V. F / Ecology
Initiative #11 - Biodiversity enhancement

IMPLEMENTATION CONSIDERATIONS

- Re-establishing native ground cover and grassland on previously degraded land can be costly and time-consuming. It would also require concerted effort to ensure vegetation re-establishes as desired. Consultation with ecologists and experienced land managers would be required
- Obtaining locally indigenous plant species can be difficult to achieve at large-scale, due to limited plant stock. This would require coordination with local nurseries and the staging of planting activities, unless a nursery function is adopted as an interim use
- Biodiversity enhancement activities will need to be designed effectively to ensure that no new bushfire or grassfire hazards are introduced to the BREP site which put future workers and residents at risk

KEY DELIVERY ROLES & PARTNERSHIPS

- Key stakeholders include:
  - + Landowners and developers
  - + Traditional Owners
  - + Landscape architects, arborists and bushfire experts
  - + Local nurseries
  - + Council arborists
  - + Landscape contractors
  - + Asset owners and managers (e.g. Council or private landholder)
  - + Maintenance teams
- The arboricultural assessment will provide recommendations of tree retention through a site assessment on all existing trees within the precinct
- Management of regenerated waterways and corridors is yet to be determined

IMPLEMENTATION ACTIONS

Structure Plan & planning scheme implementation

- Establish this initiative as a priority for the development of the BREP through technical reports, the Structure Plan and co-design process:
  - + Enhancing the biodiversity on site can be included as an objective in the Structure Plan
  - + This can be further supported by open space, biodiversity and land management requirements and guidelines in the Structure Plan; subject to additional technical studies and consultation with landowners, Traditional Owners and land management experts being undertaken
- Ensure the initiative is followed through at the Planning Scheme Amendment Stage (policy and control) - spatial allocation and potential planning trigger for a biodiversity/land management plan where relevant, detailed landscape plan and/or any other planning tool identified as part of the technical biodiversity study (e.g. native vegetation precinct plan)

Sub-precinct masterplan & development plan

- Ensure the initiative is followed through at the sub-precinct masterplan / development plan stage
- Landscape masterplan which demonstrates sub-precinct approach and connects whole of precinct waterways and other corridors

Planning application

- Ensure the initiative is implemented through the planning application process / detailed design
  - + Biodiversity/land management plan, detailed landscape plan (including plant species selection) and/or other can be required at the subdivision application stage (public land)
  - + Biodiversity enhancement on private land can be demonstrated via compliance with proposed Design Guidelines

Precinct development & operation

- Roll-out the initiative in combination with precinct development
- Encourage early delivery of canopy tree coverage recognising longer growth timeframes for large trees
- During precinct operation, monitor the success of this initiative and upgrade or scale-up infrastructure as necessary

V. G / Integrated Water Management

Fig 42. Permeable pavement in carpark. Photography by Joerg Hackemann.

V. G / Integrated Water Management
Initiative #12- Roofwater harvesting

IMPLEMENTATION CONSIDERATIONS

- Stakeholder engagement would be required early, to understand ownership and operational responsibility and where private and public roles diverge
- Clear benefit must be established and compared favourably to balance upfront additional infrastructure cost

KEY DELIVERY ROLES & PARTNERSHIPS

- Key stakeholders include:
  - + Landowners and developers
  - + Responsible Authorities (including Coliban Water and Council)
  - + Engineers and designers
  - + Construction contractors
  - + Precinct operational management entity (if established)
- Feasibility required at a 'whole of system' level prior to further allocation of resources to governance (i.e. who would own and operate the asset)
- If established, a precinct operational management entity could provide a key role in optimising benefit for participants

IMPLEMENTATION ACTIONS

Structure Plan & planning scheme implementation

- Feasibility of precinct wide roof water harvesting scheme, including consideration of high costs of water supply to the location
- Subject to feasibility, establish this initiative as a priority for the development of the BREP through technical reports, the Structure Plan and co-design process:
  - + Water efficiency and drought resilience can be included in the Structure Plan vision and objectives
  - + It can be supported by a number of IWM requirements and guidelines. The structure plan may not need to aside land for this use, it would likely be integrated as part of any public open space if it were to be included
- Undertake stakeholder engagement and dedicated co-design process to resolve governance arrangements of any viable scheme
- Utilities Plan and potentially Infrastructure Contributions Plan to incorporate scheme if precinct approach proves feasible

Sub-precinct masterplan & development plan

- Ensure the initiative is followed through at the sub-precinct masterplan / development plan stage
- This would depend on which if any confirmed viable scale for roofwater harvesting scheme

Planning application

- Ensure the initiative is implemented through the planning application process / detailed design
  - + Connections from buildings and works to any precinct system can be addressed via an SMP/SSMP requested prior to the certification of plan of subdivision or buildings and works (permit condition)
  - + In the absence of a viable precinct scheme, requirements for rainwater harvesting at the site scale likely implemented through Design Guidelines

Precinct development & operation

- Roll-out the initiative in combination with precinct development

V. G / Integrated Water Management
Initiative #13 - Local waste water processing

IMPLEMENTATION CONSIDERATIONS

- Emissions associated with the processing of waste water locally may need to be considered within the context of the Zero Carbon target (including renewable electricity for pumping and treatment and capturing methane and other emissions from the treatment process)

KEY DELIVERY ROLES & PARTNERSHIPS

- Key stakeholders include:
  - + Responsible Authorities (including Coliban Water and Council)
  - + Developers
  - + Engineers
  - + Designers
  - + Construction contractors
- Delivery roles would need to be established further through feasibility / cost-benefit analysis compared with connecting to the existing sewer
- Cost benefit analysis between local wastewater treatment (on-site or adjacent land) and connection to Coliban Water asset is a relatively urgent first step and if the infrastructure is to be funded through a Structure Plan instrument (otherwise the distant infrastructure connection to will be the default option)
- Key governance implication is who would be best placed to own and operate the asset (Coliban Water, Council, Precinct operational management entity or commercial provider)

IMPLEMENTATION ACTIONS

Structure Plan & planning scheme implementation

- Undertake cost benefit analysis to compare on site waste water treatment with treatment off-site at the existing facility
- Subject to feasibility, establish this initiative as a priority for the development of the BREP through technical reports, the Structure Plan and co-design process:
  - + Include efficiency in service provision as a key objective
  - + Following further feasibility, if included in Structure Plan, spatial allocation and buffer distances will need to be allocated as part of urban structure
  - + It can be supported by a number of IWM requirements and guidelines, with infrastructure spatially depicted in the Utilities Plan
- Undertake additional investigations, stakeholder engagement and dedicated co-design process to resolve feasibility and governance arrangements

Planning application

- Ensure the initiative is implemented through the planning application process / detailed design
  - + Ensure the initiative is implemented through the planning application process / detailed design
  - + Connections from buildings and works to any precinct system can be addressed via an SMP/SSMP requested prior to the certification of plan of subdivision or buildings and works (permit condition)

Precinct development & operation

- The size of the wastewater treatment facility on site could be scaled over as the volume of wastewater increases
- Roll-out the initiative prior to or in combination with precinct development depending on whether or not the facility is scaled or built at its ultimate scale at the outset
- During precinct operation, monitor the success of this initiative, upgrade or scale-up infrastructure as necessary

Fig 43. Stockland Logistics Centre, Sydney. Photography by Stockland.

V. H / Urban Heat

Initiative #14 - Urban heat reduction targets

IMPLEMENTATION CONSIDERATIONS

- An urban heat reduction target of at least 50% is recommended for public realm and 75% for private realm. It may also be appropriate to set a minimum benchmark for green cover (nominally 15% horizontal equivalent) in private realm as part of the 75% urban heat target. Green cover includes trees, shrubs, grasses, climbers, living green roofs and walls, other vegetation and lawn. In industrial sites, the most cost-effective landscaping approach in the private realm is ground-level landscaping and green façades, recognising the predominance of steel-roof constructions which are structurally not sound for living green roofs without substantial reinforcement
- A supporting canopy cover target of 30% would contribute to urban heat reduction in the public realm and provide an opportunity to provide multiple benefits, including being a catalyst for private investment. This target is well ahead of what is generally achieved in industrial/employment precincts and will require strong implementation through several stages of precinct design, construction and operation to be successful. The 30% canopy cover target is set through the PSP 2.0 Guidelines, which does not have a separate target or exemption for Employment Precincts

KEY DELIVERY ROLES & PARTNERSHIPS

- Key stakeholders include:
  - Landowners and developers
  - Council arborists
  - Civil engineers and contractors
  - Architects, landscape architects and contractors
  - Traditional Owners
  - Asset owners / managers
- Early consultation with Council arborists required to advise on tree species selection, planting methodology and ongoing maintenance regimes
- It is the responsibility of the landowner/developer (with support from civil and landscape) to identify additional urban heat mitigation initiatives suitable to the BREP site
- Following development of open space plan through the Structure Plan, operations of public streets and open space will be vested in Council
- The role and responsibility of all stakeholders in the lifecycle of the assets needs to be made clear early in the project. This includes private land owners where streets are retained in private ownership
- Beyond the streetscapes, the approach for linking existing ecological assets into the open space network that will support canopy cover would benefit from Traditional Owner input

IMPLEMENTATION ACTIONS

<u>Structure Plan & planning scheme implementation</u>

- Establish this initiative as a priority for the development of the BREP through technical reports, the Structure Plan and co-design process
  - The Structure Plan can include objectives for urban heat reduction and increased canopy cover, locking in targets consistent with the Structure Plan 2.0 guidelines
  - Guidelines in regard to how to meet green cover objectives through the inclusion of trees, shrubs, grasses, climbers, etc. can also be included
  - Spatial allocation in the public realm can also be addressed as part of structure plan (i.e. passive open space, links to linear open spaces in areas of high amenity pocket parks)
  - Open space provision should link to encumbered land used for drainage purposes if possible to improve efficiencies and maximise benefit
- Ensure the initiative is followed through at the Planning Scheme Amendment Stage (policy and control) which would set the target for subsequent planning stages

<u>Sub-precinct masterplan & development plan</u>

- Ensure the initiative is followed through at the sub-precinct masterplan / development plan stage (requiring demonstration with public realm targets)

<u>Planning application</u>

- Ensure the initiative is implemented through the planning application process / detailed design
  - Subdivision plan, landscape masterplan and SMP / SSMP to be required at the subdivision stage
  - Architectural plans (with material schedule) and detailed landscape plan to be required as part of any buildings and works application demonstrating 75% target being met
  - Design Guidelines can also drive the private realm targets and be required at the application stage (and enforced via agreement or encumbrance on title plan)

<u>Precinct development & operation</u>

- Roll-out the initiative in combination with precinct development (if ‘plant nursery’ is earmarked as a desired interim land use, tree canopy could be accelerated through early planting)
- During precinct operation, monitor the success of this initiative

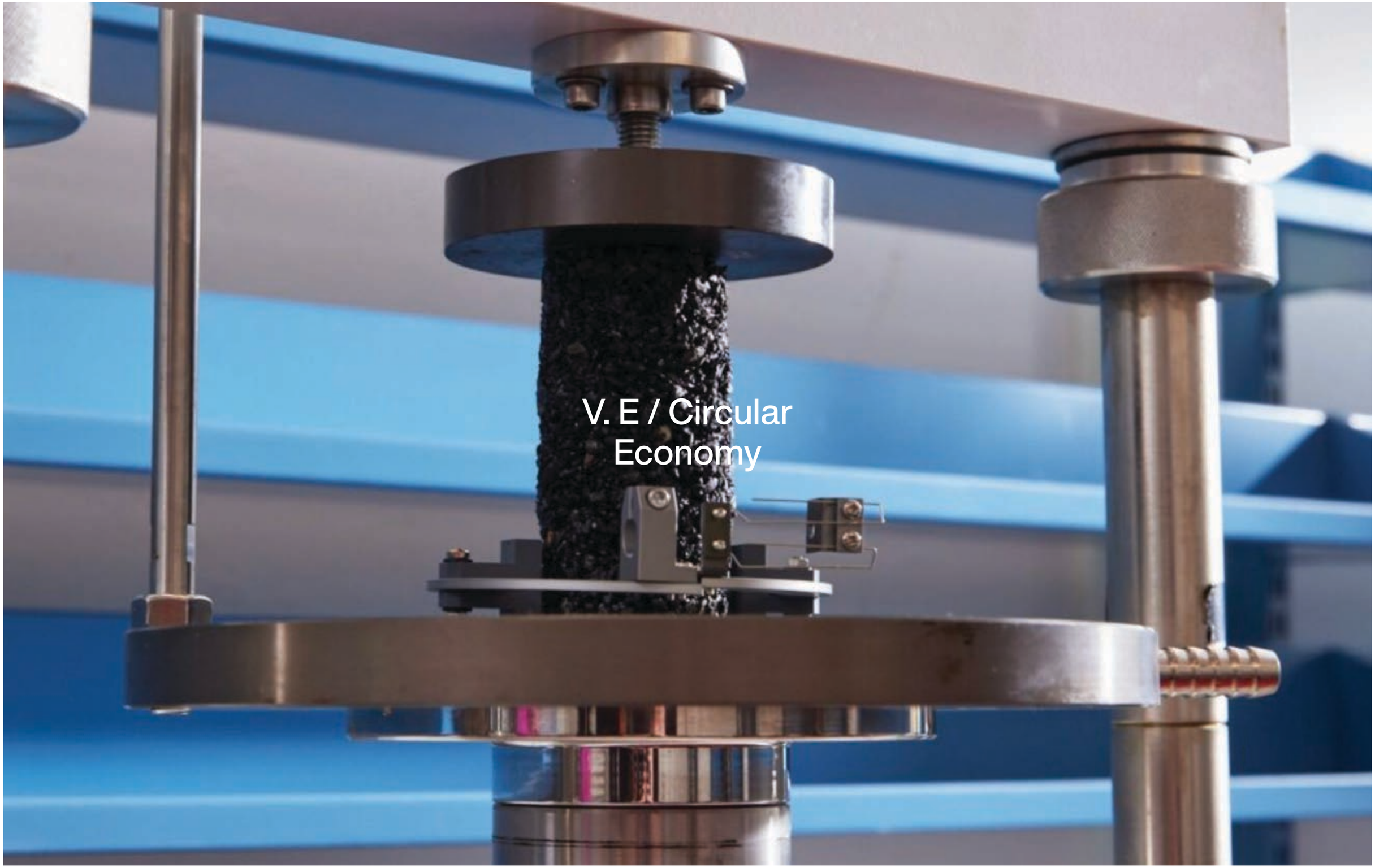


Fig 44. Porous Lane Pavement sample, made of recycled tyres, rock and purpose-built and engineered binder.
Fig 45. Photography by Porous Lane.

V. E / Circular Economy

Initiative #15 - A circular economy demonstration precinct

IMPLEMENTATION CONSIDERATIONS

- Further justification to support investment is required, including outlining key roles of Government and private sector partners
- Planning for the precinct must provide certainty on buffer distances to sensitive uses as a pre-condition of a physical circular economy precinct locating on site
- Disclosure of waste / resource data by tenants is critical to understand hyper local opportunities, that would benefit from local processing / recycling including from adjacent or with good access to the precinct
- Ongoing governance requirements (i.e. monitoring) to ensure waste stream/ recycling systems operate effectively

KEY DELIVERY ROLES & PARTNERSHIPS

- Key stakeholders include:
  - + Landowners
  - + Circular economy businesses
  - + Construction contractors
  - + Technical experts (i.e. waste and circular economy)
  - + Local and State Government (DTP, EPA etc)
  - + Third-party waste/ recycling collectors
  - + Education institutions
- There is opportunity for a form of government led EOI / Investment process to facilitate early conversations with landowners and prospective business owners and tenants to connect them early with one another
- Government could sponsor further feasibility study of specific circular economy systems in BREP site, as well as consult with relevant authorities and third parties. Government has a key role in providing investment support, and certainty around planning and infrastructure to support any physical location for circular economy activity
- Waste/ recycling contractors to link with local operations and where not present within the precinct, provide service to link core and non-core waste / resource streams to processing / recycling capacity within the broader region

IMPLEMENTATION ACTIONS

Structure Plan & planning scheme implementation

- Establish this initiative as a priority for the development of the BREP through technical reports, the Structure Plan and co-design process:
  - + The Structure Plan can support circular economy principles to be applied in the development of the BREP as a key objective
  - + This can be supported by waste requirements and guidelines that reinforce the collection of both core and alternative waste streams within the precinct to ensure collection of waste streams is optimised
  - + Whilst the Structure Plan can set up the infrastructure conditions for a dedicated physical circular economy precinct to be located in BREP, the feasibility would need to sit beyond the Structure Plan process

Precinct development & operation

- Roll-out the initiative in combination with precinct development
- During precinct operation, monitor the success of this initiative and further invest in beneficial circular economy initiatives

Other

- Outside the planning process, undertake work to resolve demonstration precinct location/boundaries and governance arrangements
- Facilitate early conversations with landowners and prospective business owners / tenants to connect them early with one another (via government-led EOI process or other)
- Further consideration could be given to spatial allocation of outdoor storage space to support circular economy waste streams that may be beneficial for tenants / later development stages
- Partnership opportunities could be explored with education institutions

V. E / Circular Economy

Initiative #16 - Target for construction waste diversion from landfill

IMPLEMENTATION CONSIDERATIONS

- Setting a target early provides clarity and certainty to stakeholders in regard to sustainability ambitions, development process and delivery
- Planning for waste upfront also allows for key actions to be incorporated and implemented throughout the project, ensuring maximum impact
- Waste diversion targets should be considered when designing buildings and infrastructure and selecting materials to ensure the building techniques and materials required to deliver on the designs align with the targets

KEY DELIVERY ROLES & PARTNERSHIPS

- Key delivery roles and partnerships include:
  - + Developers
  - + Building designers / architects
  - + Sustainability consultants/engineers
  - + Construction contractors
  - + Waste managers / material recyclers
  - + Council / Responsible Authority
- Building designers / architects need to be aware of the targets when developing standard designs (this is especially critical in industrial development where a smaller number of design professionals design the bulk of development and projects use a relatively standard suite of materials)
- Local waste managers / construction waste recyclers should be engaged early to ensure capacity
- Council, as the Responsible Authority for planning applications, would need to ensure that CWMPs are robust and implemented

IMPLEMENTATION ACTIONS

Structure Plan & planning scheme implementation

- Establish this initiative as a priority for the development of the BREP through technical reports, the Structure Plan and co-design process:
  - + Construction waste reduction and diversion, in the context of circular economy, can be included as a Structure Plan objective
- Ensure the initiative is followed through at the Planning Scheme Amendment stage (policy)

Planning application

- Ensure the initiative is implemented through the planning application process / detailed design
  - + The capability to deliver on diversion targets can be required to be demonstrated via the preparation of an SMP/SSMP or CWMP to the satisfaction of the RA
  - + Proof of targets being met can be required to be provided prior to the certification of a plan of subdivision or any building and works (via permit conditions)

Precinct development & operation

- Roll-out the initiative in combination with precinct development
- Consider additional storage space on site during construction for construction waste separation

V. E / Circular Economy

Initiative #17 - Recycled and lower embodied carbon precinct infrastructure

IMPLEMENTATION CONSIDERATIONS

- The use of low embodied carbon materials is underpinned by a commitment to adopt recycled materials and construction methods for the project where they are demonstrated to meet technical performance requirements

KEY DELIVERY ROLES & PARTNERSHIPS

- Key delivery roles and partnerships include:
  - + Landowner
  - + Developers
  - + Council/ Victorian Government
  - + Consultants and technical experts (i.e. civil engineers) civil contractor
  - + Recycled material manufacturers/ distributors, universities or other materials research & development entities
- State Government partnership opportunity to lead with leveraging learnings from State Government Infrastructure projects to apply at precinct scale - e.g. what alternatives can developers and Council have confidence in the short term, from a technical perspective
- Responsibility of the developer/ landowner to implement with the civil contractor, recycled material manufacturers/ distributors, as well as relevant consultants to confirm the feasibility of incorporating recycled material into infrastructure design (linking with proposed technical working group)
- Council, DTP and utilities will be responsible for assessing the design and suitability of the recycled material as part of the subdivision stage, however in principle approval could be sought for a selection of materials through a proposed technical working group
- Ultimate responsibility over infrastructure maintenance to be transferred to the relevant regulatory authority

IMPLEMENTATION ACTIONS

Structure Plan & planning scheme implementation

- Establish this initiative as a priority for the development of the BREP through technical reports, the Structure Plan and co-design process:
  - + An objective relating to embodied carbon reduction and the use of recycled materials should be embedded in the Structure Plan
  - + Target instilled in Structure Plan requirements
  - + Set up a working group to supply chain considerations and technical standards with government and industry representatives
- Ensure the initiative is followed through at the planning scheme amendment stage (policy and control)

Sub-precinct masterplan & development plan

- Ensure the initiative is followed through at the sub-precinct masterplan / development plan stage

Planning application

- Ensure the initiative is implemented through the planning application process / detailed design
  - + Can be implemented and reinforced through the proposed Design Guidelines mechanism, noting that flexibility for change over time is critical
  - + Alternatively demonstrated through a permit condition demonstrating that targets have been met by proposed subdivision infrastructure

Precinct development & operation

- Roll-out the initiative in combination with precinct development
- Technological watch - Periodically revisit the list of recycled materials and construction techniques via working group or other mechanism

V. F / Sustainability Initiatives Plan

Fig 46. Caribbean Park Public Realm. Photography by Oculus.

