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DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

Moree Special Activation Precinct Package A – Structure Plan

STRUCTURE PLAN REPORT

Design for a better future

MARCH 2021

Image: Cotton farm in Moree
Image courtesy of Destination NSW

We acknowledge the **Gamilaroi people** as the traditional and continuing custodians of Moree who have cared for their Country for thousands of generations. We pay respect to their elder's past, present and emerging and recognise their cultural and ancestral connections to the land, skies and waters of the site under investigation throughout this project.

We also acknowledge and pay our respects to the people and elders of the **D'harawal, Dharug, Eora, Gandangurra, Gur-rin-gai and Yuni nations** of Sydney and its regions, as the custodians of the lands upon which we live and work.

This report seeks to genuinely recognise the needs and aspirations of the Gamilaroi people and the local Aboriginal community.

Streetscapes, Moree

James Ellis three-story mural depicting a farmer and his calf on a building at the corner of Heber Street and Roslyn Lane, Moree

Image courtesy of Destination NSW

Question today
Imagine tomorrow
Create for the future

Moree Special Activation Precinct, Package A - Structure Plan
Structure Plan Report

Department of Planning, Industry and Environment

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REV	DATE	DETAILS
1	17/12/2020	Draft Report
2	5/2/2021	Final Report
3	19/03/2021	Final Report including Clients comments

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1 INTRODUCTION

1.1 MOREE SPECIAL ACTIVATION PRECINCT

The Special Activation Precincts program facilitates job creation and economic development in designated areas of regional NSW through infrastructure investment and streamlined planning. SAPs are a place-based approach to "activate" strategic locations that are areas of state or regional significance, selected based on an assessment of economic enablers, market failures and catalyst opportunities. The five components of a SAP are government-led studies, fast track planning, government-led development, infrastructure investment, and business concierge.

Figure 1.1 The five components of the SAP program

The Moree SAP is the fourth location to be announced by the NSW Government after Parkes, Wagga Wagga and the Snowy Mountains. The focus for all SAPs is a 40-year vision for job creation and regional economic development. In November 2020, Narrabri was announced as the fifth SAP. Figure 1.2 provides an aerial 3D image of the Moree Town Centre viewed from the north-west, split by the Mehi River and showing the SAP investigation area in the distance.

Figure 1.2 Satellite image of the Moree Town Centre from the north-west

1.2 STRUCTURE PLAN

The Structure Plan is the key output of Stage 3 of the Moree SAP Structure Plan process. The Structure Plan synthesises the outcomes of the Final Enquiry by Design workshop, feedback from government agencies and recommendations from technical studies.

The overall staging of the Structure Plan process is shown in Figure 1.3 and timeframes are shown in Figure 1.4.

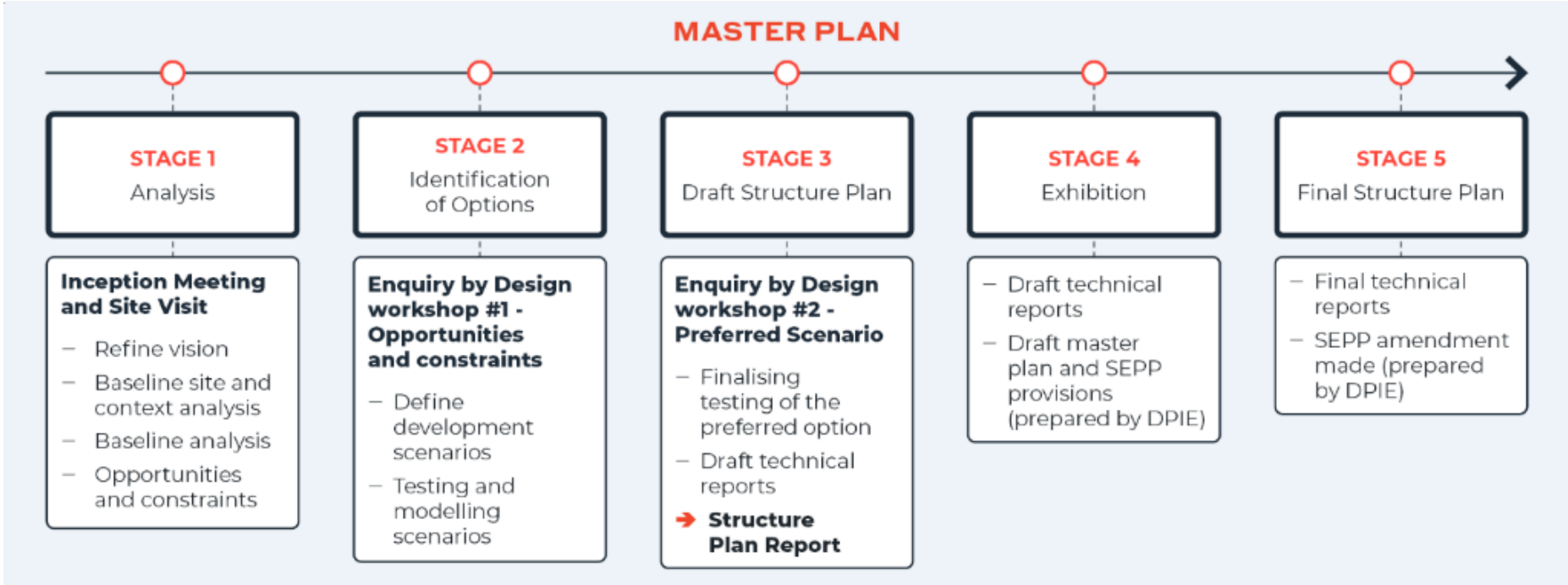


Figure 1.3 Moree SAP project stages

Figure 1.4 Diagram of Moree SAP project timeline

The Structure Plan is informed by the following reports:

- Community and Social Infrastructure Report by WSP (Elton Consulting)
- Sustainability Report by WSP
- Traffic and Transport Report by Arcadis
- Utilities Report by Arcadis
- Flooding and Water Cycle Management Report by Arcadis
- Renewable Energy Report by Arcadis
- Biodiversity Report by Aurecon
- Heritage Report by Aurecon
- Bushfire Report by Aurecon
- Hydrogeology Report by Aurecon
- Contamination Report by Aurecon
- Air, Noise and Odour Report by Todoroski Air Sciences
- Water Demand Report by WSP
- Study to Understand Moree's Indigenous Community Report by Murawin
- Economics Report by CIE.

1.3 THE VISION FOR THE MOREE SAP

The Vision for the Moree SAP sets the framework and is the roadmap for the Structure Plan. It has been developed in consultation with key stakeholder groups and has evolved over the life of the project to date. The following pages present the Vision for the Moree SAP.

VISION

With national and global connections, the Moree Special Activation Precinct enables diversification of Moree's proud agricultural economy by building on its strong connection to Country and sustainable water endowments and energy infrastructure. The Special Activation Precinct fosters world class opportunities to value-add, embrace new technologies and develop innovative energy solutions

THE PLACE

- Design a world-class welcoming and sustainable precinct that attracts investors, boosts the region's economy and improves the quality of life for the people of the Moree Shire.
- Develop a sustainable enterprise precinct that respects the community and responds to the region's landscape and agricultural setting.
- Protect the amenity of nearby neighbourhoods.
- Provide for a range of land uses to accommodate new and emerging industries.

CONNECTION TO COUNTRY

- Ensure that the Precinct responds positively to the directions set out in the NSW OCHRE Plan to the fullest extent possible.
- Open up economic opportunities through land-based activities for Aboriginal owned land. Respect the Gomeroi people's cultural rights, obligations, and roles as Traditional Custodians of the land and waterways by embedding Aboriginal cultural knowledge in the project's delivery.
- Partner with Aboriginal stakeholders to increase employment and social and economic enterprise opportunities for local Aboriginal people.
- Recognise and support appropriate engagement and consultation with Aboriginal stakeholders and the Aboriginal community.
- Ensure recognition and protection of Aboriginal cultural links to the Precinct.

ENVIRONMENT AND SUSTAINABILITY

- Protect and enhance water sources, including aquifers.
- Enable sustainable water use and energy management as standard approaches across the Precinct.
- Be carbon and climate neutral and protect biodiversity and environmental values within and surrounding the Precinct.
- Incorporate water, bio-energy and waste cycle management and ecologically sustainable development principles.
- Locate future development outside of flood prone areas and drainage corridors.
- Respect the landscape of the Moree Plains and respond appropriately to the unique black soil properties in the Precinct.
- Establish benchmarks for businesses to achieve environmental management standards aligned with the International Organisation for Standardisation.

VISION

ECONOMIC AND INDUSTRY

- Create a world-class precinct the leverages the existing investment to support new and expanded industries.
- Facilitate the streamlined establishment of new and emerging industries aligned with agriculture, transport and logistics, circular economy, advanced production and manufacturing.
- Support the establishment of circular economies through industry colocation opportunities, such as aquaculture and hydroponics.
- Attract exemplar businesses with corporate social responsibilities aligned to the vision and aspirations of the precinct.

SOCIAL AND COMMUNITY INFRASTRUCTURE

- Grow education and training opportunities across the Precinct that align with the skills of industries to benefit the Moree community. Increase job prospects and up-skill the local community through new job opportunities.
- Support the provision of social and community infrastructure to improve quality of life and amenity for workers.

INFRASTRUCTURE AND CONNECTIVITY

- Leverage transport connections through air, road and rail to drive exports and economic growth.
- Maximise opportunities arising from renewable energy, innovation and agricultural expertise for horticulture and diversified agricultural production.
- Design efficient and equitable transport connections that reduce traffic, travel times and increases road safety.
- Enable effective linkages between Moree Town Centre and the Precinct with access through equitable transport choices.
- Enable effective linkages between the Precinct and Moree Regional Airport to facilitate growth in trade and value-add products.
- Ensure the whole Precinct has access to appropriate utility and services (water, sewer, stormwater, communications and digital connectivity) including the potential for district level energy and storage.
- Lead the implementation of smart technology within the Precinct (including ag-tech revolution).
- Build on and enhance connections to regional centres which provide strong opportunities for value-add to food and fibre.

2 STRUCTURE PLAN METHODOLOGY

2.1 KEY STAGES

The development of the Moree SAP Structure Plan has progressed through a series of stages involving:

- An Integrated Analysis of the Investigation area
- Preparation of Scenarios (preliminary workshop)
- Evaluation of Scenario Options
- Preparation of a Preferred Scenario (final Enquiry by Design workshop)
- Evaluation of the Preferred Scenario
- Preparation of the final Structure Plan.

The process for this evolution in the Structure Plan has been driven through collaborative Enquiry by Design processes and engagement with key stakeholders, supported by technical studies. Ongoing consultation with Moree Aboriginal Elders, local businesses, landowners and service providers was also key to the Structure Plan's development. This section summarises this overall process and the key outputs from each stage.

2.1.1 *INTEGRATED ANALYSIS*

Following an inception workshop in Moree in July 2020, the consultant teams undertook a ground truthing exercise across the investigation area through desktop analysis, data collection, field surveys, and modelling of existing context. This included establishing base models, identifying constraints, and recommending key areas for further investigation. An Integrated Analysis Report was produced which drew conclusions around key areas requiring further examination and consideration across four themes, namely:

- Overarching considerations (economic, social and sustainability)
- Aboriginal Planning and Design
- Environment and Resources
- Infrastructure and Land Use.

2.1.2 *PRELIMINARY ENQUIRY BY DESIGN WORKSHOP*

A two-day Enquiry by Design workshop was held in September 2020, involving DPIE, MPSC, key agencies and the consultant teams. Three scenarios were developed from this workshop to inform further testing by the consultant teams.

2.1.3 *SCENARIO EVALUATION*

The three scenarios were evaluated against the Vision for the SAP and reports produced across all technical streams, along with the identification of innovative solutions that could support and strengthen SAP outcomes. A strengths, weaknesses, opportunities and threats (SWOT) analysis was undertaken, which consolidated all evaluation outcomes. This SWOT can be found at Appendix B to this Report.

2.1.4 *FINAL ENQUIRY BY DESIGN WORKSHOP*

A final Enquiry by Design workshop was held over four days in Moree to develop a preferred Structure Plan, based on the findings of the technical studies, outcomes of community and stakeholder consultation and testing of scenarios.

During the workshop, participants worked collaboratively to progress the Preferred Scenario from 50 per cent to 95 per cent completion.

Figure 2.1 Structure Plan package consultant facilitating group discussion during Final Enquiry by Design workshop

Figure 2.2 Group interrogating design solutions during Final Enquiry by Design workshop

2.2 ENQUIRY BY DESIGN WORKSHOPS

Enquiry by Design workshops are a structured, iterative design process that brings together all workstreams and packages to thoroughly test land use and infrastructure options, concepts and solutions. The preliminary and final Enquiry by Design workshops are critical decision-making points and touchstones for the collaborative and integrated approach to the Structure Plan. Successful navigation of these complex and inter-dependent process is key to fostering collaboration, achieving stakeholder buy-in and realising the Vision for the SAP.

Table 2.1 provides an overview of the objectives of the preliminary and final Enquiry by Design workshops.

Table 2.1 Objectives and outcomes of Moree SAP Enquiry by Design workshops

DESCRIPTION	DETAILS	OBJECTIVE
Preliminary Enquiry by Design	Department of Planning, Industry and Environment Parramatta Office Monday 14 September–Tuesday 15 September 2020	Participants worked collaboratively to develop three Structure Plan scenarios that align with the precinct vision and respond to the findings of the Stage 1 Baseline SAP Technical Studies. The workshop provided the opportunity to think strategically and holistically about what the SAP should achieve and to test best practice, innovative design solutions through three identifying varying spatial configurations.
Final Enquiry by Design	Moree Shire Council Chambers Tuesday 17 November–Friday 20 November 2020	Participants leveraged the Stage 2 analysis and worked collaboratively to interrogate the three proposed Scenarios to develop one final Structure Plan scenario which aligns with the precinct vision. The Final Enquiry by Design workshop provided clarity around the preferred Draft Structure Plan options, identified gaps that require resolution and a clear workplan across all packages to enable delivery of the Draft Structure Plan for public exhibition.

2.3 STAKEHOLDERS

Stakeholders engaged through the development process for the Moree SAP Structure Plan included:

- Department of Planning, Industry and Environment (including DPIE Water, DPIE Biodiversity Conservation and Science Directorate, NSW Environment Protection Authority)
- Moree Plains Shire Council
- Regional Growth NSW Development Corporation
- Department of Regional NSW
- Moree Local Aboriginal Land Council
- Transport for NSW
- Training Services NSW
- Aboriginal Affairs NSW
- Hunter New England Health
- Department of Education
- Department of Community and Justice
- Moree Secondary College
- Moree East Public School
- NSW TAFE
- Moree PCYC
- Moree Police
- Moree Aged and Disability care
- Moree Aboriginal Elders
- Moree service providers
- Moree businesses and landowners, including the owners of Moree Solar farm, Moree Chamber of Commerce and several industry representatives.

Figure 2.3 Online engagement with technical specialists and stakeholders

Figure 2.4 Online engagement with technical specialists and stakeholders

3 THE STRUCTURE PLAN AT A GLANCE

The Structure Plan provides the road map for the planning and development of the Moree SAP across a 40 year horizon. It does this by integrating outcomes from investigation, analysis and engagement processes to provide a development framework which balances the various aspirations set out in the SAP Vision across all environmental, economic and social considerations.

The subsequent chapters of this Plan set out the detailed investigation and analysis processes that have been applied to key technical considerations, including Sustainability, Economic and Social Outcomes, Environment, Movement and Infrastructure. Each of these considerations have been built on a set of Principles, drawn down from the Vision, to determine the optimal approach and outcomes for the Structure Plan.

This Chapter serves to provide an overview and summary of the Structure Plan and the manner in which key technical outcomes have been integrated to enable a holistic and well-considered planning pathway for the Moree SAP.

KEY PRINCIPLES

The 40-year Structure Plan Vision builds on key Principles that are derived from each area of technical analysis. This analysis and key Principles can be found in subsequent chapter. Key Principles include:

SUSTAINABILITY

- Deliver a net-zero carbon and climate precinct
- Embed circular economy principles within the design of the precinct
- Efficient use and protection of ground water resources
- Design to mitigate known local climate risks.

SOCIAL OUTCOMES

- Optimise benefits for the local community
- Recognise and responding to the historical disadvantage and trauma experienced by local indigenous communities
- Enable education and employment opportunities to build a local workforce
- Mitigate adverse impacts to adjacent residential communities
- Support the delivery of social infrastructure and community services to improve Moree's amenity and quality of life offering to attract and retain a skilled workforce.

ABORIGINAL PLANNING & DESIGN

- Heritage - retain and celebrate Moree's proud Aboriginal culture and heritage
- Indigenous led - Indigenous people (designers, elders etc.) should be leading or co-leading the Indigenous elements in the design.
- Community involvement - the local Indigenous community needs to be engaged in this process.
- Appropriate use of Indigenous design - all Indigenous design elements must be approved of by involved Indigenous people/ community/elders. If approval is not given, the knowledge will not be used in the project.

ECONOMIC OUTCOMES

- Ensure that the competitive attributes of the Moree SAP are optimised for investment attraction and jobs creation
- Build economic opportunity for the local and regional communities through jobs and growth
- Strengthen local industries and enterprises

ENVIRONMENT

- Avoid, minimise impact or offset areas of high biodiversity value.
- Avoid developing flood prone areas and water catchment areas.
- Provide access to utilities and sustainable water and energy resources.

MOVEMENT

- Facilitate the uptake of active transport through increasing connectivity to the Moree town centre and improving the precinct's permeability
- Deliver an intermodal precinct which leverages Moree's air, road and rail connectivity

INFRASTRUCTURE

- Ensure infrastructure delivery is phased to support development objectives
- Deliver infrastructure in a cost-effective and fit-for-purpose manner

3.1 40 YEAR DEVELOPMENT VISION

A 40 year indicative development vision is shown in Figure 3.1, demonstrating the manner in which different parts of the SAP may ultimately be developed under the Structure Plan

Figure 3.1 Moree SAP 40 year development vision

3.2 SUB-PRECINCT PLAN

To support the orderly planning and development of the overall SAP, a number of key sub-precincts have been identified, enabling more fine-grain development objectives, staging and infrastructure planning to occur. Figure 3.2 provides an overview of the sub-precincts. Table 3.1 provides a summary of their areas.

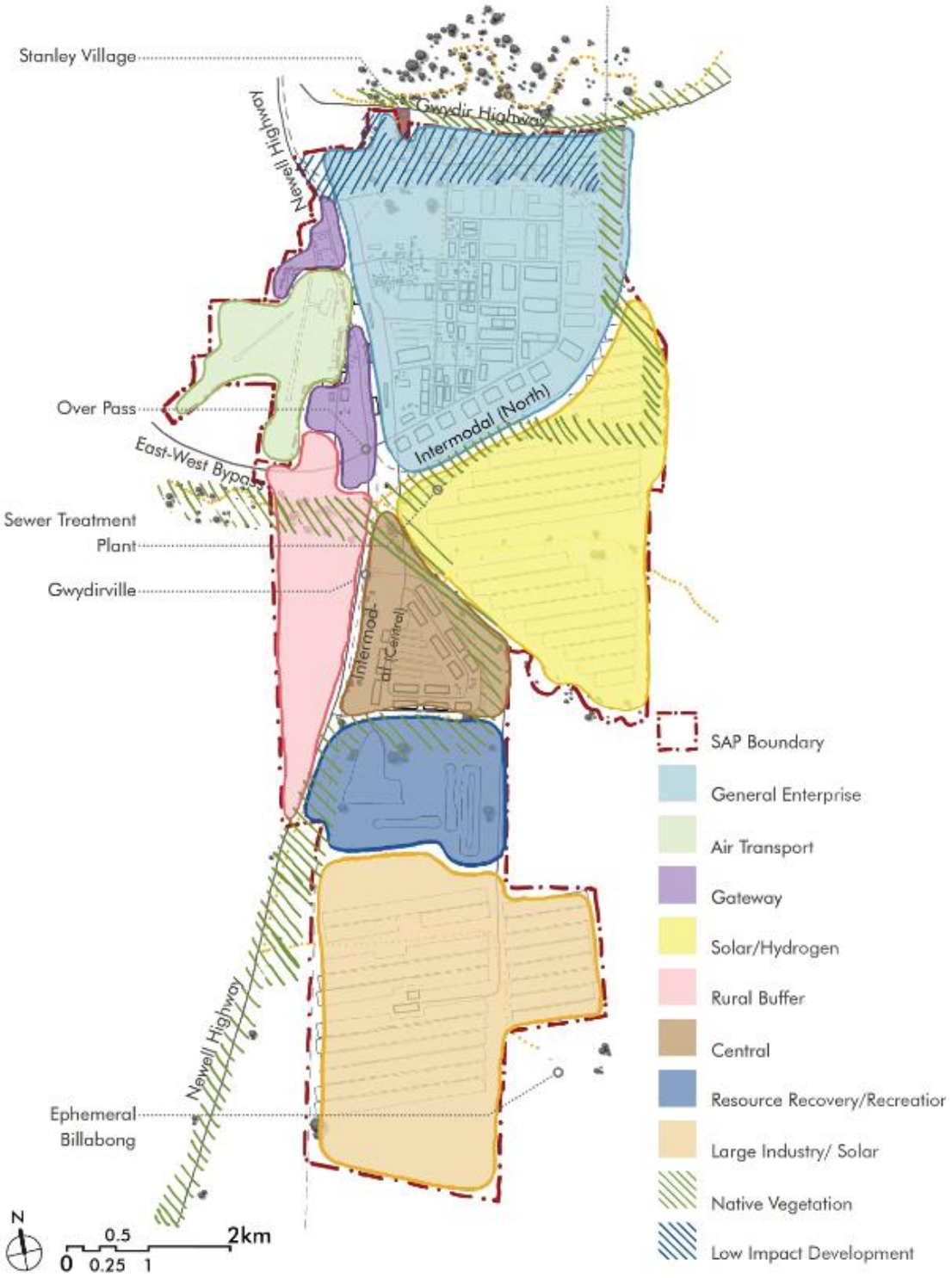


Figure 3.2 Moree SAP sub-precinct plan

Table 3.1 Summary of sub-precincts and their areas

Sub-Precinct	Area (ha)
General Enterprise	1195
General Enterprise (low impact area)	213
Central	351
Gateway	127
Central Solar/Energy	938
Resource Recovery & Recreation	359
Large Industry & Solar	1158
Air Transport	237
Rural buffer	292
Total	**4931**

3.2.1 *GENERAL ENTERPRISE SUB-PRECINCT*

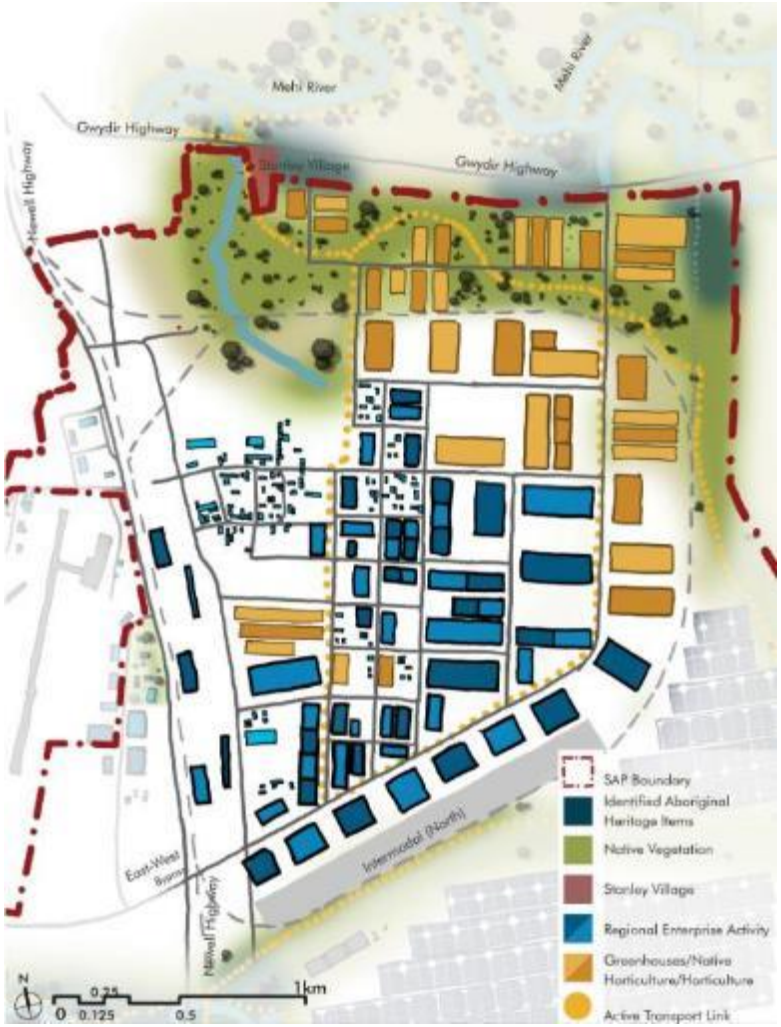


Figure 3.3 Moree SAP General Enterprise Sub-Precinct

The General Enterprise Sub-Precinct builds off the existing development in the north of the investigation area, including the Industrial Drive industrial area and existing inter-modal terminal and grain storage facilities.

There are substantial areas of land and existing subdivisions which are well serviced by existing infrastructure (roads, sewer, drainage, etc) and which are presently available for development (especially near the Industrial Drive Estate). There are existing private inter-modal terminals along the Inland Rail alignment and good road access from the Newell Highway. Access is also available from the Gwydir Highway.

The existing infrastructure makes the General Enterprise sub-precinct an obvious early stage of development, supporting a diversity of activity associated with intermodal transport, warehousing, advanced manufacturing, horticultural and agriculture processing businesses, and ancillary infrastructure.

There is access to the Lower Gwydir Alluvium, potentially providing high quality groundwater to support water intensive agriculture, such as horticulture and native horticulture, though the scale of this activity may be limited by the balancing need to protect groundwater supplies and the cost of alternative water resources.

This sub-precinct also includes the Moree Local Aboriginal Land Council lands, which are suitable for development and align with the Aboriginal Planning and Design principles. The northern edge of the sub-precinct borders Stanley Village where it is proposed to provide a landscape buffer and adjacent low impact development area, also picking up areas of land which are potentially flood prone and which have higher bio-diversity values.

The sub-precinct would be mainly accessed from the new Moree Intermodal Overpass (MIO) in the south, providing safe and efficient access to and from the Newell Highway, with existing level crossing routes retained at Bullus Drive and Tycannah Street. A new road connection from the MIO around the perimeter of the sub-precinct and through to the Gwydir Highway forms a part of the proposed Moree East-West Bypass.

A new rail spur is envisaged along the southern edge of the sub-precinct to enable the development of a substantial inter-modal terminal to support anticipated future investment in agricultural good processing, grains transfer and freight management. This rail spur would loop around the sub-precinct and re-join the existing Inverell Line alignment. A corridor along the western edge of the sub-precinct is retained to support a potential future realignment of the Inland Rail around Moree.

The Travelling Stock Route (TSR) runs along the western and southern edges of the sub-precinct and would be re-aligned in the south to enable the optimum location for the new inter-modal terminal. The TSR also enables an active transport link (walking and cycling) through the sub-precinct, with a connection in the north back to Moree via Stanley Village.

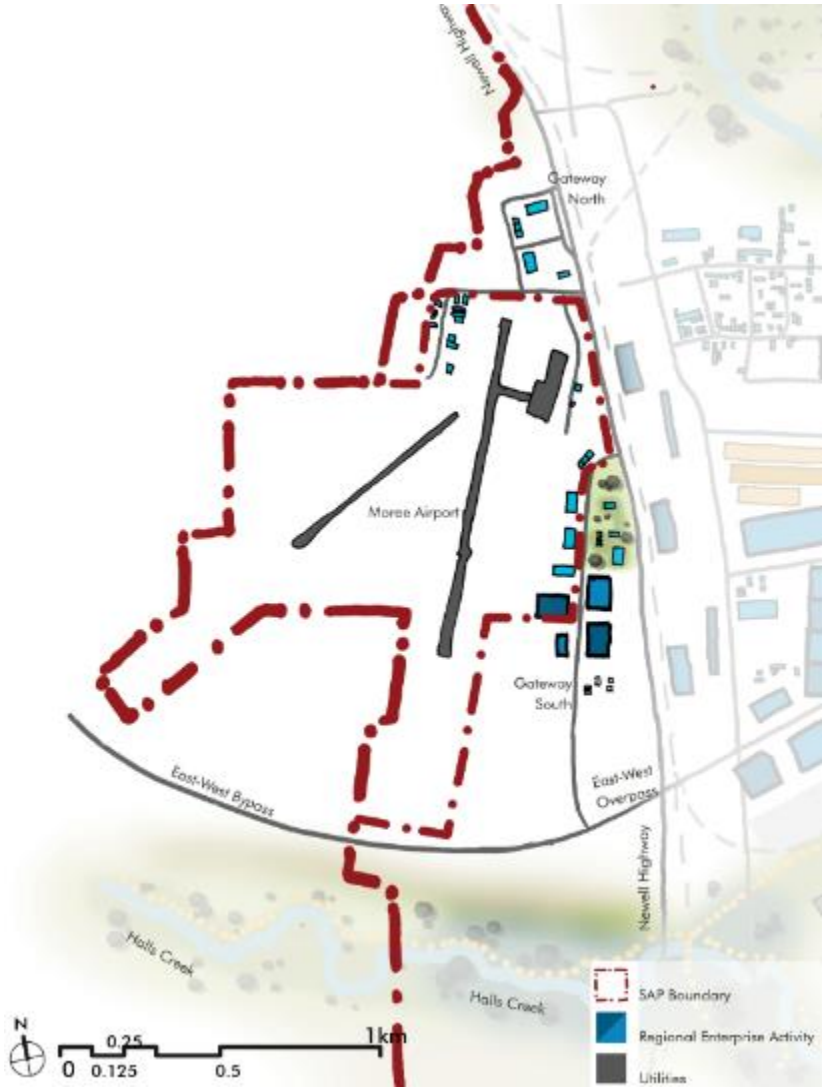


Figure 3.4 Moree SAP Air Transport and Gateway Sub-Precincts Plan

3.2.2 *AIR TRANSPORT SUB-PRECINCT*

Moree Regional Airport is included in the Moree SAP due to its strategic importance to the region and Precinct generally, particularly in strengthening efficient access to export markets. It is expected that the importance of the Airport to regional development will continue to grow and this will be supported by a proposed extension in the length of one of the runways, to facilitate the use of larger aircraft. The land required for a potential runway extension is included in the sub-precinct.

3.2.3 *GATEWAY SUB-PRECINCT*

The Gateway sub-precinct includes the Gateway Estate being developed by MPSC along the Newell Highway (north of the Airport) and areas of rural land south of the Airport currently used for cropping. The southern end of this quadrant will have access to the MIO and connecting roads back to the Newell Highway.

The Gateway sub-precinct provides serviced land for activities that may require proximity to the Airport or which can take advantage of proximity to the Newell Highway. There is potential to extend the Gateway Estate further south between the Newell Highway and Moree Airport to take advantage of access to the MIO and roads connecting back to the Newell.

The Halls Creek riparian corridor overlaps with the TSR through this area and has relatively high environmental attributes, warranting protection and rehabilitation, potentially as part of an active transport circuit.

Figure 3.5 Moree SAP Central Sub-Precinct Plan

3.2.4 *CENTRAL SUB-PRECINCT*

The Central Sub-Precinct is currently dominated by the Louis Dreyfus cotton gin and intermodal terminal. It includes the small village of Gwydirville (approximately nine dwellings) and will benefit from the 2 km ARTC siding along the upgraded Inland Rail alignment. The edges of this sub-precinct, within the TSR, contain significant Aboriginal heritage artefacts and scarred tree sites which are to be protected and included in the active transport circuit.

Although constrained by Gwydirville, this sub-precinct provides the most practical and probably most economically viable site for the first stage of SAP development, by leveraging the ARTC siding investment, to enable early implementation of a publicly accessible inter-modal facility and associated development of freight and logistic facilities and value-add agricultural production.

The upgrade of the Inland Rail will necessitate closure of the Burrington Road/ Newell Highway intersection.

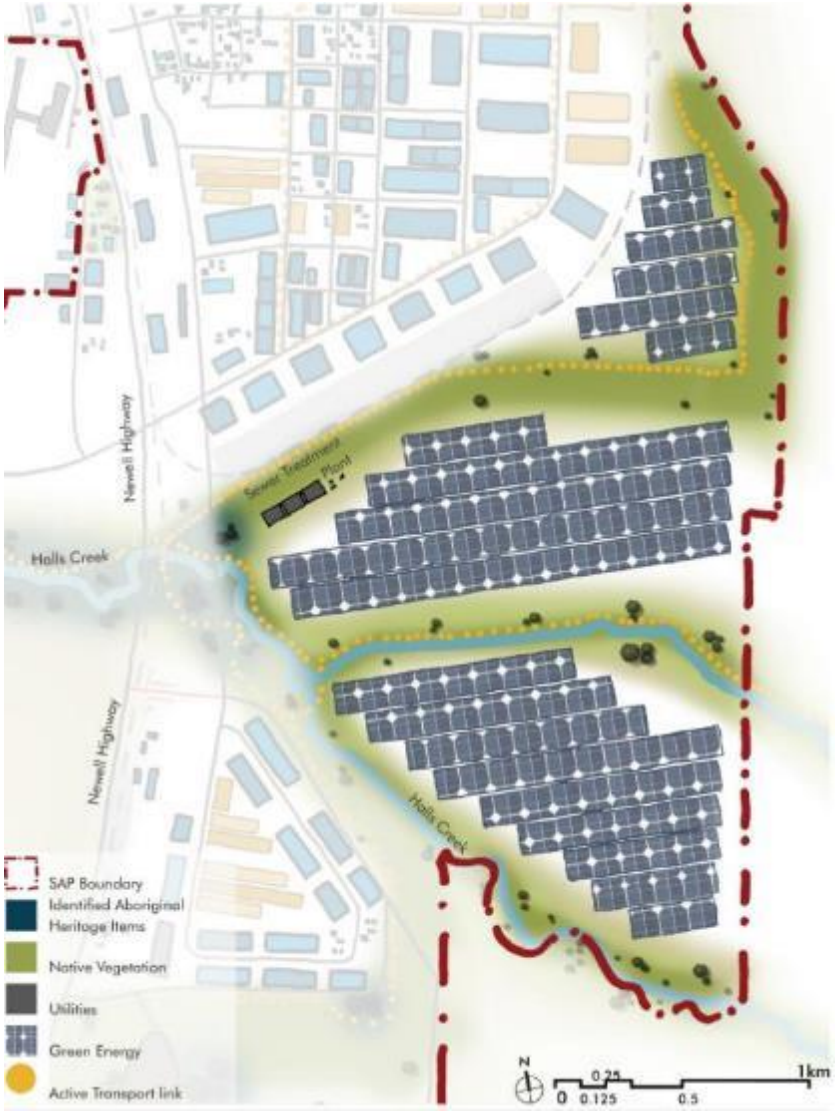


Figure 3.6 Central Solar Sub-Precinct

3.2.5 *CENTRAL SOLAR SUB-PRECINCT*

This sub-precinct is relatively undeveloped and divided by the upper reaches of Halls Creek. There are few development constraints and limited environmental or heritage attributes. Although centrally located, there is limited existing infrastructure in place, making this sub-precinct best suited for land uses that have large land and relatively low infrastructure requirements, such as energy/solar facilities. A preferred location for a future Sewage Treatment Plant (STP) has also been identified in this sub-precinct.

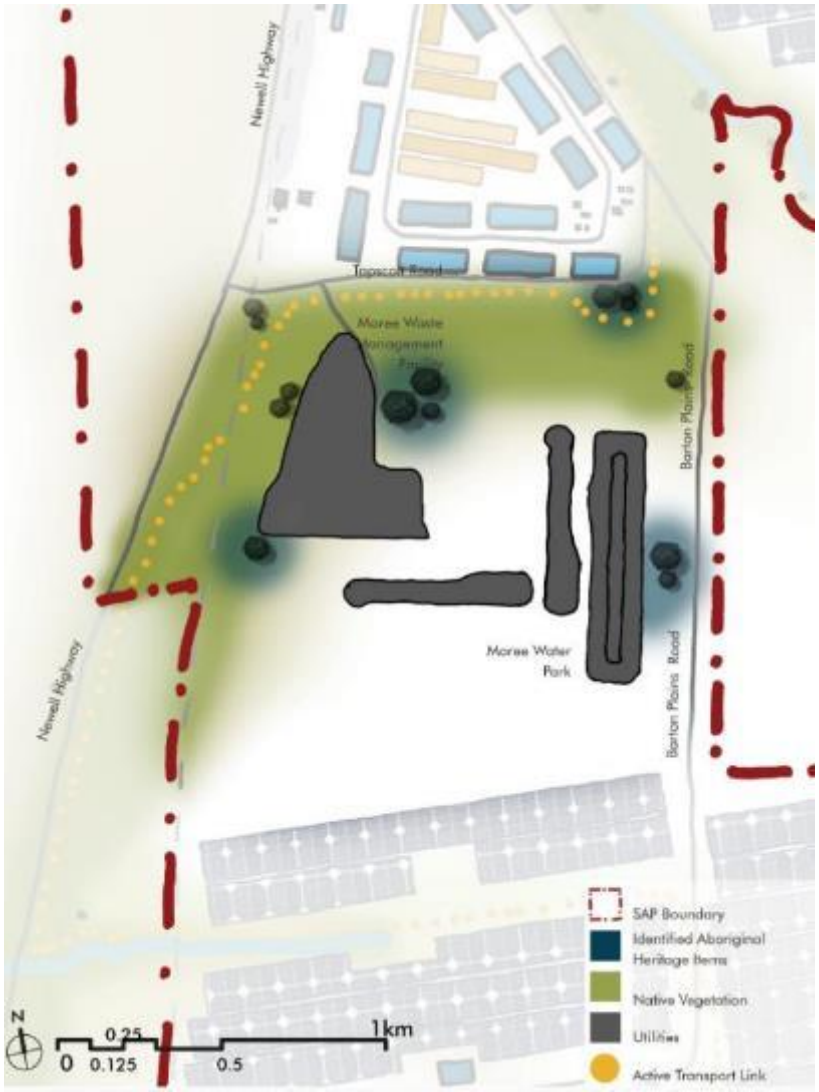


Figure 3.7 Resource recovery sub-precinct

3.2.6 *RESOURCE RECOVERY AND RECREATION SUB-PRECINCT*

This is a transitional sub-precinct between the Central and Large Industry/Solar Sub-Precincts and includes the existing Moree Regional Waste Facility and the Moree Ski Park as important continuing land uses, each of which provides an opportunity for further compatible development.

Access to the Moree Waste Facility and the new inter-modal terminal make this sub-precinct well-suited to industries that leverage circular economy eco-systems, to reuse and repurpose waste to produce higher value products.

However, opportunities for development may be constrained due to the large area of land taken by the existing TSR and potential use of land in this sub-precinct to offset vegetation removal in other areas of the SAP (refer to Environment Chapter).

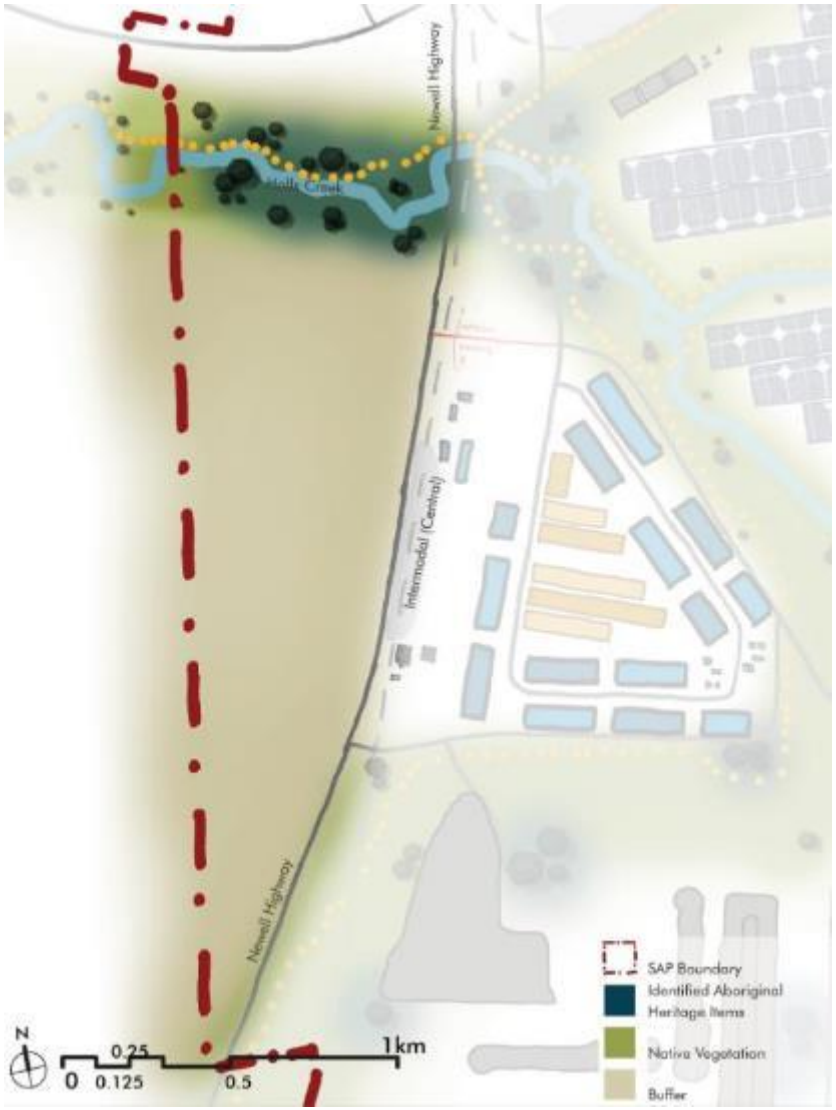


Figure 3.8 Rural buffer sub-precinct

3.2.7 *RURAL BUFFER SUB-PRECINCT*

This sub-precinct has been identified as an area which may suffer from adverse noise, odour and air-quality impacts once the General Enterprise and surrounding sub-precincts are developed (refer to Environment Chapter). It is a relatively isolated area with little existing infrastructure, so is not well suited to development. Accordingly, it is to be retained as a rural buffer area, with ongoing rural uses.

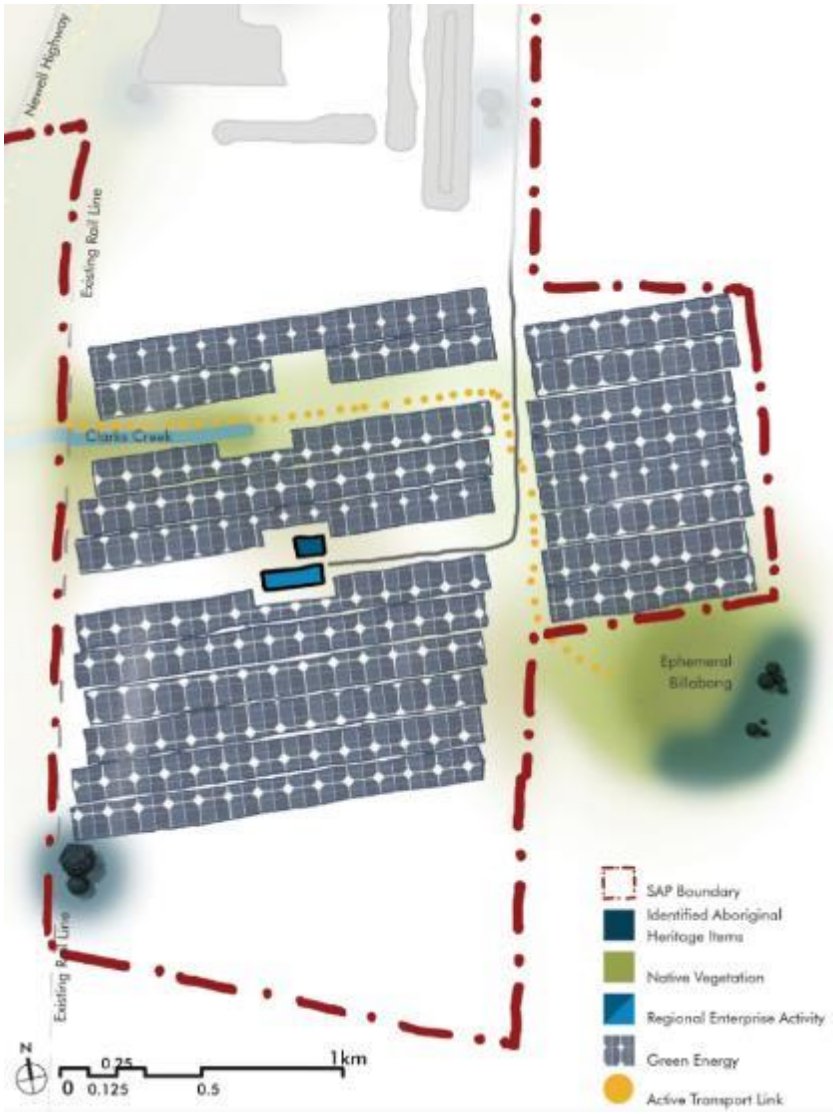


Figure 3.9 Moree SAP Large Industry/Energy Sub-Precinct Plan

3.2.8 *LARGE INDUSTRY/ENERGY (SOLAR) SUB-PRECINCT*

A large precinct at the southern end of the SAP which is includes the existing Moree Solar Farm and is well-suited to new solar development and higher impact land uses. The relative isolation of this area from housing and other sensitive land uses makes it potential suited to land uses that requires a substantial buffer area such as large industrial development and potentially including hazardous and offensive industries, such as hydrogen or fertiliser production. Buffer zones would be well-suited to additional solar development.

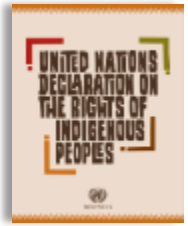
4 POLICY CONTEXT

The Policy landscape affecting the planning of the Moree SAP is wide and complex, encompassing strategic objectives formulated by Federal, State and local governments as well as international considerations and many sectors of consideration. This section seeks to document and provide an overview of most relevant and the extent to which they may be considered in the Structure Plan process.

4.1 GLOBAL AND NATIONAL POLICIES

4.1.1 *SUSTAINABILITY*

UN Sustainability Goals (United Nations, 2015) prioritises 17 Sustainable Development Goals as part of a Sustainable Development Agenda with the purpose of transforming our world by ending poverty, protecting the planet and ensuring prosperity for all. To achieve these goals change is sought from governments, the private sector and civil society.



UN Declaration on the Rights of Indigenous Peoples (United Nations, 2007) was developed to enshrine and protect the rights of Indigenous peoples across the world that may not already be protected in other human rights charters.
The Declaration establishes a framework of minimum standards for the survival, dignity and well-being of the Indigenous peoples of the world.

Australia's Commitment to the COP21 Paris Agreement (United Nations, 2015) demonstrates Australia's commitment to taking strong domestic and international action on climate change. Australia became a signatory to the Paris Agreement on 22 April 2016. Under the Paris Agreement, Australia has committed to reducing emissions to 26–28 per cent on 2005 levels by 2030.

