



Modification 16 Northern Tailings Storage Facility Buttress Optimisation

Attachment C
Photomontages Report





Cadia Valley Operations Modification 16 NTSF Buttress Optimisation

Photomontages

Cadia Valley Operations Modification 16 NTSF Buttress Optimisation

Photomontages

Prepared for
Cadia Holdings Pty Limited

Project Number
2926

Revision
I

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Edit / Review
CC / CC

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Photomontage Development Methodology

The process for generating the photomontages involves computer generation of a 3D model wire-frame perspective view of the Modification and the topography from each viewpoint. **Figure 01** demonstrates the process of photomontage development.

Step 1

Develop 3D Model

Where available, the engineering design models supplied by the project engineers are incorporated directly into the assessment. If these models are not provided, a detailed 3D model of the proposed element is developed by the project team based on the engineers' drawings. All proposed elements are geo-referenced to scale within the digital environment.

The terrain surface is constructed using LiDAR survey data supplied by the client, to the extent that coverage is available. For broader contextual terrain outside the surveyed area, publicly available Digital Elevation Model (DEM) data is sourced from ELVIS – Elevation and Depth (Foundation Spatial Data)¹.

Step 2

Align Photograph and Model

The geographic coordinates of each viewpoint are recorded at the time of photography. These coordinates are transformed into the relevant spatial reference system to obtain precise easting and northing values, enabling accurate alignment with the engineering model and project drawings.

A virtual camera—equivalent to a 50 mm focal length—is positioned within the 3D model at the viewpoint location, set at an eye height of 1.5 m above ground level (AGL). To replicate the field of view that is captured in 360 degree 50mm focal length panoramic photographs taken at each of the viewpoints. The program then generates 24 rendered images at 15-degree intervals which are subsequently stitched into a full 360-degree panoramic rendered image for each viewpoint. This 360 degree image is then used to create the 180 degree and 60 degree photomontages in the report. A 180 degree cylindrical panoramic image is prepared to provide broader visual context. Due to the nature of cylindrical projection, this format may introduce perceptual differences when compared with normal human perspective, particularly in the foreground. A 60 degree cropped view is therefore extracted from the panorama, as this more closely represents the perspective and field of view perceived by the human eye.

Topography, control points, visible obstacles, and existing landscape features are used as reference markers to calibrate the rendered panorama against the real-world photograph. Additional verification is undertaken using 2D spatial information software to confirm the horizontal angle of view, camera orientation, and overall alignment between the rendered output and the photographed panorama.

