

Appendix G. Visual Impact Assessment

Hume Battery Energy Storage System Project

Visual Impact Assessment

21.07.2020

PROJECT INFORMATION

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Document Title: Hume Battery Energy Storage
System Project Visual Impact Assessment Rev. A
Project Number IA213400

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Hume Battery Energy Storage System Visual Impact Assessment 21 July 2020

INTERNAL REVIEW SIGN-OFF: REV 01

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01. INTRODUCTION

1.1 Project Context

Meridian Energy Australia Pty Ltd proposes to develop the Hume Battery Energy Storage System (BESS) Project (the Project), to be constructed on WaterNSW land near the pre-existing Hume Dam Hydro Power Station (HPS) in NSW. The project is proposed to be undertaken in the Albury City Council Local Government Area (LGA), with an estimated capex cost in excess of \$33 million.

Jacobs has been engaged to prepare an Environmental Impact Statement (EIS) for the Project to address legislative requirements of the EP&A Act and Regulations and the EPBC Act and Regulations, including the Planning Secretary's Environmental Assessment Requirements (SEARs) issued by the NSW Department of Planning, Industry and Environment (DPIE) on 14 May 2020. The EIS focuses on key issues of biodiversity, heritage, land, visual, noise and vibration, water, air quality, hazards and socio-economic impacts. The EIS has not found any issues that would preclude the approval of the Project by the consent authority.

1.2 Purpose of this document

Jacobs' Cities & Places team were commissioned to undertake a Visual Impact Assessment (VIA) as part of the Project EIS.

This report is intended to be read in conjunction with the EIS to inform the project approval authority, stakeholders and the community of the potential visual impact of the Project and the associated mitigation measures.

It is not the intention of this report to describe in detail the design of the proposals.

1.3 Methodology

The methodology for this VIA includes the following steps:

- Describe the subject site and surrounding area;
- Describe the proposed works;
- Describe the planning instruments that are relevant to visual impact and apply to the subject site and the surrounding area;
- Assess the visual impact of the proposed development from publicly accessible locations.

It should be noted that photography from GoogleMaps has been used to aid the understanding of the assessment. GoogleMaps photography is understood to be taken from a higher elevation than the viewpoint photography taken on-site by Jacobs.

1.4 The Project

The purpose of the Project is to help address the limited dispatchability of hydro power while enabling the HPS and the connected electricity grid to be more responsive to fluctuations in demand. This would generally be achieved through the construction and operation of a 20 MW / 40 MWh battery energy storage system on WaterNSW land in proximity to the existing HPS and connected to the National Energy Market via minor alterations to the existing HPS switchyard.

The Project works will include the following elements:

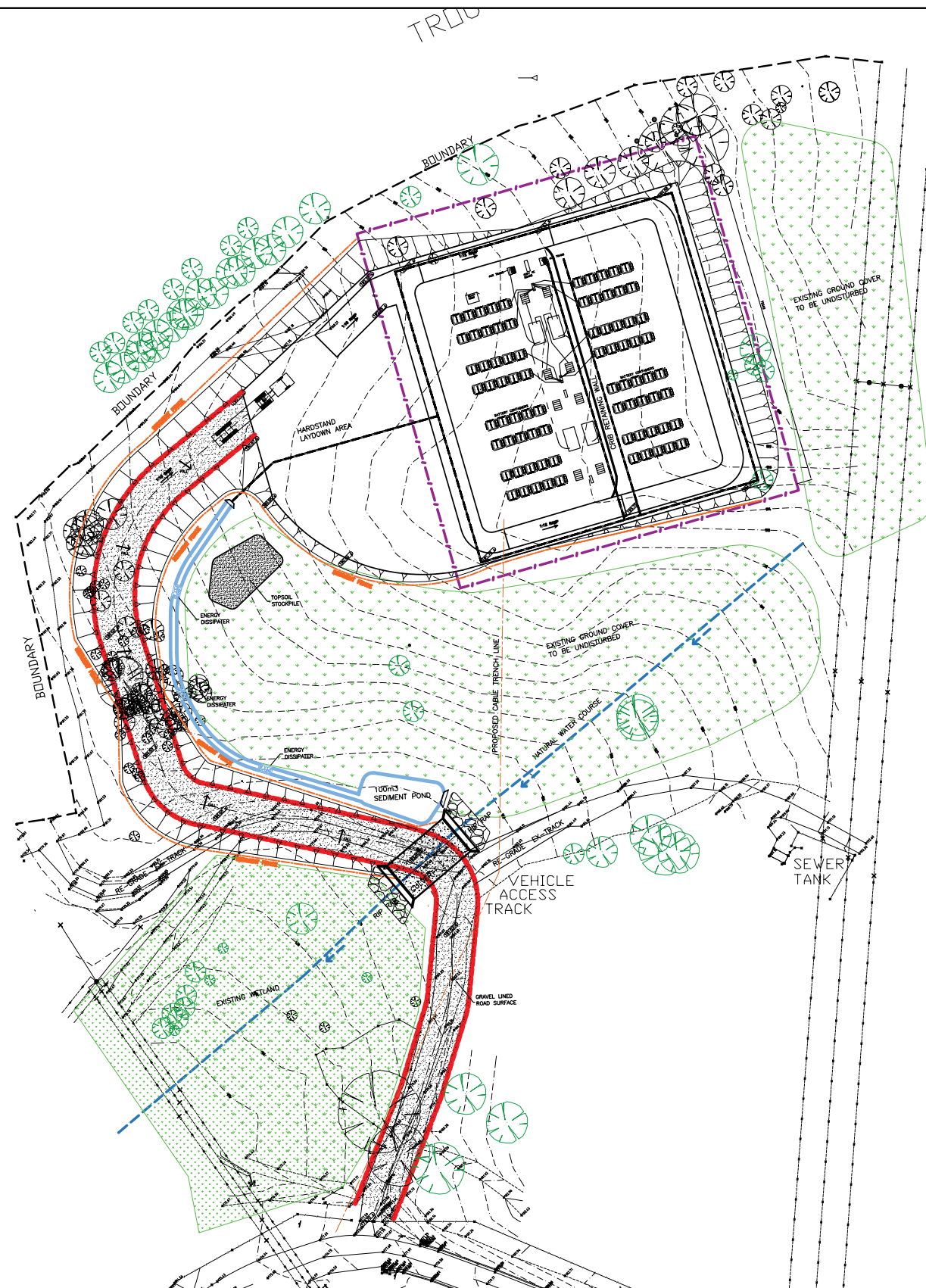
- Installation, commissioning, and operation of a 20MW/40MWh BESS
- Ancillary upgrades to the existing substation switchyard
- Underground electricity network distribution feeder connections from the existing switchyard to the BESS