National Climate Resilience and Adaption Strategy (Australian Government, 2015) articulates how Australia is managing the risks of a variable and changing climate.
It identifies a set of principles to guide effective adaptation practice and resilience building and outlines the Government's vision for a climate-resilient future.

National Waste Policy (Australian Government, 2018) details strategies to avoid waste, improve resource recovery, and increase use of recycled material and products as critical in Australia's shift toward a circular economy.

National Waste Policy Action Plan (Australian Government, 2019) presents targets and actions for implementing the National Waste Policy. It set national targets to ban the export of waste, to reach 80 per cent average resource recovery rate from all waste streams by 2030, and to significantly increase governments' and industry's use of recycled content.

4.1.2 *PLANNING*

Smart Cities Plan (Australian Government, 2016) sets out the Australian Government's vision for cities, and the plan for maximising their potential. The Plan acknowledges the need to design for the future of regional cities, maximising their unique advantages and supporting their long-term growth.

4.1.3 *TRANSPORT*

National Freight and Supply Chain Strategy (Transport and Infrastructure Council, August 2019) seeks to provide regional and remote Australia with infrastructure that connects regions and communities to major gateways, through land links, regional airports or coastal shipping. The primary pieces of infrastructure in Moree relevant to this strategy is the Brisbane to Melbourne Inland Rail and Moree Intermodal Park (MIP).

4.2 STATE POLICIES AND STRATEGIES

4.2.1 *ECONOMIC DEVELOPMENT*

State Infrastructure Strategy (Infrastructure NSW, 2018) identifies the importance of an efficient freight transport network to ports and markets. It aims to drive economic growth in regional NSW and identifies three projects funded by Infrastructure NSW: North Moree heavy duty pavement, North Narrabri to Moree heavy duty pavement and Moree Hospital upgrade.

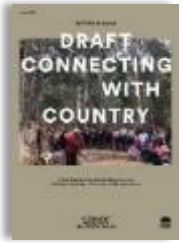
NSW Regional Development Framework (NSW Government, 2017) recognises that inland regions have a strong need for projects and government investment to support the local economy and support emerging alternative industries.

20 Year Economic Vision for Regional NSW Refresh (NSW Government, 2021), aims to accelerate economic growth in key sectors such as freight and logistics, advanced manufacturing and renewable energy. It also aims to improve connectivity across inland regional areas to capital cities to help boost business activity, increase labour force and improve the ability of inland areas to attract population and business. Moree is identified as playing a crucial role in high value agriculture, logistics and food processing.

Investment attraction Package for Regional NSW (NSW Government, 2018) aims to attract jobs and investment to regional NSW through financial incentives such as grants and loans. It identifies Special Activation Precincts as offering a coordinated approach to land use and infrastructure planning, with the aim of creating attractive centres for businesses to establish and grow.

4.2.2 *PLANNING*

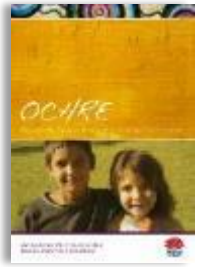
The New England North West Regional Plan 2036 (NSW Government, 2016) sets the high-level strategic planning priorities for the New England North West region. The Plan provides a summary of the Regional Plan Goals and Actions that directly affect Moree Plains Council through local planning instruments and decision making.



Connecting with Country (NSW Government Architect, 2020) is a framework for developing connections with Country to inform the planning, design, and delivery of built environment projects in NSW. It is intended to help project development teams – advocating ways they can respond to changes and new directions in planning policy relating to Aboriginal culture and heritage.

Urban Design Guide for Regional NSW (NSW Government Architect, 2020) identifies the projected climate warming for the New England North West Region and the need to use good urban design practices to enhance local character and improve place making in urban areas.

4.2.3 *ABORIGINAL AFFAIRS*



Opportunity, Choice, Healing, Responsibility, Empowerment (OCHRE) (NSW Government, 2013) was created to support the development of strong Aboriginal communities in which Aboriginal people actively influence and fully participate in social, economic and cultural life. The Plan's core beliefs lie in fostering aspirations, identifying opportunities and promoting responsibility. It's evidence-based approach recognises that the NSW Government should work with Aboriginal communities to deliver community-driven solutions which appreciate that there is no quick fix to the complex challenges Aboriginal communities face. Sustainable change occurs over a generation and young Aboriginal people are at the centre of that change, the business community has a key role to play in broadening opportunities for Aboriginal people and recognising the diversity of Aboriginal communities is paramount.

4.2.4 *SOCIAL INFRASTRUCTURE*

SPORT AND RECREATION

Office of Sport Strategic Plan (Office of Sport, 2018) promotes a vibrant and valued sport and active recreation sector that enhances the lives of the people of NSW. The Plan explores the challenges and opportunities for increasing participation in active, passive and organised recreational activities.

New England and North West Sport and Active Recreation Plan (Office of Sport, 2018) is complementary to the New England North West Regional Plan 2036. The outcomes of the plan align to those outlined in the Office of Sport Strategic Plan and have linked strategies which include a strong focus on Aboriginal participation in sport and recreation – a focus pertinent for the Moree area due to the significant Aboriginal population.

ARTS AND CULTURE

Cultural Infrastructure Plan 2025 (CIPMO, 2018) provides the strategic framework for how the NSW Government will invest in and support cultural infrastructure across the State until 2025 and beyond. Specifically, the Plan aims to help revitalise regional centres and create jobs, expanding the vision for a strong, liveable and productive regional NSW.

HEALTH

Strategic Plan for the Hunter New England Local Health District (HNE Health, 2018) focuses on planning for the future health needs of the District, with a vision of building healthier communities and providing world class care. The Plan includes strategies focused on closing the gap between Aboriginal and non-Aboriginal health and highlight the importance of increasing clinical capacity and investment in Moree Hospital over the subsequent four years.

4.2.5 *SUSTAINABILITY*

NSW Climate Change Policy Framework (NSW Government, 2016) aims to maximise the economic, social and environmental wellbeing of NSW in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change. The Framework defines the NSW Government's role in reducing carbon emissions and adapting to the impacts of climate change, sets policy directions to guide implementation of the framework, commits NSW to achieving aspirational long-term objectives, and sets out next steps for implementation.

The **Net Zero Plan Stage 1: 2020–2030** (NSW Government, 2020) sets an intermediate target of a 35 per cent emissions reduction in New South Wales by 2030 compared to 2005 levels and outlines the path to achieving this. The Plan acknowledges that achieving net zero emissions by 2050 will require more than action from the State and Commonwealth Governments, and will depend on action from local government, business, communities and individuals.

NSW Circular Economy Policy Statement (NSW Government, 2019) guides decision making in the transition to a circular economy. The impetus behind this move is to provide long-term economic, social, and environmental benefits for NSW. This transition will generate jobs, increase the robustness of the economy, increase the accessibility of goods, maximise the value of resources, and reduce waste. The Policy Statement provides a framework for implementing initiatives throughout the product life cycle, from design, manufacturing, and retail to end-of-life-disposal.

Adapt NSW New England North West Region Report (NSW Government, 2017) is a part of the Western Enabling Regional Adaptation (WERA) project. The WERA project builds on local knowledge to understand climate vulnerabilities in Western NSW and identify opportunities to respond, enabling regional decision-makers to enhance government service delivery and planning at a regional and subregional scale. The Adapt NSW New England North West Region Report also identifies the following systems as particularly vulnerable to long-term disruptions due to climate change: major regional centres, communities, human services, youth, grazing (of livestock), agricultural production, water, and energy.

4.2.6 *ENVIRONMENT*

HYDROLOGY AND FLOODING

Water Management Act 2000 is **t**he main piece of legislation for the management of water within NSW. Following its introduction, water sharing plans have been developed to preserve water resources in river and groundwater systems for the future. The plans detailed below establish rules for sharing water between the environmental needs of the river or aquifer and water users (for town and rural domestic water supply, industry, irrigation and stock watering).

Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2020 replaces the Water Sharing Plan for the NSW Great Artesian Basin Ground Water Sources 2008. The aim of this Plan is to protect the condition of the groundwater sources and their dependent ecosystems, continue productive extraction of groundwater for economic benefit, preserve the social and cultural benefits to urban and rural communities that result from groundwater extraction, and maintain and celebrate the spiritual, social, customary and economic benefits of groundwater to Aboriginal communities.

Water Sharing Plan for the Gwydir Alluvial Groundwater Sources 2020 applies to the Upper and Lower Gwydir Groundwater sources. The aim of this Plan is to protect the condition of the groundwater sources and their dependent ecosystems, continue productive extraction of groundwater for economic benefit, preserve the social and cultural benefits to urban and rural communities that result from groundwater extraction, and maintain and celebrate the spiritual, social, customary and economic benefits of groundwater to Aboriginal communities.

Gwydir Alluvium Water Resource Plan (NSW Government, 2018) sets out how NSW will meet its obligations under the Murray-Darling Basin Plan 2012 in the Gwydir Alluvium Water Resource Plan Area by addressing the requirements of Chapter 10 of the Basin Plan.

The NSW government has published several groundwater policy documents that, although now quite old, are understood to remain in effect.

NSW State Groundwater Policy Framework (Department of Land and Water Conservation (DLWC) 1997). The Framework Policy goals were to slow, halt or reverse degradation in groundwater resources, ensure long-term sustainability of the biophysical characteristics of the groundwater system, maintain the full range of beneficial uses of these resources and maximise the economic benefit to the region and state.

NSW Groundwater Quality Protection Policy (DLWC, 1998) was developed to protect groundwater resources against pollution and ensure that that the sustainability of groundwater resources and their ecosystem support functions were given explicit consideration in resource management decision making. One of its major roles was to assist the selection of priorities

for the later development of groundwater management plans in groundwater water sharing plans. It set out nine key principles for groundwater quality management and protection.

NSW Groundwater Dependent Ecosystem Policy (DLWC, 2002) has not been revised since it was issued in 2002 and is now substantially superseded by the provisions of the Water Sharing Plan and the research described in section 2.4.5 above.

The NSW Aquifer Interference Policy (DPI, 2012) defines aquifer interference activities and describes how these will be managed under the licensing and approvals regime in the Water Management Act 2000. Under this legislation, the requirements for a licence and approval are determined based on a risk and minimal impact assessment process. The process for assessment is also influenced by the location of the activity with respect to designated Strategic Agricultural Land', and where the development is deemed to be "State Significant".

The NSW Aquifer Interference Policy (AIP) was finalised in 2012 following several rounds of public review.

The **NSW Government's Flood Prone Land Policy** provides a framework for managing development on the floodplain. The primary objective of the policy is to develop sustainable strategies for managing human occupation and use of the floodplain using risk management principles. Under the Policy, the management of flood liable land remains the responsibility of local government, but the State Government provides specialist technical advice to assist Councils in the discharge of their floodplain management responsibilities. The NSW Government's **Floodplain Development Manual (2005)** has been prepared to support the NSW Government's Flood Prone Land Policy and provides councils with a framework for implementing the policy to achieve the required objectives.

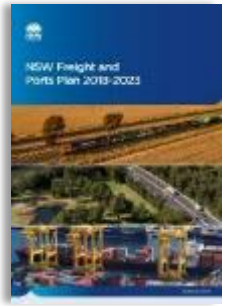
Gwydir Valley Floodplain Management Plan was prepared by the NSW Department of Planning, Industry and Environment and commenced on 12 August 2016. The Plan includes management zones, rules and assessment criteria for granting or amending approvals for flood works within the plan area. The rules applicable within each zone vary and are provided to prevent a flood work approval from being granted where works or development on the floodplain may result in ecologic, cultural or hydraulic impacts greater than pre-defined assessment criteria.

4.2.7 *TRANSPORT AND MOVEMENT*

Future Transport Strategy 2056 (NSW Government, 2016) strategy is an update of the **New South Wales Transport Master Plan** (2012) and notes Moree as a hub to support travel in the New England North West region, with funding committed for the planning of heavy vehicle pavement upgrades to the Newell Highway between Narrabri to Moree and north of Moree. The Strategy also outlines proposed infrastructure improvements for throughput enhancement on Inland Rail in addition to intermodal rail investigations.

Road Safety Plan 2021 (NSW Government, 2018) features targeted, evidence-based strategies to drive progress towards road safety goals, including an ambitious goal of zero fatalities and serious injuries on our roads by 2056. It aims to address, assess, and understand key trends, risks and the types of crashes on NSW roads and highways.

NSW Heavy Vehicle Access Policy Framework (NSW Government, 2019) outlines a strategic, staged approach to heavy vehicle access in NSW for both state and council roads. The framework identifies a vision for future heavy vehicle access in NSW and priorities in metropolitan areas as well as on strategic regional routes.



NSW Freight and Ports Plan 2018–2023 (NSW Government, 2018) the increasing importance of economic activity in regional NSW to become specialised due to regions producing fewer types of goods and focusing on exporting outside of their region. Of relevant to Moree are the NSW Government actions to address the goal of Improved Road Freight Access, including implementing the NSW Heavy Vehicle Access Policy Framework, funding infrastructure improvements to increase higher productivity vehicle access and assisting local councils in making higher productivity vehicle access decisions.

Newell Highway Corridor Strategy (NSW Government, 2015) details how the NSW Government will manage road transport along the Newell Highway in the long term (over 20 years), from Tocumwal on the Victorian border to Goondiwindi on the Queensland border.

4.3 LOCAL POLICIES AND STRATEGIES

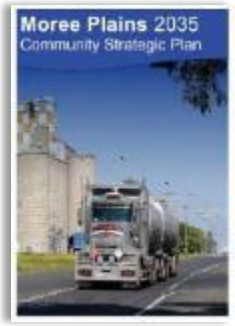
4.3.1 *PLANNING*

Moree Plains Shire Local Strategic Planning Statement (LSPS) (Moree Plains Shire Council, 2020) was adopted in July 2020, consistent with the NENW Regional Plan. The priorities for the Moree community are to develop a strong, dynamic regional economy, leveraging from the Inland Rail project, to minimise risk to the environment, and create a more resilient community, including better collaboration with and improvement of economic self-determination for the Aboriginal community.

Moree Growth Management Strategy (Moree Plains Shire, 2009) identifies the Moree airport as an important gateway to Moree on the Newell Highway corridor incorporating Blueberry Road and adjoining industrial development. The Airport Industrial Area is identified as being important to the entry to Moree and was subsequently zoned Special Activities, Enterprise Corridor and Business Park in the *Moree Plains Local Environmental Plan 2011* (Moree LEP).

Moree Plains Shire Council Development Control Plan (DCP) (Moree Plains Shire Council, 2013) provides more detailed provisions to guide development within the Council area so that it achieves the aims and intent of the Moree LEP. General planning considerations that apply to development concern matters such as parking and landscaping of industrial land. The area known as the "Moree Gateway Precinct" has a detailed range of provisions to assist in meeting the standard of development.

4.3.2 *SOCIAL INFRASTRUCTURE*



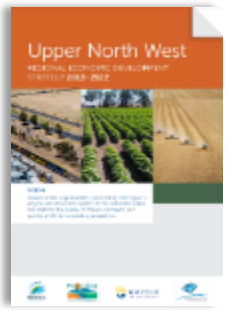
Moree Plains Community Strategic Plan (Moree Plains Shire Council, 2013) provides a community-centric approach to achieving the future vision of Moree Plains Shire. The CSP's vision for Moree is to be "a *community that works together achieving a balance between quality of life, enterprising business, agriculture pursuits and looking after our natural resources now and into the future."* To achieve this vision, Council identified four key themes that discussed existing challenges and strategies associated with each. The four themes of the CSP are: an inclusive, caring community, sustainable spaces and places, a vibrant regional economy and a leading organisation.

Section 94A Development Contributions Plan (now referred to as S7.11 Contribution Plans and Levies) (Moree Plains Shire Council, 2019) does not have established benchmark and provision rates for social and community infrastructure. Instead, the Section 94 focuses on monetary contribution, work in kind and voluntary planning agreements. Identified projects for the period 2019–2026 reflect an emphasis on embellishing public open space.

Disability Inclusion Action Pan 2017–2021 (Moree Plains Shire Council, 2017) reflects the narrative of the LSPS, Section 94A and the CSP. Improving access and relevance of services and spaces should be the focus of current and future social infrastructure.

The South Moree Social Plan (Moree Plains Shire Council, 2017) was developed to support the update, delivery and implementation of the South-West Moree Precinct Master Plan. Moree South is a recognised area of concentrated public housing with high degrees of socio-economic disadvantage and poor community image. The Plan was developed through extensive community and stakeholder consultation, planning and policy review and analysis of existing funding opportunities, however has not yet been formally adopted.

4.3.3 *ECONOMIC DEVELOPMENT*



The **Upper North West Regional Economic Development Strategy** applies to Moree Plains, Narrabri, Gwydir and Inverell Councils. The Inland Rail line is identified as passing through Narrabri and Moree. The significant bulk grain and cotton handling facilities and intermodal terminal in Moree are mentioned, along with the need for more investment in road and rail infrastructure to improve efficiency and connectivity to ensure the advantage of Inland Rail is leveraged. The Moree Solar Farm is mentioned as an example of the region's topographic advantage. The Moree Water Park is noted as an important water-based attraction (in the SAP precinct) and "international standard events venue". Recommendations relevant to the SAP are for infrastructure upgrades for road and rail, and promotion of the Water Park.

Moree Plains Economic Development Strategy (Moree Plains Shire Council, 2020) is a 20-year economic plan to strengthen Moree's local and regional economy. In doing so, Council will expand on its current economic strengths to attract and encourage new industries, create new jobs and attract more visitors. Whilst recognising agriculture will remain the bedrock of the local economy, the emergence of Moree Plains as a major player in intermodal freight and logistics provides substantial opportunity for economic extension and diversification with improved access to national and international markets.

4.3.4 *ENVIRONMENT*

FLOODING

Moree Plains Shire Council has adopted a **Floodplain Risk Management Plan.** As part of the ongoing floodplain risk management process and following on multiple flood studies of the region, the Moree Plains Shire Floodplain Management Committee was formed in May 2018. The role of the Committee is to assist Council with the final phase of development and implementation of proposed works and measures to manage the flood prone lands of Moree and surrounds. Consistent with recommendations of the NSW Government's Floodplain Development Manual (2005), Council has adopted the 1 per cent AEP flood event plus 0.5 m freeboard for Flood Planning Levels (FPL) applicable to the Moree area.

The **Gwydir Valley Floodplain Management Plan** 2016 was prepared by the NSW Department of Planning, Industry and Environment and includes management zones, rules and assessment criteria for granting or amending approvals for flood works within the plan area. Parts of the Moree SAP falls within various zones in the domain of the Gwydir Valley Management Zones.

5 MOREE AND THE INVESTIGATION AREA

5.1 OVERVIEW

Nestled along the banks of the Mehi and Gwydir Rivers, Moree is the ancestral Country of the Gamilaroi people.

Moree is well-connected at a State and national level, with the Newell Highway providing connection to Melbourne, Brisbane, Newcastle and Sydney, some of the country's most significant population and export hubs, along with a high-quality airport and daily train services to Sydney. Catalysed by the development of the Inland Rail, Moree will become even more central to North-Western NSW's regional economic, agricultural and population development.

An abundance of rich black-soils, favourable climate and geographic location in relation to the Great Artesian Basin and water resources, make the Moree region a key centre for Australian crop, cotton and agricultural production.

With a relatively young population (37.4 years in 2018) and high Indigenous population (24.3 per cent in 2016), the Moree SAP has the ability to provide long-term sustainable economic and social development through the promotion of high-quality, regionally relevant training, jobs and education, whilst also providing opportunities to grow the regions national and international profile.

As identified within the Moree Local Strategic Planning Statement, Moree Plains Shire Council's (Council) 2030 goals are to develop a liveable, diverse, connected and productive regional centre. To achieve this Council has identified six key growth areas:

- Transport and Logistics – leveraging opportunities presented by the Inland Rail
- Tourism – develop and renew existing tourism, while enhancing and growing Indigenous tourism potential
- Education and Training
- Agri-processing – value adding through processing and production
- Advanced Manufacturing – both agri and non-agri goods and services
- Renewables – capitalising on the Moree Solar Farm to develop a sustainable future.

5.2 NATIONAL CONTEXT

Well placed within interstate transport networks (both proposed and existing), the Moree SAP offers significant opportunities to strengthen western NSWs position within the national context.

Figure 5.1 shows how Moree is situated within the national context.

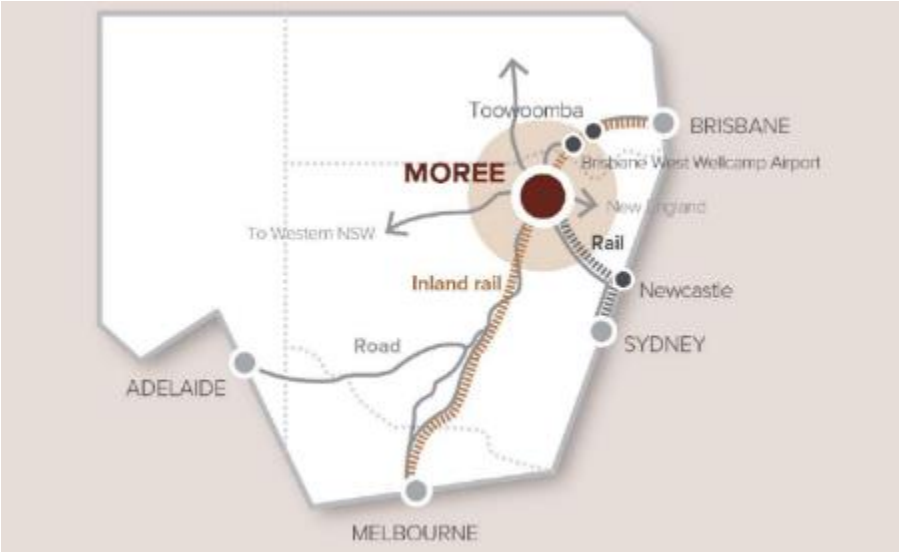


Figure 5.1 National context

5.3 REGIONAL CONTEXT

Located within the eastern edge of the Great Artesian Basin, Moree is well connected to significant National Parks and wetlands. Its position in relationship to Inverell, Armidale, Narrabri, Goondiwindi, Tamworth and Toowoomba also offers opportunities for greater expansion and integration into existing regional farming and industry.

Figure 5.2 shows Moree's connectivity, infrastructure and relationship to natural features.

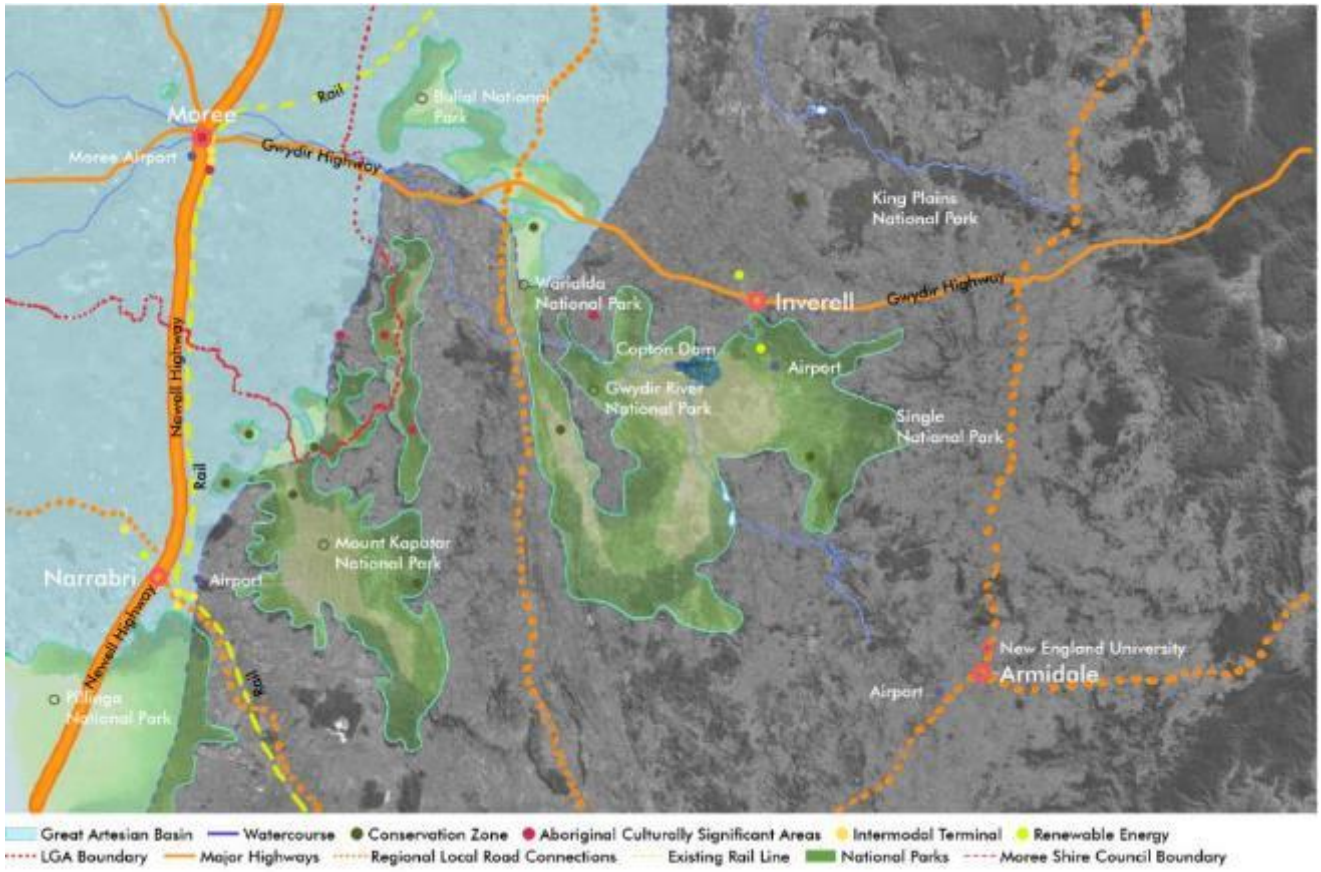


Figure 5.2 Satellite image showing Moree's regional context

The surrounding context and character around Moree show the historical, natural, spatial and production diversity present across the region.

Figure 5.3 provides an overview Moree's regional surrounding natural, agricultural, and spatial characteristics.

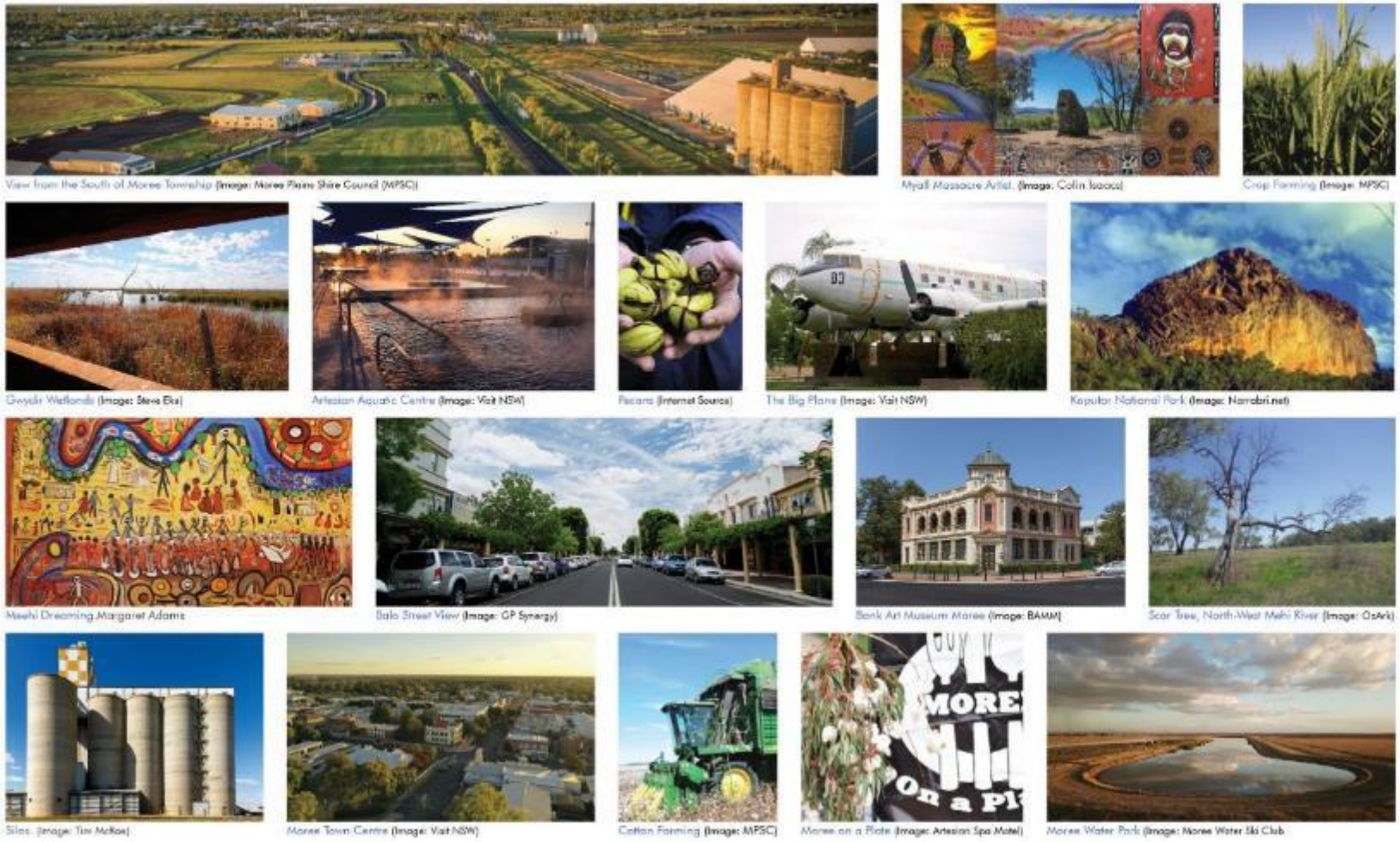


Figure 5.3 Collage of images describing Moree's regional character

5.4 MOREE CONTEXT

The township of Moree is defined by its location in relation to both natural features and infrastructure, encompassing rich natural resources and the potential of the Newell Highway and Inland Rail.

Figure 5.4 shows the contextual relationships between Moree and the Moree SAP investigation area.

Figure 5.4 Satellite image detailing the spatial context between the Moree town centre and Moree SAP investigation area

5.4.1 *TOWNSHIP CHARACTER*

Defined by its uniform grid road network, Moree is centrally divided by the Mehi River.

Although early European development occurred initially during the mid to late 19th century, Moree's most prominent buildings are primarily designed in the early 20th Century Art Deco style. The town centre also has significant areas of historical and contemporary Indigenous significance.

Figure 5.5 Images showing Moree's urban character

5.4.2 *COMMUNITY PROFILE*

CURRENT DEMOGRAPHIC PROFILE

Moree is a thriving town with enormous potential for growth. Moree and its surrounding region have a deep, complex and unique Aboriginal history, with the town located on one of the largest Indigenous nations in Australia, Kamilaroi Country. The region boasts a tightknit community which utilise and celebrate Moree's rich environmental offerings. The below points provide an overview of Moree's current demographic and community profile.

- The LGA of Moree Plains is home to 13,159 residents, with 7,383 residents residing within the Moree town centre.
- Moree has a higher proportion of school aged population (17.7 per cent) and younger people (15.9 per cent) in comparison to state averages (15.9 per cent, 20 per cent).
- Consultation indicates there is a perceived lack of 'younger' people aged between 18–39. However, data shows that the percentage of the population in this age group in Moree LGA is higher than the state average – a trend that is consistent across numerous age groupings (e.g. 18–24, 18–34, 25–39).
- The majority of Moree residents were born in Australia and speak English at home.
- Single parent households are significantly higher in Moree (21.8 per cent) than across the state (16 per cent).
- Moree has a lower proportion of homeowners, both outright and with a mortgage (28.5 per cent), in comparison to the state average (32.2 per cent).
- Moree possesses a higher proportion of government housing and those residing in a housing co-operative/community/church group (3 per cent in Moree compared with 0.7 per cent across NSW).
- Moree residents are more likely to leave school at an earlier age and participate in vocational training (such as TAFE) than the NSW average.
- Moree's economy is dominated by the agricultural, fishing and forestry industry, contributing to 33 per cent ($225.1 million) of Moree's Gross Regional Product. Regional employment is also dominated by this sector, as shown in Figure 5.6.

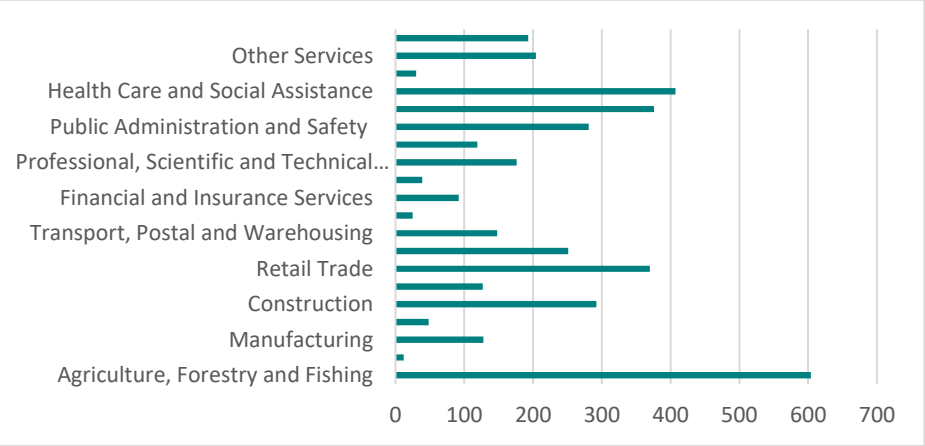


Figure 5.6 Moree's regional employment by industry

LOCAL ABORIGINAL COMMUNITY

Moree is the traditional homeland of the Gamilaroi people and is rich in both historical and contemporary Aboriginal culture and heritage. Moree's cultural and heritage offerings are sprawled across its cultural landscape, connecting the Aboriginal community that reside in Moree to other key places within the LGA.

Although rich in beauty and culture, Moree is also home to immense unhealed trauma that is evident in the socio-economic and wellbeing status of many Aboriginal people living in Moree. The literature and conversations with members of the local Aboriginal community demonstrate the resilience and strength of Moree's Aboriginal population as they continue to strive for change, social justice, healing and an improved social and economic outcome for their people.

The Murawin Report has identified specific issues pertaining to Moree's Aboriginal community that they recommend for consideration through the SAP Master Plan process. These are:

- Impacts of racism on community participation, access to services, housing and employment.
- Connection of physical and spiritual wellbeing to current degradation of land and environment.
- Uncertainty of current land claims.
- Need to address cultural and spiritual value of water access and water quality.
- Low employment rates contribute to social disadvantage and social "disfunction".
- Capacity of health and community services to meet existing and potential future needs.
- Low levels of participation by Aboriginal community in all levels of education.
- Barriers to accessing safe, appropriate and affordable housing.
- Acknowledgement, respect and protection of Aboriginal cultural heritage.
- Access to affordable and reliable transport.

DEMOGRAPHIC OVERVIEW

- As shown in Figure 5.7, one in four of the overall population of the Moree Town Centre (7,383 people) identify as Aboriginal and/or Torres Strait Islander (25.6 per cent)

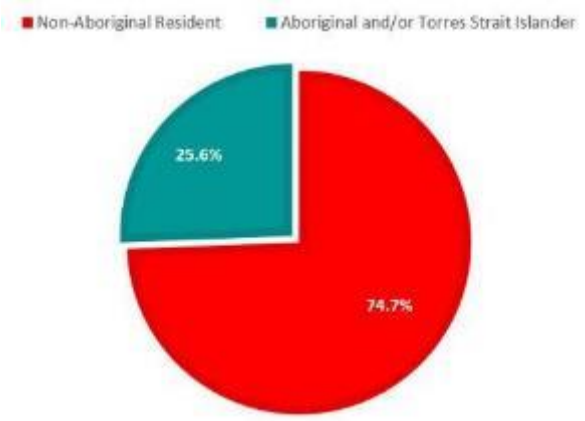


Figure 5.7 Aboriginal and/or Torres Strait Islander identifying residents in Moree Town Centre

- 21.6 per cent of the population residing across the Moree Plains LGA identifies as Aboriginal or Torres Strait Islander, or both, in comparison to 2.9 per cent for New South Wales. Of this 21.6 per cent, 98 per cent identified as Aboriginal.
- Between 2011 and 2016, the Aboriginal population rose by approximately 2 per cent whereas the overall population of the LGA fell by 2 per cent.

EDUCATION

- Early childhood education is an important contributor to success in primary and secondary school. In 2016, 22 per cent of Aboriginal infants in Moree Plains were in early years' education, compared to 27 per cent of non-Aboriginal infants.
- Education of older teenagers is vital for future employment and overcoming disadvantage. In 2016, 49 per cent of Moree Plains Aboriginal teenagers between the ages of 15–19 were in education compared to 69 per cent of non-Aboriginal teenagers.

- Almost 30 per cent of local Aboriginal residents (814 people) attend an educational institution. As shown in Figure 5.8, comparatively with non-Aboriginal residents of the same age, there are:
  - 20 per cent fewer Aboriginal people aged 15–19-year-old in education
  - 13 per cent fewer Aboriginal people aged 20–24-year-old in education.
- 35 per cent of Aboriginal adults have some type of post-school qualification; compared with 59 per cent of non-Aboriginal adults (2 per cent of Aboriginal adults have a degree or higher, compared with 25 per cent of non-Aboriginal adults).

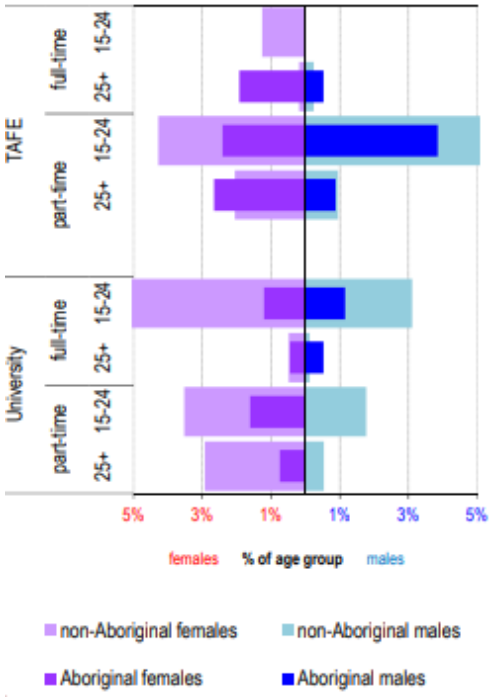


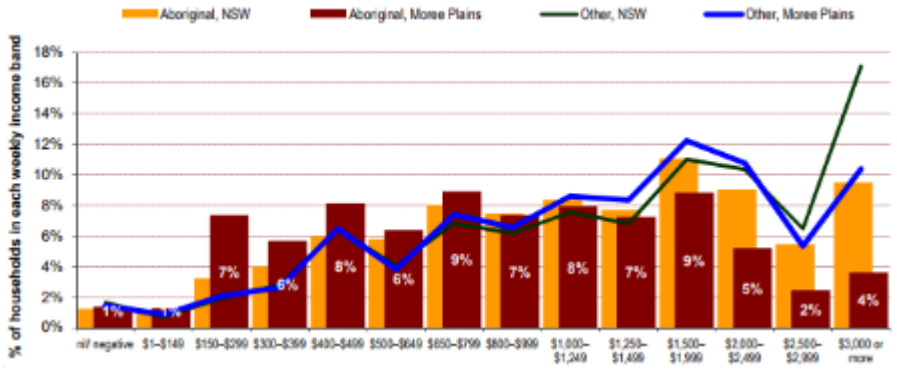
Figure 5.8 Tertiary attendance ratios Moree Plains

EMPLOYMENT

- In 2016, the Aboriginal unemployment rate in the Moree Plains Shire was 25 per cent with 213 people out of work. This rate was 3 per cent higher than the non-Aboriginal adults in the LGA. The Aboriginal unemployment rate in 2016 was 28 per cent for men and 22 per cent for women. Unemployment was the highest among those aged 15–24 years (25 per cent) and lowest amongst those aged 45–64 years (20 per cent).
- Employment in the workforce is key to accessing income and independence. When the proportion of adults in the workforce is low, communities become more dependent on income support and poverty and its adverse impacts increases. In 2016, Aboriginal workforce participation rates were:
  - Lower for women (40 per cent) than men (48 per cent)
  - 26 per cent lower than the average for non-Aboriginal adults in the LGA
  - 11 per cent lower than the average for Aboriginal adults in NSW.
- Major industries comprising of Aboriginal employment include Agriculture, Forestry and Fishing (23.7 per cent), Education and Training (23.0 per cent) and Health Care and Social Assistance (10.4 per cent).

INCOME

- There is a significant disparity in weekly income earnings between non-Indigenous residents and Indigenous households.
- Non-Indigenous households in Moree town centre earn an average weekly income of $300–$399 and in the Moree outer area $800–$1,249 per week, compared to all Indigenous households which earn an average of $150–$299 per week.



Source: *Aboriginal Affairs' Community Profile: Moree Plains LGA (2016)*

Figure 5.9 Moree's household income pattern (2016)

HEALTH

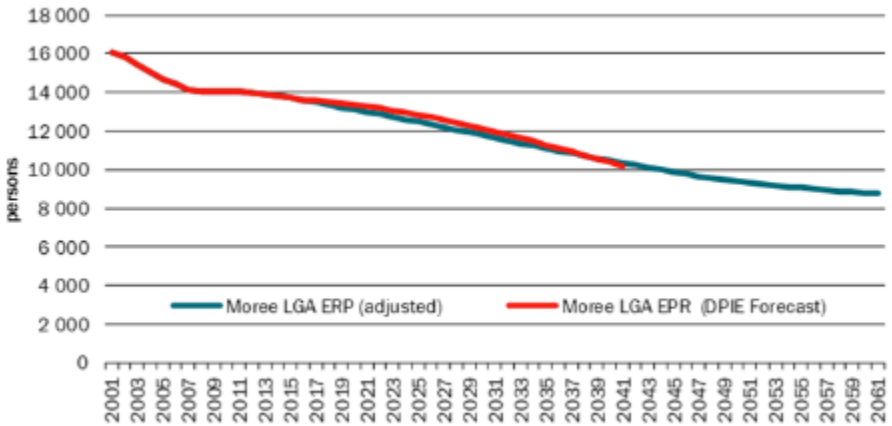
- The life expectancy for the Aboriginal population in the Hunter New England Central Coast region is around 10 years less than the non-Aboriginal population. This is due to health risk factors and chronic illness being more prevalent in the Aboriginal population.
- A high prevalence of overweight and obesity, and health risk behaviours, including smoking, poor nutrition, physical inactivity, alcohol and other drug misuse contributes to the poorer health status of the Aboriginal population. Within the Moree Plains region 60.9 per cent of Aboriginal people aged 2 years and above are overweight (23.2 per cent) or obese (37.7 per cent), and 36.7 per cent of Aboriginal people aged 15 years or above smoke daily.

5.4.3 *FUTURE TRENDS*

The LGA of Moree Shire has a declining population, driven largely by net migration out of the region and exacerbated by recent years of drought. The following observations were identified as key trends as to why this is occurring:

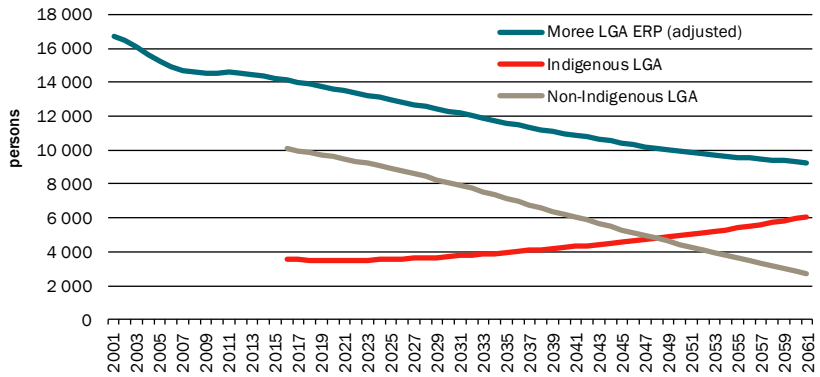
- High school graduates or tertiary education students are most likely to leave the Moree district. It is common for farming families to send children to boarding school in Toowoomba, Armidale, Tamworth and Sydney. This is especially the case where these people are likely to go onto further tertiary education.
- Farm retirees tend to leave the region, rather than moving into Moree, to areas such as Toowoomba and the North Coast of NSW.
- Ongoing labour productivity across broadacre agriculture and the increased prevalence of itinerant workers (prior to COVID-19) contribute to the downward pressure on population across the Moree region.

Figure 5.10 shows a predicted ongoing decline in the Moree population out to 2061, whereas Figure 5.11 predicts that the Indigenous population of Moree will continue to increase over this period, as the Indigenous population is less likely to leave Moree. It also important to note the intrinsic role Moree's drought conditions has played in contributing to a declining population.



Source: *DPIE and CIE (2020)*

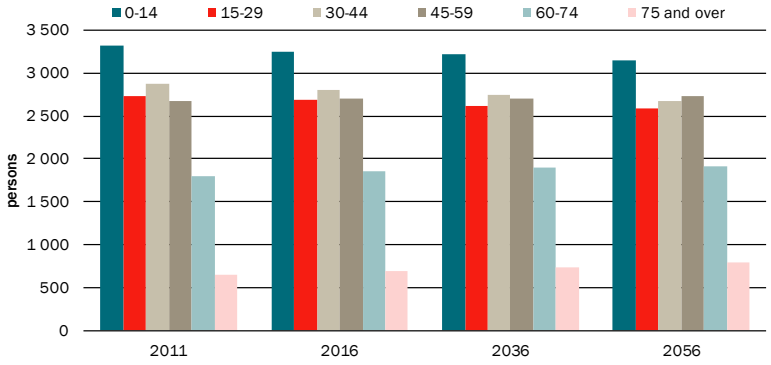
Figure 5.10 Moree's local and regional population projections



Source: *CIE (2020)*

Figure 5.11 ERP of Indigenous and non-Indigenous segments for Moree LGA

In terms of future population age breakdown, Figure 5.12 shows that the proportions across cohort groups are likely to remain stable — with the estimated average age increasing from 36 years in 2016 to 38 years in 2056.



Source: *CIE Baseline Analysis Report (2020)*

Figure 5.12 ERP by cohort for the Moree local government area

5.5 MOREE SAP INVESTIGATION AREA

The Moree SAP investigation area is located south of Moree town, encompassing an approximate area of 5880 ha.

