

# SHIRE OF LEONORA

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## Local Planning Strategy

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Endorsed by the  
Western Australian Planning Commission

19 January 2021

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# **Shire of Leonora**

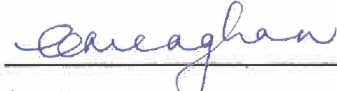
## Local Planning Strategy

June 2021



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The Shire of Leonora Local Planning Strategy certified for advertising on .....15 October 2019.....


  
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An officer of the Commission duly authorised by the Commission  
(pursuant to the Planning and Development Act 2005)

Date: 25 March 2020

**ADOPTED**

Adopted by resolution of the Council of the Shire of Leonora at the Ordinary Meeting of the Council held on the .....15..... day of .....09..... 2020.....

  
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Shire President

  
\_\_\_\_\_

Chief Executive Officer

**ENDORSEMENT**

Endorsed by the Western Australian Planning Commission on the .....19... day of ...January  
20.21.

  
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An officer of the Commission duly authorised by the Commission  
(pursuant to the Planning and Development Act 2005)

Date: 7 July 2021

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# **PART 1**

# **THE STRATEGY**

# 1. Introduction

## 1.1 Statutory context

Under the *Planning and Development Act 2005* (P&D Act), all local governments are required to maintain a local planning scheme. Local planning schemes provide the statutory framework to management land use and development within a scheme area.

As a precursor to the development of a local planning scheme, local governments are required to prepare a local planning strategy (LPS or strategy) in accordance with Part 3 of the *Planning and Development (Local Planning Schemes) Regulations 2015* (the Regulations).

## 1.2 Role and purpose

The Shire of Leonora *Local Planning Strategy* has been prepared to operate as a local planning strategy in accordance with the *Planning and Development (Local Planning Schemes) Regulations 2015*.

In accordance with regulation 11 (2) of the Regulations, a local planning strategy is to:

- (a) *set out the long-term planning directions for the local government; and*
- (b) *apply any State or regional planning policy that is relevant to the strategy; and*
- (c) *provide the rationale for any zoning or classification of land under the local planning scheme.'*

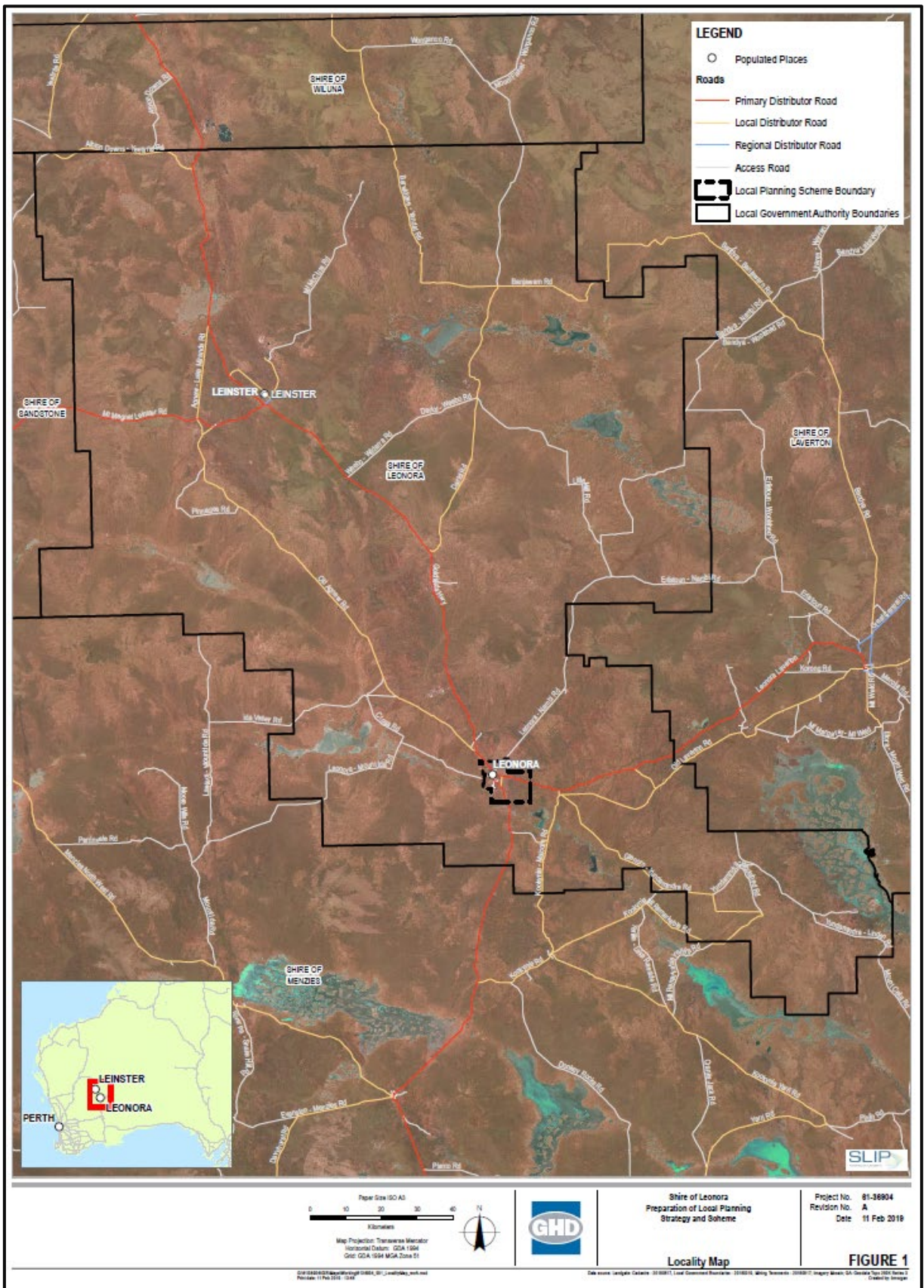
The LPS provides the background information that underpins the statutory requirements under the local planning scheme. The LPS also provides the vision for the future development of the local government area and therefore can inform future decision making on planning matters such as scheme amendments.

The LPS is divided into two parts. Part one provides the vision, objectives, the key strategies and actions for how they will be achieved. Part one also contains the strategic plans which are a visual representation of proposed planning for the area, proposed land uses areas and key strategies.

Part two of the strategy provides the background information, analysis and provides justification and supporting information for part one.

This LPS applies to the entirety of the Shire of Leonora (the Shire) (Figure 1), however, the corresponding local planning scheme only applies to the townsite of Leonora and immediate surrounds, as depicted on the scheme maps. The rationale for this is outlined in section 4 of the strategy.

The LPS has been prepared through engagement with the local community and the local government to understand the vision and key issues for the Shire.

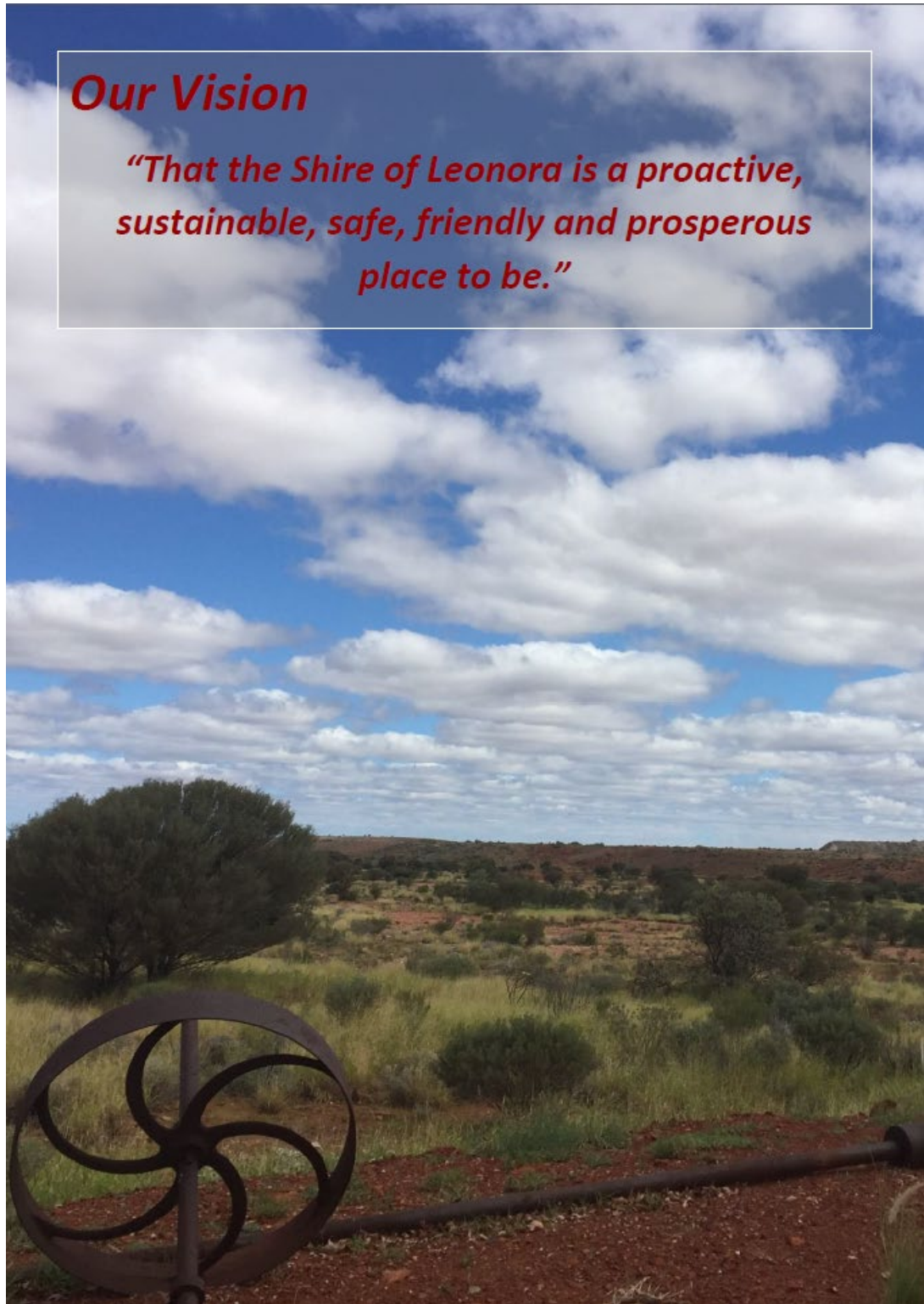


**Figure 1 Shire of Leonora**

## 2. Vision and objectives

### 2.1 Vision

The vision for the Shire of Leonora is articulated in the Strategic Community Plan 2017-2027.



**Figure 2 Vision Statement**

## 2.2 Objectives

Based on community engagement, the Shire's Strategic Community Plan (2017-2027) has developed a strategic objective based on four themes of community interest.

Social – *An empowered and spirited community*

Economic – *Economic hub of the northern goldfields*

Environment – *Forward thinking management of the built and natural environment*

Leadership – *Innovative and proactive Shire and Councillors*

The Shire's LPS provides a framework for land use and infrastructure planning to achieve these key strategic community objectives, and address issues identified by the community during early engagement. The Strategy objectives are:



**Figure 3 Strategy Objectives**

Through these objectives, strategic land use planning and decisions made by the Shire on planning matters will support the community in achieving the objectives and vision as set out in the Strategic Community Plan. The planning strategies and actions in Section 3 demonstrate how the local planning framework will deliver on these strategic objectives.

## 3. Strategies and actions

The objectives of the strategy have been developed to address key land use and planning issues, and provide a framework for local planning processes to contribute to the objectives and vision of the Strategic Community Plan.

The following section analyses the key issues that influence each planning objective, and provide appropriate planning strategies and actions to resolve these issues and achieve the community's vision for Leonora. These strategies and actions also provide the context for the Strategic Plan.

### 3.1 Acknowledge and respect cultural heritage

Aboriginal culture and historic heritage are a strong part of Leonora's identity. These important cultural elements are significant to the community, and present key opportunities in tourism experiences that supports diversification of the Shire's **economy**.

#### 3.1.1 Cultural heritage

Engagement with Aboriginal representatives and traditional owners identified the Shire of Leonora *Town Planning Scheme No. 1* (TPS 1) as a "white mans' document". TPS 1 does not include any specific objectives about Aboriginal culture, and therefore cultural considerations do not carry any statutory weight in local planning decisions. By acknowledging Aboriginal culture in the new scheme, *Local Planning Scheme No. 2* (LPS 2), consideration can be given to Aboriginal culture in planning decisions made by the Shire of Leonora and the Western Australian Planning Commission (WAPC).

At present, there are some activities undertaken in the practice and exercise of traditional cultural use of land by Aboriginal people that constitute as development or uses that are regulated by the scheme, for example development associated with camp sites or artist studios. These traditional cultural practices require development approval of the Shire under TPS 1, however, this is not intended or appropriate. A review of the existing scheme provisions is necessary to ensure that traditional cultural practices can occur without influence or interruption by the scheme.

Acknowledging the importance of Aboriginal heritage and traditional culture in Leonora will be a key step in working towards greater social cohesion, and a strong identity for the local community.

Current public housing policy may not effectively reflect cultural and family patterns and relationships. In preparing the local planning strategy, engagement with Aboriginal representatives identified demand for family settlements out of the immediate Leonora townsite, to provide a safe and sustainable place for their families to thrive. It is acknowledged that the *Native Title Act 1993* is and will continue to be the primary piece of law regarding land rights. Decisions about the tenure and ownership of lands around Leonora are not made by the Shire, and cannot be influenced by this strategy.

There are over 700 registered Aboriginal Sites within the Shire that are protected and managed under the *Aboriginal Heritage Act 1972*. However, there may be an opportunity to review the Municipal Heritage Inventory (MHI) to provide greater recognition and incorporate and acknowledge sites of importance to the Aboriginal community within the inventory.

#### 3.1.2 Historic heritage

The twin township of Leonora and Gwalia was established in 1896 following gold discovery in the region. The name Leonora was taken from Mount Leonora and its location was chosen for

its proximity to the Gwalia mines and the four mile leases. The Gwalia townsite closed in 1963 following the closure of the Sons of Gwalia mine, however the Leonora townsite survived. Today the townsite continues to be a service centre for mining exploration, mining services and the pastoral industry. Gwalia Ghost Town now exists as a tourist attraction, providing insight into life during the mining boom.

There are 47 State Registered Places identified within the Shire and 60 heritage areas on the Shire's MHI that require appropriate protection measures. The Shire's MHI was adopted in 1997 and there is an opportunity to review and update the planning arrangements to reflect local historic heritage places of value within the Shire that are currently not on the State Register.

**Table 1 Strategies and Actions - Heritage**

Strategy	Action
1. Acknowledge and respect Aboriginal heritage and culture in local planning documents and policies	<p>1.1 Include the acknowledgement and respect of Aboriginal culture and traditional cultural use of land in LPS 2 through the introduction of a new scheme aim, and objective in both the Civic and Community reserve and Rural zone.</p> <p>1.2 Acknowledge traditional law and culture within LPS 2 by exempting development associated with the exercise of traditional law and culture.</p>
2. Develop an effective planning framework to protect sites of historic heritage	<p>2.1 Review and update the planning arrangements for historic heritage sites that are not on the State Register.</p> <p>2.2 Establish a heritage list adopted under Part 3 of the <i>Planning and Development (Local Planning Schemes) Regulations 2015 - Deemed Provisions</i> for local planning schemes to protect important heritage and historic sites listed on the Municipal Inventory.</p>

### 3.2 Facilitate a vibrant, liveable town

Leonora and Leinster are the two primary settlements within the Shire of Leonora. Leinster is a private town, managed by BHP Billiton in accordance with the *Nickel (Agnew) Agreement Act 1974* (the State agreement). Under the State agreement, the Shire of Leonora has no role in the delivery of services or infrastructure within Leinster. The Leonora townsite is a service centre for the Shire, providing a range of facilities such as education and health services and local shops. There is an opportunity for the Shire to promote Leonora as a liveable hub and create a strong sense of place and identity for the community.

Fly In Fly Out (FIFO) is a key challenge for both Leinster and Leonora, as it is for all regional towns with a mining economy. The barriers to a resident workforce are many, and cannot be addressed by planning alone. Leonora has a unique opportunity to challenge the status quo, as proximity to St Barbara's mining operations presents a great opportunity to encourage a resident workforce compared to other areas where mining operations are more remote from local towns. Whilst there will be many barriers, the local planning framework can assist by making relocation to Leonora, rather than FIFO, a more attractive choice for people employed in mining and associated businesses. Developing planning frameworks that support greater vibrancy and liveability in Leonora is a key way to provide more choice. Facilitating vibrancy and liveability is also essential to support and retain the existing community.

#### 3.2.1 Vibrancy and liveability of Leonora

There is currently limited demand for retail floor space in Leonora, with vacancies on the primary Tower Street retail strip. There is opportunity to assist private investment into opening

businesses by removing planning approval impediments to new businesses and encouraging temporary pop-up shops and ventures. This can be achieved through land use controls that simplify change of use procedures.

Land on Otterburn Street, zoned Town Centre under TPS 1, that abuts Tower Street properties is not currently used in line with the zone objectives, and is either vacant, residential, or used for light industrial purposes. This land might be better integrated into the adjacent service industrial area (discussed later in Section 3.4), rather than being retained as unutilised centre land. This will assist in focussing retail land use and investment on Tower Street, supporting greater vibrancy of the main street area.

There is opportunity to enhance the visual character of Tower Street and improve the enjoyment and liveability of the centre. There is limited street furniture available to enable passive recreation and enjoyment. The addition of street furniture including benches, rubbish bins, bicycle racks, artwork and gardens would assist to create a more active and enjoyable space and support all members of the community. There are opportunities for the Shire to work with local community groups to take ownership over the beautification and activation of the town centre through street cleaning programs, vegetation planting, art projects etc.

Leonora's sports oval and surrounding recreation land provides an opportunity for recreational pursuits within the community, particularly its youth. However, these areas are isolated from the town centre by freight routes and the industrial area. Greater connectivity between the existing sports oval and surrounding land is needed for pedestrians and cyclists to safely access these areas. This can be achieved through enhanced active transport infrastructure. Enhanced connectivity to the town centre also has the potential to increase use of these areas.

### **3.2.2 Growth and residential land supply**

In 2016, the former Department of Planning prepared the *Central Regions Land Capacity Analysis* to provide an overview of existing and future land capacity. The analysis suggested that there is sufficient land capable, based on current zoned residential land, for substantial further development to meet the anticipated population growth as indicated in *Western Australia Tomorrow 2026*.

The analysis calculates that there is 23 hectares of undeveloped residential land in the Leonora townsite. It does not identify any residential growth areas, as the analysis determined that no additional residential zoned land is required and that the current residential zoned land will be sufficient to cater for medium to long-term growth.

Whilst new residential zoned land is not necessary to meet overall population growth, there is no availability of land to provide choice of alternative residential options in the Shire. Further investigation of demand and appropriate locations may be warranted. In addition, the Nambi Village, zoned Settlement under TPS 1, should be brought into the residential zone, as it is not classified as a settlement under *State Planning Policy 3.2 – Aboriginal settlements*.

The *Central Regions Land Capacity Analysis* noted that there is no developed or future land identified for rural residential development. Whilst the analysis did not recognise land zoned as Rural A, which in essence is a rural residential zone, there is no undeveloped rural residential land available in Leonora. Conversations with community members identified that greater choice is desired, in particular the opportunity to live on larger lots outside the main residential areas of Leonora.

Growth and residential development in Leinster is provided for by BHP Billiton in accordance with a State agreement, therefore is not planned for further in this strategy.



**Table 2 Strategies and actions - liveability**

Strategy	Action
3. Identify Tower Street as the primary location for retail, commercial, hospitality, and other active uses in Leonora.	<p>3.1 Designate land fronting Tower Street as Regional Centre zone in LPS 2.</p> <p>3.2 Identify land use permissibility in the proposed Regional Centre zone to facilitate flexible change of land uses, through identification of permitted uses for desirable town centre uses, including entertainment and tourist uses.</p>
4. Create a sense of place and identity for the Leonora townsite.	<p>4.1 Prepare a streetscape masterplan for Tower Street including signage, branding that is reflective of culture landscaping and street furniture. Give consideration to the design principles set out in Schedule 1 of <i>State Planning Policy 7.0 - Design of the Built Environment</i> (SPP 7.0).</p> <p>4.2 Engage with community groups and agencies to establish a street beautification program, including regular maintenance and cleaning, to foster greater community stewardship of public areas.</p> <p>4.3 Include guidance in LPS 2 for private signage in the Leonora townsite.</p>
5. Provide high quality community infrastructure to support the local community.	<p>5.1 Develop a masterplan to guide the redevelopment of Leonora's sports precinct, including enhanced accessibility to town.</p> <p>5.2 Enhance pedestrian and cycle linkages throughout the town centre when undertaking improvements and road maintenance works.</p> <p>5.3 Designate appropriate reserves for sites of community infrastructure, and rationalise the number of reserves where possible to streamline the scheme.</p> <p>5.4 Modify Civic and Community reserve by adding a new objective to acknowledge Aboriginal culture.</p>
6. Improve the quality of infrastructure and services.	<p>6.1 Develop an ongoing dialogue with local services providers to review challenges and barriers to growth of digital infrastructure.</p> <p>6.2 Appropriate new reserves for sites of public infrastructure, rationalising the number of reserves where possible to streamline the scheme.</p>

Strategy	Action
7. Identify growth areas and the necessary infrastructure and services to support this.	<p>7.1 Rezone Nambi village from Settlement to Residential zone.</p> <p>7.2 Develop an ongoing dialogue with local services providers to determine the infrastructure required to support future growth areas.</p> <p>7.3 Engage with Main Roads to identify and construct to a sealed standard an appropriate bypass road for heavy vehicles.</p> <p>7.4 Investigate the need for future Rural Residential land for a variety of rural lifestyle opportunities, subject to consideration of bushfire risk, high pressure gas pipeline protection requirements, separation from industrial land, road and rail transport noise, access and demand for future rural residential lots in the Shire.</p>

### 3.3 Diversify the local economy and employment

The Shire of Leonora's workforce is highly dependent on the mining industry, with the majority (71%) of the workforce employed in mining activities (ABS 2017). A key constraint for the Shire is the strong interdependency between the Shire's population and the mining industry. This makes the Shire vulnerable to population decline should there be impacts to the mining industry. Exploring new and varied industries and employment areas will create opportunities to support more sustainable population growth. This could be achieved through an economic development strategy for the Shire.

