



intelligent outcomes | respected experience

Bushfire Management Plan

Anketell Strategic Industrial Area

Prepared for
LandCorp
by Strategen

April 2017



Bushfire Management Plan

Anketell Strategic Industrial Area

Strategen is a trading name of
Strategen Environmental Consultants Pty Ltd
Level 1, 50 Subiaco Square Road Subiaco WA 6008
ACN: 056 190 419

April 2017

Limitations

Scope of services

This report ("the report") has been prepared by Strategen Environmental Consultants Pty Ltd (Strategen) in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen has also not attempted to determine whether any material matter has been omitted from the data. Strategen will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen. The making of any assumption does not imply that Strategen has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Client: LandCorp

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Draft Report	A	For client review	A Ennis / R Banks (Level 2 BPAD No. 36857)	Electronic (email)	04/04/2017
Final Report	0	For client use: to accompany Improvement Scheme and Guide Plan	A Ennis / R Banks (Level 2 BPAD No. 36857)	Electronic (email)	11/04/2017

Filename: LAN17068_01 R001 Rev 0 - 11 April 2017

Executive Summary

The Anketell Strategic Industrial Area (SIA) Improvement Scheme boundary includes approximately 4,400 ha in the City of Karratha and has been recognised as of strategic economic significance to the State through establishment and gazettal of the 'Improvement Plan No 42 – Anketell Strategic Industrial Area' on 8 May 2015. LandCorp has prepared an Improvement Scheme and Guide Plan for the Anketell SIA to guide staged development for a variety of heavy industrial developments and supporting general industry.

Due to the current extent of on-site and adjacent vegetation, the SIA is designated as bushfire prone, as outlined on the Western Australian *Map of Bush Fire Prone Areas* (DFES 2017). Strategen has prepared this Bushfire Management Plan (BMP) to accompany the Improvement Scheme and Guide Plan in order to meet planning requirements triggered under *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (WAPC 2015).

Under Section 78B of the *Planning and Development (Local Planning Schemes) Amendment Regulations 2015* bushfire management provisions only apply to habitable¹ buildings. Although the dominant development within the SIA is unlikely to be habitable buildings, permissible land uses within the SIA under the Improvement Scheme include land uses for habitable buildings such as offices.

Given that timing of required planning and subsequent staged construction within the SIA cannot be forecast at the strategic level, this BMP has been prepared based on existing state of the on-site and surrounding fire environment. A pre-development bushfire hazard level assessment identifies the SIA as having a 'Moderate' bushfire hazard level, reflecting that native vegetation consists of grassland fuels will a discontinuous fuel profile and confirming that development can avoid areas of 'Extreme' bushfire hazard level. Given that proposed development will result in clearing and/or management of on-site vegetation, the post development state of the site will result in even lower hazard levels.

Strategen considers a bushfire approaching the SIA from the northwest, east of west to be the worst case bushfire scenarios due to the likely summer prevailing winds from these directions. However, the low available fuel loads and broken up nature of the low grassland vegetation are not expected to be capable of supporting a bushfire with significant fire intensity and ember attack characteristics.

To manage bushfire risk to future assets and achieve compliance with bushfire planning requirements, this BMP recommends a range of bushfire management measures to be addressed as part of subsequent bushfire planning requirements for development within the SIA, including:

- provision of minimum Asset Protection Zones to achieve a maximum BAL–29 rating under Australian Standard AS 3959–2009 *Construction of Buildings in Bushfire-prone Areas* (SA 2009)
- staged vegetation clearing within development areas in advance to achieve low fuel buffers where necessary to ensure habitable building construction is not inhibited by temporary vegetation extent located within adjacent stages yet to be cleared
- construction of habitable buildings to meet the standard appropriate to the BAL for that location where reasonably practicable, regardless of building class, and to not exceed BAL–29
- design at future planning stages to ensure that all occupiers and visitors are provided with at least two vehicular access routes connecting to the surrounding public road network at all times, including during development staging
- any proposed public roads, cul-de-sacs and private driveways longer than 50 m to meet or exceed technical requirements of the *Guidelines for Planning in Bushfire-Prone Areas* (WAPC 2017)
- implementation of and compliance with provisions of the City of Karratha annual firebreak notice

¹ 'Habitable building' is defined as any permanent or temporary structure that is fully or partially enclosed and has at least one wall and a roof of solid material and is used for a purpose that involves the use of the interior of the structure by people for living, working, studying or being entertained.

- implementation of water supply services as development progresses to ensure an all year round supply of water to meet emergency water supply requirements
- at subsequent planning stages, preparation of and implementation of detailed plans demonstrating the location and capacity of fire emergency water infrastructure
- at subsequent planning stages, BMPs to include a requirement for notification to be placed on title for all lots within bushfire prone areas as a condition of subdivision to ensure landowners and prospective purchasers are aware that increased building construction standards and a BMP may apply
- at development application stage, preparation and implementation of emergency evacuation plans and risk management plans for proposed high risk land uses located in areas of BAL-12.5 to BAL-29
- individual BMPs and revision of existing BMPs, including detailed BAL contour assessment on an individual lot basis, to be required at appropriate future planning stages (such as subdivision) to ensure the management measures and BAL ratings and separation distances are consistent with the final development proposal.

As development within Anketell SIA is expected to occur over a long term timeframe, Section 5 of the BMP identifies bushfire planning requirements that will need to be addressed at future planning stages.

Table of contents

1. Introduction	1
1.1 Background	1
1.2 Purpose and application of the plan	1
2. Spatial consideration of bushfire threat	4
2.1 Existing site characteristics	4
2.1.1 Location	4
2.1.2 Zoning and land use	4
2.1.3 Assets	5
2.1.4 Access	6
2.1.5 Water and power supply	6
2.2 Existing fire environment	8
2.2.1 Vegetation	8
2.2.2 Site topography and slope under vegetation	8
2.3 Bushfire hazard assessment	12
2.4 Identification of any bushfire hazard issues	12
2.5 BAL contour assessment	13
3. Bushfire management measures	15
3.1 Hazard separation distances	15
3.1.1 Asset Protection Zones	15
3.1.2 On-site staging buffers	16
3.2 Increased building construction standards	16
3.3 Vehicular access	17
3.3.1 Public access	17
3.3.2 Firebreaks	18
3.4 Water supply	18
3.5 Additional measures	19
4. Proposal compliance and justification	22
5. Future bushfire requirements	25
5.1 Statutory requirements	25
5.2 Planning stage requirements	25
5.2.1 Subdivision applications	25
5.2.2 Development applications	26
5.2.3 Building permits	26
5.3 Adoption of proposed management measures	27
6. References	28

List of tables

Table 1: Minimum hazard separation distances based on effective slope	13
Table 2: Vehicular access technical requirements	18
Table 3: Acceptable solutions assessment against bushfire protection criteria	23
Table 4: Bushfire management measures to be adopted via revised BMP(s)	27

List of figures

Figure 1: Improvement Scheme Map	2
Figure 2: Improvement Scheme Guide Plan	3
Figure 3: Site overview	7
Figure 4a: Vegetation class and effective slope (HIA1 and HIA2)	10
Figure 4b: Vegetation class and effective slope (GIA)	11
Figure 5: Pre-development bushfire hazard levels	14
Figure 6: Transport and traffic network	21

List of appendices

Appendix 1 Site photographs
Appendix 2 City of Karratha annual firebreak notice

1. Introduction

1.1 Background

The Anketell Strategic Industrial Area (SIA) Improvement Scheme boundary includes approximately 4,400 ha in the City of Karratha and has been recognised as of strategic economic significance to the State through establishment and gazettal of the 'Improvement Plan No 42 – Anketell Strategic Industrial Area' on 8 May 2015. The Improvement Plan provides for advanced planning and development of the SIA by the Western Australian Planning Commission (WAPC) and authorises the establishment of an Improvement Scheme for the SIA.

Department of State Development is the Lead Agency for Anketell SIA and LandCorp is the industrial estate manager, landowner and lessor. LandCorp has prepared an Improvement Scheme and Guide Plan for the Anketell SIA to guide staged development for a variety of heavy industrial developments and supporting general industry. The Improvement Scheme Map identifies heavy industrial areas to the north and south, a general industrial area to the west and an industry protection area to accommodate required industry buffers (Figure 1) and the Guide Plan identifies strategic infrastructure corridors (Figure 2).

Due to the current extent of on-site and adjacent vegetation, Anketell SIA is designated as bushfire prone, as outlined on the Western Australian *Map of Bush Fire Prone Areas* (DFES 2017). As a result, Strategen has prepared this Bushfire Management Plan (BMP) to inform strategic planning and fulfil the following key objective:

1. Accompany the proposed Improvement Scheme and Guide Plan in order to meet planning requirements triggered under *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015).

The following information is required to accompany the Improvement Scheme and Guide Plan as required under SPP 3.7 Policy Measure 6.3:

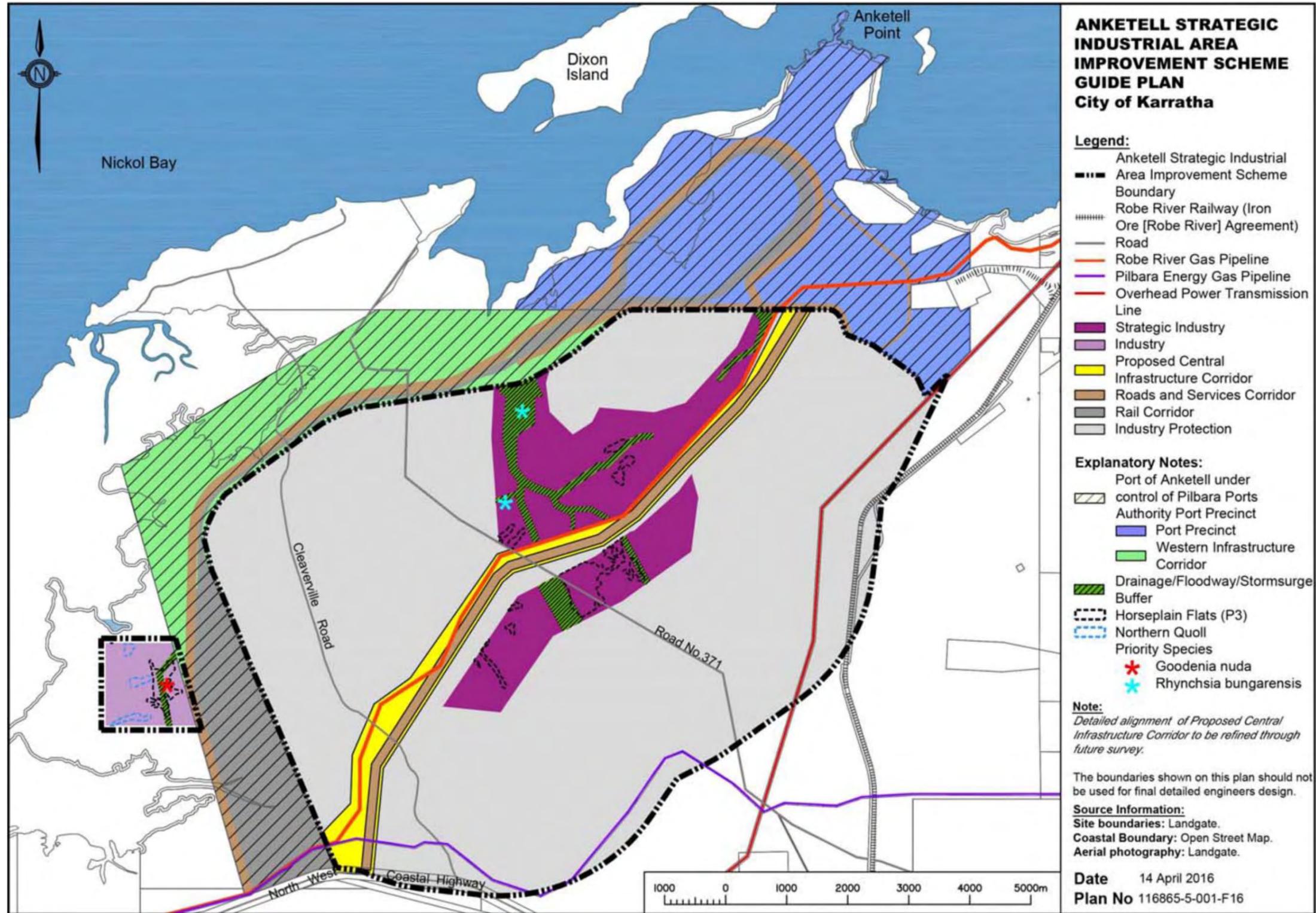
- Results of a Bushfire Hazard Level assessment determining the applicable hazard level(s) across the subject land in accordance with methodology set out in *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2017) – refer to Section 2.3 and Figure 5.
- Where lot layout of the proposal is known, a Bushfire Attack Level (BAL) contour map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines – given that lot layout is not yet known a BAL contour map has not been prepared as part of this BMP.
- Identification of any bushfire hazard issues arising from the relevant assessments – refer to Section 2.4.
- Clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages – refer to Section 3 and Table 3.

This BMP has been prepared in accordance with the Guidelines and addresses all of the above information requirements to satisfy SPP 3.7 at the strategic planning stage.

