



Appendix C

| *Woodlawn ARC
design report*



Woodlawn Advanced Energy Recovery Centre

Design Report

July 2022

00288-A-04-F00-0001

Revision E

Revisions

REVISION	DESCRIPTION	DATE
A	Issued for Environmental Impact Statement	15.11.21
B	Amended Issue for Environmental Impact Statement - Site Rehabilitation Montages amended	25.03.22
C	Amended Issue for Environmental Impact Statement - Section 4.5 Proposed Development - Landscape Design annotation amended	06.06.22
D	Amended Issue for Environmental impact statement - Development Footprint Updated - Aerial Photos Annotation Updated - Section 4.8 Introduction Updated - EIS Drawing Appendix (Drawing List) Amended	01.07.22
E	Amended Issue for Environmental Impact Statement - Development Footprint Adjusted - Development footprint terminology update	06.07.22

Acknowledgment of Country

We acknowledge the enduring spirit of Country and the stories, songlines, languages, land, skies, and waters that have nurtured the local people here since the beginning of time. We pay our respects to the local people of the Ngunnawal as the traditional and continuing custodians of south-eastern New South Wales who have cared for their Country for thousands of generations.

We pay respect to their elder’s past, present and emerging, and recognise their continuing living practices, acknowledging the intricate knowledges and kinship relationships they each hold to this Country. They are, and forever will be, embedded within this space.

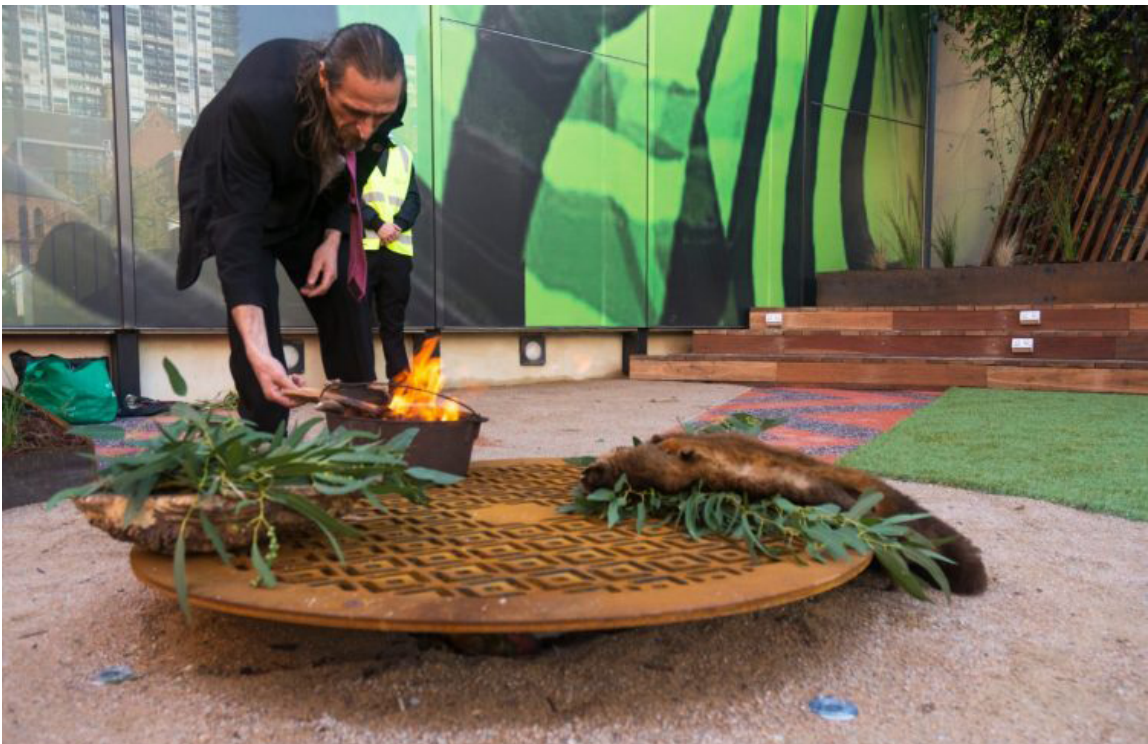
We also acknowledge the many First Nations people who now know this Country as their home and mother and recognise the care-taking relationships they hold here.



Aboriginal Plant Use Trail Walk
Teaching & Learning with Country



Badu Mangroves Boardwalk, Lorna Munro & Bangawarra.
Songlines, Storytelling & Poetry



Ngarara Place
Spatially Enacted Culture

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01

INTRODUCTION

INTRODUCTION

1.1 Executive Summary

Purpose of this report

This reference design report has been prepared by **nettletontribe** on behalf of Veolia for it's proposed facility at the Woodlawn Eco Precinct, Tarago NSW.

The primary purpose of this report is to accompany an Environmental Impact Statement submission for the subject site. It includes a detailed urban, site and design analysis and an indicative concept plan which has been developed based on key design principles that echo the objectives of the established planning frameworks.

ERF

The Woodlawn Advanced Energy Recovery Centre (ARC) is an Energy Recovery Facility (ERF) designed to recover energy from waste that will otherwise be disposed to landfill. ERFs are a proven technology in other parts of the world and are now beginning to gain momentum in Australia as a viable method of generating energy from an otherwise wasted material stream. The Woodlawn ARC will be one of the first such facilities in Australia and will complement several integrated waste management operations located on the site including a Bioreactor, Mechanical Biological Treatment (MBT) facility, aquaculture, and agriculture facilities.

The proposed design draws inspiration from the surrounding natural rural farmland, mining, and waste management context in which it sits. It also draws influence from Veolia's commitment to sustainable methods of processing waste and generating clean electricity evident throughout the Woodlawn Eco Precinct.

The building form and site layout has been designed and orientated to act as a visual anchor point to the existing ridgeline located to the south of the site. The roof form has been oriented to complement that ridgeline and endeavours to blend the building in to the environment when viewed from Collector Road.

The verticality of the stack echoes the wind turbines that meander along the ridgeline stretching south to Lake George. The side elevations contrast the homogenous roof by demonstrating and highlighting the technology contained within. The reference design prioritises the use of recycled and upcycled materials generated from waste products with emphasis on a whole of life approach to all materials selection.





02

LOCATION & CONTEXT

2.1 State Context

New South Wales

The Goulburn Mulwaree Council area is located in central New South Wales, about 200 kilometres south-west of the Sydney CBD, and 70 kilometres north-east of the Canberra CBD.

The Goulburn Mulwaree Council area is bounded by Upper Lachlan Shire in the north and west, Wingecarribee Shire and Shoalhaven City in the east, and the Queanbeyan - Palerang Regional Council area in the south. The Council area's boundaries are Oxley Creek and the Tarlo and Wollondilly Rivers in the north, Uringalla Creek and the Shoalhaven River in the east, and Boro Creek in the south.

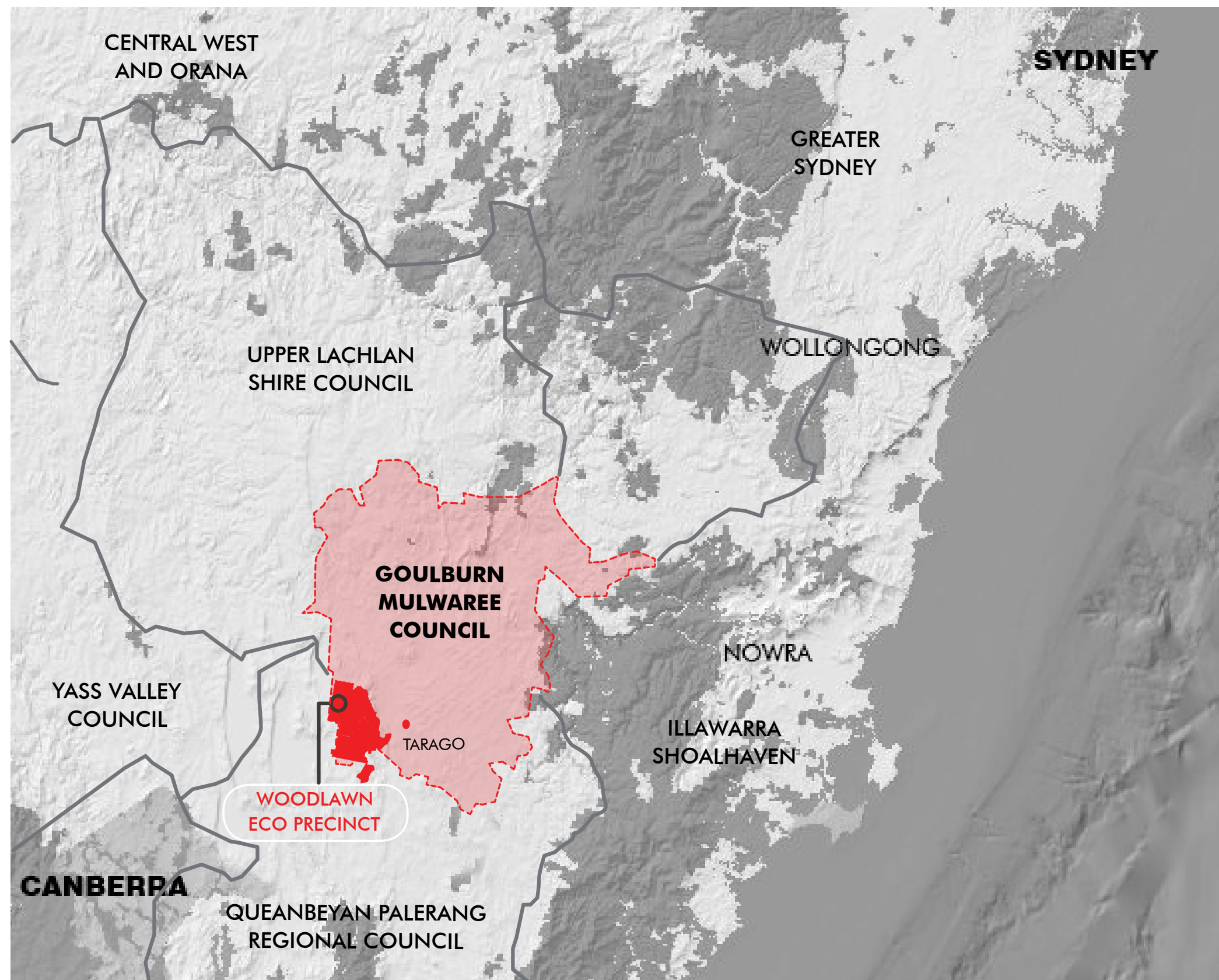


Figure 1 - State Context

2.2 Regional Context

Goulburn Mulwaree Local Government Area

The Goulburn Mulwaree Council Local Government Area (LGA) has a population of approximately 31,550, primarily located in and around the city of Goulburn and small villages at Bungonia, Lake Bathurst, Marulan, Tallong and Tarago.

The LGA encompasses a land area of approximately 3,200 square kilometres made up of predominately rural and woodland forest landscape.

As Australia's first inland city, Goulburn is a strategic regional centre which provides a variety of high order services. Major regional transport corridors (Hume and Federal Highways) pass through the LGA connecting with Sydney, Canberra and Melbourne. The Main Southern Railway Line also passes through the LGA.

The LGA is rich in natural Aboriginal and European cultural and built heritage. The European heritage reflecting historical agricultural and gold mining booms that resulted in the construction of many significant buildings particularly within the Goulburn CBD.

Goulburn Mulwaree LGA has expanded from its traditional agricultural base, with the region's largest employers being health care and social assistance, retail trade, construction and public administration and safety. Hard rock and limestone extraction at Marulan and the bioreactor near Tarago contribute to the local economy and national construction markets. Agriculture continues to be a significant contributor to the economy with livestock meat processing being a significant sector.

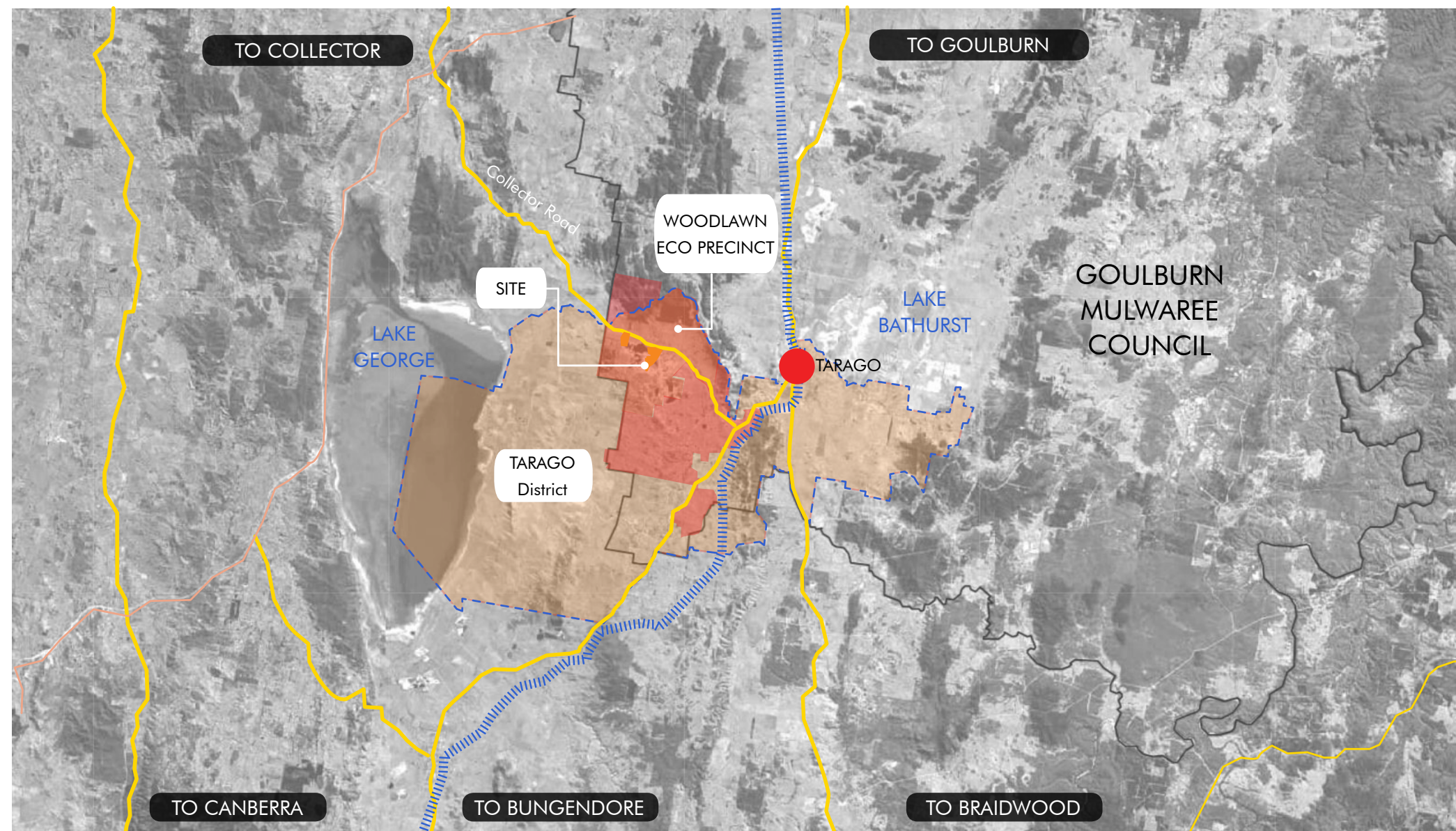


Figure 2 - Regional Context

- Woodlawn Eco Precinct
- Site
- Tarago District
- Existing Roads
- Rail Line

2.2 Regional Context

South-East and Tablelands Regional Plan 2036

The South-East and Tablelands Regional Plan 2036 (Regional Plan) provides a blueprint for regional growth balanced with protection of the natural environment. The Regional Plan was developed to provide an overarching framework to guide more detailed NSW government policies for regional land use planning and inform infrastructure funding decisions.

Key goals identified in the Regional Plan:

- Goal 1: A connected and prosperous economy
- Goal 2: A diverse environment interconnected by biodiversity corridors
- Goal 3: Healthy and connected communities
- Goal 4: Environmentally sustainable housing choices

Of the four key goals of the Regional Plan, there are several directions which are considered to have relevance to the proposed development of the ARC.

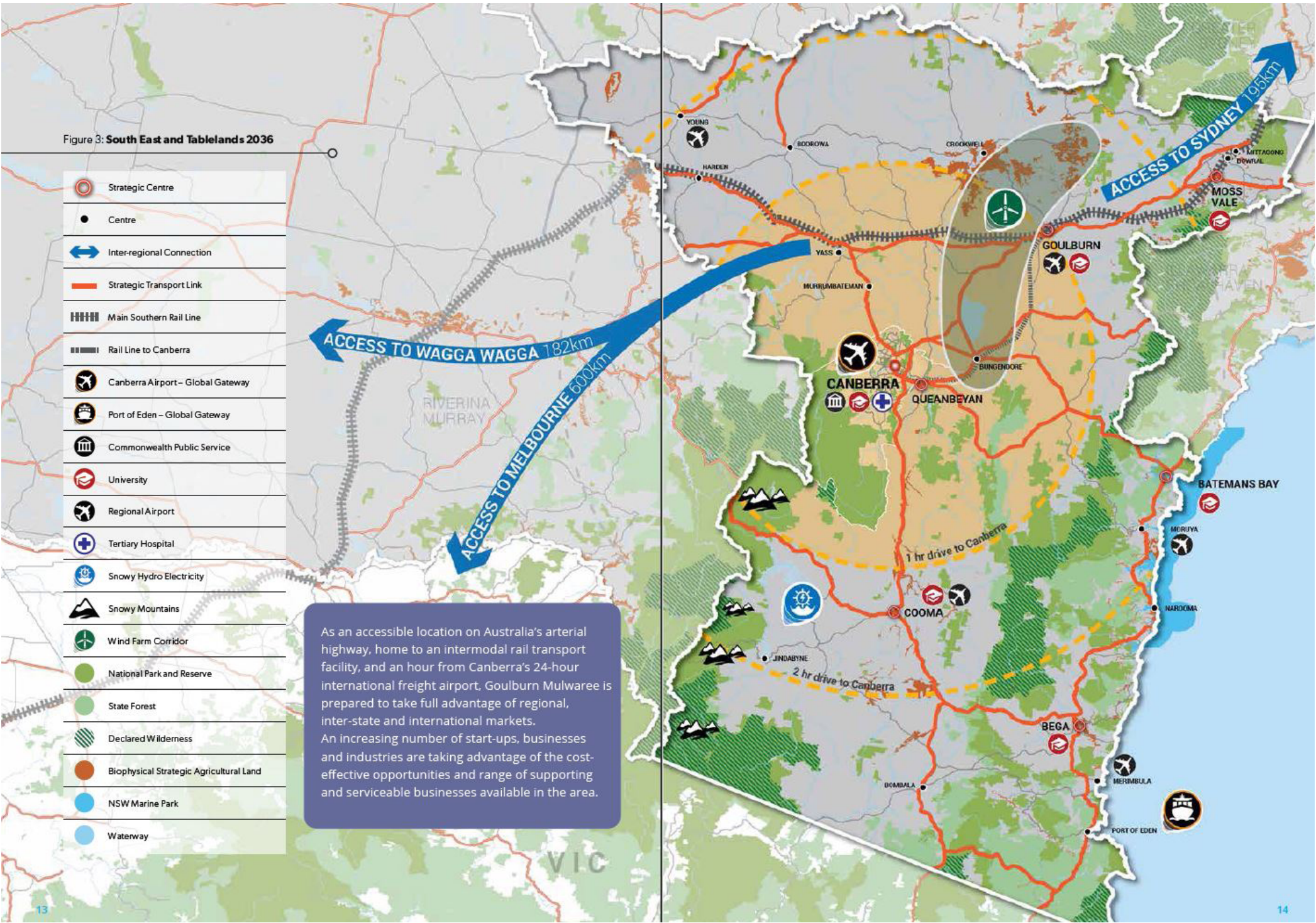


Figure 3 - Goulburn Mulwaree Strategic Context [Source: Goulburn Mulwaree Local Strategic Planning Statement]

2.2 Regional Context

Direction 5: Promote agricultural innovation, sustainability, and value add opportunities

The project provides commercial related activities that support the agricultural sector with ongoing production using agricultural lands. The development also offers tourism opportunities through the inclusion of educational and visitor experience related facilities value-add to the Eco Precinct and surrounding businesses. By design, the Eco Precinct provides co-location of facilities including agriculture, aquaculture, tourism and educational facilities, and maximises access to infrastructure.

Direction 6: Position the region as a hub of renewable energy excellence

The Eco Precinct, with landfill gas, wind, and solar generated electricity, is a part of an existing hub of renewable energy generation which will be complemented by the ARC, a low carbon energy source.

Direction 14: Protect important environmental assets

High environmental value lands and the region's networks of biodiversity corridors. Pockets of the site provide diversity and habitat for endemic flora and fauna, which are to be protected and enhanced on the site as part of the development.

