Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Point Grey Local Structure Plan

Suburb: Point Grey **State:** WA **P/code:** 6208

Local government area: Shire of Murray

Description of the planning proposal: Structure Plan application

BMP Plan / Reference Number: 66385 **Version:** Rev 0 **Date of Issue:** 22/08/2024

Client / Business Name: Point Grey Development Company

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	☐	☒
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	☐	☒
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	☐	☒
Strategic planning proposal (including rezoning applications)	☒	☐
Minor development (in BAL-40 or BAL-FZ)	☐	☒
High risk land-use	☐	☒
Vulnerable land-use	☐	☒

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Strategic Planning Proposal - LSP

Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Louisa Robertson	Level 3	BPAD 36748	28/02/2025
Company		**Contact No.**	
JBS&G		08 9792 4797	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner LM Robertson **Date** 22/08/2024

Bushfire Management Plan

Point Grey Local Structure Plan

Prepared for Point Grey Development Company Pty Ltd

JBS&G 66385 | 161289

22 August 2024

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.

Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte

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Abbreviations

Term	Definition
ABCB	Australian Building Codes Board
ACP	Activity Centre Plan
AHD	Australian Height Datum
AS	Acceptable Solution
AS 3959	*Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas* (SA 2018)
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BHL	Bushfire Hazard Level
BMP	Bushfire Management Plan
BPAD	Bushfire Planning and Design
BLT	Broader Landscape Assessment
CCW	Conservation Category Wetland
CHRMAP	Coastal Hazard Risk Management and Adaptation Planning
DFES	Department of Fire and Emergency Services
DPLH	Department of Planning, Lands and Heritage
EAW	Emergency Access Way
EP Act	*Environmental Protection Act 1986*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Sensitive Area
F/US	Flat/upslope
FDI	Fire Danger Index
FESA	Fire and Emergency Services Authority (now DFES)
FSAR	Fire service access route
Guidelines	*Guidelines for Planning in Bushfire Prone Areas Version 1.4* (WAPC 2021)
LEMA	Local Emergency Management Arrangements
LSP	Local Structure Plan
ODP	Outline Development Plan
PGDC	Point Grey Development Company
POS	Public Open Space
ROS	Regional Open Space
SA	Standards Australia
Shire	Shire of Murray
SPP 3.7	*State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015)
TEC	Threatened Ecological Community
WAPC	Western Australian Planning Commission
WWTP	Waste water treatment plant

Executive Summary

Point Grey Development Company (PGDC) is seeking approval for an amended Local Structure Plan (LSP) for the Point Grey urban area, in the Shire of Murray (the project area). An Outline Development Plan (ODP) has been previously approved for the site and the relevant environmental approvals have been issued. The ODP is valid until October 2025.

This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measures 6.2 and 6.3 of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas Version 1.4* (the Guidelines; WAPC 2021) and in accordance with *AS 3959-2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018).

This report provides an assessment of the proposed development, bushfire risk context, and required bushfire mitigation measures and includes:

- A review of existing and anticipated post-development vegetation class and effective slope within the project area and surrounds.
- The results of both pre-development and post-development Bushfire Hazard Level (BHL) assessments to provide a strategic overview of bushfire risk that relates to the existing and anticipated post-development vegetation hazards to inform the suitability of land for future subdivision and development.
- The results of an indicative Bushfire Attack Level (BAL) contour assessment to conceptually demonstrate how the anticipated development and landscaping design can achieve a suitable and compliant BAL outcome, based on worst-case post-development vegetation assumptions.
- Consideration of staged subdivision of the LSP area, including an indicative BAL contour assessment for the early stages and nomination of appropriate risk management strategies to address the temporary bushfire risk within undeveloped stages.
- An analysis of bushfire risk context and identification of associated bushfire hazard issues relevant to the site and proposed development.
- The development of a suite of risk mitigation measures designed to reduce the bushfire risk and ensure an appropriate bushfire risk management outcome is achieved for the site and proposed land use.
- A compliance assessment to demonstrate the proposed development can comply with the bushfire protection criteria of the Guidelines at subsequent planning stages.
- Due consideration has been given to draft policy and guidelines prepared as part the 2019 Bushfire Policy Framework review.

Point Grey will primarily be a residential community and residential land uses make up the majority of the proposed LSP area. A Village Centre will comprise the highest densities with grouped and multiple dwellings as well as a commercial complex. The remainder of lots will be suburban and rural residential. Tourism land uses are also expected, and short-stay accommodation options will be developed on site. The LSP area is expected to be developed over an approximately 20-year period, with staggered release of subdivision stages.

The site comprises approximately 500 ha and is currently vegetated with areas of grazed pastureland along with patches of remnant native forest vegetation in the internal development area, fringed by coastal scrub along the north and west boundaries. While much of the project area is proposed to be cleared/managed to facilitate the proposed residential land uses, scrub and forest vegetation will

be retained in ROS in the north of the site, and a band of scrub will be retained along the western boundary as a foreshore reserve. There is one area identified as Conservation POS within the central portion of the site, and some rehabilitation is proposed along the eastern boundary. It is anticipated that mature trees (primarily Tuart) will be retained as part of low threat landscaping within internal POS corridors.

The LSP area will be provided with two access routes through construction of a new entry road and investigations have commenced into providing a new second access route leading to Forrest Highway to the southeast. The site will be established as a self-sufficient community at the outset, providing for creation of a suitable destination.

A Bushfire Hazard Level (BHL) assessment has been undertaken in accordance with Appendix 2 of the Guidelines to provide an indication of the potential intensity of a bushfire event associated with vegetation within and adjacent to the project area. The results of the BHL assessment indicate that existing BHLs across the site are Moderate and Extreme. However, all land proposed for development of lots will be within areas of Low or Moderate BHL post-development due to proposed vegetation modification and strategic siting of lots.

An indicative BAL contour assessment has also been undertaken to demonstrate conceptually, the worst-case BALs that may be applicable to future habitable development, based on worst-case assumptions regarding future landscaping and revegetation within POS. The results show that minimum APZs proposed at the vegetated interfaces will ensure the highest BAL applicable to the external boundary of future lots is BAL–29. The APZs will be built in to future landscaping design, as indicated in the sites Landscape Masterplan.

A BAL Contour assessment has been undertaken for the first stage of development (Stages 1 and 2) to provide an indication of the BALs and access provisions potentially applicable through a range of staging measures.

The results of the BHL and BAL Contour assessments demonstrate that the proposal can achieve compliance with the applicable acceptable solutions of the bushfire protection criteria of the Guidelines at all stages.

Potential bushfire hazard issues have been identified for the proposed development, along with a suite of mitigation measures to be implemented at future planning stages to mitigate the identified risks. Some of the key issues include:

- The LSP is located at the tip of a peninsula in a rural environment and is vulnerable to potential bushfire impact from vegetation hazards in the local and wider area. Bushfire mitigation measures proposed within this strategic level BMP take into consideration the local bushfire risk context and aim to minimise these risks through a range of mitigation measures, including establishment of the site as a suitable destination during the first stage of subdivision and provision of two different access routes.
- Vegetation is proposed to be retained and rehabilitated within on-site and adjoining foreshore POS and ROS. An appropriate APZ response is to be implemented at these interfaces to manage the risk.
- Perimeter roads are to be incorporated into subdivision design to provide hazard separation and a defendable space for fire suppression operations.
- Establishing fragmentation between external foreshore vegetation and internal POS corridors and vegetation retained within the rural-residential lots is critical to reduce the potential for a bushfire to spread through the site. This will be achieved through low threat landscaping treatments within internal POS.

- Some areas of vegetation may be retained within the larger rural-residential lots to maintain rural amenity and conserve environmental values. A co-ordinated approach to vegetation management within these lots should be adopted at future planning stages through development of a Landscape Management Plan.
- The school sites, contingency community refuge building, and tourist accommodation options represent vulnerable land uses and will require additional consideration of bushfire risk at subdivision and DA stage, including appropriate siting and consideration of emergency management procedures.
- Given the location of the site on a peninsula, appropriate vehicular access is required for both egress by residents and visitors and access by firefighters to/from and around the project area. Two different access routes will be provided, with the alignment under investigation for confirmation at subdivision stage.
- Impacts of staged subdivision on bushfire risk, BALs and vehicular access will need to be considered and appropriately addressed at future planning stages.
- The proposed development will result in expansion of the existing population which may put pressure on the existing public road network during a bushfire emergency. Upgrades to existing roads will occur as a result of implementation of the Structure Plan to improve the existing roads network and ensure the existing population is not placed at additional risk.
- The project area is not currently within a reticulated area; this will need to be provided to secure a permanent firefighting supply given the density of development proposed. As the site is relatively isolated, it is important that it is established as a self-sufficient community with a fire brigade, trained personnel, and contingency community shelter, as proposed
- Ensuring residents and visitors have bushfire awareness will assist with an appropriate response in a bushfire emergency, thereby reducing the burden on fire and emergency services.

A compliance audit has been undertaken to assess the capacity of the proposed development to comply with the acceptable solutions of the Guidelines at future planning stages. The assessment demonstrates that the project is able to satisfy all four elements of the bushfire protection criteria, as follows:

- Element 1 – Location ✓
- Element 2 – Siting and design ✓
- Element 3 – Vehicular access ✓
- Element 4 – Water ✓

Compliance with the acceptable solutions will be demonstrated at each subsequent stage of subdivision, and any further development applications, as noted in Section 6.1 of the BMP. An assessment against draft policy and guidelines also indicates that future subdivision has capacity to achieve compliance with all draft acceptable solutions. The LSP is therefore considered to be suitable for the intended residential development.

1. Introduction

1.1 Background

Point Grey Development Company (PGDC) is seeking approval for an amended Local Structure Plan (LSP) for the Point Grey urban area, in the Shire of Murray (the project area). An Outline Development Plan (ODP) has been previously approved for the site and the relevant environmental approvals have been issued. The ODP is valid until October 2025.

An amended LSP is required because of Amendment No. 314 to the Shire of Murray Town Planning Scheme No. 4, which removed 'Marina' as a permissible use on the subject site. The WAPC Statutory Planning Committee resolved the following as part of the Amendment recommendation:

Advise the Shire that the Point Grey Structure Plan requires amendments, limited to those required, to align it with:

a. The State Planning Framework including, but not limited to, policy on planning for school sites, bushfire planning and coastal processes; and

b. Subject to the Minister granting final approval to Amendment No. 314, the changes to LPS 4 resulting from Amendment No. 314; and

c. That the amendments to the Point Grey Structure Plan should not provide for additional dwelling yields or density beyond that considered in the current approved structure plan.

A Masterplan Concept for the proposed amended LSP is included as Figure 1-1 (Hatch 2024). The approved ODP is depicted in Appendix A.

1.2 Overview of proposed development

It is anticipated that the development will be established primarily as a residential community, with visitors/tourists also attracted to the site to enjoy access to the estuary and the village centre offerings. The village centre will include short stay accommodation options, conference facilities, restaurants, a medical centre, and retail stores. The remainder of the village centre will comprise residential development. Further residential and rural-residential intensification is planned to occur throughout the LSP area at successive development stages, along with development of a small commercial precinct.

A community centre, bush fire brigade, group gardens and public gathering spaces are proposed to be constructed during the first stages of development to provide for establishment of a community at the earliest possible stage. Later stages of the LSP will include a primary school and playing fields.

The development will be self-sufficient in terms of drinking water and treatment of wastewater. Power is also anticipated to be generated on-site with back up from the Western Power network.

1.3 Site description

1.3.1 Site location

The project area is situated on a peninsula surrounded by the Peel Inlet and Harvey Estuary in the Shire of Murray (the Shire) (Figure 1-2). The suburbs of Dawesville, Wannanup and Falcon are located on the western side of the Peel-Harvey Estuary, a minimum distance of 1.8 km from the project area, as the crow flies. The Dawesville cut provides marine access to the Indian Ocean beyond the surrounding land masses.

The subject land is located approximately 24 km west of the Pinjarra townsite and 32 km driving distance south-east of the Mandurah city centre, the strategic regional centre servicing the Peel Region.

1.3.2 Existing land uses

The project area has historically been used for hay cropping and as pasture for sheep and cattle grazing as evidenced by the large areas of open grassland and lack of understorey beneath unfenced canopy vegetation (refer to Figure 1-3).

Gazettal of the Peel Region Scheme has resulted in cessation of agricultural activities from the Regional Open Space reserve located between the waterline and the land zoned Urban, generally around the east, west and northern portions of the site.

The portion of land zoned Urban under the Shire of Murray Local Planning Scheme is currently used for the grazing of cattle and the balance will continue to be used for this purpose on the undeveloped land during staged development of the site.

1.3.3 Land tenure

As depicted in Figure 1-3, PGDC owns the majority of land within the LSP area, with landholdings comprising lots 138, 139, 672 and 1132.

Plunkett Properties Pty Ltd currently owns lots 137, 738 and 1133 which are partially located in the southern portion of the LSP area.

Portions of the LSP area will be created as Regional Open Space (ROS) as foreshore reserve and vested to the Crown for the purposes of conservation and recreation. These areas are depicted on the Concept Masterplan (Figure 1-1).

1.3.4 Existing vehicular access

The client has prepared a plan showing existing roads servicing the LSP area, including whether the roads are of bitumen construction or gravel/limestone, and whether the road reserves are unconstructed. This plan is included as Appendix B.

Forrest Highway provides the main access route to the project area from destinations to the north and south. Currently, the site is accessed by the public solely from Carrabungup Road, which terminates with a turnaround at the south-east corner of the LSP area, adjacent to the eastern boundary of Lot 137. However, the road is formally gazetted a further 320 m north-west through Lot 137 (refer to Figure 1-3 for cadastral details).

There are three full-service intersections on Forrest Highway, which provide three existing access options to reach the project area via Carrabungup Road, as follows:

1. **Greenlands Road intersection:** 6.4 km southwest on Greenlands Road, then 7.5 km northwest on Carrabungup Road, with a total travel distance of approximately 13.8 km.
2. **Paull Road intersection:** 1.2 km west on Paull Road, then 1.5 km north on Thompson Road, 3.1 km southwest on Greenlands Road and 7.5 km northwest on Carrabungup Road, with a total travel distance of approximately 13.3 km.
3. **Mills Road intersection**: 75 m west on Mills Road then 7.3 km northeast on Thompson Road and 7.5 km northwest on Carrabungup Road, with a total travel distance of approximately 15.5 km.

The peninsular location of the project area and existing public road network results in the site being serviced by a single access route for a total distance of approximately 10.6 km, which is the distance between the site and intersection of Greenlands Road and Thompson Road, where two different access routes to Forrest Highway become available.

Greenlands Road is fully paved to a width of four to six metres and a minimum trafficable width of six to eight metres considering constructed gravel shoulders. Paull Road is partially paved and partially gravel base with a minimum trafficable width of six to eight metres. A 1.8 km section of

Carrabungup Road, between Greenland Road in the east and Boggy Bay Road in the northwest, was sealed in 2021. The remaining (approximately 5.7 km portion of the road is a gravel base road. The trafficable width is approximately six to seven metres along the length of the road. All existing access routes are suitable for two-way traffic.

Sections of the existing access roads will be upgraded, and new portions of road may be constructed as part of the proposed development, as discussed in Section 3.5.

1.3.5 Existing water supply

The project area is not currently provided with an existing reticulated water supply.

There is an existing waste water treatment plant (WWTP) on site which is proposed to be re-commissioned as part of Stage 1 development works (see Section 3.4.2).

1.3.6 Existing vegetation hazards

Existing vegetation within and adjacent to the Point Grey development site includes (refer to Figure 1-3):

- Inner development areas
    - The internal urban development areas of the project area currently comprise vegetation consisting of grazed grassland; isolated stands of mature Tuart trees with an open canopy and little to no understorey; and isolated stands of mixed Eucalypts, Peppermint and Banksia with little to no understorey but a relatively dense canopy.
- Northern ROS reserve
    - The northern ROS reserve is mostly vegetated with coastal Banksia scrub vegetation, with a band of Tuart forest being predominant at the urban development interface.
- Western foreshore
    - The western foreshore is predominantly coastal Banksia scrub, which extends east from the estuary under varying degrees of slope toward the western development interface.
- Eastern foreshore
    - Tuart woodland intermingled with low lying wetland grasses and shrubs fringes the eastern foreshore reserve area.
- Southern development interface
    - The interface with farmland immediately south of the project area includes grassland with isolated pockets of open Tuart woodland. A pocket of Jarrah-Marri forest vegetation exists to the southwest of the site.

1.4 Bushfire prone designation

The project area is designated as bushfire prone on the *Map of Bush Fire Prone Areas* (DFES 2021; see Plate 1-1).

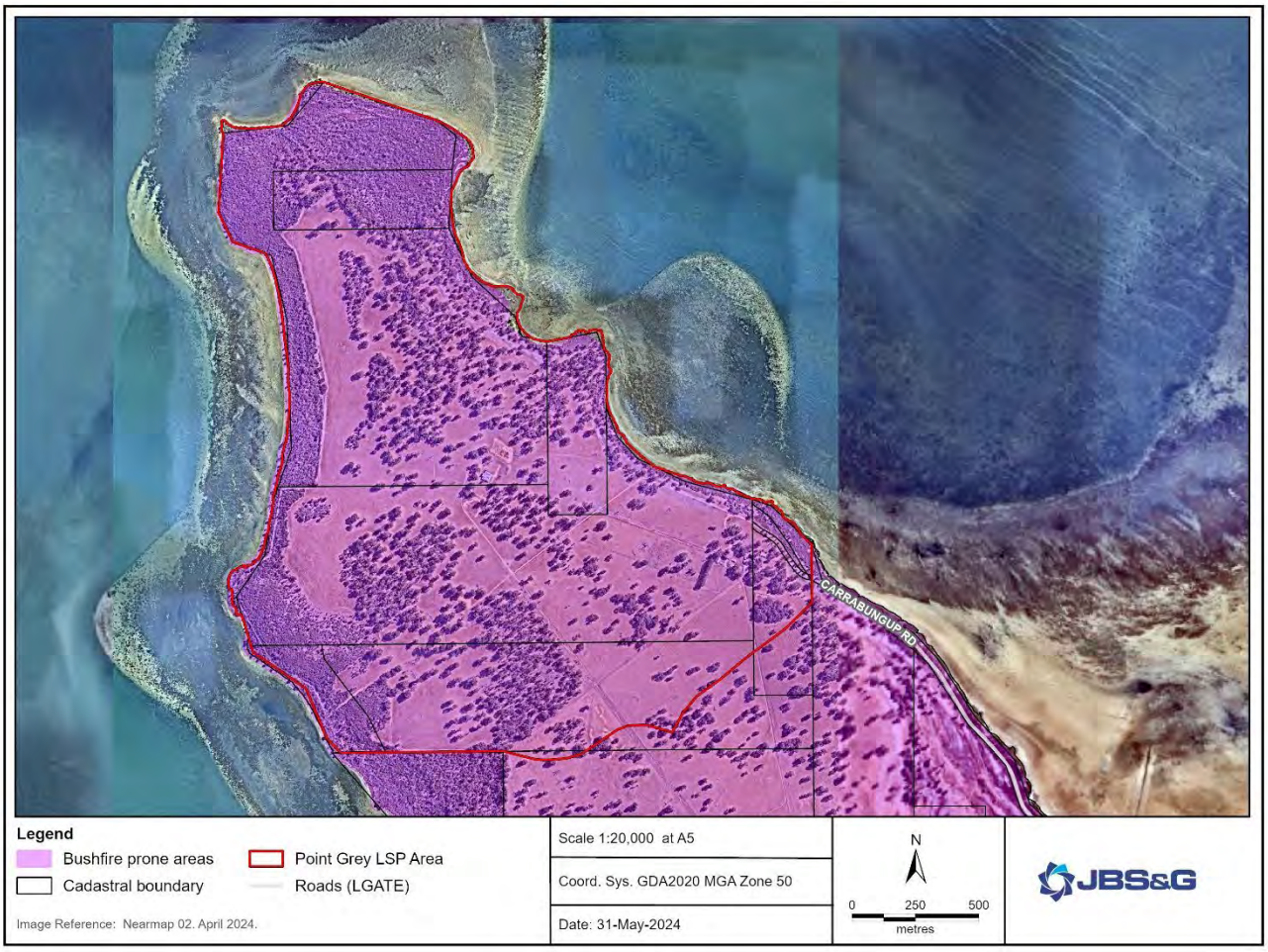


Plate 1-1: Map of Bush Fire Prone Areas (DFES 2021)

1.5 Approvals history

1.5.1 Shire of Murray Town Planning Scheme No 4

Amendment No 104 rezoned the subject land to 'Special Development' zone in the Shire of Murray Town Planning Scheme No 4 (TPS 4) in August 2011. In addition to rezoning the land, the Amendment also included the site in Schedule 7 outlining a range of specific provisions to control and guide the future development of the land and included a marina as an additional land use.

A development application was submitted in relation to development of the marina, however was refused and TPS 4 was amended to remove discretion for planning approval for a marina. Accordingly, the current LSP application does not include provisions for a marina.

1.5.2 Point Grey Outline Development Plan

The Point Grey Outline Development Plan (ODP) was endorsed by the WAPC in November 2011 and remains in effect until October 2025.

The ODP provides the framework for guiding the future development of the site under the ODP approval. The overall design was configured around a regional marina facility incorporating a village

centre, supported by approximately 3,400 dwellings with an ultimate population of 6,500 and a range of facilities and services to meet the needs of residents and visitors to Point Grey.

The development principles listed on the approved ODP include the following notes of relevance to the current LSP application and this BMP. It is noted that the recommendations on the current LSP will supersede any recommendations or requirements made during approval of the ODP.

Movement network principles

- The street network should be highly interconnected, legible and provide a structure that facilitates the requirements of all users.
- The street network should also facilitate view corridors to maximize vistas from the project area.
- The street network to be designed to reflect the principles of Liveable Neighbourhoods.
- Upgrading requirements for the access road are to be in accordance with the Access Road Construction Management Plan approved by the Shire of Murray. The implementation of this plan will be subject to an agreement between the proponent and the Shire of Murray including traffic volume triggers for the upgrading as a condition of subdivision approval for the first subdivision application over the ODP area.
- Emergency road access to the site is required to be investigated by the proponent to the satisfaction of the Shire of Murray. The proponent is responsible for the implementation of emergency access as a condition of subdivision approval.

Public Open Space

- Public Open Space to be provided as 10% of the residential development area and to be configured as a series of linear vegetation corridors.
- A key principle for the location of public open space is to ensure the retention of significant areas of vegetation providing parkland linear corridors to facilitate pedestrian and cyclist movement.

1.5.3 Foreshore Reserve subdivision

Condition 7 of State Ministerial Statement No. 906 requires that a 10.6 ha portion of land be created as foreshore reserve and vested to the Crown for the purposes of conservation and recreation. A subdivision to create the subject foreshore reserve was approved by the WAPC on 5 June 2019 (WAPC reference 157828). The reserve will be vested with the State prior to the commencement of construction.

1.5.4 Entry road subdivision

Conditional subdivision approval was granted for a proposed entry road to the Point Grey site by WAPC on 19 December 2019 (WAPC Ref: 158527). The approved subdivision plan showing the road alignment is included in Appendix C. This approval is valid through to December 2025.

1.5.5 State and Commonwealth environmental approvals

The Point Grey marina project has previously undergone significant environmental impact assessment and public consultation by the State and Commonwealth.

The project has been assessed under the *Environmental Protection Act 1986* (EP Act) and under the *Environmental Protection and Biodiversity Act 1999* (EPBC Act) due to likely impact of the following environmental factors:

- State Assessment:
  - Flora and Vegetation
  - Terrestrial Fauna
  - Marine Environmental Quality
  - Marine Fauna.
- Commonwealth Assessment:
  - Impacts on Wetlands of International Significance: The Peel Inlet Harvey Estuary System (Ramsar)
  - Listed Migratory Species
  - Listed Threatened Species and Communities.

The proposal was assessed under a PER level and was granted the Ministerial Statements, MS 906 and MS 1082 for the Marina part of the project. The proposal was also approved by the Department of Agriculture, Water and the Environment (DAWE) as a "controlled action". Approval for an extension of time limit for substantial commencement was provided in September 2018 with the EPA granting Ministerial Statement 1082 with the following condition:

"The proposal shall not commence implementation of the proposal after 1 August 2022, and any commencement, prior to this date, must be substantial."

EPBC 2010/5515 was granted in June 2014 covering the formerly proposed marina part of the project and EPBC 2011/5825 in March 2019 covering the residential development area.

1.6 Relevant plans and reports

1.6.1 Bushfire

Bushfire briefing strategies

The following briefing strategies have been prepared by JBS&G for PGDC to consider how bushfire risk and compliance will be addressed for the current LSP application during preparation of this BMP. The strategies contained within these briefing memos have been presented to the Department of Planning, Lands and Heritage (DPLH) and the Department of Fire and Emergency Services (DFES) through a consultative process with key feedback from the agencies being considered and incorporated into this BMP.

- Point Grey ACP Bushfire Design Brief – Project briefing prepared for PGDC and presented to the Department of Planning, Lands and Heritage (DPLH) Bushfire Policy Manager (JBS&G May 2020).
- Point Grey LSP BMP Strategy – Revised bushfire strategy briefing prepared for PGDC and presented to DPLH and the Department of Fire and Emergency Services (DFES; JBS&G November 2023).

Previous Bushfire Management Plan

A BMP was prepared by FirePlan WA in 2009 to support the approved ODP application. The BMP was prepared in accordance with the now superseded *Planning for Bushfire Protection Guidelines Edition 1* (WAPC 2006) and prior to gazettal of SPP 3.7.

It is acknowledged that there has been a substantial reform to bushfire planning legislation in WA since the BMP was prepared and the current BMP aims to address deficiencies in the previous development design in the context of current day compliance requirements with SPP 3.7 and the Guidelines.

Notwithstanding, the current BMP has been given due consideration to the bushfire management strategies proposed within the previous BMP, where appropriate. The following relevant bushfire management measures have also been considered in development of the current BMP:

- Strategic firebreak around stages, in the alignment of the internal road in the next stage
    - 6 m wide, 4 m vertical clearance and with 4 m wide trafficable surface, with road base where heavy sand exists.
    - 6 m wide passing bays every 200 m
    - turnaround areas every 500 m
    - 4.1 m wide gates may be installed to exclude day to day use of strategic firebreak.
- Staging buffer around stages to act as an Asset Protection Zone (APZ) and provide separation to adjacent land to be developed in the future.
- Compliance with the Shire of Murray Firebreak Notice.
- Perimeter roads between proposed lots and POS, ROS and foreshore reserve.
- Where no perimeter road is able to be provided between lots and adjacent bush areas, a fire service access route is to be installed to allow fire fighters to access the perimeter of the development
- Design standard for any footpaths within ROS are to be of a suitable standard to be trafficable for firefighting appliances
- 20 m APZs for buildings on the perimeter of the development, comprising roads and managed lands.
- Building construction to comply with AS 3959.
- Distribution of The Homeowners Bush Fire Survival Manual (historical Fire and Emergency Services Authority [FESA, now DFES] publication) at time of sale, to property owners adjoining POS and foreshore reserve areas.
- Reticulated fire hydrant network to be installed.
- Provision of land (2000 m2) to the Shire of Murray for a fire station
- Shire and FESA to be responsible for the following:
    - Developing and maintain District Firefighting Facilities
    - Coordinating a review of Bush Fire Brigade areas and Proposed Fire Station locations, with developers of Austin Cove and Point Grey to be involved.

It is worth noting that approval of the ODP, supported by the 2009 BMP, was done so without the provision of a second vehicular access route to the project area, which the BMP states as being acceptable to WAPC based on preliminary advice at the time. The approved ODP does however, make provisions for investigation of a second access route as a condition of subdivision approval (see Section 1.5.2). Additionally, there appears to have been an undertaking from the Shire and FESA (now DFES) to assist with establishment of local volunteer firefighting capabilities, with the proponent to ensure a suitable fire station location within the development was provided.

1.6.2 LSP reports

The following relevant reports have been prepared in support of the current LSP application:

- Point Grey Amended Local Structure Plan Report – Hatch 2024a
- Environmental Impact Report – JBS&G 2024a
- Environmental Sustainability Report – JBS&G 2024b
- Traffic Impact Assessment – Transcore 2024
- Landscape Masterplan – Emerge 2024a
- Ethnographic and Aboriginal Heritage Report – Ethnosciences 2024
- Coastal Hazard Risk Management Plan – MP Rogers 2024
- Retail Needs Assessment – Pracsys 2024a
- Economic Development Strategy – Pracsys 2024b
- Community Assessment and Infrastructure Strategy – Hatch 2024b
- Servicing Report – Tabec 2024
- LWMS/Hydrology Technical Notes – Emerge 2024b.

N

Legend

- Structure Plan Boundary
- Regional Open Space (external to SP)
- Regional Open Space
- Foreshore Reserve
- Public Open Space
- Widened Verge / Pedestrian Link
- Public Purpose - Education
- PRS Urban Zone
- CCW 50m Buffer
- Indicative Drainage Areas
- Town Centre
- Special Use: Servicing and Community
- Transferred to State Government in accordance with Ministerial Statement 906
- Point Grey Rehabilitation Sites in accordance with Ministerial Statement 906
- Conservation POS rehabilitation

Setbacks (Baird, June 2021)

- Coastal Processes 2120 Setback
- [20m offset to 2120 setback]

Road Hierarchy

- Neighbourhood Connector
- Access Street B
- Access Street C
- Access Street D

Residential Density Codes

- R2-R10
- R12.5-R25
- R30-R40
- R-AC4
- R-AC3
- BORE LOCATIONS

ROBERT BAY

R-AC3
R-AC4
R-AC3
R-AC3
R-AC4
R-AC4
R-AC4

REHABILITATION SITE 2

REHABILITATION SITE 1

REHABILITATION SITE 3

TEMPORARY SECONDARY ACCESS (TBC)

ACCESS TO EXISTING (CARRABUNGUP ROAD)

PRIMARY ACCESS

POTENTIAL SECONDARY ACCESS

T2 RURAL SOUTH WEST PRECINCT

The T2 South West Precinct will be subject to a Detailed Area Plan (DAP) to be prepared at subdivision to determine development standards including lot size, densities, setbacks etc.

DISCLAIMER: THIS MASTERPLAN DEPICTS A HYPOTHETICAL DEVELOPMENT SCENARIO AND IS SUBJECT TO STATUTORY ASSESSMENT AND APPROVALS FROM THE SHIRE OF MURRAY AND WESTERN AUSTRALIAN PLANNING COMMISSION. THE LOCATION OF STRUCTURAL DESIGN ELEMENTS INCLUDING LAND USES, ROADS, PUBLIC OPEN SPACE, DRAINAGE AREAS AND ACCESS POINTS ARE SUBJECT TO DETAILED SITE INVESTIGATIONS BY QUALIFIED CONSULTANTS AND TECHNICAL ASSESSMENT BY SERVICE AGENCIES.

POINT GREY DEVELOPMENT COMPANY PTY LTD.

CADASTRAL INFORMATION
SOURCE: MNG
YYMMDD: 200623
DWG REF: 91549pr-290a
PROJECTION: PCG94
AERIAL PHOTOGRAPHY
SOURCE: NEARMAP
YYMMDD: 240408

HATCH

SIZE A3_1:9000

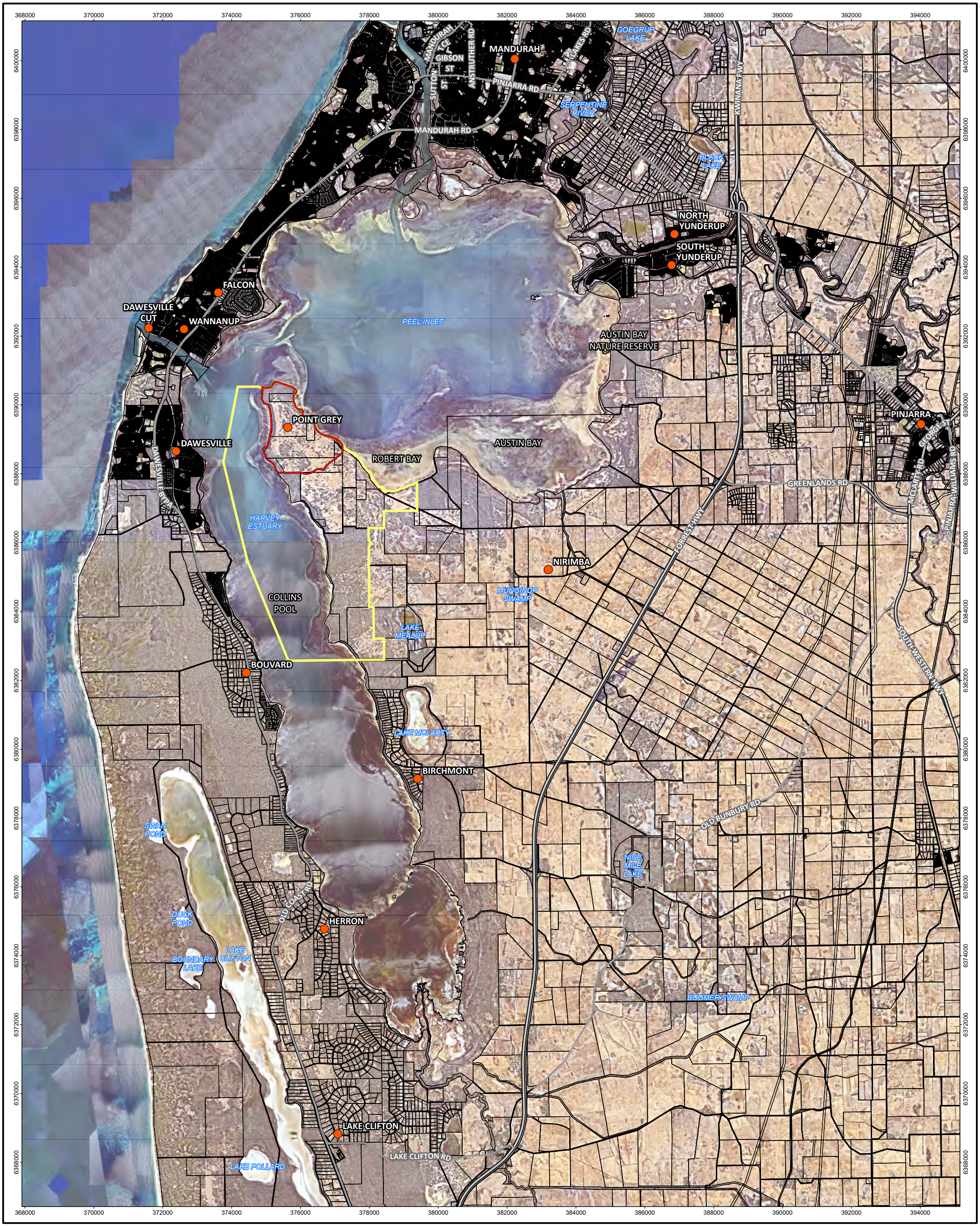
0 metres 90 180 270 360 450

REV	DESCRIPTION	YYMMDD	DRAWN	APPR'D
C	UPDATE DRAINAGE/STREETS	240731	SB	AC
B	UPDATE DRAINAGE/STREETS	240729	SB	DRAFT
A	BASE H369508 001D	240702	RG	RD

LOCAL STRUCTURE PLAN
Point Grey
Shire of Murray

JOB CODE	SERVICE	DOC.TYPE	DRAW NO.	REV.
H369508	**DES**	**DWG**	**003**	**C**

DISCLAIMER: ISSUED FOR DESIGN INTENT ONLY. ALL AREAS AND DIMENSIONS ARE SUBJECT TO DETAIL DESIGN AND SURVEY



Legend

- Point Grey LSP Area
- Cadastral boundary
- Point Grey locality
- Highway
- Major road
- Towns

JBS&G

0 4 Kilometers

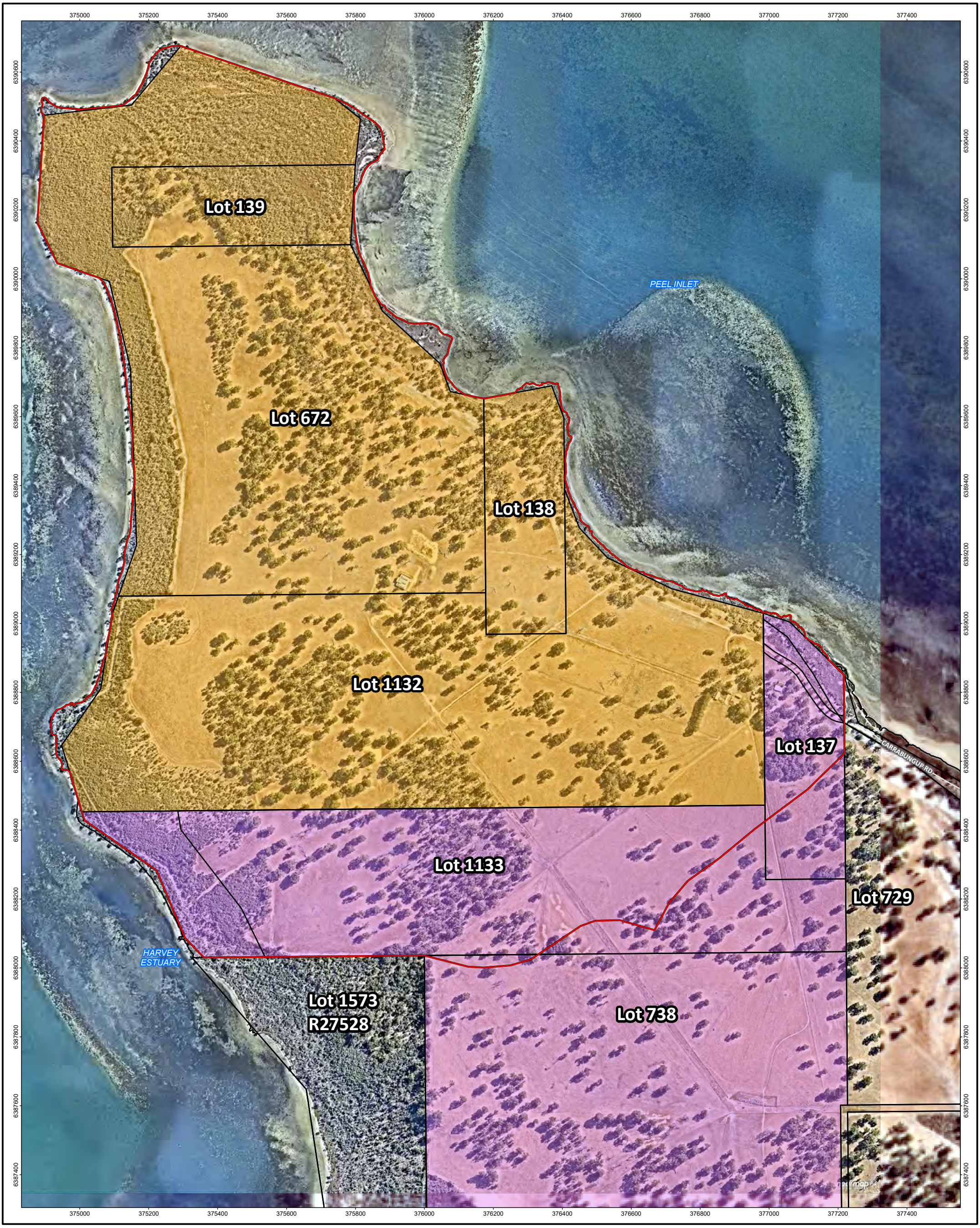
Point Grey, WA

LOCATION

Job Number: 59293		Scale 1:100,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**FIGURE: 1-2**

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.



Legend

- Point Grey LSP Area
- Cadastral boundary
- Point Grey Development Company
- Plunkett Developments
- Minor road

JBS&G

0 300 Meters

Point Grey, WA

SITE OVERVIEW

Job Number: 59293		Scale 1:10,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**FIGURE: 1-3**

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

2. Development objectives and purpose of report

2.1 Bushfire regulatory objectives

The proposed development will trigger compliance with:

- State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7) and the Guidelines for Planning in Bushfire Prone Areas Version 1.4 (Guidelines; WAPC 2021).
- AS 3959:2018 Construction of buildings in bushfire prone areas (AS 3959; SA 2018).
- Shire of Murray – Firebreak Notice.

Bushfire regulatory objectives applicable to the proposed development, including draft policy, are detailed within Table 1-1.

Table 1-1: Bushfire regulatory objectives

Instrument	Objectives
Current policy	
SPP 3.7 and the accompanying Guidelines	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.
AS 3959	To prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire, appropriate to the – (a) potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and (b) intensity of the bushfire attack on the building.
Shire of Murray – Firebreak Notice and Bushfire Information	Statutory requirements relating to permitted, restricted and prohibited burn times, total fire ban day requirements and the preparation and access (firebreak) requirements for properties.
Draft policy	
Draft SPP 3.7 and *Planning for Bushfire Guidelines*	5.1 Ensure future development is resilient to the bushfire-related impacts of climate change. 5.2 Manage the risk of bushfire to people, property and infrastructure. 5.3 Improve the bushfire resilience of communities through provision of appropriate community infrastructure, for use by emergency services and the community in the event of a bushfire. 5.4 Achieve an appropriate balance between the modification or removal of native vegetation for bushfire risk management, biodiversity conservation and landscape amenity.

2.2 Non-regulatory objectives

Non-regulatory objectives set by the developers include:

- Create a new community which inspires residents to live an active, sustainable, coastal lifestyle surrounded by nature and pristine waters.
- Establish a vibrant village centre as the heart of the community and regular destination for locals and visitors.
- Develop a self-sufficient town site which adapts to its location through the provision of critical service infrastructure.
- Improve environmental outcomes for the land and surrounding water bodies, including retention of green belts across the site to maintain ecological corridors.
- Develop economic, social and cultural opportunities to benefit the local and regional community.
- Develop the landscape, built form and infrastructure to reflect and reinforce local character, ecology and traditional culture.

2.3 Purpose of report

This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measures 6.2 and 6.3 of SPP 3.7 (WAPC 2015) and the Guidelines and in accordance with AS 3959. Considerations of the Shire of Murray Firebreak Notice are also included herein.

This report provides an assessment of the proposed development, bushfire risk context, and required bushfire mitigation measures and includes:

- A review of existing and anticipated post-development vegetation class and effective slope within the project area and surrounds.
- The results of both pre-development and post-development Bushfire Hazard Level (BHL) assessments to provide a strategic overview of bushfire risk that relates to the existing and anticipated post-development vegetation hazards to inform the suitability of land for future subdivision and development.
- The results of an indicative Bushfire Attack Level (BAL) contour assessment to indicatively demonstrate how the anticipated development and landscaping design can achieve a suitable and compliant BAL outcome, based on worst-case post-development vegetation assumptions.
- Consideration of staged subdivision of the LSP area, including an indicative BAL contour assessment for the early stages and nomination of appropriate bushfire risk management strategies.
- An analysis of bushfire risk context and identification of associated bushfire hazard issues relevant to the site and proposed development.
- The development of a suite of risk mitigation measures designed to reduce the bushfire risk and ensure an appropriate bushfire risk management outcome is achieved for the site and proposed land use.
- A compliance assessment to demonstrate the proposed development can comply with the bushfire protection criteria of the Guidelines at subsequent planning stages.
- Due consideration of the 2019 Bushfire Policy Framework review undertaken by the Department of Planning, Lands and Heritage (DPLH), including the following draft documents, which are scheduled for gazettal in late 2024:

- *Draft State Planning Policy 3.7 Bushfire* (April 2023)
- *Draft Planning for Bushfire Guidelines* (April 2023).

3. Proposed development

3.1 Proposed land uses

3.1.1 Residential land uses

Point Grey will primarily be a residential community and residential land uses make up the majority of the proposed LSP area.

The Village Centre will comprise the highest development densities with Transect 4 (T4) Village Urban catering for R-30 to R-40 lots ranging from 120 m^2 to 400 m^2 in area. Grouped and multiple dwellings and multi-level apartment buildings will also be located within this area having an R-AC-3 and R-AC-4 coding.

Suburban lots (T3) are most prevalent within the LSP area and are located within the central portions of the site. Lots range in size from 300 m^2 to 1,000 m^2 and are coded R12.5–R25.