This BMP will need to be updated at subsequent planning stages (e.g. subdivision and development application), at which time any changes to development and clearing within and surrounding the SIA can be considered and addressed in a revised BMP or BMP addendum.

1.2 Purpose and application of the plan

The purpose of this BMP is to provide a high level consideration of bushfire risk within the Anketell SIA and provide guidance on bushfire planning and requirements at future planning and development stages.



Source: RPS 2016

Figure 2: Improvement Scheme Guide Plan

2. Spatial consideration of bushfire threat

2.1 Existing site characteristics

2.1.1 Location

Anketell SIA is located approximately 5 km west of Wickham in the City of Karratha. The Improvement Scheme area comprises approximately 4,400 ha of land consisting of heavy industrial areas to the north (HIA 1) and south (HIA 2), a general industrial area (GIA) to the west and an industry protection area to accommodate required industry buffers (Figure 3).

The industry development areas have been located to enable efficient access to resource stockpiles, transport infrastructure (such as road, rail and conveyors) and utility services (including power, water and communications).

Anketell SIA is bound by the following (Figure 3):

- Anketell Port precinct and Dixon Island to the north
- North West Coastal Highway and undeveloped pastoral land to the south and Roebourne townsite to the southeast
- Robe River railway and road infrastructure, Wickham townsite and undeveloped pastoral land to the east
- recreational beach at Cleaverville including tidal mudflats within Crown Reserve 51015 to the west.

2.1.2 Zoning and land use

Anketell SIA is currently zoned 'Strategic Industry' and 'Rural' under provisions of the City of Karratha Local Planning Scheme No 8.

The *Planning and Development Act 2005* enables the WAPC to prepare Improvement Plans and Improvement Schemes, with Improvement Schemes being prepared as if they are local planning schemes. The City of Karratha's local planning scheme ceases to have effect to the extent of land included within the Improvement Scheme area. The WAPC will become the decision making authority within the Improvement Scheme Area once the Improvement Scheme takes effect.

The following zones are proposed within the Anketell Improvement Scheme area (Figure 1):

- Strategic Industry Zone
 - * Heavy Industry Area 1 (HIA 1) – 667 ha
 - * Heavy Industry Area 2 (HIA 2) – 422 ha
- Industry Zone
 - * General Industry Area (GIA) – 174 ha
- Industry Protection Zone – 3,137 ha.

In association with the proposed Anketell Port, heavy industrial development specialising in downstream resource processing is the ultimate land uses within the Anketell SIA being established through the Improvement Scheme, with a staged release of development. The SIA is also intended to provide support for development of the Port and provide services to transport and mining operations.

The purpose of the Industry Protection Zone is to avoid conflict between heavy industry operations and sensitive land uses.

Under Section 78B of the *Planning and Development (Local Planning Schemes) Amendment Regulations 2015* bushfire management provisions only apply to habitable² buildings. Although the dominant development within the Anketell SIA is unlikely to consist of habitable buildings, land uses that may be permitted within the 'Strategic Industry' and 'Industry' zone under the Improvement Scheme that have the potential to include habitable buildings include:

- Civic use
- Convenience store
- Industry
- Industry – resource processing
- Motor vehicle repair
- Office
- Service station
- Trade supplies
- Transport Overnight Facility.

The site is currently utilised as a pastoral station (Mount Welcome Station).

Under provisions of the City of Karratha Local Planning Scheme, land surrounding Anketell SIA is zoned 'Rural' to the east, west and south and "Strategic Industry" associated with the Anketell Port precinct to the north.

2.1.3 Assets

Land within Anketell SIA is undeveloped, and therefore contains limited life or property assets. The Robe River railway transects a portion of the Improvement Scheme area.

Proposed industrial development will ultimately increase the critical life and property assets of the site by intensifying the number of occupiers, visitors and built assets across the SIA.

The Anketell SIA Environmental Assessment Report (EAR) is included as an appendix to the Improvement Scheme Report (RPS 2016) and provides a high-level assessment of the potential environmental impacts of the SIA. No Threatened Ecological Communities or Declared Rare Flora species were found to be present within proposed development areas. One Priority 3 Ecological Community (Horseland Flats) and two Priority 4 flora species, as depicted in Figure 2, were identified to be present within the SIA.

The EAR identified the presence of five fauna species which may be impacted by proposed development, including the northern quoll which is listed as an endangered species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), with other species potentially occurring in the area unlikely to be affected due to their ability to move away from disturbances. A Terrestrial Fauna Management Plan will be required for development proposals under each zone in the Improvement Scheme with specific attention required where northern quoll habitat is affected.

A conclusion of the EAR is that none of the identified key environmental factors alone present a significant environmental impact which would preclude development within the Anketell SIA and the Improvement Scheme text will require environmental management plans be developed in association with future subdivision and/or development applications to ensure optimal environmental management outcomes are achieved and maintained.

The presence of and potential impacts on environmental assets will also be considered as part of standard referral requirements at the relevant planning and development stages under the EPBC Act and *Environmental Protection Act 1986*.

² 'Habitable building' is defined as any permanent or temporary structure that is fully or partially enclosed and has at least one wall and a roof of solid material and is used for a purpose that involves the use of the interior of the structure by people for living, working, studying or being entertained.

2.1.4 Access

Anketell SIA is currently accessed via North West Coastal Highway to the south. Cleaverville Road also traverses the western end of the Improvement Scheme area, running north from the North West Coastal Highway to a boat ramp on the coast at Cleaverville (see Figure 3). The SIA is also traversed by a number of informal access tracks.

2.1.5 Water and power supply

There is no existing water supply infrastructure within the vicinity of Anketell SIA. Power in the vicinity of the SIA is distributed by Horizon Power and is generated at multiple power stations. The Horizon Power owned Cape Lambert zone substation is located approximately 6 km north east of the site.



Figure 3: Site overview

Scale 1:50,000 at A3



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 22/03/2017
 Author: JCrute

Source: Aerial image: Neamap, flown 11/2016. Existing cadastre and concept plan: Client 03/2017.
 Path: Q:\Consult\2017\LAN\LAN170668\ArcMap_documents\I001\RevA\LAN170668_01_R001_RevA_F003_A3.mxd

Legend

- Project area
- 100m wide assessment area
- Anketell Strategic Industrial Area Improvement Scheme Boundary
- Existing cadastre
- Industry
- Strategic Industry



2.2 Existing fire environment

2.2.1 Vegetation

Strategen undertook an assessment of the vegetation within the Anketell SIA development areas (i.e. HIA1, HIA2 and GIA) and 100 m of surrounding land on 9 March 2017. The proposed Industry Protection Zone is not proposed for development and therefore was not included within the assessment.

Pre-development vegetation class has been assessed in accordance with the *Visual guide for bushfire risk assessment in Western Australia* (DoP 2016) and *AS 3959–2009 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2009).

Vegetation within and adjacent to development areas is dominated by spinifex and tussock grasslands interspersed with small areas of scattered and fragmented low shrubs and open woodland along creeklines. Areas of scattered open woodland and low shrubs along creeklines have been classified on the basis of their grassland understorey in accordance with AS 3959.

Vegetation classes are depicted in Figure 4a and Figure 4b along with the location and direction of georeferenced site photographs (refer to Appendix 1 for site photographs). The following vegetation classes were identified:

- HIA1 and adjacent land consists of:
 - * Class G Grassland (Photo 1, Photo 2, Photo 3, Photo 4, Photo 5, Photo 6, Photo 7, Photo 8 and Photo 9)
- HIA2 and adjacent land consists of:
 - * Class G Grassland (Photo 10, Photo 11, Photo 12, Photo 13 and Photo 14)
- GIA and adjacent land consists of:
 - * Class G Grassland (Photo 15, Photo 16, Photo 17, Photo 18, Photo 19 and Photo 20)

Although vegetation has been classified as per the above, the coverage of vegetation across the landscape is discontinuous and assessed at 50–70% actual coverage.

Strategen emphasises that the vegetation extent discussed above and mapped in Figure 4a and Figure 4b demonstrates current site conditions and does not take into account vegetation clearance proposed as part of future staged development and proposed adjacent infrastructure corridors. Therefore, the extent of Clause 2.2.3.2 exclusions within and adjacent to the SIA will increase as development progresses throughout the site and on adjacent land.

The above information has been used to inform a pre-development bushfire hazard level assessment for Anketell SIA (refer to Section 2.3).

2.2.2 Site topography and slope under vegetation

Strategen has assessed site topography and effective slope under classified vegetation within the subject site and adjacent 100 m through assessment of topographic information and on-ground verification in accordance with AS 3959 methodology (Figure 4a and Figure 4b).

Topography of the Anketell SIA varies, with proposed development areas consisting of:

- HIA1 – in general the topographic elevation across the site ranges from approximately 10 Australian Height Datum (mAHD) to approximately 25 mAHD in the north, with an area of higher elevation (approximately 60 mAHD) along the northern boundary adjacent to the ranges to the north. The site is also spotted with small rocky outcrops.
- HIA2 – topographic elevation across the site ranges from approximately 40 mAHD at the eastern and western boundaries to approximately 15 mAHD along creeklines that dissect the site in a north south direction.
- GIA - topographic elevation across the site ranges from approximately 40 mAHD to the southeast to approximately 10 mAHD in the northwest.

Development areas within the Anketell SIA have been located primarily on plateau land to avoid areas of significant slope. The SIA includes low lying areas that will be prone to flooding and placement of fill will be required to achieve proposed development levels across the site.

With the exception of small areas running along and adjoining the northern boundary of HIA1 and small areas associated with isolated rocky outcrops in GIA, all proposed development areas are affected by slope of less than 10 degrees. The ranges to the north of HIA1 and southwest of GIA will be located upslope of development areas.

The above information has been used to inform a pre-development bushfire hazard level assessment for the SIA (refer to Section 2.3).

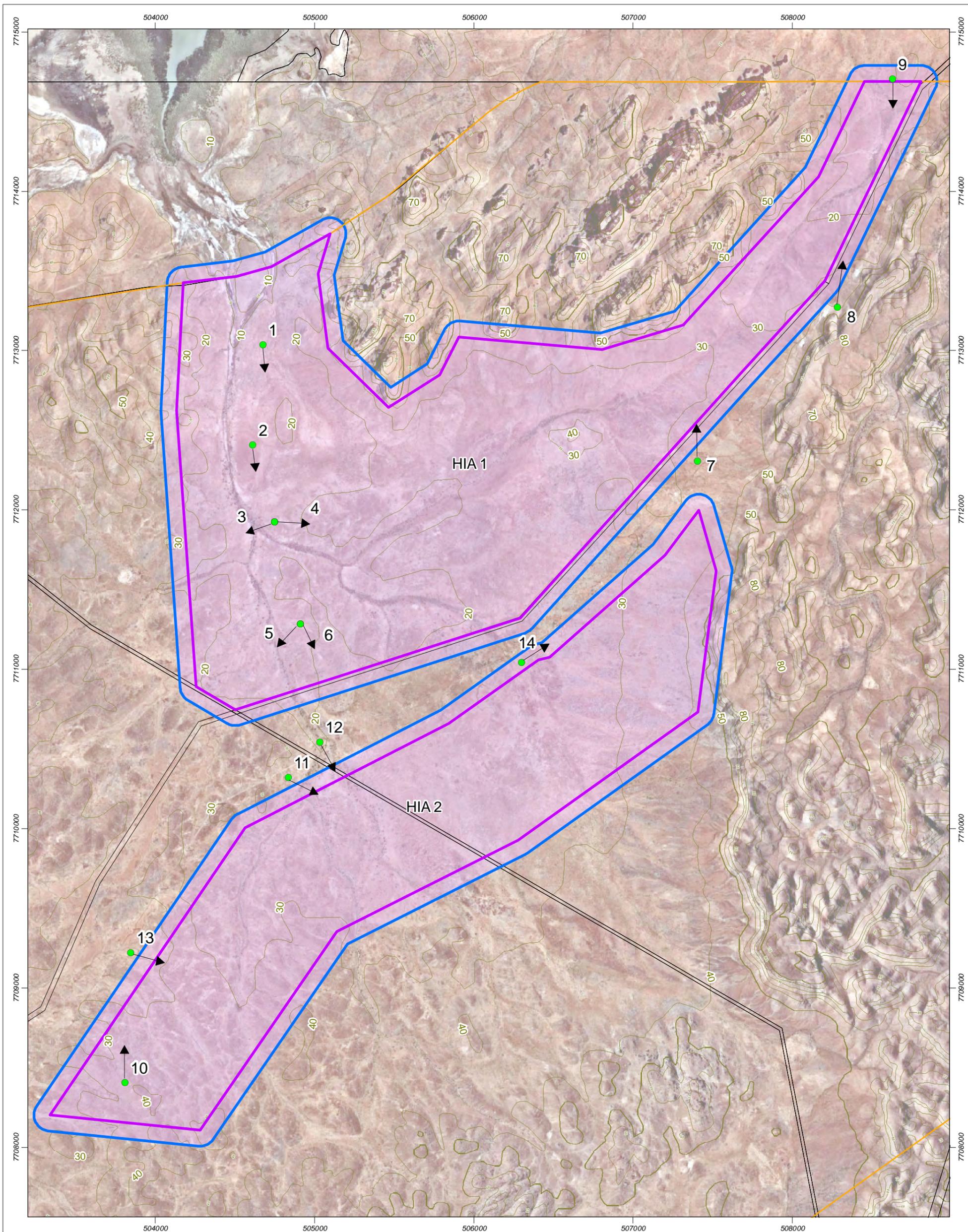


Figure 4a: Vegetation class and effective slope (HIA 1 and HIA 2)

Scale 1:22,000 at A3



Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 22/03/2017

Author: JCrute

Source: Aerial image: Nearmap, flown 11/2016. Existing cadastre and concept plan: Client 03/2017. Surface elevation: SLIP, Landgate 2017.