Another important way for people employed in the mining and construction industry to choose to be resident workers, rather than FIFO, is to have employment opportunities for other members in the family. This is a key reason to support diversification of the local economy through appropriate planning frameworks and further justification for an economic development strategy that identifies new and varied employment opportunities.

#### 3.3.1 Encouraging tourism growth

Whilst Leonora currently serves predominantly as a service centre for the region, there is an opportunity to capture and share the unique history and landscapes in the region through tourism ventures.

The Gwalia Ghost Town provides an interactive snapshot into life during the operation of Gwalia Mine. There are existing facilities and activities that exist to showcase this one of a kind town, which should be continued and expanded on where possible.

The Shire of Leonora has a number of Registered Aboriginal Sites. There is an opportunity to develop cultural heritage tours that provide visitors with an understanding of Aboriginal culture and heritage in the local area.

There are a number of beautiful areas outside Leonora that could support nature-based camping activities. Camping is currently offered at Malcolm Dam however, the facilities provided are basic. There is an opportunity to develop and enhance nature-based camping in and around Leonora to attract more tourists to visit and stay in the region. Malcolm Dam is one such location with the potential for sustainable upgrading and expansion.

Leonora hosts a number of special events including the Leonora Gift, Gwalia's Gold and Leonora's races. These events should continue to be supported and promoted to draw people

to the town. Other tourist opportunities include prospecting, which not only provide tourists with an exciting activity, but can also be a way of educating visitors of the town's mining history.

Tourist growth can be supported on pastoral leases with diversification permits, although there are limited opportunities in proximity to Leonora townsite due to mineralisation and mining leases. The establishment of a new caravan park/overflow caravan parking area would provide visitors with increased accommodation options.

### 3.3.2 Pastoral and waste

Pastoral leases cover the vast majority of the Shire, however much of this land is impacted by operating, proposed and undeveloped mining and resource areas. Activities on pastoral lease areas need to be undertaken in accordance with the pastoral lease. Other activities outside this will require a Diversification Permit, which is granted under Part 7, Division 5 of the *Land Administration Act 1997*. Diversification Permits could provide opportunities for new employment industries and economic diversity.

The Council is currently considering a potential proposal for a Federal hazardous waste disposal site in the Shire. The Federal Government has not determined a preferred location for the facility; however, there may be a site in the Shire which may be suitable. Further investigation would be required to consider this option. Should this be a viable option, considerable consultation would be required as it is envisaged that there would be community and environmental considerations to be addressed.

**Table 3 Strategies and actions – diversified economy**

Strategy	Action
8. Support diversification of the local economy, considering the potential economic contributions of tourism, waste, and pastoral industries.	<p>8.1 Develop an economic development strategy, to investigate opportunities to support new employment industries.</p> <p>8.2 Establish an appropriate Special Use zone for the Gwalia heritage precinct that facilitates the development of the area as a tourism node, supporting complementary hospitality and accommodation uses.</p> <p>8.3 Identify a suitable location for a new caravan park/overflow caravan parking area.</p> <p>8.4 Investigate opportunity to create nature-based camping at Malcom Dam, and include a new land use 'nature based park' and suitable permissibility in LPS 2.</p> <p>8.5 Support diversification permits on pastoral leases where proposals contribute to the Shire's planning objectives and where the predominant pastoral industry is not adversely impacted.</p> <p>8.6 Exempt development associated with pastoral uses from the need for Development Approval by incorporating a new supplemental provision to the deemed provisions in LPS 2.</p> <p>8.7 Explore opportunities to enhance the waste processing industry in the Shire of Leonora, and apply the Infrastructure Services reserve to the existing landfill site to support its continued waste operations. Include waste land uses in LPS 2 to facilitate this economic opportunity.</p>

### 3.4 Facilitate the mining and construction economy

The majority of mining related activities occur outside the Leonora townsite and therefore outside the local planning scheme area. In addition, the prevalence of the Mining Act 1978 over the planning legislation means that the planning framework has little control over mining related activities. The local planning strategy recognises the importance of the mining and construction industry and should endeavour to facilitate these activities. This may include but not be limited to supporting industries within the Leonora townsite, provision of workers accommodation and provision of essential services to support workers and their families.

#### 3.4.1 Workers accommodation

Businesses are unable to be economically viable in Leonora without a FIFO workforce. Many premises in the existing industrial area have workers accommodation units on them, and there will continue to be pressure for businesses that support the town to require onsite workers accommodation. This is part of the unique operating environment of Leonora's businesses, and it is important for this to be facilitated in the town.

The existing industrial area has had spot re-zonings to a Mining Accommodation zone (to support the St Barbara mining operation) under TPS 1. The remaining industrial zoned land is predominantly made up of service industries and transport depots servicing the mining industry. The area requires a more flexible industrial zone that reflects the current situation, to accommodate the combination of service industries and workers accommodation operating in the area. This will enable ongoing support for the mining and construction industries.

#### 3.4.2 Availability of land for general industry

In 2016, the former Department of Planning prepared the *Central Regions Land Capacity Analysis* identified 12 hectares of surplus industrial land. However, land currently zoned for industry is immediately adjacent to accommodation uses and not appropriate for general industrial uses. Furthermore, surplus industry zoned land is located on mineralised land, therefore subject to mining leases and not available for industrial development.

Based on the constraints of how the existing industrial area has transitioned over time into a service industry and accommodation area, there is no general industrial land available.

The Shire has been approached regarding potential ore refining operations and fuel operations, which will require establishment within a general industrial area with suitable buffers from accommodation uses. Such an area is not currently available. Land located to the east of Leonora on the Laverton Road is most appropriate for future industrial purposes, due to access to services and being located outside areas of high mining value. Consultation with the Department of Mines, Industry Regulation and Safety (DMIRS) could not identify any viable alternative sites for future industrial development due to the land use constraints associated with mineralisation around Leonora. Zoning this area of land for industrial development will enable the preparation of a structure plan to determine specific development approaches and infrastructure required to address localised site opportunities and constraints, including drainage, bushfire risk, detailed servicing, and appropriate access points.

**Table 4 Strategies and actions – mining and construction**

Strategy	Action
9. Facilitate growth of the existing industrial area as a specialist service industry and	9.1 Apply a new light industry zone to the existing industrial area, with workers accommodation as a discretionary use reflecting the need for local service businesses and mining operations to accommodate short-term workers in Leonora.

Strategy	Action
industry accommodation precinct	
10. Facilitate the release of appropriate land for general industrial development	<p>10.1 Rezone land for industrial development in LPS 2 with the requirement for the preparation of a structure plan to address servicing, water availability, waste water disposal, visual amenity, buffers, emissions and topography.</p> <p>10.2 Work with state government and mining lease holders to investigate and release land for general industrial development.</p>
11. Facilitate the establishment of industry and business that support the mining and construction industry	<p>11.1 Apply land use permissibilities in LPS 2 that facilitate the introduction of new businesses. Such uses may include trade display, trade supplies, transport depot and warehouse/storage in the Light Industry and General Industry Zones.</p>

### 3.5 Protect the natural environment in local planning

The Shire's natural environment is typical of a desert with low to medium sparse shrubs and trees. Generally, there are few environmental issues in the Shire, with the exception of the naturally high levels of salinity in the groundwater and the occurrence of 15 species of conservation importance.

To ensure a safe drinking supply, a reverse osmosis plant is used to reduce salinity levels in groundwater. Native vegetation has naturally adapted to withstand hypersaline environments where they occur.

The strategy does not propose any land use change or anticipated growth that would cause significant environmental impacts. The existing state planning policies provide a suitable planning framework to consider development applications within the Shire. In addition, other environmental legislation provides sufficient provisions and mechanisms to protect the natural environment.

#### 3.5.1 Bushfire risk

With a changing climate, the risk of bushfire – as a result of hotter and drier conditions – will increase. Areas within and adjacent to remnant vegetation around the Leonora townsite are identified as bushfire prone.

*State Planning Policy 3.7 - Planning in Bushfire Prone Areas (SPP 3.7)* and the *Guidelines for Planning in Bushfire Prone Areas Guidelines (WAPC, 2015)* provide a strong planning framework to integrate an understanding of bushfire hazard into planning decisions within the bushfire prone area. The key focus of the policy is to ensure vulnerable and high-risk land uses are located away from areas of extreme bushfire risk.

A bushfire hazard level assessment has been undertaken for the Leonora townsite, and illustrates that parts of the townsite are influenced by moderate bushfire risk. The hazard assessment illustrates that bushfire risk can be effectively managed in future planning and development.

**Table 5 Strategies and actions – natural environment**

Strategy	Action
12. To protect land for environmental conservation in the Leonora townsite	12.1 Identify areas of the townsite that should be protected for environmental purposes.
12. To minimise the risk of bushfire on development	12.2 Prepare a Bushfire Attack Level (BAL) contour map for the Leonora townsite.

### **3.6 Strategic land use plan**

The Leonora local planning strategy includes two maps:

- Map 1 – Leonora Townsite; and
- Map 2 – Leonora Rangelands.

## 4. Implementation

The key recommendations, strategies and actions of the local planning strategy are implemented through the local planning scheme. The local planning scheme provides the statutory provision to manage land use and development within the scheme area. The local planning scheme text consists of two parts - the model provisions and the deemed provisions and is accompanied by a set of scheme maps. In addition to the local planning scheme, local governments can prepare local planning policies to provide additional development provisions.

### 4.1 Planning scheme extent

The area subject to TPS 1 includes the townsite of Leonora and its immediate surrounds. With the exception of land within the Leonora townsite, there is no freehold land in the Shire of Leonora, and land use outside the Leonora townsite is currently managed through pastoral and mining leases. With considerable exemptions from local planning schemes provided by the *Mining Act 1978* and the *Nickel (Agnew) Agreement Act 1974* (the state agreement), there is no practical purpose for a local planning scheme outside the Leonora townsite. Therefore, LPS 2 should maintain the boundary of the existing TPS 1.

### 4.2 Model provisions considerations

The model provisions provide a template for local government planning schemes and include scheme zones, land uses and development provisions that are specific to the local government area. The model provisions form part of the Regulations to provide consistency in scheme formatting and terminology across the State. The Shire's TPS 1 was prepared prior to the Regulations and therefore requires amending to align with the new format.

Key considerations for LPS 2 are discussed below.

#### Variations from the model provisions

The strategy proposes a few minor variations to the model provisions. Variations to the model provisions will need to be considered and approved by the WAPC. The rationale for the proposed variations are outlined below.

- Civic and Community reserve objective: this new objective should include reference to cultural facilities and benefits provided by these sites (as per discussion in section 3.1.1).
- Rural zone objective: a new objective should be included to acknowledge traditional Aboriginal cultural practices (as per discussion in section 3.1.1).
- Light Industry zone objective: an objective should be included to facilitate workers accommodation to support the mining industry (as per discussion in section 3.4.1).
- Regional Centre zone: a new zone name and objective for regional centre should be included to recognise this form of centre. This is a new zone type being considered by the WAPC (as per discussion in section 3.2.1).

#### Aboriginal heritage and traditional cultural use of land

Whilst there are limitations to what the planning framework can achieve in certain areas, the recognition of Aboriginal heritage and culture in the strategy and scheme is an important step to creating social unity amongst the local community. LPS 2 should include provisions that consider this. Further discussion of this is found in section 3.1.1.

## Exempted development

All development and land use require development approval in accordance Clause 60 of the deemed provisions. However, some forms of development may be appropriate in particular locations and it not considered necessary to require planning approval. Exempted development is one step the Shire can take to remove 'red tape' and assist to facilitate development opportunities in Leonora.

The Shire should consider the following land uses for development exemption.

- Pastoral Uses: Pastoral land uses within the Rural zone that are in accordance with their pastoral lease, where a diversification permit is not required, should be deemed appropriate for that zone and not require planning approval. This enables pastoralists to continue to undertake the necessary works that are required to facilitate pastoral activities.
- Rural Zone and Rural Residential zone Development: Single houses and incidental outbuildings in the rural zone.
- Traditional Law and Culture: This exemption would acknowledge the importance of Aboriginal heritage and facilitate traditional cultural activities to occur without being impeded or influenced by the scheme.
- Street Trading and Outdoor Eating: Street trading and outdoor eating are a simple way to promote activity and facilitate social interaction. Where street trading and outdoor eating are conducted in accordance with the Shire's local law, it is not considered necessary to require planning approval. This minimises the need for additional red tape and makes the process of activating the public realm simpler.
- Signage and Advertising: Signage and advertising can be considered appropriate where it meets certain standards such as size, quantity and appearance. If these standards are met, it is not considered necessary to require approval. Signage and advertising standards can be specified in the Model Provisions of the local planning scheme.

## 4.3 Local planning policy framework

Additional development standards and requirements can be included in local planning policies. Local planning policies are prepared under Part 2 of the deemed provisions. Given that the Shire is unlikely to have an extensive planning policy framework, most provisions could be accommodated within the scheme. Notwithstanding this, the following areas could be considered appropriate for a local planning policy:

- Where a heritage area is identified in the scheme, a policy can be prepared to provide development guidance in this area.
- It is common for local governments to require public art for developments over a certain monetary value (typically development over 1 million dollars). The Shire might consider a policy that addresses public art.



## **5. Monitoring and review**

Local planning strategies provide the long term planning direction for the local government area. Whilst they are not a statutory document used for making decisions on individual development applications, it can be used to inform scheme amendments and strategic projects.

Local planning strategies can be amended from time to time in accordance with regulation 17 of the Regulations.

Under regulation 65 of the Regulations, a local government is required to review its local planning scheme every 5 years. Local planning strategies are to be reviewed at the same time as the local planning scheme.

# **PART 2**

# **BACKGROUND**

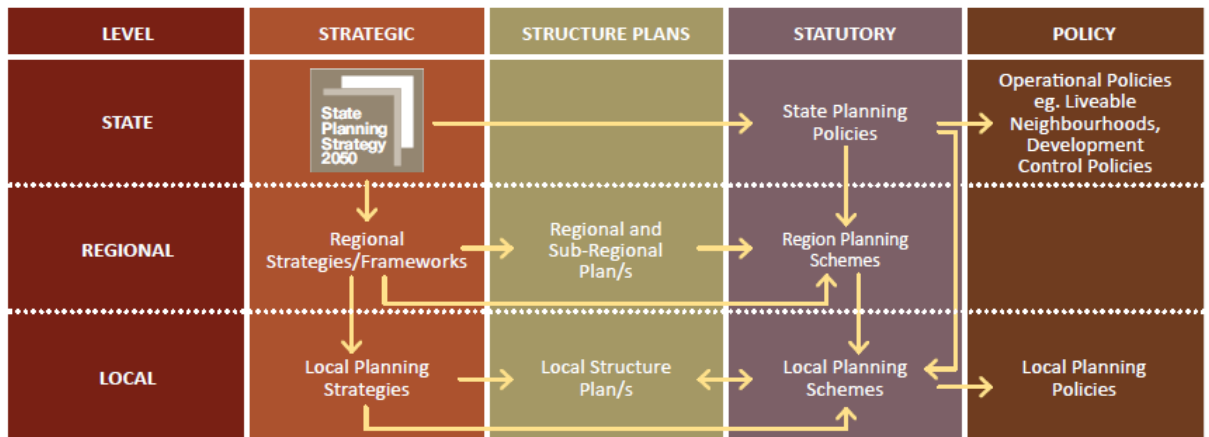
# **INFORMATION**

# **AND ANALYSIS**

# 1. State and regional planning context

The planning vision for the Shire of Leonora must align with the broader planning framework. The preparation of a LPS therefore requires consideration of existing state and regional planning documents, including state planning policies, strategies and plans. The key documents that influence the LPS are outlined below.

Western Australia has a comprehensive planning framework prepared, reviewed and implemented across different levels of governance, as depicted in Figure 4.

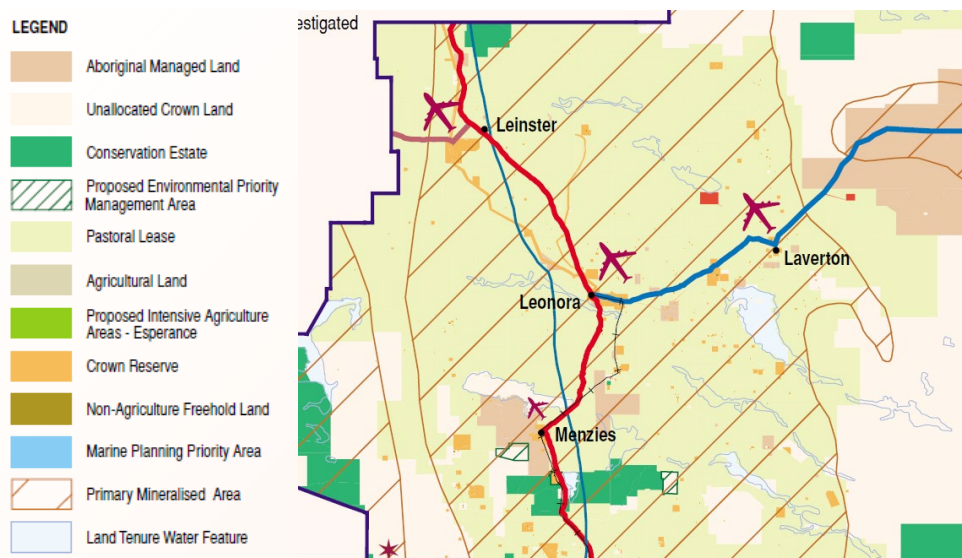


**Figure 4 Overview of the Western Australian planning system (WAPC 2014)**

The following sections of the LPS provide an overview of the key state, regional and local planning documents that are relevant to the Shire of Leonora and impact the local planning.

## 1.1 Influence of legislation related to mining and pastoral leases

With the exception of land within the Leonora townsite, there is no freehold land in the Shire of Leonora. All land use is currently subject to pastoral and mining leases. The excerpt below from the *Goldfields-Esperance Regional Planning Strategy (2000)* illustrates that the majority of the Shire area is located within a primary mineralised area.



**Figure 5 Goldfields-Esperance Regional Planning Strategy excerpt**

The prevalence of mining as the primary land use across the Shire of Leonora is recognised by the *Goldfields-Esperance Regional Planning and Infrastructure Framework (2015)*. Future land use and development outside the Leonora townsite is therefore expected to be associated with mining of identified mineral deposits, and would be exempt from any operative local planning

scheme. The various legislation that provide these exemptions, and therefore the rationale of the strategy to retain the boundary of the current TPS 1, are discussed below.

### **1.1.1 Nickel (Agnew) Agreement Act 1974**

The *Nickel (Agnew) Agreement Act 1974* (the state agreement) ratifies a State agreement between the State of Western Australia and (now) BHP Billiton associated with mining of nickel ore reserves.

The state agreement (within the first schedule of the Act) covers all mining and associated works, and includes:

*“mine development, the installation of mining plan, mining equipment and plant for the treatment of ore ... works for the provision of electricity, water, roads, communications, transportation, and the construction of housing and communal and other facilities for the proper and reasonable accommodation, health and recreation of workers employed...”*

Section 18 of the State agreement relates to the establishment of a “new town” – this is the settlement of Leinster within the Shire of Leonora. The agreement requires that all accommodation, services, works, infrastructure, education, health, recreation, etc. is provided by BHP Billiton. Under the state agreement, the Shire of Leonora has no role in the delivery of services or infrastructure within Leinster.

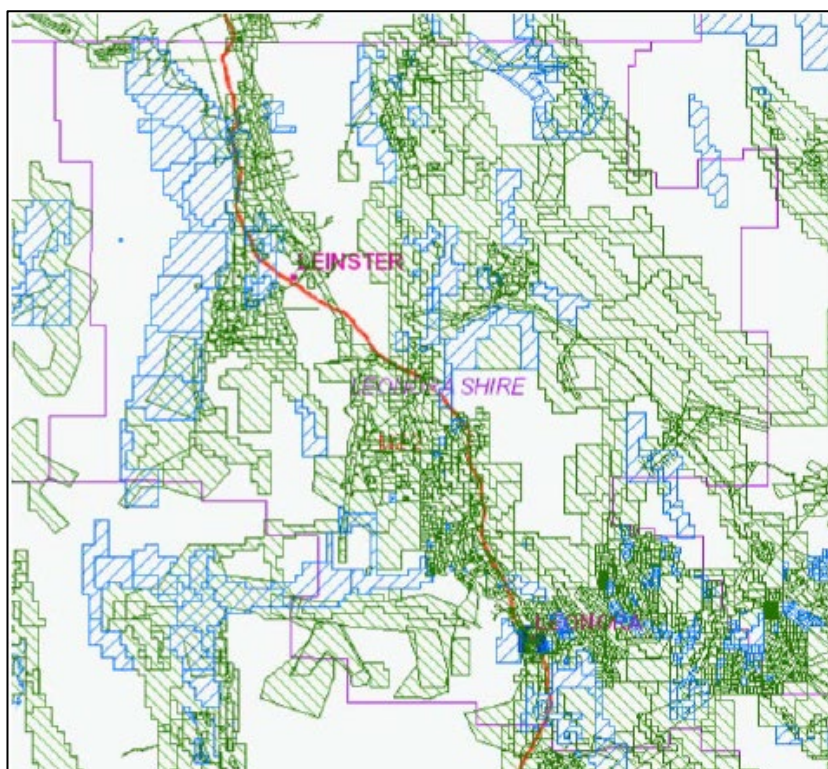
Section 23 of the agreement precludes any local government interference in any of BHP’s operations undertaken in accordance with the state agreement, including land use and development within Leinster. Section 23 states:

*“The State shall ensure that the mineral lease and any lands the subject of any Crown Grant lease licence or easement granted to the Joint Ventures under this Agreement shall be a remain zoned for use or otherwise protected during the currency of this Agreement so that the operations of the Joint Venturers hereunder may be undertaken and carried out thereon without any interference or interruption by the State by any State agency or instrumentality or by any local or other authority of the State on the ground that such operations are contrary to any zoning by-law regulation or order”.*

Whilst section 23 does not preclude zoning of Leinster and other lands subject to the state agreement, it requires that any zone does not influence operations.

