records a zero. • As data is collected along each transect, the cover (%) of weeds for each stratum (exotic shrubs <1 m, exotic grasses and exotic ground cover) is calculated by dividing the number of hits by the number of transects, then multiplying it by 100. • As data is collected along each transect, the cover (%) of each stratum of weeds is calculated by determining the average cover at each interval. Pathogens: A soil sampling program will be undertaken prior to construction by a suitably qualified person(s) to test for presence/absence of *Phytophthora* within the HLW Area. Several small sub-samples will be collected at each location (minimum of 5 sub-samples), collected and combined into a single representative sample for that location. The collection of each sub sample will involve: • Use a sterile garden trowel to scrape away surface leaf litter. • Dig a small hole, collect a small amount of soil and living plant roots (the hole does not need to be any deeper than 10 cm and you only need 100-250 grams of soil). • Place combined samples into a new, thick zip-lock plastic bag. • Label the bag with date, monitoring site code and sample number (e.g., 19/10/2025, AccomCamp1). • Place into a second bag to prevent cross contamination and as a safeguard against breakage. • Store soil samples in a cool, dark place and dispatch for analysis as practicable after sampling. • After each sample, scrub your hands and the trowel thoroughly with methylated spirits to disinfect them and prevent cross-contamination of samples. • Send samples to a suitable laboratory to analyse for Phytophthora. The samples are to be stored in temperatures below 24° C, and with ice bricks that do not directly have contact with the samples.
Timing, effort and frequency
Baseline prior to clearing at an area (during Pre-clearing Surveys), then annually during construction.

Weed and Pathogen Monitoring
Data analysis
Weed cover trends: • Compare against baseline data to detect increases in weed richness or total % cover. • Assess spatial correlation with disturbance types (e.g., stockpiles vs easement). Species incursion mapping: • Identify new weed species or spread of target weeds into sensitive zones. • Analyse trends around washdown locations, vehicle access points and bare soil areas. Pathogen presence/spread: • Monitoring data (laboratory results) for each pathogen monitoring location is to be kept in a spreadsheet with additional results added after each monitoring period.
Reporting
Pre-clearing Reports will include results from baseline weed monitoring, including: • Weed species identified, including locations (figures) and estimates of density. • Recommended weed control measures based on confirmed weed species occurrence. • Locations of weed restricted areas. The annual BMP Monitoring Report will be prepared to document results of weed and pathogen monitoring, including: • Details on the weed control actions undertaken since the last report, including; ◦ A list of the control activities undertaken. ◦ A map of areas where control activities were undertaken. • A comparative analysis against baseline data. • The efficacy of the control measures in relation to the objective of minimising weed and pathogen distribution and/or abundance in the HLW Area. • Recommendations for future control activities. • A summary of the efficacy of other control measures outlined in the Biosecurity Plan and recommendations for revisions to controls. During construction, any biosecurity issues will be reported to Transgrid immediately.
Adaptive management
• Report new weed presence to Transgrid. Develop and implement weed management options to control new weeds. Investigate the source of weed spread and implement improvements to weed management measures. Transgrid will report any new weed presence to NSW DPI, if the species is a Prohibited Matter such as *Parthenium hysterophorus*. • Report new *Phytophthora* presence to Transgrid. Develop and implement pathogen management options. Investigate the source of pathogen spread and implement improvements to pathogen management measures. • Re-train workers on hygiene protocols. Review and implement pathogen management options.

4.1.3. Connectivity corridor monitoring

Connectivity corridor monitoring is detailed in Table 4-3 below, with additional information provided in Annexure F: Connectivity Strategy of the HLW BMP.

Table 4-3 Connectivity corridor monitoring

Connectivity Corridor Monitoring
Objective and target
Ensure connectivity corridors are established/retained during construction, remain ecologically functional and provide suitable movement pathways for target fauna species. Targets include: • Ground Corridors established and retained. • Vegetation and habitat features support fauna movements. • Glider poles installed at correct locations, heights and numbers. • Glider poles show evidence of use within 2 years.
Location and sampling unit
Monitoring locations will be established at each final Ground Corridor and Glider Crossing, with each corridor as a sampling unit.
Method
<u>Ground Corridors:</u> Qualitative assessments of habitat values by the Project Ecologist, including: • Type, condition, structure, density, continuity and extent of retained vegetation. • Score ground cover/shrub retention and linkage (visual continuity across the landscape). • Identify gaps or impediments within the corridor including clearing works, fragmentation from access tracks/roads, evidence of pest use, erosion scars. • Delineation of corridors. <u>Glider Crossings:</u> Terminating glider poles (one at each end of the Glider Crossing) will be fit with one motion detecting cameras during construction. Motion detecting cameras will be set to record 10 photos per motion trigger, with one second interval between images and a quiet period of 30 second between triggers, set to record continuously.
Timing, effort and frequency
Ground corridors = biannually each spring and autumn during construction. Glider Crossing = motion detecting cameras will be set to record continuously for the entire year, with data analysis to target three months of the year during the construction period, including the target Glider species breeding periods: • Greater Glider = March. • Squirrel Glider & Yellow-bellied Glider = September. Monitoring will continue for 5 years post-installation, to be incorporated into the Operational Biodiversity Management Plan by Transgrid.

Connectivity Corridor Monitoring
Data analysis
Habitat value trends: • Track % of each corridor that maintains suitable structure (>50% groundcover continuity). • Score against baseline or predicted retention values from Revised BDAR. • Identify newly emerging barriers (e.g., vehicle tracks, erosion, pests) that may impede movement. Corridor functionality assessment: • Cross-reference presence/absence data of Gliders with habitat structure. • Determine corridor success rate (number of Glider Crossings with confirmed use over time).
Reporting
Biannual Connectivity Monitoring Reports will be prepared, including the following: • Results of Ground Corridor monitoring. • Results of Glider pole camera monitoring. • Qualitative assessments of habitat values within Ground Corridors. • Assessment of glider utilisation of glider poles. • Assessment of the overall success of the mitigation measures installed. • Identification of gaps/limitations to the connectivity monitoring methodology. This includes monitoring components, method of data collection (frequency and location), method of data, analysis and reporting requirements. • Provision of recommendations for adjustments to monitoring techniques, timing and locations. • Details of any non-conformances, including recommended corrective measures. Biannual Connectivity Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.
Adaptive management
• Rehabilitate native ground layer and shrubs, monitor regrowth and undertake pest/weed control as necessary within Ground Corridors. • Review pole spacing and height, assess surrounding vegetation, conduct additional Glider surveys in areas subject to baseline Glider surveys to compare Glider activity in surrounding areas. • Development of a mitigation plan in consultation with NSW DCCEEW Environment and Heritage, addressing causes of Glider decline as determined in initial investigation. This may include increased monitoring or additional construction related mitigation measures. • If this is ineffective, additional offsets may be required.

4.1.4. Rehabilitation monitoring

Rehabilitation monitoring is detailed in Table 4-4 below, with additional information provided in Annexure G: Rehabilitation Plan of the HLW BMP.

Table 4-4 Rehabilitation monitoring

Connectivity Corridor Monitoring	
Objective and target	
Monitor the natural regeneration of native vegetation in temporary disturbance areas to ensure the return of a resilient, self-sustaining vegetation community. Targets include: • Maintain 85% survival rate of target seedings in rehabilitated Key's Matchstick Grasshopper habitats. • Maintain a stable, non-eroding soil surface across rehabilitated temporary disturbance areas. • Re-establish ≥80% total groundcover of which ≥80% is native. • Facilitate recruitment of ≥5 native species, including at least 2 functional groups (e.g., grass, forb, shrub). • Maintain ≤10% cover of High Threat Weeds and ≤20% total weed cover. • Rehabilitated sites are stable and trending towards natural regeneration without further intervention.	
Location and sampling unit	
Indicative monitoring locations are provided in Figure 3-1 of Annexure G: Rehabilitation Plan, targeting the following minimum monitoring locations: • 1 monitoring location is required within the patch of rehabilitated KMG habitat. • 1 monitoring location is required at each accommodation camp/ancillary facility. • 1 monitoring location every 10 linear km of the alignment for all other temporary disturbance areas (i.e., brake and winch sites, rehabilitated temporary access tracks). Each monitoring location will serve as a sampling unit.	
Method	
Photo monitoring points will provide an indication of the success or failure of any areas of rehabilitation conducted. Plot-based monitoring must follow the methods outlined in the *Biodiversity Assessment Method* (BAM; DPIE 2020a). Established 20 m x 20 m plots (or 400 m^2 equivalent for linear areas) must be assessed with the information outlined below recorded.	
Growth form	Growth form for each recorded native species
Species name	Scientific name of each native and exotic species
Cover	Estimate the foliage cover of each native and exotic species within the boundaries of the plot including all attached plant material, alive or dead, rooted in or overhanging the plot. Cover should be recorded: • In decimals if less than 1% (e.g. 0.1, 0.2). • In whole numbers up to 5% (e.g. 1, 2, 3). To the nearest 5% if >5% cover (e.g. 5, 10, 15, 20, 25).

Connectivity Corridor Monitoring	
Abundance rating	Count (when ≤10) or estimate (when >10) the number of individuals of each native and exotic species rooted within the plot. Record abundance as: • Counts of 1, 2, 3… • Estimates of 10, 20, 30… • 100, 200, 300… • 1000, 2000, 3000.
Erosion	Visual assessment of soil stability; record presence/absence and dimensions (length × width × depth) of: • Rills or gullies. • Exposed subsoil. • Sediment plumes downslope.
Timing, effort and frequency	
Monitoring will be completed by the Project Ecologist annually (spring) during construction works. Any longer-term monitoring (post-construction) would be detailed within the Transgrid Operational Environmental Management Plan and should incorporate components of monitoring detailed herein.	
Data analysis	
<u>Trend analysis:</u> • Evaluate improvements or decline in vegetation metrics over time. • Use scoring matrix (e.g., 0 = no regrowth, 1 = partial cover, 2 = full cover) for rapid visualisation. • Compare abundance and cover of native/exotic species against targets listed in Revised BDAR. <u>Success rate evaluation:</u> • % plots meeting all target thresholds within specified timeframe. <u>Weed pressure mapping:</u> • Identify high weed infestation areas for early control or further rehabilitation efforts. <u>Correlation analysis:</u> • Compare vegetation recovery to original vegetation zone, soil quality or location to prioritise adaptive management.	
Reporting	
Following the completion of monitoring, all data will be collated and presented within the annual BMP Monitoring Report. The report will include the following: • Details of monitoring methods. • Assessment of rehabilitation success by annual plot data and reporting, with reference to targets provided above. Photographic evidence of condition by photo points. • Comparison of annual monitoring with previous year (if construction monitoring extends 2-years), as well as Revised BDAR data. • Assessment of incidents and non-compliances. • Recommendations for future rehabilitation and/or corrective efforts (if necessary). • If for any reason rehabilitation cannot be achieved as per the Rehabilitation Plan, evidence will be supplied and reasoning detailed within.	

Connectivity Corridor Monitoring
Adaptive management
• Implement supplementary seeding. • Increase frequency of weed control per Annexure E: Biosecurity Plan of the HLW BMP. • Reassess weed source pathways (e.g., vehicles, stockpiles) and address any barriers • Install/repair erosion controls (e.g., jute matting, coir logs). • Regrade of contour site to slow runoff. • Reapply topsoil or mulch as needed. • Infill with native mulch or topsoil. • Targeted seeding with native grasses and forbs. • Evaluate seedbank condition. • Targeted seeding with native species. • Implement secondary rehabilitation (e.g., deep ripping, re-mulching, seeding). • Consider active revegetation. • Extend monitoring and maintenance timeline.

4.2. Partial clearing zone monitoring

In line with CoA B30(d)(viii), partial clearing areas will be progressively monitored to confirm the assumptions made in the Revised BDAR regarding partial clearance within the Easement Clearing Zone and whether any changes are required to this plan.

Two key assumptions are to be tested by the partial clearing monitoring:

- Tracking the extent (hectares) of partial and total clearing with reference to the current final layout plans to demonstrate adherence to the clearing limits.
- Verify the assumptions relating to vegetation impacts and retained vegetation integrity in the partial clearing zone.

4.2.1. Tracking of clearing limits

Verification monitoring of clearing limits will be conducted every three months throughout the construction phase. Clearing must be tracked with reference to the most recent Final Layout Plans, as submitted in accordance with Condition C8 to the Department. Within these plans, all areas must be categorised as follows:

- Cleared:
    - Total clearance.
    - Partial clearance.
    - Hazard tree removal only.
- Not impacted (forecast).

Any clearing activities outside the areas identified in the most recent final layout plans must be clearly identified and justified, such as changes made in accordance with an approved Consistency Assessment or in response to an incident that has been reported.

All clearing completed during the current three-month reporting period must be verified using georeferenced drone imagery (or equivalent) with <1 m spatial resolution. A spatial polygon file must be produced to delineate both the completed and forecast clearing footprint for the reporting period. This shapefile must be used to quantify the extent of clearing for the following:

- Native vegetation.
- Threatened flora habitats.
- Threatened fauna habitats.
- Endangered population habitats.

When calculating the extent of clearing, the most current approved datasets must be used and clearly referenced. The spatial dataset, along with the following, must be submitted to Transgrid and CPHR as part of the quarterly verification report:

- Maps showing all areas cleared within the reporting period, and
- A reconciliation table comparing the clearing footprint to the current approved clearing limits.

4.2.2. Vegetation condition assessment

The vegetation condition assessment component of the progressive partial clearing monitoring is intended to verify key Revised BDAR assumptions, specifically:

- Retention of mid and understorey vegetation structure.
- Retention of Vegetation Integrity (VI) score as a proxy for condition.

Monitoring vegetation condition (a proxy for ecological function) in partially cleared areas will enable detection of changes over time. This information will then be used to inform any changes required to clearing methods to maintain the vegetation condition and meet the Revised BDAR assumptions.

Assessments will be carried out using vegetation integrity survey plot methods outlined in the *Biodiversity Assessment Method 2020* (BAM, 2020). Monitoring sites will consist of plots measuring 400 m² (e.g. 20 m × 20 m), with actual plot dimensions adjusted to suit the available area within each partially cleared site.

The target number of plots has been calculated with reference to the total area of clearing within each vegetation class, using the following rules:

- 1 plot per 3 ha by vegetation classes (rounded up).
- No plots for vegetation classes smaller than 0.5 ha.

The target number of plots for each vegetation class are then proportionally distributed across the Very High, High, and Moderate vegetation condition classes within each Plant Community Type (PCT). The target distribution of vegetation plots is summaries in Table 4-5, with indicative monitoring locations displayed in Figure 4-1. Each vegetation plot must be paired to a control plot located within adjoining, non-impacted areas of the same PCT and condition class. Control plots will be assessed as the same time (within days) of the impact plots.

Photographic monitoring points (refer Section 4.2.3) must be established in PCTs that are less than 0.5 ha and therefore do not have any vegetation plot monitoring.

Table 4-5 Minimum number of plots required per vegetation class and zone

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
Inland Riverine Forests			1.68	1	
	5	Moderate	1.68		1
Inland Rocky Hill Woodlands			0.08	0	

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
	319	Moderate	0.07		0
		Low	0.01		0
Montane Bogs and Fens			0.53	1	
	939	High	0.53		1
Montane Wet Sclerophyll Forests			34.50	12	
	638	High	25.88		9
		Moderate	7.60		3
		Low	0.88		0
		Very low	0.14		0
Southern Tableland Dry Sclerophyll Forests			62.01	21	
	299	Moderate	10.74		4
		Low	0.15		0
		Very low	1.03		0
	352	Very low	0.14		0
	953	Very high	20.97		7
		High	18.56		7
		Moderate	6.62		3
		Low	3.80		0
Southern Tableland Grassy Woodlands			0.43	0	
	731	Low	0.35		0
		Very low	0.08		0
Southern Tableland Wet Sclerophyll Forests			11.26	4	
	300	Very high	9.52		3
		Moderate	1.35		1

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
		Low	0.40		0
Subalpine Woodlands			25.20	9	
	679	High	2.27		1
		Low	0.05		0
	1196	High	21.78		8
		Low	1.09		0
Upper Riverina Dry Sclerophyll Forests			11.01	4	
	285	Very high	0.37		0
		High	3.54		3
		Low	4.09		0
	290	High	1.56		1
		Moderate	0.21		0
		Low	0.08		0
		Very low	0.13		0
	297	Moderate	0.49		0
		Low	0.08		0
		Very low	0.10		0
	306	Low	0.15		0
		Very low	0.04		0
	314	Very high	0.18		0
Western Slopes Dry Sclerophyll Forests			4.17	2	
	287	Very high	2.28		1
		Moderate	0.80		0
		Very low	0.03		0

Vegetation class	PCT ID	Vegetation zone	Area (ha)	Plots per vegetation class	Plots per vegetation zone
	343	Moderate	0.83		1
		Low	0.10		0
		Very low	0.13		0
Western Slopes Grassy Woodlands			17.65	6	
	266	Moderate	1.48		1
		Low	2.01		0
	268	Very high	1.76		1
		Low	0.27		0
	277	High	4.15		3
		Low	3.55		0
		Very low	2.35		0
	278	High	1.05		1
	280	Low	0.12		0
		Very low	0.92		0
Grand total			**168.53**	**60**	**60**

4.2.3. Photographic monitoring

Photographic monitoring aims to provide a visual reference of each monitoring site over time, and allow observations of disturbance, stress, weed encroachment, pest and pathogens, and any other general observations relevant to the condition of the vegetation. Photographic monitoring will be completed with each vegetation integrity plot, consisting of a photograph from each end of the centreline transection in accordance with the BAM.

At non-vegetation integrity plot sites, including PCTs with <0.5 ha of partial clearing, photographic monitoring will occur at fixed georeferenced locations with the orientation recorded to allow for repeat monitoring. Photographic monitoring must use consistent photo points (i.e., tripod/star picket, set height, nominated bearing) to obtain qualitative/visual data showing retention of vegetation condition and height (~200 mm) across the ECZ/HTZ.

4.2.4. Reporting

A Partial Clearing Validation Report (PCVR) will be submitted every three months during construction. The initial report will be provided within 6 weeks of completion of the first three months of construction-phase clearing (i.e., within 4.5 months of commencement of construction-phase clearing). A subsequent report will be provided every three months thereafter during construction. The report will

be prepared by a person accredited to apply the BAM.

The report will confirm partial clearance has been undertaken in accordance with procedures identified in Annexure B: Clearing Protocol. The report will also provide the results of any partial clearance monitoring undertaken during the reporting period in accordance with Table 4-6 to confirm the assumptions made in the Revised BDAR regarding partial clearance within the ECZ and HTZ.

The PCVR will report on all PCTs in which partial clearance works or monitoring have been undertaken during the reporting period. Each report will assess any changes to vegetation condition observed during monitoring, and determine any changes subsequently required to the HLW BMP, this Biodiversity Monitoring Program, or Annexure B: Clearing Protocol.

The following information is to be collected and compiled within each report:

Part A: Clearing limit tracking:

- Table of the HLW construction clearing limits with comparison to the extent of clearing completed.
- Forecast for clearing of each PCT and threatened species habitat.

Part B: Partial Clearing Monitoring:

- Description of areas subject to partial clearance to date, including area (m^2) of each PCT partially cleared.
- The name of contributors to the report and the BAM Accredited Assessor responsible for the results.
- Date(s).
- Weather conditions.
- VI scores for each paired plot by applying s4.3.3 of the BAM for assessing vegetation integrity (VI plot survey), including provision of field data sheets.
- Photographic monitoring images compared with previous and baseline images.
- Any other disturbance observed within partial clearance monitoring areas.
- Assessment against the targets in Table 4-6.
- Recommendations for any additional actions required.

Reports will be provided to Transgrid within 6 weeks of the end of each reporting period.