V. F / Sustainability Initiatives Plan

As the urban structure for BREP is not resolved, there is only limited information that can be presented on the Sustainability Initiatives Plan. Please note that all locations presented are preliminary only and would need to be revisited based on the urban structure and staging being resolved.

Note that the initiative that these sustainability initiatives correspond to is referenced via the #X.

Legend

- #3 Potential interim uses location (subject to staging and infrastructure planning for precinct solar PV)
- #5 Potential mobility hub locations (subject to future access location and PT service provision within the site)
- #6 Potential location for local park for central amenity / landscape uplift
- #9 Potential regional EV charging locations (depends on future highway alignment)
- #10 Potential central precinct energy storage (subject to infrastructure planning and network capacity)
- #11 Potential biodiversity enhancement locations
- #12 Potential roof water harvesting storage location (noting this is a low point which retains good access to potential customers - (Golf Course, intensive farming)
- #13 Potential local wastewater processing locations
- #16 Potential circular economy demonstration / interim materials storage

Fig 47. Preliminary Sustainability Initiative Plan. Prepared by HV.H.

VI. Next steps

This report concludes the technical investigation undertaken by HIP V. HYPE as part of the BREP Sustainable Development Opportunities project.

This report summarises the background research, stakeholder engagement, risk assessment, and detailed analysis of sustainable development opportunities for the BREP, providing a roadmap to the successful delivery of sustainable ambitions for the precinct.

It highlights key sustainability targets, initiatives and partnerships identified as being critical in driving this ambition to tangible built form outcomes. Importantly, it also provides key implementation roles, considerations, and mechanisms for the VPA and City of Greater Bendigo to consider and take forward as the suite of planning tools to be deployed to guide the development of the precinct gets resolved.

A co-design workshop will be held as the broader BREP project progresses and will provide an additional opportunity for the report findings to be presented and further tested with key relevant stakeholders, authorities, and landowners.

Fig 48. Sunvale Park, Sunshine. Photography by Emma Cross.

Appendices

Appendix A - Physical Context Review
Appendix B - Policy, Practice & Innovation
Appendix C - Stakeholder Engagement

Appendix A
Physical Context Review

Appendix A - Physical Context Review
(i) Site & GIS Analysis

A preliminary site and Geographic Information System (GIS) analysis was conducted to understand the Site's regional context and its existing conditions in relation to vegetation, urban heat, flooding and topography.

BENDIGO REGIONAL EMPLOYMENT PRECINCT

The Precinct is approximately 294ha of existing Farming Zone land made up of 13 titles. The City of Greater Bendigo is the largest landowner in the precinct, owning 6 titles that total 155ha or 53% of the precinct.

The Site is approximately 527m south of Marong township and 13.24km west of Bendigo City Centre. It is bound by O'sullivans Road to the west, Cemetery Rd to the south, the Wimmera Highway to the north and the Calder Alternative Highway to the east. It has excellent access to local and regional arterial road networks and its location provides great access to north and west of Victoria as well as Melbourne.

It abuts agriculture land to the west and south and future residential land to the north and east. Key surrounding development and environmental features include the Wilsons Hill Conservation and Bushland Reserves to the north-west, Bullock Creek to the east, a broiler farm approximately 1km north-west, and the Marong Golf Club and Recreation Reserve to the north-east.

The precinct is relatively flat, with a slight slope from the south-east to the north-west of the Site. The north-east of the Site also falls slightly towards the north. There are a number of scattered trees and vegetation patches, as well as extensive roadside vegetation.

The exact land uses for the precinct are yet to be determined as there are many factors that must be considered. Two of the most notable being the proposed Marong Western Freight Corridor that transverses the site and the Marong Township Structure Plan which will guide future growth of the adjoining town and provides the framework for identification of the precinct.

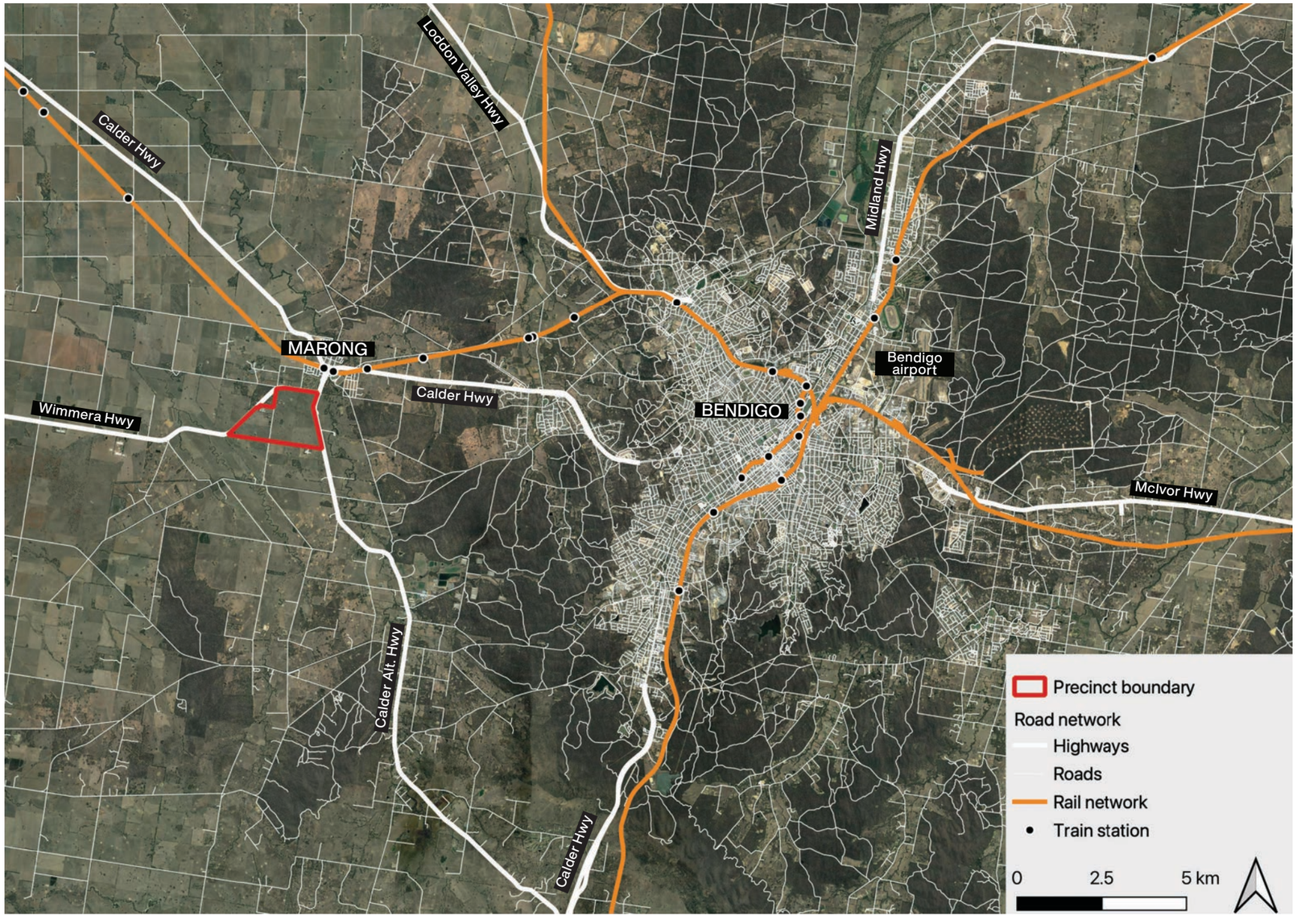


Fig 49. GIS image detailing the regional context of the BREP site, including road and rail networks. Spatial analysis by HIP V. HYPE.

Appendix A - Physical Context Review
(i) Site & GIS Analysis

TREE DENSITY AND URBAN HEAT

Consistent with its past and current agricultural use, the site is largely cleared of vegetation, with most tree density concentrated along O'Sullivans Road, Cemetery Road and Calder Alternative Highway (roadside vegetation). There is a number of scattered trees and vegetation patches, including around dwellings, farm sheds and other outbuildings, as well as centrally within the land.

The site would currently be exposed to significant levels of urban heat, due largely to the absence of significant vegetation and canopy cover. Given that land development can exacerbate urban heat by replacing natural surfaces with non-permeable, high thermal mass materials – there is a pressing need to design the built environment and streetscape to instead provide shade, reflect heat and where possible embrace and retain water to deliver urban cooling benefits. A key feature of conventional industrial development is a lack of trees and extensive hard stand areas. The project will need to challenge this business as usual approach to mitigate urban heat issues.

Urban heat is further compounded by climate change which promises to bring its own temperature increases, and as such should be prioritised as one of the critical success factors in delivering a sustainable and climate resilient precinct.

Building on existing assets, such as remnant tree copses and roadside vegetation and assets adjacent to the precinct such as Wilsons Hill Bushland Reserve to the west and Bullock Creek to the east provide the platform for significant biodiversity and urban cooling enhancement.

Given the location adjacent to agricultural uses and some relatively dense vegetation, consideration in species selection and landscape approach will be important in optimising the greening outcome for the precinct and mitigating bushfire risks.

Fig 50. GIS image detailing Tree Density (trees > 2m height) for the BREP site and surrounds. Spatial analysis by HIP V. HYPE.

Appendix A - Physical Context Review
(i) Site & GIS Analysis

FLOODING AND TOPOGRAPHY

The image to the right shows the various 1:100 Average Recurrence Interval (ARI) flood risks within and around the precinct, in addition to existing topography contouring.

The Site is relatively flat, with a maximum change in elevation of approximately 15m and a slight slope from the south-east to the north-west of the Site. The north-east of the Site also slightly falls towards the golf course and township, with stormwater runoff needing to be redirected to avoid creating a flood impact on any residential development. This also creates an opportunity for water flows to support further habitat enhancement in association with surface flows.

The Bullock Creek runs parallel to the Site, approximately 205m from its eastern boundary at its closest. It introduces additional considerations in terms flooding and inundation, given that the permeability of the site (currently near 100%) will decline significantly through the development of the land.

Further modelling is required to further understand flooding risk on the site and its surrounds, which will influence the location of key services and infrastructure. Some preliminary work has been undertaken which highlights the need for at least three stormwater detention sites within the precinct area.

Due to the proximity of the creek and Wilsons Hill Conservation and Bushland reserves, particular attention will also need to be given to the treatment of potentially polluted/contaminated runoff.

We note that by 2050, may be significantly wetter than current summer and spring rains based on the highest emissions scenarios. The opportunities assessment will examine appropriate design responses to minimise the risk to the future precinct tenants.

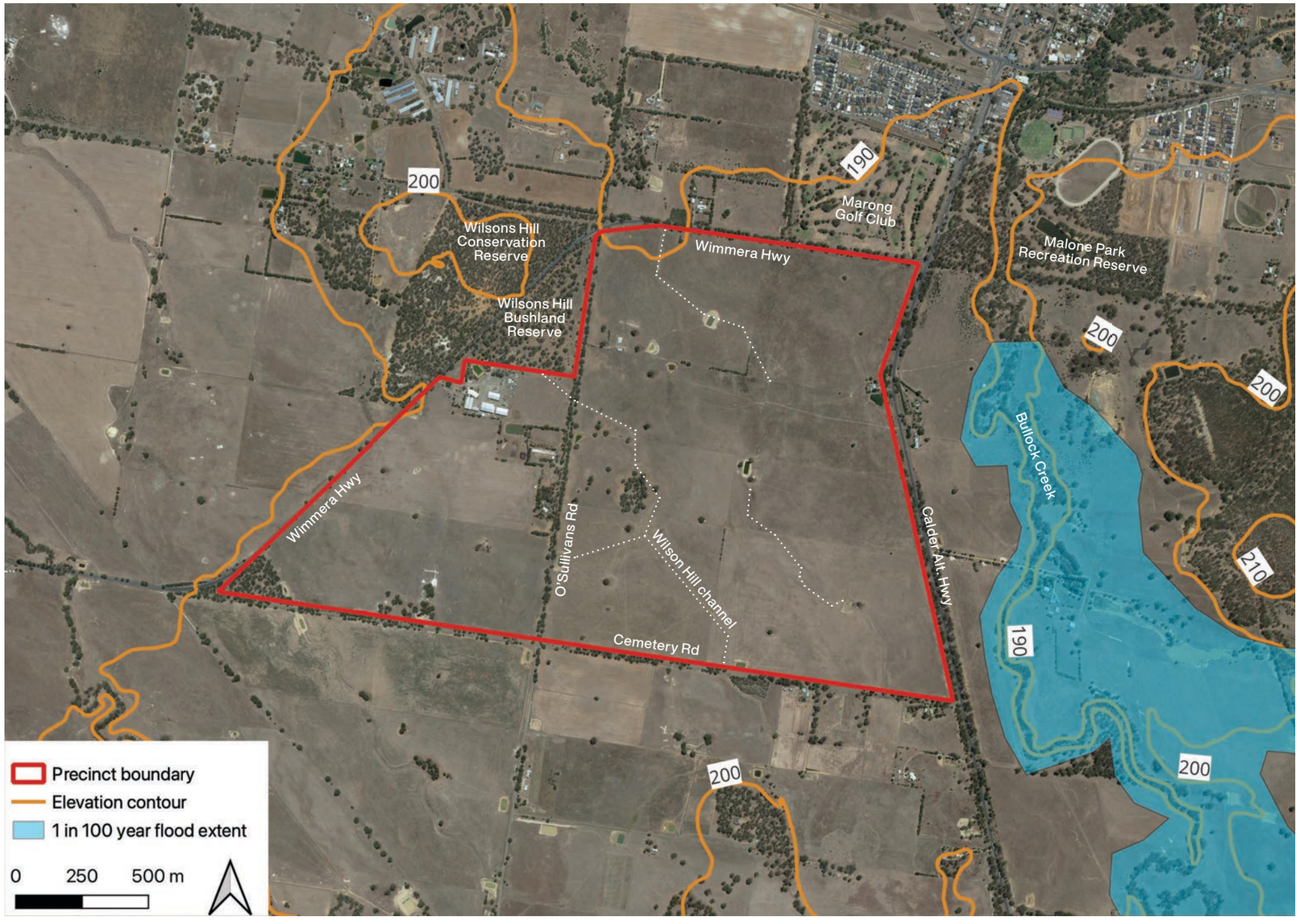


Fig 51. GIS image detailing existing 1:100 ARI flood risk and elevation contouring for the BREP site and surrounds. Spatial analysis by HIP V. HYPE.

Appendix A - Physical Context Review
(i) Site & GIS Analysis

ECOLOGICAL VEGETATION CLASSES

Ecological Vegetation Classes (EVCs) are the standard unit for classifying pre 1750 vegetation types in Victoria. Benchmarks have been developed to facilitate the assessment of vegetation quality of EVCs at the site scale in comparison to a benchmark condition. Benchmarks relate to a single EVC within one bioregion. The combination of EVC and bioregion is used to determine the bioregional conservation status (BCS) of an EVC. This is a measure of the current extent and quality of each EVC, when compared to its original extent and condition (i.e. pre-1750).*

According to the spatial analysis, the Site sits within the Goldfields and Victorian Riverina bioregions and the predominant EVCs on-site include Grassy Woodlands and Plains Woodlands, noting the image to the right shows its pre-1750 extent.

As per the Biodiversity Assessment undertaken by Ecology & Heritage Partners (2022), we note the following:

- Plains Woodland (EVC 803) An open eucalypt woodland to 15 metres tall occurring on a number of geologies and soil types. The EVC typically occurs on fertile clays and clay loam soils on flat or gently undulating plains at low elevations in areas with less than 600ml annual rainfall. The understorey typically consists of a few sparse shrubs over species-rich grassy and herbaceous ground layer, with chenopods often present
- Grassy Woodland (EVC 175) A variable open eucalypt woodland to 15 m tall over a diverse ground layer of grasses and herbs. The shrub component is usually diverse but sparse in cover. In the Goldfields bioregion, Grassy Woodland occurs on sedimentary soils on the lowest slopes at the interface between the plains and the infertile woodlands of the sedimentary hills

Most of the Site was highly modified due to past and current agricultural activities. As part of the redevelopment of the site, there is an opportunity to draw on prevalent EVC species for new plantings and landscape species selection (both streetscapes and open space). The central copse of eucalypts adjacent to Wilson's Channel in particular presents an obvious feature to support passive open space and enhanced worker amenity.

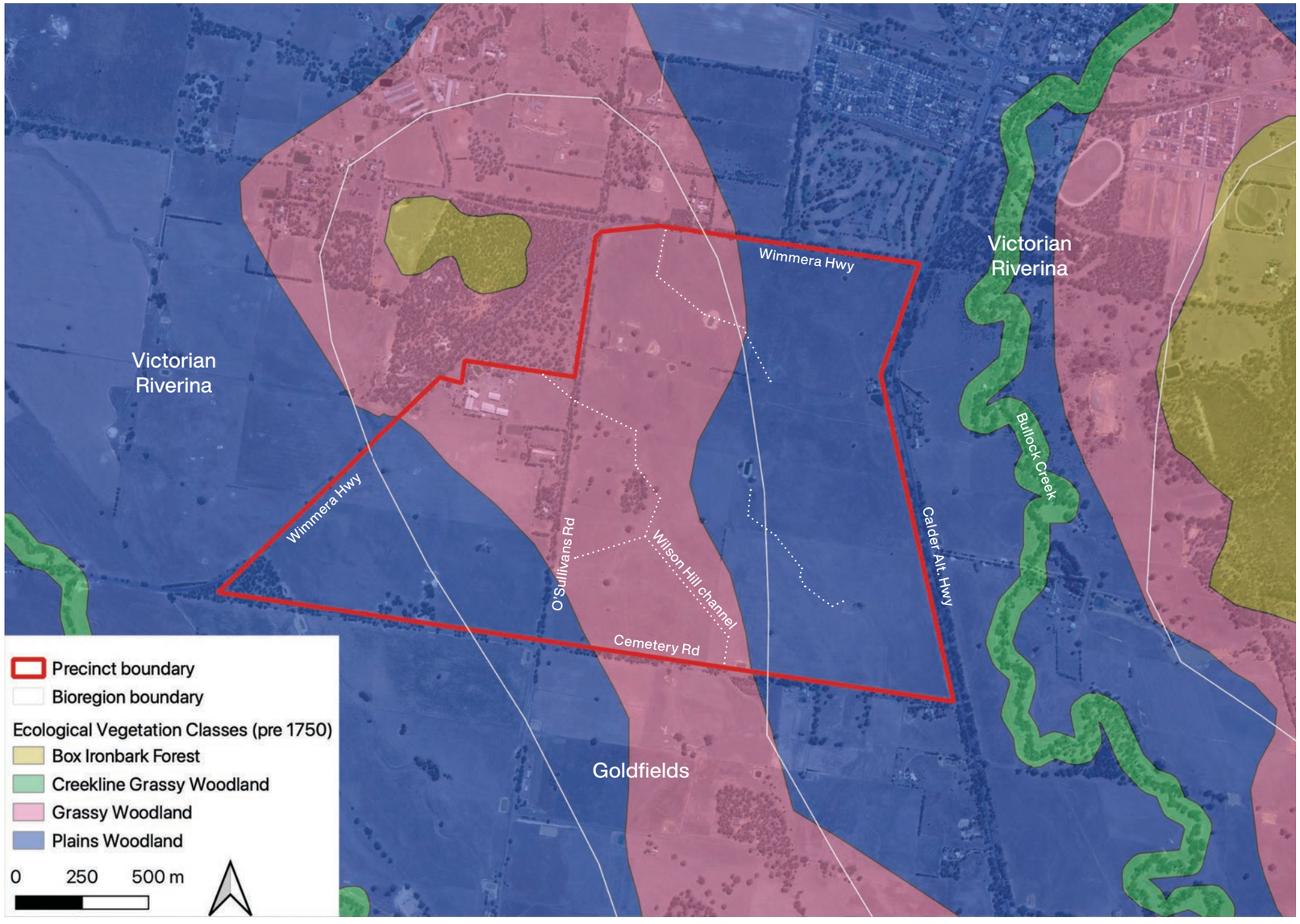


Fig 52. GIS image detailing Ecological Vegetation Classes (pre-1750) for the BREP site and surrounds. Spatial analysis by HIP V. HYPE.

