ATTACHMENTS

DEVELOPMENT AND INFRASTRUCTURE SERVICES COMMITTEE MEETING

5.30pm

City of Albany Council Chambers

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DESIGN FEATURES

1. Adjoining natural bushland contributes to the characteristics of the development
2. Public Open Space configured to incorporate established stormwater flood path and landform
3. Topographical responsive street design minimises earthworks and maximises view corridors east
4. Entry boulevard incorporating central swale median
5. Heritage tree retention within road reserve
6. Public Open Space featuring drainage swale at bottom of drainage catchment
7. Diverse range of lot sizes to respond to landform, bushfire management and household diversity, ranging 300m² - 600m²
8. Moderate sized lots located in vicinity of open space amenity
9. Roadside drainage swales to accommodate pre development stormwater requirements including drainage pits

LEGEND

- Concept plan boundary
- Residential R30
- Rural zoned area
- Public open space and drainage
- Established drainage swale to be retained
- BAL29 — Anticipated BAL29 setback
- Illustrative street tree locations
- Heritage tree to be retained
- Indicative shared path alignment
- Indicative footpath alignment

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Scale
1:2000@A3
1:1000@A1

Date
7/04/2026

0 10 20 30 40 N

Plan
25/057/004B

Grid
MGA2020-50

Drawn
MH

Approved
MB

Development Concept

LOT 39 ELIZABETH STREET, BAYONET HEAD

A DevelopmentWA Project

TBB PLANNING

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Environmental Assessment Report - Lot 39 Elizabeth Street, Bayonet Head

Prepared For:	DevelopmentWA
	Level 7/5 Spring Street, PERTH WA 6112
Report Number:	AP2026-032
Report Version:	V2
Report Date:	15 April 2026

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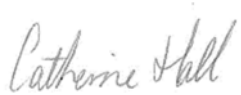
Document No: DVW-PP04074_EAR_001_ch_V2

Report No: AP2026-032

Author:	Dr Catherine Hall Senior Environmental Scientist / Zoologist		15 April 2026
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EXECUTIVE SUMMARY

Aurora Environmental was commissioned by DevelopmentWA to prepare this Environmental Assessment Report for the proposed scheme amendment and subdivision of the northern portion of Lot 39 Elizabeth Street, Bayonet Head located in the City of Albany.

The Site is currently zoned 'Rural' under the Albany Local Planning Scheme 2 and identified as an area of 'Urban Growth'. The proposal will rezone the northern portion of the Site (Scheme Amendment Area) to 'Residential' while retaining the southern portion of the Site as 'Rural'.

This Environmental Assessment Report outlines the current understanding of the environmental conditions present within Lot 39. The assessment has consolidated information and data derived from technical studies previously completed for the Site combined with up-to-date government datasets and relevant literature to assess the environmental values and constraints that could influence the scale and nature of development within the Site. This environmental assessment found:

- Lot 39 was included in the Bayonet Head Outline Development Plan which was formally assessed by the Environmental Protection Authority (EPA) as a strategic proposal and subsequently approved by the Minister for the Environment in 2013 subject to the conditions set out in Ministerial Statement (MS) 942. The approval under MS 942 included a ten year time limit, which has now lapsed.
- The Scheme Amendment Area has been extensively cleared and no longer contains any areas of intact native vegetation or fauna habitat. Remnant native vegetation and fauna habitat is present in the southern part of Lot 39, but is outside of the Scheme Amendment Area. No conservation significant flora, fauna or ecological communities have been previously identified in the Scheme Amendment Area. It is possible that some conservation significant fauna species may, on occasions, move through the Scheme Amendment Area due to the presence of habitat areas within surrounding properties. However, none of the conservation significant fauna species identified in the desktop assessment are expected to permanently reside or rely upon the Scheme Amendment Area. Remnant vegetation within the southern part of Lot 39, and outside of the Scheme Amendment Area, may provide habitat for conservation significant species such as the Western Ringtail Possum (Threatened) and Quenda (Priority 4). This habitat will not be impacted by the proposed development.
- Lot 39 has not been reported as a known or suspected contaminated site under the *Contaminated Sites Act 2003* (CS Act) and therefore is not registered in the Department of Water and Environmental Regulation's (DWER) Contaminated Sites database. The Site has predominantly been used for low-intensity agriculture (livestock grazing), with limited evidence of potentially contaminating activities. A Preliminary Site Investigation (PSI) prepared for Lot 39 (Aurora Environmental, 2024b) identified six Areas of Potential Environmental Concern (APEC). These were related to historical agricultural practices, stockpiled materials, imported fill and ground disturbance. The risk of groundwater contamination was considered extremely low.
- Approximately 70 % of the Scheme Amendment Area is mapped as 'high to moderate risk' of acid sulfate soils (ASS) occurring within 3 metres (m) of the natural soil surface. Site observations and a review of historical aerial photographs support this classification, with evidence of waterlogging and grey/dark grey organic rich soils in areas that are considered likely

to have been former wetlands. The potential presence of ASS requires further investigation. If ASS materials are confirmed, an ASS and Dewatering Management Plan will be required. The potential to disturb ASS may occur via excavation or dewatering during construction.

- Lot 39 is located within the catchment of Oyster Harbour. It is approximately 900 m west of the shoreline of Oyster Harbour. There are no permanent, surface water features present within the Site. However, surface flow from the northern portion of the Site is directed via a shallow open drain which discharges to a dam, in the northeastern portion of Lot 39. It is likely that excess surface water which is not detained or infiltrated within the Site flows into the Albany surface drainage system and ultimately discharges to Oyster Harbour. The dam and open drain were the only surface water features present within the Scheme Amendment Area. Coffey Environments (2008) mapped a wetland in the southern portion of Lot 39, which was assessed to be commensurate with a Resource Enhancement (RE) management category. This wetland is outside of the Scheme Amendment Area, and therefore will not be impacted by the proposed development.
- The Scheme Amendment Area is located within the unproclaimed Karri Groundwater Area. The depth to groundwater beneath the Scheme Amendment Area has not been confirmed through on-site monitoring, but is expected to be shallow. It is suspected that the dam in the northeastern part of the Scheme Amendment Area may intersect groundwater and therefore reflect local groundwater conditions. Water quality of the groundwater system beneath the Scheme Amendment Area has not been investigated. Shallow groundwater will need to be considered in terms of future finished levels as well as construction requirements
- Approximately 50 % of the Scheme Amendment Area is mapped as a 'bush fire prone area' where additional planning and building requirements may apply. This classification is due to the presence of vegetation that is present outside of the Scheme Amendment Area.
- The Department of Planning, Lands and Heritage's (DPLH) Aboriginal Cultural Heritage Inquiry System (ACHIS) indicates that there are no registered, lodged or historic Aboriginal Cultural Heritage (ACH) sites within the Scheme Amendment Area. A recent archaeological and ethnographic survey of Lot 39 (WKSN AC, 2024) recorded a cultural scar tree along on the western boundary of the Scheme Amendment Area. WKSN AC (2024) reported that this record would be submitted to the DPLH and nominated as a heritage site. However, it is not evident that this has occurred as there is no listing in the ACHIS. The scar tree was not recorded during an earlier archaeological and ethnographic survey conducted for the Bayonet Head Outline Development Plan by Brad Goode and Associates (2007).

Based on the environmental attributes and values identified in this assessment, a recommended environmental management framework is summarised as follows:

Inland Waters – Surface Water and Groundwater

- Implement the Water Management Report through future planning and development stages.
- Review the civil engineering design for the proposed development against groundwater levels to establish if groundwater dewatering will be required during construction.
- If gross soil contamination is identified and/or dewatering/disturbance of ASS is required during construction, investigate groundwater quality.

Terrestrial Environmental Quality (Contamination and ASS)

- Conduct targeted soil investigation as recommended in the PSI (Aurora Environmental, 2024b) ensuring data gaps are investigated appropriately. Investigations and remediation (if required) are to be implemented in accordance with the CS Act.
- Perform an ASS investigation in accordance with DWER Guidelines (DER, 2015a) to assess the extent of potential ASS risks.
- Depending on the civil engineering design and the results of the ASS investigation, prepare an ASS and Dewatering Management Plan if required. Any disturbance of ASS is to be managed in accordance with DWER Guidelines (DER, 2015b).
- Prepare and implement a Construction Environmental Management Plan (CEMP). The CEMP is to include measures to avoid, minimise and mitigate environmental impacts associated with construction. The CEMP is to include an unexpected finds procedure.

Social Surroundings

- If the scar tree cannot be retained, investigate the whether the tree is classified as a 'site' as defined in the *Aboriginal Heritage Act 1972* (AH Act);
- Pending the outcome of the above, if the scar tree is classified as a 'site' ensure it is protected, unless authorisation under the AH Act is obtained.
- Ensure the CEMP includes provisions relating to the protection of cultural heritage and management of any unexpected finds encountered during construction.
- Liaise with Wagyl Kaip Southern Noongar Aboriginal Corporation and ensure Cultural Monitors are present during ground-disturbing works.

Bushfire Management

- Implement the Bushfire Management Plan to avoid, minimise and mitigate bushfire risks.

Environmental risks related to the development of the Site can be adequately avoided, managed and mitigated by implementing the recommended environmental management framework. In terms of environmental approvals, Aurora Environmental has concluded:

- The proposed scheme amendment is not likely to result in significant environmental impacts, and therefore unlikely to be assessed by the EPA under Section 48A of the *Environmental Protection Act 1986* (EP Act). For the same reason, a referral under Section 38 of the EP Act is not recommended.
- As there is no native vegetation in the Scheme Amendment Area, a native vegetation clearing permit will not be required.
- The proposed development within the Scheme Amendment Area will not impact any TECs or threatened flora or fauna and therefore a section 40 permit under the *Biodiversity Conservation Act 2016* (BC Act) will not be required.
- As the Scheme Amendment Area is within the unproclaimed Karri Groundwater Area, approval under the *Rights in Water and Irrigation Act 1914* (RIWI Act) for the abstraction of groundwater, including dewatering, will not be required.

- The proposed development within the Scheme Amendment Area will not impact any matters of national environmental significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Therefore, a referral under the EPBC Act will not be required.

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COMMON ABBREVIATIONS AND ACRONYMS

ACH	Aboriginal Cultural Heritage
ACHIS	Aboriginal Cultural Heritage Inquiry System
ACM	Asbestos containing material
AH Act	*Aboriginal Heritage Act 1972* (WA)
AHD	Australian Height Datum
ANEF	Australian Noise Exposure Forecast
APEC	Areas of Potential Environmental Concern
ASS	Acid sulfate Soils
BAL	Bushfire Attack Level
BC Act	*Biodiversity Conservation Act 2016* (WA)
BMP	Bushfire Management Plan
COPC	Contaminants of potential concern
COT	Certificate of Title
CS Act	*Contaminated Sites Act 2003* (WA)
CSA	Contaminated Sites Auditor
DBCA	Department of Biodiversity, Conservation and Attractions (WA)
DBH	Diameter breast height
DCCEEW	Department of Climate Change, Energy, Environment and Water (Cwth)
DSI	Detailed Site Investigation
DPLH	Department of Planning, Lands and Heritage (WA)
DWER	Department of Water and Environmental Regulation (WA)
EP Act	*Environmental Protection Act 1986* (WA)
EPA	Environmental Protection Authority (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwth)
ESA	Environmentally Sensitive Area
GoWA	Government of Western Australia
ha	hectare
IBRA	Interim Biogeographic Regionalisation for Australia
KL	kilolitre
km	kilometre
LPS	Local Planning Scheme

LSP	Local Structure Plan
m	metre
MAR	Mandatory auditor review
m BGL	Metres below ground level
MGL	Maximum groundwater level
MNES	Matters of National Environmental Significance
mm	millimetre
OCPs	organochlorine pesticide
NT Act	*Native Title Act 1993* (Cwth)
PMST	Protected Matters Search Tool
PDWSA	Public Drinking Water Source Area
PSI	Preliminary Site Investigation
RIWI Act	*Rights in Water and Irrigation Act 1914* (WA)
PEC	Priority Ecological Community
SHV	Student Housing Village
SPP	State Planning Policy
SWALSC	South West Aboriginal Land and Sea Council
TEC	Threatened Ecological Community
TPFA	Threatened and Priority Fauna
TPS	Town Planning Scheme
UFI	Unique Feature Identifier
UST	Underground storage tanks
WAPC	Western Australian Planning Commission (WA)

1 INTRODUCTION

1.1 PROJECT OVERVIEW

DevelopmentWA has engaged Aurora Environmental to prepare an Environmental Assessment Report a proposed Scheme Amendment for Lot 39 Elizabeth Street, Bayonet Head (the Site). The Site is 18.8604 hectares (ha), located in Western Australia (WA), within the City of Albany (**Figure 1**).

Under the Albany Local Planning Scheme 2 (LPS2), the Site is currently zoned 'Rural' (City of Albany, 2025) and identified as an area of 'Urban Growth' (City of Albany, 2019). It is proposed to rezone the northern portion of the Site (Scheme Amendment Area; **Figure 1**) to 'Residential' while retaining the southern portion of the Site as 'Rural'.

A Development Concept Plan (Concept Plan) has been prepared incorporating areas for residential development and public open space (POS) (**Figure 2**).

For the purposes of this report the following terms are frequently used, and are defined as follows:

- **Site:** Cadastral boundary of Lot 39;
- **Scheme Amendment Area:** Northern portion of Lot 39 that is proposed for rezoning and development (10.2299 ha);
- **Concept Plan:** Proposed subdivision plan for the northern portion of Lot 39;
- **Bayonet Head Outline Development Plan area:** Extent of the former Outline Development Plan that was referred and assessed by the WA Environmental Protection Authority (EPA).

1.1.1 Project History

In 2008, the Site was included in the Bayonet Head Outline Development Plan which was referred to the EPA. The EPA considered the referred development a strategic proposal under the *Environmental Protection Act 1986* (EP Act) with the level of assessment being a 'Strategic Environmental Assessment' (SEA). Following completion of the assessment process, the development proposal was approved for implementation by the Minister for Environment in August 2013, subject to implementation of the conditions set out in Ministerial Statement 942 (MS 942). It is noted that MS 942 expired in August 2023, and therefore no longer has any statutory basis.

The current Site only comprised a small part of the Bayonet Head Outline Development Plan.

1.2 PURPOSE AND SCOPE OF WORK

1.2.1 Purpose of this Assessment

This assessment outlines the current understanding of the Site's environmental conditions and identifies environmental constraints that may influence development potential.

The assessment has consolidated information and data derived from technical studies previously completed for the Site (**Table 1**) combined with up-to-date government datasets and relevant literature to assess the environmental values and potential constraints that could influence the scale and nature of development within the Site.

1.2.2 Scope of this Assessment

The key aspects which are addressed in the report include:

- Physical characteristics such as:
  - Geology, geomorphology/landform, soils and risk of acid sulfate soils (ASS);
  - Groundwater information from online sources where available; and
  - Wetlands and other surface water features.
- Biological values and other sensitive areas including:
  - Potential conservation significant flora, fauna and ecological communities from the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) and the Department of Biodiversity, Conservation and Attractions' (DBCA's) databases for threatened and priority flora and fauna; and
  - A likelihood of occurrence assessment for conservation significant flora, fauna and ecological communities; and
  - Environmentally sensitive areas (ESAs) and other conservation significant areas.
- Aboriginal and European heritage values via review of the Department of Planning, Lands and Heritage's (DPLH) Aboriginal Heritage Inquiry System (AHIS) and the Heritage Council's inHerit database and the heritage survey conducted for Lot 39.
- Site contamination risks arising from historical uses and surrounding activities This will be ascertained by reviewing and summarising the findings of the Preliminary Site Investigation (PSI) prepared by Aurora Environmental (2024).
- An environmental management framework linking environmental recommendations to the future planning stages relevant to the proposed development of the Site. The management framework will include policy considerations, management objectives to avoid and minimise risk to the environment, recommended management plans and measures, and optimal timing for implementation.
- An overview of the environmental and heritage legislative requirements applicable to the Site, including an assessment of whether a referral under the *Environmental Protection Act 1986* (EP Act) or the EPBC Act are recommended.

1.2.3 Previous Assessments

Numerous technical studies have been completed for the Site by Aurora Environmental and other consultants (**Table 1**)**.** These reports have been reviewed to inform the preparation of this report.

TABLE 1: PREVIOUS ENVIRONMENTAL ASSESSMENTS COMPLETED FOR THE SITE

SURVEYS AND ASSESSMENTS
Aurora Environmental is aware of the following environmental and heritage investigations relevant to the Site that were prepared or used for the original Bayonet Head Outline Development Plan submitted in 2008.

SURVEYS AND ASSESSMENTS
• Coffey Environments (2007) Acid Sulfate Soil Desktop Assessment Bayonet Head Outline Development Plan Area Albany. Report prepared for Heath Development Company and CAMABB. Project ref.: 2007/255 • Coffey Environments (2008) Bayonet Head Outline Development Plan Wetlands Assessment. Report prepared for Heath Development Company. EP2008/061 • Coffey Environments (2009) Flora and Vegetation Assessment. Bayonet Head ODP Albany. Report prepared for Heath Development Company. EP2008/064 • Coffey Environments (2009) Bayonet Head Outline Development Plan Area – Fauna Assessment. Report prepared for Heath Development Company. EP2009/035 • Coffey Environments (2010) Bayonet Head – Plan for Development Strategic Environmental Assessment (EPA Assessment No. 1758). EA2009/014 • Brad Goode & Associates Consulting Anthropologists & Archaeologists (Brad Goode) (2007) An Aboriginal Heritage Survey for the Proposed Sub-division of Bayonet Head Albany Western Australia. • PPK Environment & Infrastructure (PPK) (2000) Bayonet Head Flood Management Plan. Report prepared for the City of Albany. 92L057A:PR2:5683A, Rev B Other reports were also used for the Bayonet Head Outline Development Plan. However, the Site was not included within the study area for these reports.
The following investigations have been undertaken since 2024 for the Site: • Aurora Environmental (2024) Environmental Due Diligence Investigation – Lot 39 Elizabeth Street, Bayonet Head. Letter prepared for DevelopmentWA. • Aurora Environmental (2024) Preliminary Site Investigation. Lot 39 Elizabeth Street, Bayonet Head. Report prepared for DevelopmentWA. 2024/183 • PGV Environmental (2024) Lot 39 Elizabeth Street, Bayonet Head – Environmental Advice. Letter prepared for DevelopmentWA. • Rowe Group Design (2024) Due Diligence Planning Report. Lot 39 Elizabeth Street, Bayonet Head. R9896 • Stantec (2024) Lot 39 Elizabeth Street, Albany. Engineering Servicing Report. Civil, Electrical and Communication Services. Report prepared for DevelopmentWA. 304770492 • Wagyl Kaip Southern Noongar Aboriginal Corporation (WKSN AC) (2024) Report of an Ethnographic and Archaeological Site Identification Survey at Lot 39 Elizabeth Street, Bayonet Head, Albany, Western Australia. Report prepared for DevelopmentWA. WKSN-AN-003

2 SITE DETAILS

2.1 SITE IDENTIFICATION DETAILS

Lot 39 Elizabeth Street, Bayonet Head (the Site) comprises 18.8604 ha. It is located approximately 7.5 km northeast of the Albany CBD (**Figure 1**). Site identification details are summarised in **Table 2**.

TABLE 2: SITE DETAILS

IDENTIFICATION FEATURES	DETAILS
Site Address	No Street Address
Certificate of Title	323/16A
Parcel Identifier	Lot 39 on Diagram 33941
Land Tenure	Freehold
Current Site Owner	Western Australian Land Authority
Local Government Authority	City of Albany
Local Planning Scheme Zoning	The Site is zoned Rural in the City of Albany Local Planning Scheme No. 2.

2.2 PLANNING CONTEXT

The Site is zoned 'Rural' under the City of Albany Local Planning Scheme 2 (LPS2). It is also within an area identified as 'Urban Growth' (City of Albany, 2019).

2.3 LAND USE

2.3.1 Current Land Use

The Site is divided into paddocks for livestock grazing.

2.3.2 Historic Land Use

Aerials photographs from 1961 to 2024 accessed via Landgate were viewed to assess previous uses and land activities within the Site and surrounding area. A summary of historic activities is summarised in **Table 3** and selected historical aerial photographs are provided in **Appendix 1**.

TABLE 3: SUMMARY OF HISTORICAL AERIAL PHOTOGRAPHS

YEAR	THE SITE	SURROUNDING AREA
October 1961	The Site is cleared of native vegetation. Areas within the eastern, northern and southern portion appear much darker in colour, corresponding with low-lying areas. Based on the date of the photograph (26 October 1961) and topography, these areas are likely to be inundated, have been subject to recent inundation, or comprise organic rich soils.	**North:** Land has been partially cleared for agricultural purposes. **South:** Land has been partially cleared for agricultural purposes. **East:** Land has been partially cleared for agricultural purposes. **West:** Land has been partially cleared for agricultural purposes.
February 1977	Fencelines matching current boundary lines evident. No inundation apparent. Dam constructed just to the	**North:** Land has some areas of vegetation regrowth.

YEAR	THE SITE	SURROUNDING AREA
	southeast of the Site. Cleared track within the central portion of the Site.	**South:** Land has some areas of vegetation regrowth. **East:** Land has been cultivated with some areas of vegetation regrowth. **West:** Land is used for agricultural purposes.
April 1988	Vegetation has re-established in the southern portion of the Site. Cleared track no longer evident. Cleared area in northeast of the Site (Northeast dam) with clearly delineated drainage line extending from the northwest corner. Access track from Elizabeth Street towards the western boundary of the Site, crossing the drainage line. Patches of white sand in northern portion of the Site, possibly indicative of test pits.	**North:** Area has been developed for residential purposes. **South:** Land has some areas of vegetation regrowth. **East:** Area is cleared for agricultural purposes. **West:** Land is used for agricultural purposes.
November 1996	A shed has been constructed along the western boundary of the Site, with a driveway extending from Elizabeth Street. The southern portion of the Site is vegetated. The northeast dam remains visible, with vegetation establishing along the drainage line. Green grass is likely an indicator of shallow groundwater levels.	**North:** More residential development. **South:** Land is now covered with vegetation. **East:** Land is partially cleared for agricultural purposes with other areas vegetated. **West:** Land is used for agricultural purposes.
January 2001	No obvious changes from 1996 except for the extension of riparian vegetation along the drainage line to northeast dam and clearing of vegetation in southeastern part of the Site.	**North:** More residential development. **South:** Same as 1996 photo. **East:** More vegetation growth. **West:** Land is used for agricultural purposes.
February 2003	No significant changes since 2001.	**North:** No significant change. **South:** No significant change. **East:** Increasingly vegetated. **West:** Earthworks for future housing development.
January 2007	No substantial change from 2001, except interior fence visible delineating northwest part of Site.	**North:** No significant change. **South:** No significant change. **East:** Increasingly vegetated. **West:** Earthworks for future housing development.
June 2010	Northeast dam vegetation increased in density. Vegetation growth near mid-eastern boundary.	**North:** No significant change. **South:** Pump station installed. Boundary fire breaks installed. **East:** Increasingly vegetated.

YEAR	THE SITE	SURROUNDING AREA
		West: West to northern part of Site occupied by residences.
January 2011	Northeast dam and drainage line vegetation increased density. Vegetated area along eastern boundary shows access tracks throughout.	**North:** No significant change. **South:** Small area of vegetation cleared. **East:** Increasingly vegetated. **West:** No significant change.
October 2012	Northeast dam and drainage line - vegetation has been cleared. Vegetated area along the eastern boundary has been cleared. Seasonal inundation visible in northwest corner.	**North:** No significant change. **South:** Small area of vegetation cleared. **East:** Increasingly vegetated. **West:** No significant change.
2014 Jan – 2016 Nov	No significant change since 2012.	**North:** No significant change. **South:** No significant change. **East:** Increasingly vegetated. **West:** Geotechnical investigation sand mounds visible. Stockpiles of soil.
February 2017	Laydown area for the storage of equipment and stockpiling of gravel (?) associated with roadworks on Elizabeth Street. No other changes.	**North:** No significant change. **South:** No significant change. **East:** Increasingly vegetated. **West:** More stockpiles of soil.
May 2018	Drains constructed near the dam in the northeastern portion of the Site as well as within the in southern wetland area. Lay down area for storage of equipment returned to pasture and stockpiles no longer evident.	**North:** No significant change. **South:** No significant change. **East:** Increasingly vegetated. **West:** More stockpiles of soil.
May 2018 – May 2022	No significant change.	**North:** No significant change. **South:** No significant change. **East:** No significant change. **West:** No significant change.
April 2024	Vegetation in south of the Site partly cleared. No other significant change.	**North:** No significant change. **South:** No significant change. **East:** No significant change. **West:** No significant change.
November 2024	No significant change.	**North:** No significant change. **South:** No significant change. **East:** No significant change. **West:** No significant change.

2.3.3 Surrounding Land Use

Land to the north and east of the Site has been developed for residential use. Land to the east is vacant, supporting dense regrowth vegetation . This area is also used for grazing livestock (**Table 4**).

TABLE 4: SURROUNDING LAND USE

ASPECT	DETAILS
North	Urban Residential – Elizabeth Street, Residential R5/20.
East	Undeveloped wetland – Dense vegetation with weed infestation. Property used for running sheep.
South	Undeveloped wetland – Dense native vegetation with access tracks as firebreaks around inside boundary of lot. Area indicated as Primary School in Local Planning Scheme.
West	Northern part – Urban Residential Paul Terry Drive. Southern part – Cleared undeveloped land with access tracks linking Paul Terry Drive with land to the south, identified as City of Albany Polygon ID 12241629. Part of Oyster Harbour Estate.

3 EXISTING ENVIRONMENT

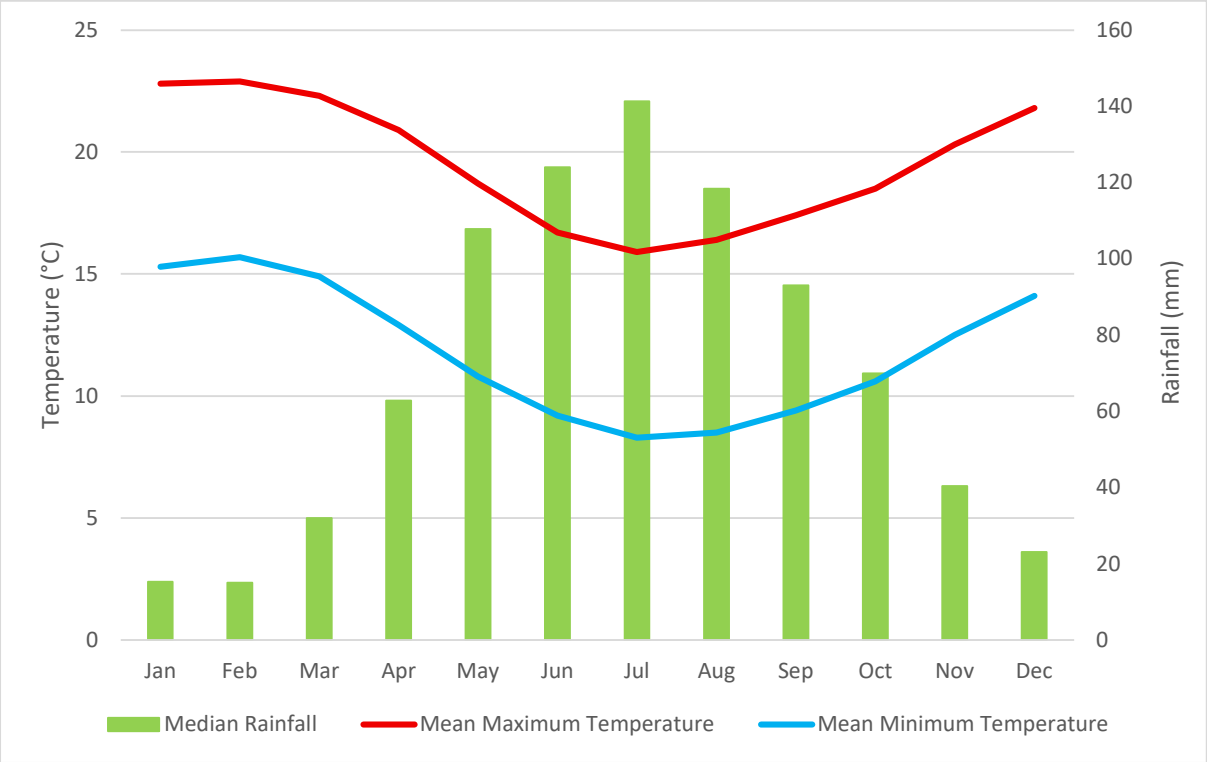
3.1 CLIMATE

Albany has a Mediterranean climate, characterised by generally warm summers and cool, wet winters. The median annual rainfall for Albany is 920.9 millimetres (mm) (Bureau of Meteorology, 2026; Station: 009500). Most rainfall falls between May and August with each of these months typically receiving over 100 mm (**Plate 1**).

Temperatures are generally mild, with summer average minimum and maximum temperatures of 15°C to 23°C respectively, and average minimum and maximum winter temperatures of 9°C and 16°C (**Plate 1**).

The least windy time of the year is typically during the mornings between March and August, with the calmest month being May. Afternoons are typically windier than the mornings throughout the year. Summer is the windiest season (BoM, 2026).

PLATE 1: CLIMATE STATISTICS



3.2 TOPOGRAPHY

The Site is elevated between approximately 5-14 metres Australian Height Datum (m AHD), with the lowest points within the eastern and southern portions, rising up to the north and west.

3.3 LANDFORM AND SOILS

3.3.1 Geology and Soils

The geology of the Site is identified as predominantly sand of alluvial origin, with a small area of residual colluvial sand along the north and northeastern Site border (DMIRS, 2018a). The regolith is 'Sandplain' (DMIRS, 2018b), and the bedrock is 'granitic gneiss interlayered with metagabbro' (DMIRS,

2018c). The Site is part of the Albany Sandplain Soil Zone (DPIRD, 2025a), King Soil System (DPIRD, 2025b) and Minor Valleys S7 slope phase (DPIRD, 2025c). Characteristics of the geology and soil types are provided in **Table 5**.

TABLE 5: GEOLOGY AND SOIL CHARACTERISTICS

ASPECT	UNIT NAME	DESCRIPTION	REFERENCE
Geology			
Regolith	Sandplain	Sandplain, mainly eolian; includes some residual deposits.	DMIRS, 2018b
Bedrock	Nornalup Zone metagranitic unit	Granitic gneiss interlayered with metagabbro; may include intrusions of Recherche and Esperance Supersuites.	DMIRS, 2018c
Surface Geology	S14	SAND - white to pale grey, fine to medium, occasionally coarse, angular to sub-angular quartz, few fines, moderately sorted.	DMIRS, 2018a
Surface Geology	S6	SAND - pale grey, fine to coarse, angular to sub-rounded quartz, loose, moderately sorted, occasional pebbles of laterite.	DMIRS, 2018a
Soils			
Soil Zone	Albany Sandplain Zone	Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels.	DPIRD, 2025a
Soil System	King System	Dissected siltstone and sandstone terrain, on the southern edge of the Albany Sandplain Zone, with shallow gravel, sandy gravel, grey sandy duplex and pale deep sand. Jarrah-marri-sheoak woodland and mallee-heath.	DPIRD, 2025b
Soil Phase	Minor Valleys S7 slope phase	Broad valleys in sedimentary rocks; 30 m relief; smooth slopes. Deep sands and iron podzols on slopes; Albany Blackbutt-jarrah-sheoak woodland. Podzols and yellow duplex soils on floors; paperbark woodland, teatree heath.	DPIRD, 2025c

3.3.2 Acid Sulfate Soils

The common name given to soils and sediments containing iron sulfides is acid sulfate soils (ASS). When exposed to air due to drainage or disturbance, these soils produce sulfuric acid, often releasing toxic quantities of iron, aluminium and heavy metals.

Almost the entirety of the Site is mapped as a Class I ASS risk area (**Figure 3**). This classification indicates there is a high to moderate risk of ASS occurring within 3 m of the natural soil surface (DWER, 2017a). These areas are associated with low lying areas prone to inundation and are likely to be within the footprint of historic wetlands that have since been cleared and or heavily modified. The subsurface acidification risk for the entire Site is mapped as H2 which indicates that >70% of the map unit has a high subsurface acidification risk or is presently acid (DPIRD, 2025d).

During a site inspection, Aurora Environmental (2024b) recorded indicators of high-risk ASS including waterlogged soil, former wetlands and grey/ dark grey organic rich soils. The site observations align with the risk mapping.

3.4 CONTAMINATION

A review of the DWER Contaminated Sites Database did not identify any registered contaminated sites within or adjacent to the Site (DWER, 2026a). DevelopmentWA commissioned Aurora Environmental to prepare a Preliminary Site Investigation (PSI) for Lot 39. As part of the PSI, a Basic Summary of Records search request was submitted to the DWER and confirmed that the Site has not been reported as a known or suspected contaminated site either prior to or after the commencement of the *Contaminated Sites Act 2003* (CS Act) (Aurora Environmental, 2024b).

The PSI (Aurora Environmental, 2024b) made the following findings:

- **Historical and Current Land Use:** The Site has predominantly been used for low-intensity agriculture (sheep grazing), with limited evidence of potentially contaminating activities, including pesticide application and minor material stockpiling.
- **Areas of Potential Environmental Concern (APECs):** Six APECs were identified, primarily related to historical agricultural practices, stockpiled materials, imported fill, and ground disturbance.
- **Contaminants of Potential Concern (COPCs):** COPCs include asbestos containing materials (ACM), agricultural chemicals (e.g., pesticides, herbicides), and potential hydrocarbons. Limited sampling detected no asbestos in surface fragments; however, further investigation was recommended.
- **Groundwater and ASS:** The risk of groundwater contamination was deemed extremely low. Portions of the Site are mapped as High to Moderate risk for ASS, necessitating specific management during future works.
- **Regulatory Compliance:** The Site has not been classified under the CS Act. However, future redevelopment may trigger additional assessment and reporting requirements.

Notwithstanding the above findings, the likelihood of gross contamination at the Site was considered low, though further investigations were recommended to confirm environmental suitability for residential use (Aurora Environmental, 2024b).

3.5 HYDROLOGY

The Site is situated in the unproclaimed Albany Coast surface water area (DWER, 2026b) and the Oyster Harbour Estuarine sub-catchment (DWER, 2026c). It is situated 900 m west of the shoreline of Oyster Harbour. The Site is hydrologically linked to Oyster Harbour via surface and groundwater. Two major rivers flow into Oyster Harbour; King River and Kalgan River. The Site is located 1.2 km south of the King River. Oyster Harbour is part of the Healthy Estuaries WA program, a State Government initiative aimed at improving the health of estuaries in WA by reducing nutrient inputs and managing water quality.

There are no permanent, surface water features present within the Site. However, surface flow from the northern portion of the Site is directed via a shallow open drain that discharges into a dam, in the northeastern portion of the Site. It is likely that excess surface water which is not detained or

infiltrated within the Site flows into the Albany surface drainage system and ultimately discharges to Oyster Harbour.

Surface and groundwater enter the southern portion of the property from the west and flow into the wetland located in the southern portion of the Site before exiting to the east, where the water discharges into an unnamed wetland on the adjacent property.

3.5.1 Flood Risk

The Site has a flood risk category of 'L2', which is described as '3-10% of map unit having a moderate to high flood risk' (DPIRD, 2026). The 1961 aerial photograph (**Appendix 1**) suggests that a large proportion of the Site may be susceptible to inundation during wet conditions.

The Site is also mapped as having a waterlogging category of 'M1', which is described as '10-30% of map unit has a moderate to very high waterlogging risk' (DPIRD, 2025e).

Floodplain mapping provides guidance about land potentially impacted by major flooding events (DWER, 2024). Floodplain risk mapping identifies areas which may be within the floodway (i.e., at risk of moving floodwaters) and floodplain areas (i.e., at risk of inundation in flood events). The Site is not within any mapped floodway or floodplain areas.

Flood modelling for the greater Bayonet Head Catchment (which includes Lot 39) by PPK (2000) investigated pre- and post-development scenarios. The drainage study found the Catchment generally slopes toward the Alison Parade and Elizabeth Street outlet to Oyster Harbour. Under an extreme event, the drainage network present (at the time of the investigation) was considered insufficient to cater for a large storms such as the 100 year Average Recurrence Interval (ARI) event, causing inundation. A large wetland area east of Lot 39 was identified as providing a detention function for surface water. Drainage modelling for the Bayonet Head Outline Development Plan retained this function with overland flow from the northwest area passing through Lot 39 to the east and discharging offsite.

3.5.2 Wetlands

The Site does not intersect any South Coast Significant Wetlands (DBCA, 2017).

A wetland assessment within the Bayonet Head Outline Development Plan area by Coffey Environments (2008) mapped and assessed a wetland that intersects the southern portion of Lot 39, but outside of the proposed Scheme Amendment Area (**Figure 4**). This wetland (Wetland. 62) extends into adjacent properties to the south and east of Lot 39 (**Figure 4**).

Wetland 62 is known as Elizabeth Heights Wattie Swamp. It was assessed and considered to be commensurate with the Resource Enhancement (RE) management category. It is noted that:

- the methodology adopted at the time of the original assessment by Coffey Environments (2008) has since been superseded; and
- significant clearing has occurred at this wetland between 2022-2024, though parts still remain densely vegetated.

The Strategic Environmental Assessment(Coffey Environments, 2010) reported that degraded portions of Wetland 62 would contain stormwater management infrastructure, such as swales and

detention basins, depending on further detailed planning prior to subdivision. This wetland will not be impacted by the proposed development on Lot 39.

3.6 HYDROGEOLOGY

The Site is located within the Albany Sandplain Hydrological Zone which is described as:

> *"Gently undulating plain dissected by a number of short rivers flowing south. Eocene marine sediments overlying Proterozoic granitic and metamorphic rocks. Soils are sandy duplex soils, often alkaline and sodic, with some sands and gravels… The western part of the hydrozone is reasonably well drained by the Kalgan and King rivers, resulting in local and intermediate groundwater flow systems discharging into the surface drainage."* (DPIRD, 2022).

3.6.1 Groundwater

The Site is within the unproclaimed Karri groundwater area (DWER, 2026d) and the Karri groundwater subarea (DWER, 2026e).

Groundwater monitoring undertaken for the Strategic Environmental Assessment was limited to the southern half of the Bayonet Head Outline Development Plan area, with Lot 39 being outside of the groundwater investigation area. The investigation by Crisalis (2008) found the soil profile within investigation area generally comprises fine-grained silty sands and a layer of low permeability silty clays at a depth of approximately 2.5 m below ground level (BGL), resulting in the presence of a locally perched water table above the regional groundwater table with both rapidly responding to rainfall events (Coffey Environments, 2010). The perched water table does not intersect with the surface, except where wetlands were mapped (Coffey Environments, 2010). It is not known if similar conditions exist within Lot 39 without further investigation.

The depth to groundwater beneath the Scheme Amendment Area has not been established. However, groundwater is expected to be shallow based on the presence of year round water in the dam within the northeastern part of the Site (which is suspected to intersect groundwater) and evidence of inundation during the winter months. The surface water observed within the Site during the PSI was considered likely to be an expression of groundwater, in which case the water table rises above the surface for part of the year (Aurora Environmental, 2024b). Groundwater quality beneath the Site is unknown (Aurora Environmental, 2024b).

3.6.2 Groundwater Licences

There are no groundwater abstraction licences within the Site or within 2 km of the Site (DWER, 2026f).

No registered groundwater bores are present on the Site (DWER, 2026g).

3.6.3 Public Drinking Water Source Areas

Public drinking water source areas (PDWSAs) are surface water catchments and groundwater resources that provide drinking water to cities, towns and communities throughout WA. They are declared and protected under the *Metropolitan Water Supply, Sewerage, and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*.

The Site is not located within a PDWSA, with the closest PDWSA being more than 10 km from Lot 39 to the west (DWER, 2025).

3.7 VEGETATION AND FLORA

3.7.1 Regional Context

The Site is located in the Jarrah Forest region (JAF), one of 89 bioregions recognised under the Interim Biogeographic Regionalisation for Australia (IBRA). There are two sub-regions in the JAF, namely Northern Jarrah Forest (JA0F1) and Southern Jarrah Forest (JAF02). The Site is located within the JAF02 sub-region described as "Jarrah-Marri forest on laterite gravels and, in the eastern part, by Wandoo - Marri woodlands on clayey soils. Eluvial and alluvial deposits support *Agonis* shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands" (Hearn *et al*., 2002).

Broadscale (1:3,000,000) pre-European vegetation mapping of WA, identifies one Vegetation Association (VA) that is mapped across the Site:

- **VA 978:** Low forest, woodland or low woodland with scattered trees comprising Jarrah (*Eucalyptus marginata*), Banksia (*Banksia* spp.) or Casuarina (*Allocasuarina* spp.) (vegetation type 7) (DPIRD, 2019).

The Albany Regional Vegetation Survey (ARVS) provides a local and regional overview of the native vegetation by describing, mapping and assessing the conservation status of the vegetation within the City of Albany. The ARVS identifies the remnant vegetation in the southern portion of Lot 39 as *Taxandria juniperina* Closed Forest[1] (**Figure 5**). There is 779 ha remaining of this vegetation type which represents 1.8 % of the native vegetation in the ARVS survey area, with 9.9 % protected in conservation reserve and an additional 25.8 % within 'Other Crown Reserves' (Sandiford and Barrett, 2010). The vegetation patch on Lot 39 is outside of the Scheme Amendment Area, and is 4.15 ha which represents 0.53% of this vegetation type in the ARVS survey area. Recent aerial photographs indicate that part of this vegetation was cleared between 2022-2024.

3.7.2 Site Vegetation

Vegetation mapping within the broader Bayonet Head Outline Development Plan area was undertaken by Coffey Environments (2009a). At the time of the survey (circa 2005), two patches of native vegetation were mapped within Lot 39, with the balance comprising pasture and cleared areas (**Figure 6**). The patches were mapped as two vegetation types and were described as:

- **AfLCF:** Low Closed *Allocasuarina fraseriana* Forest over *Agonis theiformis, Jacksonia furcellata* and *Xanthosia rotundifolia* over *Lepidosperma gradiatum* and *Lepidosperma squamatum.*
- **AsCiTOS:** Tall Open *Astartea scoparia* and *Callistachys lanceolata* scrub over *Juncus kraussii*, *Baumea articulata*, *Lepidosperma gladiatum* and *Hypolaena exsulca*.

The mapped extent of the AfLCF patch was 0.16 ha and its condition was assessed as Good (**Figure 6**). This patch was mapped within the Scheme Amendment Area but has since been cleared.

The extent of the AsCiTOS patch was originally mapped as 4.77 ha and its condition was assessed as Good to Degraded (**Figure 6**). The 2024 aerial photograph shows a reduced vegetation extent within

[1] This survey may not have included a site visit

the area mapped as AsCiTOS in Lot 39 (**Figure 6**), and is estimated to occupy approximately 2.4 ha. This vegetation type occurs wholly outside of the Scheme Amendment Area.

Both vegetation types were described as Wetland/Transitional Vegetation which comprised a mosaic nature with the understorey including wetland/transitional species as well as species more common in drier areas (Coffey Environments, 2009a).

3.7.3 Significant Vegetation Communities

Database results from the Commonwealth PMST (DCCEEW, 2026a; **Appendix 2**) and the DBCA restricted dataset for significant ecological communities (10 km radius) identified four significant vegetation communities listed under the EPBC Act, the WA *Biodiversity Conservation Act 2016* (BC Act) and / or listed by DBCA, these were:

- *Banksia coccinea* Shrubland/*Eucalyptus staeri*/Sheoak Open Woodland (DBCA listed Priority 1 Priority Ecological Community (PEC) and part of the EPBC Act listed Endangered Proteaceae dominated Kwongkan shrubland Threatened Ecological Community (TEC));
- Subtropical and Temperate Coastal Saltmarsh (DBCA listed Priority 3 PEC and EBCA Act listed Vulnerable);
- *Astartea scoparia* Swamp Thicket (DBCA listed Priority 1 PEC, EPBC Act not listed); and
- *Empodisma* peatlands of southwestern Australia (EPBC Act listed Endangered).

The buffered extents of known occurrences of TECs/PECs from the DBCA's restricted records do not overlap with the Site, except for approximately 125 square metres in the south-eastern corner of Lot 39 (**Figure 7**). The area intersecting with Lot 39 is devoid of native vegetation and not representative of a TEC/PEC.

The PMST database search (DCCEEW, 2026a; **Appendix 2**) identifies the *Empodisma* peatlands and Kwongkan shrublands as likely to occur and may occur respectively within the Site. However, these ecological communities are not present as the Site does not support Kwongkan shrublands due to historical clearing and the remnant vegetation within Lot 39 does not meet the flora or soil diagnostic characteristics of the *Empodisma* peatlands (DCCEEW, 2022).

The remnant wetland vegetation within the southern portion of Lot 39 (outside of the Scheme Amendment Area), appears to share similarities in species composition with the *Astartea scoparia* Swamp Thicket PEC, with *A. scoparia being a* dominant species. The closest known occurrence of this PEC in the DBCA Threatened and Priority Ecological Community database is approximately 2.5 km southwest of Lot 39, with a further 10 occurrences approximately 3-5 km south of Lot 39 (**Figure 7**).

Astartea scoparia Swamp Thicket was not listed as a PEC at the time of the Coffey Environments (2009a) flora and vegetation assessment for the Bayonet Head Outline Development Plan. As this area has been impacted by clearing since the original assessment, an updated flora and vegetation survey would be required to assess if the remaining vegetation is representative of the *Astartea scoparia* Swamp Thicket PEC.

3.7.4 Conservation Significant Flora

The DBCA restricted dataset for Threatened and Priority flora identified 23 conservation significant flora species, represented by 59 records within 10 km of the Site (**Figure 8**). The WA Herbarium

(WAHERB) dataset identified 73 conservation significant flora species, represented by 205 records within 10 km of the Site. Records from the WA Herbarium should be reviewed with caution as data accuracy can be highly variable. None of the records from these database searches intersect the Site.

A search of the Commonwealth PMST identified the following EPBC Act listed flora which are known, or suitable habitat is known, to occur within the Site (DCCEEW, 2026a; **Appendix 2**):

Species or species habitat known to occur within area:

- Brown's Banksia (*Banksia brownii*); EPBC Act listed Critically Endangered;
- Good's Banksia (*Banksia goodii*); EPBC Act listed Vulnerable;
- Manypeaks Rush (*Chorifex abortivus*); EPBC Act listed Endangered;
- Dwarf Hammer-orchid (*Drakaea micrantha*); EPBC Act listed Vulnerable;
- Albany Cone Bush (*Isopodon uncinatus*); EPBC Act listed Endangered;

The northern portion of the Site is cleared and no longer contains areas of intact native vegetation (Aurora Environmental, 2024b). This area does not provide suitable habitat for any conservation significant flora.

The southern portion of the Site contains a wetland with some native vegetation. Coffey Environments (2009a) did not record any conservation significant flora species within Lot 39. However, no quadrats were sampled within Lot 39 during the flora and vegetation survey. This does not necessarily mean that the presence of significant flora was not assessed in Lot 39, but the absence of tracklogs mean the survey coverage can be verified. Nonetheless, the likelihood of conservation significant flora being found in this area is considered low due to historic and relatively disturbances that include clearing, grazing and weed invasion.

3.7.5 Dieback

The DBCA's *Phytophthora* Dieback Occurrence dataset (DBCA, 2025a) shows no occurrences of *Phytophthora* dieback have been recorded within the Site or within 2 km of the Site. A significant proportion of Lot 39 is uninterpretable due to the absence of native vegetation.

A dieback survey was conducted for Lots 1000 and 1001 Lower King Road, approximately 560 m southwest of Lot 39. The survey by Coffey Environments (2008) confirmed the presence of *Phytophthora cinnamomi* extensively throughout both lots.

3.8 CONSERVATION AREAS

3.8.1 Reserves

No DBCA Legislated Lands and Water reserves (DBCA, 2025b) intersect the Site. The closest DBCA managed reserves are approximately 2.4 km southeast (Green Island Nature Reserve; Reserve no. 24808), 2.9 km north (Bon Accord Road Nature Reserve; Reserve no. 30469), and 3.8 km southeast of the Site (Gull Rock National Park; Reserve no. 27107).

A review of the Collaborative Australian Protected Areas Database (CAPAD) did not identify any additional reserve areas (DCCEEW, 2026b).

3.8.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are areas declared by the Minister for Environment under section 51B of the *Environmental Protection Act 1986* (EP Act) and are typically associated with environmental values such as important wetlands, TECs, threatened flora and Bush Forever sites.

No ESAs intersect the Site ESAs (DWER, 2021). The closest ESAs are approximately 950 m east (Oyster Harbour) and two sites, one 1.3 km southwest and another 1.7 km northwest, that are likely associated with threatened flora.

3.8.3 Albany Local Biodiversity Strategy

The City of Albany's draft Local Biodiversity Strategy (City of Albany and Aurora Environmental, 2025) evaluated and ranked remnant native vegetation patches (or Local Natural Areas) within the local government area using a multi-criteria analysis based on weighted ecological criteria. The ecological criteria included aspects such as connectivity, presence of wetlands, habitat for significant species, representation, patch size, etc. This classification process ranks Local Natural Areas and allows the City of Albany to prioritise efforts and resources towards protecting against threats and enhancing of areas with important ecological value.

The only area within Lot 39 that was scored, is a small native vegetation patch associated within the wetland in the southern part of the Lot, which is outside of the Scheme Amendment Area. The native vegetation patch was assigned an overall ranking score of 57, placing it outside of the top 100 Local Natural Areas.

3.9 BUSH FIRE RISK

The Bush Fire Prone Areas 2025 dataset (Department of Fire and Emergency Services [DFES], 2025) identifies bush fire prone areas of WA, as designated by the Fire and Emergency Services Commissioner. Approximately 50 % of the Scheme Amendment Area is mapped as a 'bush fire prone area' (**Figure 6**). The exception being the northwest part of the Scheme Amendment Area.

3.10 TERRESTRIAL FAUNA

Fauna habitat mapping within the broader Bayonet Head Outline Development Plan area was undertaken by Coffey Environments (2009b). One habitat type was mapped within Lot 39 (**Figure 9**):

- **Wetland Mosaic (WM):** Degraded Peppermint (*Agonis flexuosa*) and *Callistachys lanceolata* Woodland over *Pteridium esculentum.*

A total of 9.59 ha within Lot 39 was mapped as WM habitat type by Coffey Environments (2009b), with the remaining areas mapped as Cleared Pasture (**Figure 9**). Habitat condition ranged from 'Good' within the wetland area in the southern portion of the Site to 'Disturbed' and 'Highly Degraded' across the remainder of the Site (**Figure 10**).

Since this survey, the northern portion of the Site has become further degraded and no longer includes any areas of intact, naturally occurring native fauna habitat. The small dam in the northeast may provide some refuge for water birds and other fauna. The extent of habitat surrounding the wetland has decreased due clearing between 2022-2024 however, some fauna habitat remains (Aurora Environmental, 2024b).

3.10.1 Conservation Significant Fauna

The DBCA's restricted dataset for Threatened and Priority fauna identified 4,212 conservation significant fauna records comprising 79 species occurring within 10 km of the Site (**Figure 11**) including:

- 53 species of bird;
- Two species of fish;
- Five species of invertebrate;
- 16 species of mammal; and
- Three species of reptile.

Of the above classes of fauna, the following conservation status has been nominated (noting that some species have multiple statuses):

- One species listed Extinct under the BC Act;
- Five species listed Critically Endangered under the EPBC Act and BC Act;
- 17 species listed Endangered under the EPBC Act and BC Act;
- 13 species listed Vulnerable under the EPBC Act and BC Act;
- 27 species listed Specially Protected - Migratory;
- Two species listed Specially Protected - Conservation Dependent;
- Two species listed Specially Protected - Other Specially Protected
- One species listed as DBCA Priority 2;
- Three species listed as DBCA Priority 3; and
- Six species listed as DBCA Priority 4;

Common terrestrial conservation significant species recorded within 10 km of the Site include Carnaby's Cockatoo (Endangered), Baudin's Cockatoo (Endangered), Forest Red-tailed Black Cockatoo (Vulnerable), Western Ringtail Possum (Critically Endangered) and Quenda (Priority 4). A single Baudin's Cockatoo has been recorded in the wetland vegetation on the Site. The record is dated 2001 with an accuracy of 500 m and confidence in identification listed as 'uncertain'. No other records of conservation significant fauna intersect the Site. No conservation significant fauna species were recorded within the Site during the fauna survey by Coffey Environments (2009b).

The habitat in the southern portion of the Site (outside of the Scheme Amendment Area) was identified as potentially providing suitable habitat for Western Ringtail Possums (*Pseudocheirus occidentalis*; Critically Endangered) (Aurora Environmental, 2024a). It may also provide suitable habitat for Quenda (*Isoodon fusciventer;* Priority 4). Both of these species have been recorded in native vegetation on adjacent or nearby properties. Due to vegetation condition and past clearing, these species may be present but the vegetation is unlikely to be considered primary habitat.

3.10.2 Black Cockatoo Habitat

The Site is located within the known breeding range of Baudin's Cockatoo and Carnaby's Cockatoo, and within the modelled distribution of Forest Red-tailed Black Cockatoo (DAWE, 2022).

The habitat within the Site intersects an area that is mapped as requiring investigation as foraging habitat for Carnaby's Cockatoo (DBCA, 2018). However, site visits have confirmed that the native vegetation is unsuitable as foraging habitat for Carnaby's Cockatoo (Aurora Environmental, 2024a). In addition, the native vegetation does not meet the criteria of high-quality foraging habitat for Baudin's Cockatoo or Forest Red-tailed Black Cockatoo (DAWE, 2022).

There is no suitable nesting or roosting habitat present in the native vegetation in the southern portion of the Site (Aurora Environmental, 2024a). However, the Site is located within 6 km of confirmed roosting sites for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo (DBCA, restricted dataset, 2026) and adjacent to Eucalypt woodland and proteaceous heath (Coffey Environments, 2009a) which would be considered high-quality foraging habitat (DAWE, 2022). This indicates that the wetland and the dam in the northeast of Lot 39 may provide a water resource to these species. The native vegetation surrounding the wetland may provide temporary shelter to Black Cockatoos that have been drinking from these areas. However, other wetlands in better condition are present within 500 m of the Site and would also provide a suitable water source for Black Cockatoos. Although Black Cockatoos may overfly the Site or temporarily be present at water sources or forage on pasture weeds, it is highly unlikely that the Site represents a significant habitat resource for Black Cockatoos in this area.

3.11 HERITAGE

3.11.1 Aboriginal Cultural Heritage

The Site does not intersect any registered, lodged or historic Aboriginal cultural heritage (ACH) sites (DPLH, 2026a, DPLH-, 2026b, DPLH, 2026c). The following sites are present within 2 km of the Site:

- Place ID 24019: 'Oyster Harbour Caravan Park Lake' (Historic). Camp; Creation / Dreaming Narrative; Landscape / Seascape Feature. Approximately 210 m east;
- Place ID 21498: 'Windemere Scatter' (Lodged). Artefacts / Scatter; Ochre; Other. Approximately 640 m east;
- Place ID 22553: 'Alfred Knapp's Seasonal Camp' (Historic). Camp; Historical. Approximately 640 m west;
- Place ID 636: 'Oyster Harbour (total)' (Registered). Creation / Dreaming Narrative. Approximately 1 km east; and
- Place ID 5744: 'Oyster Harbour, Albany' (Registered). Artefacts / Scatter; Camp; Fish Trap; Other. Approximately 1.9 km northeast.

An archaeological and ethnographic survey was conducted by Brad Goode and Associates (2007) for the Bayonet Head Outline Development plan, inclusive of Lot 39. The survey, which included consultation with Aboriginal representatives nominated by the Albany Heritage Reference Group Aboriginal Corporation. Nominated persons represented the Southern Noongar and Wagyl Kaip Native Title Claimant Groups (Brad Goode and Associates, 2007). No ACH sites within Lot 39 were identified from desktop research or as a result of the site visit and consultation with Aboriginal representatives.

An ethnographic and archaeological site identification survey specific to Lot 39 (WKSN AC, 2024) was commissioned by DevelopmentWA. This survey identified one cultural feature recorded as a scar tree along the western boundary of the Site (**Figure 2**). The report indicated that this record would be submitted for registration as a Cultural Heritage Site with the DPLH. However, it is not evident that this has occurred. In addition, it was requested that the wetland on the southern portion of the Site be retained and protected as 'green space' to assist in protecting floral and faunal diversity and populations in the area, local subterranean waterways and cultural heritage values embedded in significant landscapes such as wetlands, forests and waterways (WKSN AC, 2024).

3.11.2 Other Heritage

No World Heritage Properties occur within the Site (DCCEEW, 2026a). The Commonwealth PMST identified the buffer of 12 Commonwealth Lands within 10 km of the Site (DCCEEW, 2026a; **Appendix 2**).

The Site does not intersect any State heritage places and there are no State heritage places within 2 km of the Site (DPLH, 2026d).

The Site does not intersect any Municipal heritage places (DPLH, 2026e). Three heritage sites are located within 2 km of the Site including:

- Lower King Store; Place no. 15674; located 1.4 km northeast of the Site;
- Point Henty; Place no. 15641; located 1.9 km northeast of the Site; and
- Eyre and Wylie Memorial; Place no. 15578; located 1.9 km southwest of the Site.

InHerit (GoWA, 2026) contains information about cultural heritage places listed in the State Register of Heritage Places, local government inventories, the Australian Government's heritage list and other non-government lists and surveys. No sites registered on InHerit intersect the Site.

4 ENVIRONMENTAL ASPECTS AND IMPACTS

4.1 IDENTIFICATION OF RELEVANT ENVIRONMENTAL AND HERITAGE ASPECTS

The preparation of the Concept Plan (**Figure 2**) has considered the preliminary environmental factors identified in previous environmental reports, in conjunction with various technical inputs and supporting documentation.