Legend

- Photo points and direction
- Industry
- Strategic Industry
- Anketell Strategic Industrial Area Improvement Scheme Boundary
- Surface elevation (mAHD)
- 100m wide assessment area
- Existing cadastre
- Vegetation class**
- Class G Grassland



Info@strategen.com.au
www.strategen.com.au

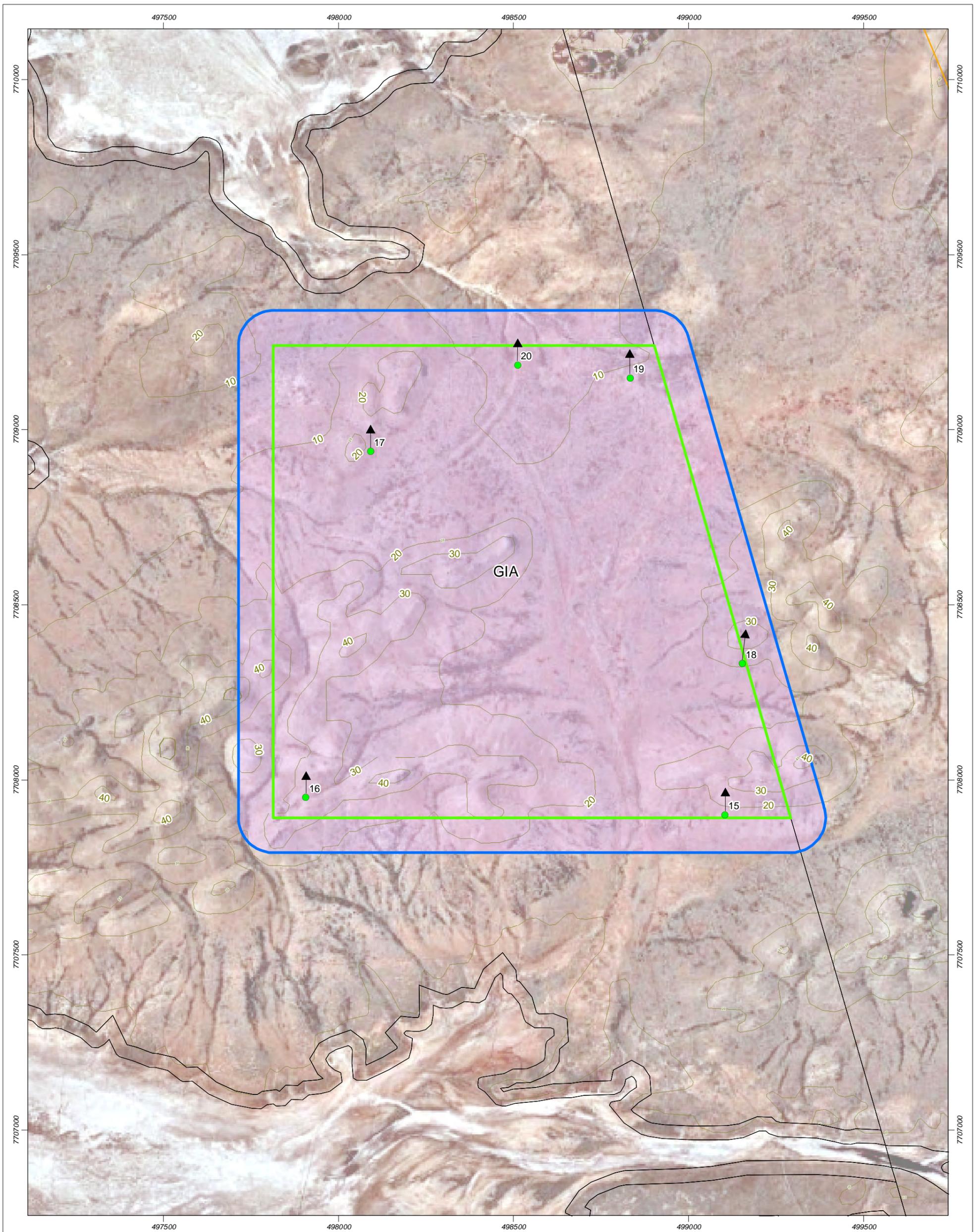


Figure 4b: Vegetation class and effective slope (GIA)

Scale 1:10,000 at A3



Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 22/03/2017

Author: JCrute

Source: Aerial image: Nearmap, flown 11/2016. Existing cadastre and concept plan: Client 03/2017. Surface elevation: SLIP, Landgate 2017.

Legend

- Photo points and direction
- Industry
- Strategic Industry
- Anketell Strategic Industrial Area Improvement Scheme Boundary
- Surface elevation (mAHD)
- 100m wide assessment area
- Existing cadastre
- Vegetation class**
- Class G Grassland



Info@strategen.com.au
www.strategen.com.au

2.3 Bushfire hazard assessment

Bushfire hazard levels have been assessed for development areas in accordance with methodology contained within the Guidelines. Strategen has mapped the bushfire hazard levels within the proposed development areas (HIA1, HIA2 and GIA) and adjacent 100 m as per the pre-development conditions outlined in Figure 4a and Figure 4b.

As depicted in Figure 5, all Class G grassland vegetation is considered to be a 'Moderate' bushfire hazard level. This is due to vegetation being discontinuous and low in height and slopes being less than 10 degrees across the majority of the site. Small areas of slope greater than 10 degrees to the north of HIA1 and southwest of GIA will be upslope of development areas. Vegetation on slopes also lacks an intact fuel ladder beyond the ground level, which limits the effect of slope on potential fire behaviour.

Given that proposed industrial and infrastructure development will result in clearing of a significant proportion of the on-site and adjacent vegetation extent, the post development vegetation extent will result in even lower hazard levels than those currently depicted within Figure 5.

2.4 Identification of any bushfire hazard issues

Predominant bushfire weather conditions (those that occur 95% of the time during the designated bushfire season) for the project area generally correlate with average January climatic conditions. Based on available data from the closest weather station (Roebourne), the January prevailing summer winds for the area are from the east and west in the morning and northwest in the afternoon (BoM 2017).

Strategen therefore considers a fire front approaching the Anketell SIA from the northwest, east or west, to be the worst case bushfire scenarios due to the presence of potential bushfire runs within undeveloped land in these directions. In the event of a bushfire under these conditions, the proposed vehicular access within the Western Infrastructure Corridor and Central Infrastructure Corridor will provide safe access along North West Coastal Highway to the south.

However, bushfire occurrence within the development areas from the surrounding Industry Protection Zone or adjacent lands is considered unlikely to significantly impact future assets of the proposed development since the on-ground fire environment, environmental characteristics and potential fire conditions are not conducive to intense bushfire occurrence in this area. The low available fuel loads and broken up nature of the low grassland vegetation are not expected to be capable of supporting a bushfire with significant fire intensity and ember attack characteristics. Available fuel loads for this vegetation type are not expected to readily accumulate due to low rainfall and maritime effects.

Volunteer Fire and Emergency Services resources stationed at Wickham and Roebourne and Bush Fire Brigade resources at Point Sampson are expected to provide a best case emergency suppression response time of 30-45 minutes should a bushfire threaten development within the SIA.

A pre-development bushfire hazard level assessment identifies the SIA as having a 'Moderate' bushfire hazard level, reflecting that native vegetation consists of grassland fuels with a discontinuous fuel profile and confirming that development can avoid areas of 'Extreme' bushfire hazard level. Given that proposed development will result in clearing and/or management of on-site vegetation, the post development state of the site will result in even lower hazard levels.

The bushfire risks to proposed development posed by post development hazards can be managed through standard application of acceptable solutions under the Guidelines, including provision for and implementation of Asset Protection Zones (APZs) around habitable buildings, bushfire construction standards where relevant, provision of adequate emergency water supply and vehicular access, as well as through a direct bushfire suppression response if required.

Given the staged nature of proposed development, vehicular access arrangements in the short, medium and long term duration of development will need to ensure that all occupiers and visitors are provided with at least two vehicular access routes at all times.

On completion of development within the SIA, there will be a reduced bushfire risk to future assets as a result of vegetation clearing that will be undertaken to facilitate development. Vegetation clearing throughout development staging will play an important role in managing the bushfire risk posed by on-site temporary vegetation during roll out of individual development stages. This is discussed as a key management measure in Section 3.1.2.

On this basis, Strategen considers the bushfire hazards within and adjacent to Anketell SIA and the associated bushfire risk to be readily manageable through standard management responses outlined in the Guidelines and AS 3959. These responses will be factored in to proposed development early in the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life, property and environmental assets.

2.5 BAL contour assessment

A BAL contour assessment has not been undertaken as part of this BMP on the basis that proposed lot layout and development detail over Anketell SIA is not yet known.

A BAL contour assessment will need to be undertaken at future planning stages (i.e. to accompany each stage of subdivision application) and an updated BMP(s) prepared to reflect the outcomes of the assessment, including requirements that any proposed development consisting of habitable buildings located within 100 m of classified post development vegetation may require application of AS 3959 and increased building construction standards in response to assessed BAL.

Proposed development areas consisting of habitable buildings will need to achieve minimum hazard separation distances (APZs) necessary for a BAL-29 or lower rating (Table 1).

Table 1: Minimum hazard separation distances based on effective slope

Classified vegetation	Effective slope	Minimum hazard separation distance (APZ)	Corresponding separation distance range from Table 2.4.3 of AS 3959	Corresponding maximum BAL rating
Grassland (Class G)	Up-slope and flat	8 m	8-<12 m	29
Grassland (Class G)	Downslope >0-5 degrees	9 m	9-<14 m	29
Grassland (Class G)	Downslope >5-10 degrees	10 m	10-<16 m	29

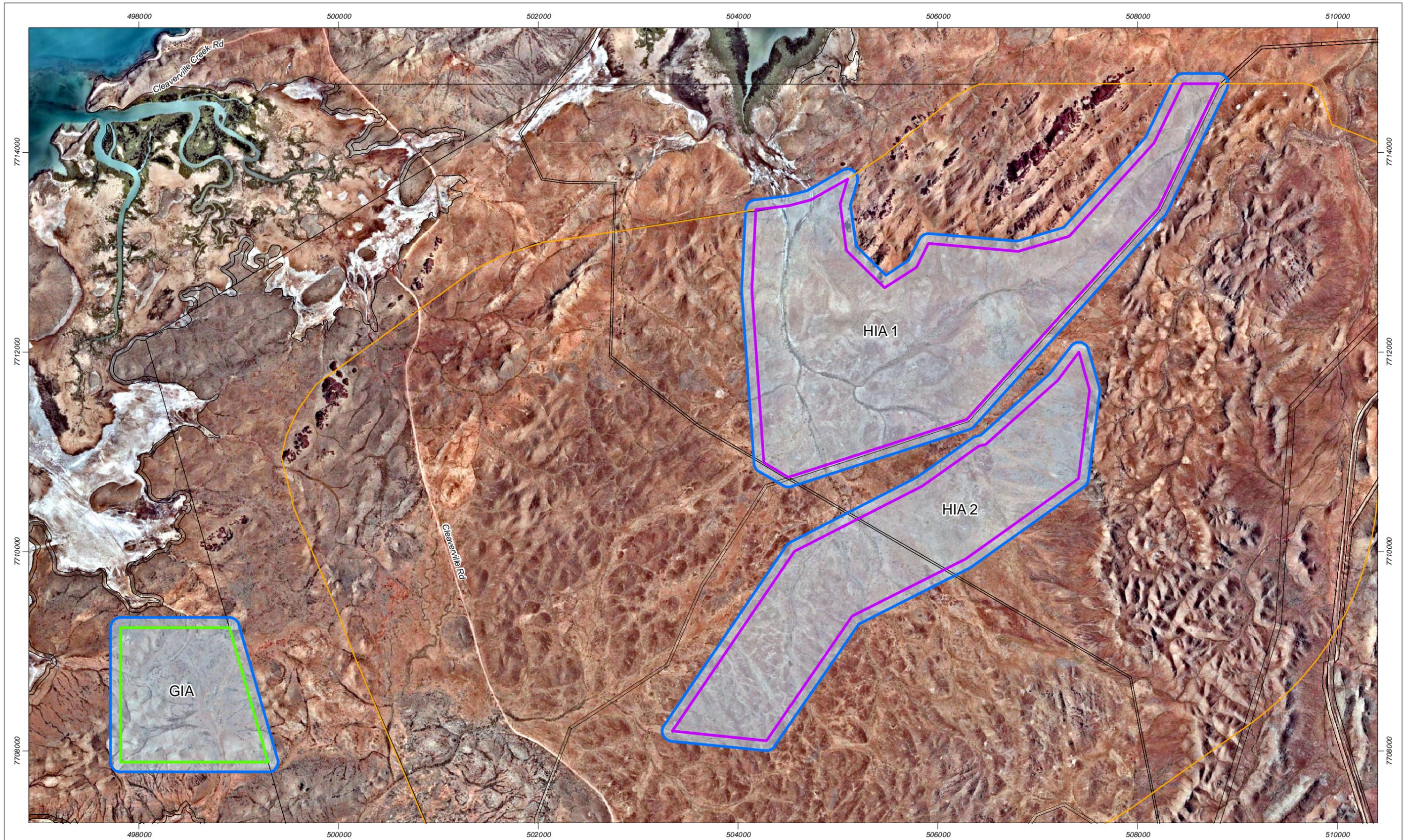
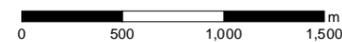


Figure 5: Pre-development bushfire hazard levels

Scale 1:35,000 at A3



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 22/03/2017
 Author: JCrute

Source: Aerial image: Neamap, flown 11/2016. Existing cadastre and concept plan: Client 03/2017.
 Path: Q:\Consult\2017\LAN\LAN17068\ArcMap_documents\R001\RevA\LAN17068_01_R001_RevA_F005_A3.mxd

Legend

- Industry
- Strategic Industry
- 100m wide assessment area
- Anketell Strategic Industrial Area Improvement Scheme Boundary
- Existing cadastre
- Bushfire hazard level: Moderate

3. Bushfire management measures

Strategen has identified a range of bushfire management measures that will need to be incorporated into development design and construction as part of future planning stages to ensure bushfire planning requirements for the SIA achieve compliance with the Guidelines. It should be noted that these measures are being provided at the strategic level in the absence of detailed subdivision or development plans and that future addendums to this BMP will need to be prepared to align with future planning stages on provision of greater levels of detail.