Step 3

Render Photomontage

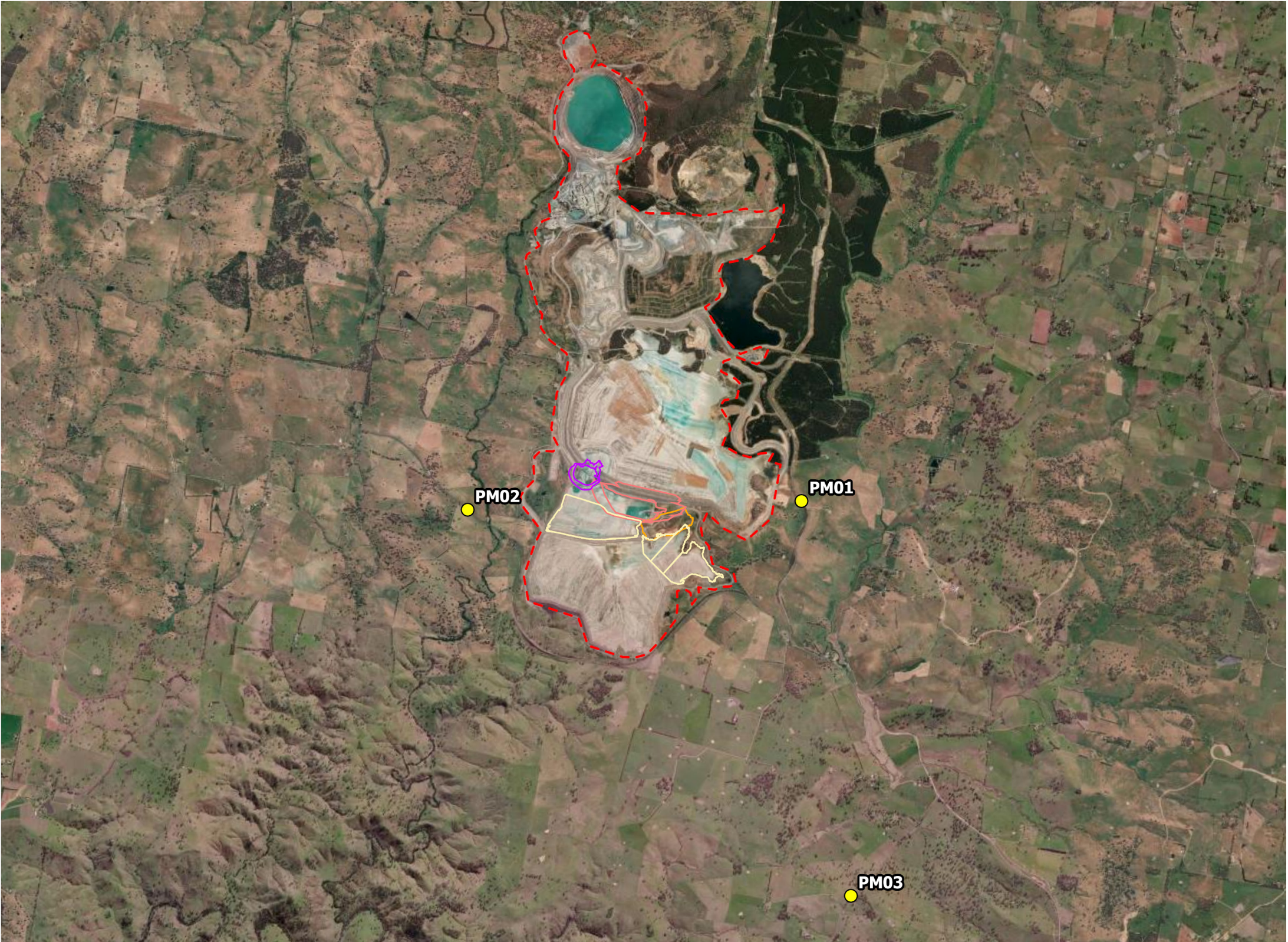
Materials and textures are applied to the 3D model based on reference imagery and design information provided by the client. The model is then geo-located, and the corresponding solar position and location of the original photograph is applied to replicate real-world lighting and shadow conditions. Once rendered, detailed removal of intervening elements (such as vegetation) is undertaken to provide an accurate representation of the Modification.

Figure 02 shows the locations of photomontages prepared for the Modification.