The Concept Plan covers the northern portion of the Site, identify areas for residential development and POS, some of which will be associated with drainage features such as the dam in the northeastern corner of the Site and drainage to this area. The road layout in the Concept Plan has been designed to avoid the scar tree identified in the 2024 heritage survey. The southern portion of Lot 39, which includes the RE wetland, is not proposed to be rezoned. This area will be considered separately as part of planning for the broader Bayonet Head area.

Using the information collated in Section 3 of this report it has been determined that the following EPA environmental factors are relevant to the proposed rezoning and development of the northern portion of Lot 39:

- Inland waters;
- Terrestrial environmental quality; and
- Social surroundings.

The key considerations and recommendations relevant to each of the above factors are discussed in Sections 4.2 to 4.4. Flora, fauna and vegetation factors are not considered relevant for this assessment as no intact native vegetation or significant fauna habitat features will be impacted.

4.2 INLAND WATERS

4.2.1 Key Considerations

Based on the outcomes of the assessment the following key considerations have been identified for the factor of inland waters:

- Pre-development surface water and groundwater conditions within the Scheme Amendment Area have been investigated. These are being considered in further detail in a Water Management Report, consistent with the requirements of State Planning Policy (SPP) 2.9.
- Shallow groundwater levels (<3 m BGL) are likely to be present within the Scheme Amendment Area. Historical evidence and site observations suggest groundwater is expressed naturally on the surface during wet seasons. Groundwater conditions will need to be considered:
    - when determining the finished levels to ensure there is adequate protection of property and infrastructure, including when designing the drainage system; and
    - during construction where temporary dewatering may be needed for the installation of servicing infrastructure.
- The dam in the northeast corner of the Scheme Amendment Area will be retained in a proposed POS area. Historic aerial photographs show water is present in this dam year round. Under

certain conditions, standing water bodies may become a potential source of nuisance insects such as midges and mosquitoes. This matter should be addressed in the Water Management Report.

- The PSI (Aurora Environmental, 2024b) consider the risk of groundwater contamination is extremely low, unless gross soil contamination is identified.

4.2.2 Recommendations

The following recommendations are made regarding inland waters:

- Prepare and implement a Water Management Report in accordance with the requirements of SPP 2.9 (WAPC, 2025a and 2025b) as part of future planning and development, ensuring stormwater quality, erosion/sediment controls and treatment trains align with the Stormwater Management Manual for WA (DWER, 2022) and Decision Process for Stormwater Management in WA (DWER, 2017b).
- Review the civil engineering design against groundwater conditions to establish whether dewatering will be required during construction. If required, further investigations will be required to establish groundwater quality and guide management of dewatering discharge to prevent adverse impacts to water resources, including Oyster Harbour.
- Implement a groundwater quality assessment if dewatering is proposed or gross contamination is identified within the Scheme Amendment Area.

4.3 TERRESTRIAL ENVIRONMENTAL QUALITY

4.3.1 Key Considerations

Based on the outcomes of the PSI (Aurora Environmental, 2024b), six APECs were identified as discussed below.

AEPC 1: Farm shed and sheep handling yard

A farm shed was observed near the western boundary of the Site. The farm shed was constructed between 1988 and 1990 with zincalume sheeting and a concrete base. Access to the interior of the shed was not possible at the time of the site inspection. Anecdotal information provided by a representative of the Site owner suggests that the shed is used for machinery storage (including a tractor), and small quantities of fuel (<100 litres of diesel) and chemicals (e.g., glyphosate). It is understood that refuelling activities, as well as chemical handling, are conducted inside the shed on the concrete hardstand. It is also possible that soils beneath the concrete slab were treated for termites using pesticides during the shed construction.

A small sheep handling yard adjoins the southern side of the shed. Anecdotal information indicates that these handling yards are used for animal husbandry activities, including the application of lice control treatments to sheep. There was no evidence of a sheep dip on Site.

During the inspection, minor fragments of potential asbestos containing materials (PACM) were noted. Laboratory analysis of these fragments did not detect the presence of asbestos. However, other fragments of flat sheet fibre cement material with a dimpled pattern on one side were observed but

could not be retrieved for laboratory analysis. Based on Aurora Environmental's experience in visual identification of asbestos, it is considered likely that this material contains asbestos.

It is currently uncertain if additional ACMs were used in the internal construction of the shed.

APEC 2: Application of pesticides/herbicides/insecticides to pastures

Aerial photography indicates that portions of the Site have been used for low-intensity agricultural activities since the earliest available photograph (1961). According to the DWER (2021) guidelines, agricultural land use can be a potentially contaminating activity. Anecdotal information also suggests that the firebreaks at the Site are managed by the application of glyphosate. The COPCs associated with such activities include heavy metals, organochlorine pesticides (OCPs), organophosphorus pesticides (OPPs), and carbamate-based pesticides.

APEC 3: Rubble used to consolidate the dam wall in northeast portion of the site

Anecdotal information provided by the representative of the site owner suggest that approximately 100m^2 of cement/clay roofing tiles, derived from a demolished house in the area, were used to consolidate the southern wall of the dam in the northeast portion of Lot 39. Aerial photographs shows that the dam was constructed between February 1977 and April 1988. During the inspection fragments of cement roof tiles were observed in this area, and there were no signs of uncontrolled construction and demolition waste co-located with the roof tile fragments. ACM is commonly associated with historic demolition materials and maybe present in the materials used in the dam wall.

APEC 4: Ground disturbing activities, material stockpiling and laydown during Elizabeth Street 2017 roadworks

Aerial photographs captured between February 2017 and May 2018 show that the northeastern portion of Lot 39 was temporarily used as a laydown area for material and plant equipment, as well as what appears to be a site office, during roadworks on Elizabeth Street. The photos reveal several stockpiles of raw materials stored on-site, along with stockpiles of what appear to be reworked natural soils or fill materials excavated from the road alignment.

The presence of plant equipment introduces the potential that refuelling and minor mechanical work may have been carried out during this period. The May 2018 aerial photograph shows that these materials were removed and the footprint of the laydown area was scraped/graded after completion.

APEC 5: Imported material used to construct internal roadways

The 1977 aerial photograph shows a constructed track in the central portion of Lot 39, appearing to be made from imported material. The footprint of this track is not visible in subsequent aerial photographs. The 1988 and 1996 aerial photographs show a new track leading from the site entrance from Elizabeth Street to the farm shed along the western boundary. This track also appears to have been made using imported fill material. This access track remains in place.

APEC 6: Stockpiles of sand of unknown origin in the northwest of site

The May 2020 aerial photograph shows evidence of a stockpile or ground disturbance along the northwestern boundary of Lot 39, coinciding with the neighbouring housing development. The origin and nature of these materials are uncertain. During the site inspection, a second area of stockpiled imported cream coloured sand fill was observed north of the farm shed. The origin of this material is

also unknown, although no construction and demolition waste were observed on the surface of this stockpile.

Acid Sulfate Soils

A substantial proportion of the Scheme Amendment Area is mapped as Class I ASS risk (high to moderate risk of ASS occurring within 3 m of the natural soil surface) and indicators of high-risk ASS (waterlogged soils, former wetlands and grey/dark grey organic rich soils) were observed during a site inspection.

The risk of encountering high-risk ASS was assessed as high.

The DWER (formerly the Department of Environment and Regulation [DER]) guidance *Identification and Investigation of ASS and Acidic Landscapes* (DER, 2015a) indicates that earthworks that disturb more than 100 m^3 of soil or involve lowering of groundwater levels in areas mapped as Class I require intrusive investigations to evaluate the presence of ASS materials prior to ground disturbing activities.

4.3.2 Recommendations

The following recommendations are made in relation to terrestrial environmental quality:

- **Targeted Soil Investigation:** Conduct additional assessment and sampling (where necessary) to confirm the absence or extent of contamination associated with the identified APECs.
- **ASS:** Perform an ASS investigation in accordance with DWER guidelines to assess the extent of potential ASS risks. Pending the results of the ASS investigation, prepare an ASS and Dewatering Management Plan (ASSDMP) in accordance with DWER guidelines.
- **Groundwater Quality Assessment:** Only required if gross soil contamination is identified and/or dewatering/disturbance of ASS is required during construction.
- **Construction Environmental Management Plan (CEMP):** A CEMP to be prepared and implemented by the construction contractor. The CEMP is to include measures to avoid, minimise and mitigate environmental impacts associated with construction, and to include an unexpected finds procedure in the event of contamination or hazardous materials are discovered during site works.

These recommendations could be undertaken simultaneously and will support compliance with regulatory requirements and mitigate possible risks associated with developing the Site for future residential land use.

4.4 SOCIAL SURROUNDINGS

4.4.1 Key Considerations

Based on the outcomes of the assessment the following key considerations have been identified for social surroundings:

- Based on the DPLH's AHIS, the Site does not intersect any ACH sites (registered, lodged or historic).

- A cultural feature (recorded as a scar tree) was identified during the archaeological and ethnographic assessment midway along the western boundary of Lot 39 (WKSN AC, 2024). WKSN AC (2024) indicated that this tree would be submitted to the DPLH for lodgement and eventual registration. However, it is not evident that this has occurred as there is no listing in the ACHIS. It was requested that this tree be protected and any damage to it constitutes damage to Aboriginal heritage representing a breach of the *Aboriginal Heritage Act 1972* (AH Act) (WKSN AC, 2024).
- WKSN AC (2024) advised that there is moderate potential for encountering Aboriginal sites and/or cultural materials within Lot 39.
- The Scheme Amendment Area is approved by Project Elders for development, barring the damage of any cultural heritage values (WKSN AC, 2024).

4.4.2 Recommendations

The following recommendations are made in relation to social surroundings:

- Clarify the status of the scar tree to determine if it is classified as a 'site' as defined in the AH Act.
- Pending the outcome of the above, if the scar tree is classified as a 'site', ensure it is protected, unless authorisation under the AH Act is obtained.
- Wagyl Kaip Southern Noongar Aboriginal Corporation requested that Cultural Monitors be present during ground-disturbing works and that communications between the Corporation and DevelopmentWA remain open.
- The CEMP referenced in Section 4.3.2 also include provisions relating to the protection of cultural heritage and management of any unexpected finds encountered during construction.

5 ENVIRONMENTAL APPROVALS

5.1 STATE APPROVALS

5.1.1 Part IV *Environmental Protection Act 1986*

5.1.1.1 Scheme Amendment

Under the EP Act, the EPA can formally assess scheme amendments that may have a significant impact on the environment. Only the Scheme Amendment Area is proposed to be rezoned, with the zoning for the southern portion remaining as 'Rural'.

The EPA environmental factors identified as potentially relevant include:

- Inland waters;
- Terrestrial environmental quality; and
- Social surroundings.

Based on the assessment of the values outlined in Section 3 of this report, along with the recommendations provided in Section 4, it is considered highly unlikely that the EPA would assess the proposed scheme amendment. This aligns with current practice, especially given prescribed classes of scheme amendments exempt from referral/assessment and the ability for EPA to decide not to assess under s48A.

5.1.1.2 Section 38

A proponent or a decision-making authority may refer a proposal to the EPA under Section 38 of the EP Act, if the proposal has environmental issues not considered in the assessment of the Scheme Amendment, or the proposal does not comply with an assessed Scheme. Referral under Section 38 of the EP Act can be made by:

- The proponent;
- A decision-making authority; or
- A third party.

Referral to the EPA is generally undertaken where a project or proposal is deemed to have a high risk of a significant environmental impact. In 2008, Lot 39 was included in the Bayonet Head Outline Development Plan that was referred to the EPA under Section 38. The referred development was considered a strategic proposal and was formally assessed by the EPA as a SEA. On completion of the assessment, the EPA provided its recommendation to the Minister for the Environment. The referred proposal was subsequently approved by the Minister for the Environment in August 2013, subject to implementation of the conditions in MS 942. MS 942 had a time limit of ten years, which has now passed and the Ministerial authorisation has lapsed.

Based on the results of this assessment, it is Aurora Environmental's view that the proposed rezoning and development within Lot 39 will not significantly impact the environment. The potential environmental impacts can be adequately managed under other regulatory mechanisms throughout the subsequent planning stages. Therefore, a referral to the EPA is not recommended. Although

MS 942 has now lapsed, the development proposed within the northern portion of Lot 39 will not directly impact any of the previously proposed conservation areas nor does it conflict with any requirements of the previous EPA approval.

5.1.2 Native Vegetation Clearing Permits

In WA, the clearing of native vegetation requires authorisation from the DWER, unless the clearing is being conducted for an exempt purpose. The potential exemptions are contained in Schedule 6 of the EP Act and Regulation 5 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, noting that Regulation 5 exemptions do not apply to areas mapped as ESAs.

Development approval (e.g. subdivision approval) under the *Planning and Development Act 2005* provides a pathway for clearing of native vegetation without requiring a native vegetation clearing permit. This pathway falls into the Schedule 6 exemptions (Clause 9). However, if clearing is required in advance of subdivision approval (e.g. to conduct earthworks or construct servicing infrastructure), approval via a native vegetation clearing referral or a clearing permit will be required to clear remnant native vegetation.

As the Scheme Amendment Area has been cleared and no longer contains areas of native vegetation, a clearing permit will not be required.

5.1.3 Biodiversity Conservation Act 2016

The BC Act provides a framework for the protection of biodiversity in WA. The objectives of the Act are to provide for:

- The conservation and protection of biodiversity and biodiversity components in WA; and
- The ecologically sustainable use of biodiversity components in WA.

The scope of the BC Act and its associated regulations protect flora, fauna, ecological communities, and critical habitats.[2] Approvals under the BC Act (section 40 permit) are required for activities that take or disturb listed threatened species or TECs.

Based on the results of this assessment, the proposed development will not impact any TECs or threatened flora or fauna species. Therefore, a section 40 permit will not be required.

5.1.4 Rights in Water and Irrigation Act 1914

The *Rights in Water and Irrigation Act 1914* (RIWI Act) governs the regulation and rights associated with water resources in WA. The Act is administered by the DWER which issues licences and permits to:

- Take water (for groundwater abstraction or for dewatering);
- Construct wells (including bores and soaks); and
- Interfere with the bed and banks of a watercourse.

In accordance with Schedule 1, Division 2, clause 7(2) of the RIWI Act, the DWER ensures the proposed taking and using of water are ecologically sustainable and environmentally acceptable. Approvals to

[2] Critical habitats are habitats listed under the BC Act as being critical to the survival of a threatened species or a threatened ecological community.

construct a groundwater bore and to abstract groundwater for dewatering (except for minor dewatering below threshold levels) or irrigation purposes requires approval when proposed in proclaimed groundwater areas. However, as the Scheme Amendment Area is not within a proclaimed groundwater area, no 5C/26D licences are anticipated. Nevertheless, any temporary dewatering and discharge must be managed in accordance with Water Quality Protection Note 13 (Department of Water, 2012) and an ASSDMP prepared for the Site.

5.1.5 Aboriginal Heritage Act 1972

The AH Act Guidelines (DPLH, 2023) outline that before embarking on any activities on land, landowners should undertake the following steps to determine whether those activities will affect Aboriginal sites or Aboriginal objects (as defined in the Guidelines):

- Assess whether there is any Aboriginal heritage on the land. This may include searching the ACHIS or undertaking consultation with Aboriginal people;
- Consider any potential for harm to any Aboriginal sites that are discovered; and
- Determine the nature and level of potential harm and whether a Section 18 consent will be required.

Two archaeological and ethnographic assessments have been undertaken which cover the Scheme Amendment Area. One archaeological feature (cultural scar tree) was recorded on the western border of the Scheme Amendment Area. The Concept Plan shows that this tree will be retained. If this tree cannot be retained, then further investigation to confirm its status will be required, and if deemed a 'site', authorisation under the AH Act will be needed. It was also deemed moderately likely that other cultural features may be found on the site during ground-disturbing activities (WKSN AC, 2024). It is recommended an Aboriginal Heritage Management Protocol is included as part of the CEMP to manage unexpected finds encountered during construction. WKSN AC (2024) also recommended Cultural Monitors are employed to be present at the Site during ground-disturbing activities.

As ACH is unlikely to be impacted by the proposed development, no further approvals are expected to be required under the AH Act. However, this position may change if new cultural heritage materials are discovered during the course of site works, or if the scar tree cannot be retained, and it is found that the tree is classified as a 'site'.

5.1.6 Contaminated Sites Act 2003

The CS Act provides the legal framework for:

- Identifying, reporting, classifying, and remediating contaminated land in WA;
- Managing risks to human health, the environment, and land use viability; and
- Complementing the EP Act by addressing contamination and legacy issues not covered under that Act.

Under the Act, owners, occupiers, polluters, and auditors must report known or suspected contamination to the DWER. After reporting, the DWER may classify sites as:

- Possibly Contaminated – Investigation Required;
- Contaminated – Remediation Required;

- Contaminated – Restricted Use; and
- Remediated for Restricted Use.

These classifications guide the actions needed before development or proposed changes in land use.

As discussed in previous sections of this report, further investigations are recommended to determine the absence or extent of contamination associated with the identified APECs. The requirement to report under the CS Act should be reviewed once the findings of these investigations have been completed. Where required, remediation of any identified contamination should be completed in accordance with the requirements of the CS Act.

5.2 COMMONWEALTH APPROVALS

5.2.1 Environment Protection and Biodiversity Conservation Act 1999

Actions that have, or are likely to have, a significant impact on a matter of national environmental significance (MNES) require referral to the Commonwealth DCCEEW under the EPBC Act. A significant impact is defined as an impact which is important, notable, or of consequence, having regard to its context or intensity (DoE 2013).

There are nine MNES protected under the EPBC Act as follows:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (listed under the Ramsar Convention);
- Listed threatened species and ecological communities;
- Migratory species protected under international agreements;
- Commonwealth marine areas;
- The Great Barrier Reef Marine Park;
- Nuclear actions (including uranium mines); and
- A water resource, in relation to coal seam gas development and large coal mining development.

The EPBC Act applies to 'actions' which:

- Have a 'significant impact' on MNES;
- Are undertaken by Commonwealth government agencies and have a significant impact on the environment anywhere in the world; or
- Are undertaken by any person and have a significant impact on Commonwealth land (even if the activity is not actually carried out on the Commonwealth land).

If a proposal fits one of these descriptions, it will be required to be referred to the DCCEEW. If the proposal is not consistent with any of the above descriptions, the Environmental Impact Assessment provisions of the EPBC Act will not apply and there is no need to obtain the approval of the Commonwealth Minister for the Environment (Environmental Defenders Office [EDO], 2024).

This assessment has determined that it is highly unlikely that any MNES would be significantly impacted by the proposed development. Therefore, there is no requirement to refer the project under the EPBC Act.

5.3 STATE PLANNING POLICIES

Table 6 provides a summary of key considerations for relevant SPPs that may be relevant to environmental management within the Site.

TABLE 6: STATE PLANNING POLICY CONSIDERATIONS

SPP	RELEVANT ASPECT	CONSIDERATION
2.0 Environment and Natural Resources Policy	Avoid development that may result in unacceptable environmental damage. Protect significant natural and cultural features. Consider potential on-site and off-site impacts.	The Scheme Amendment Area does not contain any areas of intact native vegetation. Native vegetation associated with a RE wetland is present south of the Scheme Amendment Area within the southern portion of Lot 39. This area will not be impacted by the proposed development. A cultural heritage feature (scar tree) was identified along the western boundary of the Scheme Amendment Area. This tree will be avoided and retained. No other significant natural or cultural features have been identified within the Scheme Amendment Area.
	Water resources	Groundwater and surface water constraints have been identified. A Water Management Report is being prepared and will be implemented.
	Air Quality	Surrounding land uses have been reviewed. The proposed development will not impact upon surrounding receptors. Potential dust emissions during construction will be temporary, and can be adequately managed by preparing and implementing a CEMP.
	Soil and land quality	A PSI has been prepared for Lot 39, recommending further investigation be conducted. Potential contamination issues, if identified through further investigation, will be managed in accordance with the requirements of the CS Act. Intrusive site investigations are recommended to confirm the presence of ASS in accordance with DWER Guidelines (DER, 2015a). Pending the findings of this investigation, an ASS and Dewatering Management Plan outlining the treatment and management of ASS in accordance with DWER guidelines (DER, 2015b) may be required.
	Biodiversity	The Scheme Amendment Area has been extensively cleared and no longer contains areas of significant biodiversity. Biodiversity values can be improved through new planting opportunities in POS areas.
2.9 Water	Integrated water management	Groundwater and surface water constraints have been identified.

SPP	RELEVANT ASPECT	CONSIDERATION
		A Water Management Report has been prepared for the Scheme Amendment Area, addressing pre-development and post-development conditions. The Water Management Report aims for adequate protection of water resources, public health and the management of flood risk through the provision of appropriate design and infrastructure.
3.7 Bushfire	Bushfire protection.	Approximately 50 % of the Scheme Amendment Area is mapped in a bush fire prone area. Further assessment of bush fire risk and potential development of management strategies to manage bushfire risk will be required due to the presence of vegetation to the east and south of the Scheme Amendment Area.

6 ENVIRONMENTAL ASSESSMENT AND MANAGEMENT FRAMEWORK

Based on the key environmental attributes and values identified in this assessment, a recommended environmental management framework for investigations and management strategies is summarised in Table 7.

TABLE 7: ENVIRONMENTAL MANAGEMENT FRAMEWORK

ASPECT	RECOMMENDED ACTIVITY	TIMING
Inland waters - surface water and groundwater	A Water Management Report has been prepared for the Scheme Amendment Area in accordance with SPP 2.9 (WAPC, 2025a) and *Planning for Water Guidelines* (WAPC 2025b), ensuring stormwater quality, erosion/sediment controls and treatment trains align with the Stormwater Management Manual for WA (DWER, 2022) and Decision Process for Stormwater Management in WA (DWER, 2017b).	Implement the Water Management Report through future planning and development stages.
	Review the civil engineering design against local groundwater conditions to establish if dewatering will be required during construction.	Subdivision
	If gross soil contamination is identified (see below) and/or dewatering/disturbance of ASS is required during construction, investigate groundwater quality.	Subdivision and construction
Terrestrial environmental quality	Conduct targeted soil investigation as recommended in the PSI (Aurora Environmental, 2024b) ensuring data gaps are investigated appropriately. Investigations and remediation (if required) are to be implemented in accordance with the CS Act.	Prior to subdivision
	Perform an ASS investigation in accordance with DWER Guidelines (DER, 2015a) to assess the extent of potential ASS risks.	Subdivision
	Depending on the civil engineering design and the results of the ASS investigation, prepare an ASS and Dewatering Management Plan if required. Any disturbance of ASS is to be managed in accordance with DWER Guidelines (DER, 2015b).	Subdivision and construction
	Prepare and implement a CEMP. The CEMP is to include measures to avoid, minimise and mitigate environmental impacts associated with construction. The CEMP is to include an unexpected finds procedure.	Construction
Social Surroundings – Aboriginal cultural heritage	If the scar tree cannot be retained, investigate whether the tree is classified as a 'site' as defined in the AH Act.	Construction
	Pending the outcome of the above, if the scar tree is classified as a 'site' ensure it is protected, unless authorisation under the AH Act is obtained.	Construction
	Ensure the CEMP includes provisions relating to the protection of cultural heritage and management of any unexpected finds encountered during construction.	Construction

ASPECT	RECOMMENDED ACTIVITY	TIMING
	Liaise with Wagyl Kaip Southern Noongar Aboriginal Corporation and ensure Cultural Monitors are present during ground-disturbing works.	Construction
Bushfire	A bushfire risk assessment has been undertaken and management plan prepared. Implement the Bushfire Management Plan to avoid, minimise and mitigate bushfire risks.	Implement the Bushfire Management Plan through future planning and development stages.

7 SUMMARY AND RECOMMENDATIONS

Aurora Environmental was commissioned DevelopmentWA to undertake an environmental assessment of Lot 39 Elizabeth Street, Bayonet Head. The findings and recommendations of the environmental assessment support the rezoning and future subdivision of the Scheme Amendment Area. Contained within this report is a recommended environmental management for the proposed development.

This environmental assessment found:

- Lot 39 was included in the Bayonet Head Outline Development Plan which was formally assessed by the EPA as a strategic proposal and subsequently approved by the Minister for the Environment in 2013 subject to the conditions set out in MS 942. The approval under MS 942 included a ten year time limit, which has now lapsed.
- The Scheme Amendment Area has been extensively cleared and no longer contains any areas of intact native vegetation or fauna habitat. Remnant native vegetation and fauna habitat is present in the southern part of Lot 39, but is outside of the Scheme Amendment Area. No conservation significant flora, fauna or ecological communities have been previously identified in the Scheme Amendment Area. It is possible that some conservation significant fauna species may, on occasions, move through the Scheme Amendment Area due to the presence of habitat areas within surrounding properties. However, none of the conservation significant fauna species identified in the desktop assessment are expected to permanently reside or rely upon the Scheme Amendment Area. The remnant vegetation in the southern part of Lot 39, and outside of the Scheme Amendment Area, may provide habitat for conservation significant species such as the Western Ringtail Possum (Threatened) and Quenda (Priority 4). This habitat will not be impacted by the proposed development.
- Lot 39 has predominantly been used for low-intensity agriculture (livestock grazing), with limited evidence of potentially contaminating activities. A PSI prepared for Lot 39 (Aurora Environmental, 2024b) identified six possible APECs. These were related to historic agricultural practices, stockpiled materials, imported fill and ground disturbance. The risk of groundwater contamination was considered extremely low.
- Approximately 70 % of the Scheme Amendment Area is mapped as ‘high to moderate risk’ of ASS occurring within 3 m of the natural soil surface. Site observations and a review of historical aerial photographs support this classification, with evidence of waterlogging and grey/dark grey organic rich soils in areas that are considered likely to have been former wetlands. The potential presence of ASS requires further investigation. If ASS materials are confirmed, an ASS and Dewatering Management Plan will be required. The potential to disturb ASS may occur via excavation or dewatering during construction.
- A dam and an open drain were the only surface water features present within the Scheme Amendment Area. Coffey Environments (2008) mapped a wetland in the southern portion of Lot 39, which was assessed to be commensurate with a Resource Enhancement management category. This wetland is outside of the Scheme Amendment Area, and therefore will not be impacted by the proposed development.

- The Scheme Amendment Area is located within the unproclaimed Karri Groundwater Area. The depth to groundwater beneath the Scheme Amendment Area has not been confirmed through on-site monitoring, but are expected to be shallow. It is suspected that the dam in the northeastern part of the Scheme Amendment Area may intersect groundwater and therefore reflect local groundwater conditions. Water quality of the groundwater system beneath the Scheme Amendment Area has not been investigated.
- Approximately 50 % of the Scheme Amendment Area is mapped as a 'bush fire prone area' where additional planning and building requirements may apply. This classification is due to the presence of vegetation that is outside of the Scheme Amendment Area.
- The DPLH's ACHIS indicates that there are no registered, lodged or historic ACH sites within the Scheme Amendment Area. A recent archaeological and ethnographic survey of Lot 39 (WKSN AC, 2024) recorded a cultural scar tree along on the western boundary of the Scheme Amendment Area. WKSN AC (2024) reported that this identification would be submitted to the DPLH and nominated as a cultural heritage site. It is not evident that this has occurred as the tree is not registered in the ACHIS. The scar tree was not recorded during an earlier archaeological and ethnographic survey conducted for the Bayonet Head Outline Development Plan by Brad Goode and Associates (2007).

Based on the environmental attributes and values identified in this assessment, a recommended environmental management framework is summarised as follows:

Inland Waters – Surface Water and Groundwater

- Implement the Water Management Report through future planning and development stages.
- Review the civil engineering design for the proposed development against groundwater levels to establish if groundwater dewatering will be required during construction.
- If gross soil contamination is identified and/or dewatering/disturbance of ASS is required during construction, investigate groundwater quality.

Terrestrial Environmental Quality (Contamination and ASS)

- Conduct targeted soil investigation as recommended in the PSI (Aurora Environmental, 2024b) ensuring data gaps are investigated appropriately. Investigations and remediation (if required) are to be implemented in accordance with the CS Act.
- Perform an ASS investigation in accordance with DWER Guidelines (DER, 2015a) to assess the extent of potential ASS risks.
- Depending on the civil engineering design and the results of the ASS investigation, prepare an ASS and Dewatering Management Plan if required. Any disturbance of ASS is to be managed in accordance with DWER Guidelines (DER, 2015b).
- Prepare and implement a CEMP. The CEMP is to include measures to avoid, minimise and mitigate environmental impacts associated with construction. The CEMP is to include an unexpected finds procedure.

Social Surroundings

- If the scar tree cannot be retained, investigate the whether the tree is classified as a 'site' as defined in the AH Act.
- Pending the outcome of the above, if the scar tree is classified as a 'site' ensure it is protected, unless authorisation under the AH Act is obtained.
- Ensure the CEMP includes provisions relating to the protection of cultural heritage and management of any unexpected finds encountered during construction.
- Liaise with Wagyl Kaip Southern Noongar Aboriginal Corporation and ensure Cultural Monitors are present during ground-disturbing works.

Bushfire Management

- Implement the Bushfire Management Plan to avoid, minimise and mitigate bushfire risks.

Environmental risks related to the development of the Site can be adequately avoided, managed and mitigated by implementing the recommended environmental management framework. In terms of environmental approvals, Aurora Environmental has concluded:

- The proposed scheme amendment is not likely to result in significant environmental impacts, and therefore unlikely to be assessed by the EPA. For the same reason, a referral under Section 38 of the EP Act is not recommended.
- As there is no native vegetation in the Scheme Amendment Area, a native vegetation clearing permit will not be required.
- The proposed development of the Scheme Amendment Area will not impact any TECs or threatened flora or fauna and therefore a section 40 permit under the BC Act will not be required.
- As the Scheme Amendment Area is within the unproclaimed Karri Groundwater Area, approval under the RIWI Act for the abstraction of groundwater, including dewatering, will not be required.
- The proposed development of the Scheme Amendment Area will not impact any MNES protected under the EPBC Act. Therefore, a referral under the EPBC Act will not be required.

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FIGURES

Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50
Image source: Landgate (2026) - Summer 2024, Open Street Maps (2026)
Data sources: Cadastre (LGATE-002), Roads (LGATE-195)

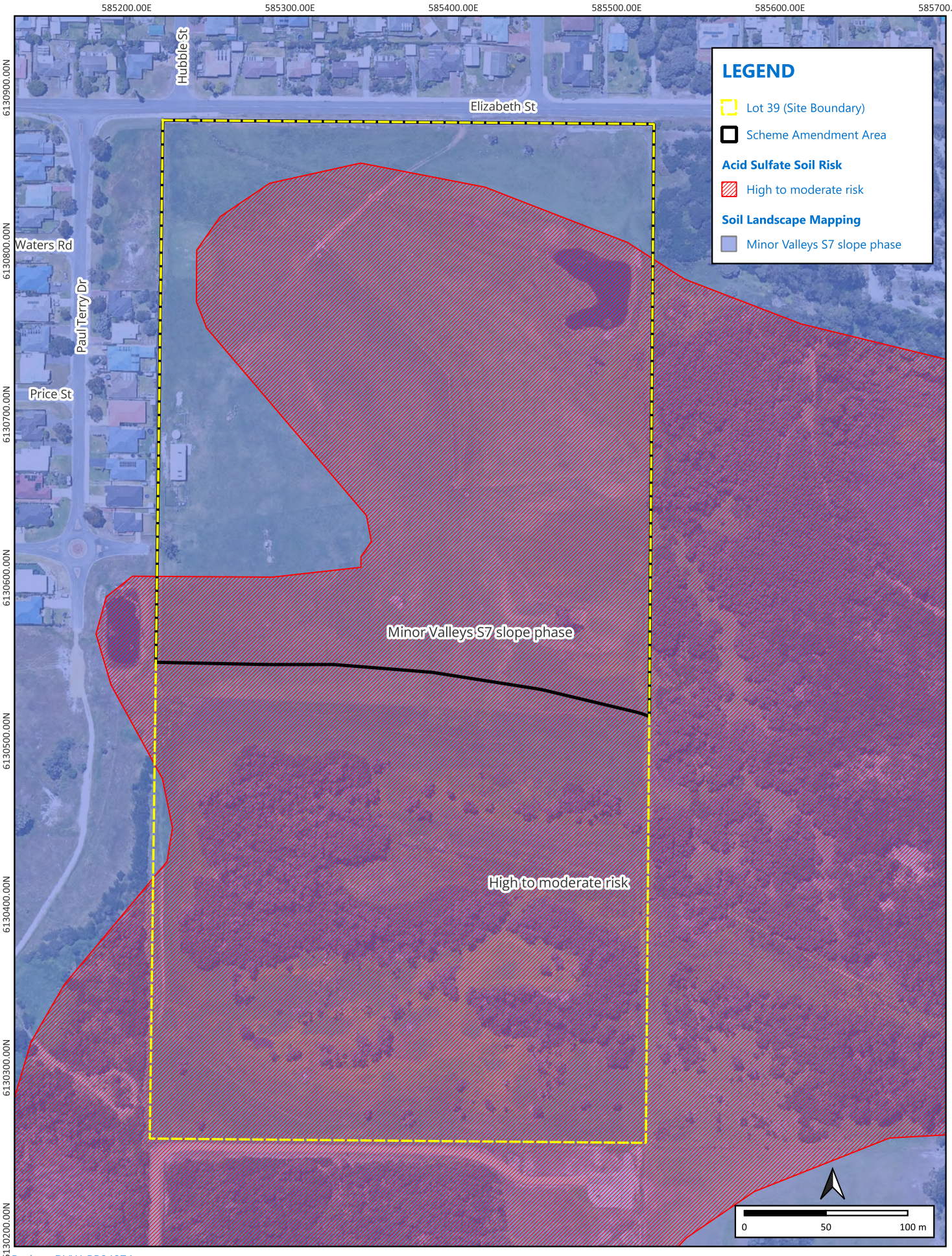
FIGURE 1

Location

Aurora environmental

Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50
Image source: Development Concept (TBB, 2026)
Data sources:

FIGURE 2
Development Concept Plan



Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
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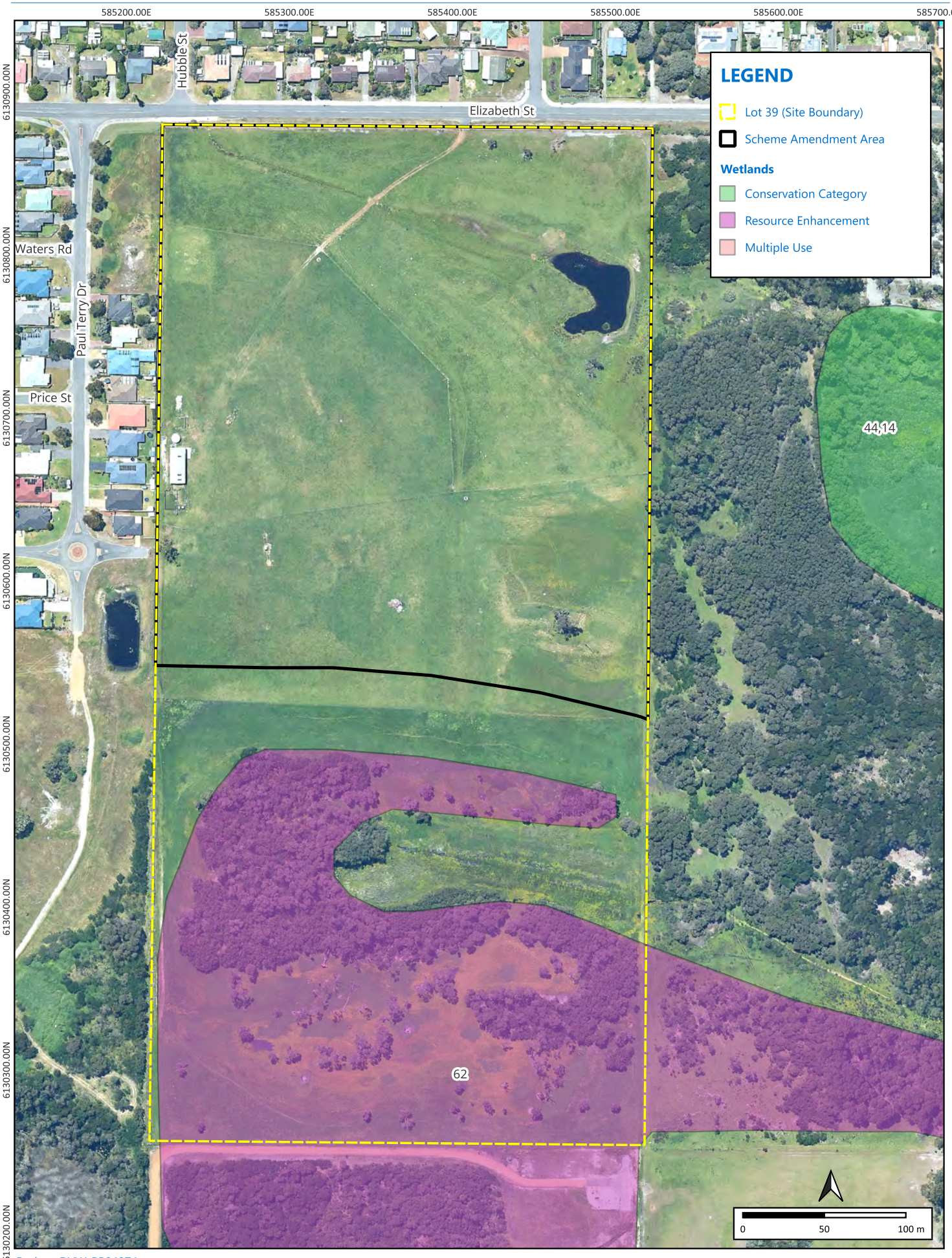
FIGURE 3

Soils

Aurora environmental



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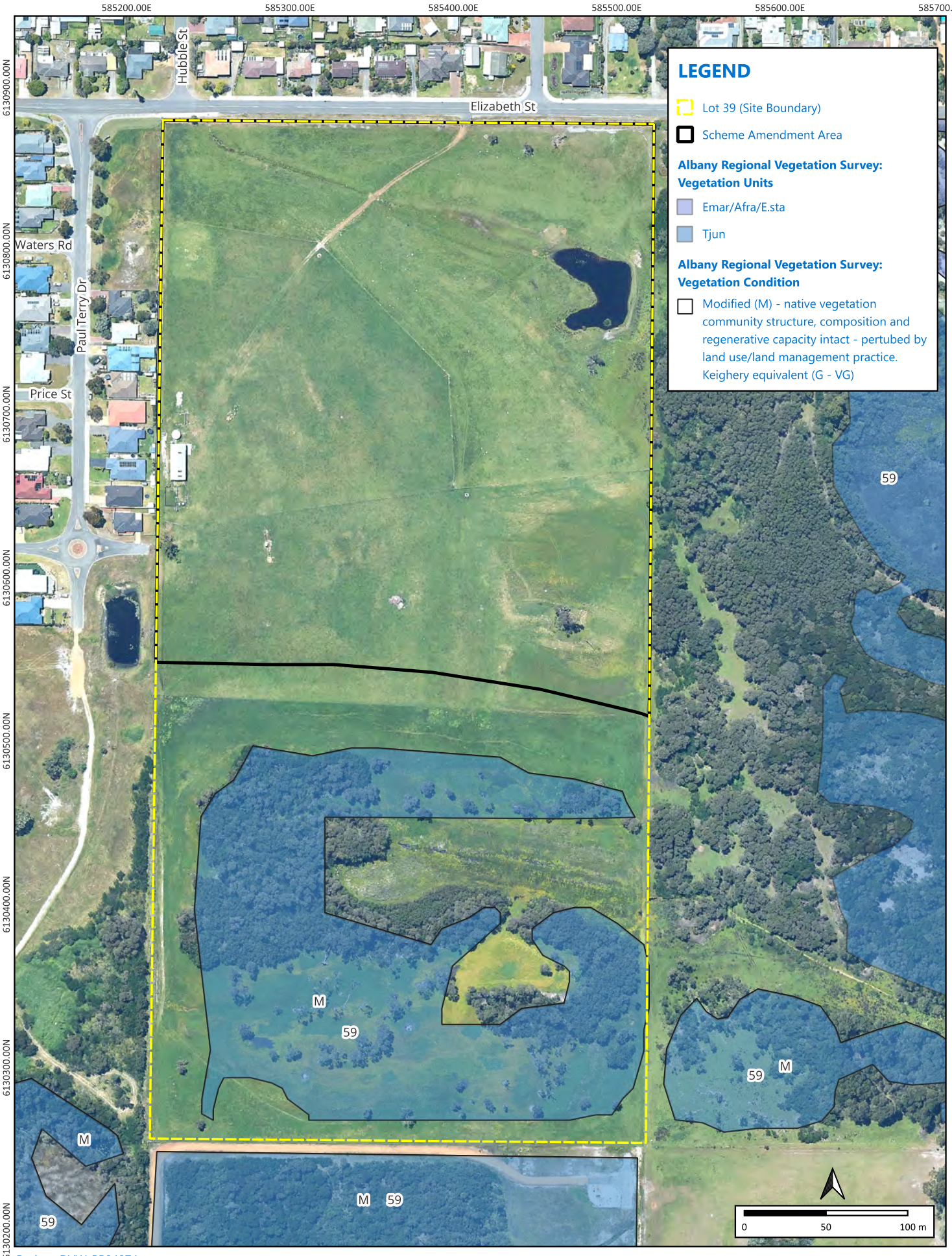
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: Wetlands (Coffey Environments, 2008)

FIGURE 4

Wetlands

Aurora environmental



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Author: PZ
Date: 15/04/2026
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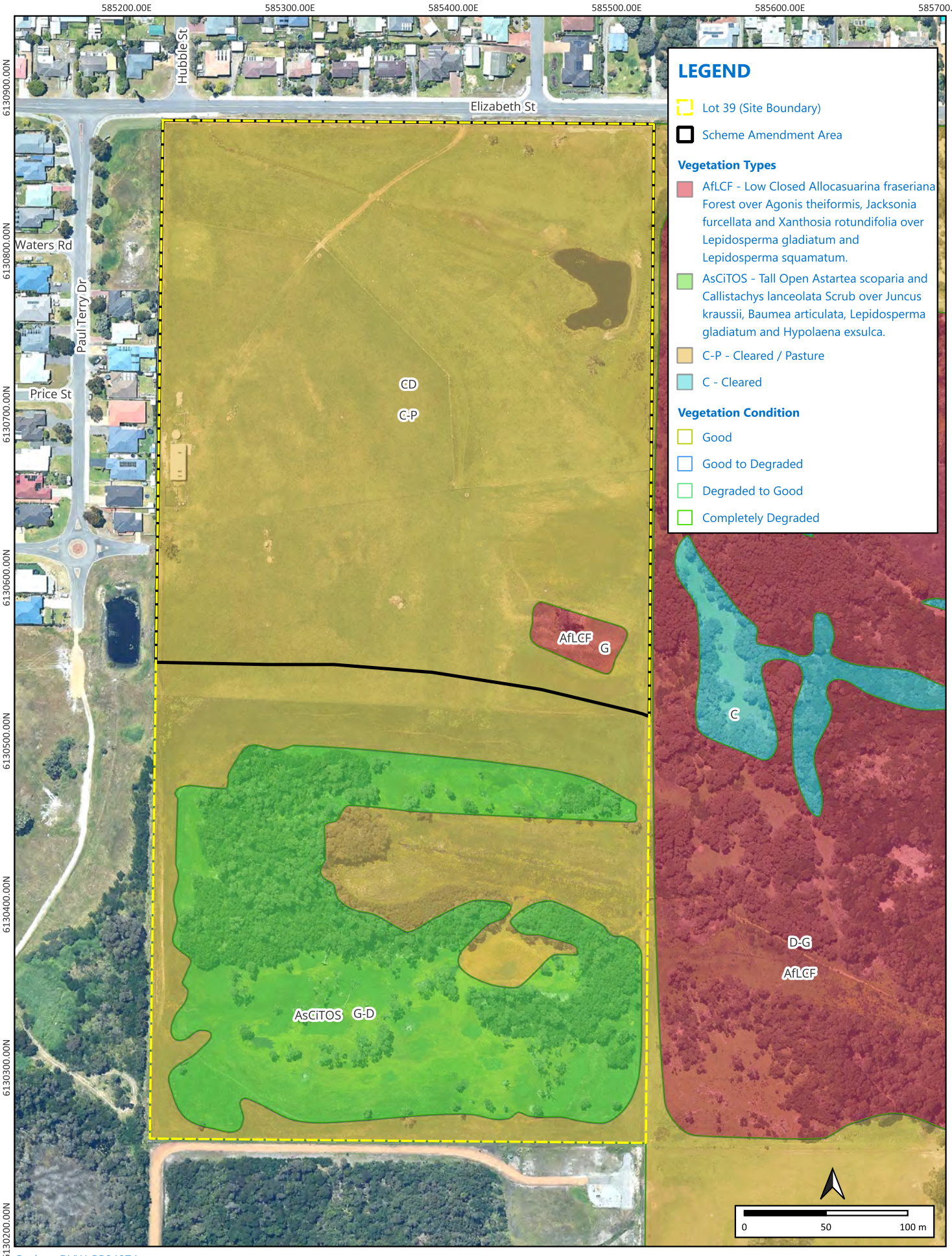
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: Vegetation: Albany Regional Vegetation Survey (Sandiford & Barrett, 2010)

FIGURE 5
Regional Vegetation



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Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: Vegetation: Flora & Vegetation Assessment (Coffey Environments, 2009a)

FIGURE 6
Vegetation

Aurora environmental

575000.00E 580000.00E 585000.00E 590000.00E 595000.00E

6140000.00N 6135000.00N 6130000.00N 6125000.00N 6120000.00N

Bailey Rd
Youngs Rd
Yungup Rd
Churchlane Rd
Millbrook Rd
Jones Rd
Hazzard Rd
Albany Hwy
Hawley Rd
Douglas Rd
Dempster Rd
South Coast Hwy
Down Rd
Douglas Rd
Hunton Rd
Parker Brook Rd
Willyung Rd
Bon Accord Rd
Bushby Rd
Prideaux Rd
Rocky Crossing Rd
Copal Rd
Chester Pass Rd
Norwood Rd
The Esplanade
Nanarup Rd
Gunn Rd
Greatrex Rd
Elizabeth St
Gull Rock Rd
Two Peoples Bay Rd
Reddale Rd
Menang Dr
Federal St
Kooyong Av
Harvey Rd
Terry Rd
Henty Rd
Henry St
Lancaster Rd
Rufus St
Mercer Rd
Lower King Rd
Mount Richard Rd
Unk Rd
John St
Catalina Rd
Albany Hwy
Hudson Rd
Ledge Beach Rd
South Coast Hwy
George St
Target Rd
Ulster Rd
Wright St
Emu Point Dr
Hardie Rd
Regent St
Serpentine Rd
David St
Cuming Rd
Golf Links Rd
Lower Denmark Rd
Hare St
Festing St
Earl St
Apex Dr
Marine Dr
Roberts Rd
Princess Royal Dr
Home Rd
Princess Av
Frenchman Bay Rd

0 1 2 3 km

LEGEND

- Lot 39 (Site Boundary)
- 10km Buffer

DBCA TEC/PEC Records

- Priority 1 Ecological Community
- Priority 3 Ecological Community

FIGURE 7

Significant Vegetation

Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:85000 @A3
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: TECs/PECs (DBCA Restricted Records Search Reference: 43-0126EC; conducted 2026)

LEGEND

- Lot 39 (Site Boundary)
- 10km Buffer

DBCA Threatened & Priority Flora Restricted Records by Conservation Status

- Threatened
- Priority 1
- Priority 2
- Priority 3
- Priority 4

WA Herbarium Threatened & Priority Flora Historic Records by Conservation Status

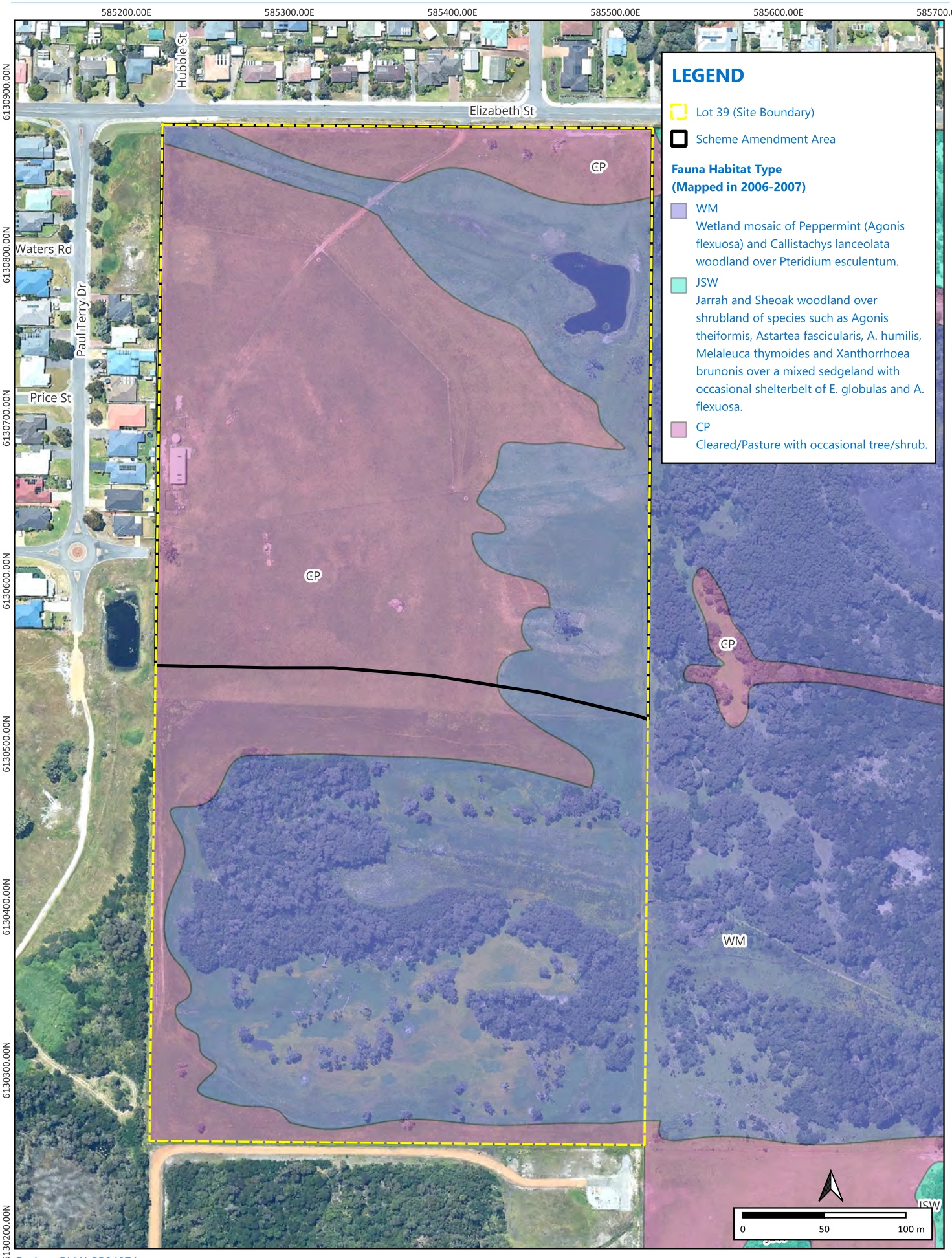
- Threatened
- Priority 1
- Priority 2
- Priority 3
- Priority 4

FIGURE 8

Significant Flora

Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:85000 @A3
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: Threatened & Priority Flora / WA Herbarium (DBCA Restricted Records Search Reference: 09-0226FL; conducted 2026)

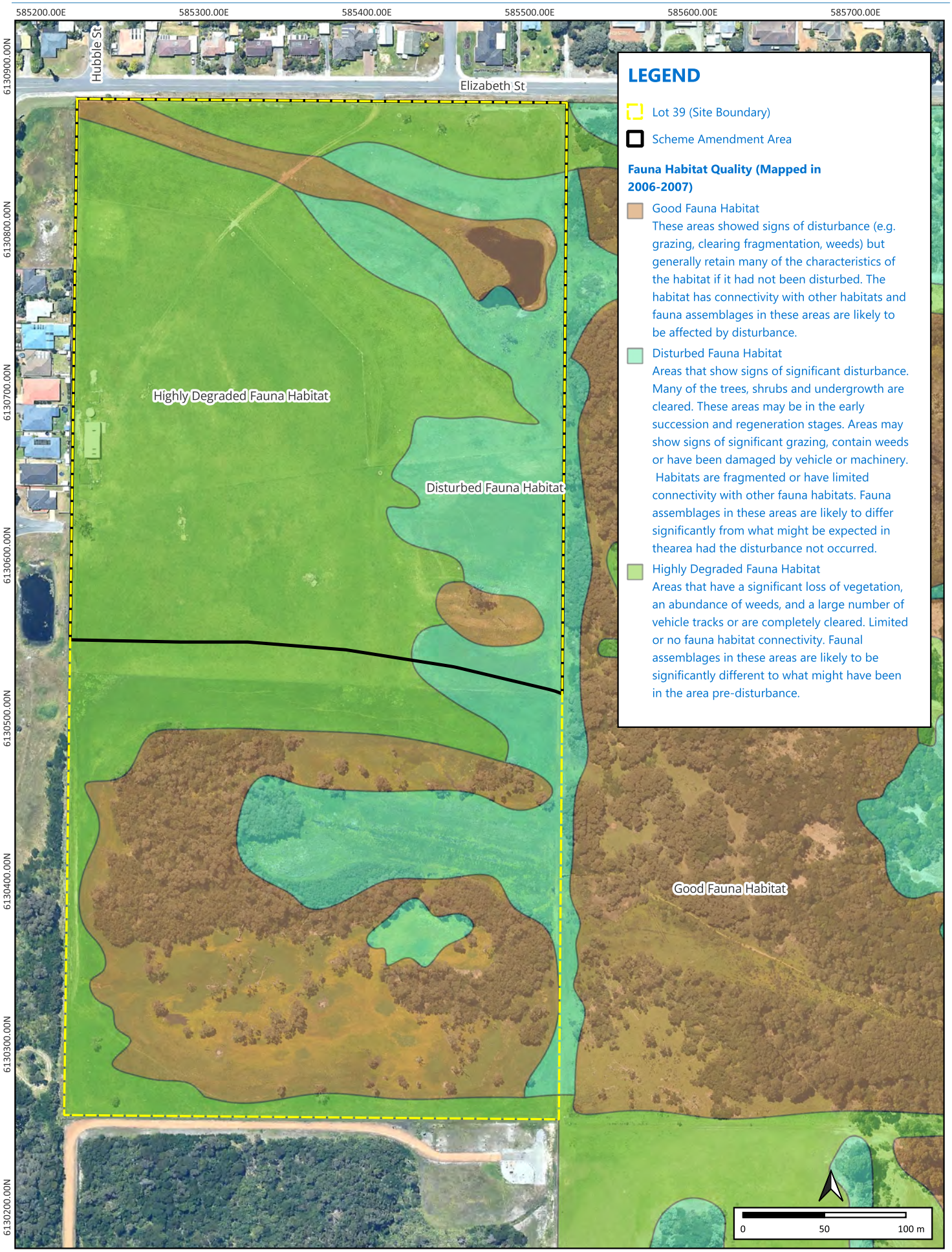


Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: Fauna Assessment (Coffey Environments, 2009b)

FIGURE 9
Habitat

Aurora environmental

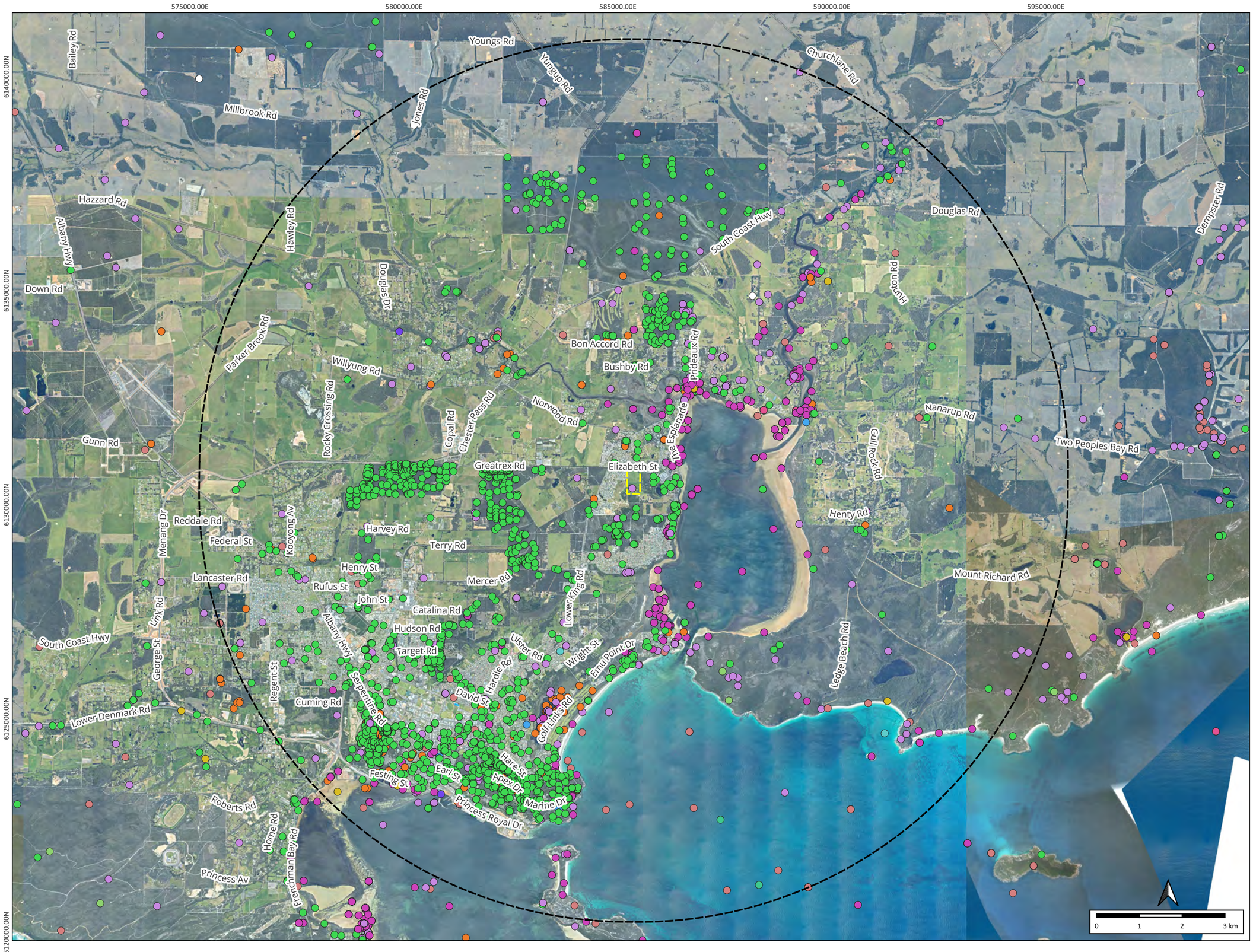


Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: Fauna Assessment (Coffey Environments, 2009b)