In the absence of detailed development design such as lot layout and local access network, this BMP demonstrates capacity within the project area and a commitment to implement all of the bushfire management measures identified to achieve compliance with the Guidelines in subsequent planning stages. Bushfire planning requirements at future planning stages are discussed further in Section 5.

3.1 Hazard separation distances

3.1.1 Asset Protection Zones

APZs will be identified for any habitable buildings as part of BMPs or a revised BMP to be prepared at future planning stages on the basis of compliance with minimum separation distances necessary to achieve a maximum BAL-29 rating under AS 3959-2009, as outlined in Table 1.

As depicted in the Guide Plan (Figure 2), the proposed Western and Central Infrastructure Corridors will result in low fuel hazard separation at the interfaces of a significant proportion of the HIA1, HIA2 and GIA interfaces. The proposed internal/local vehicular access network cannot be identified at this strategic planning stage, due to proposed development lot layout being unknown. However, the size of the development areas ensures that there is capacity to achieve either a local access network or building setbacks at subsequent planning stages at the remaining perimeter of post-development classified vegetation and proposed development areas.

This will ensure that minimum APZ requirements as per Table 1 and the Guideline acceptable solution A2.1 can be met at future planning stages and that development is avoided throughout all areas of BAL-FZ and BAL-40 as per Guideline acceptable solution A1.1.

The APZs are low fuel areas and are required to be maintained on a regular and ongoing basis by proponents at a fuel load less than 2 t/ha to achieve a low threat minimal fuel condition status all year round. Overstorey trees can be retained to some extent within the APZ provided all flammable material including understorey grasses, weeds, shrubs and scrub are removed from the fuel profile, essentially creating a managed parkland cleared landscape, which would result in a diminishing level of radiant heat, ember attack and fire rate of spread at the dwelling interface.

Requirements under the Guidelines for APZs include:

- Fine Fuel Load: combustible dead vegetation matter less than 6 mm in thickness reduced to and maintained at an average of 2 t/ha
- Trees (> 5 m in height): lower branches should be removed to a height of 2 m above the ground, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 m apart as to not form a continuous canopy
- Shrubs (0.5 m to 5 m in height): should not be located under trees, should not be planted in clumps greater than 5 m² in area, clumps of shrubs should be separated from each other by at least 10 m
- Groundcovers (<0.5 m in height): can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 m of a structure
- Grass: should be managed to maintain a height of 10 cm or less.

The City of Karratha annual firebreak notice (Appendix 2) also requires industrial land 2024 m² or less to be clear of all flammable material, with the exception of living standing trees, across the entirety of the property.

3.1.2 On-site staging buffers

Development within Anketell SIA will be subject to staging, with HIA1 forecast to be developed before HIA2 (RPS 2016).

Given that timing of required planning and subsequent construction cannot be forecast at the strategic level, BMPs to be prepared at future planning stages will not be able to rely on full construction within adjacent development areas.

Vegetation clearing in advance may need to occur to ensure habitable building construction is not inhibited by a temporary vegetation extent located within adjacent stages yet to be cleared. This can be achieved by ensuring each approved stage subject to construction is surrounded by a minimum 50 m wide, on-site cleared or low threat buffer from any Class G grassland prior to development (not including vegetation proposed to be retained). Once the buffers are created, they will need to be maintained on a regular and ongoing basis at a fuel load less than 2 t/ha to achieve a low threat minimal fuel condition all year round until such time that the buffer area is developed as part of the next development stage. This will assist in managing the current on-site grassland hazards in proximity to proposed development during the staging process.

This BMP will be reviewed at subsequent planning stages, at which time any changes to development and clearing within surrounding areas can be considered and addressed in a revised BMP(s).

3.2 Increased building construction standards

As outlined in Section 2.5, BAL contour assessments will need to be undertaken at future planning stages and BMPs updated to reflect the outcomes of the assessments.

As outlined in Section 3.1.1, APZs will be identified for habitable buildings as part of BMPs to be prepared at future planning stages on the basis of compliance with minimum separation distances necessary to achieve a maximum BAL-29 rating under AS 3959-2009, as outlined in Table 1.

Strategen acknowledges that the bushfire construction provisions of the Building Code of Australia do not apply to Class 4 to Class 9 buildings, which are likely to be the dominant types of habitable buildings constructed throughout the SIA. Therefore, the proponent has the discretion to utilise any or all of the elements of AS 3959 in the construction of the building that they deem appropriate if the building is a Class 4 to Class 9 building (WAPC 2015).

Whilst acknowledging the above, Strategen considers however that to achieve a best practice outcome for protection of future life and property assets, building design measures be applied for all proposed habitable buildings situated within the 50 m wide of Class G grassland to ensure the building construction standard aligns with the assessed BAL under AS 3959 as far as reasonably practicable, regardless of building class. This measure intends to address the deemed provisions relating to construction of habitable buildings³ in Bushfire Prone areas as outlined in Section 78B of the *Planning and Development (Local Planning Schemes) Amendment Regulations 2015*.

Permissible land uses within the 'Strategic Industry' and 'Industry' zone under the Improvement Scheme that have the potential to include habitable buildings include:

- Civic use
- Convenience store

³ 'Habitable building' is defined as any permanent or temporary structure that is fully or partially enclosed and has at least one wall and a roof of solid material and is used for a purpose that involves the use of the interior of the structure by people for living, working, studying or being entertained.

- Industry
- Industry – resource processing
- Motor vehicle repair
- Office
- Service station
- Trade supplies
- Transport Overnight Facility.

3.3 Vehicular access

3.3.1 Public access

The Transport and Traffic Planning Report included as an appendix to the Improvement Scheme Report (RPS 2016) investigates the high-level infrastructure corridor network requirements in relation to transport, services and utility requirements for the Port and the SIA. These requirements are planned to be met through corridors as outlined below and depicted in Figure 6.

Western Infrastructure Corridor

This corridor forms part of the Anketell Port and is not part of the Improvement Scheme area. The western corridor will accommodate a port access road that will be the primary point of access to HIA1. Access will intersect with the North West Coastal Highway at a point approximated 15km east of Karratha Road, running north-northwest towards the coast, then east between Cleaverville and Mount Anketell to the Port Precinct.

Primary access to the GIA will also be achieved via the Western Infrastructure Corridor. Timing of development of the GIA will be dependent on demand.

It is proposed that the existing Cleaverville Road won't be closed until the Western Corridor Port Access Road is operational.

Central Infrastructure Corridor

This corridor incorporates the existing easement for the Robe River Gas Pipeline and is identified as a future road and utilities route between Anketell Port and North West Coastal Highway and will provide access to both HIA1 and HIA2. The corridor provides a secondary alignment should it be found necessary to supplement the Western Infrastructure Corridor, with construction being reliant on progress of mining in and around HIA2.

The above proposed strategic corridor network provides for two main access points to North West Coastal Highway in the south and Anketell Port in the north. This will ensure that site occupants will have the option of safe access and egress to at least two different destinations, to the port in the north and east or west along North West Coastal Highway.

Given the staged nature of proposed development, vehicular access arrangements in the short, medium and long term duration of development will need to ensure that all occupiers and visitors are provided with at least two vehicular access routes at all times.

Indicative access points from these corridors have been identified for HIA1 and GIA (Figure 6). The proposed internal/local vehicular access network cannot be identified at this strategic planning stage, due to proposed development lot layout being unknown.

The internal/local vehicular access network within development areas, to be identified at subsequent planning stages, will be required to link to the adjacent strategic corridor network and provide occupiers with at least two vehicular access routes, including during development staging. Due to the staged nature of development, this may involve construction of temporary access tracks during development staging until two formal access roads are available.

Any public roads, cul-de-sacs and private driveways longer than 50 m proposed at subsequent planning stages will need to comply with technical requirements of the Guidelines, as outlined in Table 2.

Development design to be undertaken at future planning stages can ensure that the proposed development will avoid inclusion of any battle-axe access legs.

Table 2: Vehicular access technical requirements

Technical requirement	Public road	Cul-de-sac	Private driveway
Minimum trafficable surface (m)	6*	6	4
Horizontal distance (m)	6	6	6
Vertical clearance (m)	4.5	N/A	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5

* Refer to E3.2 Public roads: Trafficable surface

Source: WAPC 2015b

3.3.2 Firebreaks

The City of Karratha annual firebreak notice (Appendix 2) includes the following firebreak requirements for industrial land:

- land that is more than 2024m²: provide firebreaks at least 3 m wide, immediately inside all external boundaries of the land and also immediately surrounding all buildings and haystacks situated on the land. Where several adjoining lots are held or used by the owner/occupier, the firebreaks may be provided inside and along the external boundaries of the group or lot.

Annual firebreak notice requirements apply to the existing landowner and prospective landowners following land transfer unless a firebreak variation is sought and approved by the City of Karratha.

3.4 Water supply

The Engineering Services and Infrastructure Plan Report included as an appendix to the Improvement Scheme Report (RPS 2016) addresses the full range of utility services required to be provided to the SIA, including water and power supply.

Given that neither scheme water nor sufficient groundwater is available for use in the SIA, privately owned facilities will be required to meet the forecast water demands. It is proposed that centralised facilities be established within the SIA to produce fit-for-purpose industry feedwater and potable water from a combination of desalination and wastewater recycling.

It is anticipated that power would be routed to the SIA via the existing transmission line between Karratha and Cape Lambert. If the transmission line is heavily utilised for this purpose it is anticipated that the 132 kV line will require an upgrade to 220 kV. These transmission lines would be extended on overhead cables into the SIA and terminated into a zone substation within the development area.

Further design work providing detailed arrangements for infrastructure provision will be undertaken through subsequent subdivision and/or development planning stages.

At subsequent planning stages, developers will be required to prepare, have approved by the relevant water supply authority and Department of Fire and Emergency Services (DFES), and implement a detailed plan demonstrating the location and capacity of fire emergency infrastructure.

Depending on capacity of final water supply infrastructure and development detail, the below requirements for hydrants or water tanks will apply to subsequent planning proposals.

Hydrants

A network of hydrants will need to be provided along the internal road network at locations which meet relevant water supply authority and DFES requirements, in particular the Water Corporation Design Standard DS 63 'Water Reticulation Standard Design and Construction Requirements for Water Reticulation Systems up to DN250'. This standard will guide construction of the internal reticulated water supply system and fire hydrant network, including spacing and positioning of fire hydrants so that the maximum distance between a hydrant and the rear of a building envelope (or in the absence of a building envelope, the rear of the lot) shall be 120 m and the hydrants shall be no more than 200 m apart.

Water tanks

Water tanks for fire fighting purposes with a hydrant or standpipe will need to be provided as per the following requirements under the Guidelines:

- volume: minimum 50,000 litres per tank
- ratio of tanks to lots: minimum one tank per 25 lots (or part thereof)
- tank location: no more than 2 km to the further most habitable building within the development to allow a 2.4 appliance to achieve a 20 minute turnaround time at legal road speeds
- hardstand and turnaround areas suitable for a type 3.4 appliance (i.e. kerb to kerb 17.5 m) are provided within 3 m of each water tank
- water tanks and associated facilities are vested in the relevant local government.