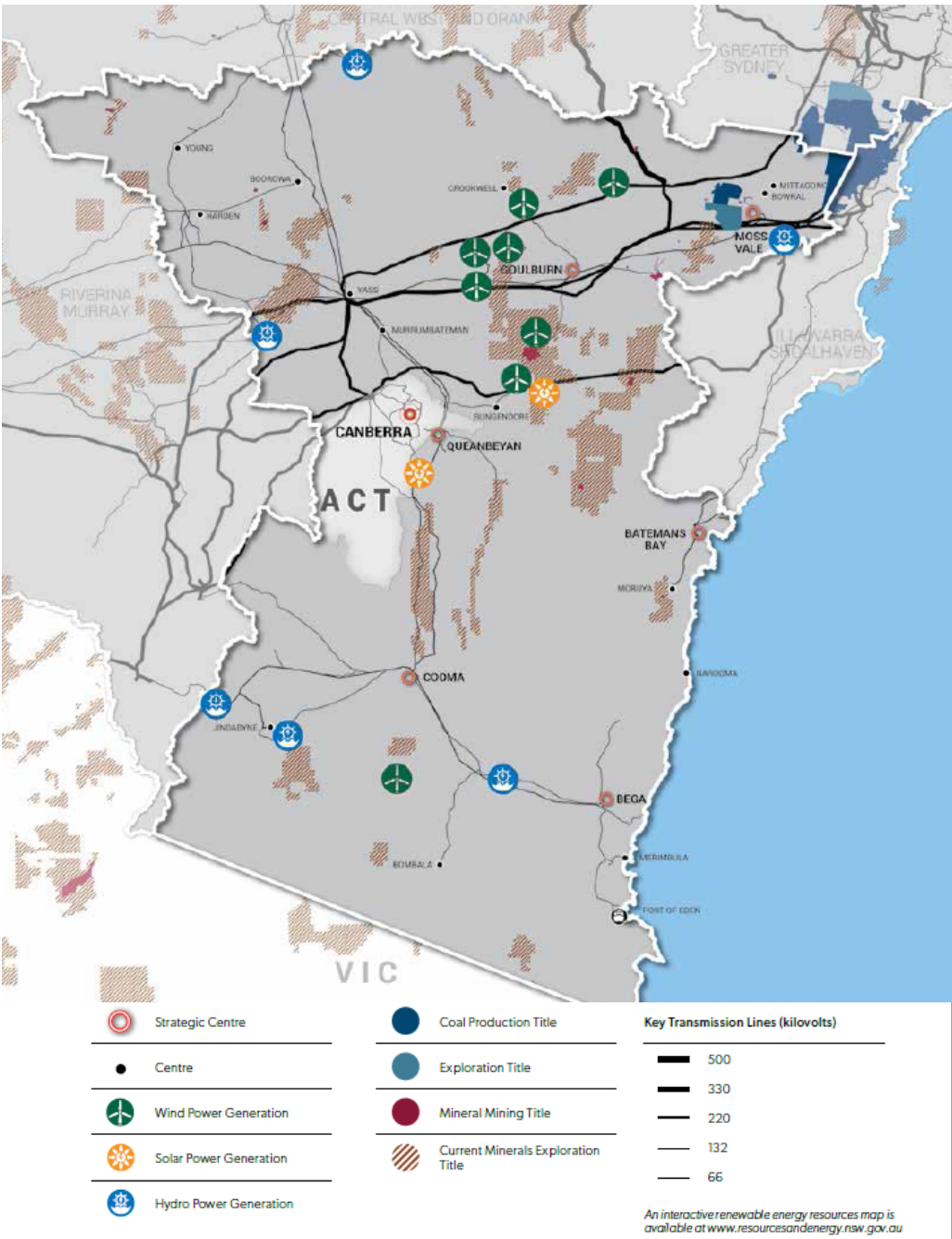


Figure 4 - Direction 6 - South East and Tablelands Regional Plan 2036

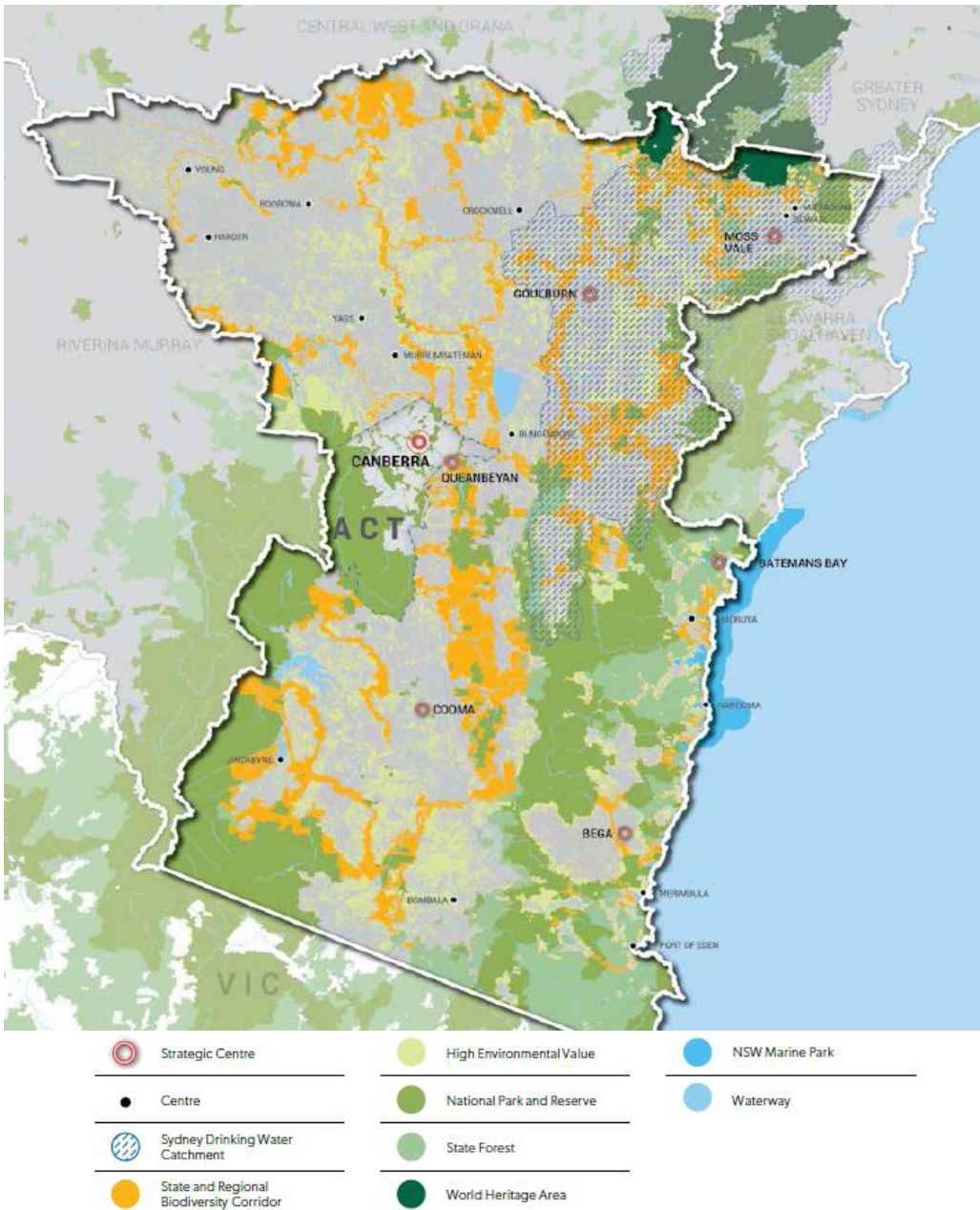


Figure 5 - Direction 14 - South East and Tablelands Regional Plan 2036

2.3 Local Context

Tarago and the Crisps Creek Intermodal Facility

Tarago is a town in the Southern Tablelands of New South Wales, Australia in Goulburn Mulwaree Council.

It is located on the eastern shore of Lake George in the Queanbeyan–Palerang Regional Council, approximately 40 kilometres south of the city of Goulburn and 70 kilometres north-east of Canberra.

Mining was a major industry in the area, with the Woodlawn Mine (within the Eco Precinct) operating during two separate periods, 1978 to 1998, and 2015 to present to produce copper, lead and zinc. Veolia’s integrated waste operations are located on land previously impacted by mining, including the Bioreactor which is a former open cut mine void.

For many years, Tarago was a staging post and railhead for the Main Southern Railway Line. The Crisps Creek Intermodal Facility (IMF) is an integral part of Veolia’s logistical operations at the Eco Precinct. The IMF is located 6 km from the main entrance to the Eco Precinct, adjacent to the Goulburn-Bombala Railway line. Containers with waste transported from Greater Sydney by rail are unloaded and transferred onto road trailers at the IMF for transport to the Bioreactor.

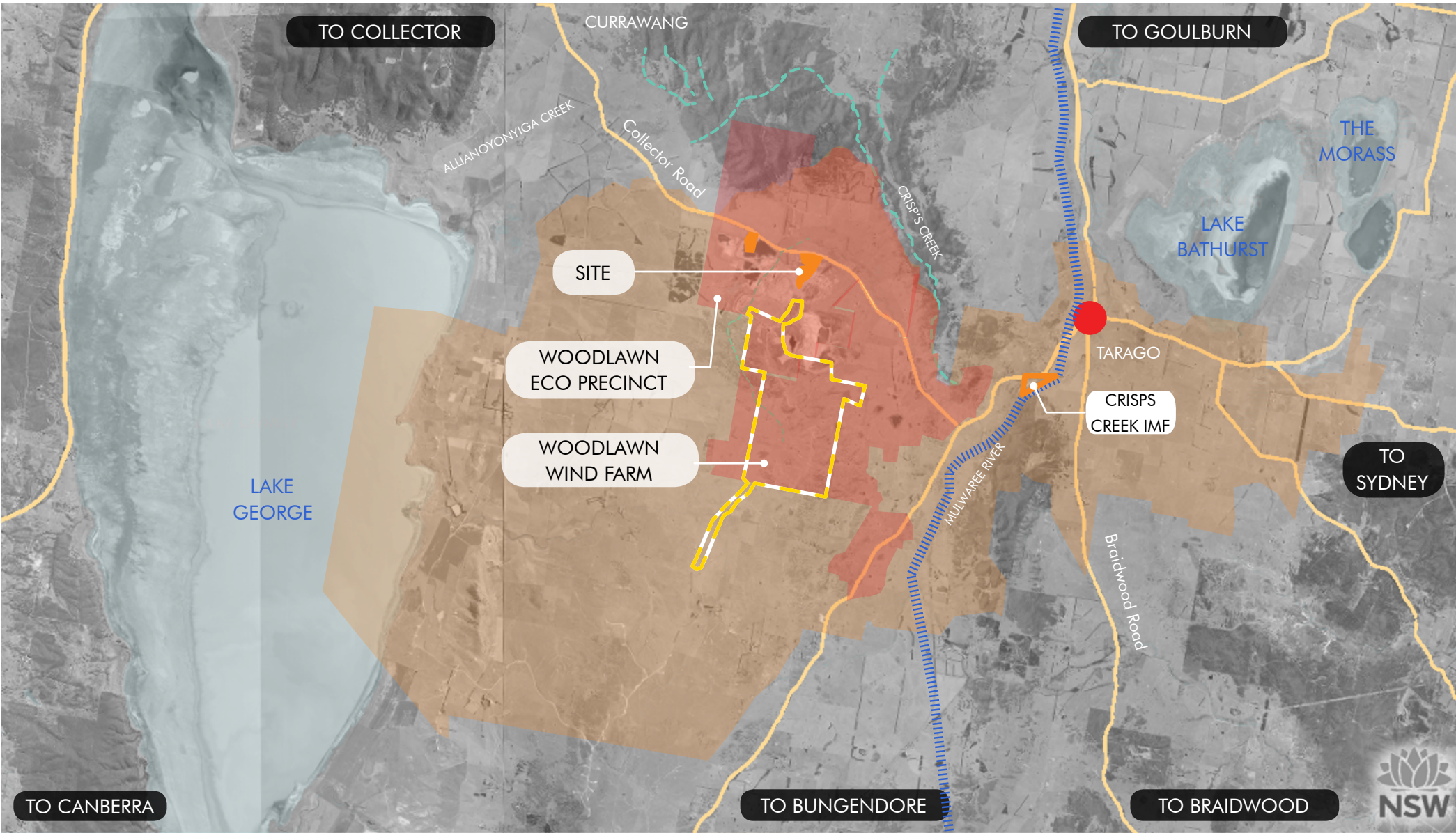


Figure 6 - Local Context, Tarago [Source: SIX Maps]

2.4 Precinct Context

Woodlawn Eco Precinct

The Woodlawn Eco Precinct site is located approximately 7km west of the township of Tarago in the Goulburn Mulwaree LGA.

The Eco Precinct comprises the following integrated waste management operations, energy recovery technologies and energy generation, and other sustainable land uses, including the following:

- Woodlawn Bioreactor (the Bioreactor) – a landfill in which leachate is recirculated to help bacteria break down the waste, enhancing the early generation, capture and extraction of landfill gas, including leachate and landfill gas management systems.
- Woodlawn BioEnergy Power Station – utilises landfill gas from the Bioreactor to generate electricity.
- Woodlawn Mechanical Biological Treatment (MBT) Facility – extracts the organic content from a portion of the municipal solid waste (MSW) for use in tailings dam remediation.
- Agriculture – includes a working farm that applies sustainable management practices.
- Aquaculture and horticulture – use of captured waste heat from the BioEnergy Power Station for use in sustainable fish farming and hydroponic horticulture at the Eco Precinct.
- Renewable energy generation – the Woodlawn Wind Farm (operated by Iberdrola) which has an installed capacity to generate up to 48.3 MW of clean energy, and a solar farm with installed capacity to produce up to 2.3 MW of clean energy.

Land immediately surrounding the operational areas of the Eco Precinct is owned by Veolia, providing a buffer between operations and surrounding private properties.

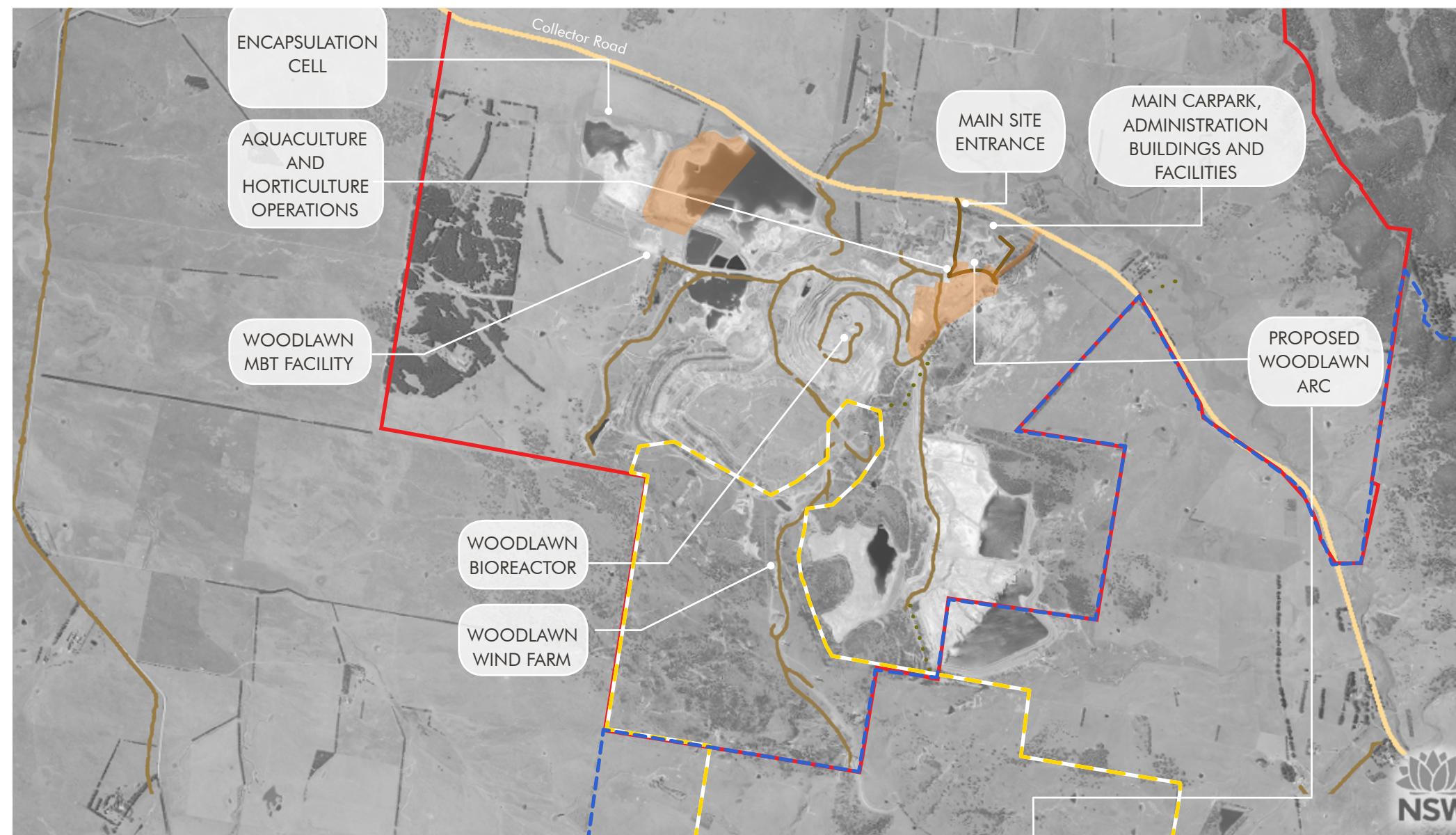
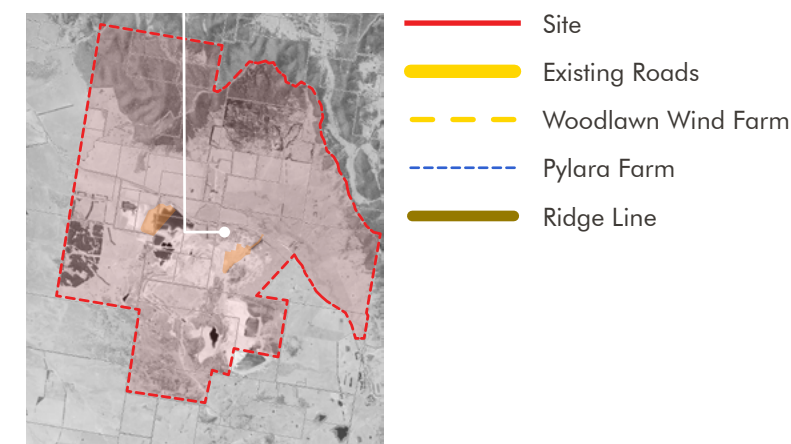


Figure 7 - Precinct Context [Source: SIX Maps]



2.5 Summary

Site Suitability

The proposed site for the ARC is within Veolia's Woodlawn Eco Precinct. The proposed area within the Eco Precinct is already appropriately zoned and has substantial infrastructure developed for integrated waste management and resource recovery. The Eco Precinct has prioritised sustainable and innovative waste management practices for the last 20 years and includes a range of complementary waste management and resource recovery operations and technologies. The project is considered a compatible extension of the existing operations at the Eco Precinct, involving the addition of waste recovery technology in line with existing sustainable and innovative waste management practices. The project will enable the use of existing transmission and associated infrastructure and may provide the impetus for upgrades. Additional infrastructure development in the region provides greater industry stability and increases investment confidence for continued sector growth.

These factors are identified as being desirable attributes of future regional development in the previously discussed regional and strategic plans. These plans, policies, and strategies provide further context to the suitability of the Eco Precinct for the project. The local and regional planning strategies identify support from local governments for development of technologies, such as the recovery of energy from waste proposed by the project, to assist in delivery of goals associated with waste management, a circular economy, job creation, and investment in regional infrastructure.

Veolia has a proven history of developing and operating waste management facilities within the Woodlawn Eco Precinct. The Eco Precinct has provided additional opportunity for development of renewable energy industries initiating development of the Woodlawn BioEnergy Plant, Woodlawn Windfarm (operated by Iberdrola), and the Woodlawn Solar Farm. Development of side industries such as Veolia's investment in aquaculture and hydroponic horticulture has demonstrated that by-products of energy production can be utilised for additional sustainable industries. It is considered that this site demonstrates suitability for development of the project based on its existing land use, proximity to infrastructure, and in consideration of relevant plans, policies, and strategies associated with the region.



03

SITE ANALYSIS

3.1 Waste Journey

Waste Journey

Veolia’s integrated waste management operations are facilitated by two transfer terminals in Greater Sydney, located at Clyde and Banksmeadow, which receive waste for transport to the Eco Precinct.

Waste is unloaded, sorted, compacted and containerised into purpose-built shipping containers at these terminals for transport via the Goulburn-Bombala Railway line to the Crisps Creek IMF.

Containers with waste transported from Greater Sydney are unloaded and transferred onto road trailers at the Crisps Creek IMF for transport to the Eco Precinct.

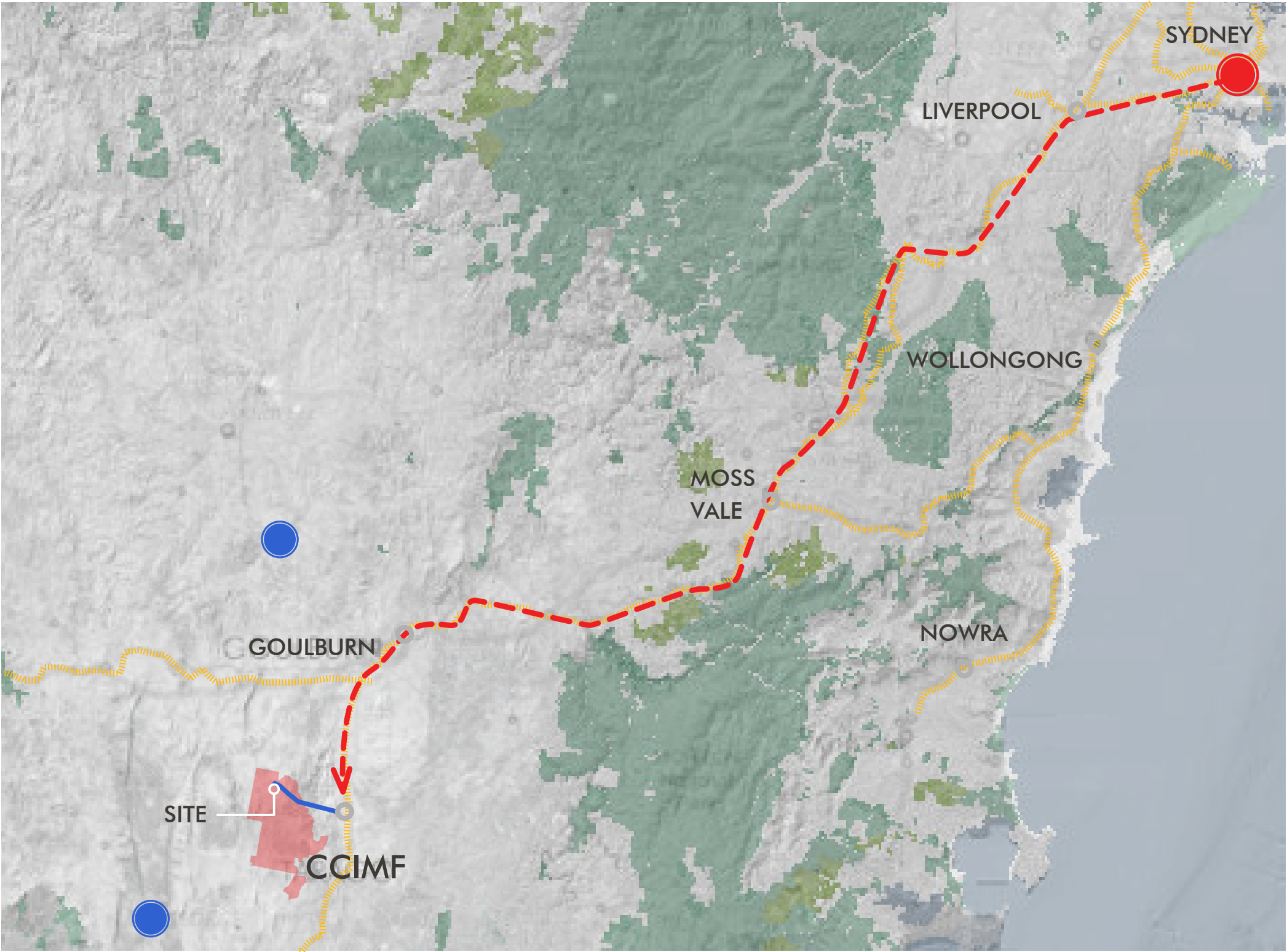


Figure 8 - Waste Journey Route

- Railway Journey
- Road Journey
- Rail Line
- Greater Sydney Area
- Regional Areas

3.1 Waste Journey

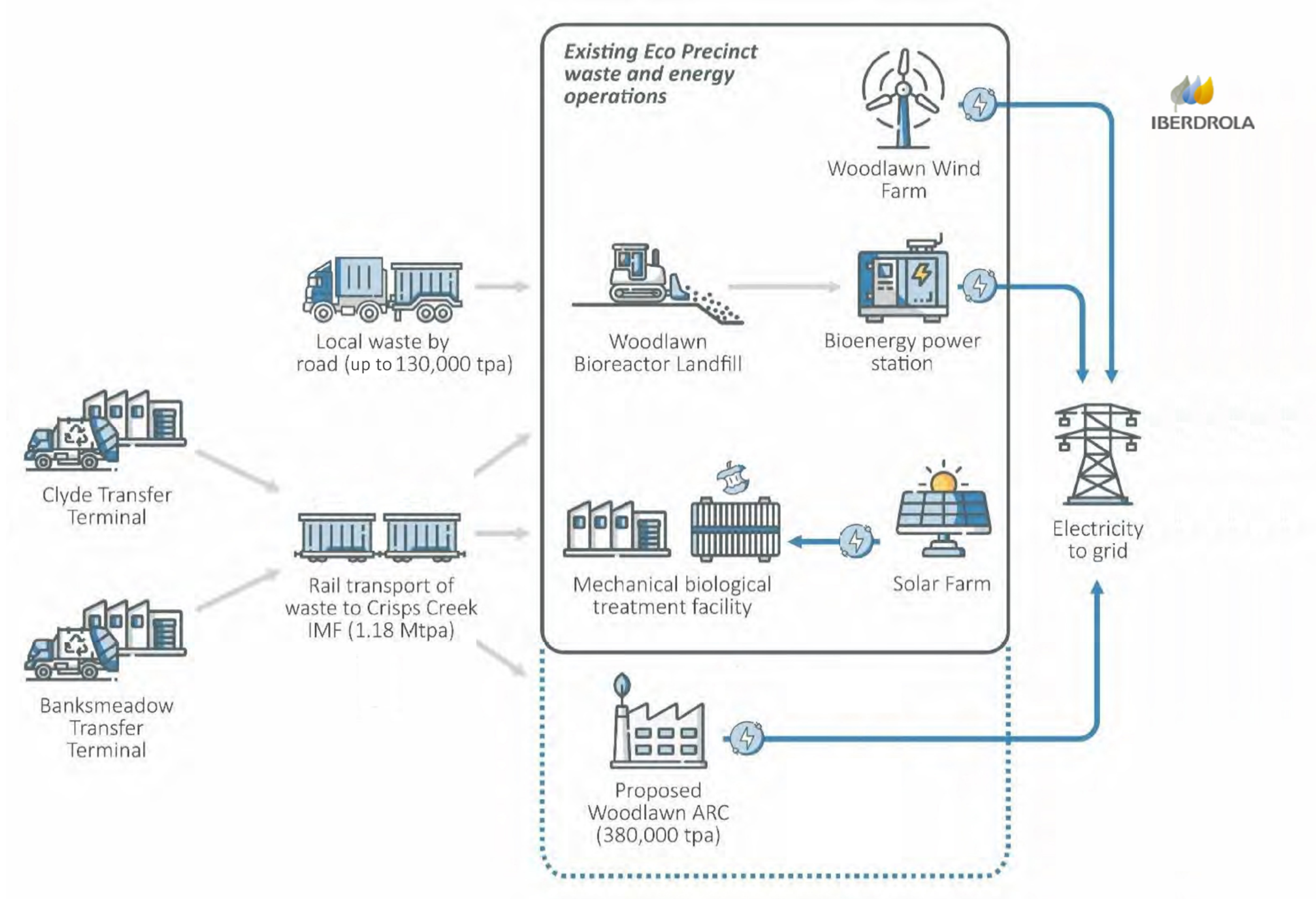


Figure 9 - Waste Journey

3.2 Heritage

Indigenous Australian Heritage

The Development Footprint is understood to be located on Ngunnawal land.