4.2.5. Monitoring procedure

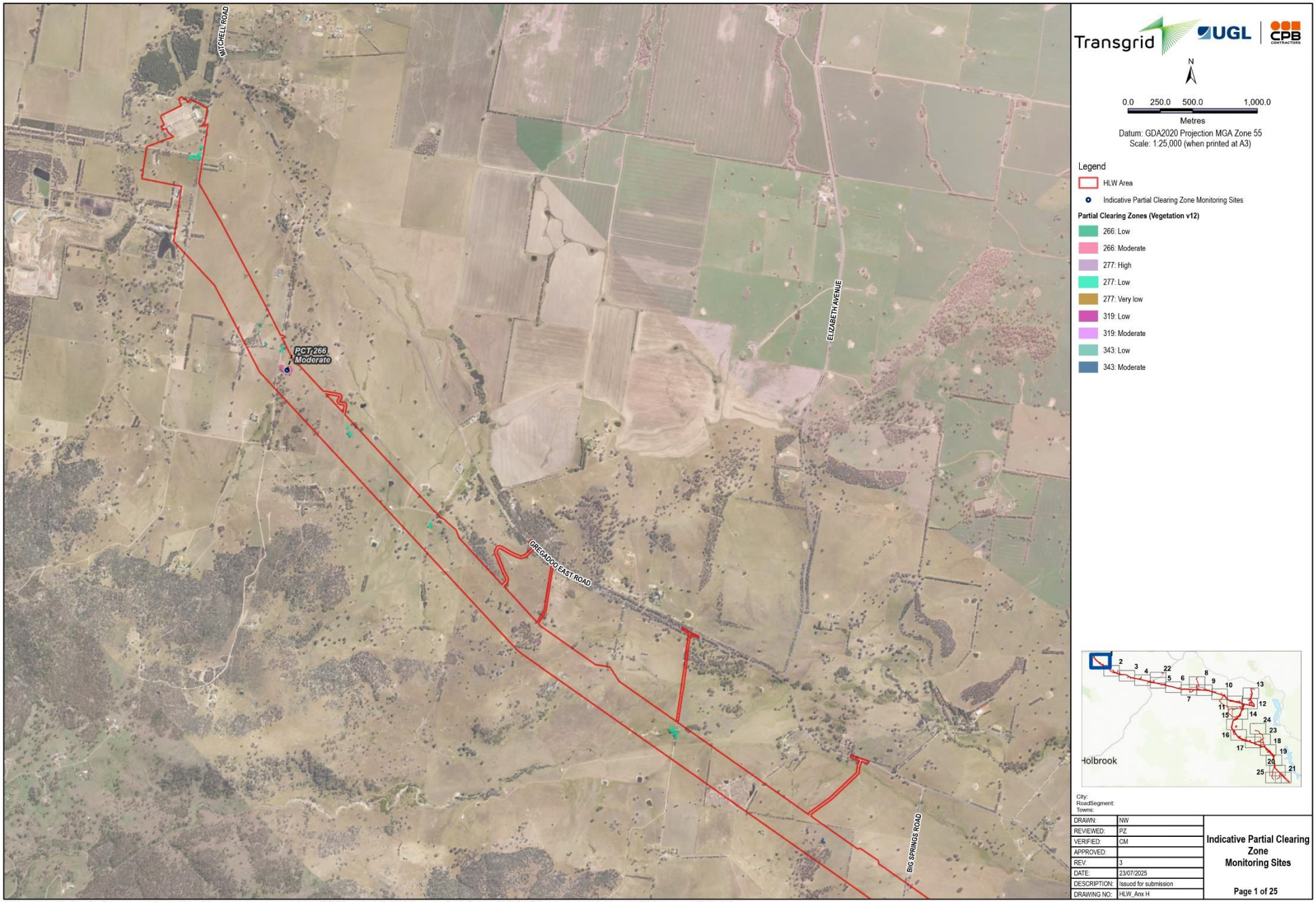
Clearing limit and partial clearing monitoring is summarised in Table 4-6 below.

Table 4-6 Clearing limit and partial clearing monitoring

Clearing Limit and Partial Clearing Monitoring
Objective and target
The following objectives relate to partial clearing monitoring: • Track the extent (hectares) of partial and total clearing with reference to the current final layout plans to demonstrate adherence to the clearing limits. • Verify the assumptions relating to vegetation impacts and retained vegetation integrity in the partial clearing zone. Overall, vegetation performance will be assessed against the following targets: • Consistent visual condition of each PCT compared to the baseline monitoring sessions and baseline data. • Consistent VI scores compared to control plots (<10% difference).
Location
<u>Tracking of clearing limits:</u> • All areas where clearing has occurred. <u>Vegetation condition monitoring:</u> • Point location of proposed partial clearing zone (impact) and reference (control) monitoring points per Table 4-5. Indicative locations are shown in Figure 4-1. <u>Photographic monitoring:</u> • Point location of proposed partial clearing zone (impact) and reference (control) monitoring points. • Point location of proposed photographic monitoring points in vegetation zones <0.5 ha.
Method

Clearing Limit and Partial Clearing Monitoring
<u>Tracking of clearing limits:</u> • Georeferenced drone imagery (or equivalent) with a spatial accuracy <1 m must be used to verify the clearing. <u>Vegetation condition monitoring:</u> • Assessments will be carried out using vegetation integrity survey plot methods outlined in the BAM. Monitoring sites will consist of plots measuring 400 m² (e.g. 20 m × 20 m), with actual plot dimensions adjusted to suit the available area within each partially cleared site. <u>Photographic monitoring:</u> • Baseline data will consist of 'baseline' photographs taken prior to the commencement of clearing works. Photographic monitoring locations established in baseline session will be permanent for the duration of the monitoring program. The geolocation and bearing of the initial (baseline) photographs will be recorded, and a physical marker installed, to ensure subsequent photographs remain consistent throughout the construction phase and allow accurate comparisons to be made. • BAM plot photos in conjunction with vegetation condition monitoring. • At non-vegetation integrity plot sites, photographic monitoring will continue at baseline photo monitoring points.
Timing, effort and frequency
<u>Tracking of clearing limits:</u> • Within 3 months of clearing in the monitoring area then quarterly for the duration of construction. <u>Vegetation condition monitoring:</u> • Within 3 months of clearing in the monitoring area then biannually at each monitoring site for the duration of construction. <u>Photographic monitoring:</u> • Within 3 months of clearing in the monitoring area then biannually at each monitoring site for the duration of construction.
Data analysis
<u>Tracking of clearing limits:</u> • The vegetation tracking must be reconciled with reference to the most current final layout plans submitted to the Department. • Vegetation and Species Polygons must utilise the most current HumeLink data set approved by CPHR from the Revised BDAR or subsequent Condition 29 Biodiversity Assessment Verification Report. <u>Vegetation condition monitoring:</u> • Comparison of VI Score, composition and structure scores for grass and forb growth forms and leaf litter for each paired plot. <u>Photographic monitoring:</u> • The visual condition of PCTs is to be directly compared to the baseline photographic monitoring session and all previous photographic monitoring session(s).

Clearing Limit and Partial Clearing Monitoring
Reporting
Partial Clearing Validation Report (PCVR) will be prepared quarterly by an appropriately experienced ecologist accredited under the BAM. The following information is to be collected and compiled within each report: <u>Part A: Clearing limit tracking:</u> • Table of the HLW construction clearing limits with comparison to the extent of clearing completed. • Forecast for clearing of each PCT and threatened species habitat. <u>Part B: Partial Clearing Monitoring:</u> • Description of areas subject to partial clearance to date, including area (m^2) of each PCT partially cleared. • The name of contributors to the report and the BAM Accredited Assessor responsible for the results. • Date(s). • Weather conditions. • VI scores for each paired plot by applying s4.3.3 of the BAM for assessing vegetation integrity (VI plot survey), including provision of field data sheets. • Photographic monitoring images compared with previous and baseline images. • Any other disturbance observed within partial clearance monitoring areas. • Assessment against targets listed above. • Recommendations for any additional actions required. Reports will be provided to Transgrid within 6 weeks of the end of each reporting period.
Adaptive management
• Forecast exceedance of the clearing limits must be addressed by avoiding impact within the future clearing areas. If this is not possible, a request must be made in accordance with B25 to change the clearing limits. • Unless otherwise explained by non-HLW associated impacts (e.g., extreme climate events, bushfires, etc.), corrective actions will be required should the triggers be met. Depending on the likely cause of visible condition decline, the decline in VI or negative changes in other metrics such as dieback, stress or disturbance, the Project Ecologist and Environmental Manager will determine the best course of action in consultation with Transgrid. Corrective actions that would be discussed and confirmed between Transgrid and the Project Ecologist may include: ◦ Identifying the cause of declines in vegetation condition. ◦ A review of the areas identified as ECZ and HTZ. ◦ A review of works occurring within partial clearance zones. ◦ Review of this Biodiversity Monitoring Program and Annexure B: Clearing Protocol of the HLW BMP for any changes required. ◦ Review if further Project training is required and implemented. • Where the triggers are met, Transgrid will determine appropriate additional mitigation measures in consultation with CPHR.



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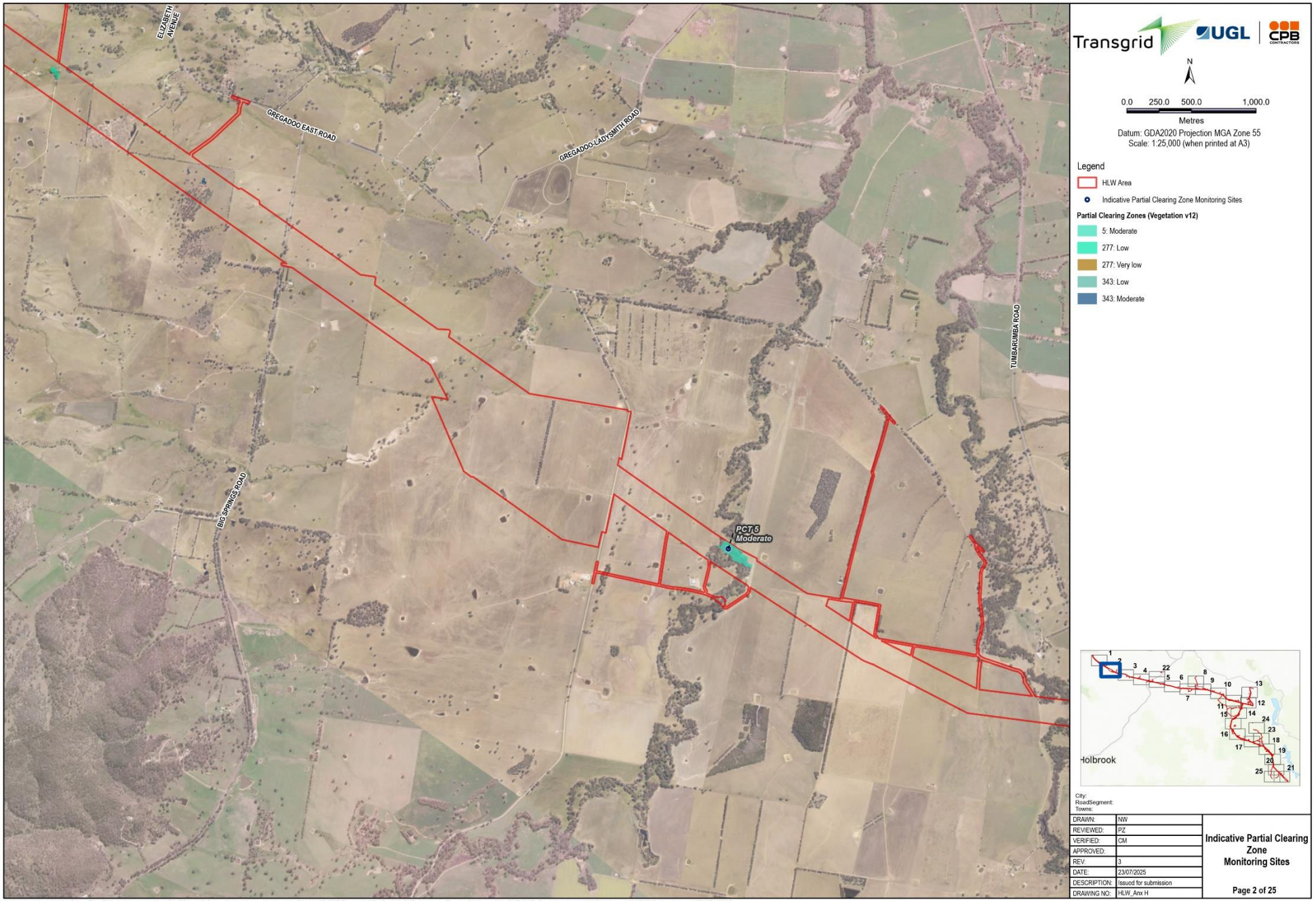

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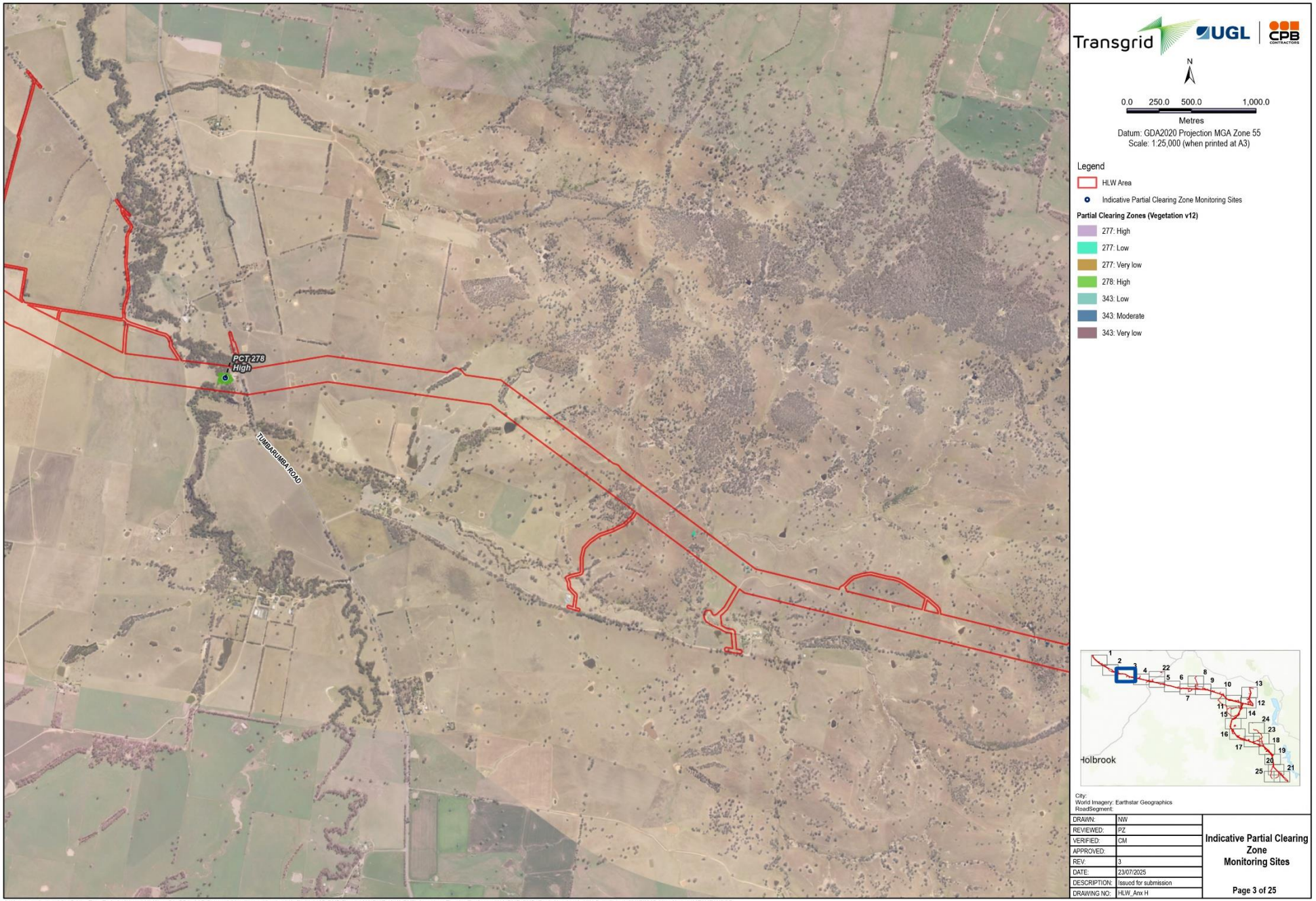

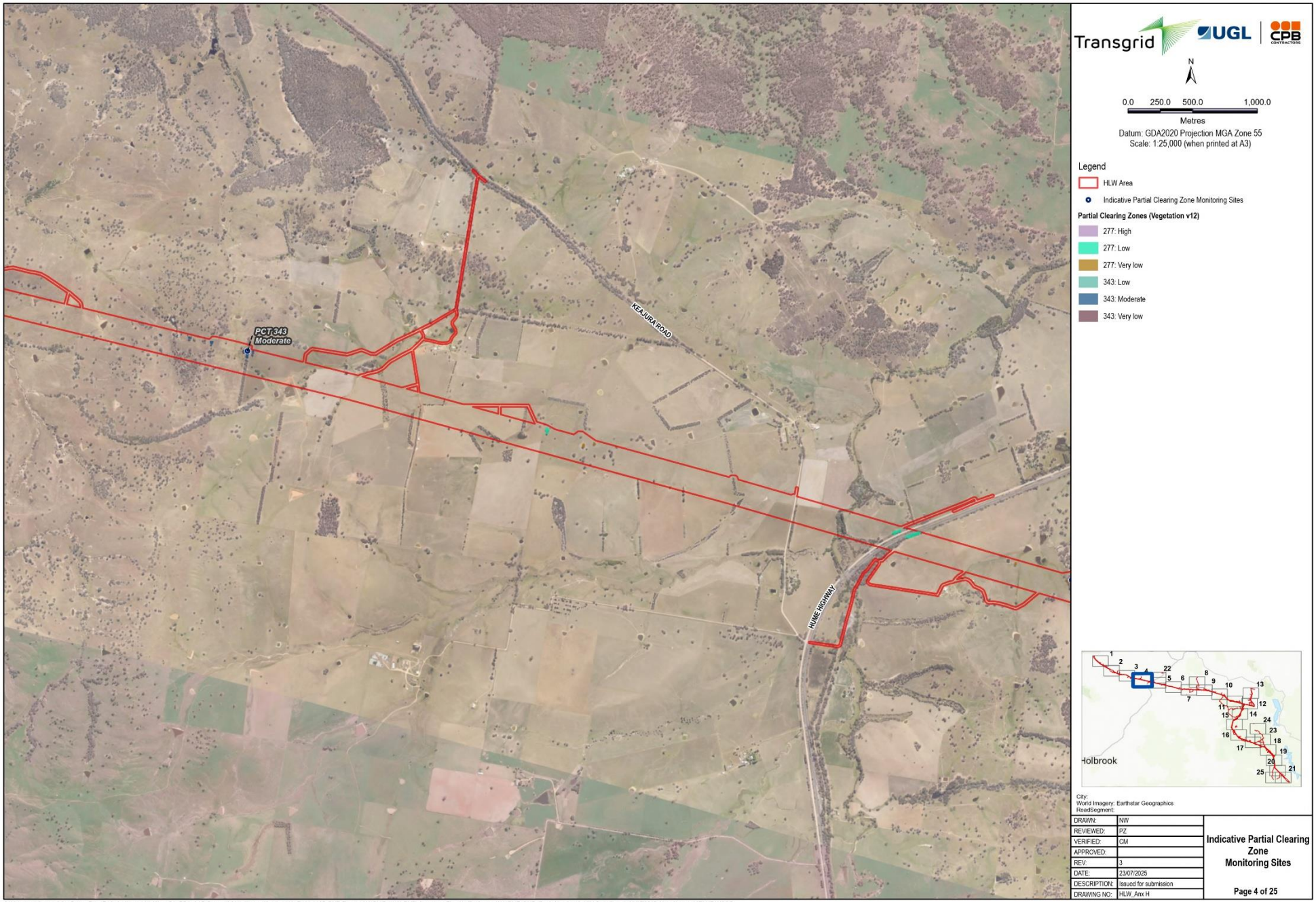

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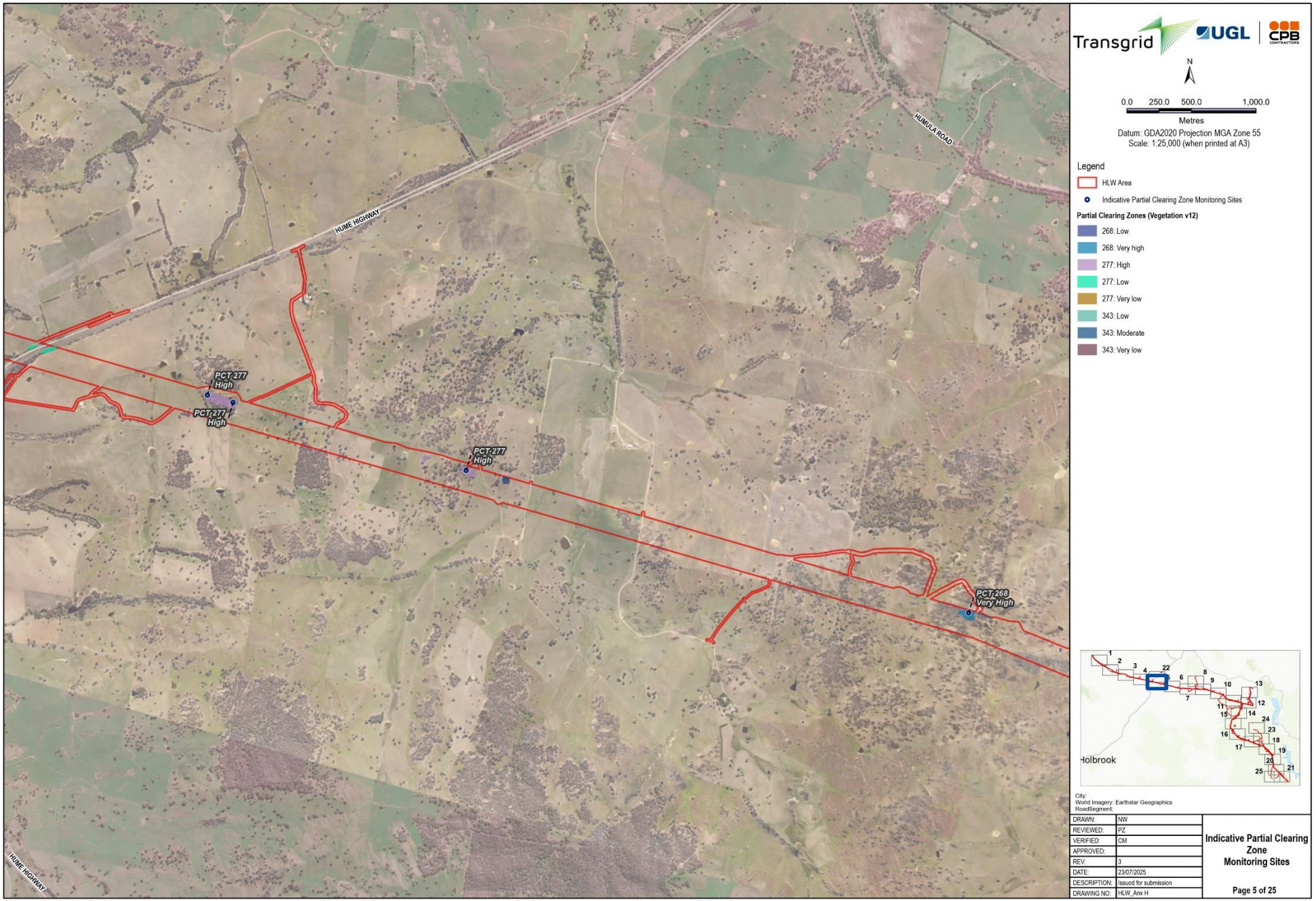