Rural Living lots (T2) are situated at the southern interfaces with surrounding land and comprise lots ranging in size from 1,000 m^2 to 2,000+ m^2 (R-2 to R-10).

Plate 3-1: Lot layout and urban transects (Hatch 2024)

3.1.2 Village Centre

A Village Centre will be developed along the western foreshore. Indicatively, this may occur during Stages 6, 7 and 8, following construction of some initial residential stages. The centre will include short stay accommodation options, conference facilities, restaurants, a medical centre, and retail stores. Users of the Village Centre will include local residents as well as visitors/tourists visiting the site for tourism, conference and recreation purposes.

3.1.3 Community and recreation

Community centre

A community building is proposed to be developed during Stage 1. The community centre will have a central location, adjacent to the existing WWTP site and will be utilised as both a men's shed and fire station for a new volunteer fire brigade. This building will also be constructed as a bushfire shelter to cater for contingency on-site refuge during the early stages of construction and development and visitors.

Primary school

A primary school site has been designated within the southeast of the LSP area. The land is proposed to be ceded to the Department of Education, indicatively during Stages 2 and 18 (as per the indicative Staging Plan, Appendix D) and developed when there is sufficient population to demand a school.

Outdoor recreation

Outdoor recreational facilities will occur within the POS, ROS and foreshore reserves. This will be in the form of pedestrian paths, walkways and boardwalks among the site's inherent environmental assets. Jetties for small boats and non-powered water craft (e.g. kayaks, stand up paddleboards) are also proposed on the western foreshore.

There are plans for a cultural and environmental education centre to be developed at the northern point of the peninsula, catering for school groups, conferences and tourists. This will consist of simple open pavilions and no habitable buildings.

3.1.4 Tourism land uses

The foreshore area, village centre and short stay accommodation options are expected to attract a range of tourists to Point Grey. Additionally, it is anticipated that Point Grey could become a hub for conferences with the development of conference facilities and targeted accommodation options.

3.2 Staging

Construction of the initial stages of Point Grey is expected to commence in 2030. An indicative staging plan has been prepared to indicate how the development will be constructed over an approximately 20 year time frame, and is included in Appendix D.

Stage 1 will commence with construction of the central WWTP and community bushfire refuge. Once established, Stage 2 will follow with the construction and release of residential lots, immediately adjacent to the WWTP and bushfire refuge.

Further development will radiate out from Stages 1 and 2, with development of the Village Centre expect to commence during Stages 6, 7 and 8.

3.3 Proposed dwelling and occupant numbers

A summary of estimated occupant numbers and dwelling construction is contained in Table 3-1.

Occupancy is expected to increase relatively steadily as each successive stage is released. Lots are anticipated to be released at a rate of 75 residential and 15 terrace lots per year, but will depend on demand. On completion of the LSP, over a 20 year time frame, occupancy is estimated to reach approximately 7,000 residents and 27,000 annual visitors.

Table 3-1: Estimated occupancy and number of dwellings from the first stage in 2030 to completion of development in 2051

Year	Resident numbers (cumulative)	No dwellings (cumulative)		No. visitors and tourists (annual)
		Residential	Terrace	
2030	**237**	**75**	**15**	
2031	474	150	30	
2032	712	225	45	
2033	949	300	60	
2034	1,186	375	75	
2035	1,423	450	90	

Year	Resident numbers (cumulative)	No dwellings (cumulative)		No. visitors and tourists (annual)
		Residential	Terrace	
2036	1,661	525	105	**16,500***
2037	1,898	600	120	
2038	2,135	675	135	
2039	2,372	750	150	
2040	2,610	825	165	
2041	2,847	900	180	
2042	3,084	975	195	
2043	3,321	1050	210	
2044	3,558	1125	225	
2045	3,796	1200	240	
2046	4,033	1275	255	
2047	4,270	1350	270	
2048	4,507	1425	285	
2049	4,745	1500	300	
2050	4,982	1575	315	
2051	**6,985**	**2075**	**330**	**27,700**

NOTES:

***Commencement of tourists visiting Point Grey is likely to be dependent on timing of construction of the foreshore park, village centre and short stay accommodation.

3.4 Proposed buildings and services

3.4.1 Proposed habitable buildings

Future habitable buildings are expected to include:

- Single residential Class 1 dwellings and associated Class 10a garages and/or carports
- Grouped and multiple residential Class 2 dwellings.
- A tourism hotel/resort within the Village Centre, including 150 rooms.
- Multi-storey mixed-use buildings with ground floor retail, food and beverage (Class 6) and upper floor apartments comprising residential and short stay accommodation (Class 2 and 3).
- Retail precinct buildings including a supermarket and cafes etc (Class 6).
- Community Refuge Building, designed and constructed in accordance with the Guide for Design and *Construction of Community Bushfire Refuges* (ABCB 2014). May incorporate the bushfire brigade and community building.

The development aim is to create an organic, natural look for the site which may involve inclusion of timber construction elements to the facing of buildings.

Residential buildings are generally expected to be constructed of double-brick masonry as is typical of Western Australian building construction. Commercial buildings may incorporate steel and timber elements as deemed to be appropriate during the development application consultation phase.

3.4.2 Proposed services

The following sub-sections provide a summary of the proposed critical infrastructure from the Engineering Construction Report prepared by TABEC in 2024.

Water supply and wastewater

Given the nearest Water Corporation water supply and wastewater assets are over 25 km from the project area, the proponent, through Peel Water, has been granted a licence to operate a water supply and wastewater scheme at Point Grey.

Construction of a water treatment facility was commenced in 2011 in anticipation of the development of a previously approved subdivision, which has now lapsed. The facility was only partially completed, and the remainder will be finished and extended in order to supply potable water and treat the wastewater, as part of Stage 1 of the development. Redundancy will be included in the power supply system to ensure continuity of supply (e.g. generators).

A reticulated water supply network will be installed throughout the project area on a staged basis, in accordance with Water Corporation requirements to meet or exceed minimum working pressure requirements. Street hydrants will be provided at intervals of no greater than 200 m intervals in accordance with DFES requirements.

The wastewater network will consist of a network of below-ground gravity pipes, discharging to one of four below-ground sewer pumping stations located around the development that will pump the effluent to the water facility for treatment.

The water supply and wastewater systems will be maintained by Peel Water through an annual consumer levy and user pays charges for potable water.

Power supply

The existing 10 kVa supply to the project area is insufficient for the demand of the proposed development and will require upgrading. The nearest power supply connection is 15 km from the site on Greenlands Road.

During the initial stages of development, it is anticipated that power demand will be relatively low which enables several options to be entertained, with the most likely being a solar power and battery energy storage system (BESS) with diesel or gas powered generator back up. It is anticipated that the system would be co-located with the water treatment facility.

As the project area is successively developed, and demand increases, below ground High Voltage feeder lines would be extended to the project area from Greenlands Road. Further increase in power demand from the latter stages of the development, will require a secondary feeder from Pinjarra zone sub-station to be extended to the project area.

Other than the initial power generation supply for the early stages, and local above ground transformers, all power supply is expected to be reticulated throughout the project area via underground cabling.

Gas supply

On-site Liquified Petroleum Gas (LPG) may be proposed to supplement the electrical power generation requirements by providing reticulated LPG throughout the development. A previous offer from Kleenheat for the provision of gas storage equipment (likely an above-ground storage bullet) would be reviewed again, with consideration made to the significant advancements in the efficiency of domestic electrical appliances since 2010.

The gas storage equipment, expected to be co-located with the water treatment facility, would be connected to underground supply pipework, and reticulated to service lots throughout the project area.

Telecommunications

It is expected that telecommunications will be provided through the National Broadband Network (NBN) installed in piping in pits within the future road reserves.

Stormwater management

Stormwater will be collected from road reserve through the use of pits and pipes and diverted to a series of bio-retention basins and swales located within POS throughout the project area.

A Local Water Management Strategy addendum has been prepared by Emerge (2024a) to support the LSP submission and an Urban Water Management Plan will be prepared at future planning stages to support further detailed design.

Roads and traffic

Roads within the development will be constructed of asphalt wearing course and concrete curbing in accordance with Shire guidelines and will also meet requirements of the Guidelines. A footpath network will be provided throughout the project area in accordance with Shire guidelines.

The main access road will be subject to staged upgrades which will include road widening and possible realignment, as well as a new entry road extending from Carrabungup Road. There are also multiple options being explored for provision of a second access route to and from the project area, as discussed below.

3.5 Proposed access

3.5.1 Vehicular access

Primary access route

A new primary access road is proposed to be constructed to connect the LSP area to Forrest Highway. Construction of the new road will result in approximately 12 km of upgraded carriageway extending from the Forrest Highway intersection in the east, to the southern end of the proposed central Neighbourhood Connector. The alignment is anticipated to be similar to the previously approved subdivision for the new entry road (refer to Section 1.5.4).

The likely alignment of the ultimate primary access route to the LSP area is identified in Figure 3-1. The entry road will comprise a combination of upgraded existing roads (Route 1) and new portions of road constructed through cleared paddocks (Route 3) as follows:

- Access to the entry road will be from Forrest Highway at the Greenlands Road intersection.
- The access route will follow the existing Greenlands Road and Carrabungup Road alignments until it veers to the west to provide a central access route to the site. Subdivision approval for this section of new road was granted in December 2019 (WAPC Ref: 158527). The new portion of road will extend through a 2.5 km portion of Lots 293, 1145, 75, 299, 735 and 1133 prior to reaching the LSP area.

Existing Water Corporation bridges will be upgraded and/or replaced with appropriate bridge structures and culverts.

An access Road Construction Management Plan prepared in 2011 (RPS) for the ODP and subsequently approved by the Shire, includes a 30 m road reservation to accommodate passing lanes due to heavy traffic associated with the previously proposed marina precinct. Since the marina is no longer being proposed, it is possible that it may be appropriate to now reduce the width of the road. This will be determined at future planning stages.

The final alignment of the entry road is subject to further planning and will be reviewed and optimised as the development progresses.

Secondary access route

The proponent has identified opportunity to create a new second access route to the site which joins Forrest Highway to the southeast.

The new access route will provide for enhanced access to the predominant vegetation hazards to the south of the project area which will facilitate a direct fire suppression response before a fire has opportunity to reach the site.

The second access route will also provide a potential alternative egress route for site occupants, if required. It is expected however, that early evacuation via the main access route would occur in the first instance since it is likely to provide a more direct route and pass through a lesser extent of bushfire prone vegetation than the options for secondary access being considered.

Provision of a secondary access route is considered to be of higher importance in the early stages of development, while the LSP is less built out. As the site is progressively developed over time, it will become less of a priority to vacate residents prior to arrival of a bushfire, since the site will contain large expanses of low threat land which will enable people to more safely stay on site. Accordingly, provision of a second access route is considered to be ancillary to compliance requirements in the long term, but will be provided to facilitate an enhanced level of safety during the early stages; provide for enhanced firefighter access at the key vegetation interfaces; and to provide for the best possible access outcome when considering the sites inherent geographical constraints.

There are several options for the provision of a second access route under consideration, as identified in Figure 3-1 and outlined below.

1. Route 4

Route 4 involves construction of an Emergency Access Way (EAW) and/or temporary public road south from the LSP through lots 1133, 738, 299 and 1145 over approximately 2.1 km to connect with the unconstructed road reserve identified as Route 6. This land is currently privately owned rural land and the EAW/road alignment will extend through paddocks to avoid clearing of native vegetation.

2. Route 5

Two options are being considered for Route 5 (Routes 5a and 5b), which would provide a connection from the portion of newly constructed entry road (Route 3) to Mealup Road North (Route 7). Route 5 would be constructed in place of Route 4, if the preferred route.

Route 5a would be constructed as a public road within an existing unconstructed road reserve, through privately owned land (between lots 299 and 738). The alignment is largely devoid of treed vegetation and would require minimal clearing.

Route 5b would be constructed through Lot 1145 (privately owned land). The alignment extends through low-lying areas adjacent to a Conservation Category Wetland (CCW) and may require some clearing of vegetation. The route may be constructed as an EAW since it is on private land and there is potential for it to comply lengthwise (i.e. be less than 500 m).

3. Route 6

Route 6 utilises an existing road reserve which borders the southern boundary of lots 299, 738 and 1145 (private land). This route would provide a connection for Route 4 and Route 5 onto Mealup Road North, where access becomes available to the south. As the road reserve contains areas of remnant vegetation, an alternative option would be for Route 6 to be constructed as an EAW (or public road) within the cleared paddocks adjacent to the road reserve.

4. Route 7

Route 7 utilises Lake Mealup Road North to provide connections back to Forrest Highway via either Greenlands Road in the northeast and Thompson Road/Mills Road in the southeast.

Lake Mealup Road North is constructed as a farm track from the junction with Route 6 for some distance (potentially up to 3.4 km) before becoming a substantial limestone based road. There may be sections of this alignment where there is currently no track in place. This portion of the road reserve would be upgraded to the required public road standards which would require surfacing (gravel/limestone) and widening of the road and under pruning of overhanging tree branches. Some clearing may be required in areas where/if there is no track in place.

The remainder of the alignment to Greenlands Road (via Lake Mealup Road) is likely to already meet the minimum public road standards, or requires minimal modifications. To access Forrest Highway via Thompson Road and Mills Road, a short portion of existing road reserve would be constructed to connect Lake Mealup Road and Thompson Road, which may require some clearing of native vegetation.

5. Route 8

Route 8 would require construction of a portion of Route 7 for approximately 1.2 km from the junction with Route 6. A new public road would then extend east then south along an unconstructed road reserve to join Daudson Road, which is an existing gravel road, likely to meet minimum public road standards. Daudson Road connects to Lake Mealup Road (Route 7), with options to head north to Greenlands Road, or potentially southeast via Thompson Road and Mills Road to Forrest Highway (Route 7).

6. Route 9

Route 9 extends from Lake Mealup Road (Route 7) then utilises an unconstructed road reserve which heads south to connect with Birch Drive/Kangaroo Loop in the existing Birchmont rural residential area. There is a short section of land (~150 m) within Lot 173 (Reserve 24739) which is not within a designated road reserve. There is community benefit in constructing Route 9 as it would provide an alternative means of access and egress for residents of Birchmont, which are currently serviced by a single access route in a high bushfire risk environment.

7. Route 2

Route 2 incorporates the portion of Carrabungup Road which will extend north of the intersection with the new entry road (Route 3), to join the southeastern corner of the LSP area. This route could be utilised as a contingency access route that is additional to the options discussed above, which all traverse the southwestern side of the peninsula. The advantage of maintaining Carrabungup Road along the east side of the peninsula once the main entry road is constructed, is that it would provide an additional option for accessing or egressing the site, however it does lead back to the same destination as the main entry road and along the same route and wouldn't be suitable as the sole secondary access option. Retention of Carrabungup Road is likely to be most useful during the early stages.

A Coastal Hazard Risk Management and Adaptation Planning (CHRMAP) assessment (MP Rogers and Associates 2024) indicates that portions of the road are currently impacted by coastal processes (refer to Figure 1-1), therefore the suitability of this road for contingency access requires further review and consideration.

Conclusion

The review of access options demonstrates that there are multiple potential alignments for the provision of a secondary access route. The potential access options aim to utilise existing road reserves were possible to reduce planning complexity and the extent of native vegetation removal

(where the roads are cleared or constructed). While creation of public roads is preferred, sections of the route may require construction of an emergency access way where it extends on private land.

Based on preliminary investigations, the proponent's current preference is for the following secondary access route:

1. South from the LSP area via the main entry road (Route 3).
2. South to Lake Mealup Road North via Route 5a or 5b and Route 6.
3. South then east via Lake Mealup Road North and Lake Mealup Road then connecting to Thompson Road via a new public road then southeast to Forrest Highway.
4. The access route may be supplemented by Carrabungup Road (Route 2) which could provide alternative access along the eastern foreshore.

This route will connect to Forrest Highway approximately 9 km from the Greenlands Road intersection and creates two independent access routes leading in different directions.

An appropriate alignment for the secondary access route will be considered during the first stage of subdivision, with selection involving consideration of a range of values.

3.5.2 Marine access

The Mandurah Volunteer Marine Rescue base is located at the Mandurah Marina on Breakwater Parade, approximately 11.5 km travel distance via boat from Point Grey.

A long jetty is proposed along the western foreshore to enable recreational boats to berth in deeper waters. There may also be mooring provided.

3.5.3 Aerial access

Aerial helicopter access to the project area could be possible at multiple locations including:

- The Village Foreshore Park (on the western foreshore)
- The roof of the medical centre
- The future primary school oval.

Helicopter access to the site could be of benefit in a bushfire emergency to bring emergency services personnel to the site, or to evacuate vulnerable, injured or sick people if required.

3.6 Establishment of the site as a 'suitable destination'

Given the unique position of the proposed development on a peninsula, a key bushfire mitigation strategy will be to establish the site as a suitable destination at the outset of development, to ensure the site provides a place of safety to shelter if early evacuation during a bushfire emergency cannot be safely undertaken. The site lends itself toward being established as a suitable destination due to the large areas of space available to create substantial areas which are deemed to be low threat and suitable for sheltering. Although the site will be established as a suitable destination during the early stages, two different access routes will be provided to facilitate safe evacuation, if required.

A 'suitable destination' is defined in the draft Guidelines as:

An area that is not designated as bushfire prone on the Map of Bush Fire Prone Areas or is greater than 100 m from classified vegetation, or 50 m from Class G Grassland, as per AS 3959 and can provide protection during and after a bushfire event.

Key bushfire mitigation measures designed to provide for a suitable destination are outlined in Section 7 and include:

- Provision of low threat buffers to the perimeter vegetation hazards and establishment of low threat POS.
- Construction and maintenance of a purpose-built community refuge building to provide shelter for tourists and to a lesser extend residents, supplemented by residential dwellings constructed to AS 3959 and open air refuge (if required).
- Multiple vehicular access options to/from Forrest Highway and improvements to the existing public road network.
- Provision of vehicular access to key vegetation interfaces to facilitate a fire suppression response (including provision of a secondary access route).
- Appropriate siting of habitable development in BAL-29 or lower.
- Provision of an on-site bushfire brigade and trained personnel.
- Provision of a reticulated water supply and static tanks to provide redundancy.
- Development of site-specific emergency management arrangements.
- Community awareness initiatives.
- Development of a Landscape Management Plan to guide the ongoing management of vegetation throughout the site for all stages.

Legend

- Point Grey LSP Area
- Cadastral boundary
- Lot and road layout
- Route 1: Primary access route from Forrest Highway
- Route 2: Potential temporary access from Carrabungup Road
- Route 3: Approved entry road
- Route 4: Potential Emergency Access Way (~2000 m) option along west of peninsula
- Route 5: Potential new public road option from main access road
- Route 6: New public road to service Routes 3 and 4
- Route 7: Potential public road option via Lake Mealup Road North
- Route 8: Potential public road option via Daudson Road
- Potential new public road linkage to faciliate access to the south
- Route 9: Potential access through Birchmont
- Full access intersections

JBS&G

0 2 Kilometers

Point Grey, WA

POTENTIAL ACCESS ROUTES

Job Number: 59293		Scale 1:55,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

FIGURE: 3-1

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4. Bushfire risk context

4.1 Bushfire history

Review of bushfire history can be an important consideration during the strategic planning phase of a development. Locations with significant bushfire history may require further analysis, especially when considering the suitability of proposed infrastructure for firefighting operations and evacuation.

However, while review of bushfire history can provide some insights into past events under historical fire weather conditions, it does not necessarily correlate that future development will be subject to the same events. The introduction of residential land uses to a new area could result in increased likelihood of bushfire ignition but conversely, would result in an increased level of surveillance, improved access and provisions of firefighting resources (personnel, water and infrastructure), leading to an enhanced fire suppression response and turn out time. These factors are likely to reduce the impact of a bushfire at Point Grey compared to historical conditions.

The below sub-sections provide a review of local bushfire history, including the January 2016 Waroona-Yarloop bushfire.

4.1.1 Local bushfire history

Figure 4-1 depicts the Department of Biodiversity and Attractions (DBCA) Fire History dataset (DBCA-060) which contains records of bushfire events on departmental-managed land and where available non-departmental managed land dating back to 1937. The dataset divides fire history into the following categories:

- Wildfire/bushfire
- Prescribed burn
- Plantation (clearfell) area
- Mining rehabilitation area
- Unknown (historic fire event).

Review of the data indicates that historical bushfires on the Point Grey peninsula have been relatively small local events and not of a size that would be considered 'landscape-scale'. Bushfires are mostly prevalent along the western side of the peninsula, as expected, due to the higher presence of intact vegetation at this interface compared to the eastern side.

Historical bushfires on the peninsula are mostly associated with scrub/forest fuels in defined reserves, with no evidence of bushfire spread over pastureland to impact other areas of remnant vegetation. Vehicular access to the historically recorded bushfires was likely to be limited to tracks and would therefore have been limited.

The only recorded bushfire in the LSP area is a relatively small fire in March 2009 which impacted 9.7 ha of scrub vegetation at the northern tip of the peninsula (within future ROS). The bushfire was confined to this area and did not spread to affect other parts of the peninsula.

The instance of bushfire in the Darling Scarp, approximately 26 km to the east of the LSP area, is high and generally correlated with the presence of intact forest fuels. The Waroona-Yarloop bushfire provides a recent example of a landscape-scale bushfire which spread from the scarp across the plains to reach the coastline, and is discussed in detail below.

4.1.2 January 2016 Waroona-Yarloop bushfire

The most recent significant bushfire in proximity to the project area was the Waroona-Yarloop bushfire, which occurred in January 2016, resulting in the loss of 181 properties and two lives, burning 69,165 ha of both public and private land. The key progression of the fire is detailed below.

- The fire was ignited by lightning strike in State Forest south of the town of Dwellingup, which lies approximately 35 km east of Point Grey, on the Darling Scarp. The fire spread south through long unburnt State Forest and rehabilitated mining land. Access for firefighting efforts was hindered by heavy fuels, extreme fire behaviour, steep rocky terrain and bauxite mining land uses.
- Within 24 hours, the fire had created a pyro-cumulonimbus cloud which resulted in lightning strike igniting further fires which threatened the town sites of Waroona and Hamel, located down from the scarp on the Swan Coastal Plain.
- The fire then spread further west onto the plain, which is largely cleared of forest vegetation, through fuels associated with the Waroona Main Drain as well as roadside vegetation. This resulted in long narrow fires, acting as a 'fire fuse'.
- Much of the town of Yarloop was destroyed by the eastern fire when it crossed west of South Western Highway following strengthening of easterly winds.
- The western fire eventually crossed Forrest Highway, near the coast, and cut access to Preston Beach. Residents took shelter at the carpark adjacent to the beach before Marine Rescue evacuated some people by boat to Bunbury.

Recommendations of Special Inquiry

Some of the main recommendations of the Special Inquiry ('Reframing Rural Fire Management', the Ferguson Report; GoWA 2016) are as follows:

- Prioritisation of hazard reduction burns in proximity to towns and critical assets.
- Continued emphasis on landscape hazard reduction burning by Parks and Wildlife.
- Increased hazard reduction on private land, including mechanical thinning in mining rehabilitation forest.
- Development of public guidance in relation to breaking up long lineal fuels along drainage channels and roads.
- Development of 'opt-in' bushfire warnings sent directly to personal devices (e.g. smart phone).
- Installation of bushfire and emergency community sirens for 'at-risk' communities.
- Designation of "Places of Last Resort" by Local Government for townsites with an elevated risk from bushfire.
- Policy development by DFES in relation to community bushfire refuges and household bushfire refuges.
- Policy changed to enhance ability to clear vegetation to protect assets and dwellings.
- Review of policies relating to traffic management at emergency incidents.
- Creation of a Rural Fire Service to enhance rural fire management and bushfire risk management.
- Establishment of State Bushfire Coordinating Committee.

JBS&G understands many of these recommendations have since been implemented by the State, including creation of the Rural Fire Service.

Relevance to Point Grey

The Waroona-Yarloop bushfire originated in dense forest with long unburnt fuels which created a large and intense bushfire and ultimate formation of a pyro-cumulonimbus weather event, igniting further fires in the area.

A bushfire with this severity of behaviour is far more likely to occur up on the Darling Scarp, where fuels are higher and fire runs are continuous and exhaustive, than for a bushfire originating in proximity to the project area, where vegetation is predominantly grazed pastureland with fragmented patches of remnant coastal scrub and open Tuart woodland vegetation. Nevertheless, the Waroona-Yarloop bushfire has demonstrated that a bushfire can spread from the scarp onto the coastal plain through remnant vegetation corridors.

Roadside and drainage vegetation channels are limited on the Point Grey peninsula and grassland areas are widely grazed, having limited potential to support fire spread in these cleared areas. Remnant vegetation to the east of the LSP area is sparse and fragmented and bushfire is most likely to travel toward the site along the more vegetated western foreshore, under south-easterly wind conditions, which most commonly occur in the morning, when bushfire weather conditions are less extreme.

In the case of a similar future fire threatening to impact Point Grey, significant firefighting resources would be deployed and as the scarp is 25 km away, there would likely be several days to organise the emergency management response, including early evacuation of Point Grey well in advance of the bushfire impacting the site or evacuation routes.

4.1.3 March 2024 Nanga Brook bushfire

A recent bushfire was accidentally ignited in Marrarup Nature Reserve approximately 44 km southeast of the LSP area. The bushfire burnt through 3180 ha of forest vegetation on the Darling Scarp and destroyed three residences and another five smaller properties. Unlike the Yarloop fire, the Nanga Brook bushfire remained on the scarp before being contained and did not spread west on the Swan Coastal Plain.

4.2 Vegetation and topography on the Point Grey Peninsula

4.2.1 Overview of vegetation

Intact vegetation within the LSP area includes Tuart woodland and Tuart/Jarrah forest within the proposed development areas, coastal scrub within the northern trip and extending along the western foreshore, and Eucalypt woodland with scrub and samphire understorey along the eastern fringes.

Native vegetation has been predominantly cleared from the wider peninsula to accommodate agricultural grazing. The eastern portion of the peninsula extending from the LSP area to Forrest Highway has been subjected to the highest level of clearing with little remaining intact vegetation and is primarily a combination of grassland and woodland vegetation profiles.

Pockets of retained native scrub and forest vegetation do exist throughout the peninsula, with the most significant areas located on the western foreshore in associated with Mealup Point Nature Reserve, Lake McLarty Nature Reserve and McLarty Nature Reserve. Substantial areas of coastal scrub vegetation also exist to the north of Carrabungup Road and west of Boggy Bay Road.

4.2.2 Remnant native vegetation mapping

Remnant vegetation on the peninsula can be divided into the four pre-European vegetation complexes detailed in Table 4-1, which are based on pre-European mapping of remnant vegetation by Heddle et, al. (1980). The AS 3959 classification assigned to each of the complexes acknowledges that, based on the descriptions, each complex likely comprises a combination of vegetation types.

Vegetation not mapped within any complex mostly comprises pastureland with scattered trees classified as Class G Grassland or Class B (open) Woodland.

Table 4-1: Pre-European vegetation complexes on Point Grey Peninsula

Complex (Heddle et. al 1980)	Description	Location	AS 3959 classification
Cottesloe complex-Central and South	Mosaic of woodland of E. *gomphocephala – E. marginata – E. calophylla*; closed heath on the limestone outcrops.	Predominant along the western shore of the peninsula and extending into the LSP area in association with remnant treed vegetation. The only vegetation type identified within the project area.	Class A Forest Class D Scrub
Vasse complex	Mixture of closed scrub of *Melaleuca spp*., fringing woodland of *E. rudis – Melaleuca spp*. and open woodland forest of *E. gomphocephala – E. marginata – Corymbia calophylla*. Will include areas dominated by *Tecticornia* and *Sarcocornia spp*. (Samphire) near Mandurah and south of the Capel River.	Present to the north and south of Carrabungup Road in association with the estuarine environment and inland wetlands. Predominantly associated with low tidal areas on the coast and inland low wetland areas.	Class A Forest Class D Scrub Class C Shrubland
Southern River complex	Open woodland of *C. calophylla – E. marginata – Banksia spp*. with fringing woodland of *E. rudis – M. rhaphiophylla* along creek beds.	Present to the north and south of Carrabungup Road in association with inland wetlands and water courses.	Class A Forest Class B Woodland
Cannington complex	Mosaic of vegetation from adjacent vegetation complexes of Bassendean, Karrakatta, Southern River and Vasse.	Interspersed in small pockets mainly in grazed grassland areas.	Class A Forest Class D Scrub Class C Shrubland

4.2.3 Topography and effective slope

The Point Grey Peninsula is relatively low lying and flat, especially the eastern portion extending from Forrest Highway to the LSP area, which sits predominantly at 0 to 5 m AHD. Variation in elevation is confined to the western portion of the peninsula and the central 'spine' of the LSP area, with elevation generally ranging from 0 to 25 m AHD. There is a maximum high point of 37 m AHD within Lake Mealup Nature Reserve to the south of the project area.

Bushfire behaviour throughout the central part of the Point Grey peninsula to Forrest Highway will largely be through grassland and woodland fuels, typically on flat or gently undulating slopes. Along the western extent of the peninsula, retained native scrub and forest vegetation occurs through the various reserves typically on undulating land, however there are some areas where effective slope can increase to over 10° downslope of the project area.

Effective slope adjacent to the existing and future proposed access routes (refer to Section 3.5) is generally flat. Where the future road is proposed to deviate from Carrabungup Road toward the centre of the LSP area, the undulating terrain presents a general effective upslope in relation to the proposed road alignment.

4.3 Bushfire weather characteristics

Based on BOM data from Mandurah (Station No. 9977 and 9887) weather stations the following broad bushfire weather information for Point Grey can be assumed from average January climatic conditions:

- Mean maximum temperature peaking at around 29.6°C.
- Average morning (9am) winds are from the east, southeast and south, averaging around 14 km/h, with a mean relative humidity of 51%.
- Average afternoon (3pm) winds are typically from the southwest, averaging around 20 km/hr, with a mean relative humidity of 40%.

Rainfall does occur year-round must mainly in the winter months. During the summer months, average rainfall is typically less than 15 mm per month.

4.4 Landscape-scale bushfire conditions

Figure 4-4 provides a bushfire hazard landscape assessment for the LSP area. The assessment is based on the review of bushfire history, vegetation, topography and bushfire weather presented above. The landscape assessment identified the following possible bushfire scenarios, which are further detailed below.

1. Bushfire approaching over the Point Grey peninsula from the east, southeast or south
2. Bushfire approaching from the southwest or west
3. Bushfire approaching from the northwest, north or northeast
4. Bushfire igniting internally within the development site.

4.4.1 Bushfire approaching over the Point Grey peninsula from the east, southeast or south

Bushfire impact from predominant east/southeast/south morning winds has potential to carry landscape scale fire behaviour through extreme bushfire hazard level vegetation toward the site, particularly along the western foreshore.

While fire runs are potentially long in these directions, they extend primarily through grassland and fragmented areas of remnant native vegetation (woodland and forest), with fragmentation being higher along the central and eastern portion of the peninsula. Landscape scale fire behaviour is possible to the east and southeast; however, the fragmentation of fuels will reduce the likelihood of this eventuating.

Extended fire behaviour is most likely within the vegetated reserves along the west of the peninsula, with fire runs of up to 5 km approaching from the southeast. However, fire behaviour would be moderated prior to reaching the LSP area as the vegetation narrows in width just south of the project area to 200 m – 550 m.

The highest risk interface under these scenarios is at the southwest corner of the LSP area, where the site abuts scrub and forest fuels within Reserve 27528. A substantial road will be provided at this interface, and the larger rural-residential lots are located here which will ensure there is sufficient separation to future habitable buildings, and a fire suppression interface.

The risk from vegetation to the south to southeast within the adjacent rural property is considered to be lower, although grassland fires can still represent a significant threat. There are plans by the adjoining landowners to develop this land in the future, which would further reduce or remove the risks at this interface.

A bushfire approaching the LSP area from due east would be through coastal shrub and revegetated foreshore reserve with fire runs being limited 100m – 200 m at the very most. Establishment of low threat foreshore areas and substantial perimeter roads will ensure habitable development is appropriately site and there is an interface to manage a local bushfire.

A bushfire approaching from these directions has potential to impact both the primary and secondary vehicular access routes which could impact the ability to safely evacuate the site in the case of a sudden bushfire. The LSP area will be developed as a stand-alone town, which will provide a suitable destination for sheltering on site in the event that evacuation cannot be undertaken. Staged measures such as provision of a community bushfire refuge (on-site safer place) and low threat subdivision buffers will ensure that a suitable destination is provided on-site for all stages of the Point Grey development.

There is a history of bushfires occurring to the south, southeast and east, however, these have generally been small and contained within forested reserves greater than 2.5km from the site (see Figure 4-1). It is likely these fires have been less controlled than they would be during occupation of the Point Grey development, given the higher priority placed on the protection of life (it is currently sparsely inhabited), improved access, and future availability of personnel and fire suppression resourced.

The most significant recent bushfire in the local area is the Waroona-Yarloop bushfire which spread west from the Darling Scarp and generated its own unpredictable fire weather patterns. As mentioned previously, in the case of a similar fire threatening to impact Point Grey, significant firefighting resources would be deployed and it is likely there would be sufficient time to carry out a full evacuation of the site, if deemed to be necessary.

4.4.2 Bushfire approaching from the southwest or west

A bushfire approaching from the southwest is likely to occur under the prevailing afternoon summer conditions for the locality where the relative humidity is slightly lower and temperature and wind speed higher than morning conditions, resulting in more severe bushfire behaviour.

Bushfire behaviour from the southwest is likely to be through the western foreshore reserve, or located across Peel-Harvey Estuary to the west. Bushfire impacts to the LSP area are expected to be limited to a localised scrub fire or possible low levels of ember attack from across the estuary. A bushfire travelling from the southwest on the wider peninsula also has potential to impact the secondary access route, and potentially the primary access route, depending on the location of the fire.

Landscape-scale bushfire is unlikely in the case of a bushfire approaching from the southwest as fire runs would be limited by the presence of the estuary. However, there is potential for fire to reach a steady-state, with fire runs of up to 500 m through Reserve 27528, adjacent to the southwest corner of the site.

There are limited recorded instances of bushfire in the local area under this scenario, with the nearest substantial fire that would have had potential to impact the secondary access route (but not the LSP area) occurring within a reserve approximately 2.5 km to the south (see Figure 4-1). The bushfire does not appear to have spread from the reserve to impact the peninsula further.

4.4.3 Bushfire approaching from the northwest, north or northeast

Winds can approach the locality from northwest, north and northeast occasionally during the morning and afternoon, with the prevalence increasing later in the season (April). Northerly winds often exhibit a significant FDI, due to stronger winds and hotter temperatures.

A bushfire approaching the LSP development area from the north would occur through on-site ROS with fire runs of up to 500 m through intact scrub and forest fuels. Significant steady state fire behaviour is possible at this interface due to the high fuel loads and runs exceeding 100 m, however the estuary surrounding the peninsula precludes this scenario from presenting a landscape-scale risk.

Perimeter roads and low threat POS will be provided at the northern interface to ensure appropriate siting of development, as well as a fire suppression interface. The proposed cultural centre, which is proposed to sit within the northern portion of the site will need to ensure that an appropriate APZ is provided to reduce impact from a bushfire occurring from the north.

There is potential for a bushfire to spread from the northern vegetation, south along the western and eastern sides of the peninsula, especially under worst case bushfire weather conditions with winds generated from the north. Provision of firebreaks to prevent this situation, and provide a fire suppression interface should be considered by the relevant land managers.

Review of bushfire history shows there has been at least one bushfire that has occurred recently within this vegetation. The bushfire occurred on 2 March 2009 and appears to have been contained to scrub vegetation within the ROS.

A bushfire approaching from the north is unlikely to impact access/egress from/to the development.

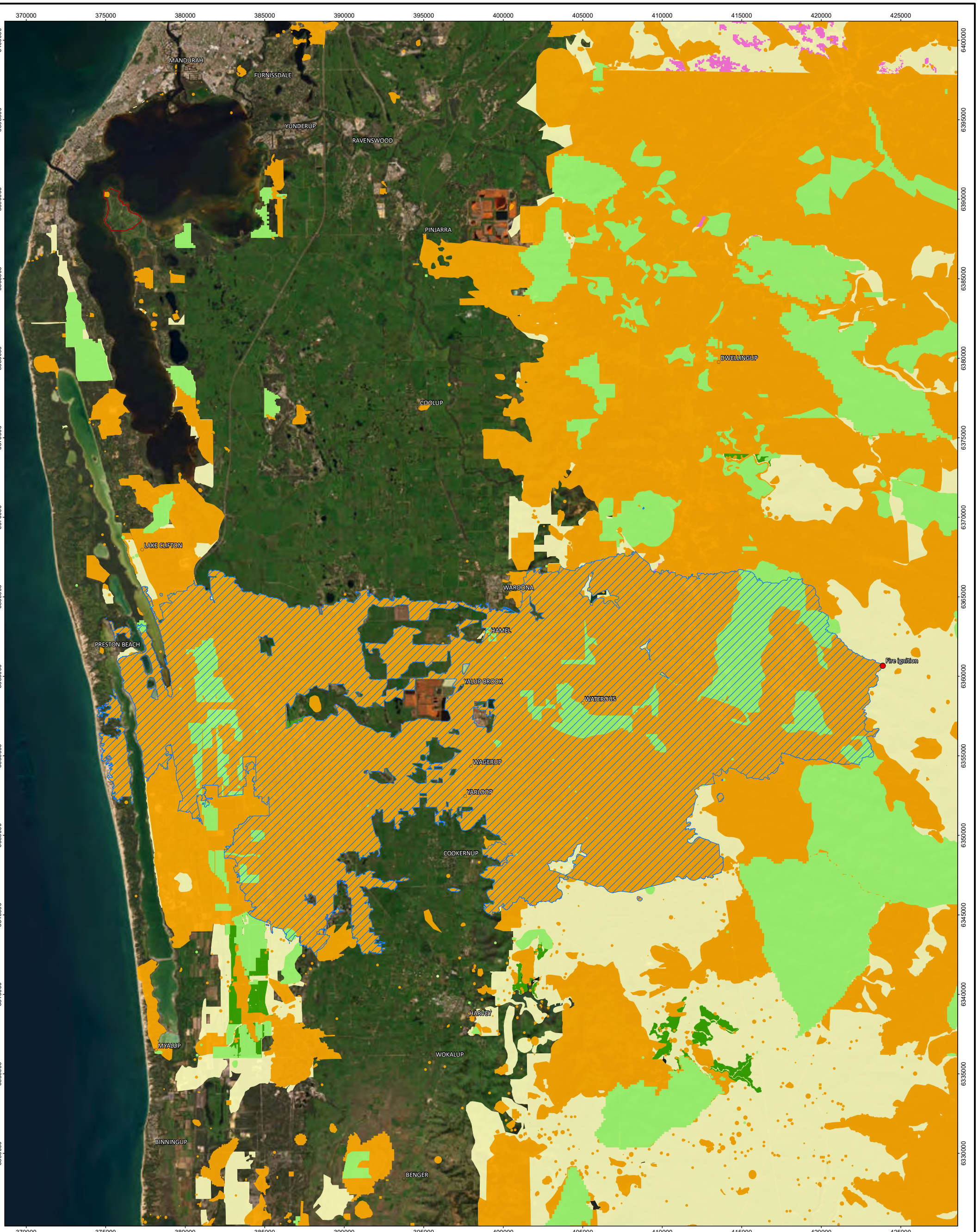
4.4.4 Bushfire igniting internally within the development site

It is anticipated that bushfire hazards will be limited to the perimeter of the project area once the site has been fully developed. The retained vegetation around the site perimeter does, however, have potential to impact future development as part of a localised bushfire event or a larger bushfire spreading from the south.

A bushfire igniting within the development site is most likely to occur within the central Conservation POS or foreshore reserve/POS either due to accidental ignition or arson. The remaining internal portions of POS will be established and maintained in a low threat, and will be designed to ensure the vegetation does not support fire spread through the development.

An internally ignited fire is most likely to be a localised fire and likely to be contained due to community surveillance, perimeter access to hazards and fire suppression resources and infrastructure. Landscape-scale fire behaviour is therefore unlikely for a fire which originates from within the development site.

The presence of bushfire hazards around the perimeter of the site places high importance on managing vegetation within the site, in particular internal POS areas, to prevent a bushfire penetrating into the development area and impacting habitable development.