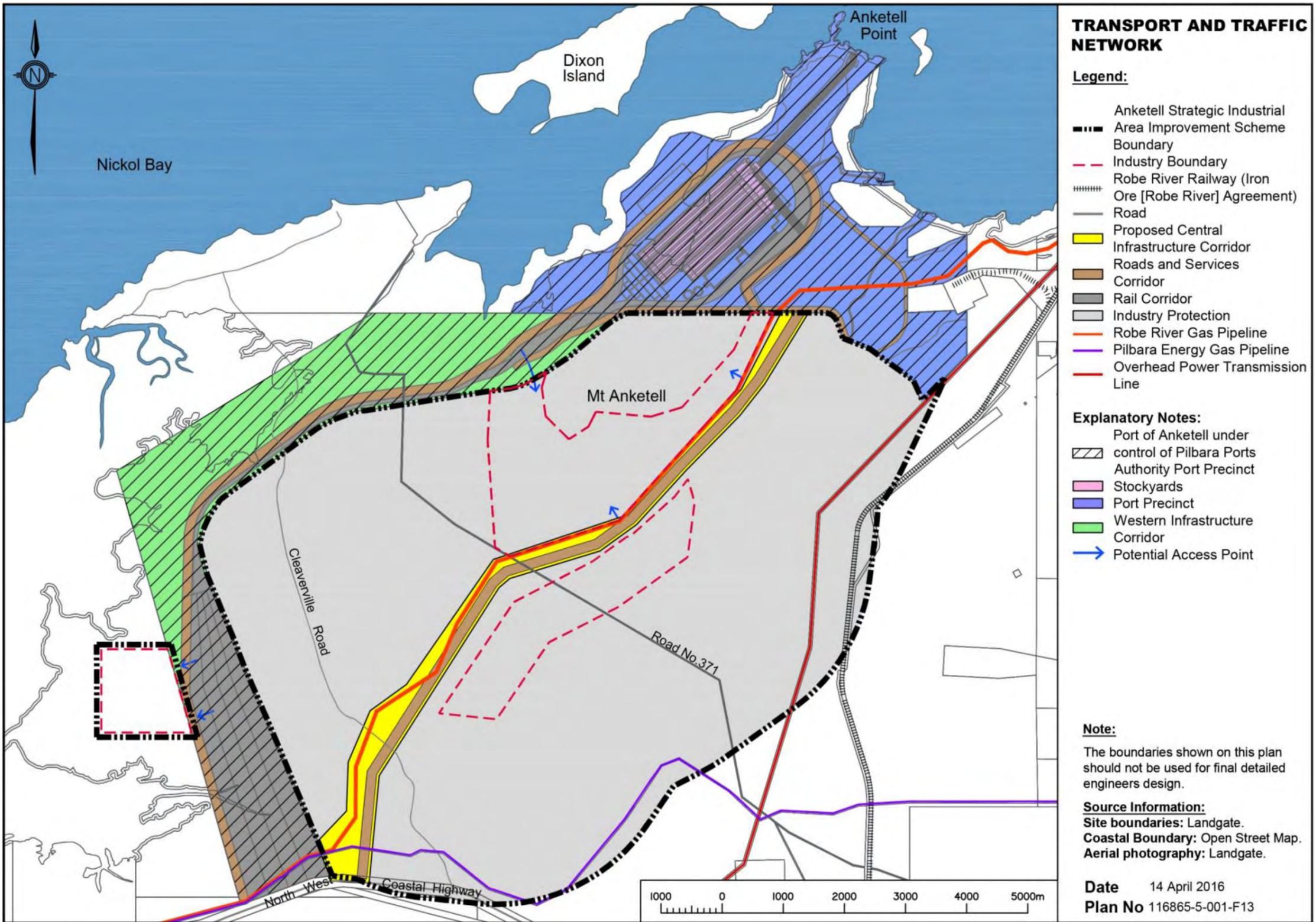
3.5 Additional measures

Strategen makes the following recommendations for additional bushfire management measures to inform ongoing planning stages of the development and increase the level of bushfire risk mitigation across the site:

1. **BMP and BAL assessment at future planning stages:** Proposed management measures are based on information at the strategic planning stage. Consequently, a revised BMP(s), including detailed BAL contour assessment on an individual lot basis, will be required for proposed development at an appropriate future planning stage (such as subdivision) to ensure the management measures and separation distances are consistent with the final development proposal.
2. **Notification on Title:** Strategen recommends that the abovementioned revised BMP(s) include a requirement for notification to be placed on title for all lots (either through condition of subdivision or other head of power) to ensure all landowners/proponents and prospective purchasers are aware that their lot is subject to an approved BMP and BAL assessment, however, since the lot is situated within a designated bushfire prone area (at creation of title), the BAL for proposed buildings may, at the discretion of the City of Karratha, need to be confirmed at the building permit stage.

3. High risk land uses: proposed industrial development has the potential to establish high risk land uses^[1] throughout the SIA. Where they can't be avoided, high risk land uses located in areas of BAL-12.5 to BAL-29 will require the following under Policy Measure 6.6.1 of SPP 3.7 to accompany submission of development or building permit applications (whichever is deemed more appropriate):
 - (a) Emergency Evacuation Plan
 - (b) Risk Management Plan.
4. Compliance with the City of Karratha annual firebreak notice: the developer/land manager and prospective land purchasers are to comply with the current City of Karratha annual firebreak notice (Appendix 2).

^[1] High risk land uses may include, but are not limited to: service stations, landfill sites, bulk storage of hazardous materials, fuel depots and certain heavy industries as well as military bases, power generating land uses, saw-mills, highways and railways, among other uses meeting the definition.



Source: RPS 2016

Figure 6: Transport and traffic network

4. Proposal compliance and justification

Proposed development within Anketell SIA is required to comply with SPP 3.7 and the Guidelines, as required under the following policy measures:

6.2 Strategic planning proposals, subdivision and development applications

a) Strategic planning proposals, subdivision and development applications within designated bushfire prone areas relating to land that has or will have a Bushfire Hazard Level (BHL) above low and/or where a Bushfire Attack Level (BAL) rating above BAL-LOW apply, are to comply with these policy measures.

b) Any strategic planning proposal, subdivision or development application in an area to which policy measure 6.2 a) applies, that has or will, on completion, have a moderate BHL and/or where BAL-12.5 to BAL-29 applies, may be considered for approval where it can be undertaken in accordance with policy measures 6.3, 6.4 or 6.5.

c) This policy also applies where an area is not yet designated as a bushfire prone area but is proposed to be developed in a way that introduces a bushfire hazard, as outlined in the Guidelines.

6.3 Information to accompany strategic planning proposals

Any strategic planning proposal to which policy measure 6.2 applies is to be accompanied by the following information prepared in accordance with the Guidelines:

a) (i) the results of a BHL assessment determining the applicable hazard level(s) across the subject land, in accordance with the methodology set out in the Guidelines. BHL assessments should be prepared by an accredited Bushfire Planning Practitioner; or

a) (ii) where the lot layout of the proposal is known, a BAL Contour Map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines. The BAL Contour Map should be prepared by an accredited Bushfire Planning Practitioner; and

b) the identification of any bushfire hazard issues arising from the relevant assessment; and

c) clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages.

This information can be provided in the form of a Bushfire Management Plan or an amended Bushfire Management Plan where one has been previously endorsed.

Implementation of this BMP is expected to meet the following objectives of SPP 3.7:

5.1 Avoid any increase in the threat of bushfire to people, property and infrastructure. The preservation of life and the management of bushfire impact are paramount.

5.2 Reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process.

5.3 Ensure that higher order strategic planning documents, strategic planning proposals, subdivision and development applications take into account bushfire protection requirements and include specified bushfire protection measures.

5.4 Achieve an appropriate balance between bushfire risk management measures and, biodiversity conservation values, environmental protection and biodiversity management and landscape amenity, with consideration of the potential impacts of climate change.

In response to the above requirements of SPP 3.7 and the Guidelines, bushfire management measures, as outlined in Section 3, have been devised for the proposed development in accordance with Guideline acceptable solutions to meet compliance with bushfire protection criteria. An 'acceptable solutions' assessment at the strategic planning stage is provided in Table 3 to assess the proposed bushfire management measures against each bushfire protection criteria in accordance with the Guidelines and demonstrate that the measures proposed at future planning stages meet the intent of each element of the bushfire protection criteria.

Table 3: Acceptable solutions assessment against bushfire protection criteria

Bushfire protection criteria	Intent	Acceptable solutions	Proposed bushfire management measures	Compliance statement
Element 1: Location	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.	Refer to Sections 0, 2.5 and 3.2, which demonstrate that all future development will be able to avoid areas of Extreme bushfire hazard and BAL-FZ and BAL-40 and development areas have the capacity to achieve a rating of BAL-29 or lower.	Measures proposed are considered to comply and meet the intent of Element 1 Location.
Element 2: Siting and design of development	To ensure that the siting and design of development minimises the level of bushfire impact	A2.1 Asset Protection Zone Every building is surrounded by an APZ, depicted on submitted plans, which meets detailed requirements (refer to the Guidelines for detailed APZ requirements).	Refer to Section 3.1.1, which demonstrates that proposed development areas have capacity to achieve minimum APZ requirements at subsequent planning stages to achieve a rating of BAL-29 or lower.	Measures proposed are considered to comply and meet the intent of Element 2 Siting and design of development
Element 3: Vehicular access	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event	A3.1 Two access routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.	Refer to Section 3.3, which demonstrates that at least two different vehicular access routes will be provided for development areas at all times via the strategic corridor network and the local/internal access network (to be identified at future planning stages).	Measures proposed are considered to comply and meet the intent of Element 3 Vehicular access
		A3.2 Public road A public road is to meet the requirements in Table 2, Column 1.	Refer to Section 3.3, which demonstrates that proposed public roads will be designed to meet minimum requirements outlined in Table 2.	
		A3.3 Cul-de-sac (including a dead-end-road) A cul-de-sac and/or a dead end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent), detailed requirements will need to be achieved (refer to the Guidelines for detailed cul-de-sac requirements).	Refer to Section 3.3, which demonstrates that if any cul-de-sacs are proposed at future planning stages they will be designed to meet minimum requirements outlined in Table 2.	
		A3.4 Battle-axe Battle-axe access leg should be avoided in bushfire prone areas. Where no alternative exists, (this will need to be demonstrated by the proponent) detailed requirements will need to be achieved (refer to the Guidelines for detailed battle-axe requirements).	N/A No battle-axe lots are being proposed at this strategic planning stage	
		A3.5 Private driveway longer than 50 m A private driveway is to meet detailed requirements (refer to the Guidelines for detailed private driveway requirements).	Refer to Section 3.3, which demonstrates that any private driveways longer than 50 m proposed at future planning stages will be designed to meet minimum requirements outlined in Table 2.	

		<p>A3.6 Emergency access way An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent), an emergency access way is to be provided as an alternative link to a public road during emergencies. An emergency access way is to meet detailed requirements (refer to the Guidelines for detailed EAW requirements).</p>	<p>N/A No fire service access routes are required as part of the development. .</p>	
		<p>A3.7 Fire service access routes (perimeter roads) Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for fire fighting purposes. Fire service access routes are to meet detailed requirements (refer to the Guidelines for detailed fire service access route requirements).</p>	<p>N/A No fire service access routes are required as part of the development.</p>	
		<p>A3.8 Firebreak width Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government</p>	<p>Refer to Section 3.3, which demonstrates that relevant lots will need to meet minimum internal perimeter firebreak requirements as per the City of Karratha annual firebreak notice.</p>	
<p>Element 4: Water</p>	<p>To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.</p>	<p>A4.1 Reticulated areas The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.</p>	<p>N/A The SIA is not within a reticulated water supply area.</p>	<p>Measures proposed are considered to comply and meet the intent of Element 4 Water</p>
		<p>A4.2 Non-reticulated areas Water tanks for fire fighting purposes with a hydrant or standpipe are provided and meet detailed requirements (refer to the Guidelines for detailed requirements for non-reticulated areas)</p>	<p>Refer to Section 3.4, which demonstrates that water supply options have been identified for future development, with subsequent planning stages being required to meet fire fighting water requirements in accordance with local water authority, City and DFES requirements.</p>	
		<p>A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively) Single lots above 500 square metres need a dedicated static water supply on the lot that has the effective capacity of 10 000 litres.</p>	<p>N/A The SIA Improvement Scheme will result in creation of more than 1 lot.</p>	

5. Future bushfire requirements

Development within Anketell SIA is expected to occur over a long term timeframe dependent on demand for strategic and heavy industry sites within HIA1 and HIA2. Due to the uncertain nature of demand for such sites within the SIA, future subdivision and development is intended to occur when required by future proponents or industry operators.

5.1 Statutory requirements

Applicable legislation, standards, supporting guidelines and local government provisions that determine or influence bushfire requirements for future planning stages within Anketell SIA include:

- *Bush Fires Act 1954*
- State Planning Policy 3.7 *Planning in Bushfire Prone Areas* (SPP 3.7; WAPC 2015)
- *Planning and Development (Local Planning Schemes) Regulations 2015* (deemed planning provisions)
- *Building Act 2011* and *Building Regulations 2012* (Building Regulations)
- Building Code of Australia (BCA)
- Australian Standard AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* (AS 3959-2009: SA 2009)
- *Guidelines for Planning in Bushfire Prone Areas* (the Guidelines; WAPC 2017)
- Local Government annual firebreak notices.

5.2 Planning stage requirements

5.2.1 Subdivision applications

SPP 3.7 policy measure 6.4 requires subdivision applications to be accompanied by the following information in accordance with the Guidelines:

1. A BAL Contour Map or BAL assessment to determine the indicative acceptable BAL ratings across the subject site.
2. The identification of any bushfire hazard issues arising from the BAL Contour Map.
3. An assessment against the bushfire protection criteria requirements demonstrating compliance within the boundary of the subdivision site.