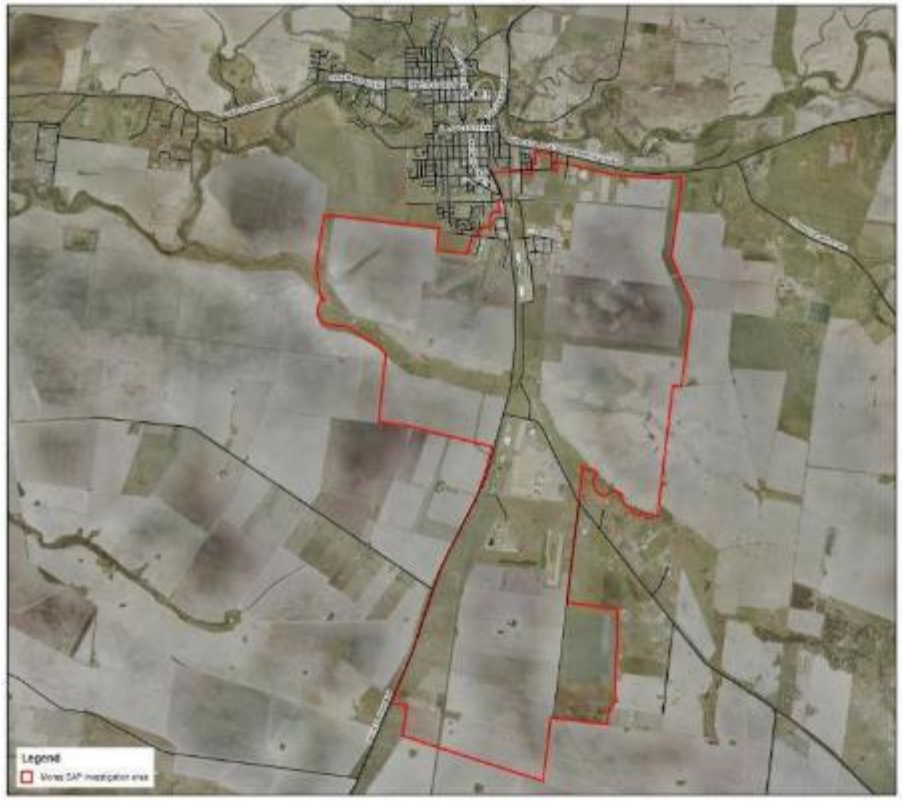


Figure 5.13 Moree SAP Investigation area

5.5.1 *LAND USE*

The investigation area is generally bounded by Moree Town to the north and broadacre agricultural areas in other directions. In the north-west quadrant of the investigation area is the Moree Regional Airport and the Moree Gateway Estate, developed by Council. To the north-east are a series of grain silos operated by a variety of grain distribution companies, using rail sidings owned by Australian Rail and Track Corporation (ARTC), along with the light industrial area, known as Industrial Drive Estate (Figure 5.14). Gwydirville, a small residential community, is also located within the SAP investigation area. The small grouping of residential dwellings is in the middle of the SAP investigation area along Burrington Road, located in proximity to an abandoned abattoir which they once served.

Figure 5.14 Grain silos, rail sidings and Industrial Drive Estate viewed from the south-east

The Moree Solar Farm is located at the south-eastern section of the SAP investigation area (Figure 3.16) along with the Moree Waste Management Facility and Moree Water Ski Park.

Figure 5.15 Moree Solar Farm

LANDSCAPE

The Investigation area falls within the Moree Plains Shire which is a part of the NSW Murray Darling Basin. The landscape of the area is generally flat plains with gentle undulation with no obvious physical barriers to movement across the landscape. The Australian Height Datum levels for the investigation area vary within a narrow range of 195 m and 225 m. These plains consist mainly of black soils, with cracked surface conditions and a poor drainage profile, and predominantly vegetated by grassland/herbland.

Local geology consists of large areas of unconsolidated alluvial deposits 100 m thick in some places consisting of medium to heavy clay textured soils. Soils are very dark grey to black in colour, the alluvial deposits that make up the vast plains are referred to as the “Black Plains”. These highly fertile soils are conducive to fast plant growth. Alluvial deposits are overlaid on a mosaic of sedimentary rocks that form part of the Great Artesian Basin.

Natural features within the SAP study area include vegetated road reserves along the Newell Highway, the Travelling Stock Route and vegetated riparian areas at Halls Creek and Clarks Creek.

LAND USE ZONES

There are eight different land use zones applying within the boundary of the SAP. The northern urban portion of the SAP includes industrial and business zones that are within the existing urban structure of Moree town. As the precinct extends south, the land use zone is predominately rural. The arrangement of zones is shown in Figure 5.16.

The RU1 Primary Production zone accounts for 82 per cent (or 4,810 ha) of the 5847.8 ha site. The zones and their spatial distribution within the SAP are described as below.

The IN1 General Industrial zone is 384 ha and IN2 Light Industry, 78 ha in area. There is 85 ha of land zoned B6 Enterprise Corridor and 10 ha of B7 Business Park. The SP1 Special Activities zone is on 168 ha of land, and the SP2 Rail Infrastructure zone is 24 ha. Residential uses take up only 0.032 ha of R1 General Residential zone, 1.2 ha of land zoned RU5 Village at Gwydirville and the RU4 Primary Production Small Lots is 285 ha.

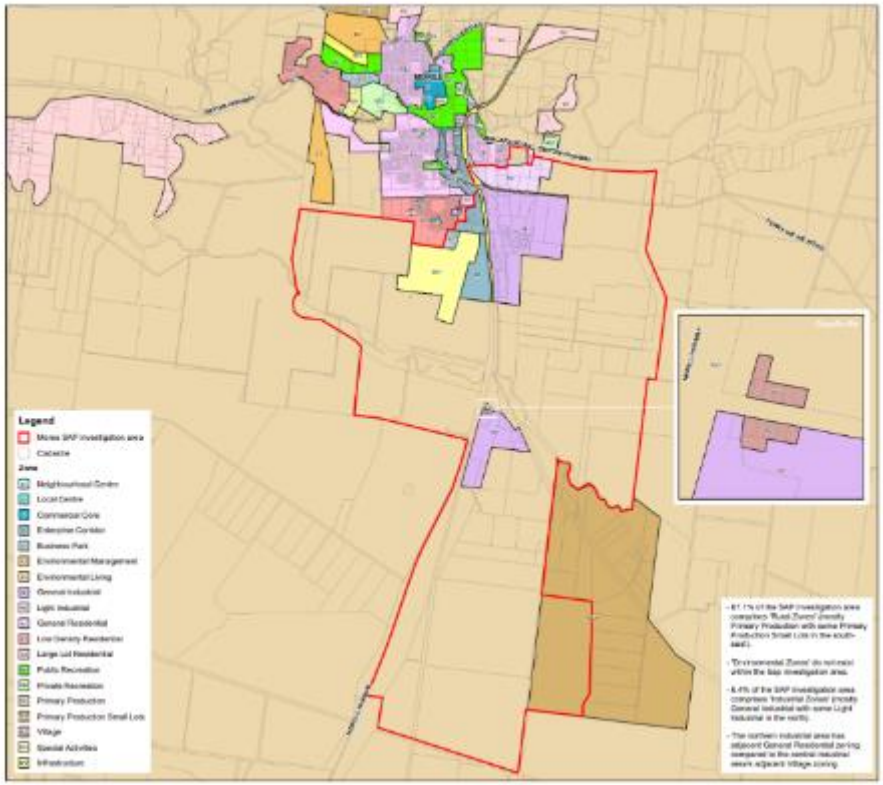


Figure 5.16 Moree Local Environment Plan 2011 zoning map of SAP investigation area

5.5.2 *EXISTING BUILDINGS AND DEVELOPMENT*

The grain silos and large grain storage sheds located along the rail line in the northern section of the Investigation area are recognisable rural landmarks within an open landscape setting. Their simple geometry, utilitarian form and monumental scale serve as markers of Moree's role as a centre for agricultural production, history and heritage. Smaller scale development of industrial facilities, service

industries and dwellings occur in a fragmented manner across the Investigation area.

Figure 5.17 Silos and grain stores dominate the views along the Newell Highway within the Investigation area

5.5.3 *AGRICULTURAL OUTPUT*

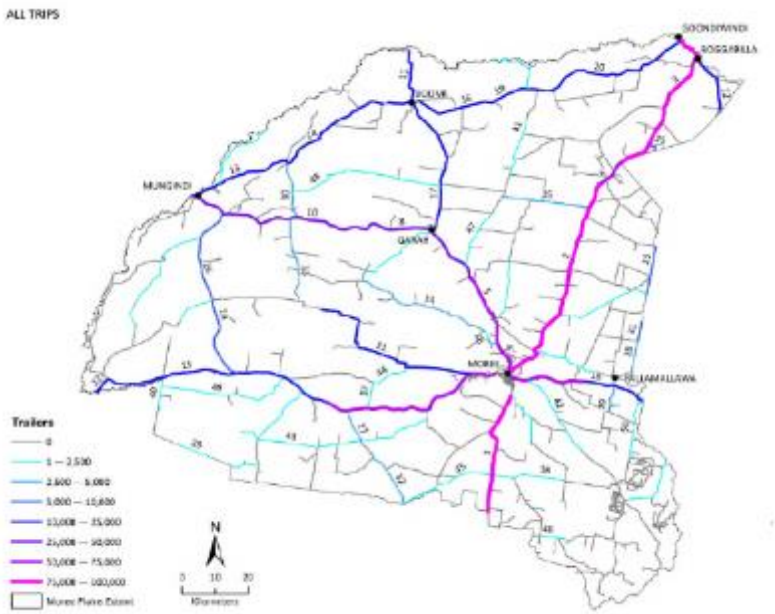
Agriculture is the main engine industry within the Upper North West Region; the region is one of the most productive agricultural areas in Australia. In 2015–2016, cropping accounted for 92.8 per cent of the value of agricultural production ($866 million) within Moree Plains area, with livestock contributing 6.7 per cent ($64 million) and horticulture (fruit, vegetables and nuts) five per cent ($5 million). Cropping is the dominant activity in the Moree Plains area.

ROAD FREIGHT

The percentage of heavy vehicles in rural areas of the Newell Highway corridor in 2011 ranged from 26 to 52 per cent of total traffic volumes. Moree to Boggabilla was observed to have the highest of rural highway section with the percentage of heavy vehicles (52 per cent) in 2015 (ARTC, 2015).

Survey daily traffic volume data shows that almost half of daily annual average daily traffic (AADT) northbound and southbound are observed to be heavy vehicles.

As shown in Figure 5.18, most freight flows in the Moree region are carried on the Newell Highway.



Source: CSIRO, 2019

Figure 5.18 Freight flows for all movements in the Moree region

Rail freight

Moree is located on the Mungindi line, which is currently part of the ARTC heavy vehicle network, branching from the Great Northern Railway at the major rail centre of Werris Creek, and heading north to the remote town of Mungindi, on the Queensland border. This line will form part of the N2NS section of Inland Rail. The line is currently utilised for almost its entire length for grain transport, and for coal from the Preston and Gunnedah collieries.

Existing rail facilities from Moree to Narrabri are restricted and can currently generally only accommodate 800-metre trains carrying a total of 2,300 tonnes of grain. Inland Rail will accommodate 1,600-metre long double-stack trains.

EXISTING INTERMODAL FACILITIES

Moree currently has a number of intermodal facilities (MPSC, 2020) including:

- Louis Dreyfus Company (LDC) provides bulk grain and cotton storage, handling and shipping. There is limited container "pick and place" operations and is utilised largely for blended grain products. It should be noted that LDC owns a private rail siding
- Manildra Grain provides bulk grain storage, handling and shipping. Manildra Grain utilises dedicated trains with grain utilised in the company's internal operations. It should be noted that Manildra has access to an ARTC managed rail siding
- GrainCorp provides bulk grain storage, handling and shipping. It should be noted that GrainCorp has access to an ARTC managed rail siding
- Austgrains provides silo-based grain storage, handling and shipping. It should be noted that Austgrains have access to an ARTC managed rail siding
- CHS Broadbent provides bulk grain storage, handling and shipping. It should be noted that Broadbent utilise a rebuilt section of the Inverell Line, which is ARTC managed.

The location of the existing intermodal facilities is shown in Figure 5.19.

Source: MPSC, 2020

Figure 5.19 Indicative location of existing intermodal facilities

INLAND RAIL AND FREIGHT FORECASTS

Inland Rail will be a 1,700-kilometre rail line between Melbourne and Brisbane via regional Victoria, New South Wales and Queensland that will provide freight producers and regional centres with efficient rail access to domestic and international trade gateways. The N2NS section of Inland Rail is expected to be completed by 2025.

Inland Rail is a project that will catalyse and increase the rate of growth of the agricultural sector in Moree Plains Shire. As the most productive agricultural shire in Australia, and as a key transport junction of road and rail, Moree is well-positioned to be the transport and logistics hub of North West NSW. Moree is located on the N2NS section of Inland Rail enabling efficient rail freight between Moree and key seaports, as well as large population centres such as Newcastle.

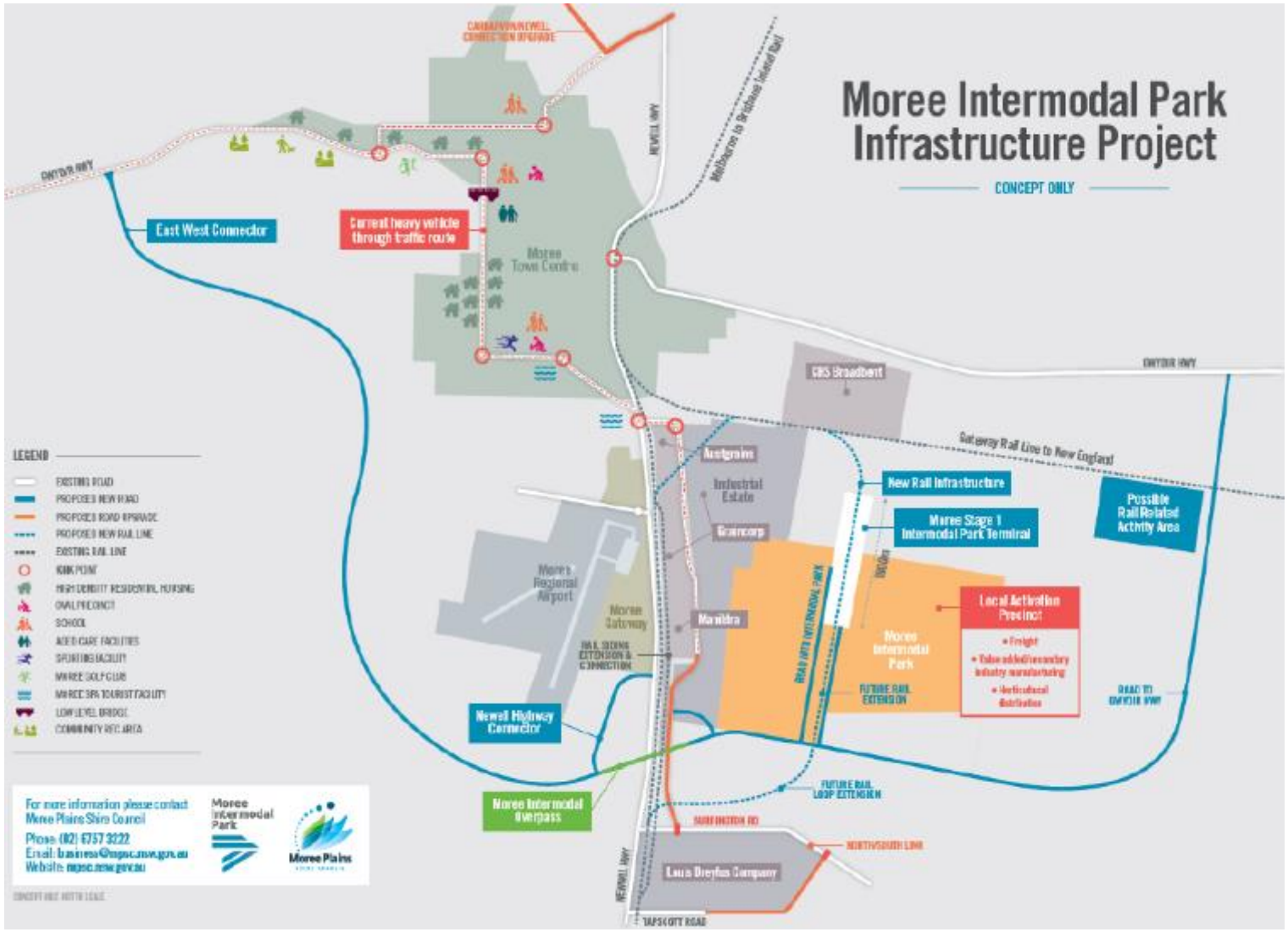
Source: ARTC, 2019

Figure 5.20 Narrabri to North Star Inland Rail Alignment

The N2NS project involves 188 kilometres of track upgrade within the existing rail corridor and construction of approximately 1.6 kilometres of new rail track to accommodate future planning for 1,800-metre double-stacked freight trains. N2NS construction is expected to commence in the second half of 2020.

MOREE INTERMODAL PARK

MPSC has had a long-term vision to maximise the benefits of Inland Rail and improve efficiency in the Shire's key economic driver of agri-business. The Moree Intermodal Park has been conceived by MPSC as part of this vision and interfaces with the Weemelah rail network and Inverell New England Line providing opportunities for region-wide freight activation. It centres on the General Enterprise Sub-Precinct within the SAP, an area that currently hosts a range of bulk commodity and low volume containerised logistics providers. Each provider has a different form and quality of access to Inland Rail. However, all cannot currently conduct fast outload operations for bulk commodities and have limited 'pick and place' capability for containerised freight. The Moree Intermodal Park was conceived to increase Inland Rail freight throughput and enable productivity improvement and has formed a key part of the considerations for the preparation of the Moree SAP Structure Plan.



Source: MPSC, 2019

Figure 5.21 Previously Developed Conceptual Scheme – Moree Intermodal Park

AIR FREIGHT

The Moree Freight Services via the Moree Regional Airport has two components – Qantas and Toll Priority. Prior to COVID-19, these services operated as below:

- Qantas:
  - The Qantas freight services from Moree operated twice daily:
    - The daily morning flight was for livestock
    - The daily evening flight was for bank bags
  - Medical supplies to Moree and emergency freight operated weekly from the airport.
- Toll Priority:
  - The Toll Priority air freight route covers Moree, Armidale, and Sydney, for an overnight stay in Moree
  - Peak hours for Toll Priority freight are in the Christmas and harvest periods.

AIR SERVICES

Moree Regional Airport is an important gateway for business, tourism, and personal travel. For freight, the airport serves as an opportunity for high-value commodities. It also provides services for workers and access to specialist health, education, and commercial facilities.

The Moree Regional Airport Master Plan 2014 highlighted the types of activities occurring in the airport. The regional airport primarily provides general aviation services, facilities and maintenance for agricultural aviation but also operates twice-daily services to Sydney by QantasLink, as shown in Figure 5.22. Discussion on air freight is highlighted in section 1.1.1.

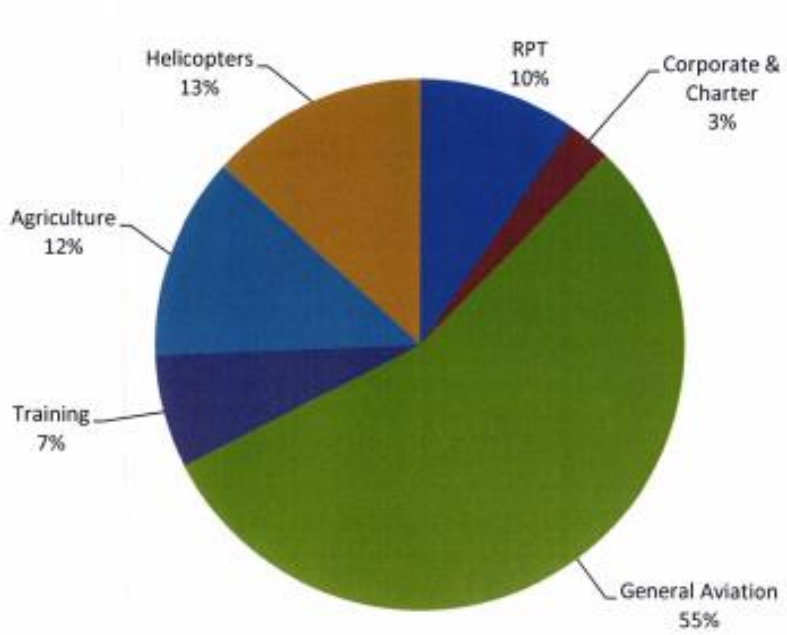


Figure 5.22 2012 Aircraft movements by activity

6 ABORIGINAL PLANNING AND DESIGN

The Aboriginal Planning and Design Guidelines for Moree SAP have been prepared as a separate stand-alone document to provide guidance on how to best acknowledge Aboriginal culture and history in the design of the Moree SAP. They can be found at Attachment A. This section provides a brief overview of some of the key aspects of these Guidelines to assist in informing the Structure Plan, but does not seek to address the full suite of findings and recommendations arising from the Guidelines.

A Summary of the outcomes from engagement with the local Aboriginal community is also provided in this section, along with an overview of the manner in which the Structure Pan addresses issues raised through this engagement.

KEY STRUCTURE PLAN PRINCIPLES

- Heritage – retain and celebrate Moree's proud Aboriginal culture and heritage
- Indigenous led – Indigenous people (designers, elders etc.) should be leading or co-leading the Indigenous elements in the design.
- Community involvement – the local Indigenous community needs to be engaged in this process.
- Appropriate use of Indigenous design – all Indigenous design elements must be approved of by involved Indigenous people/community/elders. If approval is not given, the knowledge will not be used in the project.

6.1.1 *PRE-COLONIAL SETTLEMENT*

Pre-colonial Moree was a land of abundance due to highly sophisticated land management practices which ensured resources were predictable, thus permanent settlement and housing occurred here. Figure 6.1 provides a reconstruction of the likely settlement pattern in pre-colonial times, based on the referenced and publicly available material as referenced in the Aboriginal Planning and Design Guidelines.

Before roads and rail, great grass highways connected the country of Australia. Crafted by fire and maintained to keep the tall trees out, they were special places for food, access and ceremony but also used by the early bullock drivers and then an easy location to lay train tracks on.

The Newell Highway and Inland Rail follows an ancient song line that goes straight through Moree, which is an important crossroads between East and West, and North and South.

Figure 6.1 Artist impression of the likely pre-colonial settlement pattern of the Moree SAP Investigation area

6.1.2 *ABORIGINAL PLANNING AND DESIGN PRINCIPLES*

The aim of Aboriginal planning and design principles are to ensure that Country is cared for. The custodians of Country have a responsibility to keep its best interests at heart. This includes ensuring it has an intact "sense of place", history and spirit when we pass it onto the next generation.

The application of Aboriginal planning and design principles will assist in providing appropriate recognition of the ongoing cultural significance of the SAP Investigation area to the Gamilaroi people. Detailed planning and design principles are set out in the full Moree SAP Aboriginal Planning and Design Guidelines, however, at the highest order, these principles include:

Indigenous led. Indigenous people (designers, elders etc.) should be leading or co-leading the Indigenous elements in the design.

Community involvement. The local Indigenous community needs to be engaged in this process. Can we use their patterns? Can they design patterns for the project?

Appropriate use of Indigenous design. All Indigenous design elements must be approved of by involved Indigenous people/community/elders. If approval is not given, the knowledge will not be used in the project.

6.1.3 *SIGNIFICANT LANDSCAPE AND SITES*

Throughout the Investigation area there are many aspects of the landscape which are significant to the Gamilaroi people, as well as specific significant sites. Section 8 of this report addresses the specific heritage items that have been identified in the Investigation area. Broad based principles to recognise landscape and sites include:

Parks and public zones should be the wet areas and high areas

As all waterways are so significant to Gamilaroi people in the maintenance of their ongoing cultural connection to Country we recommend that wet areas i.e. creeks, billabongs and wetlands within the SAP be maintained, enhanced and restored.

Creation of public open space, parks, walking tracks and recreation areas along waterways is highly desirable using Water Sensitive Urban Design (WSUD) principles and guidelines such as permeable pathways, native reed beds and settlement ponds for water runoff.

Protecting, maintaining and enhancing natural features such as endemic habitat along riparian areas can also provide employment, empowerment and connection to Country by establishing and engaging Gamilaroi landcare groups (via the Moree LALC) to maintain and care for these areas.

Areas for resource gathering

The revival of traditional weaving and tool making in communities has highlighted the need for resource and gathering areas for Aboriginal people to access materials. The enhancing of billabongs, wetlands and riparian zones can allow weavers and artists to sustainably collect materials in landscapes that have been highly modified since colonisation.

Roads – avoid creek-lines and ridge tops

Ridgelines and waterways are places that traditionally were used for resource gathering and habitation. Placing roads and other heavy infrastructure in alternative places where possible allows for these cultural landscape features to be protected from disturbance and be available for all to enjoy.

High points are rare in the floodplains, maintaining views and sightlines can enhance a sense of place and allow for sightseeing and tourism opportunities.

Figure 6.2 broadly maps the main areas that have identified heritage sites or sites that have potential cultural significance, such as watercourses or higher ground. Further detailed analysis and mapping of these areas would need to occur in consultation with the local community.

KEEP SITES AND SIGNIFICANT AREAS

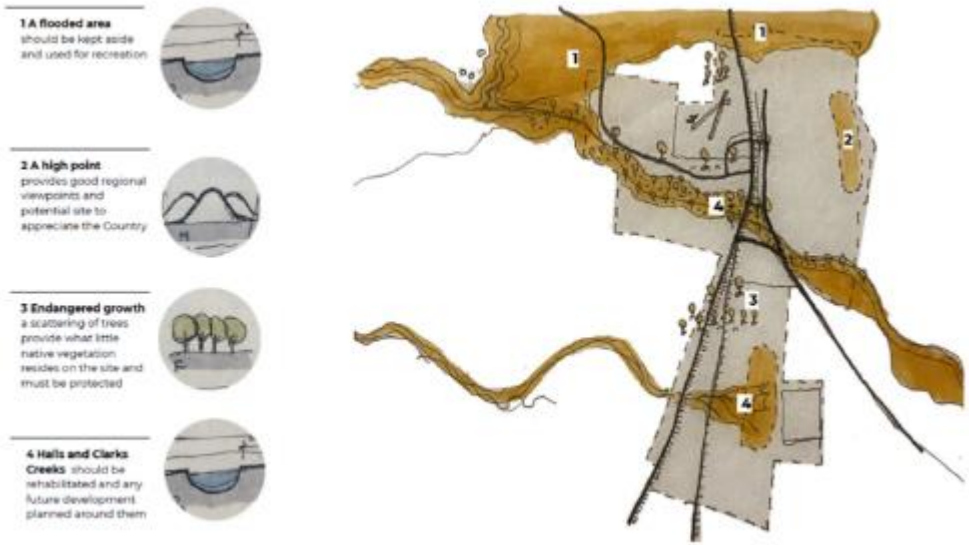


Figure 6.2 Artist impression of potentially significant areas for protection, interpretation or rehabilitation

6.1.4 *RECOMMENDATIONS ARISING FROM ENGAGEMENT WITH THE MOREE ABORIGINAL COMMUNITY*

The Moree Aboriginal community have provided feedback on the draft Moree SAP Structure Plan through participating in stakeholder meetings and a targeted community workshop which was held with relevant organisations including the Local Aboriginal Land Council and the Aboriginal Employment Service. These engagement activities were also followed up with further consultation with community stakeholders including the Local Aboriginal Land Council (LALC), Miyay Birray and the Aboriginal Employment Service.

In response, the Moree Aboriginal community have identified the below recommendations for consideration within the final Structure Plan.

- **Maximise economic and social outcomes for the local Aboriginal community.** The Local Aboriginal Land Council Land in the centre of the SAP area is in a potentially valuable position, dependent on the infrastructure built around it and the rezoning. The potential rezoning of the LALC land parcel to “high impact” may open up opportunities for negotiation with potential users to secure income through leasing, partnership, or joint venture arrangements. This would require ongoing negotiation with the LALC, which should be facilitated by Regional Growth NSW.
- **Locate low impact uses adjacent to residential areas.** This was a strong recommendation from the whole of the community in response to all the tested scenarios. It is therefore recommended that there be a low impact land use or buffer zone between residents and the rest of the precinct.
- **Provide suitable entry points for pedestrians.** Feedback from stakeholders highlighted the importance for nearby residents to access the SAP area on foot and particularly important for Aboriginal people living near the SAP. It is recommended that walking tracks be included from the entry point into the SAP to the waterways, which can also be used for cultural purposes.
- **Include active transport linkages within the SAP.** Miyay Birray, a local Aboriginal youth service, highlighted the importance of cycling as an activity to bring kids together. At this time there isn’t anywhere that youth can cycle that does not take them across major intersections or rail, and nowhere that they can be seen and supervised from a single central point. Bike paths in the SAP could include a circular track for training and exercise purposed, available to the whole community, but that could be used by Miyay Birray.

- **Take advantage of a hub space within the SAP to provide hands on education:** To boost employment opportunities for Aboriginal people, it is recommended that the proposed hub space should have the flexibility to be used for education and training purposes, particularly hands-on training opportunities for jobs that will be created within the SAP. Conversations with both TAFE and the CSIRO point to the possible opportunities for training, which should be explored.
- **Repair of the riparian corridors and create opportunities for working on Country:** The draft Structure Plan proposes to rehabilitate small portions of the riparian corridor. This is work well suited to those Aboriginal people who want to work on Country. It is recommended that the rehabilitation occurs across the waterways within the SAP area.
- **Provide opportunities for designing with Country.** Designing with Country must include the protection of identified significant sites, repair and maintenance of Country (particularly waterways), Welcome to Country at important entry points into the SAP area, and dual naming of places and waterways.

7 ECONOMIC AND SOCIAL OUTCOMES

7.1 ECONOMIC OUTCOMES

7.1.1 *ECONOMIC OVERVIEW*

The local economy of Moree has key strategic economic advantages, particularly for the agriculture industry, which has made it one of the most productive agriculture regions across Australia. These key advantages include:

- Reliable access to both groundwater and surface water.
- The region benefits from rich, alluvial black soils that are highly productive for agricultural purposes.
- Strong transport links across rail, road and air freight, providing producers with reliable and efficient links to local and international markets.
- Relatively cheap land compared to other regional locations.

The creation of a Special Activation Precinct which capitalises on these economic advantages, while easing development costs, regulatory barriers and approval timeframes, will facilitate the achievement of economic benefits for the entire local and regional community. This section draws heavily on the findings of the CIE Report.

KEY STRUCTURE PLAN PRINCIPLES

- Ensure that the competitive attributes of the Moree SAP are optimised for investment attraction and jobs creation.
- Build economic opportunity for the local and regional communities through jobs and growth.
- Strengthen local industries and enterprises.

7.1.2 *ECONOMIC CONTEXT*

GROSS REGIONAL PRODUCT

Moree's Gross Regional Product (GRP), is substantial, contributing approximately 17.5 per cent of NSW's entire gross agricultural product.

Moree LGA GRP was $1 013 million in 2018–2019 (Table 7.1 and the gross value added by industry was $940.4 million.

Table 7.1 Gross Regional Product by expenditure, 2018–2019

Gross Regional Product expenditure method	Value (millions)
Household Consumption	707.7
Government Consumption	227.6
Private-Gross Fixed Capital Expenditure	230.0
Public Gross Fixed Capital Expenditure	60.1
Gross Regional Expenses	**1225.4**
plus Regional Exports	754.0
minus Domestic Imports	855.9
minus Overseas Imports	110.6
Gross Regional Product	**1013.0**

Source: REMPLAN

JOBS AND BUSINESSES

The agriculture, forestry and fishing industry contributes the greatest number of jobs to the Moree economy. The total number of jobs by each industry is shown in Table 7.2 below.

Table 7.2 Number of jobs by industry sector

Industry sector	Employees	
	Number	% of total
Agriculture, Forestry and Fishing	1 559	26.91
Mining	17	0.29
Manufacturing	145	2.50
Electricity, Gas, Water and Waste Services	39	0.67
Construction	383	6.61
Wholesale Trade	174	3.00
Retail Trade	491	8.47
Accommodation and Food Services	317	5.47
Transport, Postal and Warehousing	241	4.16
Information Media and Telecommunications	28	0.48
Financial and Insurance Services	115	1.98
Rental, Hiring and Real Estate Services	56	0.97
Professional, Scientific and Technical Services	230	3.97
Administrative and Support Services	174	3.00
Public Administration and Safety	389	6.71
Education and Training	565	9.75
Health Care and Social Assistance	557	9.61
Arts and Recreation Services	32	0.55
Other Services	282	4.87
Total	**5 794**	**100.00**

Source: REMPLAN

Historical ABS census data suggests that between 2011–2012 to 2016–2017, there has been a 2.3 per cent increase in the number of jobs in the Moree LGA. Females have been the driving force behind this growth, with the number of females in employment rising 6 per cent between this period, compared to males have had no change in employment numbers.

The distribution of jobs aligns with the composition of businesses in the local government area, with the agriculture sector providing over 40 per cent of all businesses, as shown in Table 7.3.

Table 7.3 Composition of businesses in the Moree Plains LGA, 2019

Industry	Businesses		Change since 2015
	No.	% of total	%
Agriculture, Forestry and Fishing	814	42	0
Mining	0	0	0
Manufacturing	43	2	12
Electricity, Gas, Water and Waste Services	19	1	-1
Construction	207	11	-1
Wholesale Trade	44	2	-5

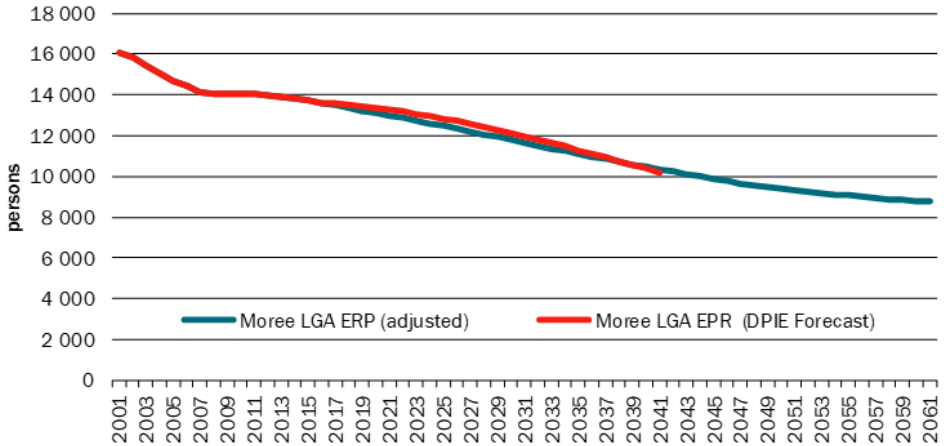
Industry	Businesses		Change since 2015
Retail Trade	70	4	-8
Accommodation and Food Services	62	3	6
Transport, Postal and Warehousing	117	6	-1
Information Media and Telecommunications	0	0	0
Financial and Insurance Services	82	4	5
Rental, Hiring and Real Estate Services	224	12	16
Professional, Scientific and Technical Services	70	4	12
Administrative and Support Services	30	2	-28
Public Administration and Safety	3	0	-1
Education and Training	6	0	-46
Health Care and Social Assistance	47	2	1
Arts and Recreation Services	9	0	-11
Other Services	75	4	9
Total	**1 926**	**100**	**0.7**

Source: 8165.0 Counts of Australian Businesses, including Entries and Exits, June 2015 to June 2019.

When considering the whole agriculture sector, it is clear that Moree has a key focus and advantage in broadacre crops. In 2016, broadacre crops accounted for 92 per cent of the total agricultural production of the Moree Plains LGA, with a gross value of $794.7 million. Based on the ABS commodity summary, 1 040,021 hectares or 13 per cent of NSW broadacre crops were produced in the Moree Plains LGA. This includes approximately 11 per cent NSW's production of cereals for grain, 47 per cent of cotton, and 20 per cent of pulses and oilseeds.

POPULATION

Despite the impressive economic base in Moree, the population is expected to continue to decline. Over the next 40 years, the Moree Plains LGA population is projected to decline at an average annual rate of 1 per cent each year, as shown in Figure 7.1.



Source: DPIE and CIE estimates

Figure 7.1 Population projections of Moree Plains LGA

Whilst the demographic analysis points to a population decline, it is expected Moree's agricultural base and the opportunities created within the SAP will support a steady increase in population, with a local workforce intrinsic to delivering on the ambitions and outcomes of the SAP. In addition, a stronger focus on education, skills and training throughout the delivery process will create career pathways to skilled employment for Moree's youth.

AGRICULTURAL TRENDS

The agricultural sector has been going through a period of significant transformation over the past few decades. This has led to various productivity and efficiency improvements and operational requirements, such as the following:

- Continuous adoption of advanced machinery and automation has resulted in significant productivity and output improvements over the past 20 years. This has resulted in increased yields per hectare and an increase in water efficiency. However, this has also led to a reduction in the number of staff employed by the sector, as the productivity of labour increased. Since 1990, improvements in labour productivity has seen the amount of labour use per hectare roughly half.
- There has been streamlining of the supply chain and marketing practices, with a much wider use of on-farm storage and forward selling.
- There has been a general trend of farms consolidating, with farmers selling to either their neighbours or to corporate farming enterprises. This has the overall impact of rationalising overheads and unlocking economies of scale (such as through higher utilisation of capital).
- With an increased level of investment into automation and other technologies, there has been an increasing requirement for highly skilled staff and supporting businesses to service the agriculture industry.

7.1.3 *INDUSTRY ATTRACTION*

CIE has made an assessment of the manner in which creation of the Moree SAP will assist in unlocking investment that capitalises on the economic advantages of the region. CIE has concluded that the industries that are likely to be attracted to the Moree SAP will be dominated by industries which:

- Are attracted by water and land availability – mainly focused around outdoor and indoor horticulture and intensive agriculture
- Can leverage off Moree's strength in grains and cotton production, being industries which can value add to these commodities through early stage processing
- Can offset production inputs in areas such as diesel and fertiliser
- Will build on locational advantage and intermodal infrastructure, being mainly freight and logistics
- Can take advantage of access to transport, waste products and climate to create "circular economy" industries, including waste processing and transformation, solar power and hydrogen generation
- Provide support services for other industries.

A summary of the CIE assessment of the types of businesses, potential jobs and land required for this investment is provided in Table 7.4.

Table 7.4 Types of businesses, potential jobs and land required for investment into Moree SAP

	New businesses	Average allotment size	Building footprint	Employment per business	
	Number	Ha/business	Ha/business	Persons	FTEs
Building on water and land availability					
Aquaculture	1	5	0.7	400	300
Outdoor horticulture	3	50	—	60	27
Undercover horticulture					
Medicinal marijuana stage 1	1	40	2.0	90	68
Medicinal marijuana stage 2	1		2.0	70	53
Medicinal marijuana additional small[b]	2	40	2.6	144	52
Medicinal marijuana additional large	1	40	20	600	450
Glasshouse/aquaponics Stage 1	1	40	20	333	250
Glasshouse/aquaponics Stage 2	1	40	20	333	250
Glasshouse production additional	2	40	20	333	250
Poly tunnels (berries and vegetables)	3	15	10	160	100
Building on grain/cotton advantage					
Increasing value from the supply chain					
grain storage, sorting and handling	5	5	1	10	10
Early-stage processing					
Flour/chickpea milling/canning	2	5	1	10	10
Oil crushing plant	1	5	1	10	10
Plant proteins	1	10	1	60	48
Grain ethanol	1	30	5	30	24
Reducing reliance on imported inputs					
Diesel replacement (methanol) — Gas to liquids	0	5	<1	5	5
Chemicals manufacture/mixing	1	15	1	15	15
Fertiliser mixing— Urea Ammonium Nitrate	1	10	1	10	10

	New businesses	Average allotment size	Building footprint	Employment per business	
Building on location					
Intermodal terminal (public access)	1	30	5	15	
Freight and logistics	2	10	5	5	
Abattoir	0	30	5	1000	600
Circular economy					
Resource recovery (tyres and plastics)	2	30	5	10	10
Waste to energy — Biogas	1	30	5	10	10
Solar electricity	1–3	700	<1	4	4
Hydrogen production	1	10	<1	4	4
Supporting/service industries					
Light industry/commercial	5	2	2	5	5

Source: Market Sounding and CIE analysis

7.1.4 *40 YEAR LAND DEVELOPMENT ESTIMATE*

Using this economic assessment, an estimate of the potential land required to accommodate the 40 year development horizon has been assessed. The broad categories of land use and their likely land requirements are summarised in Table 7.5.

Table 7.5 40 year land development estimates

Land use type	40 year land requirement (ha)
Intermodal	30
Freight & Logistics	20
Horticulture, Intensive Agriculture and Native Horticulture	520
Resource Recovery	60
Value Add Agriculture	80
Bio-Energy/Hydrogen	40
High Impact Industrial	25
Energy/Solar	700–2100
Service/Light Industrial	10
Total	**1885–2885**

Land development estimates have been reconciled with the SAP sub-precinct areas to generate an estimate of the likely extent of development across each sub-precinct over the 40 year timeframes, as shown in Table 7.6. In doing so, assumptions have been made for the quantum of land required in each sub-precinct for infrastructure and other special purposes (such as roads, railway lines, sewage treatment facilities, environmental protection areas, etc.). Generally speaking, each sub-precinct is likely to be developed to around 50 per cent of its capacity over a 40 year timeframe. The low impact area and Resource Recovery and Recreation Sub-Precinct are likely to be developed to a lesser extent due to environmental constraints and potential role as biodiversity offset areas, while areas identified as suitable for solar power production are likely to be developed to a higher extent.

Table 7.6 Sub-Precinct and Land Use Areas

Sub-precinct	Total area (ha)	% allocated to infrastructure or other special purposes (notional)	% land developed over 40 years	Net developed area over 40 years (ha)
General Enterprise	1195	10%	50%	538
General Enterprise (low impact area)	213	20%	30%	51
Central	351	15%	50%	149
Gateway	127	15%	50%	54
Central Solar/Energy	938	5%	75%	668
Resource Recovery & Recreation	359	20%	10%	29
Large Industry & Solar	1158	5%	75%	825
Air Transport	237	100%	0	0
Rural buffer	292	0	0	0
Total	**4927**			**2314**

7.2 SOCIAL OUTCOMES

The Moree SAP has the potential to transform social and economic outcomes for local and regional populations, though providing meaningful employment opportunities, education and training and enhanced local facilities and infrastructure.

Unlocking the SAP's economic potential is reliant on transforming Moree's existing social disadvantage, increasing social capital and shifting current perceptions of Moree.

The following sections explore the key findings and recommendations related to unlocking the potential of the SAP to improve social and economic outcomes for Moree's Aboriginal and the broader community.

KEY STRUCTURE PLAN PRINCIPLES

- Optimise benefits for the local community.
- Recognise and respond to the historical disadvantage and trauma experienced by local indigenous communities.
- Enable education and employment opportunities to build a local workforce.
- Mitigate adverse impacts to adjacent residential communities.
- Support the delivery of social infrastructure and community services to improve Moree's amenity and quality of life offering to attract and retain a skilled workforce.

7.2.1 *ACHIEVING POSITIVE OUTCOMES FOR MOREE'S ABORIGINAL COMMUNITY*

The Moree SAP provides an opportunity to attract investment into Moree, providing a base to unlock social and economic outcomes for Moree's Aboriginal community.

The Moree Local Aboriginal Land Council (LALC) owns an area of land within the SAP investigation area. The aspiration for the LALC land is to maximise benefit from the land for the purposes of advancement of the local aboriginal community. Ongoing engagement with LALC during the development of the Structure Plan was key to exploring these aspirations.

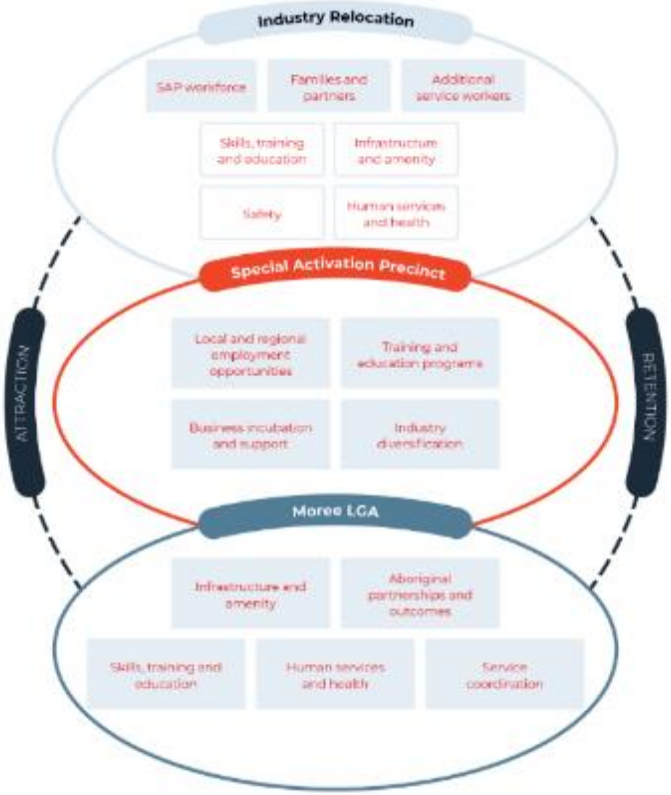
The LALC land is situated near the northern intermodal terminal in the draft Structure Plan. This provides opportunities for the LALC to develop their land and/or enter into a leasing agreement, joint venture or partnership with a developer or establishing business.

The realignment and rehabilitation of the TSR also provides opportunities to create active transport links through the SAP, in addition to providing opportunities for local Aboriginal people to work on Country. Low impact land uses, including an area retained for its high biodiversity value, will be located adjacent to Stanley Village to avoid amenity impacts on the local Aboriginal community.

Key design elements recommended for inclusion within the SAP were Welcome to Country signs at the entry points into the SAP and providing a community hub space that can be used for education, cultural recognition , business incubation, and as a home for items of cultural significance found throughout the SAP.