* NatureKit Layers & Datasets, Victorian State Government (2022)

Appendix A - Physical Context Review
(ii) Climate Impact Analysis

EXPECTED HAZARDS

Understanding how climate hazards translate to the local context is a key step in understanding the exposure, vulnerability and impacts that climate hazards may present for the BREP site and surrounds. The output of this task includes a consolidation of key existing and future climate impacts that will need to be taken in consideration in the design response.

The increased concentration of C02 in our atmosphere will have significant consequences and influence the global climate.

Within Australia and more locally Victoria, these hazards are expected to include: increased temperatures and solar radiation, increased extreme heat days, more extreme storm events, decreased annual rainfall and harsher fire weather and longer fire seasons.

The graphic to the right provides an overview of the specific changes expected across a moderate case emissions scenario over the next 50 years (this implies accelerated global action to reduce emissions). The high emissions scenario (RCP 8.5) has been adopted.

The data has been sourced with relevance to the local area generated using the underlying (5km) gridded change datasets provided by CSIRO and the Bureau of Meteorology.

The baseline data is the mean climate between 1986-2005, which represents the ‘time lag’ between the end of ‘historic’ observations and subsequent climate modelling and analysis for IPCC reports.

Fig 53. Expected climate hazards and climate impacts expected over the next 50 years. Image by HIP V. HYPE.

Appendix A - Physical Context Review
(ii) Climate Impact Analysis

CLIMATE HAZARDS AND ADAPTIVE CAPACITY

When considering responses to climate impacts and the risks they present to the community or a precinct, adaptive capacity – or the ability of systems to adjust to potential damage and respond to consequences – plays a critical role. The 5-capitals framework outlined to the right acts as a critical lens to explore deeper elements of capacity and resilience for the new business community.

The 5-capitals encompasses the full range of ecological and man-made assets and infrastructure within a community, and the tangible and non-tangible connections in-between. Physical capital for example underpins both human and social capital by providing the infrastructure, technology and services to connect people and communities – which is critical when responding to climate events and natural disasters.

On the following pages, the blue highlights represent the impacts most relevant to both the Structure Plan process and the intended use of the BREP site.

The initiatives recommended seek to address these impacts.

5-CAPITALS FRAMEWORK

The 5-capitals framework (created by the Forum for the Future) allows for a holistic understanding of adaptive capacity, acknowledging that beyond the natural and physical impacts (such as damage to infrastructure and ecosystems), human and social systems such as knowledge and networks are critical determinants of the ability to 'bounce back' after shocks and deal with stressors.

An overview of each is provided below.

Natural Capital

This refers to biodiversity and ecological assets such as land, water, ecosystems and the wildlife they support. Natural capital can also cover biological materials (i.e. timber) and ecosystem services (i.e. stormwater management from waterways).

Social Capital

Social capital is associated with the institutions, networks and services that build human capital such as business networks, stakeholders, relationships with Council. It impacts the trust and decision making within a business community.

Financial Capital

This refers to the savings, future earnings and financial risk present within a community. Liquidity during weather events to purchase supplies, and increased maintenance and repairs costs are all included within financial capital.

Human Capital

This is the health, knowledge, skills and motivation of the people within a community, and is strongly linked to education and training opportunities.

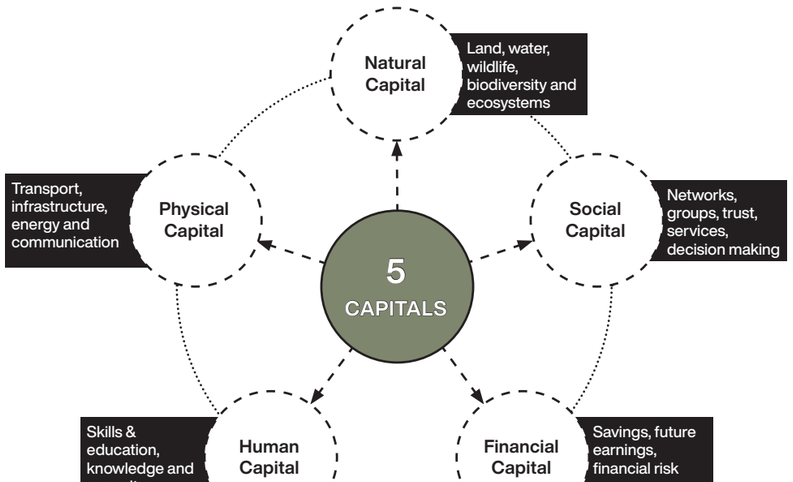


Fig 54. The 5-Capitals lens provides a holistic framework for interpreting climate change impacts. Image by HIP V. HYPE

Physical Capital

Physical capital refers to the man-made physical assets and infrastructure within a community. Critical infrastructure such as roads and bridges, telecommunications and power networks and physical structures such as industrial buildings are all included.

Physical capital can influence other system capital. For example, if a storm disrupts the power and telecommunications network, financial transactions and communication may also be disrupted - often until the physical asset/s are repaired. Ensuring both building and infrastructure assets are designed to withstand climate impacts is critical in climate adaptation.

Appendix A - Physical Context Review
(ii) Climate Impact Analysis (Natural Capital)

Precinct-scale adaptation measures can assist in minimising impacts on local ecosystems and individual species affected by climate impacts both directly or indirectly. Image by Greater Bendigo City Council.

CLIMATE HAZARDS - LODDON MALLEE (INCLUDING GREATER BENDIGO)					
PRIMARY	GENERAL	INCREASED TEMPERATURE AND SOLAR RADIATION	INCREASED EXTREME HEAT DAYS	MORE EXTREME STORM EVENTS	DECREASED ANNUAL RAINFALL
SECONDARY		HEATWAVES, HUMIDITY, EVAPOTRANSPIRATION AND LONGER FIRE SEASONS	BUSHFIRE / GRASSFIRE RISK	FLASH FLOODING, INCREASED WIND AND STORMS	DROUGHT

	CLIMATE IMPACTS				
NATURAL IMPACTS E.g. Land, water, wildlife, biodiversity and ecosystems	Amplification of existing threats to flora and fauna	Earlier flowering and planting times	Loss of flora and fauna species	Environmental damage to waterways from more intense rainfall events	Impact on groundwater resources, particularly shallow aquifiers
	Stress on flora & fauna	Stress on flora & fauna	Wider distribution of invasive species	Environmental damage to vegetation from more intense rainfall events	Changes to habitat quality and availability
	Changed distribution of pests and diseases	Intense fire events can damage surrounding water quality and biodiversity quality		Environmental damage to vegetation from more intense wind events	Reduced flow into local waterways hindering water quality and biodiversity
	Changing dynamics of invasive species	Due to bushfire risk, increase prescribed burning and subsequent costs		Increased runoff and flash flooding	Amplification of existing water scarcity threats to flora and fauna
	Greater evaporation leading to further loss of water supplies			Loss of soils / increased erosion	Increased irrigation requirements of plants
	Damage to popular environmental sites				Water scarcity and restrictions to supply and use (i.e. no irrigation)

Note: Impacts highlighted in blue are those most relevant to the BREP site.

Appendix A - Physical Context Review
(ii) Climate Impact Analysis (Social Capital)

A key feature of conventional industrial development is a lack of trees and extensive hard stand areas, both of which exacerbate urban heat. There is a pressing need to design the built environment and streetscape to instead provide shade, reflect heat and where possible embrace and retain water to deliver urban cooling benefits. Image by EquipSafe.

CLIMATE HAZARDS - LODDON MALLEE (INCLUDING GREATER BENDIGO)					
PRIMARY	GENERAL	INCREASED TEMPERATURE AND SOLAR RADIATION	INCREASED EXTREME HEAT DAYS	MORE EXTREME STORM EVENTS	DECREASED ANNUAL RAINFALL
SECONDARY		HEATWAVES, HUMIDITY, EVAPOTRANSPIRATION AND LONGER FIRE SEASONS	BUSHFIRE / GRASSFIRE RISK	FLASH FLOODING, INCREASED WIND AND STORMS	DROUGHT

CLIMATE IMPACTS					
SOCIAL IMPACTS E.g. Networks, groups, trust, services, decision making	Increased incidence of domestic violence	Impact on community sport, outdoor sporting events, social gatherings and events	Decreased outdoor thermal comfort	Short term isolation of community members (exacerbating recovery efforts) due to transportation disruptions	Water scarcity and restrictions to supply and use (i.e. no irrigation)
	More stress on health and emergency services			Impact on housing availability, potentially resulting in the need for relocation	
	Stress and demand on communication networks				
	Impacts to cultural heritage connections to sites and country				
	Volunteer fatigue / decline in community groups from continual emergency response				

Note: Impacts highlighted in blue are those most relevant to the BREP site.

Appendix A - Physical Context Review
(ii) Climate Impact Analysis (Financial Capital)

Road closures associated with localised flooding can impact supply chains and affect revenue streams for businesses. Image by Bendigo Advertiser.

CLIMATE HAZARDS - LODDON MALLEE (INCLUDING GREATER BENDIGO)					
PRIMARY	GENERAL	INCREASED TEMPERATURE AND SOLAR RADIATION	INCREASED EXTREME HEAT DAYS	MORE EXTREME STORM EVENTS	DECREASED ANNUAL RAINFALL
SECONDARY		HEATWAVES, HUMIDITY, EVAPOTRANSPIRATION AND LONGER FIRE SEASONS	BUSHFIRE / GRASSFIRE RISK	FLASH FLOODING, INCREASED WIND AND STORMS	DROUGHT

CLIMATE IMPACTS					
FINANCIAL IMPACTS E.g. Savings, future earnings, financial risk	Increased cost of business inputs (e.g. electricity)	Reduced productivity due to OHS or machinery malfunction	Loss of productivity due to uncomfortable conditions	Increased threats to tourism infrastructure	Reduced water security
	Financial stress due to inability to work			Reduced financial capacity for asset renewal	Increased costs for asset managers, reduced service quality and availability
	Increased costs for cooling/heating businesses			Supply chain affected by flooding and soil runoff	Reduced water quality affecting agricultural, ecological, amenity and recreational values in region
	Increased insurance costs (or reduction of coverage)			Loss of business continuity to extreme weather events	Decreased potable supply and associated increased cost of potable water
	Increased cost and difficulty of access to fresh food				

Note: Impacts highlighted in blue are those most relevant to the BREP site.

Appendix A - Physical Context Review
(ii) Climate Impact Analysis (Human Capital)

The design and development of the BREP can support a public realm that responds to increased heat impacts and provides safer movement through the employment precinct by sustainable travel modes. Image by MyUV.

CLIMATE HAZARDS - LODDON MALLEE (INCLUDING GREATER BENDIGO)					
PRIMARY	GENERAL	INCREASED TEMPERATURE AND SOLAR RADIATION	INCREASED EXTREME HEAT DAYS	MORE EXTREME STORM EVENTS	DECREASED ANNUAL RAINFALL
SECONDARY		HEATWAVES, HUMIDITY, EVAPOTRANSPIRATION AND LONGER FIRE SEASONS	BUSHFIRE / GRASSFIRE RISK	FLASH FLOODING, INCREASED WIND AND STORMS	DROUGHT
CLIMATE IMPACTS					
HUMAN IMPACTS E.g. Skills & education, knowledge and capacity]	Cumulative mental health stressors, exacerbated by multiple climate events	Health impacts from reduced physical activity due to high outdoor temperatures	Inability to access essential services or commute to place of employment	Higher incidence of mental health impacts, trauma and longer term disruptions to social systems – for example, due to lost income and property damage or loss	Decreased potable supply and associated increased cost of potable water
	More stress on health and emergency services		Health impacts associated with the displacement of populations (including mental health)	Health impacts associated with the displacement of populations (including mental health)	Disruptions to wastewater treatment
	More heat-related deaths among elderly (65+) and disadvantaged			Increases in food- , water- and vector-borne diseases due to the altered distribution of vectors (including mosquitoes)	Increase in illnesses related to drinking water and recreational water; for example, due to increases in blue-green algae

Note: Impacts highlighted in blue are those most relevant to the BREP site.

Appendix A - Physical Context Review
(ii) Climate Impact Analysis (Physical Capital)

Climate hazards such as flooding, more extreme heat days and storm events are resulting in a faster deterioration of transport assets as roads, disrupting transport routes and supply chains. Image by the Weekly Times.

CLIMATE HAZARDS - LODDON MALLEE (INCLUDING GREATER BENDIGO)					
PRIMARY	GENERAL	INCREASED TEMPERATURE AND SOLAR RADIATION	INCREASED EXTREME HEAT DAYS	MORE EXTREME STORM EVENTS	DECREASED ANNUAL RAINFALL
SECONDARY		HEATWAVES, HUMIDITY, EVAPOTRANSPIRATION AND LONGER FIRE SEASONS	BUSHFIRE / GRASSFIRE RISK	FLASH FLOODING, INCREASED WIND AND STORMS	DROUGHT
CLIMATE IMPACTS					
PHYSICAL IMPACTS E.g. Transport Infrastructure Energy Communication	Loss of businesses and services	Increased energy usage via higher demand for AC/cooling etc.	Failure of cooling infrastructure to perform on extreme heat days	Increased damage and maintenance costs of buildings and infrastructure	Decreased water recycling ability
	Increased asset maintenance costs	Decreased durability of certain building elements due to increased heat and radiation	Loss of transportation routes and connectivity due to infrastructure failure	Loss of usable land - Land subject to inundation in 1% AEP event to increase	Infrastructure and buildings impacts due to drying soils vulnerable to degradation and structural failure
	Disruptions to roads and supply chains		Increased road maintenance due to faster deterioration of transport assets (e.g. roads)	Inundation and increased damage to roads and disruption to transport services	
	Loss of escape routes from natural disasters		Power outages due to increased electricity demand on hot days	Building inundation due to flooding	
				Stormwater overflow and drain blockages	
				Damaged underground infrastructure including wastewater systems	
				Power outages	

Note: Impacts highlighted in blue are those most relevant to the BREP site.

Appendix A - Physical Context Review
(iii) Technical Review

TECHNICAL REVIEW

A review of existing relevant technical documents that specifically relate to the Bendigo Regional Employment Precinct (BREP) was undertaken.

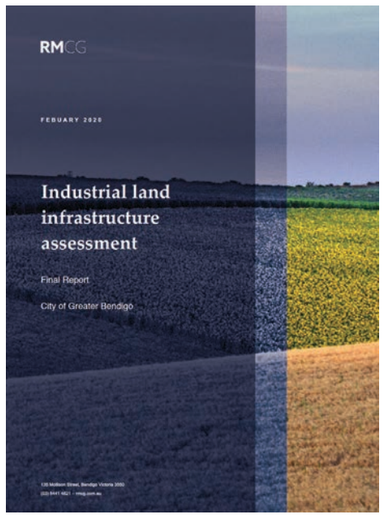
Each document was summarised, with key opportunities and barriers relevant to the BREP, as well as implementation considerations highlighted.

Noting that at the time of writing, the majority of technical studies were still underway or yet to be undertaken, the technical review was limited to the following documents:

- Marong Township Structure Plan and Background document (2020)
- Industrial land infrastructure assessment (2020)
- Draft Biodiversity Assessment (2022)
- Marong Flood Study (2018)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Marong Township Structure Plan and Background document (2020)	City of Greater Bendigo	The Township Structure Plan is a long-term plan for future urban development in Marong. It describes how the land is expected to be developed, and how and where services are planned to support development. This document provides certainty about future development by providing a plan as well as objectives, guideline and requirements for the development of Marong. This document will be used to guide investment and funding decisions, as well as guiding future plans, policies and decision-making by Council. Importantly, it provides direction on the transition of future urban growth areas in Marong and identifies the infrastructure projects required to ensure the timely access to services and improved transport connections necessary to support a liveable community.	The Plan clearly identifies the Site ('South Marong Industrial Investigation Precinct') and its potential to be developed as an industrial employment precinct. Its further investigation is noted as a short term action. The document also notes that: – The Precinct could be expected of accommodate between 2,000 – 3,000 new jobs for the Greater Bendigo area and provide local employment opportunities for the growing Marong township – A mix of industrial land uses can be accommodated in precinct, with a particular opportunity for land uses that require larger parcels of land that cannot be situated elsewhere in the City – In areas that interface with highways and the Proposed Western Bypass Investigation Corridor, a sensitive design response is needed. The design response should focus on achieving a smooth transition of rural to urban character into the Marong township. Larger setbacks, service roads or internal perimeter roads, and land uses that compliment highway and township activity can assist in achieving this (which will also allow for the retention of roadside vegetation)	Implementation considerations include the location of: – The Marong Bypass/ Marong Western Freight Corridor and necessary alignment and specific design requirements that may be required (i.e. larger setbacks, service roads or internal perimeter roads, etc). This will ultimately impact the layout and design of the precinct, and have implications in regard to future uses, tenant attraction and overall operation of the Site – Existing and approved residential development (including within the north east corner of the Site) which might reduce land available for development and exclude industries that require large buffer distances – Township entrances and urban design implications for the site – Site vegetation, including road vegetation in relation to the surrounds – The Wilson Hill channel, which subject to further investigation could be used as a feature or potentially under-grounded – The Bullock Creek which will require design optimisation to reduce polluted/ contaminated runoff to protect the quality of the creek. – Buffers from the Broiler Farm

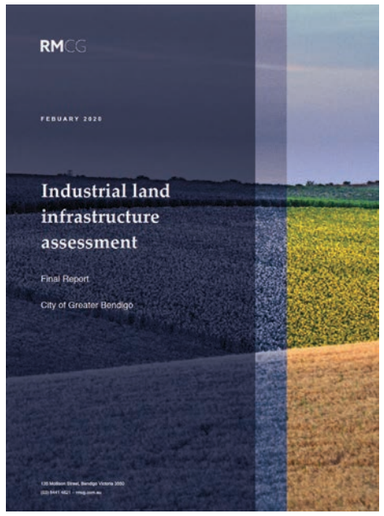
Appendix A - Physical Context Review
(iii) Technical Review



Industrial land infrastructure assessment (2020)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Industrial land infrastructure assessment (2020)	RMCG, with sub-consultant Chris Smith & Associates	Building on work already undertaken by Charter Keck Cramer (June 2019), the City of greater Bendigo engaged RMCG with sub-consultant Chris Smith & Associates to undertake a preliminary infrastructure and feasibility assessment of four sites earmarked for their industrial development potential. The purpose of this assessment was to provide indicative costs, uses and development yield for each site.	– This document assesses 209ha of the BREP i.e. the land to the east of O'Sullivans Road. It provides key insights in the feasibility and infrastructure required to develop the site, including in regard to transport, flooding and drainage, water, electricity and gas. – Transport + The Site has excellent access to local and regional arterial road networks and Its location provides great access to north, west and south parts of the state + Importantly, the proposed Marong Bypass / Marong Western Freight Corridor is likely to traverse the site and/or might result in intersection treatment upgrades which might impact the industrial development of the Site + Further, due to the unknown timeline of the bypass, the proposed development might need to be accessed through a channelised intersection on either highways + If the development of the Site occurs prior to the bypass or intersection upgrades, it might trigger the upgrade of two intersections; Calder Alt highway with both Wimmera and Calder. Funding and contributions to be determined – Flooding & Drainage + There is a watercourse that runs through the site in a north west direction which acts as the main drainage outfall location for the majority of the site, with no catchment management authority overlay + The north east corner of the site generally falls slightly in a northern direction towards the golf course and township + There is a local shallow groundwater system that could impact the stormwater drainage outfall retention basin design in relation to size and location. + (cont.)	Implementation considerations include: – The need to set aside a corridor for the bypass to be constructed at a future point in time (approx 30-40m in width for dual carriageway road) and potentially for an internal intersection to provide good connectivity into the site from bypass, unless the bypass can also be used as an initial internal road connection – The need to undertake detailed flood modelling to determine the depth and extend of onsite flooding during a 1% AEP – Considering the town is downstream from the Site, the design must ensure stormwater runoff is directed to the north-west corner of the site, along the existing drainage line and away from the north, where it could create a flood impact on future development or the Marong township – The watercourse running in a north-west direction through the site and likely 30m buffer required, as well as the Wilsons Hill channel - understand if either of these assets can be used as the beginning of a green spine/corridor through the Site – The spatial implications of the local shallow groundwater system that may require an increase in the extent of land required for a retention basin – The potential timing and consequential cost in relation to an up-sizing of the Coliban Water Potable water supply and drainage assets. Alternative solutions for servicing the development and broader area should be investigated, noting the development of decentralised assets within the site or in close proximity would be advantageous in lowering development costs and reducing reliance on existing assets. This could include stormwater infrastructure for localised source of recycled water and decentralised wastewater treatment plant, etc – (cont.)