¹ ELVIS – Elevation and Depth: <https://elevation.fsdf.org.au/>



Figure 01 Photomontage Development

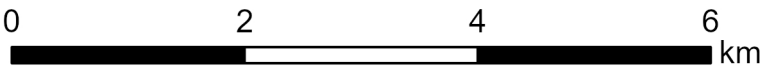


Photomontage Locations

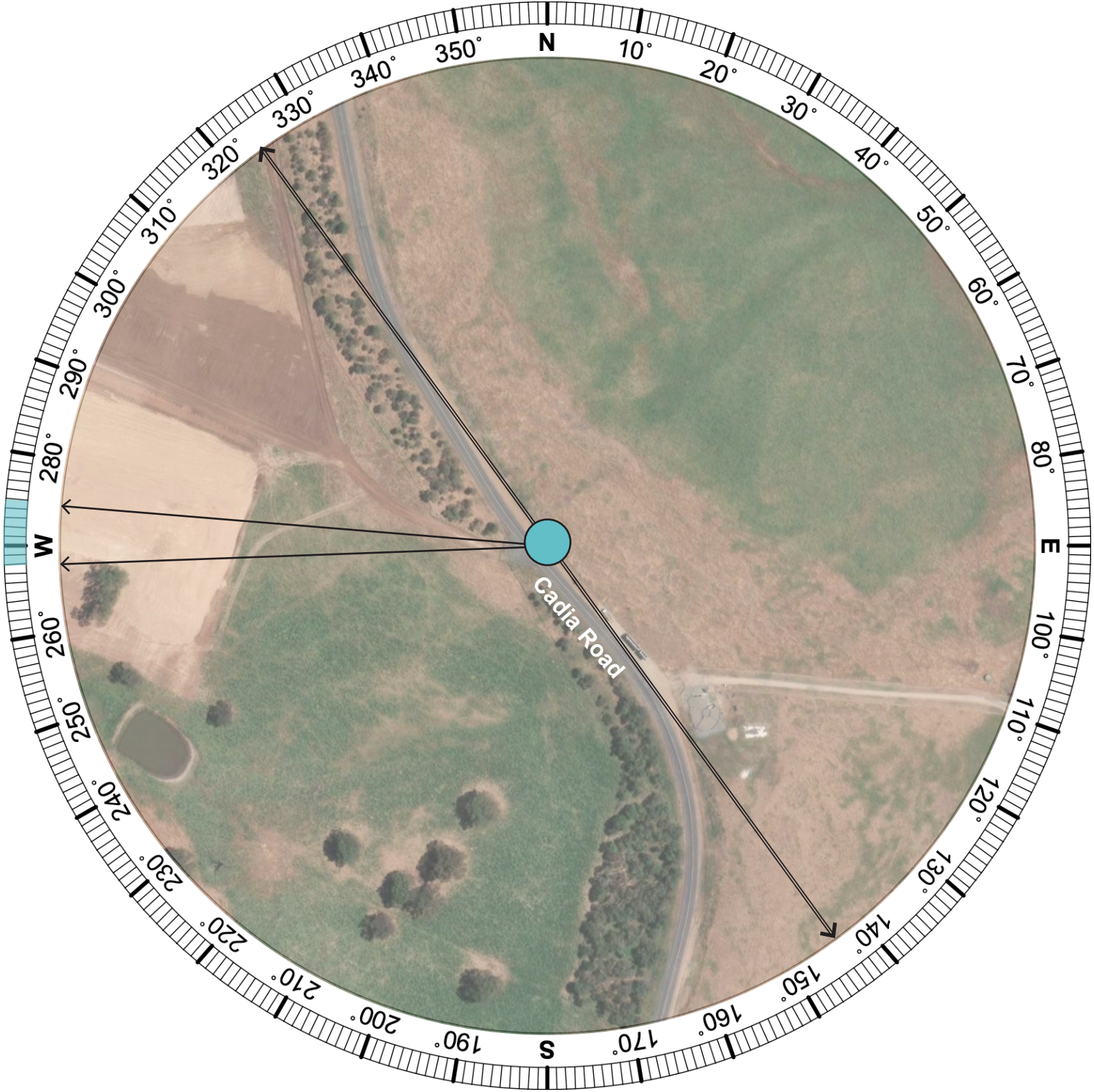
LEGEND

- Photomontage Locations
- Recovered Sand Demonstration Embankment (Approved)
- Recovered Sand Buttress (Proposed)
- Rockfill Slump Repair (Approved)
- Excess Recovered Sand Stockpile/Emplacement (Proposed)
- Existing Mine

Figure 02 Photomontage Locations
Basemap Source - Esri, 2025



Photomontage:
PM01



Summary:

Location:

Cadia Road, Errowanbang, NSW

Coordinates: Distance to Modification:

149° 01' 43.35" E 1.57km
33° 30' 24.32" S

Viewing Direction: Elevation:

West 776m

Viewpoint Date & Time:

2022.10.27 2:38PM

Modification Layout used:

2025.11.10

Photomontage Preparation Date:

2025.11.12

LEGEND

-  Extent of Potential Visibility
-  Extent of Panorama
-  Approximate Extent of Modification

Aerial Image Source: ESRI, 2025

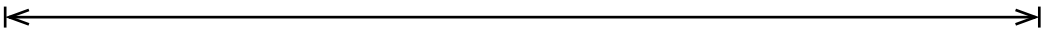
Photomontage:

PM01 Cadia Road, Errowanbang, NSW



180° Existing View

Refer to 60° Cropped Proposed Photomontage



180° Proposed Photomontage

- NTSF Approved Maximum Embankment Height (779m)
- STSF Approved Maximum Embankment Height (702m)