FIGURE 10
Habitat Quality

Aurora environmental



LEGEND

- Lot 39 (Site Boundary)
- 10km Buffer

DBCA Threatened & Priority Fauna Restricted Records by Conservation Status

- Extinct
- Critically Endangered
- Endangered
- Endangered or Priority 4
- Vulnerable
- Priority 2
- Priority 3
- Priority 4
- Migratory International & Priority 4
- Migratory International
- Conservation Dependent & Migratory International
- Conservation Dependent
- Other Specially Protected Fauna Species

FIGURE 11

Significant Fauna

Project: DVW-PP04074
Author: PZ
Date: 15/04/2026
Ver: 02
Doc. No.: DVW-PP04074_EAR_001_ch
Scale: 1:85000 @A3
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026) - Summer 2024
Data sources: Threatened & Priority Fauna (DBCA Restricted Records Search Reference: 09-0226FA; conducted 2026)

APPENDIX 1

Historical Aerial Photographs

Project: DVW-PP04074
Author: PZ
Date: 01/04/2026
Ver: 01
Doc. No.: DVW-PP04074_EAR_001_ch_V1
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026)
Data sources: Cadastre (LGATE-002), Roads (LGATE-195)

APPENDIX 1

1961

Project: DVW-PP04074
Author: PZ
Date: 01/04/2026
Ver: 01
Doc. No.: DVW-PP04074_EAR_001_ch_V1
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026)
Data sources: Cadastre (LGATE-002), Roads (LGATE-195)

APPENDIX 1

1977

Project: DVW-PP04074
Author: PZ
Date: 01/04/2026
Ver: 01
Doc. No.: DVW-PP04074_EAR_001_ch_V1
Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50

Image source: Landgate (2026)
Data sources: Cadastre (LGATE-002), Roads (LGATE-195)

APPENDIX 1

1988

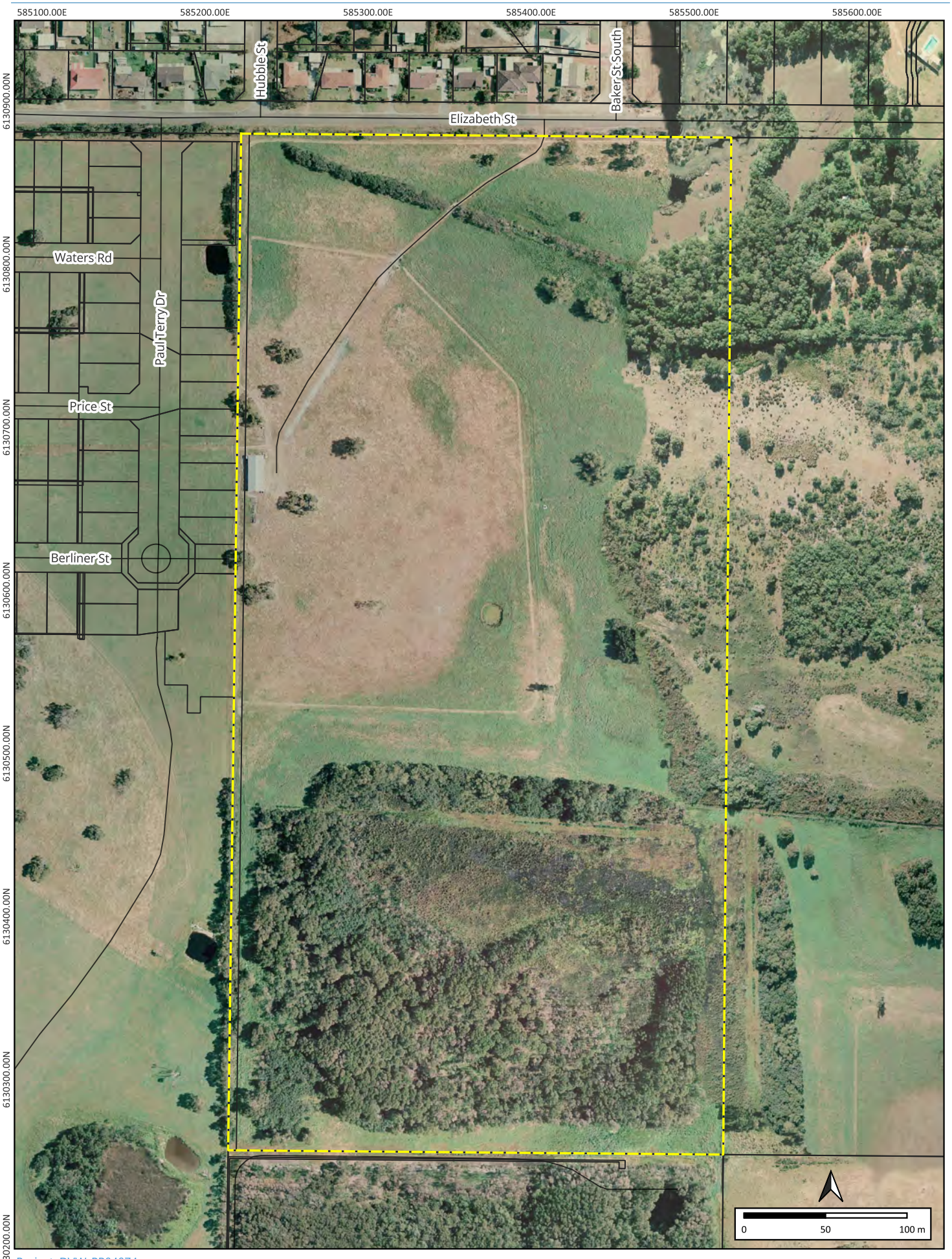


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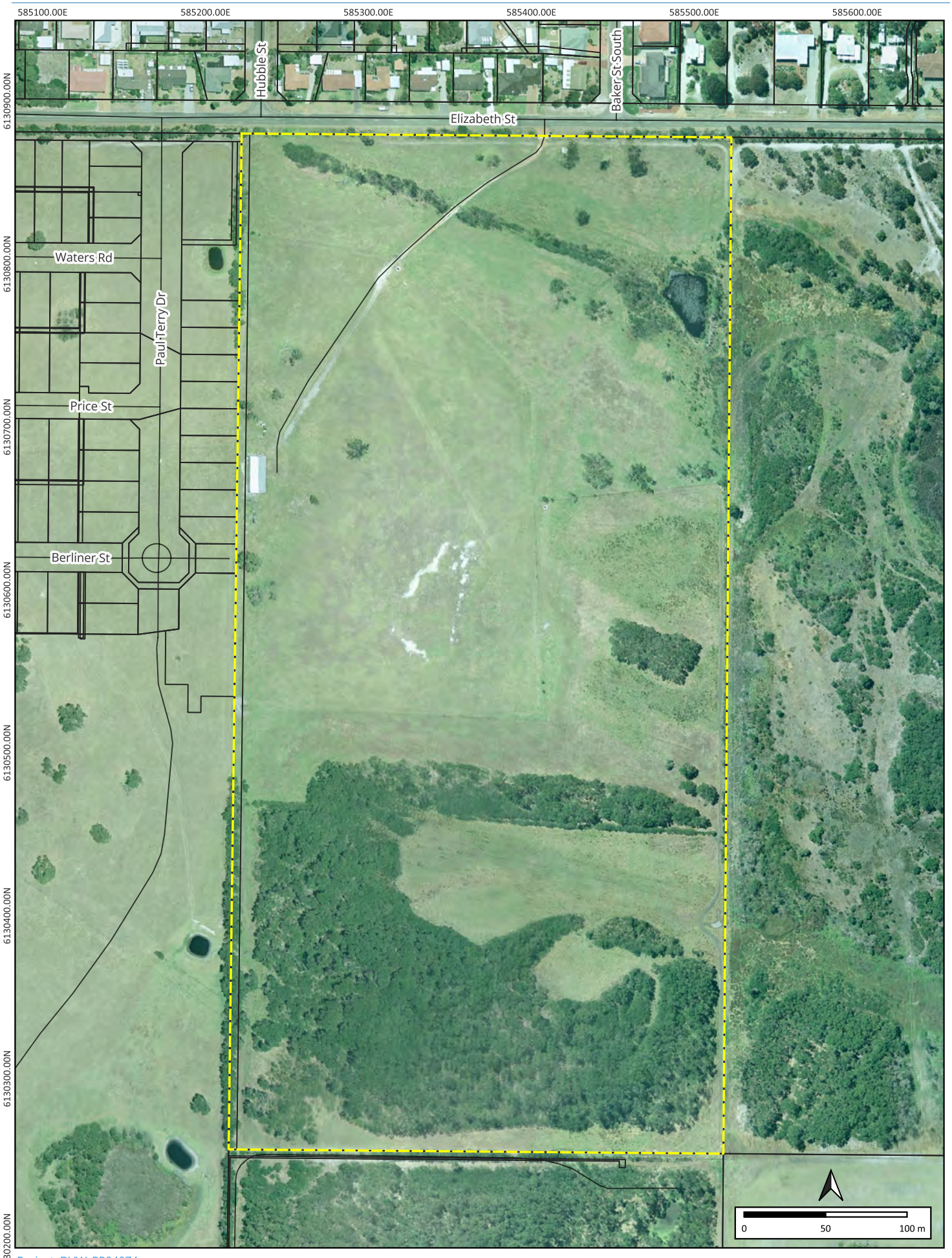
Image source: Landgate (2026)
Data sources: Cadastre (LGATE-002), Roads (LGATE-195)

APPENDIX 1

1996



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Scale: 1:3000 @A4
CRS: GDA2020 / MGA zone 50
Image source: Landgate (2026)
Data sources: Cadastre (LGATE-002), Roads (LGATE-195)

APPENDIX 1
2001

Aurora environmental

Project: DVW-PP04074
Author: PZ
Date: 01/04/2026
Ver: 01
Doc. No.: DVW-PP04074_EAR_001_ch_V1
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CRS: GDA2020 / MGA zone 50
Image source: Landgate (2026)
Data sources: Cadastre (LGATE-002), Roads (LGATE-195)

APPENDIX 1

2007

APPENDIX 2

Protected Matters Search Tool Results

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 02-Feb-2026

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	71
Listed Migratory Species:	62

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	12
Commonwealth Heritage Places:	None
Listed Marine Species:	89
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	12
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	23
Key Ecological Features (Marine):	None
Biologically Important Areas:	8
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Empodisma peatlands of southwestern Australia	Endangered	Community likely to occur within area	In feature area
Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia	Endangered	Community may occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area	In buffer area only
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Dasyornis longirostris Western Bristlebird [515]	Endangered	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In buffer area only
Psophodes nigrogularis nigrogularis Western Heath Whipbird [64449]	Endangered	Species or species habitat known to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
FISH			
Galaxiella munda			
Western Dwarf Galaxias, Western Mud Minnow [79240]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Nannatherina balstoni			
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat known to occur within area	In feature area
INSECT			
Trioza barrettae			
Banksia brownii plant louse [87805]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Dasyurus geoffroii			
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eubalaena australis			
Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Neophoca cinerea			
Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
Parantechinus apicalis			
Dibbler [313]	Endangered	Species or species habitat likely to occur within area	In feature area
Pseudocheirus occidentalis			
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat known to occur within area	In feature area
OTHER			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Westralunio carteri](#) Carter's Freshwater Mussel, Ambiguus Mussel [86266]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
PLANT			
[Banksia brownii](#) Brown's Banksia, Feather-leaved Banksia [8277]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Banksia goodii](#) Good's Banksia [16727]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Banksia verticillata](#) Granite Banksia, Albany Banksia, River Banksia [8333]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Caladenia granitora](#) [65292]	Endangered	Species or species habitat may occur within area	In buffer area only
[Caladenia harringtoniae](#) Harrington's Spider-orchid, Pink Spider-orchid [56786]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Chordifex abortivus](#) Manypeaks Rush [64868]	Endangered	Species or species habitat known to occur within area	In feature area
[Conostylis misera](#) Grass Conostylis [21320]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Diuris drummondii](#) Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Drakaea micrantha](#) Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Isopogon uncinatus](#) Albany Cone Bush, Hook-leaf Isopogon [20871]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Kennedia glabrata			
Northcliffe Kennedia [16452]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Microtis globula			
South-Coast Mignonette Orchid [6780]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Sphenotoma drummondii			
Mountain Paper-heath [21160]	Endangered	Species or species habitat may occur within area	In buffer area only
Verticordia fimbrilepis subsp. australis			
Southern Shy Featherflower [24630]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
REPTILE			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
SHARK			
Carcharias taurus (west coast population)			
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharias taurus Grey Nurse Shark [64469]		Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Arenaria interpres](#) Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In buffer area only
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
[Calidris alba](#) Sanderling [875]		Roosting known to occur within area	In buffer area only
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Roosting known to occur within area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Vulnerable	Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Australian Broadcasting Corporation		
Lot 31 P027286 [AGPR208]	WA	In buffer area only
Australian Postal Corporation		
Lot 30 D067227 [AGPR7256]	WA	In buffer area only
Commonwealth of Australia		
Lot B 42 P144904 [AGPR6654]	WA	In buffer area only
Lot B 44 P144904 [AGPR6655]	WA	In buffer area only
Department of Defence		
AAFC 705 Squadron - Albany [DD_0950]	WA	In buffer area only
Albany AIRTC Depot [AGPR4283]	WA	In buffer area only
Albany AIRTC Depot [AGPR4282]	WA	In buffer area only
Albany Training Depot [DD_0670]	WA	In buffer area only
ANC TS VANCOUVER - Albany [DD_0078]	WA	In buffer area only
Lot 50 D095534 [AGPR4470]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Department of Home Affairs		
Lot 359 P019014 [AGPR6135]	WA	In buffer area only
Lot 669 P055175 [AGPR4737]	WA	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Cereopsis novaehollandiae grisea Cape Barren Goose (south-western), Recherche Cape Barren Goose [25978]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area	In buffer area only
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area	In buffer area only
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area	In buffer area only
Phaethon rubricauda Red-tailed Tropicbird [994]		Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Pterodroma macroptera Great-winged Petrel [1035]		Breeding known to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area	In buffer area only
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In buffer area only
Leptoichthys fistularius Brushtail Pipefish [66248]		Species or species habitat may occur within area	In buffer area only
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In buffer area only
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In buffer area only
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pugnaso curtirostris](#) Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In buffer area only
[Solegnathus lettiensis](#) Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In buffer area only
[Stigmatopora argus](#) Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
[Stigmatopora nigra](#) Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
[Urocampus carinirostris](#) Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
[Vanacampus margaritifer](#) Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
[Vanacampus phillipi](#) Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only
[Vanacampus poecilolaemus](#) Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In buffer area only
Mammal			
[Arctocephalus forsteri](#) Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat likely to occur within area	In buffer area only
[Neophoca cinerea](#) Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only
Reptile			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat likely to occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Bakers Junction	Nature Reserve	WA	In buffer area only
Bon Accord Road	Nature Reserve	WA	In buffer area only
Green Island	Nature Reserve	WA	In buffer area only
Gull Rock	National Park	WA	In buffer area only
Mill Brook	Nature Reserve	WA	In buffer area only
Mistaken Island	Nature Reserve	WA	In buffer area only
Mount Mason	Nature Reserve	WA	In buffer area only
Unnamed WA23923	Nature Reserve	WA	In buffer area only
Unnamed WA30791	Nature Reserve	WA	In buffer area only
Unnamed WA33308	5(1)(h) Reserve	WA	In buffer area only
Voyagers Park	5(1)(h) Reserve	WA	In buffer area only
West Mount Mason	Nature Reserve	WA	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Albany Heritage Park Link Trail, WA	2019/8480		Post-Approval	In buffer area only
Bayonet Head Residential Development, Albany, WA	2015/7624		Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Eradication of the European House Borer, Perth metropolitan area, WA	2009/5027		Completed	In buffer area only
Sydney Street Subdivision	2023/09530		Completed	In buffer area only
Controlled action				
Albany Heritage Park Trail Network Concept Plan	2017/7943	Controlled Action	Completed	In buffer area only
Albany Port Authority dredging project	2006/2540	Controlled Action	Post-Approval	In buffer area only
Albany Ring Road Stages 2 and 3B, WA	2020/8769	Controlled Action	Post-Approval	In buffer area only
Emu Point Residential Area Project	2010/5479	Controlled Action	Completed	In buffer area only
Southdown Magnetite Mine	2006/2544	Controlled Action	Completed	In buffer area only
Not controlled action				
Albany Port Maintenance Dredging, Albany, WA	2014/7246	Not Controlled Action	Completed	In buffer area only
Anzac Centre Develpment, Albany, WA	2012/6571	Not Controlled Action	Completed	In buffer area only
Anzac Interpretive Centre Development, Albany, WA	2013/6903	Not Controlled Action	Completed	In buffer area only
Firebreak Creation, Kalgan, WA	2020/8681	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Mount Barker to Albany Water Supply Pipeline	2013/6720	Not Controlled Action	Completed	In buffer area only
Prescribed burn of Cells 5, 6 & 8 of Crown Land Reserve 35381, Napier, WA	2013/6798	Not Controlled Action	Completed	In buffer area only
Protected Harbour Development	2006/3091	Not Controlled Action	Completed	In buffer area only
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
South Coast Highway Widening 8.2-14.16 SLK	2017/8009	Not Controlled Action	Completed	In buffer area only
Sth Coast Hwy Road Widening, Albany, WA	2018/8279	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Albany Port Maintenance Dredging	2010/5527	Referral Decision	Completed	In buffer area only

Biologically Important Areas

[Resource Information]

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Eudyptula minor Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In buffer area only
Hydroprogne caspia Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In buffer area only
Larus pacificus Pacific Gull [811]	Foraging (in high numbers)	Known to occur	In buffer area only
Sternula nereis Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
Sharks			
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur	In buffer area only
Whales			
Eubalaena australis Southern Right Whale [40]	Migration		In buffer area only
Eubalaena australis Southern Right Whale [40]	Reproduction		In buffer area only
Megaptera novaeangliae Humpback Whale [38]	Migration (north)	Known to occur	In buffer area only

Scientific Name	Behaviour	Presence	Buffer Status

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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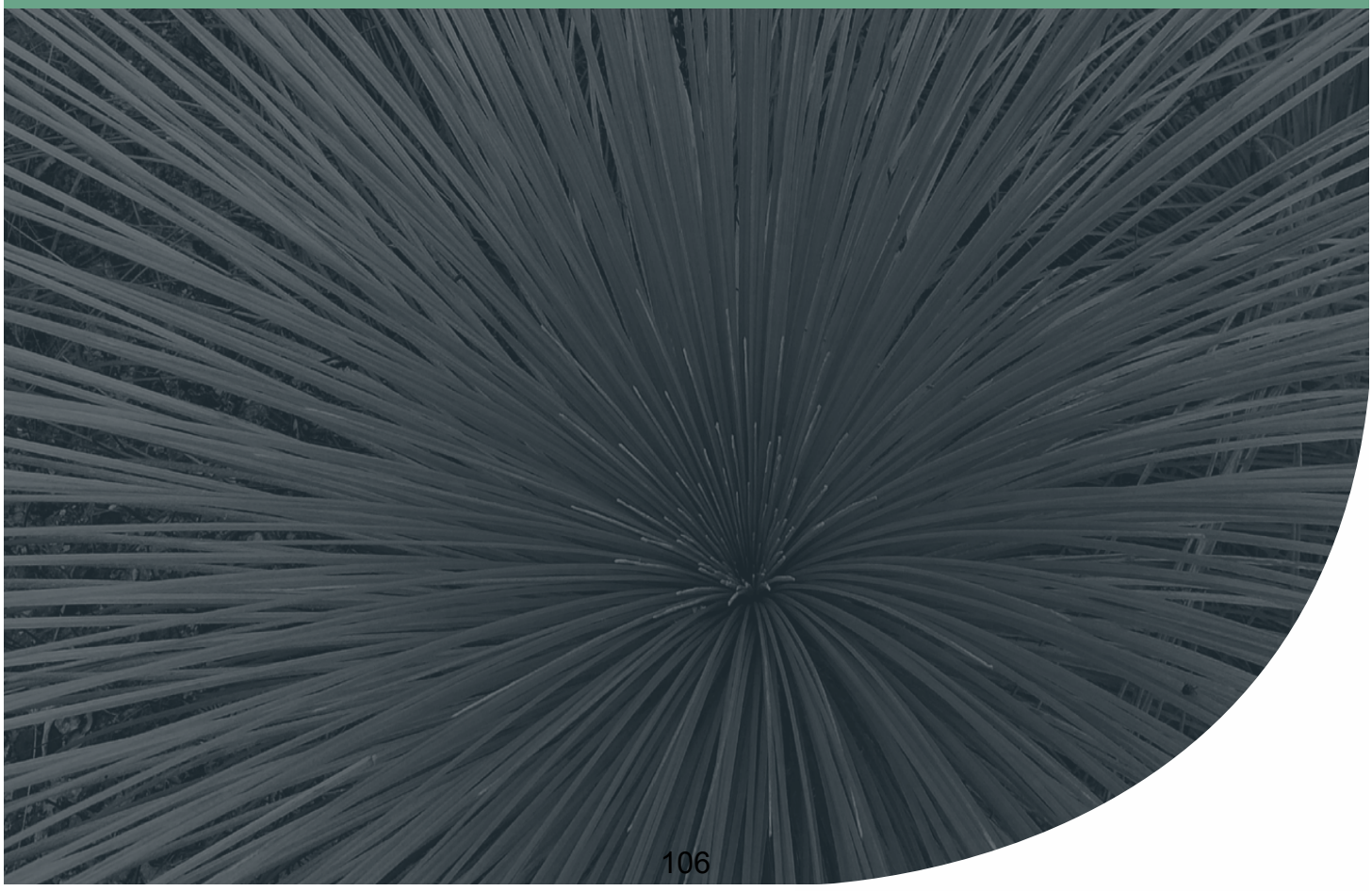
Local Water Management Report

Lot 39 Elizabeth Street, Bayonet Head, Albany

Project No: EP26-007(01)

Prepared for Development WA
May 2026



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Executive Summary

DevelopmentWA propose to develop the northern portion of Lot 39 Elizabeth Street, Bayonet Head (herein referred to as 'the site') for residential purposes. The site is approximately 10.23 ha in size and is 8.2 km north-east of the Albany town centre and is located within the City of Albany (CoA).

This local water management report (LWMR) details the water management approach to support the development of the site. The LWMR aims to demonstrate that the conceptual approach to developing the site can meet the relevant water management requirements, is intended to satisfy the requirements of *State Planning Policy 2.9 – Water* (SPP 2.9) (DPLH 2025) and to address the expectations of the Department of Water and Environmental Regulation (DWER) and CoA.

Water will be managed using an integrated water cycle management approach. The first step in applying integrated water cycle management in urban catchments is to establish environmental values for receiving water and/or downstream ecosystems. In summary, the existing environmental features that are relevant to water management within the site include:

- The site receives 922 mm of rain on average annually with the majority of this rainfall received between May and September.
- Topography within the site ranges between 16 metres Australian height datum (m AHD) in the west to 6 mAHD on the eastern site boundary.
- Regional geological mapping indicates the site is comprised of sands (S6), laterite (LA7) and sand (S14). Geotechnical investigations generally aligned with the regional geological mapping further noting the presence of gravels and cementation of some sands and coffee rock.
- Infiltration rates varied between 20 m/day to 1.5 m/day, with the lower infiltration likely due to shallow groundwater.
- ASS risk mapping and the geotechnical investigations indicate a high to moderate risk of ASS occurring within 3 m of the natural soil surface.
- Potential wetlands have been mapped as part of previous investigations, however they are not recorded within the Department of Biodiversity, Conservation and Attractions (DBCA) wetland datasets.
- Steep topography and the modest permeability of the underlying soils will likely lead to surface runoff in response to rainfall.
- Inflow from upstream catchments to the north and north-west enters the site at five locations and is conveyed by a mixture of drainage lines and wide overland flow.
- Drainage in the northern portion of the site is conveyed to an existing dam before discharging offsite. The natural storage appears to have been artificially created, and reportedly retains water throughout the year.
- No groundwater monitoring bores are located within the site, however seepage was observed during the test pitting. Further investigation may be warranted to define groundwater beneath the site. Further investigation is required to define groundwater beneath the site.
- No registered heritage areas have been identified within the site.
- The entire site is located within a sensitive water resource area (SWRA).

The water management design objectives for the LWMR seek to deliver best practice outcomes using a Water Sensitive Design (WSD) approach, including management approaches for:

- Water conservation
- Flood mitigation
- Stormwater quality management
- Groundwater management.

The overall approach to water conservation is to reduce the amount of scheme water required within the development at both a lot and estate scale. At lot scale, potable water consumption will be reduced by lot scale rainwater tanks (RWTs) (where adopted) and implementation of water conservation measures (e.g. water efficient fixtures, use of water wise landscaping approaches).

Runoff from roofs, impervious areas within lot and road reserves will be treated as close to source as possible using a treatment train approach, which incorporates co-located basins (BRA/FSA) and swales. Treatment will occur via contact with vegetation and the underlying soil profile (which will adsorb nutrients). Detention of the small (i.e. first 15 mm), minor (20% Annual Exceedance Probability (AEP)) and the major (1% AEP) rainfall event runoff will be managed by the co-located basins, prior to discharging offsite at rates that mimic the pre-development hydrology.

Groundwater management will include the use of subsoil drains to manage seasonally perched groundwater and permeable sand fill where required to provide appropriate clearances to the impermeable surface or invert of subsoil drains. Subsoil drains will be directed to co-located basins or swales to provide treatment before ultimate discharge.

This LWMR is a key supportive document for the proposed development. It provides a usable framework to assist in establishing a stormwater management approach based on site-specific investigations that are consistent with relevant State and Local Government legislation, policies and guidelines. It is also intended to provide guidance to the general stormwater management principles for the area and to guide the future subdivision water management reports (WMR).

The water management design criteria and the manner in which the civil and landscape designs will achieve compliance is demonstrated in **Section 6**.

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Educational Material

This page has been left blank intentionally.

Abbreviation Tables

Table A1: Abbreviations – Organisations

Organisations	
CoA	City of Albany
DEC	Department of Environment and Conservation (now DER)
DoH	Department of Health
DoW	Department of Water
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority

Table A2: Abbreviations – General terms

General terms	
AEP	Annual exceedance probability
AHD	Australian height datum
ASS	Acid sulfate soil
CCW	Conservation category wetland
LWMR	Local water management report
MGL	Maximum groundwater level
POS	Public open space
SSA	Sewage sensitive areas
TWL	Top water level
WMR	Water management report

Table A3: Abbreviations – units of measurement

Units of measurement	
ha	Hectare
m	Metre
m2	Square metre
m AHD	m in relation to the Australian height datum
mm	Millimetre
m BGL	Metres below ground level

Table A4: Abbreviations – Rainfall terminology

Rainfall event	Annual exceedance probability (AEP)
Small	63.2% AEP - first 15 mm of rain
Minor	20% AEP
Major	1% AEP

1 Introduction

1.1 Background

DevelopmentWA propose to develop the northern portion of Lot 39 Elizabeth Street, Bayonet Head (herein referred to as 'the site') for residential purposes. The site is approximately 10.23 ha in size and covers the northern portion of Lot 39 with the remaining 8.63 ha to remain zoned as rural. The site is 8.2 km north-east of the Albany town centre and is located within the City of Albany (CoA). The location of the site is shown on **Figure 1**.

1.2 Purpose

This local water management report (LWMR) details the water management approach to support the development of the site. The LWMR aims to demonstrate that the conceptual approach to developing the site can meet the relevant water management requirements, is intended to satisfy the requirements of *State Planning Policy 2.9 – Water* (SPP 2.9) (DPLH 2025) and to address the expectations of the Department of Water and Environmental Regulation (DWER) and CoA.

1.3 Policy framework

There are several State and Local Government policies of relevance to the site, including:

- *State Water Strategy* (Government of WA 2003)
- *State Planning Policy 2.9 Water (DPLH 2025b)*
- *State Planning Policy 2.9 Water and the Planning for Water Guidelines (DPLH 2025a)*
- *Statement of Planning Policy No. 3: Urban Growth and Settlement* (WAPC 2006)
- *State Water Plan* (Government of WA 2007)
- *Liveable Neighbourhoods (4th Edition)* (WAPC 2009, 2015)
- *Guidance Statement No. 33: Environmental Guidance for Planning and Development* (EPA 2008)
- *Local Planning Scheme No. 2* (City of Albany 2024)
- *Local Planning Scheme No. 2 - Maps* (City of Albany 2024)
- *Local Planning Strategy* (City of Albany 2019)
- *Stormwater Management Strategy* (City of Albany 2018).

In addition to the above policies, there are several published guidelines and standards available that provide direction regarding water management in an urban context, including:

- *Australian Rainfall and Runoff* (Ball J *et al.* 2019)
- *Australian Runoff Quality* (Engineers Australia 2006)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG 2018a)
- *Decision Process for Stormwater Management in Western Australia* (DWER 2017)
- *National Water Quality Management Strategy (NWQMS)* (Australian Government 2018)
- *Stormwater Management Manual for Western Australia* (DoW 2007; DWER 2022).

1.4 Previous studies

1.4.1 Bayonet Head Outline Development Plan

Numerous studies were undertaken to support the Bayonet Head Outline Development Plan (ODP) with the findings documented in a strategic environmental assessment (SEA) (Coffey Environments 2010b). The findings of the SEA were used to inform development of the proposed structure plan for the site.

1.4.2 Oyster Harbour Local Water Management Strategy and Addendum

A LWMS (Aurora Environmental 2012) was prepared to support development along Lower King Road to the west and south-west of the site. Emerge Associates(2026) reviewed the previous LWMS, including catchments and design criteria. The output of the review was an addendum to the LWMS to include more detailed stormwater management planning and updates to align the water management objectives with current best practice. The design criteria detailed in the LWMS addendum included:

- Water conservation
  - Adopt a fit for purpose water supply strategy to meet potable and non-potable needs.
  - Consumption target of 100 kL/person/year for residential areas with no more than 40-60 kL/person/year of scheme water.
  - POS irrigation requirements not to exceed 7,500 kL/ha/year.
- Stormwater management
  - Manage runoff from the small rainfall event (i.e. first 15 mm) as close to source as possible.
  - Post-development peak discharge rates from the site should not exceed the pre-development flow rates for the 1% AEP event.
  - Discharge locations should be consistent with the pre-development environment.
  - Provide flow pathways for upstream catchments which enter the site.
  - Finished floor levels must have at least 500 mm clearance above the major (1% AEP) rainfall event flood levels within flood detention structures.
  - Apply appropriate non-structural measures to reduce nutrient loads.
  - Finished floor levels must have at least 300 mm clearance from the 1% AEP rainfall event flows being conveyed within road reserves.
- Groundwater management
  - Groundwater quality leaving the site should be at least the same as or better than groundwater entering the site.
  - Subsoil drains will be used for managing shallow perched groundwater.

The LWMS addendum has been reviewed and approved by CoA and this LWMR aligns with the criteria and principles adopted by the LWMS addendum for the nearby development.

1.5 LWMR objectives

This LWMR has been developed in consideration of the objectives and principles detailed in *State Planning Policy 2.9 – Water* (SPP 2.9) (DPLH 2025). It is intended to support development within the site and is based on the following major objectives:

- Provide a broad level stormwater management framework to support future urban development.
- Identify site environmental constraints and assets that should be considered in water planning for the site.
- Incorporate appropriate best management practices into the drainage systems that address the environmental and stormwater management issues identified.
- Minimise ongoing operation and maintenance costs for the land owners and CoA.
- Develop a water management strategy that aligns with the pre-development hydrology and which adopts contemporary standards and guidelines to assess the hydrology of the site.
- Gain support from the DWER and CoA for the proposed method to manage stormwater within the site and potential impacts on downstream areas.

Detailed objectives for water management within the site are further discussed in **Section 4.**

2 Proposed Development

The proposed development covers the northern portion of Lot 39, approximately 10.23 ha (the southern portion will remain rural), and will include:

- Residential lots (5.90 ha)
- Internal road network (2.94 ha)
- Public open space (POS) (1.28 ha), which will include drainage infrastructure
- Drainage reserve (0.07 ha)
- Consideration of adjacent and upstream catchments.

The key elements of the water management approach for the site include:

- Runoff from lots will be managed as close to source as possible using a combination of soakwells and overflow connections to the pipe network.
- Runoff from lots and road reserves will be directed/conveyed towards downstream bio-retention areas (BRA) and flood storage areas (FSA) before discharging offsite downstream.
- Water quality management will adopt a treatment train approach in which treatment will be provided by inline drainage infrastructure.
- The existing inundated area will be retained within POS and utilised to provide flood detention
- FSAs will provide detention storage up to the 1% AEP event.
- Conveyance of flows from the northern upstream catchment will be achieved by a combination of pipes and swales to the downstream FSA, prior to discharge at or below pre-development discharge rates.
- Shallow or perched groundwater will be managed by the use of fill to provide separation and subsoil drains located beneath road reserves and back of retaining walls.

The structure plan is provided in **Appendix A** and landscape concept in **Appendix B**.

3 Existing Environment

3.1 Existing and historical land use

The area was historically utilised for rural purposes and is currently largely cleared. There is one shed within the site, and the land appears to be used for agricultural purposes such as grazing.

3.2 Climate

Average maximum temperature ranges from 15.9°C in July through to 22.9°C in February, while the average minimum temperatures range from 8.3°C in July through to 15.7°C in February (BoM 2025). Based on the Albany Bureau of Meteorology (BoM) site (#009500), average annual rainfall is 922 mm, with the majority occurring between May and September (BoM 2025).

3.3 Geotechnical conditions

3.3.1 Topography

Topography across the site is relatively steep, ranging from 16 metres Australian height datum (m AHD) in the west to approximately 6 mAHD on the eastern site boundary. The site slopes in an easterly direction.

Topographic contours are shown on **Figure 2**.

3.3.2 Regional geology

Regional surface geology is shown on **Figure 3** (Gozzard 2011). Regional geological mapping indicates the site is comprised of sands (S6), laterite (LA7) and sand (S14).

3.3.3 Local geology and soils

Geotechnical investigations were undertaken by Douglas Partners (2026) (see **Appendix D**) . These investigations involved:

- Test pitting (20)
- Permeability testing (3)
- Laboratory testing

The site investigations show soils which generally align with the regional mapping and these can be summarised as:

- Topsoil and organic sand to depths of between 0.1 m and 0.45 m at all test locations. With the organic soil present under the fill at TP02 and TP07.
- Fill (sand, gravelly sand, clayey sand) – variable fill at TP02 and TP07 to depths between 0.9 m and 1.1 m.
- Sand – fine to medium grained, underlying the topsoil and fill material to depths of 0.9 m and 2.7 m.

- Cemented silty sand/coffee rock – weakly to strongly cemented coffee rock, at test locations TP01, TP03, TP04, TP06, TP08 to TP13 and TP17 from depths between 0.9 m to 1.7 m.
- Clayey materials including clayey sand, clayey silt sand and clayey silt, at locations TP02, TP03, TP05 to TP06, TP11 and TP12 from depths between 1.45 m and 2.6 m.

The geotechnical report is provided in **Appendix C**.

3.3.3.1 Infiltration rates

Permeability testing carried out by Douglas Partners (2026) measured permeability to be between 20 m/day and 1.5 m/day. The lower rate of 1.5 m/day was measured at location TP10 and is likely due to shallow groundwater at this location.

3.3.4 Acid sulfate soils

Regional acid sulfate soil (ASS) risk mapping identifies the entire site as having a 'high to moderate' risk of ASS occurring within 3 m of the natural soil surface(DWER 2025). The geotechnical investigations aligned with the regional mapping, concluding that ASS are present beneath the site to depths of 3 m (Douglas Partners 2026). Regional ASS mapping is shown on **Figure 3.**

3.4 Surface water

3.4.1 Wetlands

The vegetated areas in the southern portion of the site and to the east of the site have been identified as potential wetlands by Coffey Environments (2010a), however they are not recorded within the Department of Biodiversity, Conservation and Attractions (DBCA) significant or important wetlands datasets (DBCA 2017, 2018). A buffer of 50 m has been allowed for to the potential wetland to the south. The potential wetlands are shown on **Figure 4**.

3.4.2 Surface water quantity

The hydrological characteristics of the site are dominated by steep topography (see **Section 3.3.1**) and low permeability soils which leads to runoff in larger rainfall events. Inflow from the upstream catchments to the north and north-west enters the site at five locations and is conveyed by a mixture of drainage channels and wide overland flow. Drainage in the northern portion of the site is conveyed to an existing dam before discharging offsite. The dam appears to have been artificially created, and reportedly retains water throughout the year. It is therefore possible that it is maintained by some measure of subsurface flow.

In order to confirm the hydrology of the broader structure planning area, the upstream catchments have been assessed. These catchments have then been modelled using XPSWMM software to determine the overall outflow rates from the site. The modelling undertaken indicates that the 1% AEP pre-development outflow rate at the downstream (eastern) boundary of the site at the location of the existing dam is 4.353 m^3/s and in the south-east corner of the site is 0.373 m^3/s.

The pre-development assumptions/methodology are detailed in the Modelling Assumptions Report (MAR) provided in **Appendix E**.

Existing hydrological features and catchments are shown on **Figure 4**.

3.4.3 Surface water quality

There is no known surface water quality information for the existing dam.

3.5 Groundwater

3.5.1 Groundwater levels

There is limited information on groundwater beneath the site. The *WIR database* (DWER 2026a) indicates that there are no groundwater bores located within the site. Groundwater monitoring undertaken by Coffey between April and May 2007 as part of the SEA, covers the areas to the west and south-west of the site and indicates that the regional maximum groundwater level (MGL) is approximately 0.2 mBGL in the potential wetland area in the southern portion of the site. Test pitting undertaken by Douglas Partners (2026) observed groundwater seepage in most test pits with the shallowest groundwater observed at TP10 at 0.8 mBGL. It is noted that TP10 is located nearby the onsite dam, and groundwater levels could be influenced by retained water within the dam. Observed groundwater levels across the rest of the site were greater than 1.0 mBGL and generally follow topography.

Given the previous monitoring to the south south-west and observations during test pitting it can be concluded that groundwater is shallow in proximity to the existing dam and in the vegetated area in the south of the site. Upslope of these areas, groundwater was observed to increase. Further groundwater monitoring may be warranted to quantify the level of any permanent aquifer that may be present. Final lot levels, road pavement design and POS design should consider groundwater conditions where it is found to be shallow.

Groundwater contours based on the monitoring undertaken by Coffey (that covered the southern part of the site) are shown on **Figure 2**.

3.5.2 Groundwater quality

No groundwater quality information is available.

3.5.3 Groundwater resources

A review of the *Water Register* (DWER 2026b) does not show any groundwater resources beneath the site. However, Investigations undertaken as part of the development along Lower King Road indicate a mix of localised perched groundwater and potential presence of a regional grounwater table, suggesting that groundwater may be available to meet non=potable demand.

3.6 Heritage

A review of the Aboriginal cultural heritage and inquiry system (DPLH 2026) and the State Heritage Office database (Heritage Council WA 2022) did not identify any heritage areas within the site.

3.7 Sensitive water resource area

The entirety of the site is classified as a sensitive water resource area (SWRA) according to the criteria described in SPP 2.9 and supportive mapping. The three classifications of relevance to the site define a SWRA are:

- Within 2 km of selected estuaries and inlets
- Within 1 km of significant wetlands
- Land that drains to and is within 1 km of other estuarine areas.

SWRA are shown on **Figure 4.**

3.8 Summary of the existing environment

In summary, the existing environment can be described as:

- The site receives 922 mm of rain on average annually with the majority of this rainfall received between May and September.
- Topography within the site ranges between 16 mAHD in the west to 6 mAHD on the eastern site boundary.
- Regional geological mapping indicates the site is comprised of sands (S6), laterite (LA7) and sand (S14). Geotechnical investigations generally aligned with the regional geological mapping further noting the presence of gravels and cementation of some sands and coffee rock.
- Infiltration rates varied between 20 m/day to 1.5 m/day, with the lower infiltration likely due to shallow groundwater.
- ASS risk mapping and the geotechnical investigations indicate a high to moderate risk of ASS occurring within 3 m of the natural soil surface.
- Potential wetlands have been mapped as part of previous investigations, however they are not recorded within the DBCA wetland datasets.
- Steep topography and the low permeability of the underlying soils lead to surface runoff.
- Inflow from upstream catchments to the north and north-west enters the site at five locations and is conveyed by a mixture of drainage lines and wide overland flow.
- Drainage in the northern portion of the site is conveyed to an existing dam before discharging offsite. The natural storage appears to have been artificially created, and reportedly retains water throughout the year.
- No groundwater monitoring bores are located within the site, but seepage was observed during the test pitting. Further investigation may be warranted to define groundwater beneath the site. Further investigation is required to define groundwater beneath the site.
- No registered heritage areas have been identified within the site.
- The entire site is located within a SWRA.

4 Design Criteria and Objectives

SPP 2.9 (DPLH 2025) endorses an integrated water cycle management approach adopting water sensitive design (WSD) principles to provide improvements in the management of surface water, groundwater, and to encouraging the efficient use of water supplies. The key principles of integrated water cycle management include:

- Considering all water sources, including wastewater, stormwater and groundwater
- Integrating water and land use planning
- Allocating and using water sustainably and equitably
- Integrating water use with natural water processes
- Adopting a whole of catchment integration of natural resource use and management.

These principles have guided the water management design criteria proposed below.

4.1 Water conservation

The design criteria for water conservation management within the site include:

Criteria WC1 Adopt a fit for purpose water supply strategy to meet potable and non-potable needs.

Criteria WC2 Consumption target of 100 kL/person/year for residential areas with no more than 40-60 kL/person/year of scheme water.

Criteria WC3 POS irrigation requirements not to exceed 6,750 kL/ha/year.

4.2 Stormwater management

The design criteria for stormwater management include:

Criteria SW1 Manage runoff from the small rainfall event (i.e. first 15 mm) as close to source as possible.

Criteria SW2 Post-development peak discharge rates from the site should not exceed the pre-development flow rates for the 1% AEP event.

Criteria SW3 Discharge locations should be consistent with the pre-development environment.

Criteria SW4 Provide flow pathways for upstream catchments which enter the site.

Criteria SW5 Finished floor levels must have at least 500 mm clearance above the major (1% AEP) rainfall event flood levels within flood detention structures.

Criteria SW6 Apply appropriate non-structural measures to reduce nutrient loads.

4.3 Groundwater management

The design criteria for groundwater management include:

Criteria GW1 Groundwater quality leaving the site should be at least the same as or better than groundwater entering the site.

Criteria GW2 Finished floor levels to be achieve minimum 1.2 m above MGL or subsoil drains if utilised.

5 Water Conservation Strategy

5.1 Fit-for-purpose water use

Conservation of water through fit-for-purpose use and best management practices is encouraged so that water is not wasted. Fit-for-purpose principles have been utilised in the water conservation strategy for the site and will achieve **Criteria WC1**.

5.1.1 Scheme water

Potable water will be provided via a reticulated network operated by the Water Corporation.

5.1.2 Groundwater

The site is within the Karri groundwater area, and the *Water Register* (DWER 2026b) does not show any groundwater resources beneath the site. However, production bores exist that supply the existing POS areas in Oyster Harbour Estate immediately southwest of the site. It is expected (subject to further investigation) that irrigation requirements within the POS may be supplied from groundwater beneath the site or by connecting to the existing irrigation system supplying Oyster Harbour Estate.

5.1.3 Rainwater

Due to the modest permeability and potential areas of high or perched groundwater after rainfall, some lots may not be able to retain all runoff. Lot owners will be encouraged to install rainwater tanks (RWTs), this can provide some buffer storage (although it is not included in the runoff calculations described in **Section 6**).

The harvested rainwater could be available for non-potable uses within the house by plumbing RWTs into the home. RWTs could also be used at a lot scale for some irrigation requirements, however this will likely need to be supplemented with another water source (e.g. scheme water). During the higher rainfall months, the majority of the stored rainwater can potentially be used to supplement internal building non-potable uses. The implementation of rainwater tanks could assist in achieving **Criteria WC1**.

5.2 Wastewater

The site is proposed to be connected to the Water Corporation reticulated sewer network which services the surrounding areas.

5.3 Water conservation measures

The development will utilise water wise garden (WWG) principles for lot scale gardens and estate landscaping. A key landscaping approach will be to undertake landscape planting within winter months to ensure that these can be sustained by rainfall and ideally established prior to the following summer (dry) period. Water efficient fixtures and appliances (WEFA) are important approaches to

ensure that lot water use is minimised. Details of these measures are further discussed in the following sections.

5.3.1 Water efficient fixtures and appliances

A significant reduction in potable water consumption will be achieved with the adoption of WEFA. The water conservation strategy for the development proposes that all residential lots implement WEFA. While uptake of WEFA cannot be mandated by the City, it can be encouraged by the proponent through provision of educational materials at point of sale. Examples of educational material are provided in **Appendix E**.

5.3.2 Water wise landscaping

Water use efficiency measures will significantly reduce the total water consumption for irrigation purposes. Water requirements will be reduced on both a lot and development scale by employing water wise landscaping measures including:

- Retain remnant native trees and vegetation where possible.
- The species palette will adopt local native waterwise species, adapted to the seasonal changes and tolerant against dry months with little to no rainfall.
- Landscape planting to occur during wetter months (i.e. May to September), where rainfall can supplement the establishment of plants.
- Irrigation will be avoided during winter months or where sufficient rainfall occurs.
- Where the use of turf is proposed this should align with the availability of non-potable water.
- Establishment period irrigation may be undertaken by hand/water cart.
- Where required, soil shall be improved with soil conditioner certified to Australian Standard AS4454 to a minimum depth of 150 mm where turf is to be planted and a minimum depth of 300 mm for garden beds.
- Mulch garden beds to 75 mm with a product certified to Australian Standard AS4454.
- Implementation of hydrozoning design practices, which will group plant species with similar / same water requirements.
- The adoption of xeriscaped gardens (garden beds are landscaped using ‘waterwise plants’) where possible.
- Minimise use of fertiliser and/or utilise slow release fertilisers.
- Community awareness of water conservation will be promoted at the point of sale and during the development sales lifespan.

WWG principles will be utilised within POS, road reserves and where relevant within lots. Uptake of WWG practices for lot landscaping will be encouraged by the proponent at the point of sale of lots through the provision of educational material (see examples provided in **Appendix E**).

5.4 Water conservation criteria compliance summary

5.4.1 Lot scale water use

Criteria WC2 Consumption target of 100 kL/person/year for residential areas with no more than 40-60 kL/person/year of scheme water.

Application of the following strategy will help to satisfy **Criteria WC1** and **WC2**:

- Promotion/ use of RWT
- Promotion/use of WWG practises within lots
- Promotion/use of water efficient appliances
- Promotion of water efficient fittings.

A water balance analysis has been undertaken to demonstrate the effectiveness of the water conservation strategy proposed. The analysis considers realistic uptakes of non-mandatory water conservation measures including WEFA, RWTs and WWG. Uptake rates and population assumptions are calculated using data from the Australian Bureau of Statistics (ABS 2013, 2022)

The water balance analysis has been based on the rates and calculation methodology presented in the Water Corporation Spreadsheet *AltWaterSupply_Water_Use_Model.xls (*WC 2011*)*. The water balance analysis assumes an average of 2.6 people per lot for single dwelling. The results indicate that if households in the development adopt the proposed water conservation measures at typical uptake rates, they will use 42.9 kL/year of scheme water per person on average. This achieves the consumption targets, satisfying **Criteria WC2**.

5.4.2 Development scale water usage

Criteria WC3 POS irrigation requirements not to exceed 6,750 kL/ha/year.

Water usage across the broader estate has been estimated by the amount of POS and additional areas which will require irrigation. The approximate area requiring irrigation is 1.28 ha and the estimated irrigation demand is 8,640 kL/year based on irrigation rate of 6,750 kL/ha/year.

The adoption of WWG and retention of existing vegetation will assist in limiting the overall long-term irrigation requirements. The landscape concept is provided in **Appendix B**.

6 Stormwater Management

The principle behind the stormwater management strategy is to ensure that the pre-development hydrology of the site is maintained, and that post-development peak flow rates and discharge locations are consistent with the pre-development environment. This will be achieved by ensuring runoff is first managed as close to the source as possible by the use of a treatment train approach (i.e. treatment through interaction with vegetation and soils within the soakwells, BRAs and FSAs) with runoff up to the 1% AEP rainfall event detained before discharging off site at flow rates which mimic the existing hydrology.

The stormwater management approach discussed in the following sections (and shown on **Figure 6**) takes into consideration the existing environment described in **Section 3**. Details of how the site will comply with the design criteria are detailed in **Section 6.5**.

The WSD features proposed for the site and that are of relevance of the treatment train approach include:

- Lot scale soakwells
- RWTs (where adopted by lot owners)
- BRAs
- FSAs which incorporate an existing dam feature, to be retained within the site.

Detailed hydrological and hydraulic modelling using XPSWMM has been undertaken to determine the required size of stormwater management infrastructure to detain up to the 1% AEP rainfall event and to ensure that peak discharges are consistent with the pre-development environment. The post-development assumptions/methodology are detailed in the MAR provided in **Appendix E**.

6.1 Inflow from upstream catchments

Inflow from upstream catchments (as discussed in **Section 3.4.2**) flows through the site. Upstream catchment drainage connections along Elizabeth Street will be connected to a drainage pipe via junction pits. The pipe along Elizabeth Street will be located in a public access way that will ultimately discharge to the swale and existing dam in the northern POS before discharging off site. Pre-development inflow locations are shown on **Figure 4**. Post development inflow locations will be maintained but will be conveyed by the development drainage as shown on **Figure 6**.

6.2 Lot drainage

Due to the variability in infiltration capacity across the majority of the parental soils identified within the development, lots will have soakwells sized to manage runoff from the first 15 mm of rainfall from impervious surfaces and will have an overflow connection to the pipe network. Lot owners will also be encouraged to install RWTs, however these will not be mandated.

An appropriate level of fill will also be implemented to ensure that lots have the intended functionality. This will be supported by junction pits, which will convey runoff into the road drainage network. Runoff from lots and roads will then be conveyed to the nearest downstream WSD measure

where it will be managed prior to discharging into downstream basins and the existing low lying vegetated area prior to discharging offsite.

6.3 Development drainage

Runoff in excess of the capacity of the soakwells will be conveyed to the pipe network. The road drainage network will be sized to convey runoff up to the 20% AEP event, thereby ensuring roads will remain passable in storm events up to the 20% AEP event. In events greater than the 20% event and up to the 1% AEP event, runoff will be conveyed by the pipe network, swales and road pavement to the downstream co-located BRAs/FSAs where detention will be provided. Events greater than the first 15 mm rainfall event will spill via a weir and/or pipe at rates equal to or less than the 1% AEP pre-development discharge.

The stormwater management plan showing the proposed drainage configuration is shown on **Figure 6**.

6.3.1 Co-located Basins

Stormwater runoff will be managed by treatment and detention within co-located BRAs and FSAs within POS areas on the eastern side of the site. The location of the co-located basins is shown on **Figure 6**.

For the northern catchments all runoff that is not retained higher in catchment will be captured and managed in the existing dam 'existing basin 1' which is to be retained and reshaped for amenity and to limit mosquito breeding. The existing permanent water will be retained at the base of existing basin 1, and flood storage will be achieved above the retained design top water level. Storage required for water quality and flood mitigation purposes will be achieved in the freeboard above the retained design top water level. The edges of the existing basin 1 will be vegetated with species known to uptake nutrients, consistent with the *Vegetation guidelines for stormwater biofilters in the South West of Western Australia* (Monash University 2014) to enable nutrient removal. The storage will also act as a sediment basin promoting settlement of sediments. Discharge from existing basin 1 will be via a culvert, weir overflow and minor swale as per the existing environment.

Co-located FSA 2 will be located in the southeast corner of the development area, and will be designed to dry out between storm events. Co-located FSA 2 will fill to a maximum depth of 0.3 m and maximum side slopes of 1:3 in response to a small rainfall event, and in this portion of the basin water quality treatment functions will be provided. The base of the basin will be densely vegetated with species known to uptake nutrients, consistent with the *Vegetation guidelines for stormwater biofilters in the South West of Western Australia* (Monash University 2014) and will be underlain with 300 mm of appropriate soils with high phosphorous retention index (PRI>10) to enable nutrient removal. The co-located basin will continue to fill in response to larger rainfall events and will have a maximum depth of 1.2 m with side slopes of 1:6. Overflow from Co-located FSA 2 will be via weir and flow dissipation structure at the site boundary. A low flow outlet will be installed to facilitate emptying of the FSA between storm events.

The co-located basins will assist in achieving Criteria **SW2**, **SW3**, **SW4** and **SW6**.

6.3.2 Swales

Swales will be utilised to convey flows from upstream catchments, through the site to co-located basins and existing discharge locations to the east of the site.

Swale inverts will be constructed to be at or above the low permeability soil layer, and will be connected to the downstream drainage structure to ensure that a continuous flow path is provided which can drain out between storm events.

Swales will be vegetated using plant species with high nutrient uptake capacity and low water requirements, consistent with the *Vegetation guidelines for stormwater biofilters in the South West of Western Australia* (Monash University 2014).

Utilising swales designed as above will mimic the existing environment, assist in achieving treatment of the small (i.e. first 15 mm) rainfall event. The use of swales will assist in achieving **Criteria SW1, SW2, SW3** and **SW4.**

6.4 Non-structural stormwater management measures

A number of non-structural measures will be implemented across the site to help reduce nutrient loads within stormwater runoff. These measures include:

- Retaining native vegetation within POS areas wherever possible.
- Minimising fertiliser use to establish and maintain vegetation within road verges.
- Use of drought tolerant turf species that require minimal water and nutrients.
- Street sweeping to remove sediments and gross pollutants.
- Maintenance of BRAs, FSAs, swales and the pipe network to remove sediments and other pollutants.
- Education of residents regarding fertiliser use and nutrient absorbing vegetation species within lots.

6.5 Stormwater criteria compliance summary

Criteria SW1 Manage runoff from the small rainfall event (i.e. first 15 mm) as close to source as possible.

Lots owners will be encouraged to install RWTs to intercept roof runoff and provide in-lot detention. Lots may also adopt soakwells, and these will be provided with an overflow connection point which allows surface runoff to be directly discharged into the drainage infrastructure.

Surface runoff from the small rainfall event is proposed to be intercepted by a pit and pipe network and conveyed downstream to the co-located basins. The volume and spatial requirements for management of the small rainfall event has been determined using XPSWMM software, and is summarised in **Table 1**. The structure plan is provided in **Appendix A** and the spatial configuration of the drainage basins is provided on **Figure 6**.

Table 1: Small rainfall event detention requirements

WSD feature	Side Slope	Depth (m)	TWL area (m^2)	Volume required (m^3)
Existing basin 1	-	0.25	1,685	396
Co-located BRA/FSA 2	1:3	0.3	645	180

Accommodating the volumes in **Table 1** will help achieve **Criteria SW1** and on this basis the Criteria will be satisfied.

Criteria SW2 Post-development peak discharge rates from the site should not exceed the pre-development flow rates for the 1% AEP event.

Runoff above the small rainfall event (first 15 mm) that is not retained higher in the catchment will be conveyed via the pit and pipe network, road reserve or swales to the downstream co-located basins before discharging off site.

Existing basin 1 is an existing dam that will be used as a storage. The modelled storage volume is above the assumed existing permanent TWL 5.52 mAHD. The existing dam will need to be modified to manage additional runoff post development to create the required storage capacity. This will be achieved by setting the outlet 0.53 m above the design TWL of 5.52 mAHD.

Table 2 provides the XPSWMM modelled volume for the minor and major storm events.

Table 2: Stormwater flood storage requirements from minor and major rainfall events

WSUD feature	Minor (20% AEP) rainfall event			Major (1% AEP) rainfall event			
	Modelled depth (m)	Modelled TWL area (m^2)	Modelled Volume (m^3)	Modelled depth (m)	TWL (mAHD)	Modelled TWL area (m^2)	Modelled Volume (m^3)
Existing basin 1	0.47*	1934	788	0.72*	6.24	2787	1389
Co-located FSA 2	0.47	893	317	0.5598	TBC	990	443

* From assumed static water level of 5.52 mAHD

Post-development discharge occurs via a pipe and weir at existing basin 1 and via a weir from Co-located FSA 2 and is less than the pre-development discharge as shown in **Table 3**.

Table 3: Pre- and post-development discharge from site

WSD feature	Pre-development discharge (m^3/s)	Post-development discharge (m^3/s)
	1% AEP event	1% AEP event
Existing basin 1	4.35	4.31
Co-located FSA 2	0.37	0.37

The spatial requirements detailed in **Table 2** will be accommodated in the civil design, and the 1% AEP post-development discharges are less than the pre-development discharge from the site, therefore **Criteria SW2** will be achieved.

Criteria SW3 Discharge locations from the site should be consistent with the pre-development environment.

As described in **Section 3**, the pre-development runoff flows towards the east with a concentrated discharge location at the existing basin 1 and wide overland flow south of this. Discharge will be to the east of the two proposed storages with the locations/flow directions consistent with the pre-development locations.

On this basis, **Criteria SW3** will be achieved.

Criteria SW4 Provide flow pathways for upstream catchments which enter the site.

As described in **Section 6.1** inflow from the upstream catchments to the north and north-west enters the site at five locations and is conveyed by a mixture of drainage lines and wide overland flow. A mixture of pipes and swales will convey the inflows downstream to Existing basin 1. The northern layout of the northern POS allows for conveyance of flows via a swale through a portion of the site.