Legend

- Point Grey LSP Area
- 2016 Waroona bushfire (final boundary)
- Fire ignition 2016 Waroona bushfire
- Towns

Fire history (DBCA - 060)

- Mining rehabilitation area
- Prescribed burn
- Plantation (clearfell) area
- Wildfire/Bushfire
- Unknown (historic fire event)

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0 4 Kilometers

Point Grey, WA

BUSHFIRE HISTORY IN CONTEXT OF THE 2016 WAROONA BUSHFIRE

Job Number: 59293		Scale 1:220,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**FIGURE: 4-1**

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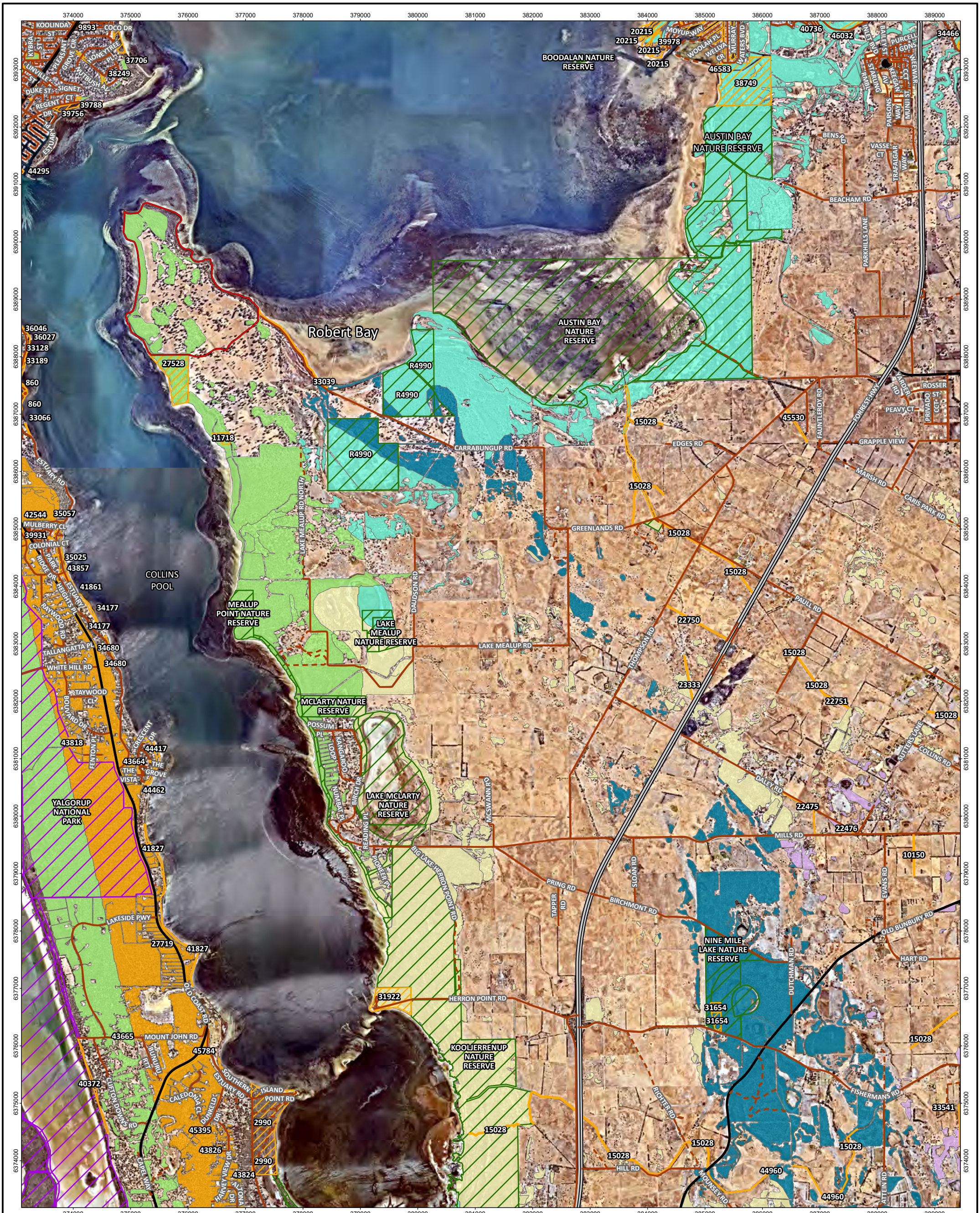

Legend			
Point Grey LSP Area	Track		
Recreation Reserves	Vegetation complexes		
Legislated_Lands and Waters (DBCA - 011)	Cannington complex		
Nature Reserve	Cottesloe complex - central and south		
National Park	Guildford complex		
Highway	Karrakatta complex -central and south		
Major road	Southern River complex		
Minor road	Vasse complex		

JBS&G

0 2 Kilometers

Point Grey, WA

REMNANT NATIVE VEGETATION TYPES OVER THE POINT GREY PENINSULA

Job Number: 59293		Scale 1:60,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

FIGURE: 4-2

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Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Primary School
- Community/servicing
- Mixed Use
- Village Centre
- Residential
- Effective slope
- Topographic contours (mAHD)
- Minor road

JBS&G

0 300 Meters

Point Grey, WA

EFFECTIVE SLOPE

Job Number: 59293		Scale 1:10,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 13-Aug-2024

FIGURE: 4-3

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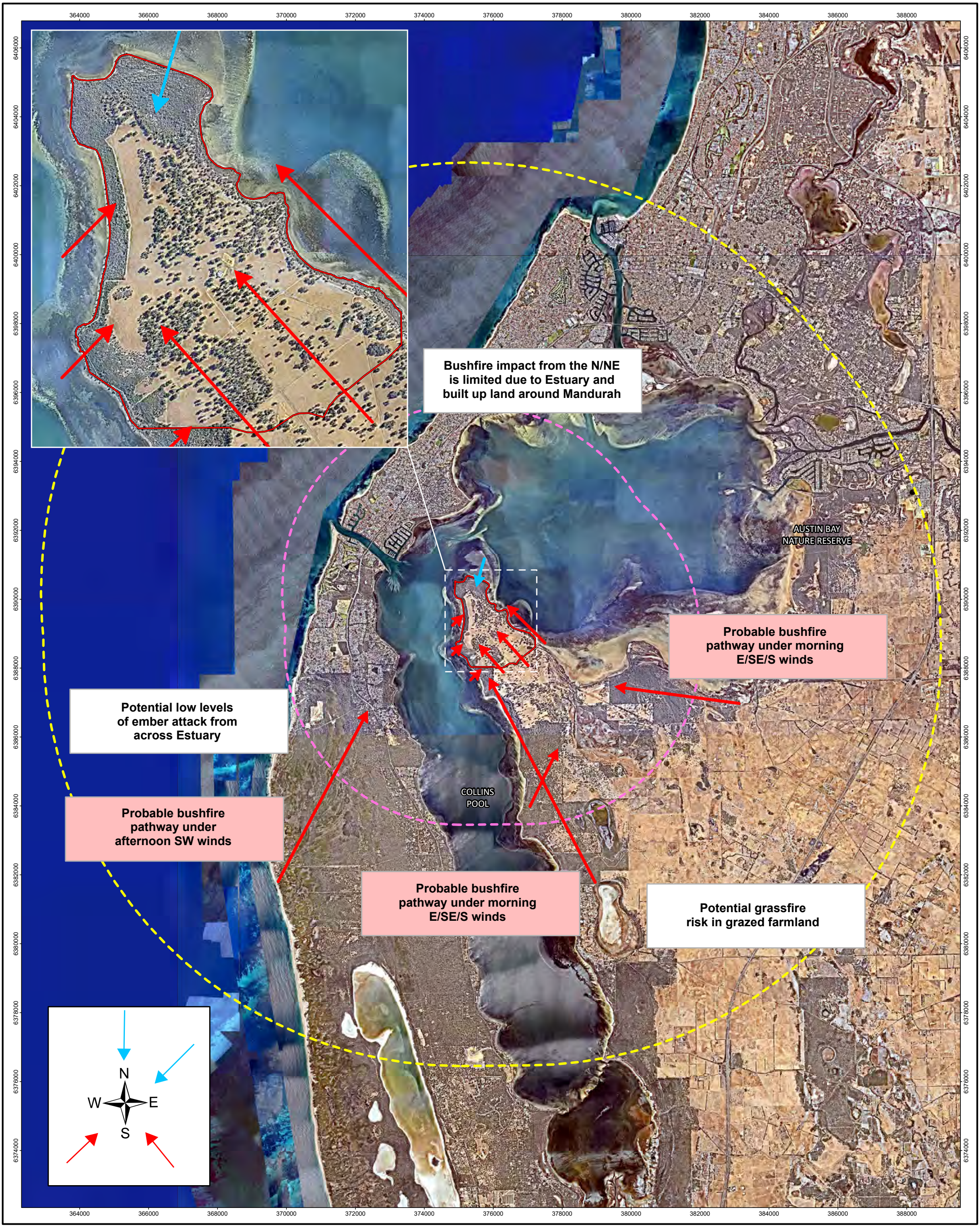

Legend

- Point Grey LSP Area
- 5km site buffer
- 12km site buffer
- Predominant wind direction
- Worst-case bushfire wind direction

JBS&G

0 2 Kilometers

Point Grey, WA

BUSHFIRE HAZARD LANDSCAPE ASSESSMENT

Job Number: 59293		Scale 1:100,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**FIGURE: 4-4**

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5. Environmental considerations

5.1 Environmental values

The project area currently contains environmental assets in the form of native remnant vegetation both within the fringing foreshore and the future internal development site. The majority of foreshore vegetation will be retained within ROS and the foreshore reserve. Varying levels of vegetation will be retained within POS, predominantly as low threat vegetation.

As discussed previously in Section 1.5.3, environmental impacts of the proposal have been previously assessed in accordance with State and Commonwealth requirements and have been subsequently approved.

Table 5-1 provides a summary of the environmental values associated with the project area that have been previously addressed by a number of environmental assessments. Key environmental values are depicted in Figure 5-1.

Table 5-1: Summary of environmental values

Environmental value	Mapped as occurring within or adjacent to the project area		Description
	Within	Adjacent	
Environmentally Sensitive Area	Yes	Yes	A large proportion of the vegetated foreshore is designated as an environmentally sensitive area. The majority of the vegetation will be retained and will only require removal for construction of the Village Foreshore Park (former marina site), where environmental impacts have been previously assessed and approved.
Swan Bioplan Regionally Significant Natural Area	Yes	Yes	The foreshore vegetation and a portion of vegetation within the project area is designated as a Swan Bioplan Regionally significant area. The majority of the foreshore vegetation will be retained and a portion of the on-site vegetation will be retained within POS.
Ecological linkages	Yes	Yes	The foreshore vegetation and a portion of vegetation within the project area is mapped as comprising regionally well-connected patches. The majority of the foreshore vegetation will be retained and a portion of the on-site vegetation will be retained within POS.
Wetlands	Yes	Yes	Land along the eastern foreshore is mapped as comprising a Conservation Category Wetland which is contiguous with large CCW areas to the south-east of the project area. No development is proposed to occur within this area. The Peel-Yalgorup Ramsar listed wetland is located along Carrabungup Road, within the Austin Bay Nature reserve. JBS&G understands that any impacts associated with road widening adjacent to this reserve have previously been addressed by the proponent. The Peel-Harvey estuary, which envelops the peninsula is classified as both a CCW and a RAMSAR wetland.
Waterways	No	Yes	The Peel-Harvey estuary surrounds the Project area to the west, north and east. Environmental impacts on the estuary have been previously assessed.

Environmental value	Mapped as occurring within or adjacent to the project area		Description
	Within	Adjacent	
Threatened Ecological Communities listed under the EPBC Act	Yes	Yes	The Endangered banksia woodlands of the Swan Coastal Plain TEC is mapped as having potential to occur within project area. The Tuart woodlands and forests of the Swan Coastal Plan TEC is mapped as occurring within the project area. This vegetation will be retained where possible within POS, ROS and the foreshore reserve. The RPS survey (2009a) confirmed no TECs occurred within the site at the time of assessment.
Threatened and priority flora	Yes	Possibly	During a survey by RSP (2009a), 36 species were identified including seven declared rare flora (DRF), one priority One, four Priority Two, 13 Priority Three and 11 Priority Four species. No DRF or Priority Flora was recorded in the project area during the spring 2007 survey.
Fauna habitat listed under the EPBC Act	Yes	Yes	The project area is mapped as potentially containing feeding habitat for the Endangered Carnaby's Black Cockatoo. This vegetation is mostly located on the foreshore areas, with patches also occurring within the development area. Roosting sites for Black Cockatoo have been confirmed on site during the annual 'Cocky Count'. A large amount of foreshore vegetation will be retained as part of the development, as well as some smaller areas within on-site POS.
Threatened and priority fauna	Yes	Possibly	During a survey by RSP (2009a), both Quenda and Carnaby's Black Cockatoo were recorded as occurring within the project area. Osprey and Rainbow Bee-eater were recorded in the project area and are listed as Migratory under the EPBC Act.
Bush Forever Site	No	No	N/A.
DBCA managed lands and waters (includes legislated lands and waters and lands of interest)	No	Yes	The nearest DBCA managed land is Austin Bay Nature Reserve, which is located to the north and south of Carrabungup Road, approximately 2 km south-east of the ODP boundary. JBS&G understands that any impacts associated with road widening adjacent to this reserve have previously been addressed by the proponent.
Heritage	Yes	No	Several registered sites and other heritage places have been reported on the Point Grey peninsula. Previous studies have determined that the proposed residential development will not impact these sites (Ethnosciences 2024).
Conservation covenants	No	No	JBS&G is not aware of any conservation covenants burdening the project area.

5.2 Proposed revegetation and landscaping

5.2.1 Native vegetation – retention and rehabilitation

Table 5-2 provides an overview of environmental management measures documented within the EIR (JBS&G 2024) to meet the requirements of the previously granted State and Commonwealth approvals relating to the previously endorsed ODP. These management measures include rehabilitation and retention of vegetation within and adjacent to the project area. Bushfire management measures proposed within this BMP will need to be balanced against these environmental obligations whilst aiming to achieve agreement with the overarching objectives of SPP 3.7.

Table 5-2: Environmental management measures with significance to bushfire management

Management measure	Description	Significance to bushfire management
Rehabilitation within the foreshore reserve	• 21.74 ha of land is to be rehabilitated within the eastern foreshore reserve, within the project area. • A further 8.83 ha of Peel Inlet foreshore is to be rehabilitated immediately south of the ODP, adjacent to Carrabungup Road.	• Rehabilitation areas will need to be clearly delineated and species composition defined to determine future vegetation classifications under AS 3959.
Rehabilitation within POS	• Replanting of a minimum 1100 trees consisting of Marri (*C. calophylla*), Tuart (*E. gomphocephala*) and Jarrah (*E. 46marginata*) within the ODP POS areas/road reserves or within an area immediately adjacent to the development. • Rehabilitation of 1 ha of Conservation POS in the south of the project area.	• Rehabilitation areas and planting densities will need to be clearly defined to determine whether replanting within POS will achieve a low threat/excludable status or require classification under AS 3959.
Planting of Black Cockatoo habitat	• At least 3 ha of Black Cockatoo habitat is to be planted at a density of 1 plant/ha.	• Location and species composition of replanting to be clearly defined to determine future vegetation classifications under AS 3959.
Protection of existing vegetation with POS	• Many of the tall Eucalypt trees present at the site will be retained within the proposed ridgeline open space area. In addition, POS locations will be selected to allow retention of *Eucalyptus gomphocephala* (Tuart) where possible. • A large area of remnant vegetation in good condition in the north of the site is proposed for retention within the ROS for the purpose of conservation. • On-site retention of and protection within POS and ROS of approximately 91 ha of potential Back-cockatoo foraging and roosting habitat (which includes 345 breeding and foraging trees).	• Tall Eucalypts expected to be able to be retained within POS in a parkland setting and able to achieve a low threat status. • Remnant vegetation within the foreshore reserve and ROS is expected to be relatively unmanaged and will comprise classified vegetation. • Black-cockatoo foraging habitat is expected to be limited to the foreshore reserve, and isolated pockets within on-site POS that will meet exclusion criteria under AS 3959. Breeding habitat is expected to be retained within tall Eucalypts, as mentioned above.
Fauna linkage	• A central north-south fauna linkage corridor will be achieved within the	• The fauna linkage is expected to be provided through retention of tall

Management measure	Description	Significance to bushfire management
corridor	central POS.	Eucalypts with a parkland cleared understorey. • There is a need balance to this requirement with reducing bushfire linkages to and within the project area.
Staged approach to vegetation clearing	• To provide habitat for terrestrial fauna during staging.	• This requirement aligns with the staged approach to development. Vegetation will need to be cleared and/or managed within temporary bushfire management staging buffers.
Visual amenity	• A Visual Impact Assessment has been carried out (Emerge 2024) in order to assess the impact of proposed development form a visual amenity point of view. • The foreshore vegetation is important in terms of screening the proposed development from surrounding areas (across the inlet). • Retention of Tuarts is especially important for shielding tall buildings.	• Retention of tall Eucalypts and foreshore vegetation aligns with environmental requirements listed above and will need to be considered when proposing measures to reduce bushfire risk within the project area.

5.2.2 Modification of vegetation and landscaping

A Landscape Masterplan has been developed to provide a conceptual demonstration of landscaped elements within the LSP area (Emerge 2024; Appendix E). The plan provides four sections adjacent to retained vegetation to demonstrate that the required bushfire setbacks to habitable buildings are able to be contained within a combination of road reserves, low threat POS and lot setbacks (R-Code setbacks)s

Visual amenity plays an important role in the Landscape strategy for the Point Grey site with a focus on retention of vegetation within the foreshore reserve and tall trees along the central POS corridor.

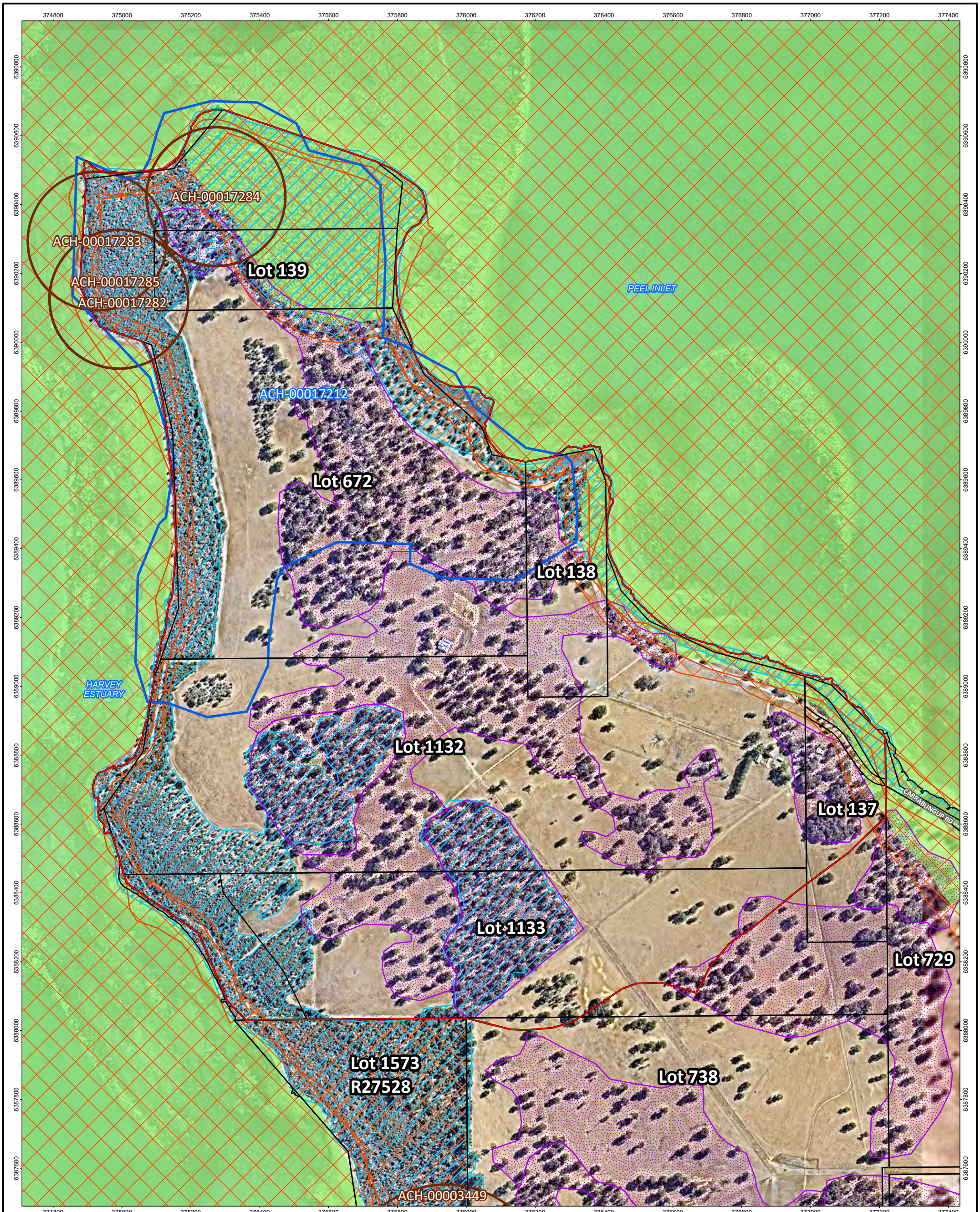
The full extent of native vegetation to be retained within the project area will be confirmed at future planning stages.

The landscape concept proposed in the Landscape Masterplan is outlined in Table 5-3.

Table 5-3: Proposed landscaping concepts

Area	Concept landscaping concepts
Foreshore Reserve and POS	• Retained existing native vegetation. • Rehabilitation areas. • Bioretention basins. • Managed garden beds. • Areas of reticulated turf.
Regional Open Space	• Existing vegetation will be retained and some areas subject to rehabilitation within the ROS at the northern tip of Point Grey. • This area includes a wetland, small swimming beach and future walking trails.
Central Conservation POS	• Subject to 2 ha of vegetation rehabilitation works in the central portion and retention of existing vegetation.
Internal POS	• Retention of mature Tuarts, with parkland clearing maintained to ensure a low

Area	Concept landscaping concepts
corridors	threat landscape. • Bioretention basins. • Areas of low threat landscaping, including garden beds and reticulated turf.
Streetscaping	• Low threat street scaping throughout the street networks. • Some of the native tree planting requirements may be accommodated within the road reserves as part of low threat landscaping.
Residential lots	• Low threat landscaping including private gardens and lawns.



Legend

- Point Grey LSP Area
- Cadastral boundary
- Environmentally Sensitive Areas (DWER - 046)
- Tuart Woodlands
- Geomorphic wetlands (DBCA -019)
- Conservation
- Swan Bioplan Regionally Significant Natural Areas (DWER-070)
- Aboriginal Cultural Heritage Lodged (DPLH - 100)
- Aboriginal Cultural Heritage Register (DPLH- 099)
- Minor road

JBS&G

0 300 Meters

Point Grey, WA

ENVIRONMENTAL CONSIDERATIONS

Job Number: 59293		Scale 1:10,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

FIGURE: 5-1

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

6. Bushfire assessment results

6.1 Methodology

6.1.1 Bushfire Hazard Level Assessment

A Bushfire Hazard Level (BHL) assessment has been undertaken to assess the BHLs which currently exist within the LSP area and the BHLs that have potential to be present on completion of development of the project.

The BHL assessment provides a 'broad-brush' indication of the potential intensity of a bushfire event associated with vegetation within and adjacent to the project area. BHL assessments are appropriate at Structure Plan stage, as there is usually limited detail available on post-development landscaping and revegetation treatments, which are critical inputs required to accurately inform the more detailed Bushfire Attack Level (BAL) Contour assessment (see below).

The BHL assessment has been prepared in accordance with Appendix 2 of the Guidelines. The assessment methodology categorises land as having a as Low, Moderate, or Extreme BHL based on the AS 3959 vegetation classification and effective slope.

Table 6-1 lists the three BHLs and their associated characteristics. Bushfire Hazard Levels have been applied to land within the project area and adjoining 150 m (the assessment area) to assess current (pre-development) bushfire hazard conditions, as well as the anticipated post-development bushfire hazard conditions.

Table 6-1: Bushfire hazard levels and characteristics

Bushfire hazard level	Characteristics*
Extreme	• Class A Forest • Class B Woodland (05) • Class D Scrub • Any classified vegetation with a greater than 10° slope.
Moderate	• Class B Low woodland (07) • Class C Shrubland • Class E Mallee/Mulga • Class G Grassland, including sown pasture and crops • Class G Grassland: Open woodland (06), Low open woodland (08), Open shrubland (09) • Vegetation that has a low hazard level but is within 100 metres of vegetation classified as a moderate or extreme hazard, is to adopt a moderate hazard level.
Low	• Low threat vegetation may include areas of maintained lawns, golf courses, public recreation reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks • Managed grassland in a minimal fuel condition (insufficient fuel is available to significantly increase the severity of the bushfire attack). For example, short-cropped grass to a nominal height of 100 millimetre • Non-vegetated areas including waterways, roads, footpaths, buildings and rock outcrops.

*Vegetation classifications from AS 3959-2018 Table 2.3.

6.1.2 Bushfire Attack Level contour assessment

Purpose

Bushfire Attack Level (BAL) contour assessments are generally carried out at the subdivision stage of planning to determine the level of bushfire risk applicable to future lots based on detailed landscaping and subdivision design inputs. Without detailed landscaping inputs, it is not possible to accurately determine the level of radiant heat flux applicable to future development. When preparing a BAL contour map at Structure Plan stage, assumptions need to be made regarding future landscaping design. It is general practice to apply worst-case assumptions in that POS will be fully revegetated to a certain class of vegetation, to ensure the worst-case conditions are considered and factored into future detailed subdivision and landscaping design.

With this in mind, an indicative Bushfire Attack Level (BAL) contour assessment has been undertaken for the LSP area to demonstrate, conceptually, the worst-case BALs that may be applicable to future habitable development, based on worst-case assumptions regarding future landscaping and revegetation within POS. The purpose of the BAL contour assessment at this high level of planning is to assist in the development of site-specific bushfire management strategies, including appropriate siting of future habitable development and refuge areas.

A BAL contour assessment has been undertaken for the two following development scenarios:

1. Full build out of the LSP area, and
2. Anticipated Stages 1 and 2, to indicate the BALs that may applicable during the early stages of development, based on implementation of specific bushfire mitigation measures.

Methodology

The BAL contour assessment has been undertaken in accordance with Method 1 of AS 3959. The Method 1 procedure incorporates the following factors:

- State-adopted FDI 80 rating.
- Vegetation classification
- Effective slope
- Distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by future development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts and/or deliver compliance with the bushfire protection criteria of the Guidelines.

The BAL contours are based on:

- The classification of and effective slope under existing vegetation that will be retained post-development, as observed at the time of the site inspection.
- Consideration of the anticipated on-site clearing and vegetation modification extent and resultant vegetation exclusions.
- Anticipated separation distances between future habitable development and classified vegetation achieved in accordance with the Concept Masterplan and Landscape Concept Plan, and considering the provision of minimum APZs at the vegetation interfaces.

The BAL contour assessments are indicative only and should not be relied upon as the final BALs for the site. It is expected that the BALs applicable to lots interfacing the foreshore areas will be reduced in comparison to those calculated in this BMP through the provision of low threat

landscaping in POS. The full extent of low threat landscaping within these areas will not be finalised until detailed design stage (subdivision stage).

Community bushfire refuge

Whilst it is anticipated that all occupants will evacuate the premises prior to a bushfire arriving at the site, or impacting the public road evacuation routes, there remains a possibility that there could be insufficient time for evacuation to occur.

A community refuge building will be provided during the first stages of development, to ensure there is a suitable shelter for both residents and visitors to Point Grey.

General principles for community refuge buildings under the Guidelines and *Australian Building Codes Board Design and Construction of Community Bushfire Refuges Handbook* (ABCB, 2014) require that radiant heat flux to the building does not exceed 10kW/m^2. A Method 2 assessment under AS 3959 has been undertaken out to demonstrate that there is a suitable location within Stages 1 and 2 for the refuge building to be located.

The Method 2 procedure incorporates the same inputs as for the Method 1 and 2 assessments detailed above in Section 6.1.2, but models flame temperature at 1200 K to build in a level of conservatism. The Method 2 model is run at various separation distances to determine the distance from each vegetation plot required to achieve ≤ 10kW/m^2. Further details of the Method 2 inputs are included in Appendix G.

6.2 Assessment inputs

6.2.1 Vegetation classification

Classified vegetation and exclusions were assessed within the project area and adjoining 150 m (the assessment area) through on-ground verification during the initial site inspection in May 2020 in accordance with AS 3959 and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016). JBS&G returned to the site on 15 February 2024 and confirms that the vegetation classifications originally assigned in 2020 remain current as the vegetation on-site has not materially changed. Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix F.

Pre-development vegetation

Pre-development vegetation was assessed based on the current extent of vegetation and effective slope within the assessment area, as discussed in Section 4.2.

Post-development vegetation

Post-development vegetation takes into consideration anticipated clearing and modification of vegetation to a low threat state which will occur during subdivision works, and potential revegetation within POS, as indicated on the Landscape Masterplan, outlined in Section 5.2.2 and summarised below. Appendix H provides a map series with a detailed view of the post-development vegetation conditions.

1. Assumptions relating to clearing, modification and low threat management of vegetation

The post-development classifications/exclusions are based on clearing/modification and ongoing management of vegetation as follows:

- Removal/management of vegetation to facilitate construction of internal roads, residential and commercial lots, other urban areas and school sites and ongoing management of these areas.

- Removal/management of vegetation for creation of minimum APZs adjoining on-site POS and ongoing management of these areas.
- Creation and ongoing management of low threat POS areas, including management of the internal POS corridors in a primarily low threat condition, as well as the Village Foreshore Park on the western side of the peninsula.

2. Assumptions relating to potential revegetation

Broad assumptions have been made regarding potential revegetation within the project area as a precautionary measure in the absence of landscaping detail at this strategic planning stage, as detailed below:

- Rehabilitation of the eastern foreshore reserve and POS to Class A Forest classification.
- Rehabilitation of a 2 ha portion of the central POS.

This is discussed further in Section 5.2.1 Native vegetation – retention and rehabilitation .

6.2.2 Effective slope

Effective slope under classified vegetation was assessed within the assessment area through on-ground verification on 15 February in accordance with AS 3959. Results were cross-referenced with DPIRD 2m contour data, which is depicted in Figure 6-2.

Review of site topography during a further site inspection undertaken on 15 February indicates that the originally assigned effective slope is consistent with current site conditions.

Detailed slope analysis will be carried out at each subsequent stage of subdivision to confirm post-development site conditions and effective slope and relevant Asset Protection Zone widths. An overview of effective slope withing the assessment area is outlined in Table 6-2 below.

Table 6-2: Overview of effective slope under vegetation

Location		Overview of effective slope under vegetation
Within the LSP area	Northern tip	• The northern tip of the LSP area has not been subject to grazing and vegetation comprises a combination of scrub and forest vegetation. • Effective slope (in relation to the proposed development areas) is typically flat with a small portion of land that is downslope >0 – 5° under forest vegetation to the north-east of the development area.
	Eastern foreshore	• The northern tip of the LSP area has not been subject to grazing and vegetation comprises a combination of scrub and forest vegetation. • Effective slope (in relation to the proposed development areas) is typically flat with a small portion of land that is downslope >0 – 5° under forest vegetation to the north-east of the development area.
	Western foreshore	The western foreshore is fringed with dense scrub vegetation with a predominant effective downslope of >0 – 5°. The south-west portion has a steeper profile of between >5 – 10°. downslope
	Future low threat POS	• Proposed POS internal to the project area will be predominantly established and maintained in a low threat state (aside from the central Conservation POS). • These areas are currently vegetated with a combination of grazed pastureland, open Tuart woodland and denser forest on undulating terrain ranging from flat/upslope (0°) to downslope >0 – 5° over a distance of 100 m.
Adjacent south of the LSP area	South of LSP area	• The predominant vegetation type immediately south of the project area is grazed pastureland with scattered mature Tuarts. Elevation is undulating, generally sloping toward the project area with effective

Location		Overview of effective slope under vegetation
(within 150 m)		downslope of >0 – 5°.
	Southwest of LSP area	• A Regional Park is located immediately adjacent to the south-western corner of the LSP area and comprises a combination of scrub foreshore vegetation and Tuart/Jarrah forest, with an effective downslope of >0 – 5°.
	Southeast of LSP area	• The escarpment on the eastern foreshore, mentioned above, continues immediately to the southeast of the LSP area.

6.2.3 Asset Protection Zones

The Asset Protection Zone (APZ) widths required between future habitable development and post-development classified vegetation to achieve BAL-29 have been determined based on the vegetation classifications and effective slope assigned during the BHL and BAL contour assessments and in accordance with AS 3959 Method 1. The BAL-29 APZs widths applicable each vegetation plot are listed in Table 6-3.

Table 6-3: Asset Protection Zone requirements from post-development classified vegetation

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	APZ to achieve BAL-29
1	Class A Forest	Flat/upslope (0°)	21 m
2	Class A Forest	Downslope >0–5°	27 m
3	Class A Forest	Downslope >10–15°	42 m
4	Class B Woodland	Flat/upslope (0°)	14 m
5	Class B Woodland	Downslope >0–5°	17 m
8	Class D Scrub	Downslope >0–5°	15 m

6.2.4 Summary of pre-development inputs

A summary of the **pre-development** classified vegetation, exclusions and effective slope within the assessment area are listed in Table 6-4 and illustrated in Figure 6-1: Pre-development vegetation classification and effective slope.

Table 6-4: Pre-development vegetation classifications/exclusions and effective slope

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	Comments
1	Class A Forest	Flat/upslope (0°)	• Remnant forest vegetation with presence of intact understorey in the northern portions of the LSP area, including ROS, on flat land. One small pocket of forest on flat land at the top of the southeastern scarp.
2	Class A Forest	Downslope >0–5°	• Remnant forest vegetation with presence of intact understorey in the central and southwestern portions of the LSP area. Slope is varied under the vegetation but worst-case up to 5 degrees in relation to the surrounding land.
3	Class A Forest	Downslope >10–15°	• Remnant open forest on the slopes of the southeastern scarp.
4	Class B Woodland	Flat/upslope (0°)	• Open Tuart woodland predominantly within

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	Comments
			the low-lying eastern foreshore area, as well as within some areas of flat land within and adjoining the LSP area.
5	Class B Woodland	Downslope >0–5°	• Predominant open Tuart woodland areas throughout the LSP area. Slope is varied under the vegetation but worst-case up to 5 degrees in relation to the surrounding land.
6	Class B Woodland	Downslope >5–10°	• Area of open Tuart woodland on the scarp to the southeast of the project area (external landholdings).
7	Class D Scrub	Flat/upslope (0°)	• Predominant coastal Banksia scrub vegetation within the northern ROS and along the western foreshore. Effective slope varies from flat/upslope (Plot 7) to downslope >5-10°.
8	Class D Scrub	Downslope >0–5°	
9	Class D Scrub	Downslope >5–10°	
10	Class C Shrubland	Flat/upslope (0°)	• Coastal shrub vegetation, including samphire and other halophytes, fringing the eastern foreshore, external to development area
11	Class G Grassland	Flat/upslope (0°)	• Open grassland with slope ranging from flat/upslope (Plot 11) to downslope >0-5° (Plot 12) and >10-15° (Plot 13) throughout the LSP area and surrounds.
12	Class G Grassland	Downslope >0–5°	
13	Class G Grassland	Downslope >10–15°	
14	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	• Existing areas of low threat and non-vegetated land include farm tracks, firebreaks, the WWTP and homestead.

6.2.5 Summary of post-development inputs

A summary of the anticipated **post-development** classified vegetation, exclusions and effective slope within the assessment area are listed in Table 6-5 and illustrated in Figure 6-2: Post-development vegetation classification and effective slope (full site build out).

Table 6-5: Post-development vegetation classifications/exclusions and effective slope

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	Comments
1	Class A Forest	Flat/upslope (0°)	• Existing areas of forest on flat land retained within ROS. • Vegetation within eastern foreshore reserve and POS is precautionarily assumed to be revegetated to full forest classification, on flat land. • Includes central POS rehabilitation area. • All other areas of pre-development Plot 1, will be modified to a low threat state (Plot 13).
2	Class A Forest	Downslope >0–5°	• Existing areas of forest land >0-5° retained within

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	Comments
			ROS and foreshore reserve. • All other areas of pre-development Plot 2, will be modified to a low threat state (Plot 13).
3	Class A Forest	Downslope >10–15°	• Vegetation within on southeastern scarp within eastern foreshore reserve precautionarily assumed to be revegetated to full forest classification, on land >10-15°.
4	Class B Woodland	Flat/upslope (0°)	• Existing areas of open Tuart woodland on flat land retained external the LSP area. • All other areas of pre-development Plot 4, will be modified to a low threat state (Plot 13).
5	Class B Woodland	Downslope >0–5°	• Existing areas of open Tuart woodland on land >0-5° retained external the LSP area. • All other areas of pre-development Plot 5, will be modified to a low threat state (Plot 13).
6	Class B Woodland	Downslope >5–10°	• Existing areas of open Tuart woodland on land >5-10° retained external the LSP area. • All other areas of pre-development Plot 6, will be modified to a low threat state (Plot 13).
7	Class D Scrub	Flat/upslope (0°)	• Scrub vegetation on flat land retained within northern ROS. • All other areas of pre-development Plot 7, will be modified to a low threat state (Plot 13).
8	Class D Scrub	Downslope >0–5°	• Scrub vegetation on >0-5° land retained along the western foreshore. • Rehabilitation works within areas of western foreshore POS assumed as a precaution to be fully vegetated with scrub. • All other areas of pre-development Plot 8, will be modified to a low threat state (Plot 13).
9	Class D Scrub	Downslope >5–10°	• Scrub vegetation on >5-10° land retained along the western foreshore. • All other areas of pre-development Plot 9, will be modified to a low threat state (Plot 13).
10	Class C Shrubland	Flat/upslope (0°)	• Coastal shrubland along the eastern foreshore, as per pre-development conditions.
11	Class G Grassland	Downslope >0–5°	• Existing areas of grassland on >0-5° land retained external the LSP area. •
12	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	• Existing areas of low threat and non-vegetated land, as per pre-development conditions (i.e. same as Plot 13 pre-development mapping).

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	Comments
13	Modified to low threat state (Clause 2.2.3.2 [e] and [f])	N/A	• All areas that are proposed to be modified to a low threat state as part of the development. Includes internal POS, western foreshore POS, APZs at the POS interface, development cells and internal roads.

6.2.6 Anticipated post-development vegetation on completion of first stages

A BAL contour assessment has been undertaken for Stages 1 and 2 to provide an indication of the worst-case radiant heat flux that may be applicable to future habitable development during the early stages. Stage 1 will involve construction of the WWTP, fire brigade and community refuge building, as shown on the staging plan (Appendix D). Stage 2 will involve construction of residential lots.

The following assumptions have been made in preparing the BAL contour assessment for Stages 1 and 2:

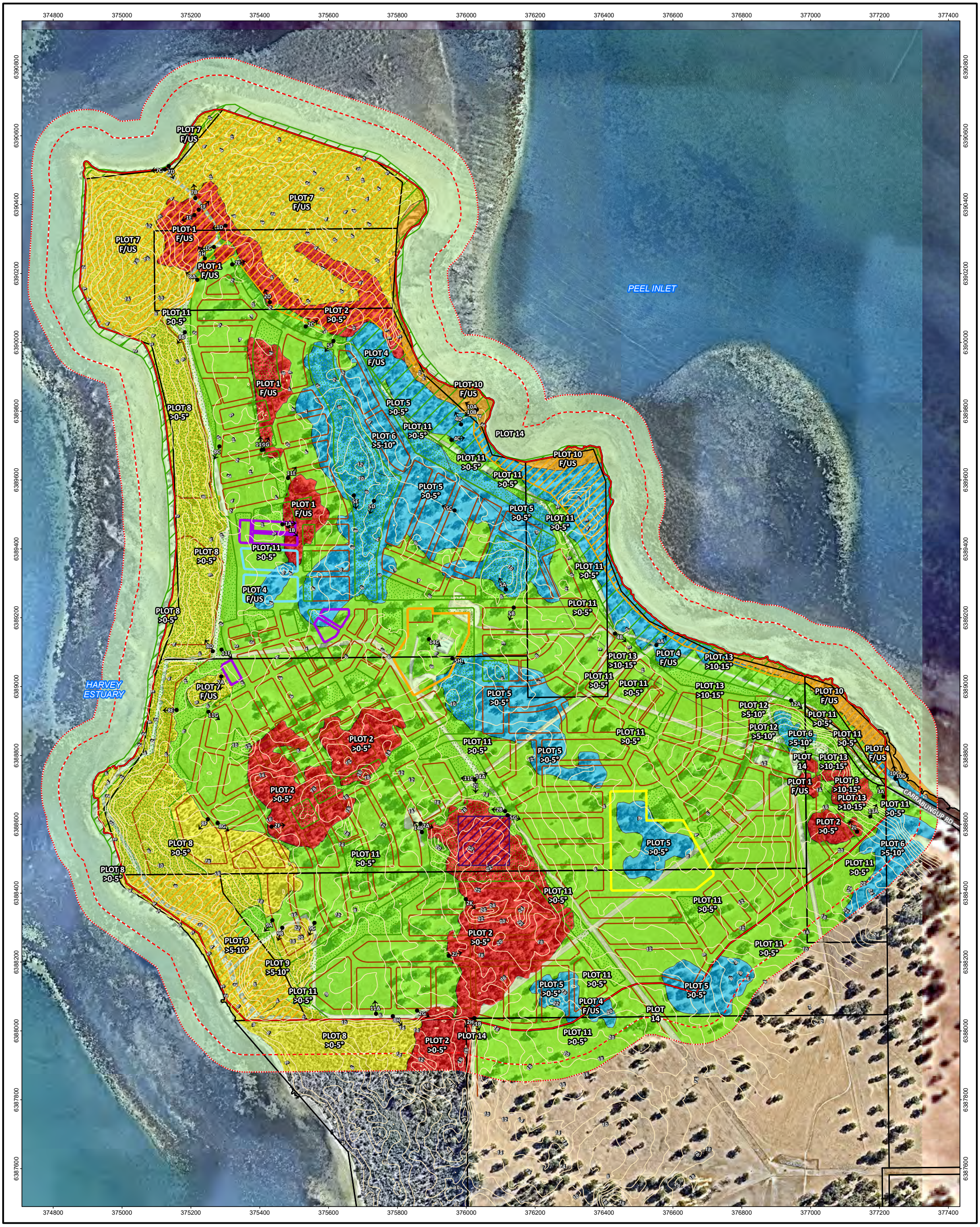
- Only land associated with Stages 1 and 2 and the entry road will be modified, the rest of the LSP will retain the pre-development classifications.
- A minimum 21m APZ will be established toward the eastern foreshore POS. This is based on revegetation of POS to Class A Forest classification as a precautionary measure. The APZ would be contained mainly in the 20 m wide proposed perimeter road.
- A 100 m wide low threat buffer will be established around Stage 1 and 2 and the main entry road to remove temporary BAL impacts resulting from vegetation retained within adjoining stages yet to be developed.
- It is assumed there will be no clearing within the position of the 100 m wide low threat buffer which is currently vegetated with Class A Forest and is located within the future central POS.

A summary of the potential post-development classified vegetation and effective slope within 150 m of Stages 1 and 2 is outlined in Table 6-6. The classifications are depicted in Figure 6-3, with a zoomed in view provided in Appendix I.

Table 6-6: Post-development vegetation classifications/exclusions and effective slope within 150 m of Stages 1 and 2

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	Comments
1	Class A Forest	Flat/upslope (0°)	• Vegetation within eastern foreshore reserve, a distance of at least 150 m from Stages 1 & 2, is precautionarily assumed to be revegetated to full forest classification, on flat land.
2	Class A Forest	Downslope >0–5°	• Existing forest vegetation within future central POS is assumed to be retained, with a precautionary effective slope of >0-5°. • Existing forest within the 100 m low threat buffer will be modified to a low threat state (see Plot 14).
5	Class B Woodland	Downslope >0–5°	• Existing areas of open Tuart woodland on land >0-5° retained external the Stage 1 and 2 areas.

Vegetation Plot	Vegetation classification/ exclusion	Effective slope under the classified vegetation	Comments
			• Existing woodland within the 100 m low threat buffer will be modified to a low threat state (see Plot 14).
10	Class C Shrubland	Flat/upslope (0°)	• Coastal shrubland along the eastern foreshore, as per pre-development conditions.
11	Class G Grassland	Flat/upslope (0°)	• Existing areas of grassland on land >0-5° retained external the Stage 1 and 2 areas. • Existing grassland within the 100 m low threat buffer will be modified to a low threat state (see Plot 14).
15	Modified to low threat state (Clause 2.2.3.2 [e] and [f])	N/A	• All areas that are proposed to be modified to a low threat state during Stages 1 and 2: • Proposed lots and roads • Proposed 100 m low threat staging buffer to stage and main entry road. • Minimum 21m APZ within foreshore POS and Reserve.



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Primary School
- Community/servicing
- Mixed Use
- Village Centre
- Residential
- Photo point directions
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class B Woodland
- Class C Shrubland
- Class D Scrub
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Minor road

JBS&G

0 300 Meters

Point Grey, WA

PRE-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE

Job Number: 59293		Scale 1:10,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

FIGURE: 6-1

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Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Residential
- Topographic contours (mAHD)
- Minor road

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Primary School
- Community/servicing
- Mixed Use
- Village Centre

- 6m wide FSAR

Minimum APZs

- 14m wide APZ
- 15m wide APZ
- 17m wide APZ
- 21m wide APZ
- 27m wide APZ
- 42m wide APZ

Vegetation classification

- Class A Forest
- Class B Woodland
- Class C Shrubland
- Class D Scrub
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state

JBS&G

0 300 Meters

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:10,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

FIGURE: 6-2

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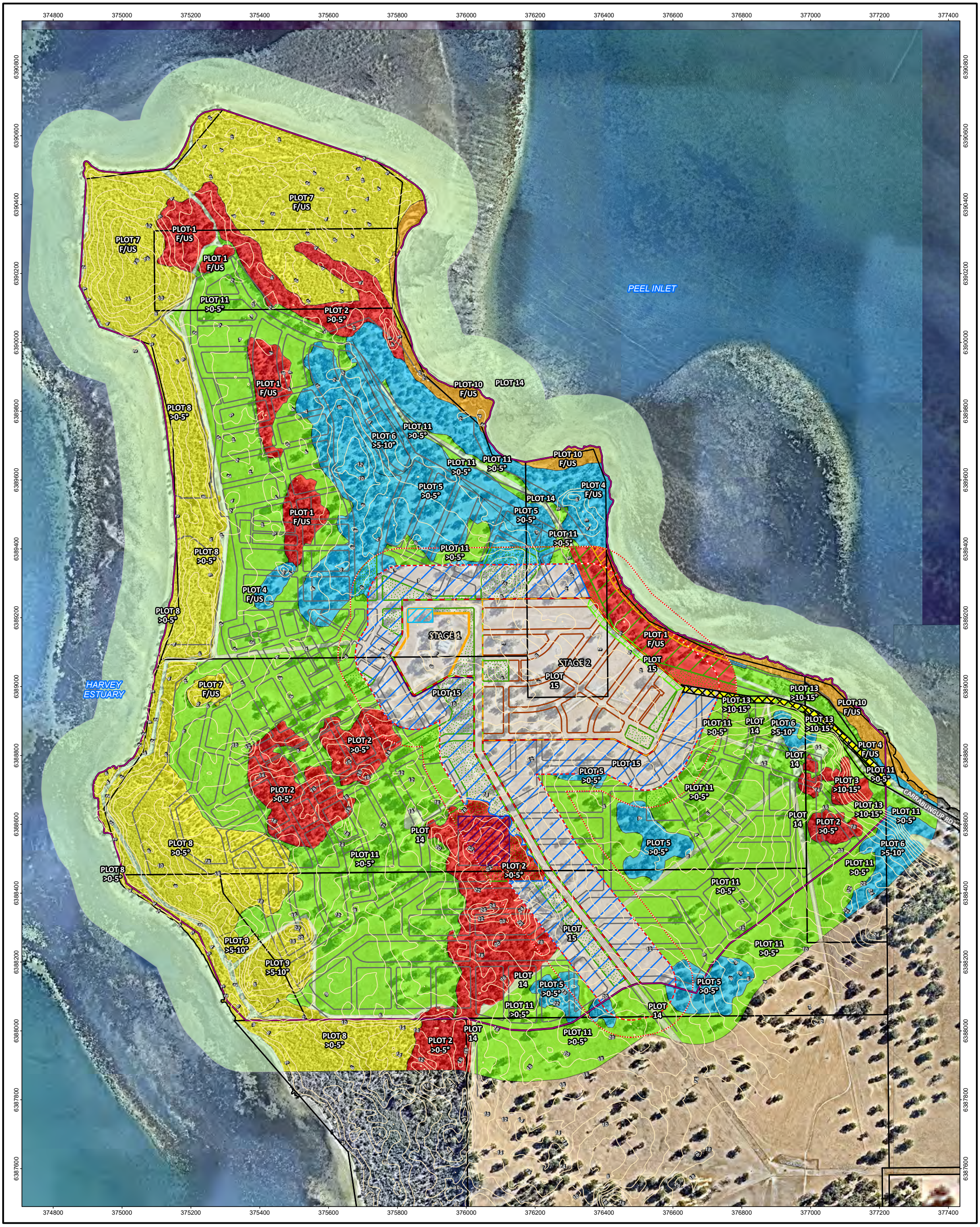

Legend

- Point Grey LSP Area
- Stage 1 and Stage 2 boundary
- 100m assessment area
- 150m assessment area
- Stage 1
- Stage 2
- Cadastral boundary
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Community/servicing
- Minimum 21m wide APZ
- 6m wide fire service access route
- Community refuge building
- Future Carrabungup Rd extension
- Residential
- Future residential layout
- Temporary second access to Carrabungup Road
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class B Woodland
- Class C Shrubland
- Class D Scrub
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state
- Minor road

JBS&G

0 300 Meters

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (STAGES 1 AND 2)

Job Number: 59293		Scale 1:10,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

FIGURE: 6-3

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6.3 Assessment outputs

6.3.1 Bushfire Hazard Level assessment results

Pre-development results

The pre-development bushfire hazard levels have been mapped within the assessment area on the basis of the pre-development vegetation discussed in Section 6.2.4 and depicted in Figure 6-1: Pre-development vegetation classification and effective slope.