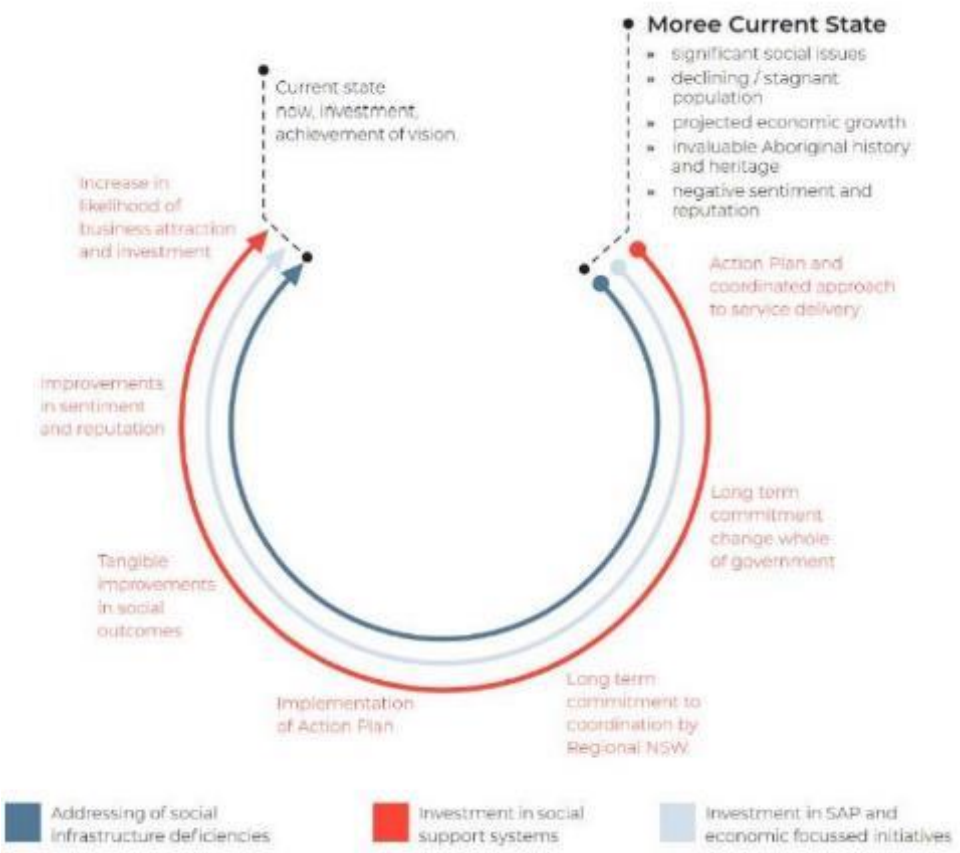
It is also recognised that changing outcomes for Moree's Aboriginal population takes more than design elements within the SAP. To achieve lasting and meaningful social change, a whole of government approach is required. This could begin with an Implementation Plan to develop an integrated human services approach for Moree. This is a possible case study for implementation of the Caring for Country Framework.

The Social Outcomes framework developed as part of the SAP is illustrated in Figure 7.2 and Figure 7.3. It is understood that social change - and the long-term investment in it - is a prerequisite to achieving the SAP vision and must occur concurrent to the development. The following figures illustrate a pathway to achieve these outcomes through encompassing a holistic framework of initiatives, opportunities and issues to address.



Source: Elton Consulting (2020)

Figure 7.2 Social Outcomes Framework for the Moree SAP



Source: Elton Consulting (2020)

Figure 7.3 Proposed approach to social change

A key outcome achieved through the development of the Moree SAP Structure Plan is a commitment from the Department of Regional New South Wales (RNSW), MPSC, the Regional Leadership Executive (RLE) and appropriate community representatives to deliver an Action Plan for social change in 2021. It is agreed the Action Plan will likely include:

- An audit of current services and providers
- Review of Treasury and NSW Audit office costing data
- Review of all existing planning, work to date and existing government metrics
- Consultation with the community to encourage buy-in and ensure the Action Plan is committed to being delivered together
- Consultation with MPSC and the RLE to determine the priorities, actions and measures to be included in the Action Plan and establish the whole of government approach to social change.

The aim of the Action Plan is for it to be a live document used by RNSW to guide their approach to coordination. The Action Plan will include discreet actions and measures, aligned with existing government targets where possible. The Action Plan will be placed on public exhibition in late 2021.

7.2.2 *COMMUNITY AND SOCIAL INFRASTRUCTURE*

There is a general agreement that the SAP will include a "community hub" of some form. It is recommended that the most appropriate uses for the community hub will be multipurpose facilities designed and built to maximise flexibility in use, so they can accommodate a wide range of uses for a diverse range of user groups.

The community hub is likely to include a range of uses to support workers, business and the local community. This may include:

- Training and innovation space potentially with a presence by a University or other training organisation
- Meeting or collaboration space for local businesses to meet
- Formal meeting space for video conferences and/or client meetings
- Storage space for culturally significant items to be displayed on Country (if deemed appropriate by the LALC and other local Aboriginal groups)
- Some form of recreation space for workers such as a gym, sports court or similar
- Food and beverage retail to support local workers and activate the hub during working hours
- Providing a base for revegetation and restoration activities of the local creeks.

Regardless of how the community hub is used, it is recommended the following principles should be embedded in the design, function and operation of the hub to ensure equal access:

- **Accessible to all members of the community**. This may include tiered pricing for different tenants, programs or activities based on the intended audience. Community members should not be excluded from communal spaces due to the cost of entry.
- **Provide a range of services and activities. C**ommunal spaces should aim to be relevant to all members of the community.
- **Culturally appropriate spaces.** Communal spaces should be designed to recognise and acknowledge Aboriginal history and heritage.

8 SUSTAINABILITY

8.1 OVERVIEW

Sustainability is a core delivery focus of the Moree SAP, as provided by the Vision. Achievement of this Vision has been translated into three core sustainability goals:

- A net zero carbon emission precinct
- No net impact on water sources and a positive impact on water quality
- Create circular economy outcomes and opportunities for industry through waste stream management.

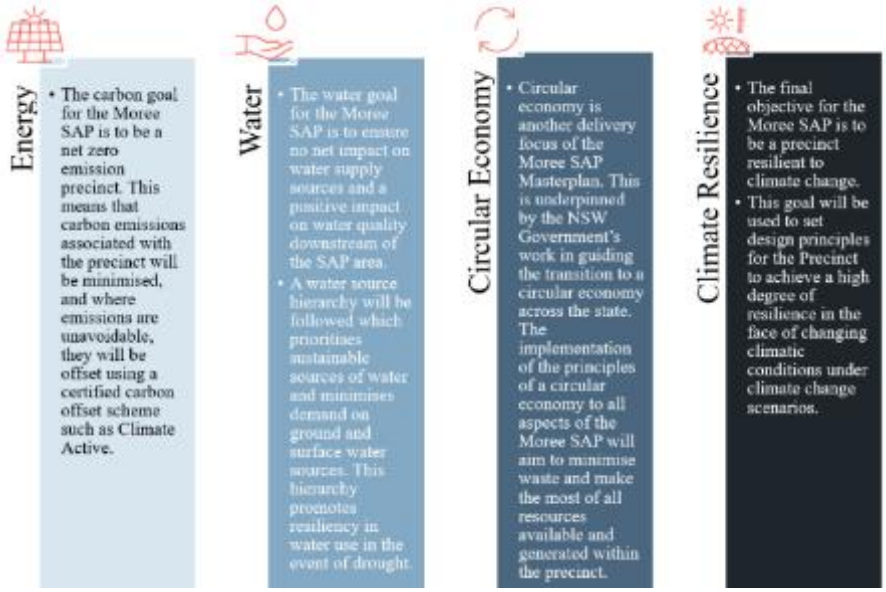


Figure 8.1 Sustainability framework for the Moree SAP

KEY STRUCTURE PLAN PRINCIPLES

- Deliver a net-zero carbon and climate precinct.
- Embed circular economy principles within the design of the precinct.
- Efficient use and protection of important ground water resources.
- Design to mitigate known local climate risks.

The Moree SAP aims for high levels of sustainability across Energy, Water and Resource use, all underpinned by the Principles of the UN SDGs, the United Nations EcoIndustrial Parks Framework and the principles of Climate resilience.

Figure 8.2 Sustainability Frameworks relevant to the Moree SAP

Developing the Moree SAP in a sustainable way is also considered to be critical to the success of the industries that decide to become resident businesses and for the overarching goals for the locality and the region.

The methodology for achieving these objectives in the SAP will be to follow a hierarchy of resource use, prioritising avoidance of consumption, followed by sources which enable a circular economy of resource consumption.

8.2 ACHIEVING NET ZERO

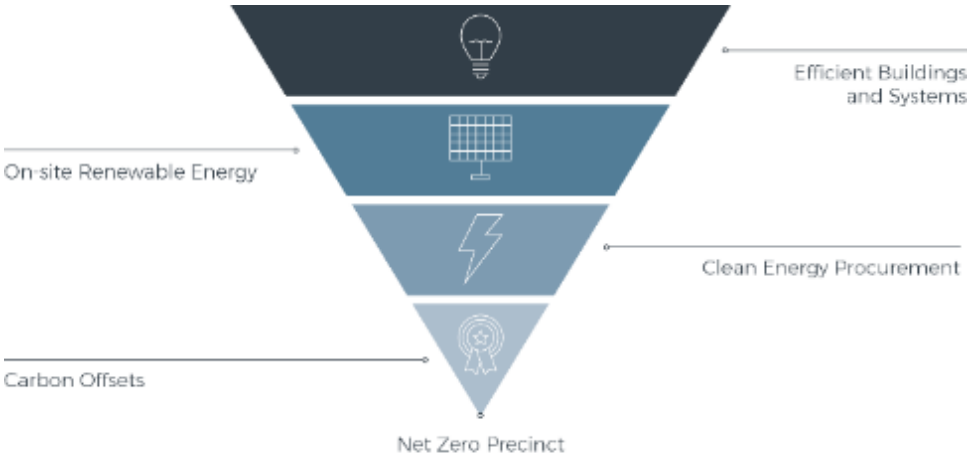


Figure 8.3 Net zero hierarchy

The goal for the Moree SAP is to be a precinct resilient to climate change. This goal will be used to set design principles for the Precinct to achieve a high degree of resilience in the face of changing climatic conditions under climate change scenarios.

In predicted climate change scenarios, rainfall is projected to decrease in the spring, and increase in the autumn, and fire weather is expected to increase in winter, spring and summer. Some of the greatest reductions in rainfall are projected to happen in areas including Moree, so more detailed understanding the future climate will influence not only development locations, but also the water use and recycling.

Design responses for the climatic changes that are likely to affect Moree are considered throughout this report as appropriate for each sustainability goal.

The NSW Climate Change Policy Framework identifies the critical risks faced by physical infrastructure and communities across the state as a result of climate change.

The Moree SAP will consider climate risk factors in its design and delivery with a climate risk assessment and climate adaptation plan.

The following provides a summary of the climatic changes that are likely to affect the Project:

- Increase in maximum temperatures
- Increase in minimum temperatures
- A greater number of extreme hot days (days over 35°C)
- A decrease in cold nights (nights less than 2°C)
- Change in rainfall patterns.

There are a range of potential design responses to the predicted impact of climate change. Some examples include:

- Emergency plant locations
- Tree canopy cover of the public domain and heat wave management
- Flood thresholds for floor levels
- Public domain utility and water management infrastructure
- Resilient systems (on-site generation + storage).

The primary delivery tool for a net zero precinct is the creation of opportunities for solar development, supported by a “behind the meter” delivery mechanism for local industry. If the proposed land area of 714 hectares was to be allocated Solar production, then the estimated energy generated would be sufficient to meet and exceed the estimated energy demands from the precinct and allow for the production of green hydrogen at about 10 tonnes/day.

The merits of establishing a “micro-grid”/”privately owned embedded network” to allow the aggregation of the renewable energy generation sources in bulk, and to supply the new land-use areas, is recommended as a possible mitigation strategy, for further consideration, to possibly support the early development of suitably sized large solar farms (in a staged manner) before the upstream transmission network augmentation works as outlined in the AEMO ISP is completed.

This would effectively provide a means for new solar farms to supply the new industries and businesses in the SAP directly, and be controlled and managed centrally as a Virtual Power Plant, effectively arranging the new generation sources “behind the meter”/“behind the point of connection” to the grid.

Solar energy from solar farms within the SAP area have the greatest potential for renewable energy provision, however this must be supported by on site roof top PV within each lot, and a gas supply from a renewable source.

The balance of energy demands and consumption from the SAP area is shown in Figure 8.4. It shows that there is the potential to provide all of the energy demands of the SAP from renewable sources provided at least 75 per cent of the land allocated to solar farms is developed for solar production.

If 75 per cent of the land allocated to solar farms is developed for this purpose, then there will be sufficient renewable energy to meet the demands of the SAP with some surplus to meet additional demand such as from the Moree township.

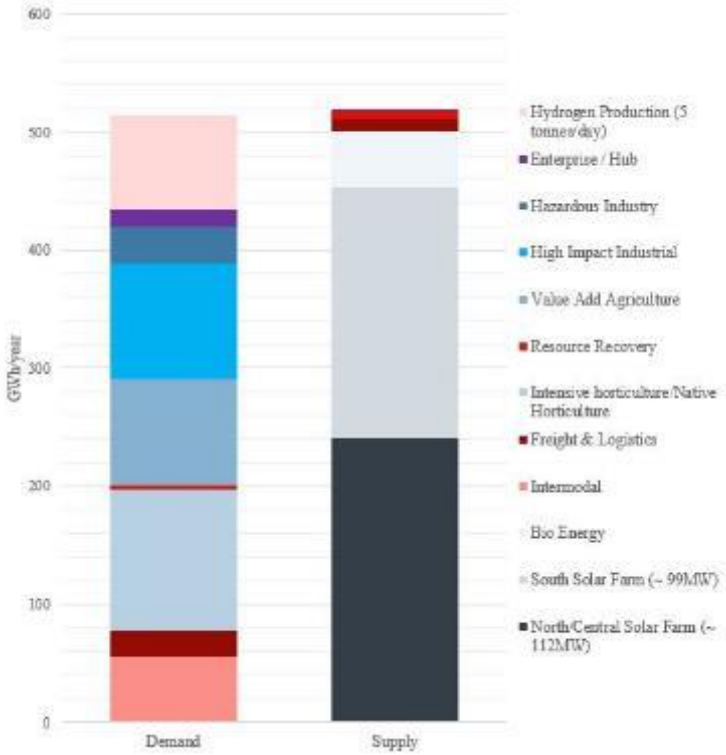


Figure 8.4 Energy balance within the SAP

8.2.1 *GAS*

Many businesses have shown an interest in having a gas and/or heat source to enable their operations. A Natural Gas line is proposed a short distance east of the SAP area, providing a viable short term solution for this need. However, to support the sustainability aspirations and vision of the SAP, it is proposed that a transition plan is put in place such that the natural gas can be substituted with biogas or hydrogen once production within the SAP area is viable.

The energy balance includes a 5 tonne/day hydrogen plant, which could potentially increase in size to 9–10 tonnes/day if all the solar farm area is developed.

8.2.2 *BIOENERGY*

Energy sourced from residual biological waste is a viable source of energy for the Moree SAP. The Delivery Plan will consider facilitation of a bioenergy plant within the SAP area by addressing planning controls and zoning of suitable areas for bioenergy process. Key considerations for a bioenergy plant include:

- Suitable buffer zones.
- Use of residual waste only. For this reason municipal waste is not typically considered a source as avoiding municipal waste generation is a preferable outcome.
- Co-location of suitable businesses requiring the bioenergy in close proximity to the plant.
- Compliance with EPA regulations for bioenergy facilities.

The energy balance in Figure 8.4 includes bioenergy from a 47.7 GWh/year bioenergy plant, based on processing 20 per cent of the cotton stalk waste from the agricultural sector around Moree.

8.2.3 *HYDROGEN*

Hydrogen is a viable source of renewable gas for the Moree SAP, however its implementation needs to be considered in the context of the energy and water strategies for the precinct. It takes energy to create hydrogen and the process has a significant water demand. Therefore the production of hydrogen within the Moree SAP will need to be limited to quantities which are sustainable.

Use of hydrogen for a bus fleet is one business model which has already been suggested for the SAP and this level of demand is considered appropriate for this SAP. Hydrogen production could be increased to up to 9–10 tonnes/day.

8.3 ACHIEVING WATER MANAGEMENT OUTCOMES

The scarcity of water is a serious issue. We face severe water shortages and compromised water quality due to global climate change. Even in Moree where the town has not had to enforce water restrictions due to a historical presence of abundant groundwater, water sources are at risk. The impacts of climate change and unsustainable water use patterns, indicate that the continued drawdown of the Gwydir Alluvium and the Great Artesian Basin (GAB) are not guaranteed to provide a continued water supply.

The strategy for the SAP is to encourage closed loop systems, with localised collection of rainwater and stormwater, localised treatment where possible, and recycling and reuse on larger scales to maximise availability of water. This strategy will help reduce raw water demand and create a more resilient water future.

The development of the SAP has been configured based on the carrying capacity of the site: harvesting sufficient water to meet the needs of the businesses in the precinct while respecting the natural hydrology of the land, the water needs of the ecosystem the site inhabits, and the ecosystem of the community.

8.3.1 *WATER EFFICIENCY*

The first step in the water strategy is water use efficiency. This will need to be controlled in the Delivery Plan to ensure water demands are minimised and to maximise the potential of meeting all water demands for the SAP.

Efficiency measures can be simple initiatives such as efficient fixtures and fittings within buildings, leading to more complicated innovations and technology to achieve the more significant water savings for industrial processes and agricultural or horticultural demands.

8.3.2 *WATER USE HIERARCHY*

To maximise resilience to water availability, the water use hierarchy shown in Figure 8.5 must be followed to maximise water availability for the SAP, the town and future generations. Town water is currently sourced from the Gwydir Alluvium Aquifer. Moree Plains Shire Council has confirmed a current unutilised 500 ML/annum from the Council allocation which can be used for demands within the SAP, subject to licence conditions as per the WSP Water Demand and Supply Report.. As this current unused allocation is not sufficient to meet all the demands of the SAP, it is essential that other sources are used as a priority.

Figure 8.5 Water use hierarchy for the Moree SAP

Rainwater is given the highest priority as the cheapest form of recycled water and facilitates staging of development until the critical mass is reached to validate infrastructure such as wastewater or stormwater recycling.

Recycled wastewater is given the second priority as sewage treatment for the SAP will need to be included regardless of water sources being used. Stormwater requires less treatment prior to reuse than wastewater and is also available in volumes large enough to be a viable source, provided sufficient storage capacity is available.

Surface water sources such as the Mehi and Gwydir rivers are potential water sources, provided appropriate licences can be obtained and associated treatment and distribution infrastructure constructed. This water source is considered low in the hierarchy due to the variability of flow within the rivers, allocation and trading constraints, and the potential impact on the river environment and sensitive receptors.

The final source in the water use hierarchy is water banking. CSIRO have been investigating “water banking”, also known as managed aquifer recharge (MAR), or aquifer storage and recovery (ASR). However, there is no precedent in NSW for MAR to enable increased groundwater abstraction. There are also significant engineering and policy hurdles associated with water banking. Therefore it is given the lowest priority based on the degree of unknowns, cost and potential risk.

There are more than six sources of water available to businesses in the SAP boundary. Sustainable management of these sources is critical to ensure the needs of future generations can be met, particularly when faced with predicted water shortages resulting from climate change.

Prioritising recycled water sources is essential to meet water demands of the SAP without impacting on existing water rights and future water demands.

8.3.3 *WATER DEMAND ASSESSMENT*

Based on the methodology and assumption detail in this report it is estimated that, for the proposed Structure Plan’s 40 year outlook there is water demand of between 1,300 and 3,000 ML/a. Of the proposed land uses, the Horticulture/ Native Horticulture and Value

Add Agriculture land-uses make up most of the total demand, and most of the variability. The existing available water sources, combined with additional recycled effluent, are insufficient to meet this demand. However, with the additional supplies potentially available, in particular the GAB and stormwater harvesting, there is likely sufficient water available.

The water balance shown in Figure 8.6 shows significant variability in potential demand from the SAP based on the unknown elements of the potential development types and activities, particularly in the land use types of horticulture and value add agriculture. The potential supply options indicate these demands can be met, however this is based on accessing water from the GAB at a rate which is not yet confirmed. Preliminary modelling suggests up to 3.3 GL/Year can be drawn from the GAB without drawdown impact on neighbouring bores (refer to Aurecon's report for further detail). This highlights the need to prioritise water demands from alternative sources when they are available to ensure sustainable water consumption and maximised resilience to water availability.

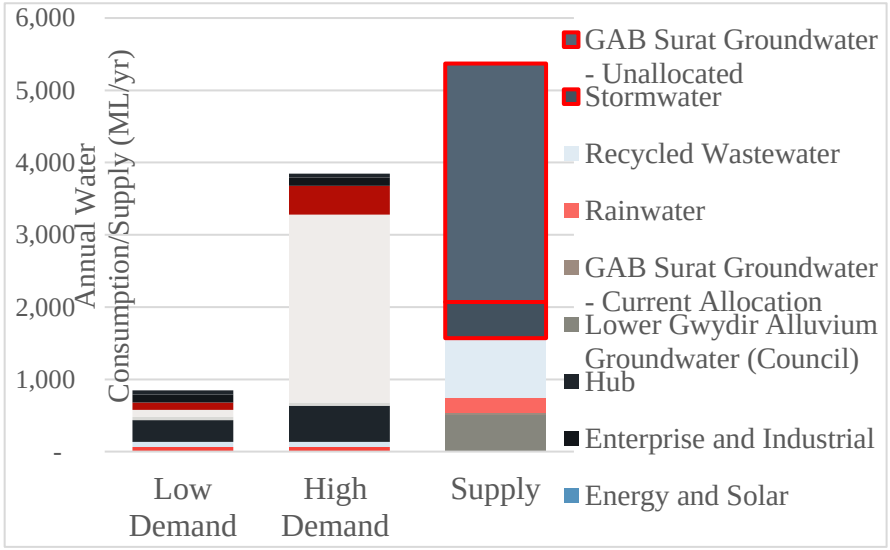


Figure 8.6 Water balance for the Moree SAP

8.3.4 *STORMWATER AND WASTEWATER RECYCLING*

The potential volumes of stormwater available for reuse have been modelled by Arcadis (refer to the Arcadis Water Management Report). Sustainable use of stormwater includes ensuring sufficient flows for management of surface water systems and allow for recharge of groundwater systems. This has been taken into consideration in the Arcadis modelling and demonstrates that with such sustainable management of stormwater flows, suitable volumes remain available to provide a viable source of water to the Moree SAP.

Recycled waste water is similarly a viable source of water. Wastewater currently produced in Moree is directed to the Moree Sewerage Treatment Plant (STP) in the North-west of the town. This water is treated, and entirely allocated for irrigation of the Golf course and some parks and fields in Moree. Wastewater from the SAP can either be directed to the current STP which would require some augmentation to increase capacity, or a new STP can be built within the SAP to enable local redirection of treated water for reuse.

Commercial viability is maximised if the recycled wastewater or stormwater can be reticulated to a few large uses instead of extensive reticulation throughout the SAP. The volumes of stormwater reserved for reuse must first ensure that natural water flows are being maintained to protect the environmental value of the rivers, creeks and ground water sources in the SAP.

8.3.5 *GROUND WATER*

Underlying the Lower Gwydir Alluvium is the Surat Groundwater Source, which forms part of the Great Artesian Basin (GAB). Preliminary analytical modelling undertaken as part of the Environment Scope (Aurecon 2020) indicates that a potential yield of 3,360 ML/yr is possible without causing unacceptable impacts to sensitive receptors or other groundwater users. The yield could potentially be increased whoever the quantity requires further exploratory work to confirm.

Town water is currently sourced from the Gwydir Alluvium Aquifer. To support employment generation and economic diversification Moree Plains Shire Council has dedicated up to 500 ML of water supply to the Moree Special Activation Precinct.

In order to achieve a Net Zero water balance for the SAP, drawing from the aquifers will need to be limited to sustainable quantities. Licencing for access to these waters takes into consideration social/economic and environmental impacts to decide how much extraction to allow for within the GAB Surat water source. Whether this is a sustainable level may be investigated in greater detail.

8.3.6 *WATER QUALITY*

Water quality in downstream environments will be mitigated through:

- Effective stormwater management
- Elements of water sensitive urban design to allow the water cycle to function as it would naturally. This reduces the impact of development on the water cycle and improves stormwater quality.
- Stormwater will be managed to ensure that post development peak flows do not exceed the predevelopment peak flows
- Rehabilitation of Halls Creek to improve the ecological value of the creek line and protect biodiversity in the area. More detail can be seen in Aurecon's report.

8.3.7 *WATER DEMAND MANAGEMENT FRAMEWORK*

The following recommendations have been identified based on the opportunities and constraints identified in this report. These recommendations have been made to progress the water supply and demand assessment for the Moree SAP and support the robust Master Plan, and Delivery Plan. While the work relating to developing detailed water servicing plans is likely to include a long list of "next steps", the following provides the key findings and short-term areas of focus to further develop a sustainable and achievable water servicing system for the Moree SAP.

- Maximise Use of Existing Water Supplies: The use of existing water supplies provides an economically sustainable method of servicing the SAP area as there is a baseline amount of infrastructure in place which therefore doesn't incur the same "start-up" cost as is required with establishing new water sources. The same logic, to maximise existing water supplies, also applies to future systems. While the current report identifies several options for alternative water supplies, their implementation must be considered holistically. That is, consideration must be made to what types of developments would use varying sources to determine the ones that warrant investment. Investigation of recycled water sources uptake is particularly important in this regard.
- Integrate Findings into the Integrated Water Cycle Management Plan: To allow for flexibility in planning water systems using varying water sources, it is recommended that the findings of the current study are incorporated into the MPSC Integrated Water Cycle Management Plan.
- Further Investigate Feasibility of Existing and New Water Sources: To further validate the use of the water sources identified as opportunities in the current report, it is recommended that the following activities are undertaken in the short term:
  - Initiate Discussions Regarding Licensing: While the report identifies possible water volumes that could be accessed from existing aquifers, the ability to draw the water is predicated on acquiring the relevant water taking licenses. It is recommended that discussions are initiated by DPIE and MPSC to progress potential acquisition of licenses.
  - Undertake Field Investigations: To validate the sustainable yields of GAB Surat water, it is recommended that DPIE and the SAP development authority should work with MPSC to obtain necessary approvals to drill a groundwater production bore and undertake pump tests. Analysis from testing this bore will assist in determination of potential yield and quantification of drawdown impact on sensitive receptors. While the current has developed preliminary modelling results with potential volumes, these figures will have to be validated through additional work in the field and additional modelling.
  - SAP Water Demand allocation tracking: Consider developing a water demand tracking tool to monitor water allocation and use. This will enable the new water sources to be planned and delivered based on actual demand triggers, if and when required.

8.4 ACHIEVING CIRCULAR ECONOMY

The goal for the Moree SAP is to achieve resource optimization through the implementation of a Circular Economy Framework for resource efficiency. This is the practice of treating waste as a resource. This objective also supports the goal to create a Moree SAP that is Carbon Neutral and has no net impact on water sources.

To create a SAP that is carbon neutral in which all waste is treated as a resource is important to implement the following waste objectives:

- To reduce the amount of waste produced
- To recycle/reuse as much as possible
- To treat what's left over in the most sustainable way.

Figure 8.7 The Waste Hierarchy

8.4.1 *WASTE IN A CIRCULAR ECONOMY*

The circular economy shows the benefits of viewing waste as a commodity, and how by-products from one industry are inputs for another. By collocating appropriate industries in the Moree SAP, it is possible to reduce Vehicle Miles Travelled (VMT) and the cost of importing new resources, when recycled or waste resources can be readily available on site.

There will be businesses in the SAP with large water demands, some which will require a constant supply, and some which may have a constant output of wastewater. Collocating these businesses will enable one business to take the waste water from the other in a symbiotic relationship to provide mutual benefit.

The same potential exists with businesses outputting large amounts of heat or other form of energy from their onsite processes, which could benefit another business which has need of heat or energy for their own processes.

Agricultural waste products can also be used for energy production. The use of cotton stalks in a bioenergy plant has been discussed for the Moree SAP and has been included as a potential source of energy in the energy balance.

9 ENVIRONMENT

9.1 OVERVIEW

Minimising the impact upon Moree's rich environmental and heritage offering is key to the success of the overall Structure Plan.

Development will avoid Aboriginal Cultural Heritage (ACH) sites and moderate-high archaeological sensitive areas, such as Halls Creek and Clarks Creek, where technically possible. A 15 m buffer will also be applied around scarred trees.

The *Biodiversity Conservation Act 2016* requires that all projects follow the guiding principle of avoiding and minimising impacts on biodiversity values. The Structure Plan has been designed to avoid, minimise and offset impacts on high biodiversity values associated with Halls Creek, the existing TSR and grassland and woodland communities along the northern SAP boundary line. Development will be concentrated on Category 1 land to minimise the disturbance of Plant Community Types (PCTs). Areas of high biodiversity value will be preserved through using them as buffers between residential areas and development within the SAP. To address potential impacts on biodiversity values, a strategic biodiversity certification was identified as the most suitable approach to achieve environmental outcomes through additional conservation measures.

Land to the west of the Newell Highway was identified as not suitable for residential/sensitive land uses. In response, the SAP boundary has been adjusted to respond to the air, noise and odour modelling. Figure 9.5 details the land impacted by potential air, noise and odour issues.

The Structure Plan has a potential ground disturbance volume of approximately 700,250 m^3 over the proposed 40-year development timeframe. There is a high likelihood that Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM) will be suitable for reuse onsite or offsite for construction purposes. Black soils located across the SAP present unique challenges to future development. Early identification of any areas that may contain black soils will allow constructability issues to be addressed efficiently before development commences or design progresses too far.

The Lower Gwydir Alluvium Aquifer is a stressed resource that is fully allocated and cannot sustainably, or legally, provide more groundwater than is currently being extracted from it. Water availability is limited to water that can be diverted from existing aquifer access licences or supplied from MPSC's approximate 500 ML/yr surplus. If available, this water would need to be supplied to industries within the SAP on a water utility basis. It is estimated that the Great Artesian Basin Surat groundwater Source has an available volume of 15,126 ML per year. Subject to appropriate management of drawdown and interference effects, this aquifer should provide a suitable, but not unlimited, supply to the Moree SAP investigation area. GAB Surat Groundwater is not suitable for irrigation due to its high sodium adsorption ratio. However, the water is of potable quality making it suitable for many industrial purposes, although it has some aesthetic issues.

The majority of the SAP is mapped as Category 3 vegetation in NSW Bush Fire Prone Land. Vegetation within these areas are considered to pose a medium bushfire risk and require an asset protection zone between bushfire hazards and buildings. The Structure Plan ensures new development within 100 m of a bushfire hazard area will have 8 m–11 m buffer between development and bushfire prone land. Figure 9.14 illustrates the required buffers across the SAP investigation area.

Halls Creek and Clarks Creek are the key flood prone areas within the SAP. The Structure Plan avoids developing these areas to minimise the risks of possible flood affectation for development within the precinct or creating adverse flood impacts for surrounding properties (upstream and/or downstream).

KEY STRUCTURE PLAN PRINCIPLES

- Avoid, minimise impact or offset areas of high biodiversity value.
- Avoid developing flood prone areas and water catchment areas.
- Provide access to utilities and sustainable water and energy resources.

9.2 HERITAGE SITES

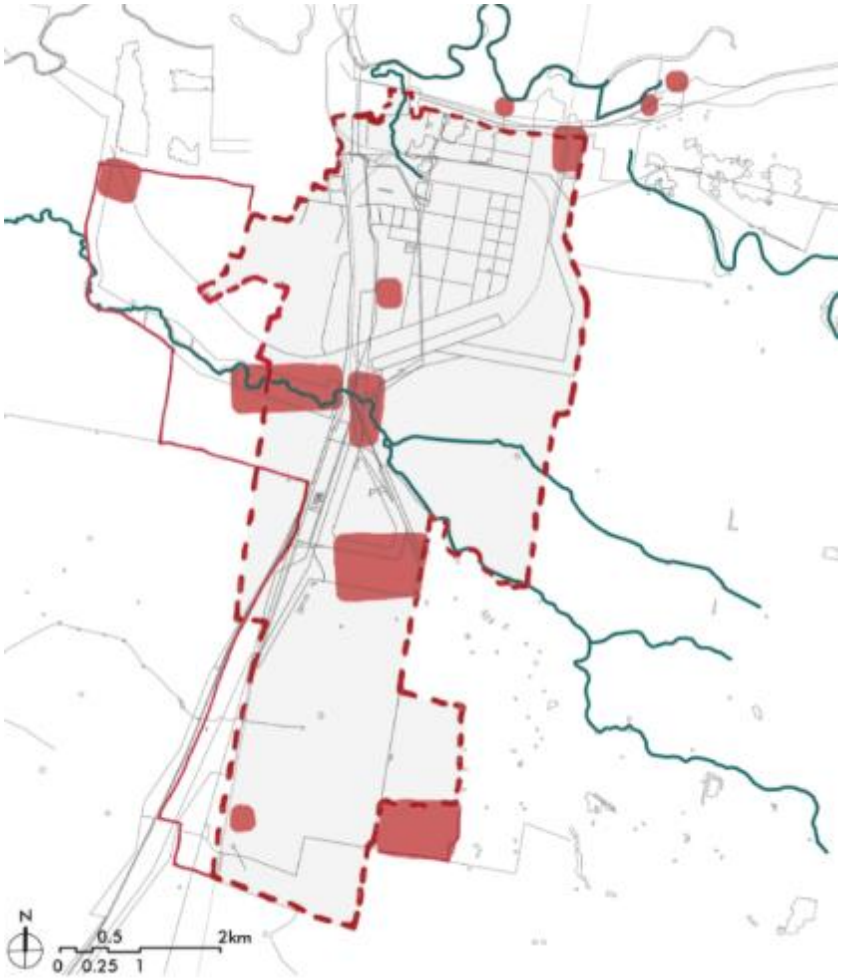


Figure 9.1 Heritage sites within SAP investigation area

9.2.1 *ABORIGINAL HERITAGE*

A baseline understanding of what is and what may be present within the SAP investigation area has been drawn from previous archaeological studies, as well as records held by heritage registers including AHIMS, the State Heritage Register and the Australian Heritage Database.

A search of the AHIMS database, conducted on 1 July 2020, resulted in the identification of 72 registered sites within the broader region (refer Table 9.1). There are 15 registered sites within and surrounding (1 kilometre (km)) of the SAP investigation area, 10 of which are within the SAP investigation area itself.

Table 9.1 Aboriginal heritage management systems registered sites

Site type	Number
Modified tree (carved or scarred)	50
Artefact (isolated or scatter)	15
Burial	2
Stone Quarry	1
Ceremonial Ring	1
Habitation Structure	1
Artefact/Potential Archaeological Deposit (PAD)	1
PAD	1
TOTAL	**72**

Source: Aurecon (2020)

A 103 ha field survey (1.8 per cent of the SAP investigation area) was also completed on the 12 to 16 October 2020. Overall, the survey coverage achieved was small but was sufficient to be able to characterise and test the site location model within the SAP. Table 9.2 provides an overview of the field survey findings.

Table 9.2 Transect information

Survey area	Sap investigation area effectively surveyed (%)	Survey archaeological result
Within 200 m of water	2.6%	157 artefacts, 6 trees
More than 200 m of water	1.8%	8 artefacts, 3 trees

In total, 165 stone artefacts were recorded, from 13 artefact scatters and 15 isolated artefacts. A large site was confirmed near what has been termed the ‘Billabong’. The “Billabong” is a natural depression that would likely have been swampy following flooding and rains in pre-European times. There were 75 artefacts recorded in this location across eight identified artefact clusters, that are likely to represent different exposures and possibly events within one overall large site complex.

To preserve and protect ACH sites within the SAP, development should avoid ACH sites and high and moderate archaeological sensitive areas, such as Halls Creek and Clarks Creek, where technically possible. A 15 m buffer should be applied around scarred trees. If impacts to ACH sites are unavoidable, a salvage collection should be undertaken and, in any case, ongoing consultation with Registers Aboriginal Parties should occur.

9.2.2 *NON-ABORIGINAL HERITAGE*

The SAP investigation area is relatively unconstrained from a European/ non-Aboriginal heritage perspective. Most importantly there are no non-Aboriginal (i.e. European/historic) items listed on statutory or non-statutory heritage registers located within the SAP investigation area. Further, there are no known areas or zones of European archaeological potential located within the SAP investigation area. Listed heritage items relating to the history and development of Moree and surrounds are concentrated in the township to the north, where the bulk of commercial and settlement activity occurred along the rivers and in proximity to the major transport interchanges.

9.3 BIODIVERSITY PROTECTION

Figure 9.2 Areas of high biodiversity value within and adjacent to the SAP investigation area

The *Biodiversity Conservation Act 2016* requires that all projects follow the guiding principle of avoiding and minimising impacts on biodiversity values. In doing so, the proposed SAP boundary was determined through the following avoidance and minimisation measures:

- Avoiding high biodiversity values (and areas of significant cultural heritage value) associated with Halls Creek and the existing TSRs, including the implementation of appropriate buffers to waterways.
- Avoiding high biodiversity values associated with the grassland and woodland communities within the north-eastern Regional Enterprise precinct by creating Biodiversity Protection Areas. Further, this area will be used for low impact land uses as a buffer between residential areas to the north, and development within the SAP.
- Locating majority of precincts within Category 1 land and minimising disturbance of Plant Community Types (PSTs) as far as is reasonably practicable.

9.3.1 *PLANT COMMUNITY TYPES*

Within the proposed precinct boundaries, there is approximately 655.30 ha of PCTs. These are broken down per precinct in Table 9.3.

Table 9.3 Table detailing the total area of PCTs

Precinct	Total area (ha)
55. Belah woodland on alluvial plains and low rises in the central NSW wheatbelt to Pilliga and Liverpool Plains regions	2.14
39. Coolibah -River Coobah -Lignum woodland wetland of frequently flooded floodplains mainly in the Darling Riverine Plains Bioregion	7.82
56. Poplar Box -Belah woodland on clay-loam soils on alluvial plains of north-central NSW	14.60
52. Queensland Bluegrass +/-Mitchell Grass	587.18
27. Weeping myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion	43.02
Total	**655.30**
PCTs as a percentage of total SAP area	**18%**

Due to current and historical land use within and surrounding Moree, native vegetation has undergone significant historical clearing resulting in a highly altered landscape. As such, PCTs within the region provide significant conservation value as remnant vegetation. The Master Plan will aim to retain all vegetation not required to be cleared for development.

Figure 9.3 details the location of PCTs within the proposed SAP boundary.

Source: Aurecon (2020)

Figure 9.3 Satellite map detailing high biodiversity areas within and adjacent to the proposed SAP boundary

The proposed SAP boundary and precinct layout aims to avoid high biodiversity values associated with the grassland and woodland communities within the north-eastern Regional Enterprise precinct, by creating Biodiversity Protection Areas. In doing so, this represents the protection of:

- 43 ha of PCT 27 (Weeping Myall Open Woodland)
- 3.86 ha of PCT 39 (Coolibah, River Coobah, Lignum Woodland Wetland)
- Up to 10 ha of PCT 52 (Queensland Bluegrass, Mitchell Grass).

9.3.2 *WATERWAYS*

Future development within the Moree SAP has the potential to impact downstream aquatic systems, including the Mehi River which is identified as a key fish habitat. In turn, it is key future development limits water quality and downstream impacts on the Mehi River or Gwydir wetlands.

9.3.3 *ISOLATION AND FRAGMENTATION*

Precinct location will likely cause impacts to landscape connectivity, resulting in the isolation and fragmentation of vegetation communities within the proposed SAP boundary. The realignment of the TSR will result in the removal of a section of PCT 52 (Grassland Community) resulting in the loss of connectivity within the proposed SAP boundary and subsequent isolation and fragmentation of intact habitat. Although the loss of connectivity is likely to be short to medium term, it is crucial the TSR realignment site is sufficiently rehabilitated in order to reconnect this section of the corridor. The realigned portion of the TSR is identified in Figure 9.4.

9.3.4 *BUFFERS*

Table 9.4 outlines buffers associated with vegetation types and waterways within the preferred SAP boundary.

Table 9.4 Table detailing the proposed guideline buffers for vegetation communities

Impact	Vegetation type	Buffer
High noise	Woodland	>60 dB
	Grassland	>60 dB
High dust	Woodland	50 m
	Grassland	50 m
Lighting	Woodland	50 m
	Grassland	50 m
Any impacts	Water ways – Halls Creek	10 m 1st order, 20 m 2nd order
	Water ways – Clarks Creek	10 m 1st order

Source: Aurecon (2020)

Further to the above buffer considerations for the precincts, there are further considerations for the placement of the sewage treatment plant (STP) within the SAP boundary. Impacts associated with the development of an STP may have potential to impact Halls Creek.

Appropriate buffers from Halls Creek would be determined after assessing performance objectives for the STP in order to mitigate potential impacts to surface and groundwater. Consideration would be given to nature of the landscape as the SAP investigation area occurs within a floodplain there is potential for an STP to be impacted by overland water flow during flood events.

9.4 BIODIVERSITY OFFSETS

The Biodiversity Offsets Scheme establishes a framework to avoid, minimise and offset impacts on biodiversity from development and clearing of native vegetation. This section considers the offsetting options for likely residual impacts on areas of biodiversity value within the proposed SAP boundary.

To address potential impacts on biodiversity values, a strategic biodiversity certification was identified as the most suitable approach due to the size of the SAP and the ability to achieve environmental outcomes through additional conservation measures. The following offsetting options are relevant for projects that obtain strategic biodiversity certification:

- **Retiring credits based on the like-for-like rules** which requires that impacts on native vegetation must be offset with vegetation that is in the same local area as the impact. The retirement of biodiversity credits requires the purchase of existing credits from a landholder who has suitable credits available for sale. Potential land for offsetting is identified in Figure 9.4.
- **Making a payment to the Biodiversity Conservation Fund.** In addition to the retirement of biodiversity credits, strategic biodiversity certification provides access to additional approved conservation measures for the preferred Structure Plan such as:
  - **Reservation of land under the National Parks and Wildlife Act 1974 (NPW Act)** must be agreed to by the relevant National Parks and Wildlife Service Manager. This option represents an opportunity to purchase private land which could be incorporated into the nearby Terry Hie Aboriginal Area or other nearby National Parks such as Bullala National Park. This offsetting option may be suitable where areas within private estates also contain areas of cultural significance to the Aboriginal people. The preservation of these areas would result in the long-term protection and management of both biodiversity and cultural heritage values in those areas.
- **Adoption of development controls or state infrastructure contributions under the EP&A Act that conserve or enhance the natural environment.** This method provides a value for controls where land zoned to be protected for conservation purposes. Therefore, this option may apply for the areas of high biodiversity value within the preferred Structure Plan.

Any other measure determined to be an approved conservation measure by the Minister for the Environment. The following measures are considered to be potential alternate land-based conservation measures for offsets:

- The Evergreen Precinct (located within the proposed SAP boundary.
- Off-site offsets within the greater Moree region.
- Funding ecological research for relevant species.
- Environmental Restoration and Rehabilitation Program which provides funding opportunities to support the sustainable management and stewardship of significant environmental assets and services.

Source: Aurecon (2020)

Figure 9.4 High biodiversity areas and potential biodiversity offset sites in proximity to the Moree SAP

9.5 AIR, NOISE AND ODOUR

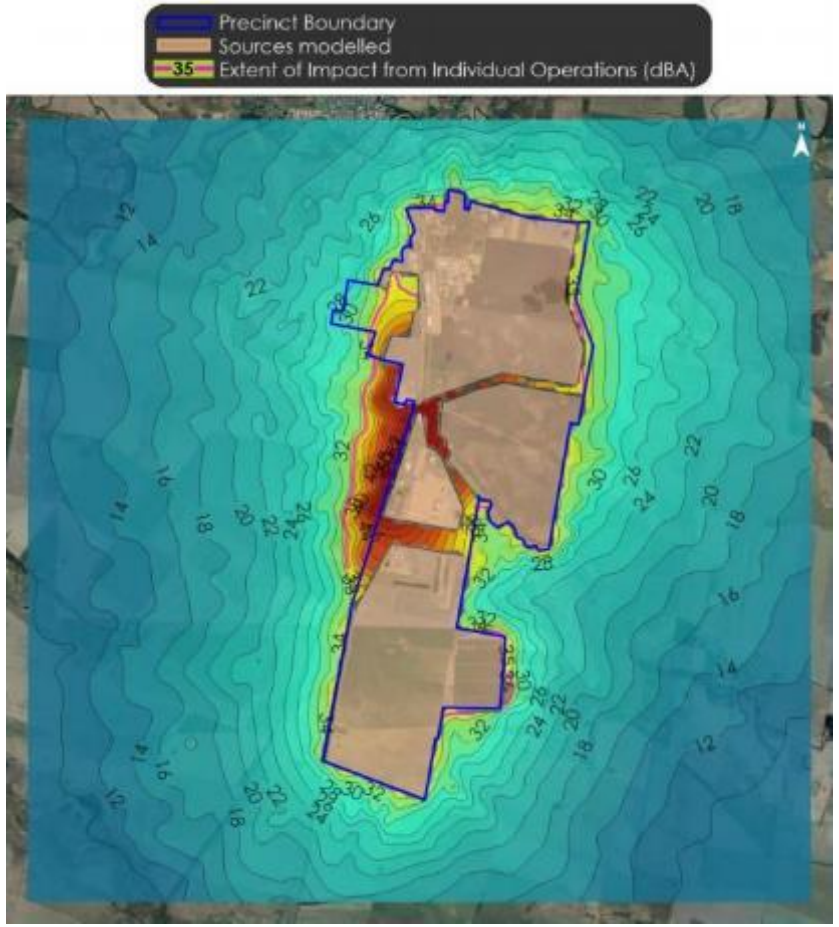
Figure 9.5 Areas impacted by potential air, noise and odour impacts within the SAP

The objective of noise, air and odour modelling is to define the maximum extent of emissions from within the proposed SAP boundary that do not cause impacts at sensitive receptor locations.

9.5.1 *NOISE*

Figure 9.6 shows the modelling results for noise levels from proposed land use activities within the proposed SAP boundary.

The pink line in Figure 9.6 represents the area outside of which any receptors/sensitive receivers would not experience sound power levels above the criteria (no sensitive receptor area). Evidently, the pink line extends outside of the SAP boundary in a small area to the south-west and slightly in the north and south-east. Thus, the land within the pink line is not suitable for residential/sensitive use.



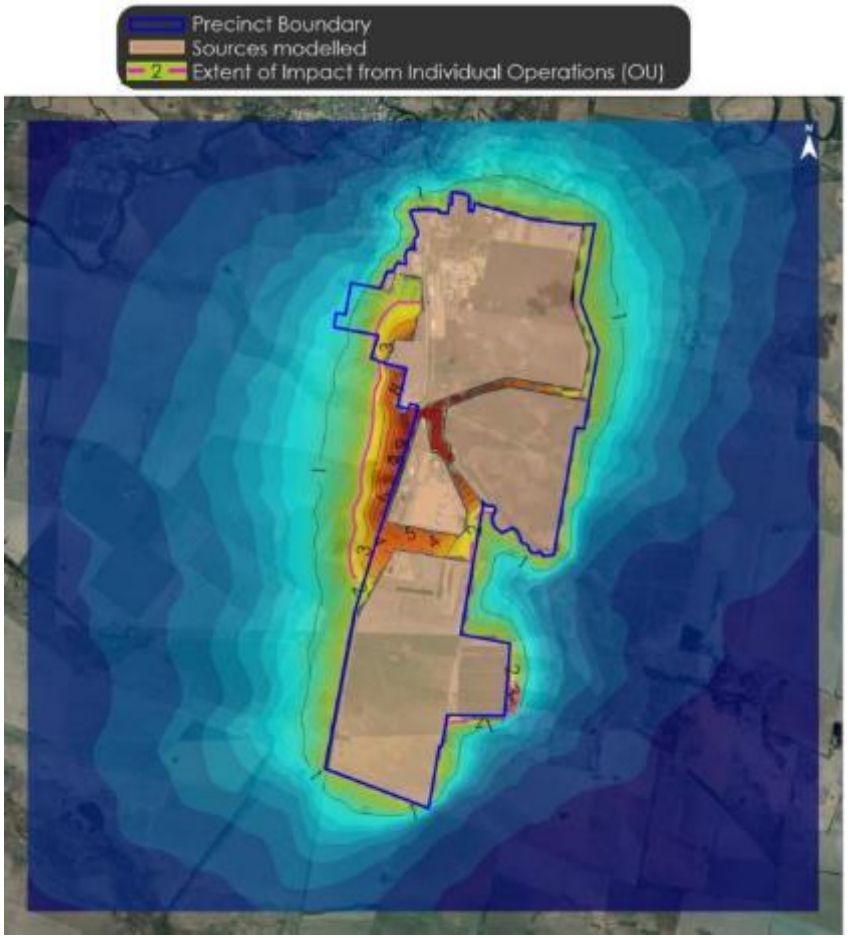
Source: *Todoroski Air Sciences (2020)*

Figure 9.6 Map illustrating received sound pressure level due to noise emissions from land use activities within the proposed SAP boundary

9.5.2 *ODOUR*

Figure 9.7 shows the modelling results for odour emissions levels from proposed land use activities within the proposed SAP boundary.