On this basis, **Criteria SW4** will be achieved.

Criteria SW5 Finished floor levels must have at least 500 mm clearance above the major (1% AEP) rainfall event flood levels within flood detention structures.

Future civil designs will ensure that finished floor levels are elevated 500 mm above the 1% AEP top water level in the storages. This will be readily achieved given the topographical variation within the site – lots will be upslope of the Existing basin 1. On this basis **Criteria SW5** will be achieved.

Criteria SW6 Apply appropriate non-structural measures to reduce nutrient loads.

Non-structural stormwater management measures as detailed in **Section 6.4** will be implemented across the site to help reduce nutrient loads from both entering stormwater runoff and infiltrating to groundwater.

Given that the above measures will be implemented, **Criteria SW6** will be achieved.

7 Groundwater Management

7.1 Groundwater management approach

The main principle behind groundwater management is to maintain the existing hydrology across the site, provide appropriate protection from groundwater inundation, and maintain or improve the existing groundwater quality.

7.2 Groundwater quality management

Management of groundwater quality within the site will occur both through stormwater quality management (i.e. WSD) features that will treat runoff before it infiltrates, and by treating water intersected by subsoil drains within vegetated BRAs and swales as discussed in **Section 6**

The treatment train proposed for the treatment of stormwater runoff includes WSD measures throughout the development. These measures have been described in **Section 6**.

7.3 Groundwater level management

Consistent with the geotechnical conditions and hydrology described in **Section 3**, groundwater is generally expected to be >1 mBGL with the exception around the existing basin 1. Groundwater controls may be required for the lots and roads around existing basin 1 pending finished levels. The groundwater management measures proposed across the site may include:

- Use of subsoil drains beneath road reserves and within lots adjacent to existing basin 1
- Discharge of subsoil drains to the FSAs, BRAs or swales. Water quality treatment will be provided by the vegetation.
- Subsoil discharges should have a minimum 150 mm clearance from the downstream invert to ensure that they remain free draining.
- Use of permeable sand fill above the MGL to achieve finished lot levels.

Fill levels and supportive drainage infrastructure (e.g. subsoils) will comply with the IPWEA (2016) *Specification Separation Distances for Groundwater Controlled Urban Development*. Fill utilised should aim to achieve an appropriate permeability of approximately 4 m/day. Where a lower permeability specification of fill is adopted consideration of this should be made within surface runoff/groundwater modelling, fill depth assumptions and other aspects relying on infiltration.

7.4 Groundwater criteria compliance summary

Criteria GW1 Groundwater quality leaving the site should be at least the same as or better than the entering groundwater quality.

The main objective for the management of the groundwater quality is to maintain or improve the existing groundwater quality. This can be achieved by treating surface runoff prior to infiltration via application of appropriate stormwater management assets, thereby reducing the total nutrient load into the groundwater that originates from the development.

The following measures will reduce the total nutrient load into groundwater and improve the quality of the water prior to it infiltrating into the underlying groundwater:

- Retention of native vegetation, which reduces the need to establish replacement vegetation within open spaces.
- Minimise fertiliser application to open space areas by adopting waterwise landscaping principles.
- Manage the first 15 mm of rainfall and runoff generated on impervious surfaces within lots and throughout the development as close to source as possible.
- Adoption of surface-based conveyance where possible. This will facilitate natural processes which trap/treat pollutants.
- Vegetation within the BRAs and swales will provide treatment prior to runoff being either locally infiltrated or discharging off-site.
- Education of lot owners regarding fertiliser use and nutrient absorbing vegetation species appropriate for use within lots.

The measures described in **Section 7.1** and the above non-structural measures will assist in achieving **Criteria GW1**.

Criteria GW2 Subsoil drains will be used for managing shallow perched groundwater.

Subsoil drains will be used to manage perched groundwater where it is expected to be within 1.2 m of the surface. Subsoils will be installed in the road reserve and within lots where required. Subsoils will discharge to the pipe network through access chambers or adjacent side entry pits before entering BRAs or swales described in **Section 6,** where vegetation will provide treatment before discharging from the site. Detailed design of the subsoil drainage network will provide inverts 150 mm above the discharge invert.

On this basis **Criteria GW2** will be achieved.

Criteria GW2 Finished floor levels to be achieve minimum 1.2 m above MGL/impermeable layer or subsoil drain invert, whichever is lower.

The invert of subsoil drains will be dictated by the outlet inverts, plus 150 mm to provide a free draining outlet. Future earthworks designs will ensure that finished floor levels are a minimum of 1.2 m above the MGL/impermeable layer or subsoil drain invert. On this basis **Criteria GW3** will be achieved.

8 Subdivision and Urban Water Management Reports

The requirement to prepare more detailed water management reports (WMR) to support subdivision is generally imposed as a condition of subdivision. The development of any future WMR should follow the guidance provided in *State Planning Policy 2.9 – Water* (SPP 2.9) (DPLH 2025).

While strategies have been provided within this LWMR that address planning for water management, it is a logical progression that future subdivision designs and the supportive WMRs will clarify details not provided within the LWMR. The main areas that will require further clarification within future WMRs include:

- Groundwater level definition
- Imported fill strategy
- Implementation of water conservation strategies
- Modelling and configuration of the drainage structures
- Infrastructure design considerations
- Construction period management strategy
- Management and maintenance requirements.

8.1 Groundwater definition

To further inform final design levels and water resources that may be used for irrigation of POS areas groundwater investigations may be required to determine the MGL, groundwater quality and potential availability of groundwater sources for extraction.

8.2 Imported fill strategy

The fill approach and specifications will need to be refined at subdivision stage. Minimum fill should aim to achieve 4 m/day, however alternative specifications could be considered. Should the permeability specifications change these will be documented in the WMR and the assumptions for surface runoff modelling will be updated as required.

8.3 Implementation of water conservation strategies

Several potential measures to conserve water have been presented within this LWMR (see **Section 5**). These water conservation strategies will be incorporated into the design and the ongoing maintenance of POS. Landscape design measures that will be incorporated into the water conservation strategy will be further detailed within the future WMRs.

It is expected that the future WMRs will demonstrate that an adequate water source has been obtained to meet irrigation requirements for the relevant stages, or that an appropriate contingency plan has been established.

8.4 Modelling and configuration of the drainage structures

The design of the drainage system to date has been undertaken at an appropriate level for current planning and surface runoff modelling of the stormwater drainage system will be reviewed once detailed drainage design has commenced. The detailed designs will need to resolve the final form of the following infrastructure:

- Existing basin 1 - to confirm the modifications to create the required storage capacity.
- Confirmation of the final form (pipe and swale sizing) for the conveyance of the upstream catchments.
- Confirmation of the final form (swale within POS or piped) for the development drainage along the southern boundary.

It is acknowledged that the drainage strategies documented in this LWMR are based upon broad-scale assumptions. These assumptions are considered adequate for development of treatment and drainage structures and are of an appropriate level of detail. However, if the site layout is refined then verification of proposed subdivision drainage designs will need to be undertaken by modelling the catchments serviced by the drainage network. Such modelling will allow verification that the development undertaken within the structure planning area is consistent with this LWMR. It is anticipated that this will be detailed in future WMRs.

The exact location and shape of stormwater management assets will therefore need to be specified and presented within the future WMRs.

8.5 Infrastructure design considerations

At the civil design stage, infrastructure (e.g. road network, subsoil drainage, verges, building footings) should be designed to consider site constraints related to shallow groundwater to maximise the longevity of the assets.

8.6 Construction period management strategy

It is anticipated that the construction stage will require some management of various aspects (e.g. dust, surface runoff, noise, traffic etc.). The management measures undertaken for construction management will be addressed either in future WMRs or a separate Construction Management Plan (CMP).

8.7 Management and maintenance requirements

The management measures to be implemented to address surface water quality (BRAs and swales) will require ongoing maintenance. It is therefore expected that future WMRs will provide detailed management and maintenance plans that will set out maintenance actions (e.g. gross pollutant removal), timing (e.g. how often it will occur), locations (e.g. exactly where it will occur) and responsibilities (e.g. who will be responsible for carrying out the actions).

9 Monitoring

9.1.1 Condition monitoring

The overall condition of the development will be monitored on a bi-annual basis from completion of the civil and landscaping works. A visual assessment will be undertaken to monitor the overall condition of the development, with the aim to ascertain that the maintenance activities (which will be detailed in the future WMRs as described in **Section 8**) are achieving the overall management objectives for the development. The parameters that will be monitored include:

- Gross pollutants
- Terrestrial weeds
- Vegetation density
- Paths, benches, walkways and other infrastructure.

The management and maintenance objectives will be detailed within future WMRs along with details of the corresponding monitoring program.

9.1.2 Water quality monitoring

Given the varied permeability of the soils across the site, groundwater monitoring may not provide a clear indication of the success (or otherwise) of water quality treatment measures proposed. Post development water quality monitoring is proposed to occur downstream of the co-located basins to assess the effectiveness of the upstream WSUD infrastructure.

9.1.2.1 Guideline values

Guideline values are presented in **Table 4** and have been established in consideration of the *NWQMS* (ANZG 2018b; Australian Government 2018) however do not reflect the legacy nutrient concentrations identified during the pre-development environment. It is not anticipated that if present, nutrients could potentially be mobilised, and therefore it is expected that the guideline values will need to be revised following initial measurement post development.

Table 4: Water quality monitoring guideline values

Monitoring Guideline	pH	EC mS/cm	TP (mg/L)	TN (mg/L)	NOx (mg/L)
Long-term Irrigation Water trigger values	6-8.0	-	0.05	5	-
NWQMS – Estuaries trigger values	7.5-8.5	-	0.03	0.75	0.045

9.1.2.2 Contingency actions

If the results from the initial monitoring occasion indicate concentrations exceeded the nominated guideline values, a number of contingency actions may be employed.

The first action that should be undertaken if guideline criteria are exceeded is to repeat the monitoring to remove the potential for sampling error. If the monitoring still shows results which breach the guideline values, the following actions should be undertaken:

- Identify the potential source from within the site and remove, if possible.
- Review implementation of management and maintenance practices.
- Remove sediments from internal piped networks, swales, and co-located basins.
- Repair eroded surfaces where erosion has occurred and could impede the intended functioning of the stormwater network.
- Remove accumulated sediment (e.g. top 2 cm to 5 cm) if signs of sediment accumulation / clogging are evident within vegetated swales and BRAs.
- Investigate whether additional maintenance is required if poor plant health or coverage is evident within treatment areas.
- Manually remove excess plant material within drainage structures to maintain plant densities.

Following the implementation of the above contingency measures the water quality will be resampled. If the results demonstrate a continued issue, CoA will be informed of the results, and the proponent will seek to work with CoA to determine whether any additional contingency actions or monitoring needs to be implemented onsite.

10 Implementation Plan

10.1 Roles and responsibility

The responsibility for working within the framework established within the LWMR rests with the proponent and their contractors, although it is anticipated that the future estate scale management actions beyond the proposed management timeframes will be the responsibility of the CoA. Lot based measures (e.g. WWG and WEFA) will be the responsibility of lot owners.

10.2 Completion criteria

The overall criteria for successful completion of the development in context to water management will be to satisfy the design and management criteria outlined in this LWMR.

If at the end of the maintenance period the proponent has satisfied the objectives and criteria highlighted within this document, the development will be considered to be in a suitable condition for management handover to the City. If the overall management objectives are not met during this period, the proponent will undertake a review of the system to determine why the objectives are not being met. On completion of the review, the City and proponent are to agree on the recommended course of action(s) to be undertaken by the proponent to ensure the objectives are met to the satisfaction of the City.

10.3 Funding

The proponent will be responsible for funding and implementing the management strategies outlined in this LWMR, with the exception of lot owner responsibilities.

10.4 Review

This document is not planned to be reviewed in the future. Future stages may be supported in an addendum or update to this WMR. Regardless of the format of subsequent documents, these will need to demonstrate compliance with the design criteria proposed in this LWMR, or to demonstrate alternative criteria and a rationale for any proposed changes. The detailed civil designs and landscape designs that are not included in this report, will be developed consistent with the approach adopted in this LWMR and submitted to the CoA when finalised.

11 References

11.1 General references

The references listed below have been considered as part of preparing this document.

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11.2 Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 11.1**, with access date information provided in **Table R1**.

Table R1 Access dates for online references

Reference	Date accessed	Website or dataset name
(BoM 2026)	9 February 2026	Climate Data Online
(DWER 2025)	9 February 2026	Acid Sulfate Soils (dataset)
(DWER 2026a)	9 February 2026	Water Information Reporting

Figures

Figure 1: Site Location

Figure 2: Topographic Contours

Figure 3: Geological Mapping and Test Pit Locations

Figure 4: Wetlands and Existing Hydrological Features

Figure 5: Sensitive Water Resource Areas

Figure 6: Stormwater Management Plan

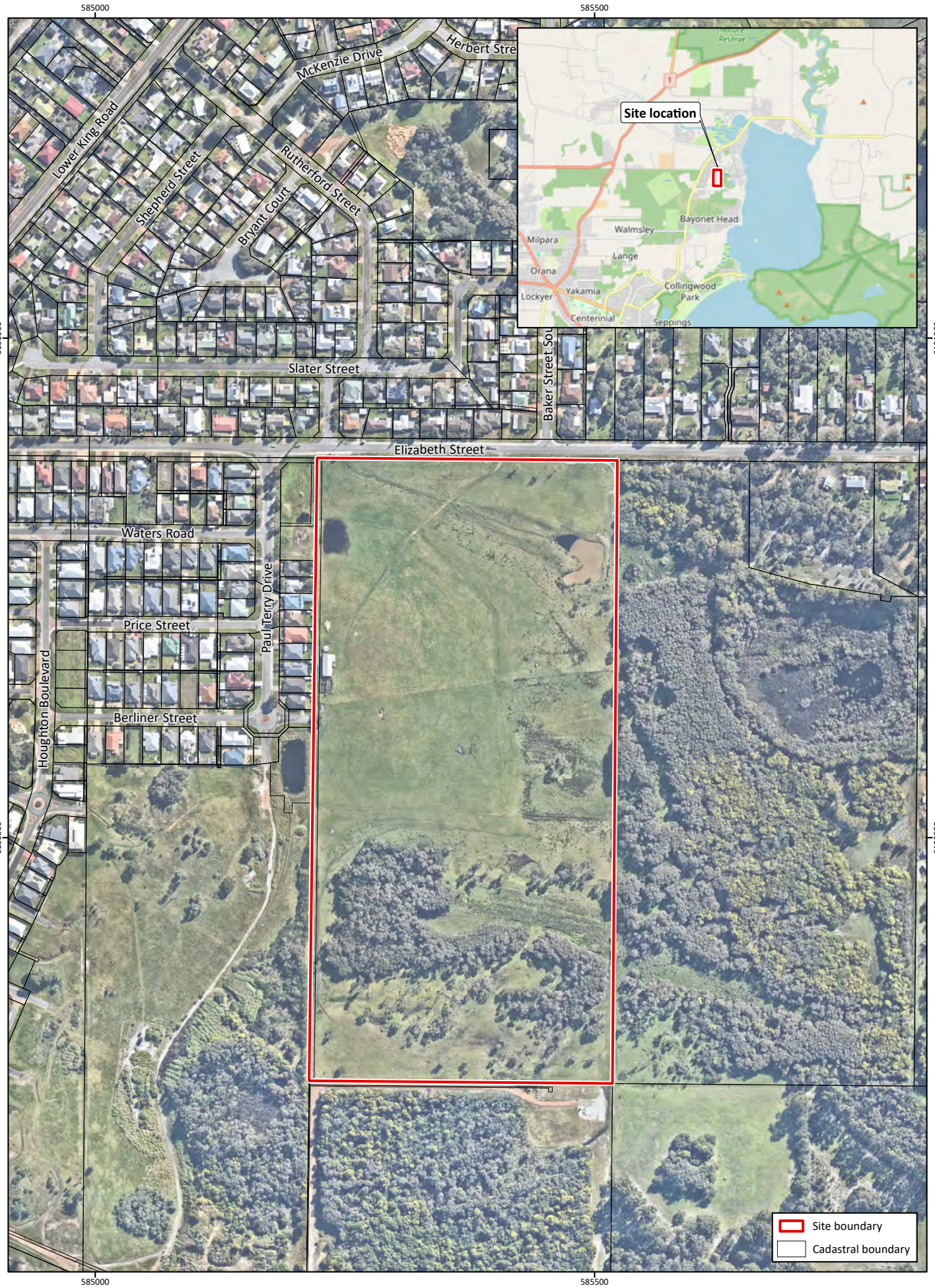

Figure 1: **Site Location**

Project:	LWMR Lot 39 Oyster Harbour
Client:	Development WA

Plan Number:
EP26-007(01)--F01

Drawn:	LAM
Date:	20/04/2026
Checked:	DRL
Approved:	DPC
Date:	24/04/2026

N

0 50 100
Metres
Scale: 1:5,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

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©Landgate (2025). Nearmap Imagery date: 12/08/2025

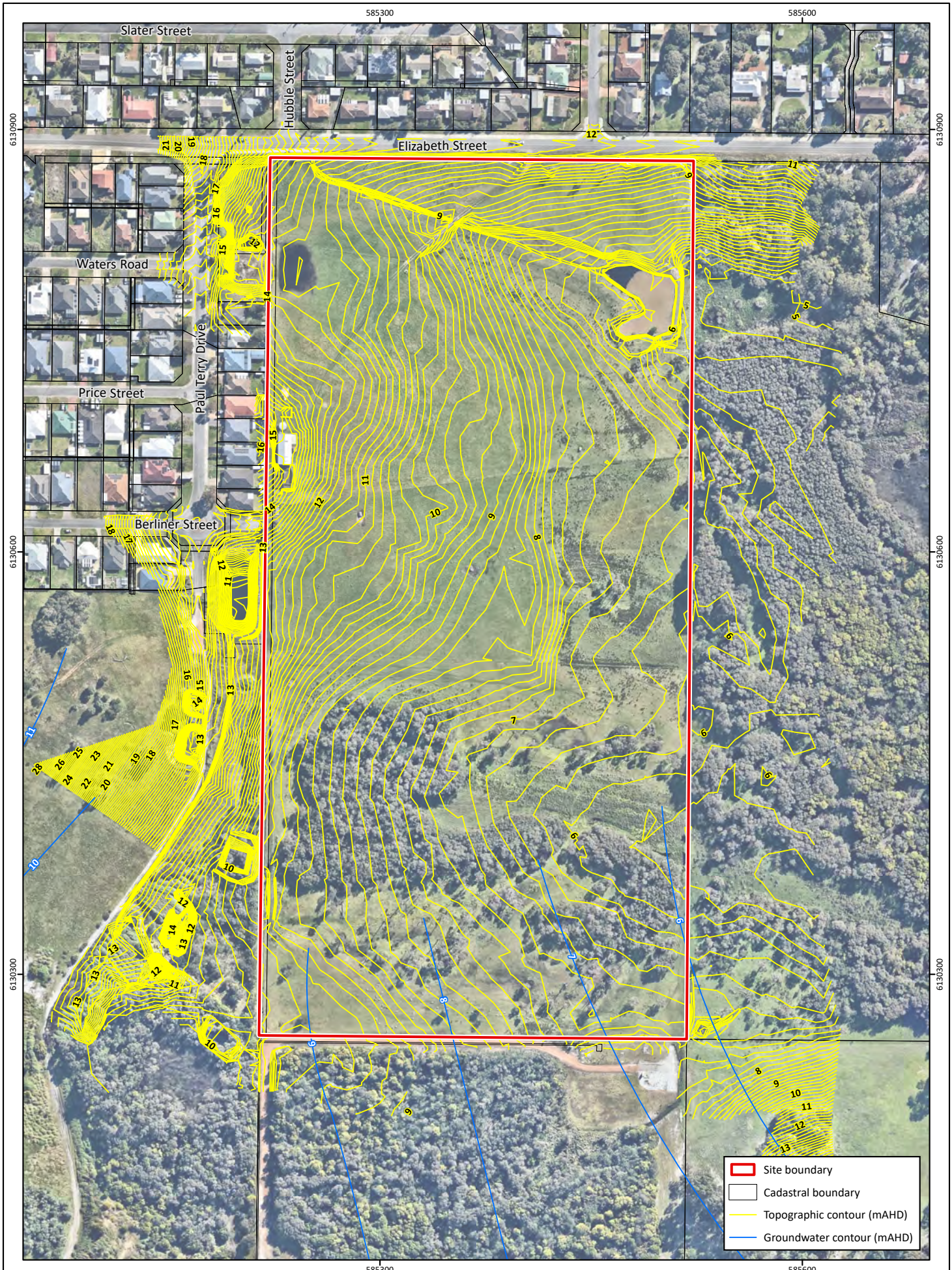

Figure 2: Topographic and Groundwater Contours

Project:	LWMR Lot 39 Oyster Harbour
Client:	Development WA

Plan Number:
EP26-007(01)--F02

Drawn:	LAM
Date:	20/04/2026
Checked:	DRL
Approved:	DPC
Date:	24/04/2026

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Scale: 1:3,500@A4
GDA2020 MGA Zone 50

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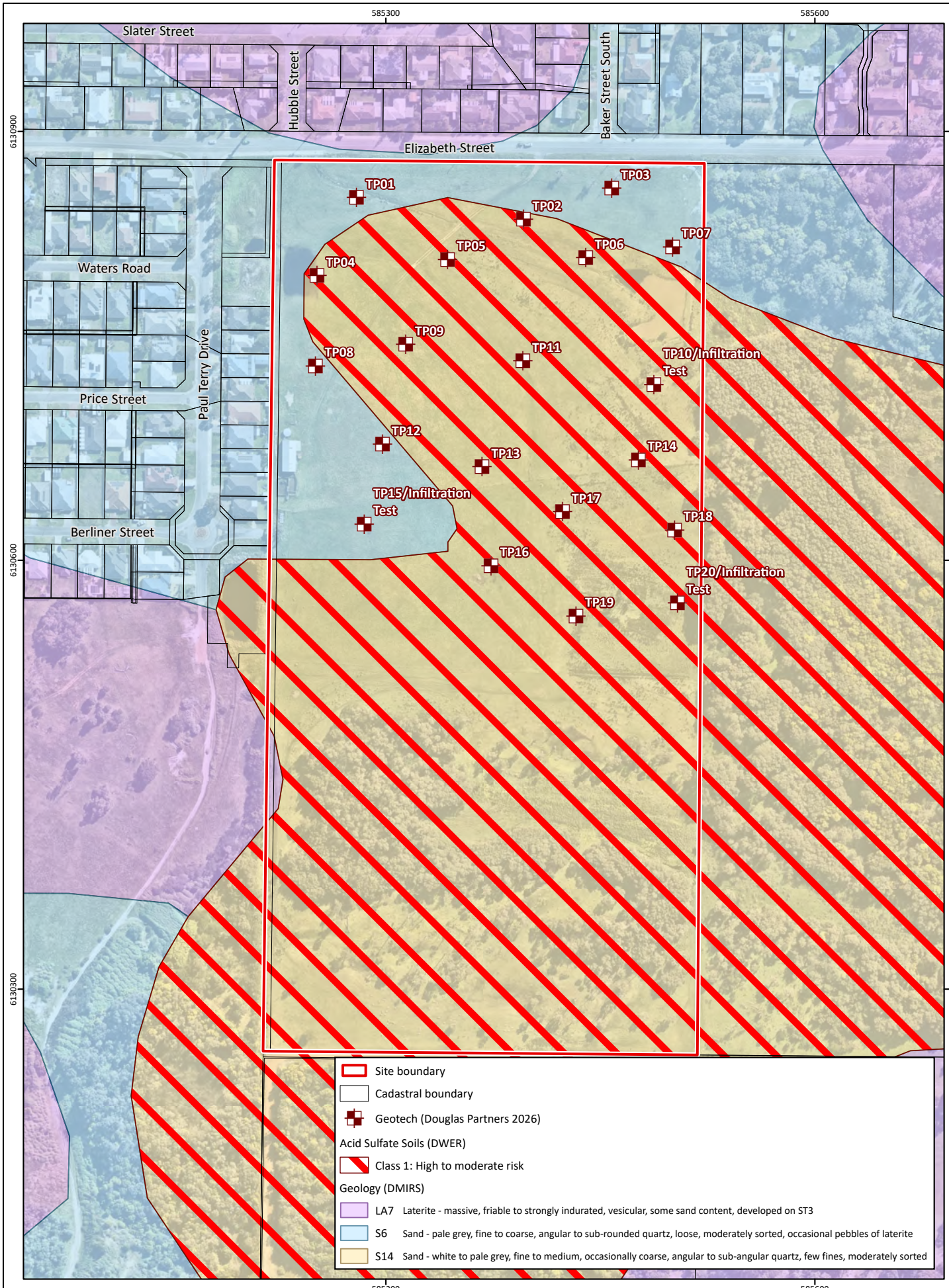

Figure 3: **Geological Mapping and Test Pit Locations**

Project: LWMR
Lot 39 Oyster Harbour
Client: Development WA

Plan Number:
EP26-007(01)--F03
Drawn: LAM
Date: 20/04/2026
Checked: DRL
Approved: DPC
Date: 24/04/2026

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GDA2020 MGA Zone 50

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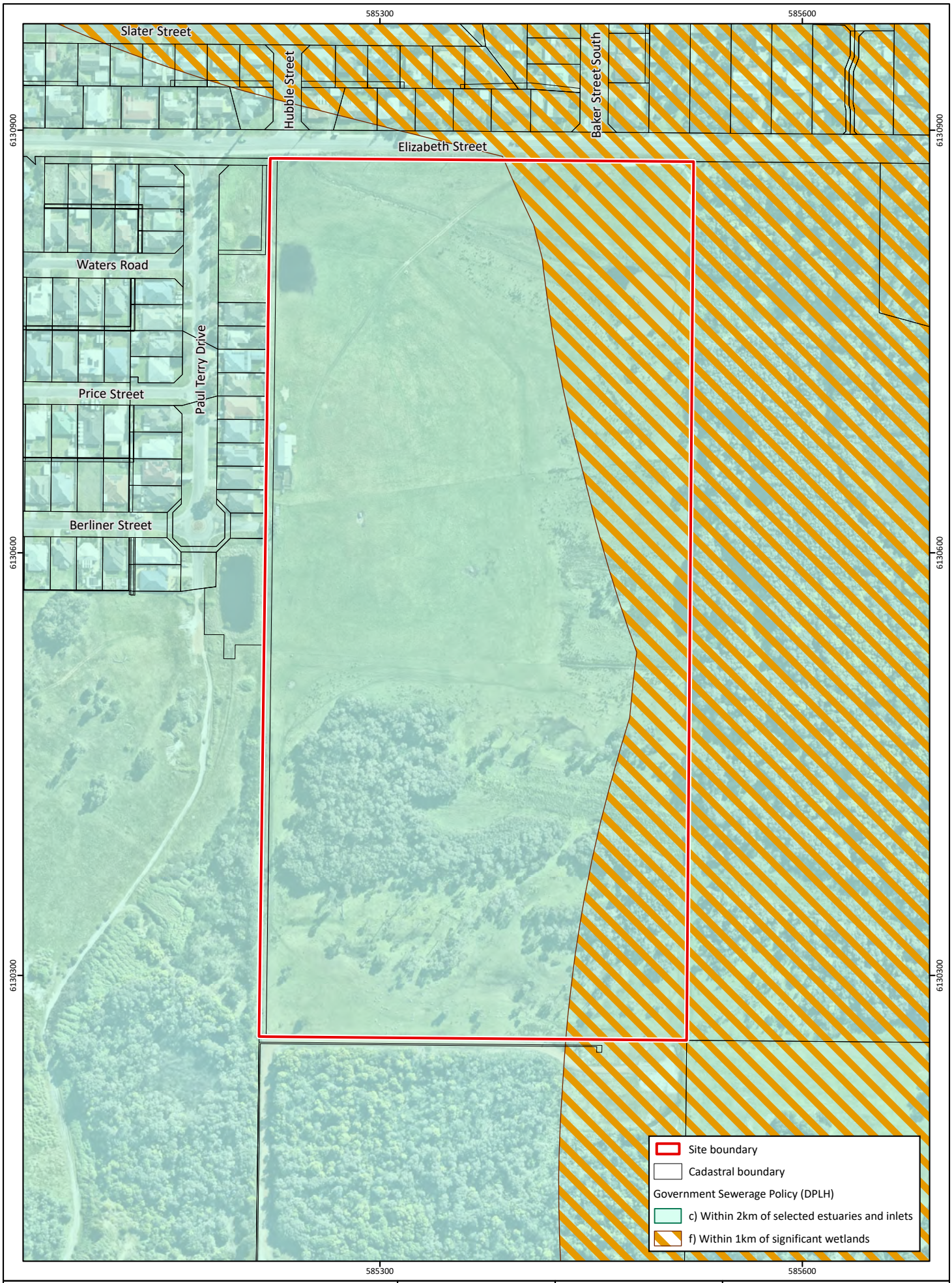

Figure 5: **Sensitive Water Resource Areas**

Project: LWMR
Lot 39 Oyster Harbour
Client: Development WA

Plan Number:
EP26-007(01)--F04
Drawn: LAM
Date: 20/04/2026
Checked: DRL
Approved: DPC
Date: 24/04/2026

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Scale: 1:3,500@A4

GDA2020 MGA Zone 50

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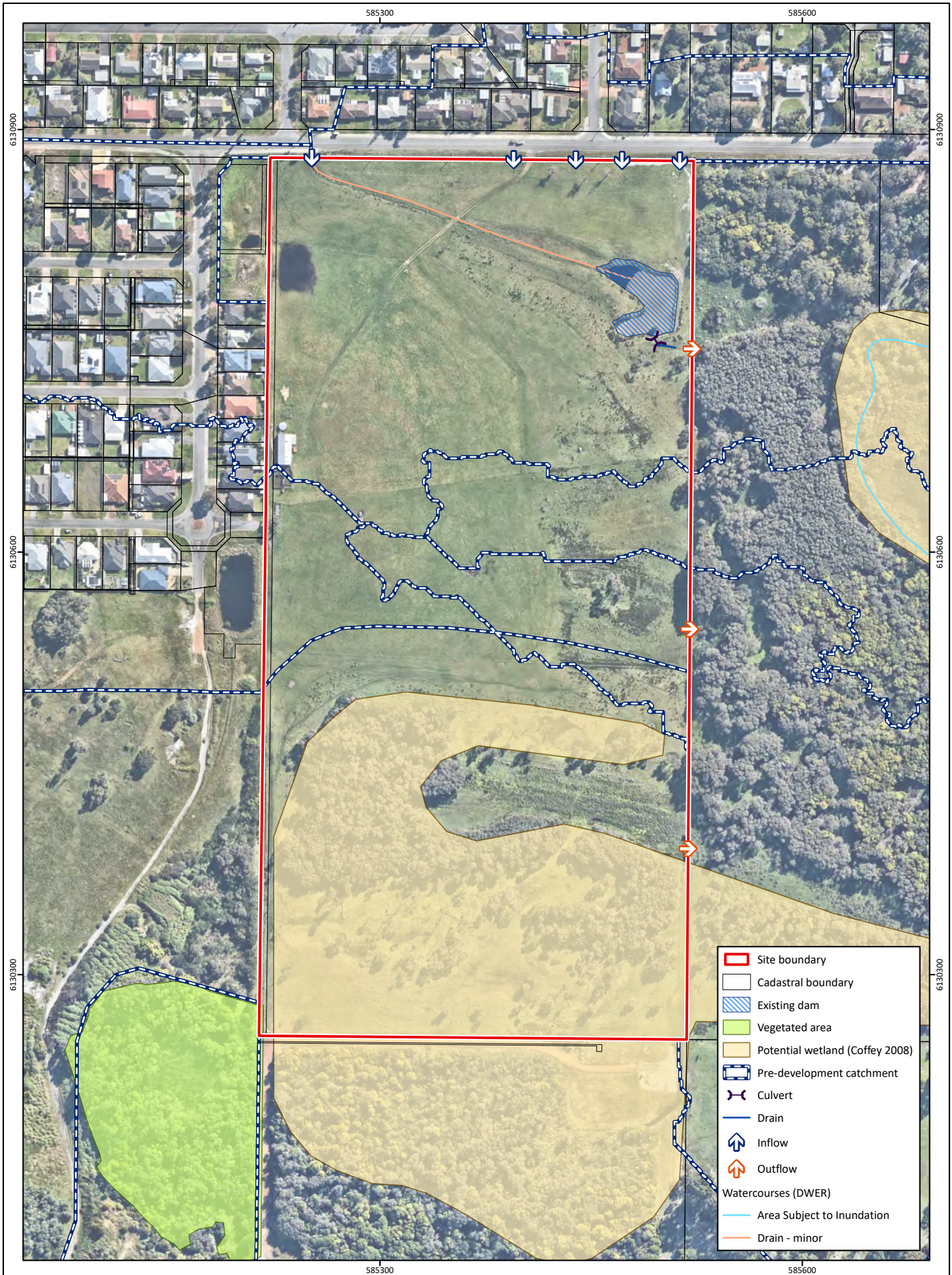

Figure 4: Wetlands and Existing Hydrological Features

Project: LWMR
Lot 39 Oyster Harbour
Client: Development WA

Plan Number:
EP26-007(01)--F05
Drawn: LAM
Date: 20/04/2026
Checked: DRL
Approved: DPC
Date: 24/04/2026

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Metres
Scale: 1:3,500@A4
GDA2020 MGA Zone 50

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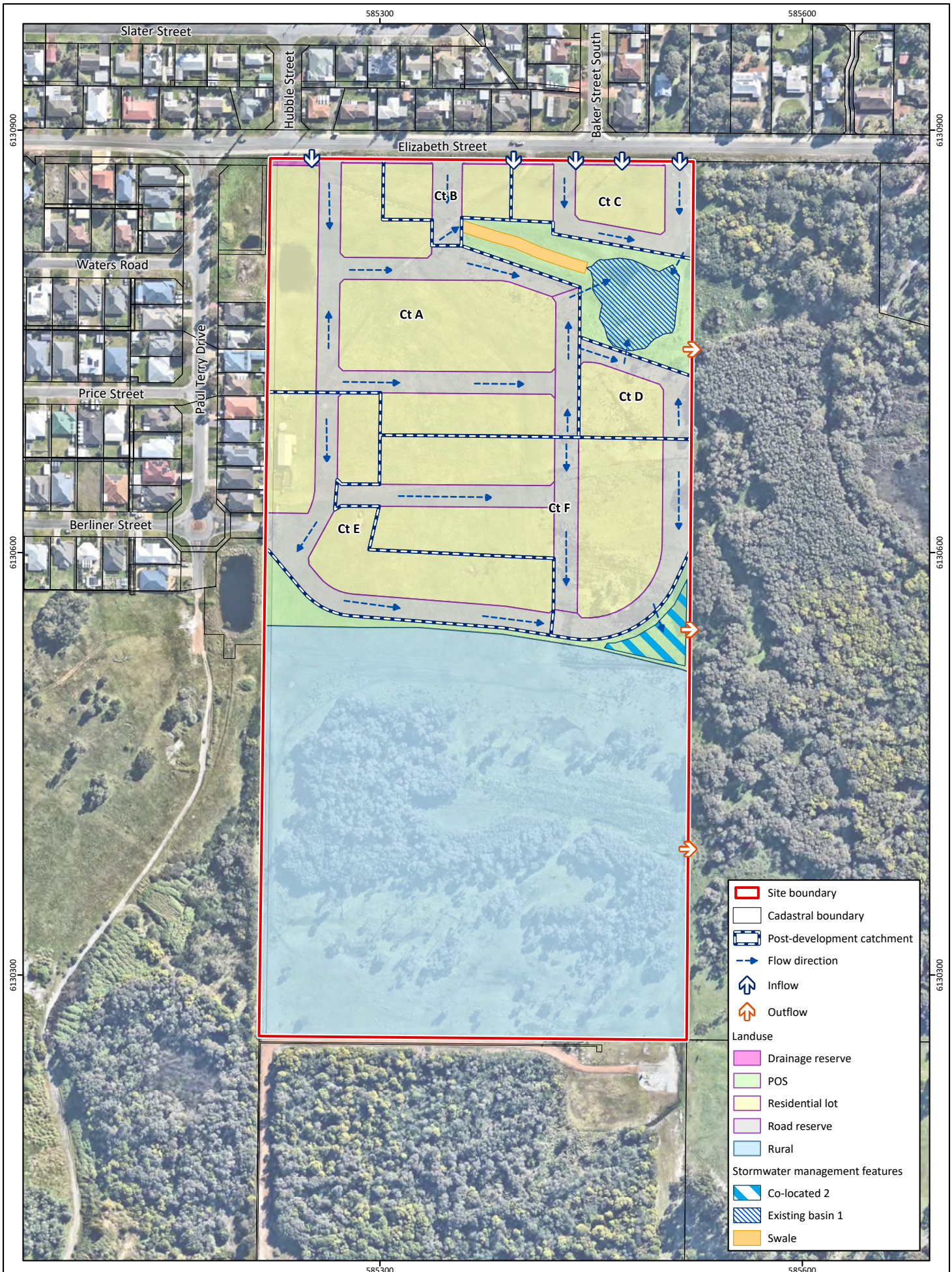

Figure 6: Stormwater Management Plan

Project: LWMR
Lot 39 Oyster Harbour
Client: Development WA

Plan Number:
EP26-007(01)--F06
Drawn: LAM
Date: 20/04/2026
Checked: DRL
Approved: DPC
Date: 24/04/2026

N

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Metres
Scale: 1:3,500@A4
GDA2020 MGA Zone 50

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Appendix A

Development Concept Plan

DESIGN FEATURES

1. Adjoining natural bushland contributes to the characteristics of the development
2. Public Open Space configured to incorporate established stormwater flood path and landform
3. Topographical responsive street design minimises earthworks and maximises view corridors east
4. Entry boulevard incorporating central swale median
5. Heritage tree retention within road reserve
6. Public Open Space featuring drainage swale at bottom of drainage catchment
7. Diverse range of lot sizes to respond to landform, bushfire management and household diversity, ranging 300m² - 600m²
8. Moderate sized lots located in vicinity of open space amenity
9. Roadside drainage swales to accommodate pre development stormwater requirements including drainage pits

LEGEND

- Concept plan boundary
- Residential R30
- Rural zoned area
- Public open space and drainage
- Established drainage swale to be retained
- BAL29 — Anticipated BAL29 setback
- Illustrative street tree locations
- Heritage tree to be retained
- Indicative shared path alignment
- Indicative footpath alignment

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Scale
1:2000@A3
1:1000@A1

Date
7/04/2026

0 10 20 30 40 N

Plan
25/057/004B

Grid
MGA2020-50

Drawn
MH

Approved
MB

Development Concept

LOT 39 ELIZABETH STREET, BAYONET HEAD

A DevelopmentWA Project

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Appendix B

Landscape Concept

LOT 39 ELIZABETH STREET, BAYONET HEAD

LANDSCAPE MASTERPLAN (CONCEPTUAL ONLY)

DWG OH-03- 01
REV C
DATE APRIL 2026
SCALE 1 : 2000 @ A3
0 10 20 30 40 50 m

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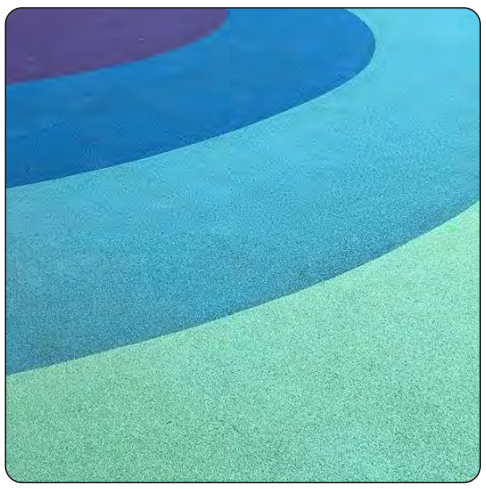
SHADE SAILS

LIMESTONE RETAINING WALLS

LOCAL STONE SEATING WALLS TO KEY AREAS

COLOURED CONCRETE TO FOCAL POINTS



RUBBER SOFTFALL

MULCH SOFTFALL

IRONCLAD ILLAWARRA SHELTER SHELTER

CHRISTIE DOUBLE BBQ

BIN ENCLOSURE

DRINK FOUNTAIN

COMPOSITE TIMBER PICNIC SETTING

COMPOSITE TIMBER BENCH SEAT WITH BACK REST

DWG **OH-03- 02**
REV **C**
DATE **APRIL 2026**

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Appendix C

Geotechnical Investigations

Douglas PARTNERS

GROUNDED EXPERTISE

Report on Preliminary Geotechnical Investigation

Proposed Residential Development

Lot 39 Elizabeth Street, Bayonet Head, WA

Prepared for DevelopmentWA

Project 240409.00

30 March 2026

Douglas Partners Pty Ltd
ABN 75 053 980 117
douglaspartners.com.au
36 O'Malley Street, Osborne Park, WA 6017
(08) 9204 3511

Document History

Details

Project No.	240409.00
Document Title	Report on Preliminary Geotechnical Investigation
Site Address	Lot 39 Elizabeth Street, Bayonet Head, WA
Report Prepared For	DevelopmentWA
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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature		Date
Author		30 March 2026
Reviewer		30 March 2026

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Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

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Appendix A: About This Report

Appendix B: Drawing 1 – Test Location Plan

Test Pit Logs

Appendix C: Geotechnical Laboratory Test Reports

Appendix D: Acid Sulfate Soil Laboratory Test Reports

Report on Preliminary Geotechnical Investigation
Proposed Residential Development
Lot 39 Elizabeth Street, Bayonet Head, WA

1. Introduction

This report, prepared by Douglas Partners Pty Ltd (Douglas), presents the results of a preliminary geotechnical investigation undertaken for a proposed residential development at Lot 39 Elizabeth Street, Bayonet Head, WA (the site). The investigation was commissioned in a letter dated 4 February 2026 by DevelopmentWA and was undertaken in accordance with Douglas' proposal P240409.00.P.001.Rev1 dated 3 February 2026.

It is understood that the site will be developed into a residential subdivision, with residential lots, pavement, retaining walls, underground services and areas of public open space (POS).

The purpose of this preliminary geotechnical investigation is to assess the subsurface conditions beneath the site and thus provide preliminary comments on:

- The geotechnical suitability of the site for the proposed development.
- The subsurface conditions across the site, including the possible presence of any geotechnically problematic or compressible soils.
- The site classification in accordance with the Australian Standard (AS 2870, 2011) and site preparation measures to improve the site classification.
- Site preparation, earthworks and compaction requirements, including the possible re-use of site soils as controlled fill.
- Excavation conditions and temporary batter slopes for shallow excavations.
- Geotechnical parameters for retaining wall design.
- A design California bearing ratio (CBR) for pavement subgrade materials based on observations made in the field, limited laboratory testing and Douglas' experience.
- The permeability of the encountered site soils and suitability for on-site stormwater disposal.
- The depth to groundwater if encountered.
- The presence or absence of acid sulfate soil across the site together with recommendations for further investigation following completion of detailed design.
- Recommendations on additional geotechnical investigation.

The investigation included the excavation of 20 test pits, in situ infiltration at three locations, and laboratory testing of selected samples. The details of the field work are presented in this report, together with comments and recommendations on the items listed above.

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

2. Site Description

The site, Lot 39 Elizabeth Street in Bayonet Head, WA, comprises a rectangular shaped area of approximately 18.9 ha. The development footprint and investigation area cover the northern half of the lot, approximately 10.2 ha in size. The site is bordered by Elizabeth Street to the north, Paul Terry Drive to the northwest, and by pastoral land and bushland elsewhere.

At the time of the investigation, the site was generally vacant and comprised cleared pastoral land. A workshop was located at the centre-western part of the site and a pond in the northeastern corner. A drainage gully runs from the northwestern corner of the site into the pond. Review of historical photos indicates that the pond and open drain were man-made sometime between 1977 and 1988, with ground disturbance visible up to about 30 m around these features. The site was separated by fences and a gravelly track connects Elizabeth Street to the workshop.

Vegetation across the site comprised long grass with both small groups and singular mature trees at isolated locations within the paddocks, surrounding the pond, and near the workshop. Tall grass, approximately 1 m to 1.5 m in height was observed within the gully and towards the southeastern corner of the site.

The ground surface across the site generally falls to the east, with surface levels of around RL 13 (relative to AHD) on the western boundary to approximately RL 6 on the eastern boundary.

The Albany 1:50,000 Environmental Geology Map indicates the subsurface conditions across the site to generally comprise alluvial sand. Areas mapped as laterite are noted in close proximity to the site.

Based on published acid sulfate soil risk mapping, the site is mapped as 'high to moderate risk of acid sulfate soils occurring within 3 m of natural soil surface. This risk mapping, shown in Figure 1, is generally supported by a historical aerial image of the site from 1961 shown in Figure 2. The historical imagery indicates possible swampy ground on the site which may have been covered with fill.

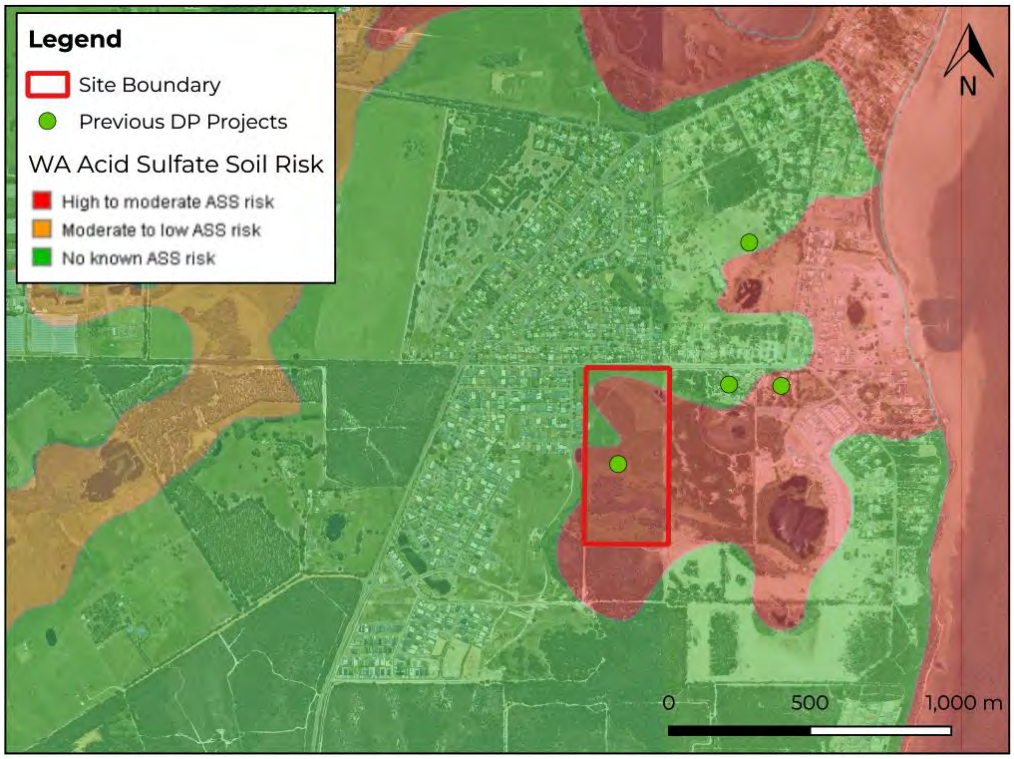

Figure 2: Acid Sulfate Soil Risk Mapping

Figure 1: Site Location Historical Imagery from October 1961.

3. Field Work Methods

Field work for the investigation was carried out between 12 and 13 February 2026, and comprised:

- The excavation of 20 test pits (TP01 to TP20).
- Perth sand penetrometer (PSP) testing adjacent to each test pit.
- In situ infiltration testing at three locations (adjacent to TP10, TP15 and TP20).

The test pits were excavated to depths of up to 3.0 m using an 8-tonne excavator equipped with a 600 mm wide toothed bucket. Ground conditions were logged in accordance with the Australian Standard (AS 1726, 2017) by a geotechnical engineer from Douglas. Soil samples were recovered for subsequent geotechnical laboratory testing.

Soil samples for assessment of acid sulfate soils were collected at 0.5 m intervals from 12 selected test pits (TP01, TP03, TP05, TP06, TP09, TP10, TP11, TP13, TP15, TP16, TP17 and TP20). All soil samples were placed into a snap-lock bag and chilled in the field and transported to the laboratory under a chain-of custody.

The PSP testing was carried out in accordance with the Australian Standard (AS 1289.6.3.3, 1997), adjacent to each test pit, to assess the density of the shallow soils. The results of these PSP tests are presented on the test pit logs in Appendix B.

Permeability testing was performed using the falling head test at depths of between 0.5 m and 1.0 m adjacent to locations TP10, TP15, and TP20.

Test locations were determined using a differential GPS and are marked on Drawing 1, Appendix B. Surface elevations at each test pit were surveyed using a differential GPS with a reported accuracy of 0.1 m.

4. Field Work Results

4.1 Ground Conditions

Detailed logs of the ground conditions and results of the field testing are presented in Appendix B, together with notes defining descriptive terms and classification methods, in Appendix A.

A summary of the ground conditions encountered at the test locations is given below:

- **Topsoil and Organic SAND SP-SM** – dark grey-brown and grey-brown sandy topsoil, trace or with silt, rootlets and organics, between 0.1 m and 0.45 m thick at all test locations. The organic soil layer was also present under the fill at test locations TP02 and TP07.
- **Fill (SAND, Gravelly SAND, Clayey SAND) SP-SM, SC** – grey-brown, orange-brown and grey, low to medium plasticity clay, fine to coarse gravel, encountered at test locations TP02 and TP07, to depths of between 0.9 m and 1.1 m. Review of historical photo suggest that this filling possibly results from the excavation of the existing pond and open drain, and thus possibly occurs in their vicinity.

- **SAND SP and SP-SM** – fine to medium grained, grey, pale grey and pale brown, underlying the topsoil and fill material, encountered at each test location, to depths of between 0.9 m and test pit termination depth of 2.7 m.
- **Cemented Silty SAND/COFFEE ROCK SM** – dark brown, weakly to strongly cemented coffee rock, encountered at locations TP01, TP03, TP04, TP06, TP08 to TP13 and TP17 from depths between 0.9 m to 1.7 m. Test pit refusal occurred within the strongly cemented coffee rock at several locations when utilising an 8-tonne excavator.
- **Clayey materials including Clayey SAND SC, Clayey Silty SAND SC-SM, Clayey SILT ML** – pale grey, grey and green-grey, low to medium plasticity, underlying the silty sand material at test locations TP02, TP03, TP05, TP06, TP11 and TP12, from depths of between 1.45 m and 2.6 m and extending to the test termination depths of 3.0 m.

4.2 Groundwater

Groundwater was encountered within several test pits during the field work between 12 and 13 February 2026. The depth and level of groundwater is shown in Table 1. The test pits were backfilled immediately following soil sampling and logging which prevented long-term monitoring of groundwater levels.

Table 1: Summary of Groundwater Levels Observed between 12 and 13 February 2026

Test Location	Ground Surface Level[1] (AHD)	Groundwater Depth (m)	Groundwater Level[2] (AHD)
TP01	11.1	1.4	9.7
TP02	8.9	2.5	6.4
TP04	11.6	2.0	9.6
TP05	9.5	1.9	7.6
TP07	7.2	2.8	4.4
TP10	6.5	0.8	5.7
TP11	8.4	1.65	6.75
TP13	9.2	1.7	7.5
TP14	7.2	1.6	5.6
TP15	11.0	2.3	8.7
TP16	8.6	2.1	6.5
TP17	7.4	1.0	6.4
TP18	6.6	1.4	5.2
TP19	7.2	1.6	5.6
TP20	6.5	2.2	4.3

Notes for Table 1: [1]: Surface level measured using a differential GPS.
[2]: Groundwater Level = Surface Level – Groundwater Depth.

It should be noted that groundwater levels are affected by climatic conditions and land usage and will therefore vary with time.

4.3 Permeability

Three in-situ permeability tests using the falling head method were carried at a depth of between 0.5 m and 1.0 m at locations TP10, TP15 and TP20. A permeability value has been estimated using a calculation derived from a method based on Hvorslev (Hvorslev, 1951). Results of the permeability analysis are summarised in Table 2.

Table 2: Summary of Permeability Analysis

Location	Depth (m)	Measured Permeability (m/day)	In situ Conditions of Tested Material
TP10	0.5	1.5	SAND SP, trace silt, medium dense, groundwater seepage at 0.8 m
TP15	1.0	>20	SAND SP, trace silt, medium dense
TP20	0.6	5	SAND SP, trace silt, medium dense

5. Laboratory Testing

5.1 Geotechnical Laboratory Testing

A geotechnical laboratory testing programme was carried out by a NATA accredited laboratory and comprised the following assessments:

- The particle size distribution of eight samples.
- The Atterberg limits of four samples.
- The organic content of four samples.
- The California bearing ratio (CBR) and modified maximum dry density (MMDD) of two samples.

Results of the testing are summarised in Table 3 and the test certificates are presented in Appendix C.

Table 3: Results of Laboratory Testing for Soil Identification

Test Location	Depth (m)	Fines (%)	Sand (%)	Gravel (%)	OC (%)	LL (%)	PL (%)	PI (%)	LS (%)	Material
TP02	2.2	-	-	-	0.9	-	-	-	-	SAND SP-SM
TP05	0.1	-	-	-	25.0	-	-	-	-	TOPSOIL/Organic SAND
TP06	0.55 – 1.05	19	71	10	-	-	-	-	-	Silty SAND SM, trace gravel
TP06	1.7	15	82	3	-	22	14	8	1.5	Clayey Silty SAND SC-SM, trace gravel, low plasticity
TP06	2.2	75	25	0	-	28	24	4	1.5	Clayey SILT ML, with sand, low plasticity
TP07	1.0	15	85	0	10.8	NO	NP	NP	0.5	Organic Silty SAND SM
TP11	0.5	8	92	0	-	-	-	-	-	SAND SP-SM, with silt
TP11	1.8	-	-	-	1.6	-	-	-	-	Silty SAND SM, with organics
TP17	0.5	10	90	0	0.1	-	-	-	-	SAND SP-SM, with silt
TP20	0.3	11	89	0	11.6	NO	NP	NP	0	Organic SAND SP-SM
TP20	0.6	5	95	0	-	-	-	-	-	SAND SP, trace silt

Notes : The % fines is the amount of particles smaller than 75 µm.
The % sand is the amount of particles larger than 75 µm and smaller than 2.36 mm.
The % gravel is the amount of particles larger than 2.36 mm and smaller than 63 mm.
OC – Organic content LL – Liquid Limit PL – Plasticity Limit
PI – Plasticity Index LS – Linear Shrinkage
NO – Not Obtainable NP – Non-Plastic

The CBR tests were undertaken at a target compaction level of 95% of modified maximum dry density. The samples were soaked for 4 days prior to testing under a confining surcharge of 4.5 kg. The results are presented in Table 4 below.

Table 4: Results of Laboratory Testing for Pavement Design Parameters

Test Location	Depth (m)	MMDD (t/m³)	OMC (%)	CBR (%)	Swell (%)	Material
TP06	0.55 – 1.05	1.67	18.5	20	0.0	Silty SAND SM, trace gravel
TP11	0.5	1.59	19.5	20	0.0	SAND SP-SM, with silt

5.2 Acid Sulfate Soil Laboratory Testing

Acid sulfate soil screening tests were undertaken by MPL Laboratories Pty Ltd (MPL) on soil samples retrieved from selected test pits at the site. The screening tests compromised measurement of pH of the soil in water (pH_F) and the pH of the soil after oxidation within a 30%

solution of hydrogen peroxide (pH_{FOX}). The results of these tests provide an indication of the presence of actual or potential acid sulfate soils and should be considered as qualitative only.

Following a review of the screening test results, selected soil samples were submitted to MPL to undergo the chromium suite of testing. This laboratory test quantifies the existing acidity and potential acidity derived from sulfide oxidation which is reported as net acidity. Soil samples were selected for laboratory analysis with due consideration of the following:

- Screening results, with a particular focus on the lowest reported pH_F or pH_{FOX} within a soil stratum at each location;
- Reported reaction strength; and
- Visual identification of the soils encountered.

The acid sulfate soil laboratory results are presented in Table D-1 in Appendix D, together with the laboratory reports and associated chain-of-custody reports.

The laboratory results indicate the following:

- The results of pH_F are not indicative of actual acid sulfate soils conditions at the sampling locations to a maximum depth of 3 m;
- The results of the pH_{FOX} are indicative of potential acid sulfate soils conditions at seven of 12 sampling locations sampling locations and at varying depths. The indications of potential acid sulfate soils conditions are generally located in the eastern portion of the site; and
- The calculated net acidity was reported above the adopted action criterion of 0.03%S for 5 out of 18 samples submitted for chromium suite analysis, including TP01, TP09, TP13, TP16 and TP17. The maximum net acidity was 0.13%S at TP01.

It should be noted that the exceedances of the action criterion are generally attributed to a higher result reported for the titratable actual acidity (TAA) component of net acidity, which is a measure of the soils existing acidity. Given the published acid sulfate soil risk mapping indicates a “high to moderate risk”, it is possible that the elevated TAA is attributed to previous oxidation of acid sulfate soils.

6. Proposed Development

The proposed development comprises a residential subdivision with lots, pavement, retaining walls, underground services and areas of POS. Owing to nature of the site, it is considered likely that the site will be filled to reach design surface levels.

7. Comments

7.1 Site Suitability

The investigation indicates that the site is generally underlain by variable soil conditions which include fill, topsoil, sand coffee rock and clayey materials, as described in Section 4.1 above.

The ground conditions are generally considered suitable for the proposed residential development.

Geotechnical constraints imposed by the ground conditions for the proposed development include:

- Uncontrolled fill such as encountered at TP02 and TP07, likely occurring along the existing pond and open drain, and possibly elsewhere across the site.
- The relatively impermeable nature of the shallow coffee rock and clayey soils, which may require raising site levels and placement of sand fill to assist site drainage.
- Perched groundwater at shallow depths is anticipated and may impact potential excavations and earthworks at the site, depending on the timing of the works.
- Hard excavation conditions should also be expected in areas where coffee rock materials were encountered, as outlined in Section 4.1.
- Earthworks are recommended to take place in the summer months, before the start of the winter rains.