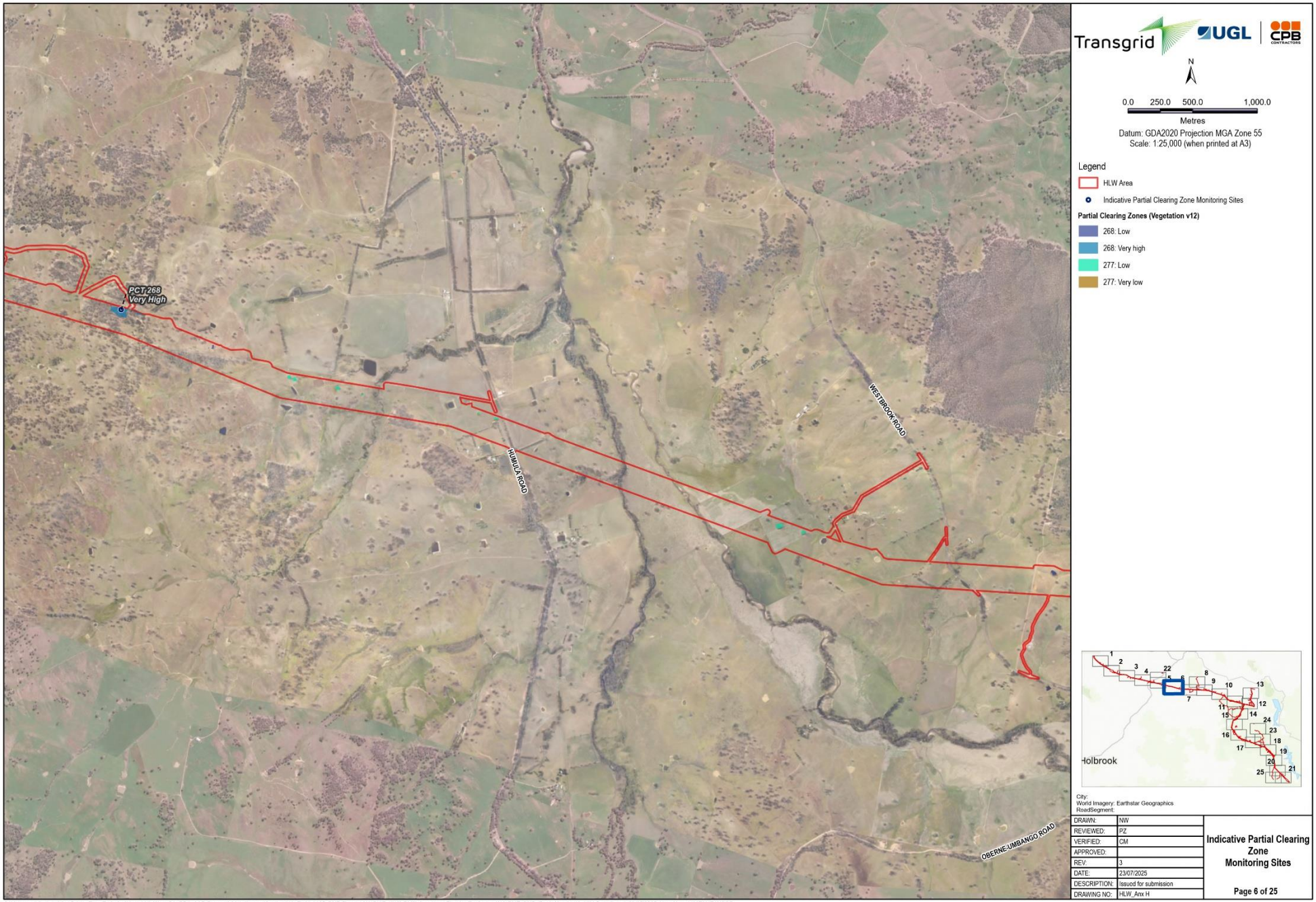

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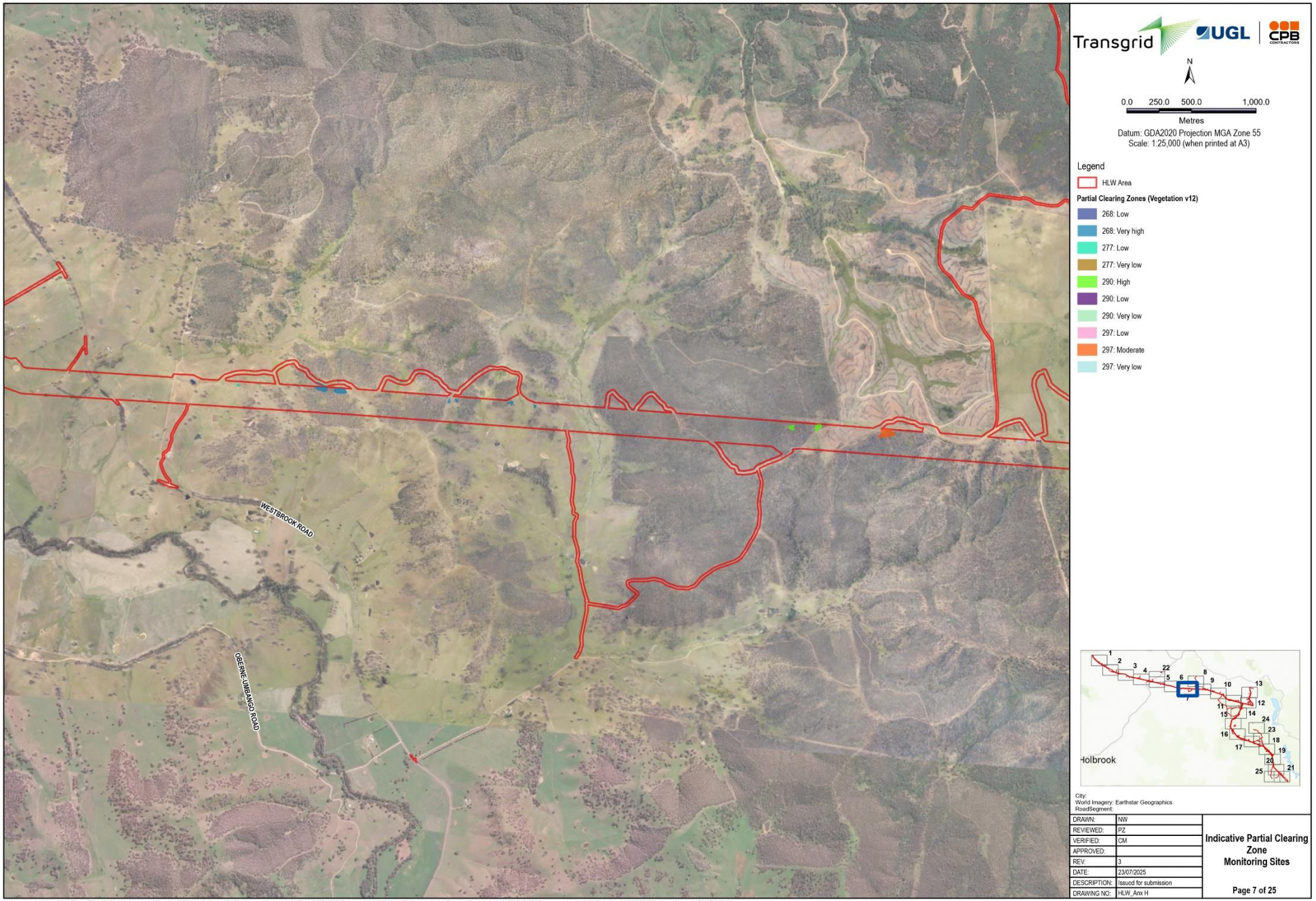

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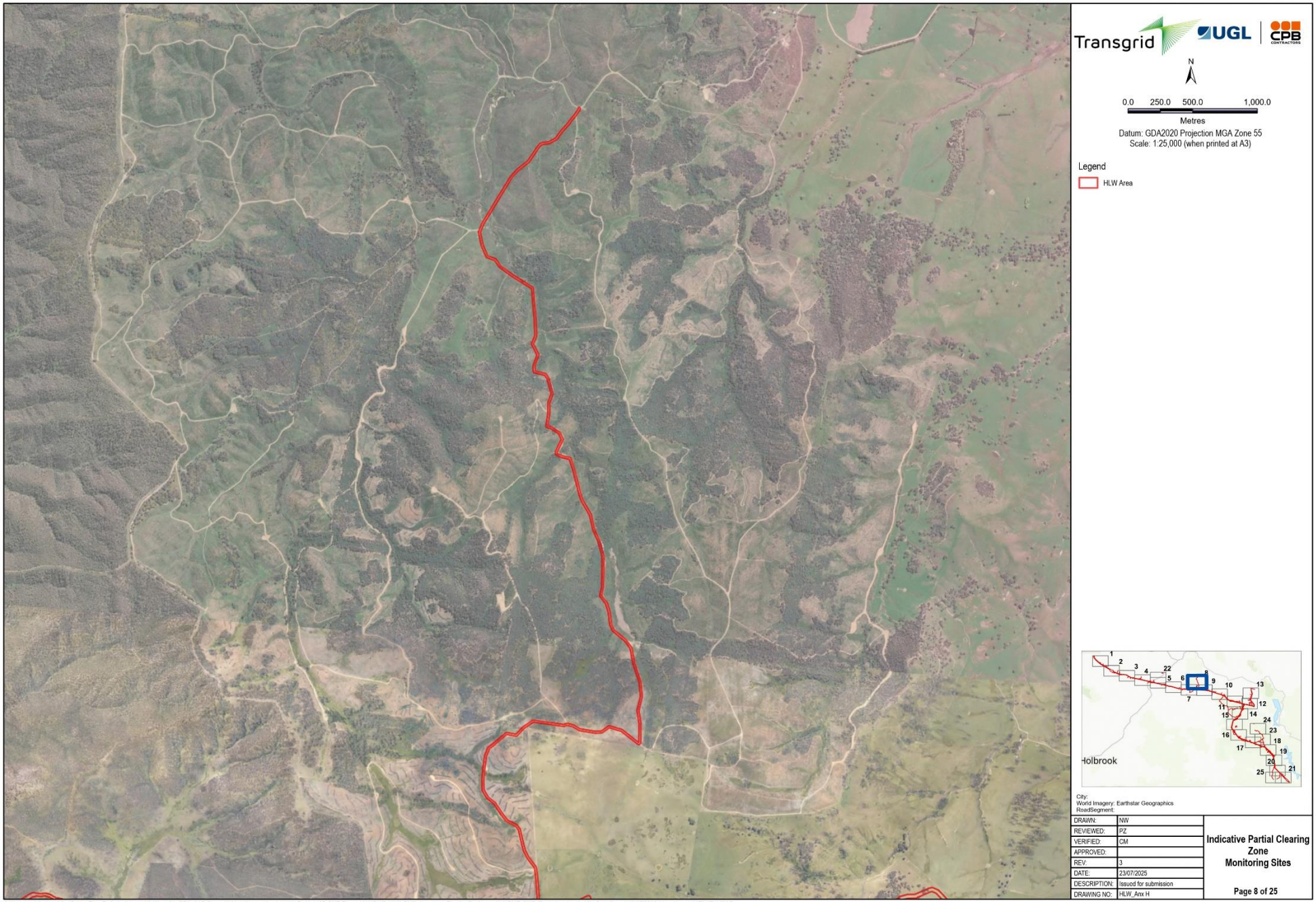

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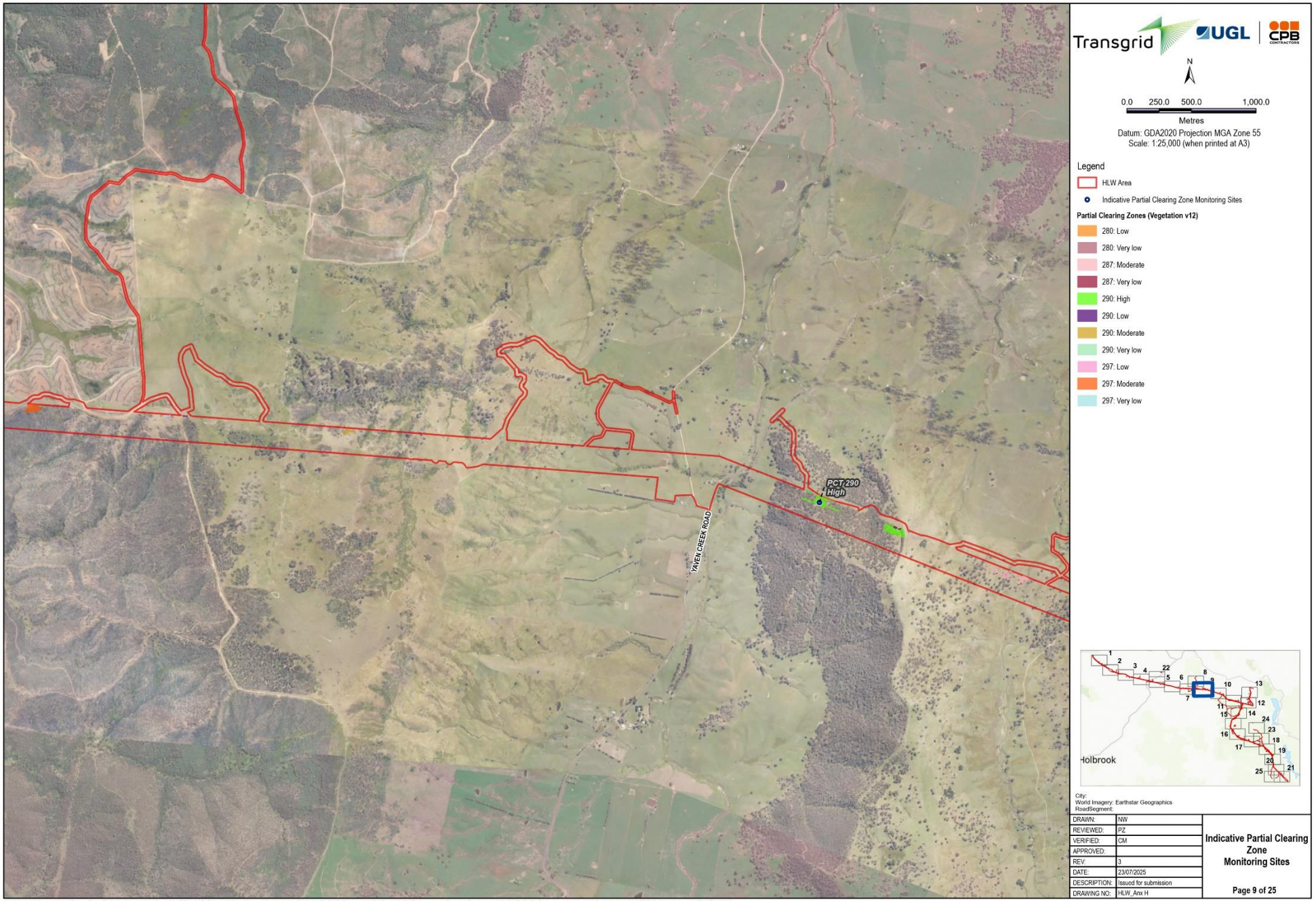

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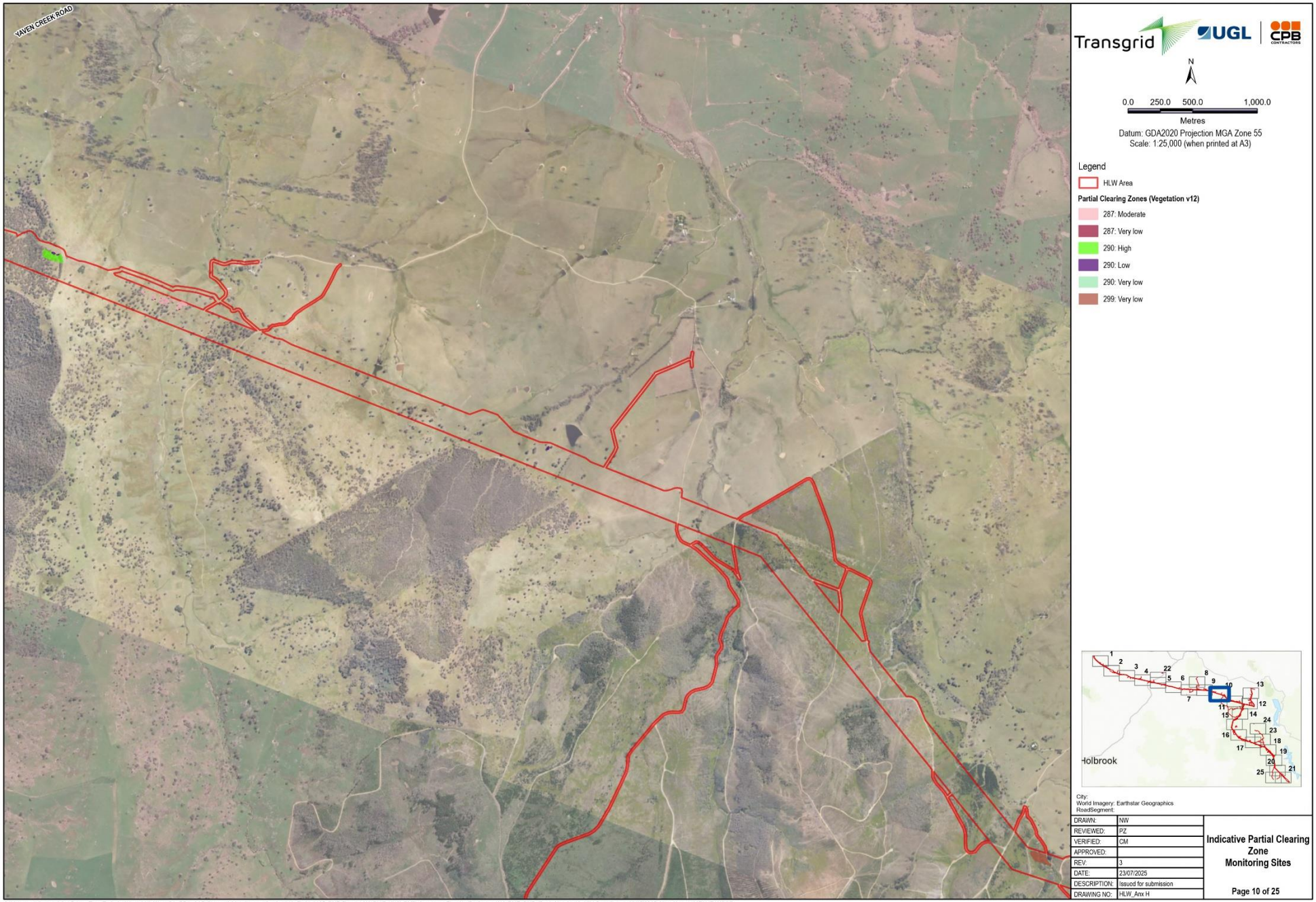