Note: Line for indicative only

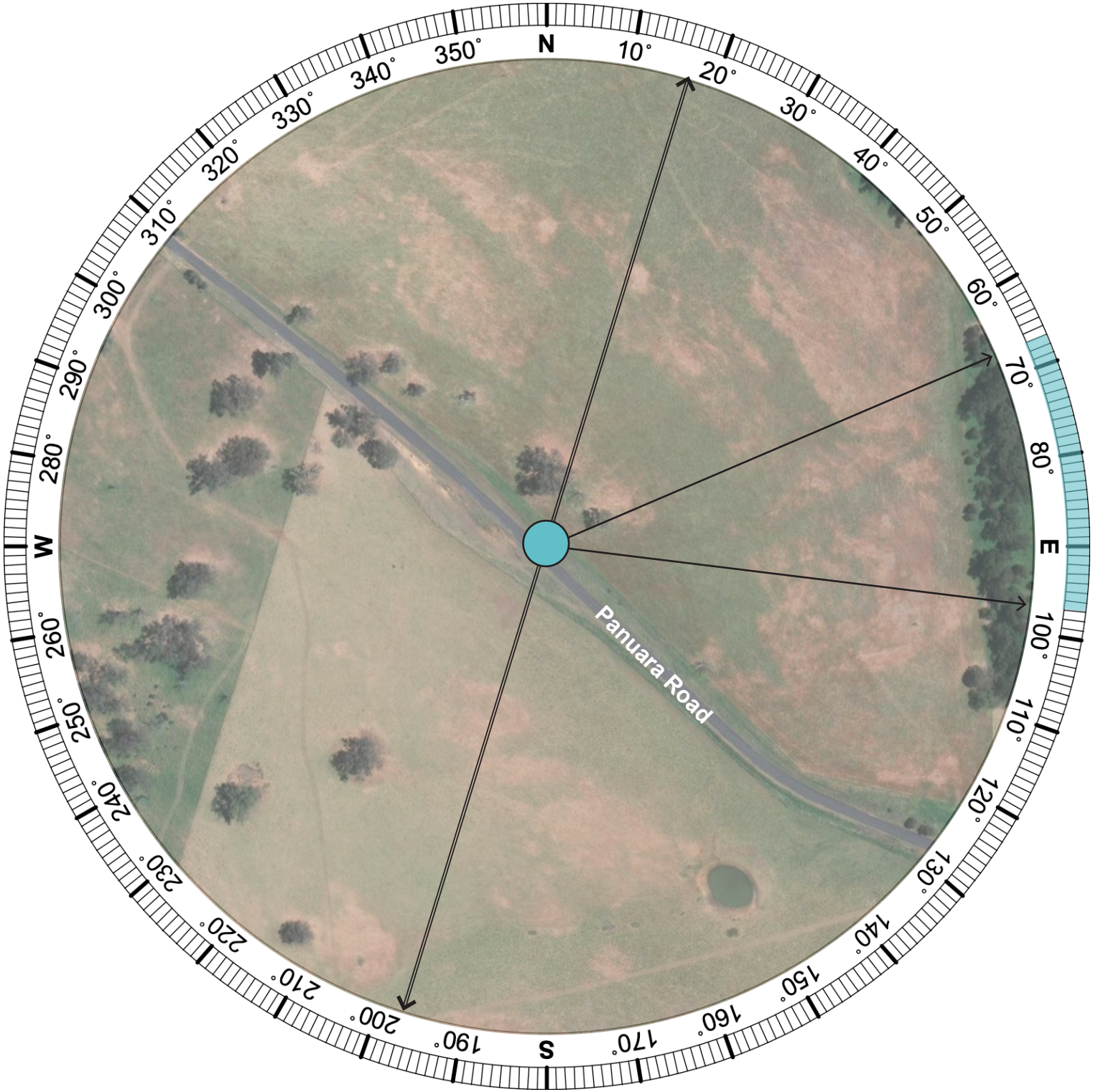
Photomontage:
PM01



60° Cropped Proposed Photomontage

- NTSF Approved Maximum Embankment Height (779m)
- STSF Approved Maximum Embankment Height (702m)
- Note: Line for indicative only

Photomontage:
PM02



Aerial Image Source: ESRI, 2025

Summary:	
Location:	
Panuara Road, Panuara, NSW	
Coordinates:	Distance to Modification:
148° 58' 34.81" E	1.19km
33° 30' 31.42" S	
Viewing Direction:	Elevation:
East	677m
Viewpoint Date & Time:	
2022.10.27 12:50PM	
Modification Layout used:	
2025.11.10	
Photomontage Preparation Date:	
2025.11.12	

- LEGEND**
- Extent of Potential Visibility
 - Extent of Panorama
 - Approximate Extent of Modification

Photomontage:
PM02 Panuara Road, Panuara, NSW



180° Existing View

Refer to 60° Cropped Proposed Photomontage



180° Proposed Photomontage

- NTSF Approved Maximum Embankment Height (779m)
- STSF Approved Maximum Embankment Height (702m)
- Note: Line for indicative only