This information can be provided in the form of a BMP or an amended BMP where one has been previously endorsed.

Subdivision applications for high risk land uses where BAL-12.5 to BAL-29 applies will not be supported unless accompanied by a BMP jointly endorsed by the relevant local government and DFES. Subdivision applications should make provision for emergency evacuation.

High risk land uses include service stations, landfill sites, bulk storage or hazardous materials, fuel depots, certain heavy industries, sawmills, highways and railways.

5.2.2 Development applications

Development applications include any application to carry out development or to change land use, but excludes applications for single houses or ancillary dwellings on lots less than 1,100 m².

SPP 3.7 policy measure 6.5 requires development applications to be accompanied by the following information:

1. A BAL assessment.
or
A BAL Contour Map that has been prepared for an approved subdivision clearly showing the indicative acceptable BAL rating across the subject site.
2. The identification of any bushfire hazard issues arising from the BAL Contour Map or BAL assessment.
3. An assessment against the bushfire protection criteria requirements demonstrating compliance within the boundary of the development site.

This information can be provided in the form of a BMP or an amended BMP where one has been previously endorsed.

Development applications for high risk land uses where BAL-12.5 to BAL-29 applies will not be supported unless accompanied by a BMP jointly endorsed by the relevant local government and DFES.

Development applications for high risk land uses are required to be accompanied by:

1. An emergency evacuation plan for proposed occupants.
2. A risk management plan for any flammable on-site hazards.

High risk land uses include service stations, landfill sites, bulk storage or hazardous materials, fuel depots, certain heavy industries, sawmills, highways and railways.

5.2.3 Building permits

For most building works a building permit is required and the permit authority will be the relevant local government. The permit authority is also responsible for enforcement and dealing with non-compliance in relation to applicable building standards.

For single houses or ancillary dwellings on sites 1,100 m² or greater, other habitable buildings⁴ (other than a single house or ancillary dwelling) or specified buildings⁵ in Bushfire Prone areas, under the deemed planning provisions a BAL assessment is required, where a BAL Contour Map does not exist from a previous approved proposal. If the BAL assessment or BAL Contour Map identifies the development site as BAL-40 or BAL-FZ, a development application and planning approval is required.

For development on sites less than 1,100 m² in Bushfire Prone areas the bushfire construction requirements under the Building Act and BCA may still apply, which also includes undertaking a BAL assessment, where a BAL Contour Map does not exist from a previous approved proposal.

Building permit applications must demonstrate compliance with applicable BCA bushfire construction requirements.

⁴ Habitable building as defined under SPP 3.7 means a permanent or temporary structure that is fully or partially enclosed and has at least one wall of solid material and a roof of solid material and is used by people for living, working, studying or being entertained.

⁵ Specified building means a structure identified in a local planning scheme as a building to which the deemed provisions apply.

The BCA bushfire construction requirements only apply to Class 1a (single dwelling), Class 1b (accommodation, grouped dwellings), Class 2 (apartments), Class 3 (accommodation, schools, health-care, detention centre) buildings, other structures and decks (Class 10a) associated with these buildings and major alterations/additions to residential buildings.

The bushfire construction provisions of the BCA do not apply to Class 4 - Class 9 buildings (mixed use, commercial, industrial buildings or public facilities). If planning approval is required for this type of development, the planning process will apply the bushfire protection criteria to ensure that the optimal outcome is achieved for bushfire protection, such as appropriate siting of buildings, provision of water supply etc. For Class 4 – Class 9 buildings, applicants have the discretion to utilise any or all of the elements of AS3959-2009 in the construction of buildings.

5.3 Adoption of proposed management measures

Proposed management measures identified in this BMP are based on information at the strategic planning stage. Consequently, a revised BMP(s), including detailed BAL contour assessment and confirmation of the proposed management measures, will be required for proposed development at an appropriate future planning stage (such as each future stage of subdivision application) to ensure the management measures are consistent with the final development proposal.

The above revised BMP(s) will also need to include a bushfire compliance table to drive implementation of all bushfire management works at the subdivision/development and building stages.

As none of the proposed management measures will be subject to implementation at the strategic planning stage, Table 4 below provides a summary of the management measures to be adopted and subsequently implemented via the revised BMP(s) to be prepared at future subdivision stages.

Table 4: Bushfire management measures to be adopted via revised BMP(s)

BMP Section	Management measure
Section 3.1.1	Identification of APZs to ensure no habitable buildings are located in BAL-40 or BAL-FZ
Section 3.1.2	Creation and maintenance of on-site staging buffers (if required)
Section 3.2	Undertake a BAL contour assessment to ensure that all development can achieve a maximum BAL-29 rating under AS 3959, with all habitable buildings within 100 m of post development classified vegetation to be constructed in accordance with AS 3959 as far as reasonably practicable.
Section 3.3.1	All public roads, any cul-de-sacs and private driveways longer than 50 m to be constructed in accordance with technical requirements of the Guidelines
Section 3.3.1	Local access network to provide occupiers with at least two vehicular access routes, including during development staging
Section 3.3.2	Firebreaks to be required as per City of Karratha annual firebreak notice
Section 3.4	Provision of emergency water supply in accordance with water authority, DFES and City technical requirements
Section 3.5	Notification to be placed on Title on lots within bushfire prone areas at subdivision stage
Section 3.5	Prepare Emergency Evacuation Plan and Risk Management Plan for any proposed high risk land uses at development application stage
Section 3.5	Compliance required with the City of Karratha annual firebreak order outlined in Appendix 2

6. References

Bureau of Meteorology (BoM) 2017, *Climate statistics for Australian locations: Monthly climate statistics for Roebourne*, [Online], Commonwealth of Australia, available from:
http://www.bom.gov.au/climate/averages/tables/cw_004035.shtml, [29/03/2017].

Department of Fire and Emergency Services (DFES) 2017, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from:
<http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx>, [29/03/2017].

Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth, WA.

RPS 2016, *Improvement Scheme Report, Anketell Strategic Industrial Area*, RPS Australia East Pty Ltd, West Perth.

Standards Australia (SA) 2009, *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.

Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth.

Western Australian Planning Commission (WAPC) 2017, *Guidelines for Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth

Appendix 1
Site photographs



Photo 1: Class G grassland within HIA1



Photo 2: Class G grassland within HIA1

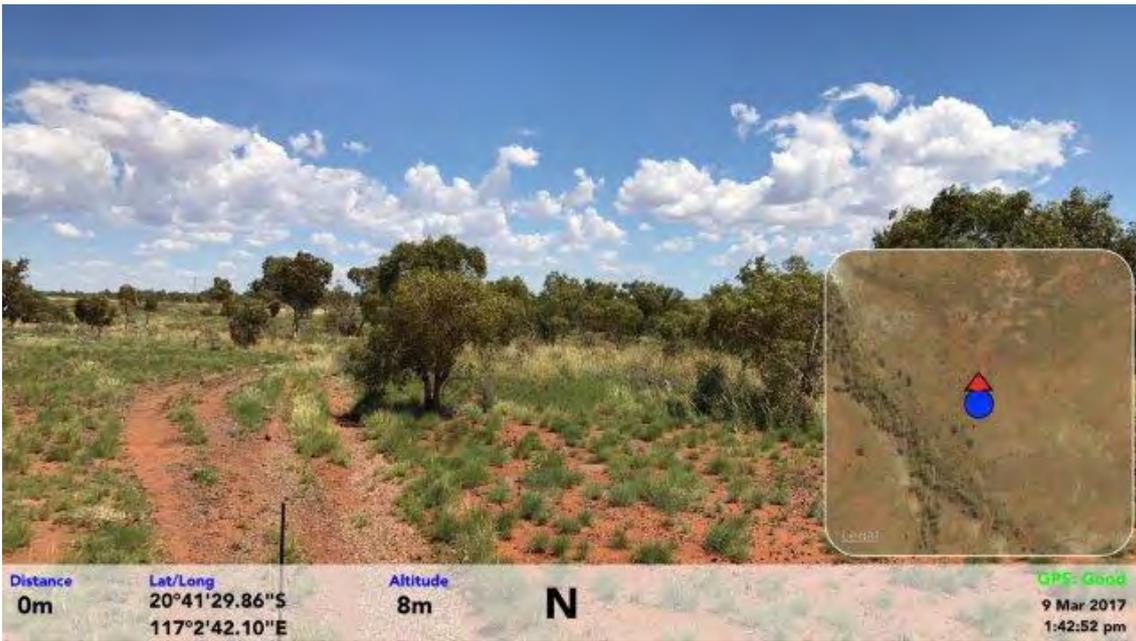


Photo 3: Class G grassland within HIA1 (areas of open woodland along creeklines are classified on basis of predominant Class G grassland understorey)

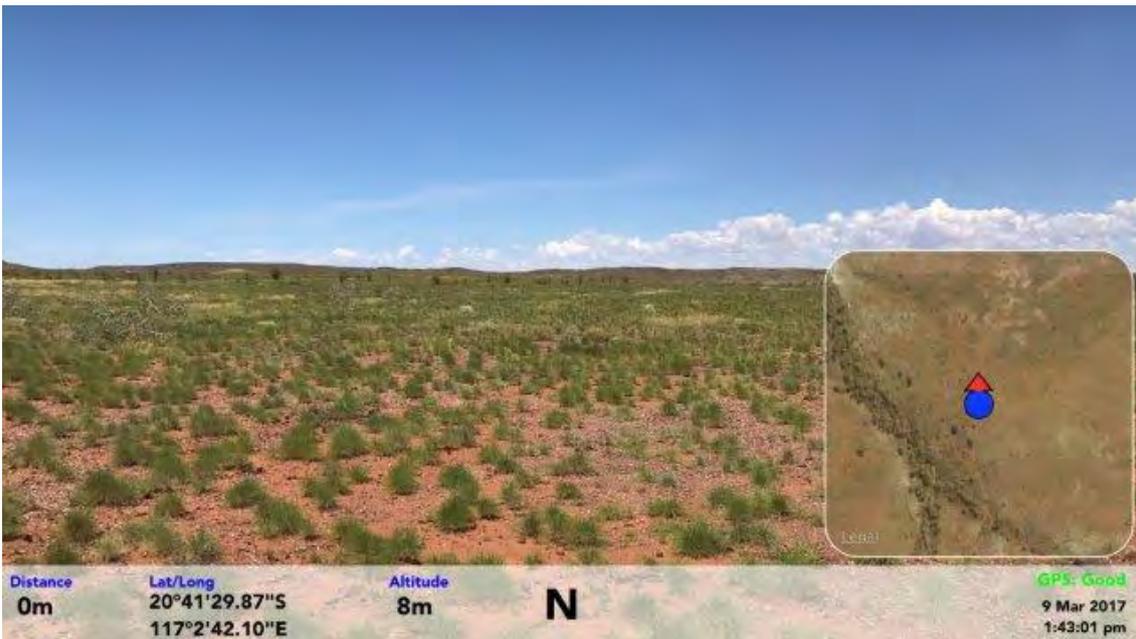


Photo 4: Class G grassland within HIA1



Photo 5: Class G grassland within HIA1 (areas of open woodland along creeklines are classified on basis of predominant Class G grassland understorey)