Suitable site preparation should include the removal of the uncontrolled fill and deleterious materials including vegetation and topsoil, and test rolling of the site. A suitable separation between finished surface level and groundwater should be maintained, which is likely to require filling the site with sand fill. There may also be the requirement to implement a sub-soil drainage network.

Overall, from a geotechnical standpoint, the land is physically capable of development provided that the provisions outlined in the subsequent subsections of the report are incorporated in the development plans.

7.2 Site Classification

The shallow ground conditions beneath the site generally comprise medium dense to dense sandy soils overlying coffee rock and clayey materials in some locations. Based on a visual and tactile assessment, combined with laboratory testing, the clayey materials are assessed to be slightly reactive.

The majority of the test locations encountered at least 1.5 m of non-reactive and non-organic soils from surface and can be classified as 'Class A', following suitable site preparation as outlined in Section 7.3. Soils considered non-reactive and non-organic include 'Sand' and 'Silty Sand' classified as 'SP', 'SP-SM', and 'SM' with no organics, in the logs in Appendix B.

Test locations with clayey materials within 1.5 m of surface (such as TP06) are currently classified as 'Class S', in accordance with the Australian Standard (AS 2870, 2011). Examples of soils that are considered reactive include the 'Clayey Sand', 'Çlayey Silty Sand', and 'Clayey Silt' classified as 'SC', 'SC-SM', 'ML' on the logs in this report. Owing to the presence of uncontrolled fill and buried organic layers (e.g. 'Organic Silty Sand' and 'Sand with organics'), test locations TP02 and TP07 should be classified as 'Class P' in current conditions.

It is generally considered that the entire development area could be re-classified as 'Class A' in accordance with the Australian Standard (AS 2870, 2011), following suitable site preparation and filling the site with controlled sand fill to maintain a minimum clearance of at least 1.5 m from the finished surface to any clayey materials (such as soils classified as 'SC', 'SC-SM', 'ML' on the logs). Suitable site preparation is outlined in Section 7.3, and in particular includes the removal of all uncontrolled fill and organic soils, followed by replacement with controlled sand fill.

7.3 Site Preparation

7.3.1 Site Stripping

All vegetation, topsoil and organic sand should be stripped from building envelopes and pavement areas, and either removed from site or stockpiled for possible re-use if applicable (see Section 7.5). Topsoil and organic sand were encountered at the majority of the site to depths of between 0.1 m and 0.45 m. Buried organic soils were also present underlying the fill at TP02 and TP07.

Tree roots remaining from any clearing operations should be completely removed, and the excavations backfilled with material of similar geotechnical properties to the surrounding ground and compacted to achieve a dry density ratio of not less than 95% relative to modified compaction for granular subgrade.

Uncontrolled fill, such as encountered at TP02 to a depth of 0.9 m, and at TP07 to a depth of 1.1 m, and likely occurring elsewhere across the site specifically near the existing pond and open drain, should be stripped from the proposed development areas. It is inferred that the encountered uncontrolled fill mostly results from the historical excavation of the existing pond and associated open drain and thus comprise a mix of excavated shallow topsoil and organics, shallow sand and deeper clayey soils. Based on observations of the test pit conditions, it is anticipated that the granular portions of uncontrolled fill would be suitable for re-use, from a geotechnical standpoint. It is suggested that the granular component of the uncontrolled fill be attempted to be separated from the other soil types during its excavation, with the subsequent objective to assess and re-use this fraction as structural fill with no impact on site classification. However, it should be acknowledged that this approach might not be practical and successful during construction, depending on the condition of the fill. Granular and clayey materials should be stockpiled separately for geotechnical assessment.

Organic soils occurring at the base of the uncontrolled fill (such as encountered at TP02 and TP07) should be removed beneath proposed development areas.

It is recommended that all site works be undertaken under the supervision of an experienced geotechnical engineer. In particular, the geotechnical engineer should assess the results of topsoil stripping and inspect the site to identify areas of uncontrolled fill, prior to placement of any fill.

7.3.2 Test Rolling

Following the site stripping (Section 7.3.1), it is recommended that the exposed ground be test rolled with a heavy smooth drum roller (say minimum 14 tonne deadweight) in vibrating mode. Care should be taken not to operate heavy vibrating plant immediately adjacent to existing buildings and services. Areas in proximity to adjacent structures or services should be rolled in static mode.

Any areas that show signs of excessive deformation during compaction should be compacted until deformation ceases or, alternatively, the poor-quality material should be excavated and replaced with suitable structural fill and compacted to achieve a dry density ratio of not less than 95% relative to modified compaction for granular subgrade.

Following test rolling to confirm suitable foundation material, the site should be assessed by Douglas.

7.3.3 Imported Filling

If required, imported filling should comprise free draining, cohesionless, well graded sand that:

- contains less than 5% by weight of particles less than 75 microns in size.
- contains no particles greater than 150 mm in size.
- is free of organic and other deleterious materials.
- has a permeability of no less than 5 m/day on a sample compacted to 95% MMDD.

It is recommended that test certificates are reviewed and approved by Douglas prior to importing material to site.

Other materials could be considered, provided they are granular and non-reactive, and following review by Douglas.

7.3.4 Fill Placement

Fill should be placed in a controlled manner as outlined in the Guidelines on Earthworks for Commercial and Residential Development (AS 3798, 2007), in near horizontal layers of uniform thickness.

The thickness of each layer should be appropriate for the type of compaction equipment utilised, although typically should not exceed 400 mm loose thickness for granular materials. Each layer should be compacted near optimum moisture content (+/- 2%) to achieve a dry density ratio of not less than 95% relative to modified maximum dry density.

7.3.5 Compaction Testing

Compaction control of the sand fill could be carried out using a Perth sand penetrometer (PSP) test in accordance with the Australian Standard test method (AS 1289.6.3.3, 1997). All areas within the proposed building and pavement envelopes should be compacted to achieve a minimum blow count of 8 blows per 300 mm penetration to a depth of not less than 1.0 m below foundation or subgrade level.

During construction, some loosening of the surface sands in foundation excavations is expected. Therefore, the top 300 mm in the base of any excavation should be re-compacted using a vibratory plate compactor prior to construction of any footings.

7.4 Excavations

7.4.1 Excavation Conditions

The encountered ground conditions generally comprise medium dense natural sand overlying coffee rock, encountered from depths between 0.9 m and 1.7 m, and clayey materials encountered from 1.45 m to 2.6 m depth.

Conventional earthmoving equipment (such as excavators) should be suitable for excavations across the majority of the site within the granular soils or stiff clayey materials. Excavations in coffee rock may require powerful excavators (say 20 t) possibly equipped with ripping tynes or rock breaker attachments for limited excavations or ripping with dozers (say D9 and heavier) for large excavations, with associated low excavation rates.

7.4.2 Safe Batter Slopes

It is recommended that temporary batter slopes in sand are maintained flatter than 1.5:1 (H:V) if not retained, to a maximum depth of 2 m. Long term batter slopes in sand should be maintained flatter than 2:1 (H:V) if not retained, to a maximum depth of 2 m. These batter angles are valid provided no surcharge loads (including live loads such as vehicles and machinery) apply at the top of the slope. Any excavation that is adjacent to existing buildings or below the level of existing footings should be supported, or the footings underpinned.

It is also emphasised that the abovementioned angles are not applicable if water emanates from the excavation slopes. In such conditions, there is potential for instability no matter how flat the batter angle. If loads are applied at the top of the batter (for example, excavated soil or equipment), or if there is any groundwater influence, then a site-specific assessment of stability should be undertaken.

7.5 Geotechnical Suitability for Re-Use of In Situ Materials

7.5.1 Topsoil and Organic Soils

Topsoil and organic soils were encountered across the site to depths between 0.1 m and 0.45 m, and underlying the uncontrolled fill (e.g. TP02 and TP07).

Owing to the high organic content of the topsoil material and other organic soils, it is generally considered that these materials are unsuitable for re-use as structural fill. It is recommended that following stripping, the topsoil and other organic soils are either stockpiled for re-use in non-structural applications such as landscaping or disposed of off-site.

7.5.2 Uncontrolled Fill

The uncontrolled fill encountered at TP02 and TP07 appears to be variable. Any uncontrolled fill should be stockpiled prior to re-use for geotechnical assessment. Granular and clayey materials should be stockpiled separately, where possible, as discussed in Section 7.3.1.

Generally, any uncontrolled fill that comprises sand and should be geotechnically suitable for re-use, provided it is free from organic matter and particles greater than 150 mm in size. Depending on the possible presence of oversized particles, screening or raking of the fill may be required. Clayey materials may be re-used, noting some limitations to their re-use, as discussed in Section 7.5.5.

7.5.3 Natural Sand

The encountered natural sand is considered geotechnically suitable for reuse as structural fill material provided it is free from organic matter and particles greater than 150 mm in size. It is

recommended that a geotechnical engineer inspects cut to fill operations, to confirm the suitability of the materials being utilised.

Sand with silt (noted as SP-SM on the attached logs) will have a lower soil permeability compared to clean sand. Therefore, some consideration should be given to possible adverse implications on site drainage, if sand with silt (SP-SM) is re-used as shallow fill.

7.5.4 Coffee Rock

Excavated coffee rock is likely suitable to be re-used as deep fill following suitable crushing and blending with clean sand. It is suggested that owing to the marginal organic content of the coffee rock, that once excavated and crushed (no particles greater than 150 mm), the excavated coffee rock should be blended with clean sand at a ratio of 1:1, prior to re-use as deep fill. Blending with clean sand will also aid in the compaction of the crushed coffee rock material. Owing to the likely high fines of the blended coffee rock material, it is likely that this material will be of relatively low soil permeability. Implications on site drainage should be considered prior to its re-use.

7.5.5 Clayey Materials

Clayey materials could be re-used as fill however their reactivity and lower permeability will impact site classification and site drainage. Difficulties in handling and compacting clayey soils should also be considered, prior to their re-use. Earthworks plans and construction methodology should be assessed by a geotechnical engineer prior to any re-use of clayey materials as structural fill.

7.6 Soil Retention

The design of flexible or rigid walls should be undertaken using a triangular pressure distribution and the earth pressure parameters given in Table 5. In addition to the soil pressure, wall design should also allow for external loads such as buildings, live loads, hydrostatic pressure or construction activities.

Table 5: Soil Parameters for Retaining Wall Design

Soil Type	Soil Unit Weight Above Water γ (kN/m^3)	Drained Angle of Friction Φ' (Degrees)	Undrained Shear Strength C_U (kPa)	Coefficient of Earth Pressure – Active K_a	Coefficient of Earth Pressure – at Rest K_0	Coefficient of Earth Pressure – Passive K_p
Compacted Fill or Natural Sand (Medium dense)	20	32	0	0.31	0.47	3.2

Clayey materials – stiff and stronger	20	-	75	0.3	0.5	2

Safe batter slopes were discussed in Section 7.4.2.

7.7 Pavement Design Parameters

Based on field observations, laboratory testing and Douglas' experience a subgrade California bearing ratio (CBR) of 10% is recommended for pavement design for subgrades in the natural sand at this site, provided the subgrade is compacted to not less than 95% of modified maximum dry density to a depth of at least 0.5 m below subgrade level.

7.8 Stormwater Drainage and Permeability

Results of the permeability testing in Section 4.3 indicate a field permeability value of between 1.5 m/day and in excess of 20 m/day for the shallow sand encountered beneath the site.

The lower infiltration at location TP10 is likely influenced by a shallow clearance to groundwater at this location (groundwater encountered at a depth of 0.8 m at TP10).

The relatively shallow groundwater across the site would generally preclude the use of soakwells and sumps for stormwater disposal. However, soakwells could be considered if a suitable thickness of free-draining sand fill is placed across the site to increase the clearance to groundwater or any low permeability layers/impermeable layers, such as coffee rock or clayey materials. A minimum clearance of 0.5 m is recommended between the base of soakwells and groundwater or impermeable layers such as coffee rock or clayey materials. It should be noted that groundwater levels are transient and can be higher during the winter periods.

The infiltration capability commonly reduces over time due to silt build up at the base of soakwells and therefore the soakwells must be cleaned and maintained on a regular basis. Soakwells should preferably be positioned at a distance from all buildings, retaining walls and boundaries by not less than 2 m.

7.9 Acid Sulfate Soils

Based upon the results of the preliminary investigation, Douglas concludes that acid sulfate soils are present beneath the site to depths of at least 3 m. As such, a works-specific acid sulfate soil management will be required to manage potential environmental impacts associated with future ground disturbing activities (including dewatering).

In this regard, Douglas recommends that following completion of detailed design (i.e. when excavation depths and alignments are known), detailed acid sulfate soil and groundwater investigations, targeting proposed excavations, be undertaken. The investigations should be undertaken with reference to DWER endorsed guidelines and aim to determine the extent and severity of acid sulfate soils within the proposed areas of disturbance.

7.10 **Additional Geotechnical Investigation**

Additional geotechnical investigation should be undertaken prior to detailed design. An increased frequency of test pits should be undertaken across the site, as well as well as additional permeability tests across the site and at any critical drainage locations. In particular, additional test pits should be undertaken to assess the extent of the uncontrolled fill.

8. References

AS 1289.5.2.1. (2017). *Methods of testing soils for engineering purposes - Soil compaction and density tests - Determination of the density/moisture content relation of a soil using modified compactive effort.* Standards Australia.

AS 1289.6.3.3. (1997). *Methods for testing soils for engineering purposes - Soil strength and consolidation tests - Determination of the penetration resistance of a soil - Perth sand penetrometer test.* Reconfimed 2013: Standards Australia.

AS 1726. (2017). *Geotechnical Site Investigations.* Standards Australia.

AS 2870. (2011). *Residential Slabs and Footings.* Standards Australia.

AS 3798. (2007). *Guidelines on Earthworks for Commercial and Residential Developments.* Standards Australia.

Hvorslev, M. J. (1951). *Time lag and soil permeability in groundwater observations.* US Army Corps of Engineers Waterways Experiment Observation Station, Bulletin 36, Vicksburg, Mississippi.

9. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Lot 39 Elizabeth Street, Bayonet Head, WA in line with Douglas' proposal dated 3 February 2026 and acceptance received from Naomi Lawrance of DevelopmentWA dated 4 February 2026. The work was carried out under DevelopmentWA's Engineering Consultancy Services Panel Contract # 2023/01. This report is provided for the exclusive use of DevelopmentWA for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope of work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

Appendix A

About this Report

Terminology, Symbols and Abbreviations

Soil Descriptions

Sampling, Testing and Excavation Methodology

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Engagement Terms for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, Douglas will be pleased to assist with investigations or advice to resolve the matter.

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style XW. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:

The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

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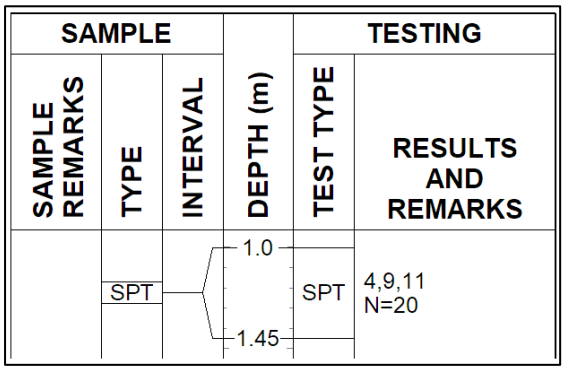
Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Driven Tube sample	DT
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U[1]
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =*x* blows for *y* mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP9/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150
Dynamic probe super heavy, followed by blow count penetration increment in mm	DPSH/100

Groundwater Observations

	water seepage/inflow
	water seepage/outflow
	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Air Track	AT
Diatube	DT[1]
Hand auger	HA[1]
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA[1]
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT[1]
Ripping tyne/ripper	R
Rock roller	RR[1]
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON[1]
Mud/blade bucket	MB[1]
Toothed bucket	TB[1]
Vibrocore	VC[1]
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB[1]

[1] – numeric suffixes indicate tool diameter/width in mm

Appendix B

Drawing 1 – Test Location Plan

Test Pit Logs

NOTE:
Test locations are approximate only and were located using differential GPS.

Douglas PARTNERS	TITLE: **Test Location Plan** **Proposed Residential Development** **Lot 39 Elizabeth Street, Bayonet Head, WA**			OFFICE: Perth DRAWN BY: GG DATE: 27.March.2026
CLIENT: DevelopmentWA	PROJECT No: 240409.00	DRAWING No: 1	REVISION: 0	SCALE: 1:1400 @A3

DP.QGIS.A3PortraitDrawingLayout.Rev2 -P:\240409.00 - BAYONET HEAD, Lot 39 Elizabeth Street\1.0 Project Management\1.1 Proposal\QGIS\240409.00.qgz

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.1 AHD
COORDINATE: E:585278.6, N:6130852.3
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP01
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Groundwater observed at 1.4 m depth 13/02/26	11 / 0.20	TOPSOIL / organic SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS TS TS T	TOP				D		0.10	PSP/150	5 10 15
	10 / 1	SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD	M		ASS/B		0.50		
	1.50	Silty SAND (SM): dark grey-brown; fine to medium; moderately to strongly cemented, "Coffee Rock".	× × × × ×	AEO	(MD)			ASS		1.00		
	9 / 2	Test Pit discontinued at 2.00m depth. (Hard digging / Collapsing conditions).			(D) to (VD)			ASS		1.50		
	8 / 3									2.00		

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater observed at 1.4 m depth

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log with Photo

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 8.9 AHD
COORDINATE: E:585395.3, N:6130837.0
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP02
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
	8	0	FILL / SAND (SP-SM) with silt trace gravel: grey-brown, brown and grey; fine to medium; trace pockets of Clayey SAND SC.		FILL	D VD						PSP/150	5 10 15 Refusal 30
		1									1		
		1.10											
		1.20	SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium; with organics.		AEO	(MD)							
	7		SAND (SP) trace silt: pale grey; fine to medium.		AEO	D to VD	M					PSP/150	5 10 15 Refusal 30
		2									2		
		2.10	SAND (SP-SM) with silt: dark grey; fine to medium.		AEO				D		2.20		
▼ 13/02/26		2.60	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay. From 2.90m: - becoming dark grey		ALV	(F) to (St)	w=PL		D		2.70		
Groundwater seepage at 2.5 m depth	6	3	Test Pit discontinued at 3.00m depth. (Target depth).										
	5												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.5 m depth

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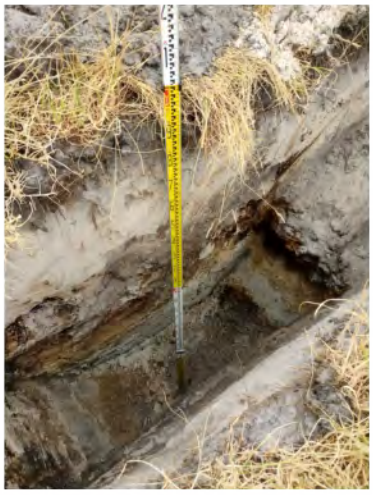
TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 9.3 AHD
COORDINATE: E:585457.1, N:6130858.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP03
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	9 / 0.10	TOPSOIL / SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS	TOP								
		SAND (SP) trace silt: grey; fine to medium. From 0.20m: - becoming pale grey		AEO	MD			ASS		0.50	PSP/150	5 10 15
	0.90 / 1 / 8	Silty SAND (SM): dark brown; fine to medium; moderately cemented, "Coffee Rock". From 1.30m: - becoming yellow-brown, weakly to moderately cemented		AEO	MD to D	M		ASS		1.00		
								ASS		1.50		
	2 / 7							ASS		2.00		
	2.30	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay.		ALV	F to St	w=PL		ASS/D		2.50	PP	100-150kPa
	3 / 6	Test Pit discontinued at 3.00m depth. (Target depth).						ASS		3.00		



NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log with Photo

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.6 AHD
COORDINATE: E:585250.9, N:6130797.7
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP04
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.10	TOPSOIL / SAND (SP) trace rootlets trace silt: grey-brown; fine to medium.	TS	TOP								
		SAND (SP) trace silt: grey; fine to medium. From 0.50m: - becoming pale brown		AEO	MD						PSP/150	5 10 15
	1.00	Silty SAND (SM): dark grey-brown; fine to medium; moderately to strongly cemented, hard digging at the western portion of the pit, "Coffee Rock".		AEO	(D) to (VD)	M				1		
▼ 13/02/26 Groundwater seepage at 2.0 m depth	2	1.90m: - becoming brown, SAND SP-SM at the eastern portion of the pit								2		
		Test Pit discontinued at 2.60m depth. (Very slow digging).										
	3											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.0 m depth

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log with Photo

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 9.5 AHD
COORDINATE: E:585342.3, N:6130809.1
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP05
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.20	TOPSOIL / organic SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS TS TS T	TOP				D		0.10		
	0.35	SAND (SP-SM) with silt: dark brown and brown; fine to medium.		AEO								
		SAND (SP) trace silt: grey; fine to medium.		AEO	D	M		ASS		0.50		
	1							ASS		1.00		
	1.50	SAND (SP-SM) with silt: dark brown and dark brown; fine to medium.		AEO	(D)			ASS		1.50		
Groundwater seepage at 1.9 m depth 13/02/26	2							ASS		2.00		
	2.20	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay.		ALV	St to VSt	w=PL		ASS/D		2.50	PP	150-200kPa
	3	Test Pit discontinued at 3.00m depth. (Target depth).						ASS		3.00		

PSP/150: 5, 10, 15

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG

METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.9 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.9 AHD
COORDINATE: E:585438.8, N:6130810.3
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP06
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	0.20	TOPSOIL / organic SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS	TOP	MD			ASS		0.50		
	0.40	SAND (SP-SM) with silt: dark grey-brown; fine to medium; with organics.		AEO						0.55		
	0.55	SAND (SP) trace silt: grey; fine to medium.		AEO	D	M		B				
	1.05	Silty SAND (SM) trace gravel: brown; fine to medium. 0.75m-0.90m: - becoming weakly to moderately cemented, "Coffee Rock"		AEO				ASS		1.00 1.05		
	1.45	SAND (SP) trace silt: pale grey; fine to medium.		AEO	D			ASS		1.50		
	2.00	Clayey Silty SAND (SC-SM) trace gravel: green-grey; fine to medium; low plasticity clay; low plasticity silt.		ALV	St to VSt	w=PL		D		1.70		
	3	Clayey SILT (ML) with sand: green-grey; low plasticity.		ALV	F to St			ASS		2.00	PP	200-250kPa
		Test Pit discontinued at 3.00m depth. (Target depth).						D		2.20		
								ASS		2.50		
								D		2.70	PP	200kPa
								ASS		3.00	PP	100-150kPa

PSP/150

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.2 AHD
COORDINATE: E:585499.6, N:6130817.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP07
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
	7	0.30	FILL / Gravelly SAND (SP-SM) with silt: grey-brown; fine to medium; fine to coarse gravel.		FILL	VD	D to M					PSP/150	5 10 15 30
		0.50	FILL / Clayey SAND (SC) trace gravel: orange-brown; fine to medium; low to medium plasticity clay.		FILL								
			FILL / SAND (SP-SM) with silt: grey-brown and grey; fine to medium.		FILL				D		0.70		
		0.90											
		1	Organic Silty SAND (SM) trace rootlets: dark grey-brown; fine to medium; low plasticity silt.		ALV	F	w=PL		D		1.00	PSP/150	5 10 15
	6	1.20	SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD to VD	M						Refusal 30
Groundwater seepage at 2.8 m depth 13/02/26	5	2				(D) to (VD)					2		
		2.60	SAND (SP-SM) with silt: dark grey and dark brown; fine to medium.		AEO		W						
	4	3	Test Pit discontinued at 3.00m depth. (Target depth).										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.8 m depth

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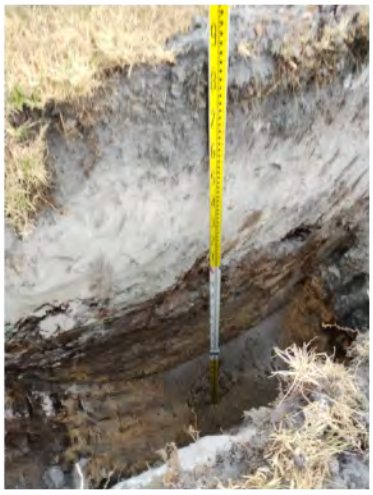
TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 12.3 AHD
COORDINATE: E:585249.9, N:6130734.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP08
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	12 / 0.20	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS TS TS T	TOP								
		SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD			B		0.50	PSP/150	5 10 15
	11 / 1.00	Silty SAND (SM): dark brown; fine to medium; moderately cemented, "Coffee Rock".				M				1		
		From 2.20m: - becoming yellow-brown, weakly to moderately cemented		AEO	(MD) to (D)					2		
	10 / 2	From 2.50m: - trace clay						D		2.70		
	9 / 3	Test Pit discontinued at 3.00m depth. (Target depth).										



NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 10.6 AHD
COORDINATE: E:585313.0, N:6130749.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP09
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/25 No free groundwater observed	0.20	TOPSOIL / SAND (SP-SM) with silt: grey-brown; fine to medium.	TS	TOP	MD	M		D		0.10	PSP/150	5 10 15
		SAND (SP) trace silt: pale grey; fine to medium.		AEO				ASS		0.50		
	1							ASS		1.00		
	1.50	Silty SAND (SM): dark brown; fine to medium; moderately to strongly cemented, "Coffee Rock".		AEO	(MD) (VD)			ASS		1.50		
		Test Pit discontinued at 1.80m depth. (Hard digging, refusal on "Coffee Rock") .						ASS		1.80		
	2											
	3											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log with Photo

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.5 AHD
COORDINATE: E:585486.6, N:6130721.7
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP10
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Groundwater seepage at 0.8 m depth 16/02/26	0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS	TOP	D	M		ASS/B		0.50	PSP/150	5 10 15
	0.40	Organic Silty SAND (SM): dark grey-brown; fine to medium; low plasticity silt.		AEO								
		SAND (SP) trace silt: grey and pale grey; fine to medium.										
	1	From 0.90m: - becoming pale brown		AEO		M to W		ASS		1.00		
					(D)			ASS		1.50		
	2.00	SAND (SP-SM) with silt: dark grey; fine to medium; weakly cemented.		AEO				ASS		2.00		
								ASS		2.50		
		Test Pit discontinued at 2.70m depth. (Collapsing conditions).						ASS		2.70		
	3											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 0.8 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 8.4 AHD
COORDINATE: E:585394.9, N:6130738.1
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP11
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
	8	0.15	TOPSOIL / SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS	TOP	D	M		ASS		0.50		
			SAND (SP-SM) with silt: grey; fine to medium.		AEO	MD			ASS		1.00		
	7	1				MD to D			ASS		1.50		
▼ 13/02/26		1.60	Silty SAND (SM): dark brown; fine to medium; weakly to moderately cemented, with organics, "Coffee Rock".		AEO		M to W		D		1.80		
Groundwater seepage at 1.65 m depth		2.00	SAND (SP-SM) with silt: dark brown and brown; fine to medium.		AEO				ASS		2.00		
	6	2.30	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay.		ALV	St to VSt	w=PL		ASS/D		2.50	PP	150-200kPa
						F to St	w<PL						
	5	3	Test Pit discontinued at 3.00m depth. (Target depth).						ASS		3.00	PP	50-100kPa

PSP/150: 5, 10, 15

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.65 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.2 AHD
COORDINATE: E:585296.8, N:6130679.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP12
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	11 / 0.20	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS TS TS T	TOP								
		SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD			D		1.00	PSP/150	5 10 15
	10 / 1.10	Silty SAND (SM): dark brown and brown; fine to medium; moderately to strongly cemented, "Coffee Rock"; strongly cemented, hard digging cemented Silty SAND observed at the southern portion of the pit.		AEO	MD to VD	M				2		
	9 / 2	From 2.20m: - becoming pale yellow-brown, weakly to moderately cemented										
	2.50	Clayey Silty SAND (SC-SM): grey; fine to medium; low to medium plasticity clay; low to medium plasticity silt.		ALV	F to St	w=PL		D		2.70	PP	100kPa
	3 / 8	Test Pit discontinued at 3.00m depth. (Target depth).										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 9.2 AHD
COORDINATE: E:585366.4, N:6130663.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP13
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.15	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS	TOP				D		0.10		
		SAND (SP) trace silt: grey; fine to medium. From 0.35m: - becoming pale grey		AEO	MD	M		ASS		0.50	PSP/150	5 10 15
	1							ASS		1.00		
Groundwater seepage at 1.7 m depth 13/02/26	1.70	SAND (SP-SM) with silt: dark grey-brown; fine to medium; weakly cemented.		AEO	(MD)			ASS		1.50		
	2				(MD) to (D)	M to W		ASS/D		2.00		
		Test Pit discontinued at 2.50m depth. (Collapsing conditions).						ASS		2.50		
	3											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.7 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.2 AHD
COORDINATE: E:585475.7, N:6130668.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP14
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.15	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS TS T	TOP								
	0.45	SAND (SP-SM) with silt: dark grey-brown; fine to medium; with organics.		AEO								
		SAND (SP) trace silt: pale grey; fine to medium.			D	M					PSP/150	5 10 15
	1	From 1.30m: - becoming grey		AEO	(D)	M to W		D		1 2.00		
Groundwater seepage at 1.6 m depth 13/02/26	2.30	SAND (SP-SM) with silt: dark grey; fine to medium.		AEO								
		Test Pit discontinued at 2.50m depth. (Collapsing conditions).										
	3											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.6 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.0 AHD
COORDINATE: E:585283.9, N:6130624.0
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP15
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.10	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS	TOP								
		SAND (SP) trace silt: grey; fine to medium.										
		From 0.25m: - becoming pale grey			MD			ASS/B		0.50	PSP/150	5 10 15
	1					M		ASS/D		1.00		
				AEO								
								ASS		1.50		
					(MD)							
	2							ASS		2.00		
▼ 13/02/26 Groundwater encountered at 2.3 m depth						M to W						
						W						
								ASS/D		2.50		
		Test Pit discontinued at 2.50m depth. (Collapsing conditions).										
	3											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater encountered at 2.3 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 8.6 AHD
COORDINATE: E:585372.6, N:6130594.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP16
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS TS TS T	TOP				D		0.10		
		SAND (SP) trace silt: grey; fine to medium.			D			ASS		0.50	PSP/150	5 10 15
	1	From 1.20m: - becoming pale grey		AEO		M		ASS/D		1.00		
					(D)			ASS		1.50		
▼ 13/02/26 Groundwater seepage at 2.1 m depth	2							ASS		2.00		
	2.40	SAND (SP-SM) with silt: grey and dark grey; fine to medium.		AEO		M to W		ASS		2.50		
		Test Pit discontinued at 2.70m depth. (Collapsing conditions).						ASS		2.70		
	3											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.1 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.4 AHD
COORDINATE: E:585422.7, N:6130632.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP17
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Groundwater seepage at 1.0 m depth 13/02/26	7 6 5 4	0.15 0.30 1 2 2.50 3	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt. Organic Silty SAND (SM): dark grey-brown; fine to medium; low plasticity silt. SAND (SP-SM) with silt: grey; fine to medium. From 0.50m: - becoming pale grey From 1.00m: - becoming dark grey and brown, weakly cemented Silty SAND (SM): brown; fine to medium; weakly to moderately cemented, "Coffee Rock". Test Pit discontinued at 2.80m depth. (Collapsing conditions).	TS T	TOP AEO AEO AEO	MD D (MD) to (D)	M M to W		ASS/B ASS ASS/D ASS ASS ASS		0.50 1.00 1.50 2.00 2.50 2.80	PSP/150	5 10 15

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG

METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.0 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.6 AHD
COORDINATE: E:585501.0, N:6130619.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP18
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS TS TS	TOP								
		SAND (SP) trace silt: grey; fine to medium. From 0.30m: - becoming pale grey		AEO	D	M		D		1.00	PSP/150	5 10 15
▼ 13/02/26 Groundwater seepage at 1.4 m depth	1.40	SAND (SP-SM) with silt: dark brown and dark grey-brown; fine to medium; trace pockets of pale brown SAND SP. From 2.30m: - trace pockets of weakly to moderately cemented cemented Silty SAND SM		AEO	(D)	M to W		D		2.50		
		Test Pit discontinued at 2.70m depth. (Collapsing conditions).										

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.4 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.2 AHD
COORDINATE: E:585432.0, N:6130559.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP19
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
undwater seepage at 1.6 m depth 13/02/26	7.2 / 0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS	TOP	MD			D		0.10	PSP/150	5 10 15
	6.2 / 1	SAND (SP) trace silt: pale grey; fine to medium.		AEO	D	M				1		
	5 / 2				(MD) to (D)	M to W				2		
	4 / 3	Test Pit discontinued at 2.50m depth. (Collapsing conditions).										

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. undwater seepage at 1.6 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.5 AHD
COORDINATE: E:585503.0, N:6130568.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP20
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS	TOP				D		0.30	PSP/150	5 10 15
	0.45	Organic SAND (SP-SM) with silt: dark grey-brown; fine to medium.		AEO	D			ASS		0.50		
		SAND (SP) trace silt: pale grey; fine to medium.						D		0.60		
	1					M		ASS		1.00		
				AEO				ASS		1.50		
Groundwater seepage at 2.2 m depth 13/02/26	2				(D)			ASS		2.00		
						M to W		ASS		2.50		
		Test Pit discontinued at 2.70m depth. (Collapsing conditions).						ASS		2.70		
	3											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.2 m depth

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Appendix C

Geotechnical Laboratory Test Results

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - ASTM D2974-20 (Test Method A)

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3387-3396_1_ORG
Project:	Proposed Residential Development	*Sample No.*	WG26.3387-3396
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	Various - see below	*Date Tested:*	4/03/2026

TEST RESULTS - Organic Content

Sampling Method: Sampled by Client, Tested as Received

Testing Completed By: WGLS - LC

Furnace Temperature (°C): 434

Sample Number	Sample Identification	Ash Content (%)	Organic Content (%)
WG26.3387	TP02 (2.2m)	99.1	0.9
WG26.3388	TP05 (0.1m)	75.0	25.0
WG26.3392	TP07 (1.0m)	89.2	10.8
WG26.3394	TP11 (1.8m)	98.4	1.6
WG26.3395	TP17 (0.5m)	99.9	0.1
WG26.3396	TP20 (0.3m)	88.4	11.6

Comments:

Approved Signatory: M Colley

Name: Mia Colley

Date: 06/March/2026

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

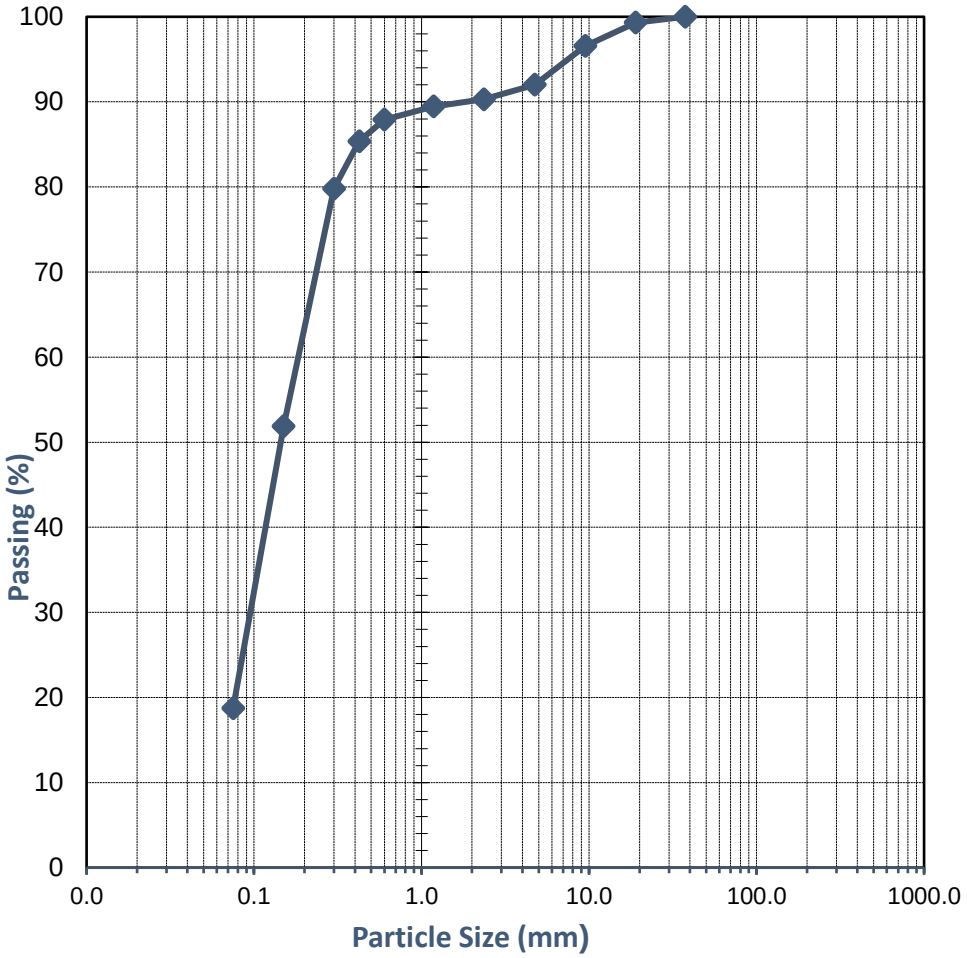
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3389_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3389
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (0.55-1.05m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	99
9.5	97
4.75	92
2.36	90
1.18	89
0.600	88
0.425	85
0.300	80
0.150	52
0.075	19



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 06/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

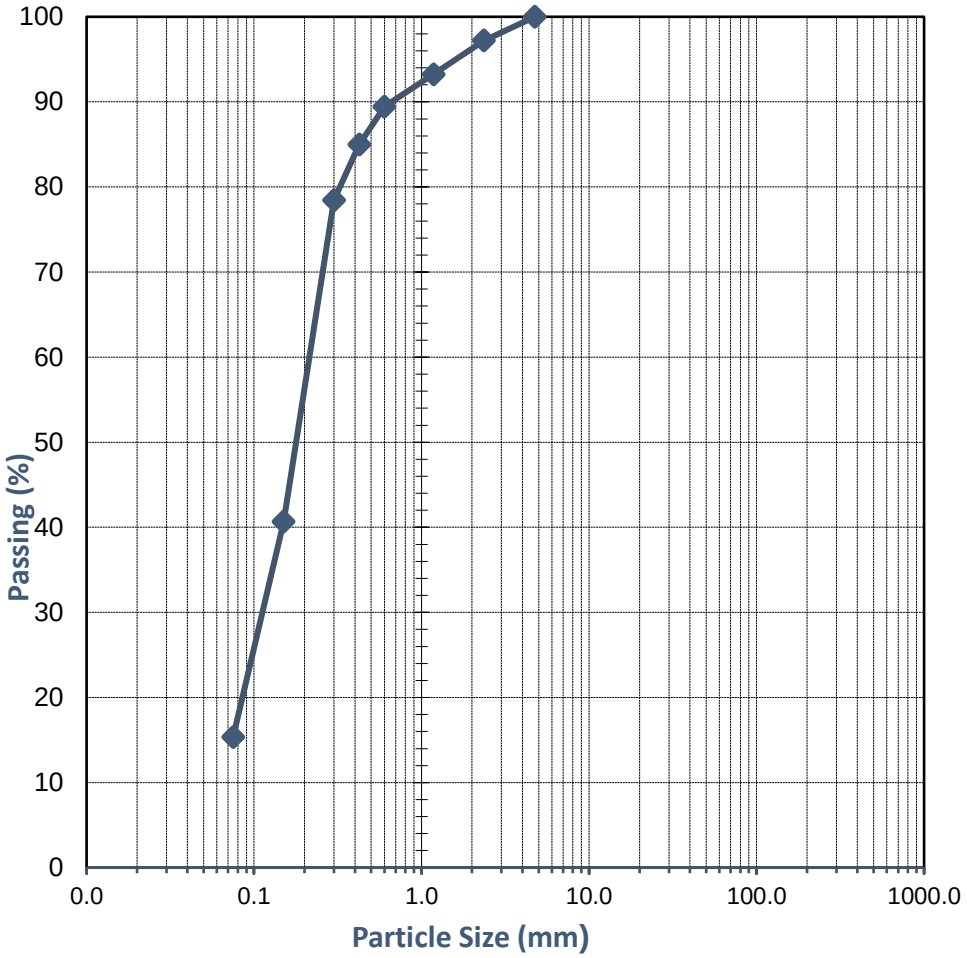
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3390_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3390
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (1.7m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	97
1.18	93
0.600	89
0.425	85
0.300	78
0.150	41
0.075	15



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 06/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3390_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3390
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (1.7m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**22**
AS 1289.3.2.1	**Plastic Limit (%)**	**14**
AS 1289.3.3.1	**Plasticity Index (%)**	**8**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**1.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3389_1_MMDD
Project:	Proposed Residential Development	*Sample No.*	WG26.3389
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (0.55-1.05m)	*Date Tested:*	4/03/2026

TEST RESULTS - Modified Maximum Dry Density

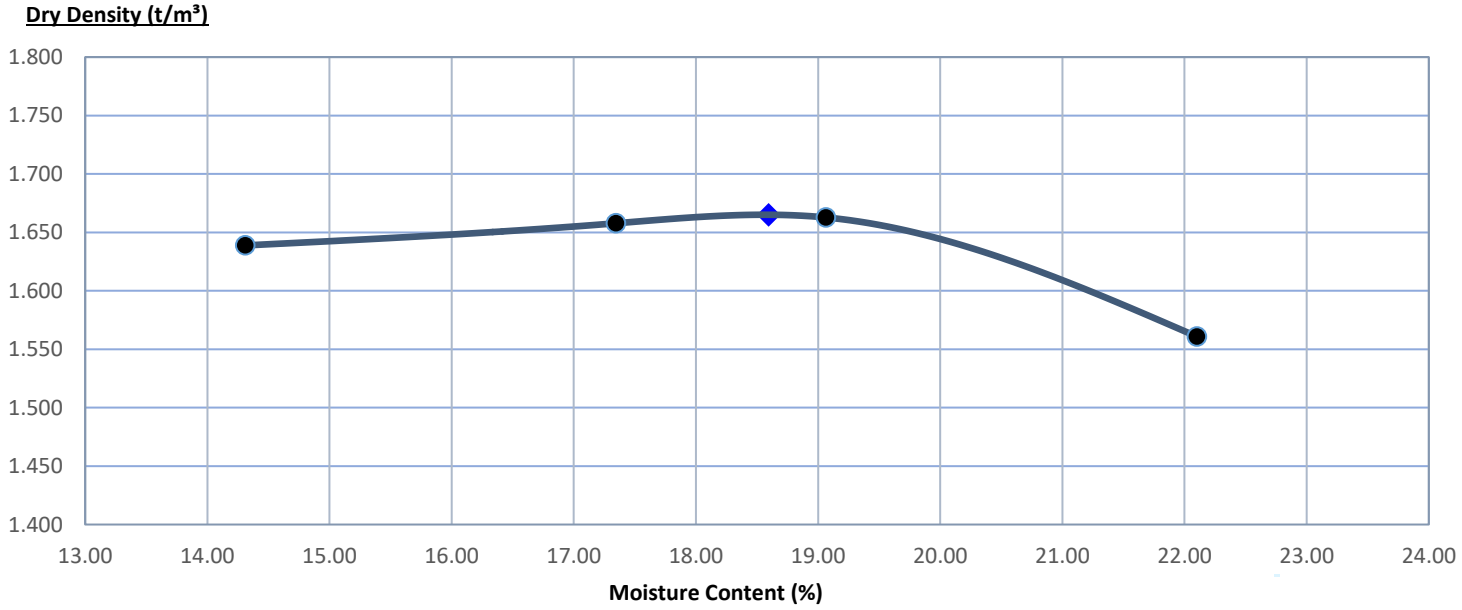
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): >2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 1 **Material + 37.5mm (%)** -

Moisture Content (%)	14.3	17.3	19.1	22.1	
Dry Density (t/m³)	1.639	1.658	1.663	1.561	



Modified Maximum Dry Density (t/m³) **1.67**

Optimum Moisture Content (%) **18.5**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 05/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

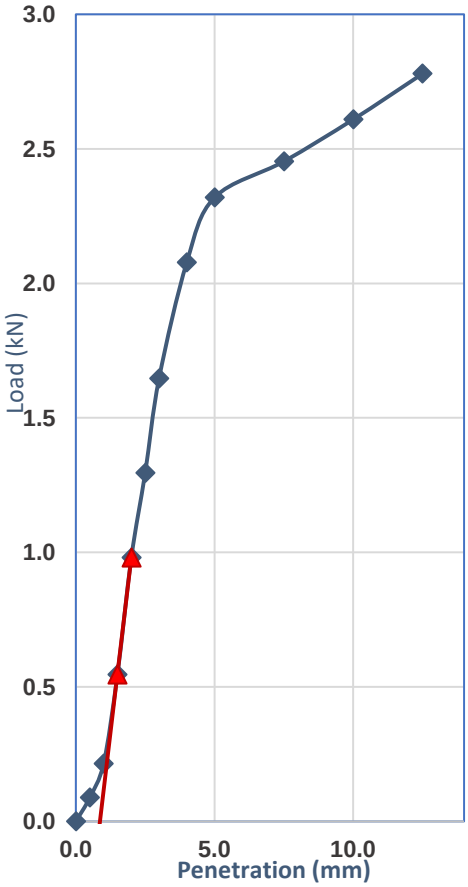
Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3389_1_SCBR
Project:	Proposed Residential Development	*Sample No.*	WG26.3389
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (0.55-1.05m)	*Date Tested:*	4/03 - 10/03/26

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Silty Sand trace Gravel

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>24
% Retained 19.0mm	1	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.67	Optimum Moisture (%)	18.5
Target Dry Density Ratio (%)	95	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.58	Moisture Content (%)	18.9
Density Ratio (%)	94.5	Moisture Ratio (%)	101.5

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.57	Dry Density Ratio (%)	94.5
Moisture Content (%)	22.4	Moisture Ratio (%)	120.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	21.1	Remaining Depth (%)	21.7

Correction applied to Penetration: 0.9mm

Determined at a Penetration of: 2.5mm

California Bearing Ratio (CBR): 14%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 11/March/2026

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3391_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3391
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (2.2m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**28**
AS 1289.3.2.1	**Plastic Limit (%)**	**24**
AS 1289.3.3.1	**Plasticity Index (%)**	**4**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**1.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 11/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

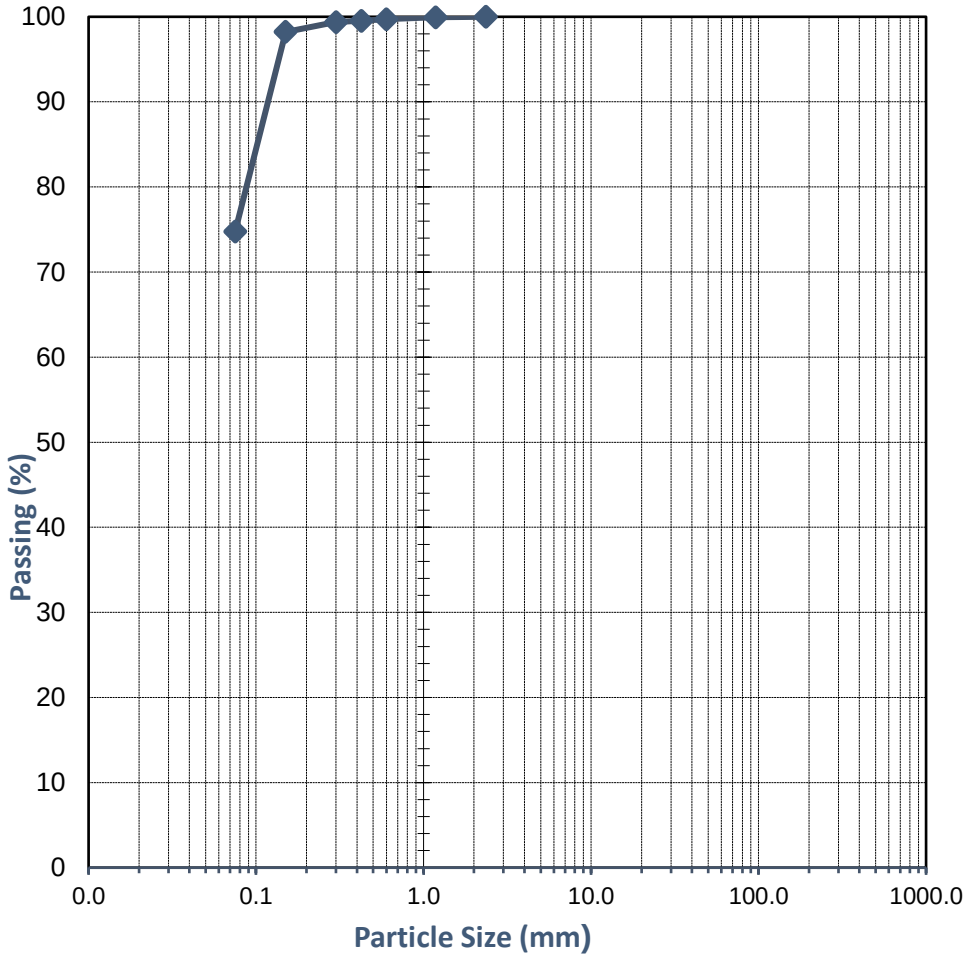
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3391_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3391
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (2.2m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	100
0.425	100
0.300	99
0.150	98
0.075	75



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

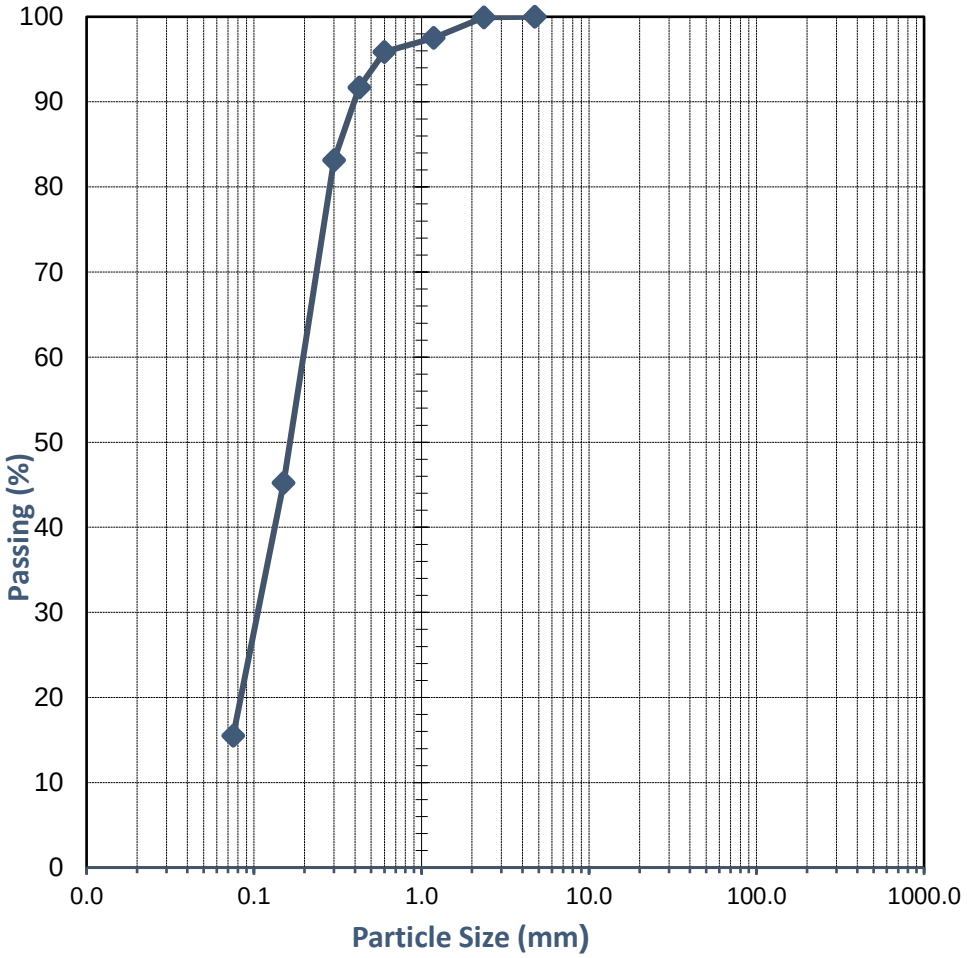
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3392_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3392
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (1.0m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	96
0.425	92
0.300	83
0.150	45
0.075	15



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 06/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3392_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3392
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (1.0m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 11/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

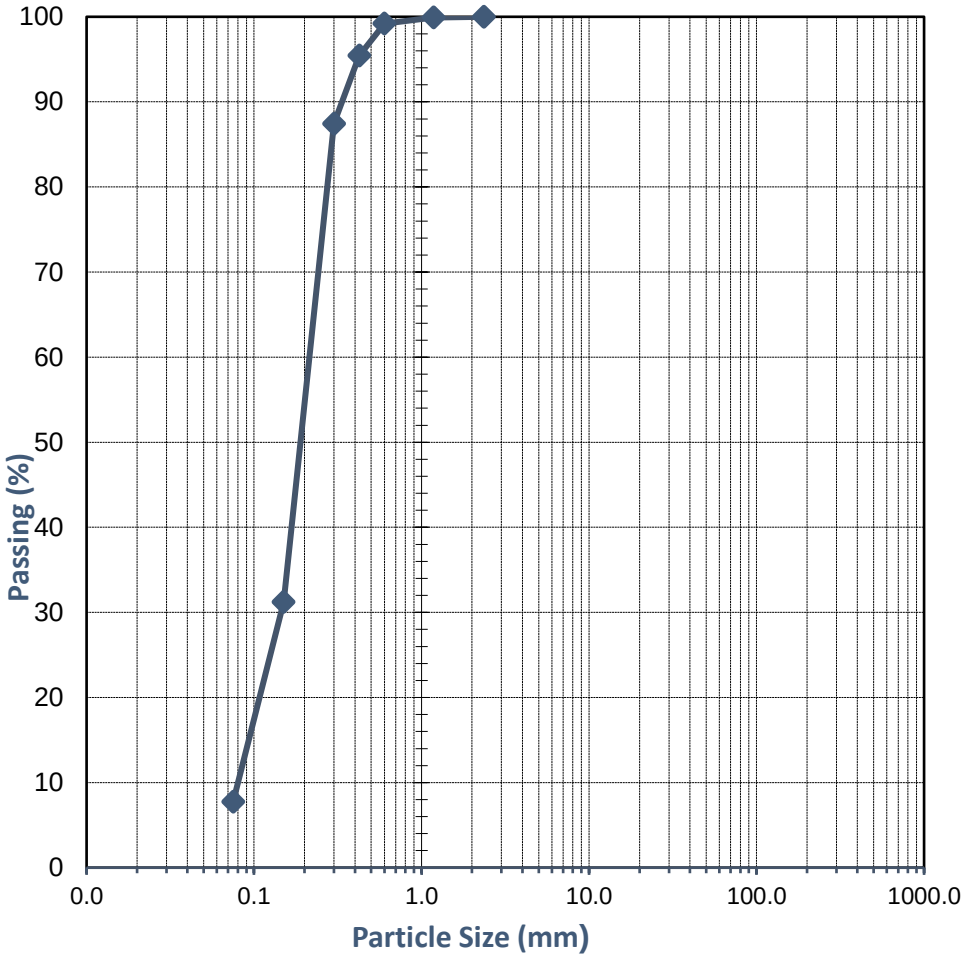
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3393_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3393
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (0.5m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	95
0.300	87
0.150	31
0.075	8



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3393_1_MMDD
Project:	Proposed Residential Development	*Sample No.*	WG26.3393
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (0.5m)	*Date Tested:*	4/03/2026

TEST RESULTS - Modified Maximum Dry Density

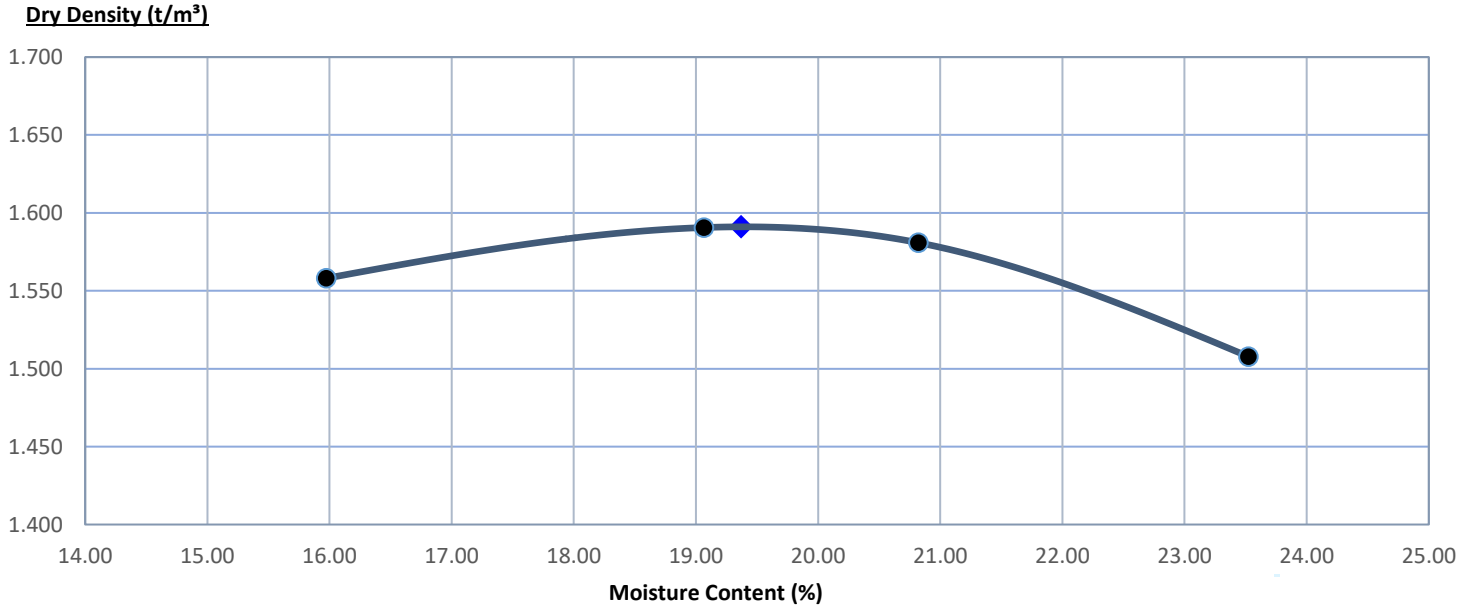
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): >2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	16.0	19.1	20.8	23.5	
Dry Density (t/m³)	1.558	1.591	1.581	1.508	