### **1.1.2 Mining Act 1978**

The *Mining Act 1978* operates to exempt practically all anticipated land use and development across the majority of the Shire area due to the extent of the mineralised area covering the majority of the Shire’s area. Therefore, a planning scheme will have no planning purpose in relation to the predominant land use in the district. As the extent of mining tenements shows (Figure 4), there are only comparatively small, isolated areas of land not subject to future mining potential. The distribution of mining tenements are shown in blue and green on 6 and the Shire boundary is depicted by the purple boundary line. These are pastoral lands managed by the *Land Administration Act 1997*.



**Figure 6 Distribution of mining tenements**

### **1.1.3 Land Administration Act 1997**

There is some land within the Shire of Leonora that is subject to pastoral leases and not in the primary mineralised area. Therefore, there will be continued pastoral land uses in the western pocket of the Shire. Pastoral land use and development is currently managed by Part 7 of the *Land Administration Act 1997*. Any non-pastoral land use or development on pastoral leases requires a permit under Division 5 – Permits of the Act.

Permits may be issued subject to any conditions, and therefore Division 5 operates to regulate land use and development in a similar manner to a local scheme. Section 14 of the Act requires that local governments are consulted before the Minister exercises any powers in relation to Crown land:

*“Before exercising in relation to Crown land any power conferred by this Act, the Minister must, unless it is impracticable to do so, consult the local government within the district of which the Crown land is situated concerning that exercise.”*

Therefore, the Shire of Leonora has the ability to influence applications for permits on pastoral lands, informed by the intent of the local planning strategy.

## **1.2 State planning framework**

### **1.2.1 State Planning Strategy 2050**

The *State Planning Strategy 2050* is the overarching strategic document outlining the State Government’s intention for future land use planning and development in Western Australia (WA).

The strategy and scheme should align with the key strategic direction as set out in the *State Planning Strategy 2050* and subsequent planning documents, as described below.

## 1.2.2 State planning policies

The following State Planning Policies (SPP) are relevant to the Shire of Leonora.

### State Planning Policy No. 1 – State Planning Framework Policy

The *State Planning Framework Policy* outlines the key principles that guide future planning decisions. The principles relate to the environment, the community, the economy, infrastructure and regional development. This policy sets the overall framework for planning within WA.

The Shire's LPS must have due regard to the policy and align with the general principles for land use planning and development.

### State Planning Policy No. 2 – Environment and Natural Resources Policy

SPP 2 examines how the environment and natural resources should be considered in land use planning and decision-making. SPP 2 covers key areas including air quality, soil and land quality, biodiversity, agricultural land and rangelands, minerals, petroleum and basic raw material resources, marine resources and aquaculture, landscape, greenhouse gas emissions and energy efficiency.

The vast majority of the Shire is covered by natural landscapes, with only a small proportion of the land being built up. Planning within the Shire will need to ensure that the environment and natural resources are given a high priority and considered an asset in the local economy. The strategy should generally seek to identify environmentally sensitive areas (if any) and natural resource management areas. The strategy will need to consider frameworks for identifying heritage sites and appropriate protection measures.

### State Planning Policy 2.5 – Rural Planning

SPP 2.5 provides guidance for the protection and use of rural land. The location of rural land should be appropriately planned for and land identified as priority agricultural land (if applicable) should be indicated in local planning strategies and schemes. SPP 2.5 also provides guidance on the location of rural living areas. The policy applies to land zoned for rural or agricultural purposes and land identified or proposed for rural living.

Given the rural nature of area surrounding the main townsite, SPP 2.5 is highly applicable to the Shire. The Strategy should consider the appropriateness of rural living precincts and identify measures to ensure they are adequately serviced and do not encroach on primary production or agricultural land. The Strategy should also identify any additional activities that may be appropriate within rural zones. In addition, the LPS should endeavour to mitigate any conflicts between rural land uses through recommendation of appropriate zoning and determination of the need for separation distances/statutory buffers.

The LPS and scheme should not seek to support subdivision or rezoning of rural land unless it is in accordance with this policy and *Development Control Policy 3.4 – Subdivision of Rural Land* (DC 3.4).

### State Planning Policy 2.7 – Public Drinking Water Source Areas

SPP 2.7 provides requirements to ensure compatibility of land use and development with the protection and long-term management of water resources for public water supply through the identification of Public Drinking Water Source Areas.

Drinking water for the Leonora-Gwalia town is drawn from the Station Creek wellfield (Department of Water 2010). The Leonora Water Reserve is outside the proposed local planning scheme boundary and therefore will not be reserved under LPS 2. Protection and management of the water reserve will be managed under the *Country Areas Water Supply Act 1947* and *Rights in Water and Irrigation Act 1914*.

### **State Planning Policy 2.9 – Water Resources**

SPP 2.9 provides guidance in the planning, protection and management of surface and groundwater catchments for total water cycle management in land use planning.

The strategy should identify and prioritise significant water resources within the Shire and should consider compatibility of land uses near water resources and implement planning provisions (including buffers, special control areas, setbacks etc.) to prevent adverse impacts of land use activities and development on water resources.

### **State Planning Policy 3 – Urban Growth and Settlement**

SPP 3 facilitates sustainable patterns of urban growth and settlement in accommodating the State's population.

The strategy reports on future housing requirements identified in the *Central Regions Land Capacity Analysis*. Areas requiring future detailed planning are identified for structure planning.

The strategy identifies suitable urban design outcomes and characteristics appropriate to the Shire and encourage a sense of place and identity for the community.

### **State Planning Policy 3.4 – Natural Hazards and Disasters**

SPP 3.4 ensures land use planning and development considers natural hazards and disasters such as flooding and bushfire.

In line with SPP 3.4, the strategy identifies areas where development may be subject to natural hazards and disasters. Appropriate mechanisms are identified for protecting development against applicable hazards, in particular related to bushfire and any other hazard identified through mapping of natural assets.

### **State Planning Policy 3.5 – Historic Heritage Conservation**

SPP 3.5 ensures sound and responsible planning for conservation and protection of the State's historic heritage. Local governments should identify places of local significance through use of a local government inventory, classifying heritage areas and a heritage list under the local planning scheme.

The Shire contains 47 State Registered Places and 60 heritage areas on the Shire's MHI. The Shire may prepare a heritage list and accompanying provisions for creation, adoption and review (as per Part 3 of the deemed provisions) for inclusion in LPS 2 in order to protect these assets.

### **Draft State Planning Policy 3.6 – Development Contributions for Infrastructure (July 2019)**

Draft SPP 3.6 provides guidance for the preparation of development contribution plans under a local planning scheme for local government. Developer Contribution Plans (DCPs) are to be prepared for a development contribution area, identified on a scheme map and within scheme text. DCPs are incorporated into schemes via special control areas

The strategy has not identified any potential future need for developer contribution arrangements.

### **State Planning Policy 3.7 – Planning in Bushfire Prone Areas**

SPP 3.7 guides land use planning to address bushfire risk management. The policy applies to all designated bushfire prone areas as identified on the Map of Bush Fire Prone Areas (as amended). All strategic planning proposals, including a local planning strategy and scheme should take into account bushfire protection measures and seek a balance between bushfire risk management and environmental/biodiversity conservation values

A bushfire hazard level assessment has been completed for identified bushfire prone areas in the Shire as part of this strategy.

#### **Draft State Planning Policy 4.1 – Industrial Interface (November 2017)**

Draft SPP 4.1 guides decision-making for the protection and long-term security of industrial zones, major infrastructure and special uses.

The strategy addresses the requirements of SPP 4.1 through the identification of a new general industrial area that maintains a separation distance from sensitive land uses in Leonora.

#### **State Planning Policy 5.4 – Road and Rail Noise**

SPP 5.4 provides guidelines for minimising noise impacts from transport infrastructure. Within the Shire, Goldfields Highway and Laverton-Leonora Road are identified as state freight roads and the Leonora Line of the Goldfields-Esperance Rail Freight Network identified as a railway corridor.

#### **State Planning Policy 7 – Design of the Built Environment**

SPP 7 guides design decision-making, review and assessment to improve built environment outcomes. The policy sets out principles, processes and considerations which apply to the design of the built environment in WA.

#### **State Planning Policy 7.3 – Residential Design Codes Volume 1 and 2 (R Codes)**

The R Codes provide comprehensive planning controls for residential development across the state. Residential density codes should be discussed in the LPS including the appropriateness of existing codes and any proposed modifications. The R Codes are to be incorporated through reference in the local planning scheme.

### **1.3 Regional planning framework**

#### **1.3.1 Goldfields-Esperance Regional Planning and Infrastructure Framework (2015)**

This document, prepared by the WAPC, provides a framework for delivery of coordinated policy and planning in the Goldfields-Esperance Region. The framework is afforded the same level of importance as a regional strategy under the State Planning Framework. The key drivers identified in the framework are:

- Economy and employment
- Transport and infrastructure
- Natural resources and cultural heritage

The Leonora townsite is identified as a sub-regional centre (i.e. retail appropriate for day-to-day expenditure with potential for some comparative retail, as well as commercial and light industry to service the local economy). Operating mine sites within the Shire are recognised as specialised centres. Future development and population growth should be in accordance with the designated activity hierarchy.

The strategy recognises appropriate areas for general industry in response to identified need.

In order to retain a more permanent population and in turn support the local economy, the strategy identifies potential actions to increase retention of FIFO workers within the region. In addition, the local economy can be further supported through new and enhanced industries, such as tourism. Tourism opportunities within the Shire should be recognised and developed, where appropriate.



### ***Goldfields-Esperance Regional Investment Blueprint (2016)***

The Blueprint, prepared by the Goldfields-Esperance Development Commission, guides development and directs investment of strategic plans to ensure economic and community aspirations in the region. Regional priorities outlined in the document that are relevant to the Shire include:

- Enhancing regional living: improving regional lifestyle and liveability to retain and attract population and workforce
- Enabling infrastructure: expand and improve infrastructure, and provide new energy sources and accessible reliable utilities.
- Fostering an innovative economy: build on the Shire's comparative advantage to develop, value-add and diversify economic opportunities for growth.

The strategy should build on the Leonora townsite as a service centre for Shire as well as promote the townsite for education, vocational, training and health services for the Northern Goldfields.

There is a need for more affordable housing that is functional and varied to meet market demands, including aged care which should be discussed in the LPS.

Opportunities for tourism based on the location and proximity to regional attractions (Golden Quest Discovery Trail, Outback Way, Gwalia Ghost Town) and events (Golden Gift, Leonora Cup Race Meeting), should be investigated.

The strategy should identify the potential for Leonora to develop new waste processing facilities and expertise.

The strategy should also review challenges and barriers to growth of digital infrastructure, including lack of appropriate mobile telecommunications

### ***Central Regions Land Capacity Analysis***

The *Central Regions Land Capacity Analysis* (CRLCA) provides an overview of existing and future land capacity to assist regional planning and inform strategy and scheme reviews. It also examines the population projections based on *WA Tomorrow* to determine whether future growth can be accommodated within the area. The analysis of the CRLCA informs the land use supply recommendations of this local planning strategy.

## 2. Local planning context

### 2.1 Strategic Community Plan 2017-2027

The Shire's Strategic Community Plan is prepared in accordance with the *Local Government Act 1995* and is the Council's main strategy and planning tool.

The Shire's vision, as outlined in the Plan, is '*That the Shire of Leonora is a proactive, sustainable, safe, friendly and prosperous place to be*'

The Plan has four key objectives:

- Social: An empowered and spirited community
- Economic: Economic hub of the northern goldfields
- Environment: Forward thinking management of the built and natural environment
- Leadership: Innovative and proactive Shire and Councillors

The strategic plan has been instrumental to the development of the LPS, in particular the vision.

### 2.2 Local planning scheme

The Shire of Leonora's TPS 1 was originally gazetted in 1984. The scheme covers the Leonora townsite and immediate surrounds. The majority of the Shire is not impacted by the local planning scheme.

As TPS 1 was prepared prior to the 2015 Regulations, the format does not align with the current requirements. In addition, the Shire does not have a LPS. This review will include the preparation of the Shire's first LPS and will update the scheme to align with the new format of the 2015 Regulations.

### 2.3 Local planning policies

The Shire does not currently have any local planning policies.

## 3. Local profile

### 3.1 Environment

#### 3.1.1 Climate

The climate is semi-arid with hot, dry summers and cold to mild winters. Rainfall averages 236 millimetres per year and is generally confined to intense events associated with tropical cyclones during the summer months and frontal systems in the winter months. The average potential evaporation at Leonora is approximately 2,000 millimetres per year (Leonora Water Reserve: Drinking Water Protection Plan, Department of Water 2010).

Seasonal variations in temperature are reasonably large. Summer temperatures may exceed 40°C and winter fronts within the region are not uncommon. Mean maximum temperatures recorded range from 37.0°C in January to 18.4°C in July. Mean minimum temperatures range from 21.8°C in January to 6.1°C in July.

Table 6 outlines the mean minimum and mean maximum temperatures as well as the mean rainfall for Leonora (Bureau of Meteorology 2018).

**Table 6 Climate Summary**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
<b>Temperature</b>													
<b>Mean Max (°C)</b>	37.0	35.3	32.6	27.9	22.8	19.0	18.4	20.7	24.9	28.9	32.3	35.3	27.9
<b>Mean Min (°C)</b>	21.8	20.9	18.6	14.8	10.2	7.3	6.1	7.0	10.0	13.7	17.0	20.0	14.0
<b>Rainfall</b>													
<b>Mean Rainfall (mm)</b>	26.3	31.2	29.0	20.4	23.9	25.0	18.8	15.9	9.0	9.5	12.4	16.8	236.4

Bureau of Meteorology – Climate Data Online, accessed 28 November 2018

#### 3.1.2 Physical features

The Shire of Leonora is situated within the Northern Goldfields region, covering an area of 32,189 square kilometres and is a service centre for the mining, exploration and the pastoral industry.

The Shire's main township is Leonora, 832 kilometres northeast of Perth and 230 kilometres north of Kalgoorlie. Neighbouring Shires include Wiluna, Laverton, Sandstone and Menzies.

As part of the golden outback and one of the gateways to the Outback Way, Leonora's natural attractions are drawing an increase in visitors with a number of self guided drive tours promoted through the region. Attractions include 'The Terraces' 40 kilometres northeast of Leonora, a fine example of so-called 'break-away' formations, created through the erosion of plateaux by wind and rain (Shire of Leonora Strategic Community Plan 2017 – 2027). Mount Leonora is a highly valued landscape feature, giving the primary town its name.

The Shire falls within the Murchison Province which consists of an extensive plateau of low relief. The terrain within this Province consists predominately of gently undulating wash plans and sand plains sitting below mesas and hills.

No major rivers are located within the Shire, however, there are a number of ephemeral wetlands including Lake Darlot.

### **3.1.3 Natural heritage**

#### **Vegetation**

The vegetation has been mapped and described by Beard (1981). Most of the area comprises low woodland dominated by mulga and mixed eucalypt scrub. Mulga and mallee shrublands thrive towards the south on elevated rocky features such as greenstone ridges. In the northern part of the area, spinifex hummock grasslands with scattered mulga and eucalypt overstorey are prominent on gently undulating sandplain. The drainage lines are often occupied by thick woodland with salt tolerant halophytes, such as samphire and saltbush, surrounding the playa lakes (refer to Figure 7 and Figure 8).

Large areas of mulga and mallee trees around the localities of Laverton and Leonora were cleared for firewood and timber during the initial mining activities; however, this vegetation is regenerating. In the pastoral areas, overstocking and feral animals, such as goats and rabbits, have caused local erosion and land degradation (Groundwater Resources of the Northern Goldfields, Western Australia, Water and Rivers Commission, 1999). This degradation has however, had minimal impact on overall native vegetation coverage within the Shire (Figure 9).



**Figure 7 Area of Laverton and Leonora**

## Rare and threatened species

Significant fauna and flora species are protected under both State and Commonwealth legislation. Any activities that are deemed to have a substantial impact on fauna and flora species that are recognised by the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) or the *Wildlife Conservation Act 1950* (WC Act) can trigger referral to the Department of Biodiversity, Conservation and Attractions (DBCA) and/or the Environmental Protection Authority (EPA).

Significant fauna and flora in Western Australia that are protected under the WC Act are listed as Threatened (Declared Rare) flora. The DBCA produces a supplementary list of Priority Fauna and Flora, these being species that are not considered Threatened under the WC Act but for which the DBCA feels there is a cause for concern. Such taxa need further survey and evaluation of conservation status before consideration can be given to declaration as threatened flora. As such these species have no special legislative protection, but their assessment of the conservation status of an area.

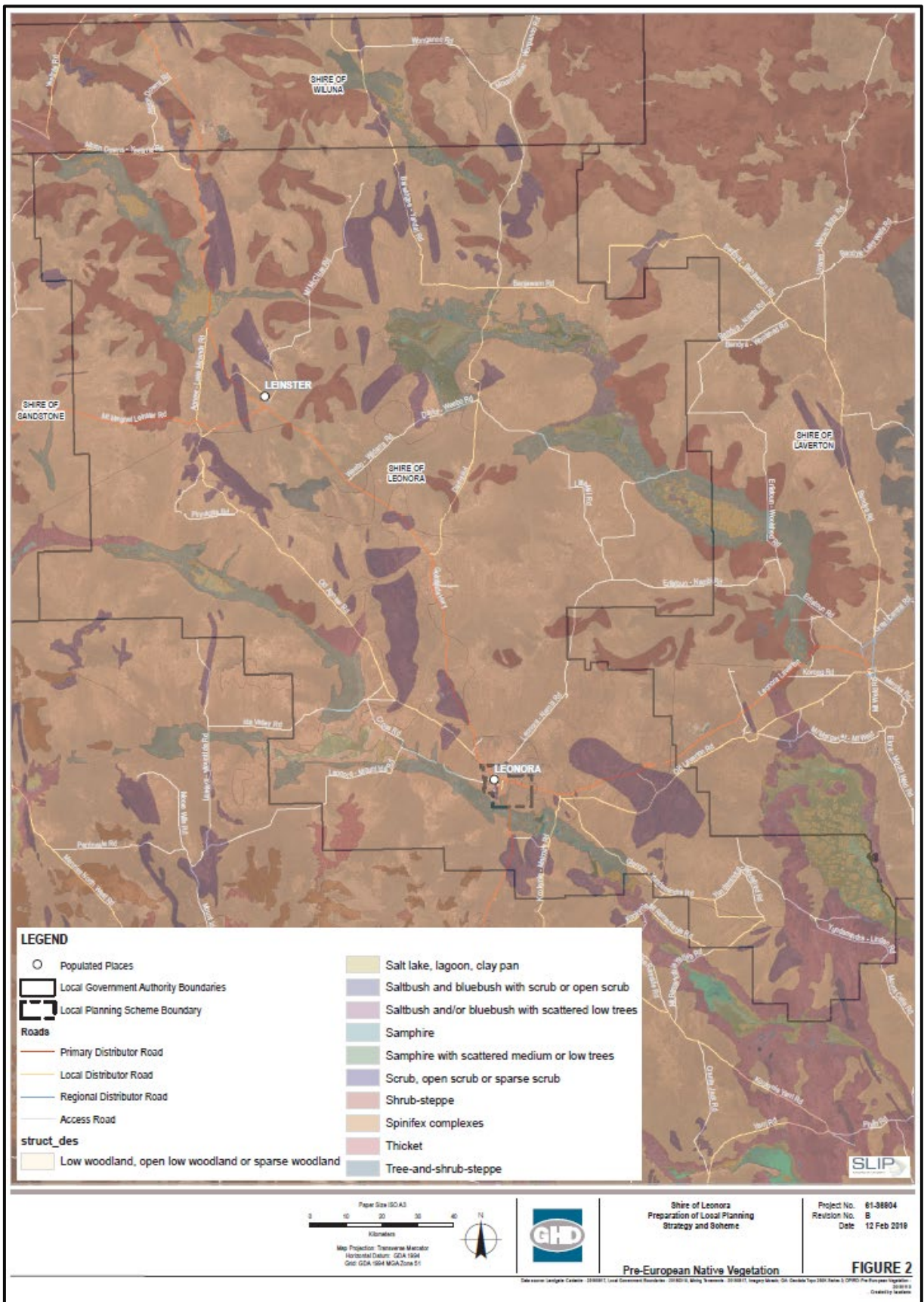
## Fauna

Three hundred and eighty-nine (389) native animal species are known to occur in the Shire from 6498 records. Of these, fifteen (15) are considered to be rare, threatened, specially protected, priority or are protected by international agreement. Threatened species include:

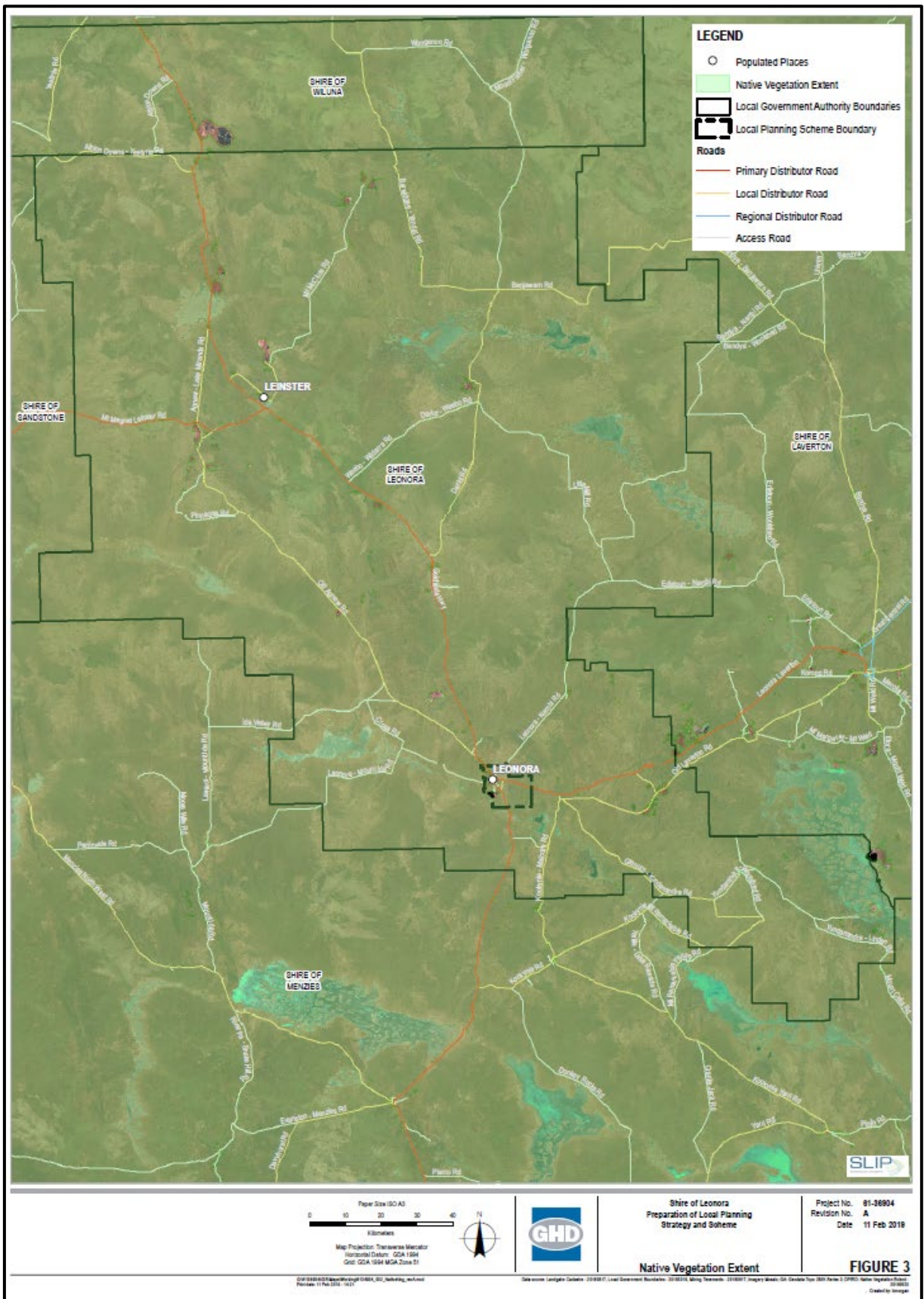
- *Leipoa ocellata* (Mallee Fowl)
- *Liopholis kintorei* (Great Desert Skink)
- *Macrotis lagotis* (Bilby, Dalgyte, Ninu)

## Flora

Eight hundred and sixty-eight (868) native plant species are known to occur in the Shire from 4649 records. Of these, one (1) species is a threatened flora species listed under the EPBC Act and WC Act (*Atriplex yeelirrie*) and thirty-two (35) supplementary priority species.



**Figure 8 Pre-European native vegetation**



**Figure 9 Native vegetation extent**

## Fungi

Fifty-eight (58) species of fungi are known to occur in the Shire of Leonora. Of these, two (2) have priority status. Priority fungi species are:

- *Austroparmelina macrospora* (P3)
- *Placynthium nigrum* (P3)

NatureMap search, 4 February 2019 (collaborative project between Department of Biodiversity, Conservation and Attractions and the Western Australian Museum).

### 3.1.4 Hydrogeology

Leonora lies in the Eastern Goldfields Province within the Archaean Yilgarn Craton. The Station Creek wellfield is located in the Malcolm Greenstone Belt which comprises mainly volcanic and sedimentary rocks (Griffin 1990). The greenstones are generally deeply weathered, usually 50 to 70 metres but may be up to 100 metres, and are concealed by a layer of younger deposits. Lake deposits and peripheral Aeolian deposits occur in the Lake Raeside area.

The Station Creek aquifer forms part of the Lake Raeside palaeodrainage system. Groundwater is abstracted from both shallow sedimentary rocks and fractured bedrock. The depth to groundwater varies between 6 and 11 metres.

Recharge is derived from infiltration of rainfall and runoff associated with high rainfall events. The amount of recharge is generally small due to low rainfall and high evaporation. Recharge is greatest where permeable sediments occur at the surface in the Station Creek area.

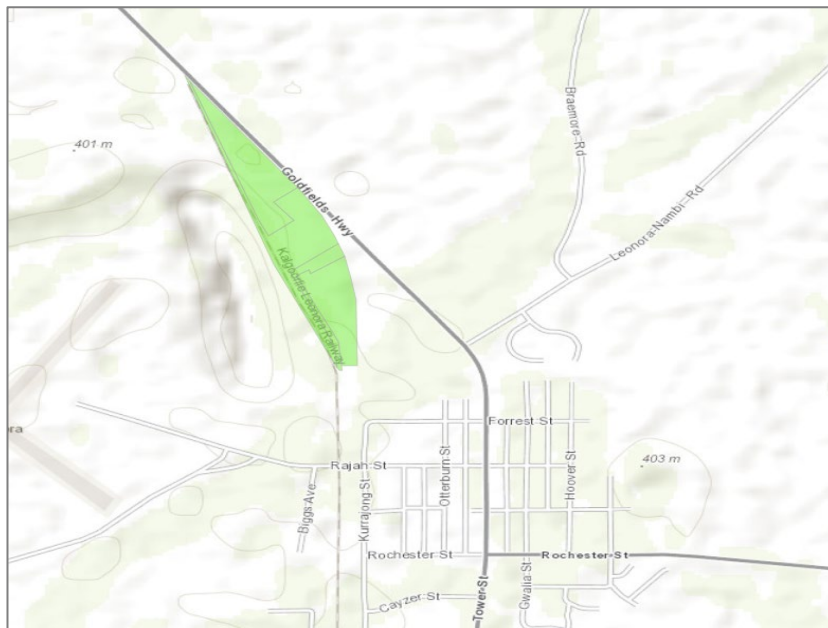
Regional groundwater flow in the sediments is slow and generally to the south-west towards Lake Raeside. Movement of groundwater within the fractured rock is controlled by the geological structure and outflow may be restricted, causing increased salinity. Discharge occurs by evapotranspiration and possibly by leakage of groundwater to palaeochannel sediments beneath the Lake Raeside area. Consequently, groundwater can range from potable in the recharge areas to hypersaline in the discharge areas, with salinity increasing in the direction of groundwater flow.

Due to the shallow, unconfined nature of the aquifer, the groundwater is considered vulnerable to contamination from land uses in the recharge area (Leonora Water Reserve: Drinking Water Protection Plan, Department of Water 2010).

### 3.1.5 Contaminated sites

The *Contaminated Sites Act 2003* was introduced to identify, record, manage and clean up contamination. There are three (3) sites known to be contaminated site within the Shire of Leonora. One site, comprised of four (4) land parcels is located within the Leonora townsite (Figure 10). This site is currently used as a railway yard. The site was reported in 2007 because transport practices potentially resulted in the deposition of heavy metals onto the site from open transport vessels. In 2009, transport practices were substantially improved (i.e. transport procedures for ore from a mine site in Wiluna), and former practices of transporting ore via open bins known as 'Kibbles' ceased. This action, comprising the enclosure of bagged ore inside containers substantially reduced potential impact on the environment.





**Figure 10 Contaminated site search Leonora townsite (Contaminated Sites Search November 2018)**

In April 2011, the container terminal (located on the northern portion of the site) ceased operation pending upgrades including hardstand capping of the container terminal and installation of a container washing facility and offices.

Several soil investigations were carried out between 2007 and 2012 confirming contamination with heavy metals. In November 2011 and October 2012, soil remediation works, comprising excavation and off-site disposal and covering with fill, were undertaken.

Provided that the land use of the site remains commercial/industrial, the Department of Water and Environmental Regulation considers that the identified metal-impacted soils remaining beneath fill material at the site do not pose an unacceptable risk to human health, the environment or any environment value. However, the impacted soils may pose an unacceptable risk to human health, the environment or any environmental value under a more sensitive land use (e.g. residential, primary school, child care centres).

As the site contaminated and has been remediated such that it is suitable for the current commercial/industrial land use, but may not be suitable for a more sensitive land use, the site is classified as 'remediated for restricted use'.

There are two (2) further sites outside of the townsite. These sites are classified Contaminated – restricted use and Contaminated – remediation required. Both site are associated with mining tenements and mine site operations. Contaminated sites classification does not affect continued operation of the mine sites.

### **3.1.6 Acid Sulfate Soils**

The classification of Acid Sulfate Soils (ASS) includes both actual acid sulfate soils (AASS) and potential acid sulfate soils (PASS). AASS are those soils that are generating acidity, whereas PASS are those soils that have the potential to generate acidity.

ASS are soils containing naturally-occurring, fine-grained metal sulphides typically pyrite (FeS<sub>2</sub>), formed under saturated, anoxic/reducing conditions. They generally occur in Quaternary (1.8 Ma – Present) marine or estuarine sediments, predominantly confined to coastal lowlands (elevations generally below 5 m AHD). Within these sediments, the majority of soils that present an environmental risk are generally confined to Holocene aged material (<10,000 years). Where these materials have oxidised, they commonly have a mottled appearance (orange and yellow discolouration) due to the presence of oxidised iron minerals.

Although soils described above represent typical conditions where ASS occurs, the presence of ASS materials is not limited to these soil types. In Western Australia, ASS materials have been identified in other soil types such as leached sands and silts. Accordingly, for areas where no data is available, the extent of ASS materials should be established through field investigations.

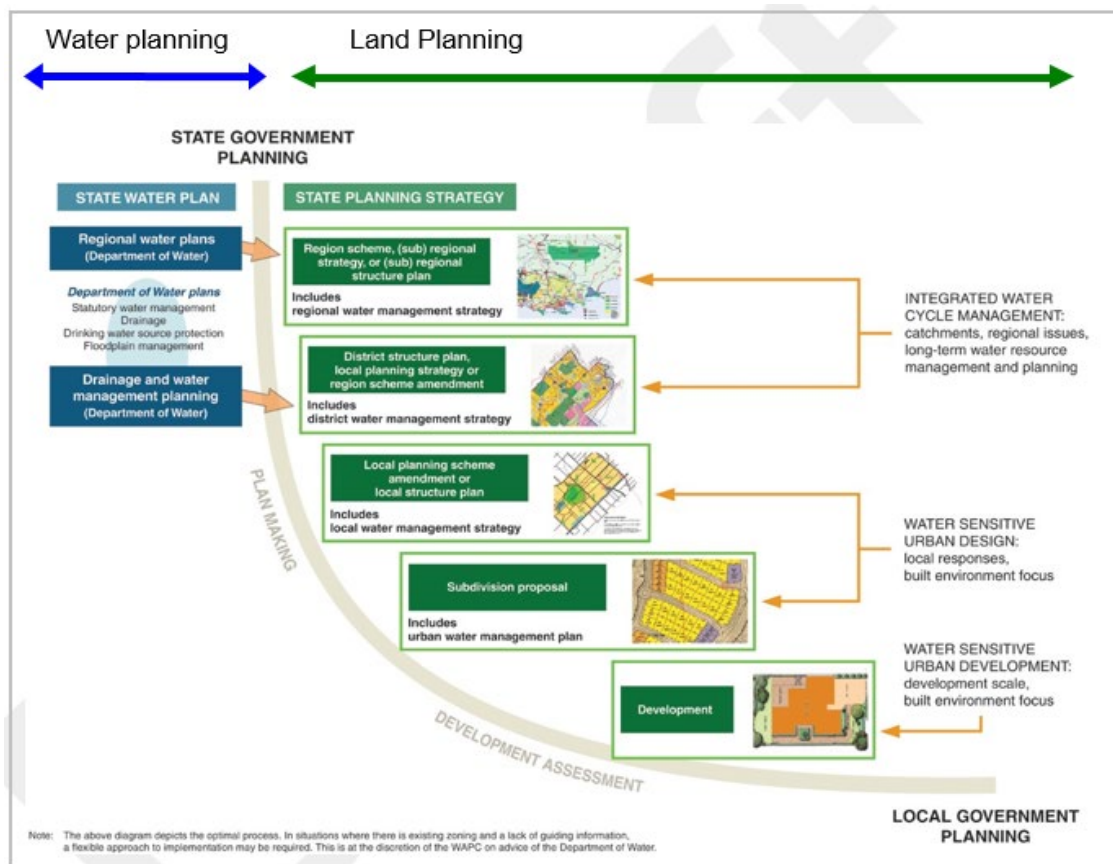
A search of the Australian Soil Resources Information System (ASRIS) (2010) website indicated that ASS have an extremely low probability of occurrence within the Shire. Further ASS assessment is not considered necessary.

## **3.2 Water management**

Water planning in the Shire of Leonora should follow the process outlined by the *Better Urban Water Management* framework (Figure 11). *Better Urban Water Management* was designed to guide water management at the regional, district, local and subdivision stages of the planning process by ensuring consideration is given to the total water cycle at each stage of planning and development. Water planning at each stage informs subsequent more detailed planning.

In line with the strategy's recommendation for a district structure plan to plan for a new industrial area, development of a District Water Management Plan should be prepared as part of that district structure plan.

A Local Water Management Plan should accompany local-level developments of a significant nature. Urban Water Management Plans will be required to support further subdivision applications in Leonora.



**Figure 11 Integration of land and water planning in Better Urban Water Management**

### Public Drinking Water

The Leonora-Gwalia town water supply is drawn from the Station Creek wellfield operated by the Water Corporation. The wellfield draws water from a shallow, unconfined, fractured rock aquifer that is vulnerable to contamination from land uses in the recharge area. Raw water from the Station Creek wellfield is treated to reduce scaling caused by hardness and disinfected using chlorine. In 2004 a reverse osmosis plant was made operational to reduce naturally occurring high levels of salinity, nitrate and hardness in the water.

The Leonora Water Reserve was proclaimed in 1990, and last amended in May 2020, under the *Country Areas Water Supply Act 1947* (WA) to protect the water source. The water reserve covers the recharge area for the Station Creek wellfield and the surface water catchment for Station Creek. Potential risks to drinking water quality in the water reserve include contamination from mining and mineral exploration activities, pathogens from livestock on pastoral leases, and hydrocarbons from fuel storage and theft in bore compounds. Open historic wells near production bores and abandoned drill holes throughout the water reserve may allow direct contamination of the aquifer.

The Department of Planning, Lands and Heritage’s protection strategy for Public Drinking Water Source Areas provides for lawfully established and operated developments to continue despite those facilities posing a potential level of risk to water quality that would not be accepted for new developments. The department will provide advice to landowners/operators on measures to improve these facilities and reduce water quality contamination risks.

It is recognised under the Western Australian Planning Commission’s (WAPC) *State Planning Strategy 2050* that appropriate protection mechanisms in statutory land-use planning processes are necessary to secure the long-term protection of drinking water sources. Any development proposals within the proposed Leonora Water Reserve that is inconsistent with advice in the Department of Water and Environmental Regulation’s *WQPN No. 25: Land Use Compatibility in*



### 3.3 Population and housing

#### 3.3.1 Demographic patterns

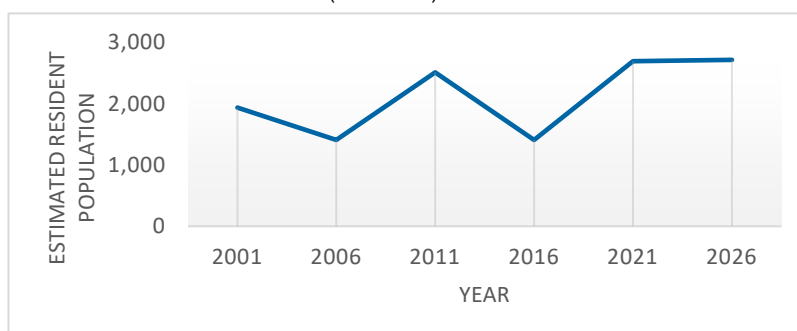
The Shire of Leonora had an estimated resident population of 1,411 at the 2016 Census, comprising 62.7 percent males and 37.3 percent females. Aboriginal and/or Torres Strait Islander people made up 14.3 percent of the total population.

**Table 7 Population and growth rate (Shire of Leonora)**

Year	2001	2006	2011	2016	2021	2026
Total Population (usual residence)	1,941*	1,409	2,512	1,411	2,700	2,720
Total Population (enumeration)**	2,964	2,344	4,344	2,813**	-	-
Average annual growth rate (%) (usual residence)	-	-5.5	2.9	-1.8	2.0	1.6

\*Place of Enumeration 2016 Datapack LGA55040 (ABS 2017)

\*\*2001 Usual Residence Profile (ABS 2003)



**Figure 13 Estimated Residential Population (ABS 2017, DPLH 2015)**

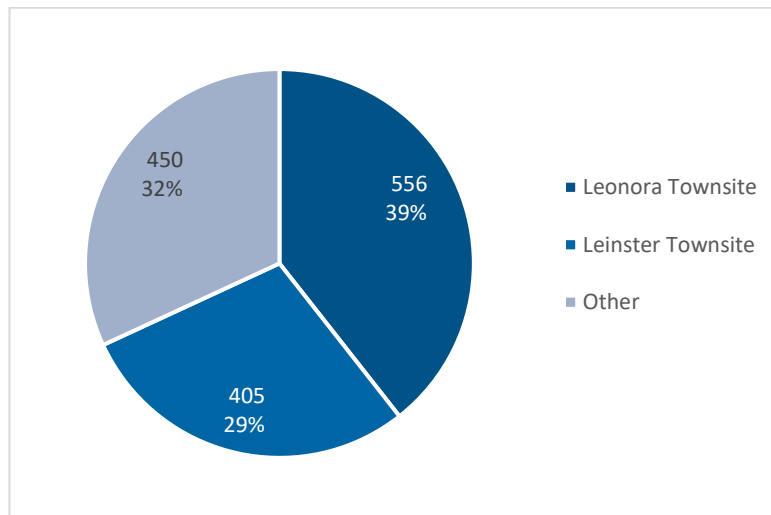
The data in Table 7 and the graph in Figure 12 depicts the population growth pattern in the Shire over the past 15 years based on Census data. Following a period of decline from 2001-2006, the Shire experienced a significant population increase between 2006 to 2011, with an increase in resident population of 75 percent. This was followed by another period of decline, in which the population declined by approximately 1,100 persons, or 44 percent of the population. This decline is likely a result of suspended mining operations in late 2013, resulting in the loss of many jobs (GEDC 2016).

It is important to note that a large proportion of the Shire’s population comprises fly-in fly-out (FIFO) workers. The ABS estimates resident population in the Census using ‘place of usual residence’, meaning “the location where a person spends more than six months of the year”. Many FIFO workers will respond based on their interpretation of which location is their usual residence at the time of response. This effectively means a large portion of the population spending half of their time living in the Shire may not be captured and reflected in the population estimates.

Place of enumeration, on the other hand is based on the respondent’s location at the time of response. Notwithstanding, this may also only capture a portion of the FIFO workers, depending on individual work cycles. For example, the ABS Worker Population Profile for the Shire of Leonora estimated a workforce of 2,272 workers in 2016, while the Goldfields-Esperance Regional Investment Blueprint (Blueprint) estimated a population of 2,310 persons in 2016 compared to a total estimated resident population of 1,411 according to the ABS Housing and Population Census. Findings in the Blueprint suggest that more than half of the population in the Shire consist of non-residents, predominantly FIFO workers.

As the Census has not yet implemented a clear way to identify FIFO workers and this impact on population figures, it is important to look beyond the estimated resident population when evaluating population growth for regions with high numbers of FIFO workers. Nevertheless, the estimated resident population does provide an indication of growth pattern. In particular, it highlights the relationship between economic activity and resident population.

Table 7 and Figure 12 indicate projected growth for the Shire based on the WA Tomorrow forecasts (looking at Band C, the median growth scenario). These projections estimate an almost doubling of the Shire's population between 2016 to 2021 before tapering off to a moderate increase of 20 people from 2021 to 2026. It should be recognised that the WA Tomorrow forecasts were developed in 2015, prior to the 2016 Census.



**Figure 14 Resident Locations (ABS 2017)**

The majority of the population within the Shire reside in either the Leonora or Leinster townsites, with the remaining 32 percent located in other areas (Figure 13).

As a 'closed' mining town, Leinster is one of two unique Western Australian mining communities. Leinster has a population of approximately 400 permanent residents with the remainder of the workforce on a fly-in-fly-out roster. The town is serviced by BHP Billiton's Leinster Nickel Operations (NLN) and Agnew Goldfields' mining operations. Residents of the town predominantly work for BHP Billiton, Agnew Goldfields, Thiess, Spotless or contract maintenance and service companies.

### Demographic Characteristics

A comparative analysis of the Shire against the Leonora and Leinster townsites, Goldfields Region and State provide insights into trends, challenges and opportunities that the Shire is experiencing or may experience in the future. Table 8 summarises the key demographic characteristics within each of the areas.