Photo 6: Class G grassland within and adjacent to HIA1

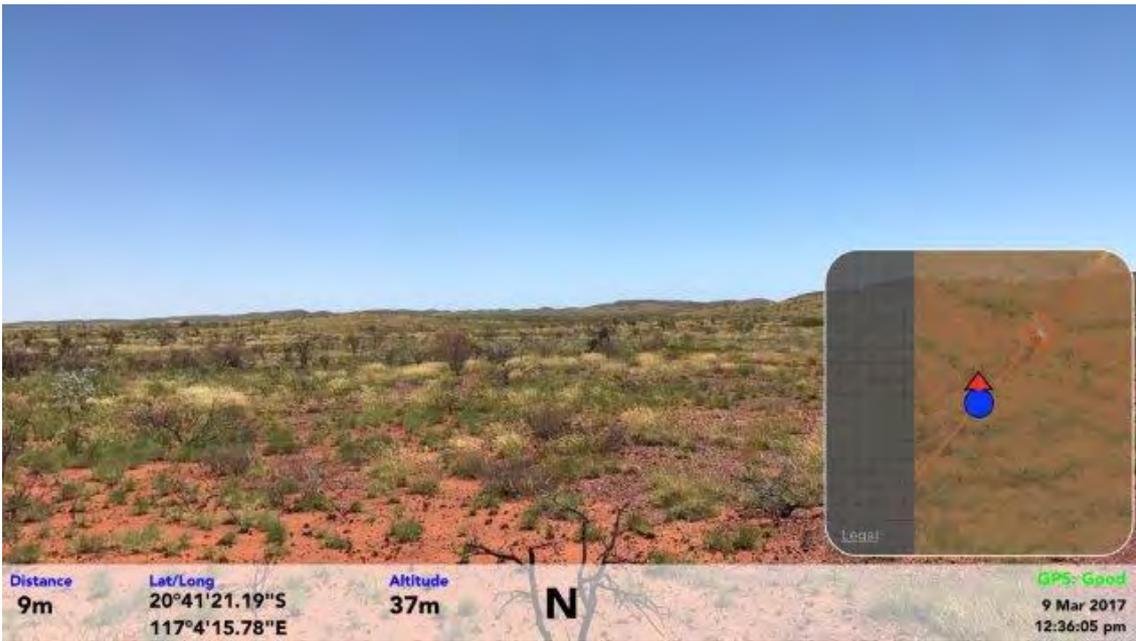


Photo 7: Class G grassland within and adjacent to HIA1

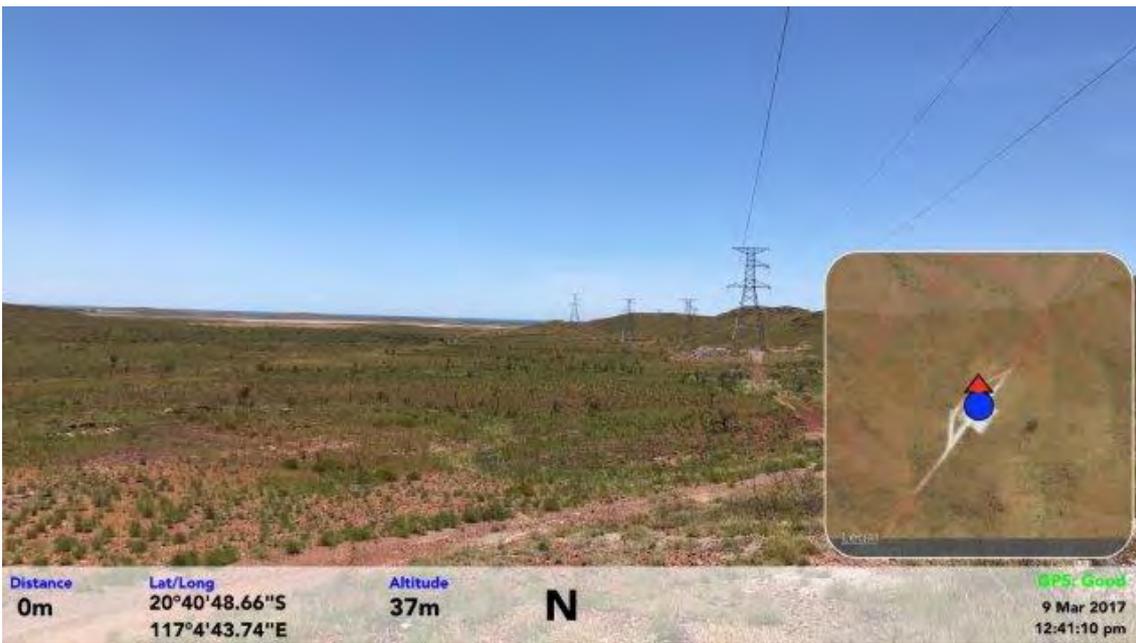


Photo 8: Class G grassland within and adjacent to HIA1

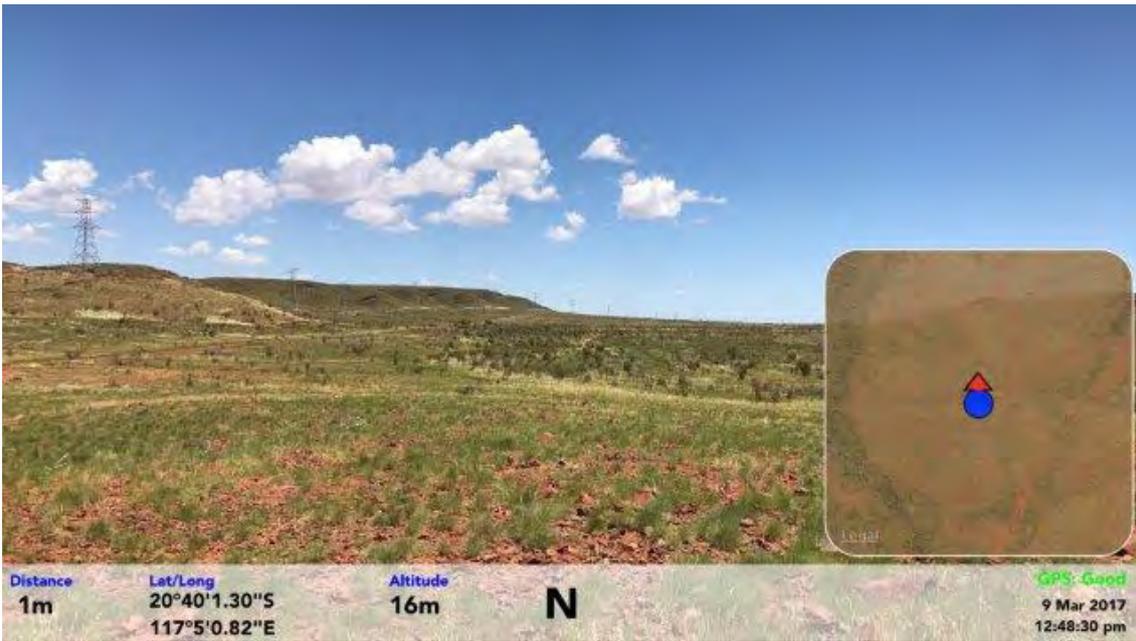


Photo 9: Class G grassland within and adjacent to HIA1

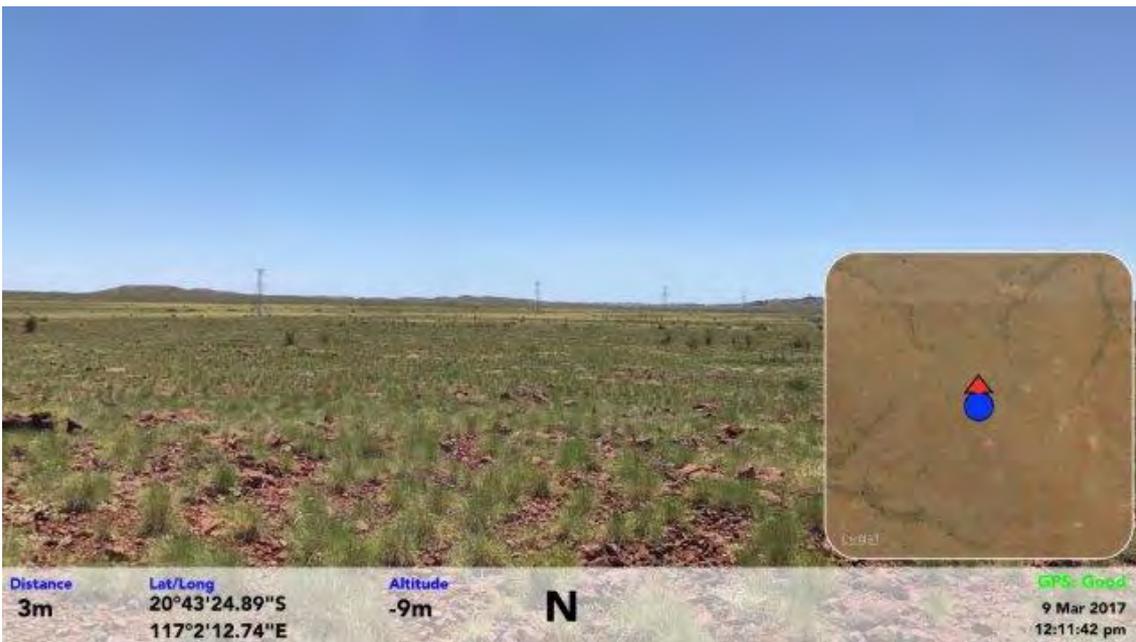


Photo 10: Class G grassland within HIA2

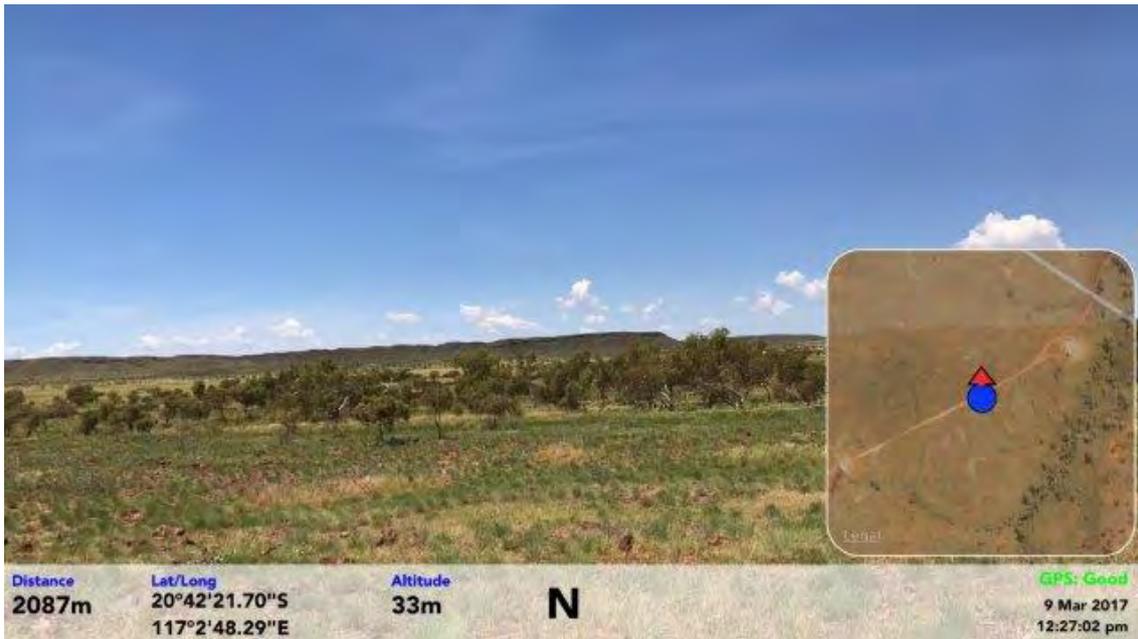


Photo 11: Class G grassland with HIA2 (areas of open woodland along creeklines are classified on basis of predominant Class G grassland understorey)



Photo 12: Class G grassland with HIA2 (areas of open woodland along creeklines are classified on basis of predominant Class G grassland understorey)