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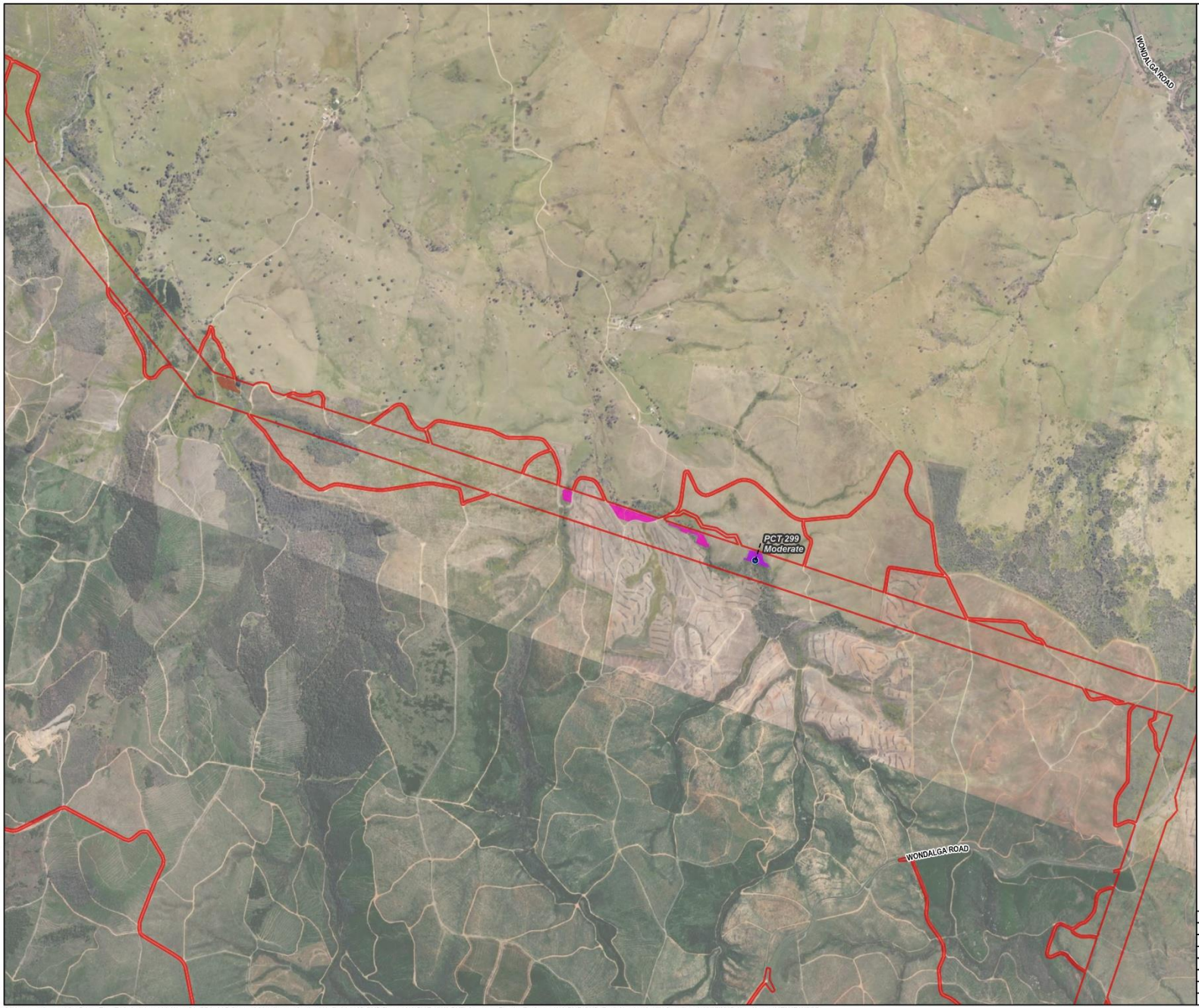

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Metres

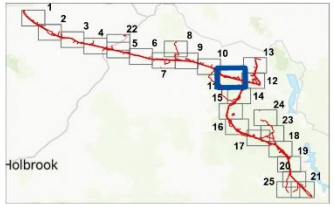
Datum: GDA2020 Projection MGA Zone 55
Scale: 1:25,000 (when printed at A3)

Legend

- HLW Area
- Indicative Partial Clearing Zone Monitoring Sites

Partial Clearing Zones (Vegetation v12)

- 285: Low
- 299: Moderate
- 299: Very low



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VERIFIED:	CM
APPROVED:	
REV:	3
DATE:	23/07/2025
DESCRIPTION:	Issued for submission
DRAWING NO:	HLW_Anx H

Indicative Partial Clearing Zone Monitoring Sites

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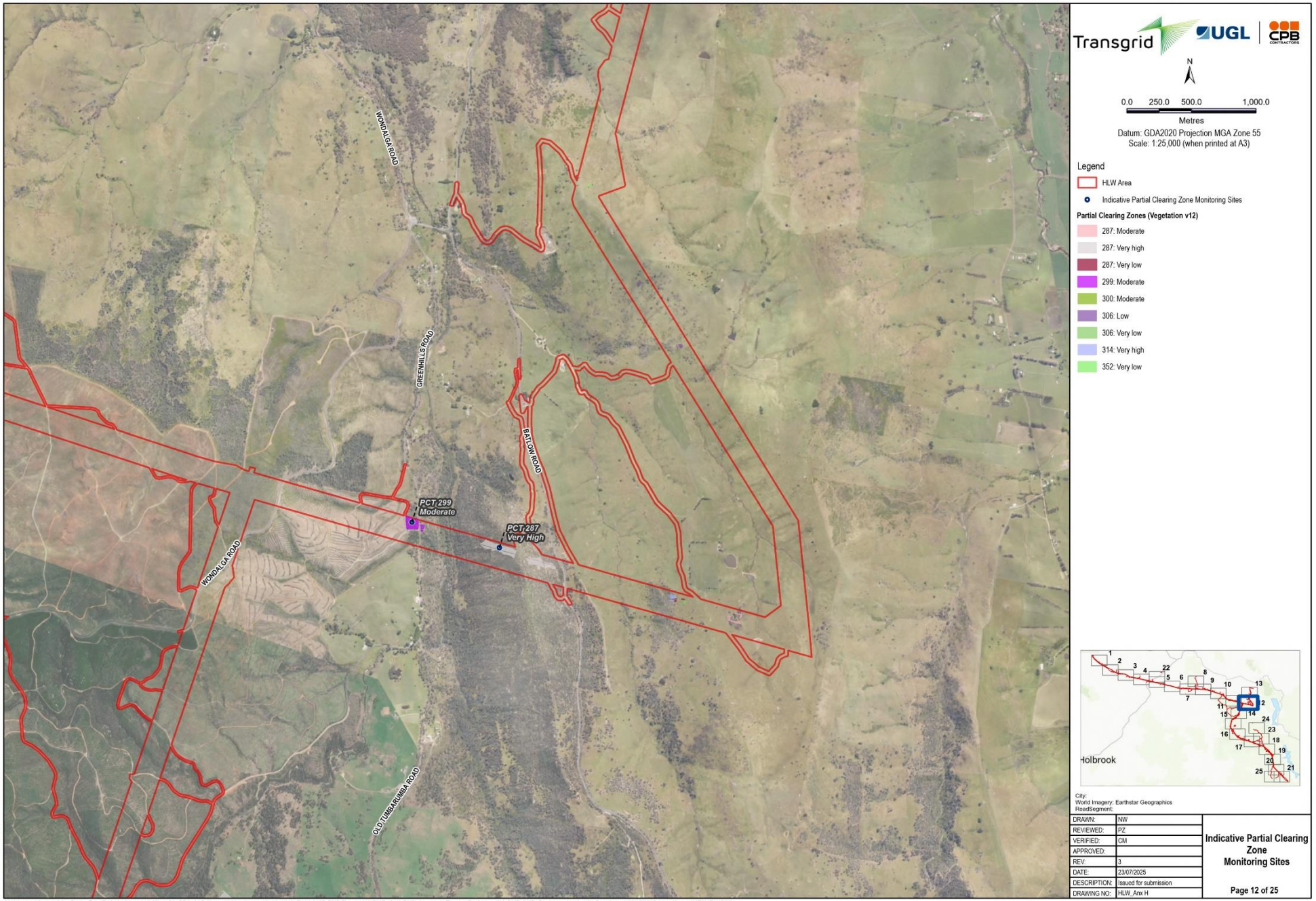

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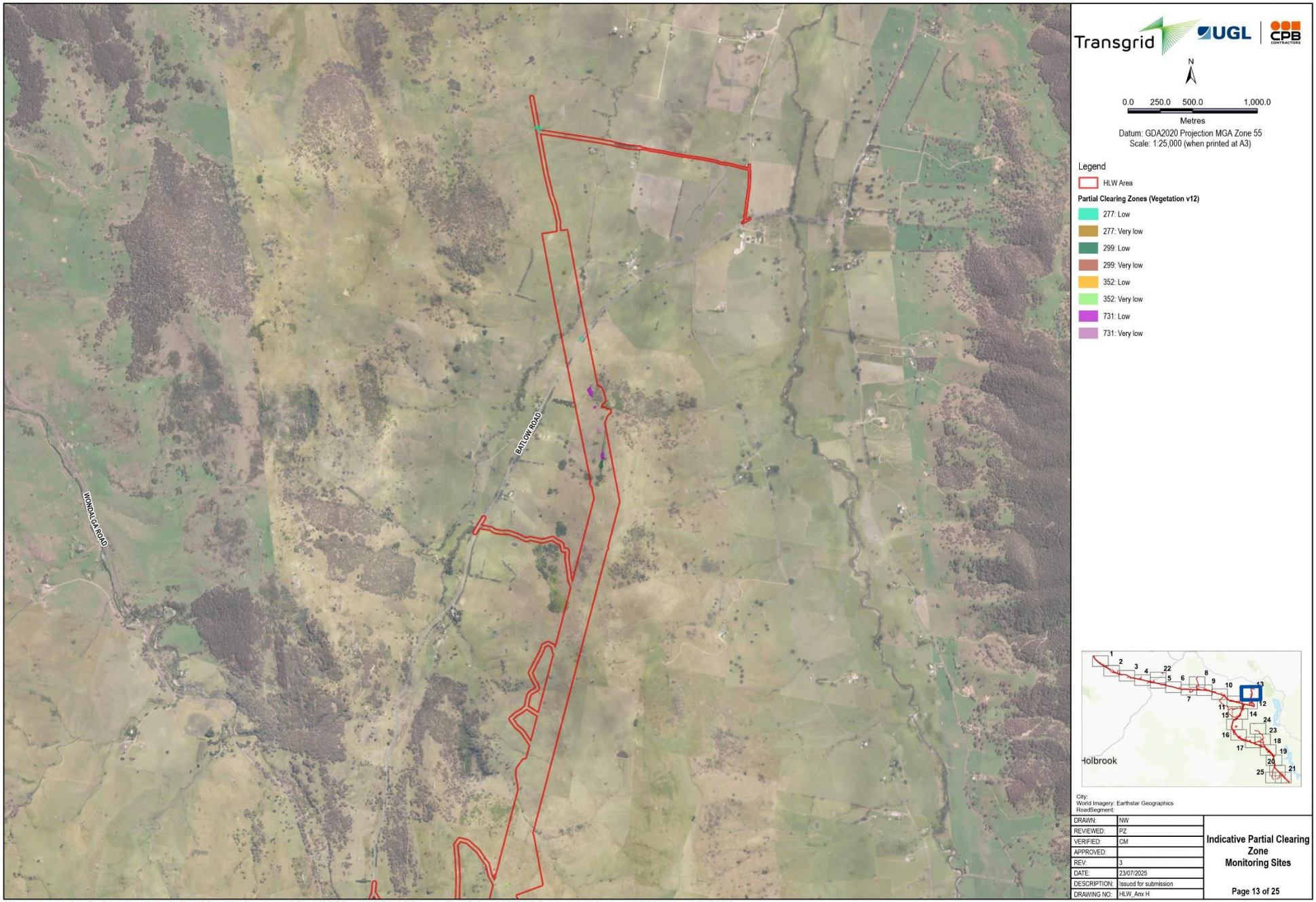

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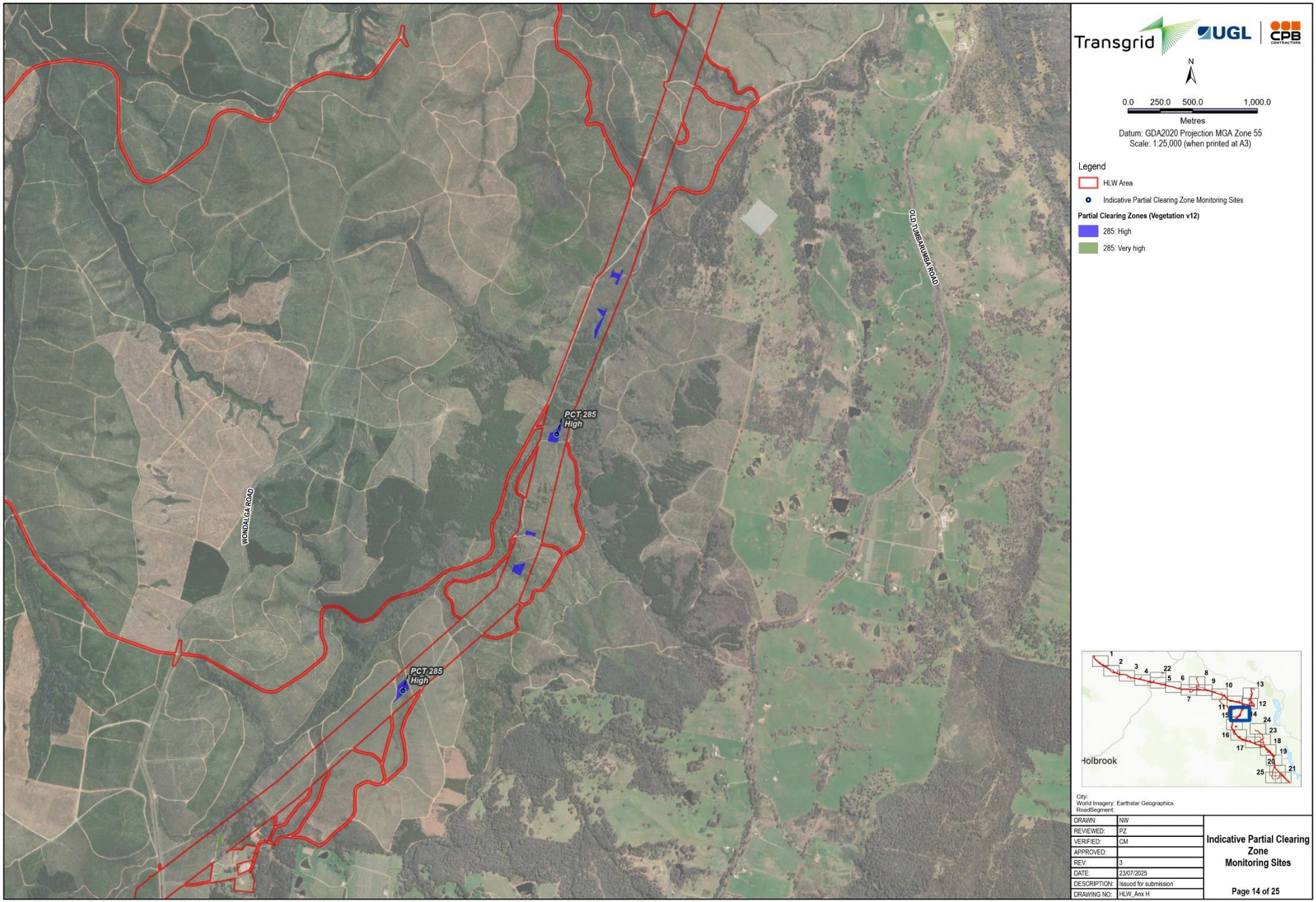

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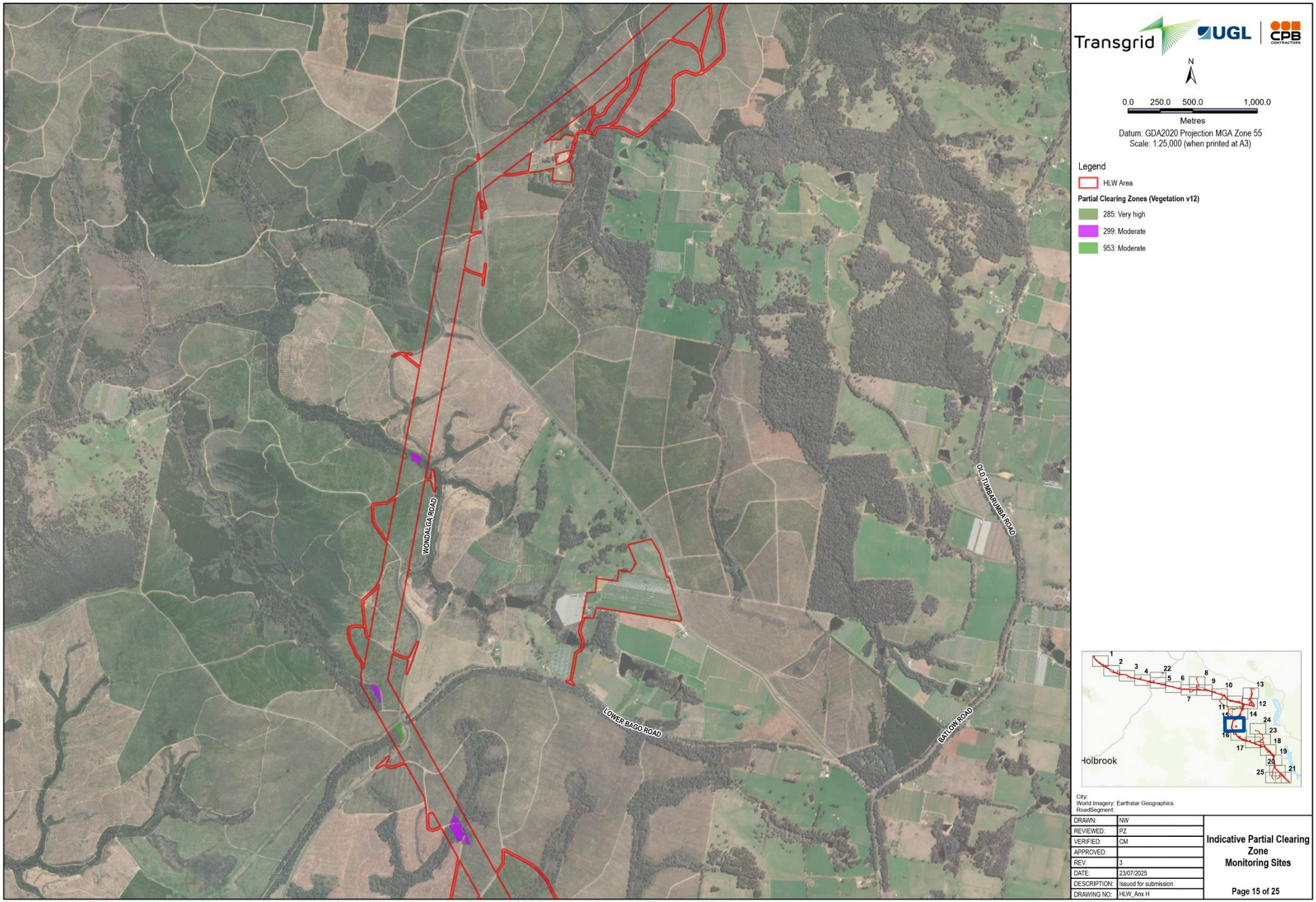