**Table 8 Comparative analysis of demographic characteristics**

Characteristics	Leonora*		Leinster*		Shire of Leonora**		Goldfields Region***		Western Australia	
<b>Population</b>										
Male	308	55%	267	66%	883	63%	20,800	53%	1,238,419	50%
Female	250	45%	138	34%	526	37%	18,295	47%	1,235,991	50%
<b>Total</b>	<b>556</b>		<b>405</b>		<b>1,411</b>		<b>39,097</b>		<b>2,474,410</b>	
Median Age	36		35		35		33		36	
<b>Aboriginal and Torres Strait Island Population</b>										
<b>Total</b>	<b>155</b>	<b>28%</b>	<b>8</b>	<b>2%</b>	<b>202</b>	<b>14%</b>	<b>4,794</b>	<b>12%</b>	<b>75,978</b>	<b>3%</b>
Median Age	23		29		26		24		23	
<b>Age</b>										
0-14	109	19%	53	13%	230	16%	8,682	22%	476,686	19%
15-24	62	11%	24	6%	118	8%	4,906	13%	310,329	13%
25-44	176	31%	187	47%	605	43%	12,886	33%	724,212	29%
45-64	159	28%	119	30%	378	27%	9,823	25%	617,002	25%
65+	57	10%	14	4%	81	6%	2,789	7%	346,185	14%
Dependency ratio (%)	31%		20%		28%		42%		50%	
<b>Income</b>										
Median household weekly income	1,319		2,250		1,810		1,980		1,595	
<b>Family Composition</b>										
Couple family without children	44	43%	27	43%	78	38%	3,136	35%	247,841	38%
Couple family with children	34	33%	30	48%	87	42%	4,357	48%	292,133	45%
One parent family	25	24%	6	10%	38	18%	1,367	15%	93,344	14%
Other family	-	0%	-	0%	3	1%	151	2%	10,869	2%
<b>Total</b>	<b>103</b>		<b>63</b>		<b>206</b>		<b>9,011</b>		<b>644,187</b>	
<b>Housing</b>										
Owned outright	30	18%	-	0%	40	13%	2,138	17%	247,050	29%
Owned with mortgage	23	14%	-	0%	20	6%	4,690	38%	344,014	40%
Rented	102	61%	78	94%	226	73%	5,120	41%	245,705	28%
Other/not stated	12	7%	5	6%	23	7%	437	4%	30,004	3%
<b>Total dwellings</b>	<b>241</b>		<b>199</b>		<b>527</b>		<b>15,060</b>		<b>999,641</b>	
Average household size	2		2		3		3		3	
Dwellings occupied	161	67%	82	41%	311	59%	12,379	82%	866,767	87%

\*Urban Centres and Localities

\*\*Local Government Area

\*\*\* Statistical Area Level 3

## Population

The gender disparity in the Shire of Leonora population, 63 percent males and 37 percent females, can be partly attributed to the prevalence of mining and labour job opportunities in the area, which have historically been male dominated industries.

The Leonora townsite demographic profile, including age and gender distribution, median income and housing characteristics is more comparable to the state average than both the Shire and Goldfields regional demographic profile.

In contrast, the Leinster townsite characteristics are vastly different from the state average, with the highest gender disparity, percentage of persons aged between 25 and 44, and weekly income. Consistent with the nature of the town as a 'closed' mining town, the high income levels and age distribution indicate a large proportion of the population within the townsite participate in the mining workforce. The gender disparity suggests that, despite the services provided, it is difficult to attract families to Leinster, rather than individuals participating in the mining workforce through FIFO.

The Shire experiences a high population turnover rate, with 64 percent of current residents having recently moved to the region in the past five years as compared to the WA average of 44 percent. The Blueprint reveals that the Shire experiences an average annual turnover of approximately one-in-six residents compared to the average of one-in-ten across the State.

### Aboriginal population

The median age of Aboriginal and Torres Strait Islander persons is considerably higher in Leinster (29) than the state average (23), however accounts for a small proportion of the overall Aboriginal and Torres Strait Islander population within the Shire. The overall average for the Shire remains higher than the state average at 26 years. Aboriginal and Torres Strait Islander persons make up 14 percent of the total population in the Shire of Leonora, almost five times higher than the state wide proportion (3%) and slightly higher than the regional makeup (12%). The majority of the Shire's Aboriginal and Torres Strait Islander population (77%) reside within the Leonora townsite. The average age for the Aboriginal and Torres Strait Islander population remains lower than the overall median age across all localities, this is linked to both higher fertility rates and higher mortality rates within the Aboriginal population.

It should be noted that, typically, Aboriginal and Torres Strait Islander people are underrepresented in census statistics.

## Age

The average age of residents within the Shire fell from 33 in 2001 to 31 in 2006, and has since climbed back to 35 based on the 2016 Census estimate. The current estimated median age has closed the gap between the State average (36 years for the past decade) while remaining slightly above the average age for the region (33).

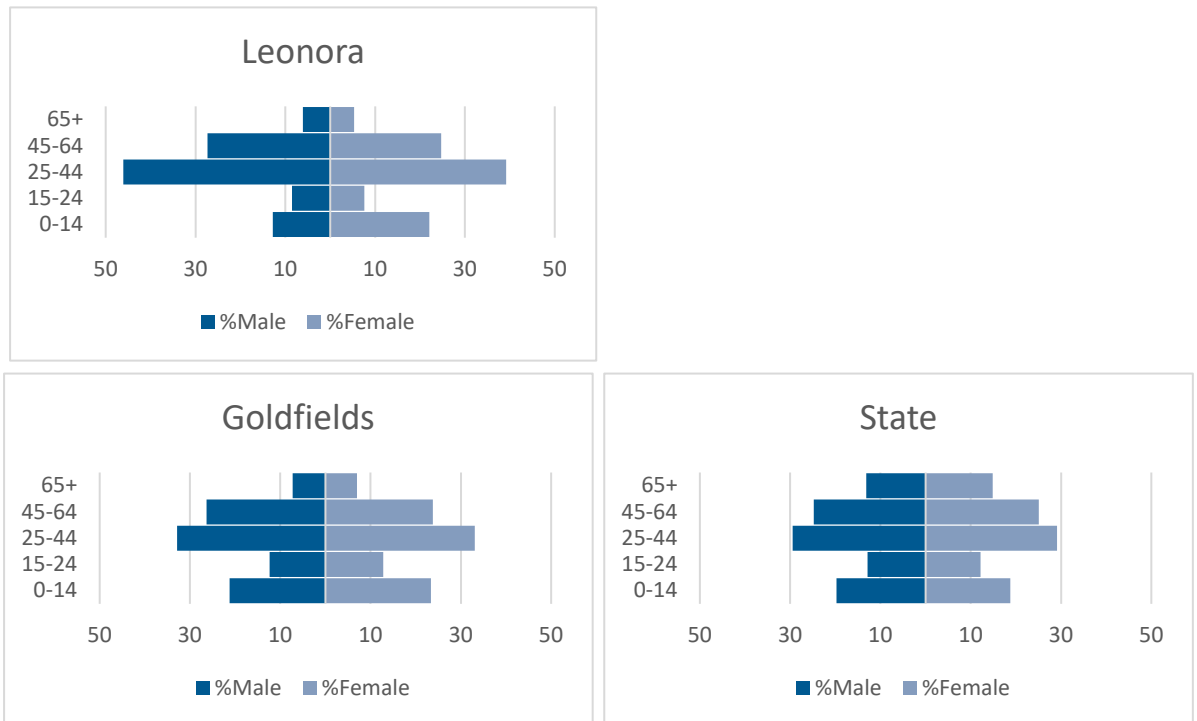
The Shire of Leonora age structure reveals an underrepresentation of the 65+ and 15-24 cohorts and an overrepresentation of the 25-44 age group. The overrepresentation of 25-44 age group in the Shire is likely to be associated with people employed in the labour workforce. The underrepresentation of the 65+ age group is likely linked to retirees seeking living arrangements in areas with additional amenities and services for an aging population. The underrepresentation of the 15-24 cohort is likely attributable to persons seeking increased education and lifestyle opportunities outside of the Shire.

The Leinster townsite (47%) reflects a significantly higher proportion of persons aged between 25-44 than the State average (29%) while the Leonora townsite was much closer at 31 percent.



This demonstrates the difference between the two settlements, with more diversity and permanent population in Leonora (Figure 14).

The dependency ratio (ratio of persons aged 0-14 and 65+ to persons aged 14-64) for all areas was significantly less than the State average (50%), particularly in the case of Leinster townsite (30% less). This difference is likely attributable to the industry workforce within the Shire.



**Figure 15 Age profiles (ABS 2017)**

### Income

The median household weekly income for persons living in the Leinster townsite (\$2,250) is significantly higher than the State average (\$1,595). In contrast, the average household income for the Leonora townsite (\$1,319) is far less than Leinster townsite, and below both the State and regional average (\$1,980). Because of this disparity, the overall Shire average weekly income (\$1,810) remains higher than the state average however falls below the average for the Goldfields region (\$1,980).

The median individual weekly income for the Shire of Leonora is double the State average at \$1,443, and significantly higher than the regional average of \$938 (Table 9). Despite the high average income in the Shire, the median total personal income per week in the Leonora townsite is only \$717, highlighting the disparity in income distribution across the Shire.

More than a third of residents in the Shire who stated their income are classified as high income earners (\$1,750 or more) compared to 26 percent in the region and 17 percent across the State. The number of low-income earners (less than \$500) is 16 percent in the Shire compared to 23 percent in the Goldfields and 28 percent across Western Australia. Within the Shire, there is once again a stark contrast between the Leonora townsite and Leinster townsite. In Leonora, 31 percent of individuals who stated their income are low-income earners, while in Leinster this figure drops to five percent. Almost half of the respondents in the Leinster townsite are high-income earners (45%).

**Table 9 Individual weekly income (ABS 2017)**

Income (per week)	Shire of Leonora		Goldfields Region		Western Australia	
Negative/Nil income	55	6%	2,771	11%	202,459	11%
\$1-\$499	139	16%	6,033	23%	502,555	28%
\$500-\$999	122	14%	4,665	18%	409,512	23%
\$1,000-\$1,749	194	23%	5,750	22%	390,378	22%
\$1,750+	336	39%	6,644	26%	301,483	17%
Median income	\$1,443		\$938		\$724	

## Housing

Renting is the most common form of housing occupancy in the Shire.

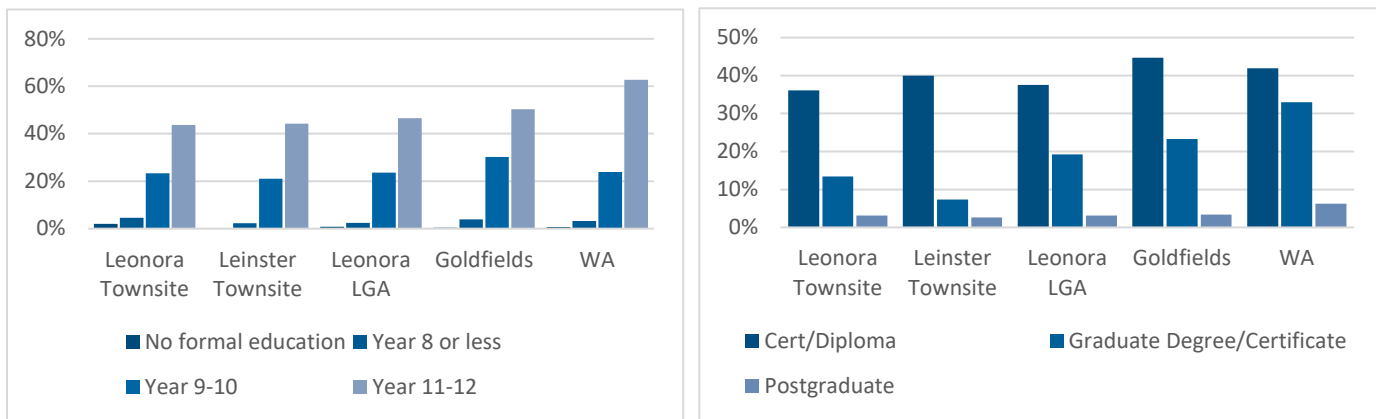
No dwellings were owned either outright or with a mortgage in the Leinster townsite in 2016, as no dwellings are available to be owned.

Leonora includes a large percentage of rental properties (61%), compared to the number of dwellings owned outright (18%) or with a mortgage (14%). The high proportion of rental dwellings in the Shire is a reflection of both the transient FIFO population and the socio-economic status of some community members.

The Blueprint suggests that periods of high growth create acute demand for housing, which leads to challenges in attracting and retaining a workforce, particularly outside of the mining sector in lower wage positions. Conversely, when mining operations are suspended, or there is a downturn in the economy this can lead to a surplus of housing infrastructure (GEDC 2016).

## Education and skills

Leonora and Leinster both fall behind the State average for completion of secondary school across all year groups (Figure 15). The Shire's completion rate for Year 11 and 12 (or equivalent) at 47 percent, falls below the State by 16 percent, and lags behind the region average by 3 percent. The percentage of the population in the Shire achieving a tertiary qualification falls short of the state average across all categories. In particular, the likelihood of persons in the Shire obtaining a graduate qualification (Bachelor, Graduate Diploma) is 11 percent less than the WA average (30%) (Figure 15). Notably this translates to around 13 percent in the Leonora townsite, and just 7 percent in Leinster. The percentage of persons seeking postgraduate qualifications is 3 percent across Leonora and Leinster townsites, as well as the overall Shire average commensurate to the Goldfields regional average. This represents half the number of people achieving postgraduate qualifications within Western Australia.



**Figure 16 Attained education levels (ABS 2017)**

### 3.3.2 Population projections

Population projections, for local government areas, have been determined by the State Demographer and are outlined in the WAPC's *Western Australia Tomorrow Population Report No. 11* (2019) document. The Shire of Leonora's projections are shown in Table 10.

**Table 10 Shire of Leonora – WA Tomorrow 2026 population forecasts (WAPC, 2019)**

WA Tomorrow forecast bands	2026 forecast population	Additional population*
Band A	870	-1,760
Band B	1,145	-1,485
Band C	1,285	-1,345
Band D	1,415	-1,215
Band E	1,740	-890

\*difference between ABS 2014 preliminary estimated residential population.

### 3.3.3 Housing projections

The majority of residents in the Shire reside in Leonora or Leinster. A land supply analysis has been prepared by the then Department of Planning (2016) which examines land supply and the residential land requirements to accommodate future populations. Table 11 outlines the area of developed land and land capable of substantial further development for residential, rural residential and rural smallholdings.

**Table 11 Development status of land (DoP 2016)**

	Total	Developed (ha)	Capable of substantial further development (ha)
Residential and future residential (total)	108	85	23
Leonora townsite	58	35	23
Leinster townsite	50	50	0

	Total	Developed (ha)	Capable of substantial further development (ha)
Rural residential and future rural residential (total)	0	0	0
Leonora townsite	0	0	0
Leinster townsite	0	0	0
Rural smallholdings and future rural smallholdings (total)	0	0	0
Leonora townsite	0	0	0
Leinster townsite	0	0	0

The *Central Regions Land Capacity Analysis* noted that there is no developed or future land identified for rural residential development. Whilst the analysis did not recognise land zoned as Rural A, which in essence is a rural residential zone, there is, nevertheless, no undeveloped rural residential land available in Leonora. Conversations with community members identified that greater choice is desired, in particular the opportunity to live on larger lots outside the main residential areas of Leonora.

Table 12 examines the additional residential land required to accommodate the projected population. The land requirements have been examined using three different density codes. In all scenarios, there is sufficient land available to accommodate additional residential development.

**Table 12 Shire of Leonora – estimated additional residential land requirements to accommodate population forecasts (DoP 2016)**

Residential <sup>1</sup>								
WA Tomorrow forecast bands	Additional population	Current and future land capable of substantial further development (ha) <sup>2</sup>	R10 average density		R20 average density		R30 average density	
			Est. land required to accom. additional population (ha) <sup>3</sup>	Surplus (ha) <sup>4</sup>	Est. land required to accom. additional population (ha) <sup>3</sup>	Surplus (ha) <sup>4</sup>	Est. land required to accom. additional population (ha) <sup>3</sup>	Surplus (ha) <sup>4</sup>
Band A	-130	23	0	23	0	23	0	23
Band B	-10	23	0	23	0	23	0	23
Band C	90	23	5	18	3	20	2	21
Band D	180	23	11	12	5	18	4	19
Band E	330	23	20	3	10	13	7	16

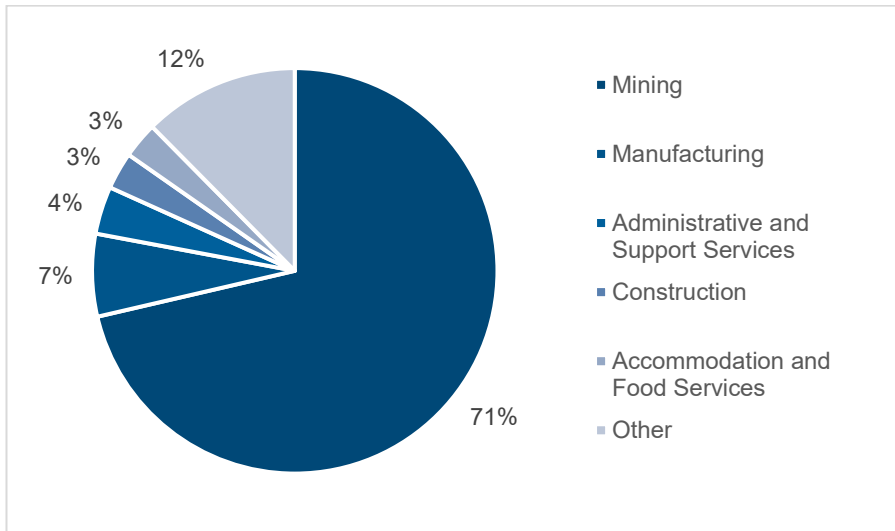
Growth in the mining industry will create more demand for mining accommodation. This should be accommodated within the Leonora townsite in order to support local retail and commercial businesses as well as contribute to the social vibrancy of the town. As determined in the tables above, there is sufficient land within the Leonora townsite to accommodate this growth.

Population growth may trigger the need to upgrade existing schools or provide additional school sites. Where required, additional school sites should be provided in accordance with the Western Australian Planning Commission's *Development Control Policy 2.4 - School Sites* and Objective 8 of *Liveable Neighbourhoods*.

### 3.4 Economy and employment

The Goldfields-Esperance region's Gross Regional Product (GRP), or net wealth, was estimated at \$6.91 billion for 2016-17, constituting 2.79 percent of the Gross State Product. The Shire of Leonora contributed 10 percent of the region's GRP (\$697.398 million).

The Goldfields Esperance Development Commission (GEDC) identified 2457 jobs in Leonora in 2016-17 (compared to 2272 revealed in the ABS 2016 Census). The economic base for the Shire is heavily reliant on Mining and Manufacturing, making up 85.5 percent and 12 percent of the Shire's exports, respectively. This is comparable to the regional exports for Goldfields-Esperance, where Mining makes up 87.7 percent and Manufacturing 11.2 percent.



**Figure 17 Industry of employment (ABS 2017)**

Figure 16 breaks down the industry of employment by occupation of workers in the Shire of Leonora. Mining is by far the most significant employer in the Shire, making up 71 percent of total employment. The balance is made up of manufacturing (7%), administrative and support services (4%), construction (3%) and accommodation and food services (3%).

The Department of Mines, Industry Regulation and Safety (DMIRS) reveals 27 mines in operation within the Shire, 16 of which mine gold as their primary commodity. Within the mining industry, more than 40 percent of participants are Machinery Operators and Drivers, Technicians and Trade Workers make up 29 percent of the work force, with professionals and managers contributing to 15 percent and six percent of the employee mix, respectively.

The *Goldfields Esperance Regional Investment Blueprint* (2016) outlines the following data for Shire of Leonora relating to economics and entrepreneurship (Table 13).

**Table 13 Economic indicators (GEDC 2016)**

Indicator	Leonora
<b>Economic fundamentals and sustainability</b>	
Local businesses	19.9
Business turnover	\$9,743
Long term unemployment	4.0%
Youth unemployment	3.4%
Economic diversification rating	0.07
Welfare dependence	8.8%
Senior dependency ratio	3.9%
<b>Entrepreneurship and innovation</b>	
New business start-ups	14.0%
Non-employed microbusinesses	25.9

Indicator	Leonora
<b>Economic fundamentals and sustainability</b>	
Income source own business	\$12,525
Local economic	0.1
Local patenting rating	0.0
Small businesses	13.9
Human resources in science and technology	1.6%

### 3.4.1 Industrial uses

The CRLCA identifies the amount of land within Leonora and Leinster that has been developed for industrial uses as well as the land capable of substantial further development (Table 14).

**Table 14 Development of land status (industrial)**

Industrial land	Total	Developed (ha)	Capable of substantial further development (ha)
Leonora Townsite	27	15	12
Leinster Townsite	7	6	1
Total	34	21	13

Data source: Department of Planning 2016

A large component of the western side of the Leonora town is currently zoned industrial. The area consists predominantly of light industry and workers accommodation. These land uses are essential to support the mining and construction industries within the Shire.

The CRCLA identifies 12 hectares capable for further industrial development however this land is located adjacent to accommodation uses which affects its suitability for industrial use. The areas are also located on mineralised land and subject to mining leases, therefore not available for industrial development.

One hectare has been identified capable for further industrial development within the Leinster townsite. As specified in section 4.3.3 of Part 1, planning and land use for Leinster is managed by BHP Billiton, therefore the development of any future industrial land will be determined by BHP Billiton.

### 3.4.2 Other economic opportunities

#### Diversification of pastoral lands

Pastoral leases cover the vast majority of the Shire, however much of this land is impacted by operating, proposed and undeveloped mining and resource areas. Activities on pastoral lease areas need to be undertaken in accordance with the pastoral lease. Other activities outside this will require a Diversification Permit, which is granted under Part 7, Division 5 of the *Land Administration Act 1997*. Diversification Permits could provide opportunities for new employment industries and economic diversity.