The pink line detailed in Figure 9.7 represents the 2 OU criteria boundary line. This represents the area outside of which any receptors/sensitive receivers would not experience unacceptable odour levels above the criteria. The pink line extends outside of the precinct boundary in a small area to the southwest and slightly in the southeast. Thus, the land within the pink line is not suitable for residential/sensitive land uses.



Source: Todoroski Air Sciences (2020)

Figure 9.7 Map Illustrating received odour due to odour emissions from land use activities within the proposed SAP boundary

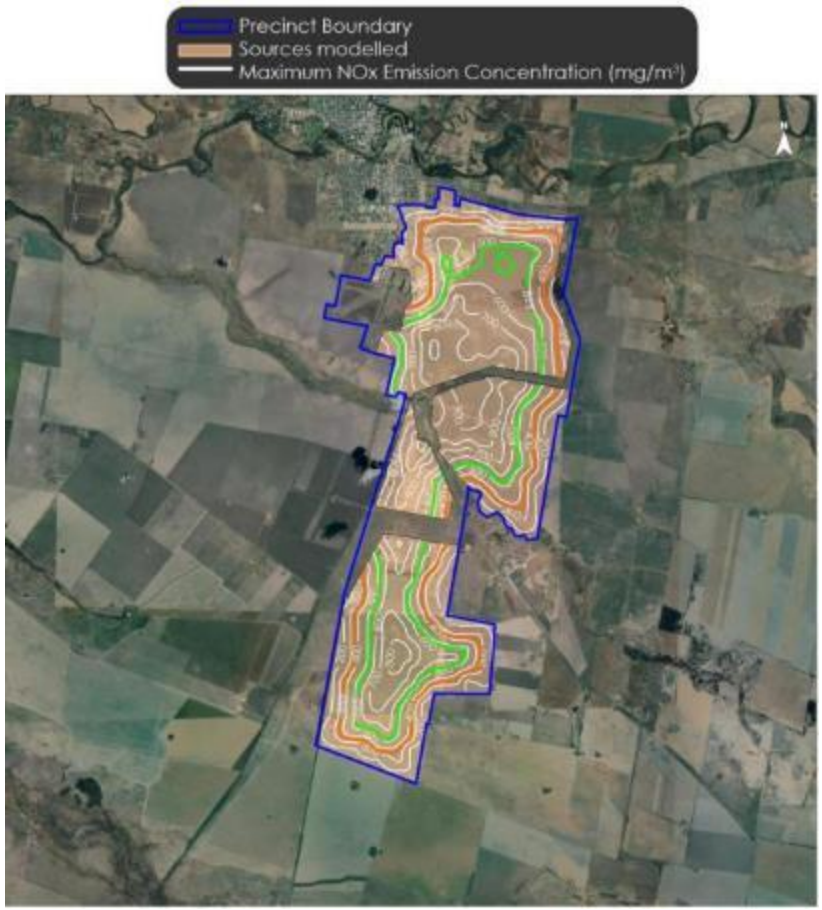
9.5.3 *AIR*

For air emissions, it is not possible to ascribe a maximum quantity of emissions per hectare, given that there may be hundreds of different types of air emissions each with differing criteria averaging periods or locations for compliance. For air, the approach taken is to accept that all air toxic emissions must be minimised to the maximum practicable extent.

Previous work identified that for fugitive air emissions, odour is the most limiting emission affecting potential compliance. As fugitive emissions will arise from area or volume sources, their zone of potential impact is considered as part of the odour assessment. Thus, stack emissions are considered in detail within the air modelling.

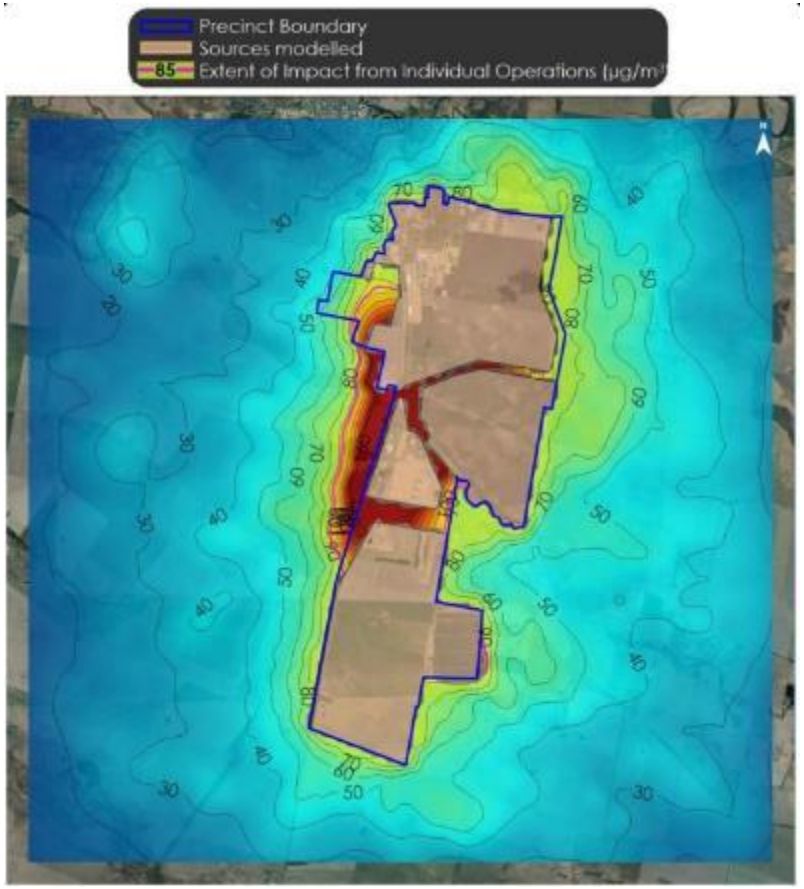
Stacks have the potential to cause most impact at locations where the dispelled plume may reach the ground. Earlier work has shown it is preferable to locate stacks in more elevated areas. This however is not mandatory as it is feasible for an applicant to simply specify a taller, higher velocity or higher temperature stack that has better dispersion and can perform equally well in a low-lying area than a less highly performing stack in an elevated area. In turn, Figure 9.8 shows no constraints beyond those for noise and odour.

The pink line shown in Figure 9.9 shows the received air pollutant concentrations due to NOx emissions from land use activities within the proposed SAP boundary. The pink line extends outside of the SAP boundary in a small area to the southwest and slightly in the southeast. Thus, the land within the pink line is not suitable for sensitive land uses.



Source: *Todoroski Air Sciences (2020)*

Figure 9.8 Map illustrating an example of Air emission rates per stack within the proposed SAP boundary



Source: *Todoroski Air Sciences (2020)*

Figure 9.9 Map illustrating the received air pollutant concentrations due to NOx emissions from land use activities within the proposed SAP boundary

Modelling has identified that the compliance boundary line for uses which emit high volumes of air pollutants, noise and odorous materials extends beyond the SAP boundary to the west. In response, it is recommended that the SAP boundary be amended to encompass any impacted land or restrictions be placed on development in high impact areas.

Air, noise and odour controls and mitigation measures should also be controlled at the source by industries during their construction and operation periods. Additional mitigation strategies can be implemented at receptors to further minimise air, noise and odour impacts as required.

It is currently expected that Moree Regional Airport will receive a runway extension. A review of the current OLS would allow for more headroom for potential stacks in the high impact zones and a larger diversity of potential industries in these areas.

9.6 CONTAMINATION

Figure 9.10 Areas of potential environmental concern within SAP investigation area

It is understood there is generally a low risk of encountering elevated Concentrations of Potential Contaminates (PoPC) throughout the proposed SAP area. Within the proposed SAP boundary there are five specific Areas of Potential Environmental Concern (APECs), namely:

- Moree Transport Juncture
- Industrial Area NE within the SAP
- Moree Regional Airport
- Cotton Farming and intensive livestock agriculture
- Moree Waste Treatment Facility.

Figure 9.10 details the location of the potential APEC sites and areas of high soil contamination within the proposed SAP boundary.

Source: Aurecon (2020)

Figure 9.11 Specific sites identified as areas of potential environmental concern within the Moree SAP

The soil chemistry throughout the proposed SAP area indicates that acid sulfate soils or potential acid sulfate soils (ASS/PASS) are not present and saline soils are not present. No additional investigations or management of issues related to ASS/PASS or saline soils will be required.

A well-known constraint in the proposed SAP area is the presence of black soil, presenting unique challenges to future development. The erosion potential of the alluvial and residual soils within the proposed SAP area is moderate to high. Future development on black soils presents a range of complexities that may present a significant design constraint and cost. The extent and location of black soils throughout the proposed SAP area is not known at this point.

It is assumed that the draft Structure Plan has the potential to result in approximately 4,755,000 m^3 of potential ground disturbance and 7,000,250 m^3 over the proposed 40-year development timeframe. These calculations are further broken down in Table 9.5 and Table 9.6.

Table 9.5 Table detailing the volume of potential soil disturbance for land use categories excluding infrastructure allocation

Land use	Sub-Precinct	Volume of likely soil disturbance 40 years ($m^{3)}$
Intermodal	Central	600,000
Freight and Logistics		200,000
Resource Recovery	General Enterprise	1,100,000
Horticulture/Native Horticulture		900,000
Value-add Agriculture		700,000
Bioenergy		600,000
Potentially Hazardous	Solar & Large Industry	300,000

Land use	Sub-Precinct	Volume of likely soil disturbance 40 years ($m^{3)}$
Enterprise/Hub	Gateway	50,000
Energy/Solar	Solar	305,000
Total		4,755,000

Source: Aurecon (2020)

Table 9.6 Table detailing the volume of potential soil disturbance for precinct infrastructure allocations

Sub-Precinct	Volume of likely soil disturbed 40 years ($m^{3)}$
General Enterprise	405,000
Central	255,000
Solar & Large Industry	15,000
Gateway	10,000
Solar (North/central)	15,250
Total	**700,250**

Source: Aurecon (2020)

There is a high likelihood that Virgin Excavated Natural Material (VENM) or Excavated Natural Material (ENM) will be suitable for reuse onsite or offsite for the purposes.

Overall, as a change of land use is expected over the majority of the land included within the Structure Plan, further investigations into the soil and groundwater should be carried out prior to or during concept design phase. This will be key to assessing the extent and significance of potential contamination, particularly around identified APECs. Further investigations will also inform the likelihood of remediation under the SEPP 55 process, inform design constraints, risks to human and ecological receptors as well as establish likely volumes and preliminary waste classifications of excavated soil.

A well-known constraint in the SAP area is the presence of black soils. These soils present unique challenges to future development. Prior to or during concept design, a comprehensive assessment of the extent of black soils within the SAP boundary should be undertaken. Early identification of any areas that may contain black soils will allow constructability issues to be addressed efficiently before development commences or design progresses too far.

It is also recommended any potentially hazardous land uses should be evaluated against SEPP 33 guidelines to identify whether the developments will be classified as a "potentially hazardous industry" or "potentially offensive industry".

9.7 HYDROGEOLOGY

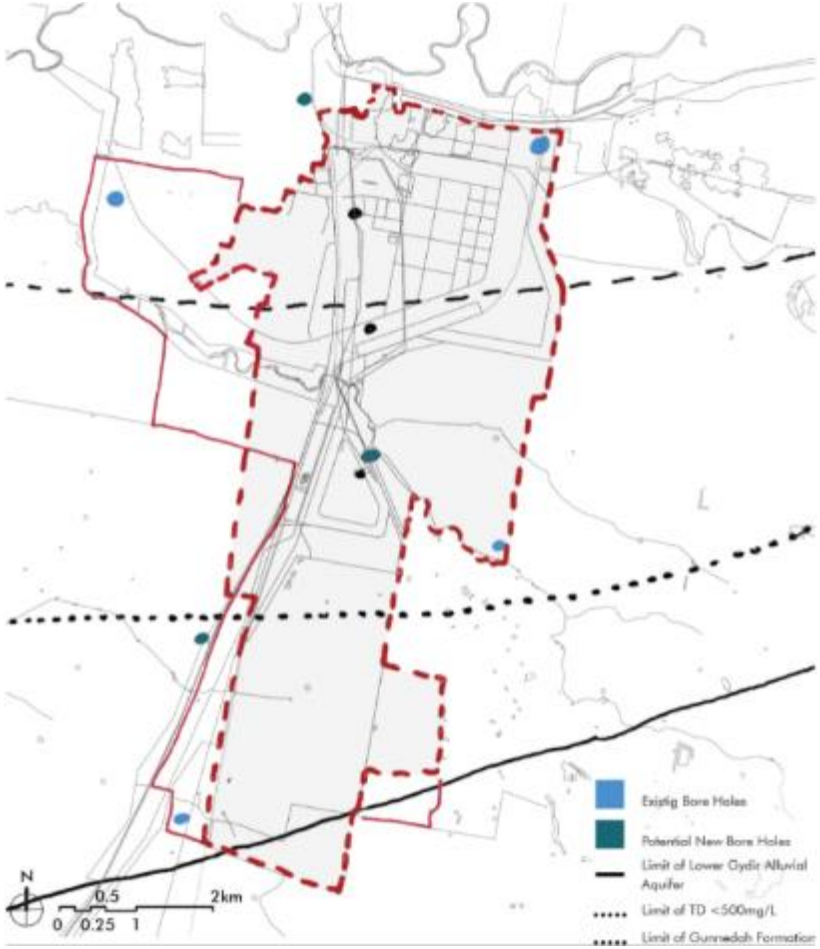


Figure 9.12 Location of existing bores and proposed bores within and adjacent to SAP investigation area

9.7.1 *LOWER GWYDIR ALLUVIAL AQUIFER*

The Lower Gwydir Alluvial Aquifer (LGAA) is comprised of two distinct hydrostratigraphic units, the shallow (40 m) Narrabri Formation and the deeper (up to 90 m) Gunnedah Formation.

The deeper unit of the LGAA, the Gunnedah Formation, is physically capable of providing high yields (>500 ML/yr, with pumping rates of up to 50 L/s) of low-salinity, low-SAR water that is suitable for most uses, including public water supply and irrigation. As shown on Figure 9.12, the Gunnedah Formation is only present beneath the northernmost 25 per cent of the SAP investigation area. At this time there are 20 bores with aquifer access licences used for industrial or irrigation purposes located within and immediately adjacent to the SAP investigation area, between the line showing the limit of the Gunnedah Formation and the Mehi River. South of the line there are none.

The LGAA is fully allocated and as a whole cannot sustainably, or legally, provide more groundwater than is currently being abstracted from it. In turn, Water availability is limited to:

- That which can be provided by MPSC
- Water that can be diverted from the aquifer access licence share currently allocated to existing bores within the SAP
- Shares which can be purchased from holders of aquifer access licences with extractions from the LGAA outside the SAP to allow works approval to be obtained for transfer to new bores drilled within the SAP.

It is understood that MPSC may have approximately 500 ML/yr of entitlement that is surplus to projected requirements and approximately 40 ML/yr may currently be supplied to businesses within the SAP area. If available, this 540 ML of water would need to be supplied to industries within the SAP on a water utility basis, as is stipulated in s.71M(2) of the *Water Management Act 2000* (i.e. it could not be transferred to an aquifer access licence, whether held by MPSC or another party).

9.7.2 *GREAT ARTESIAN BASIN*

It is understood the main aquifer within the NSW part of the GAB Surat Basin, the Pilliga Sandstone, is likely to be encountered beneath the Moree SAP investigation area at a depth of about 700 m and have an aquifer thickness of about 150 m. This aquifer should provide a good supply of relatively low-salinity groundwater.

GAB Surat Groundwater is not suitable for irrigation due to its high sodium adsorption ratio. However, the water is of potable quality making it suitable for many industrial purposes, although it has a sulphurous odour and may cause staining due to its iron content.

As stated in the *Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2020 (*the WSP), the current annual usage from the NSW Surat Groundwater Source totals about 29,320 megalitres (ML) compared with the long-term average annual extraction limit set by the WSP of 43,446 ML. In turn, the estimated volume available for further sharing from the Surat Groundwater Source is 15,126 ML per year.

Subject to appropriate management of drawdown and interference effects, this aquifer should provide a suitable, but not unlimited, supply to the Moree SAP investigation area. However, due to the absence of local data, investigation drilling and testing would be necessary to establish that this is indeed the case.

Figure 9.12 details the location of four hypothetical bores at a separation of about 7.5 km, spread out across the SAP investigation area. This work was carried out using the SAP investigation area boundary to position the bores. Analytical modelling carried out using these parameters has indicated that up to 3,900 ML/yr could be available from four well-spaced bores located within the SAP investigation area. A sensitivity analysis reducing the assumed hydraulic conductivity by 40 per cent indicated that 3,360 ML/yr would then be available.

Due to the limited volume of water available from the LGAA, water should be reserved for users who cannot use water sourced from the GAB due to chemical unsuitability. In any event, it is likely that bores providing an adequate yield for industrial (or irrigation) purposes would need to be constructed in the northern part of the SAP Investigation area; thus, reticulation would be needed to serve businesses in the southern part of the area.

It is recognised that drilling and completing water bores in the deeper aquifers of the GAB is expensive and would be a high cost impost on individual businesses. The option of individual landowners installing their own bores in the GAB aquifer is not considered to be economically or hydrogeologically viable, and the option of individual landowners installing their own bores in the LGAA would only be available if sufficient share component could be purchased by those landholders.

9.8 BUSH FIRE

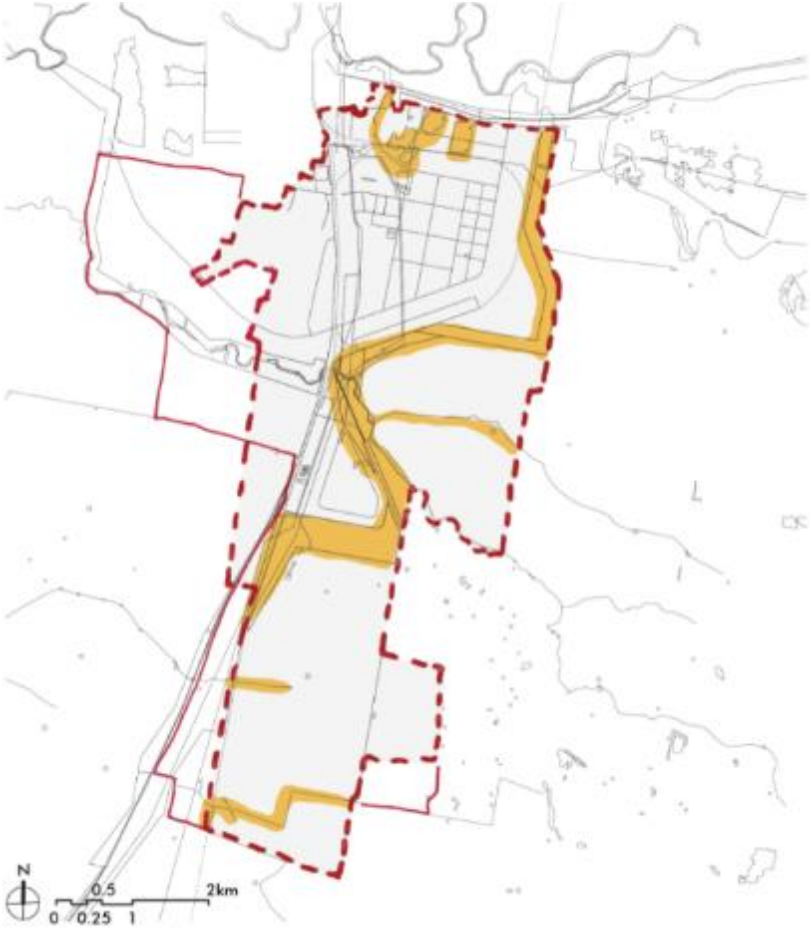


Figure 9.13 Areas impacted by bushfire protection measures within the SAP boundary

The landscape within the SAP investigation area has the potential to provide suitable conditions for grass fires in areas of natural grassland, pasture and cropping. Risk is particularly high in areas where pasture and native grasses have not been grazed by livestock or native fauna. The majority of the SAP investigation area has been mapped as Category 3 vegetation in NSW Bush fire Prone Land. Vegetation within these areas are considered to pose a medium bushfire risk and require an asset protection zone between bushfire hazards and buildings.

The default for the Moree SAP area is Fire Danger Index 80. It is understood new subdivision developments should not have a heat level exposure to buildings >29 kW/m² and all new development within 100 m of a bush fire hazard area should provide an 8 m–11 m buffer. Figure 9.14 illustrates the required across the SAP investigation area.

It is noted that the internal road network provided in the draft Structure Plan does not show secondary access, or detail around perimeter roads. To meet statutory requirements and achieve compliance with *Planning for Bush Fire Protection* (NSWRFS 2019) it is crucial that subdivisions of three or more allotments have more than one access in and out of the development and are through roads, and these are linked to the internal road system at an interval of no greater than 500 m.

Source: *Aurecon (2020)*

Figure 9.14 Bushfire protection measures to be applied across the Moree SAP

9.9 FLOOD AFFECTED AREAS

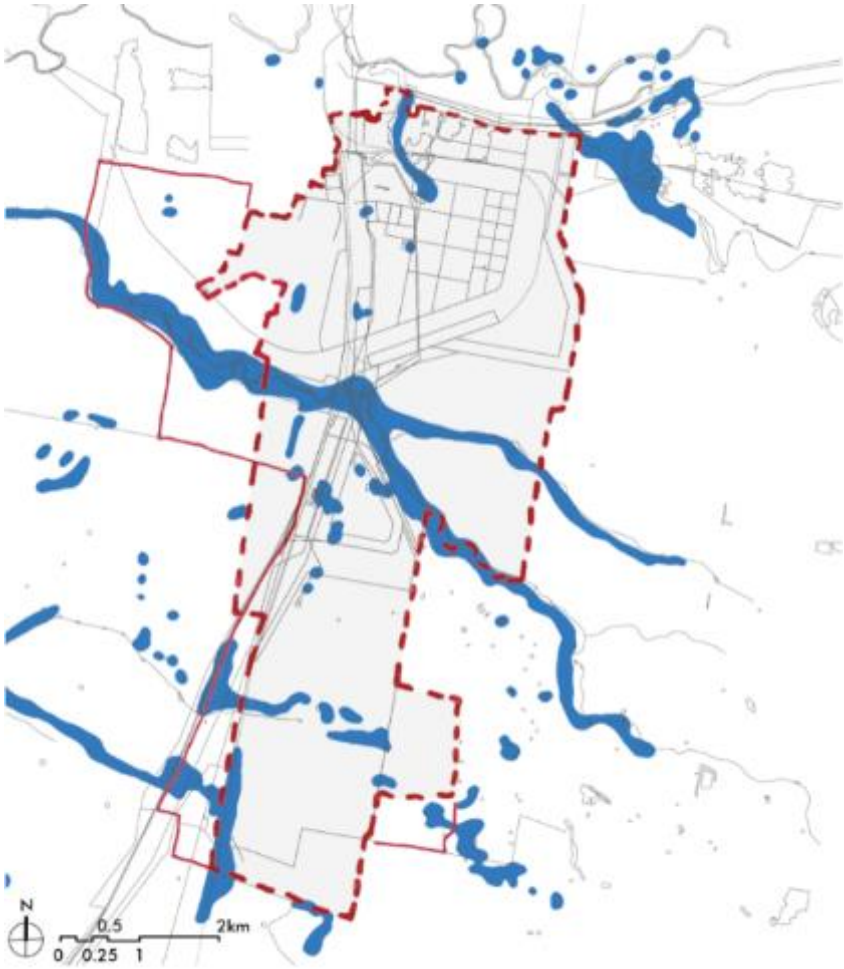


Figure 9.15 Flood prone land within the SAP boundary

9.9.1 *10% AEP LOCAL FLOOD EVENT*

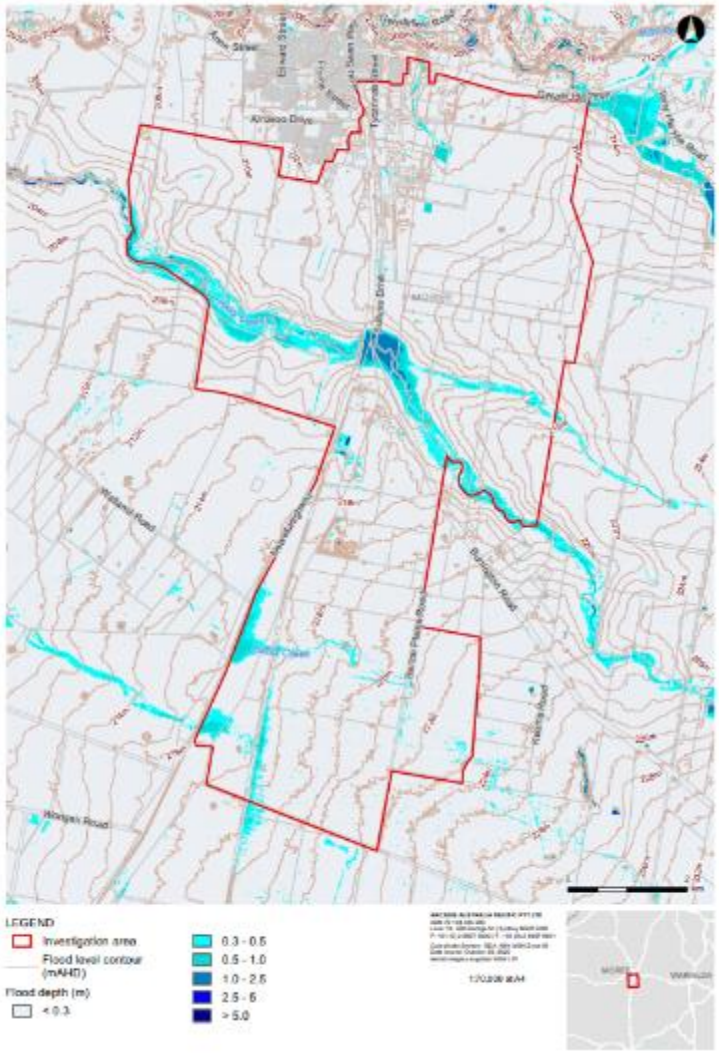
Figure 9.16 shows the estimated flood levels, depths and extent for the 10% AEP local catchment flood event. Evidently, most of the developable land within the proposed SAP boundary appears to be largely unaffected by significant flooding in the 10% AEP event. The main flooding through the SAP area is attributable to Halls Creek where the depths are mostly shown to be in the range of 0.3 m to 0.5 m with some areas up to 1.0 m deep.

9.9.2 *1% AEP LOCAL FLOOD EVENT*

The results show that Halls Creek is a major flow path through the SAP. Land use planning around this creek should be uncomplicated, with simple no-build zones derived from the flood extent.

The Newell Highway and adjacent railway line can also be seen to present a notable hydraulic feature in the vicinity of the main waterways traversing the SAP. If necessary and appropriate, land use planning for the SAP should consider possible future upgrades of waterway infrastructure at these locations which may lead to changes in flow path widths and flood levels downstream and/or upstream of the highway and railway.

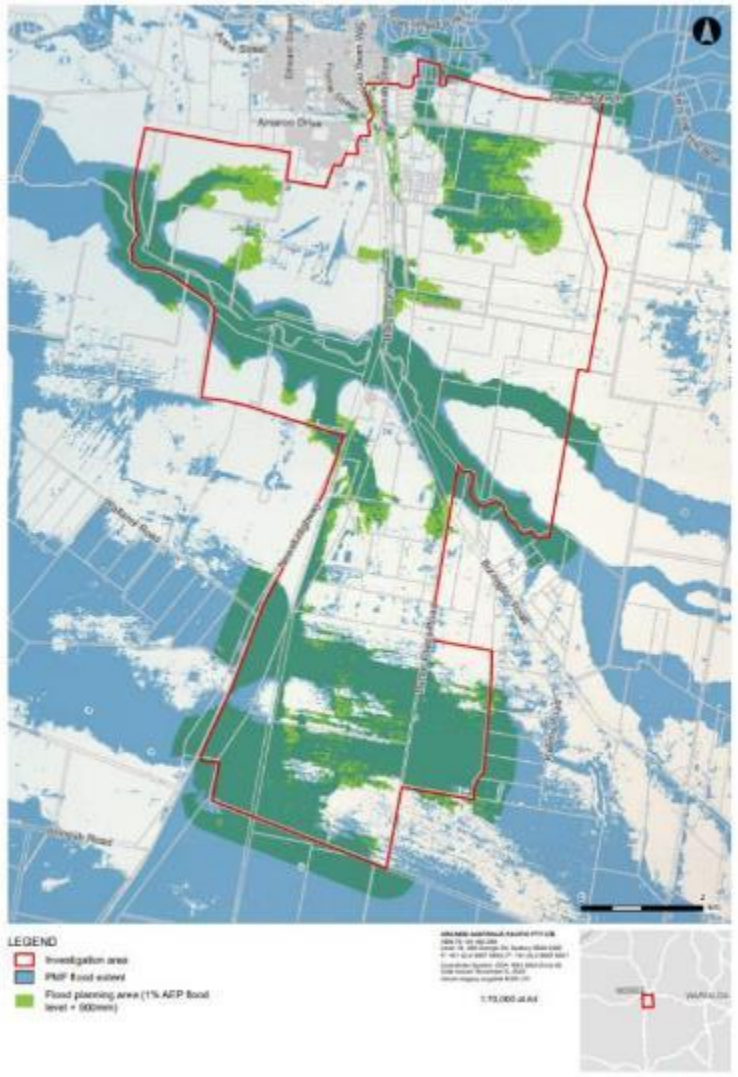
South of Halls Creek the overbank flows from Tycannah Creek can be seen to spread and follow ill-defined flow paths, probably influenced by vegetation more than terrain. The model results indicate that formalisation of a flow path may be a good option when planning the land use for the southern part of the SAP.



Source: *Arcadis (2020)*

Figure 9.16 Peak flood levels and depths – 10% AEP local event

In order to minimise the risks of possible flood affectation for development within the precinct, or creating adverse flood impacts for surrounding properties (upstream and/or downstream), development should be avoided on lands that are at risk of flooding. These areas are defined as MSPC's Flood Planning Area (1% AEP flood level plus 0.5 m freeboard). Based on the flood modelling results for existing flood conditions, the extent of what would be the Flood Planning Area and Possible Maximum Flood (PMF) within the SAP site is indicated on Figure 9.17.



Source: Arcadis (2020)

Figure 9.17 Moree SAP Flood planning area and PMF

10 MOVEMENT

10.1 OVERVIEW

The connectivity between Moree and major markets and export hubs by road, rail and air is a core value proposition for the Moree SAP.

To accommodate the forty-year vision of the Moree SAP, various road network provisions are proposed to service the developments within the SAP. Those include a new rail overpass (Moree Intermodal Overpass), a new connection to the Newell Highway near the centre for the SAP (Tapscott Road), realignment of Bullus Drive to create a north-south connection, a future east-west connector extending to Gwydir Highway, and a network of internal road and intersections with the existing network to provide local access to future SAP industries.

KEY STRUCTURE PLAN PRINCIPLES

- Facilitate the uptake of active transport through increasing connectivity to the Moree town centre and improving the precinct's permeability
- Deliver an intermodal precinct which leverages Moree's air, road and rail connectivity

Two new intermodal terminals are proposed by the structure plan to assist in the movement of freight. The southern intermodal terminal is to be located west of the Newell Highway and proposed to connect into the existing Mungindi Line. The north-east intermodal terminal is proposed to be located north of an investment driven rail loop connection to the Inverell Line, expected to be completed within the next 10 years. Road network upgrades would be implemented in the initial 10 years to support the operation of both intermodal terminals. 20 to 40 years after the initial implementation of the SAP, an east-west corridor road link between the Gwydir Highway east and west of Moree via the Moree Intermodal Overpass would be implemented, and a realignment of the Inland Rail (currently passing through the Moree township) is available as a future option.

The proposed road and rail network upgrades are illustrated in Figure 10.1 and Figure 10.2.

While shared paths are provided within the Moree township, active transport provisions in the surrounding network are minimal due to the rural nature of the region. New active transport links to support the SAP have been proposed, including a new connection between the Moree township and Moree railway station and routes between residential precincts and the SAP internal road network. Footpaths would allow direct connections within the SAP from the regional enterprise precincts to the commercial hub and end of trip facilities would be provided at the regional hub and for businesses with higher numbers of employees. The active transport provisions are intended to encourage active transport as a mode for travel to work, as well recreational trips along Halls Creek.

The SAP would be supported by the on-demand bus service currently servicing Moree, and an additional internal bus network between the hub and the regional enterprise precincts is also proposed, utilising the the proposed overpass and the Gateway loop road, which connects between the two sides of the Newell Highway.

With the planned runway extension for Moree Regional Airport, a connected road network to the Moree Gateway Precinct and the airport access through Blueberry Road enables a smooth movement of commodities aimed for air freight between the SAP industries and Moree township, and Moree Regional Airport.

The Travelling Stock Route (TSR) has a strong historical connection to the heavy agricultural heritage of the Moree township. As such, the current TSR alignment would be mainly maintained in the structure plan, with a proposed realignment of the route south of the northern regional enterprise precinct.

10.2 MOREE INTERMODAL OVERPASS (MIO) LOCATION

Figure 10.1 Proposed road network within the SAP boundary

Following the preliminary Enquiry by Design workshop, a high-level analysis of potential locations for the Moree Intermodal Overpass (MIO) was undertaken to compare six overpass connection options, with three routes emerging as preferred. These included; Airport South, followed by Blueberry Road then Amaroo Drive. The Airport South MIO option was selected for the Structure Plan. The MIO, a committed future infrastructure would enhance the operation of the intermodal facility proposed for the SAP, reduce freight traffic traversing the Moree township, and integrate with a future east-west connection.

10.3 RAIL AND INTERMODAL TERMINALS

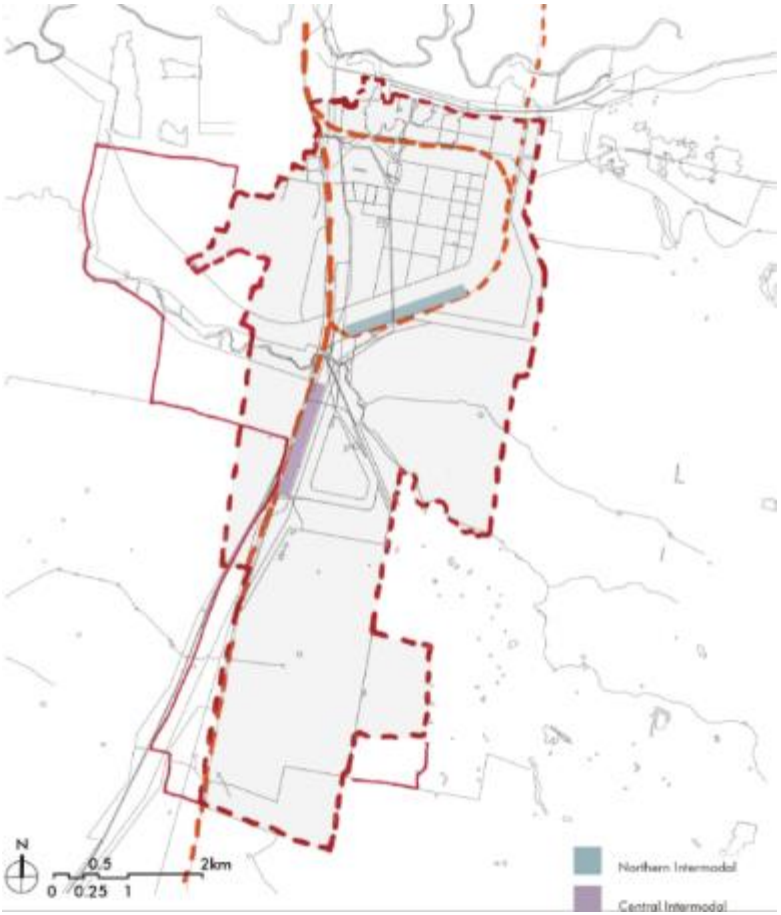


Figure 10.2 Potential rail and road network within the SAP boundary

Rail forms a critical component of transporting freight within the Moree SAP. The final structure plan proposes to build upon the existing rail network, which currently runs north-south through Moree, parallel to the Newell Highway. The N2NS section of the Inland Rail project would provide additional capacity for rail freight, and is proposed to be completed by 2023, which would connect Melbourne and Brisbane via Moree. When complete, the Inland Rail would span 1,700 kilometres and allow for fast and efficient movement of freight to and from the Moree SAP.

> Where the existing rail facilities can accommodate only 800-metre long trains, the Inland Rail will accommodate for 1,600-metre long double-stacked trains.

.

Two new intermodal terminals are proposed, them being the southern intermodal terminal, to be located west of the Newell Highway and proposed to connect into the existing Mungindi Line. The southern intermodal terminal builds off the 2 km rail siding that ARTC will provide adjacent to the Louis Dreyfus site towards the centre of the SAP Investigation area and provides a logic location to initiate the first intermodal terminal.

The north-east intermodal terminal is proposed to be located north of an investment driven rail loop connection to the Inverell Line, expected to be completed within the next 10 years.

10.4 NORTHERN INTERMODAL TERMINAL LOCATION

A discussion on the proposed location of the intermodal terminal for the northern regional enterprise precinct arose during the final Enquiry by Design workshop. The two options shortlisted for the discussion centred on the orientation of the intermodal terminal, and subsequent location, and they are:

- A vertical, north-south option: This scenario places the terminal in the middle of the regional enterprise precinct, with future rail line connecting and bisecting the precinct.
- A diagonal option: This option places the terminal on the southern border of the regional enterprise precinct.

The following were the assessment criteria:

- Rail connectivity and operations – Ease of rail operations, e.g. requirement for shunting
- Services connection costs/ease
- Constructability – Flood levels, staging and construction delivery, construction complexity
- Minimises road/rail conflicts – The option with the least number of rail/road conflicts
- Maintenance
- Capital cost (total) – Construction and operation cost
- Environmental impacts – Impact on the TSR and biodiversity
- Proximity to road connections – Vicinity to proposed internal road network and highways
- Minimises fragmentation of land – Decreasing impact on land segmentation
- Facilitates preservation of potential Moree Rail Bypass – Maintains a vision for a long-term Moree Rail bypass to the east of the SAP
- Amenity impacts
- Marketability – Easy to sell the SAP regions based on the location.

Based on the overall evaluation, the diagonal terminal option was chosen following a deliberation including representatives from TfNSW, ARTC, RGDC, DPIE and MPSC.

The preferred location for this northern is constrained by the current location of the Travelling Stock Route as shown in Figure 10.6. The TSR would require re-alignment to accommodate the preferred intermodal location and discussion are required with NSW Local Land Services to determine the process and feasibility of this re-alignment.

Environmental consideration associated with this potential re-alignment are addressed in Section 8 of this report.

10.5 ACTIVE TRANSPORT

Figure 10.3 Active transport corridors within the SAP boundary

Shared paths are provided within the Moree township, and additional proposals have been made to close the gap in the existing network. However, due to the rural nature of the land use outside of the township, active transport provisions in the surrounding network are minimal. The Structure Plan proposes linkages through areas of native vegetation and acknowledge that direct and indirect impacts will be addressed in the Master Plan.

Additionally, the SAP internal road network is provisioned for a connected footpath network to ensure walking and cycling mode share opportunities with the SAP.

As part of the structure plan, the following upgrades have been proposed to improve the connectivity of the active transport network:

- Active transport links between the Moree township and Moree Station
- Active transport route between Stanley Village, Amaroo Residential Precinct, and the SAP internal road network
- Recreational active transport linkages along Halls Creek and the TSR
- Footpaths which would provide direct connections within the SAP from the regional enterprise precincts to the commercial hub, located on the western side of the Newell Highway
- Capitalising on opportunities to expand walking and cycling networks to areas of heritage importance and billabongs
- Wide footpaths with bike racks and appropriately designed intersection crossings
- End of trip facilities located at businesses with higher number of employees in the SAP and the regional hub.

10.6 PUBLIC TRANSPORT

Figure 10.4 Public transport connections to Moree town centre from the Moree SAP

The Moree on-demand bus service is a trial service that replaced Moree Bus Service. Plans are currently being developed by key transport stakeholders to expand the on-demand service to major employment areas around the township.

With the vision of a 24/7 precinct driving the development of the SAP, there is a significant challenge in building a fixed route service with hourly timetables. The renewal and expansion of the on-demand bus service; however, allows for the flexibility of public transport operation, which can be assisted with bus mobility infrastructures, such as shelters and seats. An internal bus network between the Gateway Precinct and the Regional Enterprise precincts is also proposed, utilising the MIO and the Gateway loop road to connect between the two sides of the Newell Highway.

10.7 AIR TRANSPORT

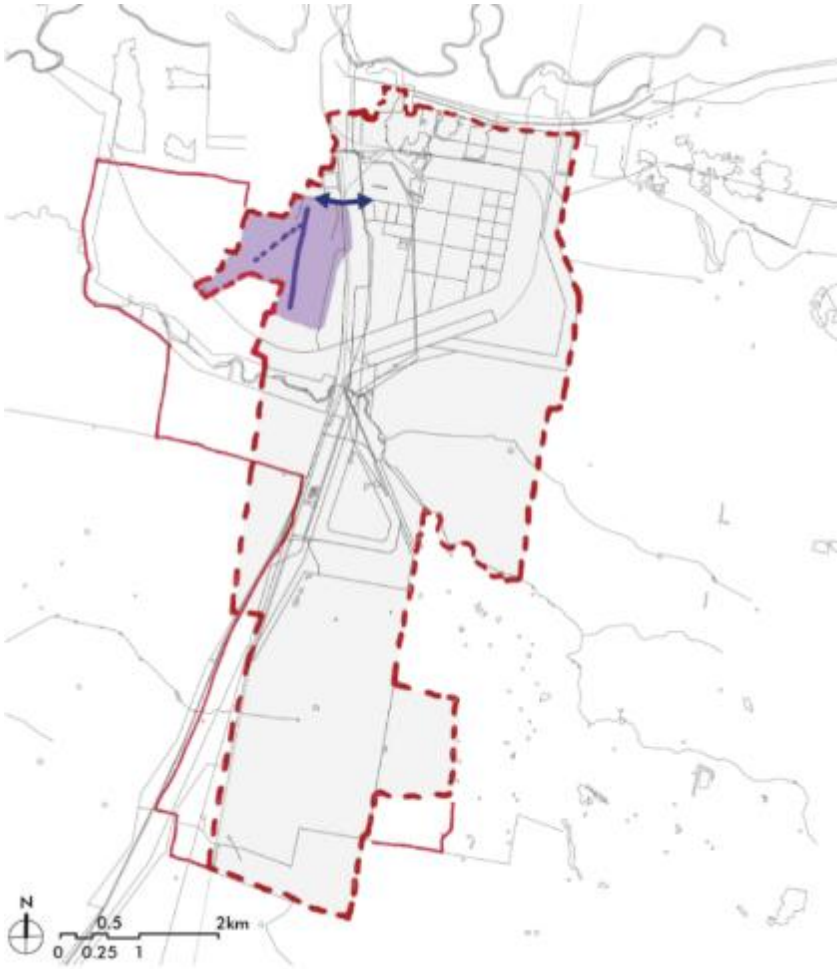


Figure 10.5 Moree Regional Airport within the SAP boundary

With the planned runway extension for Moree Regional Airport, a connected road network to the Moree Gateway Precinct and the airport access through Blueberry Road enables a smooth movement of commodities aimed for air freight between the SAP industries and Moree township, and Moree Regional Airport.

Development of the SAP is constrained by the Obstacle Surface Limitation contours (OLS) contours in place for the Airport. It is understood that these may be reviewed with potential extension of the runways. Figure 10.5 shows the current OLS contours affecting the SAP.

10.8 TRAVELLING STOCK ROUTE

Figure 10.6 New alignment of TSR within SAP boundary

The TSR has a strong historical connection to the heavy agricultural heritage of the Moree Township, with its need likely to continue in the future with expanded livestock and horticultural businesses projected for the SAP. As such, the current TSR alignment would be majorly maintained in the structure plan, with a proposed realignment of the route south of the northern regional enterprise precinct. Figure 10.6 highlights the TSR realignment.

11 INFRASTRUCTURE

11.1 OVERVIEW

The planning process for the Moree SAP has identified a range of infrastructure requirements that will need to be delivered over the 40 year development horizon, in order to enable investment as envisaged in this Plan. Well considered planning and staging of infrastructure will be essential to ensure cost-effective and fit-for-purpose infrastructure roll-out. This section seeks to summarise and provide an overview of the infrastructure requirements that have been scoped at this early planning stage and provide a high-level delivery schedule for the first 5 years of SAP implementation. It is expected that this schedule will continue to evolve as planning proceeds and responds to funding availability and market decisions.

The physical infrastructure requirements of the preferred Scenario have been identified and are summarised in Table 11.1.