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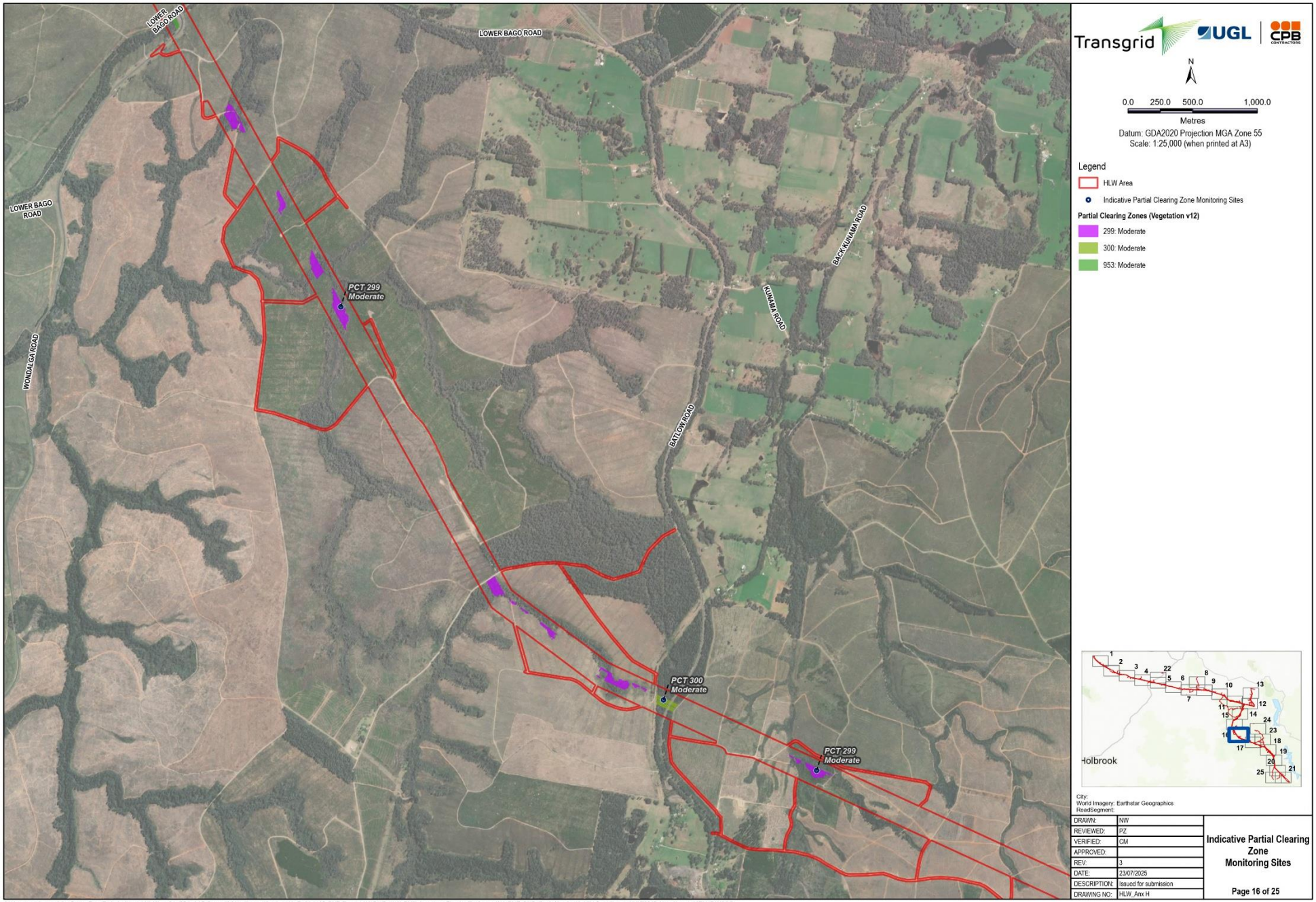

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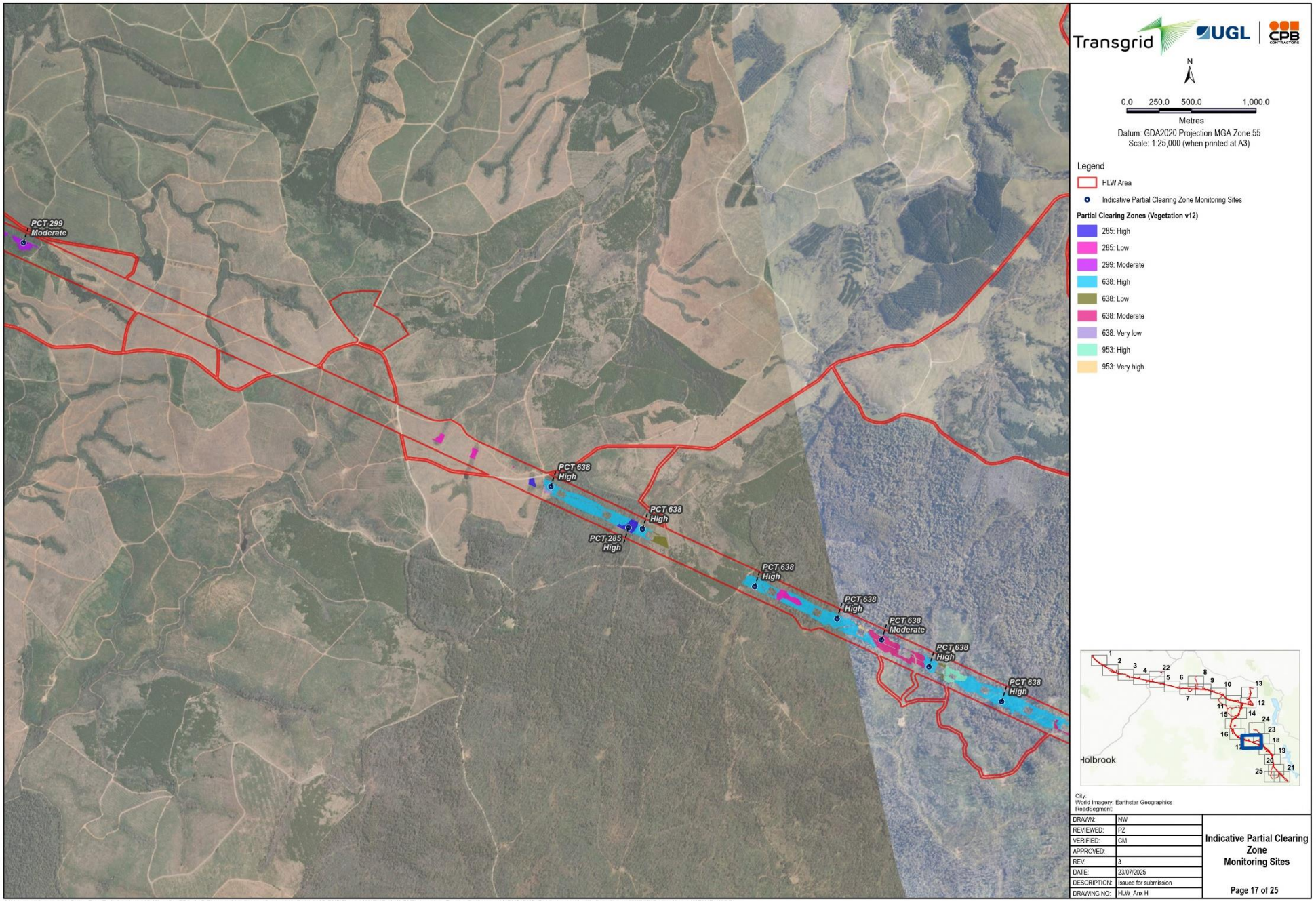

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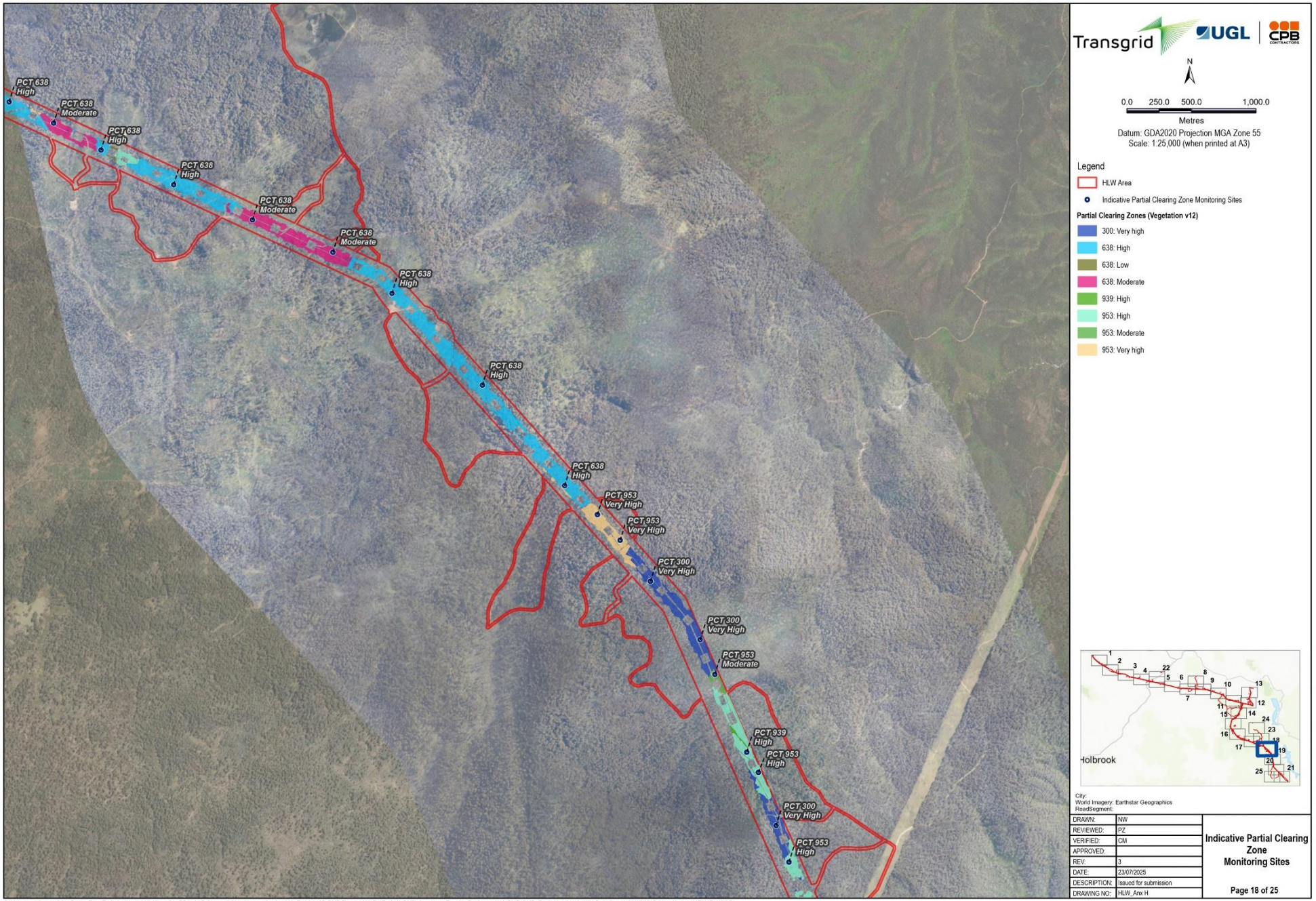

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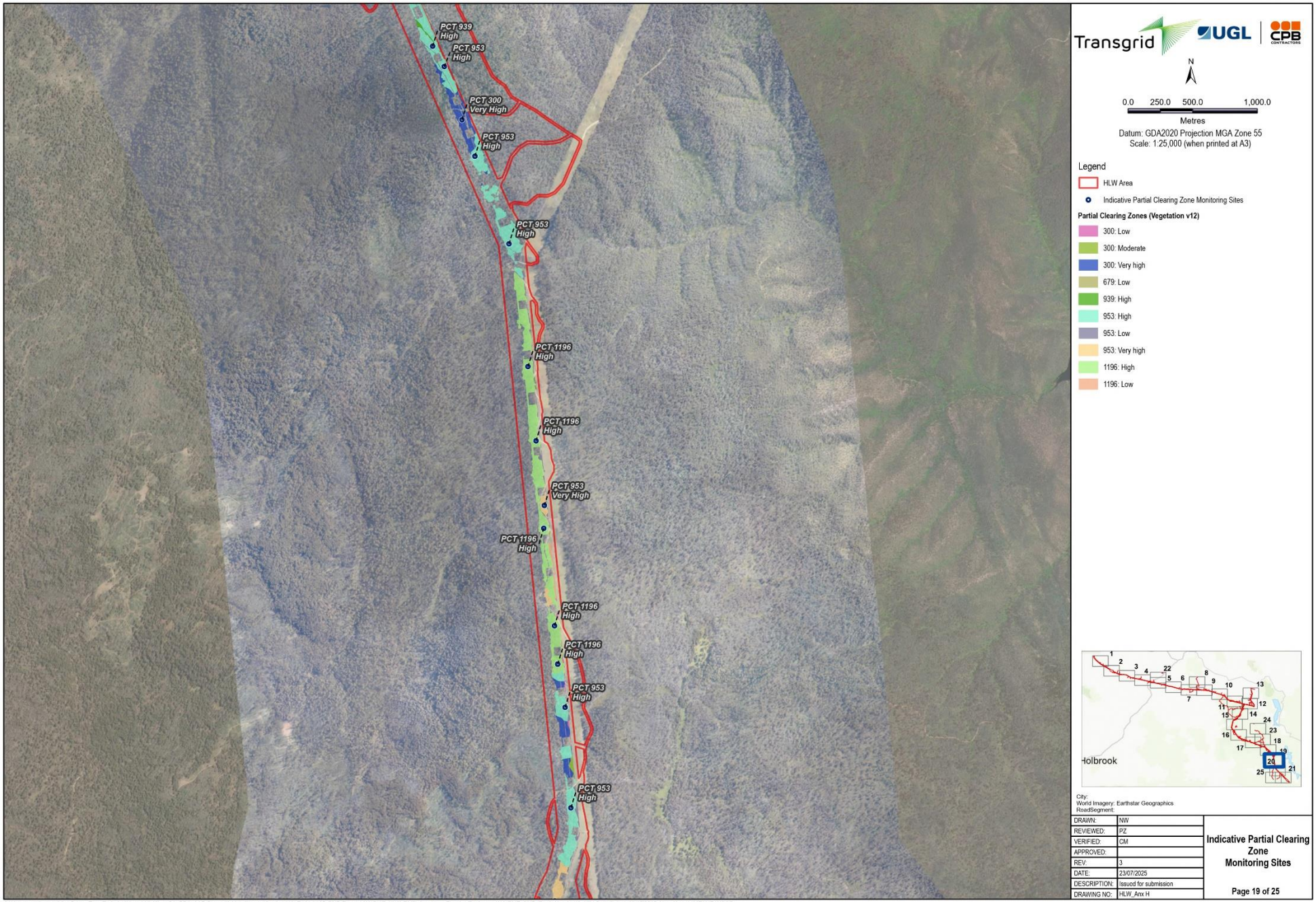

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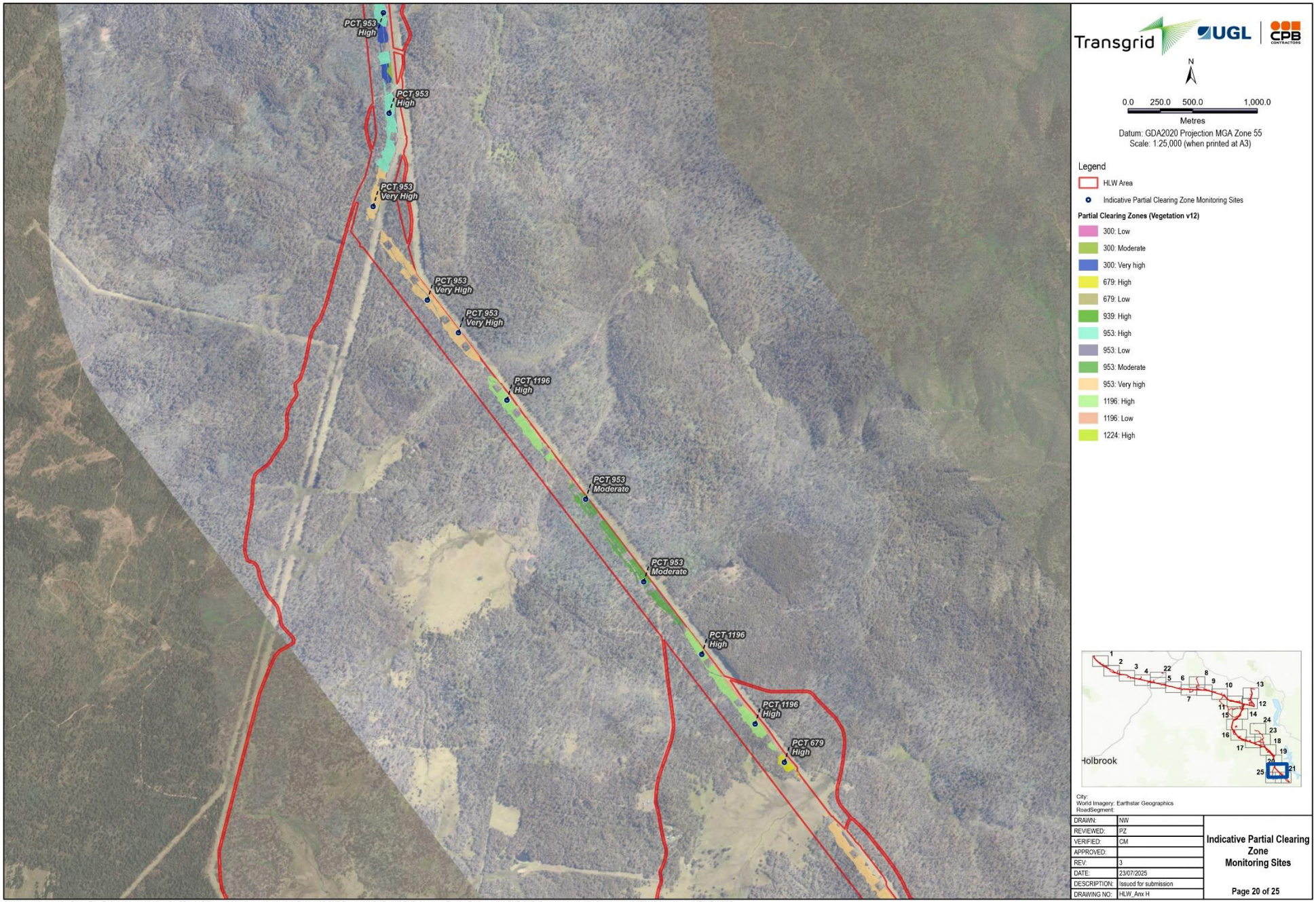