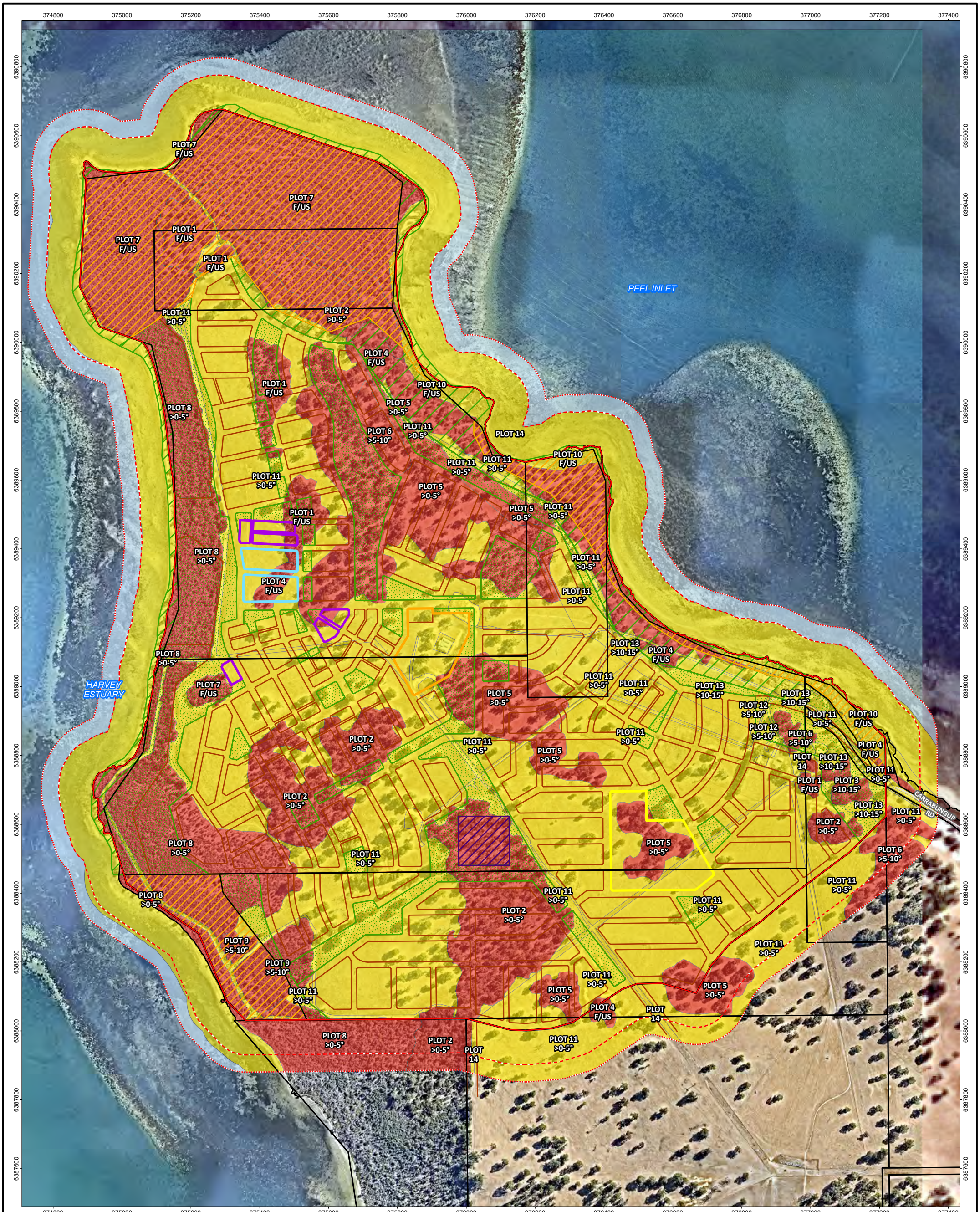
The pre-development BHL assessment map (Figure 6-4) demonstrates that existing land within the assessment area comprises **Moderate** and **Extreme** bushfire hazard levels.

Land with an Extreme BHL is not suitable for development and the Structure Plan provides a design response to the bushfire hazards to ensure no development occurs within these areas, as outlined below.

Post-development results

The post-development bushfire hazard levels have been mapped within the assessment area on the basis of the anticipated post-development vegetation discussed in Section 6.2.5 and depicted in Figure 6-2: Post-development vegetation classification and effective slope (full site build out).

The post-development BHL assessment map (Figure 6-5) demonstrates that on completion of development of the LSP area, all proposed development areas will be located on land with either a **Low** or **Moderate** bushfire hazard level. This achieves compliance with Element 1 of the bushfire protection criteria of the Guidelines, as discussed in Section 8.



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Primary School
- Community/servicing
- Mixed Use
- Village Centre
- Residential

Bushfire hazard level

- Extreme
- Moderate
- Low
- Minor road

JBS&G

0 300 Meters

Point Grey, WA

PRE-DEVELOPMENT BUSHFIRE HAZARD LEVEL ASSESSMENT MAP

Job Number: 59293		Scale 1:10,000 at A3		**FIGURE: 6-4**
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	

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Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Residential
- Minor road

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Primary School
- Community/servicing
- Mixed Use
- Village Centre

- 6m wide FSAR

Minimum APZs

- 14m wide APZ
- 15m wide APZ
- 17m wide APZ
- 21m wide APZ
- 27m wide APZ
- 42m wide APZ

Bushfire hazard level

- Extreme
- Moderate
- Low

JBS&G

0 300 Meters

Job Number: 59293		Scale 1:10,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 13-Aug-2024

Point Grey, WA

POST-DEVELOPMENT BUSHFIRE HAZARD LEVEL ASSESSMENT MAP (FULL SITE BUILD OUT)

FIGURE: 6-5

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Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

6.3.2 BAL Contour assessment results

Full site build out

The results of the indicative BAL contour assessment are detailed in Table 6-7 and illustrated in Figure 6-6. A detailed view is included in Appendix J. The minimum APZs proposed at the vegetated interfaces will ensure the highest BAL applicable to the external boundary of future lots is BAL–29.

Table 6-7: Method 1 BAL contour assessment results – full site build out

Plot	Vegetation classification	Effective slope	Minimum Asset Protection Zone	Separation distance (to nearest lot boundary)	Highest BAL (to nearest lot boundary)
1	Class A Forest	Flat/upslope (0°)	21 m	21 m	BAL–29
2	Class A Forest	Downslope >0–5°	27 m	27 m	BAL–29
3	Class A Forest	Downslope >10–15°	42 m	42 m	BAL–29
4	Class B Woodland	Flat/upslope (0°)	14 m	14 m	BAL–29
5	Class B Woodland	Downslope >0–5°	17 m	17 m	BAL–29
6	Class B Woodland	Downslope >5–10°	N/A (minimum 22 m achieved)	32 m	BAL–19
7	Class D Scrub	Flat/upslope (0°)	N/A (minimum 13 m achieved)	15 m	BAL–19
8	Class D Scrub	Downslope >0–5°	15 m	15 m	BAL–29
9	Class D Scrub	Downslope >5–10°	N/A (minimum 17 m achieved)	46 m	BAL–12.5
10	Class C Shrubland	Flat/upslope (0°)	N/A (minimum 9 m achieved)	>100 m	BAL–Low
11	Class G Grassland	Downslope >0–5°	N/A (minimum 9 m achieved)	20 m	BAL–12.5
12	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	N/A		N/A
13	Modified to low threat state (Clause 2.2.3.2 [e] and [f])	N/A	N/A		N/A
Highest BAL to all future residential lots					**BAL–29**

Stages 1 and 2

The results of the indicative BAL contour assessment for Stages 1 and 2 is detailed in Table 6-7 and illustrated in Figure 6-7, with a detailed view included in Appendix K.

The assessment demonstrates that the establishment of a minimum 21 m APZ toward the foreshore POS will ensure the interfacing residential lots will be subject to a worst-case BAL of BAL-29. Furthermore, implementation of the 100 m wide low threat staging buffer will ensure that temporary BAL impacts from land to be cleared and/or managed in a low threat state as part of future development stages are removed from Stage 1 and 2 lots.

Table 6-8: Method 1 BAL contour assessment results – Stages 1 and 2

Plot	Vegetation classification	Effective slope	Minimum Asset Protection Zone	Separation distance (to nearest lot boundary)	Highest BAL (to lot boundary)
1	Class A Forest	Flat/upslope (0°)	21 m (road reserve and POS, or setback into lot)	21 m	BAL–29
2	Class A Forest	Downslope >0–5°	100 m low threat staging buffer	100 m	BAL–Low
5	Class B Woodland	Downslope >0–5°	100 m low threat staging buffer	100 m	BAL–Low
10	Class C Shrubland	Flat/upslope (0°)	N/A	>100 m	BAL–Low
11	Class G Grassland	Flat/upslope (0°)	100 m low threat staging buffer	100 m	BAL–Low
15	Modified to low threat state (Clause 2.2.3.2 [e] and [f])	N/A	N/A	N/A	BAL–Low
Highest BAL to all future residential lots – Stages 1 & 2					**BAL–29**

Community refuge building

The results of the Method 2 BAL contour assessment undertaken to identify a suitable location for the community refuge building is summarised in Table 6-9, with detailed modelling inputs and outputs being provided in Appendix G.

Table 6-9: Method 2 BAL contour assessment (<10 kW/m^2 community refuge building)

Plot	Vegetation classification	Effective slope under vegetation	Distance to achieve ≤10kW/m^2	FDI	Flame width	Flame temperature
1	Class A Forest	Flat/upslope (0°)	63.2 m	80	100 m	1200K
2	Class A Forest	Downslope 5°*	75.3 m	80	100 m	1200K
5	Class B Woodland	Downslope 5°*	55.5 m	80	100 m	1200K
11	Class G Grassland	Downslope 5°*	33.9 m	80	110 m	1200K

NOTES:

* Worst-case effective slope applied.

The portion of Stages 1 and 2 calculated as being subject to less than 10kW/m^2 is shown on the BAL Contour map (Figure 6-7). The assessment confirms that establishment and ongoing maintenance of the proposed 100 m low threat staging buffer, the currently proposed location for the bushfire refuge is within an area subject to less than 10kW/m^2 radiant heat flux. The level of radiant heat flux applicable to the building will be further reduced over time as the surrounding stages are developed.

It is emphasised that nomination of the open-air refuge is a contingency measure only, and all efforts should be made to carry out an evacuation well in advance of a bushfire impacting or threatening to impact the project area and access/egress routes. Provisions for the community refuge have been made in acknowledgement of the sites unique position on a peninsula and to enhance the level of safety for visitors and residents primarily during the early stages, prior to the site being fully built-out.

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Residential
- Minor road

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Primary School
- Community/servicing
- Mixed Use
- Village Centre

- 6m wide FSAR

Minimum APZs

- 14m wide APZ
- 15m wide APZ
- 17m wide APZ
- 21m wide APZ
- 27m wide APZ
- 42m wide APZ

- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

JBS&G

0 300 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:10,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**FIGURE: 6-6**

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Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Legend

- Point Grey LSP Area
- Stage 1 and Stage 2 boundary
- 100m assessment area
- 150m assessment area
- Stage 1
- Stage 2
- Cadastral boundary
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Community/servicing
- 100m wide low threat staging buffer
- Minimum 21m wide APZ
- 6m wide fire service access route
- Community refuge building
- Future Carrabungup Rd extension
- Residential
- Future residential layout
- Temporary second access to Carrabungup Road
- <10kW/m2 line
- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low
- Minor road

JBS&G

0 300 Meters

Point Grey, WA

BAL CONTOUR MAP (STAGES 1 AND 2)

Job Number: 59293		Scale 1:10,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 20-Aug-2024

FIGURE: 6-7

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7. Identification of bushfire hazard issues and proposed mitigation measures

Examination of strategic development design in accordance with the Concept Masterplan, bushfire risk context, and pre-development and post-development bushfire hazard levels and indicative post-development BAL contour assessment, has identified bushfire hazard issues to be considered at future planning stages. These bushfire hazard issues, and proposed mitigation measures are detailed in Table 7-1 and are also considered in the compliance assessment in Table 8-1 (Section 8).

JBS&G considers the bushfire hazards within and adjacent to LSP area and the associated bushfire risks are manageable through the development of these mitigation measures and will result in development of the suit as a suitable destination, which provides for appropriate levels of defendable space, compliant APZs, suitable access provisions, appropriate firefighting water supply and firefighting resources, and a suitable place of shelter for both the community and visitors. These measures should be reviewed at all stages of the planning process to ensure a suitable, compliant, and effective bushfire management outcome is achieved for the protection of future life, property and environmental assets.

Table 7-1: Bushfire hazard issues and bushfire management measures

No.	Bushfire hazard issue	Proposed mitigation measures
1	The LSP area is located at the tip of a peninsula in a rural environment and is vulnerable to potential impact from vegetation hazards in the local and wider area. The bushfire risk to the site requires consideration during strategic development design and all subsequent planning stages.	Bushfire mitigation measures proposed within this strategic level BMP take into consideration the local bushfire risk context and aim to minimise these risks by providing for providing for establishment of the site as a suitable destination. Key bushfire risk mitigation measures include: • Appropriate siting of habitable development in BAL-29 or lower. • Large areas of low threat/BAL-Low internal spaces. • Low threat landscaping within interior POS to prevent spread of fire through the site. • Multiple vehicular access options to/from Forrest Highway and improvements to the existing public road network. • Perimeter access to adjoining vegetation hazards. • An on-site fire-fighting water supply, equipment and resources. • A contingency community refuge/safer place.
2	The retention and rehabilitation of vegetation within the foreshore reserves/POS and internal Conservation POS will result in interfaces between vegetation hazards and habitable development. An appropriate APZ response is to be implemented at these interfaces.	• The development design provides for perimeter roads at the majority of vegetation interfaces. In most cases, the road widths provide the minimum APZ requirements for BAL-29 to be achieved, or there are only minimal building setbacks required (e.g. 1 m lot setback at the eastern development interface with Plot 1). Furthermore, the Landscape Masterplan indicates that there will be areas of low threat landscaping within POS, including managed turf and gardens, which will provide for additional hazard separation to future habitable development. • Where the perimeter roads (or in limited cases FSARs) are insufficient to provide the required separation for BAL-29, the minimum separation distances will be achieved through habitable building setbacks (e.g. R-Code setbacks) or APZs extending into future low threat areas of POS, or a combination of both. This will be determined at detailed

No.	Bushfire hazard issue	Proposed mitigation measures
		design stage, however, the indicative BAL contour assessment demonstrates that all lots have capacity for BAL-29 to be achieved, as required. • A network of FSARs may be considered within portions of the foreshore reserves, as dual pedestrian and vehicular access routes.
3	Due to the vegetation hazards fringing the perimeter of the Point Grey peninsula, and therefore the proposed development areas, perimeter roads are required to provide a defendable space for emergency services personnel as well as hazard separation between bushfire prone vegetation and habitable development. Where perimeter roads are not able to be provided, FSARs will need to provide the necessary vehicular access. The central POS will contain retained/rehabilitated forest which also requires perimeter roads.	• The vast majority of proposed lots will be provided with public road perimeter access (20 m - 30 m width) to provide hazard separation and defendable space between vegetation hazards. • There are two direct interfaces between proposed lots and adjoining vegetation hazards where FSARs may be required in lieu of a public road for visual amenity purposes. These development cells are located on the western side of the development and adjoining coastal scrub. • Provision of perimeter access at all vegetated interfaces will provide for a fire suppression response immediately between on-site and external bushfire hazards and habitable development throughout the development site. • Temporary FSARs may also be employed during staged subdivision to provide vehicular access to temporary vegetation hazards that will be cleared during future development stages.
4	Revegetation is expected to occur within some areas of open space which requires consideration in the context of post-development bushfire hazard levels and bushfire attack level contours.	• Landscaping detail is currently not available at this strategic stage of planning and the post-development BHL and BAL contour assessments makes assumptions around revegetation within Conservation and foreshore POS. These on-site hazards will be mitigated through the provision of low threat POS, perimeter roads and APZs at the interfaces to ensure BAL-29 is achieved as a minimum. • BAL contour assessments carried out at subdivision stage will consider detailed landscaping design to further investigate the impacts of revegetation on habitable development and ensure that revegetation does not result in unacceptable impacts on future development.
5	Establishing fragmentation between external foreshore vegetation and internal POS corridors and vegetation retained within the rural-residential lots is critical to reduce the potential for a bushfire to spread through the project area.	• A key bushfire risk mitigation measure is for internal POS corridors and rural-residential lots (which may retain some vegetation) to be established and maintained in a low threat state (to the greatest extent possible in respect of State and Commonwealth rehabilitation commitments) to reduce the risk of fire spread internally through the development. This approach will also ensure that internal vehicle movement in a bushfire emergency (e.g. to refuge areas) will occur through areas of low threat land. • A Landscape Management Plan prepared during the first stage of subdivision may be useful for setting out the landscaping approach for the whole site, so that subsequent detailed plans can be guided by the overarching low threat landscaping strategies as the development is subsequently subdivided over time.

No.	Bushfire hazard issue	Proposed mitigation measures
6	Some areas of existing vegetation may be retained within the larger rural-residential lots in the south of the LSP area to maintain rural amenity and conserve environmental values. A co-ordinated approach to vegetation management within these lots should be adopted at future planning stages to ensure the low threat standard is established and appropriately maintained.	• It is recommended that a Landscape Management Plan (as per above) is prepared during the first stage of subdivision to clearly set out the required low threat standard within these lots and how the vegetation should be maintained on an ongoing basis and by whom (the landowners). • Reducing bushfire fuels to a low threat state will not necessarily require full clearing of vegetation and significant trees are anticipated to be retained where possible. Creating a low threat landscape within these lots, which are primarily sited at the perimeter of the project area, will act to prevent bushfire penetration from external and on-site vegetation hazards into the interior portions of the site, thus reducing bushfire threat to the project area as a whole, as discussed above.
7	The school sites and community refuge represent vulnerable land uses and will require additional consideration of bushfire risk at subdivision and DA stage.	• The proposed school site is relatively large and future development is expected to be able to meet compliance with the bushfire protection criteria within the lot boundaries, as required. • The school site will be subject to future planning and design through a development application process. It is expected that these sites will be cleared, managed to a low threat standard, or will retain vegetation in accordance with a relevant exclusion under AS 3959 Clause 2.2.3.2. • Future BMPs prepared at subdivision and DA stage will consider bushfire compliance for future vulnerable land uses as well as site-specific bushfire mitigation measures, including preparation of an emergency evacuation plan at DA stage. • Requirements under the National Construction Code (NCC) also apply to school buildings, as discussed below.
8	Specification 43 of the NCC sets out bushfire protection measures for certain Class 9 buildings, including Class 9a healthcare buildings, Class 9b early childhood centres and schools, Class 9c residential care buildings, and associated Class 10a structures. These requirements will need to be considered at future planning and building stages.	• The NCC requirements for certain Class 9 buildings will need to be considered at subdivision stage when determining an appropriate location for the school site. It should be demonstrated at this stage of planning that there is capacity to achieve sufficient separation between future buildings and classified vegetation as prescribed in the NCC. The high-level BAL contour assessment undertaken as part of this BMP indicates that the current location is likely to be suitable (less than 10 kW/m^2) given the siting in BAL-Low. • NCC requirements will need to be further investigated at DA stage during the specific siting of buildings in relation to vegetation hazards, allotment boundaries and carparking areas, and other buildings. Other considerations at DA and building permit stage include access, firefighting water supply, signage, provision of an outdoor refuge site, internal tenability, construction to AS 3959, and emergency power supply. • It is noted that Specification 43 of the NCC sets out the deemed-to-satisfy pathway and that alternative solutions may also be considered. It is recommended that appropriate siting of buildings is considered early in the planning process, to ensure these types of land uses are located in the lowest possible bushfire risk area with the appropriate bushfire mitigation measures in place.

No.	Bushfire hazard issue	Proposed mitigation measures
9	The LSP includes provisions for vulnerable tourism land uses, including a hotel precinct, and other potential short-stay accommodation options which require additional consideration of bushfire risk at subdivision and DA stage.	• Future subdivision and development applications will need to consider the siting and design of vulnerable tourism land uses at the appropriate stage. • It is anticipated that these land uses can be developed in a manner that complies with SPP 3.7 and the Guidelines, due to the strategic bushfire mitigation measures set out in this BMP (e.g. provision of APZs and low threat land, landscaping strategy to reduce bushfire risk, two access routes, water supply, establishment of the site as a suitable destination) and through the detailed design process at future stages.
10	Critical infrastructure to be surrounded by appropriate APZs	• Critical infrastructure such as the WWTP, fire brigade and any aboveground services will be located centrally at the current WWTP, which is sited in BAL-Low. The location will ensure infrastructure is subject to a reduced level of bushfire related risk which increases the likelihood of ongoing operation of services during and immediately after a bushfire event. • Low threat staging buffers established and managed during staged subdivision will ensure the BAL-low location is achieved and maintained at all times prior to the site being fully developed. • The community building will be situated in a location subject to 10 kW/m^2 or lower, as required.
11	Given the location of the LSP area on a peninsula and potential bushfire risk in the local area, appropriate vehicular access is required for both egress by residents and visitors and access by firefighters to/from and around the project area.	• The proposed internal vehicular access network will comply with the requirements of the Guidelines, with a focus on preventing entrapment of the public or firefighters in a bushfire scenario. This will be achieved through a continuous road network and all roads being through roads. • Two different access routes will be provided to/from the LSP area to ensure there are multiple options for both the public and emergency service vehicles to access and egress the site. The alignment of the various access routes will be further considered at each subsequent stage of subdivision. • Perimeter roads and FSARs will be provided at vegetation interfaces to ensure access for emergency service vehicles.
12	The proposed development will result in expansion of the existing population which has potential to put pressure on the existing public road network during a bushfire emergency.	• To ensure there is no impact to the existing population from a traffic management point of view, upgrades to existing roads will occur as a result of implementation of the LSP, including provision of a new entry road. • Preliminary traffic modelling (Transcore 2024) indicates that the entry road will be capable of supporting the future population. • As the site will comprise a suitable destination, there is potential for residents and occupants to stay on site during a bushfire, if safe and appropriate. This would result in reduced pressure on the road network and reduced potential for evacuation issues.
13	Impacts of staged subdivision on bushfire risk, BALs and vehicular access will need to be considered at future planning stages.	The following key bushfire mitigation measures will be adopted during staged subdivision: • A 100 m wide low threat staging buffer will be established and maintained around each stage of subdivision to remove residual BAL impacts from future stages and prevent bushfire

No.	Bushfire hazard issue	Proposed mitigation measures
		spread into the constructed stages. • A public perimeter road should be provided around the external boundary of each stage to provide a substantial accessible buffer between habitable development and the foreshore reserve/POS, or yet to be developed portions of the LSP area. • Where a public road is not possible, consideration may be given to either a temporary emergency access way (EAW) or Fire Service Access Route (FSAR), primarily to facilitate firefighter access around the perimeter of the development stage. • All internal access roads are to comply with Guidelines requirements, including provision of through-roads. Temporary EAWs may be required to connect temporary no-through roads which are sometimes unavoidable during staging.
14	The LSP will be established as a suitable destination at the outset of development. Bushfire risk mitigation measures will need to be adopted to ensure people will be safe to stay on site as a contingency measure.	• The entirety of the Stage 1 and Stage 2 area will be landscaped to a low threat state during Stage 1/2 development works to provide for creation of a 'suitable destination'. The area comprising a suitable destination will be expanded with each subsequent stage of subdivision. • A dedicated community bushfire refuge will be provided during Stage 1/2 to service any initial tourism land use and visitors, as well as any vulnerable residents. • An open space refuge may be designated within an area adjacent to the community refuge, to accommodate the anticipated resident and visitor numbers. • Firefighting infrastructure will be included within the Stage 1/2 area, including local bushfire brigade and appliances and static firefighting tanks, in addition to the reticulated hydrant water supply. The brigade will be established with local resources during the first stage of development. • Consideration regarding whether the estuary and a helipad can provide opportunity for external firefighting support to access the site, or extraction of vulnerable, sick or injured residents and visitors, if the roads in/out are compromised.
15	The project area is not currently within a reticulated area. A water supply for bushfire suppression purposes will need to be provided to secure a permanent firefighting supply for the LSP area.	• The fire water supply is anticipated to be provided via reticulated water and hydrants to service the entirety of the LSP area. • The firefighting water supply should have appropriate redundancy and flexibility, which is likely to consist of a reticulated town main water supply complete with street hydrant connections, supplemented by strategic static firefighting water tanks.
16	As the LSP area is relatively isolated, having local bushfire firefighting resources on site will assist with providing an immediate bushfire suppression response.	• A local bushfire brigade, with trained personnel and appropriate firefighting equipment and appliances will be established during the first stage of development. This will ensure that a prompt bushfire suppression response can be provided locally rather than relying on broader regional brigades/emergency services that may not be able to access the site quickly, or if the access routes are compromised.

No.	Bushfire hazard issue	Proposed mitigation measures
17	Ensuring residents and visitors have bushfire awareness will assist with an appropriate response in a bushfire emergency, thereby reducing the burden on fire and emergency services.	• Community awareness and local ownership of risk and management should be promoted through the development of household bushfire survival plans. • The community refuge building should be considered for use as a hub for community training on bushfire awareness. • Signage should be installed throughout the area advising residents and visitors of bushfire emergency procedures for the site. • Community specific emergency management arrangements, including a community evacuation strategy should be incorporated into the Shire's Local Emergency Management Arrangements (LEMA).
18	There are several existing no-though roads adjoining the project area and opportunity has been recognised for the Structure Plan design to resolve these roads through extension of the public road network and construction of EAWs.	The LSP design will result in extension of Carrabungup Road into the project area via the new entry road, thereby resolving the existing dead-end. This will improve access options within the local area and provide local residents with a place of relative safety within the development site.

8. Assessment against the bushfire protection criteria

8.1 Compliance with the Guidelines Version 1.4

8.1.1 Compliance with Elements 1 – 4

Compliance with Elements 1 – 4 of the bushfire protection criteria of the Guidelines (Version 1.4) is demonstrated by meeting the acceptable solutions, as detailed in Table 8-1.

Table 8-1: Compliance with the bushfire protection criteria of the Guidelines (Elements 1 – 4)

Bushfire protection criteria	Performance Principle	Method of compliance Acceptable solutions	Statement of development compliance	Compliance achievable at future planning stages
Element 1: Location	**P1** – The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL–29 or below, and the risk can be managed. For unavoidable development in areas where BAL–40 or BAL–FZ applies, demonstrating that the risk can be managed to the satisfaction of the decision-maker.	**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.	The post-development BHL assessment (Figure 6-5) identifies that on completion of development, all developable land within the LSP area will comprise either a **Low** or **Moderate** bushfire hazard level. All land with an Extreme BHL will be restricted to Conservation POS, ROS and Foreshore Reserve/POS which will not be developed for habitable purposes. This satisfies A1.1. Future habitable buildings will be located within areas deemed suitable for development as per acceptable solutions of the Guidelines through the following means: 1. Creation of APZs to achieve a suitable BAL. 2. Provision of perimeter roads and FSARs at vegetation interfaces. 3. Establishment and maintenance of low threat landscaping with lots and POS. The BAL Contour assessment (Figure 6-6), further demonstrates that there is capacity for all future habitable development to be located in areas subject to BAL-29 or lower. The sections in the Landscape Masterplan (Appendix E) provide an indication of how this may be achieved adjacent to POS/reserves.	✓
Element 2: Siting and design	**P2** – The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. The proposal incorporates a defendable space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.	**A2.1 Asset Protection Zone** Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements: ✓ **Width:** Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL-29) in all circumstances. ✓ **Location**: the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes). ✓ **Management:** the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones' (see Schedule 1).	It is anticipated that all proposed development areas and the majority of internal POS areas (aside from Conservation POS) will be established and managed in a low threat state as per provisions of AS 3959 Clause 2.2.3.2. Consideration of Asset Protection Zones is required for areas of the LSP where there is an interface with retained/rehabilitated vegetation. The minimum APZs for consideration are depicted on the post-development vegetation classification map (Figure 6-2) and include: 1. A minimum 21 m APZ adjoining residential lots at the interface with central Conservation POS vegetation, sufficient to achieve BAL-29. The APZ will largely be provided for within the perimeter road proposed between the lots and POS. 2. A minimum 21 m APZ adjacent to residential lots along the eastern foreshore, based on revegetation of the foreshore to Class A Forest. This is likely to be an overestimation since there will also be areas of low threat POS present within these areas. The APZ will be largely accommodated within the 20 m wide proposed perimeter road. 3. A 42 m wide APZ toward the escarpment in the southeast corner of the LSP area, which has an effective down slope of >10-15°. A portion of the APZ would be located within the 20 m wide perimeter road, with the remainder consisting of low threat POS, and/or building setbacks into the residential lots. 4. A 27 m wide APZ adjacent to forest vegetation with a down slope of >0-5° at the northern tip of the peninsula. As per above, a portion of the APZ would be located within the 20 m wide road reserve and the remainder as low threat POS or building setbacks into the lots. 5. A 15 m wide APZ adjacent to scrub vegetation with a down slope of >0-5° along the western foreshore. This would be fully located within the 16 m – 20 m wide proposed perimeter roads. There is one residential cell with a direct interface with foreshore POS where the APZ would need to be contained within POS. This cell is within the northern corner of the LSP and the land for the low threat portion of POS is existing cleared land. 6. APZs of various widths along the southern development boundary where there is an indirect interface with external vegetation hazards. All lots have a 20 – 30 m wide perimeter road which will	✓

Bushfire protection criteria	Performance Principle	Method of compliance Acceptable solutions	Statement of development compliance	Compliance achievable at future planning stages
			provide the necessary APZ widths of 14 m – 27 m to achieve BAL-29. The APZ standard is anticipated to be established within the proposed lots prior to subdivision clearance, which will ensure unmanaged vegetation hazards with potential to inhibit the neighbouring lots from achieving BAL-29 are not present. The required APZs are to be identified at future planning stages based on future subdivision/development design and following a BAL contour map assessment. Likely APZ distances for BAL-29 are detailed in Table 6-3. Any APZ setbacks will be enforced through mandatory R-Code setbacks, where the setbacks are sufficient to cater for the required BAL-29 APZ, restrictive covenant on title, and/or preparation of a LDP as a condition of subdivision approval. APZs are to be implemented and maintained in accordance with Schedule 1 of the Guidelines (Appendix L) and the Shire's Firebreak Notice (see Appendix M). It is anticipated that where possible, on-site significant trees will be retained as part of low threat landscaping within the APZs.	
Element 3: Vehicular access	**P3i** – The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	**A3.1 Public roads** *The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.* Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	Provisions for the construction of future public roads to relevant technical requirements under the Guidelines (refer to A3.1 and Appendix N) are to be made at the subdivision stage of planning. All proposed public roads have been designed to meet the relevant Guidelines and Standards to satisfy Shire requirements. The substantial road reserve widths (16 m – 30 m) will provide for a direct firefighting response with simultaneous evacuation of residents, enhanced defendable space and reduced bushfire impacts at the critical interfaces. The future entry road will be designed to meet minimum requirements for the class of road in the local rural area and will facilitate two-way vehicular access to and egress from the project area to places of relative safety. The future secondary access route will be constructed as a public road wherever practicable, however may include sections constructed as EAWs if required. Separate traffic evacuation modelling by Transcore (2024) has identified some road upgrades required to accommodate a growing population at Point Grey, including upgrades to intersections at Forrest Highway and provision of the new entry road. The road upgrades will be attended to as required prior to implementation of the relevant stage of development.	✓
		A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.	On completion of future subdivision within the LSP area, the existing public road network and proposed new public roads (external and internal) will provide all occupants with the option of travelling to least two different suitable destinations via multiple access routes in different directions. Stage 1 will be established as a 'suitable destination' at the outset of development through the provision of substantial areas of BAL-Low land and a contingency community bushfire refuge. This is an important management measure given the site is located on a peninsula, and access in two completely different directions is naturally constrained. Since the site itself will represent a suitable destination, the proposed access road from Forrest Highway (which will be significantly upgraded as part of the proposal), will provide access in two different directions (north to the LSP area and east to Forrest Highway) to two different suitable destinations (the LSP area, and townsites to the north and south via Forrest Highway). Although the LSP area will be established as a suitable destination at the outset, with appropriate bushfire mitigation controls in place, it is acknowledged that the level of suitability of the site for sheltering in place will be lowest during the early stages and that it will progressively increase over time as further development occurs and on-site temporary bushfire hazards are reduced. For this reason, an alignment for a secondary public access road is being investigated along the south side of the peninsula to provide an alternative means of accessing Forrest Highway from the LSP area. This will provide an alternative egress option for site occupants, however, it is more likely that it will be used by emergency services to access the interfacing bushfire hazards during a fire suppression response given the primary access route is likely to traverse land with a reduced level of bushfire risk. Section 3.5.1 outlines possible alignments for both the main entry road and secondary access route, which are depicted in Figure 3-1. Establishment of these publicly available roads will provide for the following access routes:	✓

Bushfire protection criteria	Performance Principle	Method of compliance Acceptable solutions	Statement of development compliance	Compliance achievable at future planning stages
			1. Access from Forrest Highway (Greenlands Road intersection) to the central Neighbourhood Connector via the proposed new entry road then to other areas of the LSP via the internal public road network. This route travels in a southeasterly from the LSP area. 2. Potential temporary primary or emergency access via Carrabungup Road, which intersects the southeast corner of the project area and provides a connection between the LSP area and Forrest Highway. 3. Secondary access/egress to/from Forrest Highway (likely Mills Road intersection) via a new access route traversing the southern side of the peninsula. This route travels south from the LSP area, in a different direction to Route 1 (above), thereby ensuring access is provided in multiple directions. Once occupants reach Forrest Highway, there will be opportunity to travel to suitable off-site destinations to the north, east and south, including: • Mandurah – 32 km driving distance to the northwest via Forrest Highway and Pinjarra Road (west). • Pinjarra – 24 km driving distance to the east via Forrest Highway and Greenlands Road (east). • Bunbury – 85 km driving distance to the south via Forrest Highway. As development of the LSP area will be staged, each stage of subdivision is to be provided with multiple access/ egress routes to two different suitable destinations. This will be achieved via establishment of the site as a suitable destination, construction of public roads in advice of later stages and/or provision of temporary compliant EAWs to the satisfaction of the Shire and DFES. Compliance with these provisions will be driven through the subdivision clearance process for each stage of subdivision through preparation of a Bushfire Management Plan compliance report.	
		A3.2b Emergency access way *Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.* An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	The LSP design has avoided the creation of no-though roads, with all proposed roads within the project area providing through access to a suitable destination. This includes the proposed entry road, which will terminate at the LSP site which will be established and maintained as a suitable destination from the outset. The secondary public access route is anticipated to be developed as a public road, however, where portions of the road alignment are temporary until future roads are established in adjoining land (e.g. within privately owned land to the south) some sections may need to be instated as an EAW. There is also a possibility that temporary EAWs may be required within the LSP area as a result of staged subdivision, to ensure multiple access routes are provided at all stages. Any temporary EAWs required as a result of staged development are to comply with provisions of A3.2b and be constructed to the relevant technical requirements of the Guidelines (see A3.2b and Appendix N).	✓
		A3.3 Through-roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: • it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exemption provisions in A3.2a of this table. • A no-through road is to meet all the following requirements: • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24.	As mentioned above, the LSP design will not result in THE creation of any no-though roads. On this basis, all proposed public roads will provide for continuous vehicular access throughout the project area and to a suitable destination (including the LSP site itself). Temporary no-though roads may be required during staged subdivision due to site/staging constraints, however, the aim should be to provide a continuous road network at all stages. Any temporary no-through roads are to meet technical provisions set out under A3.3 (refer to Appendix N).	✓

Bushfire protection criteria	Performance Principle	Method of compliance Acceptable solutions	Statement of development compliance	Compliance achievable at future planning stages
	P3ii – The design of vehicular access and egress provides: • access and egress for emergency service vehicles while allowing the community to evacuate; • a defendable space for emergency services personnel on the interface • between classified vegetation and development site; and • hazard separation between classified vegetation and the subject site to reduce the potential radiant heat that may impact a lot(s).	**A3.4a Perimeter roads** A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision) with the aim of: • separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and • removing the need for battle-axe lots that back onto areas of classified vegetation. A perimeter road is to meet the requirements contained in Table 6, Column 1. A perimeter road may not be required where: • the adjoining classified vegetation is Class G Grassland; • lots are zoned for rural living or equivalent; • it is demonstrated that it cannot be provided due to site constraints; or • all lots have frontage to an existing public road.	The vast majority of proposed lots at the external development interfaces with classified vegetation will be provided with public perimeter roads ranging in width from 20 m to 30 m. These roads will provide for defendable space at vegetation interfaces, enable simultaneous emergency services response and community evacuation and will act to provide low threat separation between vegetation hazards and habitable development. There are two residential development cells adjacent to the western foreshore where a perimeter road is not currently proposed. Provision of low threat POS and fire service access routes should be considered for these interfaces at future planning stages to ensure there is access for firefighters, defendable space and hazard separation between the vegetation and future habitable development (see below). The merits of providing perimeter roads/FSARs will be further investigated during detailed design at subdivision stage and balanced against visual amenity and landscaping objectives.	✓
	P3iii – Vehicular access is provided which allows: • access and egress for emergency service vehicles; • defendable space for emergency services • personnel on the interface between classified vegetation and development; and • hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).	**A3.4b Fire service access route** *Where proposed lots adjoin classified vegetation under AS3959 (excluding Class G Grassland), and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.* A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.	As discussed above, FSARs may be required where public perimeter roads are not proposed within the concept development design. FSARs may also be provided within the foreshore areas to enhance firefighter access to the fringing vegetation hazards as an additional bushfire hazard management measure. Temporary FSARs may also be required during staged development to ensure firefighters are able to gain access to the stage perimeter prior to future subdivision roads being constructed. An example of where a temporary FSAR may be required is depicted on the BAL contour map for Stages 1 and 2 (Figure 6-7). As there is currently no perimeter proposed around the WWTP site in Stage 1, a compliant temporary FSAR is proposed as a temporary staging measure. A network of FSARs may be considered within portions of the foreshore reserves, as dual pedestrian and vehicular access routes. Permanent and temporary FSARs established at subdivision stage are to comply with requirements of A3.4b (also refer to Appendix N).	✓
	P3iv – Vehicular access is provided which allows emergency service vehicles to directly access all habitable buildings and water supplies and exit the lot without entrapment.	**A3.5 Battle-axe access legs** *Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.* There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area.	Creation of battle-axe lots is to be avoided in bushfire prone areas wherever possible. Where unavoidable, provisions for battle-axe legs in accordance with relevant technical requirements under the Guidelines (refer to A3.5 and Appendix N) are to be made at the subdivision stage of planning	✓

Bushfire protection criteria	Performance Principle	Method of compliance Acceptable solutions	Statement of development compliance	Compliance achievable at future planning stages
		In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements: • requirements in Table 6, Column 4; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres).		
		A3.6 Private driveways There are no private driveway technical requirements where the private driveway is: • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements: • requirements in Table 6, Column 4; • passing bays every 200 metres with a minimum length of 20 metres and a minimum • additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and • turn-around area as shown in Figure 28 and within 30 metres of the habitable building.	Where required, future development is to be serviced by a private driveway that complies with the requirements of A3.6 (refer to Appendix N). This will be demonstrated through preparation of a BMP at DA stage.	✓
Element 4: Water	No performance principle applies	**A4.1 Identification of future water supply** Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2. Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be identified on the structure plan, to the satisfaction of the local government.	The LSP area will be provided a fire water supply generated on site with a system of reticulated firefighting hydrants in accordance with specifications of Water Corporation. Although a reticulated water supply is proposed, if this not achievable during the early stages then firefighting water tanks will need to be provided in accordance with Guidelines standards set out in Schedule 2 (Appendix O) and as per Shire requirements. Firefighting water will need be provided via strategic (community) firefighting tanks at a ratio of 50,000 L per 25 lots or part thereof. Consideration may also be given to provision of a 10,000 L dedicated water tank within individual lots.	✓
	P4 – Provide a permanent water supply that is: • sufficient and available for firefighting purposes; • constructed from non-combustible materials (e.g. steel), or able to maintain its	**A4.2 Provision of water for firefighting purposes** Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies: • The provision of a water tank(s), in accordance with	Provisions for reticulated water supply will be addressed at the subdivision and DA stages of planning, as discussed above.	✓

Bushfire protection criteria	Performance Principle	Method of compliance Acceptable solutions	Statement of development compliance	Compliance achievable at future planning stages
	integrity throughout a bushfire; and • accessible, with legal access for maintenance and re-filling by tankers and emergency service vehicles.	the requirements of Schedule 2; and • Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: o land to be ceded free of cost to the local government for the placement of the tank(s); o the lot or road reserve where the tank is to be located is identified on the plan of subdivision; o tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and o a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds). Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.		

8.2 Compliance with Draft bushfire planning policy and Guidelines

A high-level assessment of the proposed development against the bushfire protection criteria of the Draft Guidelines has been undertaken and is outlined in Table 8-2. The Guidelines Version 2.0 are due for gazettal by the end of 2024.

The purpose of this assessment is to demonstrate that the LSP proposal, and subsequent subdivision applications are capable of achieving compliance with potential future compliance requirements.

JBS&G understands that the criteria for Element 1 has been modified since the draft Guidelines were released, however the below assessment provides an overview of the draft material publicly available at the time this report was prepared.

As outlined in Table 8-2, the proposed LSP is capable of delivering compliance with all relevant acceptable solutions of the draft Guidelines at future planning stages. It is assumed that the project area will fall within 'Category 2' on the revised Map of Bush Fire Prone Areas, as per the draft map (also due to be published by the end of 2024).