KEY STRUCTURE PLAN PRINCIPLES

- Ensure infrastructure delivery is phased to support development objectives
- Deliver infrastructure in a cost-effective and fit-for-purpose manner

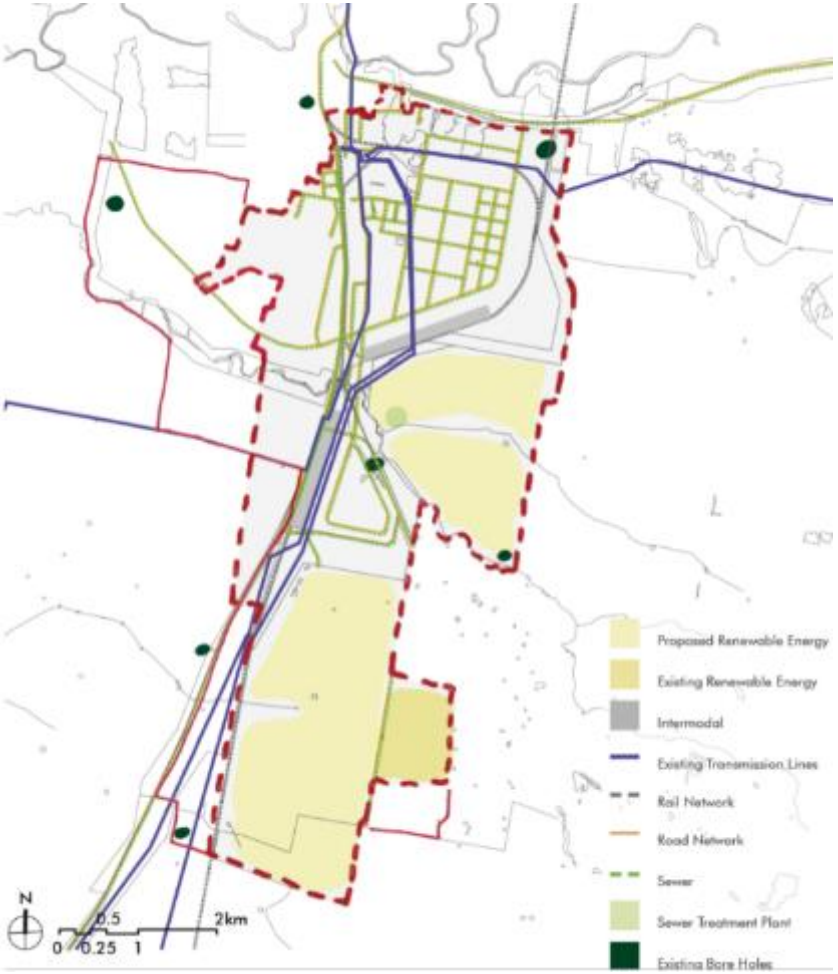


Figure 11.1 Combined utilities, water and energy infrastructure within and adjacent to the SAP boundary

11.1.1 *SUMMARY OF INFRASTRUCTURE REQUIREMENTS*

A large number of specific technical studies have been produced which seek to analyse and align the planning for Moree SAP with infrastructure requirements. The key findings of this analysis are summarised in Table 11.1. Infrastructure associated with movement (road, rail, active transport) is addressed separately in Section 10: Movement.

Table 11.1 Moree SAP Infrastructure Requirements

Type of infrastructure	Requirement
Electricity	Estimated maximum demand: 82.5 MVA. Future electricity demand for the SAP will require an upgrade to the existing 66/22 kV zone substation with a 3rd Transformer and establish a 2nd zone substation in the south portion of Precinct. Following the upgrade of zone substation, new 22 kV and low voltage overhead/underground network will likely to be established along the proposed main road to provide the utilities power supply.
Water	The SAP potable water demand estimate based on the development area is 1,300 ML/annum. The unused allocation of Moree water (500–750 ML/annum) can potentially be provided to cater for Moree SAP, subject to Council's approval. This can cover up to approximately 60% of the development potable water demand. Alternative sources proposed to cover the rest of the water demand (non-potable component such as toilet flushing, etc), include rainwater harvesting, treated wastewater and bore water etc (refer to Section 8: Sustainability in this report for further details). It is proposed to reticulate the new potable water pipework within the future road reserves to each industrial precinct as required. The pipe sizes will depend on the simultaneous demand of each precinct. A single shared supply would allow the basic water infrastructure, including a small number of bores, to be installed at the beginning of operations in the SAP investigation area, then added to as demand increased. This would allow adaptive planning, design and management to optimise the system as it is progressively developed. Proposed bore locations are shown in Figure 9.12.
Sewer	SAP sewer flow, based on the development area, is 3,800 kL/day. Existing sewage treatment plant (STP) spare capacity can cover up to ~50% of the development in the interim, which would require installation of a local pump-out facility. A new STP is proposed to cover entire SAP development at the ultimate development scenario. Wastewater is proposed to be treated and re-used within the SAP development area. Further details of the development and investigation is required to confirm if on-site sewer management facilities can be utilised in some areas of the development. The potential location for the future STP are shown on Figure 11.1.
Communications	Telstra Developer Application Form & Application of Reticulation are to be completed. The NBN is currently available to the northern parts of the SAP, namely Moree Airport, Gateway Precinct (north) and the Industrial Drive Estate.

Type of infrastructure	Requirement
Stormwater	It is assumed that each development within the SAP will be responsible for managing its own runoff through implementation of rainwater harvesting and/or on-site detention For the purposes of assigning water quality treatment requirements for this Moree SAP project, the pollutant retention targets from a similar master planning process for the *Growth Centre Precincts Development Control Plan* Table 2.1 have been adopted as listed below: — 90% Gross Pollutant (>5 mm) — 85% of Total Suspended Solids (TSS) — 65% of Total Phosphorus (TP) — 45% of Total Nitrogen (TN) — 90% Hydrocarbons.
Flood Management	The proposed land use layout is generally located on land outside or above the 1% AEP flood extent and would not be exposed to any high hazard flooding. Some potential areas of development intersect with the Probable Maximum Flood (PMF) or are adjacent to, or situated within, what would be categorised as flood fringe with relatively shallow depths of flooding and/or low velocities experienced. Given climate risk it may be appropriate to adopt a 0.5% AEP for planning purposes and to require a 0.5 m freeboard where flood prone land is developed. Given the low flood levels and nominal expected velocity, the freeboard requirement could be varied subject to developments meeting key performance requirements to avoid any human risks and to mitigate economic loss. There is a local catchment and overland flow path that originates and runs through the intermodal and freight logistics area of the General Enterprise Sub-Precincts and the southern Solar/Large Industry Sub-Precinct. However, any inundation shown within these areas is not of major concern as this would be removed by the provision of drainage systems as part of the development.
Gas Supply	A proposed high-pressure gas from Newcastle to Wallumbilla is in preliminary planning stage by a private company Westonal, through Moree. Westonal have been consulted to provide the details of the proposed High-Pressure gas. The proposed 610 mm diameter High-Pressure gas is planned to be installed adjacent to the Newell Highway in 2023 through the Moree Plains Shire. — The gas supplier information is limited at this stage. — The gas pipeline alignment is not finalised and may travel through the stock routes or private properties. — The gas has 10 m easement requirements. A further consultation will be required between MPSC and Westonal if MPSC would like Westonal to supply customers at Moree, including the Moree SAP. It is understood that MPSC has resolved not to accept gas supply from this pipeline. The sustainability and renewable energy reports recommend the creation of a gas supply for the SAP from agricultural waste reuse (bio-gas).

11.2 INFRASTRUCTURE STAGING

At this early planning stage, the expected initial areas of infrastructure investment (0–5 years) have been scoped and illustrated in Table 11.2 and Figure 11.2.

This initial infrastructure is focused on those works required to enable the major road and rail networks to be established and to support early stage investment in the General Enterprise and Central Sub-Precincts.

Table 11.2 Preliminary Infrastructure Staging (Years 0–5)

Item	Description	Role
1	ARTC Rail Siding	This 2 km rail siding will be built by ARTC as part of the Inland Rail. It provides the opportunity for early stage investment in inter-modal facilities that will catalyse investment in the SAP.
2	MIO and connecting roads	The MIO is expected to be funded by ARTC under the approval provisions for the Inland Rail. It will provide safe and efficient access from the Newell Highway to the SAP, reducing reliance on level crossings and supporting the development of the General Enterprise and Central Sub-Precincts. The connecting road from the MIO back to the Newell Highway on the western edge of the SAP will enable the creation of a southern extension to the Gateway Sub-Precinct. The MIO also provides the initial enabling infrastructure for the eventual development of a Moree east-west bypass.
3	Investigate Relocation of Transmission Lines	Existing high-voltage transmission lines adjacent to the ARTC rail siding in the Central Sub-Precinct may inhibit the optimal development of inter-modal facilities in this strategic location. An opportunity exists to relocate these lines to the Rural Buffer Sub-Precinct.
4	Northern Active Transport Link	The early establishment of active transport links between the SAP and Moree will strengthen community engagement and access to opportunity. It will also provide the first stage in a circular corridor along the TSR linking cultural and heritage sites within the SAP. Along the northern boundary of the SAP, the first stage of this corridor will provide an opportunity to integrate high bio-diversity value land with pedestrian and cycling networks and strengthen early stage access to employment from Stanley Village and adjacent areas.
5	Early Works for the MIO – Gwydir Highway connection	The road link from the MIO to the Gwydir Highway provides the primary movement spine for the largest potential development area across the General Enterprise Sub-Precinct. The early development of this spine road will open up large areas of the SAP for investment and support the first stage of the Moree east-west bypass.
6	Protect the Railway Corridor	The railway corridor from the Inland Rail through the SAP should be protected to enable the future development of the northern inter-modal terminal and broader rail network investment. This corridor provides for the relatively unimpeded movement of freight trains from the Inland Rail and through the SAP and also provides a potential corridor for the future relocation of the Inland Rail around Moree.
7	Realign the Travelling Stock Route	A section of the TSR, approximately 1.5 km in length, should be realigned to facilitate the development of the northern inter-modal in the most strategic location for the overall SAP development and in a manner that provides the optimal geometry for the rail network through the SAP.

Item	Description	Role
8	Locater and design the Sewage Treatment Plant	A new STP will eventually be required for the SAP once the existing Moree STP is at capacity. This provides an opportunity for the latest technologies in waste-water recycling and re-use to be introduced. The location and a preliminary design for this STP should be secured at an early stage.
9	Rehabilitation Plan for Halls Creek and heritage sites	The early rehabilitation of a section of Halls Creek through the Central Sub-Precinct provides an opportunity for enhanced environmental outcomes from the SAP and integration with the interpretation of nearby heritage sites. This will also support the establishment of an active transport movement corridor through the SAP.
10	Central Sub-Precinct Loop Road	The Central Sub-Precinct is likely to be an early area of investment and development once the ARTC rail siding and MIO is built. The planned loop road through this sub-precinct will enable efficient early-stage access and optimise development opportunity.

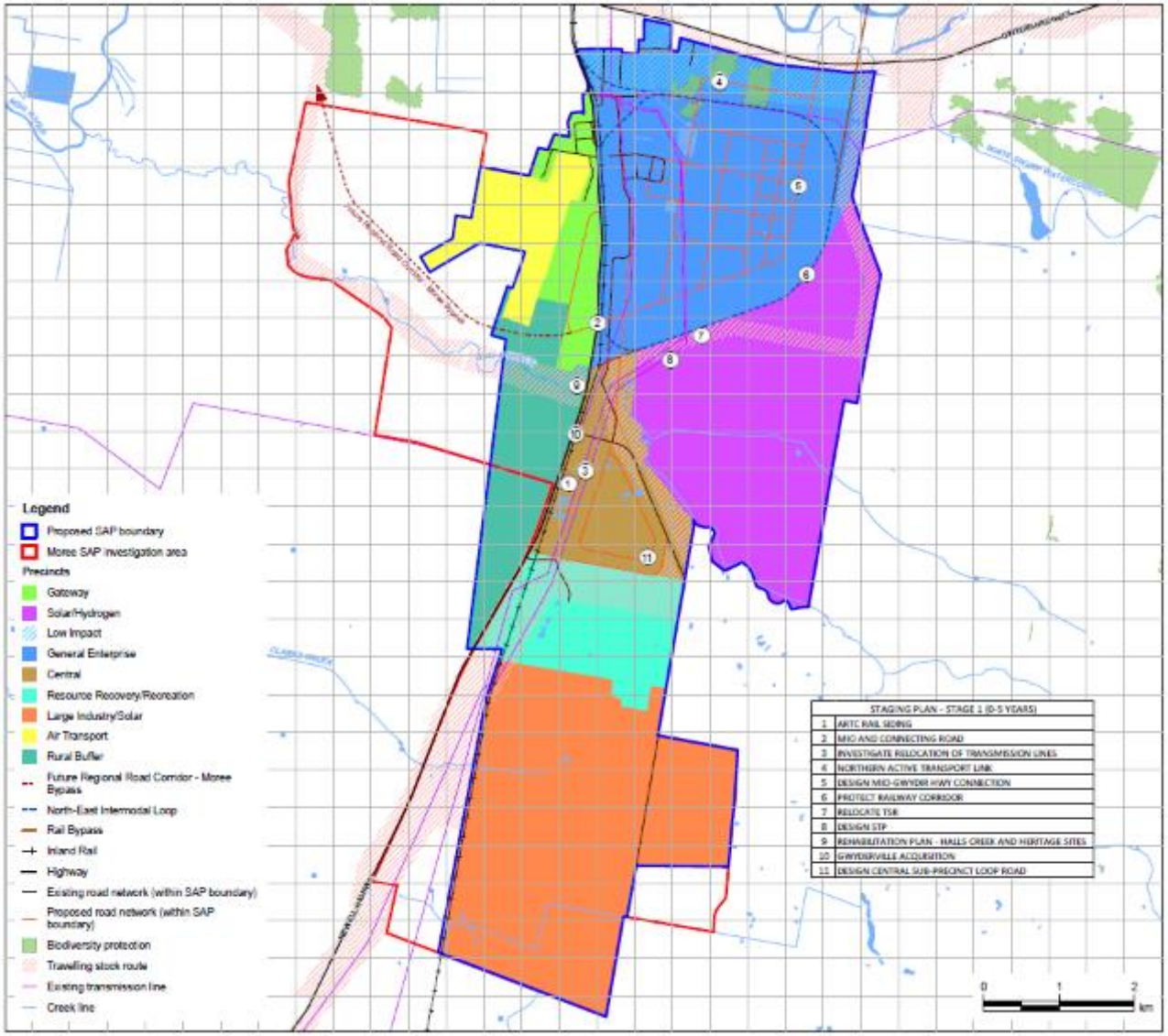


Figure 11.2 Moree SAP infrastructure staging plan

12 PLANNING FRAMEWORK

12.1 OVERVIEW

The Structure Plan provides the road map for the planning and development of the Moree SAP. It does this by integrating outcomes from the investigation, analysis and engagement processes in such a manner as to enable the creation of a Schedule to the Activation Precincts SEPP which establishes the planning framework, zoning, approval and masterplan requirements for the Moree SAP.

It is anticipated that the SAP will fall under a small number of zones, which provide maximum flexibility to respond to future development needs, based around a primary Regional Enterprise zone. The sub-precinct structure enables the finer grain arrangement of land uses with the clustering of compatible businesses to promote synergies and support the efficient use of infrastructure and resources. These will be further developed through a Master Plan and Delivery Plan.

This Chapter is structured to encompass:

- SAP boundary
- Approvals process
- Zoning framework
- Sub-Precincts
- Performance criteria.

12.2 SAP BOUNDARY

The SAP investigation area had an overall area of approximately 5880 ha, covering a large area east and west of the Newell Highway, south of Moree Town. The various investigations described in this report have carefully and thoroughly analysed the characteristics of the investigation area and its suitability for inclusion in the SAP.

In considering the most suitable boundary for the SAP, the key characteristics and opportunities associated with each part of the investigation area have been considered. The following general conclusions were reached at the Final Enquiry by Design workshop and fine-tuned through subsequent stakeholder and technical expert discussions, having regard to the breadth of information and analysis presented in the earlier chapters of this report. The original investigation area of 5880 ha has been reduced to a recommended Structure Plan area of 4931 ha, as shown in Figure 12.1.

In considering the final recommended boundary, the following considerations were primary:

Optimising contiguous development with existing areas of development and infrastructure

This is particularly relevant to the areas around the existing Industrial Estate and inter-modal/grain handling terminals, where there are existing subdivisions which are well serviced by existing infrastructure (roads, sewer, drainage, etc) and which are presently available for development. This north-east portion of the investigation area also has access to the Lower Gwydir Alluvium, potentially providing high quality groundwater for intensive agriculture and horticulture uses.

Leveraging existing investment

ARTC plans to construct a 2 km rail siding in the Central Sub-Precinct of the investigation area, near the existing LDC cotton gin. Although constrained by the existing housing at Gwydirville, this portion of the investigation area provides the most practical and probably most economically viable site for the first stage of development. Leveraging the ARTC siding investment will enable early implementation of a publicly accessible inter-modal facility and associated development of freight and logistic facilities and value-add agricultural production.

Similarly, the Gateway Estate being developed by MPSC along the Newell Highway provides an early stage opportunity for development and benefits from proximity to Moree Regional Airport and provides immediately available serviced land. which is proximate to both the Airport and the Newell Highway. There is potential to extend the Gateway Estate further south between the Newell Highway and Moree Airport to take advantage of access to the MIO and roads connecting back to the Newell Highway.

Areas with limited environmental constraints

Some parts of the investigation area have limited environmental constraints, meaning that they may be well suited to large industries that require unconstrained areas for development and large buffer zones from surrounding development.

The lands south of the Moree Waste Management Facility and adjacent to Moree Solar Farm provide large relatively undeveloped and unconstrained tracts of rural land. There is little existing infrastructure except access roads to the existing facilities and a transmission network to the Moree Solar Farm. The relative isolation of this area makes it suitable for a large industry that may have buffer/exclusion zone requirements, as well as potential expansion of solar development.

Protecting residential amenity

The potential proximity of development to a number of residential areas warrants bespoke responses:

- The northern boundary is close to the residential area of Stanley Village and necessitates the creation of a 'low impact buffer area' to ensure that residential areas are protected from potential amenity impacts such as noise, odour and air quality impacts.
- The Central Sub-Precinct includes the small village of Gwydirville (approximately nine dwellings), which may be adversely affected by future development.

Protecting areas with high environmental quality

The Halls Creek riparian corridor overlaps with the TSR from the north-western edge of the investigation area, through to the Central Sub-Precinct. This part of Halls Creek and the TSR has relatively high environmental attributes. Combined with the relative lack of infrastructure in this area, there appears to be limited merit in including this area within the SAP boundary.

Similarly, the land immediately south of Halls Creek and west of the Newell Highway is adjacent to the section of Halls Creek and TSR with relatively important environmental attributes and has limited existing infrastructure in place.

A portion of the rural area west of the Newell Highway has been identified as potentially being affected by air, noise and odour impacts from future development and as such should be protected from future development by inclusion in the SAP as a Rural Zone with limited development potential.

12.2.1 *RECOMMENDED SAP BOUNDARY*

The recommended SAP boundary and the original investigation area boundary are shown in Figure 12.1.

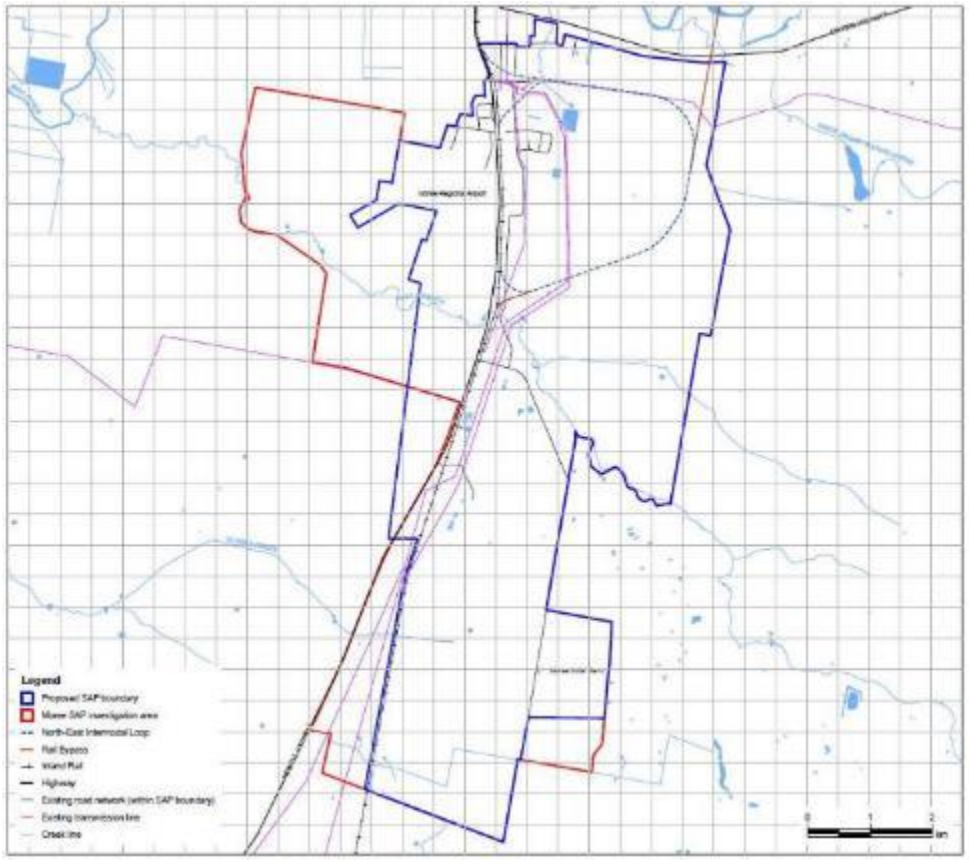


Figure 12.1 Recommended SAP Boundary

12.3 APPROVALS PROCESS

Approvals for development within the Moree SAP will be governed through the State Environmental Planning Policy (Activation Precincts) (Activation Precincts SEPP). Published in 2020, the Activation Precincts SEPP currently applies only to the Parkes SAP. Planning work is currently being undertaken in a number of other SAPs across regional NSW including Wagga Wagga, Snowy Mountains and Williamstown. The aims of the policy are to identify Activation Precincts in order to:

a Promote economic development, industry investment and innovation and to create employment in those Precincts

b Facilitate strategic and efficient development of land and infrastructure in those Precincts

c Protect and enhance land in those Precincts that has natural and cultural heritage value.

It is intended that the Activation Precincts SEPP will set aside the Moree Plains Local Environmental Plan and provide for the preparation of a master plan to:

- Establish the vision and objectives
- Arrange land uses
- Provide performance criteria for development
- Provide information about environmental and cultural heritage
- Limit development on environmentally sensitive areas.

Following the preparation and approval of the master plan by the Minister for Planning and Public Spaces, the implementation of the master plan is the responsibility of the Regional Growth NSW Development Corporation (RGDC) through the preparation of a delivery plan.

The delivery plan provides detailed strategies and plans for:

- Aboriginal cultural heritage
- Environmental protection and management
- Amenity protection
- Infrastructure provision
- Design guidelines for development
- Staging of the precinct.

12.3.1 *APPROVAL PATHWAY*

Operating like a local environmental plan, the Activation Precinct SEPP applies zones and allocates permissible land uses. However, the development approval pathway differs from that of the MPLEP in so far as the land use applications are made via an Activation Precinct certificate process rather than a Part 4 development application.

The issuing authority in the case of development under an Activation Precinct Certificate is RGDC.

An Activation Precinct Certificate is sought in respect of proposed development on land within the SAP, to certify development is consistent with the master plan and delivery plan. The certificate is issued by RGDC within a 30 day timeframe. The Certificate is to provide assurance that a proposal is consistent with the relevant land use table, principal development standards, master plan and building design and performance standards set out in a delivery plan.

12.4 ZONING

The proposed zoning for the Moree SAP is shown in Figure 12.2. The land use controls in the Activation Precincts SEPP permit a wide range of employment and industrial uses in the Regional Enterprise Zone.

The SAP will also include a Special Activities Infrastructure Zone that will apply to the Newell Highway and rail corridor.

The Airport is proposed for inclusion in the SAP, however, the land use controls will continue to be managed under the Moree Local Environmental Plan, rather than the Activation Precinct SEPP.

A Rural Activity Zone is proposed along the western edge of the SAP, which will allow a continuation of traditional rural uses, but will prohibit land uses, such as dwelling houses, that may be sensitive to potential amenity impacts from nearby development within the SAP.

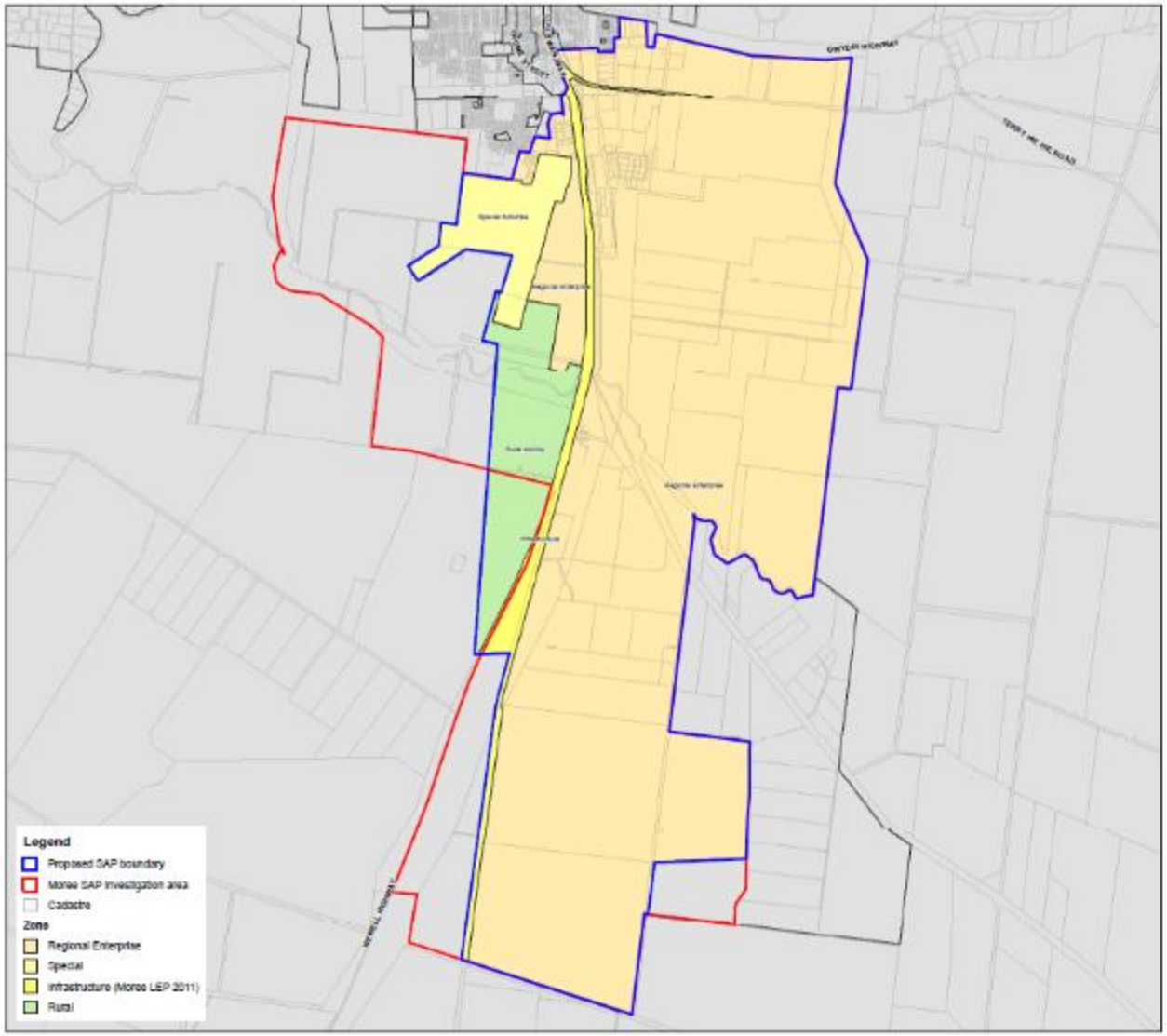


Figure 12.2 Proposed zoning for Moree SAP

Fine-grain development control and the management of amenity impacts between industry and sensitive development such as existing residential development will be managed through the application of sub precincts and appropriate land use controls and performance criteria in the Master Plan.

12.5 SUB-PRECINCTS

Drawing on the analysis and characteristics of the various parts of the investigation area, eight sub-precincts have been identified planning purposes as described in Chapter 3 (also refer to Figure 12.3).

The sub-precinct approach allows for the distribution of preferred land uses across the SAP. Sub-precincts are intended to be included in the Moree SAP Master Plan along with their objectives and proposed land uses, to support development control and guide the appropriate distribution of land uses.

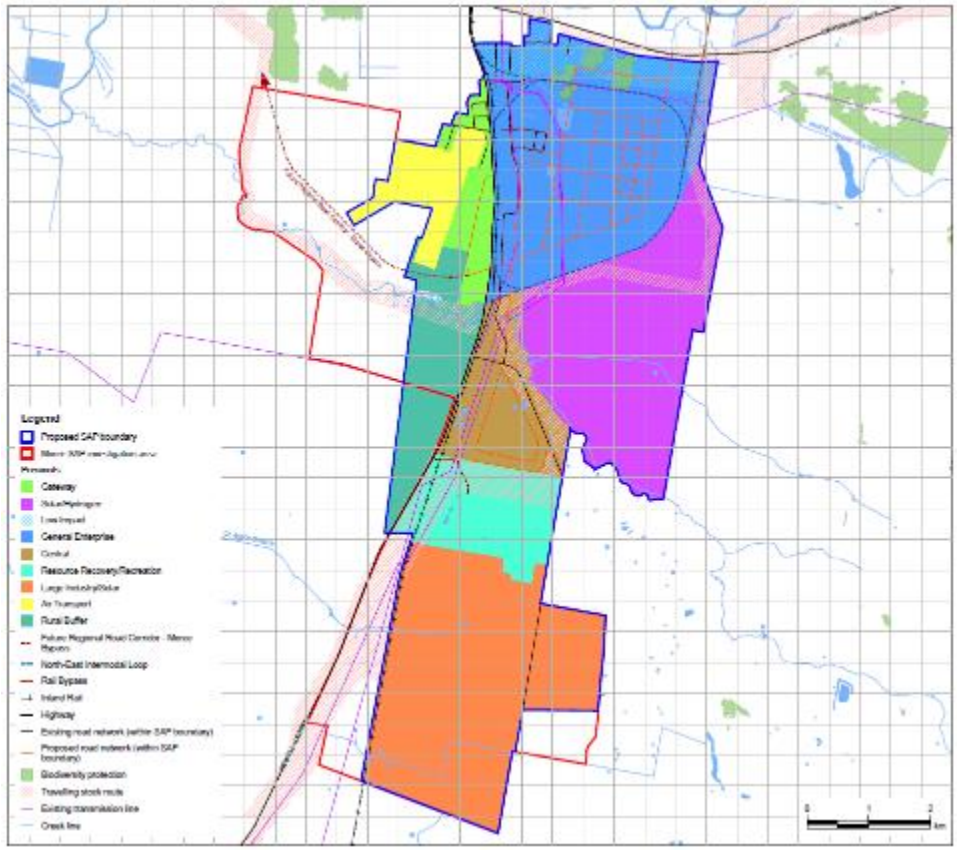


Figure 12.3 Proposed Moree SAP sub-precincts

12.5.1 *SUB-PRECINCT DESCRIPTIONS AND OBJECTIVES*

GENERAL ENTERPRISE

The most significant sub-precinct by area, located over existing and new industrial areas intended to capitalise on rail-focused freight and logistics infrastructure crucial to maintaining the competitive advantage of the Moree Special Activation Precinct. Supports a diversity of businesses and associated infrastructure associated with intermodal transport activity, warehousing, advanced manufacturing, horticultural and processing businesses, and ancillary infrastructure. Its access to groundwater and existing infrastructure makes this sub-precinct particularly attractive for early-stage horticulture and intensive agriculture development. Incorporates appropriate protections for land with high environmental and cultural heritage values such as along the TSR and Halls Creek.

A low impact area exists along the northern boundary of the sub-precinct to ensure that land uses provide a buffer and transition area to existing residential land uses such as Stanley Village and James Street/Maude Street, while also containing areas of high conservation values and flood prone lands.

Proposed objectives:

1 To encourage regional enterprise and innovation in industry, infrastructure provision, environmental management and performance in urban and industrial design.

2 To effectively manage land uses of varying intensity or environmental sensitivities and to minimise the risk of conflict associated with incompatible land uses.

3 To provide for light industries and service-oriented industries which support agricultural and urban activity.

4 To provide opportunities for regional economic development and employment.

5 To attract and support industries that contribute to and benefit from proximity to freight transport networks.

6 To protect and enhance the local character of the precinct and contribute to the surrounding environment and its amenity.

7 To provide for a low impact area with open space, biodiversity conservation and active recreation managed near residential areas to reduce potential impact and conflict.

Key land uses

Intermodal freight and road transport, agriculture value add processing and manufacturing, rural industry, intensive plant agriculture, depots, distribution centres.

CENTRAL

The Central Sub-Precinct is expected to benefit from the initial investment in an ARTC rail siding along the Inland Rail alignment and may be one of the first sub-precincts to experience substantial development. In other respects it is similar to the General Enterprise Sub-Precinct and is intended to capitalise on rail-focused freight and logistics infrastructure. It is expected to supports a diversity of businesses and associated infrastructure associated with intermodal transport activity, warehousing, advanced manufacturing, horticultural and processing businesses, and ancillary infrastructure. It also incorporates appropriate protections for land with high environmental and cultural heritage values such as along the adjacent TSR and Halls Creek.

Proposed objectives:

1. To encourage regional enterprise and innovation in industry, infrastructure provision, environmental management and performance in urban and industrial design.

2. To provide for light industries and service-oriented industries which support agricultural and urban activity.

3. To provide opportunities for regional economic development and employment.

4. To attract and support industries that contribute to and benefit from proximity to freight transport networks.

5. To protect and enhance the local character of the precinct and contribute to the surrounding environment and its amenity.

Key land uses

Intermodal freight and road transport, agriculture value add processing and manufacturing, rural industry, intensive plant agriculture, depots, distribution centres.

GATEWAY

Focused along the western side of the Newell Highway and adjacent to the Moree Regional Airport, business and enterprise land uses associated with the Airport, the Highway or to support the SAP. Offering a range of business opportunities to service local and travellers without impacting on locally provided services (with appropriate scale of accommodation, food and drink premises etc). Provides a transition between the industrial nature of SAP land uses and the township of Moree.

Proposed objectives:

1 Provide a transition between the industry uses in the SAP and the township of Moree.

2 Provide business activities ancillary to the airport.

3 Essential that land uses do not cause retail leakage.

Key land uses

Highway service centres, offices, hotel or motel accommodation, light industry.

MOREE REGIONAL AIRPORT

Moree Regional Airport is included as an existing and continuing land use within the SAP. The Moree Airport will continue to operate under the provisions of the Moree Plains LEP 2011.

RESOURCE RECOVERY AND RECREATION

A transitional sub-precinct between the Regional Enterprise and Large Industry/Solar areas, this sub-precinct recognises the existing Moree Regional Waste Facility and the Moree Ski Park as important continuing land uses, each of which provides an opportunity for further compatible development.

The Moree Regional Waste Facility provides a potential node for circular economy outcomes associated with the reuse and recycling of waste that may be generated locally or transported to the SAP.

The Moree Ski Park has the potential to be further developed and linked to active transport routes and additional recreation facilities along the TSR and in conjunction with bio-diversity conservation and local heritage and cultural interpretation.

Proposed objectives:

1 Capitalise on existing development to process and recover waste.

2 To provide for low impact land uses, open space, biodiversity conservation and active recreation managed near residential areas to reduce potential impact and conflict.

3 To provide the opportunity for business development and native horticulture in proximity to residential areas.

Key land uses

Waste or resource management facilities, recreation areas, industries, depots, environment protection works.

CENTRAL SOLAR

This large sub-precinct provides for new solar development and potentially also supports hydrogen generating developments and other forms of renewable energy such as bio-gas.

Proposed Objectives

1 To encourage the development of industry leading renewable energy generation.

Key land use

Electricity generation works, industry.

SOLAR AND LARGE INDUSTRY

This sub-precinct supports existing and new solar development. In the south of the precinct there is potential to co-locate large industrial development including hazardous and offensive industries requiring separation distances as far away from other uses as possible, buffered by other low-density land uses such as renewable energy generation (solar, wind, bioenergy and hydrogen).

Proposed objectives:

1 To provide for energy generation and potentially offensive and hazardous industries in an area with separation distances.

Key land use

Electricity generation works, industry, heavy industrial storage establishment, potentially hazardous industry.

Rural buffer

This sub-precinct is designed to provide a buffer and an area excluded from future development to ensure that potential negative amenity impacts from development within the SAP are not experienced beyond the boundaries of the SAP.

Proposed objectives:

1 To provide a buffer area, available for agricultural activity.

2 To ensure that potential negative amenity impacts are not experienced beyond the SAP boundary.

Key land uses

Rural industry (excepting dwelling-houses), environmental protection works

12.5.2 *DEVELOPMENT CONTROL AND PERFORMANCE MEASURES*

An Activation Precinct Certificate can only be issued for development that is consistent with the intent of the sub-precinct as identified in the master plan. The master plan will include performance informed by the individual technical studies and supporting documentation.

The Moree Schedule will include mapping of environmentally sensitive land based on the technical assessment undertaken at a whole of precinct level. At the master plan level, constraints mapping will inform performance criteria for specific provisions relating to the key areas of economic development, place and landscape, environment and sustainability, community and transport and infrastructure.

The key performance criteria will need to include the following matters.

BUILDING HEIGHTS

It is proposed that the Obstacle Limitation Surface levels (OLS) be used to manage overall building heights. It is understood that these are presently under review, potentially in conjunction with an extension to runways at Moree Regional Airport. The majority of the SAP would have a height limit of RL 265.5 as provided for by the OLS.

In is anticipated that the OLS will be included as a map layer with an accompanying provision in the Schedule of the SEPP or referenced in the master plan.

TRANSPORT AND MOVEMENT, UTILITIES

This will include criteria for elements such as streets, access, transport and the availability of water, sewer and energy within the precinct. It is anticipated that this will also be linked to the delivery of enabling infrastructure and the staging on the SAP.

SUSTAINABILITY

The sustainability objectives of the SAP may be achieved through the application of performance measures to building and development performance and address:

- Management and monitoring
- Energy
- Water
- Climate change
- Waste and reuse.

AMENITY CONTROL – AIR, NOISE AND ODOUR

This will be particularly important in relation to the adjoining sensitive receptors outside the SAP boundary in the north as well as considering controls for sensitive uses in the Gateway sub-precinct.

HERITAGE PROTECTION

The development within the SAP should avoid known Aboriginal sites and places. Important corridors as identified along Halls Creek will also need to be protected through performance criteria.

BIODIVERSITY, VEGETATION AND CORRIDORS

Preservation of the key environmental attributes and features of the landscape is an import part of the SAP process. In Moree these elements are concentrated in two types of corridors, the TSR and the riparian zones.

Exclusion of these areas from the operation of the complying development provisions will require a Biodiversity Sensitivity Map.

WATER RESOURCE

Access to water, use and re-use are all areas that will require consideration in the delivery of the precinct.

FLOOD MITIGATION

The Flood Planning Level (FPL) will need to be determined as a key element of the performance criteria. The hazard and risk in the case of Moree may result in a PFL for the some of the sub-precincts that is a variation on a typical approach.

APPENDIX A

ABORIGINAL PLANNING AND DESIGN PRINCIPLES

ABORIGINAL
DESIGN & PLANNING PRINCIPLES

This document acknowledges the elders, past and present, of the ***Gomeroi people*** *as the traditional custodians of the land and its knowledge*

Content

Water-marks on the banks of the River Darling. 1861 by Ludwig Becker H16486 Australian Manuscripts Collection, State Library of Victoria

“Boobera Lagoon..is the resting place of the Rainbow Serpent, and all of the gullies and all of the lagoon itself is about what the Rainbow Serpent created after he had created the universe, all the dry gullies are the tracks that he's made looking for a resting place."

Carl McGrady, Aboriginal Education Assistant, Boggabilla, describing the path of the Rainbow Serpent at Boobera Lagoon, northern New South Wales, 1996.

This document was produced by WSP Indigense Specialist Services. Signed off by Michael Hromek, Technical Executive of Indigenous Design (Architecture) and knowledge. Descended from the Budawang tribe of the Yuin nation, Michael is also currently working on a PhD in Architecture and teaches it at the University of Technology Sydney in the Bachelor of Design in Architecture.

Research by Sian Hromek (Yuin) Senior Researcher WSP

Cover page: *Heber Street [looking west along Heber St. from Frome St., Moree, before 1904]*

Aboriginal Planning Statement

Indigenous peoples and the built environment have had a problematic relationship, with settlements, roads, and railways often cutting through and disrupting the connection between people and Country.

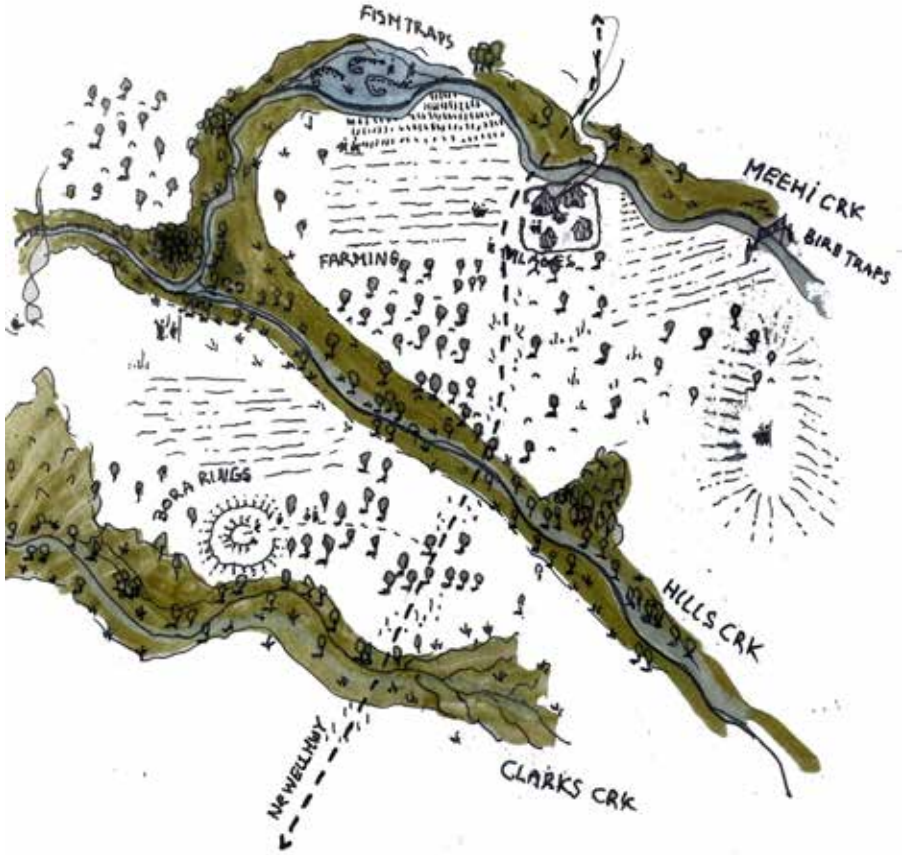
Our projects change the environment in significant, and often positive ways, yet we get asked this question a lot by Aboriginal people:

“How are you going to leave my Country better than what it was before? “

How can we reconnect the relationship between Country and people? Projects offer an opportunity to celebrate and acknowledge the Aboriginal Country, Culture and people of the land on which the project is on.

We can acknowledge Country and reveal the latent Aboriginal history of the site through the design elements of the project through place based landscape interventions (architecture, infrastructure, art etc).

The principles set out in this document are a starting point of engagement with Gomeroi people and Country. While much more consultation and permission must be sort from the local elders, the ideas set out in this document should be seen as an introduction to this more engaging process.



Artist's impression of Pre-colonial Moree. was a land of abundance due to highly sophisticated land management practices ensured resources were predictable thus permanent settlement and housing occurred here. Reconstruction is based on the referenced and publicly available material in this report.

Aboriginal Design Principles

Aboriginal design principles

This document follows 3 core principles when dealing with Aboriginal content which are:

Indigenous led/ Indigenous people (designers, elders etc) should be leading or co-leading the Indigenous elements in the design.

Community involvement/ The local Indigenous community to be engaged in this process, can we use their patterns? Can they design patterns for the project?

Appropriate use of Indigenous design/ All Indigenous design elements must be approved of by involved Indigenous people / community / elders. If approval is not given, the knowledge will not be used in the project.

These principles were established based of the Indigenous Design Charter published by Deakin University, as well as other Indigenous academics, such as Linda Tuwi Smith

Design approach

Image - Signage/surface treatment/ walls/art/ Surface treatments using local Aboriginal design knowledge, commissioned from artists, or by urban designers with engagement and approval from community. Signage shares the story of Country and its people.

Space - Indigenous space/ landscaping/ Indigenous Space. A space or landscape where Aboriginal people can have their culture celebrated. Cultural land management practices, cultural fire management, yam daisy propagation, etc.

Language - Sharing language is critical to keeping it alive through its use in the built environment.

Planning Approach - Country focused design

On the whole, Aboriginal Australia has a simple but quite different hierarchy when it comes to their connection to nature. It is best contrasted against human-focused design, depicted below.

How might this shift or enhance current practices?

Country focused design

Country, over
Community, over
Individual

Gomeroi Country

Gomeroi Country

A Country of abundance

Early explorers into Gomeroi Country, such as Major Thomas Mitchell indicated that

the people lived in a rich environment, with many resources around the rivers that they utilised. (Mitchell, 1838: 84, 95, 100).

Complete with tall stately trees, well manicured grass lands, conical roofed houses which formed villages of up to 200 people, and an abundance of fresh food supported large population of Gomeroi, early settlers thought it was God's Country, and uniquely perfect for the rearing of sheep and cattle.

'Drovers Camp' taken between 1890-1904 shows a well curated landscape of tall trees and grassy understory. NSW Library

A Country curated by Fire

Little know was that Aboriginal people in this Country utilised sophisticated environmental management conducted over long periods of time — in particular, traditional cultural fire management. The First Fleet officer John Hunter noted that Aboriginal people around *'set the country on fire for several miles extent..to clear that part of the country through which they have frequent occasion to travel, of the brush or underwood',* [1]

The mosaic of landscapes was *'maintained by Aboriginal burning, a carefully calibrated system which kept some areas open while others grew dense and dark'.*

People using fire to hunt kangaroos by [Joseph Lycett, 1817 National Library of Australia, call number # 138501179

Gomeroi Country - The Great Grassy Pathways

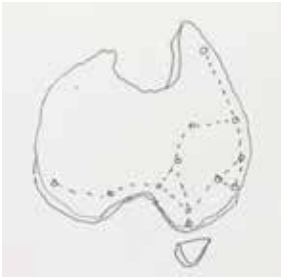
Before roads and rail, great grassy pathways connected the country of Australia. Crafted and maintained by Aboriginal people using cultural fire techniques that maintain the grassy understory within the landscape, they serve as important places for access, boundaries and ceremony, the major ones often follow songlines.

They were used to access the landscape the by explorers and livestock farmers. Many of the grassy pathways evolved into Travelling Stock Routes and the first roads in many regions followed these routes.

The Inland Rail follows an ancient songline that goes straight through Moree which is an important crossroads between East and West, and North and South.

"..grasslands remain a meeting place on ancient pathways that connect landscapes, places, people, plants and animals."

Oliver Costello - Firestics Co-Founder, 2015



Bullock trains went up and down the east coast of Australia on Aboriginal grassy pathways, which today have been formalised into modern roads and rail.

Gomeroi Country Features

Gomeroi Country Introduction

The Gomeroi nation is one of the 4 largest Aboriginal nations in Australia. The expanse of land is over 50 000 kms with a variety of terrain and landscapes evident across the area.