Modified Maximum Dry Density (t/m³) **1.59**

Optimum Moisture Content (%) **19.5**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 05/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

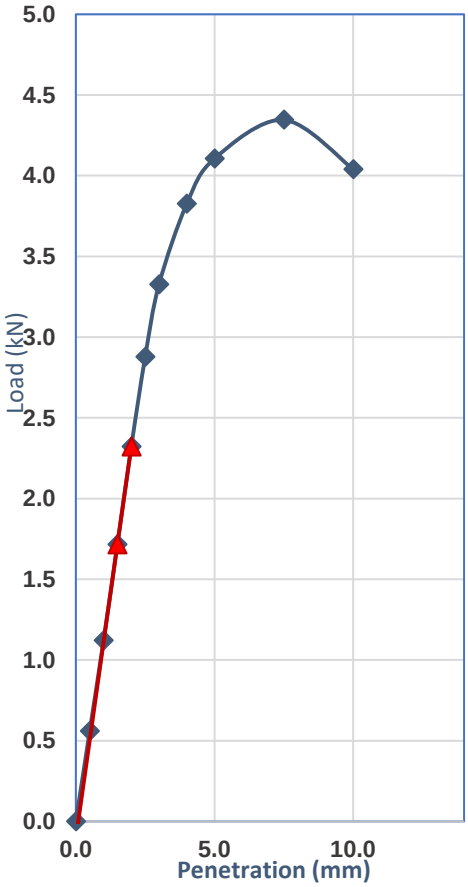
Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3393_1_SCBR
Project:	Proposed Residential Development	*Sample No.*	WG26.3393
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (0.5m)	*Date Tested:*	4/03 - 10/03/26

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Sand

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>24
% Retained 19.0mm	0	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.59	Optimum Moisture (%)	19.5
Target Dry Density Ratio (%)	95	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.50	Moisture Content (%)	19.3
Density Ratio (%)	94.5	Moisture Ratio (%)	99.5

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.50	Dry Density Ratio (%)	94.5
Moisture Content (%)	21.1	Moisture Ratio (%)	108.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	20.0	Remaining Depth (%)	21.0

Correction applied to Penetration: 0.1mm

Determined at a Penetration of: 2.5mm

California Bearing Ratio (CBR): 20%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 11/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

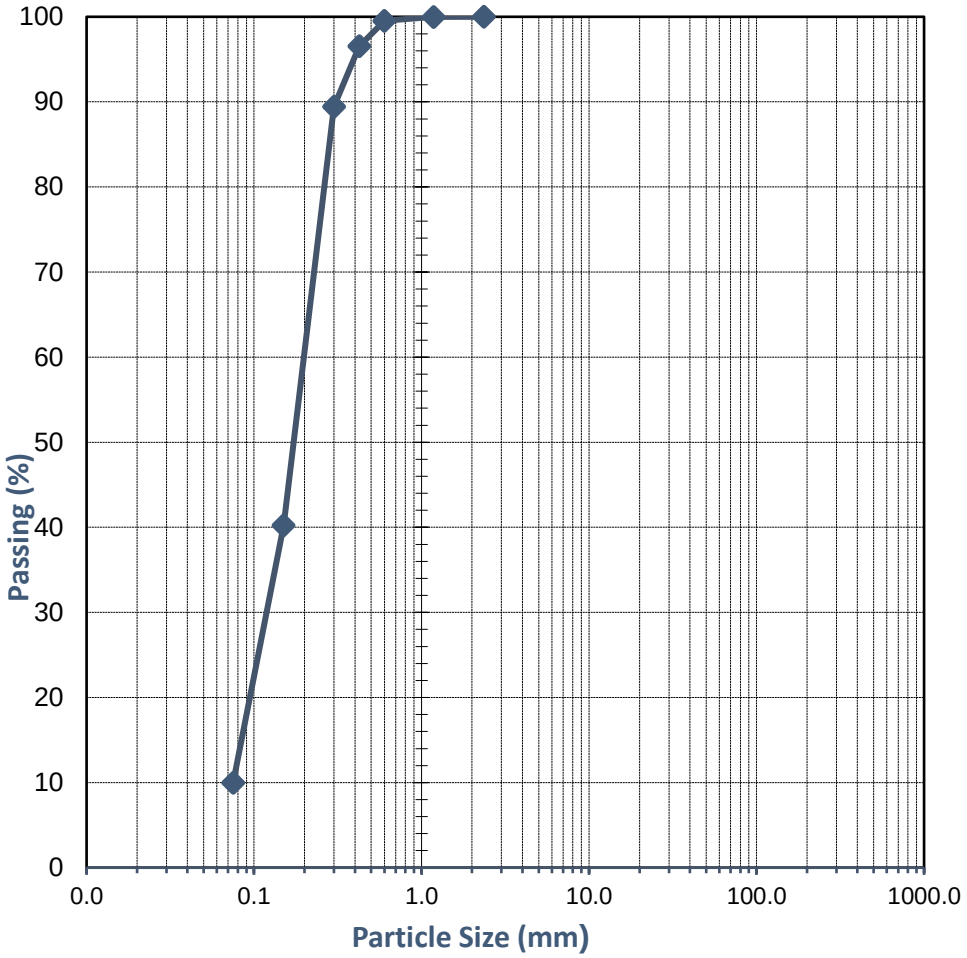
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3395_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3395
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP17 (0.5m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	100
0.425	97
0.300	89
0.150	40
0.075	10



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SOIL | AGGREGATE | CONCRETE | CRUSHING

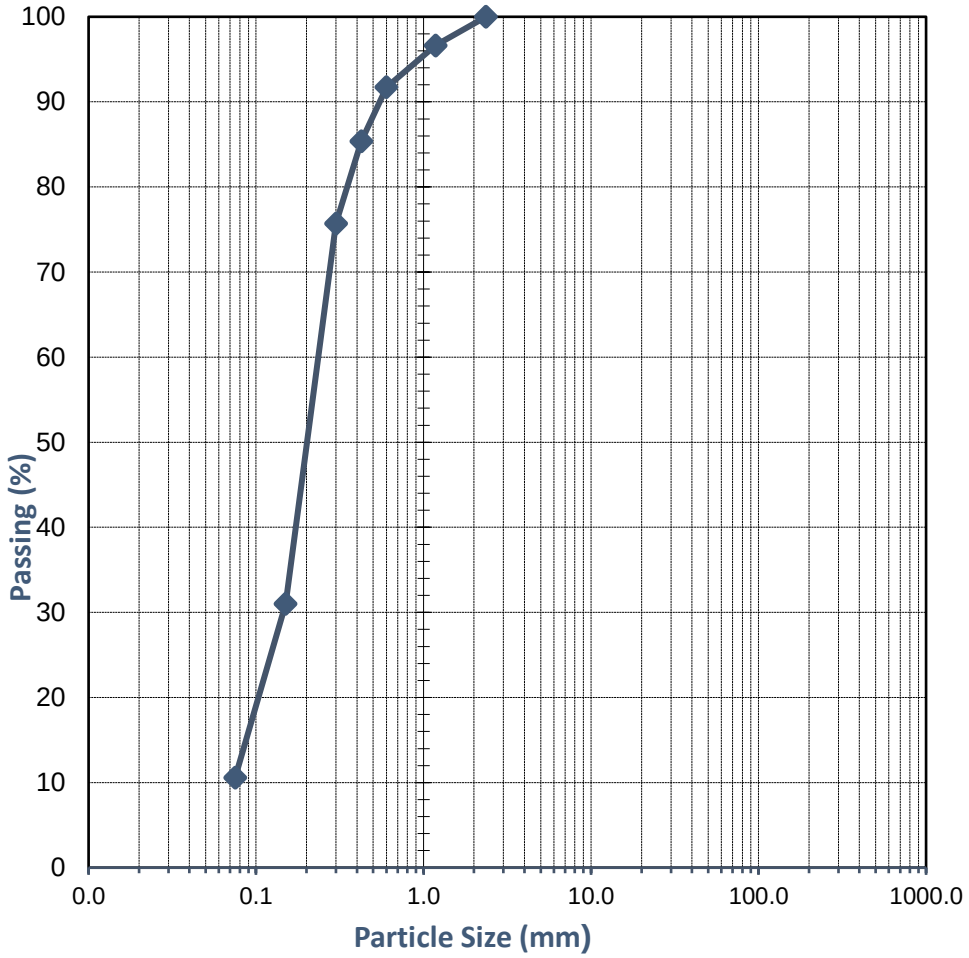
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3396_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3396
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP20 (0.3m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	97
0.600	92
0.425	85
0.300	76
0.150	31
0.075	11



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Name: Danielle Reynolds

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3396_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3396
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP20 (0.3m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

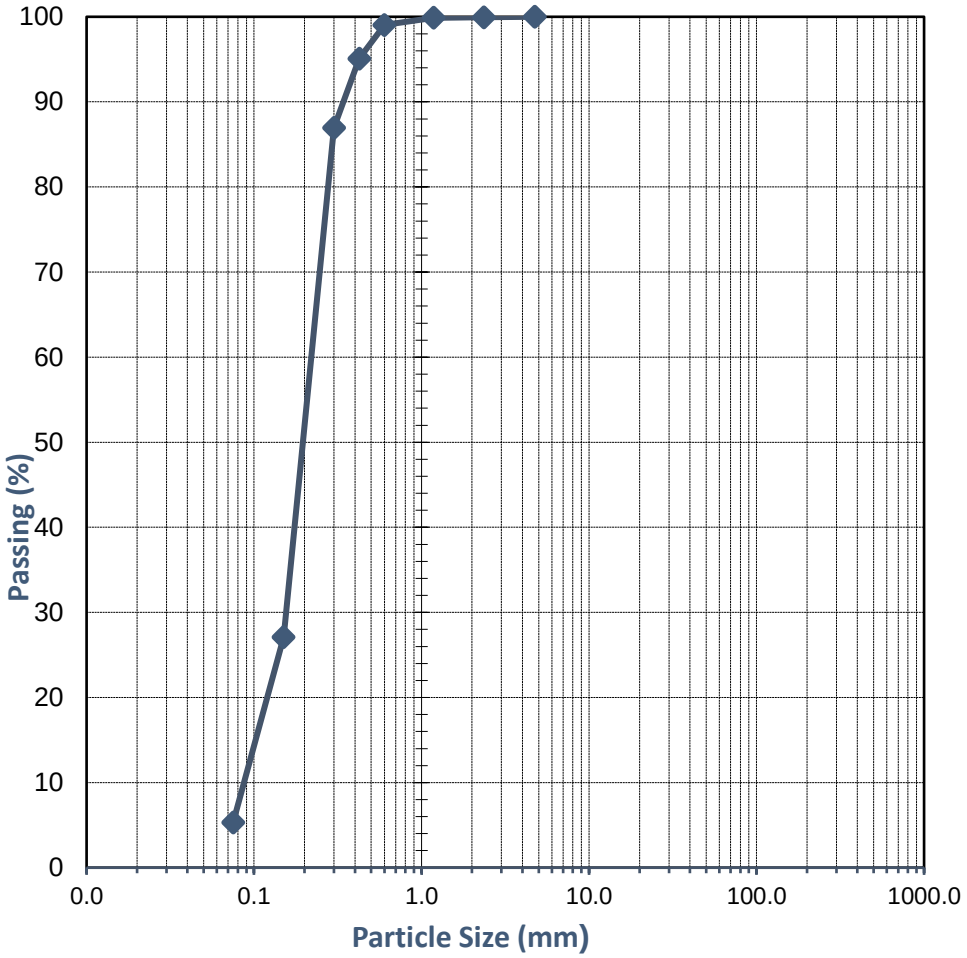
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3397_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3397
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP20 (0.6m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	100
0.600	99
0.425	95
0.300	87
0.150	27
0.075	5



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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Appendix D

Acid Sulfate Soil Laboratory Certifications

Douglas PARTNERS

Table D-1: Summary of Acid Sulfate Soil Laboratory Results

Test Location	Depth (m)	Soil Description	Screening Tests [1]				Chromium Suite of Testing					
			pH_F	pH_{FOX}	Reaction [2] Strength	Δ pH [3]	pH_{KCl}	TAA [4] (%S)	S_{CR} (%S) [5]	S_{NAS} (%S) [6]	ANC (%S) [7]	Net [8] Acidity (%S)
Assessment Criteria			**<4**	**<3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**>0.03**
TP01	0.5	Sand trace silt - pale grey	6.7	4.8	Low	1.9	-	-	-	-	-	-
TP01	1.0	Sand trace silt - pale grey	6.3	4.6	Low	1.7	-	-	-	-	-	-
TP01	1.5	Sand trace silt - pale grey	5.7	3.2	Low	2.5	4.9	0.12	0.0092	NT	NT	**0.13**
TP01	2.0	Silty Sand - dark grey-brown	5.6	3.7	Low	1.9	-	-	-	-	-	-
TP03	0.5	Sand trace silt - pale grey	6.0	3.7	Low	2.3	6.3	<0.010	<0.0050	NT	NT	<0.0050
TP03	1.0	Silty Sand - dark brown	6.0	4.0	Low	2	-	-	-	-	-	-
TP03	1.5	Silty Sand - yellow-brown	6.1	3.3	Medium	2.8	-	-	-	-	-	-
TP03	2.0	Silty Sand - yellow-brown	6.1	3.3	Medium	2.8	5.5	0.011	<0.0050	NT	NT	0.015
TP03	2.5	Clayey sand - pale grey	6.1	4.6	Low	1.5	-	-	-	-	-	-
TP03	3.0	Clayey sand - pale grey	6.0	4.2	Low	1.8	-	-	-	-	-	-
TP05	0.5	Sand trace silt - grey	5.9	4.2	Low	1.7	-	-	-	-	-	-
TP05	1.0	Sand trace silt - grey	6.2	4.8	Low	1.4	-	-	-	-	-	-
TP05	1.5	Sand trace silt - grey	5.7	3.6	Low	2.1	5.3	0.023	<0.0050	NT	NT	0.025
TP05	2.0	Sand with silt - dark brown	5.6	4.0	Low	1.6	-	-	-	-	-	-
TP05	2.5	Clayey Sand - pale grey	6.1	4.1	Low	2	-	-	-	-	-	-
TP05	3.0	Clayey Sand - pale grey	6.2	4.4	Low	1.8	-	-	-	-	-	-
TP06	0.5	Sand trace silt - grey	6.0	**2.0**	Medium	4	5.4	0.011	<0.0050	NT	NT	0.013
TP06	1.0	Silty Sand - brown	6.0	**2.9**	Medium	3.1	-	-	-	-	-	-
TP06	1.5	Clayey Silty Sand trace gravel - green-grey	6.3	**2.8**	Medium	3.5	-	-	-	-	-	-
TP06	2.0	Clayey Silt with sand - green-grey	6.6	**2.8**	Medium	3.8	5.5	0.013	<0.0050	NT	NT	0.015
TP06	2.5	Clayey Silt with sand - green-grey	6.9	3.4	Medium	3.5	-	-	-	-	-	-
TP06	3.0	Clayey Silt with sand - green-grey	6.6	3.2	Medium	3.4	-	-	-	-	-	-
TP09	0.5	Sand trace silt - pale grey	6.9	4.4	Medium	2.5	-	-	-	-	-	-
TP09	1.0	Sand trace silt - pale grey	5.9	4.6	Low	1.3	-	-	-	-	-	-
TP09	1.5	Sand trace silt - pale grey	6.1	4.7	Medium	1.4	-	-	-	-	-	-
TP09	1.8	Silty Sand - dark brown	5.6	3.5	Medium	2.1	5.1	0.088	0.0059	NT	NT	**0.094**
TP10	0.5	Sand trace silt - grey and pale grey	5.9	3.6	Medium	2.3	-	-	-	-	-	-
TP10	1.0	Sand trace silt - pale brown	5.8	3.3	Low	2.5	-	-	-	-	-	-
TP10	1.5	Sand trace silt - pale brown	5.7	3.3	Low	2.4	-	-	-	-	-	-
TP10	2.0	Sand trace silt - pale brown	5.6	**2.8**	Low	2.8	5.1	0.015	<0.0050	NT	NT	0.017
TP10	2.5	Sand with silt - dark grey	5.8	**2.9**	Low	2.9	-	-	-	-	-	-
TP10	2.7	Sand with silt - dark grey	5.7	3.1	Low	2.6	5.3	0.011	<0.0050	NT	NT	0.011
TP11	0.5	Sand trace silt - grey	4.5	3.3	Medium	1.2	5.6	<0.010	<0.0050	NT	NT	0.0085
TP11	1.0	Sand trace silt - grey	5.4	4.0	Medium	1.4	-	-	-	-	-	-
TP11	1.5	Sand trace silt - grey	5.8	3.9	Low	1.9	-	-	-	-	-	-
TP11	2.0	Silty Sand - dark brown	6.3	**2.5**	Low	3.8	5.6	<0.010	0.0055	NT	NT	0.014

Test Location	Depth (m)	Soil Description	Screening Tests [1]				Chromium Suite of Testing					
			pH_F	pH_{FOX}	Reaction [2] Strength	Δ pH [3]	pH_{KCl}	TAA [4] (%S)	S_{CR} (%S) [5]	S_{NAS} (%S) [6]	ANC (%S) [7]	Net [8] Acidity (%S)
Assessment Criteria			**<4**	**<3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**>0.03**
TP11	2.5	Clayey Sand - pale grey	6.2	**2.6**	Low	3.6	-	-	-	-	-	-
TP11	3.0	Clayey Sand - pale grey	5.9	3.1	Low	2.8	-	-	-	-	-	-
TP13	0.5	Sand trace silt - pale grey	4.7	**2.9**	Medium	1.8	4.9	0.041	<0.0050	NT	NT	**0.041**
TP13	1.0	Sand trace silt - pale grey	5.2	4.0	Low	1.2	-	-	-	-	-	-
TP13	1.5	Sand trace silt - pale grey	5.3	3.9	Low	1.4	-	-	-	-	-	-
TP13	2.0	Sand with silt - dark grey-brown	5.6	4.0	Low	1.6	-	-	-	-	-	-
TP13	2.5	Sand with silt - dark grey-brown	5.7	4.4	Low	1.3	5.4	0.015	<0.0050	NT	NT	0.017
TP15	0.5	Sand trace silt - pale grey	5.3	4.2	Low	1.1	-	-	-	-	-	-
TP15	1.0	Sand trace silt - pale grey	4.6	3.9	Low	0.7	5.9	<0.010	<0.0050	NT	NT	<0.0050
TP15	1.5	Sand trace silt - pale grey	6.0	4.6	Low	1.4	-	-	-	-	-	-
TP15	2.0	Sand trace silt - pale grey	6.1	4.8	Low	1.3	-	-	-	-	-	-
TP15	2.5	Sand trace silt - pale grey	5.7	4.9	Low	0.8	-	-	-	-	-	-
TP16	0.5	Sand trace silt - grey	6.2	4.5	Medium	1.7	-	-	-	-	-	-
TP16	1.0	Sand trace silt - grey	6.1	4.5	Low	1.6	-	-	-	-	-	-
TP16	1.5	Sand trace silt - pale grey	6.0	4.2	Low	1.8	-	-	-	-	-	-
TP16	2.0	Sand trace silt - pale grey	5.4	3.4	Low	2	-	-	-	-	-	-
TP16	2.5	Sand with silt - grey and dark grey	5.4	3.4	Low	2	-	-	-	-	-	-
TP16	2.7	Sand with silt - grey and dark grey	5.5	**2.7**	Low	2.8	5.0	0.049	0.010	NT	NT	**0.059**
TP17	0.5	Sand trace silt - grey	5.1	**2.9**	Low	2.2	5.6	<0.010	<0.0050	NT	NT	<0.0050
TP17	1.0	Sand trace silt - pale grey	5.4	3.2	Low	2.2	-	-	-	-	-	-
TP17	1.5	Sand with silt - dark grey-brown and brown	5.3	3.3	Low	2	-	-	-	-	-	-
TP17	2.0	Sand with silt - dark grey-brown and brown	5.6	3.2	Low	2.4	-	-	-	-	-	-
TP17	2.5	Sand with silt - dark grey-brown and brown	5.6	2.7	Low	2.9	5.4	0.035	0.021	NT	NT	**0.056**
TP17	2.8	Silty Sand - brown	5.6	3.0	Low	2.6	-	-	-	-	-	-
TP20	0.5	Sand trace silt - pale grey	5.1	3.0	Medium	2.1	-	-	-	-	-	-
TP20	1.0	Sand trace silt - pale grey	5.5	3.1	Low	2.4	-	-	-	-	-	-
TP20	1.5	Sand trace silt - pale grey	5.6	**2.9**	Low	2.7	-	-	-	-	-	-
TP20	2.0	Sand trace silt - pale grey	5.5	3.4	Low	2.1	5.6	<0.010	<0.0050	NT	NT	<0.0050
TP20	2.5	Sand trace silt - pale grey	5.6	3.7	Low	1.9	-	-	-	-	-	-
TP20	2.7	Sand trace silt - pale grey	5.2	3.0	Low	2.2	-	-	-	-	-	-

Note:

1. Screening Tests undertaken by MPL Laboratories
2. Low – indicates no or slight effervescence in hydrogen peroxide
   Medium – indicates moderate effervescence in hydrogen peroxide
3. Δ pH – pH_F - pH_{FOX}
4. TAA – titratable actual acidity
5. S_{CR} – chromium reducible sulfur
6. S_{NAS} – retained acidity (reported for pH_{KCl} < 4.5)

Test Location	Depth (m)	Soil Description	Screening Tests [1]				Chromium Suite of Testing					
			pH_F	pH_{FOX}	Reaction[2] Strength	Δ pH[3]	pH_{KCl}	TAA [4] (%S)	S_{CR} (%S) [5]	S_{NAS} (%S) [6]	ANC (%S) [7]	Net [8] Acidity (%S)
Assessment Criteria			**<4**	**<3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**>0.03**

7. ANC – acid neutralising capacity (reported for pH_{KCl} > 6.5)
8. Net Acidity = TAA + S_{CR} + S_{NAS}. (It should be noted that ANC is excluded as per WA Guidelines)

NT Not Tested

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lab@mpl.com.au
www.mpl.com.au

Sample Receipt Advice PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Attention	Gary Gao

Sample Login Details

Your Reference	240409.00 - Proposed Residential Development
Envirolab Reference	PHB1781
Date Sample Received	26/02/2026
Date Instructions Received	26/02/2026
Date Final Results Expected	06/03/2026

Sample Condition

Samples received in appropriate condition for analysis	See Comments
Number of Samples	66 Soil
Turnaround Time	5 Days
Temperatures / Cooling Methods	5.0°C No Cooling

Additional Info

Sample storage - waters are routinely disposed at approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Where no sampling date has been supplied for some or all samples, the date of sample receipt has been used as the associated sampling date. The sampling dates are used to assess compliance to recommended Technical Holding Times.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default).

Please direct any queries to:

Sally Harbrow

Phone 08 9317 2505
Email lab@mpl.com.au

Paul Nottle

Phone 08 9317 2505
Email lab@mpl.com.au

Analysis underway, details on the following page

Sample Receipt Advice PHB1781

Analysis Grid

The • indicates the testing you have requested. ***THIS IS NOT A REPORT OF THE RESULTS.***

	ASS Field
PHB1781-01 Soil | 13/02/2026 TP01, 0.5 m	•
PHB1781-02 Soil | 13/02/2026 TP01, 1.0 m	•
PHB1781-03 Soil | 13/02/2026 TP01, 1.5 m	•
PHB1781-04 Soil | 13/02/2026 TP01, 2.0 m	•
PHB1781-05 Soil | 13/02/2026 TP03, 0.5 m	•
PHB1781-06 Soil | 13/02/2026 TP03, 1.0 m	•
PHB1781-07 Soil | 13/02/2026 TP03, 1.5 m	•
PHB1781-08 Soil | 13/02/2026 TP03, 2.0 m	•
PHB1781-09 Soil | 13/02/2026 TP03, 2.5 m	•
PHB1781-10 Soil | 13/02/2026 TP03, 3.0 m	•
PHB1781-11 Soil | 13/02/2026 TP05, 0.5 m	•
PHB1781-12 Soil | 13/02/2026 TP05, 1.0 m	•
PHB1781-13 Soil | 13/02/2026 TP05, 1.5 m	•
PHB1781-14 Soil | 13/02/2026 TP05, 2.0 m	•
PHB1781-15 Soil | 13/02/2026 TP05, 2.5 m	•
PHB1781-16 Soil | 13/02/2026 TP05, 3.0 m	•

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-17 Soil | 13/02/2026 TP06, 0.5 m	•
PHB1781-18 Soil | 13/02/2026 TP06, 1.0 m	•
PHB1781-19 Soil | 13/02/2026 TP06, 1.5 m	•
PHB1781-20 Soil | 13/02/2026 TP06, 2.0 m	•
PHB1781-21 Soil | 13/02/2026 TP06, 2.5 m	•
PHB1781-22 Soil | 13/02/2026 TP06, 3.0 m	•
PHB1781-23 Soil | 13/02/2026 TP09, 0.5 m	•
PHB1781-24 Soil | 13/02/2026 TP09, 1.0 m	•
PHB1781-25 Soil | 13/02/2026 TP09, 1.5 m	•
PHB1781-26 Soil | 13/02/2026 TP09, 1.8 m	•
PHB1781-27 Soil | 13/02/2026 TP10, 0.5 m	•
PHB1781-28 Soil | 13/02/2026 TP10, 1.0 m	•
PHB1781-29 Soil | 13/02/2026 TP10, 1.5 m	•
PHB1781-30 Soil | 13/02/2026 TP10, 2.0 m	•
PHB1781-31 Soil | 13/02/2026 TP10, 2.5 m	•
PHB1781-32 Soil | 13/02/2026 TP10, 2.7 m	•

Sample Receipt Advice PHB1781

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-33 Soil | 13/02/2026 TP11, 0.5 m	•
PHB1781-34 Soil | 13/02/2026 TP11, 1.0 m	•
PHB1781-35 Soil | 13/02/2026 TP11, 1.5 m	•
PHB1781-36 Soil | 13/02/2026 TP11, 2.0 m	•
PHB1781-37 Soil | 13/02/2026 TP11, 2.5 m	•
PHB1781-38 Soil | 13/02/2026 TP11, 3.0 m	•
PHB1781-39 Soil | 13/02/2026 TP13, 0.5 m	•
PHB1781-40 Soil | 13/02/2026 TP13, 1.0 m	•
PHB1781-41 Soil | 13/02/2026 TP13, 1.5 m	•
PHB1781-42 Soil | 13/02/2026 TP13, 2.0 m	•
PHB1781-43 Soil | 13/02/2026 TP13, 2.5 m	•
PHB1781-44 Soil | 13/02/2026 TP15, 0.5 m	•
PHB1781-45 Soil | 13/02/2026 TP15, 1.0 m	•
PHB1781-46 Soil | 13/02/2026 TP15, 1.5 m	•
PHB1781-47 Soil | 13/02/2026 TP15, 2.0 m	•
PHB1781-48 Soil | 13/02/2026 TP15, 2.5 m	•

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-49 Soil | 13/02/2026 TP16, 0.5 m	•
PHB1781-50 Soil | 13/02/2026 TP16, 1.0 m	•
PHB1781-51 Soil | 13/02/2026 TP16, 1.5 m	•
PHB1781-52 Soil | 13/02/2026 TP16, 2.0 m	•
PHB1781-53 Soil | 13/02/2026 TP16, 2.5 m	•
PHB1781-54 Soil | 13/02/2026 TP16, 2.7 m	•
PHB1781-55 Soil | 13/02/2026 TP17, 0.5 m	•
PHB1781-56 Soil | 13/02/2026 TP17, 1.0 m	•
PHB1781-57 Soil | 13/02/2026 TP17, 1.5 m	•
PHB1781-58 Soil | 13/02/2026 TP17, 2.0 m	•
PHB1781-59 Soil | 13/02/2026 TP17, 2.5 m	•
PHB1781-60 Soil | 13/02/2026 TP17, 2.8 m	•
PHB1781-61 Soil | 13/02/2026 TP20, 0.5 m	•
PHB1781-62 Soil | 13/02/2026 TP20, 1.0 m	•
PHB1781-63 Soil | 13/02/2026 TP20, 1.5 m	•
PHB1781-64 Soil | 13/02/2026 TP20, 2.0 m	•

Sample Receipt Advice PHB1781

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-65 Soil | 13/02/2026 TP20, 2.5 m	•
PHB1781-66 Soil | 13/02/2026 TP20, 2.7 m	•

Suite Details

Suite Name	Suite Analyses
ASS Field |Soil	pH F, pH FOX, Reaction Rate

We acknowledge receipt of your samples and Purchase Order (PO) (if provided). If a PO includes your terms & conditions, Envirolab hereby expressly rejects and will not be bound by any external or third-party terms and conditions, including those referenced or attached to a PO.

All services to be performed by Envirolab will be governed exclusively by Envirolab's General Terms and Conditions attached to this acknowledgement (Envirolab Terms) via hyperlink or found on our websites.

If you do not object in writing within two (2) business days of the date of this acknowledgement, you will be deemed to have accepted the Envirolab Terms. In addition, your provision of further instructions, additional samples, payment of any invoice, or acceptance of services or results from Envirolab will constitute acceptance of the Envirolab Terms. For clarity, Envirolab's commencement or continuation of work following receipt of the PO is performed solely under the Envirolab Terms and does not constitute acceptance of any external terms. All rights are expressly reserved.

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Work Amendment Advice PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Attention	Gary Gao

Sample Login Details

Your Reference	240409.00 - Proposed Residential Development
Envirolab Reference	PHB1781
Date Sample Received	26/02/2026
Date Instructions Received	03/03/2026
Date Final Results Expected	10/03/2026

Sample Condition

Samples received in appropriate condition for analysis	See Comments
Number of Samples	66 Soil
Turnaround Time	5 Days
Temperatures / Cooling Methods	5.0°C No Cooling

Additional Info

Sample storage - waters are routinely disposed at approximately 1 month and soils approximately 2 months from receipt.

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Please direct any queries to:

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Email lab@mpl.com.au

Paul Nottle

Phone 08 9317 2505
Email lab@mpl.com.au

Analysis underway, details on the following page

Work Amendment Advice PHB1781

Analysis Grid

The • indicates the testing you have requested. ***THIS IS NOT A REPORT OF THE RESULTS.***

	SCr Suite	ASS Field
PHB1781-01 Soil | 13/02/2026 TP01, 0.5 m		●
PHB1781-02 Soil | 13/02/2026 TP01, 1.0 m		●
PHB1781-03 Soil | 13/02/2026 TP01, 1.5 m	●	●
PHB1781-04 Soil | 13/02/2026 TP01, 2.0 m		●
PHB1781-05 Soil | 13/02/2026 TP03, 0.5 m	●	●
PHB1781-06 Soil | 13/02/2026 TP03, 1.0 m		●
PHB1781-07 Soil | 13/02/2026 TP03, 1.5 m		●
PHB1781-08 Soil | 13/02/2026 TP03, 2.0 m	●	●
PHB1781-09 Soil | 13/02/2026 TP03, 2.5 m		●
PHB1781-10 Soil | 13/02/2026 TP03, 3.0 m		●
PHB1781-11 Soil | 13/02/2026 TP05, 0.5 m		●
PHB1781-12 Soil | 13/02/2026 TP05, 1.0 m		●
PHB1781-13 Soil | 13/02/2026 TP05, 1.5 m	●	●
PHB1781-14 Soil | 13/02/2026 TP05, 2.0 m		●
PHB1781-15 Soil | 13/02/2026 TP05, 2.5 m		●
PHB1781-16 Soil | 13/02/2026 TP05, 3.0 m		●

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-17 Soil | 13/02/2026 TP06, 0.5 m	●	●
PHB1781-18 Soil | 13/02/2026 TP06, 1.0 m		●
PHB1781-19 Soil | 13/02/2026 TP06, 1.5 m		●
PHB1781-20 Soil | 13/02/2026 TP06, 2.0 m	●	●
PHB1781-21 Soil | 13/02/2026 TP06, 2.5 m		●
PHB1781-22 Soil | 13/02/2026 TP06, 3.0 m		●
PHB1781-23 Soil | 13/02/2026 TP09, 0.5 m		●
PHB1781-24 Soil | 13/02/2026 TP09, 1.0 m		●
PHB1781-25 Soil | 13/02/2026 TP09, 1.5 m		●
PHB1781-26 Soil | 13/02/2026 TP09, 1.8 m	●	●
PHB1781-27 Soil | 13/02/2026 TP10, 0.5 m		●
PHB1781-28 Soil | 13/02/2026 TP10, 1.0 m		●
PHB1781-29 Soil | 13/02/2026 TP10, 1.5 m		●
PHB1781-30 Soil | 13/02/2026 TP10, 2.0 m	●	●
PHB1781-31 Soil | 13/02/2026 TP10, 2.5 m		●
PHB1781-32 Soil | 13/02/2026 TP10, 2.7 m	●	●

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-33 Soil | 13/02/2026 TP11, 0.5 m	●	●
PHB1781-34 Soil | 13/02/2026 TP11, 1.0 m		●
PHB1781-35 Soil | 13/02/2026 TP11, 1.5 m		●
PHB1781-36 Soil | 13/02/2026 TP11, 2.0 m	●	●
PHB1781-37 Soil | 13/02/2026 TP11, 2.5 m		●
PHB1781-38 Soil | 13/02/2026 TP11, 3.0 m		●
PHB1781-39 Soil | 13/02/2026 TP13, 0.5 m	●	●
PHB1781-40 Soil | 13/02/2026 TP13, 1.0 m		●
PHB1781-41 Soil | 13/02/2026 TP13, 1.5 m		●
PHB1781-42 Soil | 13/02/2026 TP13, 2.0 m		●
PHB1781-43 Soil | 13/02/2026 TP13, 2.5 m	●	●
PHB1781-44 Soil | 13/02/2026 TP15, 0.5 m		●
PHB1781-45 Soil | 13/02/2026 TP15, 1.0 m	●	●
PHB1781-46 Soil | 13/02/2026 TP15, 1.5 m		●
PHB1781-47 Soil | 13/02/2026 TP15, 2.0 m		●
PHB1781-48 Soil | 13/02/2026 TP15, 2.5 m		●

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-49 Soil | 13/02/2026 TP16, 0.5 m		●
PHB1781-50 Soil | 13/02/2026 TP16, 1.0 m		●
PHB1781-51 Soil | 13/02/2026 TP16, 1.5 m		●
PHB1781-52 Soil | 13/02/2026 TP16, 2.0 m		●
PHB1781-53 Soil | 13/02/2026 TP16, 2.5 m		●
PHB1781-54 Soil | 13/02/2026 TP16, 2.7 m	●	●
PHB1781-55 Soil | 13/02/2026 TP17, 0.5 m	●	●
PHB1781-56 Soil | 13/02/2026 TP17, 1.0 m		●
PHB1781-57 Soil | 13/02/2026 TP17, 1.5 m		●
PHB1781-58 Soil | 13/02/2026 TP17, 2.0 m		●
PHB1781-59 Soil | 13/02/2026 TP17, 2.5 m	●	●
PHB1781-60 Soil | 13/02/2026 TP17, 2.8 m		●
PHB1781-61 Soil | 13/02/2026 TP20, 0.5 m		●
PHB1781-62 Soil | 13/02/2026 TP20, 1.0 m		●
PHB1781-63 Soil | 13/02/2026 TP20, 1.5 m		●
PHB1781-64 Soil | 13/02/2026 TP20, 2.0 m	●	●

Work Amendment Advice PHB1781

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-65 Soil | 13/02/2026 TP20, 2.5 m		●
PHB1781-66 Soil | 13/02/2026 TP20, 2.7 m		●

Suite Details

Suite Name	Suite Analyses
SCr Suite |Soil	a-ANCBT, a-CRS, ANCBT, a-Net Acidity, a-Net Acidity w/out ANCE, a-SNAS, Chromium Reducible Sulfur, Fineness Factor, Liming rate, Liming rate without ANCE, pH kcl, s-ANCBT, SHCl, SKCl, SNAS, s-Net Acidity, s-Net Acidity w/out ANCE, s-SNAS, s-TAA, TAA
ASS Field |Soil	pH F, pH FOX, Reaction Rate

Work Order Amendment History

Revision	Reason for Amendment
R-01	Additional analysis requested 3.3.26

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www.mpl.com.au

Certificate of Analysis PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Contact	Gary Gao
Address	36 O'Malley St, OSBORNE PARK, WA, 6017

Sample Details

Your Reference	240409.00 - Proposed Residential Development
Number of Samples	66 Soil
Date Samples Received	26/02/2026
Date Instructions Received	03/03/2026

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Final Results Expected	10/03/2026
Date of Reissue	10/03/2026 - This report supercedes previous report, see amendment history for details

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Authorisation Details

Results Approved By	Stacey Hawkins, ASS/AMD Supervisor
Laboratory Manager	Michael Kubiak

Report Amendment History

Revision	Reason for Amendment
R-01	Additional analysis requested 3.3.26

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PHB1781-01	TP01, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-02	TP01, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-03	TP01, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-04	TP01, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-05	TP03, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-06	TP03, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-07	TP03, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-08	TP03, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-09	TP03, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-10	TP03, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-11	TP05, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-12	TP05, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-13	TP05, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-14	TP05, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-15	TP05, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-16	TP05, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-17	TP06, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-18	TP06, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-19	TP06, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-20	TP06, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-21	TP06, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-22	TP06, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-23	TP09, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-24	TP09, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-25	TP09, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-26	TP09, 1.8 m	Soil	13/02/2026	03/03/2026
PHB1781-27	TP10, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-28	TP10, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-29	TP10, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-30	TP10, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-31	TP10, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-32	TP10, 2.7 m	Soil	13/02/2026	03/03/2026
PHB1781-33	TP11, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-34	TP11, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-35	TP11, 1.5 m	Soil	13/02/2026	03/03/2026

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PHB1781-36	TP11, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-37	TP11, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-38	TP11, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-39	TP13, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-40	TP13, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-41	TP13, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-42	TP13, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-43	TP13, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-44	TP15, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-45	TP15, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-46	TP15, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-47	TP15, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-48	TP15, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-49	TP16, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-50	TP16, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-51	TP16, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-52	TP16, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-53	TP16, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-54	TP16, 2.7 m	Soil	13/02/2026	03/03/2026
PHB1781-55	TP17, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-56	TP17, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-57	TP17, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-58	TP17, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-59	TP17, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-60	TP17, 2.8 m	Soil	13/02/2026	03/03/2026
PHB1781-61	TP20, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-62	TP20, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-63	TP20, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-64	TP20, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-65	TP20, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-66	TP20, 2.7 m	Soil	13/02/2026	03/03/2026

Certificate of Analysis PHB1781

Acid Sulfate Soils (Soil)

Envirolab ID	Units	PQL	PHB1781-01	PHB1781-02	PHB1781-03	PHB1781-04	PHB1781-05
Your Reference			TP01, 0.5 m	TP01, 1.0 m	TP01, 1.5 m	TP01, 2.0 m	TP03, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.7	6.3	5.7	5.6	6.0
pHFOX (field peroxide test)*	pH units		4.8	4.6	3.2	3.7	3.7
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-06	PHB1781-07	PHB1781-08	PHB1781-09	PHB1781-10
Your Reference			TP03, 1.0 m	TP03, 1.5 m	TP03, 2.0 m	TP03, 2.5 m	TP03, 3.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.0	6.1	6.1	6.1	6.0
pHFOX (field peroxide test)*	pH units		4.0	3.3	3.3	4.6	4.2
Reaction Rate*	-		Low	Medium	Medium	Low	Low

Envirolab ID	Units	PQL	PHB1781-11	PHB1781-12	PHB1781-13	PHB1781-14	PHB1781-15
Your Reference			TP05, 0.5 m	TP05, 1.0 m	TP05, 1.5 m	TP05, 2.0 m	TP05, 2.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.9	6.2	5.7	5.6	6.1
pHFOX (field peroxide test)*	pH units		4.2	4.8	3.6	4.0	4.1
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-16	PHB1781-17	PHB1781-18	PHB1781-19	PHB1781-20
Your Reference			TP05, 3.0 m	TP06, 0.5 m	TP06, 1.0 m	TP06, 1.5 m	TP06, 2.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.2	6.0	6.0	6.3	6.6
pHFOX (field peroxide test)*	pH units		4.4	2.0	2.9	2.8	2.8
Reaction Rate*	-		Low	Medium	Medium	Medium	Medium

Envirolab ID	Units	PQL	PHB1781-21	PHB1781-22	PHB1781-23	PHB1781-24	PHB1781-25
Your Reference			TP06, 2.5 m	TP06, 3.0 m	TP09, 0.5 m	TP09, 1.0 m	TP09, 1.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.9	6.6	6.9	5.9	6.1
pHFOX (field peroxide test)*	pH units		3.4	3.2	4.4	4.6	4.7
Reaction Rate*	-		Medium	Medium	Medium	Low	Medium

Envirolab ID	Units	PQL	PHB1781-26	PHB1781-27	PHB1781-28	PHB1781-29	PHB1781-30
Your Reference			TP09, 1.8 m	TP10, 0.5 m	TP10, 1.0 m	TP10, 1.5 m	TP10, 2.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.6	5.9	5.8	5.7	5.6
pHFOX (field peroxide test)*	pH units		3.5	3.6	3.3	3.3	2.8
Reaction Rate*	-		Medium	Medium	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-31	PHB1781-32	PHB1781-33	PHB1781-34	PHB1781-35
Your Reference			TP10, 2.5 m	TP10, 2.7 m	TP11, 0.5 m	TP11, 1.0 m	TP11, 1.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.8	5.7	4.5	5.4	5.8
pHFOX (field peroxide test)*	pH units		2.9	3.1	3.3	4.0	3.9
Reaction Rate*	-		Low	Low	Medium	Medium	Low

Envirolab ID	Units	PQL	PHB1781-36	PHB1781-37	PHB1781-38	PHB1781-39	PHB1781-40
Your Reference			TP11, 2.0 m	TP11, 2.5 m	TP11, 3.0 m	TP13, 0.5 m	TP13, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.3	6.2	5.9	4.7	5.2
pHFOX (field peroxide test)*	pH units		2.5	2.6	3.1	2.9	4.0

Acid Sulfate Soils (Soil)

Envirolab ID	Units	PQL	PHB1781-36	PHB1781-37	PHB1781-38	PHB1781-39	PHB1781-40
Your Reference			TP11, 2.0 m	TP11, 2.5 m	TP11, 3.0 m	TP13, 0.5 m	TP13, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
Reaction Rate*	-		Low	Low	Low	Medium	Low

Envirolab ID	Units	PQL	PHB1781-41	PHB1781-42	PHB1781-43	PHB1781-44	PHB1781-45
Your Reference			TP13, 1.5 m	TP13, 2.0 m	TP13, 2.5 m	TP15, 0.5 m	TP15, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.3	5.6	5.7	5.3	4.6
pHFOX (field peroxide test)*	pH units		3.9	4.0	4.4	4.2	3.9
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-46	PHB1781-47	PHB1781-48	PHB1781-49	PHB1781-50
Your Reference			TP15, 1.5 m	TP15, 2.0 m	TP15, 2.5 m	TP16, 0.5 m	TP16, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.0	6.1	5.7	6.2	6.1
pHFOX (field peroxide test)*	pH units		4.6	4.8	4.9	4.5	4.5
Reaction Rate*	-		Low	Low	Low	Medium	Low

Envirolab ID	Units	PQL	PHB1781-51	PHB1781-52	PHB1781-53	PHB1781-54	PHB1781-55
Your Reference			TP16, 1.5 m	TP16, 2.0 m	TP16, 2.5 m	TP16, 2.7 m	TP17, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.0	5.4	5.4	5.5	5.1
pHFOX (field peroxide test)*	pH units		4.2	3.4	3.4	2.7	2.9
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-56	PHB1781-57	PHB1781-58	PHB1781-59	PHB1781-60
Your Reference			TP17, 1.0 m	TP17, 1.5 m	TP17, 2.0 m	TP17, 2.5 m	TP17, 2.8 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.4	5.3	5.6	5.6	5.6
pHFOX (field peroxide test)*	pH units		3.2	3.3	3.2	2.7	3.0
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-61	PHB1781-62	PHB1781-63	PHB1781-64	PHB1781-65
Your Reference			TP20, 0.5 m	TP20, 1.0 m	TP20, 1.5 m	TP20, 2.0 m	TP20, 2.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.1	5.5	5.6	5.5	5.6
pHFOX (field peroxide test)*	pH units		3.0	3.1	2.9	3.4	3.7
Reaction Rate*	-		Medium	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-66
Your Reference			TP20, 2.7 m
Date Sampled			13/02/2026
pHF (field pH test)*	pH units		5.2
pHFOX (field peroxide test)*	pH units		3.0
Reaction Rate*	-		Low

Chromium Reducible Sulfur Suite (Soil)

Envirolab ID	Units	PQL	PHB1781-03	PHB1781-05	PHB1781-08	PHB1781-13	PHB1781-17
Your Reference			TP01, 1.5 m	TP03, 0.5 m	TP03, 2.0 m	TP05, 1.5 m	TP06, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		4.9	6.3	5.5	5.3	5.4
TAA	moles H+/t	5.0	72	<5.0	6.6	14	6.6
s-TAA	% w/w S	0.010	0.12	<0.010	0.011	0.023	0.011
Chromium Reducible Sulfur	% w/w	0.0050	0.0092	<0.0050	<0.0050	<0.0050	<0.0050
a-Chromium Reducible Sulfur	moles H+/t	3.0	5.8	<3.0	3.1	<3.0	<3.0
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	0.13	<0.0050	0.015	0.025	0.013
a-Net Acidity	moles H+/t	5.0	78	<5.0	9.6	15	7.8
Liming rate	kg CaCO3/t	0.75	5.9	<0.75	<0.75	1.2	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.13	<0.0050	0.015	0.025	0.013
a-Net Acidity without ANCE	moles H+/t	5.0	78	<5.0	9.6	15	7.8
Liming rate without ANCE	kg CaCO3/t	0.75	5.9	<0.75	<0.75	1.2	<0.75

Envirolab ID	Units	PQL	PHB1781-20	PHB1781-26	PHB1781-30	PHB1781-32	PHB1781-33
Your Reference			TP06, 2.0 m	TP09, 1.8 m	TP10, 2.0 m	TP10, 2.7 m	TP11, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		5.5	5.1	5.1	5.3	5.6
TAA	moles H+/t	5.0	7.8	55	9.1	6.6	5.3
s-TAA	% w/w S	0.010	0.013	0.088	0.015	0.011	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	<0.0050	0.0059	<0.0050	<0.0050	<0.0050
a-Chromium Reducible Sulfur	moles H+/t	3.0	<3.0	3.7	<3.0	<3.0	<3.0
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	0.015	0.094	0.017	0.011	0.0085
a-Net Acidity	moles H+/t	5.0	9.2	58	11	7.1	5.3
Liming rate	kg CaCO3/t	0.75	<0.75	4.4	0.79	<0.75	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.015	0.094	0.017	0.011	0.0085
a-Net Acidity without ANCE	moles H+/t	5.0	9.2	58	11	7.1	5.3
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	4.4	0.79	<0.75	<0.75

Chromium Reducible Sulfur Suite (Soil)

Envirolab ID	Units	PQL	PHB1781-36	PHB1781-39	PHB1781-43	PHB1781-45	PHB1781-54
Your Reference			TP11, 2.0 m	TP13, 0.5 m	TP13, 2.5 m	TP15, 1.0 m	TP16, 2.7 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		5.6	4.9	5.4	5.9	5.0
TAA	moles H+/t	5.0	5.3	26	9.1	<5.0	31
s-TAA	% w/w S	0.010	<0.010	0.041	0.015	<0.010	0.049
Chromium Reducible Sulfur	% w/w	0.0050	0.0055	<0.0050	<0.0050	<0.0050	0.010
a-Chromium Reducible Sulfur	moles H+/t	3.0	3.4	<3.0	<3.0	<3.0	6.3
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	0.014	0.041	0.017	<0.0050	0.059
a-Net Acidity	moles H+/t	5.0	8.7	26	10	<5.0	37
Liming rate	kg CaCO3/t	0.75	<0.75	1.9	0.78	<0.75	2.8
s-Net Acidity without ANCE	% w/w S	0.0050	0.014	0.041	0.017	<0.0050	0.059
a-Net Acidity without ANCE	moles H+/t	5.0	8.7	26	10	<5.0	37
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	1.9	0.78	<0.75	2.8

Envirolab ID	Units	PQL	PHB1781-55	PHB1781-59	PHB1781-64
Your Reference			TP17, 0.5 m	TP17, 2.5 m	TP20, 2.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		5.6	5.4	5.6
TAA	moles H+/t	5.0	<5.0	22	<5.0
s-TAA	% w/w S	0.010	<0.010	0.035	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	<0.0050	0.021	<0.0050
a-Chromium Reducible Sulfur	moles H+/t	3.0	<3.0	13	<3.0
SHCl	% w/w S	0.0050	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	<0.0050	0.056	<0.0050
a-Net Acidity	moles H+/t	5.0	<5.0	35	<5.0
Liming rate	kg CaCO3/t	0.75	<0.75	2.6	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	<0.0050	0.056	<0.0050
a-Net Acidity without ANCE	moles H+/t	5.0	<5.0	35	<5.0
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	2.6	<0.75

Method Summary

Method ID	Methodology Summary
INORG-063	pH- measured using pH meter and electrode. Solids are oxidised with Hydrogen Peroxide or extracted with water. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions. There is no documented official holding time, we have assigned an arbitrary 180 days to frozen samples.
INORG-068	Determination of Chromium Suite analysis - a sample is analysed by traditional titration method as well as ICP-OES analysis. Ideally samples should be received in the laboratory at <4oC. Please refer to SRA for sample temperature on receipt. Samples should also ideally be received within 24 hrs of sampling, otherwise there is the potential for oxidation to occur (as indicated by the lowering of the pH). Freezing the samples may help mitigate the potential for oxidation. Neutralising value (NV) of 100% is assumed for liming rate. The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL result. However, it has been applied in the SNAS calculation: SNAS % = (SHCL-SKCL)x2".