Table 8-2: Compliance with Draft Guidelines

Element	Acceptable Solution	Statement of compliance	Compliance can be achieved at future planning stages
Element 1: Location	A1.1 Broader Landscape Type A	N/A	N/A
	A1.2 Broader Landscape Type B	A preliminary broader landscape assessment has been undertaken and it has been determined that the proposed development represents **BLT B** (see Table 8-3). The proposal can achieve compliance with A1.2 as follows: • The risks can be mitigated through a combination of meeting the acceptable solutions and the additional mitigation measures outlined in Section 7. • The proposed development will result in significant road upgrades that will improve the existing emergency evacuation situation (e.g. simplified road pattern, widening, sealing, extension). A traffic impact assessment may be required to demonstrate the road is sufficient for the proposed and existing population. The potential secondary access route will provide additional options for residents of the site and surrounding area, as well as emergency services. • The main access route will provide for evacuation out of the immediate area. Additionally, as the site will be established as a suitable destination, there is a contingency option to remain on-site in the event of a bushfire.	Yes
	A1.3 Broader Landscape Type C	N/A	N/A
Element 2: Siting and	A2.1 Siting and design	All future habitable buildings are proposed to be located within an area subject to BAL-29 or below.	Yes

Element	Acceptable Solution	Statement of compliance	Compliance can be achieved at future planning stages
design	A2.2 Hazard separation	Hazard separation will be provided between proposed lots and vegetation interfaces through provision of substantial perimeter roads, low threat landscaping/POS and building setbacks.	Yes
	A2.3 Asset Protection Zone	As per Version 1.4 (Table 8-1)	Yes
Element 3: Vehicular access	A3.1 Public roads	As per Version 1.4 (Table 8-1)	Yes
	A3.2 Access routes	*Area 2: Public road access should be provided in two different directions to two different suitable destinations, with an all-weather surface.* As per Version 1.4 (Table 8-1)	Yes
	A3.3 No-through roads	<u>Scenario 1 – secondary access route provided</u> The main access route will in effect be a through-road as the secondary access route will be provided for through-access. <u>Scenario 2 – single access road</u> The proposed no-through road will comply with A3.3 due to meeting provisions of A3.3a as follows: • the no-through road travels toward a suitable destination (the site), and • the roads providing access from each stage of subdivision, to the on-site destination will be located within a residential built out area and/or within BAL-Low.	Yes (under both possible access scenarios)
	A3.4 Emergency access way	As per Version 1.4 (Table 8-1)	Yes
	A3.5a Perimeter roads	As per Version 1.4 (Table 8-1)	Yes
	A3.5b Fire service access route	As per Version 1.4 (Table 8-1)	Yes
	A3.6 Battle-axe access legs	As per Version 1.4 (Table 8-1)	Yes
Element 4: Water	A4.1 Water supply for structure plans	As per Version 1.4 (Table 8-1)	Yes
	A4.2 Water supply for subdivision applications	N/A	N/A
	A4.3 Water supply for existing	N/A	N/A

Element	Acceptable Solution	Statement of compliance	Compliance can be achieved at future planning stages
	habitable building(s)		

8.2.1 Broader landscape assessment

A summary of the broader landscape assessment carried out in accordance with Appendix B of the draft Guidelines is detailed below:

1. Assess and map vegetation and effective slope

Vegetation within the wider landscape consists of a combination of forest and scrub fuels, along with large areas of open grassland. Effective slope ranges from flat/upslope, to >5-10 degrees downslope.

2. Assess and map aspects

The landscape assessment included in Section 4.4 maps land out to 5 km from the LSP area. Although the bushfire hazards have not yet been mapped out to this distance (as per 1. above), the mapping identifies landscape scale bushfire potential occurring from the south. There is also potential for fire spread through ROS to the north, however fire behaviour would be relatively localised due to the surrounding estuary.

3. Assess and map access routes

Potential access routes are indicated in Figure 3-1. The proposed road upgrades will result in simplification of the existing road patterns and upgrades including widening and sealing.

4. Establish the broader landscape type

Table 8-3: Broader landscape type determination

Criteria	Response	Points
Proximity of the planning proposal to a suitable destination (as the crow flies)	The location is currently remote, however will be created as a suitable destination at the outset of development.	5 (if considered remote), or 1 (when considering the site will be a suitable destination).
The road pattern immediate to the planning proposal is:	Mixed road patterns	2
Public road access to a suitable destination from the planning proposal is:	Provided to two suitable destinations: • On-site • East to Forrest Highway then north toward Pinjarra and Mandurah and south toward Bunbury,	1
Exposure of the planning proposal to an identified external bushfire hazard (excluding Class G Grassland) is from:	Two elevations: • South • North (although limited)	1
Total		4 – 9 (depending on answer to 1)
BLT		**B**

9. Responsibilities for implementation and management of the bushfire measures

This BMP has been prepared as a strategic guide to demonstrate how development compliance will be delivered at future planning stages in accordance with the Guidelines. Aside from the preparation of future BMPs to accompany future subdivision and/or development applications where appropriate, there are no further items to implement, enforce or review at this strategic stage of the planning process.

Future BMPs prepared for subsequent subdivision and/or development applications are to meet the relevant commitments outlined in this strategic level BMP, address the relevant requirements of SPP 3.7 (i.e. Policy Measures 6.4 or 6.5 where applicable) and demonstrate in detail how the proposed development will incorporate the relevant acceptable solutions or meet the performance requirements of the Guidelines. Future BMPs are to include the following detailed information:

- Proposed lot layout, including any public open space (POS) and drainage areas.
- Detailed landscaping design in regard to POS and drainage.
- Post-development classified vegetation extent, effective slope and separation distances.
- BAL contour map demonstrating that proposed development areas will achieve a rating of BAL–29 or lower.
- Width and alignment of compliant APZs.
- Location and details of the on-site refuge building and bushfire brigade.
- Confirmation of how bushfire management will be addressed regarding temporary bushfire hazards on adjacent future development stages, including low threat staging buffers or temporary quarantining of lots where required.
- Proposed approach to fuel management or AS 3959 application in response to on-site and foreshore POS.
- Vehicular access provisions, including demonstration that a minimum of two access routes will be achieved for each stage of development.
- Future requirements for proposed vulnerable land uses, including provision of a BMP and Bushfire Emergency Evacuation Plan.
- Compliance requirements with the annual local government firebreak notice.
- Assessment against the bushfire protection criteria of the Guidelines.
- Proposed implementation and audit program outlining all measures requiring implementation and the appropriate timing and responsibilities for implementation.

10. Conclusion

On the basis of the information contained within this BMP, it is considered that the bushfire hazards within and adjacent to the LSP area, and the associated bushfire risks, are readily manageable through application of acceptable solutions outlined in the Guidelines, which will be implemented as required throughout future planning stages.

Key bushfire risk mitigation measures developed in compliance with the acceptable solutions include:

- Provision of multiple access routes leading in different directions and upgrades to the existing public road network.
- Establishment of the site as a self-sufficient 'suitable destination' at the earliest possible stage.
- Provision of a contingency community refuge building to provide a safer place for tourists and other members of the community, primarily during the earlier stages of development.
- Provision of critical infrastructure to support bushfire suppression efforts, including water and power supply and a fire brigade and associated resources.
- Prevention of fire spread through the site through low threat landscaping and ongoing maintenance within internal vegetation corridors.
- Provision of perimeter access to fringing bushfire hazards to provide defendable space and reduced bushfire impacts at the key interfaces.
- Siting of habitable development in BAL-29 or below, with the majority of the site being located in BAL-Low.
- Measured consideration of bushfire risk during staged subdivision and adoption of appropriate risk mitigation measures to address temporary bushfire risk.
- Development of a site-wise Landscape Management Plan to provide a consolidated approach to site landscaping and enforcement for the ongoing management of low threat vegetation.

Implementation of the proposed management measures at future stages will enable the site to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines.

11. Limitations

Scope of services

This report ("the report") has been prepared by JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and JBS&G. 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, JBS&G 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, JBS&G 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. JBS&G has also not attempted to determine whether any material matter has been omitted from the data. JBS&G 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 JBS&G. The making of any assumption does not imply that JBS&G 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. JBS&G 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 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, including to any third parties, and no liability will be accepted for use or interpretation of this report by any third party.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G or reproduced other than in full, including all attachments as originally provided to the client by JBS&G.

12. References

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Appendix A Approved Outline Development Plan

Chalet Park

Prior to the development of the chalet park site a Detailed Area Plan (DAP) and Regional Open Space and Foreshore Management Plan is to be prepared.

The chalet park and marina parking/boat ramp facilities fall outside of the Special Development Zone, are indicative only and require separate consideration by the WAPC.

Marina Village Precinct

The Marina Village Precinct will be subject to a Detailed Area Plan (DAP) to be prepared at subdivision stage to determine final design configuration densities and development standards including land use, setbacks, carparking, height etc.

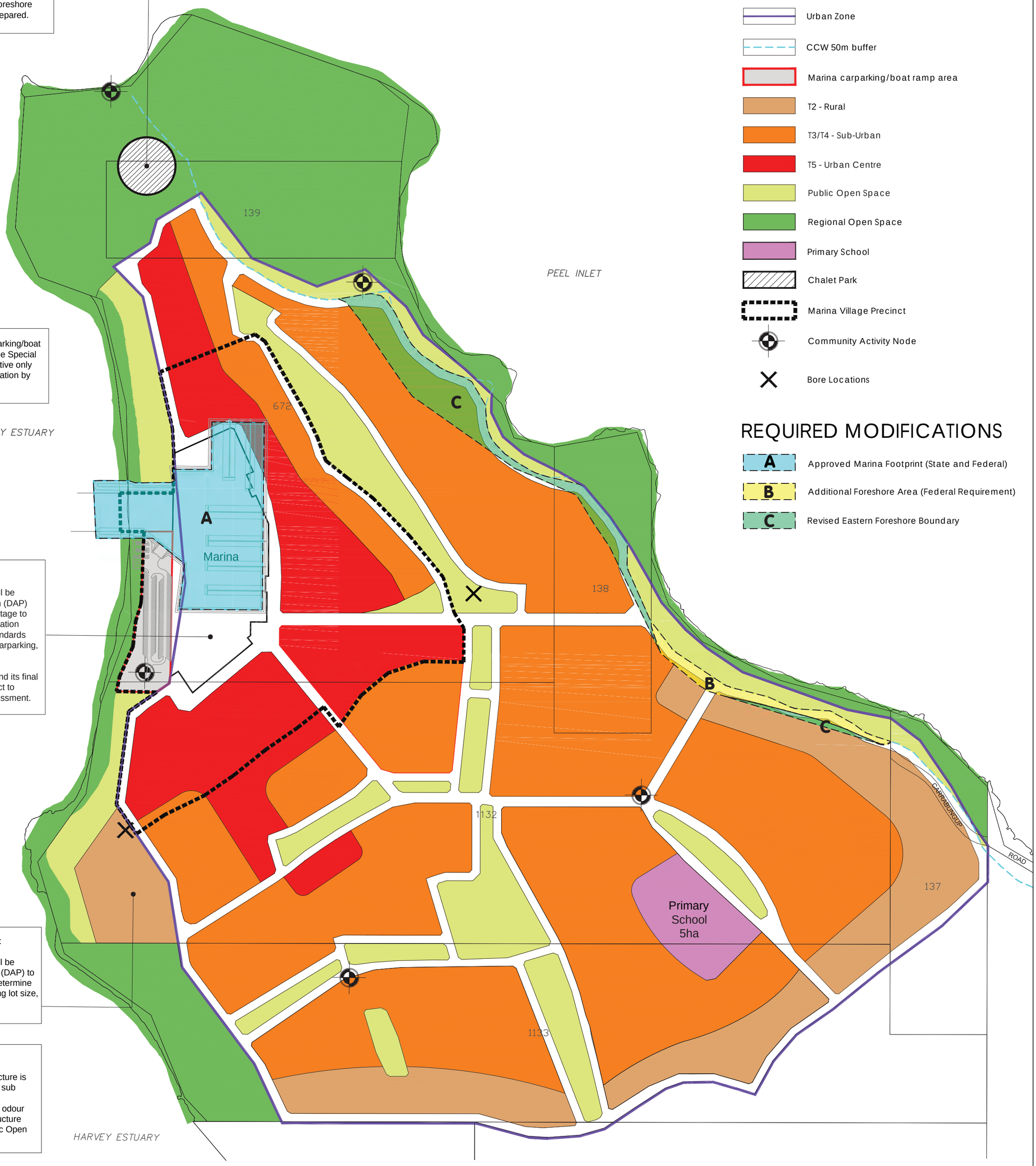
The Marina is indicative only and its final configuration and size is subject to Section 38 environmental assessment.

T2 Rural South West Precinct

The T2 South West Precinct will be subject to a Detailed Area Plan (DAP) to be prepared at subdivision stage to determine development standards including lot size, densities, setbacks etc.

Water Treatment Facility

Water and wastewater infrastructure is intended to be located in the T3 sub urban precinct and will employ technologies that do not require odour and noise buffers. This infrastructure shall not be located within Public Open Space.



LEGEND

- Cadastral Boundaries
- Urban Zone
- CCW 50m buffer
- Marina carparking/boat ramp area
- T2 - Rural
- T3/T4 - Sub-Urban
- T5 - Urban Centre
- Public Open Space
- Regional Open Space
- Primary School
- Chalet Park
- Marina Village Precinct
- Community Activity Node
- Bore Locations

REQUIRED MODIFICATIONS

- A — Approved Marina Footprint (State and Federal)
- B — Additional Foreshore Area (Federal Requirement)
- C — Revised Eastern Foreshore Boundary

DEVELOPMENT PRINCIPLES

Community Design Principles

- The ODP is intended as a guide for future urban development with the objective of generally identifying appropriate locations for housing types and densities whilst permitting flexibility to ensure the delivery of a diverse range of lot sizes throughout all transects;
- The urban framework should facilitate sustainable urban and environmental outcomes to ensure social sustainability and improved diversity, equity and choice of housing;
- The neighbourhood structure should be sufficiently robust to facilitate diversity of land use (mix use development) which is flexible and adaptable to change;
- Two launch sites for non-powered water craft are required to be provided to the satisfaction of the Shire of Murray;
- The proponent is to provide interpretive signage to recognise the Europoean heritage significance of the site within the design of public places within the ODP area to the satisfaction of the Shire of Murray;
- Development within the ODP area is required to have a minimum finished floor level of 2.8m AHD.

Movement Network Principles

- The street network should be highly interconnected, legible and provide a structure that facilitates the requirements of all users;
- The street network should also facilitate view corridors to maximize vistas from the project area;
- The street network to be designed to reflect the principles of Liveable Neighbourhoods;
- Upgrading requirements for the access road are to be in accordance with the Access Road Construction Management Plan approved by the Shire of Murray. The implementation of this plan will be subject to an agreement between the proponent and the Shire of Murray including traffic volume triggers for the upgrading as a condition of subdivision approval for the first subdivision application over the ODP area;
- Emergency road access to the site is required to be investigated by the proponent to the satisfaction of the Shire of Murray. The proponent is responsible for the implementation of emergency access as a condition of subdivision approval.

Activity Centre Principles

- The Marina Village Precinct is the identified activity centre and is envisaged to be a highly functional mixed use precinct comprising transit facilities, local retailing, tourist support facilities and mixed use development (including residential), in a high quality public domain;
- The Marina Village Precinct will be subject to the preparation of a Detailed Area Plan to determine design content including allocation of uses, final design layout, retail floor space and general development standards;
- The final configuration and size of any marina is subject to the environmental assessment outcome under Section 38 of the Environmental Protection Act;
- Should a marina not be granted environmental approval, the 'Marina Village Precinct' is required to be redesigned to provide a mixed use activity centre that addresses and interacts with the Harvey Estuary to an environmentally acceptable level.

Housing Diversity (Lot Layout) Principles

- Final residential densities will be determined at subdivision application stage, however, will generally comply with the ODP transects.

Rural (General)

- Residential Codes: R5/R10
- Indicative lot sizes 1200m² - 2000m²
- Larger lifestyle lots to retain existing trees
- Located at perimeter of project area

Rural (SW Precinct)

- Residential Code: R5
- Minimum lot size - 2000m²
- Average lot size - 3000m²
- As an alternative to R5, a survey strata rural cluster development is permitted subject to the preparation of a Detailed Area Plan.
- Detailed Area Plan required to address building envelopes, setbacks, tree retention.

Sub Urban

- Residential Code - R15 - R25
- Indicative lot sizes 300m² - 1000m²

Urban Centre

- Residential Code - R50 - R100 +
- Indicative lot sizes 70m² - 300m²

Parkland Principles

- Public Open Space to be provided as 10% of the residential development area and to be configured as a series of linear vegetation corridors;
- A key principle for the location of public open space is to ensure the retention of significant areas of vegetation providing parkland linear corridors to facilitate pedestrian and cyclist movement;
- A public open space schedule is to be provided with each subdivision application. This schedule is required to identify the percentage and area of open space being provided within the area subject to the application and within areas subject to previous subdivision approvals.

TIAN AN AUSTRALIA

CADASTRAL INFORMATION
SOURCE: RPS GROUP
YYMMDD: 190115
DWG REF:
PROJECTION: PCG94

AERIAL PHOTOGRAPHY
SOURCE: NEARMAPS
YYMMDD: 190529

RD great places

DRAFT

SIZE A2_1:7500

0 metres 75 150 225 300 375

REV	DESCRIPTION	YYMMDD	DRAWN	APPR'D
B	MARINA FOOTPRINT ADDED	191205	SB	-
A	BASE PORPTGUD1433B	190905	HH	RD

OUTLINE DEVELOPMENT PLAN - REQUIRED MODIFICATIONS
Point Grey
Shire of Murray

REF NO.	DRAW NO.	REV.
TAA PTG	**RD1 011**	**B**

Appendix B Road Network Plan

N

Peel Inlet

Carrabungup Road

Austin Bay
Nature Reserve

Greenlands Road

Carrabungup Road

Greenlands Road

Paull Road

Lake Mealup Road North

Mealup Point
Nature Reserve

Lake Mealup

Daudson Road

Lake Mealup Road

Forrest Highway

Thompson Road

Harvey Estuary

Lake Mclarty

Mills Road

LEGEND

ROAD RESERVES
- BITUMEN
- GRAVEL/LIMESTONE
- UNCONSTRUCTED
- ENTRY ROAD
- FULL ACCESS INTERSECTIONS

BOUNDARIES
- POINT GREY STRUCTURE PLAN

CADASTRAL INFORMATION
SOURCE: LANDGATE SLIP
YYMMDD: 240607
DWG REF: 240607_SLIP_Base cad point grey(_PCG94
PROJECTION: PCG94

AERIAL PHOTOGRAPHY
SOURCE: NEARMAP
YYMMDD: 240516

HATCH

DRAFT

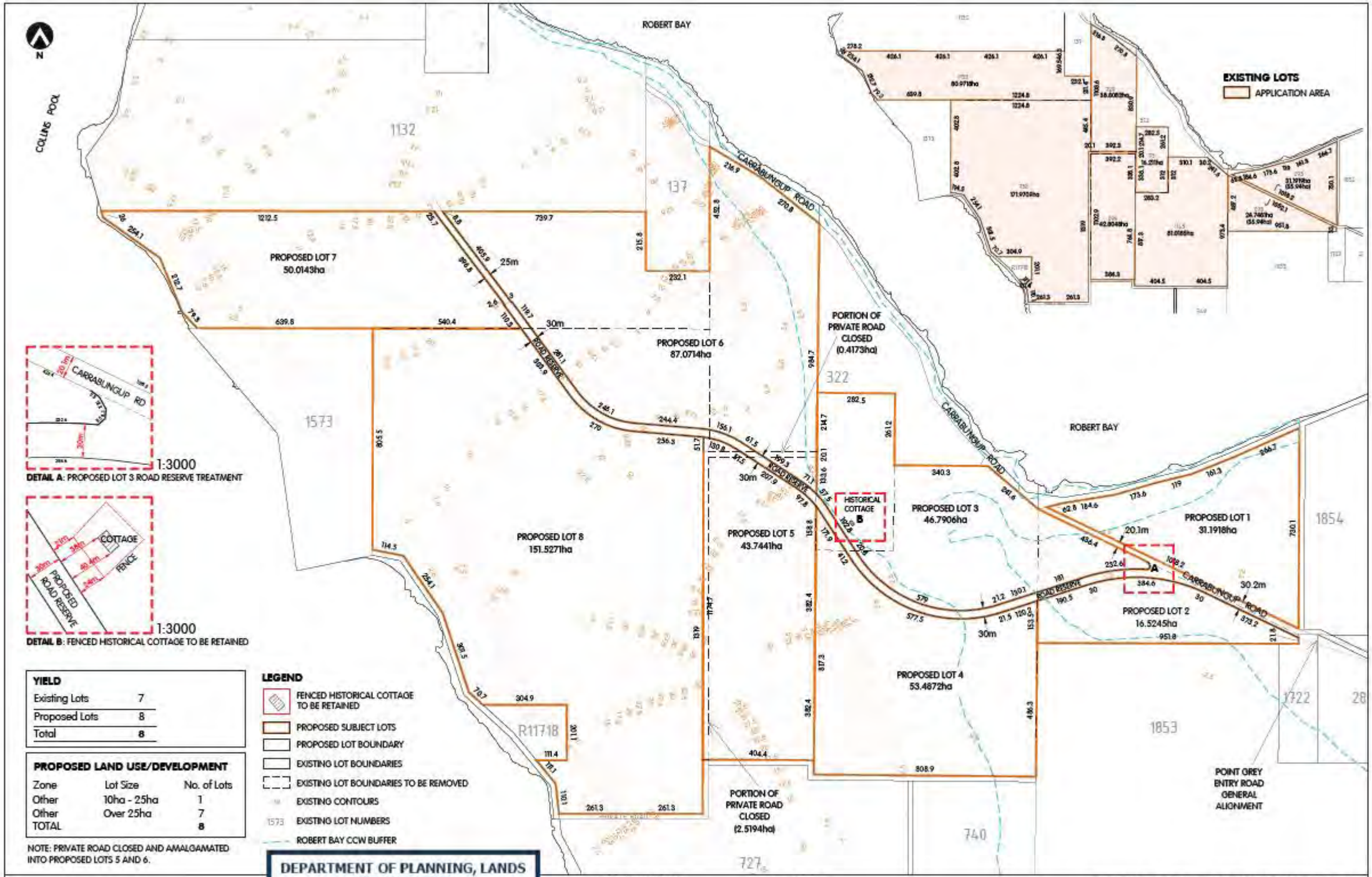
0 metres 250 500 750 1000 1250 SIZE A1 1:25000

REV	DESCRIPTION	YYMMDD	DRAWN	APPR'D
A	FIRST ISSUE	240607	SB	RDa

JOB CODE	SERVICE	DOC TYPE	DRAW NO.	REV.
H369508	DES	DWG	002	A

ROAD NETWORK PLAN
Point Grey
Shire of Murray

Appendix C Entry Road Subdivision and Amalgamation Plan



1:3000

DETAIL A: PROPOSED LOT 3 ROAD RESERVE TREATMENT

1:3000

DETAIL B: FENCED HISTORICAL COTTAGE TO BE RETAINED

YIELD	
Existing Lots	7
Proposed Lots	8
Total	8

PROPOSED LAND USE/DEVELOPMENT		
Zone	Lot Size	No. of Lots
Other	10ha - 25ha	1
Other	Over 25ha	7
TOTAL		8

NOTE: PRIVATE ROAD CLOSED AND AMALGAMATED INTO PROPOSED LOTS 5 AND 6.

LEGEND

- FENCED HISTORICAL COTTAGE TO BE RETAINED
- PROPOSED SUBJECT LOTS
- PROPOSED LOT BOUNDARY
- EXISTING LOT BOUNDARIES
- EXISTING LOT BOUNDARIES TO BE REMOVED
- EXISTING CONTOURS
- 1573 EXISTING LOT NUMBERS
- ROBERT BAY CCW BUFFER

DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE	FILE
01-Oct-2019	158527

CADASTRAL INFORMATION
SOURCE: RPS GROUP
YYMMDD: 190115
DWG REF: RPS_Transfer of ROS Back to State 110602
PROJECTION: PCG94

AERIAL PHOTOGRAPHY
SOURCE: NA
YYMMDD: NA

RD great places

SIZE A3 1:12500

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REV	DESCRIPTION	YYMMDD	DRAWN	APP'D
A	BASE PORPTG UD1501M	190731	SB	RD

PROPOSED SUBDIVISION AND AMALGAMATION PLAN
Lots 75, 293, 299, 729, 738, 1133 and 1145 Carrabungup Road, Point Grey
Shire of Murray

REF NO.	DRAW NO.	REV.
TAA PTG	RD1 007	A

Appendix D Indicative LSP Staging Plan

N

LOT 139

LOT 672

LOT 138

LOT 1132

LOT 1133

LOT 738

LOT 137

TEMPORARY SECONDARY ACCESS

ACCESS TO EXISTING (CARRABUP CUP ROAD)

PRIMARY ACCESS

POTENTIAL SECONDARY ACCESS

PRIMARY SCHOOL 4.4615ha

WTP 2.0672ha

1.4204ha

6.7796ha

2.4135ha

1.0540ha

2.006ha

1.1777ha

1.2857ha

2.2961ha

6.8469ha

2.2875ha

4.3365ha

1.6758ha

1.5872ha

0.9324ha

0.3950ha

LEGEND

- Regional Open Space
- Foreshore Reserve
- Public Open Space
- Conservation POS rehabilitation (2.1ha)
- Subject Lot Boundary

Setbacks (Baird, June 2021)

- 2020 Setback
- 2030 Setback
- 2050 Setback
- 2070 Setback
- 2120 Setback
- (20m offset)

- Village Centre
- Mixed Use
- Residential
- Primary School
- Community/ Servicing (Water Treatment Facility)

- Urban Zone
- CCW 50m Buffer
- T2 Rural South West Precinct
- Staging Line

DRAFT

CADASTRAL INFORMATION
SOURCE: MNG
YYMMDD: 200623
DWG REF: 91549pr-290a
PROJECTION: PCG94

AERIAL PHOTOGRAPHY
SOURCE: NEARMAP
YYMMDD: 240408

HATCH

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SIZE A1 1:5000

REV	DESCRIPTION	YYMMDD	DRAWN	APP'D
C	DESIGN MODS	240508	YS	DRAFT
B	DESIGN MODS	240501	SB	DRAFT
A	BASE TAA POT RDI 044M	240428	SB	DRAFT

MASTERPLAN - CONCEPT

Point Grey

Shire of Murray

REF NO. **H369508** DRAW NO. **001** REV. **C**

DISCLAIMER: THIS MASTERPLAN DEPICTS A HYPOTHETICAL DEVELOPMENT SCENARIO AND IS SUBJECT TO STATUTORY ASSESSMENT AND APPROVALS FROM THE SHIRE OF MURRAY AND WESTERN AUSTRALIAN PLANNING COMMISSION. THE LOCATION OF STRUCTURAL DESIGN ELEMENTS INCLUDING LAND USES, ROADS, PUBLIC OPEN SPACE, DRAINAGE AREAS AND ACCESS POINTS ARE SUBJECT TO DETAILED SITE INVESTIGATIONS BY QUALIFIED CONSULTANTS AND TECHNICAL ASSESSMENT BY SERVICE AGENCIES.

DISCLAIMER: ISSUED FOR DESIGN INTENT ONLY. ALL AREAS AND DIMENSIONS ARE SUBJECT TO DETAIL DESIGN AND SURVEY

Appendix E Landscape Masterplan

POINT GREY BEACH

WALKING TRAIL TO NORTHERN POINT GREY BEACH

WETLAND

INDIGENOUS INTERPRETATION / LEARNING PRECINCT

BIRD HIDE/ WATCHING OPPORTUNITIES

BIRD SANCTUARY REHABILITATION AREA

PEEL INLET

HARVEY ESTUARY

FORESHORE POS

VILLAGE CENTRE

WATER & SEWER TREATMENT PLANT COMMUNITY BATTERY

REHABILITATION ZONE

TEMPORARY SECONDARY ACCESS TO EXISTING CARRABUNGUP ROAD (TBC)

PRIMARY SCHOOL

REHABILITATION ZONE

PRIMARY VEHICLE ACCESS

POTENTIAL SECONDARY ACCESS

SPECIAL ACTIVITY FACILITIES

PROVIDING A WIDE RANGE OF COMMUNITY INFRASTRUCTURE TO SUPPORT HEALTH, WELLBEING AND SOCIAL INTERACTION.

EXAMPLES AND POTENTIAL LOCATIONS MAY INCLUDE:

1. FISHING / CRABBING
2. KAYAKING / CANOING
3. SPORT / REC AREA (EG. BASKETBALL)
4. SPORT / REC AREA (EG. BOCCE/ FINSKA)
5. PUMP TRACK/ SKATE
6. ATHLETICS / RUNNING TRACK
7. TENNIS/ PICKLEBALL/ HIT-UP WALL
8. CYCLE/ WALKING NETWORKS
9. BIRDWATCHING
10. DESTINATION FORESHORE PARK

LEGEND

- DUAL USE PATH NETWORK
- PEDESTRIAN PATH NETWORK
- TURF
- MANAGED GARDEN BEDS
- BIO-RETENTION BASINS
- POS - EXISTING VEG RETAINED
- REGIONAL OPEN SPACE EXISTING VEG RETAINED
- PLAY AREAS
- SHELTER / PICNIC NODE
- 1 SPECIAL ACTIVITY COMMUNITY SPORTS ETC TO PROMOTE WELLNESS AND MOBILITY
- 2120 SETBACK
- 50M CCW BUFFER
- VILLAGE CENTRE
- MIXED USE
- HIGH DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL
- VOLUNTEER BUSHFIRE BRIGADE

POINT GREY PENINSULA
LANDSCAPE MASTERPLAN

DWG **PG-LM-1**
REV **C**
DATE **29.07.2024**

0 10 20 30 40 50 60 m

SCALE **1 : 2500 @ A3**

emerge ASSOCIATES

LEGEND

- DUAL USE PATH NETWORK
- PEDESTRIAN PATH NETWORK
- TURF
- MANAGED GARDEN BEDS
- BIO-RETENTION BASINS
- POS - EXISTING VEG RETAINED
- REGIONAL OPEN SPACE EXISTING VEG RETAINED
- PLAY AREAS
- SHELTER / PICNIC NODE
- INDIGENOUS INTERPRETATION / LEARNING PRECINCT
- 2120 SETBACK
- 50M CCW BUFFER
- VILLAGE CENTRE
- MIXED USE
- HIGH DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL
- VOLUNTEER BUSHFIRE BRIGADE

POINT GREY PENINSULA

LANDSCAPE MASTERPLAN (GRAPHIC ONLY)

DWG **PG-LM-2**
REV **C**
DATE **29.07.2024**

0 10 20 30 40 50 60 m

SCALE **1 : 2500 @ A3**

emerge ASSOCIATES

POINT GREY
TOWN CENTRE/ FORESHORE LANDSCAPE INTERFACE

CHARACTER
The landscape character of the foreshore will be substantially enhanced. Currently the majority of the future foreshore area is cleared flat grazing land. It is proposed that rehabilitation planting occur in some areas with additional avenues of shady tree planting and grassed areas catering for active uses. Large significant trees within the foreshore will be retained where possible and integrated into the design and location of open space areas. The existing in-tact foreshore strip will be substantially retained

FACILITIES
The foreshore area is a suitable location for a suite of public facilities to support and encourage a range of social, recreational and passive uses. Facilities may include picnic shelters, bbqs, open grass areas, street furniture, adventure playground, nature play playground, bike trails and strategic lighting.

It is envisaged that a built structure will be located close to the water enabling the storage and hire of canoes and kayaks which can access the water easily from the widened sandy beach area. Two jetties extend from the park into the water enabling fishing, walking and canoe and small sailing craft launching. Users may include the general public, sea scouts, local canoe clubs and fishing clubs.

CIRCULATION
Pedestrian, cycle and vehicular circulation is catered for via an integrated circulation system. Sealed pedestrian and dual use paths traverse the foreshore creating a foreshore walk which runs along the foreshore linking various new precincts and limiting road crossings. Carparking for residents and visitors is proposed in a series of locations including on street parallel parking, park front public car parks and adjacent private parking within private land. Parking via a park access road is envisaged to extend into the foreshore to enable universal and easy access closer to the water, this also caters for maintenance and emergency service vehicles.

TOPOGRAPHY
The existing topography will be substantially retained. The existing grade up from the water will be modified to allow for universal access where required and to create a series of level usable open space areas. The majority of the foreshore is placed well above current and calculated flood levels. The existing smaller dunes will be reworked in the former marina site to create selective open vista views to the water and enable general new mounding to define and separate public spaces.

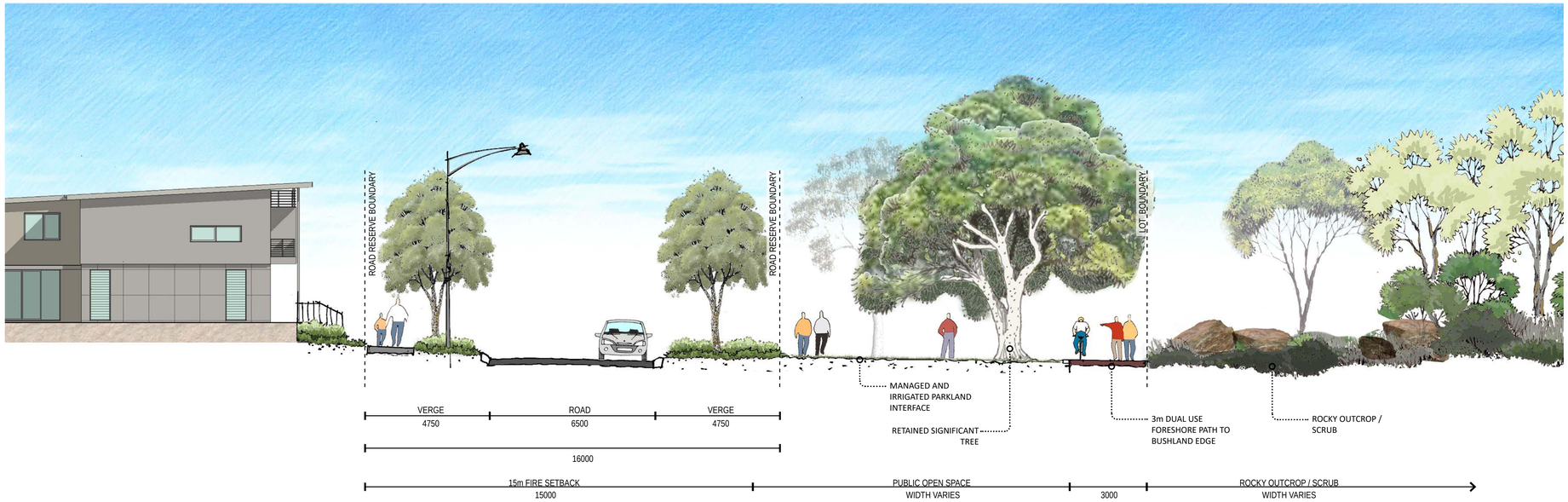
DRAINAGE
Drainage will be managed via the road and swale infiltration system. Drainage typically runs along the road system and is collected, cleaned and infiltrated within the foreshore park at the low point at the end of each street. A series of planted nutrient stripping detention basins will assist in cleansing water prior to groundwater recharge. Planted basins will be aligned with the sites existing native foreshore edge character.

SPECIES
Proposed new plantings of tree and plant species will be overwhelmingly endemic native species. Exotic species may be used in select areas as feature plantings to assist in movement and precinct legibility subject to future approvals.

POINT GREY- FORESHORE POS
LANDSCAPE CONCEPT PLAN

DWG PG-FP-1
REV C
DATE 29.07.2024
0 7.5 15 22.5 30 37.5 m
SCALE 1 : 1500 @ A3

emerge ASSOCIATES



SECTION A

POINT GREY - TYPICAL 15m OPEN SPACE FIRE SETBACK INTERFACE

SECTION B

POINT GREY - TYPICAL 21m OPEN SPACE FIRE SETBACK INTERFACE

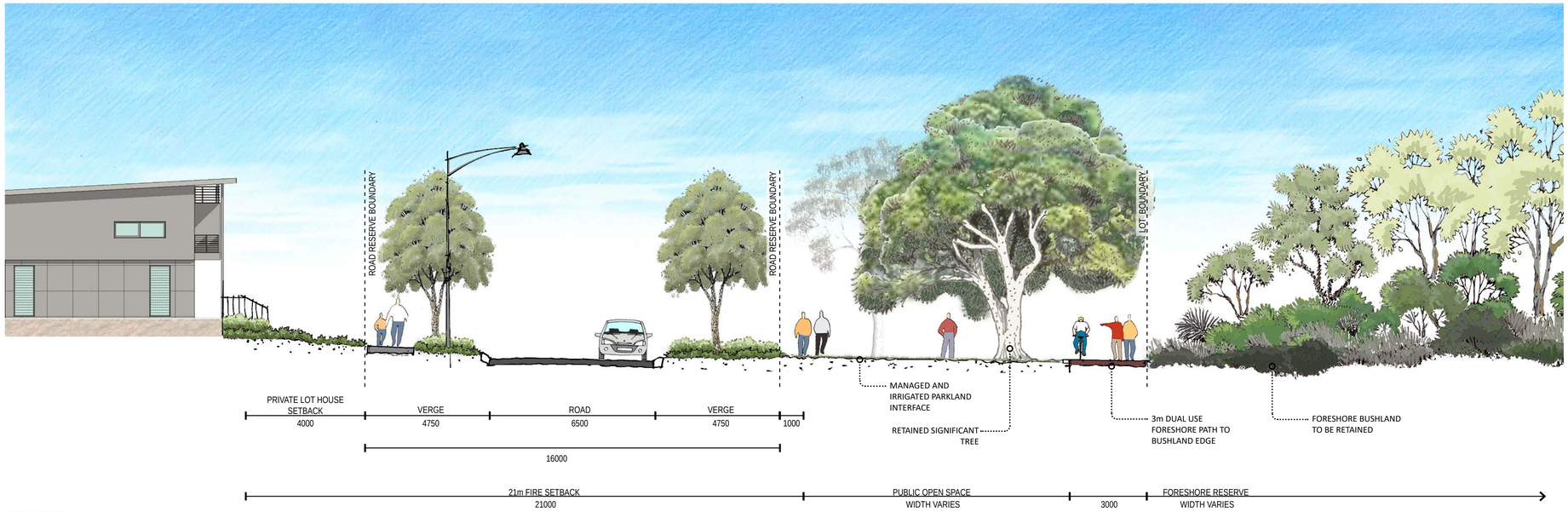
POINT GREY - FORESHORE POS

TYPICAL SECTION

DWG **PG-FP-2**
REV **B**
DATE **29.07.2024**
SCALE **1 : 100 @ A1**

0 1 2 3 4 5 m

emerge ASSOCIATES



SECTION C

POINT GREY - TYPICAL 21m OPEN SPACE FIRE SETBACK INTERFACE

SECTION D

POINT GREY - TYPICAL 42m OPEN SPACE FIRE SETBACK INTERFACE

POINT GREY - FORESHORE POS

TYPICAL SECTION

DWG **PG-FP-3**
REV **A**
DATE **29.07.2024**
SCALE **1 : 100 @ A1**
0 1 2 3 4 5 m

emerge ASSOCIATES

Appendix F Photos of pre-development vegetation plots

Plot 1		
Vegetation classification	**Pre-development**	Class A Forest
	Post-development	Class A Forest, Modified to low threat state (Exclusion 2.2.3.2)

Description / justification

Remnant forest vegetation with presence of intact understorey in the northern portions of the LSP area, including ROS, on flat land. One small pocket of forest on flat land at the top of the southeastern scarp.

Photo ID: 1a

Photo ID: 1b

Photo ID: 1c

Photo ID: 1d

Photo ID: 1e

Photo ID: 1f

Plot 1	
 **Photo ID:** 1g	 **Photo ID:** 1h

Plot 2		
Vegetation classification	**Pre-development**	Class A Forest
	Post-development	Class A Forest, Modified to low threat state (Exclusion 2.2.3.2)

Description / justification

Remnant forest vegetation with presence of intact understorey in the central and southwestern portions of the LSP area. Slope is varied under the vegetation but worst-case up to 5 degrees in relation to the surrounding land.

Photo ID: 2a

Photo ID: 2b

Photo ID: 2c

Photo ID: 2d

Photo ID: 2e

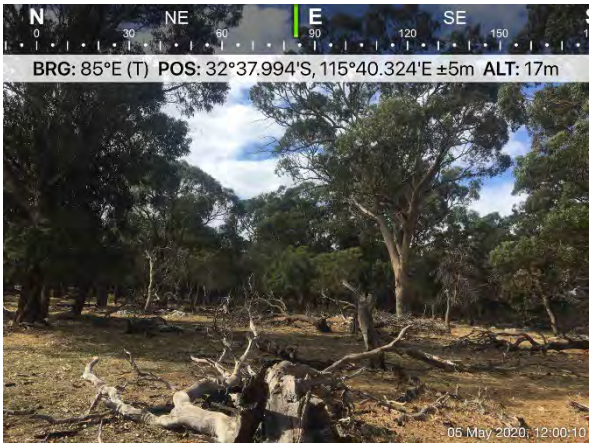


Photo ID: 2f

Plot 2

Photo ID: 2g

Photo ID: 2h

Photo ID: 2i

Photo ID: 2j

Photo ID: 2k

Photo ID: 2l

Plot 3		
Vegetation classification	**Pre-development**	Class A Forest
	Post-development	Class A Forest

Description / justification

Remnant open forest on the slopes of the southeastern scarp. Precautionarily assumed to be revegetated to full forest classification, on land >10-15 degrees post-development.

Photo ID: 3a

Plot 4		
Vegetation classification	**Pre-development**	Class B Woodland
	Post-development	Class B Woodland; Modified to low threat state (Exclusion 2.2.3.2)

Description / justification

Open Tuart woodland predominantly within the low-lying eastern foreshore area, as well as within some areas of flat land within and adjoining the LSP area.

Photo ID: 4a

Photo ID: 4b

Photo ID: 4c

Photo ID: 4d

Plot 5		
Vegetation classification	**Pre-development**	Class B Woodland
	Post-development	Class B Woodland; Modified to low threat state (Exclusion 2.2.3.2)

Description / justification

Predominant open Tuart woodland areas throughout the LSP area. Slope is varied under the vegetation but worst-case up to 5 degrees in relation to the surrounding developable land.

Photo ID: 5a

Photo ID: 5b

Photo ID: 5c

Photo ID: 5d

Photo ID: 5e

Photo ID: 5f

Plot 5	
	
Photo ID: 5g	**Photo ID:** 5h

Plot 6		
Vegetation classification	**Pre-development**	Class B Woodland
	Post-development	Class B Woodland

Description / justification

Area of open Tuart woodland on the scarp to the southeast of the project area (external landholdings).

Photo ID: Landgate imagery (photo not taken on this plot due to access restrictions)

Plot 7		
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub

Description / justification

Predominant coastal Banksia scrub vegetation within the northern ROS. Effective slope is flat/upslope of proposed development areas.

Photo ID: 7a

Photo ID: 7b

Photo ID: 7c

Photo ID: 7d

Plot 8		
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub; Modified to low threat state (Exclusions [e] & [f])

Description / justification

Predominant coastal Banksia scrub vegetation along the western foreshore. Effective slope varies from is >0-5°.