Whilst Tindale (1974) describes the land of the Ngunnawal as extending from Queanbeyan to Yass, Tumut to Boorowa and east to beyond Goulburn on highlands west of the Shoalhaven River, the site appears to be on the border of this boundary and may also have associations with the Gundungurra language group to the north, Yuin language to the east, and Ngarigo language to the south.

It is important to remember that these groupings represent an account of Aboriginal groups post contact, they may not necessarily present an accurate picture of the way lands were occupied or used in the past.

As there are no known and identified Aboriginal or historical heritage sites located within the footprint of the ARC, and given its predominantly disturbed condition, the risk of impact to items of heritage significance as the result of the project is considered extremely low. It is considered that the only potential for impacts on items of Aboriginal heritage or historical heritage is in the area of fragmented vegetation. This is considered unlikely due to previous mining operations and its current use as the Eco Precinct.

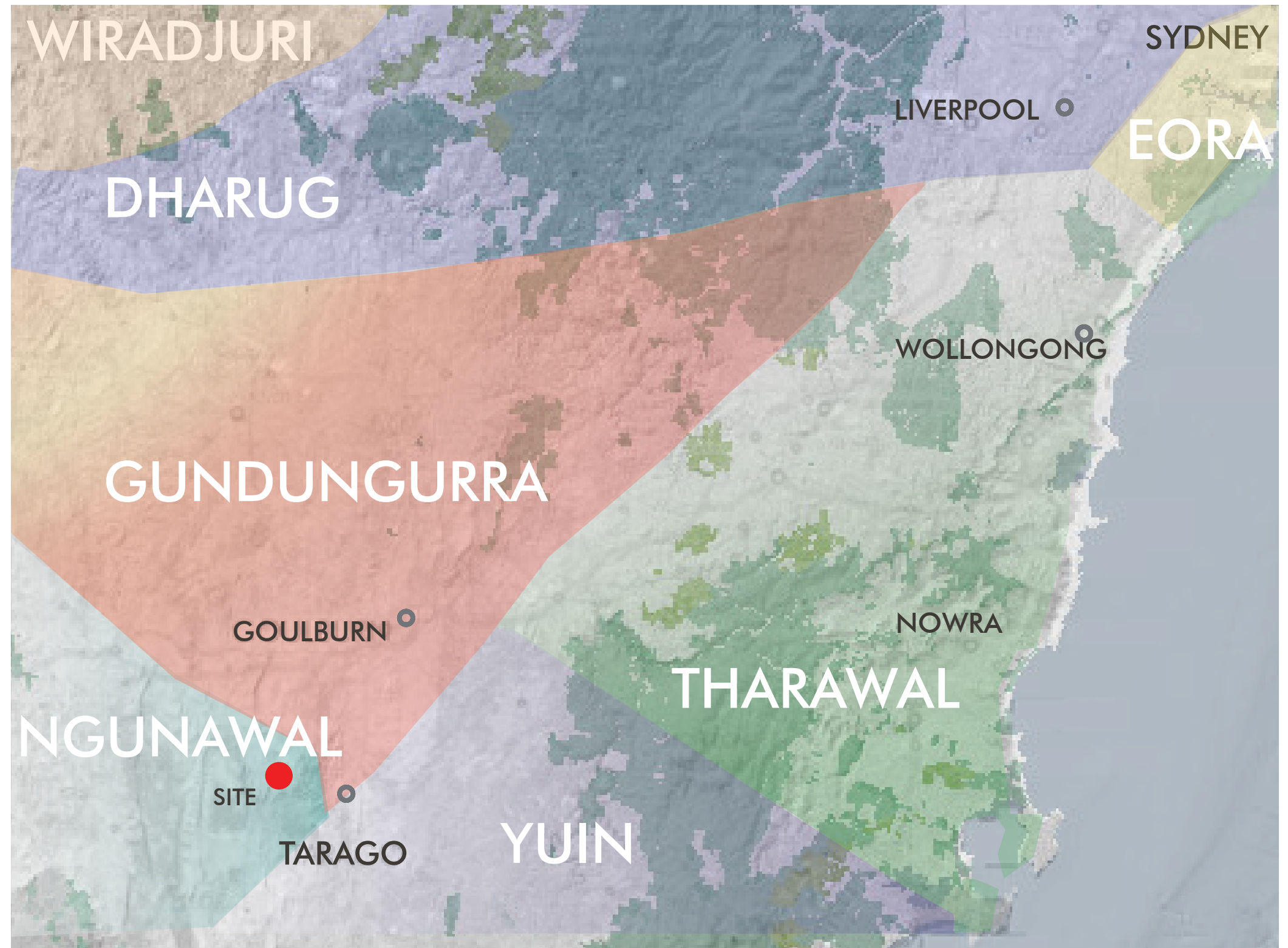


Figure 10 - Aboriginal Groups

3.2 Heritage

European Heritage (1820 – Present)

European settlement dates to the 1820s, with the township of Goulburn established in the 1830s. Land surrounding Goulburn and Tarago has been utilised for grazing and agriculture up until the present.

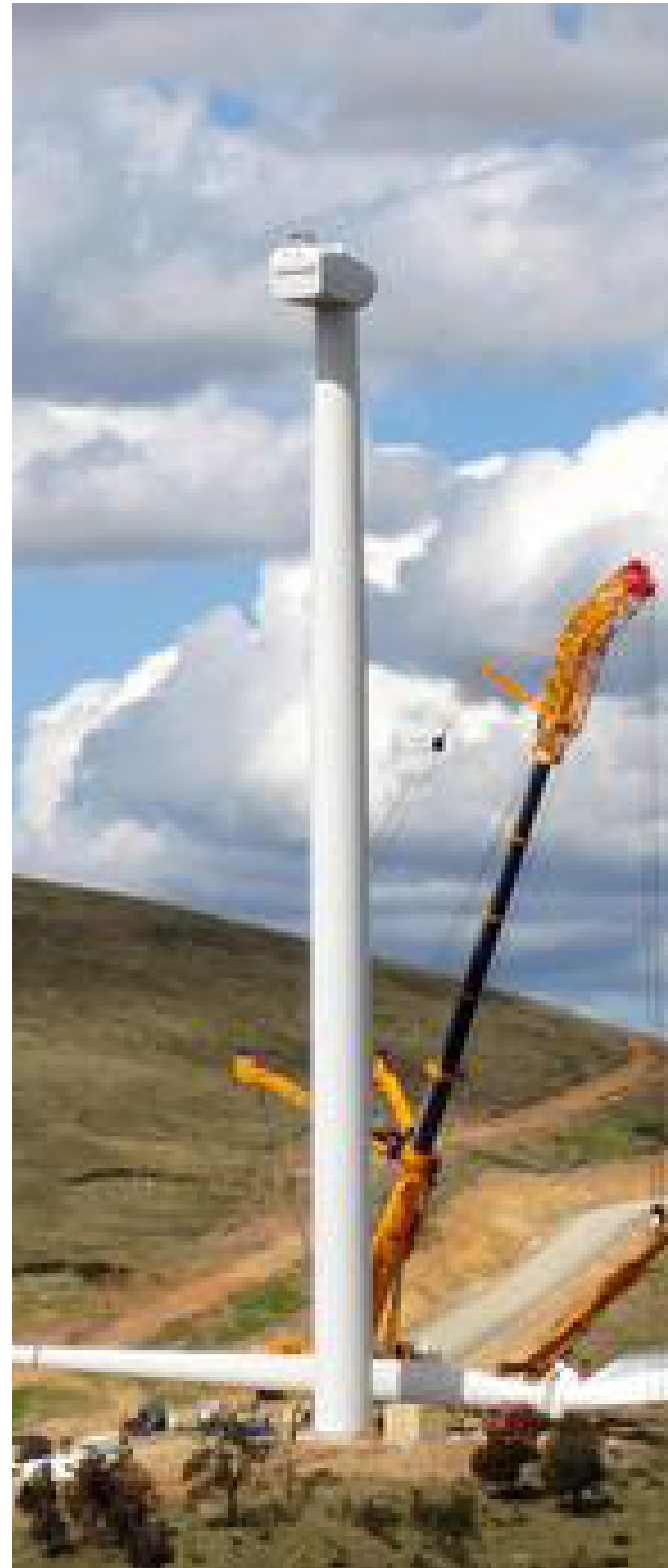
Mining at the Eco Precinct has occurred in two separate periods: from 1978 to 1998, and from 2015 to present.

Development of an open cut pit by to mine gold, silver, zinc, lead and copper on land that now forms part of the Eco Precinct commenced 1978. In 1987, operations were extended to underground mining and tailings reprocessing. Mining operations ceased in 1998.

Veolia (then Collex) purchased the Woodlawn property, now the site of the Woodlawn Eco Precinct, in 2001 following the closure of the mining operations. The property was purchased with the intention of establishing a waste management facility, whilst rehabilitating areas disturbed by prior mining operations.

Development consent for the Woodlawn Mine was granted in 2013 for mining operations, with operations commencing in 2015.

The Eco Precinct has developed over the last 20 years to become an integrated waste management and resource recovery operation, incorporating incorporating the Bioreactor, a putrescible landfill, the BioEnergy Power Station operating on landfill gas, a mechanical biological treatment (MBT) facility, a solar farm and a wind farm.



WIND TURBINE



WOODLAWN MINE



WOODLAWN MINE



WOODLAWN MINE



GOULBURN POST OFFICE



GOULBURN TOWN HALL



GOULBURN RAILWAY STATION

3.3 Zoning

Goulburn Mulwaree Zoning

The NSW Energy from Waste Infrastructure Plan released in 2021, to support the NSW Waste and Sustainable Materials Strategy 2041, identifies priority infrastructure areas for the development of energy from waste facilities, which includes the South Goulburn Mulwaree Precinct. This zoning notes the precinct as predominantly IN3 Heavy Industrial,

The balance of neighbouring properties is zoned RU1 Primary Production and RU2 Rural Landscape.

The village of Tarago, 7km to the East, is zoned a combination of RU5 Village, RU6 Transitional, RU1 Primary Production and E3 Environmental Management.

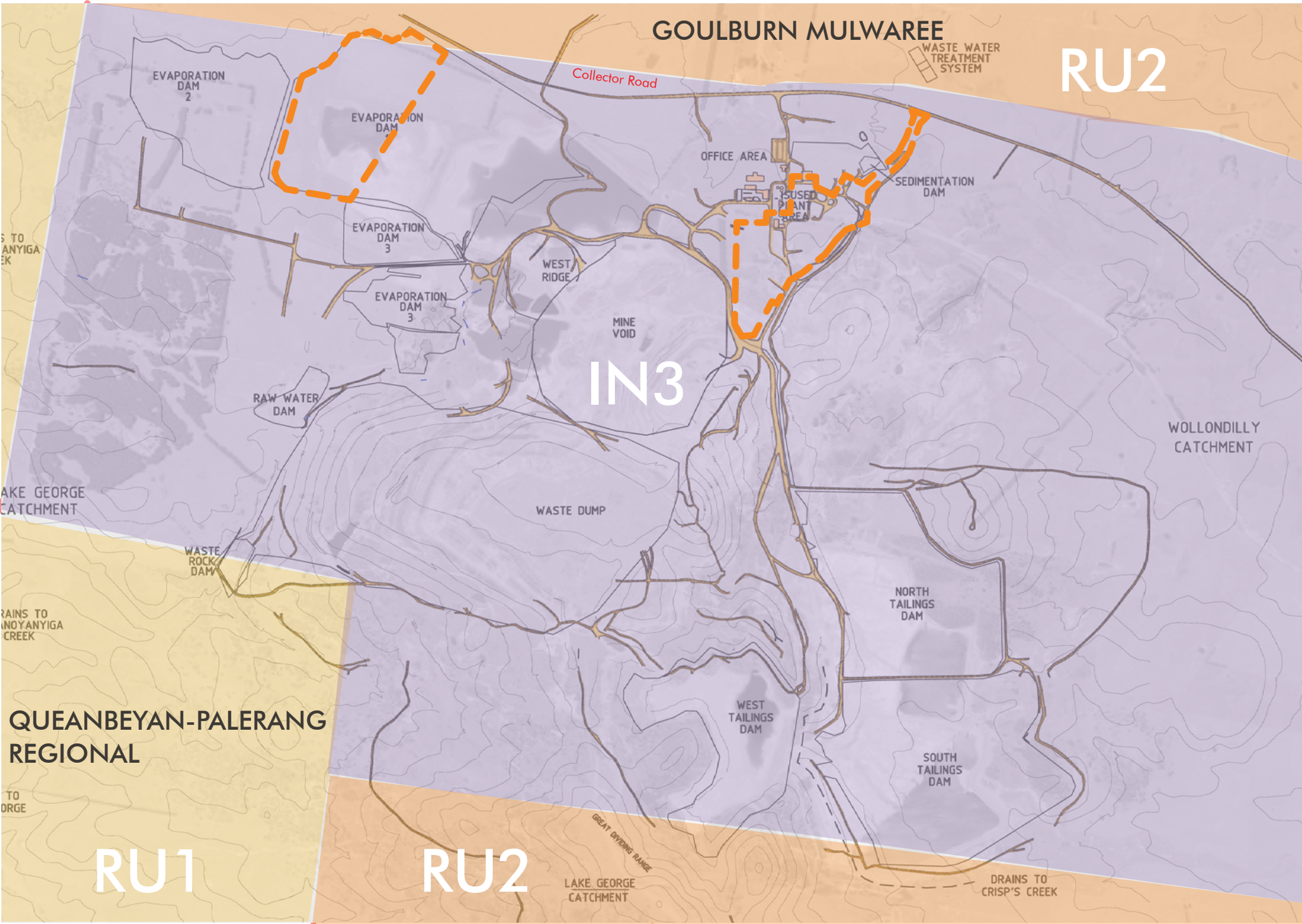


Figure 11 - Land Zoning

- IN3 - Heavy Industrial
- RU1 - Primary Production
- RU2 - Rural Landscape
- Development Footprint

3.4 Topography, Water Course, Vegetation & Rehabilitation

Topography

The Eco Precinct has an average elevation of approximately 800m above Australian Height Datum (AHD) across the site with a maximum of 1,000 m AHD in the north-eastern corner along the ridgeline of the Great Dividing Range (GDR). The region is characterised by undulating plains with the GDR running through the Eco Precinct in a north-south alignment.

Biodiversity

Due to the nature of existing operations and prior disturbance of the project footprint, the sensitivity of the receiving environment is considered to be low. The ARC is located in an area previously used for historic mining and waste related activities and is predominantly disturbed and contaminated. There are some areas of remaining fragmented vegetation in the north-eastern portion of the ARC location. Other areas of the Eco Precinct are subject to rehabilitation of former mining and related areas. The most abundant vegetation community within the Eco Precinct is derived grasslands, including a variety of native pasture grasses and exotic species disturbed from historical agriculture and extractive industry land uses. Patches of fragmented vegetation within the Eco Precinct also contain shrubs and small trees. The footprint of the ARC is generally located within cleared and disturbed land.

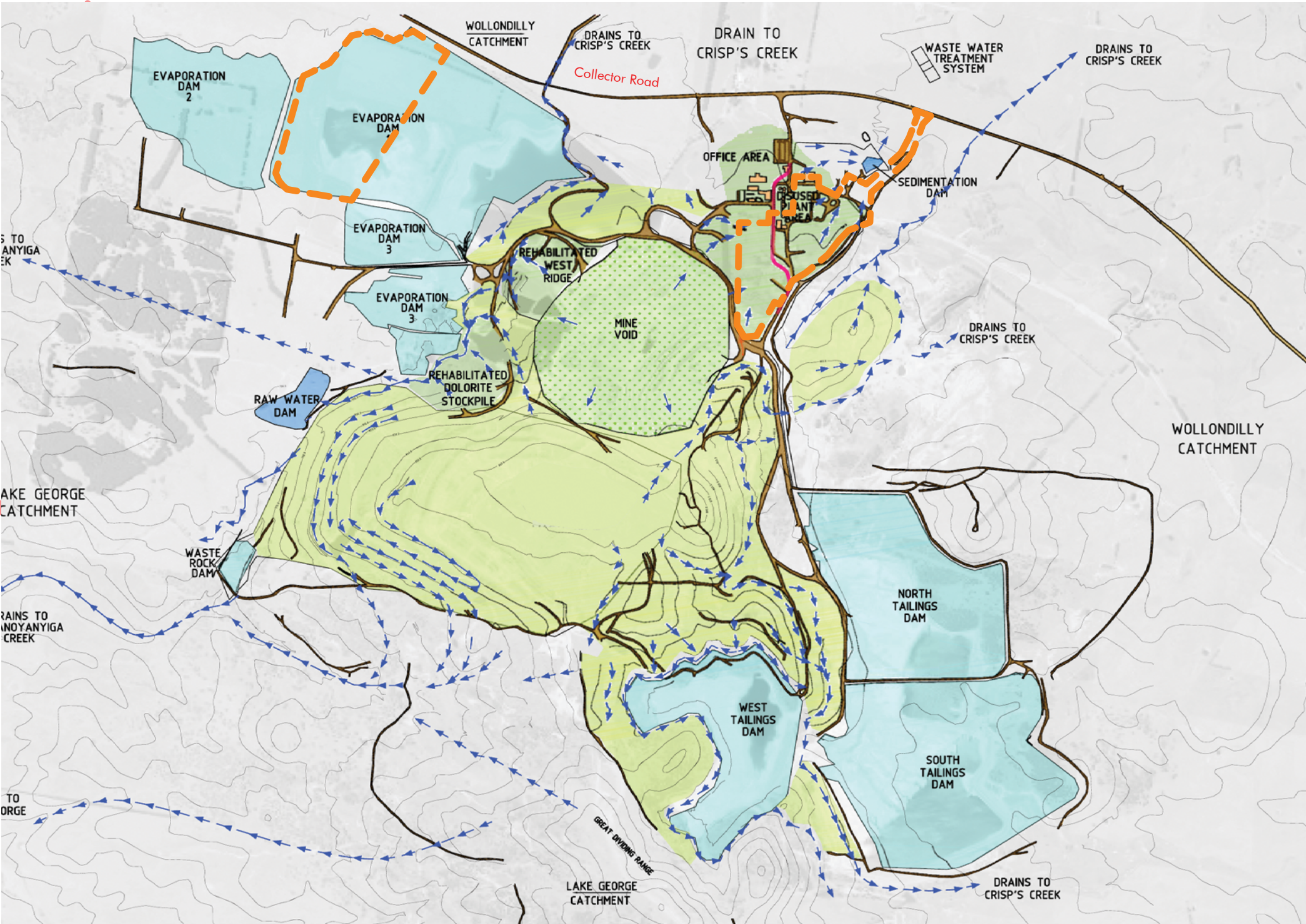


Figure 12- Topography, Water Course, Vegetation and Rehabilitation

- Clean Water Collection Dams
- Clean Water Flow Lines
- Contaminated Water Flow Lines
- Pipeline
- Haul Road
- Rehabilitated Areas
- Proposed Rehabilitated Areas
- Mine Waste Water Collection Dams
- Development Footprint

3.5 Transport & Access

Transport & Access

Vehicular access to the Woodlawn Eco Precinct is via Collector Road. Collector Road is a sealed single carriageway road which connects to Bungendore Road to the south-east and the Federal Highway to the north-west.

The Eco Precinct contains several car parking areas for visitors and employees.

The closest public rail facility is Tarago Railway Station, which is located near the town of Tarago to the east of the Eco Precinct. Tarago Railway Station is located approximately 2 km north of the Crisps Creek IMF.

The closest airport facility is the Goulburn Airport which is located approximately 32km north then the Canberra Airport located approximately 42 km southwest of the Eco Precinct.

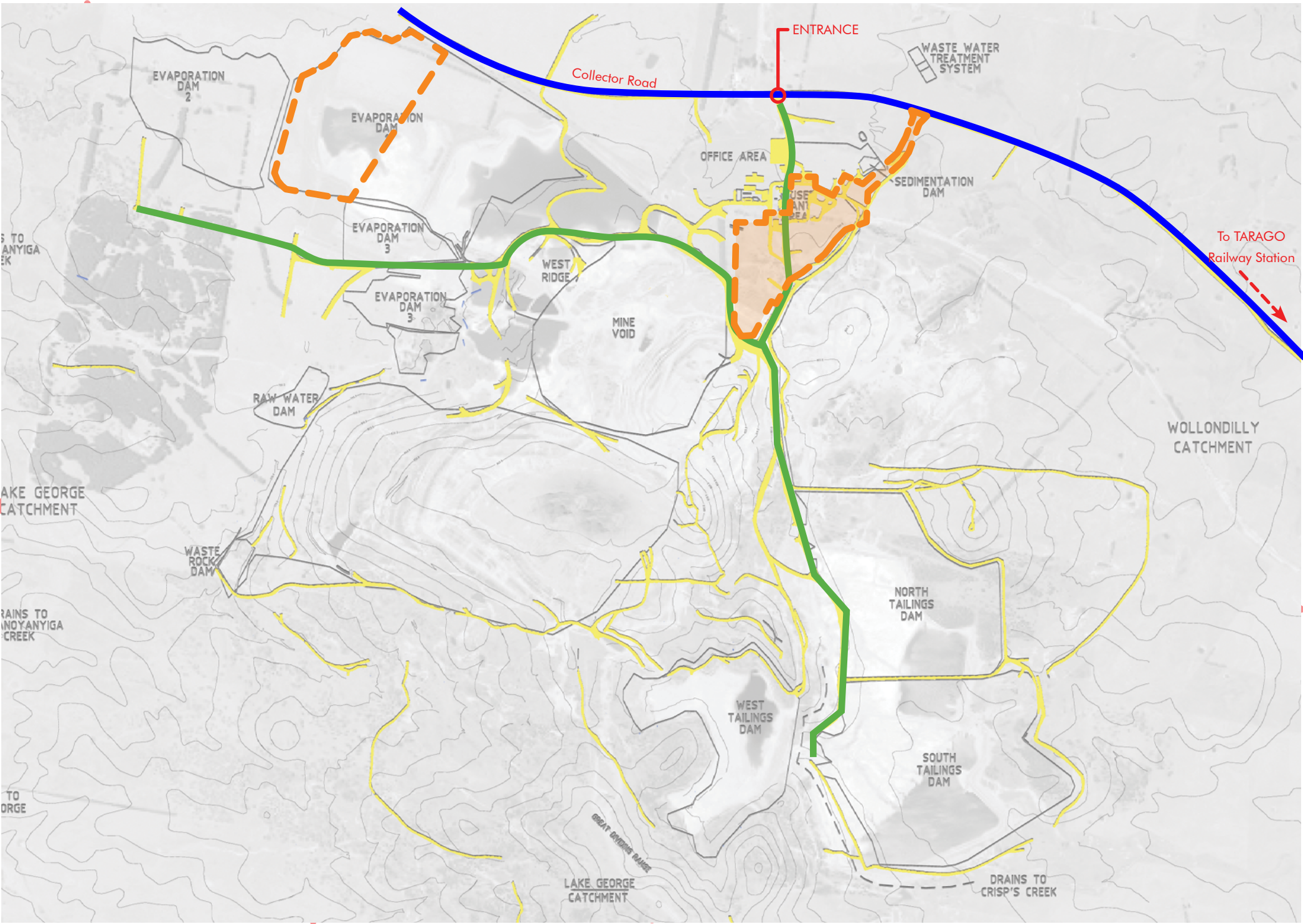


Figure 13 - Transport and Access

- Main Public Road
- Internal Main Roads
- Internal Connection Roads
- - - Development Footprint



04

REFERENCE DESIGN PROPOSAL

4.1 Project Vision

Woodlawn Advanced Energy Recovery Centre

The project vision is to deliver a world class Energy Recovery Facility (ERF) to compliment the waste disposal management and existing clean energy infrastructure, which is currently located on the Woodlawn Eco Precinct. It will be a critical piece of residual waste infrastructure to support the New South Wales plan to extend the life of current landfills and transition towards a circular economy.