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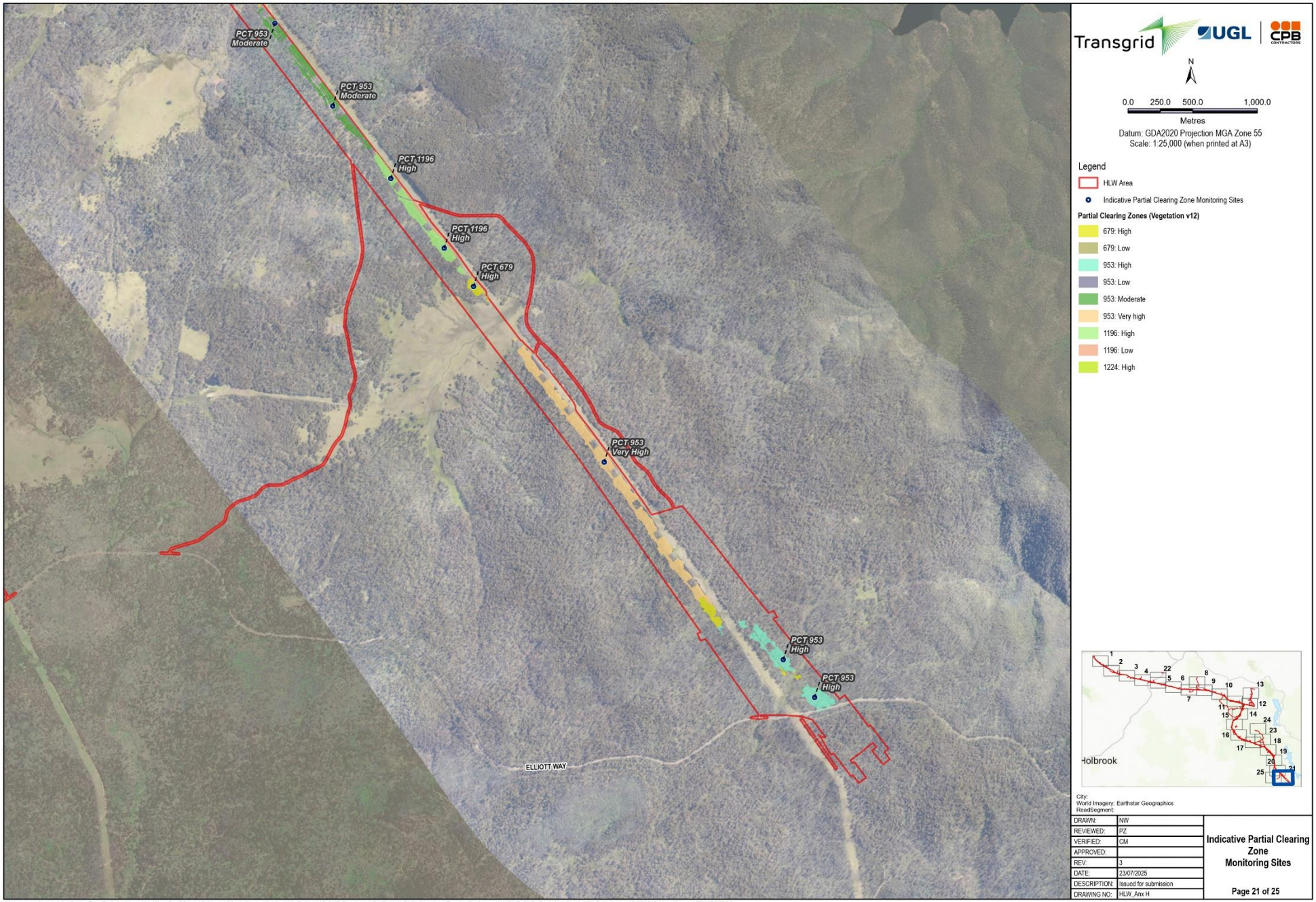

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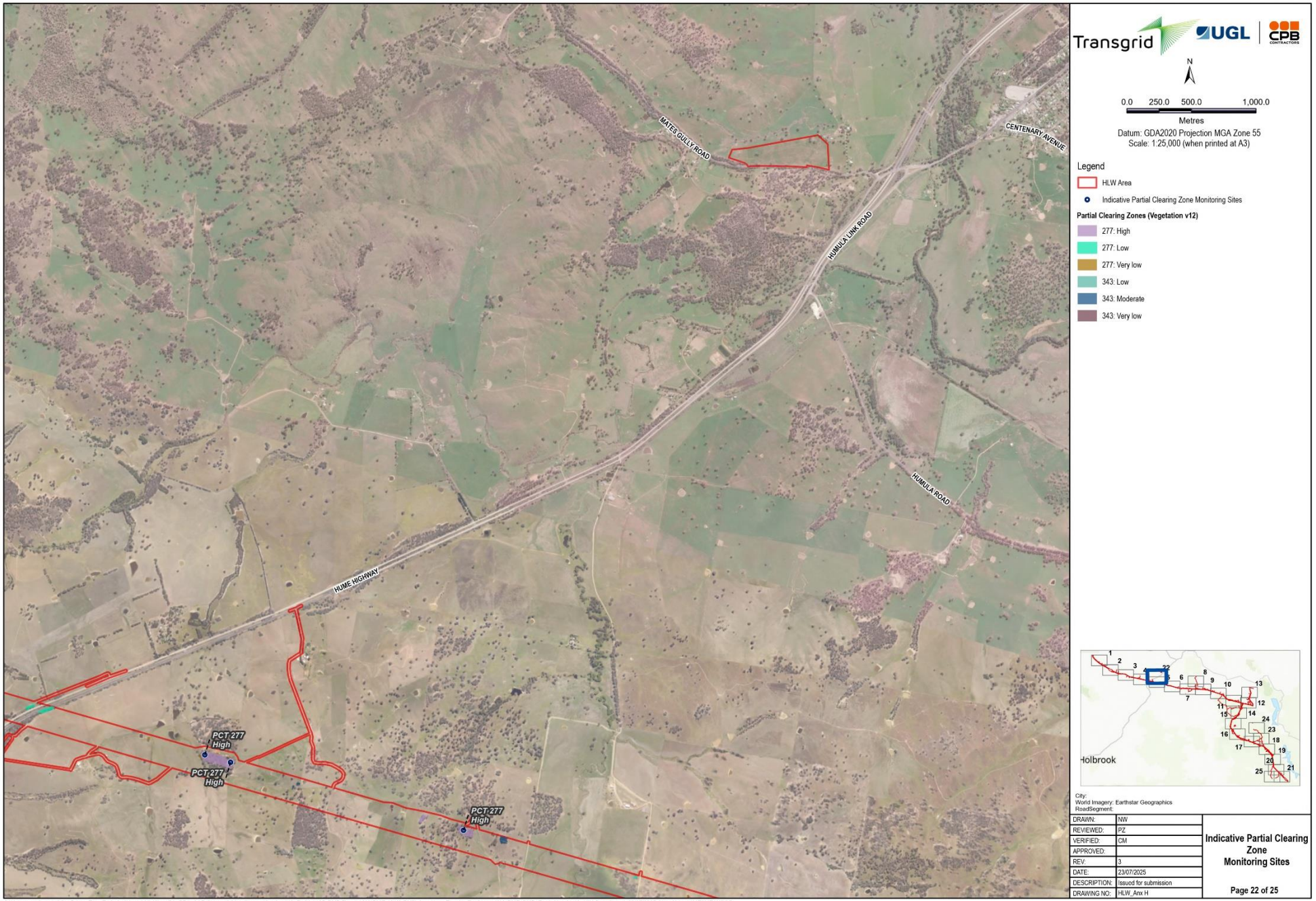

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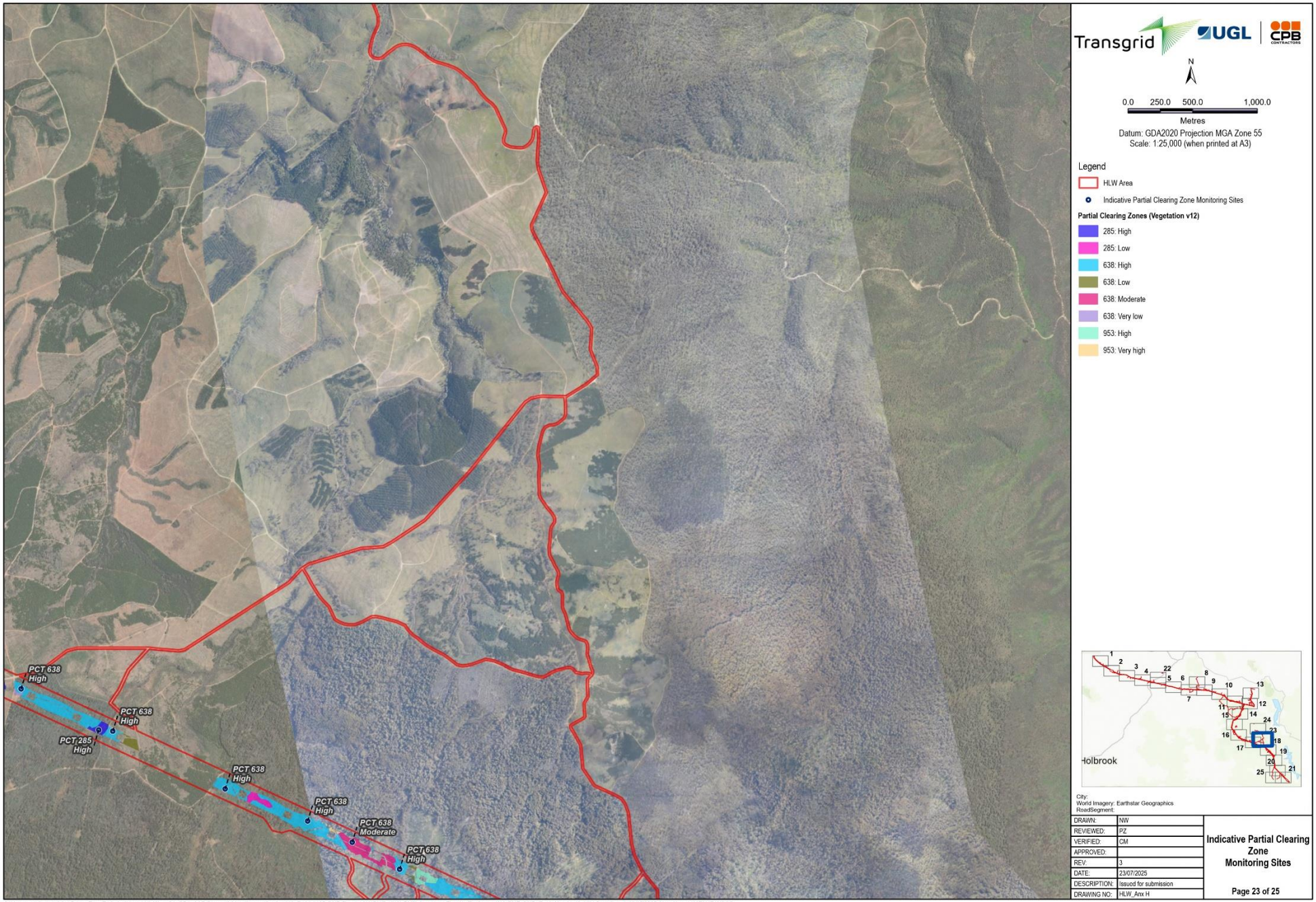

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Metres

Datum: GDA2020 Projection MGA Zone 55
Scale: 1:25,000 (when printed at A3)

Legend

- HLW Area
- Indicative Partial Clearing Zone Monitoring Sites

Partial Clearing Zones (Vegetation v12)

- 285: High
- 285: Low
- 638: High
- 638: Low
- 638: Moderate
- 638: Very low
- 953: High
- 953: Very high

City:
World Imagery: Earthstar Geographics
RoadSegment:

DRAWN:	NW
REVIEWED:	PZ
VERIFIED:	CM
APPROVED:	
REV:	3
DATE:	23/07/2025
DESCRIPTION:	Issued for submission
DRAWING NO:	HLW_Anx H

Indicative Partial Clearing Zone Monitoring Sites

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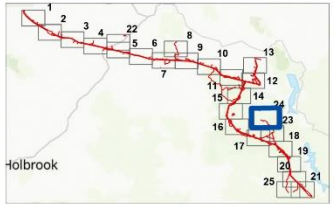
Legend

HLW Area



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DESCRIPTION:	Issued for submission
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Indicative Partial Clearing Zone Monitoring Sites

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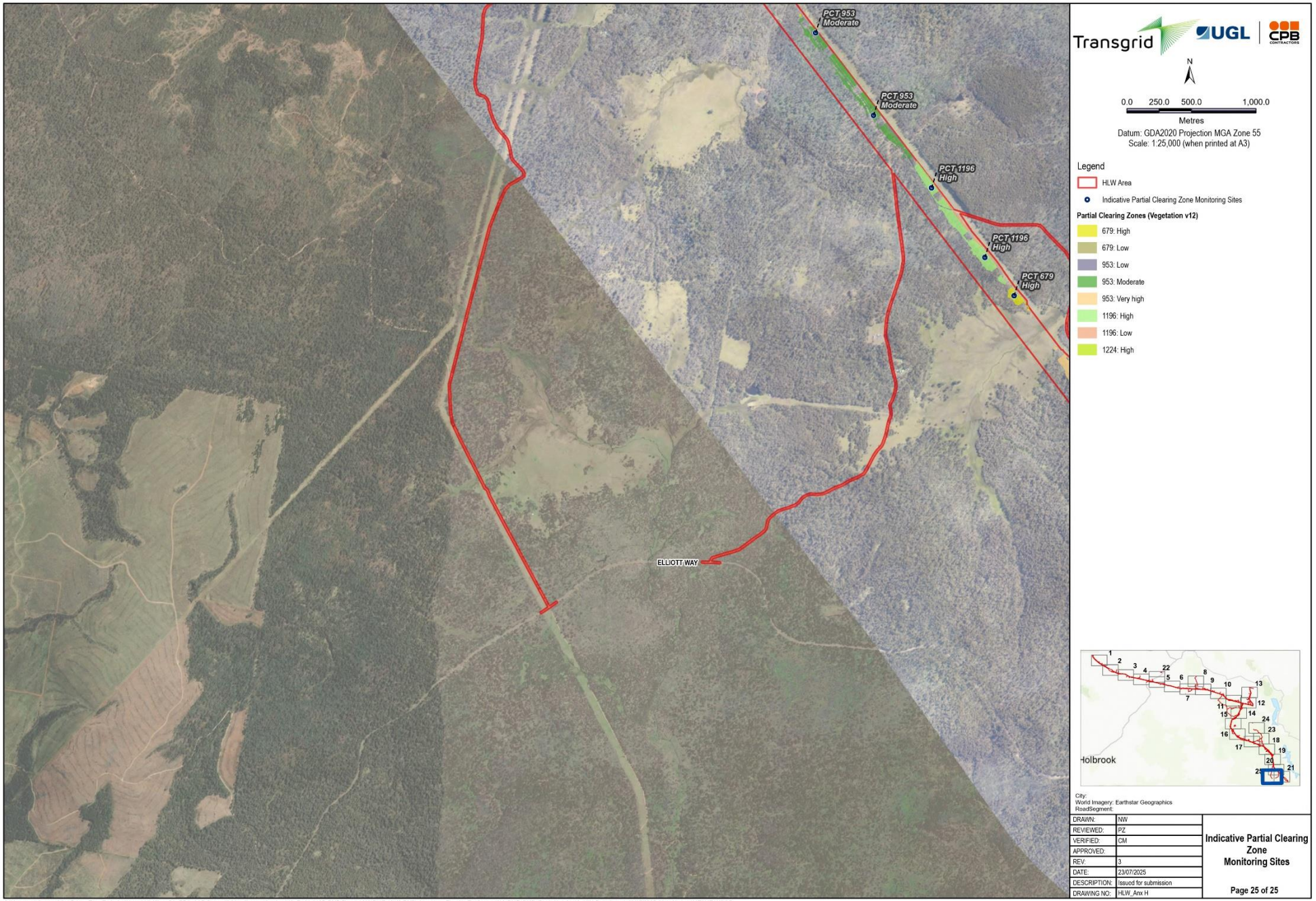

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4.3. Threatened flora monitoring

Threatened flora monitoring is detailed in Table 4-7 below.

Table 4-7 Threatened flora monitoring

Threatened Flora Monitoring
Objective and target
Monitor indirect impacts (e.g., dust, erosion, trampling, weeds) on threatened flora occurring adjacent to disturbance zones. Targets for monitoring include: • No measurable decline in abundance, condition, health, or population extent of threatened flora located within 30 m of disturbance zones. • No increase in weed % compared to control sites.
Location and sampling units
Flora monitoring sites have been identified at all locations where threatened flora species (*Ammobium craspedioides*, *Pimelea bracteata, Prasophyllum bagoense, Prasophyllum keltonii* & *Xerochrysum palustre*) have been recorded within 30 m of disturbance zones during Revised BDAR surveys (Section 4.7), as well as >30 m from disturbance sites (if present) for control sites. If pre-clearing surveys or biodiversity verification reporting identify any additional species within 30 m of disturbance zones, monitoring of impact and control sites will occur in accordance with this monitoring program.
Method
Before-After-Control-Impact (BACI) monitoring as detailed below. Fixed photographic monitoring points and vegetative monitoring 20 x 20 m plot (or 400 m^2 equivalent for linear areas). Each plot must be assessed in accordance with composition and structure plot guidelines listed in the BAM 2020. Plots will be established and permanently marked using a stake at all corners, tagged for future reference. In addition to vegetation monitoring required by the BAM 2020, record the following specific to the targeted threatened flora: • Presence/absence. • Health/condition – score based on leaf colour, turgor, flowering, insect damage, etc. • Recruitment – # seedlings, juveniles. • Dust/erosion – score based on dust accumulation, exposed root, sediment runoff, etc. • Trampling or disturbance – broken stems, soil compaction, vehicular tracks.
Timing, effort and frequency

Threatened Flora Monitoring
Where possible, one monitoring event should be undertaken prior to construction activities occurring, or as close as possible to commencement (ideally within 3 months). Monitoring will then be undertaken annually in Spring and Summer during construction to encompass the approved survey period for current target species: • *Ammobium craspedioides* = Sep-Nov. • *Pimelea bracteata* = year-round. • *Prasophyllum bagoense* = Dec. • *Prasophyllum keltonii* = Jan. Additional monitoring may be required to capture additional flora species identified during pre-clearing surveys or biodiversity verification reporting, with locations incorporated into this program per Section 2.1.
Data analysis
Based on above survey methods, compare vegetation monitoring plot data of pre-construction (if available), control and impact sites, ensuring: • Observed decline in count, cover or recruitment <10% in impact vs control sites, increase in weed cover <10% compared to control sites, OR • No significant change from baseline ($p \leq 0.05$), with enough replicates for statistical analysis, in impact vs control sites.
Reporting
Annual threatened flora monitoring will be summarised in the BMP Monitoring Report, including the following: • Details of monitoring methods. • Results and observations – monitoring plot data, threatened species occurrence, health, recruitment, existing disturbance etc. • Discussion/interpretation of impacts – comparison of impact monitoring data with pre-clearing/control data to: ◦ Identify decline in abundance, condition, health, or population extent of threatened flora. ◦ Identify increased disturbance (e.g., dust, erosion, trampling). ◦ Investigate potential causes, HLW-related or otherwise. ◦ Investigate consequence of impacts on target flora. • Adaptive management (per the below). Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.
Adaptive management

Threatened Flora Monitoring
• Initial investigation to document potential causation between decline and HLW construction related impacts. • Development of a mitigation plan, in consultation with NSW DCCEEW Environment and Heritage, addressing causes of decline as determined in initial investigation. • If this is ineffective, undertake seed collection and propagation from in-situ populations (if appropriate) and try to re-establish local populations. This will be accompanied by additional monitoring. • If this is ineffective, additional offsets may be required.

4.4. Threatened owl, cockatoo and parrot monitoring

Threatened owl, cockatoo and parrot monitoring is detailed in Table 4-8 below.