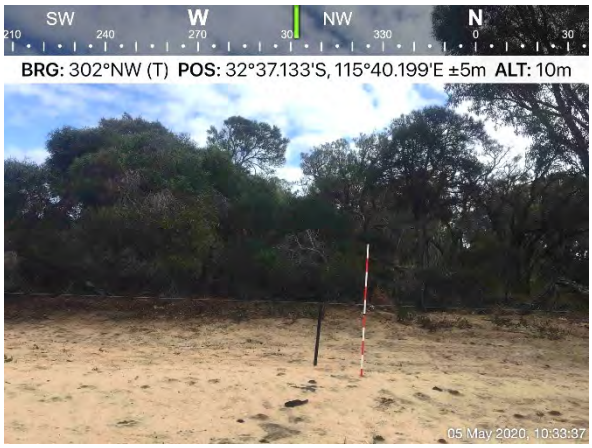


Photo ID: 8a

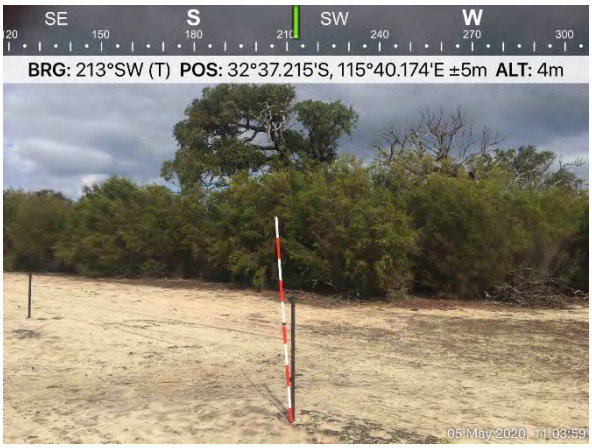


Photo ID: 8b

Photo ID: 8c

Photo ID: 8d

Photo ID: 8e

Photo ID: 8f

Plot 8	
 **Photo ID:** 8g	 **Photo ID:** 8h

Plot 9		
Vegetation classification	**Pre-development**	Class D Scrub
	Post-development	Class D Scrub; Modified to low threat state (Exclusions [e] & [f])

Description / justification

Predominant coastal Banksia scrub vegetation along the western foreshore. Effective slope is downslope >5-10°.

Photo ID: 9a

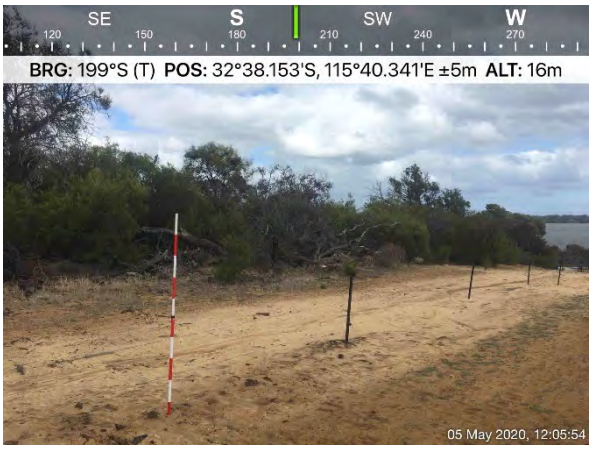


Photo ID: 9b

Photo ID: 9c

Plot 10		
Vegetation classification	**Pre-development**	Class C Shrubland
	Post-development	Class C Shrubland

Description / justification

Coastal shrub vegetation, including samphire and other halophytes, fringing the eastern foreshore, external to development area

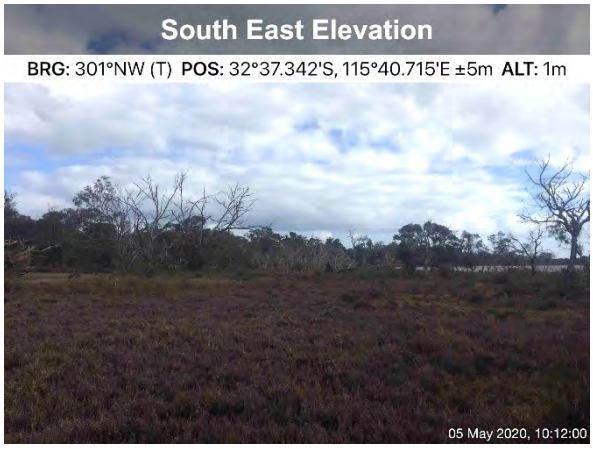


Photo ID: 10a

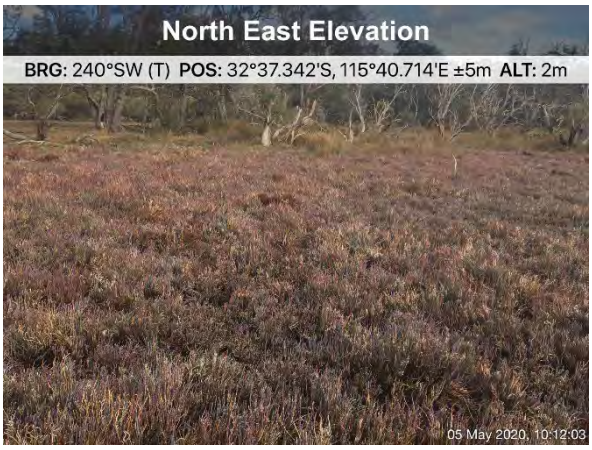


Photo ID: 10b

Photo ID: 10c

Photo ID: 10d

Plot 11		
Vegetation classification	**Pre-development**	Class G Grassland
	Post-development	Class G Grassland; Modified to low threat state (Exclusions 2.2.3.2)

Description / justification

Open grassland, flat/upslope (Plot 11) throughout the LSP area and surrounds.

Photo ID: 11a

Photo ID: 11b

Photo ID: 11c

Photo ID: 11d

Photo ID: 11e

Photo ID: 11f

Plot 11	
 **Photo ID:** 11g	

Plot 12		
Vegetation classification	**Pre-development**	Class G Grassland
	Post-development	Class G Grassland; Modified to low threat state (Exclusions 2.2.3.2)

Description / justification

Open grassland, downslope >0-5°, throughout the LSP area and surrounds.

Photo ID: 12a

Plot 13		
Vegetation classification	**Pre-development**	Class G Grassland
	Post-development	Class G Grassland; Modified to low threat state (Exclusions 2.2.3.2)

Description / justification

Open grassland, downslope >10-15°, throughout the LSP area and surrounds.

Photo ID: 13a

Plot 14		
Vegetation classification	**Pre-development**	Excluded – Low threat (Clause 2.2.3.2 [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])

Description / justification

Existing areas of low threat and non-vegetated land include farm tracks, firebreaks, the WWTP and homestead.

Photo ID: 14a

Photo ID: 14b

Photo ID: 14c

Appendix G AS 3959 Method 2 analysis

Calculated July 25, 2024, 1:41 pm (MDc v.4.9)

Plot 1 Class A Forest F/US

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	2.4 km/h
Vegetation classification	Forest	Flame length	19.8 m
Understorey fuel load	25 t/ha	Flame angle	63 °, 68 °, 73 °, 75 °, 77 ° & 82 °
Total fuel load	35 t/ha	Elevation of receiver	8.82 m, 9.17 m, 9.460000000000001 m, 9.56 m, 9.640000000000001 m & 9.800000000000001 m
Vegetation height	n/a	Fire intensity	43,400 kW/m
Effective slope	0 °	Transmissivity	0.843, 0.822, 0.796, 0.775, 0.764 & 0.712
Site slope	0 °	Viewfactor	0.4235, 0.3149, 0.2132, 0.144, 0.1168 & 0.0313
Flame width	100 m	Minimum distance to < 40 kW/m²	22.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	29.9 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	41.2 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	54.9 m
		Minimum distance to <	63.2 m

10 kW/m²	

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Calculated July 25, 2024, 1:42 pm (MDc v.4.9)

Plot 2 Class A Forest 5 degrees downslope

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	3.38 km/h
Vegetation classification	Forest	Flame length	26.22 m
Understorey fuel load	25 t/ha	Flame angle	61 °, 66 °, 70 °, 73 °, 74 ° & 81 °
Total fuel load	35 t/ha	Elevation of receiver	11.46 m, 11.97 m, 12.32 m, 12.54 m, 12.6 m & 12.95 m
Vegetation height	n/a	Fire intensity	61,280 kW/m
Effective slope	5 °	Transmissivity	0.83, 0.8080000000000001, 0.783, 0.763, 0.754 & 0.699
Site slope	0 °	Viewfactor	0.4294, 0.3207, 0.2167, 0.1462, 0.1185 & 0.0319
Flame width	100 m	Minimum distance to < 40 kW/m²	29.4 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	37.6 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	50.6 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	66 m
		Minimum distance to < 10 kW/m²	75.3 m

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Calculated July 25, 2024, 1:46 pm (MDc v.4.9)

Plot 5 Class B Woodland 5 degrees downslope

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	2.03 km/h
Vegetation classification	Woodland	Flame length	16.21 m
Understorey fuel load	15 t/ha	Flame angle	64 °, 70 °, 74 °, 77 °, 78 ° & 83 °
Total fuel load	25 t/ha	Elevation of receiver	7.28 m, 7.61 m, 7.79 m, 7.9 m, 7.93 m & 8.039999999999999 m
Vegetation height	n/a	Fire intensity	26,263 kW/m
Effective slope	5 °	Transmissivity	0.852, 0.832, 0.8070000000000001, 0.784, 0.773 & 0.72
Site slope	0 °	Viewfactor	0.4191, 0.3113, 0.2101, 0.1426, 0.1155 & 0.031
Flame width	100 m	Minimum distance to < 40 kW/m²	19.1 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	25.2 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	35.4 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	47.8 m
		Minimum distance to < 10 kW/m²	55.5 m

Flame length - NSW Rural Fire Service, 2001 & Noble et al., 1980

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Rate of Spread - Mcarthur, 1973 & Noble et al., 1980

Calculated July 25, 2024, 1:47 pm (MDc v.4.9)

Plot 10 Class C Shrubland F/US

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Fire Danger Index	80	Rate of spread	2.86 km/h
Vegetation classification	Shrubland	Flame length	7.73 m
Understorey fuel load	15 t/ha	Flame angle	66 °, 72 °, 78 °, 81 °, 82 ° & 86 °
Total fuel load	15 t/ha	Elevation of receiver	3.53 m, 3.68 m, 3.78 m, 3.82 m, 3.83 m & 3.86 m
Vegetation height	m	Fire intensity	22,207 kW/m
Effective slope	0 °	Transmissivity	0.878, 0.864, 0.844, 0.822, 0.8090000000000001 & 0.746
Site slope	0 °	Viewfactor	0.4065, 0.2983, 0.2011, 0.136, 0.1102 & 0.0299
Flame width	100 m	Minimum distance to < 40 kW/m²	9.4 m
Windspeed	45 km/h	Minimum distance to < 29 kW/m²	12.8 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	18.9 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	27.1 m
		Minimum distance to < 10 kW/m²	32.5 m

Rate of Spread - Catchpole et al. 1998

Flame length - Byram, 1959

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Calculated July 25, 2024, 1:52 pm (MDc v.4.9)

Plot 11 Class G Grassland 5 degrees downslope

Minimum Distance Calculator - AS3959-2018 (Method 2)

Inputs		Outputs	
Grassland Fire Danger Index	110	Rate of spread	20.19 km/h
Vegetation classification	Grassland	Flame length	8.16 m
Understorey fuel load	4.5 t/ha	Flame angle	66 °, 72 °, 77 °, 81 °, 82 ° & 85 °
Total fuel load	4.5 t/ha	Elevation of receiver	3.73 m, 3.88 m, 3.97 m, 4.03 m, 4.04 m & 4.06 m
Vegetation height	n/a	Fire intensity	46,945 kW/m
Effective slope	5 °	Transmissivity	0.876, 0.863, 0.841, 0.819, 0.806 & 0.744
Site slope	0 °	Viewfactor	0.4075, 0.3006, 0.201, 0.1361, 0.1106 & 0.03
Flame width	100 m	Minimum distance to < 40 kW/m²	9.9 m
Windspeed	n/a	Minimum distance to < 29 kW/m²	13.4 m
Heat of combustion	18,600 kJ/kg	Minimum distance to < 19 kW/m²	19.9 m
Flame temperature	1,200 K	Minimum distance to < 12.5 kW/m²	28.4 m

Minimum distance to < 10 kW/m²	33.9 m

Rate of Spread - Noble et al. 1980

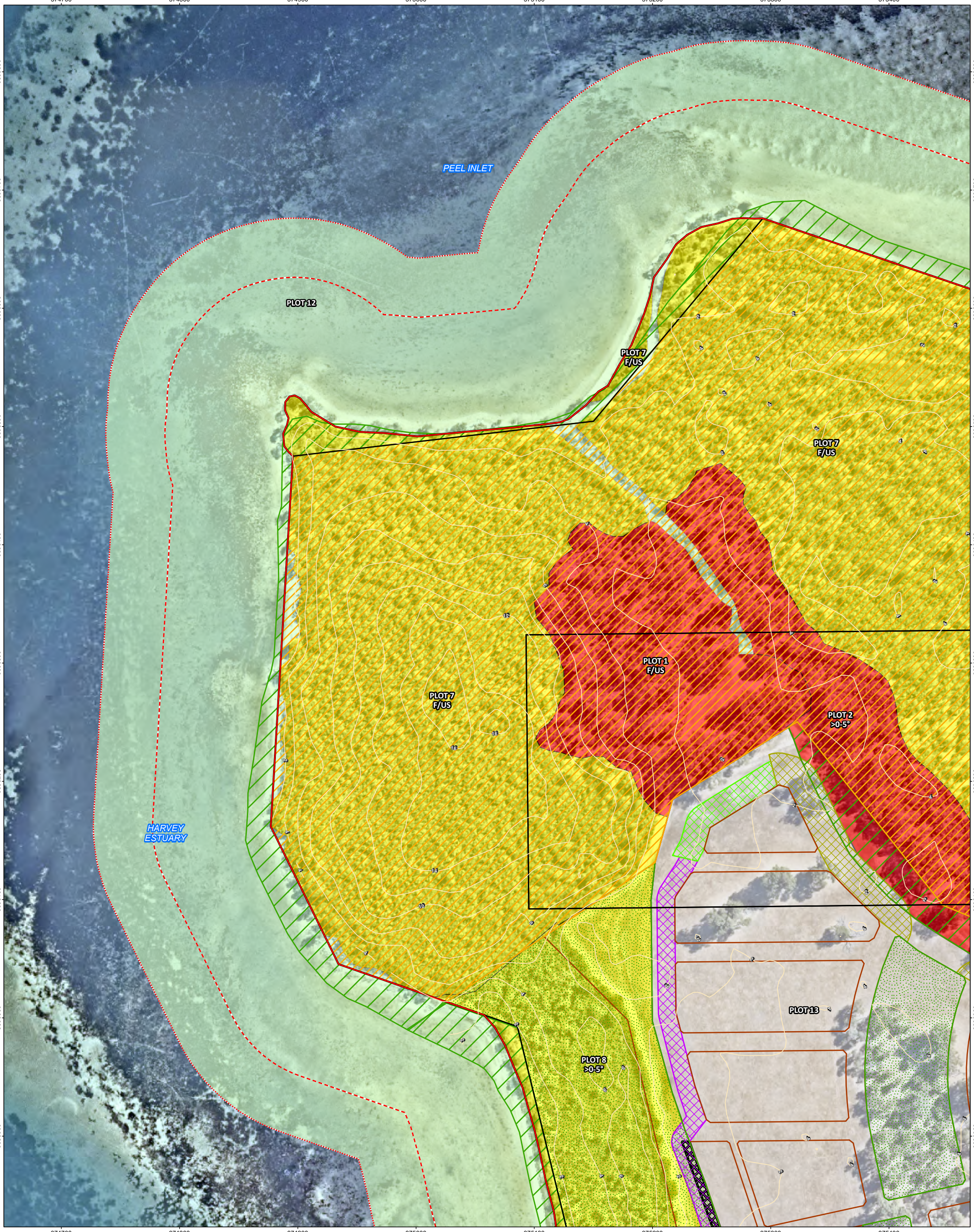
Flame length - Purton, 1982

Elevation of receiver - Douglas & Tan, 2005

Flame angle - Douglas & Tan, 2005

Radiant heat flux - Drysdale, 1999, Sullivan et al., 2003, Douglas & Tan, 2005

Appendix H Map series – Post-development vegetation classification and effective slope (full site build out)



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space

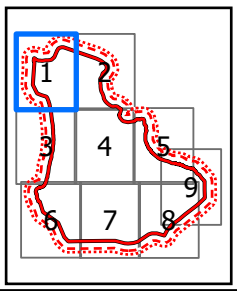
- 6m wide FSAR

Minimum APZs

- 15m wide APZ
- 21m wide APZ
- 27m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class D Scrub
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



JBS&G

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Job Number: 59293

Scale 1:3,000 at A3

Client: Tian An Australia

Coord. Sys. GDA2020 MGA Zone 50

Drawn By: jcrute | Checked By: LR | Version: Rev A | Date: 08-Aug-2024

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

APPENDIX H Map 1 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

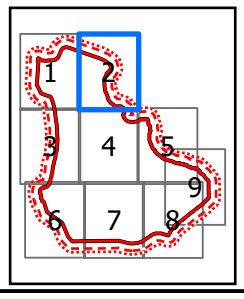
- Foreshore Reserve
- Public Open Space
- Regional Open Space

Minimum APZs

- 21m wide APZ
- 27m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class C Shrubland
- Class D Scrub
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



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Job Number: 59293

Scale 1:3,000 at A3

Client: Tian An Australia

Coord. Sys. GDA2020 MGA Zone 50

Drawn By: jcrute | Checked By: LR | Version: Rev A | Date: 08-Aug-2024

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

APPENDIX H Map 2 of 9

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Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

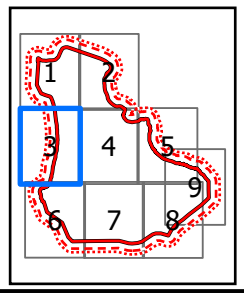
- Foreshore Reserve
- Public Open Space
- Mixed Use
- Village Centre
- 6m wide FSAR

Minimum APZs

- 15m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class D Scrub
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



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Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

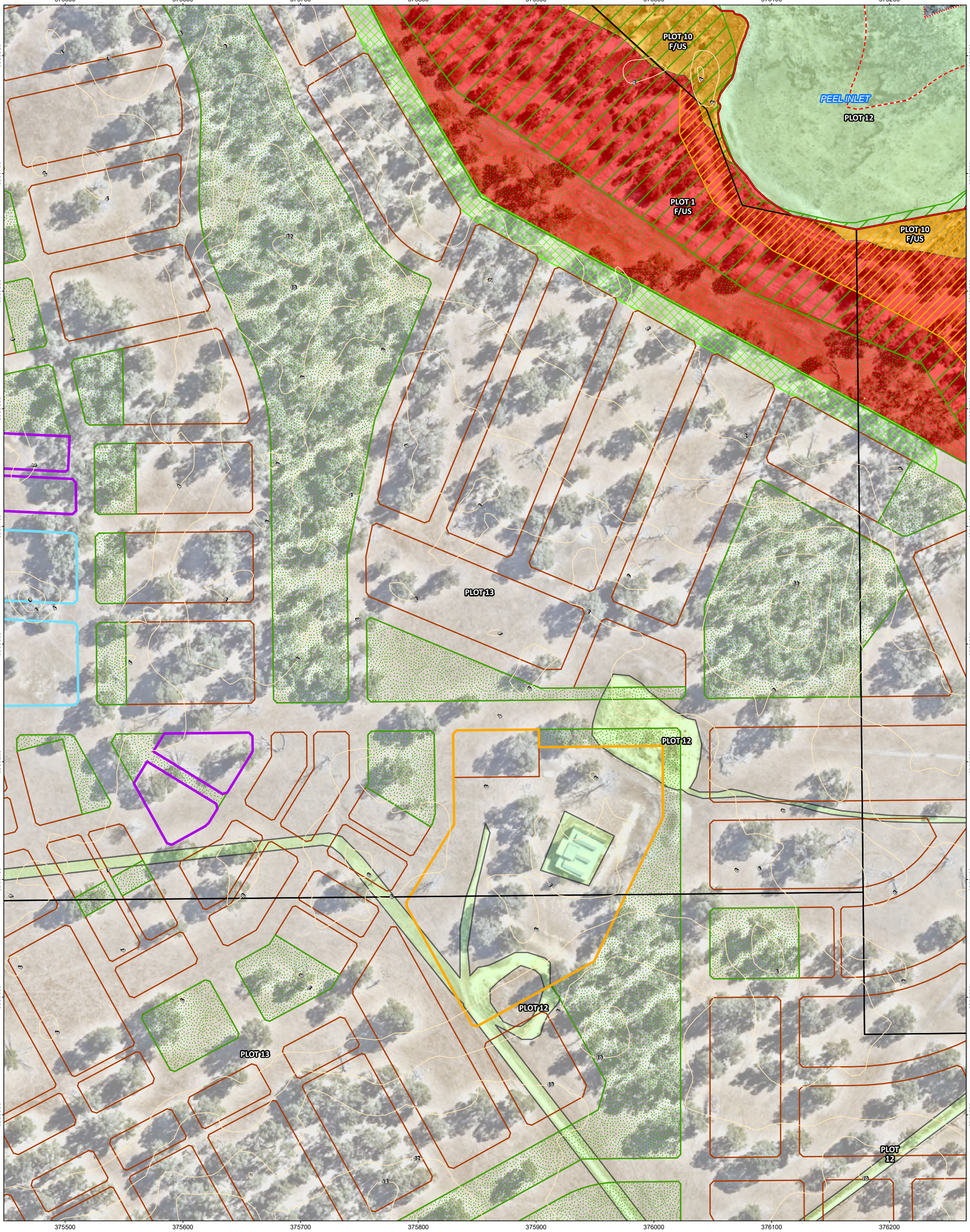
Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

APPENDIX H Map 3 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

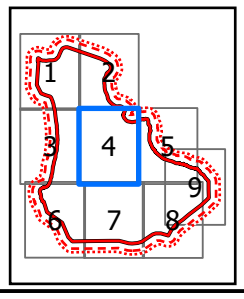
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Community/servicing
- Mixed Use
- Village Centre

Minimum APZs

- 21m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class C Shrubland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



JBS&G

0 100 Meters

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**APPENDIX H Map 4 of 9**

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Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

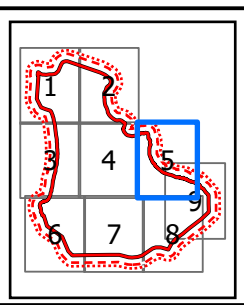
- Foreshore Reserve
- Public Open Space
- Regional Open Space

Minimum APZs

- 21m wide APZ
- 42m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class C Shrubland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



JBS&G

0 100 Meters

Point Grey, WA

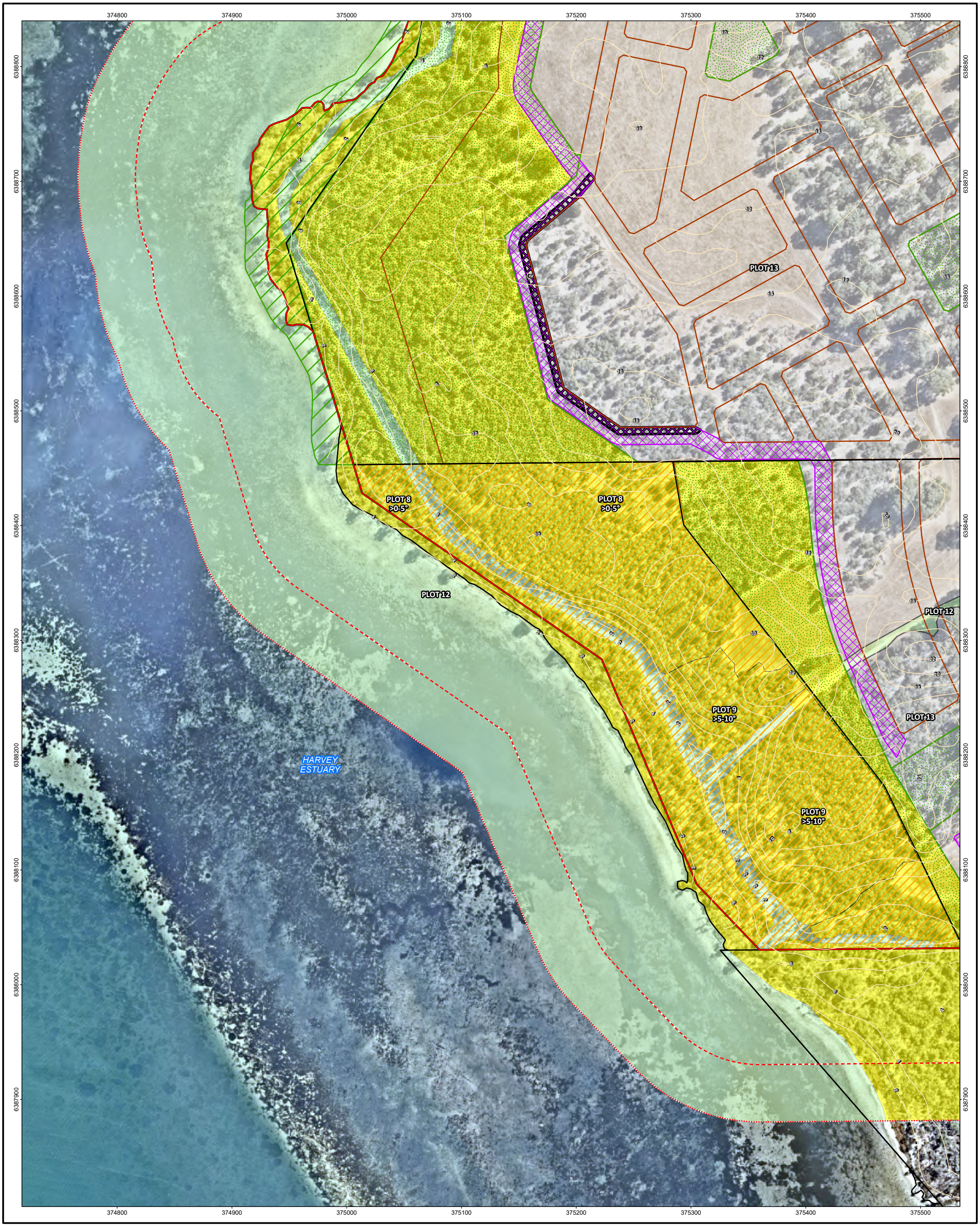
POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

APPENDIX H Map 5 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space

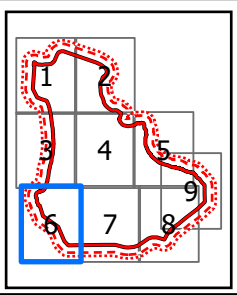
- 6m wide FSAR

Minimum APZs

- 15m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class D Scrub
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



JBS&G

0 100 Meters

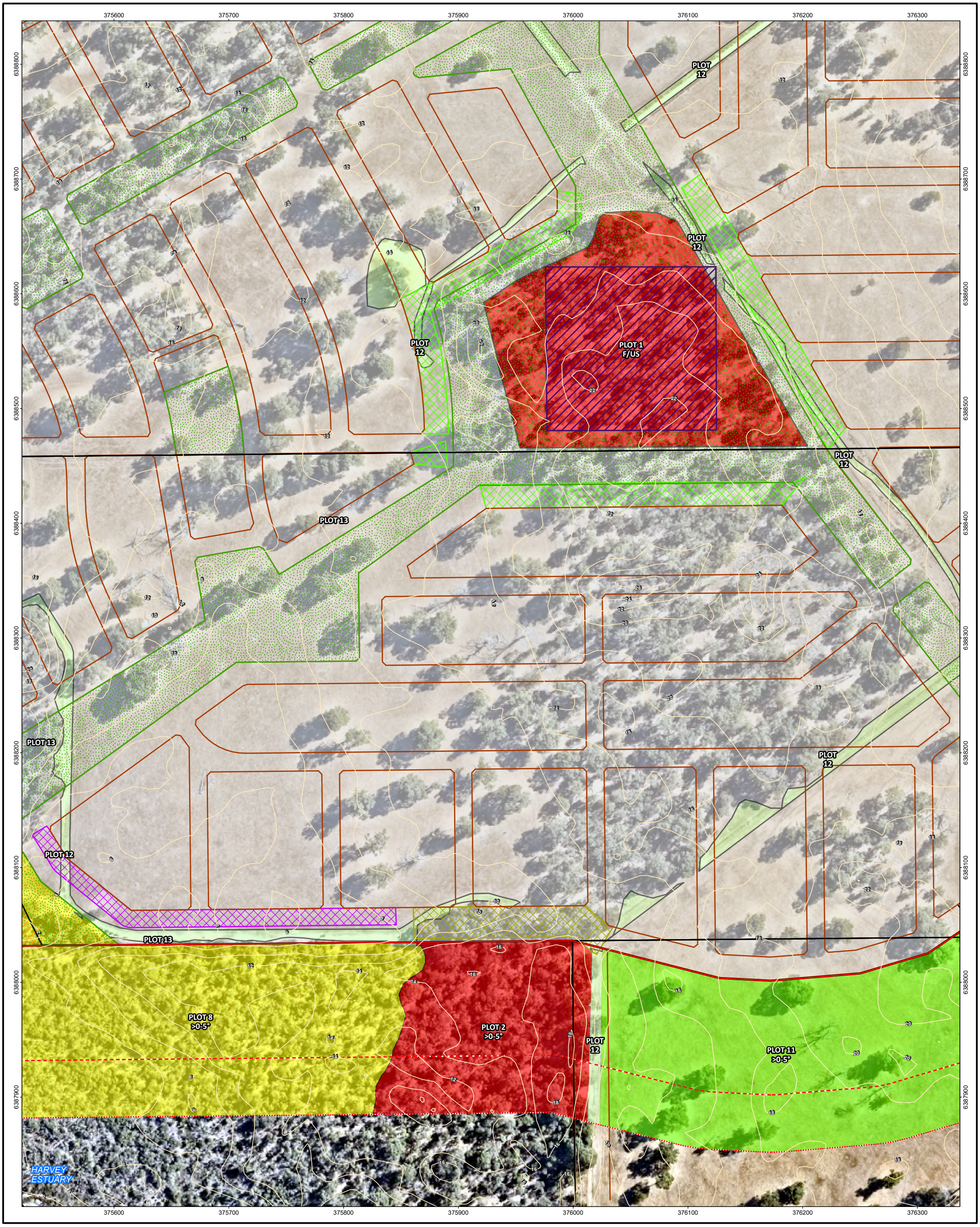
Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	APPENDIX H Map 6 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

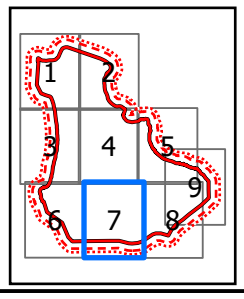
- Public Open Space
- Regional Open Space
- Conservation POS

Minimum APZs

- 14m wide APZ
- 15m wide APZ
- 21m wide APZ
- 27m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class D Scrub
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



JBS&G

0 100 Meters

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

APPENDIX H Map 7 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

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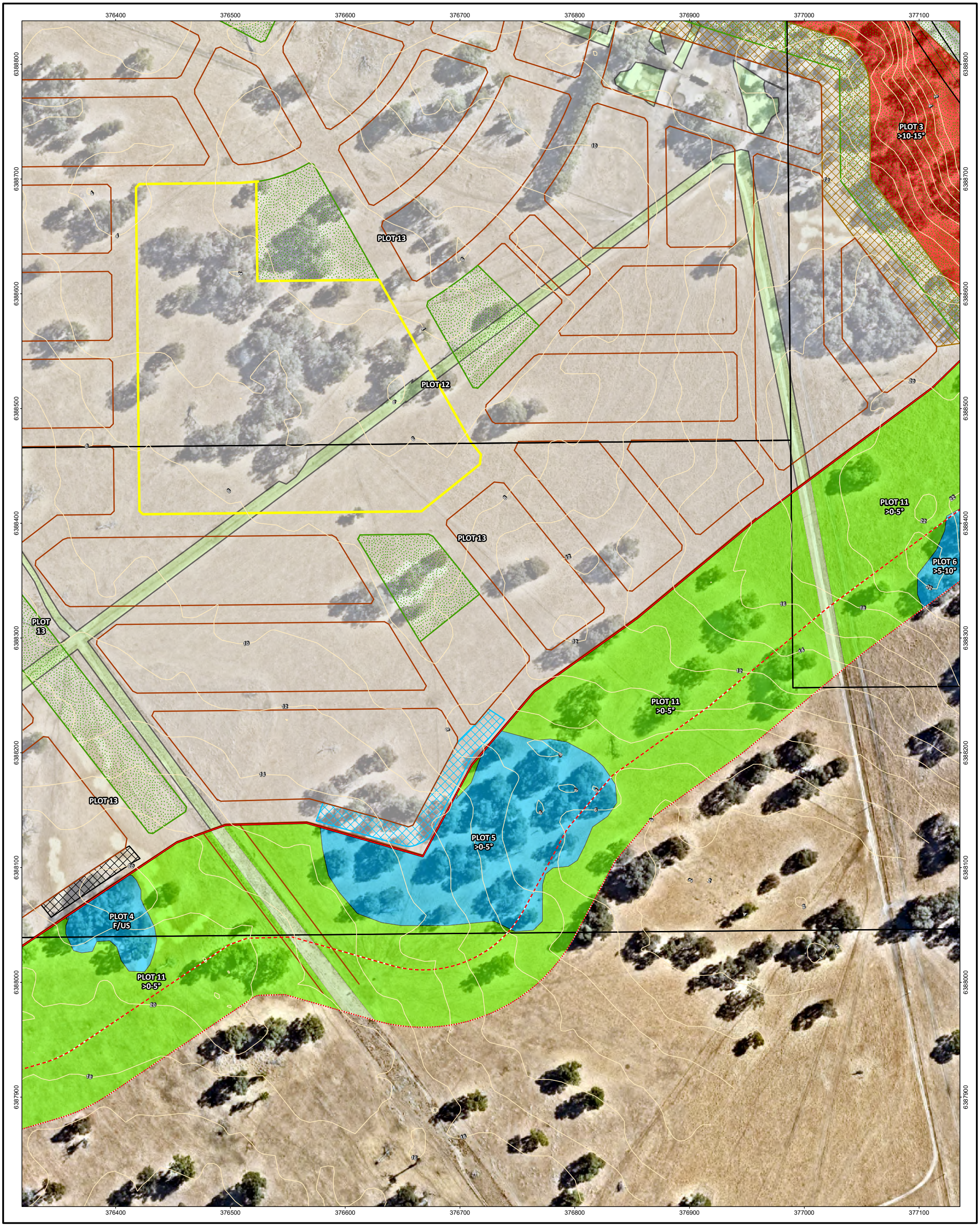


Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

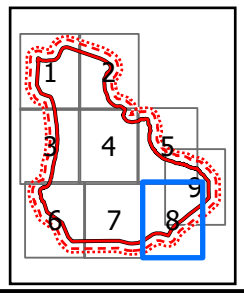
- Public Open Space
- Primary School

Minimum APZs

- 14m wide APZ
- 17m wide APZ
- 42m wide APZ
- Residential
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class B Woodland
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



JBS&G

0 100 Meters

Job Number: 59293

Scale 1:3,000 at A3

Client: Tian An Australia

Coord. Sys. GDA2020 MGA Zone 50

Drawn By: jcrute | Checked By: LR | Version: Rev A | Date: 08-Aug-2024

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

APPENDIX H Map 8 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

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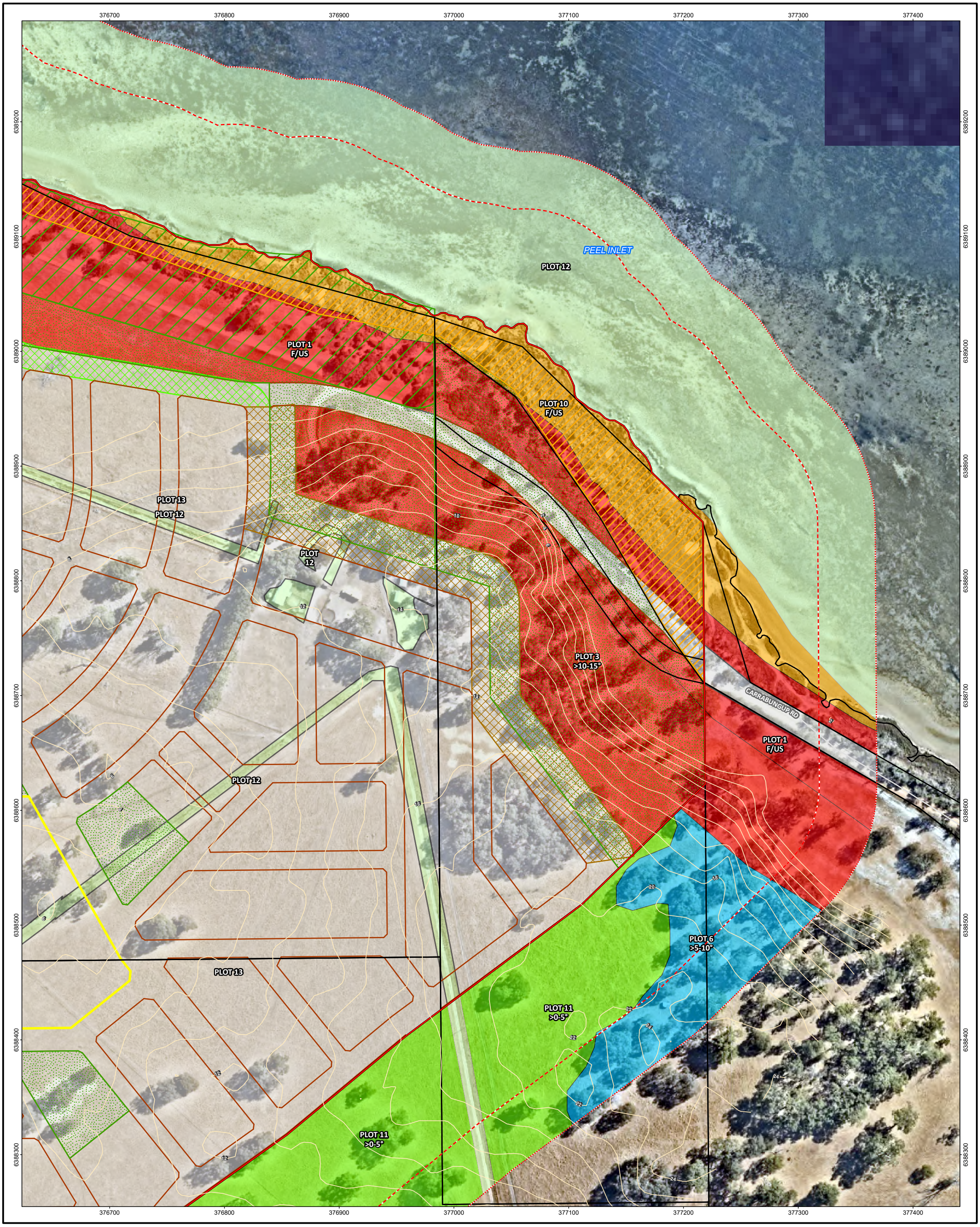


Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

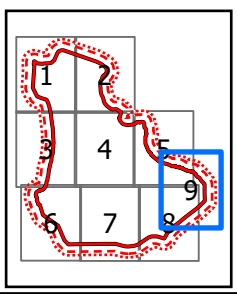
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Primary School

Minimum APZs

- 21m wide APZ
- 42m wide APZ
- Residential
- Topographic contours (mAHD)
- Minor road

Vegetation classification

- Class A Forest
- Class B Woodland
- Class C Shrubland
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state



JBS&G

0 100 Meters

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

Point Grey, WA

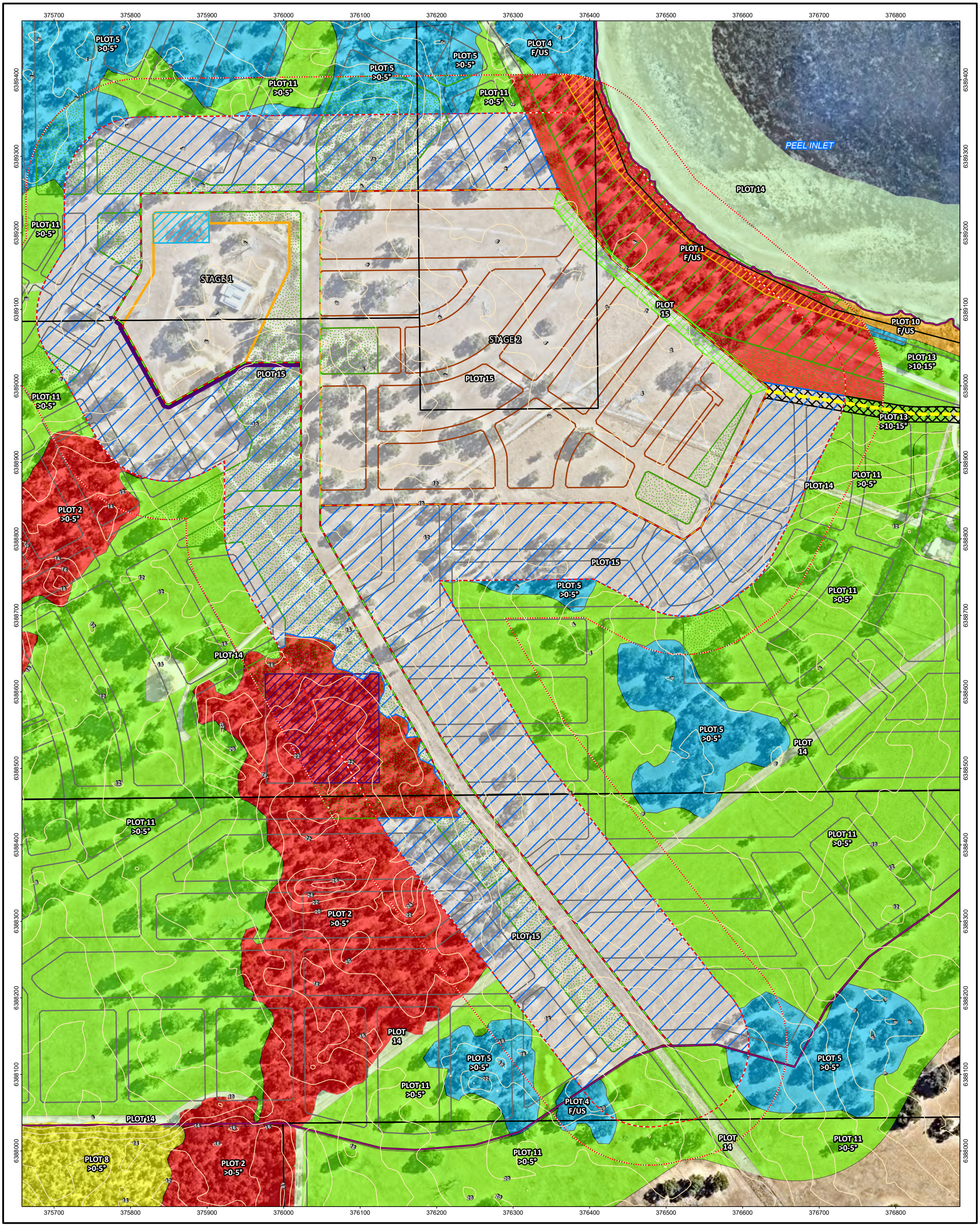
POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (FULL SITE BUILD OUT)

APPENDIX H Map 9 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Appendix I Post- development vegetation classifications and effective slope – Stages 1 and 2 (detailed view)



Legend

- Point Grey LSP Area
- Stage 1 and Stage 2 boundary
- 100m assessment area
- 150m assessment area
- Stage 1
- Stage 2
- Cadastral boundary
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Community/servicing
- 100m wide low threat staging buffer
- Minimum 21m wide APZ
- 6m wide fire service access route
- Community refuge building
- Future Carrabungup Rd extension
- Residential
- Future residential layout
- Temporary second access to Carrabungup Road
- Topographic contours (mAHD)

Vegetation classification

- Class A Forest
- Class B Woodland
- Class C Shrubland
- Class D Scrub
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Area to be modified to non-vegetated and low threat state

JBS&G

0 100 Meters

Point Grey, WA

POST-DEVELOPMENT VEGETATION CLASSIFICATION AND EFFECTIVE SLOPE (STAGES 1 AND 2)