- Construction of fencing around the perimeter of the BESS compound.
- The BESS would have storage capacity to facilitate maximum discharge for a two-hour period. During operation power generated by the Hume Dam Hydro Power Station would be used to charge the BESS during periods of low energy demand. This energy would then be available for distribution to the National Energy Market in periods of higher demand.
- The BESS would be connected to the existing TransGrid transmission lines to Albury and the existing Ausnet transmission line to Wodonga. The connection would be established via a short below ground cable to the existing switchyard which would require minor augmentation.
- The maximum disturbance area for the project, including temporary construction areas and permanent footprint, would not exceed 1 hectare. Permanent infrastructure is anticipated to

- require a maximum 0.5 hectares. Batteries are expected to be mounted on concrete footings and be containerized or otherwise enclosed. Environmental controls for hazardous substances management would be provided and suitable for the selected technology in accordance with applicable guidelines.
- The BESS is intended to have an operational life of 20 years and depending on the selected technology components may be replaced and/ or upgraded to extend this timeframe. Following the end of economic life, above ground components would be removed and land rehabilitated to achieve a safe, stable and non-polluting condition.





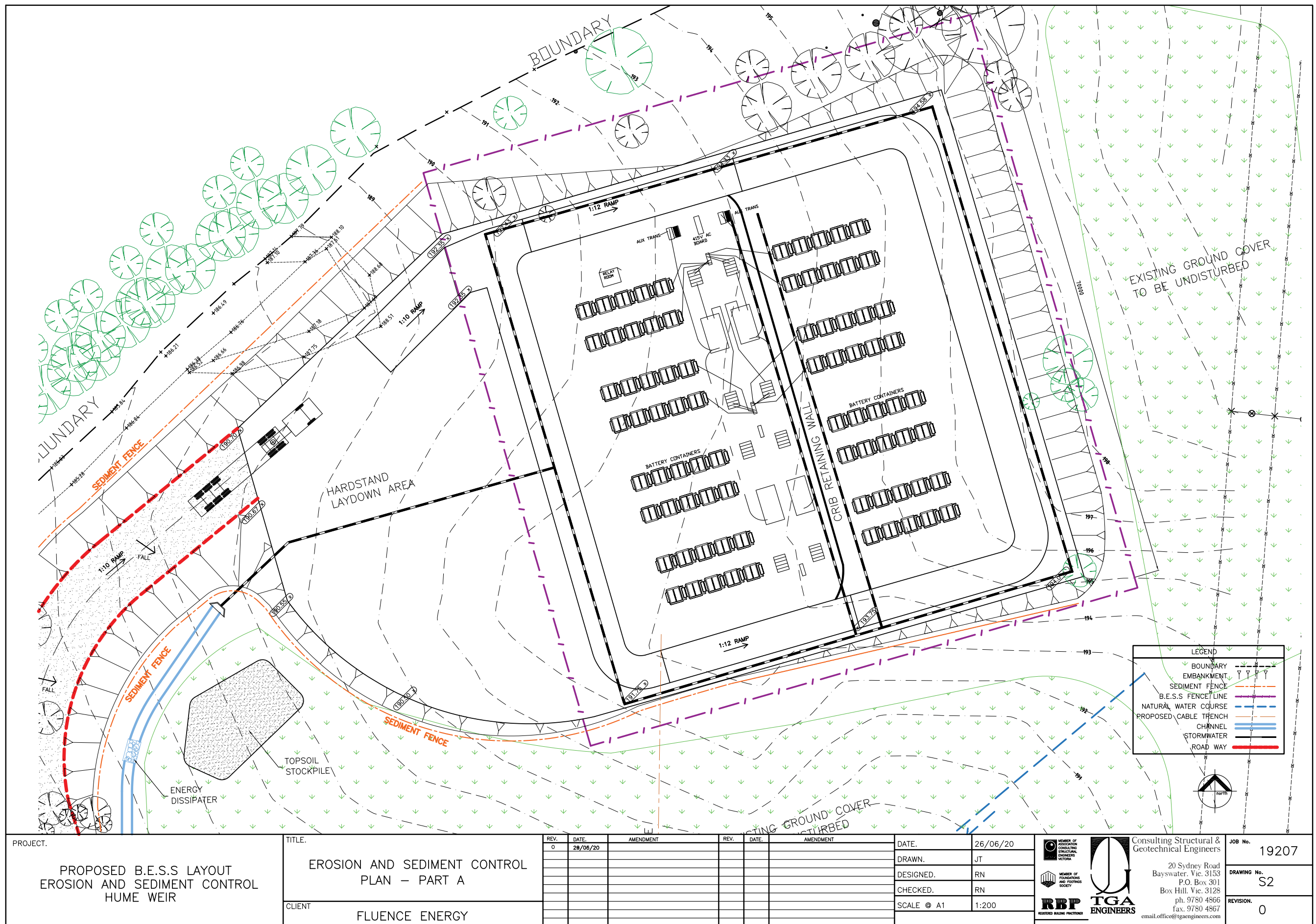
Image 1.1: Artists impression of BESS components