## Tourism

There is an opportunity to grow the Shire's tourism industry. This is further discussed in section 4.6.

## Waste

The Shire is currently considering a potential proposal for a Federal hazardous waste disposal site in the Shire. The Federal Government has not determined a preferred location for the facility; however, there may be a site in the Shire which may be suitable. Further investigation would be required to consider this option. Should this be a viable option, considerable consultation would be required as it is envisaged that there would be community and environmental considerations to be addressed. The waste facility could have the potential to generate new employment opportunities.

## 3.5 Retail and commerce

Leonora is identified as a sub-regional centre in the *Goldfields-Esperance Regional Planning and Infrastructure Framework* (WAPC 2015) and notes that the retail services provided generally cater to the day to day needs of the service population.

Retail uses in Leonora are focussed on Tower Street and include an independent supermarket and Coles express, butcher (order based, not open for general business), pharmacy, op shop, newsagent/liquor/hardware and general store, post office, two roadhouses/service stations (including restaurants), nursery/garden centre, furniture/knickknacks store, cafe, accountant and TAB. There are a number of vacant retail premises. Many community members travel to Kalgoorlie for shopping.

The shopping facilities in Leinster include a supermarket, beautician, post office, service station, newsagency, coffee shop, hairdressing salon and nursery.

The *Goldfields Esperance Regional Investment Blueprint* (2016) outlines that there are 19.9 local businesses in the Shire of Leonora.





**Figure 18 Commercial development**

### 3.6 Tourism and visitors

#### 3.6.1 Visitor numbers

There is no data available for the Shire alone; however, Tourism WA has prepared a fact sheet relating to the Goldfields Esperance region. The key findings are summarised below (Table 15).

**Table 15 Goldfields-Esperance tourism statistics (Tourism WA 2018)**

Indicator	YE Dec 2015/16/17 annual average visitors
Estimated visitors	
Intrastate	555,400
Interstate	86,700
International	34,300
Total	676,400
Purpose of visit – estimated domestic visitors	
Business	300,000
Holiday	202,600
Visiting friends and relatives	99,200

Indicator	YE Dec 2015/16/17 annual average visitors
Other	45,100
Purpose of visit – estimated international visitors	
Holiday or leisure	25,800
Visiting friends and relatives	5,100
Business	1,500
Other	2,700
Top three accommodation choices – estimated domestic visitors	
Hotel/resort/motel or motor Inn	184,900
Other accommodation	121,700
Caravan or camping – non commercial	104,100
Top three accommodation choices – estimated domestic visitors	
Caravan park or commercial camping ground	8,900
Hotel/resort/motel or motor inn	8,00
Caravan or camping – non commercial	7,100

### 3.6.2 Existing tourism attractions and events

#### Gwalia Ghost Town

The Gwalia Ghost Town is one of the Shire’s key tourist attractions. Gwalia provides a unique and interactive snapshot into life during the operation of Gwalia Mine. There are existing facilities and activities that exist to showcase this one of a kind town. The Shire should continue to support the tourism opportunities surrounding the Gwalia Ghost Town.





**Figure 19 Gwalia Ghost Town**

### Leonora heritage trail

The Shire offers a self-guided heritage trail of 30 unique sites in the Leonora townsite. The walking tour is approximately 1.6 kilometres and takes approximately an hour to complete. Visitors to the town are able to download a digital interactive map onto their electronic devices or purchase a guide book from the visitors centre.

### Leonora loop trails

The Shire has prepared two trails – the Darlot Loop and Agnew Loop, which showcase stories from the region. Each trail has 15 stops with a story at each stop.

### Events

Leonora hosts a number of special events including:

- Leonora Golden Gift: A one-mile running race through the Leonora townsite and includes concerts, fireworks, children’s entertainment and activities.
- Leonora Cup

### Prospecting

Prospecting is a key tourism activity for the area. There could be opportunities to further develop this and educate visitors on the mining history of the town.

### Scenic driving

The natural landscape in the Shire is unique and beautiful, providing the perfect environment for scenic driving.



**Figure 20 Natural landscape**

### **3.6.3 Visitor accommodation**

Leonora offers a range of accommodation options for visitors, with each option catering to different visitor needs and budgets:

- Hoover House bed and breakfast – located at Gwalia;
- Leonora caravan park – grassed camping areas, powered sites, semi self-contained cabins and single rooms;
- Leonora Lodge – refurbished mining village;
- Central Hotel;
- Leonora Motor Inn;
- Whitehouse Hotel;
- Leonora Villas.

The Shire is considering the development of a new caravan park and overflow caravan parking area. This new development would provide visitors with increased accommodation options.

The Leinster townsite includes a caravan park, single person's quarters and a motel services. The accommodation caters primarily for the FIFO workforce.

### **3.6.4 Tourism opportunities**

Whilst Leonora currently serves predominantly as a service town for the region, there is an opportunity to capture and share the unique history and landscapes in the region through tourism ventures.

### **Local Aboriginal tourism**

Aboriginal culture is an important part of the identity of Leonora and its surrounds, and the community. There is an opportunity to develop cultural heritage tours that provide visitors with an understanding of Aboriginal culture and heritage in the local area.

### **Nature based tourism**

There are a number of beautiful areas outside Leonora that could support nature-based camping activities. Camping is offered at Malcolm Dam however, the facilities are basic. There is an opportunity to develop and enhance nature-based camping in and around Leonora to attract more tourists to visit and stay in the region.

### **Diversification permits**

Tourist growth can be supported on pastoral leases with diversification permits, although there are limited opportunities in proximity to Leonora townsite due to mineralisation and mining leases.

## **3.7 Community facilities**

Community facilities are concentrated within the Leonora and Leinster townsites. The two townsites are discussed below.

### **3.7.1 Leonora townsite**

Leonora is a sub-regional centre in the region and caters for the day to day needs of the local and regional population. As a result, there are a number of essential facilities and services provided in town.

#### **Local community services**

The Leonora town centre includes the following local community services (Shire of Leonora 2019):

- post office;
- Shire offices;
- Leonora child care;
- Information centre and library;
- Community Resource Centre;
- Sacred Heart Catholic Church;
- Leonora Christian Fellowship.

#### **Health**

There are a number of health facilities within Leonora including (data source: Department of Health 2019):

- Leonora Hospital;
- Leonora child health centre;
- Leonora community health services;
- Department for Child Protection and Family Support – Leonora;
- Leonora pharmacy;
- Goldfields community alcohol and drug service – Leonora – breaking the cycle;
- Leonora medical practice.



**Figure 21 Community facilities**

### Emergency services

In addition to the Leonora hospital, the town includes a police station and a local fire and rescue service. The police station covers the areas of Kookynie, Leonora, Menzies, Plumridge Lakes and Ularring (Police 2019). The town also includes a St John Ambulance volunteer sub centre (St John 2019).

### Education

Leonora contains a district high school, catering from kindergarten to year 12. Years 11 and 12 have a modified program of school delivery and School of Isolated and Distance Education options (Leonora District High School 2019).

### Public open space and recreation facilities

Leonora contains a number of recreational facilities including. The recreation centre includes (Shire of Leonora 2019):

- two air-conditioned squash courts;
- gymnasium;
- indoor basketball court (also used for indoor cricket, volleyball and badminton);
- Aquatic centre including 25 metre lap pool and 'fun pools';
- outdoor tennis and netball courts;
- grassed oval;
- change room facility.

In addition to the facilities provided at the recreation centre, the town also includes:

- 18-hole golf course and clubhouse;
- Go-cart club situated 1 km north of Leonora;
- Clay target shooting club;
- Horse racing dirt track 4 km from town;
- Lawn bowls facility.



**Figure 22 Recreation facilities**

### **3.7.2 Leinster Townsite**

#### **Local community services**

Given the smaller population of Leinster, it does not have as many community services available compared to Leonora, however it does include the following (Shire of Leonora 2019):

- post office;
- playground, art and craft centre;
- Leinster Church.

#### **Health and Emergency services**

There are two health facilities within Leinster including (data source: Department of Health 2019):

- Leinster medical centre;
- Leinster child health centre.

The town includes a resident doctor and Silver Chain Nursing Post staffed by two nurses (Shire of Leonora).

Leinster includes a local police station which covers the areas of Lake Darlot, Leinster and Sir Samuel (Police 2019). The town also includes a St John Ambulance volunteer sub centre (St John 2019).

#### **Education**

Leinster Community School is an independent public school catering from kindergarten to year 6. Secondary students study via the School of Isolated and Distance Education (Department of Education 2019). The school has approximately 100 students. In 2018 there were approximately 95 students between kindergarten and year 6 and four secondary students (year 7-11) (Leinster Community School 2019).



## Public open space and recreation facilities

Leinster contains a number of recreation facilities including (Shire of Leonora 2019)

- Olympic-size swimming pool;
- health and fitness centre;
- two air conditioned squash courts;
- basketball, netball and tennis courts;
- a grassed oval;
- air conditioned indoor sporting stadium;
- 18-hole golf course;
- race course.

## 3.8 Cultural Heritage

### 3.8.1 Native Title

The *Native Title Act 1993* is a national piece of legislation that recognises and protects native title. There are two claims within the Shire of Leonora listed on the Register of Native Title Claims, as detailed below (Table 16).

**Table 16 Native title claims**

Application name	Date filed	Tribunal file No.	Federal Court file No.	Date claim entered on register
Kultju	28/05/2018	WC2018/007	WAD225/2018	20/07/2018
Wutha	19/01/1999	WC1999/010	WAD6064/1998	15/06/1999

Data source: National Native Title Tribunal 2019.

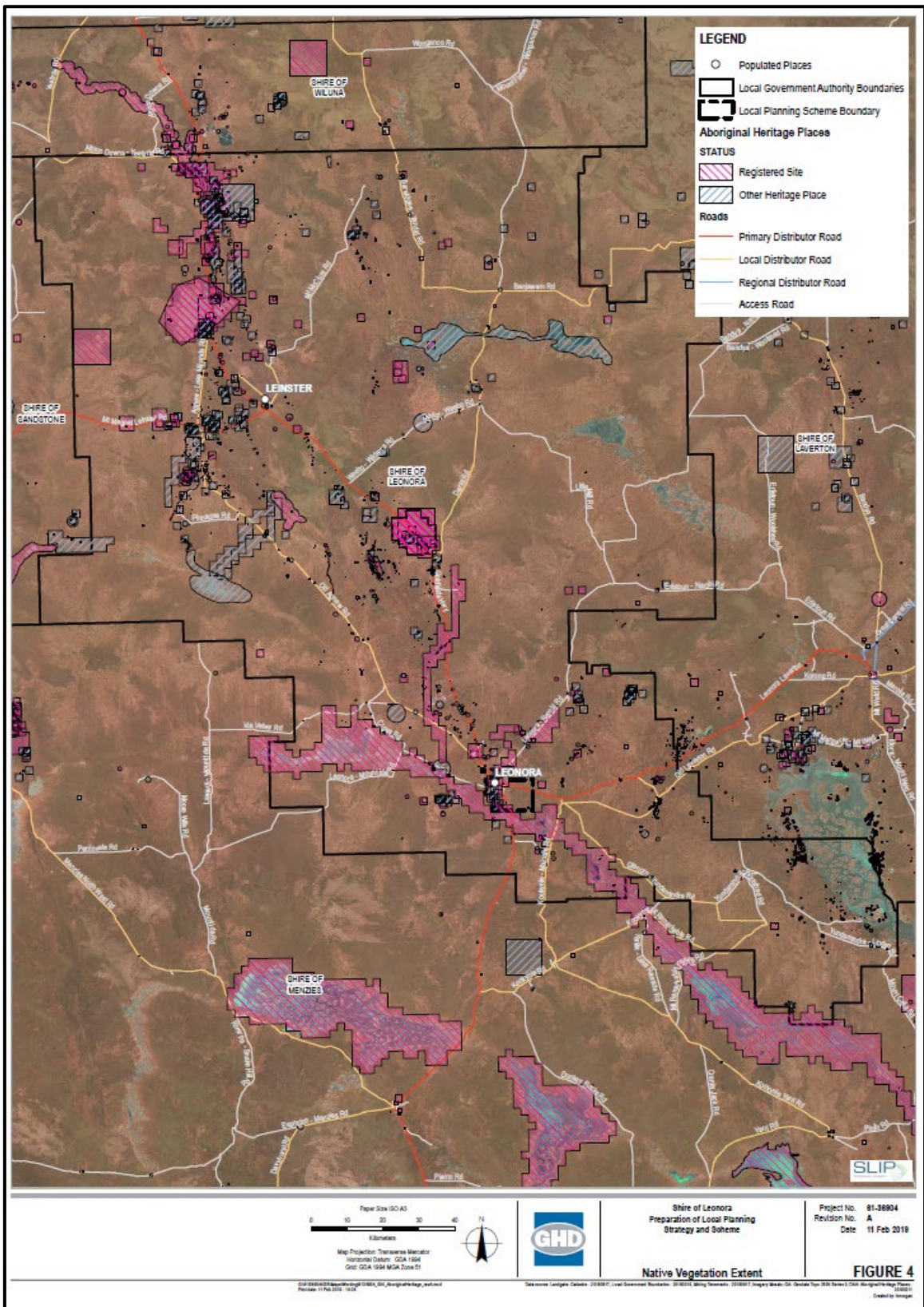
### 3.8.2 Aboriginal heritage

The *Aboriginal Heritage Act 1972* provides the legislation in Western Australia to protect Aboriginal sites. The Act allows register of sites to be maintained. Within the Shire of Leonora there are 701 Registered Aboriginal Sites as shown in Figure 22.

Anecdotal discussions with local community members, indicates that there are five main groups in Leonora. Many people used to live in pastoral areas and moved into town when stations closed. Mount Leonora and the local water courses are important cultural assets for the locals. A local women's group has been established to empower women and teach new skills (ABC News 2016)

Aboriginal art and culture is supported through the Walkatjurra Cultural Centre in Leonora. The centre provides two key activities:

- Walkatjurra Ranger Group – 'The Ranger group provide opportunities for community members to undertake cultural maintenance activities, for youth to learn and for elders to promote their culture to others and develop opportunities for training and livelihoods based on cultural experiences.' (Walkatjurra Cultural Centre 2019); and
- Walkatjurra Art Project – 'The Cultural Centre works with artists in the community to develop their work, market and sell their work.' (Walkatjurra Cultural Centre 2019).



**Figure 23 Registered Aboriginal Sites**

### 3.8.3 European heritage

A desktop search of the Heritage Council’s inherit database, identifies 95 heritage places including 47 that are on the State Register of Heritage Places (Heritage Council 2019).

Heritage places can be recognised through two means:

- Municipal Heritage Inventory (MHI) – MHI's are adopted under the Heritage Act 2018 and identify heritage assets and provide direction for dealing with heritage matters (Heritage Council 2019).
- Heritage List – Heritage Lists are established through the Planning and Development (Local Planning Schemes) Regulations 2015. Places listed on the Heritage List are often of higher significance and require additional protection through planning provisions (Heritage Council 2019).

The Shire adopted a MHI in 1997 that identifies places that are or may become, of cultural heritage significance to the Shire. The Shire does not have an adopted heritage list, however, there is an opportunity to establish a heritage list from those places on the MHI to recognise and protect valuable cultural heritage assets in Leonora.

## **3.9 Rural land use**

### **3.9.1 Mining**

The establishment of Leonora has a long history founded on mining exploration and the discovery of gold in the region. Explorers, John Forrest and party, moved through the area in 1869, camping near a hill which they named Mount Leonora. By 1896 mining claims were made and gold discovered in the region. This led to the establishment of the twin towns of Leonora and Gwalia. Leonora was connected to Kalgoorlie by rail in 1902 and still operates to date. At one point, Leonora was the largest centre on the North-Eastern Goldfields. Following World War II labour shortages were a great concern for the Sons of Gwalia. In 1963, the mine was closed due to the quality of the ore specified in a geological report.



**Figure 24 Mining activity**

Following the mine closure, the population of both Gwalia and Leonora declined. Leonora has remained an active town due to alternative economic based district administration, rail head and supply centre. Gold mining at Gwalia re-emerged in 1980 following an increase in gold prices.

Nickle mining also began in the Shire in 1979 at Agnew. The workforce associated with the mine reside in Leinster. In addition to this, 60 km north west of Leonora is a Teutonic Bore with lead, silver and zinc deposits.

The majority of the Shire area is located within a primary mineralised area, and mining remains the predominant land use on the rural lands. As described in section 1.1, this has implications for the operation of the local planning framework which has restricted influence over mining uses as a result of various pieces of legislation.



**Figure 25 Mining and the rural landscape**

### **3.9.2 Pastoral land uses**

Rural land within the Shire that is not impacted by mining tenements is generally managed by pastoral leases. Activities and land use on pastoral lands is to be in accordance with the pastoral lease. Other activities outside this will require a Diversification Permit, which is granted under Part 7, Division 5 of the *Land Administration Act 1997*.

Cattle is the primary stock for pastoral stations in the Shire (Shire of Leonora 2017).

## **3.10 Urban Design**

### **3.10.1 Leinster**

The Leinster townsite is entirely owned and managed by BHP Billiton. The townsite is logically laid out with the shopping facilities in the centre of town with residential areas surrounding the centre. The residential houses are of a similar character and there is some additional accommodation which supports single FIFO workers and resident families.

Despite the desert locality of the townsite, the streets are green with well-established trees.



**Figure 26 Leinster townsite**

### **3.10.2 Leonora**

The Leonora townsite is focussed around the Main Street of Tower Street – the commercial and retail centre of town. Tower Street has a quaint character with predominantly single storey commercial buildings. Whilst the street has some key features typically seen in activated town centres – large windows to the street enabling surveillance, wide footpaths, awnings and architectural character features, the town centre lacks vibrancy. There are a number of vacant tenancies in town which disrupts the built form cohesion. The urban form has responded directly to a number of a social issues. As a result of vandalism, many shop frontages have bars over the windows which reduce the street activation. There is also minimal street furniture in town due to maintenance concerns by Council.



**Figure 27 Leonora townsite**

There is centre zoned land fronting Otterburn Street however the area is not used for retail and rather a combination of mixed use, light industrial uses, some residences, and truck parking.

The centre lacks a central node for social interaction and passive recreation such a civic square or an area of public open space. A space such as this could facilitate better integration of Aboriginal culture and identity in town and provide a public place for locals to meet. There are opportunities for the Shire to work with local families and community groups such as MEEDAC to engage the community in stewardship and maintenance and promote a sense of ownership and pride of place. There is also an opportunity to revitalise the town through signage and public art that celebrates local Aboriginal culture.

Tower Street bisects the town into two key areas. The western hemisphere of Leonora is characterised by industrial uses, predominantly transport depots and service industry e.g. plumbing. In addition to formal workers accommodation sites in the area, most businesses have some form of accommodation on site due to the needs of local business. Businesses are reliant on FIFO workers, and maintaining housing elsewhere in town for FIFO workers is not viable for small businesses.



**Figure 28 Service industries**

The oval is located west of the light industrial area and not well connected to the town centre. In order to access it, the freight line needs to be crossed.

The eastern side of town is predominantly a residential area, characterised by low density housing. The character and quality of housing varies in town and there are issues of vacant houses being vandalised. There is a significant amount of social housing in town. A new urban expansion area is located in the south-east area of town which consists of newer housing.



**Figure 29 Residential development**

### **3.11 Traffic and transport**

The Leonora town site is located at the intersection of Goldfields Highway and the Laverton-Leonora Road, which are both sealed. Main Roads WA data suggests that current traffic volumes on each of these Primary Distributor roads are typically less than 500 vehicles per day. A number of other minor roads lead in to the town site, though they mainly serve to connect nearby towns and stations, and do not carry large volumes of through regional traffic.

Presently, there is an informal gravel track located on the north-eastern edge of the town, between the Laverton-Leonora Road and Leonora-Nambi Road, which connects through to Goldfields Highway. This route is effectively serving as a partial bypass, though the dust created by vehicles using the road is a nuisance to nearby landowners. Heavy Vehicles are particularly likely to use this route due to the easier turning movements compared to going through the town centre on legally gazetted roads. Ongoing consultation with local services providers is encouraged to determine the infrastructure required to support future growth areas, including an appropriate sealed standard bypass road for heavy vehicles.

All roads through the town centre are 50 kilometres per hour, increasing to the regional default (110 km/h) outside of the immediate town site. The town site has a typical footpath network for a



regional town. Over time, improvements to the footpath network should further improve walking and cycling access within the town site.

The town and nearby mining centres are linked by a network of bulk commodity freight railways, which connect through to Kalgoorlie. Currently, there are privately operated coach services between Leonora and Kalgoorlie operating at weekly frequencies.

Leonora's airport provides direct access to the town by air by charter operators. A private airport services Leinster.



**Figure 30 Leonora airport**

## **3.12 Infrastructure services**

### **3.12.1 Infrastructure services**

All Infrastructure Services in Leinster are provided by BHP Billiton. The following services description discusses public services provided to Leonora. It is evident that an opportunity exists to upgrade services to existing and future development in the Shire. Consultation with services providers is necessary to enable this.

The Leonora town water supply is sourced from the Station Creek wellfield, located approximately 12 kilometres north of Leonora. The wellfield is operated by the Water Corporation and consists of 12 production bores and 17 monitoring bores. Water is abstracted up to 70 m below ground level and pumped to a collector tank adjacent to the Station Creek pump station. From the pump station the water is transferred to the Mount George storage tank about 8 km north of Leonora.

Approximately half the water from the Mount George storage tank is treated at a reverse osmosis plant located about 3 kilometres west of Leonora. The remaining water bypasses the desalination plant and is dosed with Calgon to reduce scaling caused by hardness. The two streams of treated water are blended, chlorinated to disinfect the water and then stored in the desalination treated water tank. Water is pumped from this tank to the Leonora and Gwalia town reticulations and the local Buttress and Gwalia tanks.