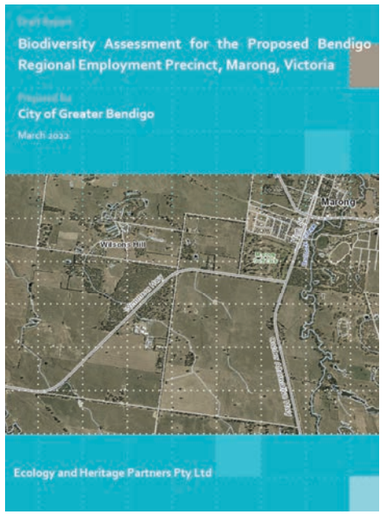
Appendix A - Physical Context Review
(iii) Technical Review



Industrial land infrastructure assessment (2020)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Industrial land infrastructure assessment (2020) **(cont.)**	RMCG, with sub-consultant Chris Smith & Associates	Building on work already undertaken by Charter Keck Cramer (June 2019), the City of greater Bendigo engaged RMCG with sub-consultant Chris Smith & Associates to undertake a preliminary infrastructure and feasibility assessment of four sites earmarked for their industrial development potential. The purpose of this assessment was to provide indicative costs, uses and development yield for each site.	+ The design of the drainage infrastructure required to service the development will be very heavily reliant on the proposed staging and initial stage location. – Rural Water - The Wilsons Hill channel may need to be piped or realigned to facilitate development around the asset – Potable water supply & sewerage connections - The Coliban Water assets are at capacity or near capacity. The development would require significant up-sizing of the assets. – Electricity + The site has a significant amount of High Voltage main feeder electricity assets in its surroundings, which provide good connectivity to the network + As such the site could be provided with 2MW supply with ‘ relatively minor augmentation but very large loads would require substantial augmentation’ and individual large loads would be better situated closer to a zone substation” + The 2 MW supply available to the site would supply approximately 100 industrial lots with an average supply of 20 kVA + If there were to be one or more customers requiring a large supply load then this would require significant offsite reconducting works of 5 km or more to enable to capacity to be upgraded. + A high voltage extension may be required to service the first stage of development, subject to the location of initial stage and estimated loads – Gas supply - would also require upgrades, noting the capacity of the Marong Daughter Station would needs further investigation.	Generally speaking, the electricity and gas network analysis for South Marong indicates that an all-electric approach will be preferable given the costs in upgrading the gas infrastructure to the site (depending on uses) – If high process heating capacity is needed however, this may indicate a role for alternatives such as hydrogen and biomethane in addition to electricity – An optimised approach to generation and storage within the precinct may also limit allow the precinct to keep demand under the 2MW supply that is currently available

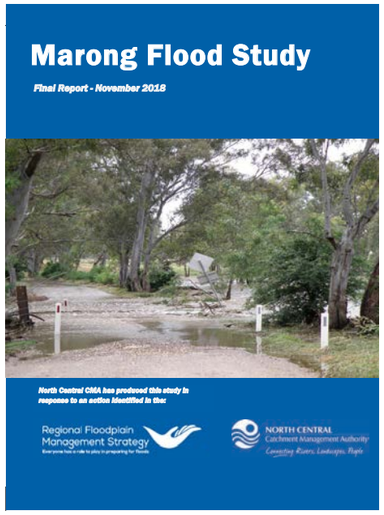
Appendix A - Physical Context Review
(iii) Technical Review



Draft Biodiversity Assessment (2022)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Biodiversity Assessment (2022) [Draft]	Ecology and Heritage Partners Pty Ltd	The purpose of the assessment is to identify the extent and type of native vegetation present with the site and determine the likely presence of significant flora and fauna species and/or ecological communities. The report also includes an assessment of potential ecological and legislative implications associated with the proposed development.	– The study area has been previously disturbed, is highly modified and possesses large areas of exotic pasture with scattered patches of native vegetation and regrowth from past clearing – Much of the indigenous vegetation and terrestrial fauna habitat remaining is confined to areas less affected by past land clearing and sustained agricultural land use – Native vegetation, where present was highly modified, with vegetation communities generally lacking structure and exhibiting a low diversity of native species – A few habitat zones appear to be consistent with the thresholds of the EPBC Act-listed ecological community for the Grey box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. This will require additional investigation – Low to moderate quality fauna habitat are present in the form of woodlands, derived native grasslands and artificial waterbodies on site. However, the majority of waterbodies lack the habitat structure most preferred by a range of fauna due and provide limited dispersal opportunities due to the fragmentation of woody vegetation along these habitats	Considerations include: – Protecting and enhancing the maintained EVs through landscape species selection and control of noxious weeds – Providing habitat connections / corridors between the remaining indigenous vegetation and terrestrial fauna habitats – Potential spatial implications of the presence of habitat zones for EPBC Act-listed ecological communities

Appendix A - Physical Context Review
(iii) Technical Review



Marong Flood Study

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Marong Flood Study **Final Report - November 2018**	North Central Catchment Management Authority	The report presents updated flood information for the township of Marong. This data can be used to assess the flood risk to existing and proposed development, define flood related controls in the Greater Bendigo Planning Scheme, develop flood intelligence products and inform emergency response planning, assist in the preparation of community flood awareness and education products and support the assessment of flood risk for insurance purposes. The scope of the study excludes the assessment of any mitigation options.	Flood behaviour has been determined for various design flood events ranging from the 50% AEP to the 0.5% AEP. The model outputs generated for these design events include flood extents, levels, depths and velocities. These results were to be used to update the available flood information for the township. Points of relevance: – The available flood information for Marong is limited and flood extents have been estimated from historical and anecdotal evidence. Addressing gaps in flood knowledge through flood mapping is a regional priority – There is no existing Land Subject to Inundation Overlay through the existing urban area of Marong. There is an existing Environmental Significance Overlay which applies to a defined 100m over the centreline of Bullock Creek. However, it has not been applied over the full width of the floodplain, leaving areas currently subject to inundation without any overlays. – The report therefore recommends to update the Greater Bendigo planning scheme to the reflect the outputs of the study and ensure future development is assessed in accordance with the latest data. – The distribution of rainfall was heaviest to the north-western and south-eastern sides of the catchment, with rainfall totals becoming weaker downstream of the catchment. A differential of 40 millimetres is observed over the catchment area – Key flood impacts for 1% AEP flood event: + Malone Park and several properties and streets of the township are flooded or partially flooded, up to 1.9 metres + Railway and Calder Highway are flooded with flow depths just over 0.3 metres, Marong Serpentine Road is overtopped with flow depths just over 0.5 metres + A considerable number of rural lots in the south of the township are partially flooded + Some flood water backup onto the railway + Some flows break to the left of the bridge crossing on Calder Highway overtopping the highway flow depths just over 0.3 metres	The Marong township faces high impacts under a 1% AEP flood event. For the BREP it is critical to minimise the additional impact added to the existing setting. Both stormwater catchment and flow are critical for the development of the site. The following points should be considered for implementation: – Planning should not solely be based on existing flood models given there are gaps in flood knowledge for Marong, and particularly given the influence of different climate scenarios on flood impacts – Setting the 1% AEP design results as a baseline for flood considerations (noting that Council currently has proposed Land Subject to Inundation and Floodway Overlays) – Limiting the pressure of additional flows on existing waterways – Ensuring access to the site during a flood event, considering Calder Highway may be impacted by flooding – Assessing and investing in mitigation options to decrease the run-off and flow from the new development – Ability of design responses to increase the resilience of new assets to impacts of inundation/flooding – Ensuring capture of water for reuse, including the potential use of larger tanks with smart tank technology

Appendix B
Policy, Practice & Innovation

Appendix B - Policy, Practice and Innovation
(i) Policy Review

This phase of the project focused on establishing the policy context for BREP and key policy drivers for its sustainable development.

POLICY REVIEW

The following documents were reviewed as part of this stage:

- State-wide
  - + Climate Change Act 2017 (VIC)
  - + Victoria's Climate Change Strategy (2021)
  - + Built Environment Climate Change Adaptation Action Plan 2022-2026
  - + Recycling Victoria: A New Economy (2021)
  - + Gas Substitution Roadmap (2022)
  - + Water for Victoria (2016)
  - + Precinct Structure Planning Guidelines (2021)
- Regional
  - + Dhelkunya Dja - Dja Dja Wurrung Country Plan (2014)
  - + Coliban Water Urban Water Strategy 2022
  - + North Central Regional Catchment Strategy
  - + Loddon Mallee South Regional Growth Plan
  - + Loddon Mallee Climate Ready Plan
  - + Loddon Mallee Circular Economy Plan
- Municipal / Local
  - + A Stronger Greater Bendigo 2030: Economic Development Strategy 2020 - 2030
  - + Greater Bendigo Industrial Land Development Strategy and Background Report (2020)
  - + City of Greater Bendigo Climate Change and Environment Strategy 2021- 2026
  - + Greater Bendigo Circular Economy and Zero Waste Policy (2021)
  - + Greater Bendigo's Environmentally Sustainable Development and Water Sensitive Urban Design local policies

POLICY INFLUENCE & STATUTORY WEIGHT

In Victoria, planning decisions are primarily guided by the Planning and Environment Act 1987 (PE Act) legislation and associated planning schemes.

The PE Act provides the statutory framework for land use planning and development in Victoria. It includes objectives for planning and outlines the hierarchy of planning instruments / documents to be considered when making planning decisions.

While the PE Act does not specifically reference the phrase 'climate change', it supports decision in the 'long-term interests of all Victorians'. The Climate Change Act 2017 (VIC) (CC Act) further supports this by providing Victoria with a statutory framework to manage climate change risks and drive Victoria's transition to a net zero emissions, climate resilient community and economy.

Both the PE Act, the CC Act are 'enabling legislation' which give legal weight to subordinate instruments that are more detailed, such as the planning schemes and the Victorian Planning Provisions (for the PE Act), and Victoria's Climate Change Strategy and the Built Environment Climate Change Adaptation Action Plan (for the CC Act).

Pursuant to sections 60(1) and 60(1A) of the PE Act, when making planning decisions responsible authorities:

- **Must** consider and give effect to (inter alia) the relevant planning scheme, including policies, provisions, incorporated documents, etc
- **May** also consider any strategic plan, policy statement, code or guideline that has been adopted by a minister, government department, public authority or council before deciding on an application. This is quite important, particularly in the context of long-term developments such as the BREP, where some key strategic work may have been undertaken and been endorsed by the relevant authorities but has not yet made its way into the planning scheme.

In this context, key policy influences include:

- Planning schemes: Local governments in Victoria are responsible for preparing and maintaining planning schemes. These schemes set out the policies and provisions that guide land use and development within a municipality. This includes a Municipal Planning Strategy (MPS) and Planning Policy Framework (PPF) in the front end (with state, regional and local policies) and Victorian Planning Provisions in the back-end. These must be considered and given effect to. This is the case of the Greater Bendigo's Environmentally Sustainable Development and Water Sensitive Urban Design local policies for example
- State and regional strategies: these may set broader objectives and sign-post clear desired outcomes from key stakeholders and regulators which can filter down to legislative change over time. Directions found in the Gas Substitution Roadmap for example directly influenced the gas ban put in place by the State Government for all new dwellings from 1 January 2024. Similarly, the Recycling Victoria strategy provides clear direction for waste streams Councils are required to collect and process by 2030
- Local strategies: these strategies, which may include environmental, social, and economic sustainability goals, are also often used to inform local planning scheme amendments. This was the case of the former the former Bendigo Industrial Land Strategy (GHD, June 2002) for example, which informed the existing Greater Bendigo MPS and PPF

Importantly, the development of government strategies (state, regional and local) also often involves extensive community and stakeholder engagement and input. While not always legally binding, these strategies often reflect community values, and therefore maintain a certain degree influence in decision-making processes.

Noting the statutory weight given to relevant policy documents may evolve over time, it is essential to continue to consult the Greater Bendigo planning scheme as the development of the BREP progresses, as well as any updates or changes in legislation. Additionally, legal interpretations and precedents may also influence the significance of these strategies in the planning decision-making process.

Appendix B - Policy, Practice and Innovation
(i) Policy Review

POLICY REVIEW

The policy review focused on relevant policy with a direct impact on climate response and sustainability outcomes for the BREP.

The next pages summarise each policy influence and highlight how these relate to the BREP, as well as any relevant implementation consideration.

Victoria's Climate Change Strategy (2021)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Climate Change Act 2017 (VIC)	Victorian State Government	The Act provides Victoria with a legislative foundation to manage climate change risks and drive Victoria's transition to a net zero emissions, climate resilient community and economy. The Act sets out a policy framework and a pathway to 2050 that is consistent with the Paris Agreement to keep global temperature rise well below 2 degrees Celsius above pre-industrial levels.	– Net zero greenhouse gas emissions by the year 2050* – Objective to build the resilience of the State's infrastructure, built environment and communities through effective adaptation and disaster preparedness action – Objective to manage the State's natural resources, ecosystems and biodiversity to promote their resilience – Objective to support vulnerable communities and promote social justice and intergenerational equity	The Act provides basis for strong target setting in relation to stationary energy, transport and waste operational emissions, recognising that areas of significant transition (such as new precincts) will need to meet zero net emissions much earlier than 2050 to allow the staged transition of existing communities. The Act supports a precinct which builds resilience into the built-environment and infrastructure through effective adaptation and disaster preparedness.
Victoria's Climate Change Strategy (2021)	Victorian State Government	Victoria's Climate Change Strategy sets out the state's plan for securing a net-zero emissions future, while at the same time creating new opportunities and new jobs.	– Net zero greenhouse gas emissions by the year 2045 – The Energy, Waste and Transport Pledge's are particularly relevant with strong 2030 targets (50% renewables/organic waste/ ZEV by 2030) – Highlights the green jobs and economic development associated with climate action (i.e. high-skill labour, and lower energy costs) – Supports innovation (e.g. battery storage, zero emissions vehicles etc.) – Targets climate smart businesses and communities through energy efficiency and improvements to pedestrian infrastructure, in addition to resilience through adaptation and reducing barriers for implementing transformational change	The strategy supports a low-carbon built environment from the outset, based on a plan to fully transition to zero carbon by 2050 at the latest. This will require bold target setting in relation to renewable energy, sustainable transport (active and EV transition) and avoidance of fossil fuels as part of the servicing strategy. Strong opportunity to link a green jobs strategy to government investment.

Appendix B - Policy, Practice and Innovation

(i) Policy Review (State-wide)

The Built Environment Climate Change Action Plan 2022-2026

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Built Environment Climate Change Adaptation Action Plan 2022-2026	Victorian State Government Department of Environment, Land, Water and Planning (DELWP)	The plan is the first of a series of adaptation action plans (AAPs) for the Built Environment system, with subsequent plans prepared every 5 years on a path to a climate-resilient Victoria in 2050. The plan aligns with the guiding principles and policy objectives of the Act and of Victoria's Climate Change Strategy and is consistent with the Victorian Government's policy in Plan Melbourne 2017–2050 to take action to adapt to climate change, reduce the likelihood and minimise the consequences of natural hazard events.	Key objectives and targets outlined in the plan: – New precincts, growth areas and suburbs are resilient to climate change – Climate change considerations incorporated into decision making about future land use planning for cities, towns, suburbs and regional areas – Plan and construct buildings with improved resilience to climate-related hazards expected during their design life – Infrastructure for new and existing suburbs incorporates climate change adaptation measures, with assets designed to be resilient and withstand, respond to and recover from extreme events – At least 30% tree canopy coverage (along with other vegetation) is provided across the urban landscape to support cooling and greening – Health, safety, liveability and community resilience	The action plan supports many of the climate resilient ambitions shared by the VPA and Council. Many of the actions are focused on improving planning processes and supporting place-based actions to achieve a more holistic response to the impacts of climate change with measures tailored to each region's needs. Actions to harness economic, financial and legal tools to support the process of adapting the built environment to climate impacts are also included, which is a particular focus of this project. The 30% canopy target can guide decision-making in relation to road cross sections in particular. Key hazards such as increased heat and greater rainfall intensity must be planned for in precinct design.

Recycling Victoria: A New Economy (2021)

Recycling Victoria: A New Economy (2021)	Victorian State Government Department of Environment, Land, Water and Planning (DELWP)	Recycling Victoria is the Victorian Government's 10-year policy and action plan for waste and recycling.	Four key goals including: 1. Design to last, repair and recycle 2. Use products to create more value 3. Recycle more resources 4. Reduce harm from waste and pollution Key relevant targets and commitments include: – Divert 80 per cent of waste from landfill by 2030, and an interim target of 72 per cent by 2025 – Cut total waste generation by 15 per cent per capita by 2030 – Halve the volume of organic material going to landfill between 2020 and 2030, with an interim target of 20 per cent reduction by 2025 – Mandatory separation of commercial recyclable materials – National policy statement to significantly increase the use of recycled content by government and industry	The Recycling Victoria strategy supports strong action relating to the circular economy, in particular: – Setting up the community/precinct scale pre-conditions for meeting operational waste targets (such as diversification of waste streams) – Leveraging infrastructure procurement to drive increased recycled product content in materials Additionally, the Strategy outlines strong support for circular economy opportunities to be explored for the precinct, including using waste products from one industrial activity as inputs for another.

Appendix B - Policy, Practice and Innovation

(i) Policy Review (State-wide)

Gas Substitution Roadmap (2022)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Gas Substitution Roadmap (2022)	Victorian State Government Department of Environment, Land, Water and Planning (DELWP)	Launched in mid-2022, the Gas Substitution Roadmap aims to tackle energy affordability, and drive the transition away from fossil gas and towards zero emissions energy.	The Roadmap outlines how we will use energy efficiency, electrification, hydrogen and biogas to drive down bills and cut carbon emissions. Key relevant initiatives in the Road Map include: – Expanding the Victorian Energy Upgrades (VEU) scheme, with new incentives for businesses and industry to switch to efficient electric appliances – Changes to the Victoria Planning Provisions to support the delivery of all-electric precincts	The Road Map supports strong action in transitioning away from fossil gas and towards zero emissions energy, in particular by: – Setting up the precinct scale pre-conditions to meet operational energy-related carbon emission targets – Putting in place incentives and programs to assist industry to improve efficiency, electrify and prepare to take up alternatives – Changing legislation to support the delivery of all-electric precincts – Expanding the VEU program to include Commercial and Industrial Heat Pump Water Heaters and other economical incentives for businesses/industry These can not only drive development in the precinct, but can also be harnessed to its advantage, especially given the increasing cost of gas. The project must consider the proportion of target sectors which may require high thermal loads in any electrification strategy for the precinct.
Water for Victoria (2016)	Victorian State Government Department of Environment, Land, Water and Planning (DELWP) In collaboration with a Reference Group and a Stakeholder Group	Water for Victoria is the Victorian Government's adaptation response to the impacts of climate change on water resources and on the availability of water in the future. It seeks to manage water to support a healthy environment, a prosperous economy and thriving communities.	The Victorian government seeks to ensure the water system meets the challenges of climate change and population growth through efficiency and innovation. – The Plan considers several points of action of relevance to the BREP: + $33 million to invest in practical programs to kick-start improvements to how we use Victoria's water resources such as preparing for climate change, improving water resource information and urban water management, the use of the water grid, and better recognising recreational water values + $14 million of further investment to help manage Bendigo's rising groundwater + Green priority spaces for community health and wellbeing using stormwater and recycled water	Given the physical context of the BREP and the long distances to existing treatment plants in particular, water is a key area of focus in its development. Facilitating water resilience and self-sufficiency by providing a local alternative water supply is critical. This could include capturing and treating rainwater and stormwater through the use of decentralised assets such as water tanks and localised wastewater treatment. Importantly, this also provides an opportunity to demonstrate how low-impact industrial developments can assist in reaching the government's ambitious commitment to achieve net-zero emissions in the water sector. (cont. on the next page)

Water for Victoria (2016)

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(i) Policy Review (State-wide)