LEGEND	
BOUNDARY	---
EMBANKMENT	
SEDIMENT FENCE	---
B.E.S.S. FENCE LINE	---
NATURAL WATER COURSE	---
PROPOSED CABLE TRENCH	---
CHANNEL	---
STORMWATER	---
ROAD WAY	---



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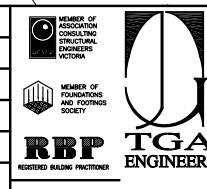
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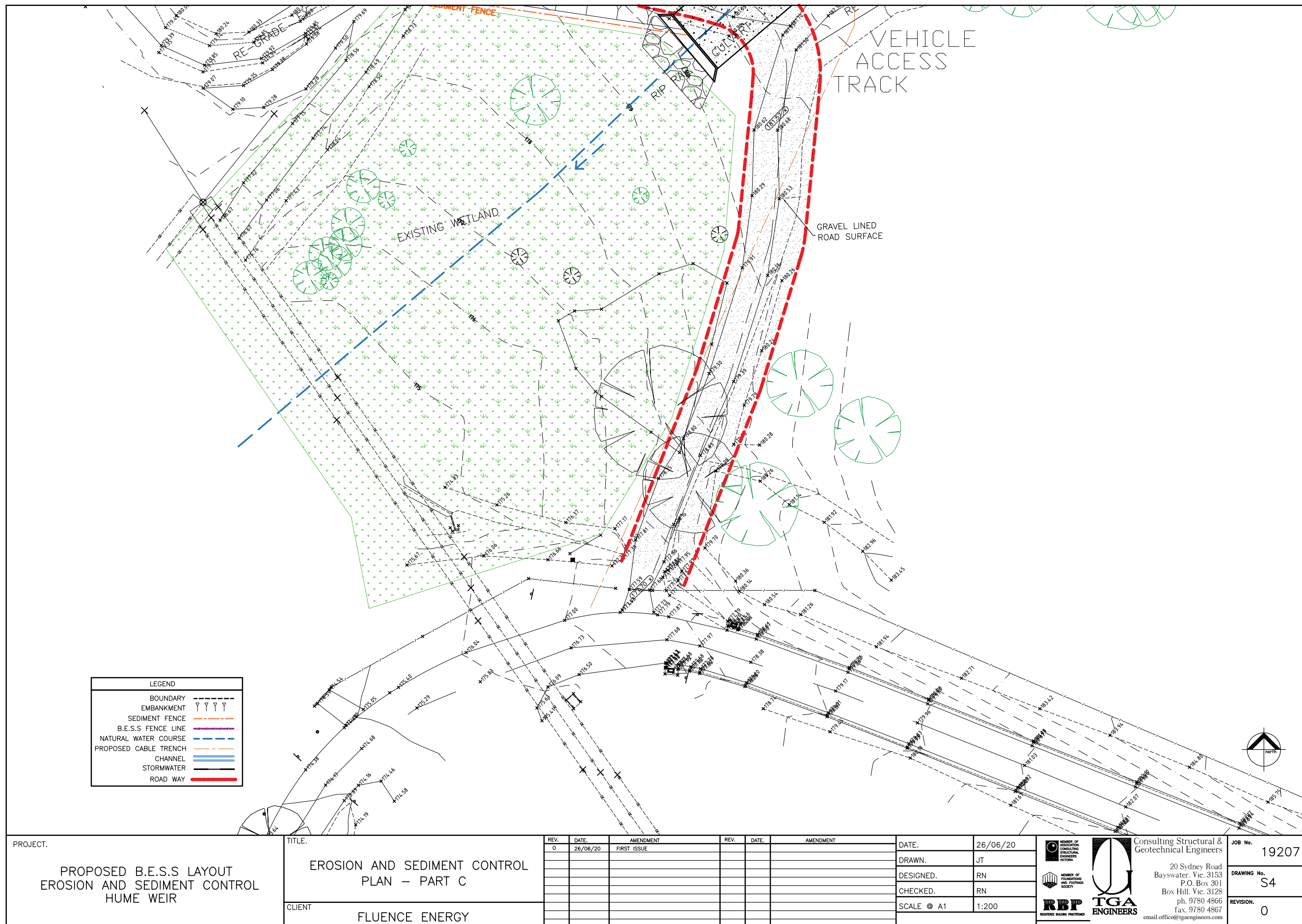