The Leonora Water Reserve was proclaimed in 1990 under the *Country Areas Water Supply Act 1947* (WA) for the purpose of public drinking water source protection.

In 2000 the Water and Rivers Commission prepared the Leonora Water Reserve draft drinking water source protection plan (Water and Rivers Commission 2000a).

### 3.12.2 Sewerage

Leonora town is partially reticulated with the majority of houses/ lots still using septic tanks for basic treatment of domestic wastewater.

A sewerage infill scheme was initiated by the Water Corporation but due to the higher costs of the scheme compared with original estimates and available State Government funding, the project did not proceed.

Effluent from the existing sewerage network is currently treated by a series of ponds located west of the town.

### 3.12.3 Power

Power is supplied to the townsite via a standalone power system which consists of five reciprocal gas gensets to provide an overall operating capacity of 3.2 MW. Gas is supplied to the power station via the Leonora Gas Pipeline that was constructed in 2000. The Leonora gas delivery station is adjacent to the power station site and contains heating, pressure reduction, filtering, pressure relief and emergency shut down facilities.

The power station is located to the west of the main townsite on the corner of Leonora-Mt Ida Road and Rajah Street. There are three feeders to distribute electricity to the townsite.

An independent power producer (IPP) manages and operates the power station facility. Horizon Power own and operate the 11 kV power distribution network.

### 3.12.4 Telecommunications

There are 351 residential connections and 21 commercial and industrial connections within Leonora.

There is limited data available relating to telecommunications for the Shire, however the *Goldfields-Esperance Regional Investment Blueprint* (GEDC 2016) provides the following data on digital connectivity for the Shire of Leonora (Table 17).

**Table 17 Digital connectivity (GEDC 2016)**

Digital connectivity	Shire of Leonora
Broadband access rating	6.3
Mobile coverage*	57%
Quality of mobile internet access	1.0
Household internet connectivity **	76.1%

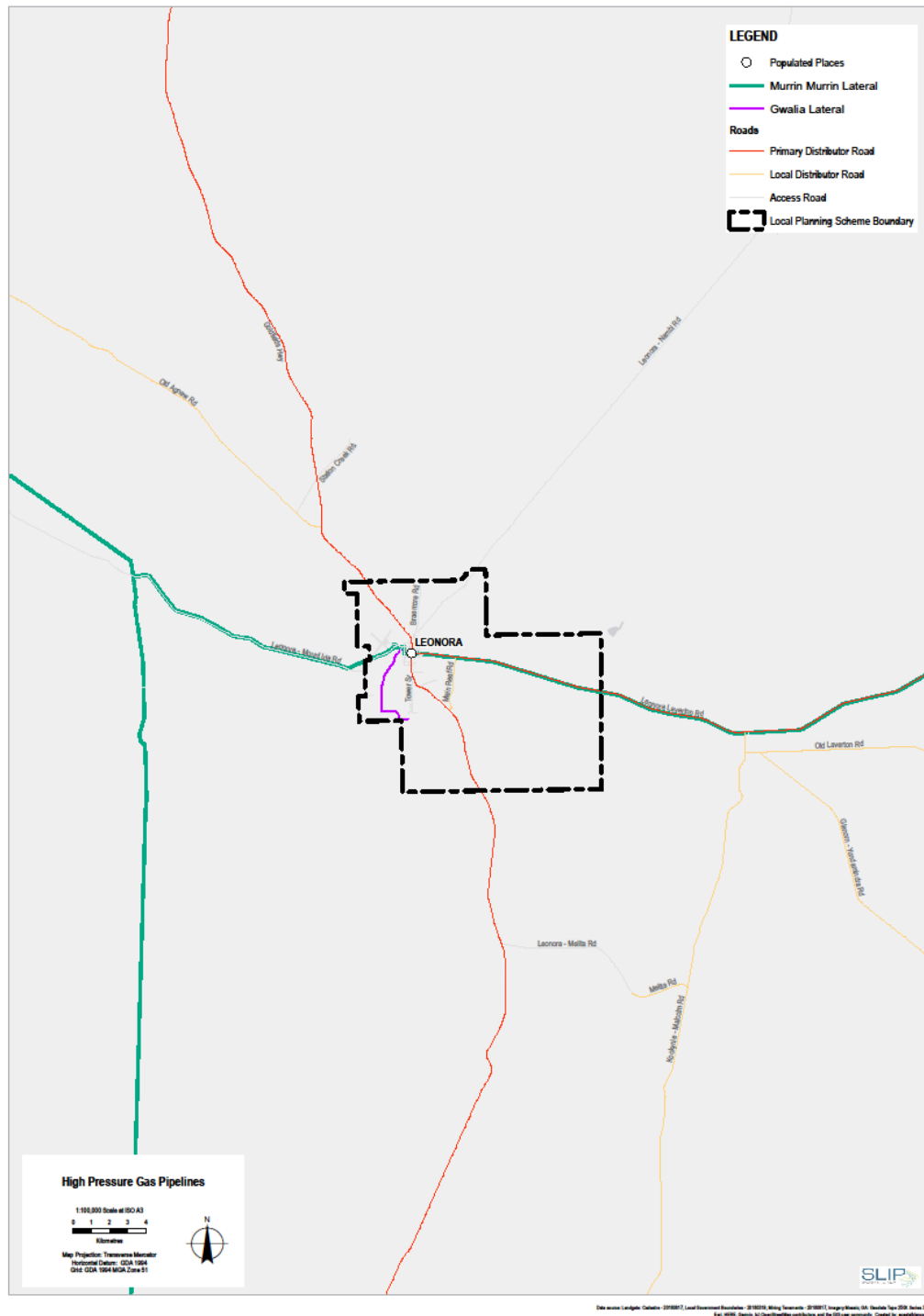
\*Percentage of area with 3G coverage

\*\* Percentage of households with internet connection

It is recommended that ongoing dialogue with local services providers is encouraged to foster the growth of digital infrastructure services to the Shire.

### 3.12.5 High Pressure Gas Pipelines

There are a number of high pressure gas pipelines that traverse the Shire of Leonora as depicted on Figure 31. Any future subdivision and/or development within the zone of influence surrounding these pipelines may need to address the policy measures outlined in the Western Australian Planning Commission’s draft *Development Control Policy 4.3 – Planning for High-Pressure Gas Pipelines* (2016).



**Figure 31 High Pressure Gas Pipeline Locations**

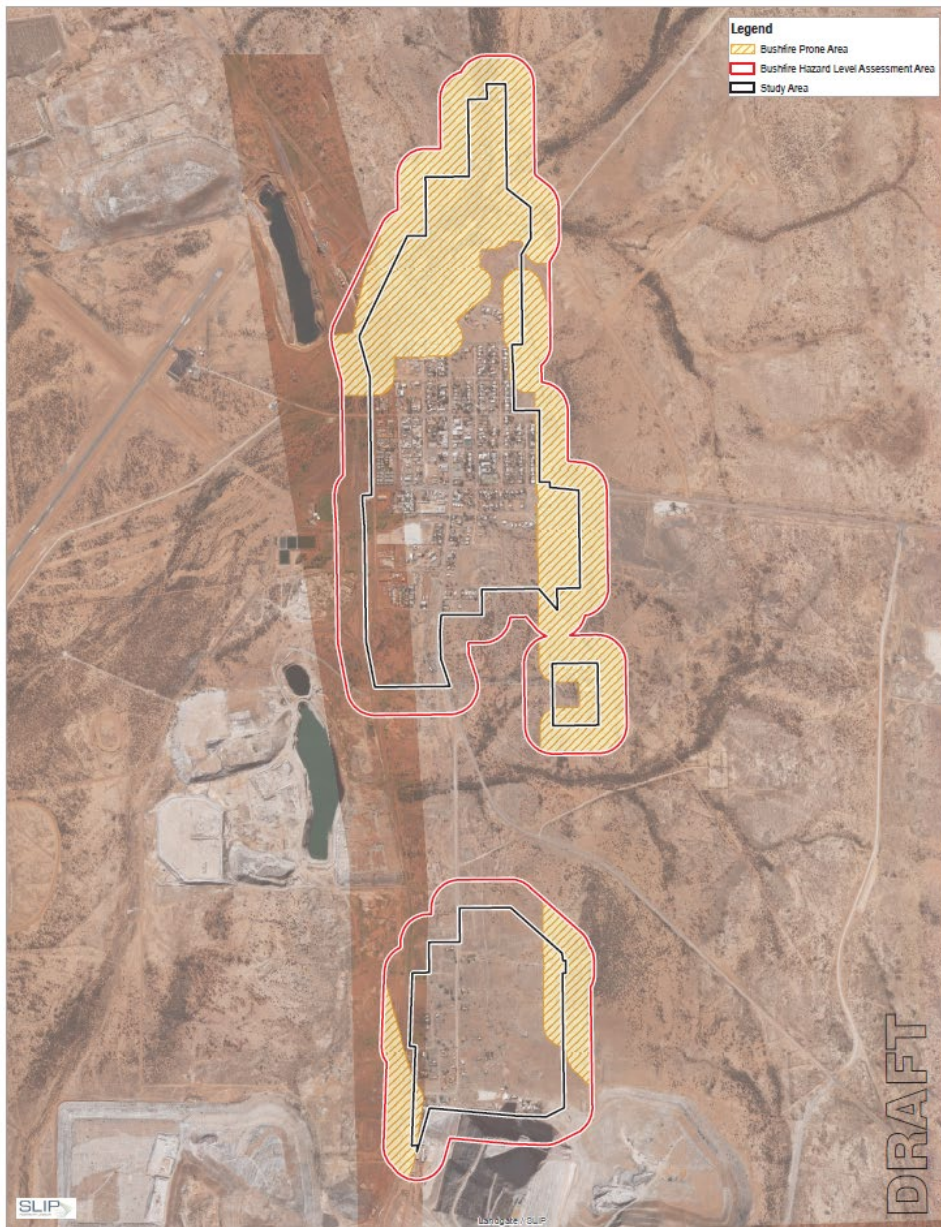
### **3.13 Bushfire hazard**

Bushfire risk is a key planning issue in Western Australia. *State Planning Policy No. 3.7 Planning in Bushfire Prone Areas* and the *Guidelines for Planning in Bushfire Prone Areas* sets out the framework to manage bushfire risk within planning processes and decisions. Local planning strategies integrate consideration of bushfire risk through a bushfire hazard level assessment.

A bushfire hazard level assessment was undertaken for the Leonora and Gwalia townships to consider how bushfire risk may influence future development.

#### **3.13.1 Proposal details**

The local planning strategy strategic plan does not propose any intensification of land use or land use change in the bushfire prone area within the existing Leonora township. However, existing, undeveloped residential zoned land within the Leonora township falls within the mapped bushfire prone area, as shown in Figure 30.



**Figure 32 Map of Bushfire Prone Areas for Leonora townsite**

### **3.13.2 Environmental considerations**

Environmental attributes of the land surrounding the Leonora townsite are described in Section 3.1.

Based on the nature of the vegetation and the residential density codes of the scheme in the residential expansion area, it is anticipated that future development will involve the clearing of vegetation to facilitate residential development.

### **3.13.3 Bushfire assessment results**

The bushfire hazard level assessment was undertaken in accordance with Appendix 2 of the *Guidelines for Planning in Bushfire Prone Areas* (as amended).

The bushfire hazard level assessment area was determined as all land zoned for residential, industrial or commercial purposes in the Leonora and Gwalia townsites, plus 150 metres.

Vegetation in the study area was classified in accordance with Table 2.3 of *AS3959-2009* (as amended) and the *Visual Guide for Bushfire Risk Assessment in Western Australian*

(Department of Planning, 2016). The classification of vegetation was based on interrogation of the most recently available aerial photography, verified by numerous field assessment points.



Consistent with the broad-brush nature of a bushfire hazard level assessment, the most appropriate vegetation classification was determined for contiguous stands of vegetation that broadly share similar structures and anticipated fire behaviour, although some minor variability may be recorded at individual assessment points across the sites. Being a broad-brush assessment, the classification took a conservative approach in relation to defining vegetation classes. Future assessments of bushfire attack level which look at smaller extents of vegetation may result in lesser classifications.

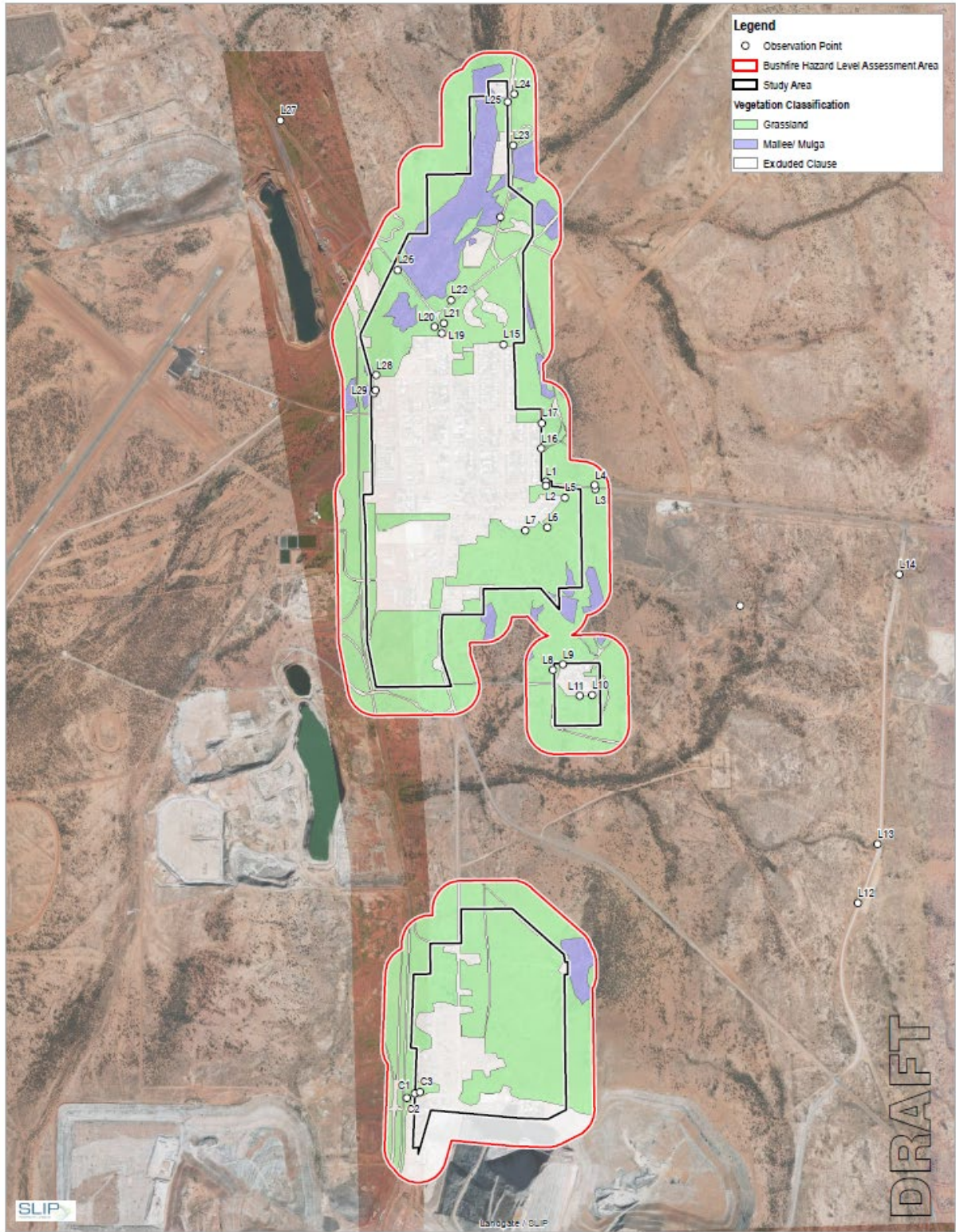
Mapped vegetation classes were combined with slope analysis based on available contour data to model the appropriate bushfire hazard level. In line with AS3959, effective slope was calculated over 100 metres, to smooth out short variations in slope/land undulation that would not influence bushfire hazard level.

### Vegetation classes

Vegetation within the bushfire hazard level assessment area reflects Class G – Grassland, with dispersed areas of Class F – Mallee/Mulga associated with drainage lines and wetter, low lying areas. The vegetation classes are described in Table 18. Figure 31 illustrates the broad distribution of vegetation classes across the bushfire hazard level assessment area. Appendix B provides field observations and identification of vegetation class for the site observation points.

**Table 18 Vegetation classes**

Vegetation class	Representative photo
<p><b>Class G – Grassland</b></p> <p>Tussock grasslands, with dispersed mallee/mulga over storey.</p>	
<p><b>Class E – Mallee/mulga</b></p> <p>Increased density of mallee/mulga over storey (greater than 10%), typically associated with drainage lines and low lying areas.</p>	



**Figure 33 Vegetation Classes**

## Assessment outputs

Bushfire hazard level in the bushfire hazard level assessment area is influenced by vegetation classification, as slope is generally flat in the locality.

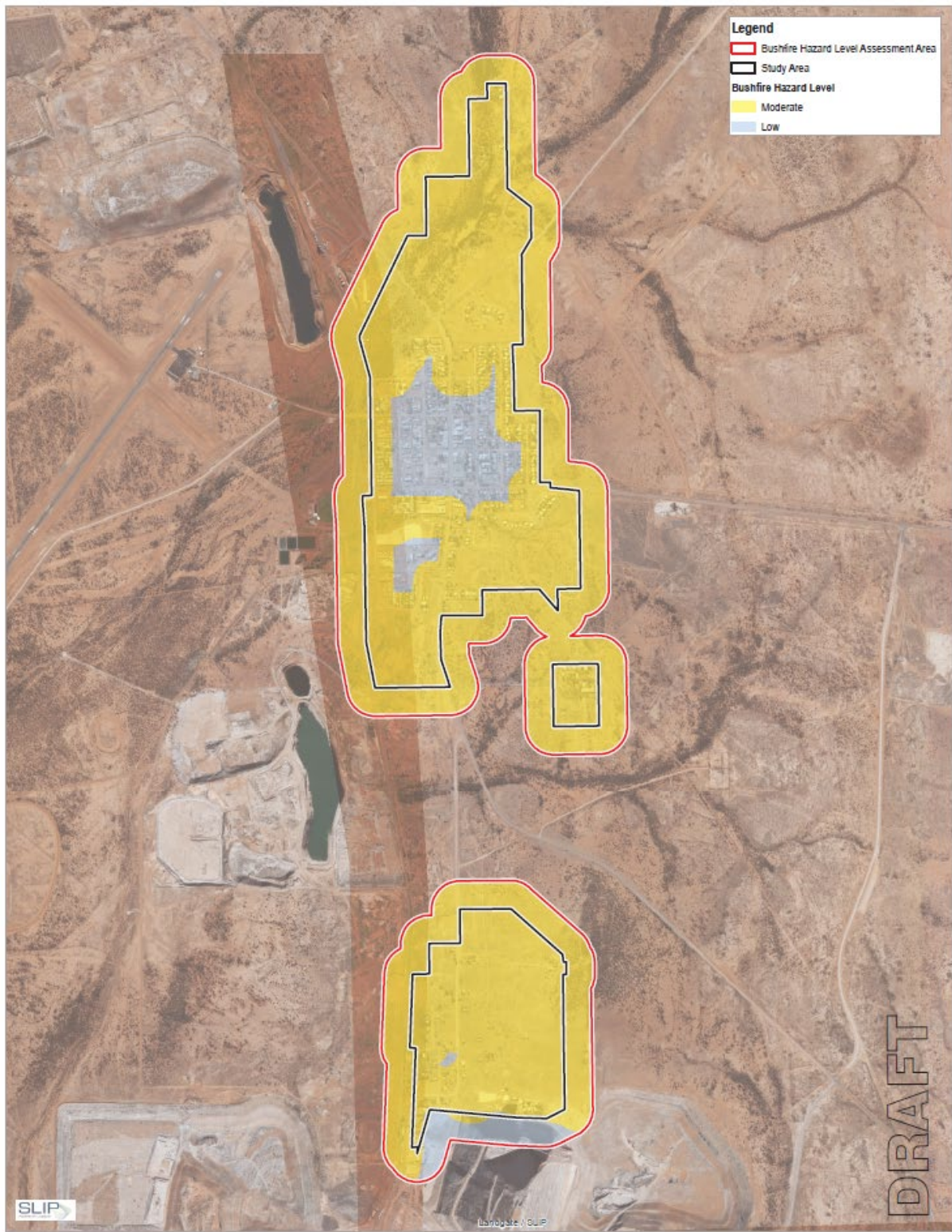
Figure 32 provides the modelled bushfire hazard level for Leonora and Gwalia, reflecting a moderate hazard influencing areas on the periphery of the settlement, and low in all other areas.

The bushfire hazard level assessment methodology set out in the *Planning in Bushfire Prone Areas Guidelines* is a very broad-brush definition of hazard levels, and the actual hazard and anticipated bushfire behaviours based on vegetation characteristics within the defined hazard levels may vary.

In line with the bushfire hazard level assessment methodology, any areas within 100 metres of vegetation classified as a moderate have also been mapped as moderate. This takes into account radiant heat and ember attack that would be experienced by development in close proximity to bushfire prone vegetation. In line with AS3959, any development within 100 metres of most vegetation types is anticipated to experience some level of radiant heat and ember attack. However, for lower threat/intensity vegetation classes – in particular the grassland class – 100 metres is likely to be overstating the actual hazard. AS3959 identifies development at a distance greater than 50 metres from these low threat vegetation classes as BAL-LOW, meaning there is insufficient risk to warrant specific bushfire requirements beyond 50 metres from the lower level bushfire prone vegetation.