Water for Victoria (2016)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Water for Victoria (2016) **(cont.)**	Victorian State Government Department of Environment, Land, Water and Planning (DELWP) In collaboration with a Reference Group and a Stakeholder Group	Water for Victoria is the Victorian Government's adaptation response to the impacts of climate change on water resources and on the availability of water in the future. It seeks to manage water to support a healthy environment, a prosperous economy and thriving communities.	+ Better designed new developments to support liveable communities – The government is committed to lead climate change adaptation across Victoria's water system and achieve net-zero emissions in the water sector. Achieving net-zero emissions is targeted to be reached before 2050 – The water sector is responsible for the largest proportion of government emissions. These are divided into indirect emissions through its use of energy to pump water around and treat water to safe standards and direct emissions, particularly from sewerage treatment – As a consequence of climate change, stream flows are projected to decrease by a greater proportion than rainfall, due to the interaction between rainfall and catchment hydrology. Reductions in stream flows of this scale would have serious consequences for water availability across Victoria – The government will strengthen links across portfolios to better align land use and water management planning by making sure that planning for water-related benefits is part of all future major projects – The government seeks to promote innovation in the water sector given that water is an important input to many industries that generate significant direct benefits through jobs and economic activity as well as creating indirect economic and social benefits bringing together the community in regional and rural areas.	Further implementation considerations include: – Developing water assets such as stormwater detention sites and constructed wetlands, with potential for multiple purposes/uses (e.g. also utilised for recreational use) – Providing for innovative solutions regarding water usage, pumping and treatment

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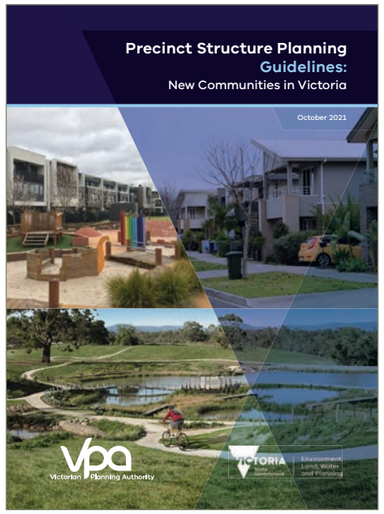
(i) Policy Review (State-wide)



Precinct Structure Planning Guidelines (2021)

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Precinct Structure Planning Guidelines (2021)	Victorian State Government Victorian Planning Authority	The Guidelines are a Victorian Government initiative to ensure the VPA and other planning authorities prepare plans for places that enable best practice, liveable new communities for Victoria.	The Guidelines support the early assessment of climate risks in Structure Plan development to ensure risk is considered in the context of the precinct's unique context, future urban outcomes, demographics and natural features. The document provides a series of principles and targets to further embed climate resilience measures into a Structure Plan that are of relevance to the BREP: – Creating a future urban structure that supports living locally through the 20-minute neighbourhood concept – Providing street layouts and road cross sections that maximise active transport, walkability and increase connectivity to key destinations – Maximising canopy tree planting on public land in streets, local parks and public places through the Structure Plan to support amenity objectives and improve resilience during extreme heat events with shading and cooling – Ensuring best practice integrated water management and water sensitive urban design outcomes are built into the planning and design of land uses and infrastructure – Mitigating the risk of natural hazards, incorporating consideration climate change. In particular to manage bushfire hazards through appropriate setbacks, vegetation breaks, use of water infrastructure and setting appropriate residential design and densities. Mitigating and adapting to flood risks will also be addressed through siting, design and infrastructure responses supporting the protection Some relevant targets include: – Potential canopy tree coverage within the public realm and open space should be a minimum of 30% (excluding areas dedicated to biodiversity or native vegetation conservation)	The new Guidelines seek to 'lift the bar' by requiring or encouraging higher standards of design and development, including consideration of sustainability, in particular carbon mitigation and adaptation. The project offers significant opportunity for delivery against multiple goals, objectives and priority actions identified in the Guidelines in an industrial/employment precinct. These are all drivers of sustainability for the precinct and will underpin the analysis and recommendations for a climate resilient approach.

Appendix B - Policy, Practice and Innovation

(i) Policy Review (Regional)

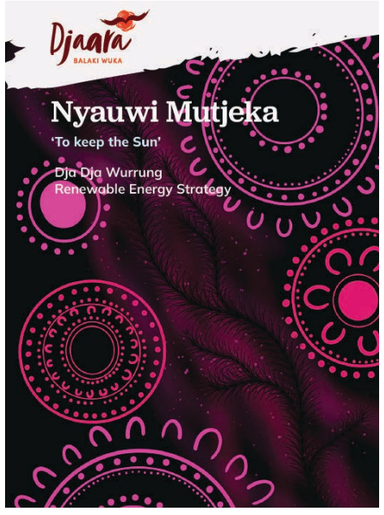
The Dja Dja Wurrung People seek to protect their rivers and waterways.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Dhelkunya Dja - Dja Dja Wurrung Country Plan **2014-2034**	Dja Dja Wurrung Clans Aboriginal Corporation	The Country Plan seeks to reaffirm the aspirations of the Traditional Owners of Dja Dja Wurrung Country. Their holistic vision is for their lands and waters to be in good condition and actively managed to protect their values and to promote the laws, culture and rights of all Dja Dja Wurrung People. The Plan is framed around the following nine themes: 1. Djaara (Our people) 2. Cultural Practices and Customs 3. Cultural Heritage 4. Bush Tucker (edible and medicinal plants & animals) 5. Rivers and Waterways 6. Land 7. Self-determination 8. Traditional Owner Economy 9. Joint Management	There are a number of principles and objectives under the Plan of relevance to the BREP including: <u>Principles</u> – The environmental conservation and protection is paramount, alongside obligations to look after Country for future generations – Infrastructure and enterprise development will be designed to minimise harmful impacts on Country. Where damage has been done through past activities, a sustained effort will be made to heal Country. – Active engagement of the Dja Dja Wurrung people in natural resource management alongside other Partners – The active pursuit of Dja Dja Wurrung economic and social development <u>Goals/ Themes:</u> – **Goal 1: Djaara** - Engagement of Dja Dja Wurrung representatives to promote their laws, culture and rights – **Goal 7: Self-determination** - Active engagement of the Dja Dja Wurrung people through the BREP and investigating involvement of the Dja Dja Wurrung People in the ongoing management of the BREP's natural environment – **Goal 8: Traditional Owner Economy** - Investigating opportunities to promote economic activity of the Dja Dja Wurrung People through the BREP. (continued on the next page)	The Dja Dja Wurrung Country Plan calls for the active participation of the Dja Dja Wurrung People as stakeholders in regional projects. The active engagement of the Dja Dja Wurrung People in the design and/ or operation of the BREP would assist in meeting the goals and principles of this Plan and should be further investigated. Some practical examples include engagement of the Dja Dja Wurrung People through an energy procurement arrangement or the management of the BREP's natural environment.

Appendix B - Policy, Practice and Innovation
(i) Policy Review (Regional)

The Dja Dja Wurrung People seek to protect their rivers and waterways.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Dhelkunya Dja - Dja Dja Wurrung Country Plan (cont.) **2014-2034**	Dja Dja Wurrung Clans Aboriginal Corporation	See above	The Dja Dja Wurrung People seek to ensure that their rivers and waterways are healthy and meet the needs of their people and lands. Given the site's proximity to waterways of the Dja Dja Wurrung People, points of relevance include: – The increasing variability in rainfall and extreme weather events will continue to challenge the repair and ongoing management of Country – Rivers, lakes, swamps and creeks are significant parts of their Country that link the Dja Dja Wurrung People to their past and will provide for their future – Past and current land management decisions had negative impacts on water bodies such as erosion, weed and pest issues or pollution from farm chemicals – Water diversions and controlled flows mean that many rivers are getting water at the wrong time, or in the wrong volumes – The Dja Dja Wurrung People have negotiated an engagement plan for Dja Dja Wurrung involvement in environmental water planning and delivery with the North Central Catchment Management Authority	Given the physical context of the BREP and the close proximity to waterways of the Dja Dja Wurrung People, there are a number of elements to be considered for implementation: – Ensuring to control the water run-off from the site and manage additional flows into surrounding water bodies – Managing the controlled flow in a way so it does not harm the existing water bodies and natural environments – Having potential new blue infrastructure accessible for the public and the original owners of the land – Involving traditional owners in planning decisions



Nyauwi Mutjeka, Dja Dja Wurrung

Nyauwi Mutjeka **'To keep the Sun'**	Dja Dja Wurrung Group	The Dja Dja Wurrung Renewable Energy Strategy sets a blueprint for investment in renewable energy on Djandak country, Central Victoria.	The Dja Dja Wurrung have committed to ensure their activities in Djandak heal Country, people and climate. This document recognises 'Energy justice' for Djaara and all First Nations people as critical for this healing process. This is of particular relevance to the BREP, specifically in regard to exploring opportunities for the Dja Dja Wurrung to collaborate with government and industry on renewable energy and battery storage projects with mutual benefits. This could include: – Shared renewable energy procurement arrangements between Council, Dja Dja Wurrung, energy providers and a group of companies or businesses requiring renewable energy in the BREP (i.e. consortium aggregation) – The inclusion of Djaara-led renewable energy and storage facilities on site.	The Nyauwi Mutjeka Dja Dja Wurrung Renewable Energy Strategy calls for partnership and collaboration to overcome barriers in terms of uptake and cost of transitioning to renewables and reaching net zero emissions by 2050. Djaara's actions can directly help to drive this transition while creating many social, economic and environmental co-benefits. Opportunities to strengthen the involvement of Djaara in the design and operation of the BREP should be further explored, both in terms of the interim and long-term use and development of the site (e.g. Dja Dja Wurrung operated native nurseries, carbon farming initiatives, renewable energy and storage initiatives, etc.)

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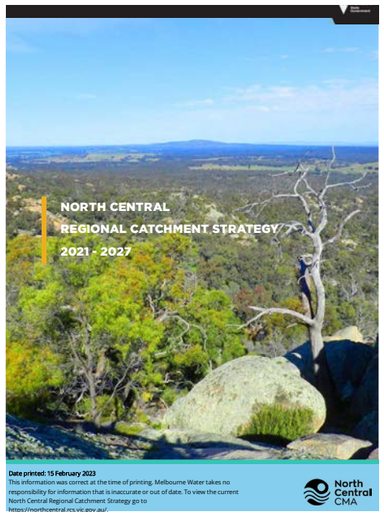
(i) Policy Review (Regional)



North Central Regional Catchment Strategy 2021-2027

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
North Central Regional Catchment Strategy **2021-2027**	North Central Catchment Management Authority	The North Central Regional Catchment Strategy (RCS) is the overarching strategy for all involved in land, water and biodiversity management within the north central region. Through its vision – 'working in partnership for a healthy catchment' – it provides a roadmap for a collective effort to care for the regional catchments. The RCS supports and integrates key legislative policy frameworks, as well as the relevant United Nations Sustainable Development Goals (SDG).	– DELWP funds regional programs to improve land, water and biodiversity outcomes, for the sustainable use of resources, including for catchment management – Priority directions for waterways: + Supporting the collaborative development and implementation of Integrated Catchment Management projects + Identifying locations where natural flows could be retained within the landscape, to improve connectivity, to increase waterbird habitat and for land health benefits, implementing pilot projects – Priority directions for biodiversity: + Improve the retention and restoration of native vegetation and habitat on private land through leveraging government and market-based incentives + Support and enable opportunities for Traditional Owners to return species of importance to the landscape + Increase overall extent of native vegetation from 2017 levels, by 2037 – Challenges Bendigo Goldfields region is facing: + Groundwater contamination and rising levels below Bendigo is a major concern	Implementation considerations for the BREP include: – Allowing natural flows on the site within the landscape as part of the blue and green infrastructure planning – Maximising native vegetation on public parcels and setting up a guideline (or other mechanism) for protecting / enhancing native vegetation on private land – Aiming for the sustainable use of water resources on-site, with possibility to leverage State Government funding

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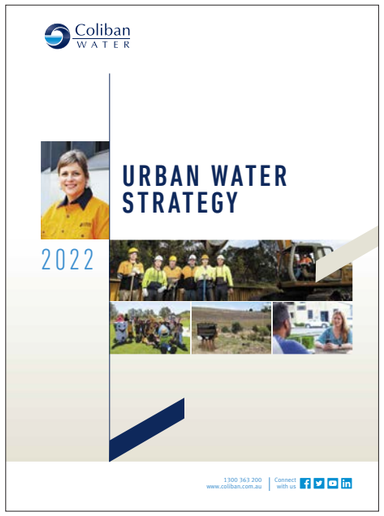
(i) Policy Review (Regional)



Urban Water Strategy 2022

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Urban Water Strategy 2022	Coliban Water	The Urban Water Strategy aims to support the resilience and liveability of the 49 towns Coliban Water serves in central and northern Victoria. It outlines a 50-year plan to identify the best mix of actions to provide water and sewerage services to ensure water security in the region. This Strategy is to be updated every 5 years.	Key water challenges in central and northern Victoria are climate change and population growth leading to an increased demand for water and wastewater services in a hotter and drier climate. As a result the area will continue to experience declines in water availability and water quality. – The Strategy focuses on: + Securing water supply through innovation, education and carbon reduction + Providing clean, affordable water for human and environmental needs, including for Aboriginal cultural values + Working with community and partner agencies to sustain attractive green spaces and recreational water access + Partnering with industry and government to plan and build water services that supports business, industry and employment – Many water assets are aging and are undersized to meet current demand and standards – Coliban Water is working with the City of Greater Bendigo through options to supply the Bendigo Regional Employment Precinct – Demand is expected to surpass yield by 2037 under medium climate conditions. Actions for Coliban Northern System in Bendigo include: + Upgrading Class A recycled water network + Increasing Class A recycled water production and seeking additional recycled water customers to offset potable and raw water use + Upgrading of Bendigo Water Treatment Plant to maintain capacity + Preparing a recycled water reuse strategy for Bendigo + Implementing further progressive sewage treatment capacity upgrades, which may include the development of a second local Water Reclamation Plant	The BREP, particularly the area owned by Council, presents a unique opportunity to introduce innovative solutions for both water supply and waste water treatment. Implementation considerations include: – Considering decentralised water infrastructure and assets on site to secure water availability facing a changing climate and growing demand including in adjacent sites – Treating and reusing water on site and developing a recycled water strategy for the BREP. Some types of industrial customers can use large volumes of water in their business processes – Preparing a concept and strategy to reduce overall water usage, including educational elements to share knowledge and support innovative solutions – Reducing carbon emissions of water assets – Providing attractive green spaces on site and using water management as a recreational asset

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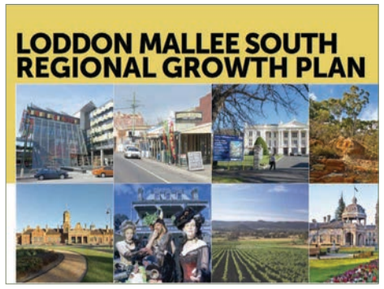

The Loddon Mallee South Regional Growth Plan.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Loddon Mallee South Regional Growth Plan	Victorian State Government in collaboration with the Central Goldfields Shire, the City of Greater Bendigo, Loddon Shire, Macedon Ranges Shire and Mount Alexander Shire	The Loddon Mallee South Regional Growth Plan is the strategic land use plan for the region to guide growth and change for the next 30 years. The plan covers the local government areas of the Central Goldfields Shire, the City of Greater Bendigo, Loddon Shire, Macedon Ranges Shire and Mount Alexander Shire. It is one of eight regional growth plans being prepared in Victoria.	The Future growth framework highlights the key directions for growth of the region. This includes 'Fostering growth in key hinterland towns around Bendigo such as Marong' which is identified as a key residential and industrial /business location. Key relevant future actions and directions include: – Ensure there is adequate zoned and serviced commercial and industrial land for employment in the regional city and centres as sub-regional hubs – Accelerate the development of the Marong Business Park as a key new location for industry and business – Attract new manufacturing and food processing industries to build on supply chain linkages – Increase opportunities for emerging sectors through policy support, investment and incentives – Develop and protect freight and logistics precincts – Minimise the impacts of land use change and development on areas with significant environmental assets – Protect water quality and quantity – Adapt to the potential impacts of climate change	The project offers significant opportunity for delivery against multiple actions and directions contained in the plan. Further, we note that "for the past 16 years, work had been progressing on the creation of a new industrial precinct in Marong [Marong Business Park], which would service the needs of new and expanding industry. Recent decisions on this long-term project have meant that the Marong precinct will not proceed as planned" (Industrial Land Strategy Inputs, Remplan 2019). The BREP presents an opportunity to provide much needed supply of industrial land, allowing new and existing business to develop and create employment opportunities. By providing industrial land within precincts, particularly in a location this accessible, businesses can also benefit from efficiencies in freight movement and co-locating with suppliers or customers.

Appendix B - Policy, Practice and Innovation
(i) Policy Review (Regional)

The Loddon Mallee Climate Ready Plan.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Loddon Mallee Climate Ready Plan	Adapt Loddon Mallee, supported by the Victorian State Government	The Loddon Mallee Climate Ready Plan is one of the six regional climate change adaptation plans developed as part of the Supporting Our Regions to Adapt program. The program supports collaboration within regional communities to strengthen resilience to climate change by building adaptive capacity and delivering place-based, locally relevant adaptation action. The plan was developed by the community to address the unique challenges and opportunities that climate change brings to Victoria's regions and guide locally relevant practical action. It was developed via a place-based, community-owned and led process, supported by the Victorian Government and funded by the Sustainability Fund.	The Plan provides a framework to achieve a climate ready region and is organised in three sections; People, Places and Sectors. Key goals relevant to the BREP include: – Our region is continuously learning about the effects of climate change on our natural and built environments – Places in our region are connected by resilient infrastructure and environmental corridors – Our natural and built environments are healthy and sustainable – Our natural and built environments are protected from the impacts of climate change – Businesses have the climate knowledge and resources they need to make confident decisions for operational continuity and competitive advantage – Local businesses feel connected, incentivised and rewarded to become climate ready – The health and safety of local workforces is protected – Local businesses have secure access to climate resilient markets, technologies, financing, and transport channels	The project offers significant opportunity for delivery against multiple goals, objectives and priority actions identified in the plan, such as: – Designing an exemplary climate resilient precinct that creates awareness of land and water practices that build resilience to current and future climate – Investigating innovative water systems such as coordinated rainwater harvesting – Supporting innovations in the built environment that improve biodiversity outcomes and increase landscape connectivity with surrounding areas – Strengthening resilience and flexibility of technology and/or infrastructure by exploring energy generation technologies – Support business adaptation to low emission and circular economy markets and supply chains – Creating equitable funding or financing opportunities for businesses to uptake technology or building upgrades that assist with protecting premises/assets from extreme events These are all drivers of sustainability for the precinct and will underpin the analysis and recommendations for a climate resilient approach.

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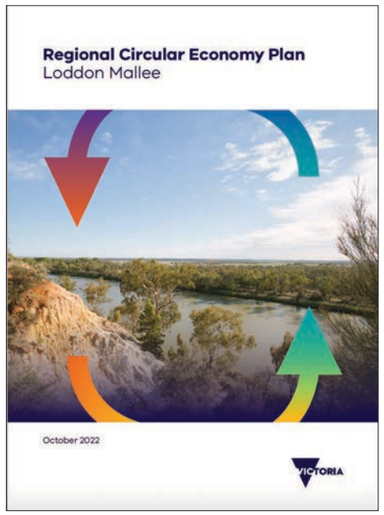
(i) Policy Review (Regional)



The Loddon Mallee Circular Economy Plan.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Loddon Mallee Circular Economy Plan	Victorian State Government in collaboration with approx. 30 stakeholders	Victoria is transitioning to a circular economy, with government, business and community looking for new ways to reduce waste, recycle and reuse more. The Loddon Mallee Regional Circular Economy Plan (RCEP) is one of five RCEPs that have been developed for Regional Victoria. The Plan sets out circular economy aspirations for the region up to 2030, provides insights into the region's strengths and challenges, and a framework to support the development of a circular economy in this context.	Key priorities relevant to the BREP include: – Improved Infrastructure + Invest in initiatives to reduce the cost of travel, e.g. hydrogen powered trucks, cost sharing, moving freight onto rail, electrical vehicle, upgrade roads + Invest in collection, reprocessing, and manufacturing technologies to improve access to collection services, and sorting and cleaning of commercial, commingled plastics, polystyrene, household soft plastics and agricultural plastics + Incentivise set up costs through a scheme to recoup upfront capital costs through solar energy savings that are not dependent on transmission network upgrades – Developing end use markets + Establish partnerships between councils and industry to support trials of new recycled products + Conduct research between educators, manufacturers and industry to understand the waste profile and potential uses for product, map current and predicted material availability and provide a brokerage service to stimulate demand + Invest in pilot projects within regional centres to demonstrate local circular economy solutions and to promote the quality and range of recycled materials and product use – (continued on the next page)	The BREP can capitalise on multiple regional aspirations and priorities listed in the Plan. These are in alignment with state policy and can be used to: – Guide the strategic vision of the precinct and its delivery, with circular economy principles applied to energy, water and waste and material management at all scales; from precinct-wide design guidelines to green leases – Support applications for funding, both for commercial and industrial operators, as well as Greater Bendigo as a landowner or RA (e.g. Regional Recycling Fund or national waste and recycling funding programs) – Support collaborative projects between governmental agencies, private businesses and research institutions The BREP has the potential to become a centre of excellence by also promoting circular economy innovation within the precinct itself and for example include: – An incubator space for small ventures and researchers to pilot and trial ideas before scaling up – A testing ground for new waste management models such as a marketplace/brokerage service for surplus resources in the precinct including energy, water and waste products that are recyclable / reusable – A testing ground for initiatives that reduce the cost of travel or promote the use of recycled materials and product reuse As the majority landowner, this could be further supported by Council through the provision of financial, constructed, human or experiential capital to de-risk specific circular economy ventures and deliver on more ambitious targets.