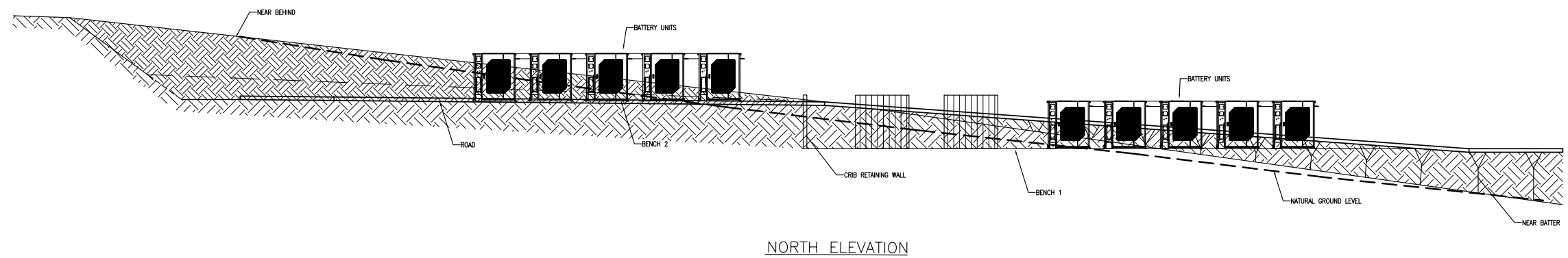
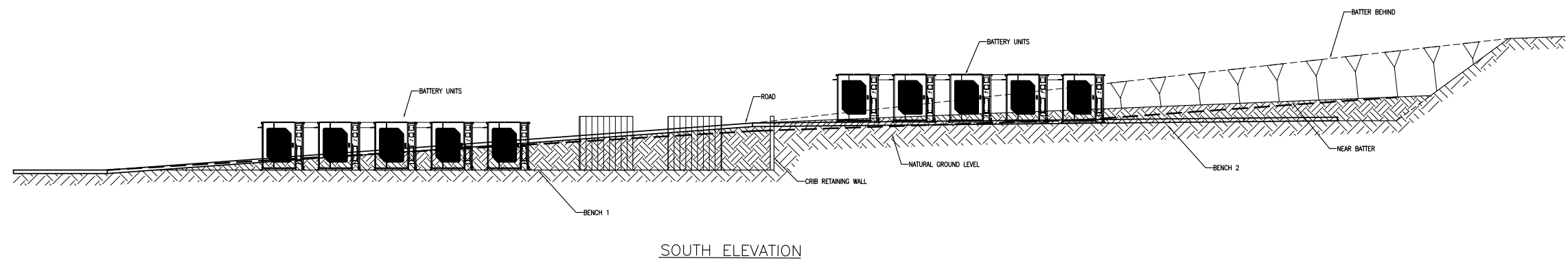
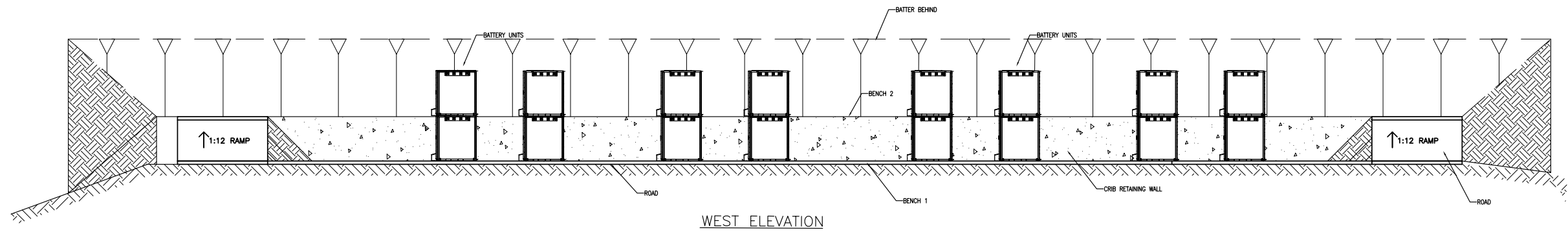
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02.

CONTEXTUAL ANALYSIS

2.1 Site Context

The proposed Project site is located in southern NSW on the border of New South Wales and Victoria, adjacent to Lake Hume Village, lying within the Albury City Council LGA. Lake Hume Village is located approximately 10km east of Albury-Wodonga, 19km south of Bowna and 120km south-west of Wagga Wagga in NSW. The site is adjacent to the Murray River and is about 300m north of the existing Hume Dam Hydro Power Station.

The proposed Project site is on land currently owned by WaterNSW, which also hosts WaterNSW offices, the Hume Dam Hydro Power Station (HPS), and a WaterNSW-owned switchyard already in use by Meridian. Transmission lines extend from the switchyard to Albury in NSW and Wodonga in Victoria. The location of the Project site is shown in Figure 2.1B.

Lake Hume Village is located around 300m east of the proposed Project site, consisting of mainly recreational and residential areas with less than 100 dwellings. The landscape local to Lake Hume Village and surrounds is characterised by the Murray River, residential dwellings, natural parklands, open space, and tourist areas including resort and villas. The closest residential dwelling is located around 200m from the proposed BESS and 90m from the existing site entry.