At the time of the assessment, grassland areas around Leonora were categorised by atypical tussock grasses. It is more typical for the grassland areas to be bare with dispersed low grass tussocks. In future BAL assessments, much of the grassland may be considered as an exclusion from the need for a BAL assessment under AS3959 as low threat due to minimal fuel condition.





**Figure 34 Pre-development BHL assessment**

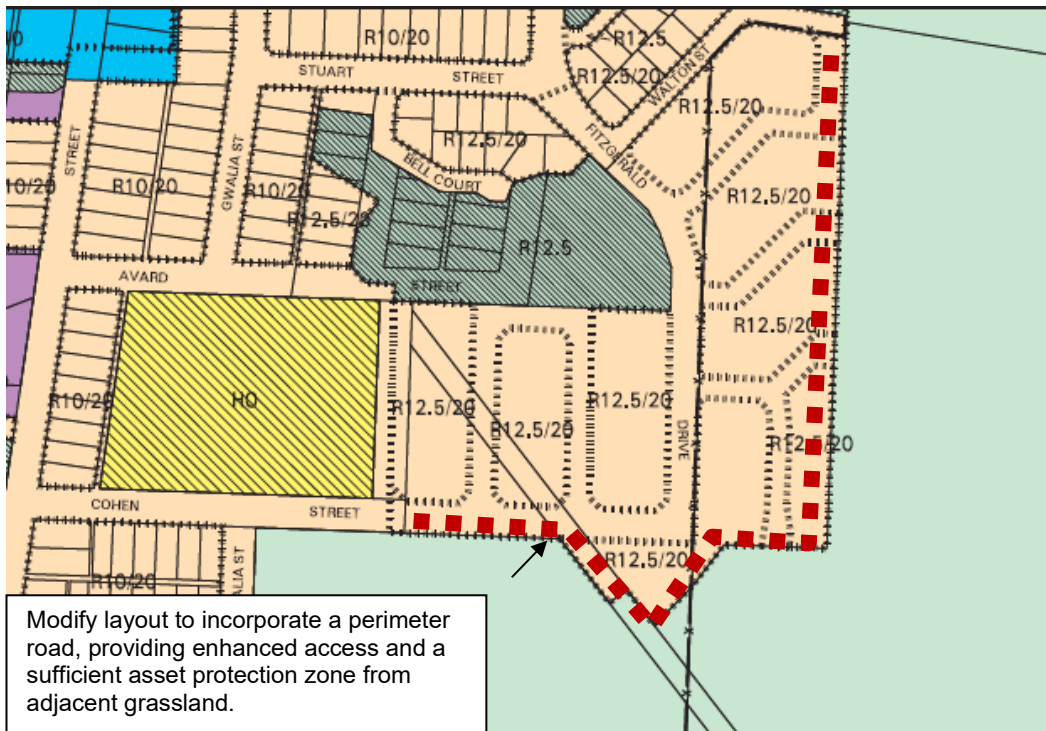
### **3.13.4 Identification of bushfire hazard issues**

Much of the townsite is already developed. An area of undeveloped, currently residential zoned land is located in the south-eastern portion of the main townsite. The future development of this area will result in a reduction of bushfire hazard level, as vegetation is cleared and replaced with low threat development. No biodiversity issues have been identified in the local biodiversity strategy that would preclude clearing the land for urban expansion, and therefore removing much of the bushfire hazard in these locations.

Peripheral areas of the Leonora townsite may continue to be influenced by moderate bushfire hazard from grassland and mallee vegetation in the surrounding landscape. Future development within these peripheral areas will require bushfire attack level (BAL) assessments to support applications for development approval, and will need to demonstrate compliance with bushfire protection criteria set out in technical appendices to the *Guidelines for Planning in Bushfire Prone Areas*. It is noted that, whilst this assessment maps the entirety of the townsite, only land within the designated bushfire prone area triggers assessment and further consideration under SPP 3.7.

### **3.13.5 Assessment against the Bushfire Protection Criteria**

The residential zoned land has been classified as grassland, reflecting a moderate hazard, and is flat. A nominal layout for future development of undeveloped residential zoned land forms part of TPS 1, with nominated residential density codes indicating the future road layout of the area (Figure 33). This has allowed this residential growth area to be assessed against the Bushfire Protection Criteria, as provided in Table 19 below. As shown by the notations on Figure 21 below, future negotiation for land release and development of this area should include modifications to the proposed layout to incorporate a complete, boundary road to provide suitable access and asset protection zone.



**Figure 35 Proposed/anticipated residential expansion area layout (shown black dashed) with recommended modifications to meet the bushfire protection criteria (red dashed line)**

**Table 19- Compliance with bushfire protection criteria – residential expansion area**

Bushfire protection criteria	Method of compliance Acceptable solutions	Proposed bushfire management strategies
Element 1: Location	A1.1 Development location	Complies. The site currently has a moderate bushfire hazard level, much of which will reduce to low upon clearing for development.
Element 2: Siting and design	A2.1 Asset Protection Zone	The required asset protection zone to achieve BAL-29 for grassland on flat land can be accommodated within a local road reserve, and sites would achieve BAL12.5 with a 20 metre road reserve separating them from the remnant grassland.
Element 3: Vehicular access	A3.1 Two access routes.	Two access roads out of subdivision area are provided by Stuart Street and Cohen Street
	A3.2 Public road	Road reserves are sufficient to meet public road requirements.
	A3.3 Cul-de-sac (including a dead-end-road)	Modification to the site layout through a local structure plan to achieve a boundary road that links culs-de-sac will achieve this criterion.
	A3.4 Battle-axe	Not applicable. None proposed.

Bushfire protection criteria	Method of compliance Acceptable solutions	Proposed bushfire management strategies
	A3.5 Private driveway longer than 50 metres	Not applicable. None proposed.
	A3.6 Emergency access way	Not applicable. Public road access provided.
	A3.7 Fire service access routes (perimeter roads)	Modification to the site layout through a local structure plan to include a boundary road will provide a fire service access route as required by criteria.
	A3.8 Firebreak width	Not applicable. Lots will be smaller than 0.5 hectares.
Element 4: Water	A4.1 Reticulated areas	All residential lots will be connected to reticulated water.
	A4.2 Non-reticulated areas	
	A4.3 Individual lots within non-reticulated areas	

### 3.13.6 Responsibilities for implementation and management of the bushfire measures

The role of a local planning strategy is to provide an effective local planning framework to address key issues in local planning processes and decisions. The state policy framework regarding bushfire risk is very well developed, and applies clearly to local planning applications and decisions. Therefore, the Shire of Leonora Local Planning Strategy does not require additional policy responses to address bushfire risk, as it is adequately dealt with at the State level.

Future planning and development of undeveloped residential land will require a local structure plan, including determination of BAL. This will be undertaken by the proponents of development. It is recommended to modify the scheme in the area of the undeveloped residential land to identify this area within the “urban development” zone in LPS 2. This will allow for redesign through a local structure plan to incorporate a full boundary road in line with the requirements of the bushfire protection criteria.

There is opportunity for the Shire to prepare a BAL contour map for areas of the Leonora townsite that are designated bushfire prone. This would remove the requirement for individual development applications to undertake individual BAL assessments. A BAL contour map would provide a more reliable indication of actual bushfire exposure risk, considering that land within 50 metres of grassland would be treated as BAL-LOW, however in line with the bushfire hazard level assessment methodology, land in Leonora that is 50-100 metres of grassland has been required to be categorised as moderate, rather than low.

## 4. Analysis of key issues

The analysis of key issues has been divided into the five key strategy objectives. The issues relate to those matters discussed in Part 1 – Section 3 Strategies and Actions.

**Table 20 Issues analysis –Acknowledge and respect cultural heritage**

Issue	Discussion	Strategy
Engagement with Aboriginal representatives and traditional owners identified that Local Planning Scheme No. 1 is a “white mans’ document”.	By including acknowledgement of Aboriginal culture in LPS 2, consideration can be given to Aboriginal culture in planning decisions made by the Shire of Leonora and Western Australian Planning Commission.	Acknowledge and respect Aboriginal heritage and culture in local planning documents and policies
The Shire’s heritage list is not formally adopted resulting in reduced protection of these heritage assets.	There are a number of places of heritage significance throughout the Shire that do not have any formal protection. The Shire has the opportunity to update their existing MHI or establish a heritage list under the local planning to provide greater protection measures for these assets.	Develop an effective planning framework to protect sites of historic heritage.

**Table 21 Issues analysis – Facilitate a vibrant, liveable town**

Issue	Discussion	Strategy
The town centre zoning currently covers parts of Tower and Otterburn Streets.	The town centre zone extends beyond Tower Street on to Otterburn Street despite the character and land uses of Otterburn Street being more conducive with a mixed use, light industrial area.  Limiting the centre zoning to Tower Street will assist to create a stronger town centre.	Identify Tower Street as the primary location for retail, commercial, hospitality, and other active uses in Leonora.
The Leonora townsite lacks vibrancy.	There are a number of vacant tenancies in town and the urban form has responded to social issues	Create a sense of place and identity for the Leonora Townsite.

Issue	Discussion	Strategy
	<p>reducing the vibrancy in the townsite.</p> <p>There are opportunities for the Shire to work with local community groups to develop incentives and programs that help to revitalise the centre.</p>	
There is limited street furniture available to enable passive recreation and enjoyment.	<p>The Council has concerns regarding maintenance of street furniture and community infrastructure and as a result there are minimal public facilities provided.</p> <p>The provision of infrastructure such as benches, rubbish bins, bicycle racks, artwork and gardens would assist to create a more active and enjoyable space and support all members of the community.</p>	Provide high quality community infrastructure to support the local community.
There are challenges to growth of digital infrastructure.	<p>As with many regional towns there is often limited access to digital infrastructure.</p> <p>There is an opportunity to develop a dialogue with services providers to investigate ways to improve this.</p>	Improve the quality of infrastructure and services.

**Table 22 Issues analysis – diversify the local economy and employment**

Issue	Discussion	Strategy
Population growth and employment in the Shire is highly dependent on the mining industry.	<p>The Shire’s population is highly dependent on the mining industry to maintain the local population and employment in the region. This makes the area susceptible to population decline and loss of employment should there be changes to the mining industry in the wider economy. In order to maintain a more permanent</p>	Support diversification of the local economy, considering the potential economic contributions of tourism, waste, and pastoral industries.

Issue	Discussion	Strategy
	population, diverse employment opportunities need to be created to reduce the dependency on mining.	

**Table 23 Issues analysis – facilitate the mining and construction economy**

Issue	Discussion	Strategy
The existing industrial area is not used for general industry.	The existing industrial area has transitioned over time into a service industry and accommodation area, there is no general industrial land available.  Service industry and accommodation uses are more appropriate for this area given the proximity to the town centre and residential areas.	Facilitate growth of the existing industrial area as a specialist service industry and industry accommodation precinct.
There is currently no land appropriate for general industry.	The <i>Central Regions Land Capacity Analysis</i> identified 12 hectares of surplus industrial land. However, land currently zoned for industry is immediately adjacent to accommodation uses and not appropriate for general industrial uses. Furthermore, surplus industry zoned land is located on mineralised land, therefore subject to mining leases and not available for industrial development.	Facilitate the release of appropriate land for general industrial development.
Potential red tape in the planning framework that may hinder the development of supporting industries and businesses.	Whilst diversifying the economy should be encouraged, it is acknowledge that the mining industry plays an important role in the Shire's economy. Businesses and other industries should be enabled through the planning framework that support the mining industry.	Facilitate the establishment of industry and business that support the mining and construction industry.

**Table 24 Issues analysis – protect the natural environment in local planning decisions**

Issue	Discussion	Strategy
<p>There are environmental conservation areas in Leonora that should be protected.</p>	<p>The Shire has a unique landscape and natural beauty. In order to preserve these environmental conservation areas for future generations, they should be protected through appropriate mechanisms in the planning framework.</p>	<p>To protect land for environmental conservation in the Leonora townsite.</p>
<p>The majority of the Shire is within a bushfire prone area.</p>	<p>With a changing climate, the risk of bushfire – as a result of hotter and drier conditions – will increase. SPP3.7 ensures that vulnerable and high-risk land uses are located away from areas of extreme bushfire risk.</p> <p>A bushfire hazard level assessment determines the bushfire risk and enables appropriate management strategies be put in place.</p>	<p>To minimise the risk of bushfire on development.</p>



# Appendices

This document is in draft form. The contents, including any opinions, conclusions or recommendations contained in, or which may be implied from, this draft document must not be relied upon. GHD reserves the right, at any time, without notice, to modify or retract any part or all of the draft document. To the maximum extent permitted by law, GHD disclaims any responsibility or liability arising from or in connection with this draft

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## **Appendix B** – Observation Points – Bushfire Hazard



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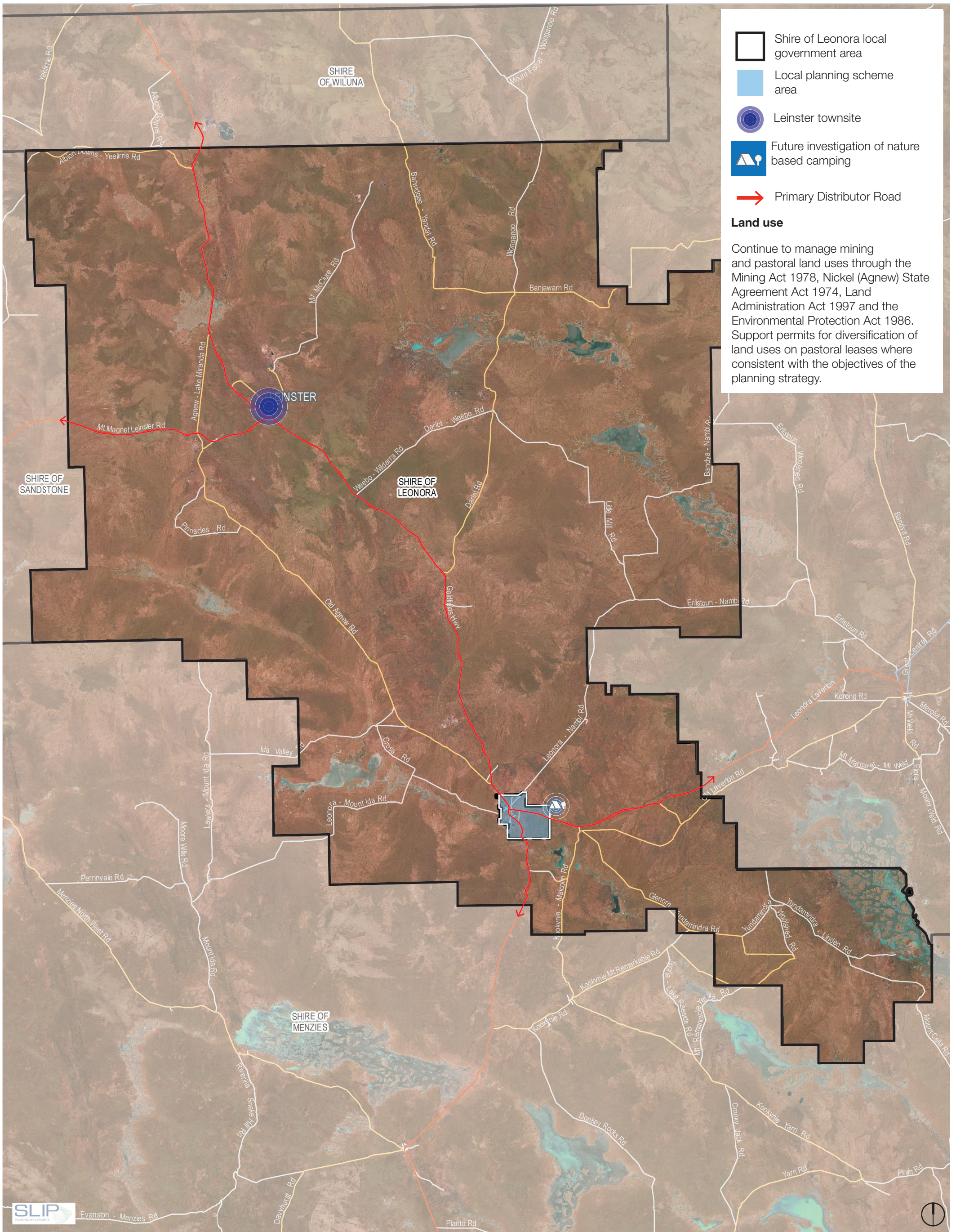
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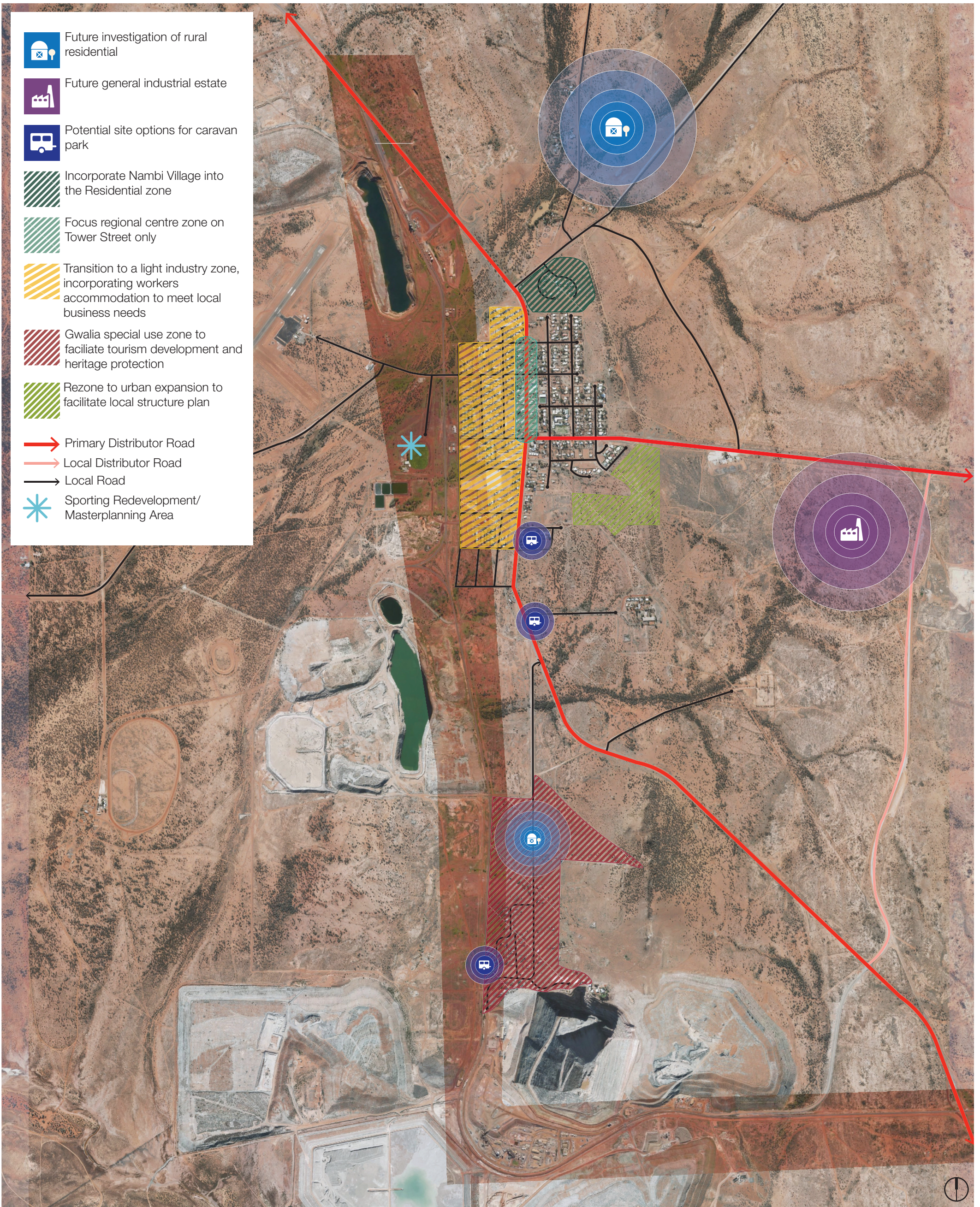
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Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	R Doohan G O'Brien	C Thompson		C Thompson		05/07/2019






















Location	Vegetation Class	Notes	Image
C1	Low threat		
			
			
C2	Grassland	Grass dominated. 5% low shrub.	
C3	Grassland	Grass dominated around development	






			
L1	Grassland	grassland. 1% mallee canopy.	
L2	Grassland	Grassland. No canopy.	
L3	Grassland	Grass with low shrubs ~30cm. Few smaller.	
L4	Grassland	Grass and low shrubs ~30cm. Few mallee	

L5	Grassland	Grass. LS.	
L6	Grassland	Grass. Mallee overstory - aerial interogration to confirm canopy.	
			
L7	Grassland	Grassland. Mallee overstorey does not exceed ten percent overall	
L8	Mallee/Mulga	Mallee over grasses	

L9	Grassland	Grass with mallee 5%. firebreak to nurses quarters.	
			
L10	Grassland	Grass with mallee scattered.	
L11	Grassland	Grass with mallee scattered.	
L12	Grassland	Grass with scattered low shrubs ~30cm	

L13	Mallee/Mulga	Increased mallee cover along drainage line	
L14	Grassland	Grasses with scattered small shrubs and mallee	
L16	Grassland		
L17	Grassland		
			

L15	Grassland		
L19	Low threat	Gravel and development	
L20	Grassland		
L21	Grassland		
L22	Mallee/Mulga	Increased mallee cover in floodway	

L22	Mallee/Mulga		
L23		Large dense mallee clump ~2m	
L24	Grassland	Low schrubland form.	
L25	Grassland	Mallee cover <10% increases to drainage line	
L26	Grassland		

L27	Grassland	Grass dominated. mallee cover <10%	
L28	Mallee/Mulga	10-15% young mallee cover. Grass dominated	
L29	Mallee/Mulga	Mallee clump within grassland	
L29	Grassland	Potential low threat classification.	