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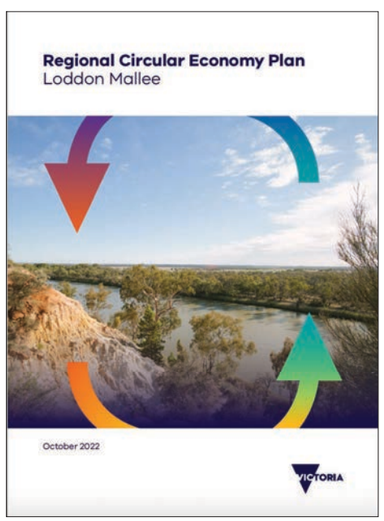
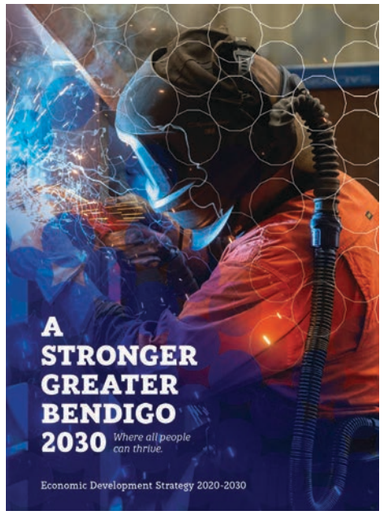
(i) Policy Review (Regional)



The Loddon Mallee Circular Economy Plan.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Loddon Mallee Circular Economy Plan **(cont.)**	See above	See above	– Improved collaboration and communication + Facilitate conversations between commercial and council operations to determine the drivers and priorities for waste management and end uses + Share and promote the success of pilots and trials to encourage more uptake and innovation – Behaviour change + Support retailers and manufacturers to implement initiatives that encourage recycling, reuse, and repair of consumer products (including funding take back programs and regulation) – Legislation and other key changes + Adapt grant funding rules to be more flexible, including grants to support projects that have already commenced + Undertake research and trials into innovative recovery solutions for commercial outcomes, understanding the market opportunities, capabilities to support businesses to relocate or establish in the region	See above

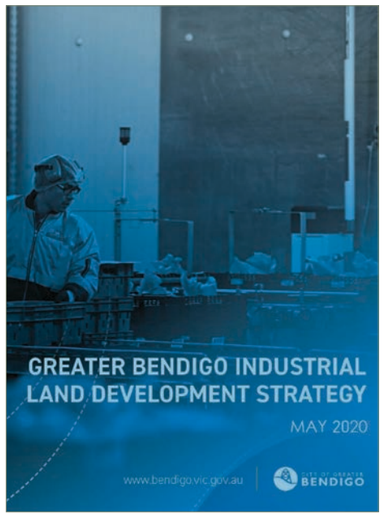
Appendix B - Policy, Practice and Innovation
(i) Policy Review (Local)



A Stronger Greater Bendigo 2030: Economic Development Strategy.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
A Stronger Greater Bendigo 2030: Economic Development Strategy 2020 - 2030	City of Greater Bendigo	Stronger Greater Bendigo was developed to provide a framework for the long-term economic growth of Greater Bendigo and region. The Strategy incorporates four strategic directions, with objectives and fourteen broad initiatives that focus on: – Growing sustainable jobs and investment – Increasing liveability for all – Linking jobs, education, skills and training offerings to the city and region's needs – Leading in innovation, environmental and climate change initiatives	The strategic directions incorporated in this document are all relevant to the BREP and align with the vision shared by the VPA and Council for the precinct. Relevant strategic directions include: – Unlocking land and building new key infrastructure particularly transport, to support major jobs growth and investment – Investing in and supporting business innovation – Planning and developing Bendigo and region as low carbon and circular economy leaders – Transitioning to a regionally owned new energy economy – Strengthening the city and region's long-term water services plan – Further developing our liveability – Building a more circular local and regional economy – Improving the quality of our environment and biodiversity	Implementation considerations include: – Low carbon - Providing modern, well located facilities that are geared to achieve zero carbon status and climate resilience – Circular economy - Developing a circular economy, inclusive of food, energy, water and waste, that captures more local expenditure and supports new industries – Energy - Investigating locally based and owned network of renewable energy production – Governance - Using a 'smart city' approach to improve sustainability and resilience, engage with the community, use collaborative leadership, work with relevant organisations and use data and integrated technologies to transform services and liveability – Innovation - Supporting the development of innovation hubs that drive and nurture knowledge and innovation and the implementation of a locally based capital raising fund to support local startups, scale-ups, creatives and entrepreneurs – Water resilience - Driving exemplar sustainable management, conservation and reuse of water resources and investigating key partnerships with Coliban Water, DEWLP and the 'Water Sensitive Bendigo Partnership'

Appendix B - Policy, Practice and Innovation
(i) Policy Review (Local)

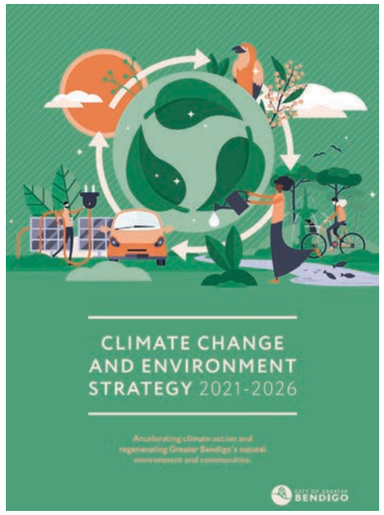


Greater Bendigo Industrial Land Development Strategy (2020).

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Greater Bendigo Industrial Land Development Strategy and Background Report (2020)	City of Greater Bendigo With the support of the Victorian Planning Authority, Department of Environment, Land, Water and Planning, Regional Development Victoria, Department of Transport and Be.Bendigo	The Greater Bendigo Industrial Land Development Strategy has been developed in partnership with the VPA to provide a strategic framework and clear road map to identify a 30-year pipeline of future industrial land which will meet the needs of current and new businesses looking to expand, locate or relocate within and to Greater Bendigo. This document provides clear directions around existing industrial precincts in order to minimise land-use conflicts, increase supply and ensure industrial land is suitably located. This strategy acknowledges that there is currently less than 100 ha of available industrial land in Greater Bendigo (~11 years supply) and there is a need to plan for at least 170ha of additional industrial land over the next 30 years to keep up with demand.	The Strategy focuses on seven objectives relevant to the BREP: 1. Provide for 30 years of industrial land supply 2. Provide future direction about the existing industrial precincts so as to: a. Reduce industry-residential land use conflicts b. Provide protection of viable industrial and employment precincts from non-industrial uses 3. Minimise the impacts of freight movements on non-industrial, particularly residential urban areas 4. Improve the function, design and amenity of existing and new industrial areas 5. Promote sustainable industrial land use and development 6. Increase regional competitiveness and grow investment and employment 7. Advocate for State and Commonwealth funding for both core infrastructure and priority economic initiatives The strategy also recognises the multiple benefits of achieving sustainability outcomes in industrial areas, such as long-term operational benefits and broader social and environmental gains.	This strategy supports the development of industrial precincts that minimise impacts on surrounding uses and development, embrace and elevate environmental outcomes, and provide high quality public realm and streetscape amenity. Providing a supply of industrial land close to Marong to meet some of these needs would provide much needed employment for a growing residential population. Beyond assisting with the provision of additional industrial land, this project also offers significant opportunity for delivery against multiple objectives and priority actions identified in the strategy including sustainability goals. As highlighted in the strategy, an implementation pathway worth considering will be to introduce area-specific design guidelines and or planning controls for the precinct, which elevate the existing 'Good Design Guide for Industry' background document, and present a stronger focus on: – Energy efficiency, water cycle management, increased tree canopy coverage, and waste minimisation – High public realm and streetscape/interface amenity

Appendix B - Policy, Practice and Innovation

(i) Policy Review (Local)



City of Greater Bendigo Climate Change and Environment Strategy 2021-2026.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
City of Greater Bendigo Climate Change and Environment Strategy 2021-2026	City of Greater Bendigo	On the 19 October 2021, the City of Greater Bendigo adopted the Climate Change and Environment Strategy 2021-2026. The Strategy aims to accelerate climate action and regenerate Greater Bendigo's natural environment and communities. The strategy has been designed to support action to restore and regenerate ecosystems and mitigate climate change through reducing carbon emissions and sequestering carbon. It further includes actions to adapt to climate change, as our communities and ecosystems must transition to a harsher climate. Action areas include: – Biodiversity and regeneration – Circular economy – Sustainable and active transport – Sustainable food systems – Water sensitive Bendigo	– The Strategy also includes flagship projects that have been chosen to lead and inspire municipal-wide action. Flagship Project 5 focuses on showcasing sustainable developments across Greater Bendigo – The developments will be on surplus council land and demonstrate four or more of the One Planet principles of environmentally sustainable design, zero carbon, water sensitive urban design, sustainable and active transport, circular economy and urban food and biodiversity – The BREP presents a unique opportunity for Council, in partnership with the Victorian Government, community, development and investment industry, to deliver such a showcase industrial development and demonstrate a model of how low impact industrial developments are achieved	The key opportunity is to present the precinct as place based implementation of the Strategy, an example for other precinct development to follow. Other implementation considerations include: – Investing in key partnerships with the community, developers and government agencies – Designing innovative financing and delivery models – Collaborating for the planning and design of the development – Documenting the process with replicability in mind as to inspire more low impact developments achieving zero carbon, circular economy sustainable and active transport and sustainable food and water sensitive principles – Maximising benefits for the BREP and its tenants but also for nearby land and the broader Marong township and region

Appendix B - Policy, Practice and Innovation
(i) Policy Review (Local)

The City of Greater Bendigo has put in place a Circular Economy and Zero Waste Policy.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Greater Bendigo Circular Economy and Zero Waste Policy (2021)	City of Greater Bendigo, Resource Recovery & Education Unit	This policy was develop to assist Council in reducing the environmental impact of its works, services and goods used in all operations and projects.	Over the 10-year period 2020-2030, Council seeks to align its activities to meet or exceed Victorian and Federal waste and resource targets: – Cut total waste generation by 15% per capita by 2030 – Divert 80 percent of waste from landfill by 2030 (72% by 2025) – Halve the volume of organic material going to landfill between 2020 & 2030 (20% reduction by 2025) – Ensure all City facilities have access to (and are using) food and garden organics waste recycling services or composting – Significantly increase the use of recycled content by government and industry – Phase out problematic and unnecessary plastics by 2025	The BREP, particularly the area owned by Council, presents a unique opportunity to deliver on these ambitious targets, set a new benchmark for industrial development by localising resource flows where possible. Implementation considerations include: – Planning and developing the Council-owned portion of the land to meet / exceed all these targets and demonstrate leadership in circular economy and low carbon industrial/ employment development – Exploring the inclusion of targets via building controls and/or design guidelines for non-Council-owned land in the precinct – Creating a marketplace for surplus resources including energy, water and waste products which are recyclable / reusable – Provide a supported space for circular economy innovation to occur within the precinct

Appendix B - Policy, Practice and Innovation
(i) Policy Review (Local)

The Victorian Government is updating the Victorian Planning Provisions to improve the sustainability outcomes in Victoria.

TITLE	AUTHOR	DESCRIPTION	RELEVANCE TO THE BREP	IMPLEMENTATION CONSIDERATIONS
Amendment VC216, Environmentally Sustainable Development (ESD) and Water Sensitive Urban Design (WSUD) policies	City of Greater Bendigo	Planning policies must be taken into account and given effect to by a Responsible Authority when making a decision.	– Amendment VC216 (gazetted in June 2022) made changes to the Planning Policy Framework (PPF) and Victorian Planning Provisions (VPP) to support ESD. It adds consideration of climate change into the purpose of the VPP and all planning schemes, and embeds consideration of ESD within all relevant planning policy themes rather than kept separate at Clause 15.02. This includes objectives, strategies and policy guidelines within Clauses 11 (Settlement), 12 (Environmental and Landscape values), 13 (Environmental Risks and Amenity), 15 (Built Environment and Heritage), and 19 (Infrastructure). – The City of Greater Bendigo also includes local policies in regards to ESD & WSUD + Clause 15.01-2L (ESD) seeks best practice in ESD from the design stage through to construction and operation, and requests the preparation of an SMP and other assessments + Clause 19.03-3L (WSUD) supports the development of urban water systems that are multi-functional and provide ecological, liveability and resource-efficiency benefits	– The BREP has the opportunity to meet a number of State and local ESD and WSUD policy guidelines and requirements, particularly in regards to: + Overall performance, from design stage to construction & operation + Energy and water efficiency, at the precinct and building level + Protection and enhancement of biodiversity + Renewable energy deployment and generation + Resilience to climate change hazards and risks + Incorporation of best practice WSUD & minimisation urban stormwater runoff + Prioritisation of sustainable transport options + Promotion of waste avoidance, reuse and recycling + Minimisation of exposure to air pollution and noise

Appendix B - Policy, Practice and Innovation
(ii) Practice & Innovation Scan

A focus on identifying examples with direct relevance to the BREP context and the Victoria's planning system was maintained through the best practice and innovation scan.

This included the development of five case studies with insights into key opportunities that could be considered for the BREP. Innovations highlighted were also selected due to their market readiness or certain commercial trajectory with project precedence and relevance to the local Bendigo context.

This work highlighted a variety of strategies that can be incorporated into new industrial/employment development in a greenfield setting to ensure they're set up for success from day one.

PRACTICE AND INNOVATION SCAN

The practice and innovation scan included two elements:

- The analysis of five case studies to draw insights into key opportunities that could be considered for the BREP, including:
  - Tonsley Innovation District, South Australia
  - Logis Eco Industrial Park, Victoria
  - Portes du Tarn, Toulouse, France
  - Höchst Industrial Park, Frankfurt, Germany
  - Kwinana Strategic Industrial Area, Western Australia
- The review of best practice and innovation trends in sustainable industrial and commercial development. Of particular interest to the sustainable development of the BREP, this includes:
  - Improved worker and landscape amenity
  - Increasing density
  - Industry 4.0
  - Transition and physical climate risk
  - Operational phase management entities
  - Industrial ecology or symbiosis and circular economy
  - Rising input costs

Appendix B - Policy, Practice and Innovation
(ii) Case Study 1 - Tonsley Innovation District, SA

PROJECT INFORMATION

Project Status

Complete | Commenced in 2010 | In progress

Location

Tonsley, Adelaide SA

Developer

Renewal SA

Type

Precinct

Scale

61 Ha, including 24 Ha for industry and commercial uses, with 35,000 of lettable space

Certification

6 Star Green Star Communities

PRECINCT CONTEXT

The Tonsley Innovation District is a 61 hectare mixed-use precinct located 10km south of Adelaide, South Australia.

Part of the former Mitsubishi car assembly site, this large-scale brownfield development leverages the existing heritage industrial built form as part of its employment and education hubs, which occupy approximately 24ha of the site.

The site aims to foster innovation by bringing together a number of complementary uses, including high-value industry and commercial, education and training, retail and residential.

It is home to two education and training institutions: Flinders' University's College of Science and Engineering and TAFE SA Building and Construction trade training. It also provides high-quality public realm, civic spaces and retail amenities, as well as 11ha of residential development comprising of a mix of townhouses and apartments, accommodating approximately 800 homes / 1,600 residents.

Fig 56. Tonsley Innovation District. Photography by Sam Noonan.

Fig 55. Tonsley Innovation District. Photography by Sam Noonan.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 1 - Tonsley Innovation District, SA

RELEVANT INNOVATIONS / INITIATIVES

Tonsley has implemented a 5MW District Energy Scheme, with battery storage and smart metering technologies being used by Tonsley's businesses and residents.

Tonsley has adopted a flexible growth strategy, with the ability to start a smaller operation and then as the business grows upscale to a more suitable premises within the precinct.

Tonsley has adopted a 'seamless servicing strategy' - which allows businesses the ability to effectively 'plug and play' for electricity, telecommunications etc.

Tonsley has adopted a comprehensive set of Design Guidelines to guide the development of public and private buildings, streetscapes and landscape.

Tonsley has two tertiary education providers as anchors, providing potential synergies with research and development.

Tonsley employs the reuse of the former Mitsubishi factory in Southern Adelaide.

APPLICATION TO THE BREP

For BREP, the District Energy Scheme is applicable in particular for the Council land component - delivered either through a micro-grid or embedded network. This may require the retention of land in single ownership to reduce complexity.

The seamless servicing strategy and scaling opportunity has interesting application for BREP. Again, in relation to the Council land, a serviced model with the potential for subsidised start-up space for businesses with the potential to scale may be an attractive proposition for businesses looking to commence small operations, but with plans to scale. This could be focused on circular economy businesses or more broader.

The use of comprehensive Design Guidelines would provide an opportunity to control built form and landscape outcomes in terms of functionality, design and overall environmental performance.

University partnerships offers another opportunity for BREP, in particular where research can support product innovation or circular economy research. There is strong opportunity to bring together the practical application of for example advanced manufacturing with learning right next door.

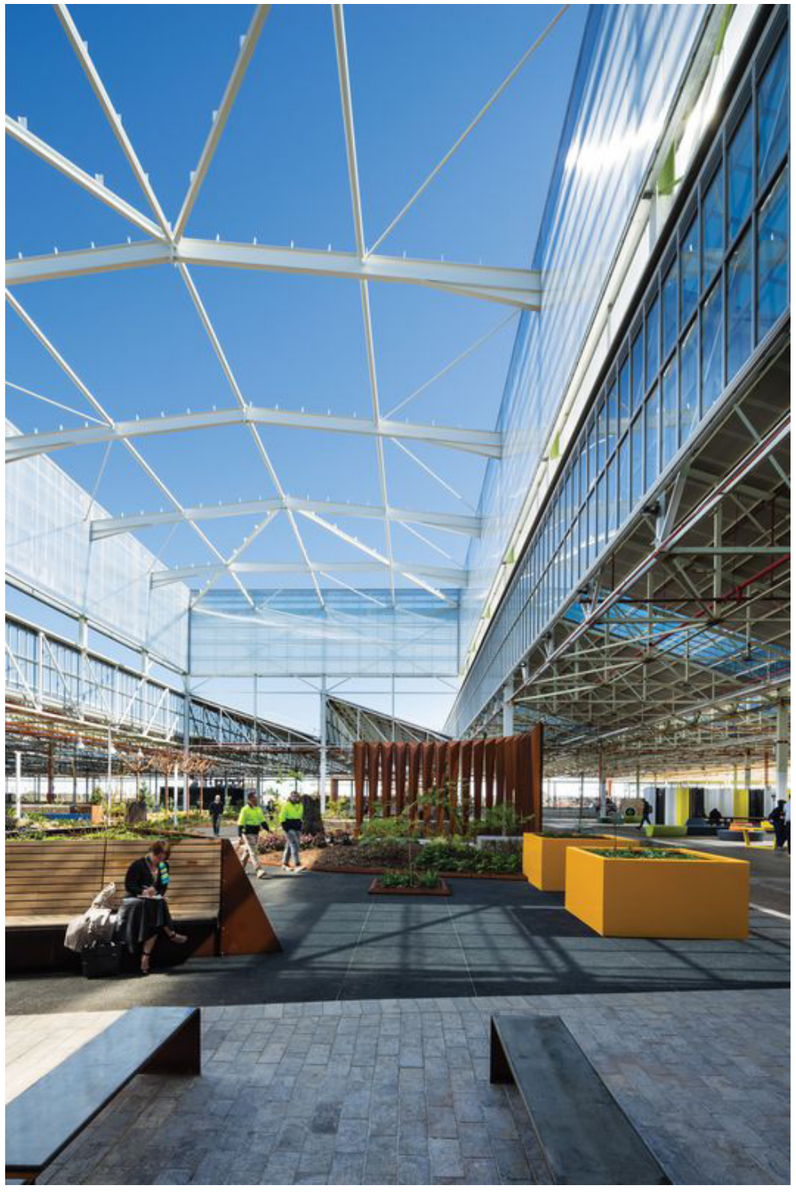


Fig 57. Tonsley Innovation District. Photography by Sam Noonan.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 2 - Logis Eco Industrial Park, VIC

PROJECT INFORMATION

Project Status

Complete | Commenced: 2014 | Completed: 2017

Location

Dandenong, Melbourne VIC

Developer

Places Victoria and Melbourne Water

Type

Precinct

Scale

154 hectares

PRECINCT CONTEXT

The 154 hectare former Dandenong treatment plant was redeveloped as an industrial, retail and commercial precinct.