The Gomeroi people depend on the rivers in their Country for their physical and cultural needs. There are four main rivers in their Country which are now called- Barwon, Namoi, Peel and Darling Rivers. Waterways are a crucial element of Gomeroi life. [2]

The landforms of the region generally contain three major formations: river channels, levees and lower floodplains with riparian woodland vegetation; upper floodplains covered by grassland; and wooded low rises with some higher gently undulating areas. Owing to the flat topography of the region a large amount of land in and around Moree is subject to flooding with vast tracts of the floodplains becoming inundated. [3]

Some variations in names of the Gomeroi- Kamilaroi; Kamilroi; Gamilaroi Gamilaraay and Goomilaroi,. [10]

Note: we predominantly use Gomeroi, however all variations are acceptable and may be used from time to time in this document.

Gomeroi People

Gomeroi people have occupied their Country for at least 40,000 years. Over these tens of thousands of years the they have maintained a strong and ongoing connection to their traditional lands and waters.
Traditionally their society comprise of family groups which all co-exist on subdivided lands which sustain them as they provide for their extended families. [2,3]

Gomeroi Language
Languages and people were known by their different words for “no” in this area, so these are now referred to as “No” languages. For example, gamil is “no” in Gamilaraay language. Gamilaraay = gamil “no” +–(b)araay “having”. 4

Gomeroi Totems
Whilst Gomeroi society is patriarchal the moiety to which one belong is matrilineal and people belong to a totemic group inherited from their mothers. These moieties would have governed most aspects of life from birth to death including whom you could marry, what you could eat and who you could talk to. [2,3]

Gomeroi people have two main totems

Kaputhin = Eagle
Dilby = Crow
There are sub-totem groupings which are also aligned with animal totems:

Kaputhin Moiety – Yibaay/Gambuu - Ringtail possum, red kangaroo, quoll, wallaroo, platypus, quail, barking owl, emu, brolga and death adder.

Dilby Moiety – Marrii/Gabii - Brush-tailed possum, bandicoot, echidna, pademelon, eastern grey kangaroo, pelican, white cockatoo and kookaburra. [2]

Spirituality

The Gomeroi believe in a large number of supernatural beings. Among them the most important are: Baiame, Dharramulan and Garriya. Baiame is believed to have the greatest of Powers. Dharramulan is the one-legged son of Baiame. Legend says that Garriya, the Rainbow Serpent, a fabulous monster which appeared in a snake-like form, is now believed to be resting deep within Boobera Lagoon, 13.5km west of Boggabilla, NSW. [5]

From: Austin, P. K (2008), The Gamilaraay (Kamilaroi) language, northern New South Wales: A brief history of research. In W. B. McGregor, (Ed.), Encountering Aboriginal languages: Studies in the history of Australian linguistics, pp. 37-58. Canberra: Pacific Linguistics.

Gomeroi Country Features

Physical Geography

The Moree Plains are encompassed within two broad bio-physiographic regions, specifically the Northern Outwash province of the Brigalow Belt South bio-geographic region and the Castlereagh-Barwon province within the northern alluvial fans of the Darling Riverine Plains bio-physiographic region.

The Northern Outwash Province is located to the east of Moree and incorporates the eastern half of the project area, while the Castlereagh Barwon Province is located to the west of Moree and incorporates the western half of the project area [3]

Moree Plains Shire LGA , showing Distribution of the Brigalow Belt South and Darling Riverine Plains Bio-physiographic Regions (reference#3)

Terry Hie Hie Aboriginal Area

Terry Hie Hie Aboriginal Area is south east of Moree and is an important ceremonial and gathering place for Gomeroi people. Evidence of long-term use of the area includes at least 240 axe-grinding grooves and the remains of a corroboree ground. A bora, several carved trees, scarred trees, and two Aboriginal cemeteries can also be found nearby.

The local community and descendants of the Gomeroi People often visit for cultural, recreational and educational purposes. The area is of great spiritual significance as it is part of the Great Ancestral Bora (buurru1). [17]

Berrygill rock carving, Terry Hie Hie Aboriginal Area. Photo: Matthew Bester

Resources

This area of Gomeroi Country is described as being rich in flora and fauna resources, with the following listed as having been managed for food.

During the summer months the dhawuraay- an annual assembly of allied bands, the largest regular residential gathering, comprising hundreds of individuals gathered along the rivers to collect fish, possums, koalas, wallabies, bandicoots, kangaroos, rats, platypus, lizards and snakes. Bird species include emu, plain turkeys, waterfowl, pelican and many others.

From the rivers and lagoons came fish (cod, perch and catfish) as well as yabbies, shrimp, mussels, crayfish and turtles. Fish traps were used for catching fish. Grubs from Casuarinas and Kurrajongs were also eaten.

Gwydir Wetlands, Image by Daryl Albertson

During the winter the dhawuraay broke up into smaller groups known as hearth groups and moved away from the riparian areas and into the plains. Food sources associated with the plains are the well-known terrestrial mammals and birds and a selection of reptiles.

Plants

Grass seeds were an important food source and they were ground up to make loaves and cakes. Other foods include: kurrajong seeds, growing tips and berries, honey, roots, acacia gum, bulrush, pulp, nuts (quandong), grass seeds, Gubiyaay (a type of lily), Capparis lasiantha (a native orange or pomegranate), Mistletoe sp., Owenia acidula (Emu apple / sour plum) and yams. Wild honey was also exploited. Cymbidium canaliculatum (Black Orchid) was used for its medicinal properties to cure stomach ailments. [19]

Kurrajong seeds, http://tree-species.blogspot.com/2008/01/lacebark-kurrajong-brachychiton.html

Country Features

Fishing Country

Society was based along the river channels, lakes and aquatic resources. Fishing nets and fish traps are common technologies used in this area. The oldest record of net fishing in the region is from Lake Tandou which contains remains of hundreds of golden perch caught and eaten in a single event around 23-44,000 years ago. 3

Fish traps are called **Nunnu** and each family had their own allotted portion of the fishing grounds. Fish traps and brush fences made of timber were extensive on all the rivers of the Darling system. Stone fish traps are rarer and found mostly on the Upper Darling River, Barwon River at Brewarrina, and Bogan River at Gongolan, **The Brewarrina fish traps** are about 40,000 years old and are one of the oldest man-made structures on earth. 3

The Brewarrina fish traps are within Kamilaroi Country, and while far north from Moree, are examples of farming practices that occured in the rivers and creeks within Moree

Material Culture of the Gomeroi People

The material culture of Gomeroi people supports the idea that communities are totally reliant upon the network of rivers that define this area. Social organisation is required to construct, maintain and operate the fish traps and nets, and the fishing equipment in the toolkit is of a sophistication unknown outside the Murray Darling River system. 3

Gomeroi people possessed a variety of tools and technology including:
Bark containers or coolamon - for holding water, gathering seeds, berries and other substances;
Boomerangs and throwing sticks - short wooden tools for hunting;
Cloaks- made of kangaroo or possum skin;
Clubs or nulla nulla - designed for hand to hand combat and made of wood in varying shapes and sizes;
Hatchets- hafted stone axes used for bark removal and other activities. Steel was also used after European settlement;
Nets- for catching fish and birds;
Spears- long wooden throwing sticks. A variety of point types are described, tapered, barbed and even trident;
Fish traps- dry stone weirs on the Barwon and less permanent wooden framework based traps common in the Gwydir River region. 3

Stone Tools
There is an division in the region between artefacts made on silcrete in the north and west and those made on quartz in the south and east. 3

Stone axe production is localised at a number of quarries in the region. The distribution of quarries is dependent on outcrops of suitable volcanic rock. Stone axe distribution, however, is indeterminate because of the low number found in the region, and the probable impact of collecting on these cultural items. 3

Grinding Grooves
Grinding grooves are physical evidence of tool making and food processing activities. These grooves are created by the manual rubbing of stones onto flat areas of soft rock, particularly sandstone, in areas near creek beds or other water sources where water provides the lubricant. Other grinding grooves include those used to shape wooden devices such as boomerang and spears. Near Moree, Terry Hie Hie Aboriginal Areas geologic landscape is predominantly sedimentary rock, coupled with semi-permanent waterholes which provides a good base for people to grind tools, weapons and food. 8

Skin cloaks – from kangaroo and possum, sewn together with kangaroo tail sinews. Patterns and designs particular to the owner were burnt into the skin and act as a signifier of the owner, their relations and connections. These were of varying sizes and were used for warmth and the lining of shelters. 19

Corroboree Grounds
Corroborees can be held over many days and nights and attended by everyone, including women and children. The songs and dances are highly structured and required a great deal of knowledge to perform. Ochres were used for body painting and the guests would have been adorned in special body ornaments made from things such as feathers, woven plant materials, animal fur, teeth, bones and shells. 8

Rock Art Engraving
Traditional art has developed in one form or another, for well over 40,000 years. Rock art is engraved by abrasion to produce artwork which may be used for teaching, ceremony and cultural purposes. Many animal track motifs are found in engraved rock art sites of the central sandstone belt of the Terry Hie Hie area indicating the animals found in that area. 8

Message Sticks
Gomeroi people had many methods of communicating over long distances. They used message sticks which held engravings that symbolise things such as clan group, time and event. The message sticks were relayed by a network of messengers over vast distances. One who carried the message stick was traditionally granted safe passage and protected entry to other nations' territory. The message stick operated like a visa or passport. 8

Gomeroi Country Features - Dendroglyphs

The Gomeroi designed their tree carvings around powerful symbols that were used during initiation ceremonies for boys being ushered into manhood. When a host clan was intending to hold a bora, a messenger with message sticks would be sent far afield to invite neighbouring clans to attend.

The ceremonies were conducted over many days and nights between two circles on the ground connected by a path.

Around this path were carved trees and ground carvings, both called yammunyamun. Senior men led the initiates along the path from the larger outer circle to the smaller inner circle, explaining the significance of the yammunyamun along the way. [20]

Gomeroi Country - a changing Country

With the influx of settlers to the area came vast amounts of livestock. As explained by historian Bill Gammage in 'The Greatest Estate on Earth: How Aborigines made Australia', and Aboriginal author Bruce Pascoe in 'Dark Emu', the problem is that Country is not unaccustomed a mass amount of hard hooved livestock. As a result the soft rich soils are compressed and the Country gets sick with soil erosion and suppression of native herbs and vegetation due to grazing pressure.

This image shows how quickly the landscape can change from the hard hooves of the sheep and cattle. What was once soft alluvial and well aerated soil, perfect for growing seeds, wheats, daisy yams etc, now all nutrients are trapped below the soil through the compression of the sheeps hove.

How might we undo these damaging monocultural farming practices?

'Droving Sheep' Photographs chiefly of Moree and surrounding areas, New South Wales library Collection, ca. 1895-1910.

This photo amazingly captures scar trees or dendroglyphs in the foreground mark what would have been a significant site for the Gomeroi people. According to tradition, the site would have been off camera to the right as the scars face the site as a marker to let people know they are entering an important ceremonial ground. These sites were often shared between many family groups of clans.

Significant Sites around Moree

1 Gnoura Gnoura Creek- Gomeroi Bora ground, and dendroglyphs or scar trees. Amongst the symbols carved in to the trees are a moon; spiral lines supposed to be those left by lightning, fish, turtle, lace lizard, human figure, snake and yammunyamun figures. [3]

2 Boobera Lagoon- the lagoon is the resting place of Garriya, the Rainbow Serpent, an important figure in dreamtime legend. The lagoon is particularly significant to the Bigambul and Gomeroi people, who held the third stage of their joint male initiation ceremonies at this site. [9]

3 Toomelah Mission and Cemetery- established in the 1930s, Toomelah is the home of about 300 Gomeroi people, located north of Moree on the MacIntyre River and close to the town of Goondiwindi across the border in Queensland. [10]

4 Midkin Nature Reserve- within the Reserve are a number of scarred tree sites of cultural significance to the local community, stone tools, including axes and grinding dishes have been found on properties adjoining the Reserve. [3]

5 Wearmatong Carved Tree. [11]

6 Ngindi Baabili Tubbiabri - the Aboriginal section of the Moree Cemetery. [3]

7 St Pius Church- former mission site. [3]

8 Taylor Oval- burial site with cultural, heritage values, a place for reconciliation in Moree. Gomeroi elder Mr Lyall Munro shares: “The boundary of Taylor Oval was the area where Ronald ‘Cheeky’ McIntosh was killed during race-related tensions in Moree in the 1970s," [12]

9 Railway Bridge Camp- a camp set up around the railway bridge after people were moved away from the Terry Hie Hie area. It still holds significance to local people today.. (pers. comms.)

10 Moree Baths and Swimming Pool Complex - during the 1965 Freedom Ride through outback New South Wales, a stark example of official segregation was encountered in the exclusion of Aboriginal people from the swimming pool. The protests brought racial discrimination to the attention and consciousness of the wider community and forced non-aboriginal Australians to examine their attitudes to Aboriginal Australians. Dr Charles Nelson Perrurle Perkins AO rose to national prominence as a leading Indigenous-rights activist initially through the Freedom Rides and the events at Moree Baths. [14]

11 Scar tree- (BP Solar Scarred Tree #1) is a modified (scarred) Bimble Box tree situated within black soils in the road corridor near a table drain in the vicinity of Halls Creek. The scar has been interpreted as a boundary marker or bullroarer scar. [18]

12 Scar Tree- (BP Solar Scarred Tree #2) is a culturally modified Carbeen tree situated within a cultivated paddock. The tree is alive and in very poor condition. 1[8]

13 Billabong (BPS OS1-) resource area and artifact scatters situated around the perimeter of an extinct ephemeral billabong associated in antiquity with Halls Creek. It is thought that this feature would fill when Halls Creek flooded and then retain water for potentially a considerable period, hence making it a resource rich area attractive for human occupation. It is appropriate to note the rarity of this site particularly in relation to the heavily agriculturally developed Moree area. [18]

14 Kirramingly Nature Reserve is situated within an area administered by the Moree LALC There is evidence of traditional use of the area in the form of recorded open camp sites, there are carved trees and burials within 25km of the Reserve. [3]

15 Ardgowan Plain Massacre- Charles Eyles, manager at Crawford's station and two stockmen, James Dunn and William Allen, shot and killed 9 Gomeroi people on Ardgowan Island and burnt and buried the bodies in a shallow grave. [15]

16 Myall Creek Massacre. On 10 June 1838 a group of white settlers murdered 28 Aboriginal men, women and children near Myall Creek Station in northern New South Wales, near Bingara. Seven of the killers were tried and hanged. The Myall Creek Massacre now serves as both a harrowing reminder of Australia's colonial violence towards Aboriginal people and an example of modern-day reconciliation. [16]

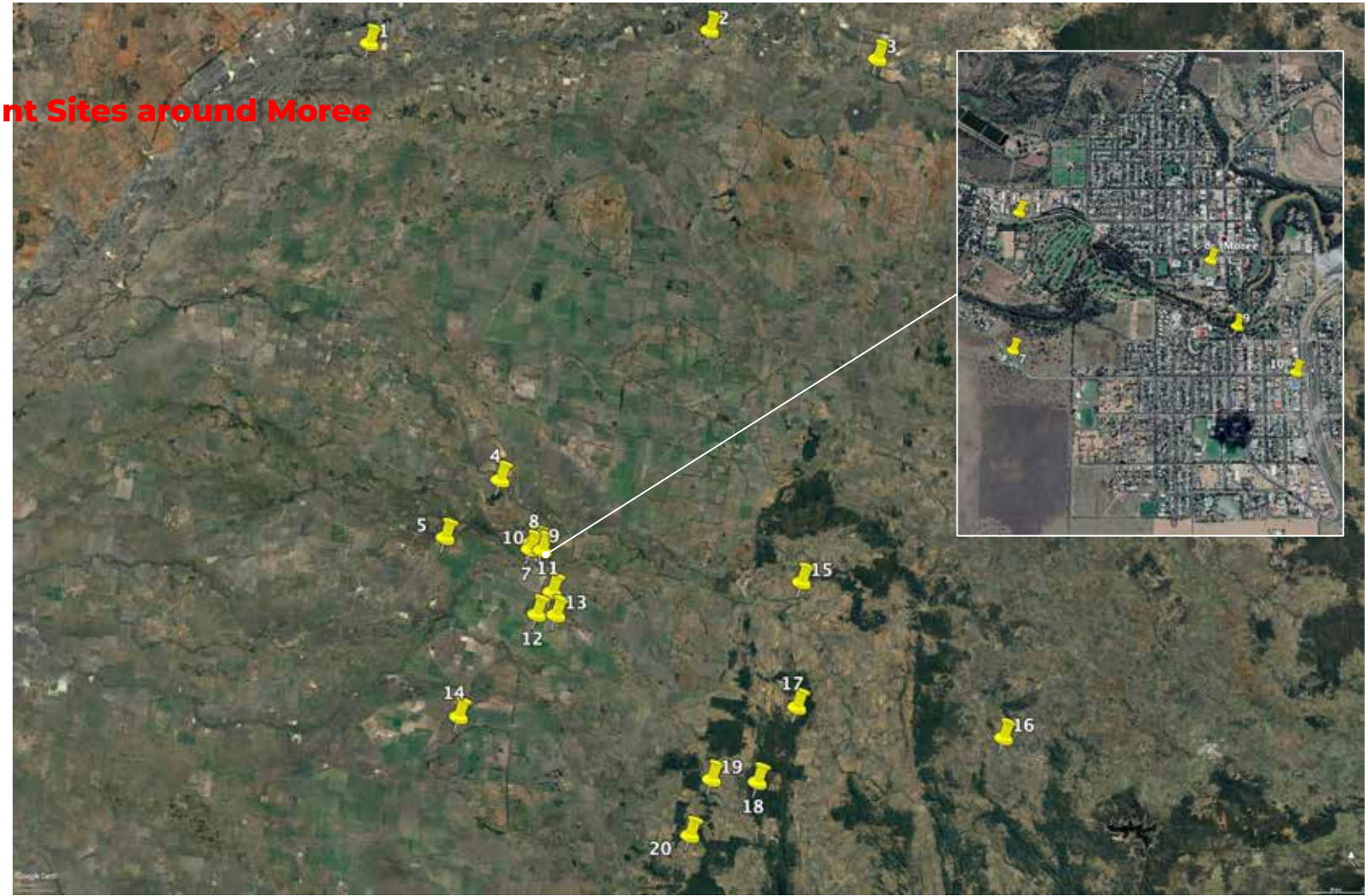
17 Slaughterhouse Creek (Biniguy) / Waterloo Creek - Fifteen heavily armed stockmen positioned themselves on the slopes of the ravine for a dawn attack on a camp below on the creek bed. About 200 Gomeroi people were slaughtered. The massacre is embedded in the memories of the Gomeroi in the region. [15]

18 Terry Hie Hie Aboriginal Area is an important ceremonial and gathering place for Kamilaroi people. Evidence of long-term use of the area includes at least 240 axe-grinding grooves and the remains of a corroboree ground. A bora, several carved trees, scarred trees, and two Aboriginal cemeteries can also be found nearby. The local community and descendants of the old people often visit for cultural, recreational and educational purposes. The area is of great spiritual significance as it is part of the Great Ancestral Bora (buurru1). [17]

19 Gamilaroi Kamilaroi Nature Reserve- is an area of great spiritual significance related to the area known as the Great ancestral Bora of Biamme, an important Bora ground to the Gomeroi people. Carved trees once found throughout the area reflect other important elements of Gomeroi spiritual association. [3]

20 Berrygill Creek Area - Tycannah and Berrygill creeks form a part of the Yellowbelly Dreaming Trail and the lands themselves are recognised as the meeting of the ‘black’ and the ‘red’ soils. [3]

Significant Sites around Moree



Contemporary Aboriginal History of Moree

Moree has a significant contemporary Aboriginal history, most paramount was the civil rights action taken by Charlie Perkins and the Freedom Ride to open access to Aboriginal people to the towns pool. This is a history that continues to have ramifications around the world and the legacy of this town, Charlie and the students should be honoured.

Famous Aboriginal soccer player and activist Charles Perkins led a group of university students to regions areas to protest racism, in this case Aboriginal kids not being able to access the Moree Pool. Their actions were a stark reminder to all of Australia to the prejudice Aboriginal people faced, and in many ways, was a turning point towards our nation addressing these difficult issues. The Courthouse, above, was one of the sites of these protests.

Massacres

As colonisation progressed conflict for land and resources resulted in multiple massacres of Aboriginal people. These events have had a profound effect on the psyche of the survivors. Healing, over time, involves truth telling and recognition of the injustice and traumatic history people experienced. This way we can move forward as a community with a shared history and a positive future.

Three significant massacres in the Moree area are:

Ardgowan Plain- Charles Eyles, manager at Crawford's station and two stockmen, James Dunn and William Allen, shot and killed 9 Gomeroi people on Ardgowan Island and burnt and buried the bodies in a shallow grave. [15]

Myall Creek- On 10 June 1838 a group of white settlers murdered 28 Aboriginal men, women and children near Myall Creek Station in northern New South Wales, near Bingara. Seven of the killers were tried and hanged. The Myall Creek Massacre now serves as both a harrowing reminder of Australia's colonial violence towards Aboriginal people and an example of modern-day reconciliation. [16]

Slaughterhouse Creek (Biniguy) / Waterloo Creek - in 1838, fifteen heavily armed stockmen positioned themselves on the slopes of the ravine for a dawn attack on a camp below on the creek bed. About 200 Gomeroi people were slaughtered. The massacre is embedded in the memories of the Gomeroi in the region. [21]

Gomeroi Design

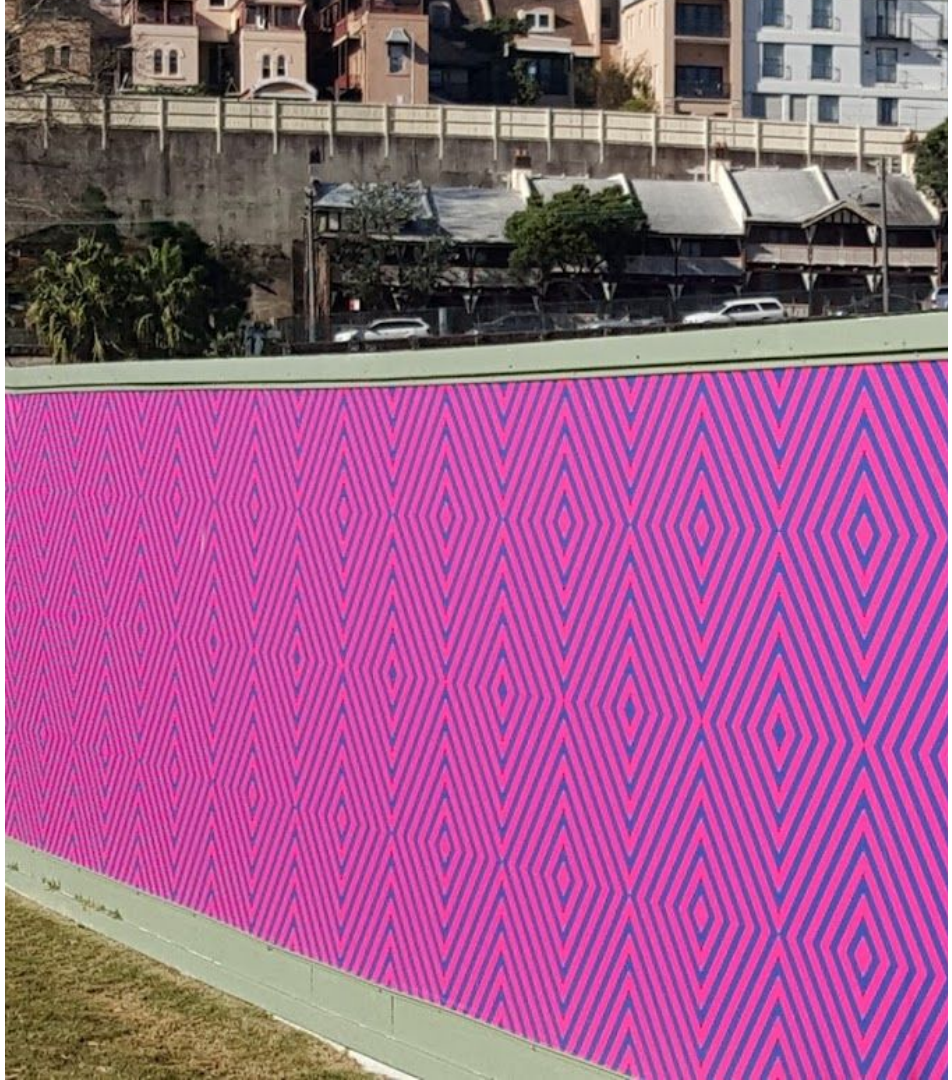
Margaret Adams was born on the banks of the Meehi River at Top Camp in Moree. She was one of the Stolen Generation; children who grew up on a mission after being forcibly removed from their families. Her works directly reflect this hub of activity–fishing, hunting and dancing are depicted and spread across the canvas, interspersed with white man's wagons and their own colonial goings-on. Adams is an important artist and community elder. She has been represented in the Parliament of NSW Indigenous Art Awards and several works have featured in exhibitions including Heart dreams and Legends which toured to the USA in 2002.

"The Meehi, as all rivers, gives sustenance to living things. The banks of the Meehi, once teeming with wildlife, was the place where many Kamilaroi settled and where people's lives and spirits were nourished", says Adams.

Dreamtime sunset, Margaret Adams 2009. Collection of Moree Plains Gallery. Photo: courtesy of Moree Plains Gallery.

Gomeroi Design

Warraba Weatherall is a Gamilaroi Artist who uses contemporary methods to communicate ancient ideas. Warraba asks “how can we better invest in our communities to develop a collective consciousness, towards unity and change? The pressure to survive forces many of us into an individual mindset, deepening the divide between work and private time and limiting opportunity for self-reflection and community interaction. If we understand ceremony to consist of the transference of knowledge through collective participation, then what variations can be applied within a contemporary context to unify communities and build a collective consciousness.”



Aboriginal Planning Principles

Aboriginal Planning Principles

Understanding Country.

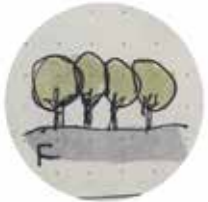
An Aboriginal persons connection to Country is personal and highly contextual to region or place. Each person is a custodian for where they live, to ensure it is always abundant in resources, but also to ensure it's honour, spirit and integrity is kept intact. Understanding Country begins with:

The Earth. The earth is often referred to as Mother and everything about it is held in great reverence. The type of rock determines vegetation, tools and trade, and minerals set the prosperity of a Country as trade was sure to follow. Morees soil has been trapped under layers of compressed earth from livestock, how might we reverse this damage?

- **The Sky**. The Father and Grandfather are often associated with the sky and sun and is where we came from and go too in the afterlife.
- **Water:** Water sets the structure of Country in the way it interacts with Earth. It carves Country up and sets the rhythm and flow of how humans experience it. It also determines where people plants and animals live by providing rich resource areas in rivers, billabongs, wetlands and riparian zones.
- **Vegetation**, determined by the above, provide the resource, tools and fuel for people to live well.
- **People**. We take the Above four points and make art, culture, civilisations etc. Understanding these 4 points about Country but in a highly localised context starts to get the the idea of what Country is for Aboriginal people.

Hills and high places hold spiritual and practical significance including important places for stone and other alpine resources, such as moth, plants, medicines etc.

Open forest a cool place important for giving cover to people and animals as well as resources and food providing a diverse range of habitats that support many species.



Plains / Park lands are important hunting grounds which are kept open using cultural fire management to provide easy access for animals and people.

Wetlands are important as they filter the water before entering rivers and provide the structure and resources for an abundance of food, ecological niches and resources.

Rivers / Water are perhaps the most significant practically and spiritually, as water sustains and promotes life.

Aboriginal Planning Principles

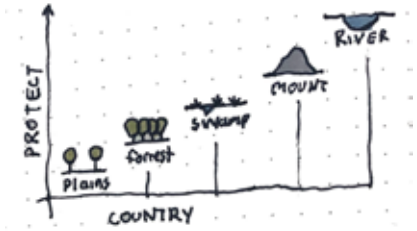
The aim of Aboriginal Planning Principles is to ensure Country is cared for. As custodians of Country we have a responsibility to keep it's best interests at heart. This includes ensuring it has an intact 'sense of place' , history and spirit when we pass it onto the next generation. The following are a collection of principles in caring for Country:

Aboriginal Led. All aspects that relate to Gomeroi Country should be led or co-led by Aboriginal people including traditional owners, elders, artists etc.

Community Involvement: The Moree Gomeroi people should have early and often involvement in the decisions that will affect their Country.

Appropriately Designed: Any potential outcomes that come from the project should be appropriately designed to ensure an authentic representation of traditional and contemporary Gomeroi identity. They should not be tokenistic, too simple, obvious etc.

Value Hierarchy. All Country is important, yet some hold more spiritual and practical significance for Aboriginal people, the most important being River, Mountains and Swamp lands.



Share the Country. Keep the important places open for all to use and benefit from, this includes the hills, high places, and mountain tops as well as rivers, waterways of well systems. Don't build too close to the river, or too high on the hilltop. These places become opportunities for parks and recreation places.

Orientation and high points. The old folk knew where the prevailing winds would come, and where the sun would go over the sky and thus plan for this in the placement of their settlement areas, cultivation areas and other engineering projects such as fish traps and aquaculture.

Kamilaroi Country was a rich and diverse through land management practices, which kept high points open, low and wet points dense etc, all to make resource more predictable and abundant

Promote biodiversity. Kamilaroi Country, before the hard hooves of cow and sheep, was a richly soiled Country with a diverse range of plants, fruits, nuts, yams, berrys, grains etc. Land was designed and cultivated to promote the difference and ensure a large range of produce / resources were available at all times of the year.

Let Country be what it wants to be. Often we fight against Country when building civilisation and make many mistakes when placing buildings towns and cities. Let the low areas be wet, the high areas be forested, the plains be wide and open. High value areas should be planned from the central point out in all future land use schemes.

The floods of 2012 in Moree show how this might not have been the best place to build a town. Ask the old folk and they would have said 100m uphill.

Aboriginal Planning Principles

Solar Control. Using vegetation, orientation and placement of buildings, optimum solar efficiency can be achieved depending on the season

Promote Culture. The way we design Country can enhance our sense of culture, of our diverse and rich differences, but also our commonalities. We can plant weaving materials or healing gardens, or reflect Gomeroi design through the landscape and building design. We design our environments, then in turn they design us.

Topographical features are important wayfinding and teaching areas, as seen in the near by Terry Hie Hie Aboriginal Area They provide identity and distinction to a place, we need to design considering these features.

Area rotation. Resource use and harvesting of resources need to be managed and timed to allow Country to recover. A deep understanding of the cycles of Country, and how seasons impact upon animals and vegetation is necessary for appropriate management.

High View Points are important to establish and understanding of Country and your place in it. Maintaining the integrity and quality of high points is important.

Diverse Vegetation. Gomeroi Country was kept rich in biodiversity through rigid Cultural Land Management Practices (CLMP) yet subsequent farming with hooved animals has threatened it. As such how might we heal Country using CLMP techniques?

Recommendations

Recommended Kamilaroi Engagement in Moree SAP

1. **Adopt Aboriginal Planning Principles within the SAP**

2. **Implement Aboriginal Land Management Practices** within i) the whole SAP site, ii) the Keep Sites, iii) the Green Zones and iv) other heritage sites such as scar trees, artifact scatters etc.

3. **Designate Keep Sites-** areas to be kept aside and protected from / or earmarked for special development. While final Keep Sites will be determined in conjunction with community.

4. **Plan infrastructure** (roads, paths, parks, buildings, facilities etc) for the appreciation of Kamilaroi sites within the SAP area and for future use as recreation and to maintain culturally significant areas.

5. **Form a reference group** made up of Traditional Owners, elders, artists etc. Client to own and maintain this relationship with community.

6. **Determine a long term Cultural Land Management Plan** with reference group for the Moree SAP including Keep Sites. Form a long term plan for how the land should be used, how it can be cared for as custodians.

7. **Engage the broader Aboriginal community** through employment, design, educational or tourism in the SAP. through Aboriginal participation plans, Reconciliation Action Plan, green teams and traditional land management practices.

8. **Consider Kamilaroi design** and how it can influence the theming of these locations through cultural heritage, land use and design.

Aboriginal Planning Recommendations

Healthy Country = Healthy People

Allowing, encouraging and reviving traditional land management practices within the SAP will help the Country recover after years of farming, grazing and mismanagement. When the Country is looked after by its people the whole community benefits, including plants and animals and everything held within the Country.

Appropriate cultural fire management is a complementary management pathway for looking after Country, including waterways and habitat by using the right fire at the right time for that type of Country. Native grasses are encouraged through the appropriate use of fire which in turn encourage native animals to use and access resources they provide.

Areas adjacent to waterways, road reserves and other open space can be managed in a culturally appropriate way that inevitably reduces erosion, wildfire damage and habitat degradation while fostering a healthy relationship with community by providing meaningful work opportunities and a sense of pride and value.

Engage with Moree LALC and/or other Aboriginal organisations to explore the reinvigoration of cultural fire practice within the landscape as an ongoing land management technique. This will allow Kamilaroi people to take an active role in looking after Country and maintain their cultural responsibilities while enhancing ecosystem health and wellbeing of the community.

Integrated art strategy - art as anti-graffiti

By engaging community member in an integrated art program the sense of ownership and buy in is increased. This can be an effective strategy to maintain areas and protect them from graffiti and vandalism.

A regional example of success is in Cowra where local artist Kym Freeman was engaged to paint murals on bridge pylons, as the pylons were a heavily vandalised area.

Mr Freeman incorporated indigenous themes with other aspects of local history in the mural. He also had input from local youth, with both Koori and non-Aboriginal school children placing their handprints onto the pylons and several local schools contributing their ideas and artwork into the murals. The size of the murals and the attention to fine detail make them a must-see when visiting Cowra.

By providing a canvas for art and engaging with community, an opportunity to create memorable and culturally respectful places is possible.

Aboriginal Planning Recommendations

Parks and public zones should be the wet areas and high areas

As all waterways are so significant to Kamilaroi people in the maintenance of their ongoing cultural connection to Country we recommend that wet areas ie creeks, billabongs and wetlands within the SAP be maintained, enhanced and restored.

Creation of public open space, parks, walking tracks and recreation areas along waterways is highly desirable using Water Sensitive Urban Design (WSUD) principles and guidelines such as permeable pathways, native reed beds and settlement ponds for water runoff.

Protecting, maintaining and enhancing natural features such as endemic habitat along riparian areas can also provide employment, empowerment and connection to Country by establishing and engaging Kamilaroi landcare groups (via the Moree LALC) to maintain and care for these areas.

Gwydir Wetlands State Conservation Area Moree

Areas for resource gathering

The revival of traditional weaving and tool making in communities has highlighted the need for resource and gathering areas for Aboriginal people to access materials. The enhancing of billabongs, wetlands and riparian zones can allow weavers and artists to sustainably collect materials in landscapes that have been highly modified since colonisation.

Weaving materials are often found in and near waterways and wetlands

Roads - avoid creeklines and ridge tops

Ridgelines and waterways are places that traditionally were used for resource gathering and habitation. By placing roads and other heavy infrastructure in alternative places where possible allows for these cultural landscape features to be protected from disturbance and available for all to enjoy.

High points are rare in the floodplains, maintaining views and sightlines can enhance a sense of place and allows for sightseeing and tourism opportunities.

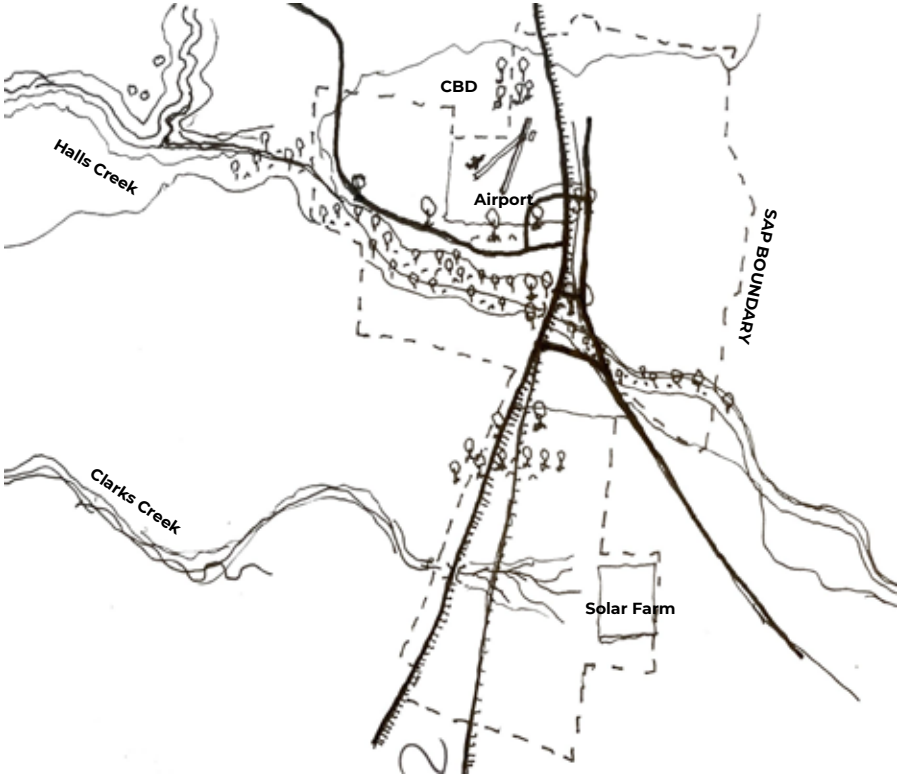
Application of Aboriginal Planning Principles

Valuing Country

Valuing Gomeroi Country

The SAP project has the potential to implement Aboriginal planning principles such as keeping highpoints open to be shared by everyone, not developing too close to water beds or interrupting water systems. Also it can acknowledge existing heritage sites such as permanent camp grounds and others that are yet to be discovered in other reports for the SAP project.

Through the protection of these areas, a green spine will emerge through the site which will provide good opportunities to appreciate the beautiful country through place based design interventions such as a landscape design, water management, the use of language in place naming, and architecture.



Valuing Country

Prior to European settlement, these areas were 'open Mitchell grassland' with small groups of gums along watercourses. High resource areas were close to waterways due to macrophytes (aquatic vegetation), shellfish and the mammals attracted to the water (possum, koala, kangaroos etc), and a high diversity of reptiles as well.

Topography
In general the topography can be described as flat to gently undulating, a terrain which provides no physical barriers to movement across the landscape. More specifically, the landscape of the SAP area is comprised of flat lands, approximately 220 m in elevation undulating slightly around Halls Creek. The creek has many subtle drainage features within it that would form small swamps, gilgais and damp areas in times of high flow.

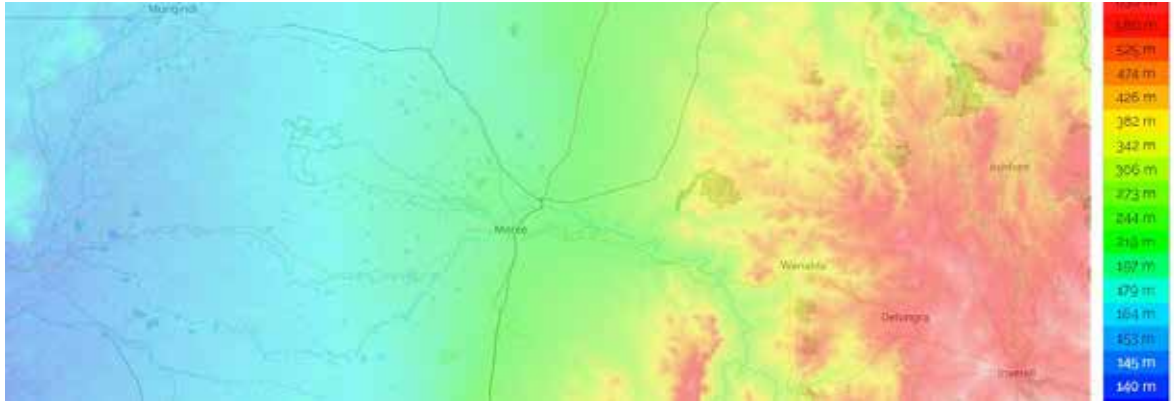
Geology
The geology of the area is dominated by large areas of alluvial deposits up to 100m in thickness, overlaying mosaic sedimentary rocks and forming part of the Great Artesian Basin.These deposits have formed vast plains, with slopes generally less than one degree. These are often referred to as the "Black Plains."

Climate
The Moree area experiences warm to hot summers, with average rainfall of 578 mm, mostly in summer. The average summer temperature is 27.2C and winter temperature 12.7 C.

Vegetation
The native vegetation within the area are predominantly comprised of Inland Floodplain Woodland and Western Slopes Grassland as described by Keith (2004:98,110). Gwydir Channels and Floodplains occur either side of the major waterways and Gwydir Alluvial Plains, the dominant landscape in the Moree LGA, adjoins the aforementioned landscape, occurring more distant to water.

Hydrology
In terms of hydrology, Moree Plains Shire lies within the catchments of what is now known as the Macintyre and Gwydir Rivers. Moree itself is transected by the Gwydir River and its smaller creeks, which run east to west. The many creeks and drainage features in the Moree LGA flow into the Gwydir or Mehi Rivers. Creeks and drainage lines are generally shallow and surrounded by many low-lying swampy areas that provided resources for people, flora and fauna. Specifically, the SAP area is traversed by Halls Creek, which drains into the Gwydir River.

Soils
Soils in the Moree plains are generally limited to grey, self-mulching clays that dominate the general area. Black earths are common in the eastern zone of the Brigalow Belt South Bioregion (BBSB) intermixed with Euchrozems, Red-Brown Earths, Brown Solodic and a range of shallow soils, mainly on upland areas. The lower areas, where the Grey Clays support open woodlands, have been used in the past for grazing and more recently for dry land and irrigated cropping. Higher areas of the plains are aeolian dunes, or prior stream deposits that comprise coarse red sediment laid down as levees during periods of high flow. These areas are dominated by texture contrast soils and may support woodland and open forest vegetation communities. 19



Designate ‘Keep Sites’

Keep Sites are high value sites to keep aside when planning the SAP

Keep Sites are areas to be kept aside and protected from / or ear marked for special development.

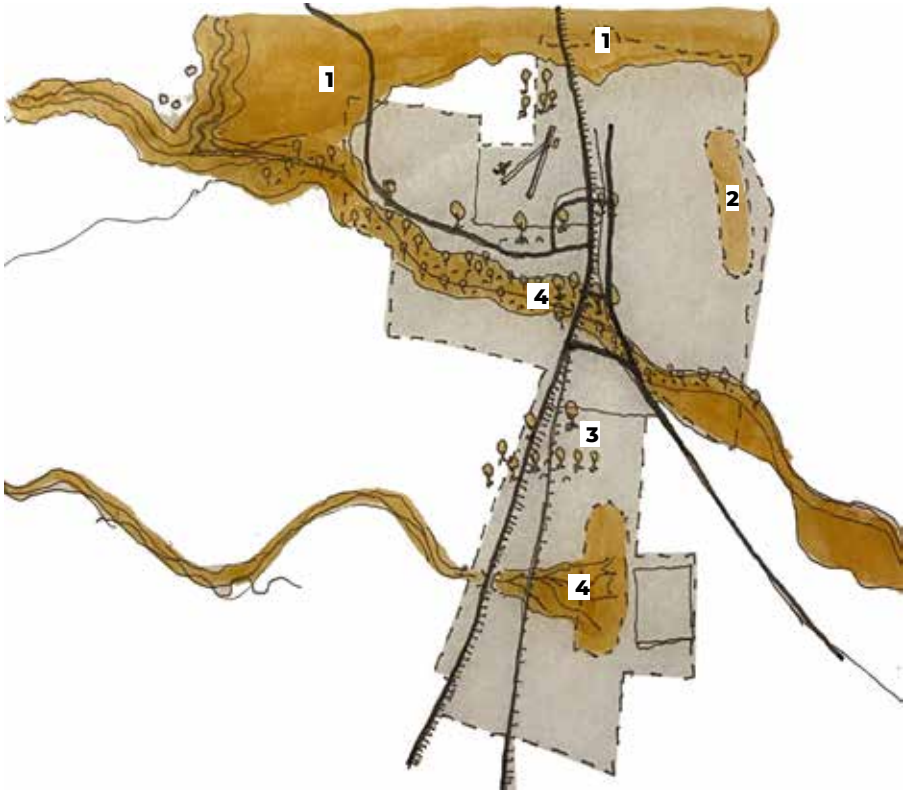
While final Keep Sites will be determined in conjunction with community, the following give an indication as to some potential sites with significance to the Gomeroi people.

1 A flooded area should be kept aside and used for recreation

2 A high point provides good regional viewpoints and potential site to appreciate the Country

3 Endangered growth a scattering of trees provide what little native vegetation resides on the site and must be protected

4 Halls and Clarks Creeks should be rehabilitated and any future development planned around them



Rehabilitate / protect Hills and Clarks Creek

There is an opportunity to give these Creeks their names back. Aboriginal naming of creeks was specific and, in many ways, formulaic. First comes the major waterway, in this case the Mehi river, which goes into the Gwydir River, which goes into Barwon River, which leads to the Darling. Second come the creeks that flow into it. Each have formular behind their name.

We can get the Local Aboriginal Land Council / Community groups to be engaged in these spaces to implement Aboriginal land management practices along these keys waterways.

Halls Creek from Newell Hwy

Clarks Creek from Newell Hwy

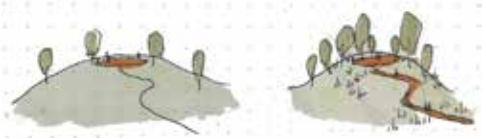
Plan infrastructure

Planning for future use should include all forms of transport and activity, including:

- **Shared pathways**. Bike, walking, horse trail paths
- **Amenities** for cultural spaces such as weaving activities, bbq, tables, seats, electric plug outlet, toilets etc.
- **Signage**, Storytelling and wayfinding devices around the landscape to guide visitors
- **Landscaping**

Historic Campsite / Creek crossing. A cultural site can be serviced by car parking and other story telling devices to provide for a future place to grow. Alternatively these sites can be protected based on community requirements and other spaces developed to tell the story.

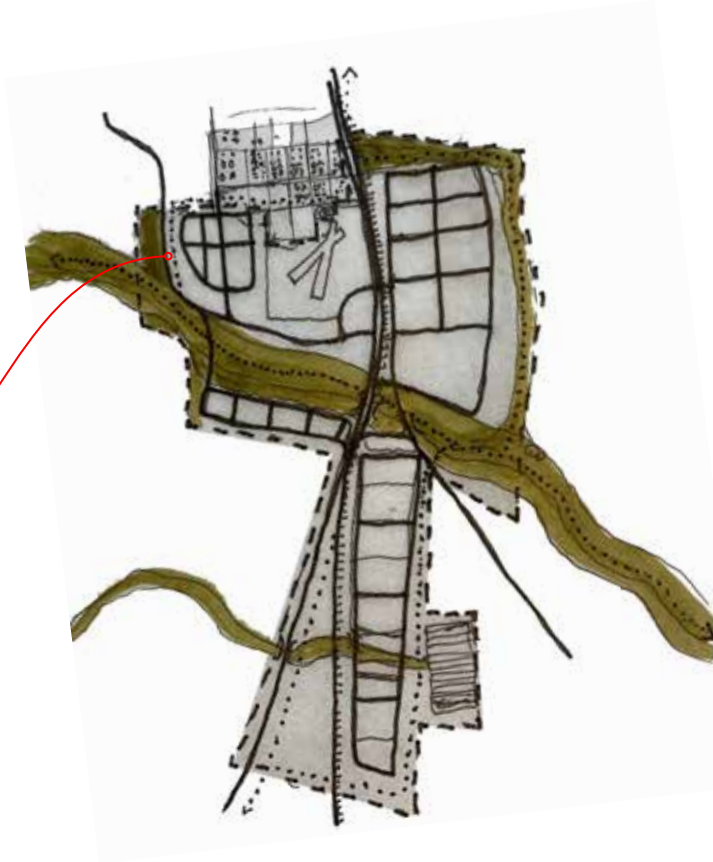
Provide infrastructure to Keep Sites if needed. As seen in the example below, a high place has a simple pathway and space articulated at the top to community requirements allowing for the development of sites once cultural care is undertaken.