The Project site is bordered by Trout Farm Road and Murray Street, and existing access to the site is via Murray Street in Lake Hume Village. Construction of a new internal access track from the existing WaterNSW access road to the BESS compound would be required.

Existing development near the Project site include WaterNSW facilities associated with the operation of the Hume Dam, Hume Dam Maintenance works which began in August 2019 and is scheduled to finish by the end of 2021 and Meridian operation of Hume Hydro Power Station.

The site has been subject to historic disturbance associated with the initial construction of Hume Dam and its subsequent upgrades. As a result the site is sparsely vegetated and largely free of habitat for native fauna.

The Project lies within the Upper Murray catchment that contains rivers such as the Mitta Mitta, Geehi, Swampy Plains and Tooma Rivers that feed into the

River Murray. This upper catchment takes in the headwaters of the Murray and its tributaries and contains rugged mountain country, alluvial valleys in the east and extends about 300km to the Hume Dam in the west. The catchment covers about 2% of the area of the Murray-Darling River Basin but provides about 17% of the water, and also contains the Snowy Mountains Hydro-electric Scheme.

The elevation of the river is over 1000m in the snowy alpine regions and drops to an elevation of 150m at Hume Dam. The Hume Dam forms Hume Reservoir which is one of two major headwater storages for the River Murray, where the flows from the Upper Murray, Mitta Mitta River and some water from the Snowy Scheme are regulated through the reservoir. The Project site is next to the Hume Dam Hydro Power Station, on the north side of the Dam embankment (MDBA, 2020).



Figure 2.1B: Proposal Location

2.2 Planning Context

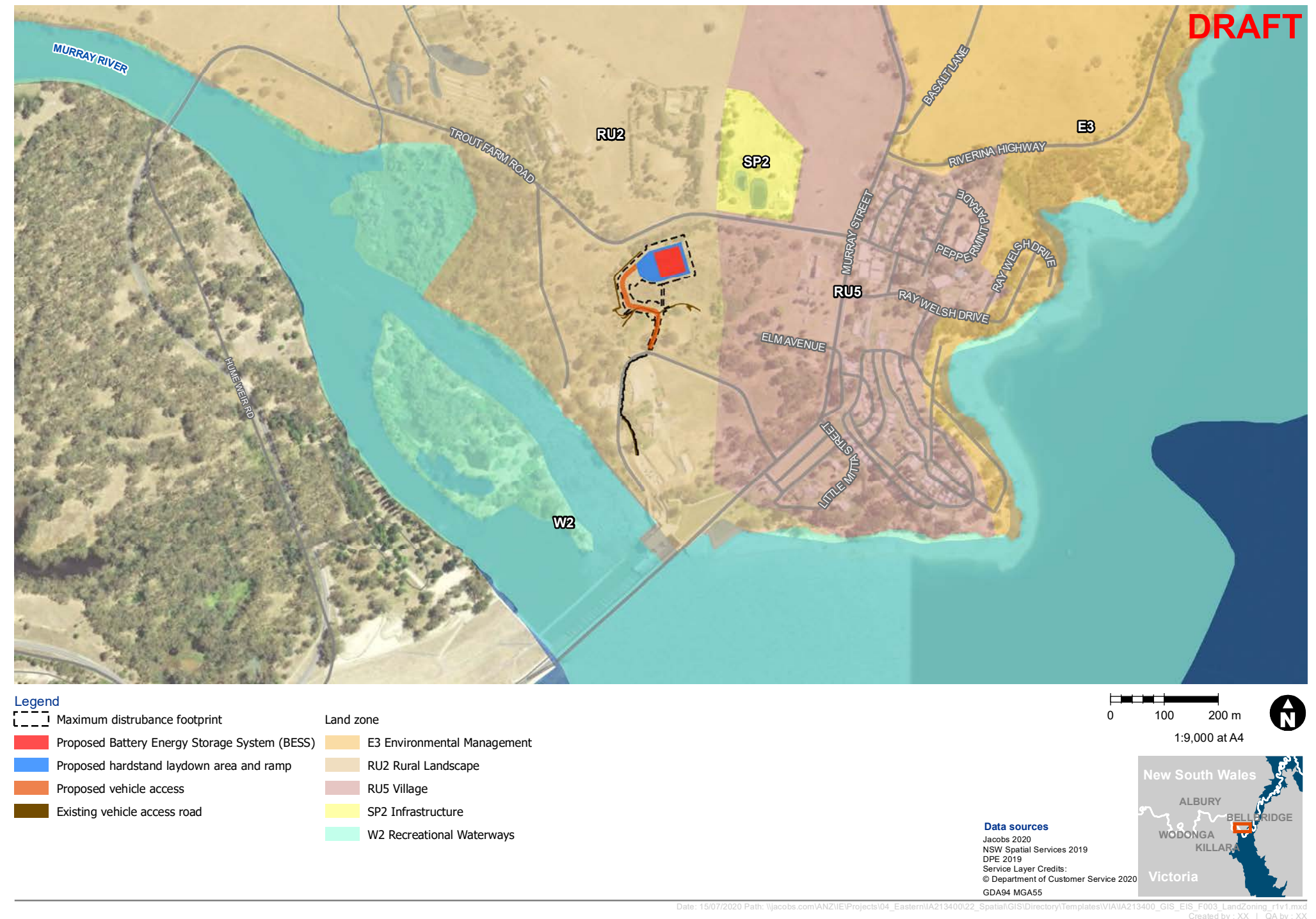
The Project area is located entirely within Albury Local Government Area (LGA). The LGA defines the Project area as zoned as RU2 – Rural Landscape. The objectives of the RU2 zone are:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- To maintain the rural landscape character of the land
- To provide for a range of compatible land uses, including extensive agriculture.