It is located at the south-east corner of the Eastlink and Dandenong Bypass in Dandenong, Victoria, approximately 30km south-west of Melbourne CBD.

The site is part of the broader Dandenong National Employment and Innovation Cluster, one of Australia's most significant and productive manufacturing areas. The cluster has strengths in advanced manufacturing, health, education, wholesale trade, retail and transport, postal services and warehousing.

This urban renewal precinct is Victoria's first eco-industrial park. It promotes cross-industry and community collaboration and is known for its overall high amenity including in terms of public open space, passive and active recreation, community facilities and integrated active transport corridors.

Fig 58. Logis Eco Industrial Park. Photography by Graeme Bentley.

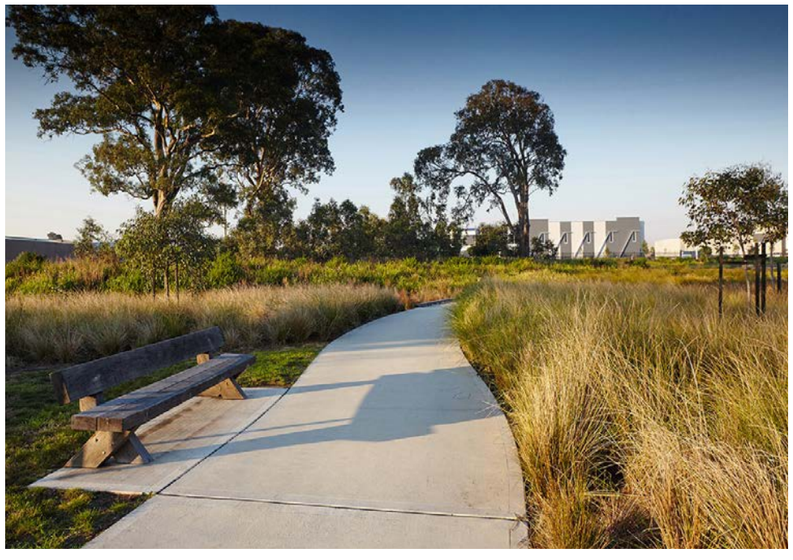


Fig 59. Logis Eco Industrial Park. Photography by Graeme Bentley.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 2 - Logis Eco Industrial Park, VIC

RELEVANT INNOVATIONS / INITIATIVES

Logis has made a significant investment in open space and landscaping. This includes a central wetland reserve which purifies stormwater before it enters Dandenong Creek. There is a strong focus on improving amenity for workers, also feeding into tenant attraction.

The Logis site has also been developed to fulfil broader community needs, which has the added benefit of activating the precinct on the weekends for added security. Security is often an issue for standalone employment precincts.

Design Guidelines have been developed for the Logis precinct to maintain sustainability deliverables such as: access for pedestrians and cyclists, site layout and orientation (for solar access), rainwater harvesting, materials (steel, concrete and low toxicity etc.), landscaping, lighting and waste infrastructure.

APPLICATION TO THE BREP

For BREP, the investment in landscape uplift is of particular application. In order to ensure that the employment precinct is regionally attractive, the ability to provide a quality business environment is critical. Urban greening is able to deliver multiple outcomes that are attractive to both businesses and their workers (recreation, aesthetics) as well as environmental outcomes such as urban heat mitigation and habitat for biodiversity. There is a strong opportunity to couple this with other ‘hub’ activators such as food and beverage and recreation.

BREP could consider opportunities for activation outside of business hours to provide more efficient use of land. Some potentially appropriate land uses for industrial areas are large format indoor facilities (e.g. Latitude, Indoor Soccer, Gymnastics) and outdoor recreation.

Design Guidelines (potentially delivered through a s173 agreement or restrictive covenant on title) are a key opportunity for BREP. It offers a mechanism for setting expectations for land subdivision, in particular that which will not be delivered directly by Council. The extent to which Design Guidelines are appropriate for built form will need to be further tested, and should this be pursued, the ‘built form’ component of the guidelines may be best to focus on a limited number of key initiatives such as renewable energy generation, low embodied carbon materials and on-lot stormwater treatment.

Fig 60. Logis Eco Industrial Park. Photography by Graeme Bentley.

Fig 61. Logis Eco Industrial Park. Photography by Graeme Bentley.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 3 - Portes du Tarn, Toulouse, France

PROJECT INFORMATION

Project Status

Currently under development | Commenced in 2012 | First building built in 2016

Location

Toulouse, France

Developer

SPLA Les Portes du Tarn (SPLA81)

Type

Precinct

Scale

198 Ha, with 126 Ha of industrial land

Certification

n/a

PRECINCT CONTEXT

Les Portes du Tarn is located approximately 20km north-east of Toulouse, in South of France. Known as the aeronautics and space capital of Europe, Toulouse and surrounds are one of the most dynamic regions of Europe in terms of economic and population growth, job creation and investment in R&D. Main industrial activities in the territory are aeronautics and space, pharmaceutical, chemical and food industry.

As demand for industrial land continues to grow steadily in the region and industrial land becomes sparse, two local authorities (the Tarn department and the Tarn-Agout federation of municipalities) combined to create a new industrial park close to Toulouse to be steadily developed over the next 20 years.

The local planning agency SPLA81 was created to manage the development of the new industrial park based on the concepts of eco-industrial parks, industrial ecology and industrial synergies. It has two important roles: project manager and seller. Importantly, this includes a crucial role in assessing applications of potential future tenants/owners, along elected members from both local authorities.

Fig 62. Portes du Tarn. Photography by Tarnagout

Fig 63. Vinovalie, the first anchor tenant of the precinct. Photography by Oze Agence.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 3 - Portes du Tarn, Toulouse, France

RELEVANT INNOVATIONS / INITIATIVES

The Park has adopted a range of IT tools which monitors real time performance and allow businesses within the park to optimise performance.

The same data is used to identify optimisation opportunities of resource flows through a project called COPRIE. This tool identifies future potential substitution and mutualization synergies across materials, energy, equipment, and services. It also allows the simulation of potential industrial installation scenarios and integrates a Web GIS (geographic information system) technology to identify the “best” plot within the park for an applicant company to operate (table B5.1.1).

Critical information about potential future tenants is gathered as part of the application process including built form, materials, energy, equipment and services required. This information is then used to assess the proposed industrial activity against a set of criteria, including potential industrial synergies both within the precinct (inner-park) and with the broader region (outer-park), overall environmental impacts, waste and water management, mobility, and transport (materials and people).

The park offers a range of amenities to cater for services to businesses and their staff. The masterplan for the precinct includes a range of open space and retail services, a food and beverage offering, public and private transport integration etc.

The park has incorporated a range of sensors which monitor a range of environmental indicators, including noise, air quality, water quality. This helps the park operators understand their environmental impact and prompts new measures to be taken to limit environmental impacts based on data.

APPLICATION TO THE BREP

For BREP, a similar approach to assessing potential future tenants and ongoing maximisation of industrial synergies in terms of built form, materials, energy, equipment, waste and services could be rolled out, particularly with the broader region to start with and within the precinct itself once the first few major tenants are clear.

The platform could operate as a standalone platform managed by a third party provider or as part of a range of services provided by a Precinct Operational Management Entity. The IT platforms could also be linked to established networks in Bendigo, such as the BHive cooperative.

BREP can explore a range of high value services to tenants and workers that are above and beyond those traditionally provided in existing Bendigo industrial areas. As highlighted, services related to recreation and hospitality are key attractors, but would need to be delivered small to start with and scaled as the employment precinct is developed over time.

BREP may consider undertaking a similar monitoring program to Portes du Tarn, focused on long term improvement to key environmental indicators. In the BREP application this could extend to monitoring factors such as urban heat conditions in addition to air and water quality (the latter of which could assist with any localised wastewater treatment facility).

Fig 64. Portes du Tarn. Photography by Mutabilis paysage & urbanisme.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 4 - Höchst Industrial Park, Frankfurt, Germany

PROJECT INFORMATION

Project Status

Currently under development | Commenced in 1997

Location

Höchst, Frankfurt, Germany

Developer

Infraserv Höchst

Type

Precinct

Scale

460 Ha (50 Ha available for new construction)

Certification

n/a

PRECINCT CONTEXT

Frankfurt am Main is an international financial centre and one of the most important transport hubs in Europe, making it an important link in European supply chains.

The Höchst industrial park is approximately 460 Ha and spans over four districts of Frankfurt. The river Main crosses the site, with two bridges connecting the northern and southern areas of the precinct. The precinct's location offers optimal connections to road and rail networks, as well as inland waterways. The precinct has been designed to embrace its locational advantage and has its own on-site trimodal port. It is also located in proximity to the Frankfurt Airport, Europe's leading airport for cargo.

The history of the precinct dates back to 1863 when it was developed as a tar-based ink factory (Meister Lucius & Co.) and then turned into a chemical company in 1883. In 1997, Infraserv Höchst (site management and industrial operator) took over the management of the former factory and redeveloped the site into what is today known as the Höchst Industrial Park. It is now home to approximately 90 businesses and provides over 22,000 people jobs. Key industries include pharmaceuticals, biotechnology, basic and specialty chemicals, crop protection, food additives and services.

Fig 65. Höchst industrial park. Photography by Sebastian T. Baum.

Fig 66. Höchst industrial park. Photography by Sebastian T. Baum.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 4 - Höchst Industrial Park, Frankfurt, Germany

RELEVANT INNOVATIONS / INITIATIVES

Höchst Industrial Park provides a range of precinct level services to its tenants, including a range of development services (planning and regulatory permits) and a number of operational services once established (energy, water and waste management, security services, facility management, emergency services and hazard response).

The operator (Infraserv Höchst), provides a range of energy related services including both management and supply contracts. The supply element coordinates a retail supply of electricity to the tenant and market competitive rates. This includes a component of electricity generation and procurement of renewable electricity on behalf of the tenant which is then distributed to tenant customers.

A range of energy management services are also provided, including optimisation of plant and machinery, tariff modification, energy efficiency etc. This operates as an additional revenue base for the park operator.

Höchst also enables a range of energy projects including the production of biogas and biomethane, the use of waste heat from production and incineration plants, and high-heat-value waste to supply energy. The precinct is positioned as an innovation hub for companies looking to implement resource-saving technology solutions.

APPLICATION TO THE BREP

BREP could consider a role in managing energy either by a third party operator or as part of a suite of roles that a precinct operational management entity might undertake.

Whilst regulations are different in Australia and don't allow as much flexibility, a willing developer such as Council, Development Victoria or value-aligned private developer may establish an entity to manage a range of energy supply and management services. These could include actual ownership of energy generation, storage and distribution (solar PV on roofs), neighbourhood level battery, even the distribution network (poles and wires under an embedded network scenario). An energy services company operating in this way would also be well placed to aggregated demand for electricity and purchase renewable electricity on behalf of a range of tenants.

A range of energy management services could also be provided to tenants, with or without this supply role. These include energy efficiency advice, facilitating business to business networks, tariff optimisation, on-site renewable electricity feasibility etc.

BREP could (subject to further feasibility and improved knowledge of the tenant mix) consider energy projects beyond solar PV and precinct level batteries. A potential focus on bioenergy, either drawing on regional feedstocks from agricultural processes or more localised outputs from industrial processes such as food manufacturing within the precinct.

Fig 67. Höchst industrial park. Photography by Sebastian T. Baum.

Fig 68. Höchst industrial park. Photography by Sebastian T. Baum.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 5 - Kwinana Strategic Industrial Area, WA

PROJECT INFORMATION

Project Status

Currently under development | Established in the 1950s and still being developed though land capability is now approaching capacity.

Location

Kwinana, WA

Developer

The land is owned and managed by Development WA and the Department of Jobs, Tourism, Science and Innovation (JTSI) is the lead development agency.

Type

Precinct

Scale

270 Ha

Certification

n/a

PRECINCT CONTEXT

The Kwinana Strategic Industrial Area (SIA) is located 30km south of the Perth metropolitan area and 15km south of Fremantle within the Western Trade Coast (WTC), Western Australia's largest industrial estate and the only heavy industrial area within the Perth metropolitan region. It has excellent access to all major transport networks, including deep-water bulk port facilities, high-wide and dangerous goods freight routes and heavy rail.

Established in 1955, the Kwinana SIA is the oldest part of the WTC and has been home to traditional heavy industries such as petroleum and minerals refineries, power stations, chemical plants and cement works since its inception. It is also a busy industrial deep-water bulk port. A number of supporting industries have also since located in the precinct and service the fabrication, construction and maintenance of machinery required by the established heavy industries.

In 1991, the precinct was incorporated as an Industry Association to deal with precinct-wide issues such as impact on air and water quality. Today, the Kwinana Industrial Council (KIC) has approximately 15 full members and 20 associated members. The Kwinana SIA is considered a world leading example of industrial symbiosis, particularly in regard to water, energy and materials flows i.e. product, by-product and utility synergy exchanges. It is estimated that over 150 synergy exchanges are currently operating on commercial terms, with the majority occurring with heavy industry. The KIC has played an important role in fostering industrial symbiosis in the precinct.

Fig 69. Kwinana Strategic Industrial Area. Photography by Development WA.

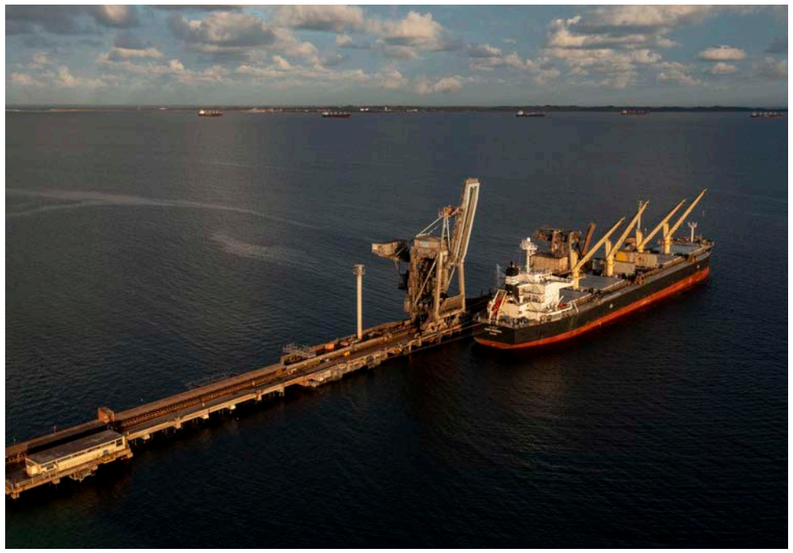


Fig 70. Kwinana Strategic Industrial Area. Photography by KIC.

Appendix B - Policy, Practice and Innovation
(ii) Case Study 5 - Kwinana Strategic Industrial Area (SIA)

RELEVANT INNOVATIONS / INITIATIVES

Since the precinct was incorporated in the early 90s, the Kwinana Industrial Council (KIC) has been the coordinating entity/force behind the development of symbiotic activity in the precinct, namely in response to perceived business opportunities and to overcome resource scarcity (i.e. in regard to water in particular). It has fostered a sense of cohesion and provided a platform for tenants to tackle precinct-wide issues collectively.

The KIC, which is industry-led has also served as a conduit for information exchange between companies, local government, and research and development institutions. This consistent sharing of information and transparency between precinct tenants and beyond has facilitated a greater understanding of the inputs and outputs of surrounding industrial processes, fostering symbiotic activity by highlighting opportunities for additional synergies. For example, this has allowed for a number of supporting industries to relocate to the precinct to support more established heavy industries.

Strong partnerships with other key entities including government, local community and education and research institutions have fostered an environment of collaboration, learning and innovation. It has also resulted in synergy exchanges being consistently recorded and reported on. This chronological history of the development provides key data insights on how to continue to improve precinct performance.

The precinct also includes a number of water-related infrastructure which decrease the precinct's reliance on expensive potable water supplies. This includes the Perth Seawater Desalination Plant, which produces around 18% of Perth's water supply, and the Kwinana Water Reclamation Plant, which manufactures process water for industry and recycles wastewater from another treatment plant.

APPLICATION TO THE BREP

BREP could consider the use of an ongoing operational entity in the precinct to facilitate its management and optimise its performance. This could be done through a model akin to how a shopping centre or a build to rent model may operate, with the entity managing environmental management systems energy, water, waste / resource flows and undertake other important monitoring, networking and financing functions. As the precinct starts to grow, a governance model where tenants have the opportunity to participate and/or take the lead in undertaking some of these functions, particularly facilitating synergic exchanges might be strategically advantageous.

To further support the above and allow the precinct to evolve as desired, Council as a land-owner has the opportunity to hold back land in a strategic location and only develop these parcels once resource and material flows are better understood, and the next wave of tenants is ready to move in. This could play an important role as part of a wider strategy around tenancy diversification and curation to achieve a healthy industrial ecology.

Fostering strong partnerships with the local community, as well as education and R&D institutions is key in creating an environment of collaboration, learning and innovation to long-term success. The BREP could provide spatial allocation and financial support for innovation within the precinct, with the goal of clustering ideas and small businesses capable of developing new ideas and products. A R&D partnership with La Trobe or other regional university could add further value along with a dedicated State or other funding stream for feasibility studies. It would also assist in developing a local skilled workforce.

Similar to Kwinana, potable water supplies need to be augmented with fit for purpose alternatives. Although desalination is obviously not a relevant local solution the objective to facilitate water resilience and self-sufficiency by provide a local alternative water supply is critical. This could include capturing and treating rainwater and stormwater through the use of decentralised assets such as water tanks and localised wastewater treatment, especially in consideration of the long distances to existing treatment plants.

Fig 71.Kwinana Strategic Industrial Area. Photography by KIC.

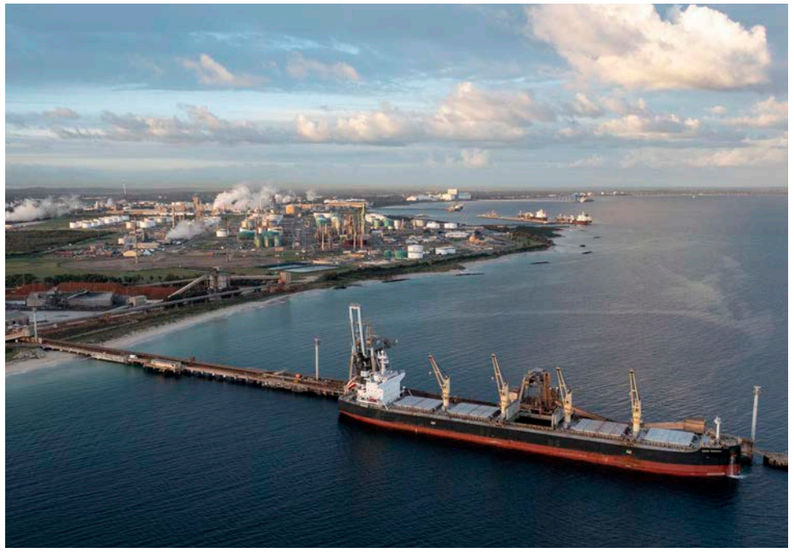


Fig 72. Kwinana Strategic Industrial Area. Photography by KIC.

Appendix B - Policy, Practice and Innovation
(iii) Trends Analysis

A number of key trends applicable to sustainability outcomes in employment precincts have been identified through the research and through conversations with stakeholders. These are highlighted below and discussed in turn with their applicability to the precinct. These are not exhaustive and have been limited to those trends capable of being capitalised on for environmental benefit.

IMPROVED WORKER AND LANDSCAPE AMENITY

Employment land development has historically suffered from poor amenity in streetscapes, in urban design outcomes, in quality and quantity of urban greening and surface water treatment. Although poor amenity industrial development is still delivered, the quality overall is slowly improving. Industrial tenants now have expectations beyond a transport network capable of conveying goods and industrial scale buildings and hardstand areas capable of housing industrial activity. Development such as Dandenong Logis and Caribbean Park in Scoresby are examples of a provision of worker and landscape amenity historically provided in higher value land uses such as residential. Complementary land uses such as gyms and childcare are also increasingly being located in or adjacent to employment land to complement the employment activity. In a tight labour market, the working environment can be an attractor for new workers and a retainer of existing, which industrial tenants are increasingly understanding makes for good business. BREP can respond to this trend through a number of initiatives which centre on the environmental and social attributes of the precinct, in streetscapes and complementary land uses.