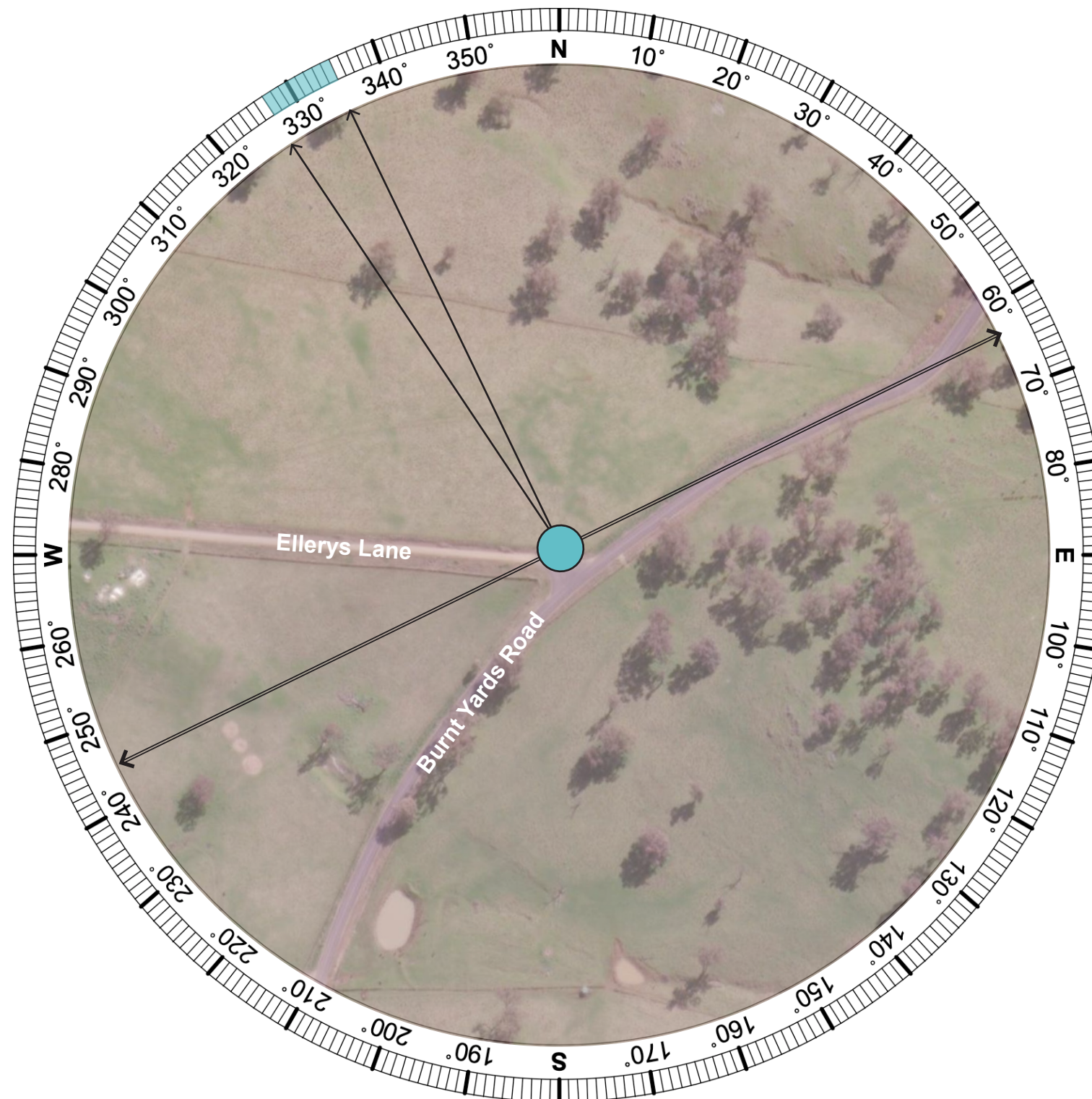
Photomontage:
PM02



60° Cropped Proposed Photomontage

- NTSF Approved Maximum Embankment Height (779m)
- STSF Approved Maximum Embankment Height (702m)
- Note: Line for indicative only

Photomontage:
PM03



Summary:	
Location:	
Intersection of Ellerys Lane and Burnt Yards Road, NSW	
Coordinates:	Distance to Modification:
149° 02' 15.48" E	4.99km
33° 33' 30.5" S	
Viewing Direction:	Elevation:
Northwest	723m
Viewpoint Date & Time:	
2022.10.26 4:51PM	
Modification Layout used:	
2025.11.10	
Photomontage Preparation Date:	
2025.11.17	

LEGEND

- Extent of Potential Visibility
- Extent of Panorama
- Approximate Extent of Modification