Any development type not listed as “permitted without consent” and “prohibited” are considered development that is permitted with consent. The Project purpose being for the development of electricity generation works is accordingly an activity that is permissible with development consent under the Albury LEP.

The Project is considered compatible with the objectives of the RU2 zone.

Refer to Figure 2.2B for the land use context of the Project.



2.3 Visual Context

The Project site is located on south-facing land rising steeply from the Murray River. The Hume Dam spans the Murray River directly south of the Proposal site and there is some intervisibility between the two. The dam is a local landmark, being recognised as one of the largest dams in the world. The structure features a lookout platform which offers 360 degree panoramic views across the local landscape.

The site comprises a grassy field with scattered shrubs and trees, separated from Trout Farm Road to the north and northwest by landform and a belt of trees. The site is not visually prominent within the landscape due to the undulating nature of surrounding landform and mature trees that heavily filter intervisibility.

A number of images (from publicly accessible and non publicly accessible areas) have been included to illustrate the visual context of the Project site:

- Images A 1,2,3– Looking south, southwest and west from within the site across the surrounding landscape
- Image B – Looking northeast towards the site from private land to the south
- Image C – View looking northeast towards the proposed site from a small public car park
- Image D – View looking south towards the Hume Dam
- Image E - View looking north across rising ground towards the proposal site
- Image F - View looking southwest along the length of the dam

Refer to Figure 2.3A for the location of each image.



Figure 2.3A: Visual Context Image Locations

Image: GoogleEarth

LEGEND


 Image Location



Image A1: View looking south across the Project site and beyond to the Hume Dam and distant landform within the National Park.



Image A2: View looking southwest across the Project site and beyond to distant landform within the National Park.



Image A3: View looking west across the Project site towards vegetation that heavily filters visibility of Trout Farm Road.



Image B: View looking northeast towards the southeastern corner of the Project site from the existing track to the south of the site.



Image C: View looking northeast towards the Project site from a small public car park adjacent to the Murray River, accessed from Trout Farm Road.



Image D: View looking south towards the Hume Dam from a lower elevation to the Project site and illustrating the undulating landform and scattered, mature trees that filter views.



Image E: View looking north across rising ground towards the Project site with intervening scattered mature trees



Image F: View looking southwest along the length of the dam from adjacent to the Murray River.

03.

VISUAL IMPACT ASSESSMENT

3.1 Introduction

When considering the predicted effect of changes upon views/ visual receptors, the sensitivity of the view to change is combined with the magnitude of the change to give an overall judgement of significance of impact supported by analysis of evidence and professional judgement. The RMS Guideline (2018) provides the following definitions:

Sensitivity: Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change. For example, a pristine natural environment is likely to be more sensitive to a change of the nature of a four-lane motorway than a built-up industrial area.

Magnitude: Magnitude refers to the physical scale of the Project, how distant it is and the contrast it presents to the existing condition. For example, a large interchange would have a very different impact on landscape character than a localised road widening in the same area.

Table 4A is taken from the RMS guidelines and has been used to rank the criteria above and provide an overall impact assessment as a conclusion to this assessment.

3.2 Sensitivity, magnitude & impact

The sensitivity to change within the selected views is evaluated using the criteria set out below:

High - Views and/ or receptors from or within areas of recognised national or local importance for their landscape value. Residential areas and occupied properties afforded existing, attractive views. Recreational users of footpaths including walkers and riders. Recreational road users. Visual receptors that are likely to contemplate, spend long periods of time and focus on particular views and, through the position of the receptor relative to the development have the capacity to experience the view.

Moderate - Recreational users of the landscape that are site or activity focussed (i.e. hunting, shooting, nature conservation, golf, etc) and outdoor workers where time to appreciate the view is limited. Visual receptors whose attention is likely to be focussed on their work or activity rather than the wider view.

Low - Travellers and people at their place of work or users of indoor facilities. Visual receptors where exposure to the view is short-term and whose attention is likely to be focussed on their work or activity within an indoor environment. Receptors that are less sensitive to the type of changes to the pre-development view that would result from the proposed development.

Negligible - Views from areas of low landscape quality/ value within which visual receptors would not value the view. Travellers and people at their place of work where exposure to/ appreciation of the view would be short-term and likely screened / heavily filtered. Receptors that are less sensitive to the type of changes to the pre-development view that would result from the proposed development.

3.3 Magnitude of change

The magnitude of change upon views resulting from the Project is evaluated using the criteria set out below:

High - Complete or very substantial adverse change in view: change very prominent involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline i.e. pre-development view through removal of key elements or addition of uncharacteristic elements.