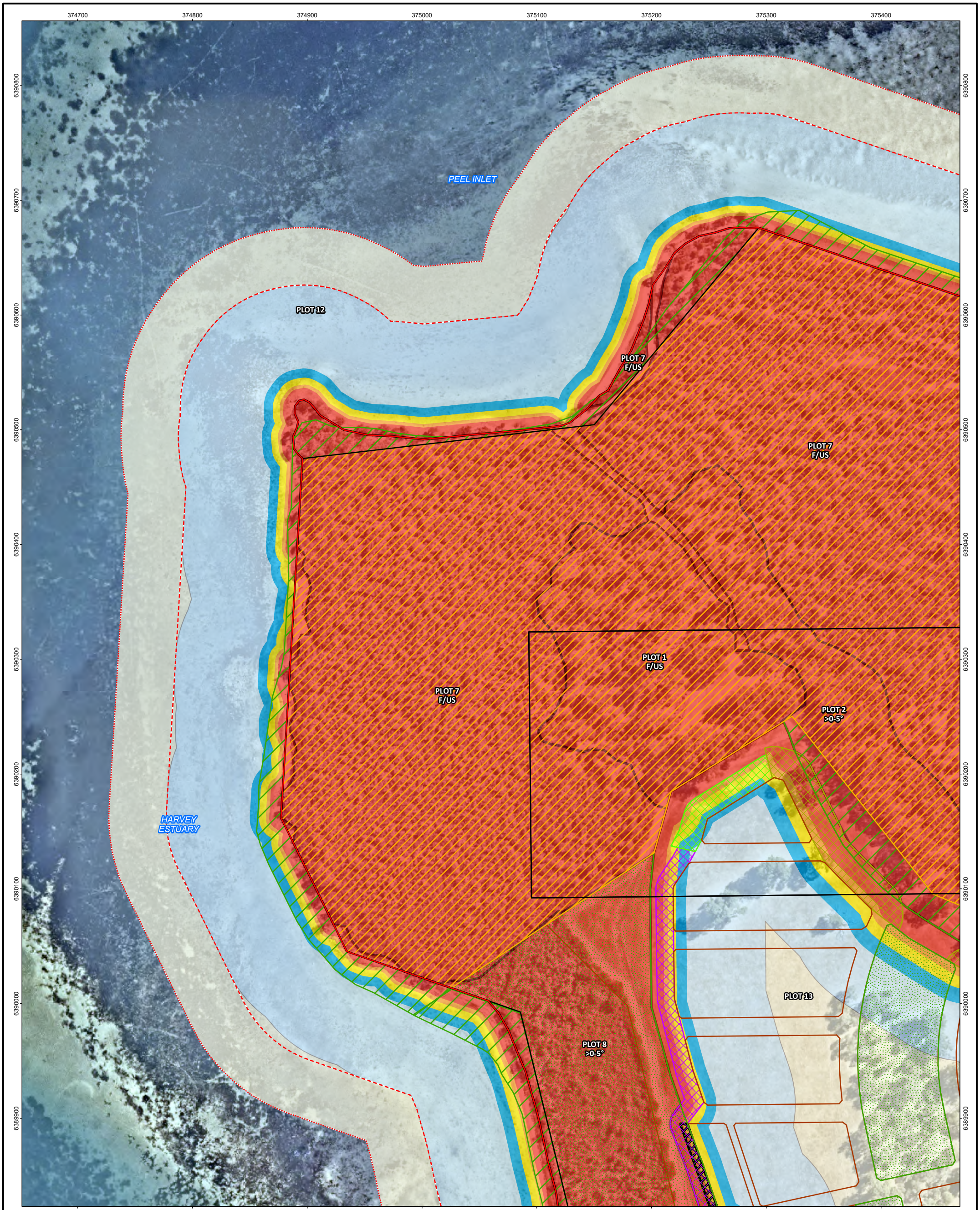
Job Number: 59293		Scale 1:4,500 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 20-Aug-2024

Appendix: I

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Appendix J Map series – BAL Contour Map (full site build out)



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

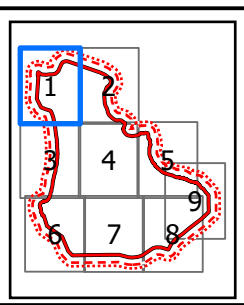
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- 6m wide FSAR

Minimum APZs

- 15m wide APZ
- 21m wide APZ
- 27m wide APZ
- Residential
- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

APPENDIX J Map 1 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

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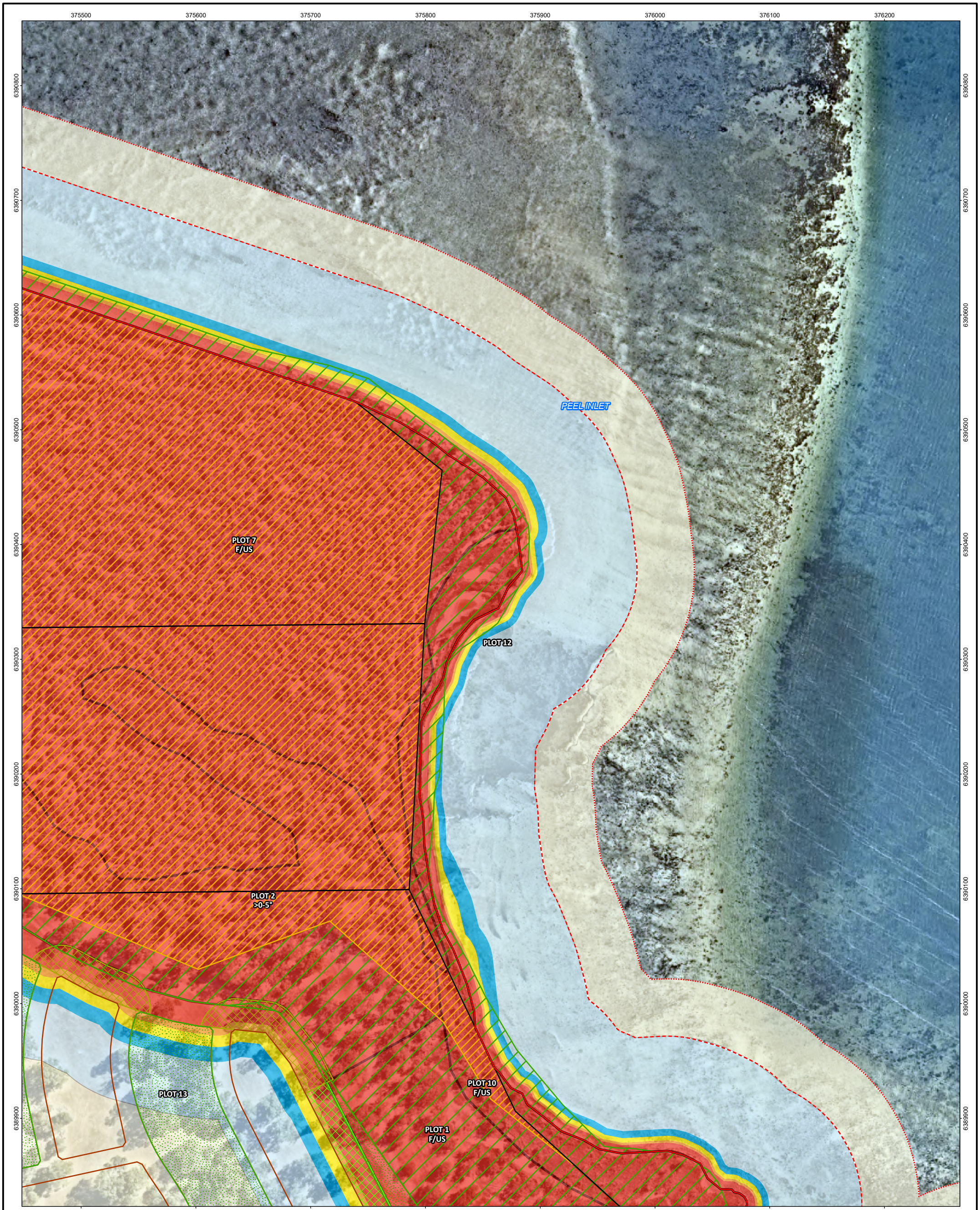


Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space

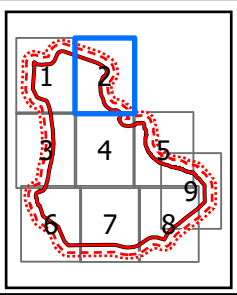
Minimum APZs

- 21m wide APZ
- 27m wide APZ
- Residential

- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

APPENDIX J Map 2 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

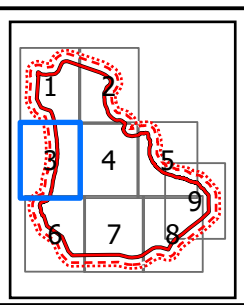
- Foreshore Reserve
- Public Open Space
- Mixed Use
- Village Centre
- 6m wide FSAR

Minimum APZs

- 15m wide APZ
- Residential
- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

APPENDIX J Map 3 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

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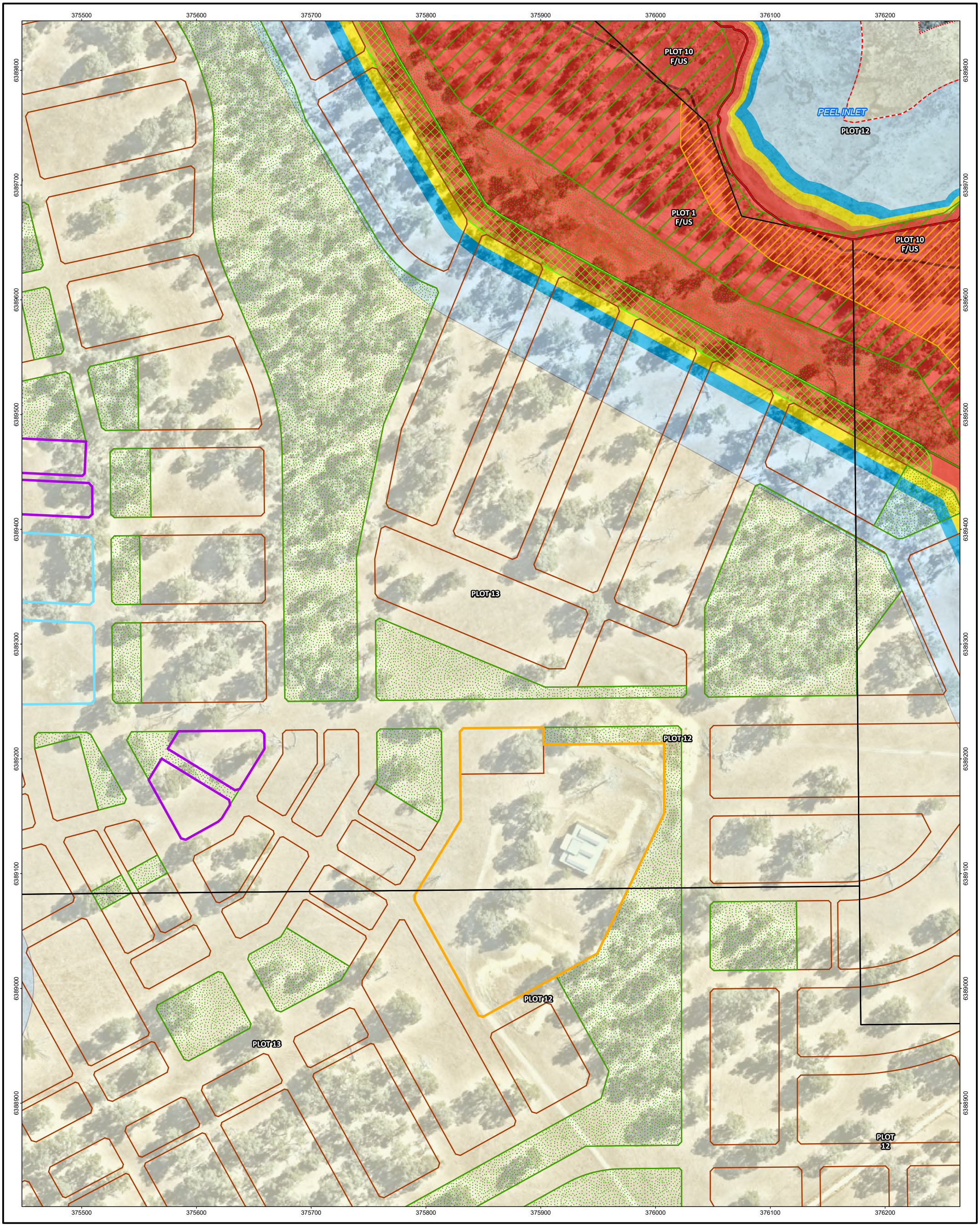


Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Community/servicing
- Mixed Use
- Village Centre

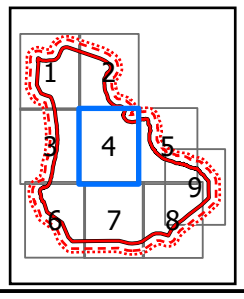
Minimum APZs

- 21m wide APZ
- Residential

- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**APPENDIX J Map 4 of 9**

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

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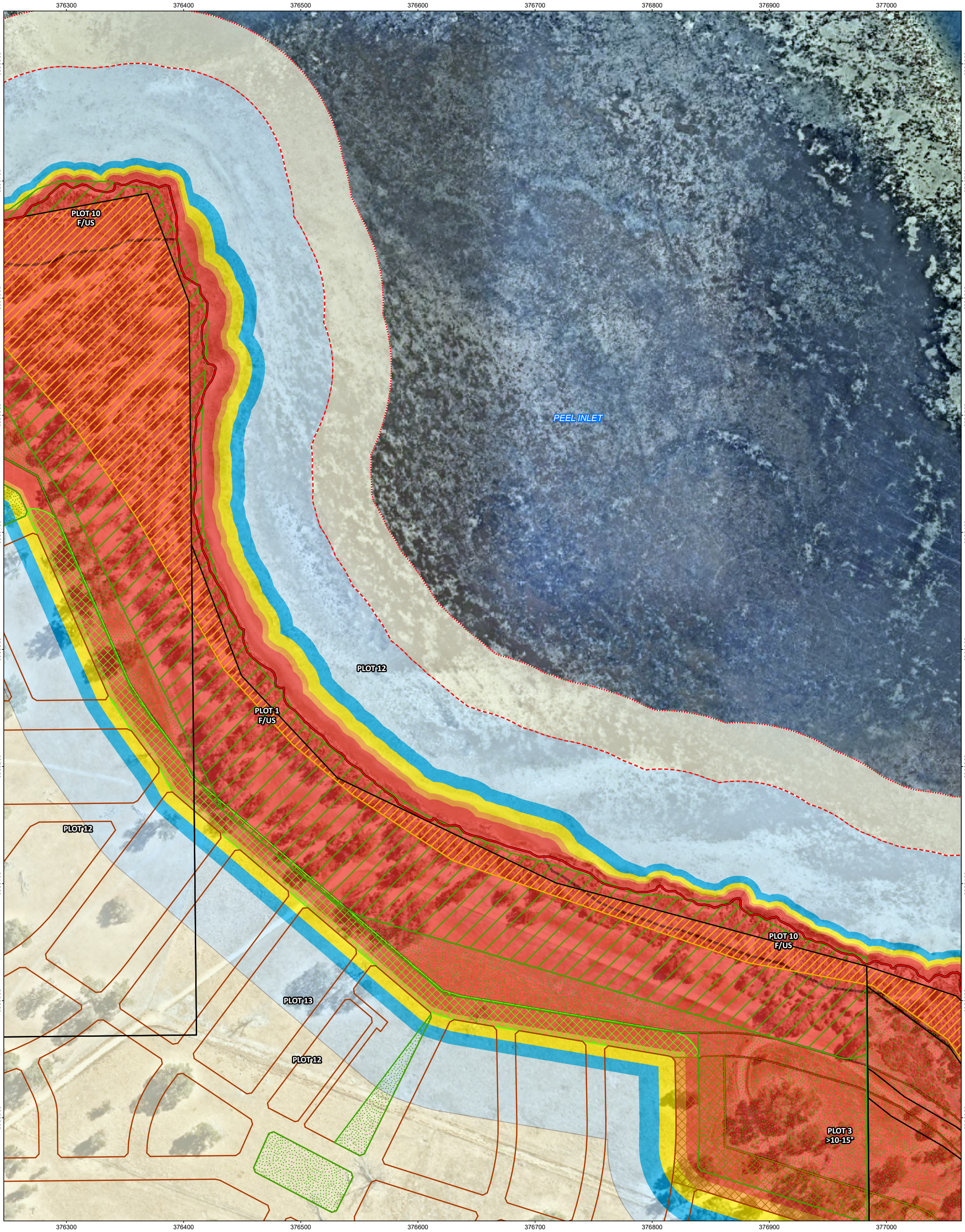


Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space

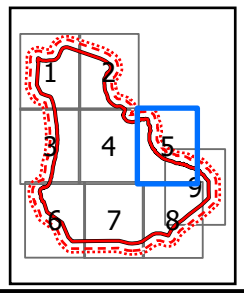
Minimum APZs

- 21m wide APZ
- 42m wide APZ
- Residential

- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3		
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50		
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024	**APPENDIX J Map 5 of 9**

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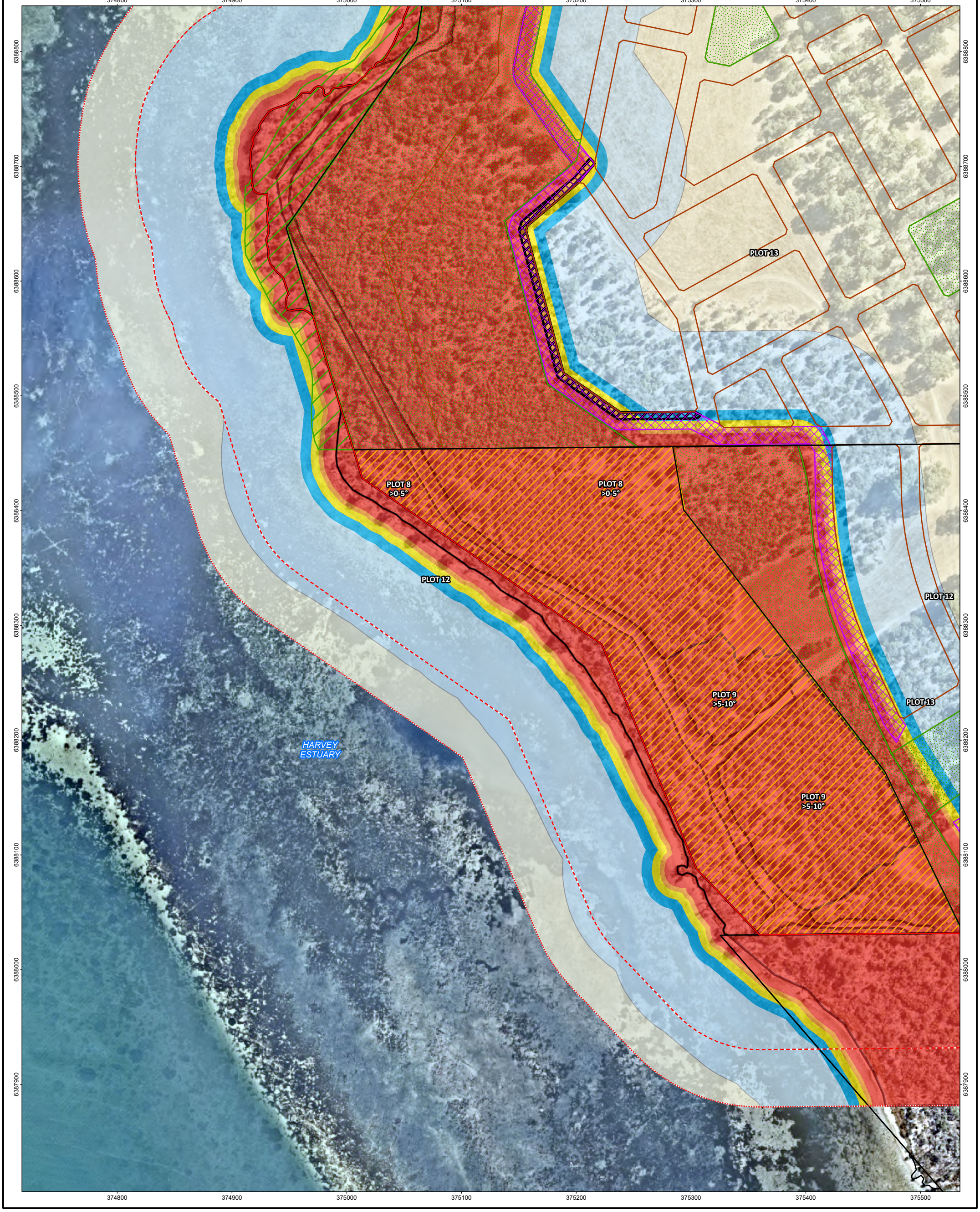


Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Foreshore Reserve
- Public Open Space
- Regional Open Space
- 6m wide FSAR

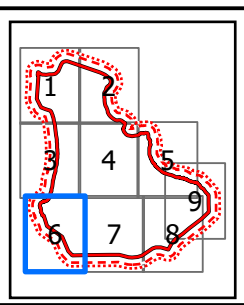
Minimum APZs

- 15m wide APZ
- Residential

- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

APPENDIX J Map 6 of 9

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375600 375700 375800 375900 376000 376100 376200 376300

6388800 6388700 6388600 6388500 6388400 6388300 6388200 6388100 6388000 6387900

PLOT 12
PLOT 12
PLOT 1 F/US
PLOT 12
PLOT 12
PLOT 13
PLOT 13
PLOT 12
PLOT 12
PLOT 13
PLOT 8 >0-5°
PLOT 2 >0-5°
PLOT 12
PLOT 11 >0-5°
HARVEY ESTUARY

Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Public Open Space
- Regional Open Space
- Conservation POS

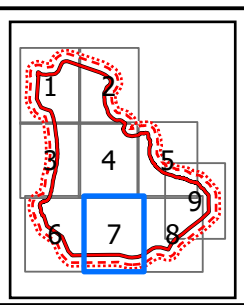
Minimum APZs

- 14m wide APZ
- 15m wide APZ
- 21m wide APZ
- 27m wide APZ
- Residential

- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

APPENDIX J Map 7 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

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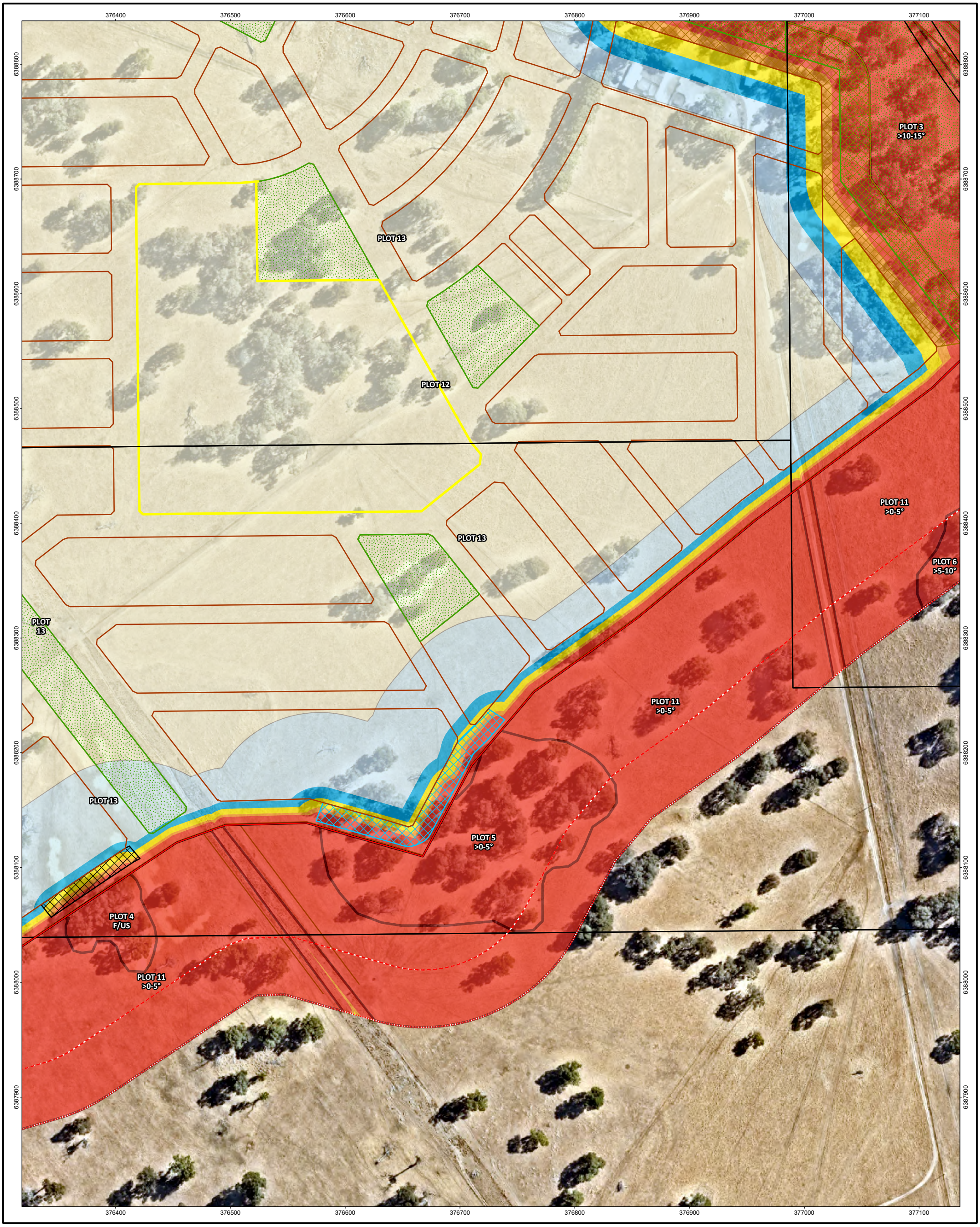


Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

- Public Open Space
- Primary School

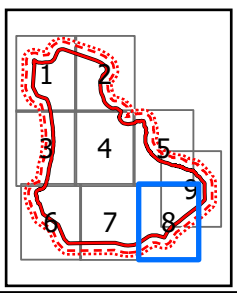
Minimum APZs

- 14m wide APZ
- 17m wide APZ
- 42m wide APZ
- Residential

- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

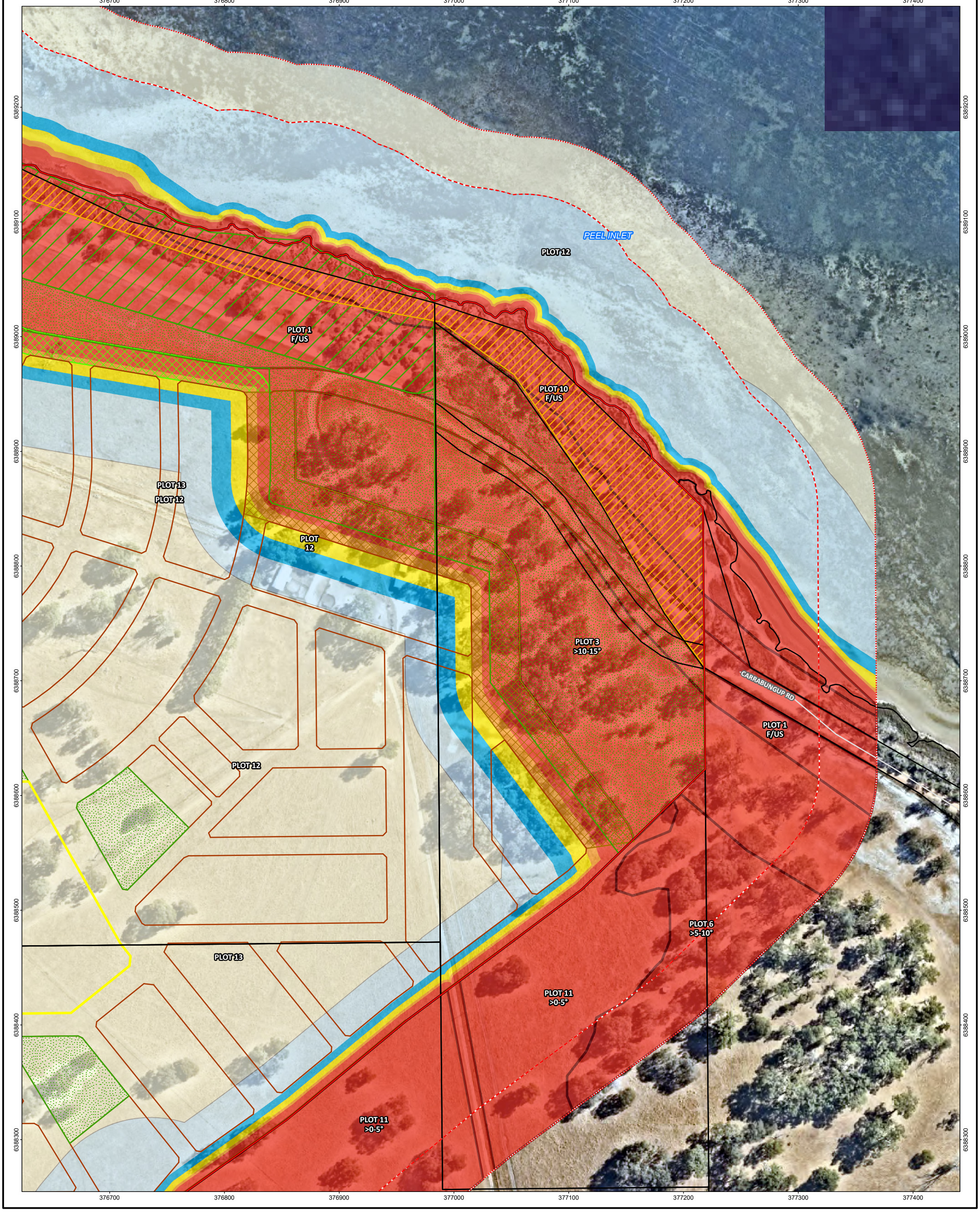
Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

APPENDIX J Map 8 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.



Legend

- Point Grey LSP Area
- 100m assessment area
- 150m assessment area
- Cadastral boundary

Development layout

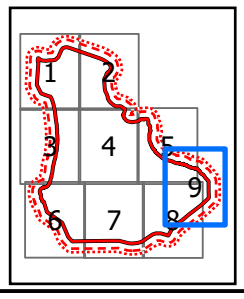
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Primary School

Minimum APZs

- 21m wide APZ
- 42m wide APZ
- Residential
- Minor road

BAL contours

- Classified vegetation
- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low



JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (FULL SITE BUILD OUT)

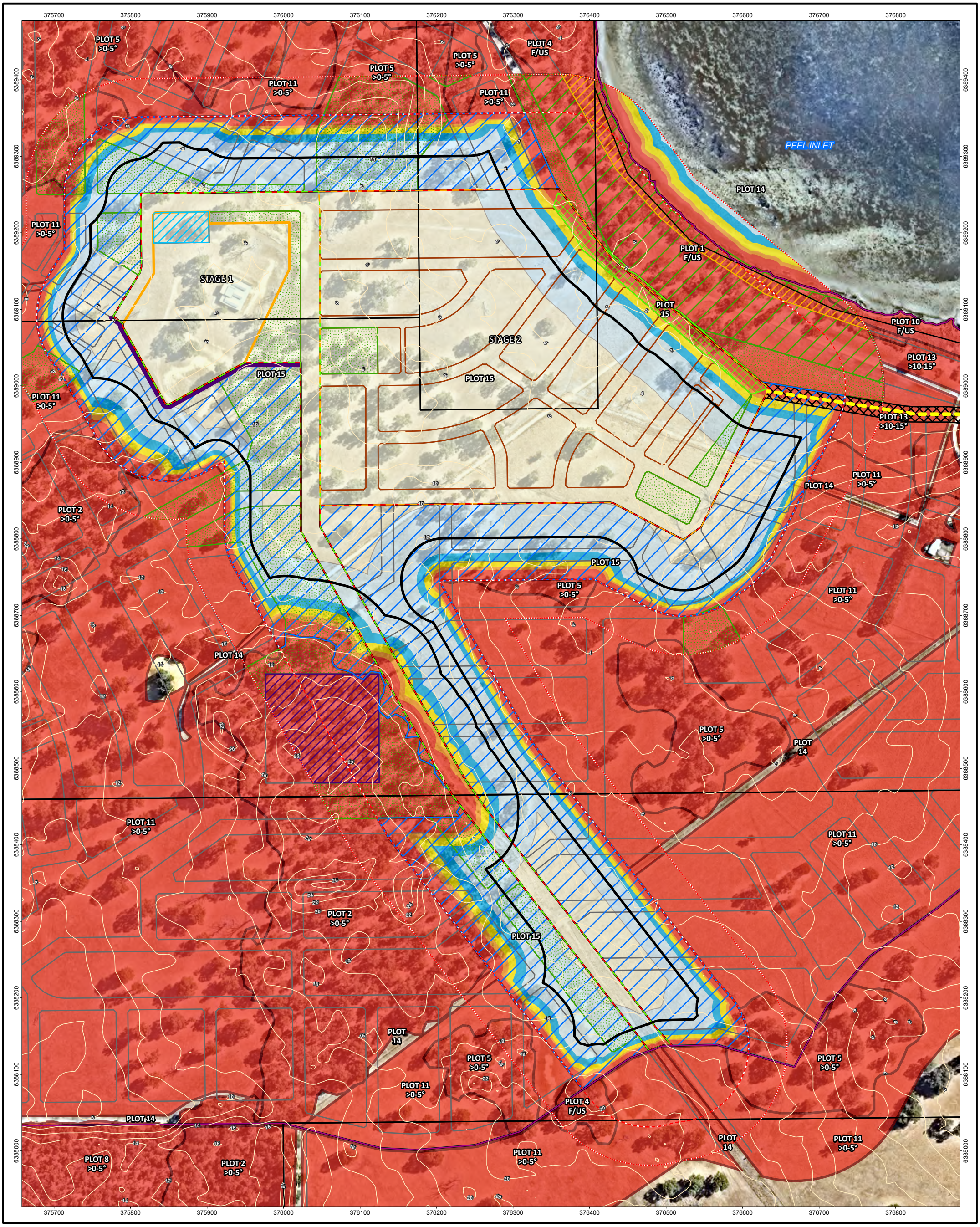
Job Number: 59293		Scale 1:3,000 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

APPENDIX J Map 9 of 9

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Appendix K BAL Contour Map – Stages 1 and 2 (detailed view)



Legend

- Point Grey LSP Area
- Stage 1 and Stage 2 boundary
- 100m assessment area
- 150m assessment area
- Stage 1
- Stage 2
- Cadastral boundary
- Foreshore Reserve
- Public Open Space
- Regional Open Space
- Conservation POS
- Community/servicing
- Minimum 21m wide APZ
- 6m wide fire service access route
- Community refuge building
- Future Carrabungup Rd extension
- Residential
- Future residential layout
- Temporary second access to Carrabungup Road
- Topographic contours (mAHD)
- <10kW/m2 line
- Classified vegetation

BAL contours

- BAL FZ
- BAL 40
- BAL 29
- BAL 19
- BAL 12.5
- BAL Low

JBS&G

0 100 Meters

Point Grey, WA

BAL CONTOUR MAP (STAGES 1 AND 2)

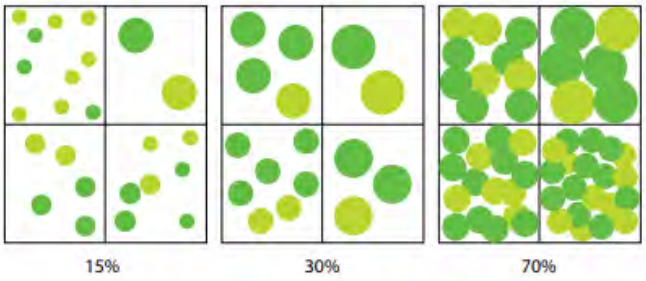
Job Number: 59293		Scale 1:4,500 at A3	
Client: Tian An Australia		Coord. Sys. GDA2020 MGA Zone 50	
Drawn By: jcrute	Checked By: LR	Version: Rev A	Date: 08-Aug-2024

Appendix: K

Document Path: C:\Users\jcrute\JBS&G Australia\JBS&G - DCS - Internal - Documents\Projects\Tian An Australia\59293 Point Grey ACP BMP\GIS\02_MapProjects\59293 Point Grey_R01\59293 Point Grey_R01.aprx

Image Reference: www.nearmap.com© - Imagery Date: 04. April 2024.

Appendix L Asset Protection Zone standards

Schedule 1: Standards for Asset Protection Zones	
Object	**Requirement**
Fences within the APZ	• Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959).
Fine fuel load (Combustible, dead vegetation matter <6 millimetres in thickness)	• Should be managed and removed on a regular basis to maintain a low threat state. • Should be maintained at <2 tonnes per hectare (on average). • Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness.
Trees* (>6 metres in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be <15 per cent of the total APZ area. • Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ. **Figure 19:** Tree canopy cover – ranging from 15 to 70 per cent at maturity 
Shrub* and scrub* (0.5 metres to six metres in height). Shrub and scrub >6 metres in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings. • Should not be planted in clumps >5 square metres in area. • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground covers* (<0.5 metres in height. Ground covers >0.5 metres in height are to be treated as shrubs)	• Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. • Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
Grass	• Grass should be maintained at a height of 100 millimetres or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
Defendable space	Within three metres of each wall or supporting post of a habitable building, the area is kept

Schedule 1: Standards for Asset Protection Zones	
	free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
LP Gas Cylinders	Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building. The pressure relief valve should point away from the house. No flammable material within six metres from the front of the valve. Must sit on a firm, level and non-combustible base and be secured to a solid structure.

***** *Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Element 2 Explanatory Notes

E2 Managing an Asset Protection Zone (APZ) to a low threat state

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defendable space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defendable space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

The width of an APZ varies with slope and vegetation type, however it should only be as wide as needed to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL-29), or 10kW/m² where a building is identified for use as an on-site shelter. An APZ is generally not required where a building or development site achieves 29kW/m² (BAL-29) or lower in its pre-development state (prior to any vegetation clearing or modification).

An APZ should include an area of defendable space immediately adjoining a building, that is kept free from combustible items and obstructions, within which firefighting operations can be undertaken to defend the structure. Where a lot contains a building envelope, it may not be necessary for the entire building envelope to achieve 29kW/m² (BAL-29) as this may result in significant unnecessary clearing. It is recommended that the BMP identifies that a sufficient APZ can be accommodated within the building envelope, with the development site and associated APZ to be determined at the development approval stage.

An APZ should be contained within the boundaries of the lot on which the building is situated, except in instances where it is demonstrated that the vegetation on the adjoining land is managed in a low threat state, as per cl. 2.2.3.2 of AS 3959, such as a road, managed park, rocky outcrop or a water body.

The siting of a habitable building and associated APZ should aim to minimise the clearing of vegetation. The BMP should demonstrate that the proposed APZ has minimised the unnecessary loss of vegetation or potential for conflict with landscape or environmental objectives; and complies with environmental approvals/exemptions (where necessary). A re-design or reduction in lot yield may be necessary to minimise the removal and modification of remnant vegetation.

It is recommended that development be located on flat areas or slopes less than 20 degrees (especially where classified vegetation is located downslope to a building) and away from ridge tops, crests or narrow gullies, as bushfire can spread rapidly in these areas. Circumstances where these locations may be suitable for development to occur include where the land is already cleared, and 29kW/m² (BAL-29) or lower can be achieved for the whole development site without the use of an APZ. To ensure soil stability within an APZ, vegetation removal on slopes exceeding 18 degrees is discouraged.

Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment. Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.

A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams. Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare. Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.

The landowner or proponent is responsible for maintaining an APZ in accordance with Schedule 1 - Standards for Asset Protection Zones. Ongoing maintenance of an APZ is usually enforced through the local government firebreak notice issued under section 33 of the Bushfires Act 1954, and/or through a condition of a development approval, which requires the implementation of measures identified within a BMP.

A copy of the firebreak notice and Schedule 1 should be included in a BMP specifically as a how-to guide for the landowner, and to demonstrate to decision-makers that the measures outlined in the BMP to achieve the appropriate BAL rating through provision and ongoing management of an APZ, can be implemented.

E2 Landscaping and design of an Asset Protection Zone

Landscaping, design, and maintenance of an APZ in a bushfire prone area can significantly improve the bushfire resilience of a building. An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that gives holistic consideration to how existing or proposed vegetation or non-combustible features

interact with, or affect the building's bushfire resilience.

A well designed APZ provides a greater level of vegetation management within the first few metres of a building with, for example, less vegetation or inclusion of non-combustible materials. The vegetation within the remainder of an APZ can increase further away from the building with carefully considered plant selection and landscaping techniques.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation (refer to E2 Plant Flammability) to create horizontal and vertical separations between the retained vegetation. The accumulation of fine fuel load from different plants is an important consideration for ongoing maintenance in accordance with Schedule 1. For example, when planting ground covers under deciduous trees within an APZ, the total fine fuel load prescribed in Schedule 1 will include any dead plant material from ground covers and leaf litter from the trees.

Plant density and final structure and form of mature vegetation should be considered in the initial landscaping stages. For example, clumps of sapling shrubs planted at a density without consideration of future growth, may increase the bushfire risk as a clump will quickly grow to exceed $5m^2$. It should be noted that in some cases, a single shrub in a mature state may be so dense as to fill a $5m^2$ clump alone.

The location of plants within an APZ is a key design technique. Separation of garden beds with areas of low fuel or non-combustible material, will break up fuel continuity and reduce the likelihood of a bushfire running through an APZ and subjecting a dwelling to radiant heat or direct flame contact. It is important to note, where mature trees are separated from a building by six metres, but the canopy has grown to extend or overhang a building, maintenance and pruning to remove the overhanging branches should be undertaken without the entirety of the tree being removed.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, rock and crushed mineral earth is encouraged. Wood mulch >6mm in thickness may be used, however it is recommended that it is used in garden beds or areas where the moisture level is higher by regular irrigation. These materials could be sourced from non-toxic construction and demolition waste giving the added benefit of reducing the environmental impact of any 'hard landscaping' actions.

Combustible objects, plants, garden supplies such as mulches, fences made from combustible material, should be avoided within 10 metres of a building. Vines or climbing plants on pergolas, posts or beams, should be located away from vulnerable parts of the building, such as windows and doors. Non-flammable features can be used to provide hazard separation from classified vegetation, such as tennis courts, pools, lawns and driveways or paths that use inorganic mulches (gravel or crushed rock). Consider locating firewood stacks away from trees and habitable buildings.

Incorporation of landscaping features, such as masonry feature walls can provide habitable buildings with barriers to wind, radiant heat and embers. These features can include noise walls or wind breaks. Use of Appendix F of AS 3959 for bushfire resistant timber selection within areas of $29kW/m^2$ (BAL-29) or below, or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged.

In addition to regular maintenance of an APZ, further bushfire protection can be provided at any time by:

- ensuring gutters are free from vegetation;
- installing gutter guards or plugs;
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps;
- trimming and removing dead plants or leaf litter;
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a building, particularly near windows and doors;
- removing vegetation in close proximity to a water tank to ensure it is not touching the sides of a tank; and/or
- following the requirements of the relevant local government section 33 fire break notice, which may include additional provisions such as locating wood piles more than 10 metres from a building.

Preparation of a property prior to the bushfire season and/or in anticipation of a bushfire is beneficial even if your plan is to evacuate. As embers can travel up to several kilometres from a bushfire and fall into small spaces and crevices or land against the external walls of a building, best practice recommends that objects within the APZ are moved away from the building prior to any bushfire event. Objects may include, but are not limited to:

- door mats;
- outdoor furniture;
- potted plants;
- shade sails or umbrellas;
- plastic garbage bins;

Element 2 Explanatory Notes

- firewood stacks;
- flammable sculptures; and/or
- playground equipment and children's toys.

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists, land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Appendix M Local Government Firebreak Notice

Shire of Murray

Bushfire Compliance Notice 2023/24

First and final notice

To all owners/occupiers of land within the Shire of Murray

Your property must comply with the requirements of this Bushfire Compliance Notice by 1 December 2023 and be maintained through to 15 May 2024

A maximum penalty of $5,000 applies for non-compliance of this Bushfire Compliance Notice

Pursuant to the powers contained in ***Section 33 of the Bush Fires Act 1954 (the Act)***, owners and/or occupiers of land within the Shire of Murray (Shire) are required to carry out fire preparedness work on their land that must comply with the requirements as stated in this Bushfire Compliance Notice (Notice). Fire preparedness work must be completed by **1 December 2023** and must be maintained through to **15 May 2024**.

Pursuant to Section ***33 (4) of the Bush Fires Act 1954***, where the owner and/or occupier of the land fails or neglects to comply with the requirements of this Notice within the times as specified in this Notice, the Shire may enter upon the land and carry out the requirements of this Notice that have not been completed by the owner and/or occupier of the land.