The proposed design draws inspiration from the surrounding natural environment, rural farmland, mining, and the waste management context in which it sits.

The site layout has been designed and orientated to act as a visual anchor point to the existing ridgeline located to the south of the site. Conceptually, the form and external appearance of the proposed building draws inspiration from the surrounding hillside. Elements such as the undulating topography, the layers in the earth, and the organic form of the local flora are celebrated in the built form.

Material selection draws influence from Veolia's commitment to sustainable methods of processing waste and generating clean electricity, which is evident throughout the Woodlawn Eco Precinct. A natural palette of colours has been applied to the façade to sympathise the building with the natural environment. When viewed from Collector Road this allows the reference design to sit gently within its setting. With a strong focus on the environmental enhancement, the landscape design response seeks to restore endemic plant species and recreate natural habitats for local fauna to return to the site.

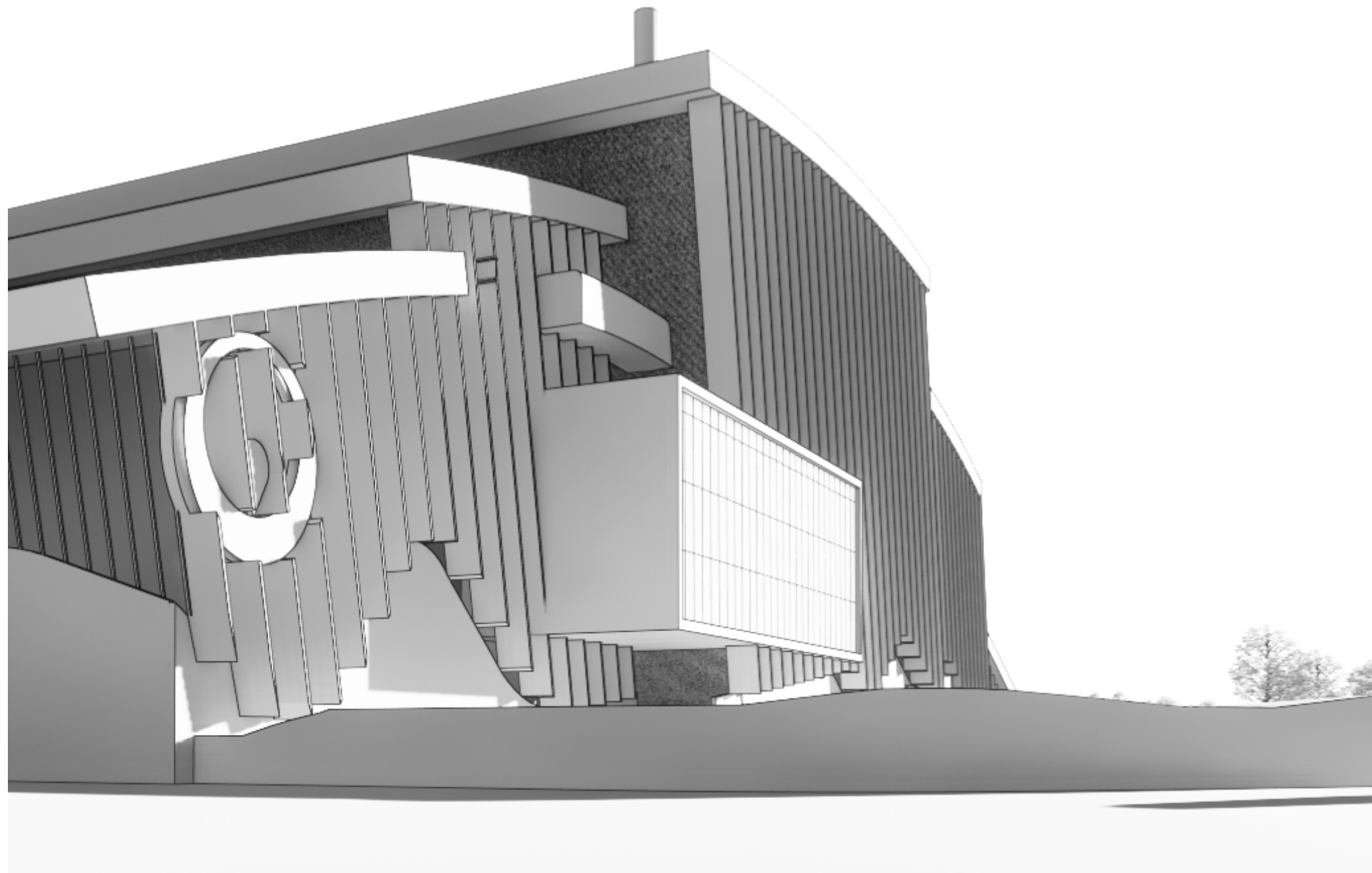


Figure 14 - Perspective Image during Design Development

4.2 Precedents

Introduction

Energy Recovery Facilities are a proven technology that have existed and developed globally for several decades.

Through systematic analysis of selected existing facilities, we sought inspiration, technical clarification and design methodology that could be utilised on the Woodlawn ARC development.

Both Australian and international facilities were analysed with features summarised in the following pages. These included the following:

1. **Staffordshire Energy Recovery Facility (Veolia)**
2. **Shenzhen Waste to Energy Plant**
3. **Krakow Thermal Waste Treatment Plant**
4. **Kwinana Waste to Energy Project (WA, Australia)**

4.2 Precedents

1. Staffordshire Energy Recovery Facility (Veolia)

The W2R Energy Recovery Facility is located at the Four Ashes Industrial Complex in Staffordshire County, England.

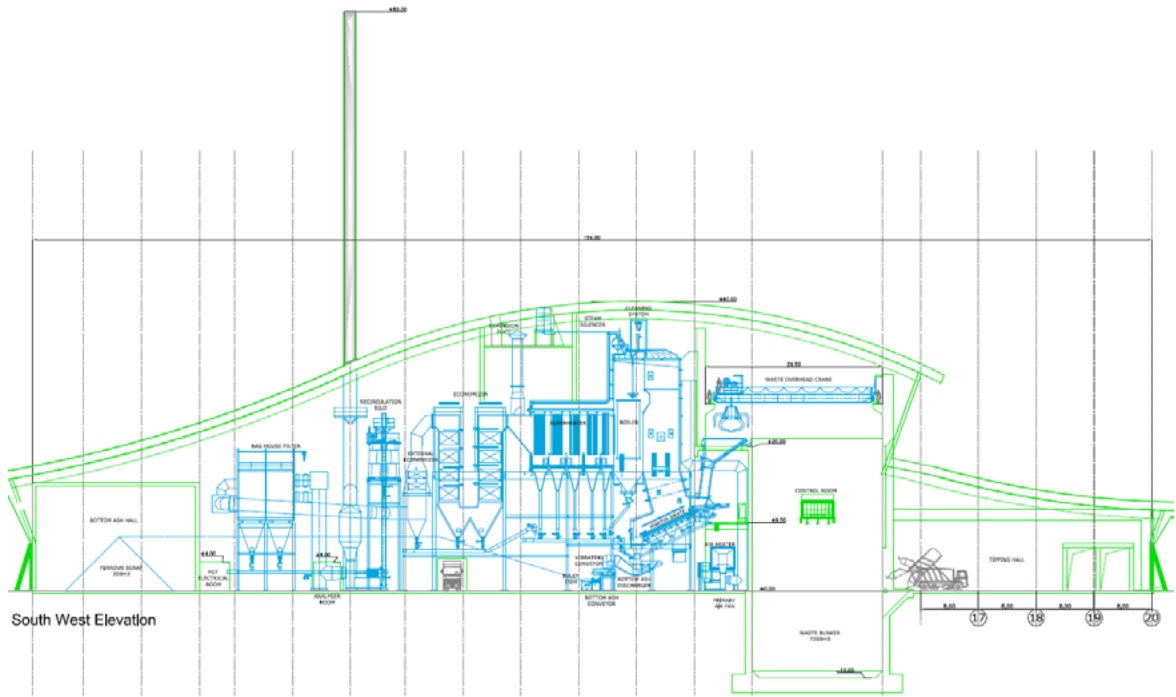
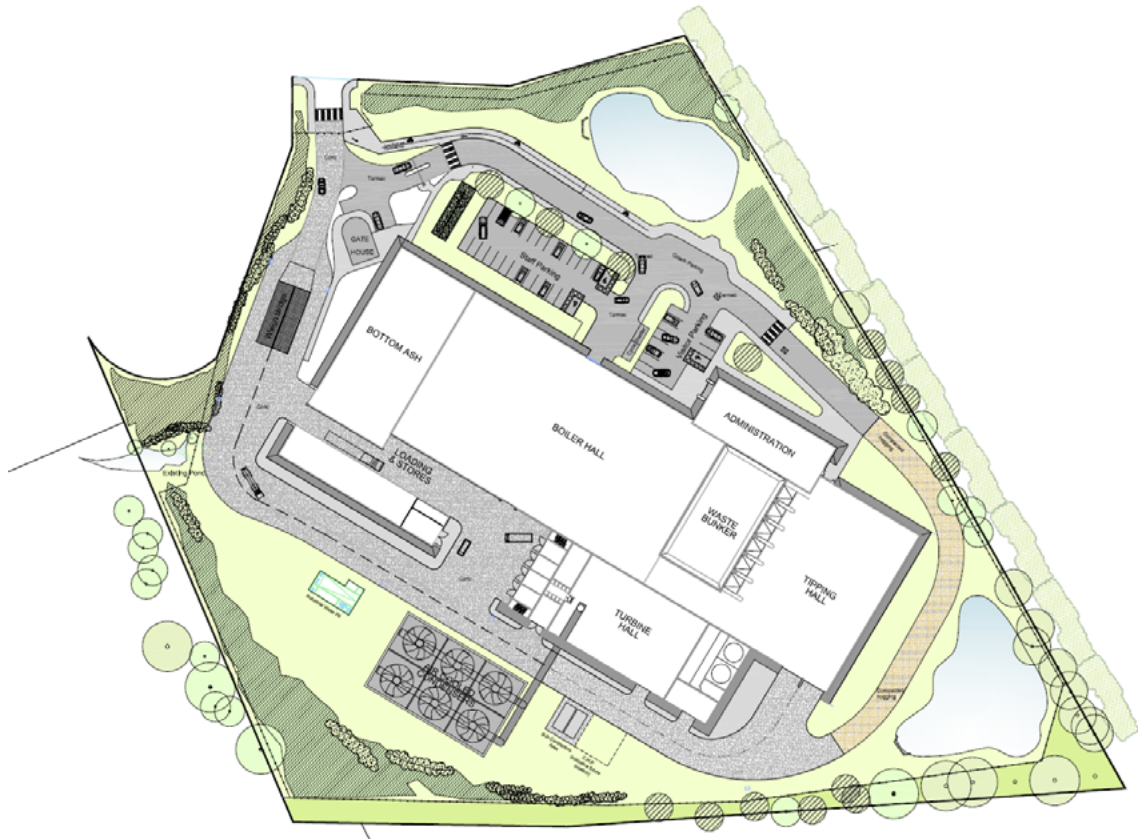
It is a 2 line facility capable of processing 340,000 tonnes of waste p/a and is able to produce 29MW of energy to power 66,000 homes.

Pros

- Simple elegant building form that is sympathetic with surrounding context.
- Living roof to minimise use of insulation products that contribute to carbon emissions.
- Material selection informed by sustainable principles.
- Stormwater management to ensure no contamination of neighbouring properties.
- Air Cooled Condensers detached from facility.
- Relationship of the site to the surrounding community, proximity of Calf Heath to the east.

Cons

- Less consideration given to visitor and educational experience.



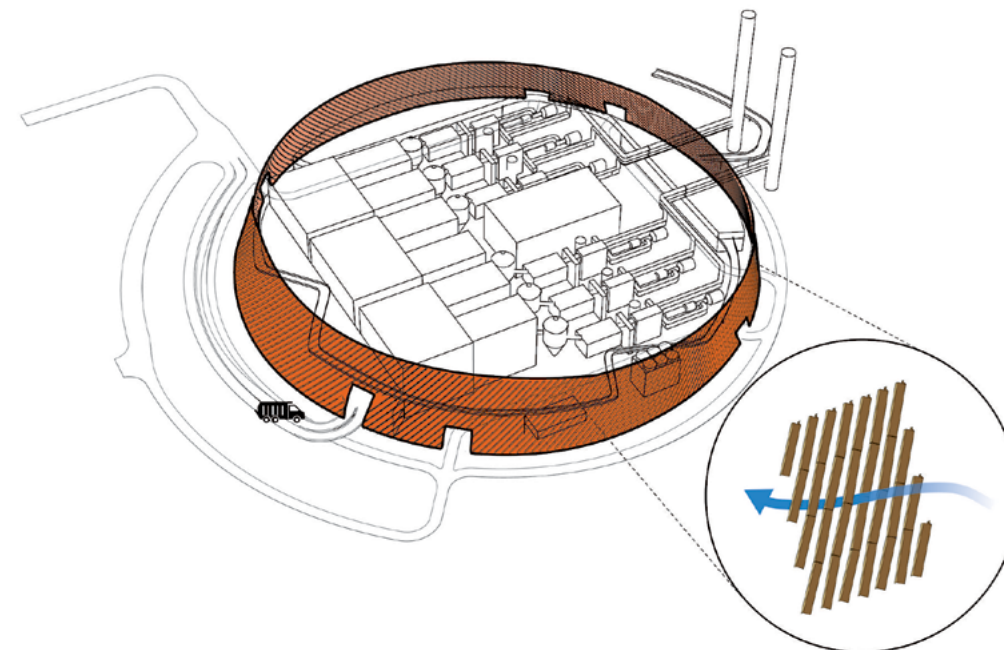
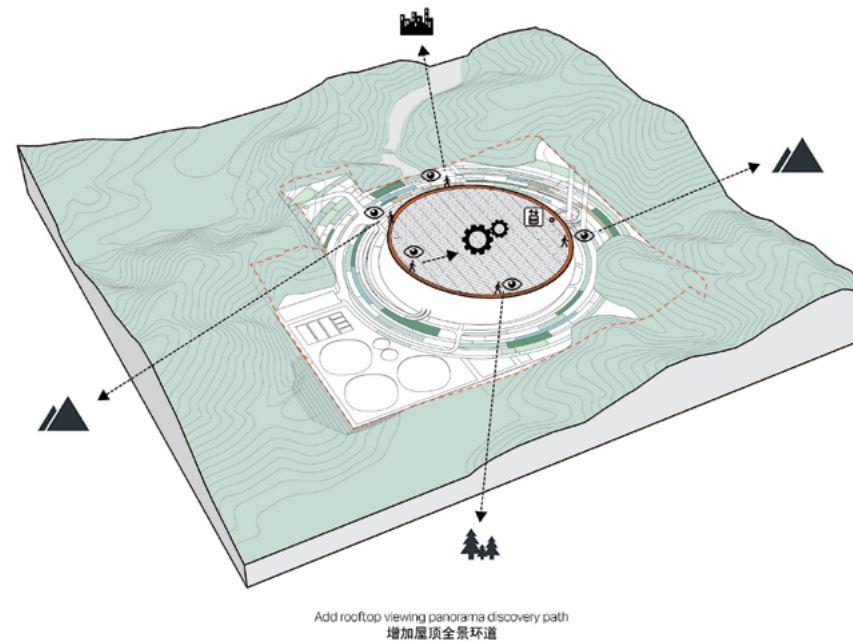
4.2 Precedents

2. Shenzhen Waste to Energy Plant

Located in Shenzhen, China, the Shenzhen East Waste to Energy Plant is currently under construction. It is the largest ERF in the world, employing multiple lines and capable of processing 5,600 tonnes of waste each day. Once operational in 2022, the plant will be capable of producing 165MW of electricity.

Pros

- Simple elegant building form concealing plant equipment.
- Photovoltaics integrated into roof providing additional clean energy benefits.
- Clearly defined circulation routes for vehicles, staff and general public.
- Strong emphasis on educating public on life cycle of waste.
- Assists in the reduction of smog of surrounding Shenzhen city.



4.2 Precedents

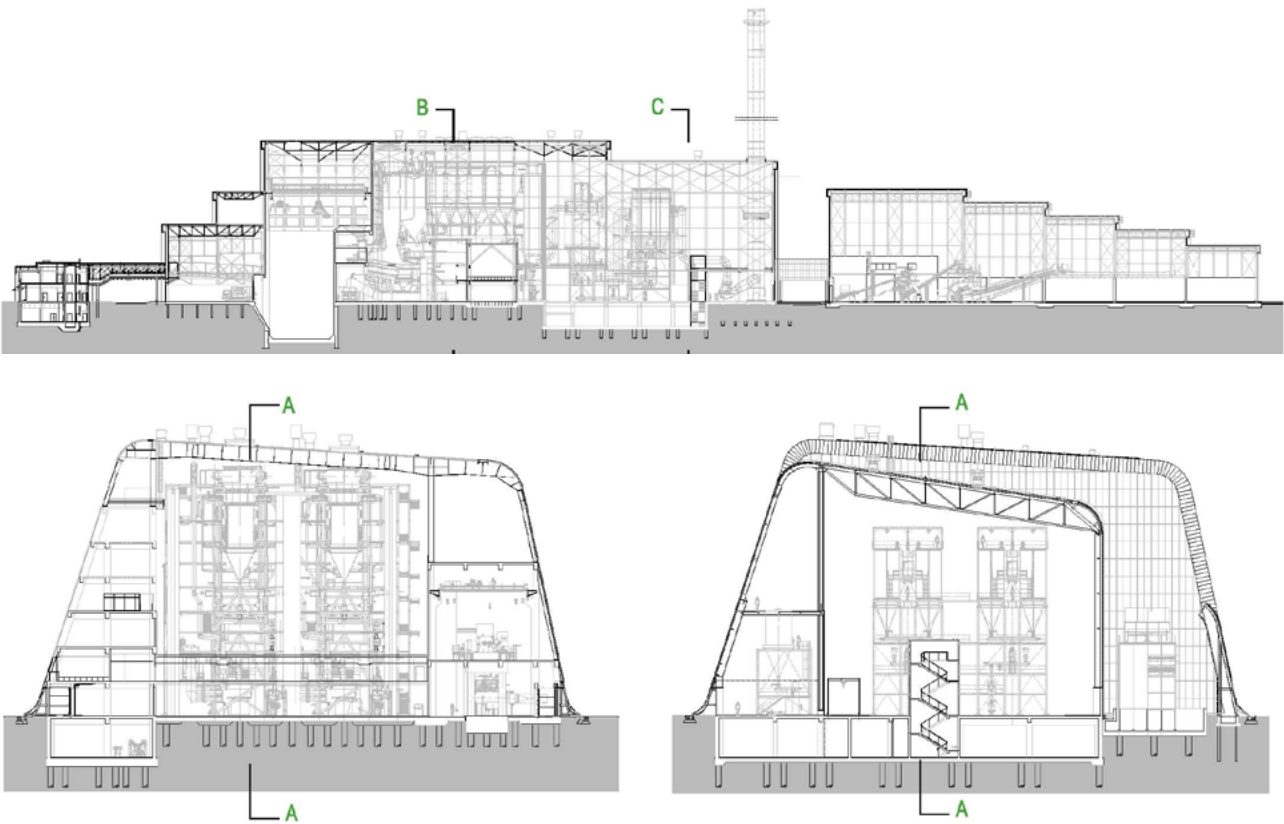
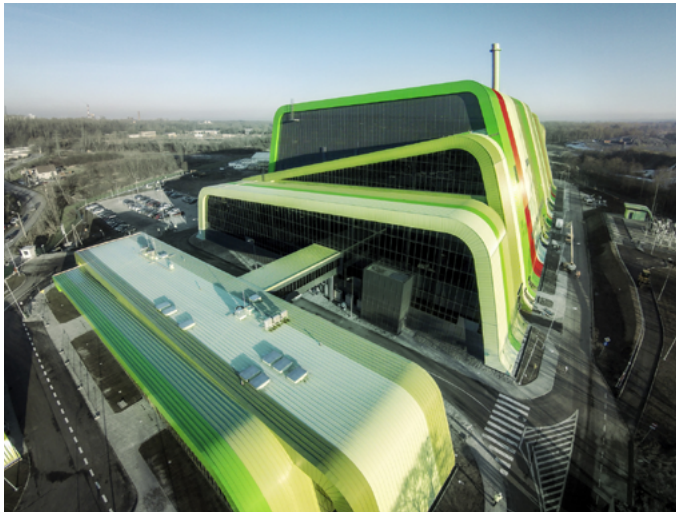
3. Krakow Thermal Waste Treatment Plant

Located in Krakow, Poland, the Thermal Waste Treatment Plant began operating in 2016.

It is a 2 line facility capable of processing 220,000 tonnes of waste p/a and is able to produce 65MW.

Pros

- Clever simple building form that seemingly follows the height and scale of the internal plant equipment.
- Strong emphasis on education with clearly defined visitor pathway.



4.2 Precedents

4. Kwinana Waste to Energy Project (WA, Australia)

Located in Kwinana, Western Australia the Waste to Energy Project is currently under construction with operations expected to begin by 2022.

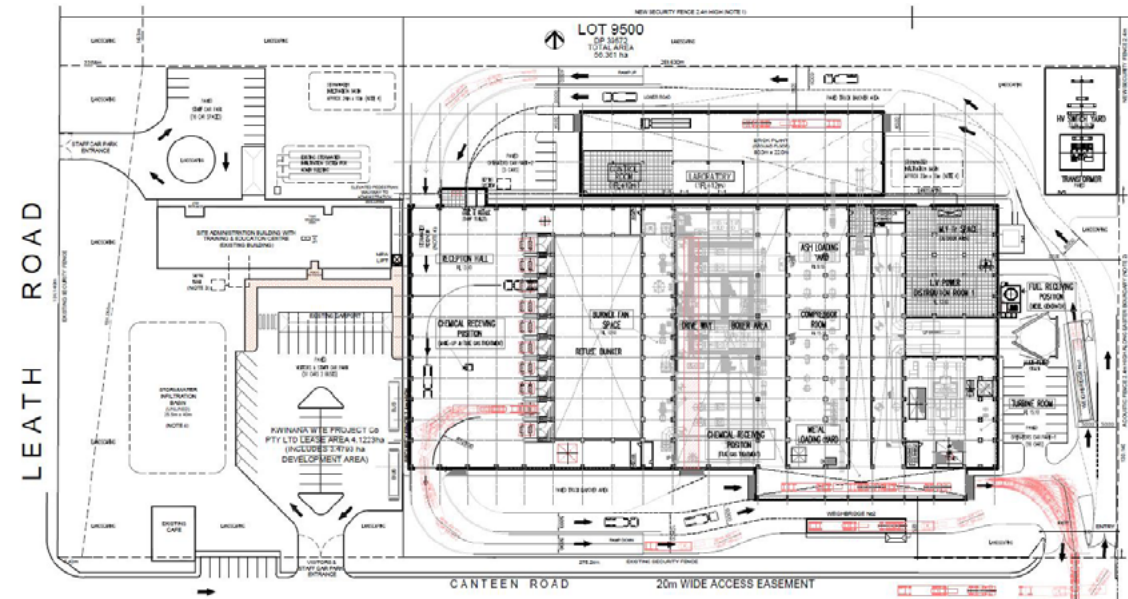
It is a 2 line facility capable of processing 400,000 tonnes of waste p/a, producing 40MW of green energy capable of powering up to 50,000 households.

Pros

- First of its kind facility in Australia.
- Use the residual waste to generate energy, recover and recycle metals, and re-use the remaining ash residue as construction materials.
- Compact, functional design resulting in a highly efficient layout.

Cons

- The building form is less considered given the facility location in a wider industrial context.
- Less consideration given to visitor and educational experience.



4.3 Reference Design Principles

Introduction

The project design principles are a set of guidelines designed to influence the architectural concept and design outcomes throughout the life of the project.

Inspiration was drawn from the surrounding natural landscape as well as the rural, industrial character of the site. The design aims to consider the working elements of the site eg. truck, vehicle and service areas, whilst creating a strong relationship between landscape and built elements through regeneration where nature interacts with the hard operational surfaces.

Sustainable innovative solutions for waste management form inspiration for material selections and are to be integral to the fabric of the building. Sustainably sourced materials with emphasis on low embodied energy and recycled or upcycled content are to be utilised as practical as possible throughout the development.