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates can be downloaded from the Envirolab Resources website or obtained directly by contacting the laboratory.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Your Reference	240409.00 - Proposed Residential Development
Date Issued	10/03/2026

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PHB1781

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
pH F | Soil	1-66	13/02/2026	26/02/2026	27/02/2026	Yes
pH FOX | Soil	1-66	13/02/2026	26/02/2026	27/02/2026	Yes
Reaction Rate | Soil	1-66	13/02/2026	26/02/2026	27/02/2026	Yes
CRS Suite | Soil	3, 5, 8, 13, 17, 20, 26, 30, 32-33, 36, 39, 43, 45, 54-55, 59, 64	13/02/2026	04/03/2026	04/03/2026	Yes

Quality Control PHB1781

INORG-063|Acid Sulfate Soils (Soil) | Batch BHB4735

Analyte	Units	PQL	Blank	DUP1 PHB1781-01 Samp | QC | RPD %	DUP2 PHB1781-11 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			6.7 | 6.6 | 1.96	5.9 | 6.0 | 1.68	99.9
pHFOX (field peroxide test)	pH units			4.8 | 4.6 | 2.76	4.2 | 4.4 | 4.37	100
Reaction Rate	-			Low | Low | [NA]	Low | Low | [NA]	[NA]

Analyte	Units	PQL	Blank	DUP3 PHB1781-21 Samp | QC | RPD %	DUP4 PHB1781-31 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			6.9 | 6.8 | 1.75	5.8 | 5.8 | 0.347	100
pHFOX (field peroxide test)	pH units			3.4 | 3.5 | 2.03	2.9 | 3.0 | 4.10	99.9
Reaction Rate	-			Medium | Medium | [NA]	Low | Low | [NA]	[NA]

Analyte	Units	PQL	Blank	DUP5 PHB1781-41 Samp | QC | RPD %	DUP6 PHB1781-51 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			5.3 | 5.2 | 2.11	6.0 | 6.0 | 1.17	100
pHFOX (field peroxide test)	pH units			3.9 | 3.8 | 2.84	4.2 | 3.8 | 8.48	99.7
Reaction Rate	-			Low | Low | [NA]	Low | Low | [NA]	[NA]

Analyte	Units	PQL	Blank	DUP7 PHB1781-61 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			5.1 | 4.9 | 4.20	100
pHFOX (field peroxide test)	pH units			3.0 | 3.0 | 2.32	100
Reaction Rate	-			Medium | Medium | [NA]	[NA]

INORG-068|Chromium Reducible Sulfur Suite (Soil) | Batch BHC0399

Analyte	Units	PQL	Blank	DUP1 PHB1781-03 Samp | QC | RPD %	DUP2 PHB1781-36 Samp | QC | RPD %	LCS %
pH KCl	pH units		NT	4.88 | 4.90 | 0.409	5.55 | 5.57 | 0.360	93.3
TAA	moles H+/t	5.0	<5.0	72.4 | 71.1 | 1.76	5.31 | <5.0 | [NA]	88.7
s-TAA	% w/w S	0.010	<0.010	0.116 | 0.114 | 1.76	<0.010 | <0.010 | [NA]	[NA]
Chromium Reducible Sulfur	% w/w	0.0050	<0.0050	0.00924 | 0.00964 | [NA]	0.00551 | 0.00531 | [NA]	103
a-Chromium Reducible Sulfur	moles H+/t	3.0	<3.0	5.77 | 6.01 | [NA]	3.43 | 3.31 | [NA]	[NA]
SHCl	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
SKCl	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
SNAS	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
a-SNAS	moles H+/t	5.0	<5.0	NT | NT | [NA]	NT | NT | [NA]	[NA]
s-SNAS	% w/w S	0.010	<0.010	NT | NT | [NA]	NT | NT | [NA]	[NA]
Fineness Factor	-	1.5	NT	1.50 | 1.50 | [NA]	1.50 | 1.50 | [NA]	[NA]
ANCBT	% CaCO3	0.010	<0.010	NT | NT | [NA]	NT | NT | [NA]	NT
a-ANCBT	moles H+/t	5.0	<5.0	NT | NT | [NA]	NT | NT | [NA]	[NA]
s-ANCBT	% w/w S	0.010	<0.010	NT | NT | [NA]	NT | NT | [NA]	[NA]
s-Net Acidity	% w/w S	0.0050	<0.0050	0.125 | 0.124 | 1.31	0.0140 | 0.0118 | [NA]	[NA]
a-Net Acidity	moles H+/t	5.0	<5.0	78.1 | 77.1 | 1.31	8.75 | 7.36 | [NA]	[NA]
Liming rate	kg CaCO3/t	0.75	<0.75	5.86 | 5.79 | 1.31	<0.75 | <0.75 | [NA]	[NA]
s-Net Acidity without ANCE	% w/w S	0.0050	<0.0050	0.125 | 0.124 | 1.31	0.0140 | 0.0118 | [NA]	[NA]
a-Net Acidity without ANCE	moles H+/t	5.0	<5.0	78.1 | 77.1 | 1.31	8.75 | 7.36 | [NA]	[NA]
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	5.86 | 5.79 | 1.31	<0.75 | <0.75 | [NA]	[NA]

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Proposed Residential Development
Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

To: MPL Envirolab
Catalano Road, Canning vale, WA
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}										NOTES
1	TP01, 0.5 m	13/2/26	S	Freezer		Y	Y										
2	TP01, 1.0 m	13/2/26	S	Freezer		Y	Y										
3	TP01, 1.5 m	13/2/26	S	Freezer		Y	Y										
4	TP01, 2.0 m	13/2/26	S	Freezer		Y	Y										
5	TP03, 0.5 m	13/2/26	S	Freezer		Y	Y										
6	TP03, 1.0 m	13/2/26	S	Freezer		Y	Y										
7	TP03, 1.5 m	13/2/26	S	Freezer		Y	Y										
8	TP03, 2.0 m	13/2/26	S	Freezer		Y	Y										
9	TP03, 2.5 m	13/2/26	S	Freezer		Y	Y										
10	TP03, 3.0 m	13/2/26	S	Freezer		Y	Y										
11	TP05, 0.5 m	13/2/26	S	Freezer		Y	Y										
12	TP05, 1.0 m	13/2/26	S	Freezer		Y	Y										
	LOR (S)																
	LOR (W)																

mpl Laboratories ENVIROLAB GROUP
Job No.- PHB1781
Date Rec - 25 FEB 2026
Time Rec - 1500
Rec By - NL
TAT Req - SAME 1 / 2 / 3 / STD
Temp - cool / ambient 8 5.0
Cooling - Ice / Ice pack / None
Security Seal - Yes / No 6

LOR = Limit of Reporting, *As per Laboratory Method Detection Limit

Sampled By: Gary Gao Relinquished By: _____ Sign: _____ Date/Time: 19/02/2026
Received By: _____ Relinquished By: _____ Sign: _____ Date/Time: _____

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Send Results to:
Douglas Partners Pty Ltd
36 O'Malley Street
OSBORNE PARK 6017
Ph: (08) 9204 3511
Fax: (08) 9204 3522
Accounts: perth@douglaspartners.com.au

Project Name Proposed Residential Development
To: MPL Envirolab

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
13	TP05, 1.5 m	13/2/26	S	Freezer		Y	Y											
14	TP05, 2.0 m	13/2/26	S	Freezer		Y	Y											
15	TP05, 2.5 m	13/2/26	S	Freezer		Y	Y											
16	TP05, 3.0 m	13/2/26	S	Freezer		Y	Y											
17	TP06, 0.5 m	13/2/26	S	Freezer		Y	Y											
18	TP06, 1.0 m	13/2/26	S	Freezer		Y	Y											
19	TP06, 1.5 m	13/2/26	S	Freezer		Y	Y											
20	TP06, 2.0 m	13/2/26	S	Freezer		Y	Y											
21	TP06, 2.5 m	13/2/26	S	Freezer		Y	Y											
22	TP06, 3.0 m	13/2/26	S	Freezer		Y	Y											
23	TP09, 0.5 m	13/2/26	S	Freezer		Y	Y											
24	TP09, 1.0 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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Project Name: Proposed Residential Development

To: MPL Envirolab

Douglas Partners
Geotechnics · Environment · Groundwater

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Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
25	TP09, 1.5 m	13/2/26	S	Freezer		Y	Y											
26	TP09, 1.8 m	13/2/26	S	Freezer		Y	Y											
27	TP10, 0.5 m	13/2/26	S	Freezer		Y	Y											
28	TP10, 1.0 m	13/2/26	S	Freezer		Y	Y											
29	TP10, 1.5 m	13/2/26	S	Freezer		Y	Y											
30	TP10, 2.0 m	13/2/26	S	Freezer		Y	Y											
31	TP10, 2.5 m	13/2/26	S	Freezer		Y	Y											
32	TP10, 2.7 m	13/2/26	S	Freezer		Y	Y											
33	TP11, 0.5 m	13/2/26	S	Freezer		Y	Y											
34	TP11, 1.0 m	13/2/26	S	Freezer		Y	Y											
35	TP11, 1.5 m	13/2/26	S	Freezer		Y	Y											
36	TP11, 2.0 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
37	TP11, 2.5 m	13/2/26	S	Freezer		Y	Y											
38	TP11, 3.0 m	13/2/26	S	Freezer		Y	Y											
39	TP13, 0.5 m	13/2/26	S	Freezer		Y	Y											
40	TP13, 1.0 m	13/2/26	S	Freezer		Y	Y											
41	TP13, 1.5 m	13/2/26	S	Freezer		Y	Y											
42	TP13, 2.0 m	13/2/26	S	Freezer		Y	Y											
43	TP13, 2.5 m	13/2/26	S	Freezer		Y	Y											
44	TP15, 0.5 m	13/2/26	S	Freezer		Y	Y											
45	TP15, 1.0 m	13/2/26	S	Freezer		Y	Y											
46	TP15, 1.5 m	13/2/26	S	Freezer		Y	Y											
47	TP15, 2.0 m	13/2/26	S	Freezer		Y	Y											
48	TP15, 2.5 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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Received By: _____ Relinquished By: _____ Sign: _____ Date/Time: _____

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CHAIN OF CUSTODY DESPATCH SHEET

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DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
49	TP16, 0.5 m	13/2/26	S	Freezer		Y	Y											
50	TP16, 1.0 m	13/2/26	S	Freezer		Y	Y											
51	TP16, 1.5 m	13/2/26	S	Freezer		Y	Y											
52	TP16, 2.0 m	13/2/26	S	Freezer		Y	Y											
53	TP16, 2.5 m	13/2/26	S	Freezer		Y	Y											
54	TP16, 2.7 m	13/2/26	S	Freezer		Y	Y											
55	TP17, 0.5 m	13/2/26	S	Freezer		Y	Y											
56	TP17, 1.0 m	13/2/26	S	Freezer		Y	Y											
57	TP17, 1.5 m	13/2/26	S	Freezer		Y	Y											
58	TP17, 2.0 m	13/2/26	S	Freezer		Y	Y											
59	TP17, 2.5 m	13/2/26	S	Freezer		Y	Y											
60	TP17, 2.8 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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DP Contact Person: Gary Gao
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16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
61	TP20, 0.5 m	13/2/26	S	Freezer		Y	Y											
62	TP20, 1.0 m	13/2/26	S	Freezer		Y	Y											
63	TP20, 1.5 m	13/2/26	S	Freezer		Y	Y											
64	TP20, 2.0 m	13/2/26	S	Freezer		Y	Y											
65	TP20, 2.5 m	13/2/26	S	Freezer		Y	Y											
66	TP20, 2.7 m	13/2/26	S	Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
LOR (S)																		
LOR (W)																		

LOR = Limit of Reporting, *As per Laboratory Method Detection Limit

Sampled By: Gary Gao Relinquished By: _____ Sign: _____ Date/Time: 19/02/2026

Received By: _____ Relinquished By: _____ Sign: _____ Date/Time: _____

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OSBORNE PARK 6017
Ph: (08) 9204 3511
Fax: (08) 9204 3522
Accounts: perth@douglaspartners.com.au

Project Name: Proposed Residential Development

To: MPL Envirolab

Sally Harbrow

From: MPL Laboratory
Subject: FW: Additional Testing (Chromium Suite) - Proposed Residential Development 240409.00
Attachments: PE252519.pdf

From: Emily Stewart <Emily.Stewart@douglaspartners.com.au>
Sent: Tuesday, 3 March 2026 12:33 PM
To: MPL Laboratory <lab@mpl.com.au>
Cc: Genevieve Massam <GMassam@mpl.com.au>; Rob Shapland <Rob.Shapland@douglaspartners.com.au>; Mubashar Ahmed <Mubashar.Ahmed@douglaspartners.com.au>
Subject: Additional Testing (Chromium Suite) - Proposed Residential Development 240409.00

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Gen,

Please find attached PO to undertake chromium suite testing for the following samples held under PHB1781

Test Location	Depth	
TP01	1.5	3
TP03	0.5	5
TP03	2.0	8
TP05	1.5	13
TP06	0.5	17
TP06	2.0	20
TP09	1.8	26
TP10	2.0	30
TP10	2.7	32
TP11	0.5	33
TP11	2.0	36
TP13	0.5	39
TP13	2.5	43
TP15	1.0	45
TP16	2.7	54
TP17	0.5	55
TP17	2.5	59
TP20	2.0	64

Kind Regards,

Appendix D

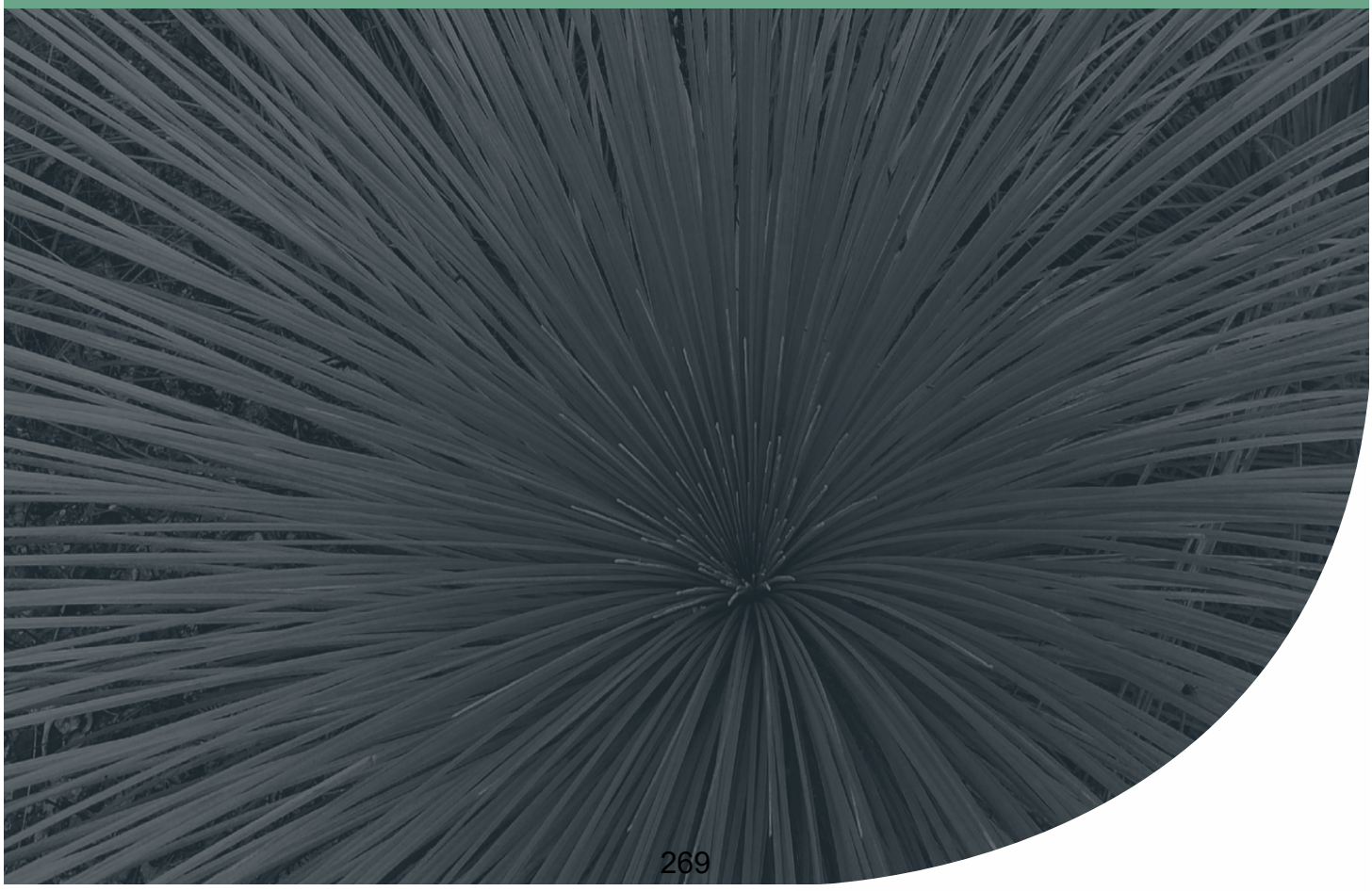
Modelling Assumptions Report

Lot 39 Elizabeth Street, Bayonet Head, Albany

Modelling Assumptions Report

Project No: EP26-007(01)

Prepared for Development WA
April 2026



Document Control

Doc name:	Lot 39 Elizabeth Street, Bayonet Head, Albany Modelling Assumptions Report				
Doc no.:	**EP26-007(01)--001 DRL**				
Version	**Date**	**Author**		**Reviewer**	
1	April 2026	Daniel Ladlow Lirui Dong	DRL LD	Dave Coremans	DPC
	Appendix to UWMP				

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1 Background

DevelopmentWA is proposing to develop Lot 39 Elizabeth Street, Bayonet Head. This report is an appendix to the Lot 39 Bayonet Head Local Water Management Report (LWMR) and provides a summary of the hydrological and hydraulic modelling undertaken to determine the flood storage and water quality treatment requirements.

2 Methodology

XPSWMM hydrologic and hydraulic modelling software (v20.1) was used to calculate the surface water runoff volumes and flow rates which reflect the pre-development and post development conditions of Lot 39 Elizabeth Street, Bayonet Head.

The hydrologic component of the software uses the Laurenson non-linear runoff-routing method to simulate runoff from design storm events. Key assumptions regarding the hydrologic model include:

- Runoff is proportional to slope, area, infiltration and percentage of imperviousness of a catchment.
- Sub-catchment areas and slopes are determined from surveyed topographical data and earthworks plans.
- Infiltration rates and percentage imperviousness have been selected based on experience with model preparation for similar soil conditions.

Runoff from each sub-catchment is routed through the catchment using the hydraulic component of XPSWMM. Generally, assumptions associated with the hydraulic component of the model include:

- Virtual links (i.e. purely for model construction, not equivalent to flow path onsite) between nodes within a sub-catchment are given the length of 10 m and slope of 0.05 to minimise the lag time of conveying the water from a sub-catchment node to a 'storage' node, a 'dummy intermediate' node or a conduit/link.
- Links between sub-catchment storages act as conveyance channels (e.g. sheet flow within roads in a 1% annual exceedance probability (AEP)). These links are given lengths and slopes that are representative of the site conditions and actual pathway lengths between catchments.
- Channels from sub-catchments are designed with a width of 5 m, roughness of 0.014 (Manning's n) and are trapezoidal in shape. This allows for easy conveyance and represents concrete pipes and road surfaces within the model.
- The swale has been modelled as 0.6 m deep, 1 m base and 1:6 side slopes.
- Where relevant swales, bio-retention areas (BRAs), and flood storage areas (FSAs) are modelled as nodal-reservoirs with infiltration depth-rating curves to account for differential infiltration rates with changing depth.

2.1 Rainfall

The ensemble temporal patterns obtained from the Australian Rainfall and Runoff (AR&R) Data Hub (AR&R 2019) were used for the rainfall analysis.

Up to eight durations ranging between 1 hour and 72 hours were tested, with the peak flood elevation being assessed as the determining result.

Following the process suggested by AR&R (Ball J et al. 2019), the highest mean duration was selected as the critical duration. AR&R also recommends that when it is not practical to run the entire ensemble array, the ensemble that produces the result closest to the mean (for the critical duration) should be adopted. The critical duration and ensemble for the 20% and 1% AEP for each basin is shown in **Table 1**.

Table 1: Critical duration and ensemble

Catchment	20% AEP	1% AEP
Existing basin 1	1hr_1	15min_6
Co-located FSA 2	2hr_4	2hr_9

3 Catchment Parameters

In order to confirm the hydrology of the broader area, the extent of upstream and downstream catchments has been assessed using a GIS analysis. These catchments have then been modelled using XPSWMM software to determine the overall outflow rates. The catchment areas are shown in Figure 6 of the LWMR.

An initial loss/continuing loss model was adopted to account for catchment losses. The pre-development catchment areas and characteristics were taken from existing topographical data, aerial photography and infrastructure information available. The post-development catchment area, land types and loss values were based on the structure plan/subdivision design, typical infiltration rates for the soils which occur onsite and based on project team experience. Post-development catchment areas and land types within the site were informed by the subdivision plan provided by project team town planners (TBB).

Table 2 summarises the loss parameters used within the pre-development and post development model.

Table 2: Post-development parameters

Land type	Initial loss (mm)	Continual loss (mm)	Roughness
Road surface	1	0.1	0.02
Road verge	9	1.5	0.05
Roof	15	0.1	0.02
Lot impervious	1	0.1	0.02
Gardens	15	1.5	0.05
POS	15	1.5	0.06
Road surface	1	0.1	0.02
Water	0	0	0.01

The following assumptions were incorporated into the model:

- Lots
  - Lots will have 50% roof areas, 30% paved areas and 20% pervious garden areas.
  - Roofs will retain the first 15 mm of runoff.
  - Residential lots will have little slope (i.e. will be flat) and pockets of storage are likely. This will effectively increase the initial loss (storage) and overall infiltration rate (continual loss).
  - Garden areas in lots will have high infiltration rates as it is likely that sand-based landscape mix or mulch will be used.
- Road reserve
  - There will be no infiltration on roads, pavements and driveways. There will however be some minor absorption storage loss which is accounted for in the initial and continuing loss values.
  - Road reserve contains 40% pervious verge and 60% impervious areas.
- Basin catchments and POS

  - Basin catchment areas (basin footprint and contributing open space) are assumed to be 100% pervious. The exception is what has assumed to be the permanent water surface in Existing basin 1 which is assumed to have no infiltration losses.
  - Basin catchment areas will likely contain landscaped or remnant vegetation.
- Storage
  - BRAs retain runoff from events up to and including the frequent event (i.e. first 15 mm).
  - BRA has 1:3 side slopes and maximum depth of 300 mm.
  - Co-located basins have maximum 1/6 side slopes and maximum depth of 1.2 m.
  - Basins detain runoff from events up to and including the 1% AEP event.
- Swale
  - Mannings n = 0.045
  - Side slopes 1/6
  - Depth = 0.6 m
  - Base width = 1 m.
- Infiltration
  - A hydraulic conductivity of 0 m/day is assumed for Existing basin 1
  - A hydraulic conductivity of 2.5 m/day is assumed for Co-located FSA 2.
  - Infiltration through base area and side slopes of the basins are considered in the overall infiltration rating curve for these areas.
- Evapotranspiration
  - Volumes leaving the system through evapotranspiration were assumed to be negligible when compared to the total runoff volume and since the duration of the model run was comparatively short. XPSWMM default evapotranspiration assumptions are therefore used.

4 Model Results

4.1 Pre-development model

The pre-development modelling undertaken indicates that the 1% AEP pre-development outflow rate at the downstream (eastern) boundary of the site is 4.353 m^3/s for Existing basin 1 and 0.373 m^3/s Co-located FSA 2.

4.2 Post development model

A summary of post development catchment information for the entire estate is provided in **Table 3**.

Table 3: Post-development catchment areas (ha)

Road reserve	Residential lots	Drainage reserve	POS
2.94	5.9	0.15	1.4

Post development modelling undertaken indicates that the 1% AEP outflow rate at the downstream (eastern) boundary of the site is 4.348 m^3/s for Existing basin 1 and 0.343 m^3/s for Co-located FSA 2.

5 References

5.1 General references

The references listed below have been considered as part of preparing this document.

Bureau of Meteorology (BoM) 2025, *Australian Rainfall & Runoff Data Hub*, <https://data.arr-software.org/>.
Bureau of Meteorology (BoM) 2026, *Climate Data Online*, <https://www.bom.gov.au/climate/data/>.

5.2 Online references

Table R 1 Access dates for online references

Reference	Date accessed	Website or dataset name
(BoM 2026)	9 February 2026	Climate Data Online

Appendix E

Educational Material

Planning your planting

Create 'watering zones' in your garden by grouping plants with similar watering needs. This will allow you to make more efficient use of your garden water by ensuring that no plants are over or under watered.

The Waterwise 'Drop Zone' system makes it easy to identify a plant's water requirements. This system divides plants into one of three groups depending on their watering needs. 'Three Drop' plants require the most watering (usually every second day in summer), whereas 'Two Drop' and 'One Drop' plants require less watering respectively.

It's also important to reticulate only once on your allocated days, either before 9am or after 6pm. Look for the Waterwise 'Drop Zone' system at your local Waterwise garden centre. To find the centre closest to you, visit www.watercorporation.com.au or call the Waterwise Helpline on 13 10 39.

Remember, a small amount of planning now can save plenty of water in the future.

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DOW310858

Government of **Western Australia**
Department of **Water**

Planting a local native garden

Looking after all our water needs

In an era of rising temperatures and decreasing rainfall it is important to look at how we use water in our gardens.

Did you know?

About half of the water typically used in our homes is actually used to water the garden (and of that almost all is used to water lawns).

Many of us water lawns that we simply don't use, or water more than we need to. Similarly, often the plant species in our gardens are exotic and not entirely suitable to our climate – needing more water to survive.

Why go native?

- Local native plants are best suited to the local climate, conditions and soil. Therefore they require minimal inputs such as water, fertiliser and maintenance.
- They attract local wildlife, insects and birds and provide corridors of biodiversity in developed areas.
- They have minimal impact on the environment – unlike many introduced species, which have become bushland weeds and prove difficult and expensive to eradicate.
- They represent local heritage, teaching us about nature and our local identity.

Mulch. Mulch. Mulch.

If everyone fully utilised mulch in the garden, a much lower percentage of household water usage would end up on the garden.

The even better news is that mulching is very easy! Raw materials like woodchips and tree clippings are best, but any organic mulch will suffice. Simply spread at least 50mm of mulch over the whole planting area, leaving a small amount of breathing space at the base of the stem. This mulch won't need to be topped up again until autumn. Be sure not to turn or disturb the mulch as this will break the fine feeder roots that develop between the mulch and the soil.

In addition to mulch, a wetting agent can help overcome water repellence in soils, allowing water to penetrate the soil more quickly and in larger amounts. You can find wetting agents at your local nursery or garden centre.

Want to know more?

The Department of Water is committed to making sure that the water needs of Western Australia are met now, and in the future. Small steps we each take can make a big difference to the sustainability of our precious water supply. If you would like to know more, visit the Department of Water website – www.water.wa.gov.au.

Key tips for reducing groundwater use

- Design gardens and landscaping to enhance absorption of rain into the ground and to minimise evaporation – by using local native garden beds, mulch and subsurface irrigation etc.
- Keep planted areas dense and group plants with similar water needs together and make use of windbreaks.
- Prepare the soil before planting to ensure that plants can make the most of the water they need.
- Re-use water from the home in the garden – this includes bucketing greywater from the laundry and bathroom as well as water from downpipes connected to your house gutters. You can also install a subsurface greywater reuse system. For further information, contact your local council or visit www.water.wa.gov.au

Key tips for protecting our groundwater

- **Reduce your reliance on bore water.** Our rainfall has reduced, which means less water to recharge our aquifers. Continued housing development in some areas can increase the number of new garden bores and the use of groundwater.

  The Department of Water has drawn up a map of Perth's groundwater area with boundaries showing which areas are better suited for bores.

- **Design gardens and landscaping to enhance maximum absorption of rainfall into the groundwater and minimise evaporation.** Use local native plants, mulch and subsurface irrigation.
- **Reduce your use of fertilisers and chemicals.** These can contaminate groundwater, particularly products high in phosphate.
- **Reduce water use through a variety of water saving mechanisms in the home and garden.**
- **Re-use water from the home in the garden – this includes bucketing greywater from the laundry and bathroom as well as water from downpipes connected to your house gutters. You can also install a subsurface greywater reuse system. For further information, contact your local council or visit www.water.wa.gov.au**

For your watering days and other information on water saving in homes and gardens visit www.watercorporation.com.au or call 1800 508 55

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Government of **Western Australia**
Department of **Water**

Looking after all our water needs

Extracting groundwater

Water quality

The quality of groundwater can be affected in many ways.

- The use of lawn and garden fertilisers heavy in phosphate is a major issue in Perth. Phosphates easily soak through the sand plain into the aquifer, rivers, ocean, creeks and swamps. This results in aquatic life dying and the growth of dangerous algae in freshwater lakes and rivers.
- Oils, paint thinners, various workshop chemicals – if poured into the sandy soil – will soak through to the aquifer and create long-term pollution issues.
- Heavy metal particles are dangerous to our health, as are hydrocarbons. These come from vehicle fuel systems, brake linings and exhaust systems. When vehicles are parked on private driveways and carports, such material will wash into your private soak wells and eventually into the aquifer. Remember to clean out your soak wells annually, to remove any leaf and pollutant build-up. This will also aid in the efficiency of your soak wells and reduce internal flooding problems.

Groundwater – the situation

Over two-thirds of Perth's water supply comes from groundwater. The Perth region has an underground geology which includes large areas of deep sand and limestone. Rain falling over this area and running off the hills builds up underground as a shallow semi-freshwater aquifer, which is available for household bores in some areas.

The freshwater aquifer is renewed each year with rainfall. With rainfall continuing to decline in Perth, and more homes being equipped with bores, the draw on the aquifer is increasing, thus creating a threat to ongoing bore water supply.

Groundwater recharge

Traditionally, stormwater run-off from roofs and roads and other surfaces has been collected in drainage pipes and exported into the ocean or waterways.

This 'lost' water can be a valuable resource to recharge a shallow groundwater aquifer. Sandy soils are extremely permeable and well suited to infiltration of stormwater to increase groundwater levels.

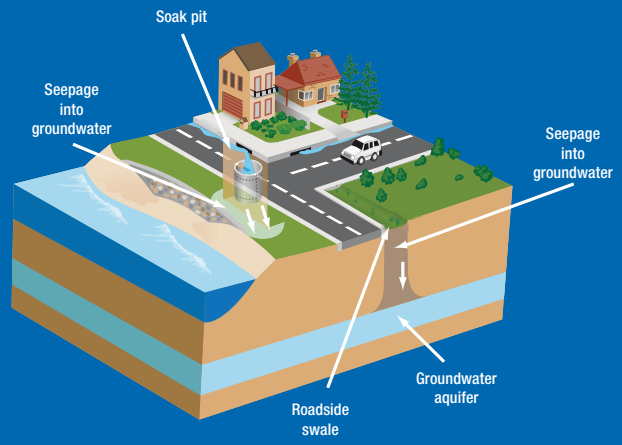
Recharging the groundwater aquifer with stormwater helps manage the local water cycle balance and prevents problems associated with increased bore water extraction, acid sulphate soils, salinity and waterlogging.

Managing local stormwater

'Stormwater' is a term used to describe the water which runs off surfaces such as houses and driveways and flows down into drains and stormwater pipes.

Poor stormwater management can damage not only individual properties but the environment in general. Local councils invest significant amounts of money into operating and maintaining the stormwater network.

Maximising infiltration of stormwater into groundwater can be achieved by replacing traditional drainage pipes with infiltration devices such as soakage pits and bioretention swales, as illustrated below.



Water sensitive urban design

Rainwater storage and reuse systems

Summary

Rainwater storage systems are a simple method of capturing rainwater, traditionally from roofs, for use as an alternative water supply source and to reduce consumption of scheme water. When installed and maintained in accordance with recommended guidelines, they can provide a high quality source of water.

This brochure is part of a series that explain various aspects of water sensitive urban design. Please see *Water sensitive urban design in Western Australia* for background information on water sensitive urban design.

Main benefits

- Rainwater storage systems reduce the demand on potable water supplies.
- More rainwater is harvested when the tank is plumbed inside the house for uses such as toilet flushing. This creates a consistent drawdown on the tank supply, so there is always space to collect rainwater.
- They reduce the amount of directly connected impervious areas.
- They reduce stormwater peak flow rates and volumes.
- They reduce water supply peak flow rates and volumes.
- They can be retrofitted in houses and other buildings, including in high density urban areas.
- They can provide a water supply for (water sensitive) urban gardens and reduce the heat island effect in high density urban landscapes.

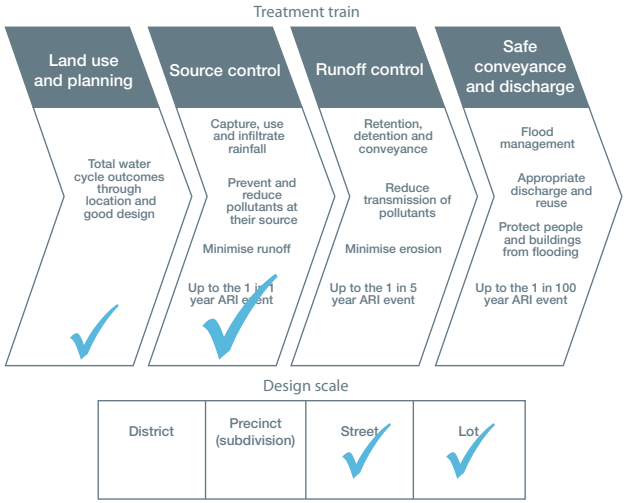
Design factors

- Put 'first flush' devices and mesh screens over all inlets and outlets to minimise maintenance requirements and preserve water quality.
- Designs for stormwater management include an air gap with trickle feed discharge level control and may include an infiltration trench or soakwell, depending on site characteristics.
- Storage can be above or below ground.
- Match storage size to collection area, end use, rainfall quantity and seasonal variability.
- Larger storage sizes are required where rainfall is unreliable and alternative supplies are not available.

Target pollutants

Rainwater storage systems are not designed to achieve direct improvements in stormwater quality.

Where they can be used in the water sensitive urban design process



Concrete underground tank

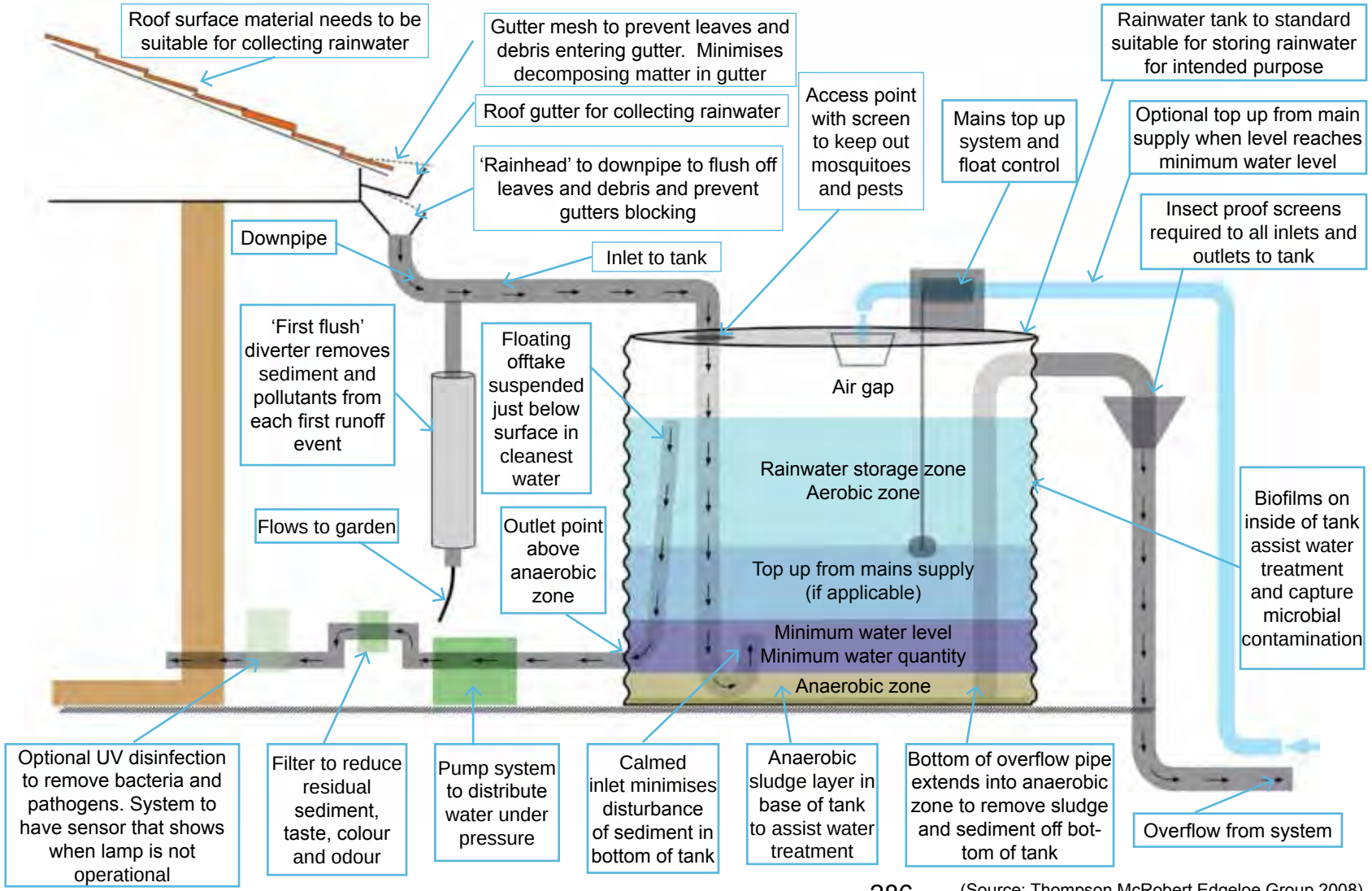
Slimline domestic rainwater tank

Poly domestic rainwater tanks

Water sensitive urban design

Rainwater storage and reuse systems

Example of above ground rainwater tank



(Source: Thompson McRobert Edgeloe Group 2008)

Required reading

Australian runoff quality: a guide to water sensitive urban design, 2006, Engineers Australia, available at <www.arq.org.au>.

Rainwater tank design and installation handbook, 2008, HB230-2008, Standards Australia.

Stormwater management manual for Western Australia, 2004–07, Department of Water, available at <www.water.wa.gov.au>. See Section 2.1 of Chapter 9 – Structural controls.

Testing of products for use in contact with drinking water, 2005, AS/NZS 4020:2005, Standards Australia.

Urban rainwater collection guidelines, Department of Health, Western Australia.

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June 2011
21592_100_06/11

The department acknowledges the past project contributions of the Leschenault Catchment Council.

Saving water in the garden.

Did you know?

Pot plants use a lot more water than plants in the ground. They're more exposed to the sun and wind, only store a small amount of water and dry out faster, so you water them more.

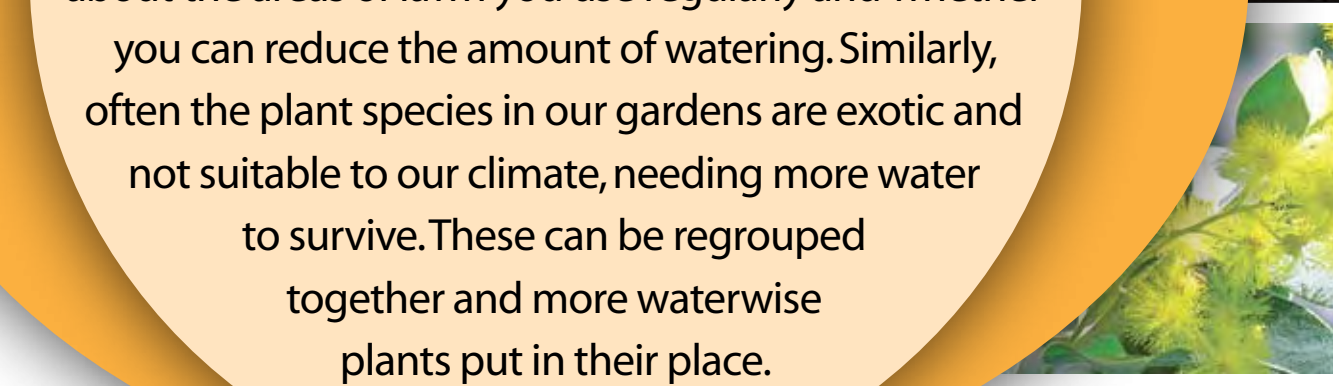
- Reduce your lawn cover. Most of the water used in our homes goes on the lawn.
- Plant local natives. They require less water and fertiliser.
- Mulch. Organic mulches reduce evaporation and restrict weed growth.
- Collect rainwater. This will save scheme water.
- Water deeply. Watering slower, for longer, less often encourages deep root growth.
- Use greywater. Re-use your laundry and bathroom water on your garden.
- Install a drip irrigation system. This will deliver water straight to the root system.
- Landscape. Group plants to suit watering needs. Keep high water use plants together.
- Use a pool cover. It will reduce evaporation by up to 97%, saving water and money.
- Maintain. Check taps and reticulation regularly for leaks and blockages.

Government of **Western Australia**
Department of **Water**

Grow local native plants and save water.

Did you know?

About half the water typically used in our homes is used to water the garden, generally lawns. Many of us water a large lawn and only use part of that lawn. Some of us overwater even those parts of the lawn we do use regularly. Think about the areas of lawn you use regularly and whether you can reduce the amount of watering. Similarly, often the plant species in our gardens are exotic and not suitable to our climate, needing more water to survive. These can be regrouped together and more waterwise plants put in their place.



- Local native plants are best suited to the local climate, conditions and soil.
- They require less water, fertiliser and maintenance.
- They attract local wildlife, insects and birds.
- They have minimal impact on the environment, unlike some introduced species which have become bushland weeds.
- Local plants represent local heritage, teaching us about nature and our local identity.

Government of **Western Australia**
Department of **Water**

Protect and maintain our local water supplies.
FertiliseWISE.

Did you know?

Fertilisers are a major contributor to surface and groundwater contamination. They run off into the stormwater system through roadside drains, collect in sumps and leach into the groundwater system. They also wash into the rivers and sea, creeks and swamps where they can do major damage to reefs and aquatic life.

WHAT YOU CAN DO TO HELP

• Minimise lawn areas and use plants that don't use fertiliser • Grow local native plants – they require less water and fertiliser • Where possible, use organic fertilisers • If you must use a chemical fertiliser, look for one that is phosphorus free. Use a nitrogen to phosphorus to potassium (N:P:K) ratio of 10:0:6. • Use a slow release fertiliser • Only apply in spring or early autumn, not in winter or summer • Fertilise only when symptoms of deficiency occur (e.g. yellowing) • Use liquid fertiliser if you have a subsurface irrigation system • Compost your garden waste • Don't fertilise near waterways or road verges • Don't let grass clippings or leaves go down the drain • Wash your car on the lawn (if you have any) not on the driveway • Pick up after your dog • Use phosphorus-free detergents (always read the labels)

Top 5 tips for saving water in the kitchen

Did you know the kitchen is a major consumer of water in the home using around 10 per cent of total household water for consumption for cooking, cleaning, washing or drinking?

If you follow these simple tips you can reduce your use dramatically.

- If you have a leaking tap, replace the washer or other components as required. Dripping taps can waste 30 – 200 litres of water per day.
- Look for dishwashers that have a National Water Conservation or WELS Label. The best water rating achieved by dishwashers is 5 stars.
- To avoid wasting warm water from a running tap when you first turn it on, collect it in a bottle or a jug and store it in the fridge until it is cool enough to drink.
- Only use dishwashers when you have full load.
- When boiling vegetables, use enough water to cover them and keep the lid on the saucepan. Your vegetables will boil quicker and it will save you water and power.

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Copies of this document are also available in alternative formats on request for those with special needs. The Department of Water is committed to quality service to its customers and makes every attempt to ensure accuracy, currency and reliability of the data contained in this document. However, changes in circumstances after time of publication may impact the quality of this information.

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Government of **Western Australia**
Department of **Water**

WATER SAVING TIPS

Saving water in the home

Looking after all our water needs

In southern Western Australia, water resources are under pressure due to reduced rainfall, increased population and other factors.

With the current pressure on Western Australia's water resources, it's time for us all to do our bit to protect and maintain them.

Did you know?

In the typical house, the use of showers, clothes washing machines and toilets can consume more than three quarters of all indoor water use. In the majority of homes, all of this quality drinking water is used once then goes to the sewer. There are now simple, low cost ways of reducing this water use whilst saving on your water costs.

Water use in the home and garden

Consider the following to reduce water use:

- Don't use drinking quality water to water your garden. Use bore water and/or water recycled from showers and clothes washing machines (grey water).
- Use covers on swimming pools and spas, to reduce evaporation. Evaporation can remove more water from a pool per year than toilet use in a home.
- A home can be cooled in summer using good orientation, window shading, natural ventilation and fans. This could remove the need for an air conditioner, particularly evaporative, where large amounts of water are used.
- All new houses must adhere to the criteria of 5 Star Plus for water efficiency, but the guidelines can also be used when renovating to help create a more waterwise home.
- Install flow control aerators on taps. They are inexpensive and can reduce water flow by 50 per cent.

Find out more

For information on greywater use and systems visit the Department of Health website at www.health.wa.gov.au
For waterwise tips see the Water Corporation website at www.watercorporation.com.au and follow the "Being Waterwise" links.
To find out more visit www.water.wa.gov.au

What you can do to help?

- **Buy and install water smart fittings and appliances in the kitchen, bathroom and laundry.** Low flow showers and taps, systems that store colder water while the hot tap is reaching the desired temperature, toilets with lower flush volumes, waterless toilets, front loading washing machines etc are all modern ways of saving on water use and cost.
- **Consider installing rainwater tanks.** The stored water can be used in a number of ways, even in Perth where there are less summer rain events. Such water can be plumbed into toilets and reduce the use of high-quality treated scheme water for flushing.
- **Install a waterwise garden and/or irrigation system.** The garden and irrigation system can be designed to minimize water use.

Use products and services with the Smart Approved WaterMark label. This is a water saving program for outdoor water use and ensures any product bearing the label will save water.

Visit www.smartwatermark.org for more information

LOT 39 ELIZABETH STREET, BAYONET HEAD

LANDSCAPE MASTERPLAN (CONCEPTUAL ONLY)

DWG OH-03- 01
REV B
DATE APRIL 2026
SCALE 1 : 2000 @ A3
0 10 20 30 40 50 m

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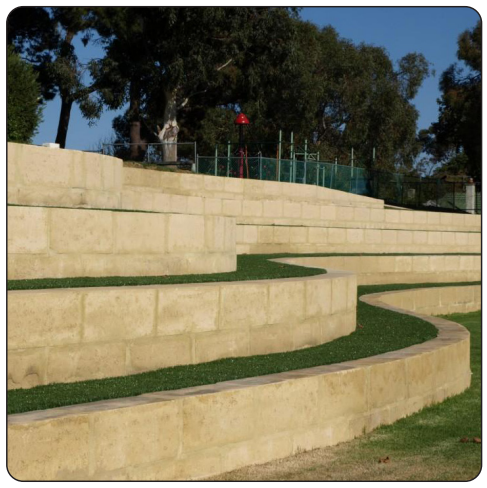
SHADE SAILS



LIMESTONE RETAINING WALLS

LOCAL STONE SEATING WALLS TO KEY AREAS

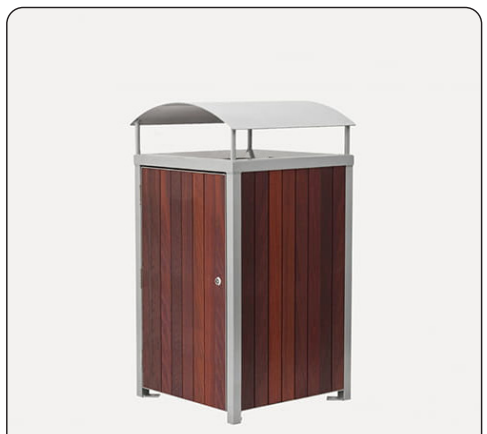
COLOURED CONCRETE TO FOCAL POINTS

RUBBER SOFTFALL

MULCH SOFTFALL

IRONCLAD ILLAWARRA SHELTER SHELTER

CHRISTIE DOUBLE BBQ



BIN ENCLOSURE

DRINK FOUNTAIN

COMPOSITE TIMBER PICNIC SETTING

COMPOSITE TIMBER BENCH SEAT WITH BACK REST

DWG **OH-03- 02**
REV **B**
DATE **APRIL 2026**

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Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lot 39 Elizabeth Street, Bayonet Head

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 25 Month 02 Year 2026

Report author or reviewer: Katharyn Kinnear

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☑ Level 3 practitioner ☐

If accredited please provide the following.

BPAD accreditation number: BPAD-30794 Accreditation expiry: Month 03 Year 2027

Bushfire management plan version number: Final v2

Bushfire management plan date: Day 04 Month 05 Year 2026

Client/business name: DevelopmentWA

	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 bushfire protection criteria elements)?		✓

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✓
Strategic planning proposal (including rezoning applications)	✓	
High risk land-use		✓
Vulnerable land-use		✓

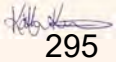
None of the above ☐

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Rezoning from Rural to Residential Land Use.

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author or reviewer 

Date 04/05/2026

BUSHFIRE HAZARD LEVEL & BUSHFIRE MANAGEMENT PLAN

Lot 39 Elizabeth Street, Bayonet Head

WA 6330

Final V2.0

4/05/2026

Site Details					
Address:	Lot 39 Elizabeth Street				
Suburb:	Bayonet Head	State:	W.A.	Postcode:	6330
Local Government Area:	City of Albany				
Description of Building Works:	Scheme Amendment (rezoning)				
Stage of WAPC Planning:	Strategic Level Proposal				

BAL Contour Plan Details			
Report / Job Number:	DLTWA010	Report Version:	Final V2.0
Assessment Date:	25 February 2026	Report Date:	4 May 2026
BPAD Practitioner:	Jason Benson (Level 2)	Accreditation No:	BPAD-37893
BPAD Practitioner:	Michelle Gray (Level 1)	Accreditation No:	BPAD-59508
BPAD Practitioner:	Kathryn Kinnear (Level 2)	Accreditation No:	BPAD-30794

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1 Introduction

DevelopmentWA engaged Bio Diverse Solutions to prepare a Bushfire Management Plan (BMP) to support a proposed Scheme Amendment for Lot 39 Elizabeth Street, Bayonet Head. The amendment seeks to rezone the northern portion of the site from Rural to Residential R30 ahead of a future subdivision application and subsequent detailed planning stages. The southern portion of the lot will remain Rural until further planning over the areas is ascertained. The Scheme Amendment and supporting Development Concept Plan contemplates future infrastructure development for residential land use, including drainage, Public Open Space (POS), and the preliminary layout of internal road reserves.

This BMP has been prepared in accordance with State Planning Policy 3.7 (WAPC 2024a) and the Planning for Bushfire Guidelines (WAPC 2024b). It provides a strategic level assessment suitable for a Scheme Amendment, noting that detailed BAL assessments, APZ design, and siting considerations will be refined at the subdivision stage.

1.1 Location

Lot 39 Elizabeth Street, Bayonet Head ("the subject site") has a total area of approximately 18.8604 ha and is currently zoned Rural under the City of Albany, Local Planning Scheme No. 2. The site is located to the northeast of the Albany CBD within the locality of Bayonet Head. It forms part of the broader Oyster Harbour urban growth area identified in the City of Albany, Local Planning Strategy.

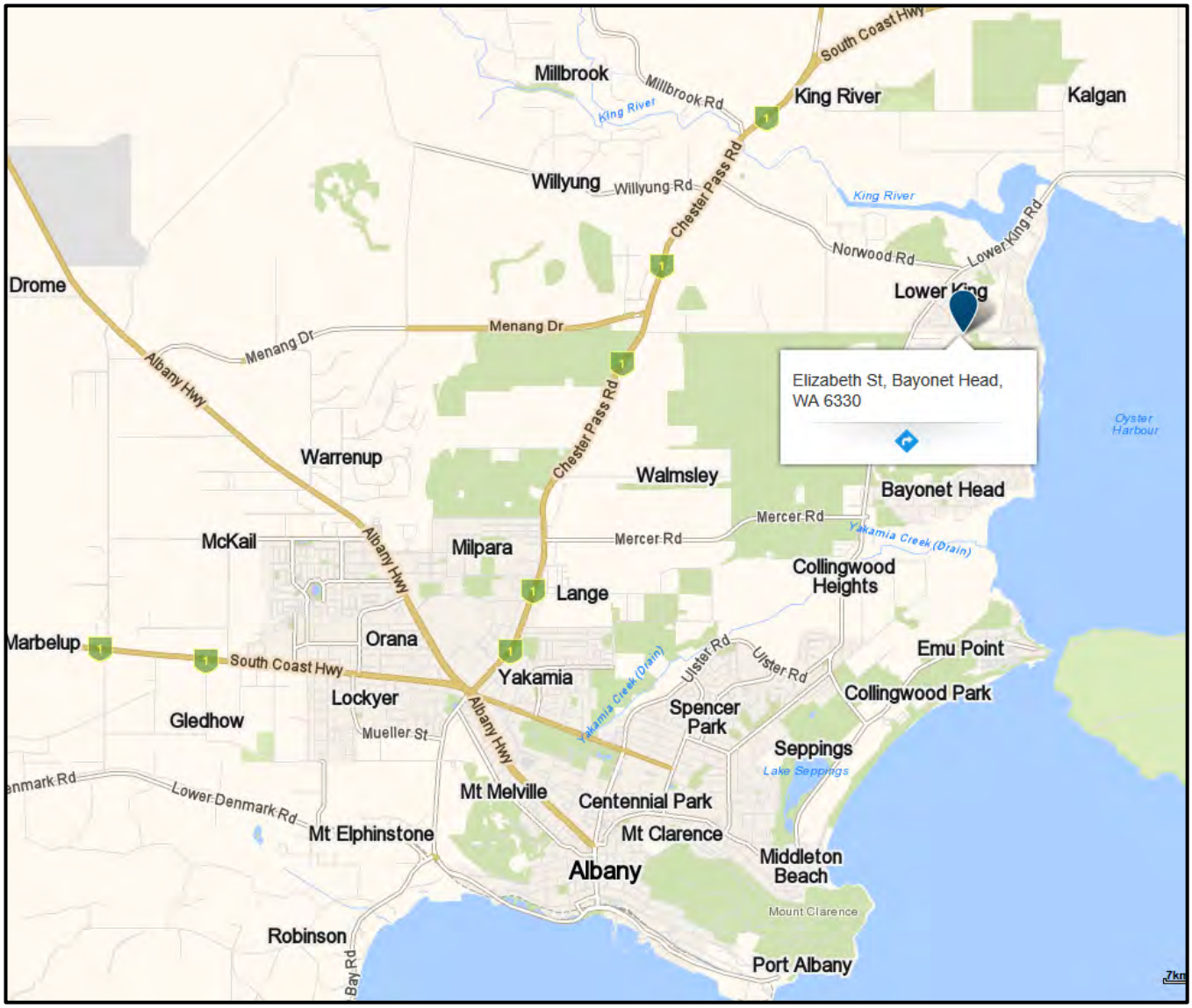

Figure 1: Location Mapping of the subject site

1.2 Development Proposal

The proposal is to rezone the northern portion of Lot 39 Elizabeth Street from Rural to Residential to facilitate future urban development within the broader Oyster Harbour growth area. The southern portion of the lot will remain rural at this stage. The development concept plan prepared by TBB Planning identifies the subject site as 18.8604ha and illustrates the preliminary arrangement of residential land, rural land, Public Open Space, drainage areas, and internal road reserves. A Conceptual Landscape Masterplan has also been prepared for the site (Appendix D) to illustrate the potential landscaping design and intent, which will be refined at the subdivision stage.

The indicative land use distribution shown on the concept plan includes:

- Residential land (5.9023 ha);
- Rural land to be retained (8.6305 ha);
- Public Open Space (1.2776 ha);
- Drainage Reserve (0.0724 ha); and
- Local Road Reserve (2.9318 ha).

The Development Concept Plan also identifies indicative BAL-29 setback lines and a proposed shared path, as well as the retention of a heritage tree within the Public Open Space. The scheme amendment will establish the statutory framework for future subdivision, with detailed lot layout, road design, APZ placement, and BAL compliance to be addressed at the next planning stage.

DESIGN FEATURES

1. Adjoining natural bushland contributes to the characteristics of the development
2. Public Open Space configured to incorporate established stormwater flood path and landform
3. Topographical responsive street design minimises earthworks and maximises view corridors east
4. Entry boulevard incorporating central swale median
5. Heritage tree retention within road reserve
6. Public Open Space featuring drainage swale at bottom of drainage catchment
7. Diverse range of lot sizes to respond to landform, bushfire management and household diversity, ranging 300m² - 600m²
8. Moderate sized lots located in vicinity of open space amenity
9. Roadside drainage swales to accommodate pre development stormwater requirements including drainage pits

LEGEND

- Concept plan boundary
- Residential R30
- Rural zoned area
- Public open space and drainage
- Established drainage swale to be retained
- BAL29 — Anticipated BAL29 setback
- Illustrative street tree locations
- Heritage tree to be retained
- Indicative shared path alignment
- Indicative footpath alignment

Figure 2: Development Concept

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Scale 1:2000@A3, 1:1000@A1
Date 7/04/2026
Plan 25/057/004B
Drawn MH
Grid MGA2020-50
Approved MB

0 10 20 30 40 N

Development Concept

LOT 39 ELIZABETH STREET, BAYONET HEAD

A DevelopmentWA Project

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The publicly released Map of Bushfire Prone Areas (OBRM, 2025) shows that the subject site is located within a Bushfire Prone Area (within 100m of >1ha of bushfire prone vegetation) and, as such, is subject to a planning assessment of the bushfire risks. Bushfire Prone Area Mapping (OBRM, 2025) is shown in Figure 3.

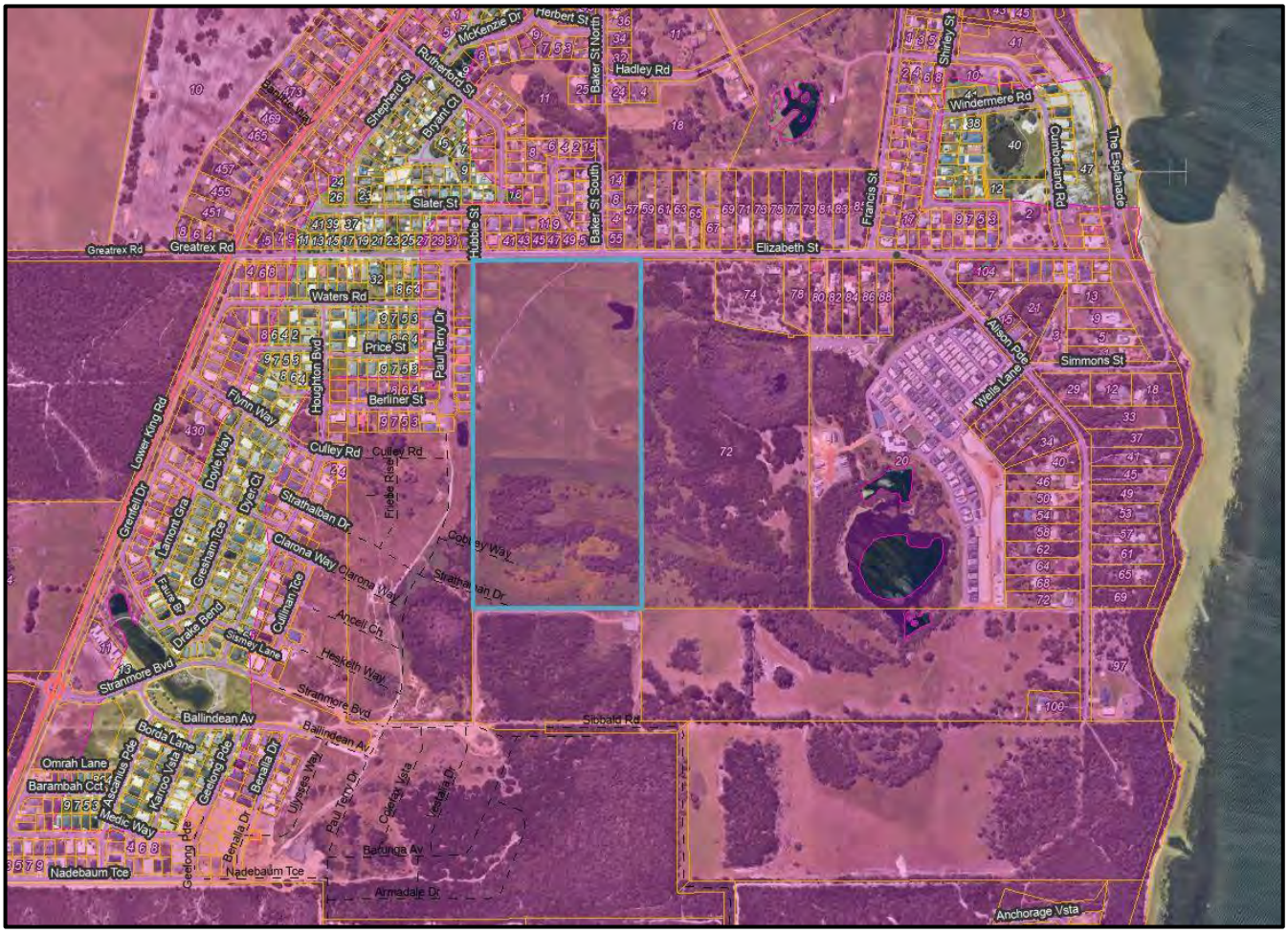


Figure 3: Map of Bushfire Prone Areas and relevance to subject site (OBRM, 2025)

1.3 Statutory Framework

This document and the recommendations contained within are aligned with the following policy and guidelines:

- Planning and Development Act 2005;
- Planning and Development (Local Planning Scheme) Regulations 2015;
- State Planning Policy (SPP) 3.7 (WAPC, 2024a);
- Planning for Bushfire Guidelines (WAPC, 2024b);
- Building Act 2011;
- Building Regulations 2012;
- Building Code of Australia (National Construction Code) (NCC, n.d.);
- Fire and Emergency Services Act 1998;
- AS 3959-2018 “Construction of Buildings in Bushfire Prone Areas” current and endorsed standards;
- Bushfires Act 1954; and
- CoA Fire Management Notice (CoA, 2025/26).

2 Environmental Considerations

2.1 Native Vegetation – Modification and Clearing

This BMP assumes that all proposed lots will be able to maintain an Asset Protection Zone (APZ) in a low-fuel state in accordance with the WAPC APZ Technical Requirements (refer to Appendix B). Implementation of the APZs will not require the removal or modification of native vegetation within this stage. Some vegetation will remain within the POS areas and the drainage reserve, but will be managed in a low-fuel, parkland-cleared state. Proposed vegetation modification areas are shown as future low fuel in Figure 6: Vegetation Classification Map.

There is no native vegetation clearing proposed (see further information in Section 2.4 of this report). Vegetation modification is in grassland paddocks only and (future) ongoing management of the POS areas. POS areas are along drainage lines and are currently proposed to be low threat in nature and are to meet APZ standards as outlined in this document, refer to Appendix B: Siting and Design Explanatory Notes. The future subdivision utilises wide road reserves for hazard separation to the east and south of the subject site. This, combined with the proposed low-threat areas within each lot and the existing low-threat areas (north and west), enables future dwellings to achieve BAL-29 or lower. Additional future management strategies for both the developer and future landowners are outlined in Section 5.2 of this report.

2.2 Review of the Environmental Data Sets (Landgate SLIP)

A review of the environmental data sets (Landgate SLIP) as identified in the Department of Planning, Lands and Heritage BMP Template for a complex development application, does not identify that any regulated (restricted) vegetation will be affected by the proposal, see Table 1 below.

Table 1: Environmental Dataset Review

Dataset	Impact on Proposal	Comment
Conservation category wetlands and buffer	No	
Wetlands and Waterways	Located Nearby	The subject site is located near Oyster Harbour, within the Albany Waterways Management Area. Wetlands occur across the site.
RAMSAR wetlands (DBCA-010)	Yes	Resource Enhancement Wetland is identified in the southern portion of the site, outside the proposed development area.
Landscape Hazards	Yes	Soil landscape risk areas for wind and water erosion cover the site and its surroundings. Soil landscape quality areas for surface acidity and salinity also cover the site and its surroundings.
Threatened and priority flora (DBCA-036)	No	No conservation significant flora has been identified within the subject site; refer to the Environmental Assessment Report prepared by Aurora Environmental (15 April 2026).
Threatened Ecological Communities (DBCA-038)	No	The proposed development within the Scheme Amendment Area will not impact any TECs or threatened flora or fauna, and therefore, a section 40 permit under the Biodiversity Conservation Act 2016 (BC Act) will not be required.
Threatened and priority fauna (DBCA-037)	No	No conservation-significant fauna species occur within the subject site. While some species may occasionally traverse the area due to habitat in the southern portion of Lot 39, none are expected to permanently reside within or rely upon the subject site.
Bush Forever areas 2000 (DPLH-019)	No	
Clearing regulations –Environmentally Sensitive Areas (DWER-046)	No	
Conservation Covenants Western Australia (DPIRD-023)	Unaware	This dataset is not publicly available.