Pursuant to ***Section 33 (5) of the Bush Fires Act 1954***, the Shire may recover from the owner and/or occupier of land the amount of any costs and expenses incurred by the Shire to complete the requirements of this Notice that have not been completed by the owner and/or occupier of the land.

Important dates to remember

Restricted burning time one

Permit to burn required

1 October 2023 — 30 November 2023 (inclusive)

Fire preparedness works deadline

Completed by 30 November 2023

Maintained up to and including 15 May 2024

Prohibited burning time

Burning prohibited

1 December 2023 — 31 March 2024 (inclusive)

Restricted burning time two

Permit to burn required

1 April 2024 — 15 May 2024 (inclusive)

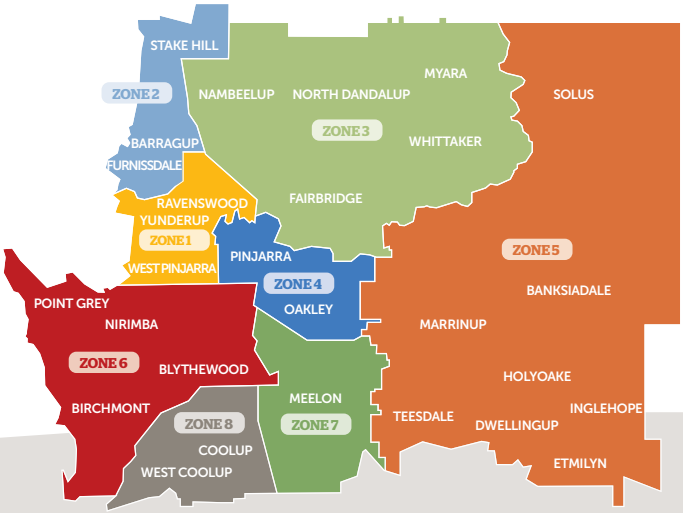
Note

- Unseasonal weather conditions may necessitate a variation to the above dates.
- Burning is prohibited on days where the Fire Danger Rating is High or above and if either a Total Fire Ban/ Harvest and Vehicle Movement Ban is declared.
- Prior to any burning, please contact and advise the DFES Communication Centre on (08) 9395 9209 as well as the Shire Ranger Services on (08) 9531 7709.

Permit to burn

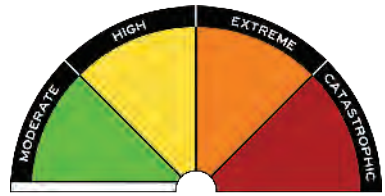
Please contact Shire of Murray Ranger Services on (08) 9531 7709 during normal business hours to arrange a Permit to Burn.

Zones for permit to burn



ZONE 1	Ravenswood, Yunderup and West Pinjarra
ZONE 2	Stake Hill, Barragup and Furnissdale
ZONE 3	Nambeelup, North Dandalup, Fairbridge, Myara and Whittaker
ZONE 4	Pinjarra and Oakely
ZONE 5	Solus, Banksiadale, Marrinup, Holyoake, Teesdale, Dwellingup, Inglehope and Etmilyn
ZONE 6	Point Grey, Nirimba, Blythewood and Birchmont
ZONE 7	Meelon
ZONE 8	Coolup and West Coolup

Australian Fire Danger Rating System (AFDRS)



Catastrophic

Fire Behaviour Index Range **100+**

Leave bushfire risk area

Unsafe for firefighters and community. Without initial attack success, likelihood of very large fire development is very high. High probability of loss of life and property.

Extreme

Fire Behaviour Index Range **50–99**

Take action now

Defensive suppression strategies. High levels of threat to life/ property. Safety of firefighters and community paramount.

High

Fire Behaviour Index Range **24-49**

Be ready to act

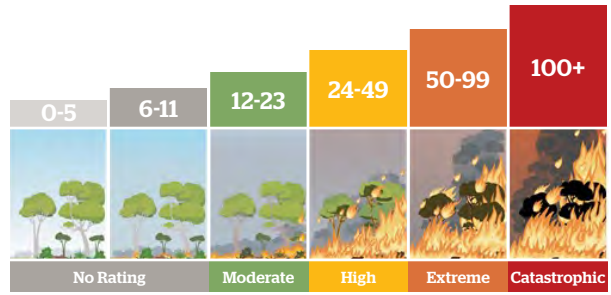
Initial attack success critical to prevent large fire development. Defensive suppression strategies.

Moderate

Fire Behaviour Index Range **12-23**

Plan and prepare

Most bushfires in this category. Fires typically suppressed with direct, parallel or indirect attack.



Stay informed

Total Fire Ban

Total Fire Bans (TFB) are declared by the Department of Fire and Emergency Services (DFES) because of extreme weather conditions or when widespread fires are seriously stretching firefighting resources.

During a TFB the lighting of any fires in the open air and any other activities that may start a fire, are prohibited, unless a written exemption or a notification requirement to a prescribed activity applies. This includes, but is not limited to:

- All open air fires for the purpose of cooking or camping (i.e. wood fuel barbeques, candles and pizza ovens).
- Incinerators, welding, grinding, soldering or gas cutting, angle grinders and lawnmowers.

Penalty: Up to $25,000 fine and/or a 12-month jail term.

Exemptions may be granted by DFES and must be requested in writing. Visit www.dfes.wa.gov.au.

Total Fire Ban information

1800 709 355

dfes.wa.gov.au | emergency.wa.gov.au

ABC720AM Local Radio

Harvest and Vehicle Movement Ban

Harvest and Vehicle Movement Bans (HVMB) in the district must be imposed by local government under the Bush Fires Regulations 1954 (Regs) when the local Fire Behaviour Index reaches 40 or as otherwise permitted under the Regs.

A HVMB may be imposed for any length of time but is generally imposed for 'heat of the day' periods and may be extended or revoked as weather conditions change.

During a HVMB the use of the following items is prohibited, in order to mitigate the associated risk of causing or contributing to the spread of a bushfire:

- Engines, vehicles, plant and machinery.

Harvest and Vehicle Movement Ban information

Shire of Murray 08 9531 7777

ABC720AM Local Radio

Local Fire Control Officer

EmergencyWA

emergency.wa.gov.au

SMS alerts

Broadcast of local Harvest and Vehicle Movement Bans, Total Fire Bans and other information. Subscribe via **murray.wa.gov.au.**

Please note: SMS alerts do not include alerts about fires or other emergencies.

Fire preparedness work requirements

Area of land - 4,000m² or less

Where the area of land is 4,000m² or less, all flammable material on the entire land must be reduced and must be maintained to a height of 50 millimetres or less.

Area of land - greater than 4,000m² and less than 45,000m²

Where the area of land is greater than 4,000m² and less than 45,000m² in size, construct and maintain a firebreak:

i. Inside all external boundaries of the land.

ii. Around all outbuildings, sheds, haystacks, groups of buildings and fuel depots/storage areas situated on the land.

Asset protection zone

i. Reduce and maintain to a height of 50 millimetres or less all flammable material within 20 metres of a habitable building.

ii. Maintain an access and/or driveway to the land free of flammable material not less than 3 metres in width and a minimum 4.5 metre vertical clearance to any overhanging vegetation.

Area of land - greater than 45,000m²

Where the area of land is greater than 45,000m² the land is not required to have firebreaks constructed except where the land is required to comply with clause (a) . Land owners and/or occupiers are encouraged to install firebreaks in strategic locations to protect their property from a bushfire or to prevent the spread of a bushfire.

a. Where land abuts other land that is in the ownership, leasehold, care, control or management of the Shire, State Government, State Government entity or State Government department (said land) the owner or occupier of the land that abuts said land is to construct and maintain a firebreak inside the external boundary of the land that abuts the said land.

b. Active bushfire preparedness work must be completed on the land throughout the period of this Notice, by means such as mowing, slashing, baling, and/or grazing by an appropriate number of livestock.

Asset protection zones

i. Reduce and maintain to a height of 50 millimeters or less all flammable material within 20 metres of a habitable building.

ii. Access ways and driveways to habitable buildings must be free of flammable material, must not be less than 3 metres in width and must have a minimum of 4.5 metre vertical clearance to any overhanging vegetation.

iii. Additionally, slash and maintain to a height of 100 millimeters or less all flammable material within 20 metres around any other buildings, haystacks and fuel storage areas on the land. OR

iv. Install a firebreak around all outbuildings, sheds, haystacks, groups of buildings and fuel depots/storage areas situated on the land

Bushfire Management Plan

All properties that are subject to a Bushfire Management Plan, or a Fire Management Plan, as a result of a subdivision or development application or a Shire approved treatment plan, must comply with the requirements of such plans in their entirety.

Plantations

Boundary firebreaks

All property boundaries must have a 15 metre firebreak installed. The outer 10 metres will be cleared of all flammable material while the inner five (5) metres (i.e. that portion closest to the trees) may be kept in a reduced fuel state by slashing or grazing grass to a height of less than 50 millimetres. This includes the trimming back of all overhanging limbs, bushes, shrubs and any other object encroaching into the vertical axis above the outer 10 metres of the firebreak area.

Internal firebreaks

Plantation area must be subdivided into areas not greater than 30 hectares, separated by six (6) metre wide firebreaks. This includes the trimming back of all overhanging limbs, bushes, shrubs and any other object encroaching into the vertical axis of the firebreak area.

Special risks

Public road and railway reserve firebreaks 15 metres wide shall be maintained where the planted area adjoins public roads and railway reserves. The specification will be as for boundary firebreaks on planted areas.

Firebreaks

Firebreaks shall be provided along power lines where they pass through or lie adjacent to planted areas. The specification of the width and height of clearing shall be in accordance with Western Power specifications.

Furthermore, all plantations shall comply with requirements contained in the Department of Fire and Emergency Services (DFES) guidelines or standards for Plantation Fire Protection.

Standards for firebreaks

All firebreaks as required by this Notice shall be constructed and maintained, where applicable, in accordance with the DFES Guide to Constructing and Maintaining Firebreaks.

A copy of this Guide is available on the Shire's website at www.murray.wa.gov.au or can be obtained by contacting Ranger Services on 08 9531 7709.

Additional fire preparedness work

In addition to the requirements of this Notice, regardless of land size and location, the owner and/or occupier of land may be required to carry out additional fire preparedness work to reduce bushfire risk considered necessary by an Authorised Officer of the Shire. Any additional fire preparedness work would be specified by way of a Work Order forwarded to the address of the owner and/or occupier of the land.

The following are examples of additional fire preparedness work that may be requested by the issuing of a Work Order:

- Ensure roofs, gutters and walls of all buildings on the land are free of flammable material.
- Remove accumulated fuel such as leaf litter, twigs, dead bush and dead trees capable of carrying fire.
- Reduce unmanaged grasses/weeds by slashing, mowing or other means.
- Reduce long grasses in areas that have not been grazed by livestock or cultivated by mowing, slashing, baling or by other means.
- Reduce vegetation on the land to a low fire risk state from the outer edge of the firebreak through to the property boundary (e.g. no long grass or overhanging branches).
- Reduce to a low fire risk any adjacent verge, road reserve, drain that is adjacent to the land.
- Assets identified in the Shire's ***Bushfire Risk Management Plan 2021 - 2026*** or any land identified with a Bush Fire Management Plan or a treatment plan to reduce bushfire risk to assets.

Engaging contractors for fire preparedness work

Any owner and/or occupier of land who engages a contractor to carry out fire preparedness work on behalf of the owner and/or occupier of the land will be held responsible for ensuring that any completed fire preparedness work complies with the requirements of this Notice.

Previous notices

Any Notice previously published by the Shire in the Government Gazette or in any locally circulated newsprint is hereby revoked.

Variation to the bushfire compliance notice

If an owner and/or occupier of land considers that it may be impractical to clear firebreaks or undertake other fire preparedness work on their land as required by this Notice they may apply to the Shire for a variation to the requirements contained in this Notice.

A Bushfire Compliance Notice Variation Application Form (Form) is available on the Shire website at www.murray.wa.gov.au or can be obtained by phoning Ranger Services on 08 9531 7709.

A completed Form can be submitted to the Shire from 1 April 2023 until 1 October 2023. Any Form received after 1 October 2023 may not be accepted.

Note: *A variation is not an exemption to the requirements of this Notice, but an application to establish other methods of fire preparedness work to land that you own and / or occupy.*

If the Shire does not grant an approval for a variation to this Notice a land owner/occupier must comply with all requirements contained in this Notice.

Lighting of camp fires or cooking fires

Pursuant to ***Section 25 (1a) of the Bush Fires Act 1954***, Notice is hereby given that the lighting of camp fires or cooking fires is prohibited on all land within the Shire district during the Prohibited Burning Times.

This prohibition on the lighting of camp fires or cooking fires does not apply to a gas appliance that does not consume solid fuel and comprises of a fire, that the flame of which is fully encapsulated by the gas appliance.

Burning of garden refuse and rubbish

A permit to burn must be obtained prior to any burning on any land that is over 4,000m^2.

The burning of any material including garden refuse or garden rubbish on any land that is 4,000m^2 or less is strictly prohibited.

Important contacts

Report All Fires: Call 000

Department of Fire and Emergency Services

General enquiries
08 9395 9300

Emergency information
133 337 (13DFES)

Register your controlled burn
08 9395 9209

Department of Biodiversity, Conservation and Attractions

General enquiries
08 9290 6100

Shire of Murray Rangers and Community Safety
08 9531 7709

Shire of Murray

@ShireofMurray

Contact us

1915 Pinjarra Road,
Pinjarra WA 6208
PO Box 21 Pinjarra WA 6208

T: 08 9531 7777
F: 08 9531 1981

mailbag@murray.wa.gov.au
murray.wa.gov.au

Appendix N Vehicular access explanatory notes

Acceptable Solution A3.1 – Public Roads

Explanatory Note E3.1

These Guidelines do not prescribe values for the trafficable (carriageway/pavement) width of public roads as they should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area.

The IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards do not prescribe a horizontal clearance. However, it is recommended that a traversable verge is provided to allow for emergency services vehicles to stop and operate on the side of the public road, specifically where the public road may traverse large areas of classified vegetation.

Where local government roads are proposed to be widened by the proponent, they must obtain approval from the local government.

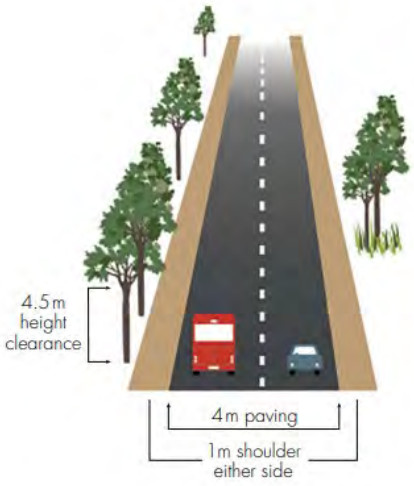


Figure 20: Example of a public road

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.2a – Multiple access routes

Explanatory Note E3.2a

Two-way public road access is public road access from a lot in at least two different directions to two suitable destinations, and provides residents and the community, as well as emergency services, with access and egress from both the subdivision and individual habitable buildings/development in the event of a bushfire emergency. A single road provides no alternative route if the access becomes congested or is unable to be traversed due to smoke and/or fallen trees during a bushfire.

Two-way public road access applies to access/egress routes leading into a subdivision, as well as those within a subdivision. A road that loops back onto itself does not constitute the option of two different directions.

Two-way public road access should always be the first option. Where the site is not able to achieve two-way access within 200 metres of the lot boundary, due to demonstrated site or environmental constraints, the proponent should identify options for an emergency access way from the subject site to a suitable destination. Where an emergency access way cannot be provided, the proponent should demonstrate compliance with the performance principle.

Subject sites or proposed lots greater than 200 metres from an intersection, which provides two-way access, do not satisfy the requirement for two-way access unless they meet the provisions which allow for no-through roads greater than 200 metres in A3.2a.

To demonstrate compliance with the performance principle for two-way access, the bushfire planning practitioner may have regard to:

a. the extent of the bushfire hazard, location and vegetation classification, the likelihood, potential severity and impact of bushfire to the subject site and the road network;
b. time between fire detection and the onset of conditions in comparison to travel time for the community to evacuate to a suitable destination;
c. available access route(s) travelling towards a suitable destination; and
d. turn-around area for a fire appliance for no-through roads.

Figure 21: Example of compliant and non-compliant two-way

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.2b – Emergency access way

Explanatory Note E3.2b

An emergency access way is not a preferred alternative to through public road access and should only be considered acceptable where it has been demonstrated that it will provide the safety and performance needs of emergency services and the community, including consideration for future needs, and that public road access to satisfy A3.2a cannot be achieved due to site constraints, such as an established road network with no opportunity to provide a public road for secondary access. Acceptance of an emergency access way should also consider the ability to accommodate reasonable worst-case vehicle volumes.

The principle function of the emergency access way is to provide a contingency (second) community evacuation route and simultaneously provide access for emergency services, in the event of a bushfire emergency. Where an emergency access way traverses classified vegetation, which has the potential to create a bushfire hazard, an emergency access way performs the secondary function of providing access by emergency services to this vegetation.

Emergency access ways should connect to a public road to allow alternative two-way through access. An emergency access way should not exceed 500 metres in length as they may not be as safe for road-use due to not being designed or constructed to the full requirements of a public road and may present uncertainties to emergency service personnel and the public as they are not part of the daily road network and not identified on Maps.

Permanent public emergency access way

An emergency access way can be provided as either a public easement in gross or a right-of-way. In both approaches, the management of the emergency access way is by the local government as the grantee of the easement or management body of the right-of-way. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the easement or right-of-way; this must be provided to the decision-maker prior to granting planning approval. The approach taken is at the discretion of the decision-maker and/ or the local government and is also dependent on whether the land is to remain in private ownership or be ceded to the Crown. Consultation with Land Use Management at the Department of Planning, Lands and Heritage should also be considered if the land is to be ceded to the Crown or if the local government is uncertain of which approach to take.

If the emergency access way is provided as an easement, it should be provided as a public easement in gross under sections 195 and 196 of the Land Administration Act 1997 in favour of the local government and/or public authority, to ensure accessibility for emergency services and the public at all times. To be provided as a right-of-way the emergency access way should be vested in the Crown under section 152 of the Planning and Development Act 2005 as a right-of-way and such land to be ceded free of cost and without any payment or compensation by the Crown. If gates are used to control traffic flow during non-emergency periods, these will be managed by the local government and must not be locked. Gates should be double gates wide enough to access the full pavement width and accommodate Type 3.4 fire appliances with the design and construction to be approved by the relevant local government.

Temporary public emergency access way

A temporary emergency access way may be proposed to facilitate the staging arrangements of a subdivision. The provision of two public roads may not be possible in the first stage of the subdivision and an emergency access way can be provided as an interim access route until the second public road is developed and gazetted in a subsequent stage of the subdivision (see figure 22). The emergency access way should be provided in the same manner as a permanent emergency access way, but it should be removed from the certificate of title once the public road is developed and gazetted. Where an emergency access way is proposed as an alternative to a public road, the Bushfire Management Plan should provide thorough justification for its use.

Restricted public emergency access way

There may be some instances where a restricted emergency access way is proposed as a performance principle based solution where access is only available to the public in the event of a bushfire emergency. This option can only be considered where the local government or Main Roads WA have advised that vehicular access on the emergency access way is not allowed during non-emergency periods, as it provides an additional thoroughfare and entry point on a local or State road. In this scenario, the emergency access way can be provided as an easement under section 195 of the Land Administration Act 1997, as public access in the event of a bushfire emergency or vested in the Crown as a reserve under section 152 of the Planning and Development Act 2005. Such land is to be ceded free of cost without any payment or compensation by the Crown. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the proposed reserve and agree to the terms of the

Acceptable Solution A3.2b – Emergency access way

Explanatory Note E3.2b

Management Order Conditions (if applicable); this must be provided to the decision-maker prior to granting planning approval.

The purpose of the reserve should be for a public purpose specified in the condition related to the subdivision, for example for emergency access only, or for emergency access and recreation. A reserve for emergency access and recreation can optimise the land-use as a dual purpose where it provides vehicular access in the event of a bushfire emergency, but can be accessed by the public (on foot) on a day-to-day basis as a recreation link. Appropriate signage can ensure the general public is aware of the purpose of the reserve. The approach taken is at the discretion of the decision-maker and/or local government.

Right-of-carriageway emergency access way

There may be some instances where a right-of-carriageway easement is proposed as a performance principle-based solution. This may be where particular landowner(s) and emergency services, but not the public, require access over a neighbouring lot(s). A right-of-carriageway easement should be provided under section 195 of the Land Administration Act 1997. The easement is to provide alternative access for the particular landowner(s) in the event of a bushfire emergency and not for use by the public. In this scenario, support will be necessary from the adjoining lot owner(s). The easement is to be granted to the local government and it is to agree with the landowner on the arrangements of the management of the easement area by deed. These management arrangements will be at the discretion of the local government. If gated, the easement area can be locked to restrict day-to-day vehicular access.

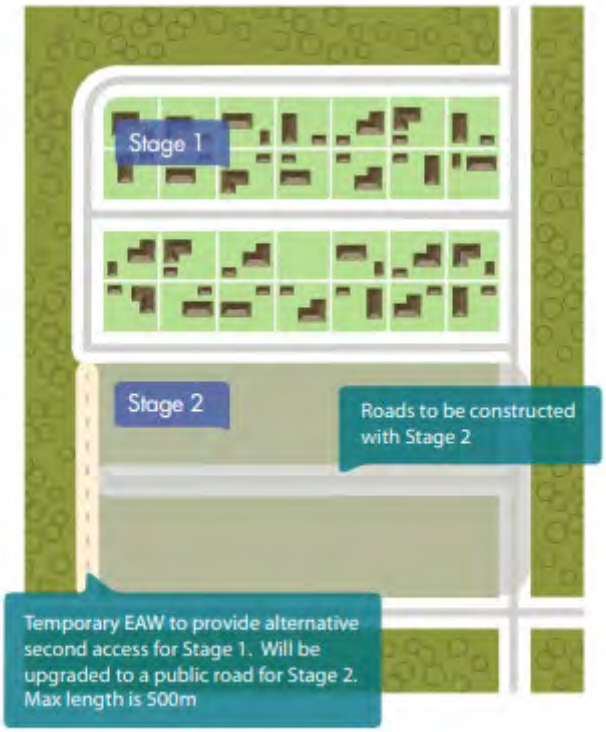


Figure 22: Example of an emergency access way

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.3 – Through roads

Explanatory Note E3.3

In bushfire prone areas, a proposed structure plan or subdivision that incorporates no-through roads should be avoided because they do not provide a connected and legible design that allows for easy access and egress by the community, residents and emergency services in the event of a bushfire. No-through roads also reduce the options available for access and egress in the event of a bushfire emergency.

There will however be situations where a subject site is accessed via an existing or proposed no-through road and alternative access cannot be provided. In these situations, the proponent should demonstrate to the decision-maker, that all efforts have been made with the local government and/or adjoining landowners to secure alternative public road access or an emergency access way and that a redesign has been explored. The bushfire planning practitioner may need to develop a performance principle-based solution or address the non-compliance and demonstrate to the decisionmaker why discretion should be exercised in accordance with section 2.6 of these Guidelines.

No-through roads will only be considered an acceptable solution where it is demonstrated by the proponent, to the satisfaction of the decision maker, that a no through-road cannot be avoided due to site constraints. For example, the internal road design of a structure plan or subdivision where site constraints, such as a water body or Bush Forever, prevent the ability to create a through-road and a no through road may be a more appropriate road layout.

No-through roads should be a maximum of 200 metres from the lot(s) boundary to an intersection where two-way access is provided and may only exceed 200 metres if it meets the provisions which allow for no-through roads greater than 200 metres in A3.2a.

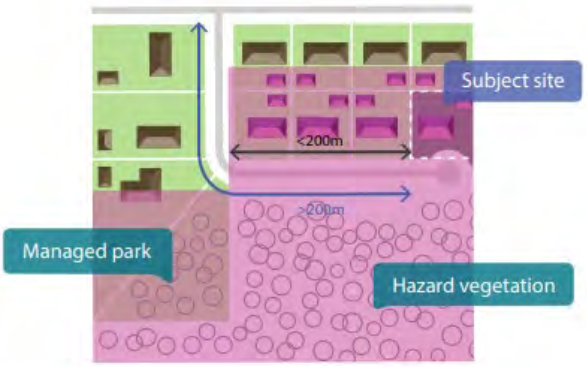


Figure 23: Example of a site on a no-through road greater than 200 metres from the intersection, but within 200 metres of BAL-LOW

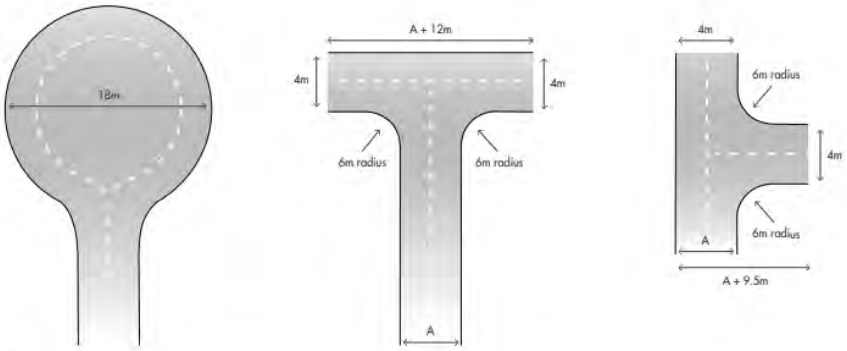


Figure 24: Turn-around area dimensions for a no-through road

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.4a – Perimeter roads

Explanatory Note E3.4a

Where a planning proposal includes the creation of 10 or more lots adjacent to each other, which adjoin classified vegetation under AS 3959 with the exception of Class G Grassland, as part of a greenfield development or large urban infill site, hazard separation and defendable space should be provided in the form of a perimeter road. Greenfield is 'undeveloped or minimally developed areas that have been identified for urban development'; and urban infill is 'the redevelopment of existing urban areas at a higher density than currently exists'. The creation of 10 or more lots includes cumulative subdivision applications where the subdivision application may be part of a staged subdivision.

A perimeter road should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area as per the requirements of a public road in Table 6, Column 1.

As the road is likely to function as a key neighbourhood distributor, or similar, consideration should be given to the provision of additional width to allow for emergency services vehicles to stop and operate on the side of the perimeter road, whilst simultaneously proving for the evacuation of the community (Figure 20).

When designing a strategic planning proposal and/or subdivision, creating a large setback between classified vegetation and proposed lots with a perimeter road, and orientating habitable buildings to front onto (rather than back onto) areas of vegetation has many benefits, including:

- passive surveillance;
- defendable space for firefighting and emergency management purposes;
- reducing the potential radiant heat that may impact a habitable building in a bushfire event;
- reducing the need for battle-axe lots; and
- unconstrained public access/egress for the community in the event of a bushfire.

In developments where no perimeter road exists, property defence in a bushfire event is difficult and can be impossible. Where proposed lots have frontage to an existing public road and abut the hazard at the rear or side, it may be an undesirable planning outcome to create lots which front the existing public road and back onto a perimeter road. In this instance, consideration should be given to a fire service access route. Refer to E3.4b below.

Figure 25: Example of a perimeter road

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.4b – Fire service access route

Explanatory Note E3.4b

Where a subdivision adjoins classified vegetation and where A3.2a has been satisfied, hazard separation and defendable space across multiple lots may be required in the form of a fire service access route.

A fire service access route is not intended to provide residents and the general public with emergency egress and therefore is not a suitable second access or substitute for a public road. A fire service access route is to provide access for emergency services to classified vegetation for firefighting and fire management purposes.

A fire service access route can be provided as either an easement in gross over private or Crown land, or ceded to the Crown as a reserve. In both approaches, the management of the fire service access route is by the local government as the grantee of the easement or management body of the reserve. Determining which approach to take is dependent on what the intended tenure of the fire service access route is, which is explained further below. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the easement or reserve and agree to the terms of the Management Order Conditions (if applicable); this must be provided to the decision-maker prior to granting planning approval. The approach taken is at the discretion of the decision-maker and/or the local government. Consultation with Land Use Management at the Department of Planning, Lands and Heritage should also be considered if the land is to be ceded to the Crown or if the local government is uncertain of which approach to take.

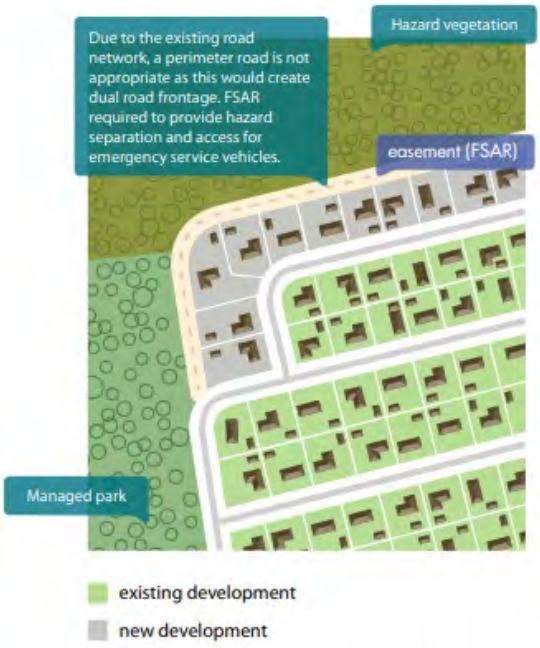


Figure 26: Example of a fire service access route

Where gates are used, these should be double gates wide enough to access the full required horizontal clearance and accommodate type 3.4 fire appliances with the design and construction to be approved by the relevant local government. Gates on fire service access routes may be locked to restrict access, provided a common key system is used, and such keys are made available for emergency services and designated fire officers within the local government area and/or surrounding district. Gates should be installed where fences cross fire service access routes. If an easement in gross is proposed, such arrangements for gates should be included in the deed of easement and be agreed to by the local government.

Fire service access route to remain in private ownership of multiple landowners

Where a fire service access route is proposed to traverse multiple private lots and they are intended to remain in the private ownership of the multiple landowners, it should be provided as an easement in gross under section 196 of the Land Administration Act 1997, to ensure accessibility for fire emergency services and not for use by the public. The easement is to be granted to the local government and/or public authority for firefighting and emergency management purposes.

Fire service access route to be created under State ownership

Where a fire service access route is proposed to traverse multiple private lots, but the decision-maker and/or local government prefer for the fire service access route to remain in one ownership under the State for management purposes, the fire service access route can be vested in the Crown under section 152 of the Planning and Development Act 2005 as a reserve, such land to be ceded free of cost without any payment or compensation by the Crown. The purpose of the reserve should be for a public purpose specified in the condition related to the subdivision, for example for vehicular access for emergency services and the local government only, or for vehicular access for emergency services and the local government and recreation. A reserve for emergency services access and recreation can optimise

Acceptable Solution A3.4b – Fire service access route
Explanatory Note E3.4b
the land-use as a dual purpose, where it provides vehicular access for emergency services, but can be accessed by the public (on foot) on a day-to-day basis as a recreation link. Appropriate signage will ensure the general public is aware of the purpose of the reserve. The approach taken is at the discretion of the decision-maker and/or local government.

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.5 – Battle-axe access legs

Explanatory Note E3.5

In bushfire prone areas, lots with battle-axe access legs should be avoided because they:

- do not enable the habitable building to be located close to a public road where it is visible to emergency services;
- result in longer than necessary access routes for evacuation and the response of emergency services;
- may be blocked by falling trees or debris; and
- may not provide certainty for emergency services regarding the width, length and ability to turn emergency services vehicle around.

In some instances, it may be appropriate for battle-axe access legs to be used to overcome specific site or design constraints created by the existing road networks or lot layout. The Bushfire Management Plan should provide justification for proposed battle-axe access leg(s), including exploration of a redesign of the proposal, and the decision-maker should determine whether the justification is valid.

The measurement of the battle-axe access leg should be from the edge of the public road to where the access leg joins the effective area of the lot. Effective lot area means that part of the battle-axe lot that is capable of development and excludes the access leg and associated truncations for vehicle manoeuvrability. Where a proposed battle-axe lot has an existing habitable building that will be retained, the private driveway requirements and/or the battle-axe requirements (as appropriate) should be satisfied.

Battle-axe access should be 6 metres in width where the battle-axe is more than 50m in length or for lots serviced by a water source within the property, such as a water tank. It is acceptable for a single battle-axe to have a trafficable width of 4 metres with a traversable edge of 1 metre on either side of the carriageway.

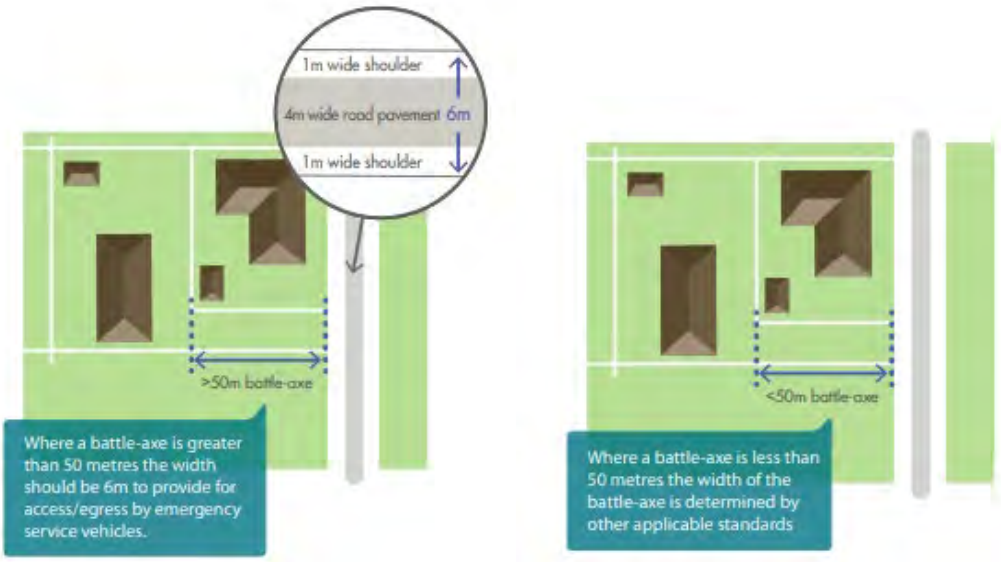


Figure 27: Battle-axe design requirements where required under A3.5

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Acceptable Solution A3.6 – Private driveways

Explanatory Note E3.6

In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage.

In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate.

Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.

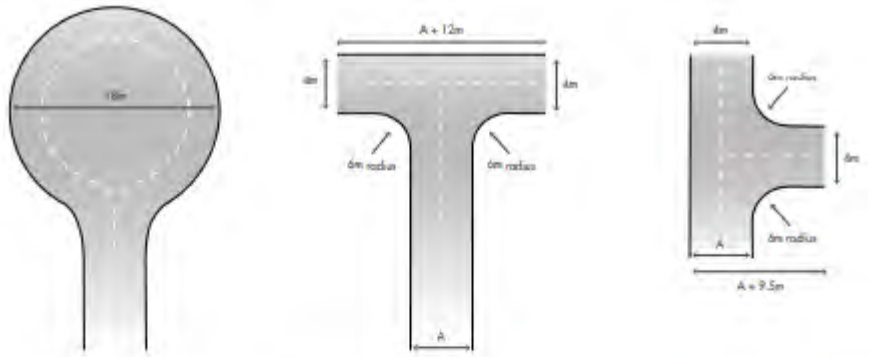


Figure 28: Design requirements for a turn-around area for a private driveway or battle-axe

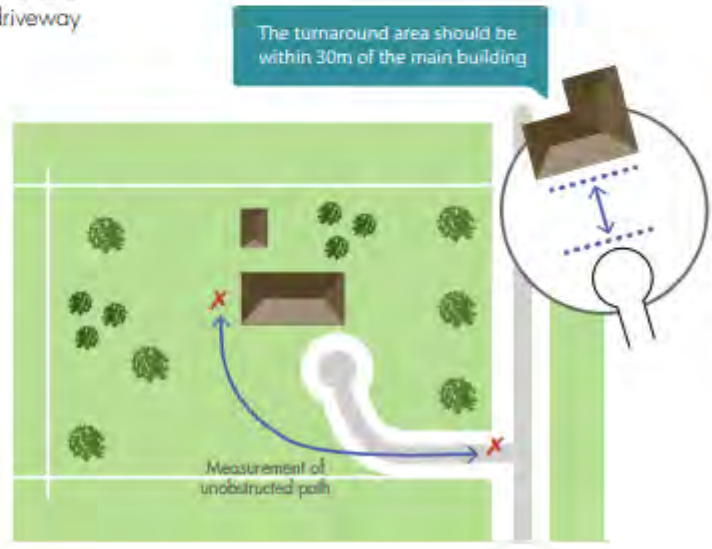


Figure 29: Design requirements for a private driveway where required under A3.6

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Technical requirement	1	2	3	4
	Public road	Emergency access way[1]	Fire service access route[1]	Battle-axe and private driveways[2]
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (m)	N/A	6	6	6
Minimum vertical clearance (m)	4.5	4.5	4.5	4.5
Minimum weight capacity (t)	15	15	15	15
Maximum grade unsealed road[3]	As outlined in the IPWEA Subdivision Guidelines	1:10 (10%, 6°)	1:10 (10%, 6°)	1:10 (10%, 6°)
Maximum grade sealed road[3]		1:7 (14.3%, 8°)	1:7 (14.3%, 8°)	1:7 (14.3%, 8°)
Maximum average grade sealed road		1:10 (10%, 6°)	1:10 (10%, 6°)	1:10 (10%, 6°)
Minimum inner radius of road curves (m)		8.5	8.5	8.5

[1] To have crossfalls between 3 and 6%

[2] Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision

[3] Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Appendix O Bushfire firefighting water supply standards and explanatory notes

Schedule 2: Water supply dedicated for bushfire firefighting purposes (Guidelines V1.4)

2.1 Water supply requirements

Water dedicated for firefighting should be provided in accordance with the table below and be in addition to water required for drinking purposes.

Planning Application	Non-Reticulated Areas
Development application	10,000L per habitable building
Structure Plan / Subdivision: Creation of 1 additional lot	10,000L per lot
Structure Plan / Subdivision: Creation of 3 to 24 lots	10,000L tank per lot or 50,000L strategic water tank
Structure Plan / Subdivision: Creation of 25 lots or more	50,000L per 25 lots or part thereof Provided as a strategic water tank(s) or 10,000L tank/lot

2.1 Water supply requirements

2.2.1 Construction and design		An above-ground tank and associated stand should be constructed of non-combustible material. The tank may need to comply with AS/NZS 3500.1:2018. Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS 3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419. Where an outlet for an emergency service vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply.
2.2.2 Pipes and fittings	2.2.2.1 Fittings for above-ground water tanks	All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire attack and be in accordance with the applicable section below, unless otherwise specified by the local government.
	2.2.2.2 Remote outlets	• Commercial land uses: 125mm Storz fitting; or • Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or • Standalone water tanks: 50mm male camlock coupling with full flow valve; or • Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires.

Element 4 Explanatory Notes

E4 Use of water supply

Water supply for firefighting in the event of a bushfire can be provided on a lot for use by emergency services or for use by the landowner, if their Bushfire Survival Plan is to stay and defend their property. Water supply in the form of a dedicated standalone tank may be provided solely for use by emergency services, and/or a water supply may be provided for use by the landowner in the form of non-drinking water (garden or grey water for firefighting) or drinking water. It is important to note, that a combined tank of drinking water and water for firefighting purposes is not recommended. It is required to be separated in accordance with section 4.2.3 of AS/NZS 3500.1:2018. This requirement is necessary, as stagnant water may alter the quality of the drinking water and the emergency services, by law, may not be able to take water from the water supply to suppress a bushfire.

E4 Independent water and power supply

Bushfires can directly impact a water service provider's equipment or pipes. As such, a reticulated water supply may not be reliable due to a reduction in water pressure or loss of supply. Where development is in a bushfire prone area (even if there is access to reticulated water), it is recommended that the landowner consider providing an additional water supply for use by emergency services.

Where a landowner intends on staying to defend their property during a bushfire event, as identified in their Bushfire Survival Plan, it is recommended that pumping equipment separate to the electricity network be provided. The pumping equipment could be a diesel or petrol powered pump, or an electric pump if there is an onsite generator or backup power supply independent from electricity network grid.

It is recommended that combustion pumps should be a minimum 5hp or 3kW diesel or petrol powered pump and should be shielded against bushfire attack. Where an electric pump is used, a backup power supply independent from electricity network grid should be provided. A 3.7kw/12kw-h sized battery (14.8kw-h reserved solely for bushfire will power a 3.7kw system for 4 hours) with blackout protection or a generator should be provided.

E4 Strategic water supplies

Many local governments have a well-developed network of strategic water tanks for firefighting within their local government area. Given this, it is at the discretion of the local government to determine if the water supply within a locality, is sufficient to cater for an increasing population when a subdivision is proposed. Local governments are encouraged to work with their local emergency services to ensure the water needs for firefighting is understood.

Where a structure plan or subdivision proposes to create more than three but less than 24 lots, it is optional as to whether each lot is provided with a 10,000 litre tank or a strategic water tank is provided for the entire development. If 25 or more lots are proposed, then it is recommended that a 50,000 litre strategic water tank (for every 25 lots) is provided.

For every lot additional to the 25, it is at the discretion of the local government whether they require an additional strategic water tank or for each lot to be provided with a 10,000 litre tank. For example, 37 proposed lots require two strategic water tanks, or a 10,000 litre tank on each lot, or a combination of both with a strategic water tank and 12 proposed lots with a 10,000 litre tank on each lot. Where the local government, following consultation with the local emergency services, is of the opinion that a strategic water tank is unnecessary, a 10,000 litre standalone tank per lot can be provided.

A strategic water tank should be located no more than 10 minutes from the subject site (20-minute turnaround time). The turnaround time is the time it takes from a lot, to the water supply and return back to the lot, at legal road speeds. Where a strategic water tank has been provided at the subdivision stage and a development application is located within the 20-minute turnaround time of that (or another) strategic water source, then the decision-maker could remove the requirement for the provision of an additional water supply at the development application stage. Local government will need to consider whether the strategic water tank has the capacity to serve the lot identified in the development application i.e. what lots were identified at subdivision stage to be serviced by the strategic water tank. A landowner should enquire with their local government to determine whether a water supply on their lot will be required.

When there is fragmented ownership of a structure plan area, or when staging of a subdivision is to occur and the local government has determined that a strategic water tank is required, then the first stage should include arrangements for the installation of a water tank and the identification of land to be ceded to the local government authority (if applicable).

Where local planning scheme provisions provide for developer contributions for public infrastructure and the local government is supportive, then a cash-in lieu arrangement may be established for the provision of a strategic water

Element 4 Explanatory Notes

tank.

Grouped dwellings may provide dedicated firefighting water supply in one standalone tank per lot or may provide one shared standalone tank with the accumulative amount of water needed, for the number of lots it will serve. For example, a development proposing three lots may either have three tanks of 10,000L (one per lot) or one tank with 30,000L (shared between three lots)

E4 Alternative water sources

A dam, river or other source may be considered a firefighting water source if it complies with DFES guidelines and it can be demonstrated that the water level will be maintained above the top of the highest fire brigade suction point in perpetuity, if it is expected that the water supply will be used by emergency services. Approval for the use of these types of water supplies are on a case by case basis and at the discretion of the decision maker, in consultation with emergency services and local government.

E4 Location of water tanks

A water tank should be located with consideration to surrounding vegetation and should avoid locations where the tank will be situated underneath existing vegetation or where vegetation will grow against or overhang the tank, as shown in Figure 30 below. Where a tank is located on the bushfire hazard side of a building, sufficient shielding for the protection of firefighters should be provided. In addition to the tank location, the fitting should be positioned and/or shielded from the bushfire hazard to allow access by emergency services. It is recommended that the fitting face away from the bushfire hazard and be within four metres of a hardstand area.

Figure 30: A good and bad example of landscaping around a water tank

Source: *Guidelines for Planning in Bushfire Prone Areas (WAPC 2021)*

Document Status

Rev No.	Purpose	Author	Reviewed and approved for Issue	
			Name	Date
Rev A	Draft report for client review	Louisa Robertson (BPAD 36748, Level 3)	Louisa Robertson (BPAD 36748, Level 3)	12 August 2024
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