4.3 Reference Design Principles

1. Sense of Place

- Exploration of surrounding cultural heritage opportunities including Indigenous and European.
- Protect existing biodiversity, rehabilitate, and carefully manage remnant vegetation as green infrastructure.
- Material palette that responds to the surrounding natural landscape.



2. Environmentally Sustainable Design Principles

- Application of Environmentally Sustainable Design Principles, including building orientation, to capitalise on passive heating / cooling, prevailing winds, and topographical features.
- Emphasis on the improvement of worker's & visitor's mental and physical health through access to open spaces and maximum natural light.



3. Rural Context

- Exploration of the surrounding built context of Tarago and the Woodlawn Eco Precinct.
- Drawing inspiration from a rural industrial vernacular – farm shed architecture.
- Using a simple palette of quintessentially Australian materials – corrugated steel and concrete.
- Acknowledgement and the sites rural and mining heritage within the design.

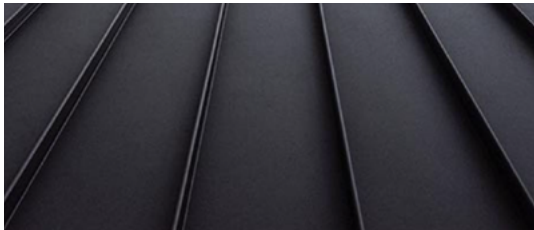


4. Sustainable Material Selection

- Recycled or upcycled material selection for the construction of the facility.
- Materials to come from environmentally sustainable sources with whole of life and embodied energy ratings to be considered.
- Materials to be selected for durability and longevity. Construction waste to be minimised and separated for recycling to avoid landfilling.
- Locally manufactured and procured materials as practical as possible to avoid unnecessary transportation and stimulate the local economy.



4.3 Reference Design Principles



COLORBOND METAL SHEET OR SHINGLE



PERFORMANCE GLASS



FEATURE INTERNAL RECYCLED GLASS WALL



PERFORATED METAL



TRANSLUCENT NON COMBUSTIBLE SHEETING



FEATURE INTERNAL CARDBOARD WALLS



CORTEN METAL CLADDING



PRECAST CONCRETE PANELS



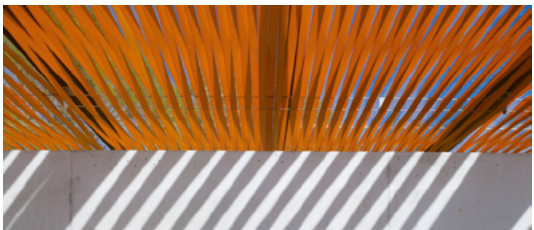
FEATURE INTERNAL LVL WALLS



GABION WALLS



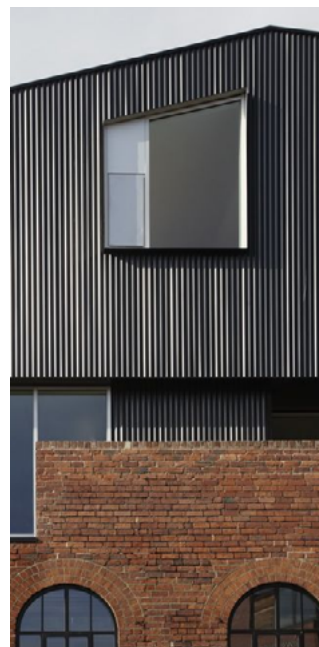
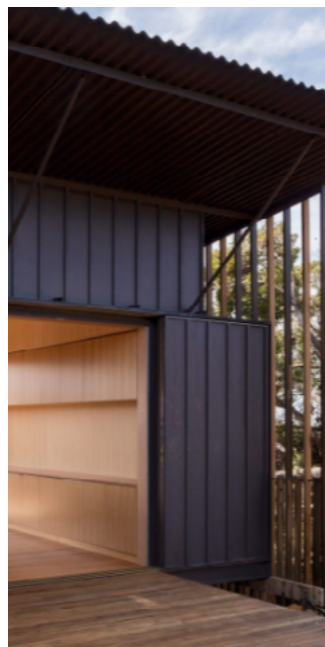
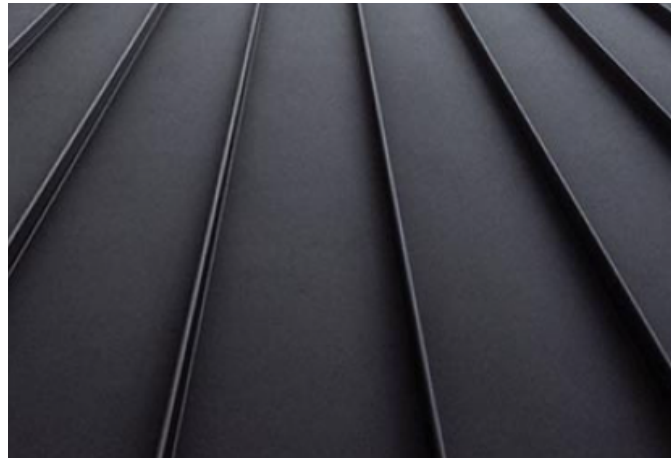
REUSED PRECAST CONCRETE ELEMENTS



RECYCLED FABRIC

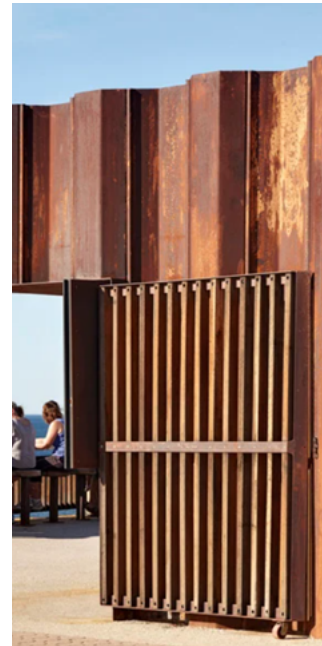


4.3 Reference Design Principles



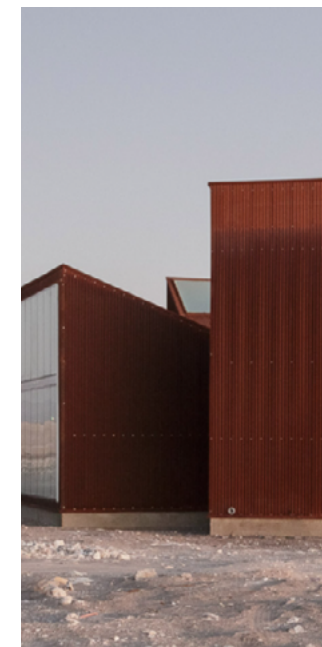
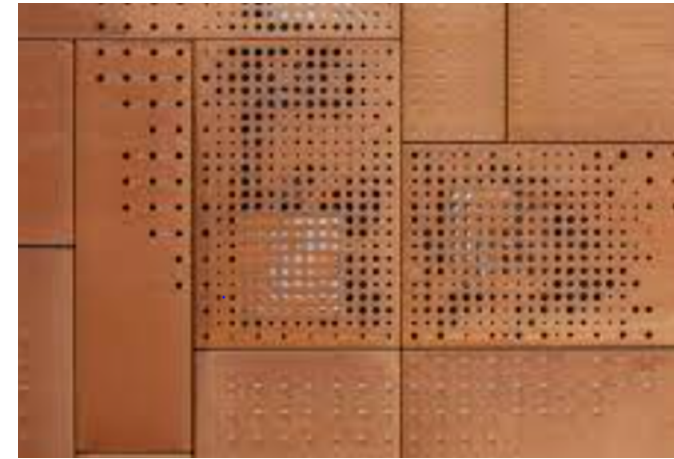
Colorbond Metal Sheet or Shingle

- Highly versatile material that can be pressed into various profiles and shapes to form roof or facade cladding.
- Base material is 100% recyclable.
- Naturally cleaning and easy to maintain.
- Durable and resilient to Australian climatic conditions with extended warranties and manufacturer guarantees.
- Manufactured and finished in Australia to Australian Standards.
- Suitable for use in bushfire prone areas in all BAL conditions.



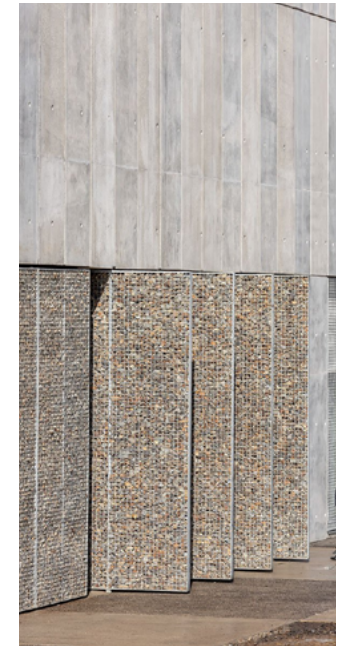
Corten Metal Cladding

- Highly versatile material that can be pressed into various profiles and shapes to form roof or facade.
- Base material is 100% recyclable.
- Naturally cleaning and easy to maintain.
- Durable, self-protecting steel resilient to Australian climatic conditions.
- Manufactured and finished in Australia to Australian Standards.
- Suitable for use in bushfire prone areas in all BAL conditions.



Perforated Metal Screen

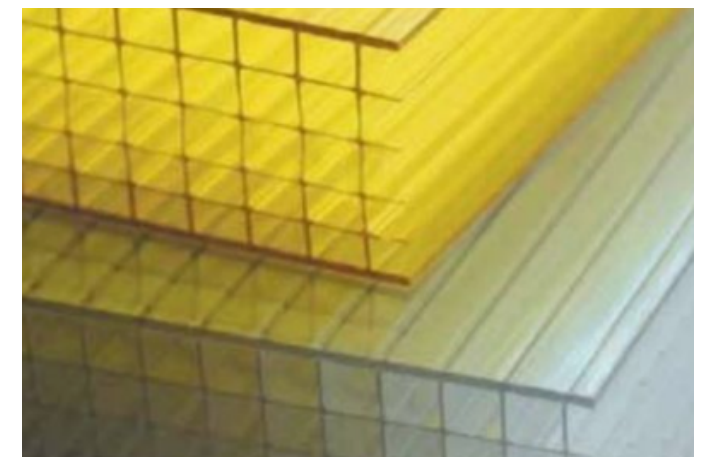
- Similar material attributes to other metal cladding systems.
- Additional energy efficient and sustainable benefits through shading and natural ventilation.



Precast Concrete Construction

- Economical material suitable for industrial use.
- High percentages of recycled masonry content can be incorporated into panels. Option to add percentage of recycled plastic to some concrete mixtures. Material can be broken down and recycled after use.
- Durable, low maintenance material that can be used externally to form a waterproof facade.
- Manufactured locally in Australia to Australian Standards.
- Exceptional fire rating levels. Suitable for use in bushfire prone areas.
- Colour and finish options through various oxide mixtures.

4.3 Reference Design Principles



Re-used Precast Concrete Elements

- Economical material suitable for industrial use.
- Versatile building products available in a variety of mass produced sizes and formats.
- High percentages of recycled masonry content can be incorporated into precast elements. Material can be broken down and recycled after use. Durable, low maintenance material that can be used externally to form a waterproof facade or in landscape design.
- Manufactured locally in Australia to Australian Standards. Exceptional fire rating levels. Suitable for use in bushfire prone areas.
- Colour and finish options through various oxide mixtures.

Gabion Walls

- Steel wire baskets filled with rubble.
- Versatility with infill rubble which can be sourced from local suppliers or contain recycled masonry or plastic material.
- Free draining construction that can be used in building facade or in landscape design.
- Colour options limitless based on infill material selection.

Performance Glass - Clear or Reflective

- Performance glass with high percentage of recycled content used in windows and feature cladding.
- Glazing available in a range of colours with SHGC and reflectance options.
- Naturally cleaning and easy to maintain.
- Durable and resilient to Australian climatic conditions with extended warranties and manufacturer guarantees.
- Suitable for use in bushfire prone areas in all BAL conditions.

Translucent Cladding

- Lightweight non-combustible translucent sheeting with high percentage of recycled content used in facade.
- Naturally cleaning and easy to maintain.
- Durable and resilient to Australian climatic conditions.
- Manufactured locally in Australia to Australian Standards.
- Fire rating levels and suitability for use on building facade to be confirmed with BCA consultant and Fire Engineer.

4.3 Reference Design Principles



Feature Recycled Glass Walls

- Internal feature wall material that celebrates the use of recycled / reused materials in a creative way.
- Colours somewhat limited to clear, brown and green.



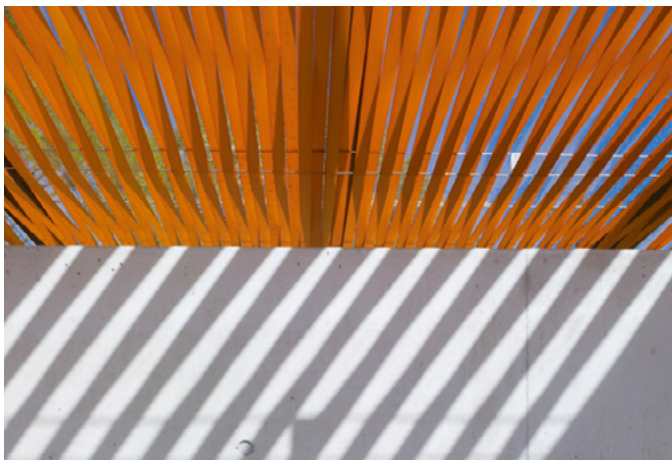
Feature Cardboard Walls

- Internal feature wall material that celebrates the use of recycled / reused materials in a creative way.
- Limitless colour selection.



Feature Recycled Timber Walls

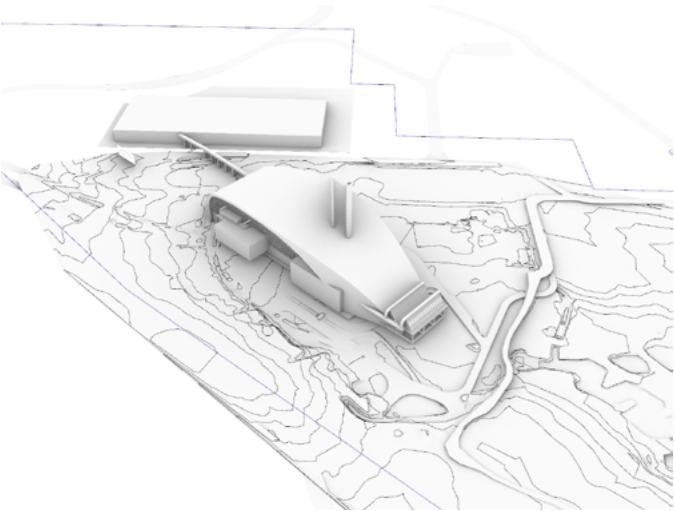
- Internal feature wall material that celebrates the use of recycled / reused materials in a creative way.
- Timber can provide warmth to feature areas of the interior where the public are able to access.



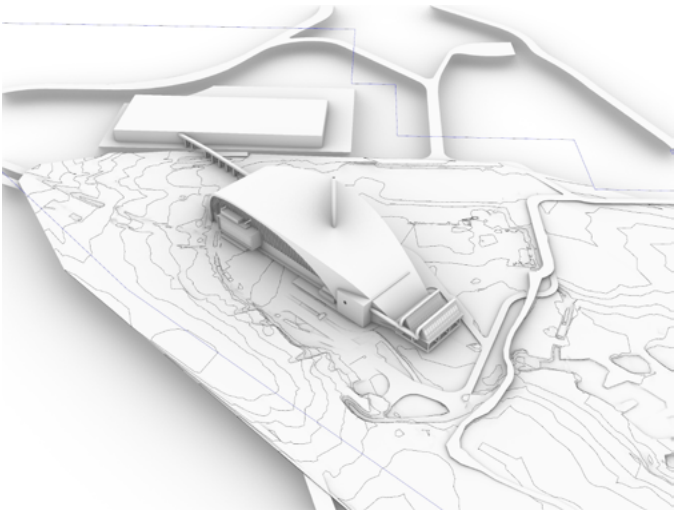
Feature Recycled Fabric

- Feature material that celebrates the use of recycled / reused materials in a creative way.
- Suitable for use externally or internally as part of wider concept design.

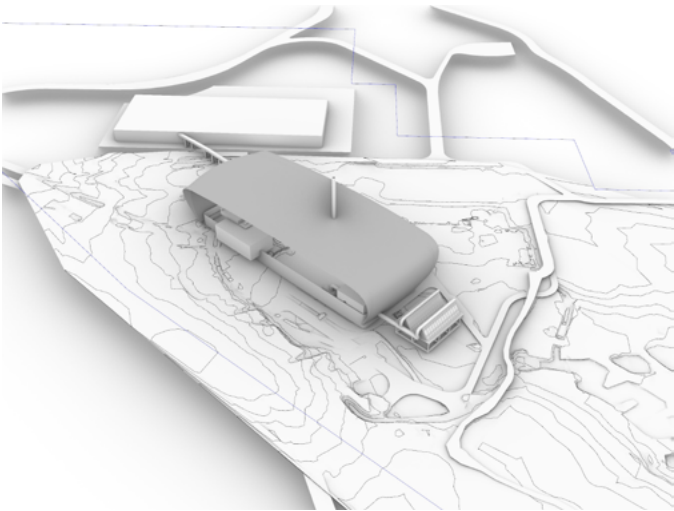
4.4 Form Options Analysis



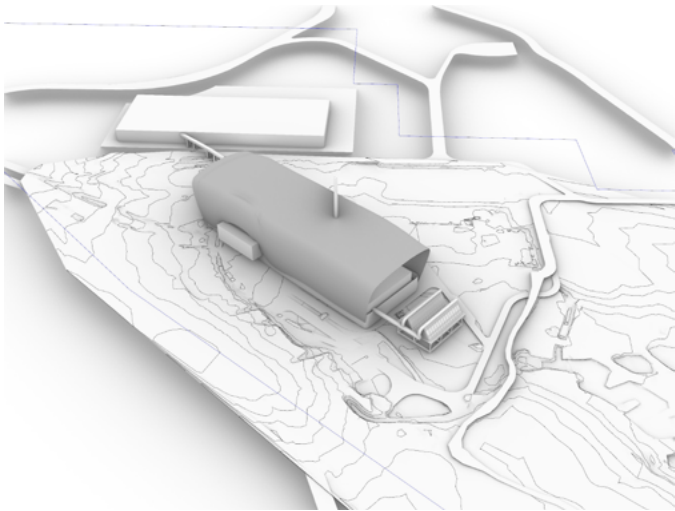
Option 1



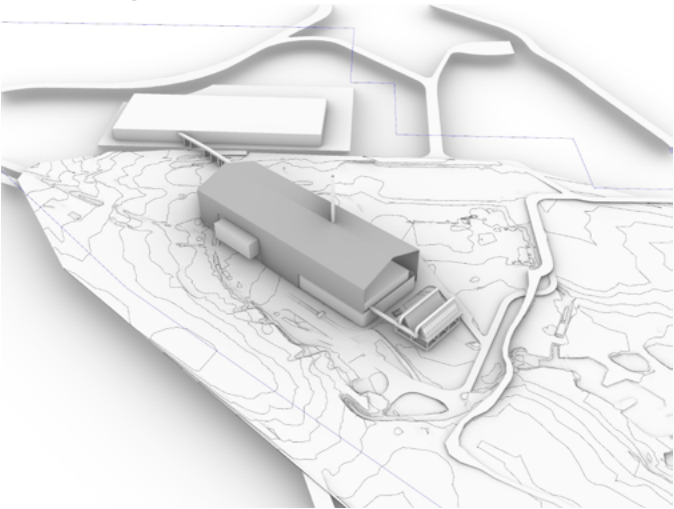
Option 2



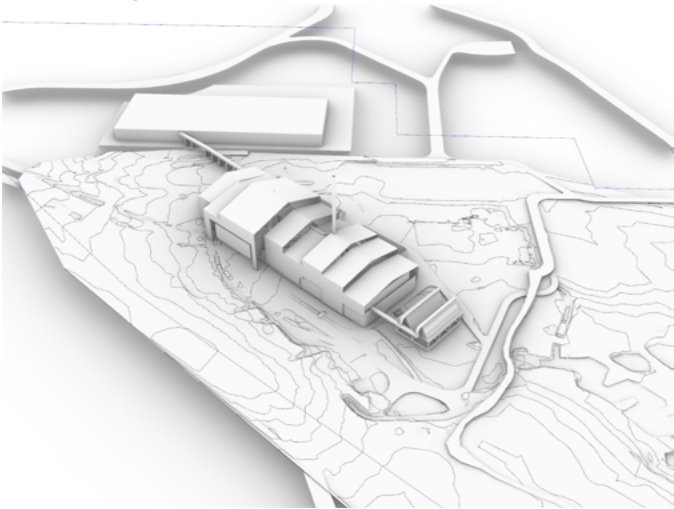
Option 3



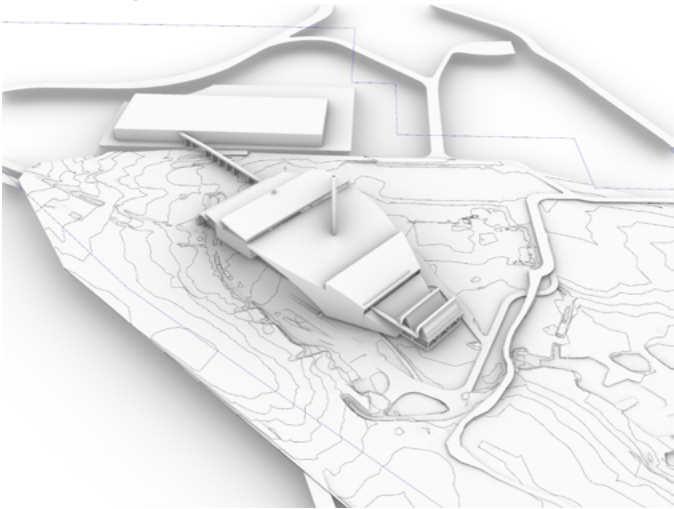
Option 4



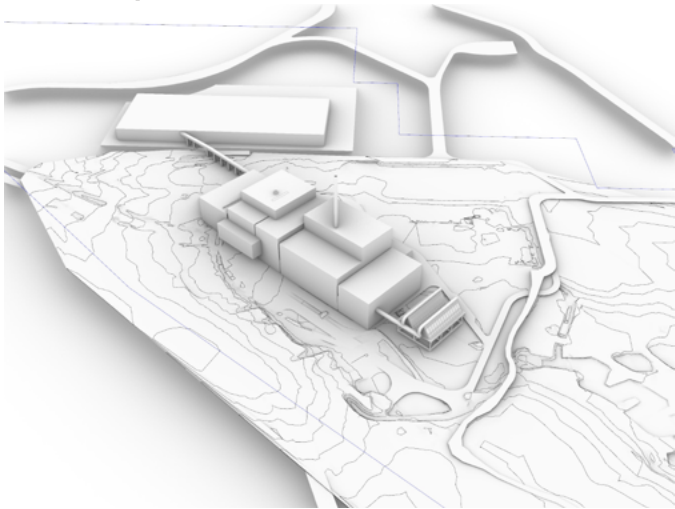
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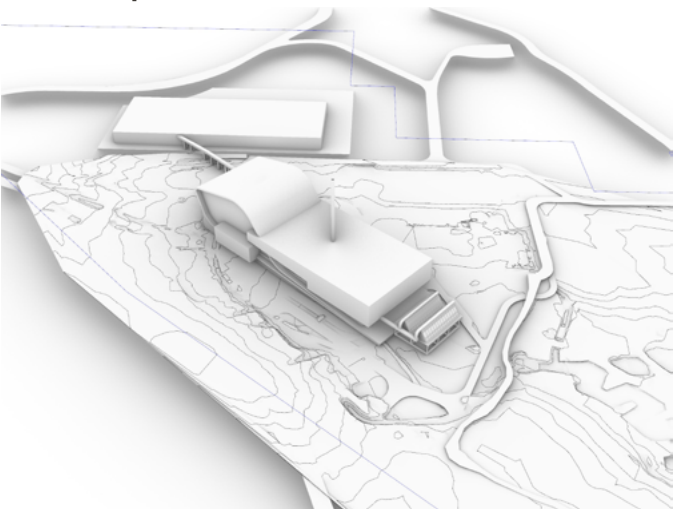
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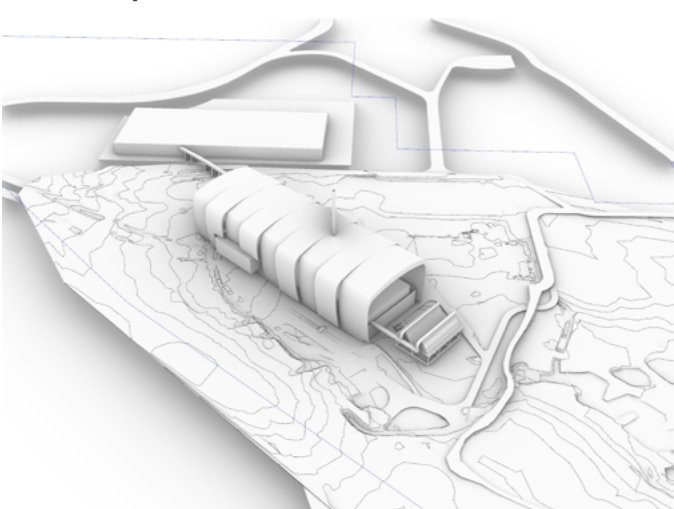
Option 7