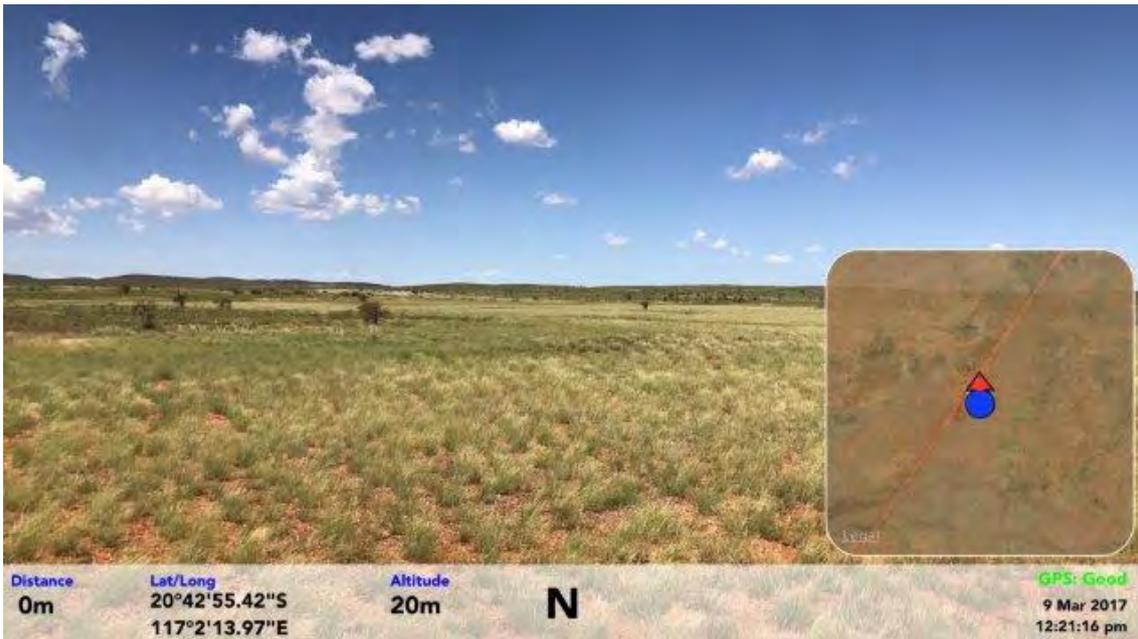


Photo 13: Class G grassland within and adjacent to HIA2



Photo 14: Class G grassland within and adjacent to HIA2



Photo 15: Class G grassland within GIA

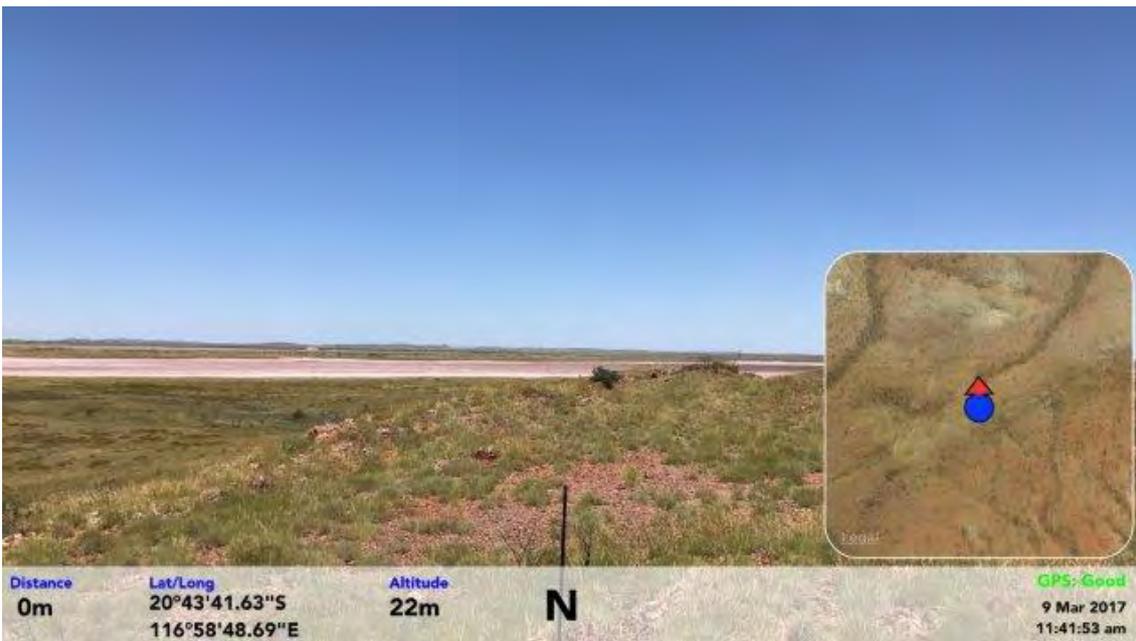


Photo 16: Class G grassland within GIA



Photo 17: Class G grassland within GIA

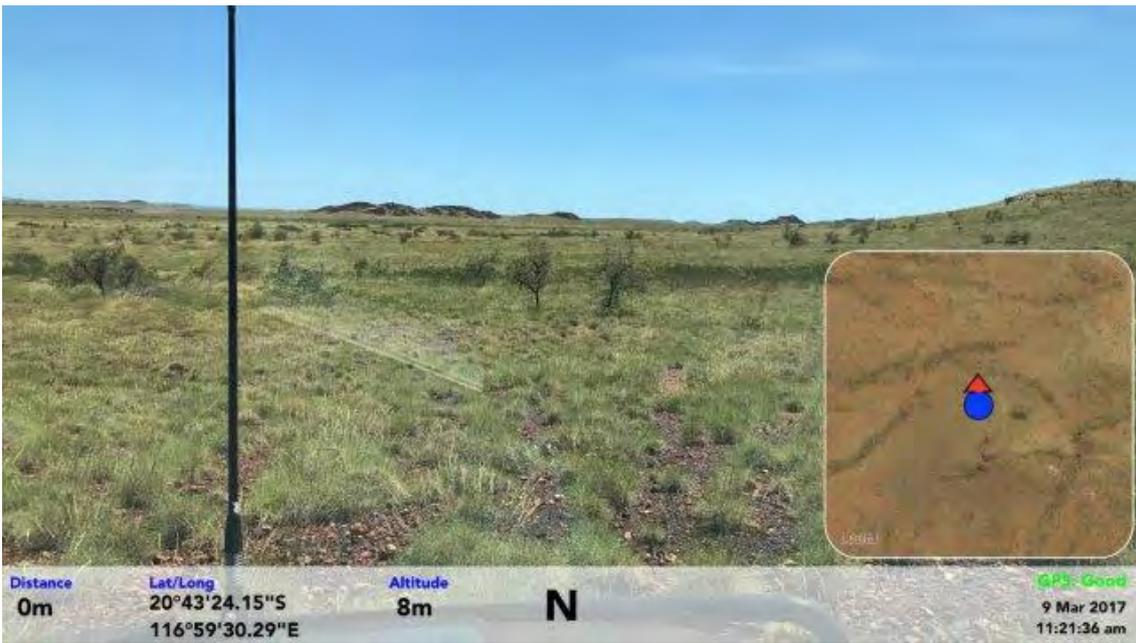


Photo 18: Class G grassland within and adjacent to GIA



Photo 19: Class G grassland within and adjacent to GIA

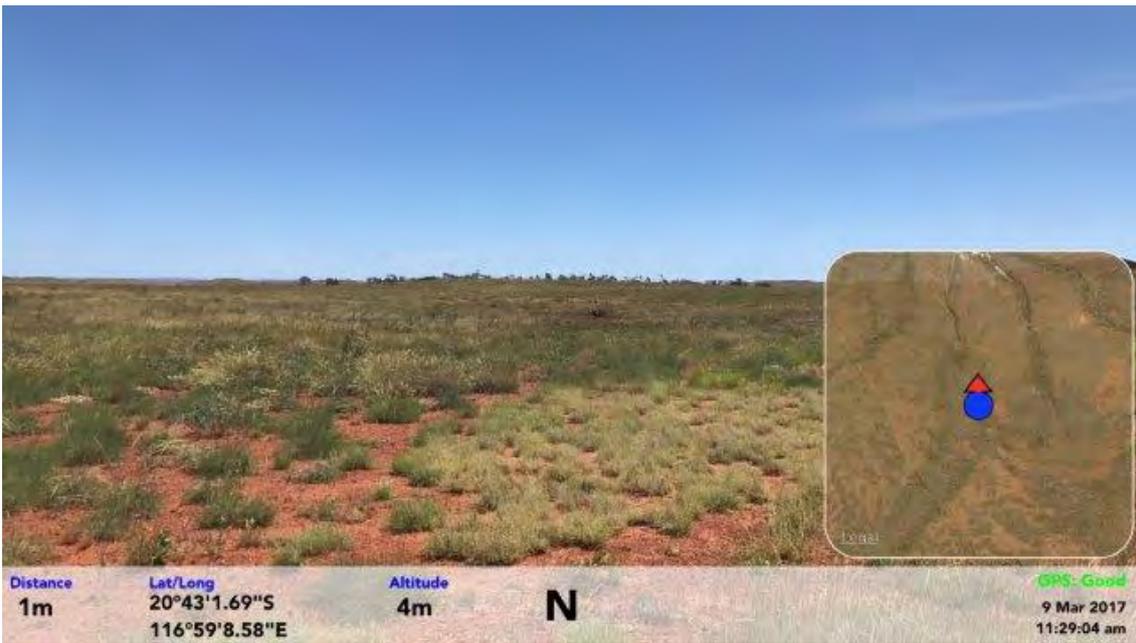


Photo 20: Class G grassland within and adjacent to GIA

Appendix 2
City of Karratha annual firebreak notice

Fire break notice

Owners or occupiers of land within the City of Karratha are hereby notified that you must comply with the Bush Fires Act 1954, (the Act) section 33, and carry out annual fire prevention work as set out in this notice.

It is the responsibility of the owner or occupier to maintain the property free of fire hazards and have all fire breaks installed as per the requirements of this Notice and maintain the land in that condition for the entire year.

Persons who fail to comply with the requirements of this order may be issued with an infringement notice which carries a modified penalty of \$250 and a maximum penalty of \$25,000. In accordance with the Act, Council may carry out the required works at the expense of the land owner or occupier regardless if issued with an infringement notice or prosecuted.

Requirements

1. Rural and Town-site Land (includes residential, commercial and industrial)

(a) Where the area of land is 2024m² (approximately half an acre) or less, remove all flammable material on the land except living standing trees from the whole of the land.

(b) Where the area of the land exceeds 2024m², provide fire breaks at least three (3) metres wide, immediately inside all external boundaries of the land and also immediately surrounding all buildings and haystacks situated on the land. Where several adjoining lots are held or used by the owner/

occupier, the firebreaks may be provided inside and along the external boundaries of the group or lot.

2. Special Rural Land

The owners of all small rural holdings zoned as Special Rural under Town Planning Schemes must maintain clear of all flammable materials a fire break at least three (3) metres wide, immediately inside all external boundaries of the land.

3. Fuel and/or Gas Depots

In respect of land owned and/or occupied by you on which is situated any container normally used to contain liquid or gas fuel, including the land on which any ramp or supports are constructed, you shall have the land clear of all flammable material.

Remember

Firebreaks must be maintained fuel-free year round. The City of Karratha is a designated "Restricted Burning" area;

A Permit to Burn is required from 1 January to 31 December (inclusive); and

On days of Very High, Severe, Extreme and Catastrophic Fire Danger Rating, as issued by Bureau of Meteorology, you are prohibited to burn-off or to use cooking fires (including gas appliances)

For more information, contact the City of Karratha on **(08) 9186 8555** or visit www.karratha.wa.gov.au.

Understanding your Rates

Why do we pay rates?

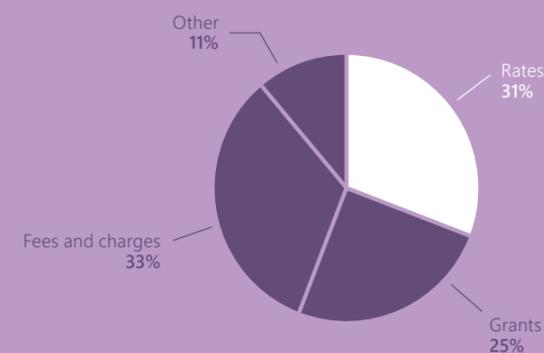
Rates are just one of the sources of revenue that the City of Karratha uses to fund our services and infrastructure.

Our major source of income is fees and charges – the user pays fees charged at facilities like Karratha Leisureplex and Karratha Airport as well as for services like Building and planning applications. Another major source of income is grants received from the State and Federal Government as well as from corporate partners which help us to build new facilities and deliver our services. We also get revenue from other sources including interest, disposal of assets and transfers from our reserves. This year, rates comprise around less than a third of our total revenue.

The City of Karratha collects rates to fund a wide range of services including the maintenance of recreational facilities, roads and footpaths, waste management, parks and gardens, libraries as well as important community infrastructure projects such as the Karratha Leisureplex, Dampier Community Hub and Karratha

Airport Terminal Redevelopment. Rates are the contribution each property owner makes to improving services and facilities within the City of Karratha for the growing needs of our community. Rates are calculated annually from 1 July to 30 June.

2015/16 Income Breakdown



Pay your rates on time to WIN!

Ratepayers who pay their rates and rubbish collection charges in full by the due date will be in the running for the following prizes*

1st prize: \$2,000 cheque sponsored by Westpac

2nd prize: \$1,500 cheque sponsored by the City of Karratha.

3rd prize: Two nights stay in a Double Deluxe Spa Suite at Point Samson Resort (valued at \$1260) and dinner at Ta Ta's Restaurant (\$200 voucher)

4th prize: 2 night weekend stay for 2 people including full buffet breakfast each morning, at the Perth Ambassador Hotel in a new, refurbished Premium Deluxe Room (valued \$560)

5th prize: \$500 cheque sponsored by the City of Karratha.

6th prize: Two nights stay in a one bedroom spa apartment at Seashells Resort Broome (valued at \$470)

7th prize: Overnight accommodation with breakfast in a Deluxe Eco Tent for 2 adults and 1 child up to 12 years old (value \$349).

*Terms and conditions apply. For the full terms and conditions please visit www.karratha.wa.gov.au.

Contact us

Front desk: **Administration Building, Welcome Road, Karratha**

Mail: **PO Box 219, Karratha WA 6714**

Tel: **08 91868555**

Email: **enquires@karratha.wa.gov.au**

Web: **www.karratha.wa.gov.au**

Facebook: **/cityofkarratha**

How are rates calculated?

To calculate how much each ratepayer is required to contribute, Council first determines how much rate income is required to run the City. The required income amount is divided by the total value of all the properties in the City of Karratha to determine the Rate in the Dollar (RID). Council then calculates rates for each property by multiplying its Gross Rental Value (GRV) or unimproved value (UV), as determined by the State Government's Valuer General, by the rate in the dollar.

For example:

$$\text{GRV of } \$31,200 \times \text{RID of } 0.064121 = \text{Total rates bill of } \$2000.58$$

As valuations move up or down the Rate in the Dollar adjusts to ensure the total amount raised in rates still meets the income required to run the City.

Property Valuations

Residential property valuations are conducted by the State Government's land authority, Landgate, every three years. The total value of all the properties in the City of Karratha is used to determine the Rate in the Dollar. Landgate last conducted a general revaluation in August 2014 with those valuations effective 1 July 2015 and used to determine this year's rates.

2015/16 Rates in the Dollar

This year Council has resolved the following rates in the dollar to be applied to properties in the City of Karratha. Final valuations received from the Valuer General have enabled Council to lower the rates in the dollar from those advertised while still achieving Council's desired overall rate yield increase.

Gross Rental Value	Proposed minimum payment	Proposed Rate in the Dollar
Residential	\$1,450	0.064121
Commercial/Tourism/Town Centre	\$1,450	0.073271
Industry/Mixed Business	\$1,450	0.056287
Airport /GRV (Strategic Industry)	\$1,450	0.126515
Transient Workforce Accommodation/ Workforce Accommodation	\$1,450	0.216481

Unimproved Value	Proposed minimum payment	Proposed Rate in the Dollar
UV (Pastoral)	\$408	0.096978
UV (Mining/Other)	\$408	0.134010
UV (Strategic Industry)	\$408	0.152053

This means that for residential properties, 6.4 cents of rates will be generated for every dollar of GRV.