Table 4-8 Threatened owl, cockatoo and parrot monitoring

Threatened Owl, Cockatoo and Parrot Monitoring
Objective and target
Monitor for threatened owls, cockatoos and parrots adjacent to disturbance zones to detect any significant decline or displacement caused by construction activities. Targets for monitoring include: • Occupancy = target species occupy identified natural or artificial hollows. • Breeding activity = evidence of nesting/breeding (e.g., courtship, nesting, incubation, feeding of chicks). • Site fidelity = repeat use of hollows across years. • Artificial hollow use = use of artificial hollows. • Breeding success = breeding events result in successful fledging of young. • Disturbance response = nesting activity maintained in proximity to disturbance zones.
Location and sampling units
All threatened owl, cockatoo and parrot nest trees identified during pre-clearing surveys or biodiversity verification surveys within 100 m of disturbance zones will be subject to monitoring. Each confirmed nest tree will comprise a sampling unit. If nest trees are identified > 100 m from disturbance zones, these nest trees will constitute control sites to monitor for disturbance response.
Method
At all confirmed nest trees within (impact) and over 100 m (control) from disturbance zone, the following will occur: • One motion-triggered or timelapse camera will be installed at each hollow entrance. • One endoscopic camera inspection of the nest hollow will be conducted. • Artificial hollow monitoring per Section 4.1.1.
Timing, effort and frequency

Threatened Owl, Cockatoo and Parrot Monitoring
Prior to clearing, targeted pre-clearing surveys will be undertaken in assumed and known habitats for threatened owls, cockatoos and parrots per Annexure B: Clearing Protocol to identify confirmed nest trees. Following clearing and annually through construction, any nest trees identified within and over 100 m of disturbance zones will continue to be monitored per this program during breeding periods: • Sooty Owl (breeding season = Mar-Sep). • South-eastern Glossy Black-Cockatoo (breeding season = Apr-Aug). • Masked Owl (breeding season = Apr-Nov). • Powerful Owl (breeding season = May-Oct). • Superb Parrot (breeding season = Sep-Nov). • Barking Owl & Gang-gang Cockatoo (breeding season = Oct-Jan). Monitoring is to continue through to fledging.
Data analysis
Based on above survey methods, the following metrics/indicators will be used/analysed: • Occupancy = direct observations of adult birds, chew marks, faeces / whitewash, feathers, prey remains. • Breeding activity = observation of nesting behavior, eggs, chicks, or fledglings. Observation of adults entering hollows repeatedly. • Site fidelity = return of the same species/individuals to known hollows. • Artificial hollow use = artificial hollow use is recorded for target species. • Breeding success = active nests produce successful fledglings. • Disturbance response = ongoing occupancy and breeding activity.
Reporting

Threatened Owl, Cockatoo and Parrot Monitoring

Annual threatened owl, cockatoo and parrot monitoring will be summarised in the BMP Monitoring Report, including the following:
• The name and qualification of contributors to monitoring, data analysis and reporting.
• Date(s) of surveys.
• Survey methods and extent, including maps of impact and control nests (if relevant).
• Distance from disturbance for each monitored nest.
• Weather conditions.
• Survey results per monitored nest including:
  ◦ Species and numbers of individuals.
  ◦ Direct and indirect (e.g., chew marks, presence of feathers or faecal staining) signs of occupancy.
  ◦ Frequency of adult visits.
  ◦ Behaviours indicating incubation (e.g., female remaining inside hollow) and feeding.
  ◦ Presence of nesting material, eggs or chicks.
  ◦ Individual markings (if identifiable) or behaviours suggesting returning pairs.
  ◦ Date of hatching and fledging (if witnessed).
• Results of artificial hollow monitoring, specific to threatened owl, cockatoos and parrots per Section 4.1.1.
• Supporting photographic/video evidence.
• Assessment against targets listed above.
• Recommendations for any additional actions required.
Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.

Adaptive management
• Initial investigation to document potential causation between decline and HLW construction related impacts. • Development of a mitigation plan in consultation with NSW DCCEEW Environment and Heritage, addressing causes of decline as determined in initial investigation. This may include increased monitoring or additional construction-related mitigation measures. • If this is ineffective, additional offsets may be required.

4.5. Threatened frog monitoring

Threatened frog monitoring has been divided into occupancy monitoring (Table 4-9) and habitat monitoring (Table 4-10) listed below.

Table 4-9 Threatened frog occupancy monitoring

Threatened Frog Occupancy Monitoring
Objective and target
Determine species occupancy (i.e., presence or absence) and estimate frog species abundance of the threatened frog target species and document any changes arising from HLW. Targets for monitoring include: • Maintain evidence of threatened frog occupancy comparable to baseline (pre-construction) or control sites. • No reduction greater than 20%.
Location and sampling units
Frog monitoring sites have been identified 250 m upstream (control) and downstream (impact), total transect effort of 500 m in assumed threatened frog habitats. These locations are displayed in Section 4.7, including: • 1 x site for Sloane's Froglet (including 1 control and 1 impact site). • 2 x sites for Yellow-spotted Tree Frog (including 1 control and 1 impact site). • 1 x site for Booroolong Frog (including 1 control and 1 impact site).
Method
Before-After-Control-Impact (BACI) monitoring as detailed below. Aural-visual surveys are to be completed as 500 m transects or, if accessible, through shallow wetlands for a 120-minute period per transect. Each transect is to be physically demarcated to ensure repetition of monitoring events. Monitoring methods include the following, to be completed at each 500 m transect (DPIE, 2020b): • Aural-visual surveys commence with an aural survey where two surveyors listen for calls (in silence and darkness), for a minimum of five minutes. • Visual surveys – Spotlight along the length of the transect to detect frogs via eye-shine. Focus on suitable habitat such as offline pools (for Sloane's Froglet) and emergent aquatic vegetation (Yellow-spotted Tree Frog). A minimum of five minutes should be taken to cover each 50 m of transect with a visual search. • Aural surveys – Listen for target frog calls every 50 m of the transect. Include a call-playback component where a loudspeaker is used to broadcast the calls of target frogs to elicit a response. The call is broadcast continuously through the speaker for a period of no less than two minutes and responses are typically heard within the first minute. The playback period is followed by a two-minute listening period to detect any late responses or responses masked by the sound of the broadcast call. • Record date, weather conditions, species, count, sex (where possible), location (easting and northing as well as descriptive attributes) and observers. • Hygiene protocols to be followed to prevent the spread of chytrid fungus (refer to Annexure E: Biosecurity Management Plan of the HLW BMP).
Timing, effort and frequency

Threatened Frog Occupancy Monitoring
Surveys will be undertaken for 120-minutes per night across 4 nights during the approved survey periods: • Sloane's Froglet = Jul-Aug. • Booroolong Frog = Oct-Dec. • Yellow-spotted Tree Frog = Nov-Dec. Survey must be undertaken after appropriate rainfall (e.g. flooding rains), with at least one monitoring event undertaken, where weather permits, prior to construction works commencing at each site. Ongoing monitoring will occur annually during construction works during the approved survey periods. Surveys during dry, windy and/or cold conditions (when frogs reduce activity) should be avoided.
Data analysis
Based on above survey methods, compare frog occupancy data of pre-construction (if available), control and impact sites, ensuring: • Observed occupancy decline <20% in impact vs control sites, OR • No significant change from baseline/control ($p \leq 0.05$), with enough replicates for statistical analysis, in impact vs control sites.
Reporting
Threatened frog occupancy monitoring will be summarised in the BMP Monitoring Report, including the following: • Details of monitoring methods. • Results and observations – aural visual survey data. • Discussion/interpretation of impacts – comparison of control and impact monitoring data to: ◦ Identify decline in occupancy. ◦ Investigate potential causes, HLW-related or otherwise. ◦ Investigate consequence of impacts on target frogs. • Adaptive management (per the below). Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.
Adaptive management
• Initial investigation to document potential causation between decline and HLW construction related impacts. • Development of a mitigation plan in consultation with NSW DCCEEW Environment and Heritage, addressing causes of decline as determined in initial investigation. This may include increased monitoring or additional construction-related mitigation measures. • If this is ineffective, additional offsets may be required.

Table 4-10 Threatened frog habitat monitoring

Threatened Frog Habitat Monitoring
Objective and target
Monitor potential frog habitats within and adjacent to the HLW Area and document any changes arising from HLW. Targets for monitoring include: • Impact sites retain at least 80% of key microhabitat features (e.g., ground cover, vegetated edge, water retention, shelter objects) post-construction and compared to control sites. • No measurable increase in sedimentation or loss of water-holding capacity in >10% of impact sites. • No measurable increase in weed cover or decrease of native vegetation cover in >10% of impact sites.
Location and sampling units
Frog monitoring sites correlate with occupancy habitat sites detailed in Table 4-9 and shown in Figure 4-2, including control (i.e., upstream) and impact locations (i.e., downstream).
Method
Before-After-Control-Impact (BACI) monitoring as detailed below. A Rapid Aquatic Assessment (RAA) modified from the Australian River Assessment System methodology (Parsons et al., 2002) is to be completed at each monitoring site, comprising a 50 m transect. The start and end points of each 50 m transect are to be physically demarcated to ensure repetition of monitoring events. Photographs are to be taken of each start and end point at an approximate height of 1.5 m. A horizontal field of view of approximately 40° is to be achieved for the central angle of view for human vision (i.e., 40-60°). The following aquatic assessments are to be conducted at each transect:

Threatened Frog Habitat Monitoring

• Stream condition:
  ◦ Flow width (m) averaged from set distance along the stream (5 m, 15 m, 25 m, 35 m, 45 m).
  ◦ Max flow width (m).
  ◦ Min flow width (m).
  ◦ Soil moisture ±3% volumetric water content averaged from set distance along the stream (5 m, 15 m, 25 m, 35 m, 45 m).
  ◦ Clarity/sediment load (0 [no clarity] – 5 [clearest]), and
  ◦ Erosion (0 [no signs of erosion] – 5 [severe]).
• Stream flow type:
  ◦ Pooling.
  ◦ Flowing.
  ◦ Continuous.
  ◦ Discontinuous, or
  ◦ Riffles.
• Aquatic vegetation type:
  ◦ Submerged.
  ◦ Floating, or
  ◦ Emergent.
• Substrate type:
  ◦ Bedrock.
  ◦ Boulder (>256mm).
  ◦ Cobble (64-256mm).
  ◦ Pebble (16-64mm).
  ◦ Gravel (2-16mm).
  ◦ Sand (0.06-2mm), or
  ◦ Clay/Silt (<0.06mm).
• Bank slope:
  ◦ Flat <10°.
  ◦ Low 10 – 30°.
  ◦ Moderate 30 – 60°.
  ◦ Steep 60 – 80°, or
  ◦ Vertical 80 – 90.
 	
This riparian assessment is to be supplemented by photo monitoring points and plot-based vegetation monitoring to be completed in an established 20 x 20 m plot (or 400 m^2 equivalent for linear areas) within the vegetated riparian corridor. Each plot must be assessed in accordance with composition and structure plot guidelines listed in the BAM 2020.

Timing, effort and frequency
At least one monitoring event should be undertaken prior to, or soon after commencement of construction works (within 6 months of construction works commencing). Ongoing monitoring will occur annually during construction works (in spring).
Data analysis
Based on above survey methods, compare frog habitat data of pre-construction (if available), control and impact sites, ensuring: • Impact sites retain at least 80% of key microhabitat features (e.g., ground cover, vegetated edge, water retention, shelter objects) post-construction and compared to control sites. • No measurable increase in sedimentation or loss of water-holding capacity in >10% of impact sites OR significant change from baseline ($p \leq 0.05$) with enough replicates. • No measurable increase in weed cover or decrease of native vegetation cover in >10% of impact sites. No significant change from baseline/control ($p \leq 0.05$), with enough replicates for statistical analysis, in impact vs control sites OR significant change from baseline ($p \leq 0.05$) with enough replicates. • Observed increase <25% with RAA results (accounting for observer bias).

Threatened Frog Habitat Monitoring
Reporting
Threatened frog habitat monitoring will be summarised in the BMP Monitoring Report, including the following: • Details of monitoring methods. • Results and observations – BAM plot and RAA data. • Discussion/interpretation of impacts – comparison of control and impact monitoring data to: ◦ Compare changes in key microhabitat features (e.g., ground cover, vegetated edge, water retention, shelter objects). ◦ Compare changes in sedimentation. ◦ Compare changes in native vegetation and weed cover. ◦ Investigate potential causes, HLW-related or otherwise. ◦ Investigate consequence of impacts on target frog habitats. • Adaptive management (per the below). Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.
Adaptive management
• Initial investigation to document potential causation between decline and HLW construction related impacts. • If the result of a HLW related event, corrective actions to address further impacts, and an assessment of whether remediation of the waterway/riparian corridor is required, undertaken in consultation with NSW DCCEEW Environment and Heritage. • Ongoing monitoring to determine if corrective actions have addressed the impact and avoided long-term impacts. • If this is ineffective, additional offsets may be required.

4.6. TEC monitoring

TEC monitoring is detailed in Table 4-11 below.

Table 4-11 TEC monitoring

TEC Monitoring
Objective and target
Ensure Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens located within no-go zones remain free from direct and indirect construction-related impacts, and maintain ecological condition throughout the construction phase. Targets for monitoring include: • No observable changes in floristic composition, structure or condition. • No increase in weed cover (>5%), physical disturbance or erosion indicators over baseline levels.
Location and sampling unit
The location of TEC will be within no-go zones relevant to Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens (PCT 637), as displayed in Section 4.7. Sampling units will be limited to one to avoid any monitoring-related impacts to the community.
Method
Before / After clearing monitoring as detailed below. Photo monitoring points and plot-based vegetation monitoring to be completed in an established 20 x 20 m plot (or 400 m^2 equivalent for linear areas). Assessed in accordance with composition and structure plot guidelines listed in the BAM 2020.
Timing, effort and frequency
Monitoring points will be established prior to the commencement of clearing to establish baseline metrics. These would be documented in Pre-clearing Reports or BMP Monitoring Reports. The first post-clearing monitoring event should occur within three months of the commencement of clearing at the nominated monitoring site. Follow-up monitoring would then occur annually there-after through construction.
Data analysis
Based on above survey methods, compare vegetation monitoring data of baseline (including Revised BDAR data) and impact sites, ensuring: • No observable changes in floristic composition, structure or condition OR no significant change from baseline/control ($p \leq 0.05$), with enough replicates for statistical analysis. • No increase in weed cover (>5%), physical disturbance or erosion indicators over baseline levels.

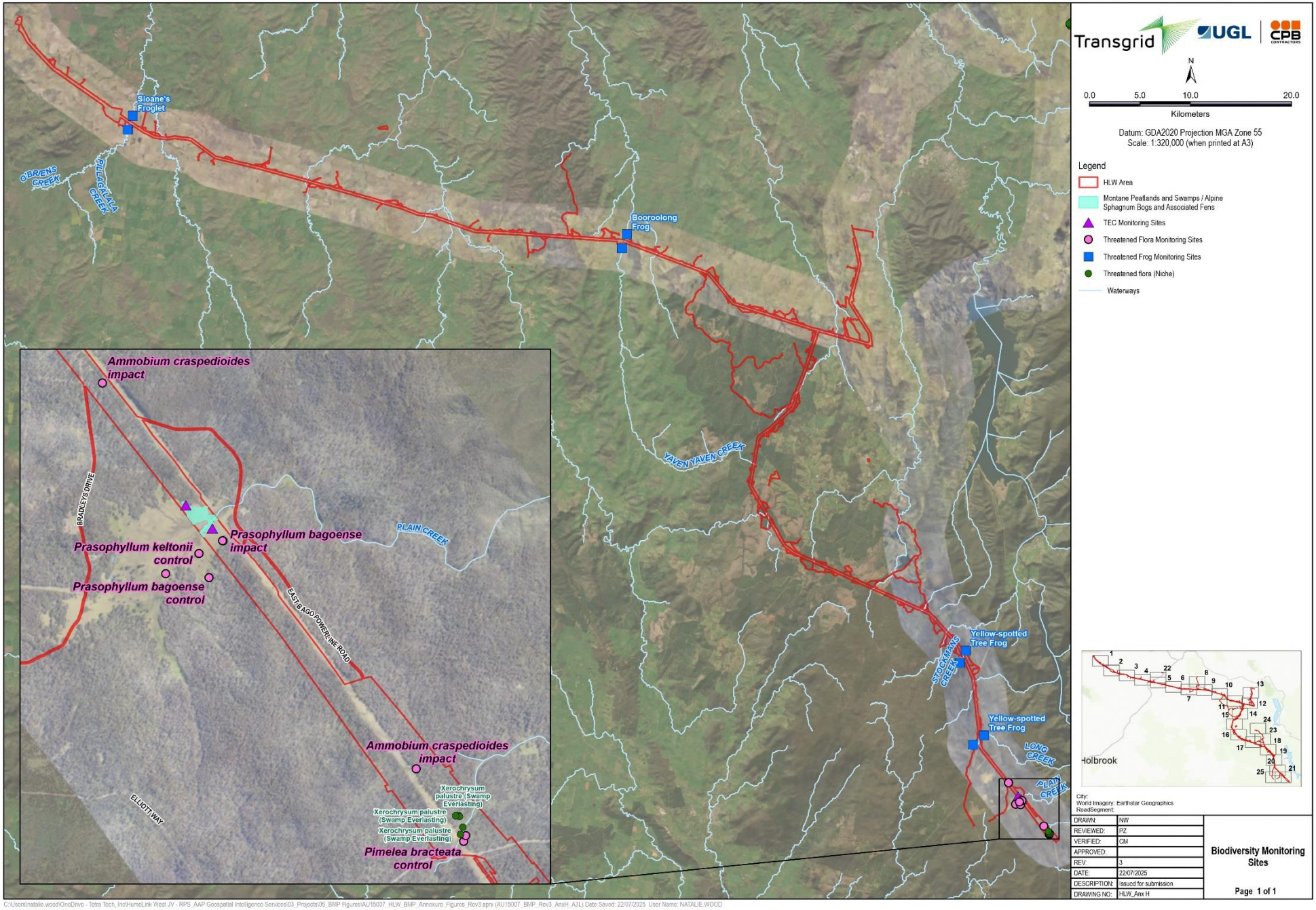
TEC Monitoring
Reporting
TEC monitoring will be summarised in the BMP Monitoring Report, including the following: • Details of monitoring methods. • Results and observations – BAM plot monitoring of floristics, associated vegetation integrity score. • Compliance assessment: ◦ Tracking of vegetation integrity scores against baseline data. ◦ Comparison of post-clearing floristic species richness and cover by growth form type for native species with pre-clearing data and Revised BDAR data to identify any losses or gains in native species composition. ◦ Comparison of post-clearing cover and species richness for exotic flora species compared with pre-clearing data and Revised BDAR data to identify any weed introductions or increases to exotic flora species cover. ◦ Confirmation of compliance with clearing requirements and reporting on any excessive clearing. ◦ Investigation of potential causes, HLW-related or otherwise • Adaptive management (per the below). Annual BMP Monitoring Reports will be provided to CPHR, NPWS, FCNSW and DCCEEW as soon as they are available.
Adaptive management
• Initial investigation to document potential causation between decline and HLW construction related impacts. • If the result of a HLW related event, corrective actions to address further impacts, and an assessment of whether remediation of the TEC is required, undertaken in consultation with NSW DCCEEW Environment and Heritage. • Ongoing monitoring to determine if corrective actions have addressed the impact and avoided long-term impacts. • If this is ineffective, additional offsets may be required.

4.7. Monitoring sites

Monitoring sites have been developed as part of this strategy based on Revised BDAR data, as displayed in Figure 4-2. This includes:

- Control and impact sites for threatened flora monitoring – *Ammobium craspedioides, Pimelea bracteata, Prasophyllum bagoense, Prasophyllum keltonii* and *Xerochrysum palustre.*
- Control and impact sites for threatened frog monitoring – Sloane's Froglet, Yellow-spotted Tree Frog and Booroolong Frog.
- Monitoring site for Montane Peatlands and Swamps / Alpine Sphagnum Bogs and Associated Fens (PCT 637 no-go zone).

Additional monitoring sites will be added if pre-clearing surveys or biodiversity verification reporting identify additional locations of target flora (within 30 m of disturbance zones), fauna or TECs, and will be subject to the monitoring program detailed in Section 4.



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Annexure I Author's Qualifications and Experience

Annexure J Additional and Appropriate Measures under Condition B30(d)(xiii)

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Monday, 2 September 2024

Allison Treweek
Senior Team Leader, Southeast Conservation Planning Team, Biodiversity Conservation Division
NSW Department of Climate Change, Energy, the Environment and Water
11 Farrer Place, Queanbeyan, NSW, 2620

Dear Allison,

Transgrid's proposals for additional and appropriate measures to compensate the likely serious and irreversible impacts arising from HumeLink

The aim of this letter is to present Transgrid's proposal for Additional and Appropriate Measures (A&AM) for all the Serious and Irreversible Impact (SAII) entities that will likely be subject to SAII due to the biodiversity impact of the HumeLink project (SSI-36656827).

Table 1 - Summary of SAII entities identified in the draft amended Biodiversity Development Assessment Report (BDAR -Revision C) for HumeLink that are likely to be subject to a SAII.