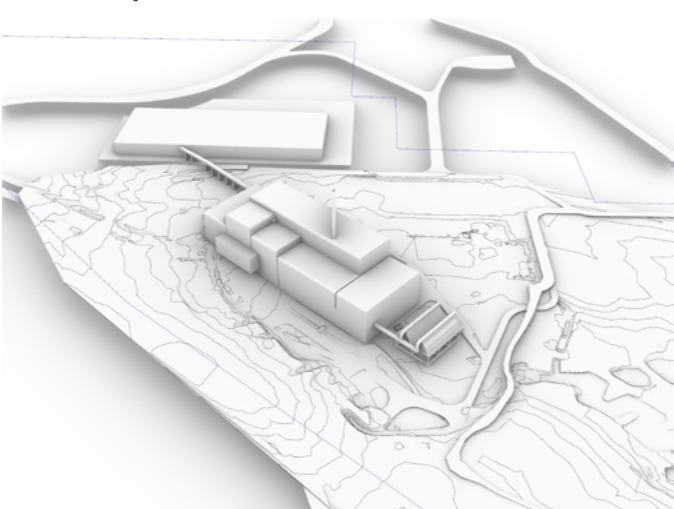
Option 8



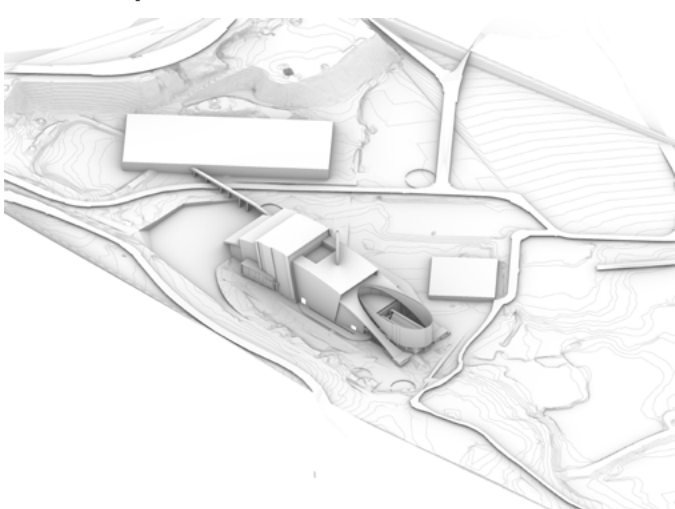
Option 9



Option 10



Option 11



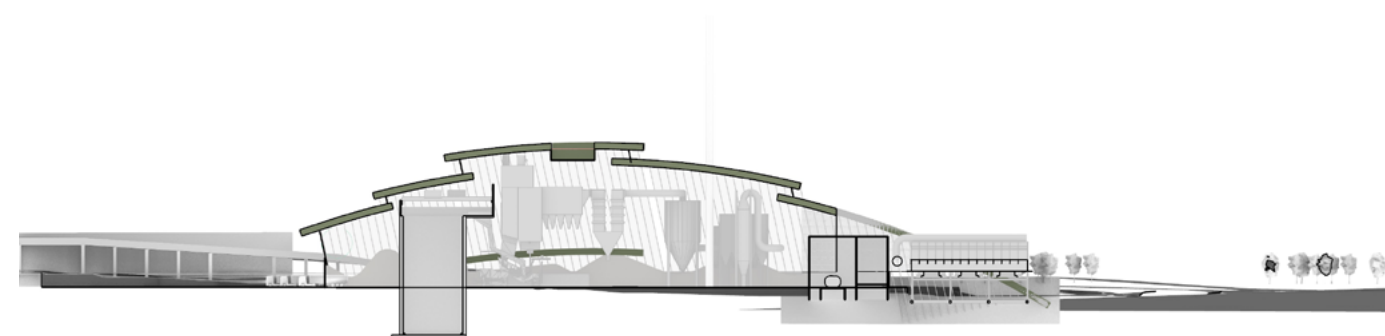
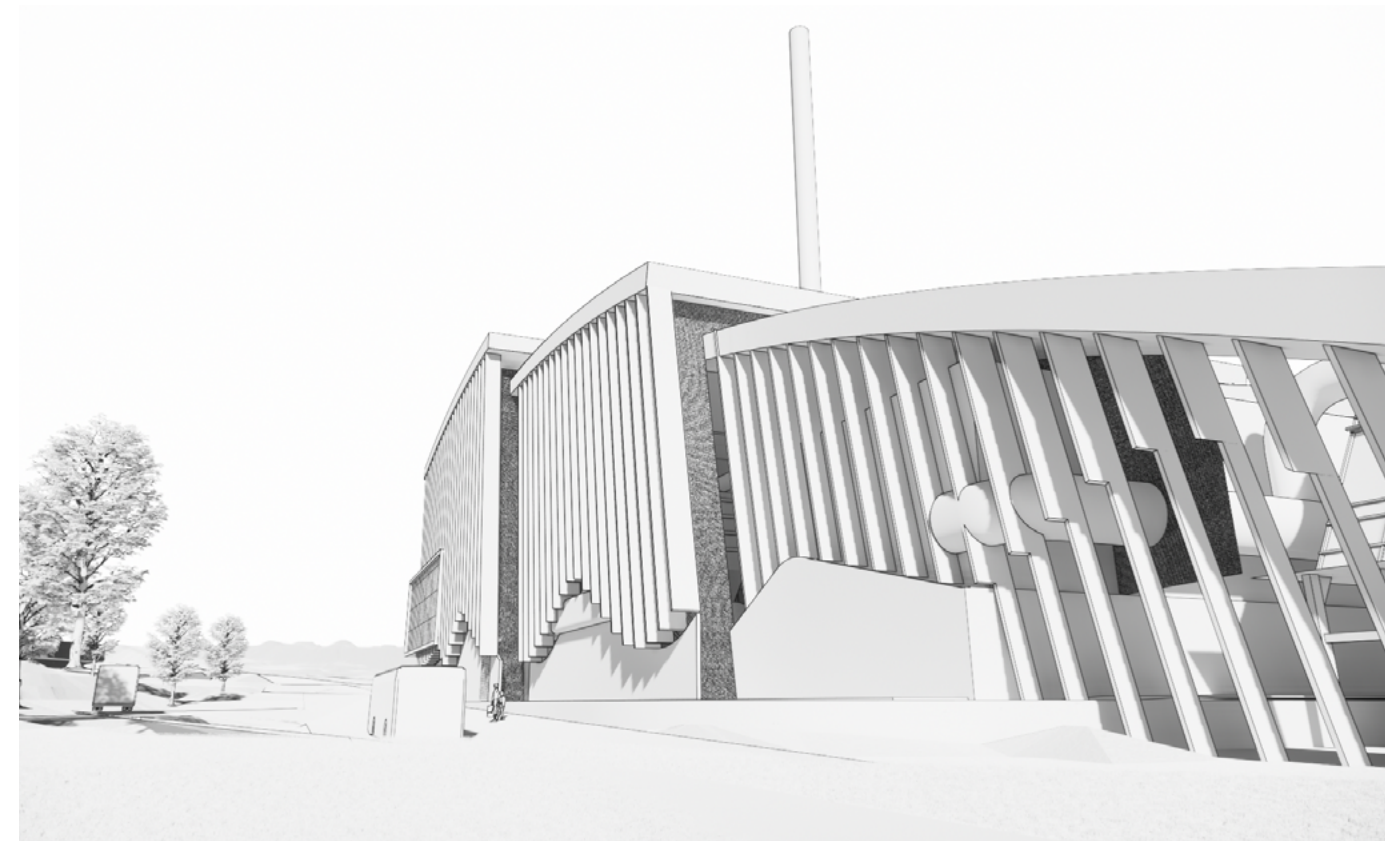
Option 12

4.4 Form Options Analysis

	Contextual Response Does the ARC building respond to surrounding natural and built environment? Does it acknowledge the history of the site?	Environmentally Sustainable Design Principles Does the ARC building orientation and form respond to the solar, wind and topographical context? Does it consider rainwater harvesting?	Visual impact to surrounding neighbouring properties Are scale and form managed in a way that softens the building when viewed from Collector Road	Visitor Experience Does the building provide a elements that enhances the visitor experience?	Reduced consumption of building materials Does the building footprint respond to the internal programming? Are external materials considered and simplified where possible?	Function and Maintenance Does the design consider operational and maintenance implications and take account of suitable engineering solutions? Are the ergonomics of the operational and maintenance routine activities considered?
Option 1	√	X	√	√	X	√
Option 2	√	X	√	√	X	√
Option 3	√	X	√	√	X	X
Option 4	√	X	√	X	X	√
Option 5	√	X	X	X	X	√
Option 6	√	√	X	X	√	√
Option 7	√	√	√	√	√	X
Option 8	X	X	X	X	√	√
Option 9	X	X	√	X	√	X
Option 10	√	√	√	√	√	X
Option 11	X	X	X	X	√	√
Option 12 (Selected)	√	√	√	√	√	√

Figure 15 - Form Options Analysis Selection Metrics

4.4 Form Options Analysis



4.5 Proposed Development

Proposed Design

The proposed layout seeks to achieve Veolia’s core objectives within the wider context of the Eco Precinct.

A new dedicated entry driveway is proposed to access the ARC from Collector Road. The building location and orientation maximises development efficiency through simple vehicular circulation paths. Areas of public amenity; landscaped areas and outdoor seating are physically separated from function and visitor vehicle circulation paths to ensure pedestrian safety.

External visitor and employee breakout spaces are isolated to the East of the building, while functional spaces including the Container Marshalling and Sub-Contractor Areas are located to the South and West respectively. A separate space dedicated to Incinerator Bottom Ash (IBA) Maturation is located to the South of the Main Haul Road with ARC IBA delivered by a dedicated conveyor.



Figure 16 - Proposed Design

4.5 Proposed Development

Landscape Design

Indicative landscaping is presented on the plans. Landscaping will include endemic plant species to enhance long term rehabilitation objectives at the Eco Precinct. Landscaping will be designed and managed to minimise fire risks and will comply with asset protection zone requirements. Landscaping directly adjacent to buildings will be limited to low-cut lawns. Trees and shrubs will be located such that:

- the branches will not overhang the roof;
- the tree canopy is not continuous; and
- any proposed windbreak is located on the elevation from which fires are likely to approach.



Figure 25 - Proposed Landscape Plan (Prepared by Arcadia)

4.5 Proposed Development



Figure 26 - Landscape Precedent Imagery (Sourced by Arcadia)



Figure 27 - Proposed Landscape Plan (Prepared by Arcadia)

4.6 Design Analysis

Access & Circulation

Vehicles

The ARC requires a dedicated road network with new access from Collector Road. A new driveway to the site will be in the form of a T-intersection along Collector Road, allowing for all movements in and out of the ARC site.

Trucks delivering waste to the facility will enter via the new driveway, proceed to the tipping hall via incoming weighbridge, and exit on a one-way road in a clockwise motion around the facility via the outgoing weighbridge. Secondary connections to existing internal facility roads are proposed to assist in movement of maintenance vehicles around the site.

Employee vehicle and visitor bus arrivals will be directed through to a dedicated parking area on the east of the building adjacent to the main entry. Cars and buses are separated from truck circulation where possible to avoid unnecessary interaction.

Pedestrians

The proposed landscape design allows for a variety of open spaces to cater for outdoor activities including employee breakout, barbeque, and visitor education. Active pedestrian movement is encouraged to improve the wellbeing of staff and the user experience of the public whilst visiting the site.

Active landscape areas are separated from heavy vehicle paths through the inclusion of fences and visual screens to ensure pedestrian safety on site.

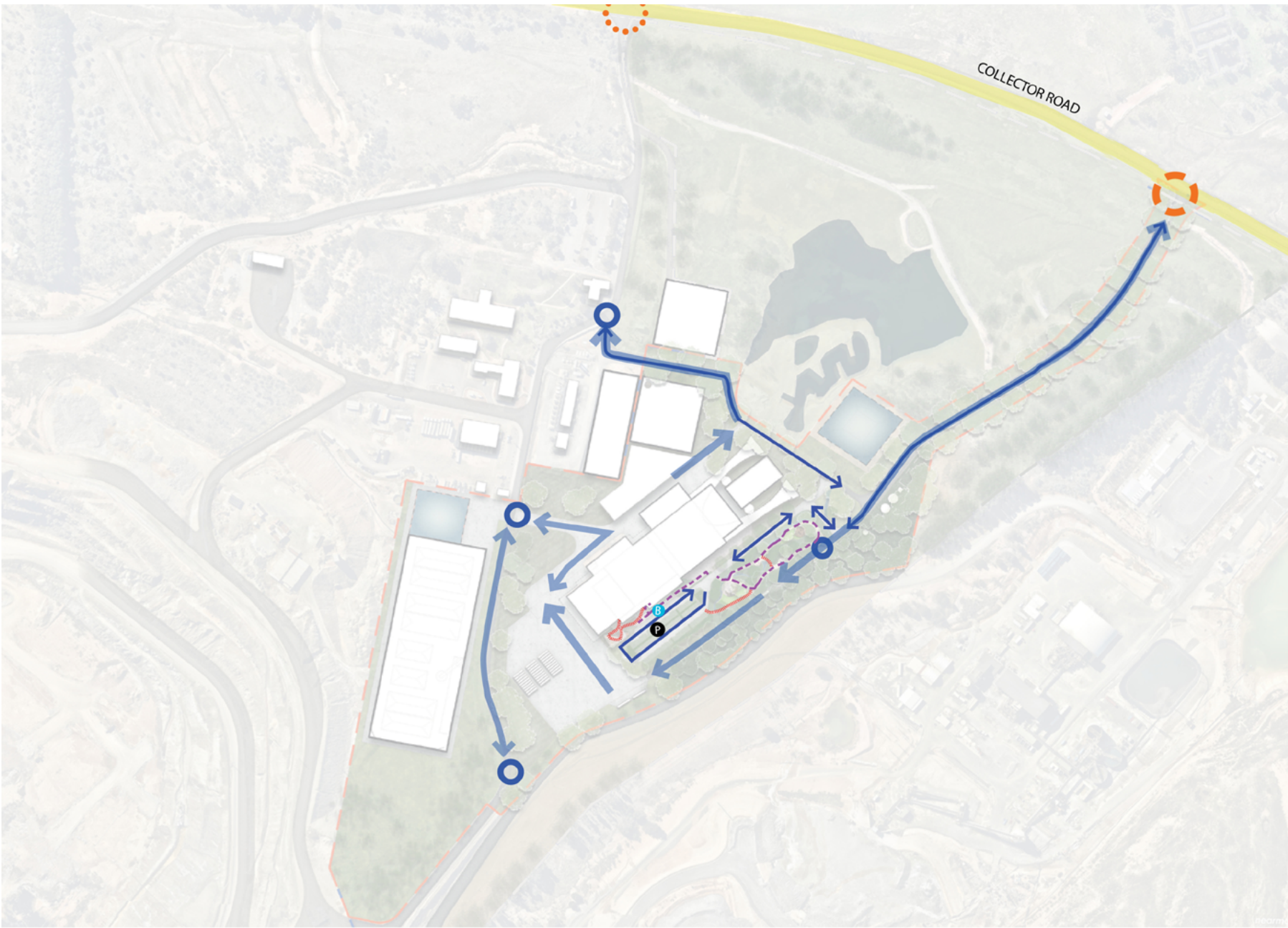
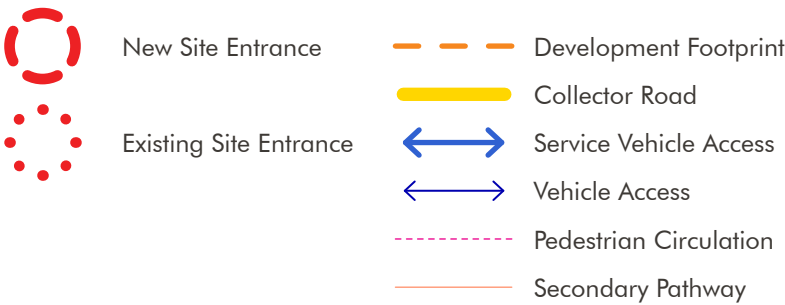


Figure 17 - Access & Circulation Analysis (Prepared by Arcadia)



REFERENCE DESIGN PROPOSAL

4.6 Design Analysis

Solar, Wind & Hydrology

Building location, orientation and form designed to capitalise on passive heating / cooling, prevailing winds, and topographical features.

Locating external areas to the East of the facility provides sunny outdoor common areas, protected from prevailing south-westerly winds. The design has considered existing hydrology and topography to manage surface water flows within the ARC development footprint.



Figure 18 - Solar, Wind & Hydrology Analysis (Prepared by Arcadia)

- Development Footprint
- Typical Winter Sunpath
- Typical Summer Sunpath
- Predominant Wind Direction

*REFER TO EMM REPORT FOR DETAILED WIND ANALYSIS

4.6 Design Analysis

Public Domain & Visitor's Experience

The development seeks to provide a visitor centre to assist in the education of the public on the importance of efficient waste management and the energy generated by the facility.

The visitor experience begins on approach to the new facility from Collector Road. Buses will enter the site through a dedicated driveway and approach the facility from the North, traversing existing dams and pockets of dry woodlands. A strong emphasis on the regeneration of the site and the role of the facility is evident in the landscaped areas directly to the east of the building where several active spaces are provided for outdoor education and gathering.

Once inside the building, visitors are transported to an elevated platform where they can follow the path of waste from delivery through to energy generation. Viewpoints are provided at each of the key points of the waste journey to allow for group gathering and informal teaching.

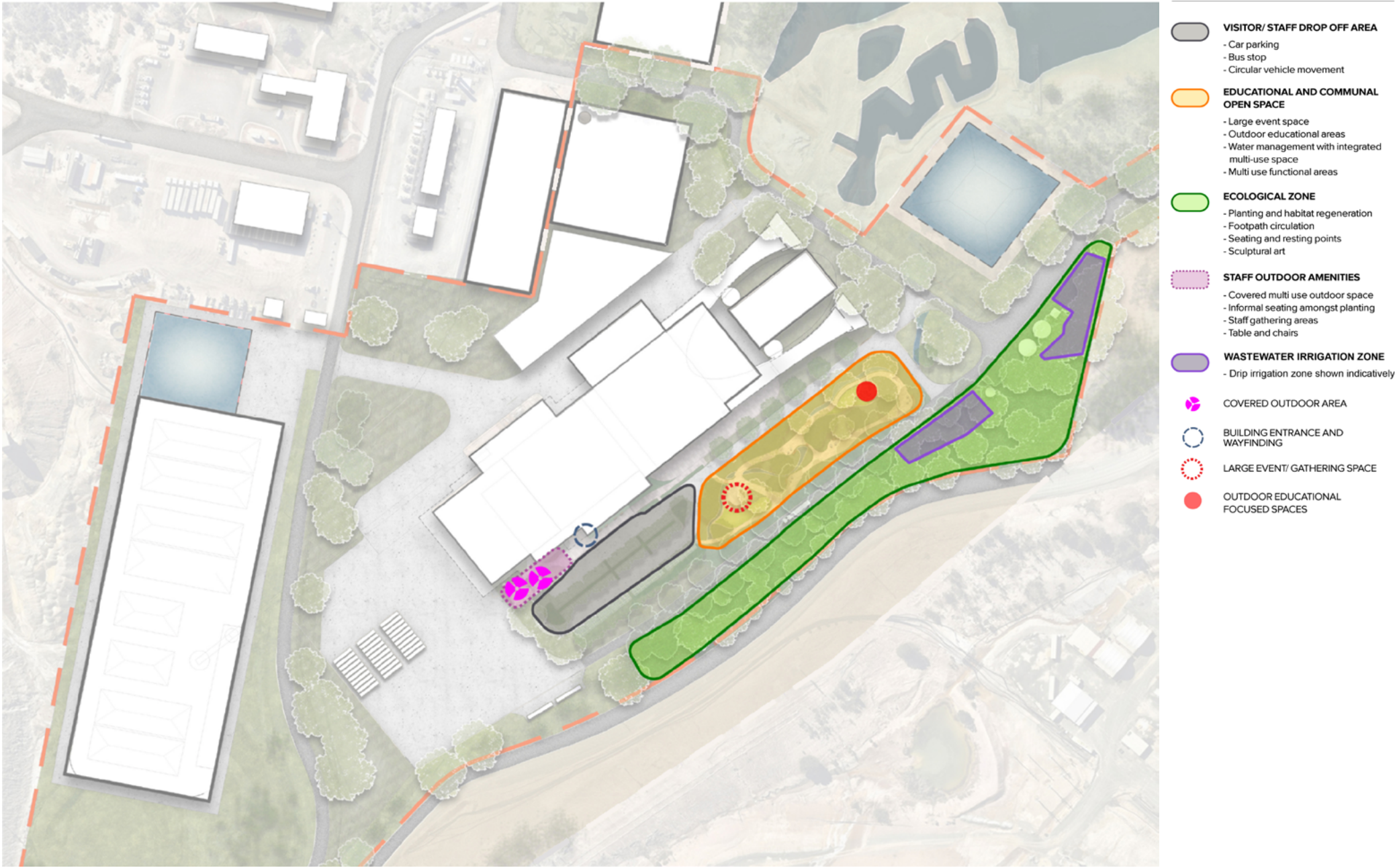


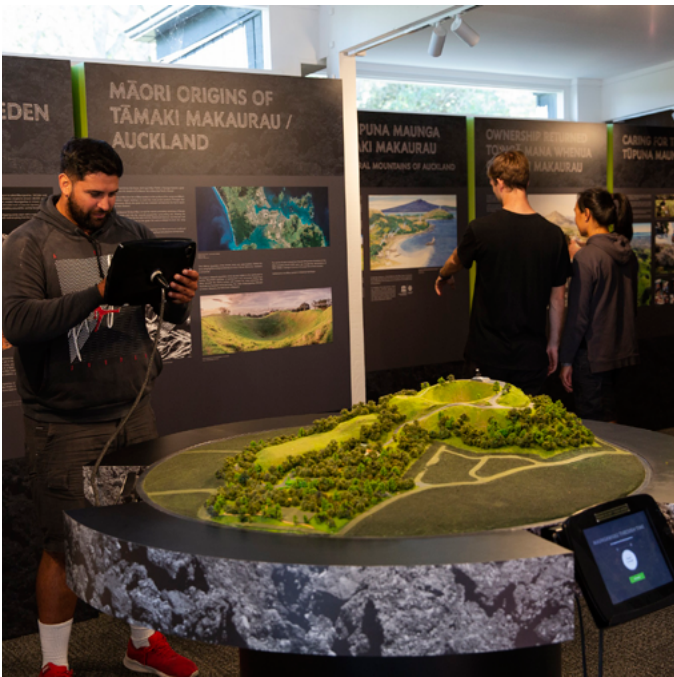
Figure 19 - Public Domain & Visitor's Experience Analysis (Prepared by Arcadia)

REFERENCE DESIGN PROPOSAL

4.6 Design Analysis

Visitor's Experience

The community has the key role to play in the protection of the environment and there is an environmental education responsibility to provide the wider community with the knowledge and tools it needs in our ongoing battle to preserve the environment. The ARC will include an educational centre to educate the community on energy from waste.