Moderate - Partial obstruction of existing view or partial change in character and composition of pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but not substantially different in scale and character from the surroundings and the wider setting. Composition of the view will alter. View character may be partially changed through the introduction of features which, though uncharacteristic, may not be visually discordant

Low - Minor adverse change in baseline i.e. pre-development view – change will be distinguishable from the surroundings whilst composition and character (although altered) will be similar to the pre-change circumstances

Negligible - Very slight change in baseline i.e. pre-development view – change barely distinguishable from the surroundings. Composition and character of view substantially unaltered

SENSITIVITY	MAGNITUDE				
		High	Moderate	Low	Negligible
	High	High	Moderate/High	Moderate	Negligible
	Moderate	Moderate/High	Moderate	Moderate/Low	Negligible
	Low	Moderate	Moderate/Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Table 3A: Impact assessment rating matrix
The assessment should also include a description to support the degree of sensitivity and magnitude assigned by the assessor.

3.4 Viewshed

The viewshed comprises the area from within which the Project site would likely be visible. The extent of the viewshed is influenced by a combination of factors including elevation, landform and vegetation. The diagram below illustrates the area from which the Project site would be visible.

The Project involves localised modification to landform levels using a combination of cut and fill and introduces relatively low-level structures however it is considered that the nature of the works would not significantly alter the vertical prominence of the site within the landscape. Therefore the viewshed has been computer generated using the visibility of a point 2m above the existing ground level at the southwestern corner of the BESS site.

As illustrated by the area coloured green in Figure 3.4A the Project site does not appear as visually prominent within either residential or publicly accessible areas within the immediate locality. Filtered views into the site are available from a section of Trout Farm Road directly north and northwest of the site, filtered by the belt of trees adjacent to the road.

The site is not visible from either the single residential property to the north or the residential leisure village to the east. The length of the dam walkway has visibility of the site as part of 360 degree panoramic views. The site is viewed over a distance of approximately 700m from the dam and is partially filtered by intervening vegetation.

The site is also visible within distant views from the west and southwest from the River Murray and the River Murray Reserve although views are likely filtered by landform and intervening vegetation.



Figure 3.4A:Viewshed

3.5 Viewpoints

A number of representative viewpoints from publicly accessible locations have been selected from within the viewshed to illustrate both the existing view and the potential visual impacts of the Project.:

- **VP 01** – Looking north from Hume Dam
- **VP 02** – Looking southwest from Trout Farm Road
- **VP03** – Looking east from Trout Farm Road
- **VP04** – Looking south across Trout Farm Road from property driveway
- **VP05** – Looking north from the dam viewing platform

Refer to Figure 3.2A for the location of each viewpoint.



Figure 3.5A: Viewpoint Location Plan

Image: GoogleEarth

LEGEND

- V1** Viewpoint Location

3.6 Viewpoint Analysis

3.6.1 VP 01 – Looking north from the Hume Dam

Description

This view looks north from the dam walkway and is centred upon the site looking across the Murray River. Views from the dam are panoramic and encompass the river channel and typically densely-vegetated river banks. The site is located within an area of open grassland, low-lying buildings and infrastructure associated with the dam. The broad nature of the view and the distance over which the site is viewed result in it not appearing as particularly prominent within the view.

Sensitivity

The sensitivity of the view is considered to be **high**. The dam is a recognised tourist attraction as one of the largest dams in the world and would be subject to recreational use of the walkway across the dam by visitors. Viewers from this location are likely to focus on the panoramic views across the landscape.

Magnitude

The magnitude of change is considered to be **low** within this view. The proposed change would not result in the loss of key elements within the view. The site is visible as a relatively small element within the view. Whilst the change may be distinguishable from the surroundings the overall composition and character of the view would be substantially unaltered from existing.

Summary

The impact of the Project on VP01 has been assessed as **moderate**.

It should be noted that the severity of the impact is due to the importance of the dam structure as a tourist attraction and the views available from it. It should be considered that the Project will form part of the grouping of buildings and infrastructure associated with the dam and therefore integral to its function and of interest to visitors.



Figure 3.6A: VP01: Looking north from the Hume Dam across the Murray River towards the Proposal site.
Image Source: GoogleMaps



Figure 3.6B Illustrative extent of the visibility of the Project from VP01.

Image Source: GoogleMaps

3.6.2 VP 02 – Looking southwest from Trout Farm Road

Description

This view looks southwest from Trout Farm Road towards the Project site. This view would be experienced by users of Trout Farm Road – typically motorists or cyclists as there is no footpath at this location. The foreground of the view comprises the roadway, a grassed embankment and a belt of mature trees which heavily filter views beyond. The telegraph pole sited immediately adjacent to the site is visible through a gap in the trees and a longer view is available south towards distant landforms.

Sensitivity

The sensitivity of the view is considered to be **low**. Viewers in this location would be moving either by bicycle or within a vehicle where views would be brief and glimpsed at speed. The lower elevation of the site would reduce the visibility of the proposed changes and the scale of the change would likely not be dominant within the view.

Magnitude

The magnitude of change is considered to be **negligible** within this view. The visible changes would likely be minimal from this location given the visual screening provided by the grassed embankment, change in level between the road and the site and the intervening vegetation.

Summary

The impact of the Project on VP02 has been assessed as **negligible** given the likely lack of visibility from this location.



Figure 3.6C: VP02: Looking southwest from Trout Farm Road

Image Source: GoogleMaps



Figure 3.6D Illustrative extent of the visibility of the Project from VP02.

Image Source: GoogleMaps

3.6.3 VP 03 – Looking southeast from Trout Farm Road

Description

This view looks southeast across Trout Farm Road towards the site. The landform falls away beyond the road towards an open, grassed landscape with scattered scrub and mature trees. The dam is hidden beyond the trees to the right of the view. The site is partially visible, filtered by landform and the belt of trees to the left of the view.