Planning of future roads and pathways

Roads should avoid creeklines and ridge tops. This mapping of potential road placement leaves a large boundary between the waterways and ridge lines to the East.

Shared space for learning and teaching about Gomeroi Country, about culture, fire management, fishing technology caring for Country etc

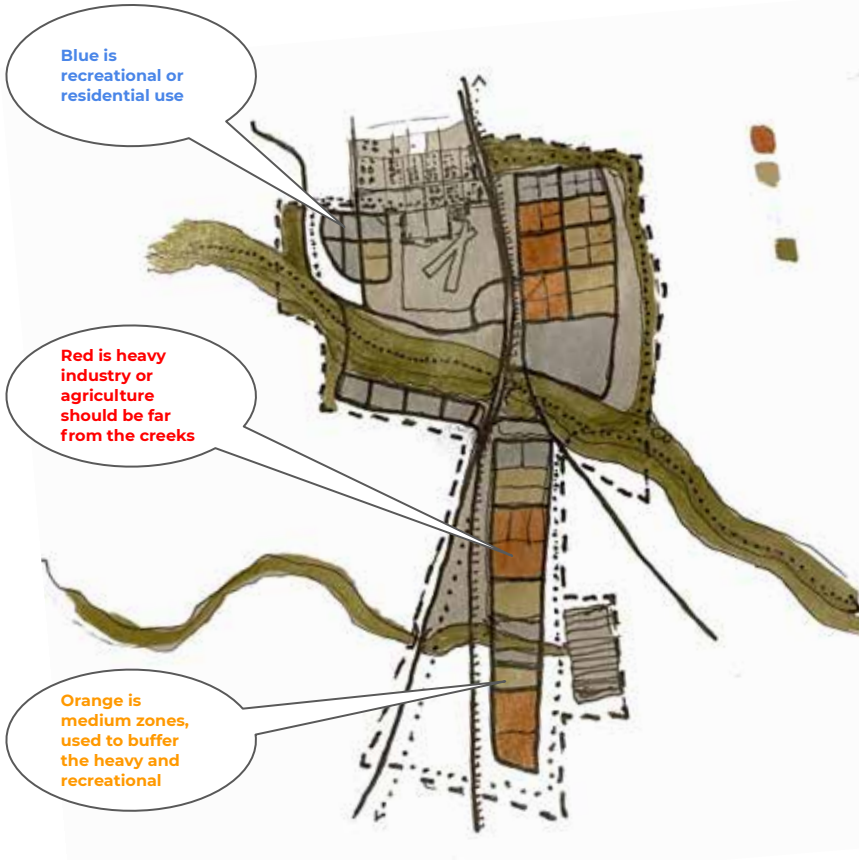


Zoning that is sympathetic to Country

Dirty or heavy industrial zones should be well away from waterways and ‘nice’ areas.

Medium industrial / commercial / agricultural can buffer between the nicer areas closer to the creek lines

Recreational, residential or other living activities should be focused around the waterways



Gomeroi Country SAP Masterplan

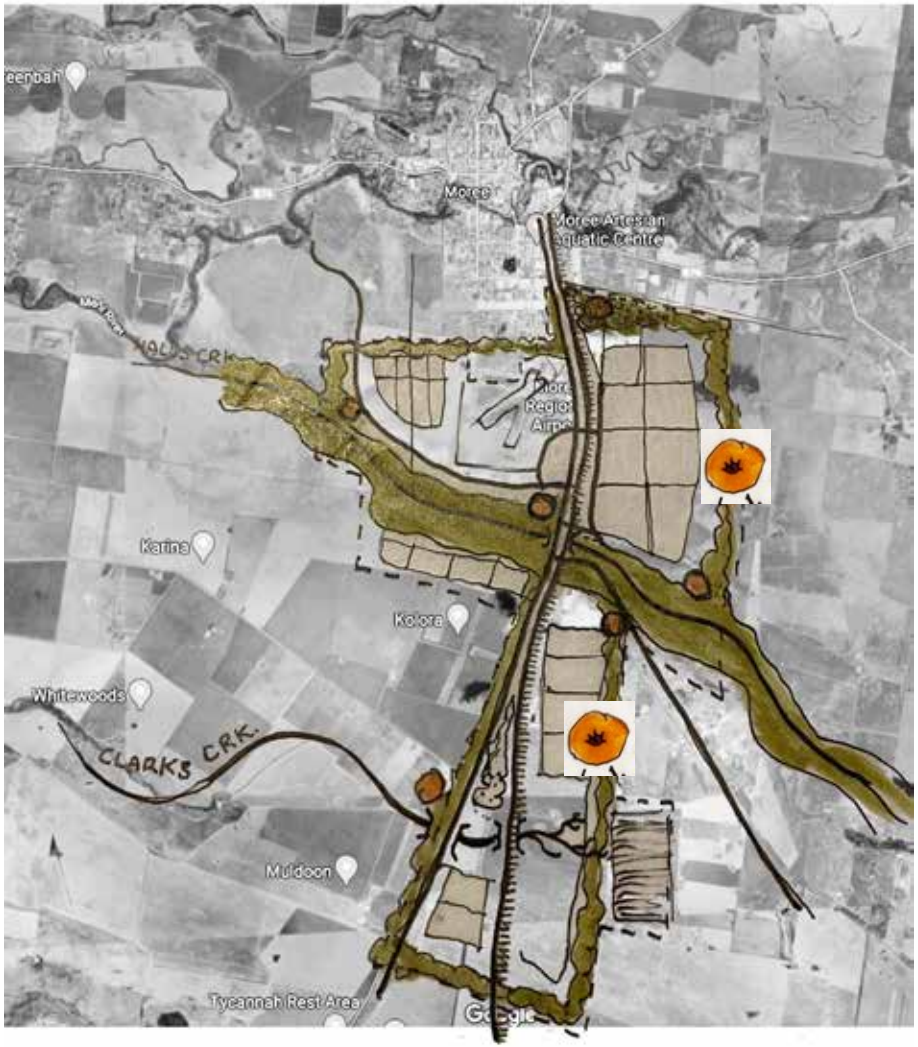
An overlay of environmental, cultural and site specific principles to provide guidelines around the planning of Gomeroi Country and how to keep it's honour intact.

High Point with a view

Scar tree and artifact scatter

Potential trail linking the sites

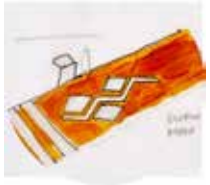
Potential site to use Kamilaroi Design



Opportunities to use Gomeroi Design

Entry statement - shared pathway, resting places

Entry statement, significant site marker sculpture referencing Gomeroi Design



Shared pathway with Gomeroi patterns in coloured asphalt

Shared Pathway Gomeroi design treatment

Significant site marker

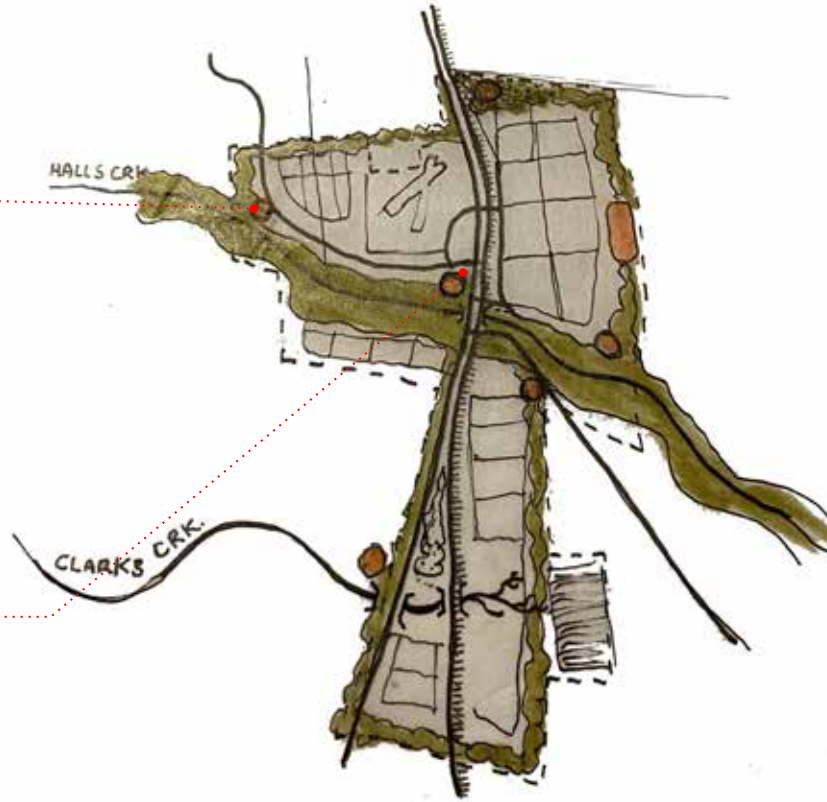
Significant site markers message sticks communicating Gomeroi stories and design

design on infrastructure

Bridge abutments, piers and safety screens are canvases for Gomeroi art

viaduct columns painted up in colours and patterns of Gomeroi Country

Wall treatment, anti throw screens, abutments, noise walls etc

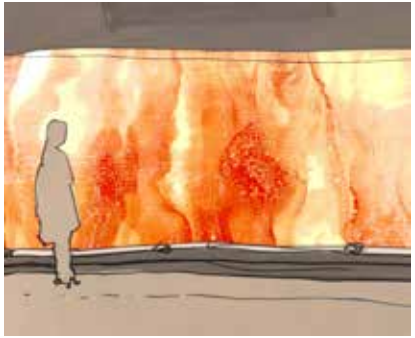


The pedestrian experience

NOTE: Some of the following examples contain art from other Aboriginal Countries and are only used as an example. Any outcomes that use Gomeroi design or knowledge will be co-designed with community

Undercroft spaces, abutments and substructures can be activated with bright and meaningful Gomeroi design either through direct application, moulding / relief or light installation. This serves the benefit of beautifying otherwise dull features and providing engaging, fun, safe and accessible areas.

Integrated Art High quality photo / print of local Gomeroi artist, or electronic or light display artwork. Example art below by Noongar artist Sharyn Egan who uses traditional resins.



Storytelling and wayfinding devices help connect people and orientate them to Country and the stories and history that came before. Signage, surface etching, sandblasting of language etc.

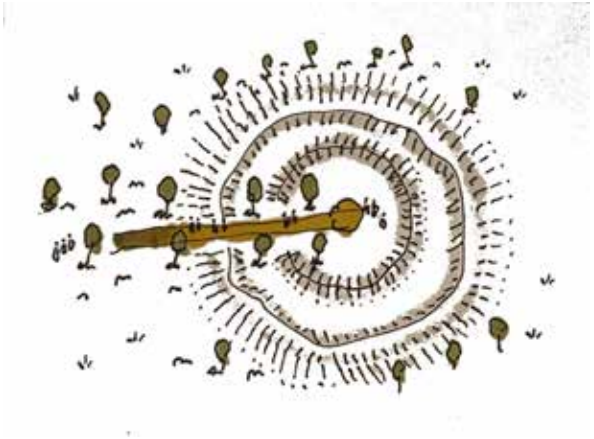
A space to celebrate culture, such as a viewing, yarning or sitting place with references to local design and stories allowing leaders to tell the story.

Places to weave and that support this cultural practice.

A space to celebrate culture

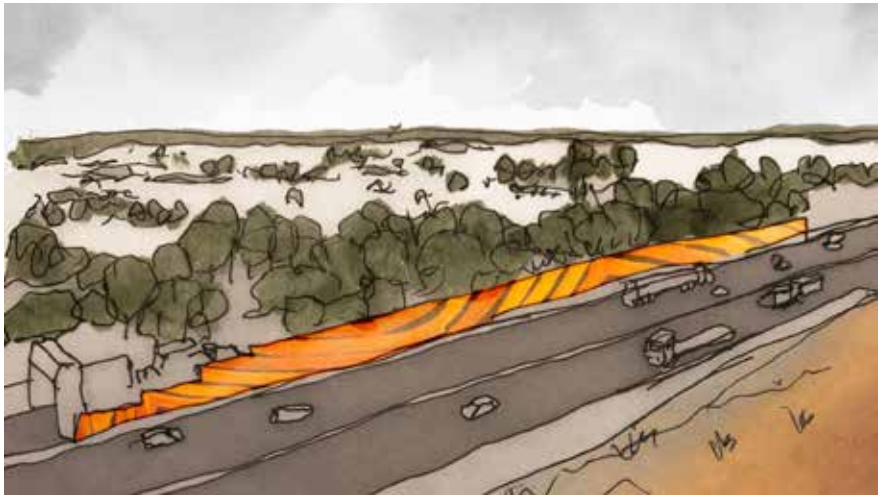
This concept represented a contemporary Gomeroi Bora Ring, Healing garden + facilities based off the following description:

> *The ceremonies were conducted over many days and nights between **two circles on the ground connected by a path**.* **Around this path were carved trees and ground carvings**, both called yammunyamun. Senior men led the initiates from the **larger outer circle to the smaller inner circle**, explaining the significance of the yammunyamun along the way. 20



Infrastructure identity

Gomeroi Country can be acknowledged and the design vernacular integrated into the Infrastructure to provide strong identity and sense of place. Below, up-scale colours of Gomeroi Country are applied to a noise wall.



Gomeroi patterns and colours of Country are applied to rail assets such as signal boxes. Below, Gomeroi artist, Jonathan Jones light art is integrated with a signal box to make a strong night affect.

Infrastructure identity

Gomeroi Country and be acknowledged and the design vernacular integrated into the Infrastructure to provide strong identity and sense of place.

Gomeroi artists Warraba Weatherall and Reko Rennie's work is used as an overlay to show what a contemporary integrated piece would look like.

How to apply these themes

1. Engagement

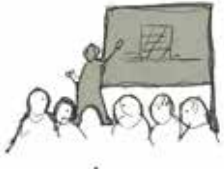
The first step will be to engage with the relevant Aboriginal group (artist / elder, Lands Council etc), early and often, through a series of 'yarns' or conversations about the potential opportunities to incorporate the theming contained within the document (or other themes) into project outcomes.

2. Co Design

To kick of the co-design process design teams are given time to integrate the themes and ideas into the scope of the project.

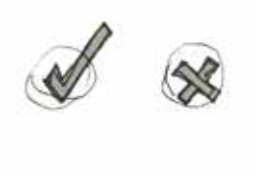
3. Co Design workshops

Engagement workshops with the relevant Aboriginal group will everyone gets in the room to co-design cultural solutions to project outcomes, yet Aboriginal voices should be given preference to ensure they are heard.



4. Endorsement: Cultural IP

All content that uses local Aboriginal theming will be endorsed by the Aboriginal group. Cultural IP will be identified and protected.



5. Other opportunities:

Should be highlighted and put forward to ensure the local Aboriginal community has opportunities, economic outcomes and better connections to their Country, through the project.

Further Aboriginal participation

1. Consultation with Aboriginal Community. Elders, community, respected community members etc

The use of Indigenous patterns and motifs must be done with approval - and hopefully involvement - from the elders and community. A document like this can begin these conversations between community.
We need to ask:

- Can we use your countries patterns?
- Do you want to make patterns for the project?
- How would you like to be involved?

2. Engage Aboriginal artists and designers

Aboriginal artists should be engaged from the local community who acknowledge Country / culture in their designs

3. A Smoking Ceremony recommended on the site

Smoking Ceremonies are conducted by Aboriginal people with specialised cultural knowledge. The ceremony aims to cleanse the space in which the ceremony takes place (this site being of major significance). Given the significant nature of the ceremony, smoking ceremonies are usually only performed at major events.

4 Perform a Welcome to Country when site opens .

Generally, providers offer participants local Aboriginal history and cultural information and will go on to welcome the delegates to the country.

Ezzeys Crossing, 1895 Gwydir River

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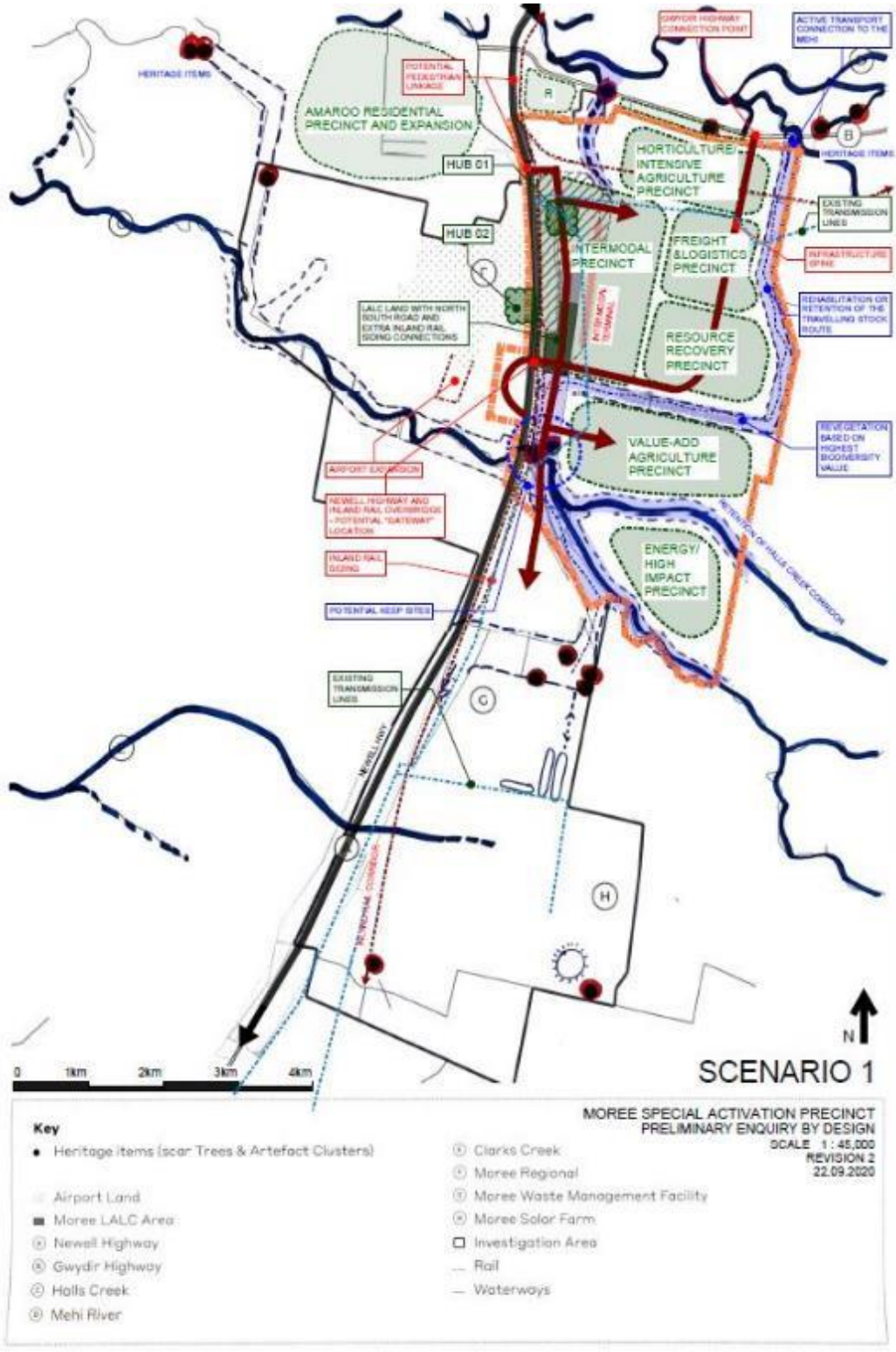
APPENDIX B

STRUCTURE PLAN DEVELOPMENT

PRELIMINARY ENQUIRY BY DESIGN WORKSHOP OUTPUTS

1.1 SCENARIO 1



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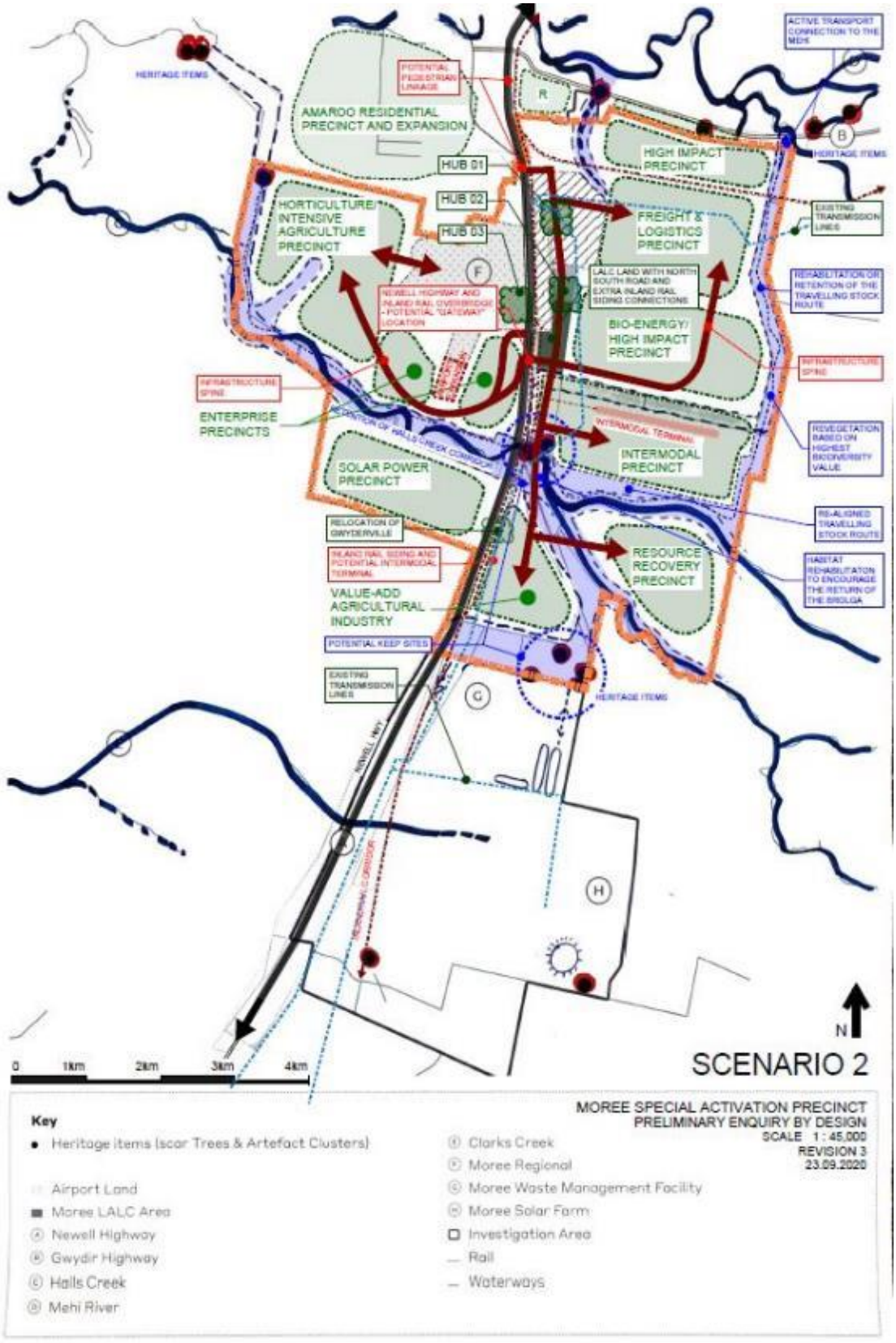

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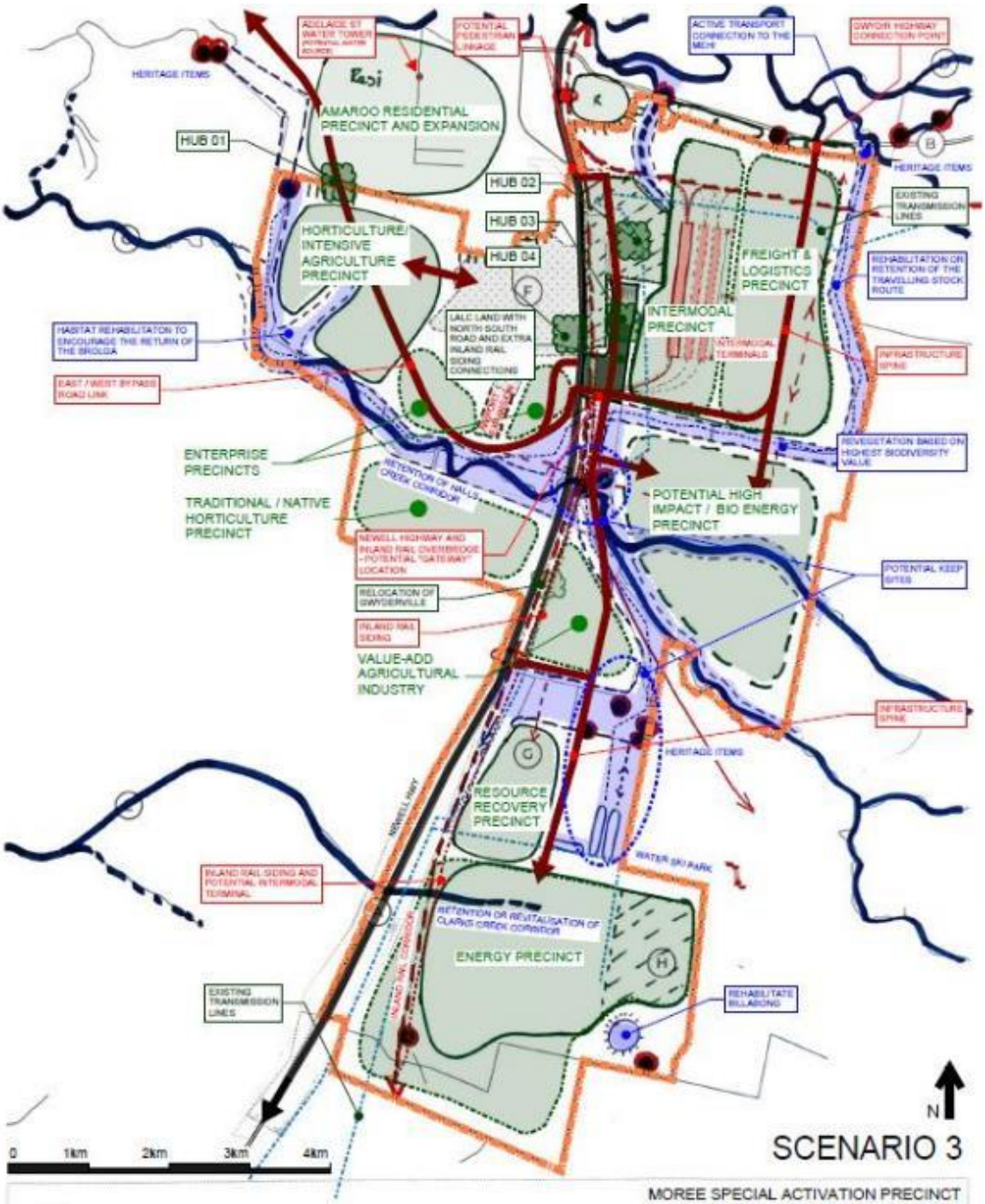
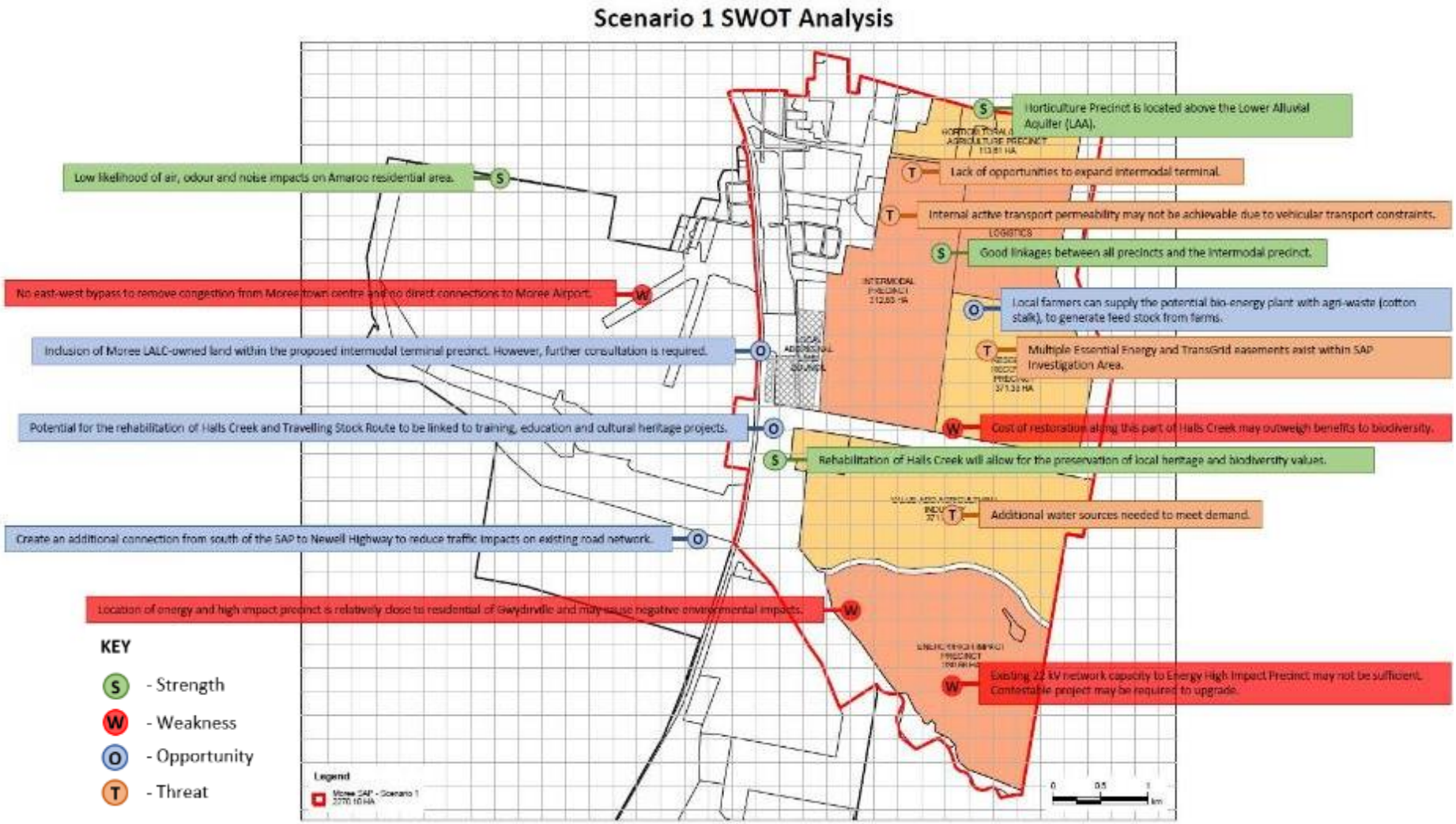


1.4 SCENARIO 1 SWOT ANALYSIS



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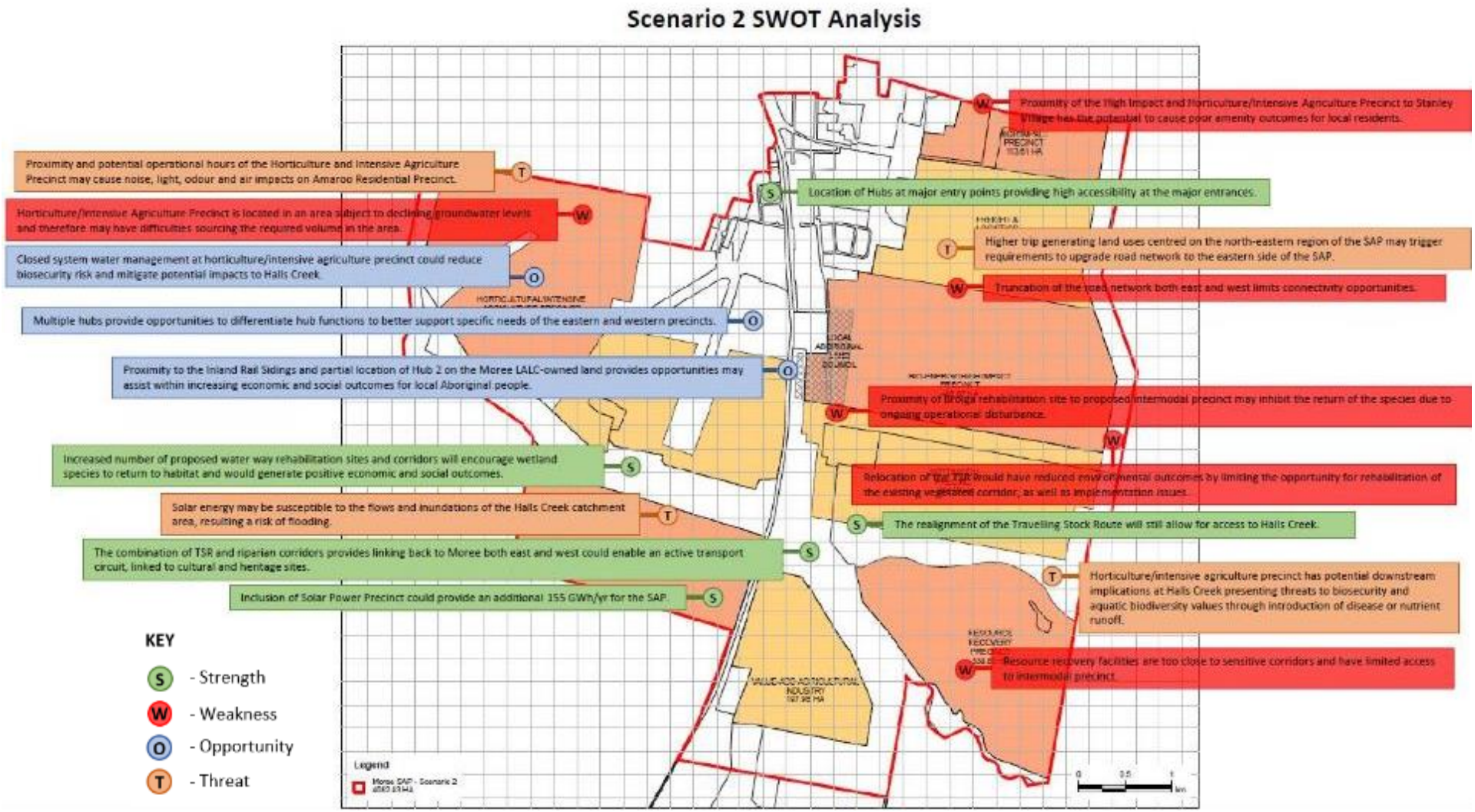

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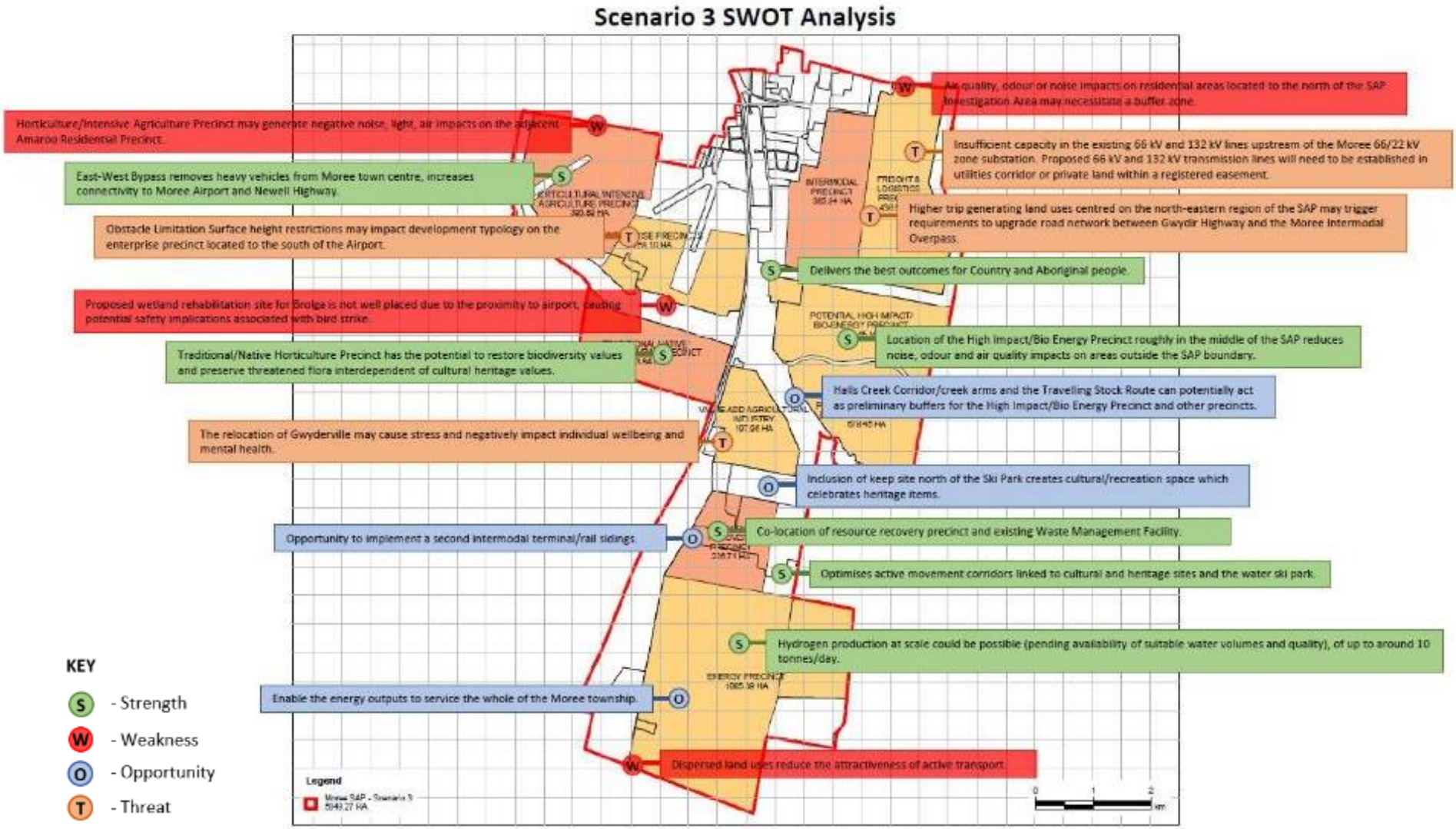
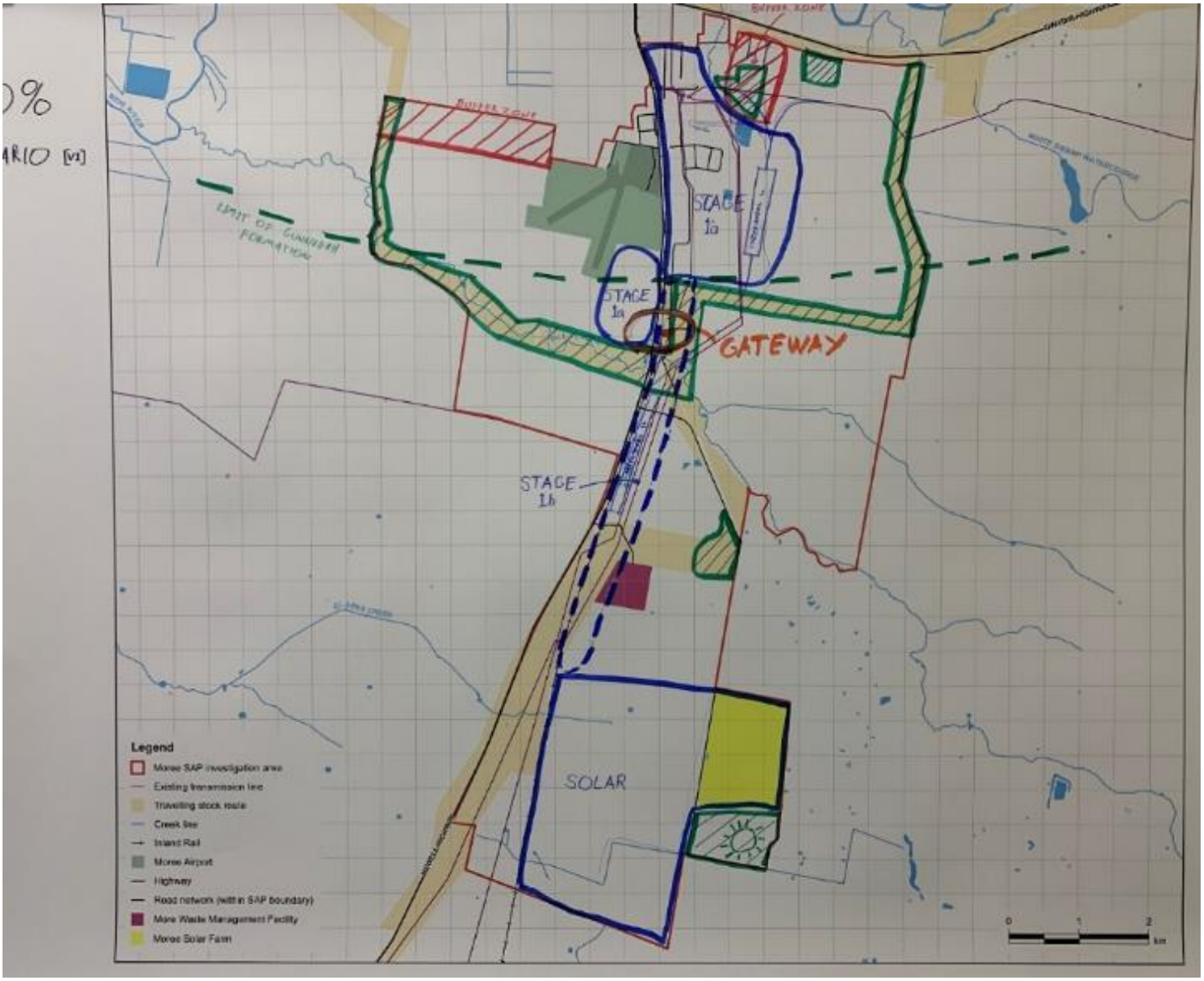


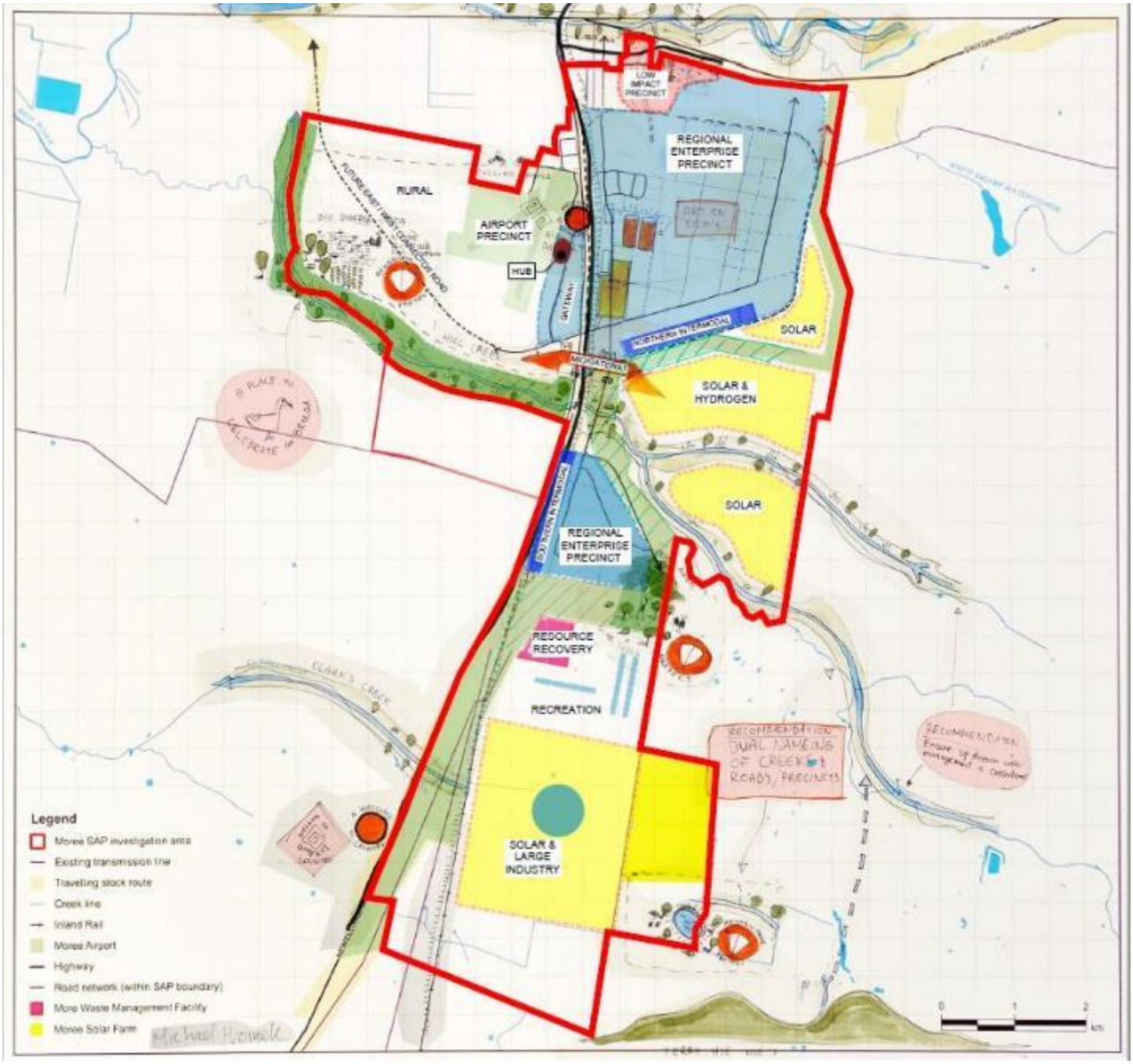
FINAL ENQUIRY BY DESIGN

1.7 50 PER CENT STRUCTURE PLAN



1.8 80 PER CENT STRUCTURE PLAN

1.9 90 PER CENT STRUCTURE PLAN



1.10 95 PER CENT STRUCTURE PLAN