INCREASING DENSITY

Generally speaking, industrial land has lower value than a range of other land uses, including residential and commercial (office) land – although this varies by location. Well serviced, suitable employment land is however in relatively short supply across some parts of Victoria and locally in Bendigo. The increase in land values and the increasing cost of infrastructure to service industrial land has prompted employment land developers to improve the efficiency of the land use in order to maintain rental yields and / or maximise sale values. The REMPlan study provided as a background to the project identifies the following land area to floor space ratios for existing industrial development in the Bendigo region which appear to representative inefficient industrial land use.

INDUSTRY TYPE	FLOOR SPACE TO LAND RATIOS
Freight and logistics	13
Light industry	9
Retail and Wholesale	8
Heavy and / or large industry	6
Service Industry	5

Whilst these ratios are representative of existing built form to land ratios in the region, we would expect the development of BREP to deliver densities that are a significantly improved use of urban land. Recent work with industrial land developers in Melbourne indicate ratios closer to 1:2 for freight and logistics are currently being delivered. This trend to increased density has two important ramifications for BREP.

Firstly, it means that this parcel of land may take longer to develop than current predicted and secondly, that it can be delivered more sustainably, with the same land area and infrastructure (transport networks, utilities etc) servicing more businesses and workers and thereby maintaining productive uses of agricultural land for longer.

Additionally, adopting higher density ‘on lot’ compared to existing industrial land development in Bendigo potentially allows further scope for improved public realm and private land landscape outcomes that require spatial allocation – namely, more space for trees.

Appendix B - Policy, Practice and Innovation
(iii) Trends Analysis

INDUSTRY 4.0

Industry 4.0 is a term designated for the next stage of the industrial revolution, which refers to the use of technology to improve efficiency and manage processes. An example is cyber-physical systems (CPS), which are composed of machines and devices that are interconnected and can share information and controls. They can interact with each other and their environment to provide insights and accurate predictions about what will happen. This information can then be used to make better decisions.

An important ramification for employment precincts is the ability to improve resource efficiency, using strategies such as narrowing, slowing and closing the resource loop, making them key drivers of competitive advantage. For BREP, the ability to harness these technological improvements to find efficiencies in supply chains, resource flows to the precinct and within the precinct and getting goods and services to local and markets further afield is a significant opportunity.

A key ingredient in Industry 4.0 is a robust advanced communication network, essentially the ability for all that make up the 'internet of things' to communicate with each other, regardless of physical location. The gigabit economy (when businesses seize on unlimited bandwidth, computational power, and scale for strategic advantage) helps enable this.

As the number of devices connected to industrial communication networks continues to increase, there is potential for the network to become a barrier to further growth. To be nationally competitive in freight and logistics and advanced manufacturing in particular adequate bandwidth needs to be planned for early on, so that often 'data hungry' processes are not limited in connecting with each other.

TRANSITION AND PHYSICAL CLIMATE RISK

Climate change presents significant risk to businesses, investors, developers and asset owners. Some of these climate risks are physical, in that they are inherent in a particular location as climate hazards. Businesses, investors, developers and asset owners can reduce the impact and risk associated by reducing exposure and vulnerability. As climate hazards increase in intensity and frequency, stakeholders are increasingly looking for locations which either have low risk profiles or have taken steps to minimise this physical climate risk, to ensure that business operation is certain, and asset and land value, insurance premiums, market value etc are not adversely affected. BREP needs to position itself as presenting low physical climate risk, and the precinct structure planning process (with investments in flood and urban heat mitigation, enhancement of natural systems etc) can assist.

Transition risks are business-related risks that follow societal and economic shifts toward a low-carbon economy. They present increased responsibility and opportunity for companies to address transition risk to a low carbon economy as part of governance and decision making at the highest level. The first movers have been listed companies where shareholders are driving some of the responses and Directors can be held personally responsible for ignoring climate risk. Precincts which reduce transition risk for businesses are increasingly attractive to investment.

We've seen this clearly with particularly larger corporate entities being attracted to higher performing assets and those with respected industry accreditations such as Green Star or high NABERS ratings.

To position itself to capitalise on this positive change in the way companies look at asset portfolio and business investments, BREP can clearly present as a low carbon or zero carbon precinct (with the associated enabling infrastructure) - 100% fossil fuel independence and renewable energy supply are critical components. We are also fast moving towards a scenario where export products which are not environmentally responsible in their manufacture will be at a global disadvantage (through international carbon pricing mechanisms etc).

Additionally, this 'positioning' can also aid a range of other environmental initiatives that help reduce transition risk for businesses (around waste management, cleaner industrial processes etc).

Appendix B - Policy, Practice and Innovation
(iii) Trends Analysis

OPERATIONAL PHASE MANAGEMENT

Existing industrial development in regional Victoria has been primarily driven through a range of approaches including the 'subdivide and sell' model where the land developer facilitates the transport network and other infrastructure provision to lot boundary and then sells land to industrial businesses to build their operations. A developer will sometimes 'build on spec' and rent out industrial buildings or facilities, but the bespoke nature of some larger industrial processes makes this a challenge. The reduced risk approach is to build on behalf of a specific tenant and then rent the premises to them or sell the land outright, allowing the tenant control of the site layout and built form.

There is a move however in the direction of keeping industrial precincts in single ownership (backed by 'patient' capital such as superannuation funds) or operating with a modified governance arrangement not unlike an owners corporation. This allows a range of opportunities around sharing and optimising resources (e.g. energy, water, waste contracting). In more than 80% of worldwide 'eco-industrial parks' an operation entity exists and provides at least some level of service to tenants. This is a consistent trend across public, private and hybrid delivery models.

This creates an operating environment more like a shopping centre, where operational services can be aggregated where it makes sense to do so, and circular economy principles can thrive because of the improved connections and information flows between businesses and the precinct management entity. This is a critical enabling piece for BREP – multiple models can and should be explored to best meet the needs of investors, developers, tenants and Council. The other upside is the ability to control the vision and sustainability outcomes over time!

INDUSTRIAL SYMBIOSIS AND CIRCULAR ECONOMY

A rapidly growing facet of employment precincts stems from the range of benefits available from taking a natural systems approach to a network of businesses located in close proximity.

In nature, symbiosis is referred to as relationships between individuals of different species where both individuals benefit. The symbiotic exchanges among different entities yield a collective benefit greater than the sum of individual benefits alone. Industrial symbiosis applies those principles to an industrial setting, where the outputs of one business or actor, become the input to another. These relationships are borne out in progressive employment precincts the world over, with the most advanced local example in Kwinana, WA where there are over 150 documented product and by-product exchanges. A case study is separately provided in this report.

This industrial symbiosis approach is highly consistent with circular economy principles and has strong policy support both at the local and State level. The Recycling Victoria Strategy highlights some opportunities, whilst initiatives such as Recycled First present state level implementation of these principles to prioritise and scale-up markets. The BREP location is well positioned to capitalise on agricultural by-products for example.

More locally within the precinct level however, BREP can capture this opportunity to provide significant economic and environmental benefit. To do so will require a commitment to facilitating transparent information flows and connection between businesses, so that exchanges of heat, energy, water, waste materials and other by-products can be optimised.

The leading examples internationally and locally have invested in precinct management and governance, imposed information requirements on new businesses and enabled exchange through digital and other platforms for business-to-business exchange. Given the large Council land holding, there is opportunity for land to potentially be set aside to assist with the 'time lag' between the outputs of one business becoming inputs into another.

RISING INPUT COSTS

Businesses are under significant pressure with a range of rising business costs including, but not limited to electricity and gas prices, transport costs related to higher diesel prices and supply chain issues. Some of these increases are cyclical or temporal and related at least in part with the war in the Ukraine and the COVID pandemic, but all are prompts for positive consideration of alternatives that improve environmental sustainability outcomes. This is what Homer Simpson might term a 'crisitunity'. For example:

- Rising gas prices and supply shortfalls mean that the fossil fuel is less attractive than electricity and other forms of energy supply, which are more easily transitioned to renewables
- Electricity price rises improves the already compelling business case for renewable generation on site, which reduces transition risk associated with climate change
- Higher diesel prices have forced efficiency in freight and logistics and are at an international and local level accelerating the transition to zero-emission transport alternatives for long haul freight
- Global supply chain issues have forced businesses to invest in local sourcing options, which can reduce associated embodied carbon emissions and boost local productivity.

BREP can ensure investors in the precinct can better control these rising input costs through the localisation of energy supply (on-site or nearby renewable energy generation), infrastructure to support transition to more sustainable freight transport and localisation of supply chains within the regional context and aligned to activity in the precinct.

Appendix C
Stakeholder Engagement

Stakeholder Engagement

In addition to the background investigation, HV.H have undertaken targeted stakeholder engagement through November and December.

The focus of these engagements was be to build on and sense-check the analysis completed to date, ensure the accuracy of these foundational pieces and gain feedback on some key scoping questions which will be used to inform the development of the Discussion Paper and Opportunities Report.

ENGAGEMENT APPROACH

Through this process, we also sought to:

- Identify the various stakeholders views on the opportunities and barriers to delivering best-practice sustainable outcomes in employment precincts, generally and with specific reference to the BREP
- Develop a better understanding of the 'value' of sustainable development to the industrial / commercial sectors and key factors influencing investment in sustainable infrastructure and industrial development.

As part of the engagement, HV.H met more than 10 different stakeholders including representatives of the City of Greater Bendigo, state agencies, industrial developers, investors, economists, infrastructure specialists, local manufacturers and zero-emission think tanks.

Stakeholders were provided with background information on the project as well as a set of questions to guide the discussions. Outcomes are summarised in the next pages.

Questions included:

- Given location, scale and proportion of local government ownership, what do you consider are the key opportunities for the BREP site from a sustainability perspective? What is unique about this context?
- Given this context, what do you consider are the key barriers to delivering best practice outcomes? And with specifics to BREP?
- What do you consider would help attract investors, developers and tenants (businesses) to BREP?
- What would make investors, developers and tenants 'nervous' about a move or investment in BREP?
- What specific sustainability initiatives have you seen succeed elsewhere that could be considered for BREP?

Stakeholder Engagement

GIVEN LOCATION, SCALE AND PROPORTION OF LOCAL GOVERNMENT OWNERSHIP, WHAT DO YOU CONSIDER ARE THE KEY OPPORTUNITIES FOR THE BREP SITE FROM A SUSTAINABILITY PERSPECTIVE? WHAT IS UNIQUE ABOUT THIS CONTEXT?

General opportunities

Overarching opportunities for the BREP from a sustainability perspective were identified as follow:

- Developing a state-of-the-art precinct that is gas-free, reasonably self-contained (water, energy, waste streams), ensures an efficient use of land through greater density than existing industrial development in the region, and redistributes / shares energy, water and waste efficiently both within the precinct and with surrounding land uses
- Council leading by example, driving ambition and de-risking investment
- Tenants becoming early adopters of a low-carbon future and branding their businesses as such
- Creating a market for this type of development in Greater Bendigo and pushing the boundaries for what can be expected as part of industrial development in the region
- Council or other stakeholders offsetting certain cost implications of specific ESD initiatives to attract businesses into the precinct and support fantastic ESD outcomes
- Meeting Council's ambitious circular economy targets and other key local, regional and state targets
- Leveraging traditional and emerging industries such as agriculture, manufacturing, information technologies, freight and logistics, and food manufacturing
- Fostering collaboration regionally, particularly in regard to industrial synergies, circular economy and waste management
- Providing a new hub for students to gain practical experience and develop an understanding of industrial practice outside of the educational setting

Uses and tenancies

In terms of uses and tenancies, the following opportunities were suggested:

- Leveraging the site's location
  - + Logistics and high-end manufacturing – the Site is seen as a great gateway to north-western Victoria, and stop point between Melbourne and Mildura or Swan Hill
  - + However, due to its distance from the railway network, the site might be more suitable to businesses that service local and regional needs (specifically north-western Victoria)
- Leveraging surrounding uses
  - + Organics and energy investments such as anaerobic digestion facilities to assist surrounding agricultural uses close and reduce overall agricultural greenhouse gas emissions
  - + Cold stores and food manufacturing facilities to leverage the existing food and beverage industry in the region
- Looking for synergies and fostering industrial symbiosis
  - + Creating industrial symbiosis within the precinct was identified as a key success factor in achieving a sustainable industrial development
  - + Synergies can be made in the precinct but also beyond precinct boundaries, with uses and development on site potentially seeking to resolve other identified issues in the region.

Ecology and open space

In regard to ecology and open space, the following opportunities were identified:

- The Site should perform ecosystem services rather than 'break' them
- The precinct should seek to create a connection between reserve to the west and creek to the east by creating a green spine, leveraging existing drainage flows or existing water infrastructure such as the Wilsons channel
- The precinct needs to have right mix between employment and open space to create a place that is enjoyable to work in and experience more broadly. This includes recognising that open space is important for recreation as well as sustainability

Energy efficiency and resilience

Opportunities in regard to energy efficiency and resilience were identified as follows:

- Energy efficiency and resilience in this context is straightforward and should be prioritised
- The scale and location of the precinct make it a great candidate for renewable energy generation and battery energy storage
- The site could have its own microgrid. It also has a significant amount of High Voltage main feeder electricity assets in its surroundings, which provide good connectivity to the network
- The site therefore needs to be developed with renewable energy capacity in mind (i.e. spatial and building design implications such as roof reinforcement)

Stakeholder Engagement

GIVEN LOCATION, SCALE AND PROPORTION OF LOCAL GOVERNMENT OWNERSHIP, WHAT DO YOU CONSIDER ARE THE KEY OPPORTUNITIES FOR THE BREP SITE FROM A SUSTAINABILITY PERSPECTIVE? WHAT IS UNIQUE ABOUT THIS CONTEXT? (CONT.)

Water resilience and self-sufficiency

Opportunities in regard to water resilience were identified as follow:

- On-site Integrated Water Management initiatives need to be at the front and centre of this development. The lack of water and drainage infrastructure on site present an opportunity for the BREP to include decentralised assets that facilitate water resilience and self-sufficiency (e.g. water tanks and a wastewater treatment facility)
- Similarly, water collected onsite should be reused and redistributed on site and with surrounding uses such as the existing golf course or other water intensive uses (either existing or that could be incentivised to relocate near the site)
- Existing water infrastructure and drainage flows should be incorporated into the landscape and leveraged in the creation of a green spine through the site. The Wilson channel provides water for stock and domestic usage and is generally dry. However, the easement might be wide enough to accommodate both the channel and a bike track for example. It could otherwise be turned into an underground asset
- Integrated Water Management initiatives should enhance the connection to aboriginal cultural history and water on site

Transport

Opportunities in terms of transport were identified as follow:

- Incorporating enabling infrastructure for EV integration is key. As a gateway to north-western Victoria and stop point between Melbourne and Mildura or Swan Hill, the development of the BREP needs to leverage its location and provide enabling infrastructure such as truck EV charging stations as well as supporting food and beverage infrastructure to ensure it becomes an attractive hub in regional freight movement
- The precinct should also seek to achieve economies of scale in transport. This could be achieved by providing EV sharing infrastructure for various vehicle sizes
- Road hierarchy and layouts should support street activation and ensure the appearance, quality and urban design of the precinct positively contributes to its setting

Waste and resource recovery

Opportunities in regard to waste and resource recovery were identified as follow:

- Waste and resource recovery infrastructure needs to be fully integrated in the design of the precinct both at the business and precinct level if it is to be successful
- Businesses need to be supported in finding ways to reduce waste streams
- A resource HUB on-site to redistribute materials efficiently would support industrial synergies within the precinct and with surrounding uses. This could be provided by Council or a separate entity such as precinct operator
- Resource sharing often comes with a time or space lag. There is an opportunity for Council to hold back land in a reasonable position to cater for this time and space and only develop these parcels once resource and material flows are better understood

Stakeholder Engagement

GIVEN THIS CONTEXT, WHAT DO YOU CONSIDER ARE THE KEY BARRIERS TO DELIVERING BEST PRACTICE OUTCOMES? AND WITH SPECIFICS TO BREP?

Key barriers were identified as follow.

- The potential lack of demand for this type of development due to the location and local regional context
- The cost of bringing infrastructure to the site, especially water and sewerage
- The lack of accessibility and connection to rail and key national transport networks, especially in regard to staff accessibility and missed inter-modal opportunities
- The proximity to sensitive uses and wind direction, in regard to potential off-site amenity impact such as smell or noise
- The timing and delivery of development which is much longer than typical business planning timeframes. This could result in the vision and economics for the site getting outdated or too much uncertainty in regard to tenant attraction
- The cost of delivering best practice being disproportionately transferred to land owners or future tenants
- General construction cost & inflation
- Unclear role for Council in delivery – ambiguity in delivery strategy and Council's role may be a barrier to market certainty over infrastructure, timeframes etc. Council additionally may be constrained by its legislated community service delivery role
- Competing interests and project drivers. For example, circular economy industries and activities tend to generally require very low employment density, which might be a concern for the City of Greater Bendigo which seeks to promote circular economy principles but will also have employment as a key driver for the development of the precinct

WHAT DO YOU CONSIDER WOULD HELP ATTRACT INVESTORS, DEVELOPERS AND TENANTS (BUSINESSES) TO BREP?

The following elements were identified as key in attracting investors, developers and tenants.

- Clarity and certainty – in regard to overall precinct vision, sustainability ambitions, infrastructure to be provided, type of industries sought, development process and delivery and overall communication and curation
- Leadership at the state and local level to assist with investment confidence
- The provision of the right infrastructure at the right time in regard to, energy, transport, water, waste and technology.
- A well-articulated site program that goes beyond industrial uses and facilitates the establishment of an employment ecosystem that can support the growth of a variety of complementary businesses and institutions.
- Capital investment that will result in overall reduced services costs for tenants
- Delivering on state and federal targets, which might in turn result in further investment and grants for the overall precinct development but also at the business level
- Flexibility around lot sizes and opportunities for businesses to scale up and grow
- Strong partnerships between existing businesses, industries and institutions, including universities

WHAT WOULD MAKE INVESTORS, DEVELOPERS AND TENANTS 'NERVOUS' ABOUT A MOVE OR INVESTMENT IN BREP?

The following elements were identified as potential deterrent to moving to or investing in the precinct:.

- Excessive prices, particularly for the first stages of the development. Attention needs to be given to costs being market relative
- Lack of clarity and certainty – in regard to overall precinct vision, sustainability ambitions, infrastructure to be provided, type of industries sought, development process and delivery and overall communication and curation
- Complexity such as:
  + Intricate planning controls
  + Restrictions that are too onerous or unevenly distributed
  + Rating systems that add cost but don't deliver outcomes
  + Overly prescriptive governance models – For example, though embedded networks present a number of advantages in terms of energy efficiency and resilience, individual connections allow businesses more control and certainty over energy costs and could therefore be seen as preferable

Stakeholder Engagement

WHAT SPECIFIC SUSTAINABILITY INITIATIVES HAVE YOU SEEN SUCCEED ELSEWHERE THAT COULD BE CONSIDERED FOR BREP?

The following specific sustainability initiatives were identified:

- Establishing a microgrid and battery energy storage facility
- Investing in waste to energy facilities on site, such as an anaerobic digestive facility
- Capturing and treating rainwater and stormwater to provide a local alternative water supply, including roof water harvesting for potable use
- Establishing a marketplace / HUB to redistribute surplus resources (energy, water and waste). The data can then be used to foster additional industrial synergies and attract complementary tenants. It also localises supply chains
- Setting up an R&D space with all the servicing necessary for a business / start-up to able to 'plug and play'. Companies at a certain stage of development can be supported for a set amount of time (e.g. 3+ years) and further invest in their own product or bigger facilities once they reached a certain amount of maturity. This can also provide an opportunity for students to gain practical experience and develop an understanding of industrial practice outside of the educational setting
- Facilitating third-party aggregation of services for tenants
- Using a Development Contribution Plan Overlay layered with Section 173 agreements and/or restrictive covenants on lot entitlement to ensure design guidelines and sustainability initiatives a rolled out throughout the whole development.
- Using a precinct operator to coordinate the precinct development and facilitate a number of operational services that are more efficiently managed at the precinct scale (facility management and maintenance, and energy, water and waste management and redistribution).

Fig 73. Tonsley Innovation District, SA. Photography by Sam Noonan.

We respectfully acknowledge that every project enabled or assisted by HIP V. HYPE in Australia exists on traditional Aboriginal lands which have been sustained for thousands of years.

We honour their ongoing connection to these lands, and seek to respectfully acknowledge the Traditional Custodians in our work.

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For additional information, questions unturned, collaboration opportunities and project enquiries please get in touch.

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