Aerial Image Source: ESRI, 2025

Photomontage:
PM03 Intersection of Ellerys Lane and Burnt Yards Road, NSW



Existing NTSF Slump
Existing NTSF



180° Existing View

Refer to 60° Cropped Proposed Photomontage

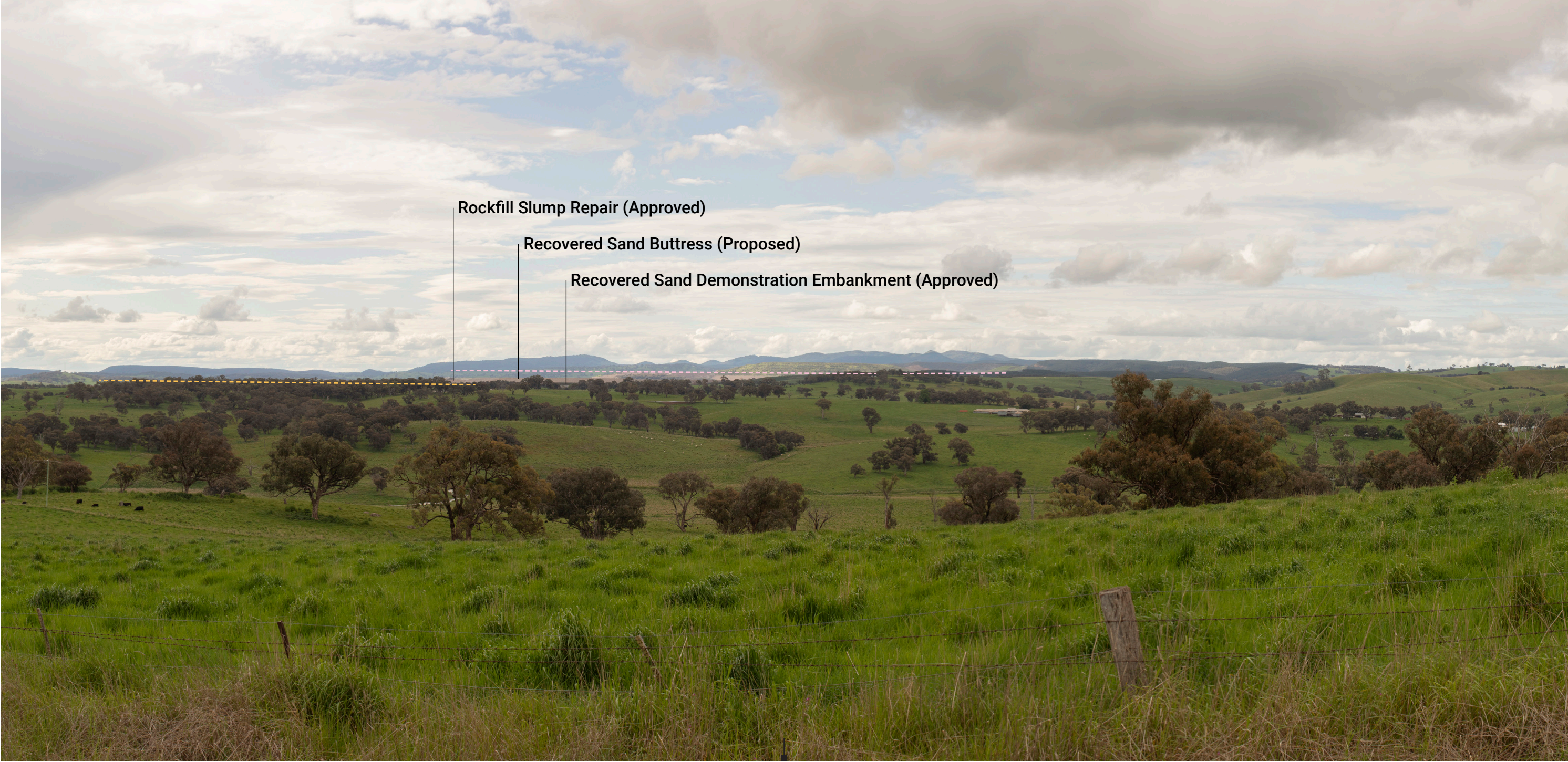


Rockfill Slump Repair (Approved)
Recovered Sand Buttress (Proposed)
Recovered Sand Demonstration Embankment (Approved)



180° Proposed Photomontage

Photomontage:
PM03



60° Cropped Proposed Photomontage

- NTSF Approved Maximum Embankment Height (779m)
- STSF Apprted Maximum Embankment Height (702m)
- Note: Line for indicative only