4.7 Perspective Imagery

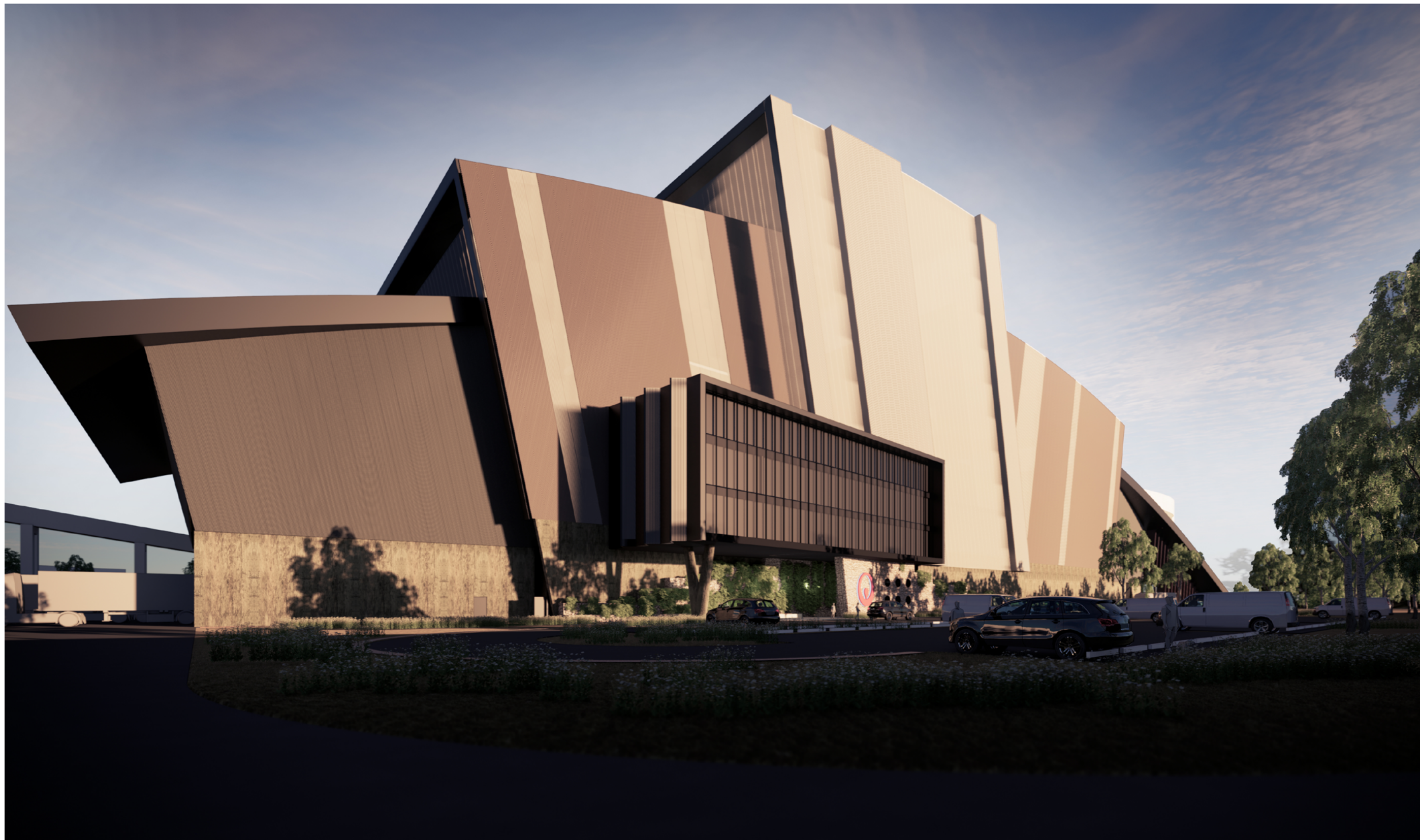


Figure 20 - Artist impression viewed from proposed carpark

4.7 Perspective Imagery

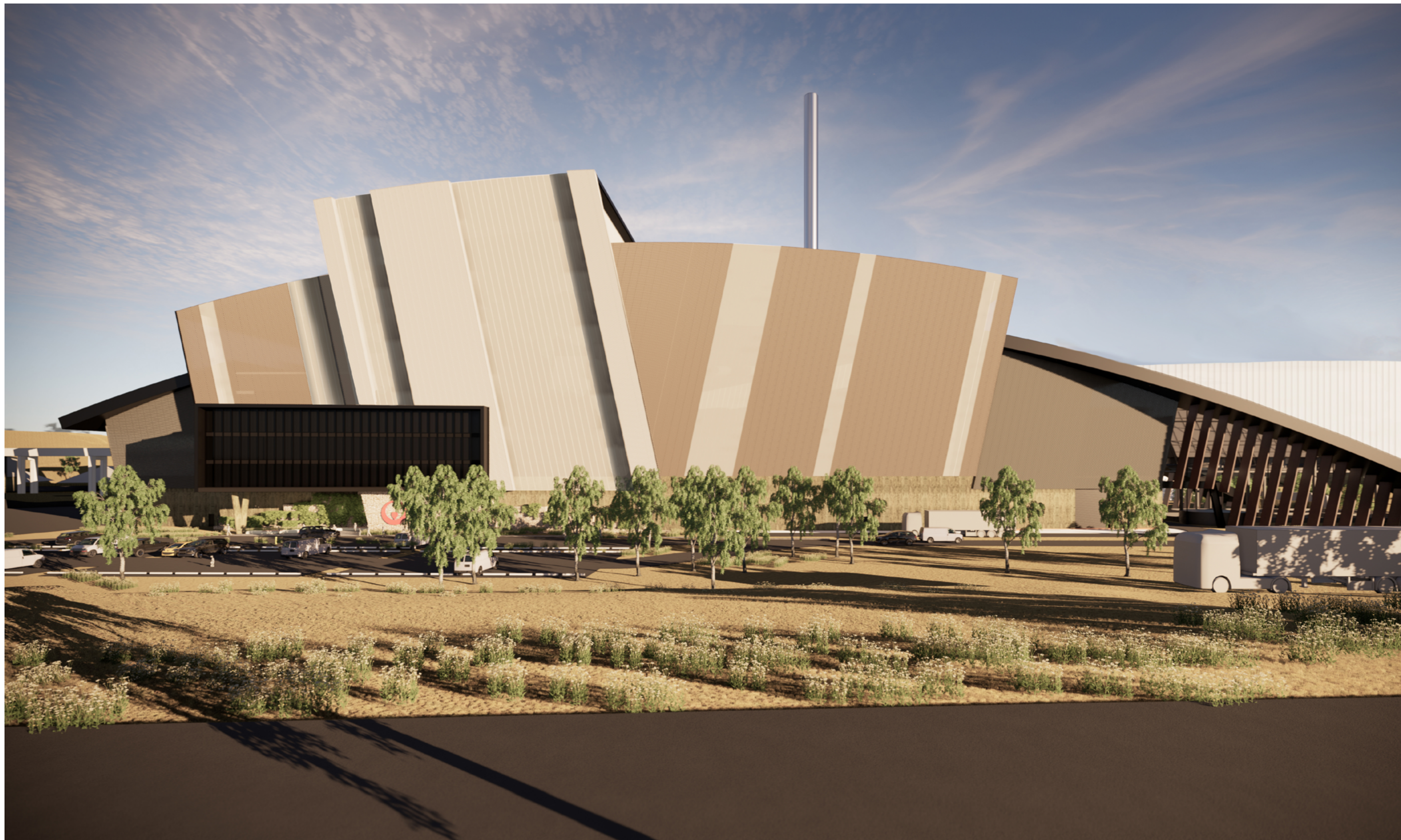


Figure 21 - Artist impression viewed from East of site

4.7 Perspective Imagery



Figure 22 - Artist impression viewed from Collector Road

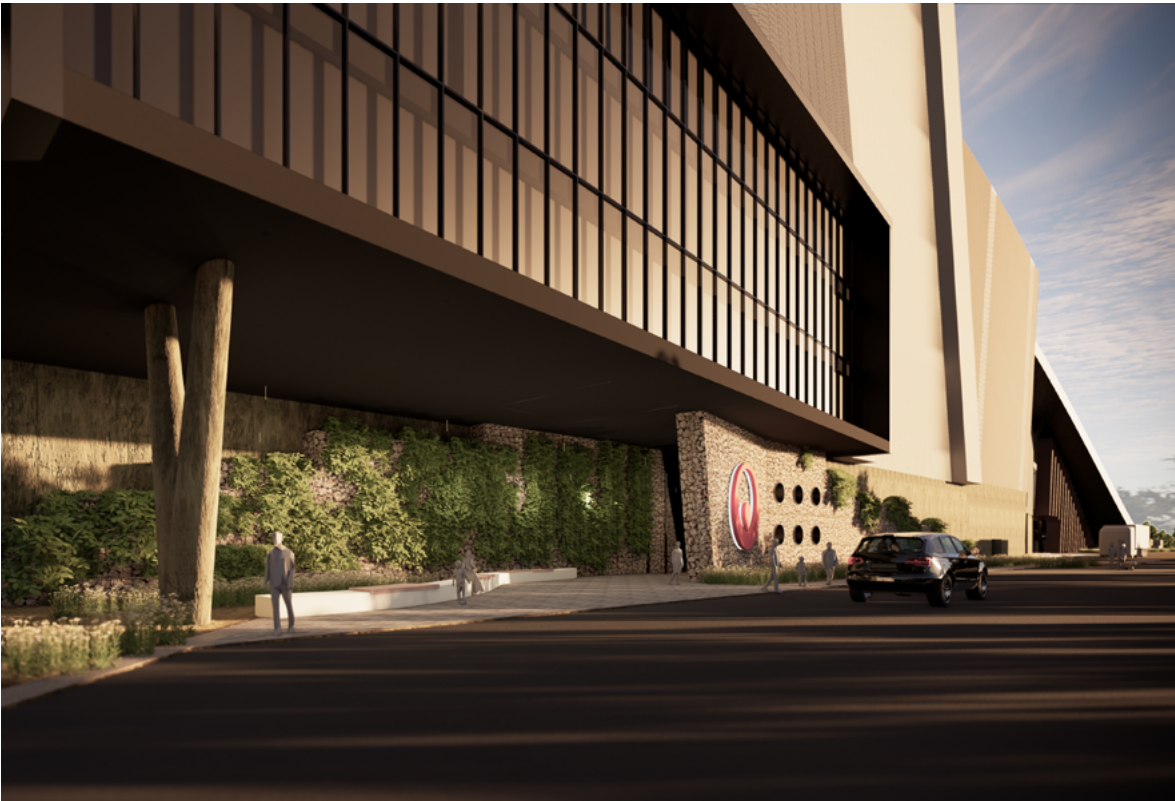


Figure 23 - Artist impression of main entry to ARC



Figure 24 - Artist impression viewed from North East of site

4.8 Proposed Development - Rehabilitation

Conceptual Rehabilitation

This series of montages provides a conceptual timing for rehabilitation to occur and will be dependent on other activities across the site. Each horizon illustrates the gradual changes and remediation that will occur on site.

There are areas of the Woodlawn Eco Precinct that are controlled by the mine operator responsible for Woodlawn Mine, who has the responsibility over rehabilitation obligations of the areas marked as 'Woodlawn Mine'. Rehabilitation requirements are in accordance with the Mine Operations Plan and relevant development consent requirements for Woodlawn Mine (project approval MP07_0143)

4.8 Proposed Development - Rehabilitation

Horizon for Year 1 (2026) - ARC and IBA Area with Encapsulation Cell (EC) Stage 1 Constructed

- 1 Bioreactor landfill to height of RL 778.000
- 2 Advanced Energy Recovery Centre (ARC) Constructed
- 3 Incinerator Bottom Ash (IBA) Area Constructed
- 4 Leachate Treatment Plant (LTP) Operational
- 5 Evaporation Dam 1 (ED1)
- 6 Coffe Dam - ED1
- 7 Plant Collection Dam (PCD)



4.8 Proposed Development - Rehabilitation

Horizon for Year 1 (2026) - ARC and IBA Area with Encapsulation Cell (EC) Stage 1 Constructed



- 1 Bioreactor landfill to height of RL 778.000
- 2 Advanced Energy Recovery Centre (ARC) Constructed
- 3 Incinerator Bottom Ash (IBA) Area Constructed
- 4 Leachate Treatment Plant (LTP) Operational
- 5 Evaporation Dam 1 (ED1)
- 6 Cofferd Dam - ED1
- 7 EC Leachate Dam
- 8 Evaporation Dam 2 (ED2) - Woodlawn Mine Operator Responsibility
- 9 Encapsulation Cell Stage 1 (EC1) Constructed

4.8 Proposed Development - Rehabilitation

Horizon for Year 6 (2032) - ARC and IBA Area Operational with Encapsulation Cell (EC) Stage 1 Rehabilitated and EC Stage 2 Constructed

- 1 Bioreactor landfill to height of RL 790.000
- 2 ARC Operational
- 3 IBA Area Operational
- 4 Leachate Treatment Plant (LTP) Operational
- 5 Evap. Dam 1 (ED1) South & West sides filled
- 6 Coffey Dam - ED1
- 7 Plant Collection Dam (PCD) transformed into new Clean Water Dam
- 8 North of IBA Maturation Pad Rehabilitated



4.8 Proposed Development - Rehabilitation

Horizon for Year 6 (2032) - ARC and IBA Area Operational with Encapsulation Cell (EC) Stage 1 Rehabilitated and EC Stage 2 Constructed



- 1 Bioreactor landfill to height of RL 790.000
- 2 ARC Operational
- 3 IBA Area Operational
- 4 Leachate Treatment Plant (LTP) Operational
- 5 Evaporation Dam 1 (ED1)
- 6 Cofferd Dam - ED1
- 7 EC Leachate Dam
- 8 Evaporation Dam 2 (ED2) - Woodlawn Mine Operator Responsibility
- 9 EC1 Rehabilitated
- 10 Encapsulation Cell Stage 2 (EC2) Constructed
- 11 Evaporation Dam 1 (ED1) South & West sides filled
- 12 Tailings Dam West (TDW) Rehabilitated Woodlawn Mine Operator Responsibility

4.8 Proposed Development - Rehabilitation

Horizon for Year 12 (2038) - ARC and IBA Area Operational with Encapsulation Cells (EC) Stage 1 & 2 Rehabilitated and EC Stage 3 Constructed

- 1 Bioreactor landfill to height of RL 808.000
- 2 ARC Operational
- 3 IBA Area Operational
- 4 Leachate Treatment Plant (LTP) Operational
- 5 Evap. Dam 1 (ED1) South & West sides filled
- 6 Coffe Dam - ED1
- 7 Residual PCD area rehabilitated
- 8 North of IBA Maturation Pad Rehabilitated
- 9 Western Ridge Rehabilitated
- 10 Clean Water Dam



4.8 Proposed Development - Rehabilitation

Horizon for Year 12 (2038) - ARC and IBA Area Operational with Encapsulation Cells (EC) Stage 1 & 2 Rehabilitated and EC Stage 3 Constructed



- 1 Bioreactor landfill to height of RL 808.000
- 2 ARC Operational
- 3 IBA Area Operational
- 4 Leachate Treatment Plant (LTP) Operational
- 5 Evaporation Dam 1 (ED1)
- 6 Cofferd Dam - ED1
- 7 EC Leachate Dam
- 8 Evaporation Dam 2 (ED2) - Woodlawn Mine Operator Responsibility
- 9 EC2 Rehabilitated
- 10 Encapsulation Cell Stage 3 (EC3) Constructed
- 11 ED1 South & West sides Rehabilitated
- 12 Tailings Dam South (TDS) Rehabilitated Woodlawn Mine Operator Responsibility
- 13 Tailings Dam North (TDN) Rehabilitated Woodlawn Mine Operator Responsibility
- 14 North of IBA Maturation Pad Rehabilitated
- 15 Western Ridge Rehabilitated

4.8 Proposed Development - Rehabilitation

Horizon for Year 25 (2051) - ARC and IBA Area Operational with Encapsulation Cells (EC) Stage 1, 2 & 3 Completed and landformed

- 1 Bioreactor landfill to height of RL 840.000
- 2 ARC Operational
- 3 IBA Area Operational
- 4 Leachate Treatment Plant (LTP) Operational
- 5 ED1 South & West sides Rehabilitated
- 6 Coffe Dam - ED1
- 7 Waste Rock Dump (WRD) Rehabilitated Woodlawn Mine Operator Responsibility



4.8 Proposed Development - Rehabilitation

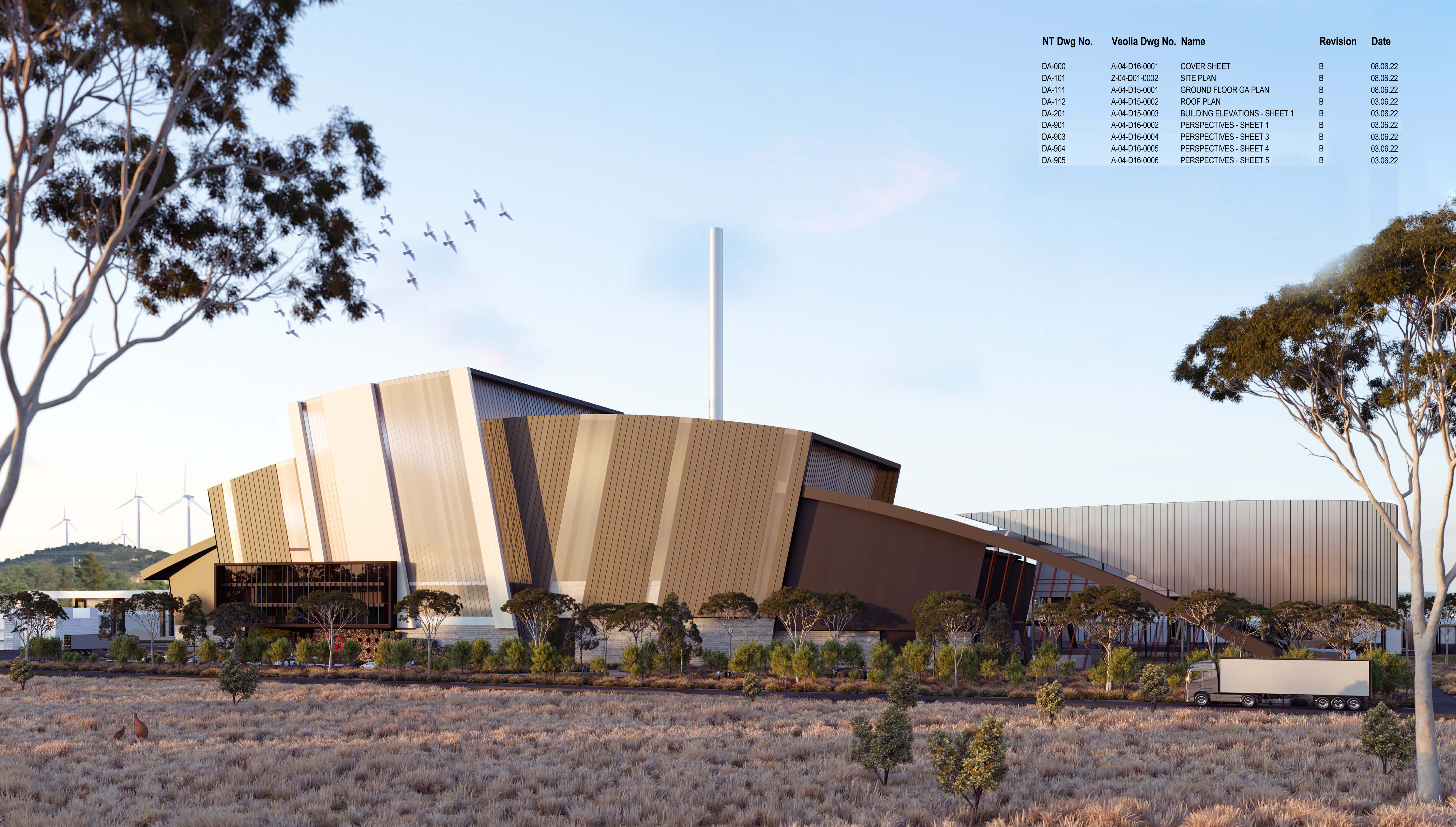
Horizon for Year 25 (2051) - ARC and IBA Area Operational with Encapsulation Cells (EC) Stage 1, 2 & 3 Completed and landformed



- 1 Bioreactor landfill to height of RL 840.000
- 2 ARC Operational
- 3 IBA Area Operational
- 4 Leachate Treatment Plant (LTP) Operational
- 5 Evaporation Dam 1 (ED1)
- 6 Cofferdam - ED1
- 7 EC Leachate Dam
- 8 Evaporation Dam 2 (ED2)
- 9 EC3 Rehabilitated
- 10 Waste Rock Dump (WRD) Rehabilitated
- 11 ED1 South & West sides Rehabilitated

05

ARCHITECTURAL
DRAWINGS



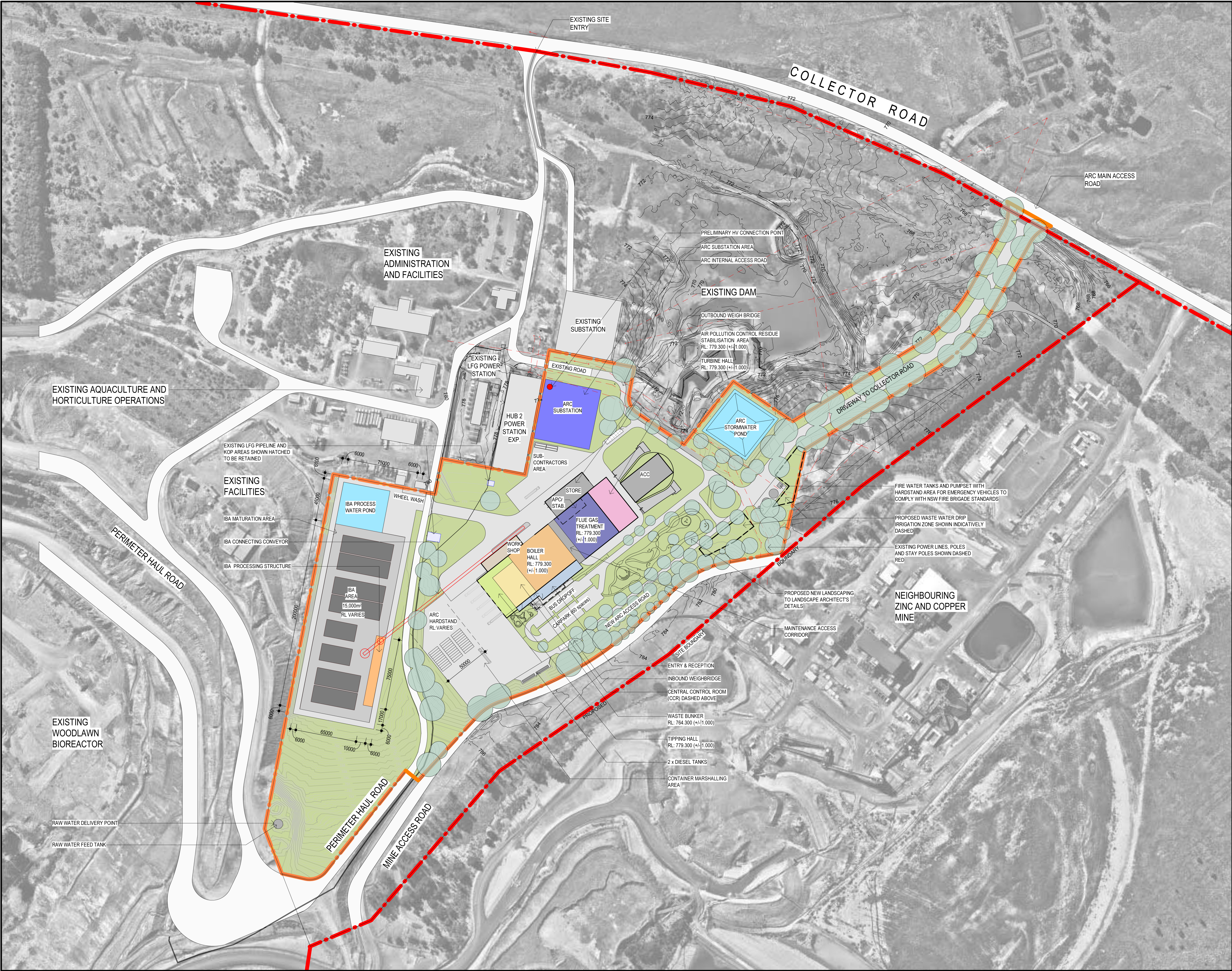
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DA-000	A-04-D16-0001	COVER SHEET	B	08.06.22
DA-101	Z-04-D01-0002	SITE PLAN	B	08.06.22
DA-111	A-04-D15-0001	GROUND FLOOR GA PLAN	B	08.06.22
DA-112	A-04-D15-0002	ROOF PLAN	B	03.06.22
DA-201	A-04-D15-0003	BUILDING ELEVATIONS - SHEET 1	B	03.06.22
DA-901	A-04-D16-0002	PERSPECTIVES - SHEET 1	B	03.06.22
DA-903	A-04-D16-0004	PERSPECTIVES - SHEET 3	B	03.06.22
DA-904	A-04-D16-0005	PERSPECTIVES - SHEET 4	B	03.06.22
DA-905	A-04-D16-0006	PERSPECTIVES - SHEET 5	B	03.06.22



nettleontribe

WOODLAWN ADVANCED ENERGY RECOVERY CENTRE

(VEOLIA JOB # 00288) 11987
EIS Architectural Documentation
JUNE 2022



LEGEND	
---	PROPERTY BOUNDARY LINES
---	DEVELOPMENT FOOTPRINT
---	EXISTING POWER LINES

CONSTRUCTION LICENSED AREA	
Name	Area
CONSTRUCTION LICENSED AREA	154828.29 m²

AREA SCHEDULE (SITE)	
Name	Area
CARPARK	1550 m²
CONTAINER MARSHALLING AREA	5230 m²
DRIVEWAY & ROAD	24030 m²
HARDSTAND	4440 m²
IBA TOTAL	14860 m²
SUB CONTRACTORS AREA	2750 m²
SUBSTATION	3840 m²