Entity names	SAII principle*	Direct impact (ha)
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland (**Box Gum Woodland or BGW**)	Principles 1** & 2†	477.91
Pimelea bracteata (**Rice Flower**)	Principle 2	4.76
Tyto tenebricosa (**Sooty Owl**)	Principle 4‡	68.81

*As per clause 6.7 the Biodiversity Conservation Regulation (2017) NSW.
SAII due to a further decline of the species or ecological community that is currently in a **rapid rate of decline.
† SAII due to a further reduction in the population size of the species or ecological community that already has a **very small population size.**
‡SAII due to the species being **unlikely to respond to measures to improve its habitat.**

The objective of this letter is to:

- Outline Transgrid's A&AM proposals for the entities listed in Table 1 to the NSW Biodiversity Conservation and Sciences Division (BCS).
- Provide sufficient detail about each A&AM to enable drafting of Conditions of Approval.

Legislative framework

Section 7.16 of the *Biodiversity Conservation Act 2016* NSW states that where state significant infrastructure is likely to have serious and irreversible impacts on biodiversity values, the Minister is required to determine whether there are any additional and appropriate measures that will minimise those

impacts if consent or approval is to be granted. The *Biodiversity Conservation Regulation 2017* does not elaborate on the meaning of 'additional and appropriate measures', there is no case law from the NSW Land and Environment Court defining the term, and there are no published NSW Government guidelines. Hence, the content of A&AM has largely been determined through consultation with the NSW BCS, the outcomes of which are documented below.

Consultation

Transgrid and BCD formally consulted about A&AM on the following dates:

- Wednesday 13 March 2024
- Wednesday 10 May 2024
- Monday 13 May 2024
- Wednesday 22 May 2024
- Wednesday 12 June 2024

Additional informal consultation occurred outside of these dates. A summary of the outcomes of this consultation can be found below:

- A&AM would ideally occur within the same IBRA region as the impact.
- A&AM must be additional to the biodiversity offset measures required to be delivered for the HumeLink project.
- Preparation, establishment and funding of a Local Area Management Plan (LAMP) is a recommended option for **Box Gum Woodland** A&AM.
- A LAMP would seek:
    - to deliver a landscape-scale restoration project, and may be based upon an indicator species model of conservation ecology
    - a net increase in the area of occupation and condition of BGW
    - to enhance ecosystem function and connectivity across the target landscape
    - establish a long-term landscape management program with potential for self-perpetuation
    - incorporate community engagement, capacity building, ownership and financial incentive as a foundation of the program
- Options for **Rice Flower** A&AM include:
    - seed and vegetative material collection
    - germination trials to understand seed dormancy and germination mechanisms
    - genetic sequencing
    - propagation of individuals from seed and vegetative material

- translocation to a secure site
- funds for the management of *in situ* populations on private land such as herbivore fencing

- Options for **Sooty Owl** A&AM include:
  - Experimenting with restoration methods such as different nest box designs
  - Nest box monitoring
  - Project management and reporting

A&AM Proposal 1 - BGW – Bango to Burrinjuck LAMP

Proposal 1 overview

For BGW, we propose the design and delivery of a Local Area Management Plan (LAMP) that:

1. Guides the establishment of a pragmatic, deliverable, landscape-scale conservation initiative to compensate for SAII impacts
2. Is located near the impact footprint of HumeLink
3. Spans an area historically covered by Box Gum Woodland
4. Seeks to establish ecological connectivity within a currently fragmented landscape
5. Incorporates community engagement, capacity building, ownership and value as a foundation of the program
6. Provides for an indicator species approach, facilitates adaptive management and has clear performance targets
7. Has the potential for self-perpetuation through community engagement

Proposal 1 seeks to prepare and seed-fund a LAMP that aims to re-establish ecological connectivity between Bango and Burrinjuck Nature Reserves (NR) (see Figure 1). The proposed corridor has an indicative distance of 31 - 47 km (yellow hashed lines in **Figure** 1) and would aim to increase ecological connectivity by restoring patches of remnant woodland, or 'stepping stones' along its path (see purple polygons **Figure** 1 for existing remnants).

The indicator species model uses the population of a specific species as a proxy for improvement in whole-of-ecosystem function. The most common indicator species are animals, and quantitative information on that species' presence and abundance is used as a surrogate that indicates the quality of the environment around it. The selection of the indicator species is determined by the objectives of the restoration program.

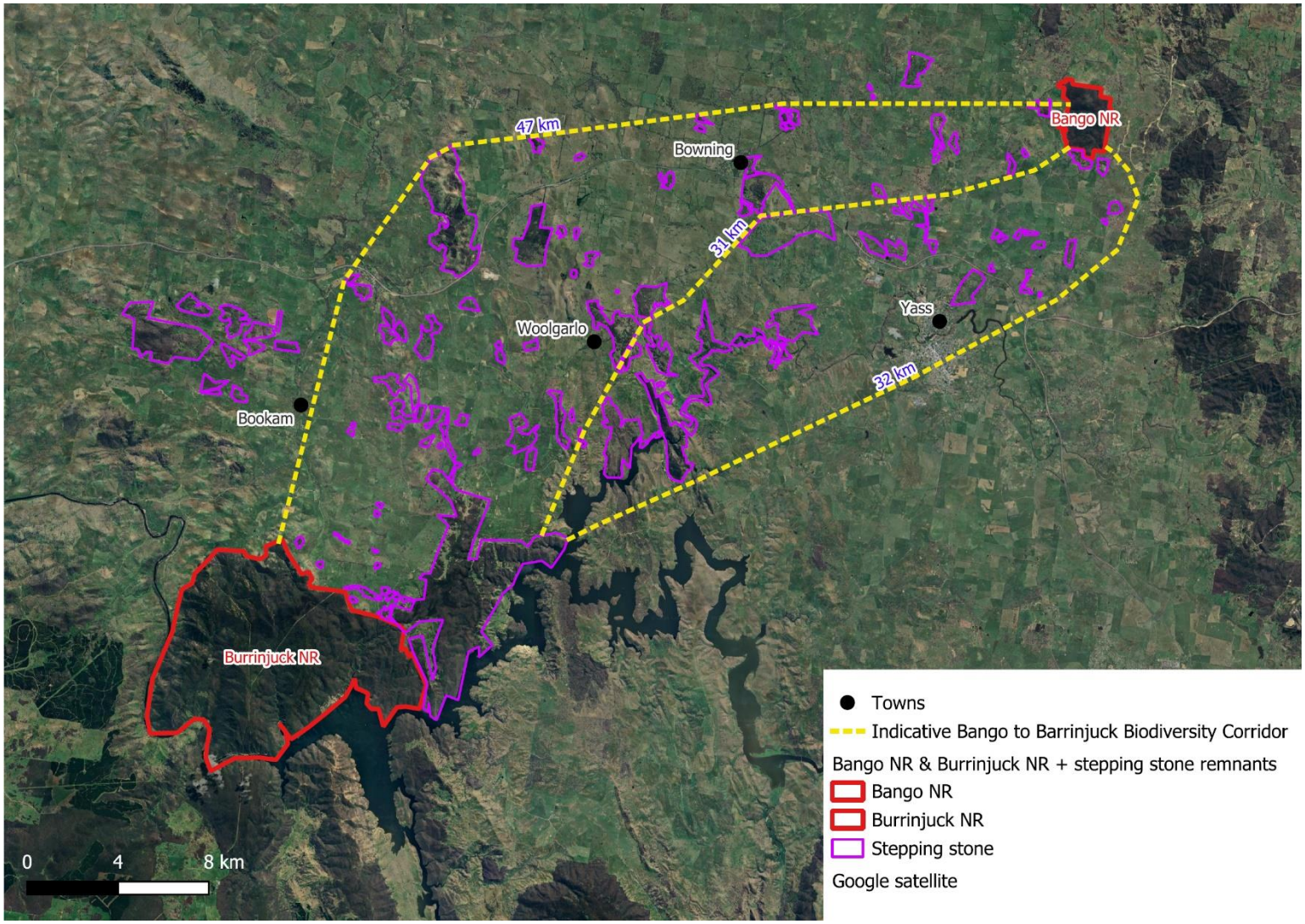

Figure 1 – indicative biodiversity corridor for a LAMP that connects Bango NR to Burrinjuck NR.

LAMP Elements

The key elements of the LAMP are:

- **Scientific review** to determine minimum requirements of a landscape connectivity network aimed at expanding extent of target indicator species populations.
- **Extensive landholder engagement and co-design** to identify a practical and achievable landscape connectivity corridor.
- **Develop a LAMP** including **mapping** to guide targeted strategic management and restoration works**,** a **Restoration Management Plan**, performance targets and **monitoring plan**.
- **Establish a steering committee** of key stakeholders that meet quarterly to determine how funds will be allocated. This committee might include representatives from:
  - The Ecosystem and Threatened Species (EaTS) team in the NSW BCS
  - The landholder network within the landscape connectivity corridor, including Local Aboriginal Land Councils
  - Landcare
  - Regen Farmers Mutual
  - Transgrid
- Identify and **engage network of landholders**. This might involve:
  - A formal process of educational workshops and mentoring driven by organisations with expertise in landholder engagement and regenerative agriculture such as Regen Farmers Mutual.
  - Co-design of the LAMP with landholders
  - Financial support to facilitate landholders in adjusting their enterprises in a way that ensures future sustainability of restoration actions.
  - Normalising behaviours to promote protection of indicator species and BGW.
  - Engaging indigenous landholders in the LAMP catchment area.
  - Establishing communication networks among landholders so that they can share their experience with the LAMP.
- **Provide seed-funds** to initiate LAMP delivery
- Establish long-term **funding structures** that maximise likelihood of achieving LAMP goals. This would include connecting the network of landholders to emergent sources of green finance such as:
  - Biodiversity Credits arising from the voluntary nature positive markets, both domestic and international
  - Generation of Australian Carbon Credit Units (ACCUs)
  - Partnering with large consumer businesses who are seeking to reduce scope 3 emissions in their supply chain
  - Philanthropy

- **Monitoring program** to measure project success against LAMP performance targets and facilitate adaptive management.

A primary benefit of a LAMP approach to A&AM compared to establishment of additional offsets is the prospect of delivering landscape-scale outcomes over a much larger land area than would be possible under Biodiversity Stewardship Agreements (BSA).

A LAMP aiming to design and deliver the Bango to Burrinjuck Biodiversity Corridor aligns with an existing project driven by Landcare's Yass Area Network (YAN) called Habitat Hops.

Funding and delivery model

For the purposes of costing the LAMP we have assumed the following:

- 2.5 FTEs across BCS, Transgrid and Landcare for a period of 3 years to undertake LAMP design, delivery, monitoring, reporting, GIS mapping and geospatial analysis, statistical analysis, project management, coordinate landholders, coordinate volunteers, and provide expert ecological advice.
- 0.5 FTE in Landcare for a period of 7 years (years 4-10) to manage ongoing delivery and funds disbursement.
- Engagement of consultants with expertise in agro-economy and regenerative agriculture to build and maximise landholder participation.
- Supply and installation of 57,500 local provenance tube stock
- Monitoring equipment (monitoring labour to be provided by landholders and funded staff)
- Ongoing costs such as software licenses, safety advice, contingency and project management
- Approximately 50 landholders would contribute to LAMP delivery

We estimate the total cost of design and delivery of a LAMP that creates a biodiversity corridor connecting Nature Reserves (NR) such as Bango NR and Burrinjuck NR to be **$6,318,000.00** (see sheet two in attached spreadsheet).The Biodiversity Stewardship Payment Fund (BSPF) or a similar trust fund mechanism could be investigated as a model for distributing funds over the life of the program.

Justification

Our proposal to prepare, fund and deliver a LAMP targeting BGW restoration via an indicator species model is **additional** to the offsets being provided for impacts of the HumeLink project upon BGW because it:

- Provides a framework and funding for the **restoration of 477.91 ha of BGW** through a landscape-scale ecological connectivity project
- Seeks to establish **biodiversity connectivity** between two nature reserves separated by 31 - 47 km.
- Seeks to build knowledge and capacity of biodiversity conservation and restoration initiatives within the local community by establishing a network of landholders who are committed to implementing, promoting and stewarding the LAMP.
- Has potential to become a long-term self-sustaining community conservation model that delivers positive habitat management and restoration outcomes beyond the scope of the LAMP.

Our proposal for **BGW is appropriate** because:

- It is costed to deliver a biodiversity corridor **within the same IBRA subregion** as the impact site
- The biodiversity corridor is planned within a **landscape historically covered by BGW**
- The LAMP proposal is a **landscape scale project** to match the HumeLink footprint.

A&AM Proposal 2 - Rice Flower – genomically diverse seed collection strategies

Proposal 2 overview

For Rice Flower, we propose a program to undertake seed and vegetative material collection and propagation, followed by genetic analysis to determine if translocation is suitable, and if so, how a translocation plan would be designed to maximise genetic diversity. Additionally, we have costed for either *in situ* management of a population or translocation of an *ex situ* population to a site secured by an in-perpetuity conservation covenant. The option chosen would be determined by the results of the genetic analysis and consultation with the Accountable Officer for Rice Flower.

Elements

Undertake the following conservation management actions:

- seed collection and vegetative tissue sampling across the known distribution of the Rice Flower (i.e. not confined to the area subject to direct impact).
- genomic sampling and sequencing to comprehensively assess the level of genomic diversity present across the species' natural distribution, which will inform seed collection strategies.
- sampling, storing and testing of collected germplasm material to guarantee representation of the species *ex situ*, and improve our understanding of seed viability and germination traits.
- seed and vegetative propagation with the aim of growing 50 juveniles.
- translocation of propagated individuals to a site secured by an in-perpetuity conservation covenant with the aim of establishing 50 individuals to sexual maturity OR management of existing *in situ* populations of Rice Flower on McPhersons Plain.
- Annual reporting to the BCD accountable officer for Rice Flower.

This proposal will:

- contribute to our understanding of the reproductive and genetic health of the species, which is vital information in supporting a species that is facing rapid decline and adverse effects of anthropogenic development.
- guide seed sourcing strategies to support genomically representative collections for *ex situ* seed banking and conservation actions (e.g., translocation).
- provide recommendations on the seed germination traits that contribute to the likelihood of plant recruitment *in situ* as well as *ex situ* propagation success.
- develop guidelines that support conservation efforts and future management actions leading to the long-term survival of the species (e.g., translocation, population supplementation, living collection propagation).

The value of the genomic sampling is threefold. Firstly it applies the principle of '*first do no harm'* by ensuring we don't undertake a translocation which introduces alleles that swamp distinct populations, thereby inadvertently reducing genetic diversity and the species' overall resilience. Second, it ensures that if a translocation is undertaken, we select the individuals with maximum genetic diversity and position them

in a way which is most likely to result in cross-pollination. And thirdly, it will determine if *Pimelea bracteata* is in fact a distinct population from its nearest relative *Pimelea ligustrina.*

Funding and delivery model

We estimate the total cost of delivery of the above conservation management actions for Rice Flower to be approximately **$271,900.00** (see sheet three in attached spreadsheet). This costing is based on the proposal developed by Dr Nathan Emery (also attached) of the Botanic Gardens of Sydney (BGS) and would engage two of their expert teams, including:

- Seedbank & Conservation Collections (SBCC), and
- Research Centre for Ecosystem Resilience (ReCER).

Transgrid have also budgeted translocation costs such as fence installation, fence maintenance, weed control, watering and monitoring. However, we note that the detailed design of any translocation program is contingent on the results of the genomic analysis undertaken by BGS, which may advise against a translocation. Instead, we have costed management actions for the preservation of an existing *in situ* population as a proxy for translocation cost. The funds that have been costed for management of an *in situ* population of Rice Flower could be reallocated to translocation of an *ex situ* population. However, all major management decisions would be made in consultation with the Accountable Officer for the species.

Justification

Our proposal for Rice Flower is **additional** for the following reasons:

- It would undertake genetic analysis and seed collection on a **representative sample** of the of the **entire population** of Rice Flower, not just the impact population.
- It would result in **knowledge** about how to relax the species' **physiological dormancy** and then **trigger germination.** Rice Flower is a notoriously difficult species to propagate from seed.
- It will determine if *Pimelea bracteata* is a distinct population from its nearest relative *Pimelea ligustrina.*

Our proposal for Rice Flower is **appropriate** for the following reasons:

- It pertains to both the **impact population** and the **entire population**.
- It indirectly addresses one of the key threatening processes (dieback) by enabling the **maintenance of genetically diverse *ex situ* populations.**
- The results of the genetic analysis would be used for **adaptive management**

A&AM Proposal 3 – Sooty Owl – Breeding Habitat Restoration

Proposal 3 overview

For Sooty Owl, we are proposing to implement habitat restoration actions at a yet-to-be determined site. Transgrid would seek to deliver all restoration actions at a site secured by an in-perpetuity conservation covenant (such as a Biodiversity Stewardship Agreement or Conservation Agreement under the *Biodiversity Conservation Act 2016*). Restoration activities would focus on artificial measures to reinstate Sooty Owl breeding habitat including different artificial nest hollow designs. The efficacy of the restoration measures would be monitored and analysed by funding a PhD student over the three-year project timeframe.

Elements

The restoration might include the following, however, detailed design of any conservation actions would be undertaken in consultation with the BCD Accountable Officer for Sooty Owl and any future PhD student:

- Installation and monitoring of the artificial nest hollow designs at a site secured by an in-perpetuity conservation covenant. Artificial nest hollow designs might include:
  - A **chainsaw cavity and entrance** where the arborist uses a chainsaw to carve out a suitably sized cavity and entrance in a tree limb or trunk. The carving would occur into mature trees with >40cm trunk diameter.
  - A **chainsaw entrance to existing cavity** where the arborist creates access to a previously inaccessible, internal tree cavity.
  - A completely artificial **plastic nest box** (such as those made by Habitat) where a thermally stable, manufactured nest box is attached to a tree. Attachment of nest boxes would occur through a mounting bracket system, which is designed to enable the tree to scar over the bracket. The habitat nest box itself involves a modular, stackable design and multiple entry configurations suitable for the species.
  - A completely artificial, **traditional plywood nest box**. This would involve mounting nest boxes with pre-determined dimensions on existing trees using the Habisure system. The standard nest box would include a hinged, sloping lid, and a suitably sized entrance hole and incised ladder for easy access.
- **Funding a PhD student** to design the study, monitor Sooty Owl response to restoration management actions and analyse results. The study would include assessment of relative efficacy of each active restoration management action. Note that while research intro restoration management actions may not be appropriate for entities such as BGW, we consider it to be essential for Sooty Owl given it is listed as an SAII entity under Principle 4, which states that the *'species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.'* Additionally, the Biodiversity Conservation Trust's Guidelines on Artificial Hollows and the NSW Recovery Plan for Sooty Owl both state *'The potential for artificial hollows (nest-boxes) to fast-track habitat development for owls should be investigated.'* Therefore, research is required to uncover methods that may improve the species habitat.

During consultation with the EaTS in May and June 2024, they indicated the preferred management action for Sooty Owl would be installation of nest boxes because additional management actions, such as

supplementary planting or installation of coarse woody debris, could interfere with scientific robustness of monitoring efforts.

Funding and delivery model

We estimate the total cost of delivery of the above restoration actions for Sooty Owl to be approximately **$473,900.00** (see sheet four in attached spreadsheet).

Justification

Our proposal for Sooty Owl is **additional** for the following reasons –

- It will **generate knowledge** about the efficacy of untested habitat restoration methods for the species

Our proposal for Sooty Owl is **appropriate** for the following reasons –

- It aims to **address one of the key habitat constraints** for the species, being large cavities for breeding
- It contains a **research component**, which is consistent with listing as SAII under Principle 4

Summary of A&AM proposals

In summary, Transgrid is proposing a total of **$7,063,800.00** of additional and appropriate measures to compensate for 524.91 ha of likely SAII to three SAII entities as a result of HumeLink's development footprint (See Table 2). This is equivalent to **$12,808.00** per ha of SAII.

Table 2 – Summary of the value of additional and appropriate measures proposed to compensate for HumeLink's likely serious and irreversible impact.

SAII entity	SAII impact (ha)	Additional and appropriate measure ($)	Cost per ha for A&AM
Box Gum Woodland	477.91	$6,318,000.00	$13,220.00
Rice Flower	4.76	$271,900.00	$57,121.00
Sooty Owl	68.81	$473,900.00	$6,887.00
Total	**551.48**	**$7,063,800.00**	**$12,808.00**

For further detail on how costings were calculated, please refer to the attached spreadsheet and zip folder containing proposals and quotes, or contact Mal Barnes [redacted]

Yours faithfully,

Daniel Whaite

Biodiversity Manager

2 September 2024

Annexure K Biodiversity figures