Sensitivity

The sensitivity of the view is considered to be **low**. Viewers in this location would be moving either by bicycle or within a vehicle where views would be brief and glimpsed at speed. The lower elevation of the site would reduce the visibility of the proposed changes and the scale of the change would likely not be dominant within the view.

Magnitude

The magnitude of change is considered to be **negligible** within this view. The visible changes would likely be minimal from this location given the visual screening provided by the grassed embankment, change in level between the road and the site and the intervening vegetation. The likely visible elements of the Project from this location would comprise the access track and associated earthworks.

Summary

The impact of the Project on VP03 has been assessed as **negligible** given the likely lack of visibility from this location.



Figure 3.6E: VP03: Looking east from Trout Farm Road

Image Source: GoogleMaps



Figure 3.6F Illustrative extent of the visibility of the Project from VP03.

Image Source: GoogleMaps

3.6.4 VP 04 – Looking south from Trout Farm Road property access

Description

This view looks across Trout Farm Road from the entrance to the driveway of a residential property located north of the Project site. This view looks southwest from Trout Farm Road towards the site. This view would be experienced by users of Trout Farm Road – typically motorists or cyclists as there is no footpath at this location. The foreground of the view comprises the roadway, a grassed embankment and a belt of mature trees which heavily filter views beyond however the structure of the Hume Dam is just visible in the distance. It should be noted that the viewpoint photograph is taken in Winter and the view would be further filtered by vegetation when the vegetation is in leaf.

Sensitivity

The sensitivity of the view is considered to be **low**. Viewers in this location would be moving either by bicycle or within a vehicle where views would be brief and glimpsed at speed. The lower elevation of the site would reduce the visibility of the proposed changes and the scale of the change would likely not be dominant within the view.

Magnitude

The magnitude of change is considered to be **negligible** within this view. The visible changes would likely be minimal from this location given the visual screening provided by the grassed embankment, change in level between the road and the site and the intervening vegetation.

Summary

The impact of the Project on VP04 has been assessed as **negligible** given the likely lack of visibility from this location.



Figure 3.6G: VP04: Looking south across Trout Farm Road



Figure 3.6H Illustrative extent of the visibility of the Project from VP04.

3.6.5 VP 05 – Looking north from dam viewing platform

Description

This view looks north from a viewing platform on the banks of the Murray River. This view looks across an area populated by a number of buildings and other dam-related infrastructure towards the rising landform beyond. Views of the Project site on the horizon are heavily filtered by intervening mature trees. This view would be experienced by pedestrians accessing the viewing platform to view the dam and river corridor.

Sensitivity

The sensitivity of the view is considered to be **high**. The dam is a recognised tourist attraction as one of the largest dams in the world and would be subject to recreational use of the viewing platform by visitors. Viewers from this location are likely to focus on the panoramic views across the landscape.

Magnitude

The magnitude of change is considered to be **low** within this view. The proposed change would not result in the loss of key elements within the view. The site is visible as a relatively small element within the view. Whilst the change may be distinguishable from the surroundings the overall composition and character of the view would be substantially unaltered from existing.

Summary

The impact of the Project on VP05 has been assessed as **moderate**.

It should be noted that the severity of the impact is due to the importance of the dam structure as a tourist attraction and the views available from it. It should be considered that the Project will form part of the grouping of buildings and infrastructure associated with the dam and therefore integral to its function and of interest to visitors.



Figure 3.6I: VP05: Looking north from dam viewing platform



Figure 3.6J Illustrative extent of the visibility of the Project from VP05.

04.

VISUAL IMPACT ASSESSMENT SUMMARY

4.1 Summary

The assessment reveals visibility of the Project as being relatively limited from publicly accesible and residential areas within the locality due to landform and dense vegetation. A number of viewpoints were selected and most notably include moderate impacts upon views from the Hume Dam and an adjacent viewing platform, based upon the high sensitivity to change resulting from the recreational value of views from the structure. The magnitude of change upon the viewfrom the dam is however considered to be low, given the distance over which the changes would be seen and the relatively small scale of the proposed changes. Impacts from the three viewpoints on Trout Farm Road experience negligible impacts due to the visual screening provided by intervening landform and trees.

Mitigation strategies relating to the Project site are described in Section 5.

Table 4A: Summary of Visual Impact Assessment

Viewpoint	Sensitivity	Magnitude	Rating
VP 01	High	Low	Moderate
VP 02	Low	Negligible	Negligible
VP 03	Low	Negligible	Negligible
VP 04	Low	Negligible	Negligible
VP 05	High	Low	Moderate



05.

MITIGATION MEASURES

5.1 Mitigation Recommendations

The following recommendations should be considered for the proposal:

- Retention and enhancement of existing landscape features (areas of scrub, individual trees) should be considered where feasible
- Limit the area of disturbance during construction
- Cutting and embankment slopes should be seeded to grass to match existing
- Mitigation tree and shrub planting should be considered to compensate for lost habitat and to visually integrate the proposal within the surrounding landscape
- Colour of proposed structures and built form should be considered in a suitable muted palette to visually integrate the proposal within the landscape
- Consider minimal use of reflective surfaces to avoid drawing attention to the site within views due to reflective glare.

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