1 DA SITE PLAN
1:2000



WOODLAWN ADVANCED ENERGY RECOVERY CENTRE

619 Collector Road, Tarago - NSW

Veolia Drawing No. 00288-Z-04-D01-0002

NT Drawing No. 11987_DA-101 (B)

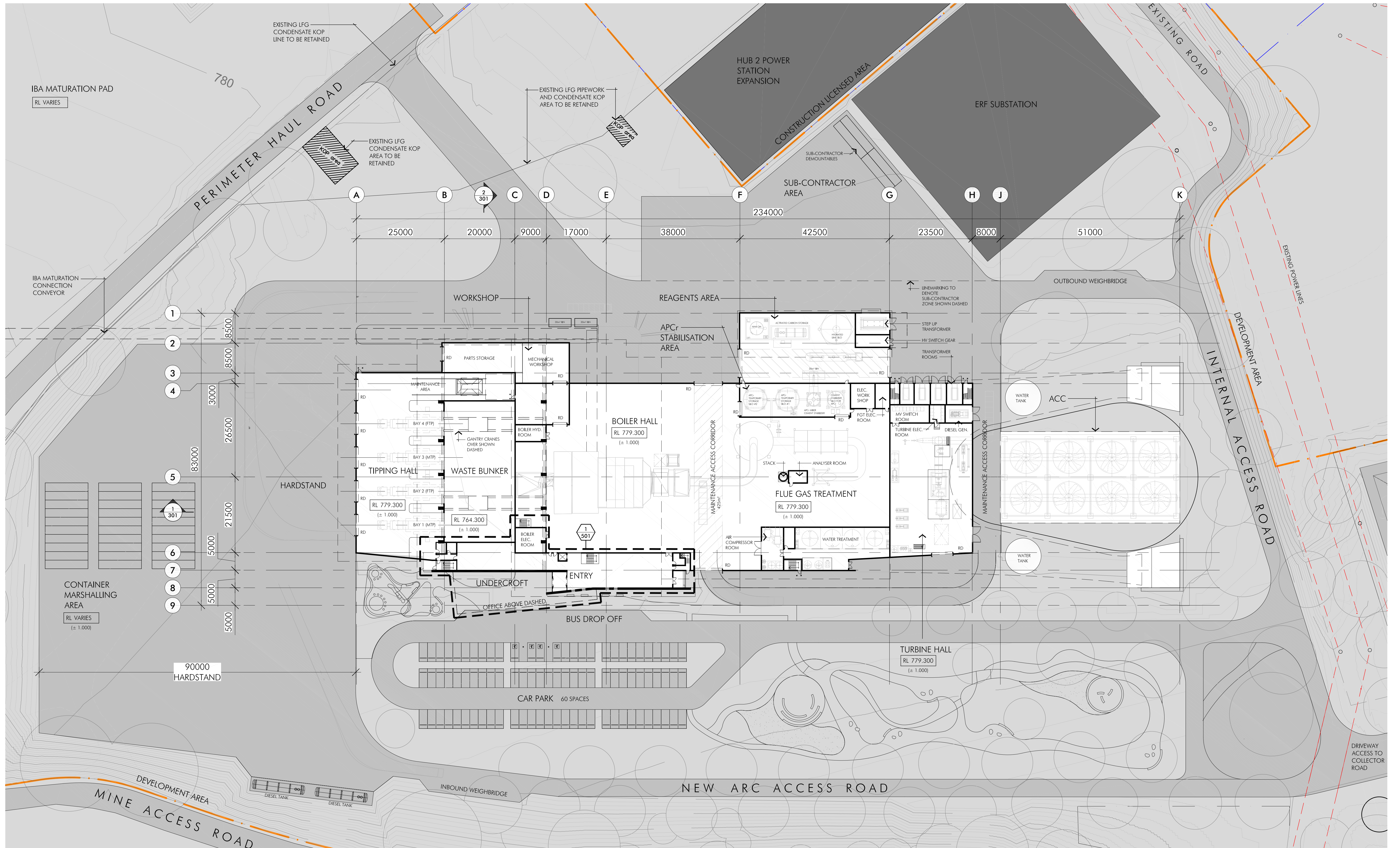
Title: SITE PLAN

Scale: 1:2000

Date: 08.06.22

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1
-
GROUND FLOOR GA PLAN
SCALE 1:500 @ A1



WOODLAWN ADVANCED ENERGY RECOVERY CENTRE

619 Collector Road, Tarago - NSW

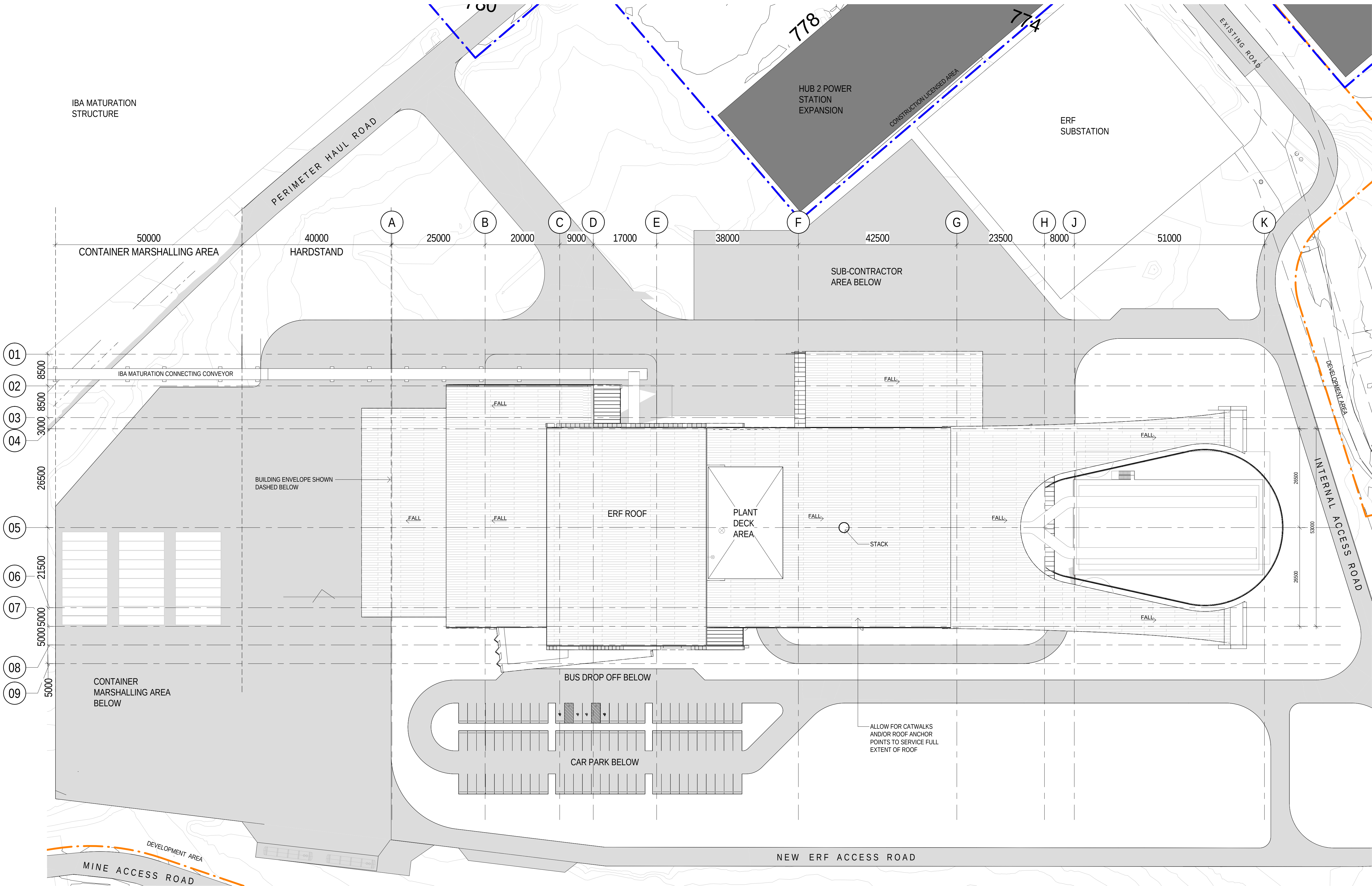
NT Drawing Number
00288-A-04-D15-0001

Title
GROUND FLOOR GA PLAN
Scale
1:500@A1
Date
08.06.22
NT Drawing Number
11987_DA-111 (B)

NOTE:
ALL DIMENSIONS INDICATIVE ONLY
SUBJECT TO DESIGN DEVELOPMENT

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1 DA ROOF PLAN
A-156 1:500



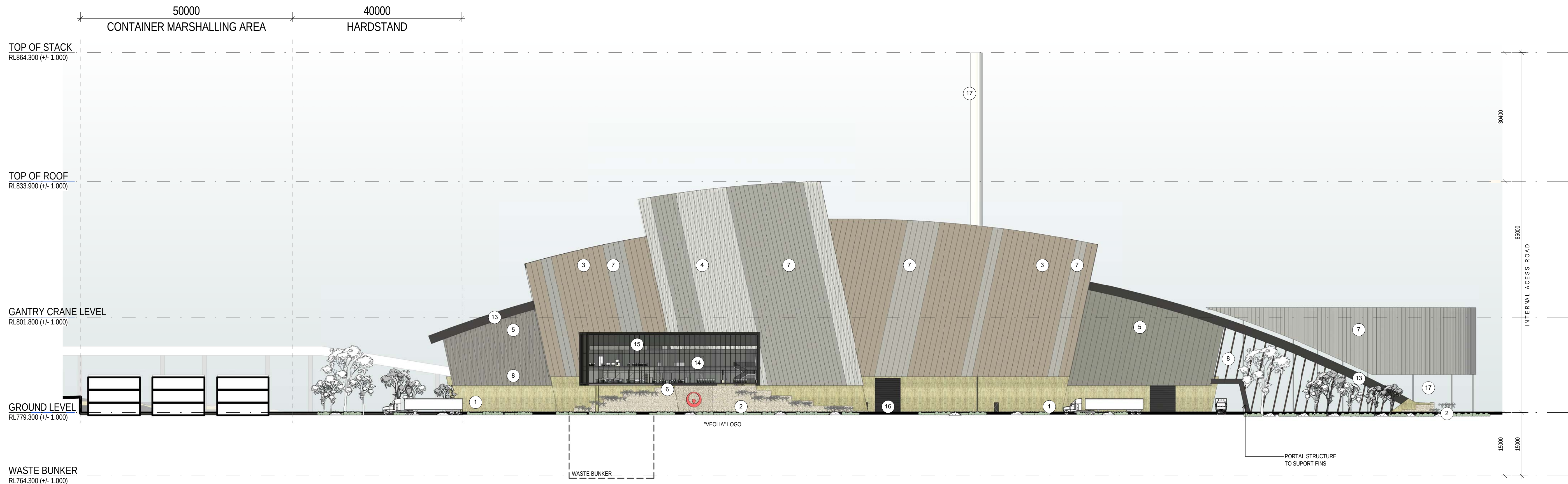
WOODLAWN ADVANCED ENERGY RECOVERY CENTRE

619 Collector Road, Tarago - NSW

Veolia Drawing No.	00288-A-04-D15-0002	Title	ROOF PLAN
		Scale	1:500
		Date	03.06.22
		NT Drawing No.	11987_DA-112 (B)

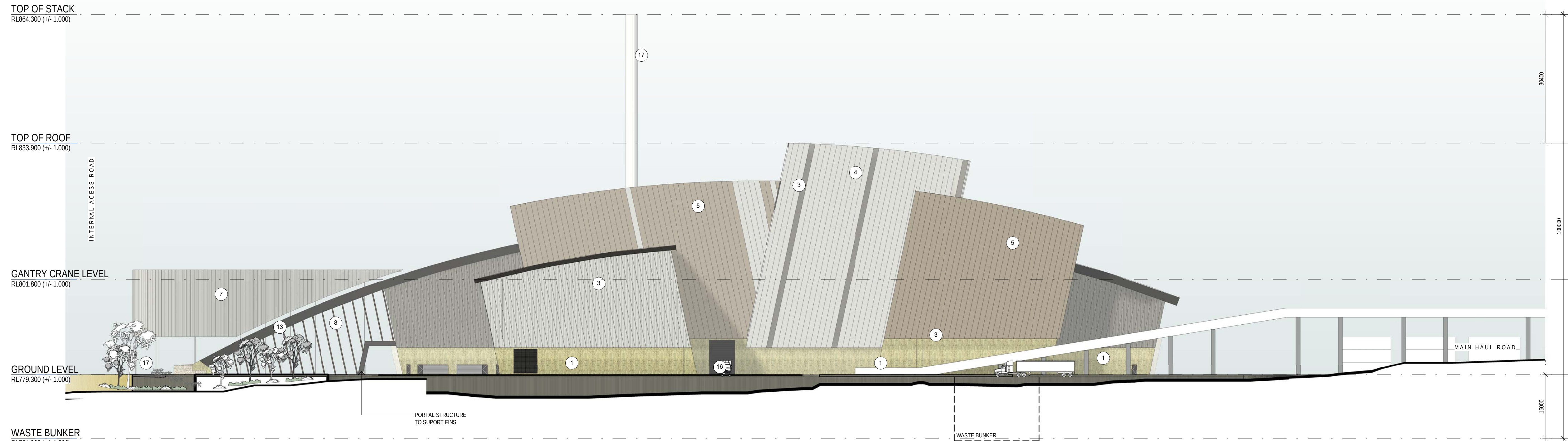
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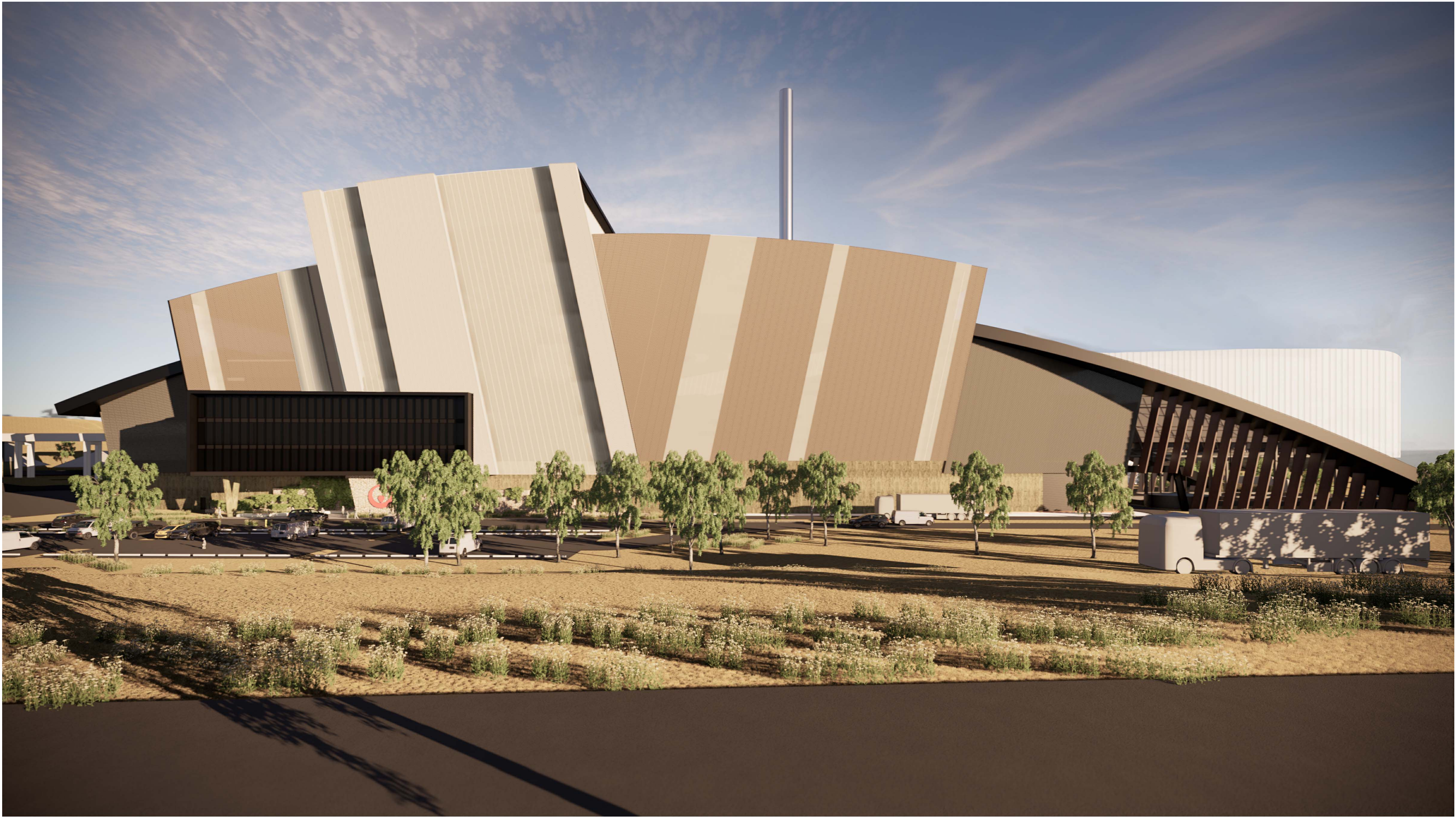


EXTERNAL FINISHES LEGEND	
1	PRECAST CONCRETE DADO WALL
2	GABION WALL INFILL WITH RECYCLED CONTENT AND ZINC/COPPER ORE
3	COLORBOND METAL WALL CLADDING TYPE 1 - WOODLAND GREY
4	COLORBOND METAL WALL CLADDING - SURFMIST
5	COLORBOND METAL WALL CLADDING - JASPER
6	ALUMINIUM FAÇADE WALL CLADDING TYPE 1 (OFFICE)
7	COMBINATION OF SOLID AND NON-COMBUSTIBLE TRANSLUCENT WALL CLADDING
8	PERFORATED MESH - CORTEN
9	COLORBOND METAL ROOF SHEETING TYPE 1 - PALE EUCALYPT
10	COLORBOND METAL ROOF SHEETING TYPE 2 - JASPER
11	COLORBOND METAL ROOF SHEETING TYPE 3 - DUNE
12	COLORBOND METAL ROOF SHEETING TYPE 4 - SANDBANK
13	FASCIA, DOWNPIPE, FLASHING & CAPPING - MONUMENT
14	GLASS - VISION
15	GLASS - COLOURBACK
16	ROLLER DOORS - MONUMENT
17	PREFINISHED METAL CLADDING TYPE 1 - SHALE GREY

1 EAST ELEVATION
1:500



2 WEST ELEVATION
1:500





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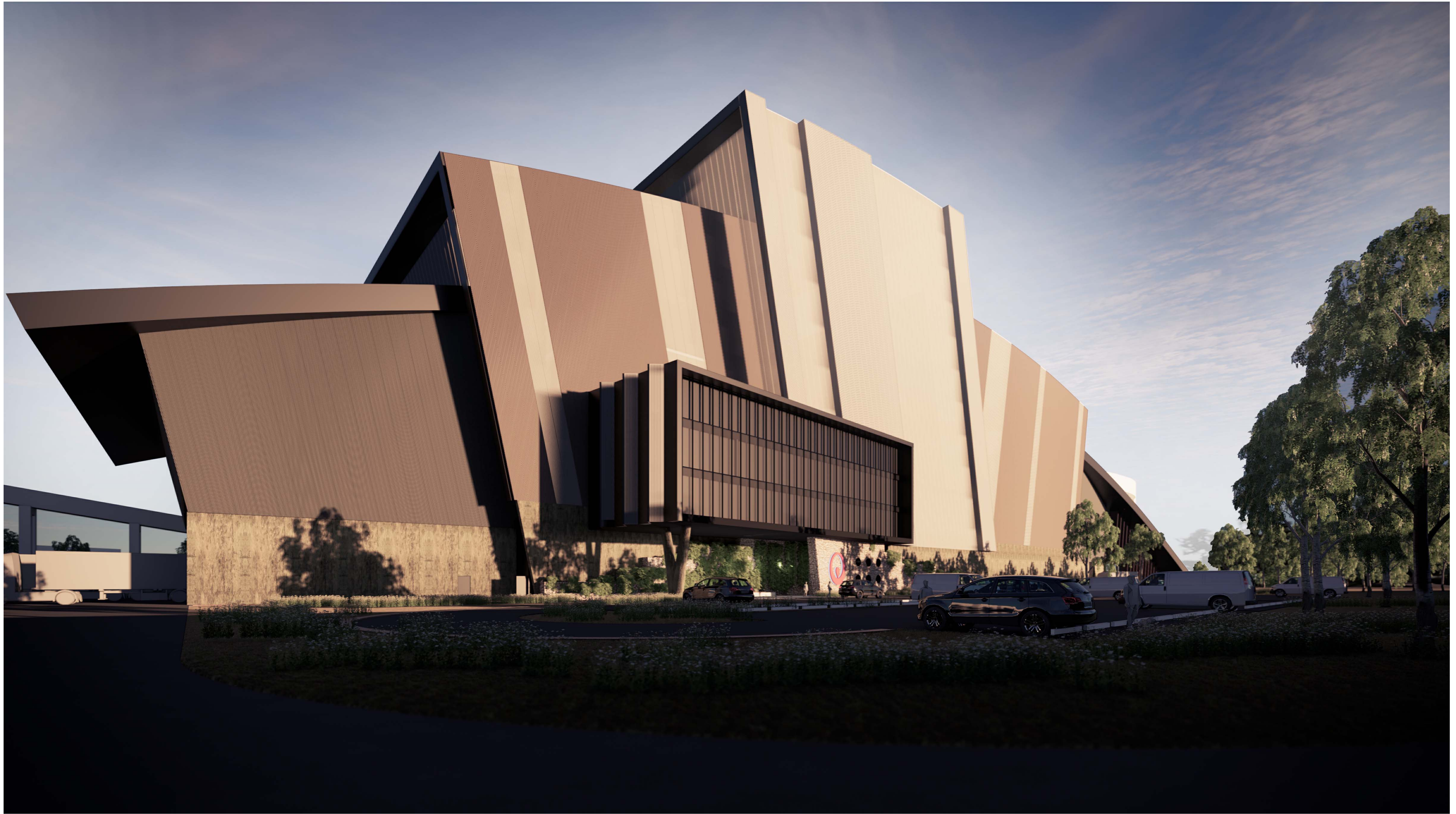
WOODLAWN ADVANCED ENERGY RECOVERY CENTRE
619 Collector Road, Tarago - NSW

Veolia Drawing No.

00288-A-04-D16-0005

Title	PERSPECTIVES - SHEET 4
Scale	NTS
Date	03.06.22
NT Drawing No.	11987_DA-904 (B)
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WOODLAWN ADVANCED ENERGY RECOVERY CENTRE
619 Collector Road, Tarago - NSW

Veolia Drawing No.

00288-A-04-D16-0006

Title	PERSPECTIVES - SHEET 5
Scale	NTS
Date	03.06.22
NT Drawing No.	11987_DA-905 (B)
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