2.3 Revegetation or Landscaping

There is streetscaping and possible planting in the southern drainage line. The planting is proposed to be low fuel in nature (grassed areas) with occasional trees (to be a minimum of 10m spacings) as shown on the concept plan (Figure 2). A Conceptual Landscape Masterplan has also been prepared for the site (Appendix D) to illustrate the indicative landscape intent, noting that final planting and species selection will be refined at the subdivision stage. Any future landscaping within the subdivision must be reviewed and approved by an accredited bushfire practitioner to ensure that proposed plantings do not increase the bushfire risk. Landscaping is to follow the principles of the Planning for Bushfire Guidelines; refer to Appendix B: Siting and Design Explanatory Notes.

2.4 Environmental Considerations

Aurora Environmental was commissioned in 2024 to undertake a Due Diligence report for a future residential subdivision. This included a database and desktop review of publicly available information. Their findings included:

- The northern part of Lot 39 has been cleared for pasture. Historic vegetation types are likely to have included Albany Blackbutt-jarrah-sheoak woodland with lower areas supporting paperbark woodland and teatree heath.
- The pre-European vegetation (high level, broad-scale mapping) is Vegetation Association 978 Albany: Low Forest, Woodland or Low Woodland with scattered trees *Eucalyptus marginata, Banksia spp., Allocasuarina spp.*
- The Albany Native Vegetation Survey (Sandiford and Barrett, 2010) indicates that the area comprises Taxandria juniperina (Wattie) Closed Forest.
- The southern area contains a wetland with native vegetation in ‘degraded’ to ‘good’ condition comprising Tall Open *Astartea scoparia* and *Callistachys lanceolata* scrub over *Juncus kraussii, Baumea articulata, Lepidosperma gladiatum and Hypolaena exsulca.*
- A dam/soak is present in the north-east portion of the site.
- A resource enhancement wetland has been identified in the southern portion of the site. (Aurora, 2024)

Noting the referenced documents used by Aurora in 2024 (Coffey Environments, 20103 and Coffey Environments, 2009b4) are dated and possible clearing may have occurred around the southern wetland area.

The Development Concept Plan for residential and infrastructure development is across the northern portion of the site and does not involve any native vegetation clearing, with the southern portion remaining in “rural” zoning for future planning and environmental considerations.

3 Bushfire Assessment Results

The bushfire assessment for this site has adhered to the requirements of the Broader Landscape Assessment (BLA), the Bushfire Attack Level (BAL) Assessment, and the Planning for Bushfire Guidelines (WAPC, 2024b)

3.1 Broader Landscape Assessment

This section presents the BLA conducted in accordance with Appendix A.1 of the Planning for Bushfire Guidelines (WAPC, 2024b). The assessment uses a points-based system to determine the broader landscape type, supported by explanatory text and figures. The BLA provides context for the bushfire risk at a landscape scale, appropriate to the complexity of the planning proposal. Relevant maps and figures required under Appendix A.1 are included to illustrate the broader landscape type and associated bushfire risk.

3.1.1 Step One: Determine the BLA area

The BLA area extends 2km from the subject site to provide a comprehensive understanding of potential bushfire risks in the surrounding landscape. This radius is appropriate given the consistency of vegetation patterns across the broader area. Refer to Figure 4: Broader Landscape Assessment Map A & B.

Predominant vegetation is located to the east, south and southwest of the site. It is noted that the proposed Scheme Amendment area is adjoined to the west by existing residential development. Land to the west and northwest comprises agricultural holdings with unmanaged grassland, which contributes to the wider bushfire landscape context. Established residential areas are located to the north, northeast, southeast, southwest, west and northwest, and are characterised by low threat vegetation and non vegetated land.

To the east is Oyster Harbour, which is a large waterbody that creates a significant break in the broader landscape and limits the potential for bushfire impact from this direction.

3.1.2 Step Two: Assess and map the broader landscape

A. Vegetation Mapping and Landscape Assessment

A desktop assessment using recent aerial imagery was undertaken to classify vegetation types and bushfire fuels within a 2km radius of the subject site. The highest bushfire risk is associated with vegetation to the east, south and southwest of the site, where continuous areas of Class A Forest and unmanaged grassland are present. These vegetation types represent the most significant contributors to potential fire runs at a landscape scale.

To the west and northwest, the landscape comprises agricultural holdings with unmanaged Class G Grassland interspersed with small patches of remnant vegetation. Residential areas are located to the north, northeast, southeast, southwest, west and northwest, and are characterised by low threat vegetation and non vegetated land. No revegetation areas were identified within the BLA area.

To the east, Oyster Harbour forms a substantial waterbody that provides a natural break in the landscape and limits the potential for bushfire impact from this direction.

B. Assessment of Vegetation Aspects Within the BLA Area

Classifiable vegetation (excluding grassland) is present primarily to the east, south and southwest of the subject site. Apart from the vegetation to the south, these vegetation areas are not extensive. However, they remain capable of contributing to bushfire behaviour at a landscape scale.

The northern, northeastern and northwestern aspects are dominated by established residential development with low threat vegetation, which reduces the potential for bushfire impact from these directions. Oyster Harbour to the east provides a significant non vegetated buffer that further limits bushfire risk from that aspect.

Refer to the Broader Landscape Assessment mapping (Figures 4 and 5) for spatial representation of vegetation types and directional context.

C. Predominant Vegetation Pattern within the BLA Area

The vegetation assessment identifies three predominant vegetation patterns within the 2km BLA area: cleared vegetation, mosaic vegetation, and large tracts of classified vegetation. Cleared vegetation accounts for the largest proportion of the landscape at 56 per cent and is primarily associated with residential development to the north, northeast, east, southeast, southwest, west and northwest. These areas contain low threat vegetation and non vegetated land, which limits the potential for landscape scale bushfire impacts from these directions. Refer to Figure 5: Broader Landscape Assessment Map C & D for supporting spatial context.

Approximately 24 per cent of the BLA area exhibits a mosaic vegetation pattern, most evident to the west and southwest. This pattern comprises unmanaged Class G Grassland interspersed with small patches of remnant vegetation. These areas typically support lower intensity fire behaviour but can still contribute to fire spread under adverse conditions.

Large tracts of vegetation represent around 20 per cent of the BLA area and are located predominantly to the east, south and southwest of the site. These areas include Class A Forest and unmanaged Class G Grassland that have the capacity to sustain higher intensity fire runs. The vegetation to the south is the most continuous and represents the highest potential for fire progression toward the site at a landscape scale.

The distribution of these vegetation patterns is consistent with the directional assessment in sections A and B and is summarised in Table 2 below.

Table 2: Predominant Vegetation Pattern (%)

Vegetation Type	Percentage Breakdown
Cleared Vegetation	56%
Mosaic Pattern	24%
Large Tracts of Classified Vegetation	20%

D. Road Pattern and Access to Suitable Destinations

Vehicular access to and from the subject site is simple and direct, with limited intersections and clearly defined routes. The primary access roads servicing the site are Elizabeth Street, Lower King Road and Francis Street, which connect the site to the existing residential areas of Bayonet Head and Lower King, which are the nearest suitable destinations.

Additional suitable destinations include the Albany Leisure and Aquatic Centre (ALAC), a designated City of Albany Local Emergency Management Arrangements (LEMA) Welfare Centre, located less than 10km to the southwest. These suitable destinations, including ALAC, are accessible via the surrounding existing road network (Elizabeth Street, Lower King Road and Francis Street), which link to Ulster Road, Mercer Road and the surrounding road network.

The road hierarchy utilised within the assessment area to access suitable destinations comprises:

- Regional Distributor: Lower King Road and Mercer Road.
- Local Distributer: Strandmore Boulevard, Allwood Parade, Norwood Road, and Nanarup Road.
- Access Roads: Elizabeth Street, Alison Parade, Francis Street, Bayonet Head Road, Nadebaum Terrace and Ballendean Avenue.

All roads are sealed and reliable, with gentle topography and no known impediments to safe evacuation. The road layout provides extended view lines and direct access to suitable destinations, following a modified grid pattern with minimal curvature or cul-de-sac features.

Vegetation along the access routes to the nearest suitable destinations is generally low-threat and well-managed, with no overhanging vegetation noted during the site assessment. Refer to Figure 5: Broader Landscape Assessment Map C & D for annotated routes and supporting spatial context.

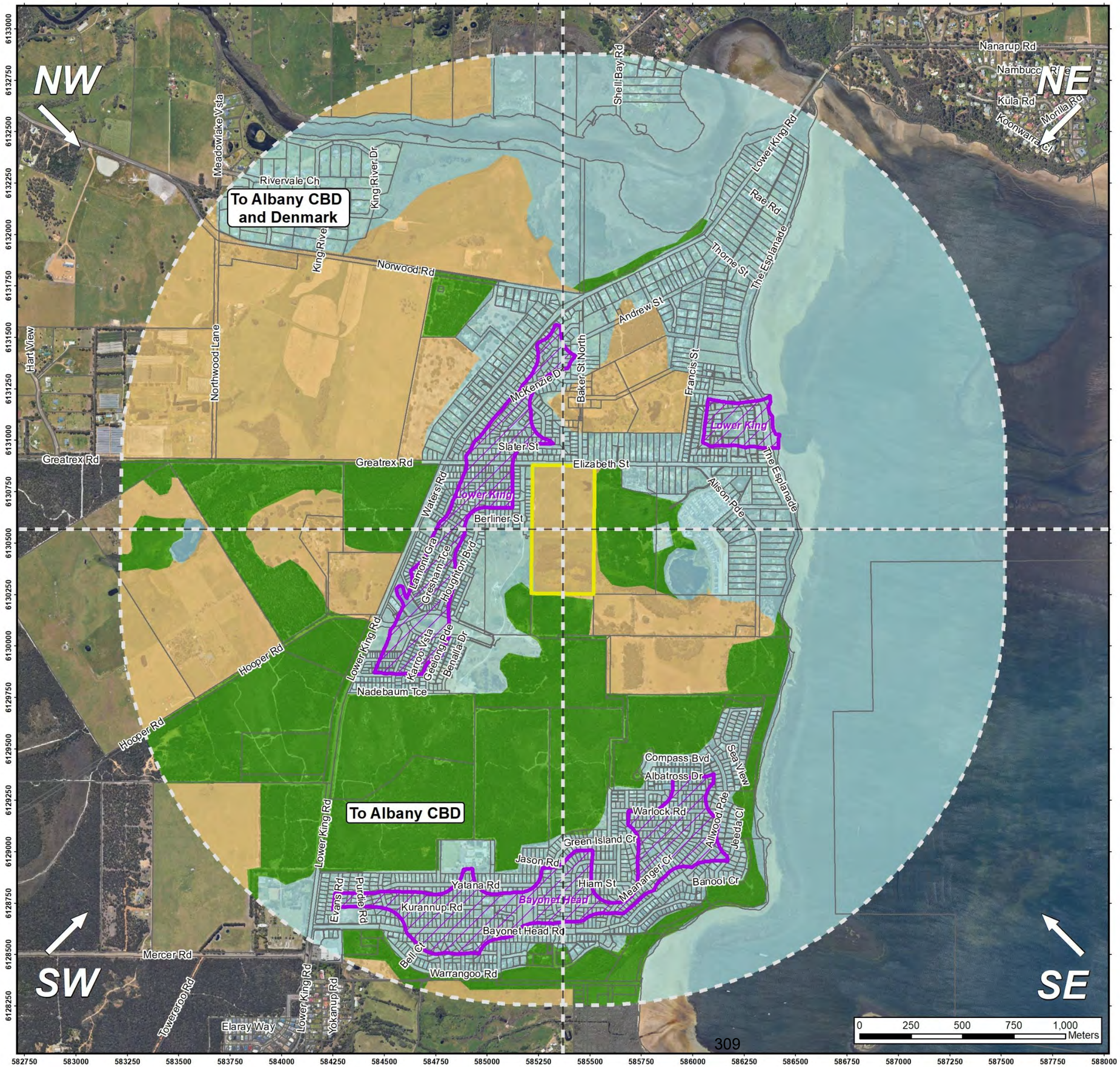
3.1.3 BLA Matrix

A BLA matrix is provided in Table 3, and the BLA Map is shown in Figures 4 and 5.

The proposal meets the acceptable solution of Bushfire Protection Criteria 4: Strategic Planning, Element 1: Location (WAPC, 2024b), as it is located in a Broader Landscape Type A.

Table 3: BLA matrix for development

Criteria	5 points	2 points	1 point	Points
Proximity of the planning proposal to a suitable destination is:	>10km	1-10km	<1 km	1
The road pattern from the planning proposal to a suitable destination is:	Complex and indirect (cul-de-sacs and/or multiple intersections)	Mixed road patterns	Simple and/or direct (limited intersections)	1
The predominant vegetation pattern is:	Large tracts of vegetation (contiguous vegetation)	A mosaic pattern of vegetation (e.g. vegetation within rural living precincts	Cleared vegetation (e.g. clearing for residential-zoned urban lots)	1
Exposure of the planning proposal to an identified external bushfire hazard (excluding Grass type G) is from:	Three or four aspects	Two aspects	From nil or one aspect only	2
Total points				5
Broader Landscape Type A applied.				



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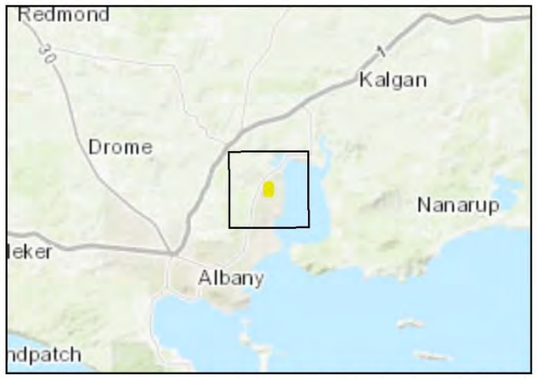

Overview Map Scale 1:500,000

Legend

- Subject Site
- 2km Assessment Boundary
- Cadastre
- Suitable Destination

Vegetation Type

- Low threat vegetation
- Unmanaged grassland
- All other classified vegetation

N

Scale
1:18,000 @ A3
GDA MGA 2020 Zone 50

Data Sources
Overview Map: World Topographic Map (Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community)
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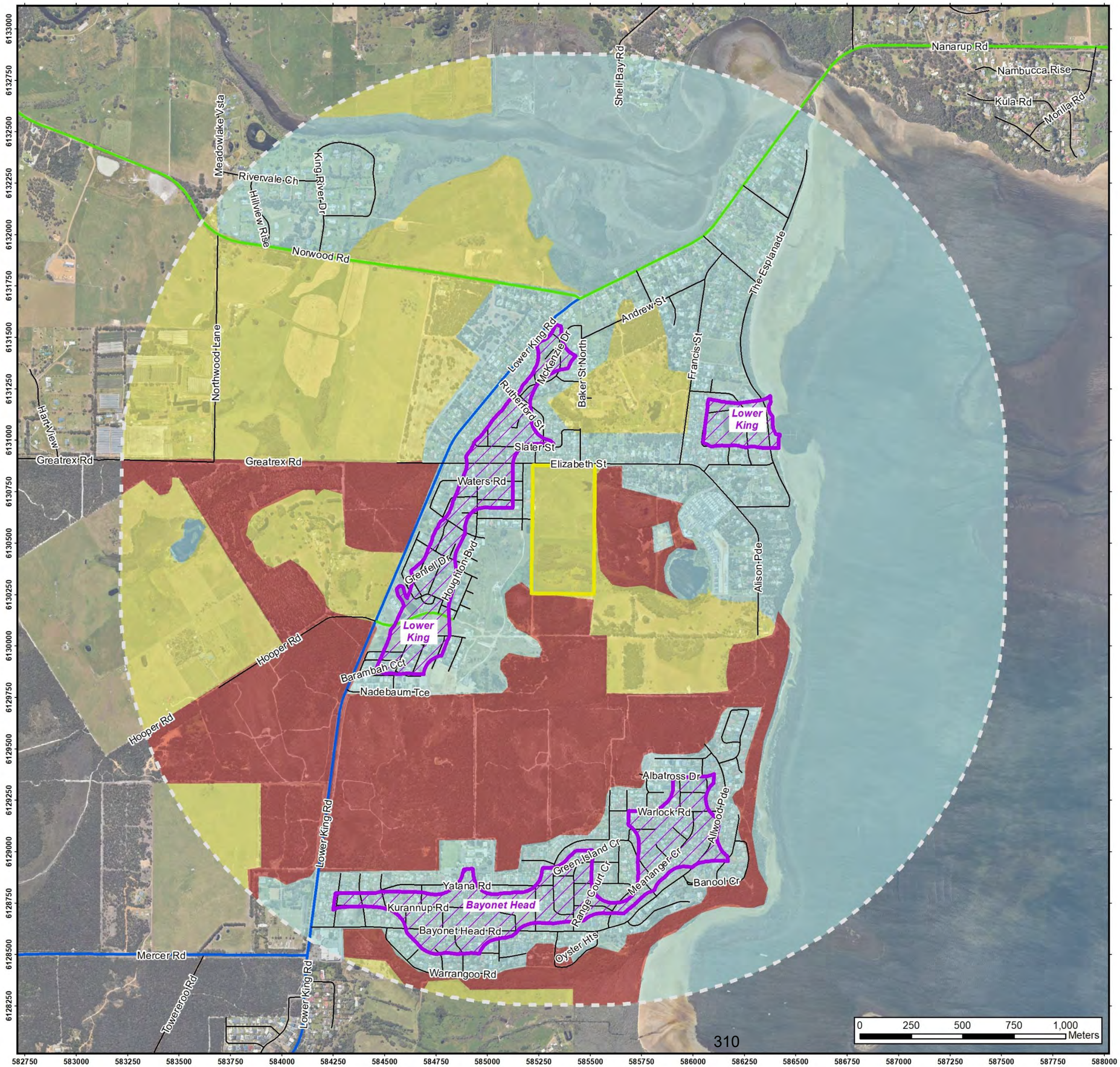
DevelopmentWA
Lot 39 Elizabeth Street
Bayonet Head WA 6330

Figure 4: Broader Landscape Assessment Map A & B

Prepared by	Accreditation Level	Accreditation Number
JRB	2	BPAD-37893
QA Check	**Drawn by**	**Status**
MKG	GSK	FINAL
File	**Date**	**Aerial**
DLTWA010	27/03/2026	October 2024



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Overview Map Scale 1:500,000

Legend

- Subject Site
- 2km Assessment Boundary
- Suitable Destination

Predominant Vegetation Pattern

- Cleared vegetation (56%)
- Mosaic pattern (24%)
- Large tracts of vegetation (20%)

Road Hierarchy

- Regional Distributor
- Local Distributor
- Access Road

N

Scale
1:18,000 @ A3
GDA MGA 2020 Zone 50

Data Sources
Overview Map: World Topographic Map (Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community)
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DevelopmentWA
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Bayonet Head WA 6330

Figure 5: Broader Landscape Assessment Map C & D

Prepared by	*Accreditation Level*	*Accreditation Number*
JRB	**2**	**BPAD-37893**
QA Check	*Drawn by*	*Status*
MKG	**GSK**	**FINAL**
File	*Date*	*Aerial*
DLTWA010	**27/03/2026**	**October 2024**

3.2 Assessment Inputs

Bushfire Assessment inputs for the site have been calculated using the Method 1 BAL Assessment procedure as outlined in AS 3959-2018. This incorporates the following factors:

- WA adopted the Fire Danger Index (FDI), with an FDI 80;
- Vegetation Classes;
- Effective Slope under classified vegetation; and
- Distance between the proposed development site and classified vegetation.

3.2.1 Vegetation Classification

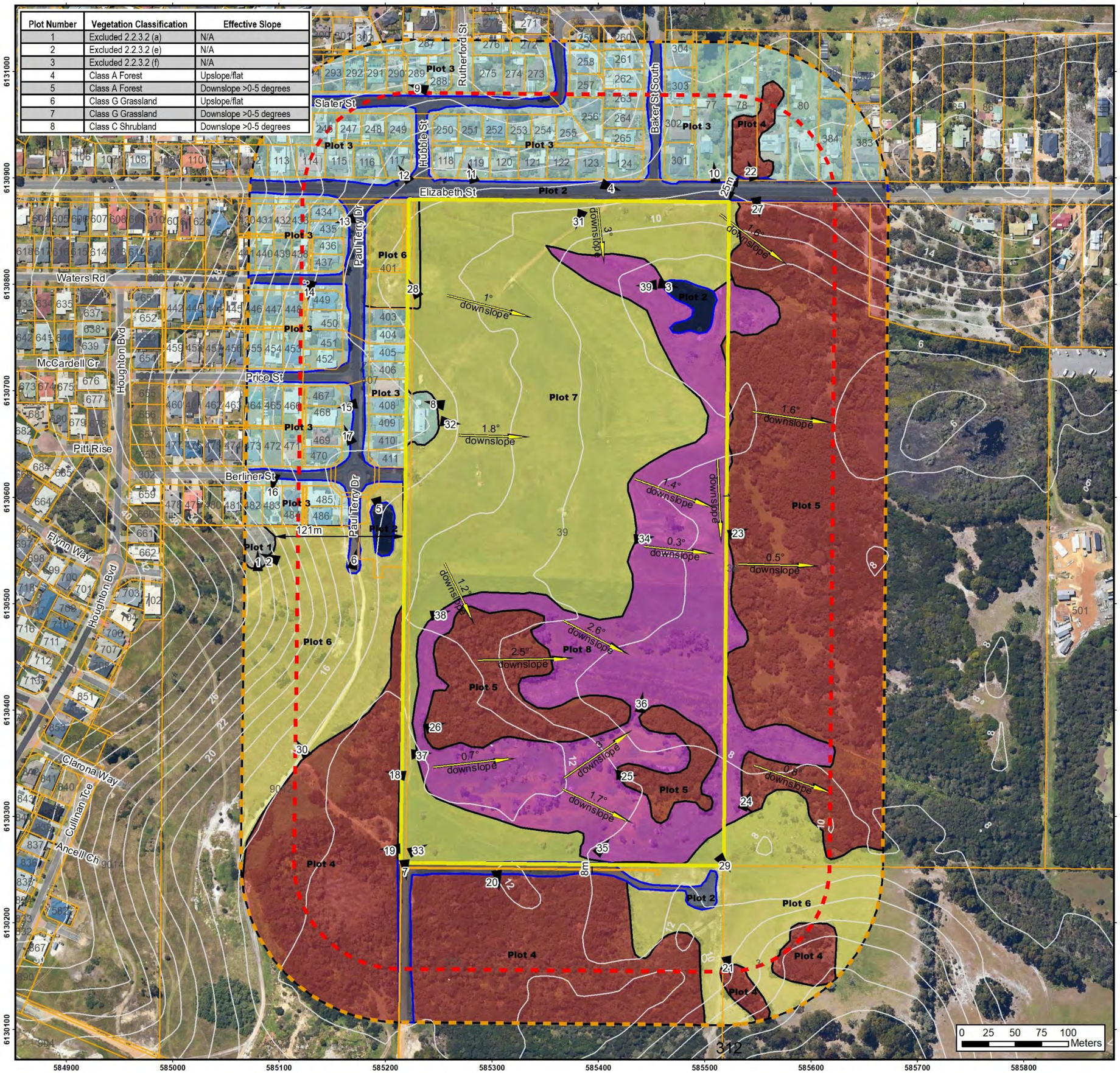
Site assessment occurred on the 25 February 2026 by Jason Benson (BPAD-37893). All vegetation within 150m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified in the following pages and shown on the Vegetation Classification Map (Figure 6) on the following page.

A summary of the plot data assessed as per Clause 2.2.3 of AS 3959-2018 is provided below in Table 4; detailed plot data is provided in Appendix A.

Table 4: Vegetation Classification Table (in accordance with AS 3959-2018) of the subject site

Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (a)	N/A
2	Excluded 2.2.3.2 (e)	N/A
3	Excluded 2.2.3.2 (f)	N/A
4	Class A Forest	Upslope/flat
5	Class A Forest	Downslope >0-5 degrees
6	Class G Grassland	Upslope/flat
7	Class G Grassland	Downslope >0-5 degrees
8	Class C Shrubland	Downslope >0-5 degrees

Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (a)	N/A
2	Excluded 2.2.3.2 (e)	N/A
3	Excluded 2.2.3.2 (f)	N/A
4	Class A Forest	Upslope/flat
5	Class A Forest	Downslope >0-5 degrees
6	Class G Grassland	Upslope/flat
7	Class G Grassland	Downslope >0-5 degrees
8	Class C Shrubland	Downslope >0-5 degrees



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BIO DIVERSE SOLUTIONS

BPAD Bushfire Planning & Design

Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 2m Contours (DPIRD-072)
- Separation Distance
- Effective Slope
- Photo Point
- Vegetation Classification Border Exclusion (e)
- Vegetation Classification Border

Classified Vegetation

- A Forest
- C Shrubland
- G Grassland

Excluded Vegetation

- Clause 2.2.3.2 (a), (b), (c) and (d)
- Clause 2.2.3.2 (e) non-vegetated
- Clause 2.2.3.2 (f) low threat vegetation

N

Scale
1:3,500 @ A3
GDA MGA 2020 Zone 50

Data Sources
Overview Map: World Topographic Map (Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community)
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Bayonet Head WA 6330

Figure 6: Vegetation Classification Map

Prepared by	Accreditation Level	Accreditation Number
JRB	2	BPAD-37893
QA Check	**Drawn by**	**Status**
MKG	GSK	FINAL
File	**Date**	**Aerial**
DLTWA010	15/04/2026	October 2024

3.3 Assessment Outputs

The BHL process identifies the likely impact of a bushfire event as it interacts with the bushfire hazards within and adjacent to the site. The BHL is a measure of the likely intensity of a bushfire and the expected level of bushfire attack on a site by categorising the hazard (WAPC, 2024b). The allocation of the bushfire hazard category is determined in accordance with Table 4 of the Planning for Bushfire Guidelines (WAPC, 2024b), as shown in Figure 7.

Table 4: Bushfires Hazard Level (BHL) and vegetation classification (as per AS 3959)

HAZARD LEVEL	CLASSIFICATION/CHARACTERISTICS
Extreme	• Class A: Forest • Class B: Woodland • Class D: Scrub • Any classified vegetation with a greater than 10-degree slope
Moderate	• Class C: Shrubland • Class E: Mallee/Mulga • Class G: Grassland, including sown pasture and crops • 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, which may include mangroves and other saline wetlands, areas of maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks. • Managed grassland in a minimal fuel condition, meaning there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example, short-cropped grass to a nominal height of 100 millimetres. • Non-vegetated areas, waterways, exposed beaches, roads, footpaths, buildings or rock outcrops.

Figure 7: BHL Assessment allocation of category (WAPC, 2024b)

The BHL process involves mapping the site to AS3959 and preparing a pre-development BHL Map and a post-development BHL Map. Vegetation classification for the site, undertaken in accordance with AS3959, is outlined in Table 4 and Figures 6 to guide the inputs to the BHL Assessment.

3.4 Potential Bushfire Impacts - BHL allocation

The potential bushfire impact on the site and proposed development from each identified vegetation plot is presented in Table 5 and shown in Figure 8: BHL Map. BHL allocation is pre-development, with post-development BHL shown in Figure 9. The BHL mapping demonstrates that the northern residential area is only impacted by Class C Shrubland and Class G Grassland, with vegetation in the southern portion of the site and the eastern adjacent lot (Lot 38) remaining unchanged due to being a wetland or offsite vegetation, respectively.

Table 5: Potential Bushfire Impacts on the Site (BHL Pre- and Post-Construction).

Plot Number	Vegetation Type (Table 2.3)	Effective Slope (Table 2.4.3)	BHL Pre-Development	BHL Post-Development
1	Excluded 2.2.3.2 (a)	N/A	Low	Low
2	Excluded 2.2.3.2 (e)	N/A	Low	Low
3	Excluded 2.2.3.2 (f)	N/A	Low/Moderate	Low/Moderate
4	Class A Forest	Upslope/flat	Extreme	Extreme
5	Class A Forest	Downslope >0-5 degrees	Extreme	Extreme
6	Class G Grassland	Upslope/flat	Moderate	Moderate
7	Class G Grassland	Downslope >0-5 degrees	Moderate	Low/Moderate
8	Class C Shrubland	Downslope >0-5 degrees	Moderate	Moderate

NOTES ON BHL ASSESSMENT

- The BHL assessment was prepared by an Accredited Level 2 Bushfire Planning Practitioner (BPAD-37893);
- The BHL Assessment and Map has been prepared in accordance with Department of Planning (WAPC) Planning for Bushfire Guidelines (WAPC, 2024b);
- Internal grassland vegetation (part of Plot 7) will be managed in a low-fuel condition as part of the development of the residential areas;
- Future management of the Forest vegetation (part of Plot 5), internal to the subject site in the south, is unknown. Post-development, the BHL in this area will remain Extreme. Future management will include the installation of a 3m wide firebreak along the boundary of the adjacent lot to the east, which is also owned by DevelopmentWA;
- The area proposed for residential development is currently subject to a Low/Moderate BHL and will remain Low/Moderate post-development;
- The area in the east of the site, within adjacent Lot 38 Elizabeth Street (Plot 5 Forest), is currently an Extreme BHL. This external vegetation presents as Extreme in both the pre- and post-development BHL. Appropriate separation distances will be established at the subdivision stage, with future road reserves providing hazard separation. Future management will include the installation of a 3m wide firebreak along the boundary of the adjacent lot to the east, which is also owned by DevelopmentWA;
- Once the lot layout is established at the subdivision stage, a BAL Contour Plan will be prepared to determine BAL ratings for the proposed lots;
- The assumptions contained within this report are based on the Development Concept Plan supplied by the client (Figure 2); and
- The subject site is located in a Bushfire Prone Area; see Figure 3 (OBRM, 2024).

Note on external vegetation

External to the subject site to the east (Lot 38) is an area of Class A Forest (refer to Figure 6: Vegetation Classification Map), which is also owned by DevelopmentWA. Vegetation within Lots 38 and 39 is within the control of the landowner and may be removed or modified to reduce bushfire risk, subject to approval. Vegetation outside the landowner's control cannot be modified, and therefore, the bushfire threat from offsite vegetation cannot be reduced. Vegetation or fuel management measures external to the subject site are not required as part of this proposal.

Note on internal vegetation

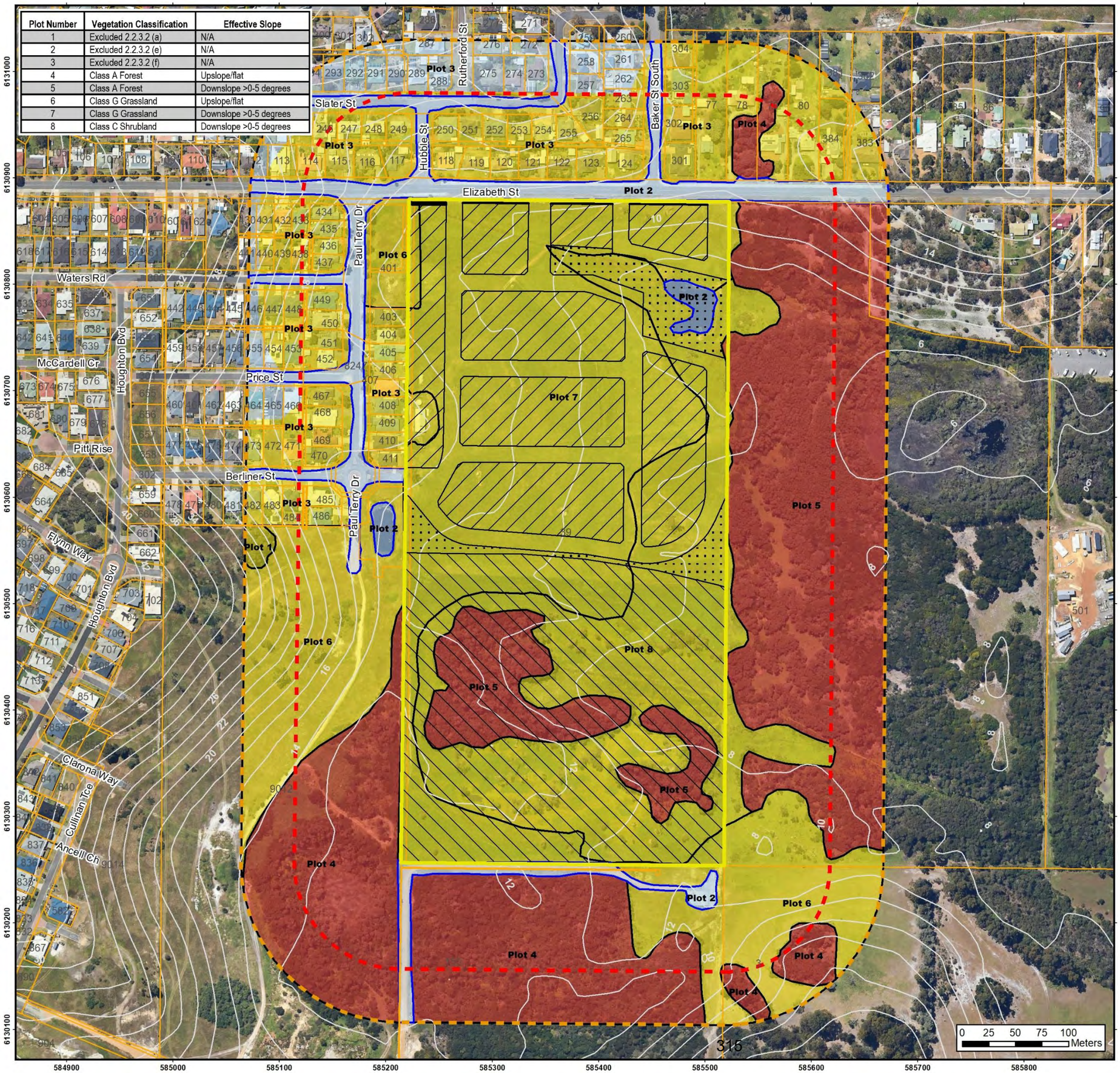
The lot contains significant areas of internal grassland, which are mapped as a low bushfire hazard. The southern wetland portion of the subject site contains a Resource Enhancement Wetland, and future management of this area is unknown. For the purposes of this BMP, vegetation in this area has been assumed to remain unchanged to establish a worst-case scenario for the future subdivision.

For the required separation distances from each vegetation plot to achieve a BAL-29 compliant Asset Protection Zone (APZ), refer to Table 6. A BAL-29 Developable Area is also shown on Figure 9: Bushfire Hazard Level Map (post-development).

Table 6: Separation Distances to achieve BAL-29 from each Vegetation Plot (BAL-29 APZ).

BAL-29 Asset Protection Zone				
Plot Number	Vegetation Classification	Effective Slope Degrees	Achievable BAL Rating	Minimum Separation Distance Required (metres)
4	Class A Forest	Upslope/flat	BAL-29	21
5	Class A Forest	Downslope >0-5 degrees		27
6	Class G Grassland	Upslope/flat		8
7	Class G Grassland	Downslope >0-5 degrees		9
8	Class C Shrubland	Downslope >0-5 degrees		10

Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (a)	N/A
2	Excluded 2.2.3.2 (e)	N/A
3	Excluded 2.2.3.2 (f)	N/A
4	Class A Forest	Upslope/flat
5	Class A Forest	Downslope >0-5 degrees
6	Class G Grassland	Upslope/flat
7	Class G Grassland	Downslope >0-5 degrees
8	Class C Shrubland	Downslope >0-5 degrees



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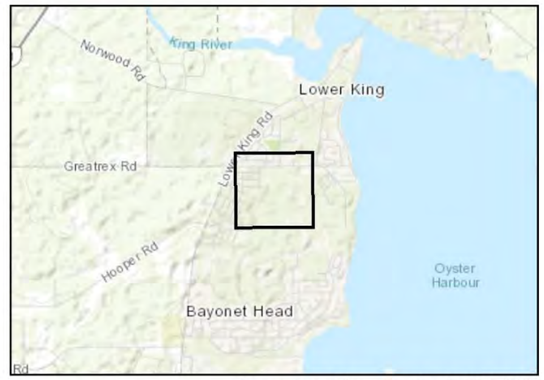

Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 2m Contours (DPIRD-072)
- Vegetation Classification Border Exclusion (e)
- Vegetation Classification Border

Land Use

- Residential (R30)
- Rural (8.6305ha)
- Public Open Space (1.2776ha)
- Drainage Reserve

Bushfire Hazard Level

- Extreme
- Moderate
- Low

N

Scale
1:3,500 @ A3
GDA MGA 2020 Zone 50

Data Sources
Overview Map: World Topographic Map (Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community)
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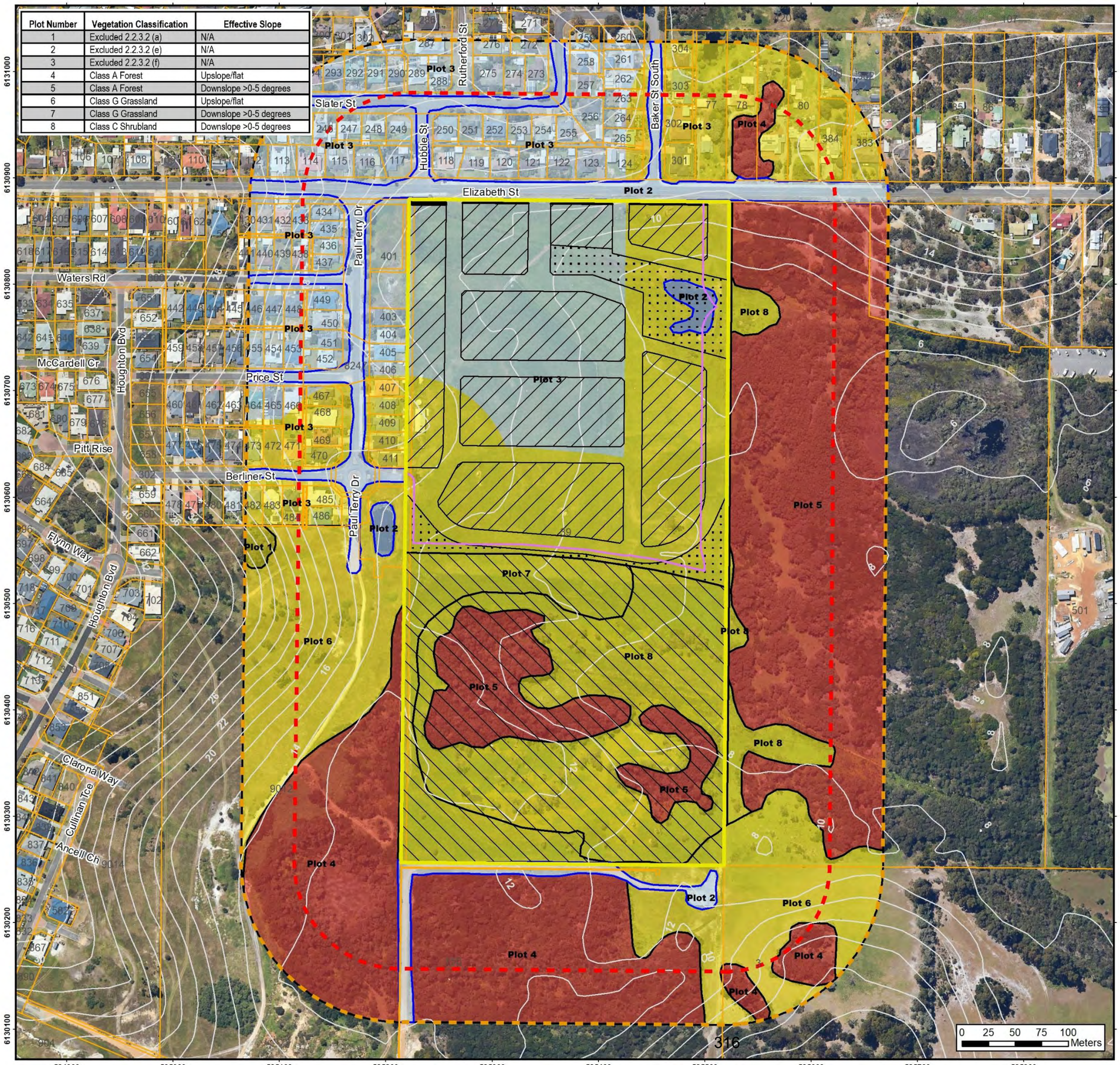
Figure 8: BHL Map – Pre-Development

Prepared by	Accreditation Level	Accreditation Number
JRB	2	BPAD-37893
QA Check	**Drawn by**	**Status**
KPK	GSK	FINAL
File	**Date**	**Aerial**
DLTWA010	15/04/2026	October 2024

Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (a)	N/A
2	Excluded 2.2.3.2 (e)	N/A
3	Excluded 2.2.3.2 (f)	N/A
4	Class A Forest	Upslope/flat
5	Class A Forest	Downslope >0-5 degrees
6	Class G Grassland	Upslope/flat
7	Class G Grassland	Downslope >0-5 degrees
8	Class C Shrubland	Downslope >0-5 degrees



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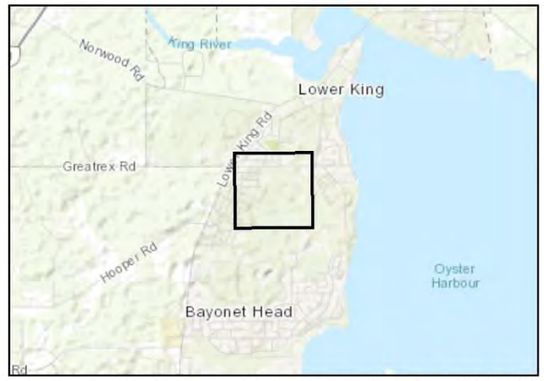

Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 2m Contours (DPIRD-072)
- BAL-29 Developable Area
- Vegetation Classification Border Exclusion (e)
- Vegetation Classification Border

Land Use

- Residential (R30)
- Rural (8.6305ha)
- Public Open Space (1.2776ha)
- Drainage Reserve

Bushfire Hazard Level

- Extreme
- Moderate
- Low

N

Scale
1:3,500 @ A3
GDA MGA 2020 Zone 50

Data Sources
Overview Map: World Topographic Map (Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community)
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Figure 9: BHL Map – Post-Development

Prepared by	Accreditation Level	Accreditation Number
JRB	2	BPAD-37893
QA Check	**Drawn by**	**Status**
KPK	GSK	FINAL
File	**Date**	**Aerial**
DLTWA010	15/04/2026	October 2024

4 Identification of Bushfire Hazard Issues

4.1 Bushfire Risk Considerations

The primary bushfire risks associated with the subject site arise from the areas of classifiable vegetation located external to the site to the south, east and southwest, along with smaller areas of remnant vegetation within the Rural portion of Lot 39. These areas present predominantly as Class A Forest, Class D Scrub and unmanaged Class G Grassland, all of which can generate significant bushfire behaviour under Extreme to Catastrophic fire weather conditions.

Large tracts of vegetation to the south represent the most continuous fuel source and the most likely direction for a sustained fire run toward the site. Vegetation in this direction extends for several kilometres before transitioning to low threat residential areas and non vegetated land closer to the Albany CBD. To the east, Oyster Harbour forms a substantial water body that provides a natural break in the landscape and limits the potential for bushfire impact from this direction.

Within the northern portion of Lot 39 proposed for rezoning, most vegetation will be removed to facilitate future subdivision. Public Open Space, drainage areas and internal road reserves will provide opportunities for compliant Asset Protection Zones at the detailed design stage. Any vegetation retained within POS areas will be maintained in a low threat state consistent with Schedule 1 WAPC APZ standards.

To the west and southwest, agricultural holdings contain unmanaged Class G Grassland interspersed with small patches of remnant vegetation. If unmanaged, this vegetation presents a moderate bushfire risk to the site. Grassland fire behaviour is typically fast moving but of lower intensity than forest fuels.

To the north, northeast and northwest, the site is bordered by established residential development characterised by low threat vegetation and non vegetated areas. These areas do not contribute to bushfire risk at a landscape scale.

4.2 Access

The subject site currently has direct access from Elizabeth Street, with additional connections available via Francis Street, Lower King Road, Paul Terry Drive and the surrounding public road network. These roads provide access in multiple directions and connect to major routes, including Lower King Road, which leads toward the Albany CBD and the wider regional road network.

The future subdivision layout will introduce a new internal road network that integrates with the existing public road system. This will provide safe access and egress in at least two different directions to two suitable destinations, consistent with the requirements of the guidelines.

Roads within and surrounding the site range from approximately 6m to 20m in width, providing compliant two-way access for emergency vehicles and residents. All new public roads will be constructed as all-weather surfaces and will meet the minimum technical standards set out in the guidelines.

4.3 Water Supply

A reticulated water supply is available to the subject site. Existing hydrants are located along Elizabeth Street, providing coverage to the site boundary. Additional hydrants will be installed within the future subdivision in accordance with Water Corporation Design Standard DS63: Water Reticulation Standard – Design and Construction Requirements for Water Reticulation Systems up to DN250.

This meets the acceptable solutions for Element 4: Water under the guidelines.

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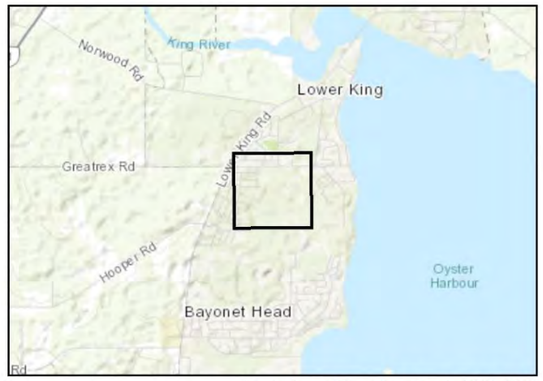

Overview Map Scale 1:100,000

Legend

- Subject Site
- Cadastre
- Land Use
- Public Access Route
- Proposed Access Route
- H Water Hydrant (WCORP-070)

N

Scale
1:3,500 @ A3
GDA MGA 2020 Zone 50

Data Sources
Overview Map: World Topographic Map (Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community)
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Figure 10: Access and Water Map

Prepared by	Accreditation Level	Accreditation Number
JRB	2	BPAD-37893
QA Check	Drawn by	Status
KPK	GSK	FINAL
File	Date	Aerial
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5 Assessment against the Bushfire Protection Criteria

5.1 Compliance Table

The Planning for Bushfire Guidelines (WAPC, 2024b) outlines bushfire protection criteria for which subdivision and development proposals are assessed for compliance. The bushfire protection criteria four are performance-based criteria utilised to assess bushfire risk management measures, and they outline four elements:

- Element 1: Location;
- Element 2: Siting and Design of Development;
- Element 3: Vehicle Access; and
- Element 4: Water.

The subject site and the proposed scheme amendment have been assessed and are required to meet the "Acceptable Solutions (Criteria 4)" of each element of the bushfire mitigation measures (WAPC, 2024b). The proposal has been assessed against all elements of the bushfire protection criteria four and found to be compliant, refer to Table 7 below.

Table 7: Bushfire protection criteria applicable to the subject site

Element	Acceptable Solution	Applicable or not Yes/No	Proposal meets Acceptable Solution
Element 1 – Location	A1.1a Broader Landscape Type A	Yes	Compliant The subject site is located within a Broader Landscape Type A. The Broader Landscape Assessment in Section 3.1 demonstrates that the surrounding 2km landscape is dominated by cleared land, residential development and mosaic vegetation patterns, with large tracts of vegetation limited to the south, east and west. The Broader Landscape Assessment Maps (Figures 4 and 5) provide justification for the allocation of the BLA Type. Proposal meets Acceptable Solution A1.1a.
	A1.1b Broader Landscape Type B	No	The proposal has not been assessed as Broader Landscape Type B. Not assessed to A1.1b.
Element 2 – Siting and Design	A2.1 Siting and design	Yes	Compliant The areas of the subject site identified for intensification and future residential development achieve a post-development bushfire hazard level of Moderate or Low. The portion of Lot 39 proposed to be rezoned to Residential R30 contains sufficient cleared and low-threat land to ensure that all future habitable buildings can be sited in locations that will achieve BAL-29 or lower once subdivision works and vegetation modifications are completed. The larger balance of Lot 39, which will remain Rural, contains areas of Extreme BHL associated with Class A Forest and unmanaged vegetation. However, this Rural land also contains sufficient Moderate BHL areas to enable a dwelling to be sited in a location capable of achieving BAL-29 or lower, provided no further intensification or additional development occurs within the higher hazard portions of the lot. Compliance will be achieved through appropriate siting and design, supported by vegetation modification and the establishment of low-threat APZ conditions in perpetuity, consistent with Schedule 1 WAPC APZ standards. Proposal meets Acceptable Solution A2.1.
	A2.2 Clearing of native vegetation	No	The subdivision does not require the removal or modification of native vegetation within this stage. Not assessed to A2.2.
Element 3 – Vehicular Access	A3.1 Public roads	Yes	Compliant Elizabeth Street, Waters Road, Francis Street, Lower King Road, Paul Terry Drive and the surrounding public road network are constructed in accordance with the minimum technical requirements set out in the Planning for Bushfire Guidelines (Appendix B.3, Table 10). The proposed new internal roads within the future subdivision will connect directly to this network and will also meet these technical requirements. All new public roads will be constructed as all-weather surfaces and will follow the specifications outlined in Appendix B.3, Table 10. Proposal meets Acceptable Solution A3.1.

Table 7: cont.

Element	Acceptable Solution	Applicable or not Yes/No	Proposal meets Acceptable Solution
Element 3 – Vehicular Access	A3.2 Access routes	Yes	Compliant The public road network provides access and egress in at least two different directions to two suitable destinations, consistent with the requirements of the guidelines. From the site, the road network provides access east and west via Elizabeth Street toward Lower King Road which heads southwest towards the Albany CBD and northeast towards toward Nanarup Road and the Albany CBD. Other local roads include Paul Terry Drive which connects to Elizabeth Street. All of these routes are sealed all-weather roads that connect to suitable destinations. The proposed internal road network will integrate with the existing public road system, ensuring safe two-way access and egress in multiple directions. Proposal meets Acceptable Solution A3.2.
	A3.3a No-through roads	No	There are no dead-end roads proposed as part of this subdivision. Not assessed to A3.3a.
	A3.3b No-through road requirements	No	There are no dead-end roads proposed as part of this subdivision. Not assessed to A3.3b.
Element 4 – Water Supply	A4.1 Water supply	Yes	Compliant The reticulated water supply is available to the subject site, with existing hydrants located along Elizabeth Street, Paul Terry Drive and Waters Road. These hydrants provide accessible firefighting water to the site boundary. At the subdivision stage, the reticulated network will be extended into the rezoned residential area, and additional hydrants will be installed in accordance with Water Corporation Design Standard DS63 and the requirements of Appendix B4: Water Supply dedicated for bushfire firefighting. Sufficient and accessible firefighting water can therefore be provided at the subdivision and development application stages, consistent with the outcomes of Element 4. Proposal meets Acceptable Solution A4.1.

5.2 Other Bushfire Mitigation Measures for the Landowners

The Identification of Bushfire Hazard Issues (Section 4.0) has outlined the bushfire risk associated with the site. The following section outlines additional measures to assist in mitigating the bushfire risk for the proposed development.

5.2.1 Internal Access Requirements

This proposal includes the construction of new public roads. All new public roads will be all-weather constructed and will meet the minimum technical requirements set out in the guidelines (see Figure 11: Vehicular Access Technical Requirements (WAPC, 2024a)). Approval of all public roads will be required from the relevant local government at the WAPC approval stage.

	1		2		3		4		5	
TECHNICAL REQUIREMENTS	**PERIMETER ROADS**		**PUBLIC ROADS**		**EMERGENCY ACCESS WAY[3]**		**FIRE SERVICE ACCESS ROUTE[3]**		**BATTLE-AXE & PRIVATE DRIVEWAYS[1]**	
MAP OF BUSH FIRE PRONE AREAS DESIGNATION	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**	**Area 2**	**Area 1**
Minimum horizontal clearance (metres)	12	8	See note 5		10	6	10	6	6	
Minimum vertical clearance (metres)	4.5									
Minimum weight capacity (tonnes)	15									
Maximum grade unsealed road[2]	See note 5		See note 5		1:10 (10% or 6°)					
Maximum grade sealed road[2,4]					1:7 (14.3% or 8°)					
Maximum average grade sealed road					1:10 (10% or 6°)					
Minimum inner radius of road curves (metres)					8.5					

Notes:

[1] Driveways and battle-axe legs to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision where not required to comply with the widths in this Appendix or the Guidelines.

[2] Dips must have no more than a 1 in 8 (12.5% - 7.1 degrees) entry and exit angle.

[3] To have crossfalls between 3 per cent and 6 per cent.

[4] For sealed roads only the maximum grade of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50 metres is permissible, except for short constrictions to 3.5 metres for no more than 30 metres in length where an obstruction cannot be reasonably avoided or removed.

[5] As outlined in the Institute of **Public Works Engineering Australasia (IPWEA) subdivision guidelines**, **Liveable Neighbourhoods**, **Austroads Standards** Main Roads standard, supplement, policy or guideline and/or any applicable or relevant local government standard or policy.

Figure 11: Vehicular Access Technical Requirements (WAPC, 2024)

5.2.2 Minimise Ignition Sources

There is limited ability to control off-site ignition sources; however, the following measures are recommended to be undertaken by the developer while in ownership of the land and any subsequent lots.

Prior to the bushfire season (December), the following activities should be undertaken:

- Mowing, slashing and brush cutting (noting these activities are illegal on designated Total Fire Ban days);
- Maintenance of road access into and out of the site; and
- Ensuring all subcontractors are aware of their obligations through contractual requirements.

During the summer bushfire season (1 December to 14 May inclusive, as designated in the City of Albany Fire Management Notice), maintenance activities internal to the site should be planned and risk assessed prior to commencement. This includes, but is not limited to:

- Mowing, slashing and brush cutting (noting these activities are illegal on designated Total Fire Ban days);
- Welding, grinding and other hot works (not undertaken on designated Total Fire Ban days);
- Management of temporary waste disposal areas and green waste piles, ensuring piles do not exceed 1.5 metres in height and are surrounded by a minimum 10 metres of bare mineral earth; and
- Ensuring a water tender (minimum 200 litres) or fast-attack unit is on-site during the fire season when construction activities are occurring.

The site construction manager, in consultation with the developer, is responsible for managing safety during subdivision construction and must ensure the site and adjacent properties are protected from potential ignition sources at all times.

5.2.3 Fuel Reduction and APZ Management

Ongoing fuel reduction by landowners to ensure their allocated BAL applies through mechanical slashing and mowing will be required to be undertaken regularly to ensure all internal grasses are maintained. Buildings are to be inspected regularly for the build-up of wind-borne debris and leaf accumulation in gutters and at penetrations to buildings (doors, windows, etc). The lot owner is to be responsible for the implementation of the maintenance schedule to maintain their BAL and general bushfire preparedness, which should generally reflect the following actions, as shown in Table 8 below.

Table 8: Maintenance schedule – landowners

Frequency	Activity
Weekly (During fire season operations and prior to bushfire events) Also refer to Appendix B: Siting and Design Explanatory Notes	Check all buildings for wind-borne debris build-up and remove as required.
	Check gutters are free from overhanging vegetation.
	Trim and remove dead plants or leaf litter.
	Pruning of climbing vegetation, such as vines on a trellis, to prevent it from attaching to a building, especially near windows and doors.
	Check outdoor objects around buildings (see list below).
	Raking and cleaning underfloor spaces (if applicable).
Monthly	Mow, slash, and maintain grass to 100mm in height. Required more frequently during the spring and autumn growth periods.
	Whipper snipper/grass cutter around all buildings.
	Check that no combustible materials are stored near buildings or penetrations of buildings (windows, doors, etc.). This includes but is not limited to gas bottles, stored combustible materials, fences, vines, and plants.
	Ensure that weeds or woody materials do not encroach into the APZ area around buildings (with a minimum distance of 20m). Address any dead material by trimming, pruning, raking, and removing it to green waste.
	Any material for pre-fire season preparation is either disposed of in green waste or burned in piles away from buildings with a 10m mineral earth break around the pile.

Prior to a bushfire event, 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;
- Firewood stacks;
- Flammable sculptures; and
- Playground equipment and children's toys.

These should always be considered in the proximity to buildings and stored appropriately when not in attendance at the site. Consider any replanting or landscaping, refer to the DFES Firewise Gardening Guide (DFES, 2024), Plant Selection or 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, which 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
- Will not become a weed in the area.

Also refer to Appendix B: Siting and Design Explanatory Notes.

5.2.4 Barrier Fencing

In November 2010, the Australian Bushfire CRC issued a "Fire Note" (Bushfire CRC, 2010), which outlined the potential for residential fencing systems to act as a barrier against radiant heat, burning debris and flame impingement during bushfire. The research aimed to observe, record, measure and compare the performance of commercial fencing of Colourbond steel and timber (treated softwood and hardwood).

The findings of the research found that:

".. *Colourbond steel fencing panels do not ignite and contribute significant heat release during cone calorimeter exposure"* (exposure to heat)

".. Colourbond steel (fencing) had the best performance as a non-combustible material. It maintained structural integrity as a heat barrier under all experimental exposure conditions, and it did not spread flame laterally and contribute to fire intensity during exposure"

It is also noted that non-combustible fences are recommended by WAPC (2024), through APZ standards: Fences and sheds within the APZ are constructed using non-combustible materials, e.g. colourbond iron, brick, limestone, metal post and wire. The developer will be encouraged to build Colourbond or non-combustible fences where applicable.

5.2.5 Evaporative Air Conditioners

Evaporative air conditioning units can catch fire as a result of embers from bushfires entering the unit. These embers can then spread quickly through the home, causing rapid destruction. It can be difficult for firefighters to put out a fire in the roof spaces of homes.

It is also recommended that the Proponent:

- Ensure that suitable external ember screens are placed on rooftop-mounted evaporative air conditioners compliant with AS 3959-2018 (current and endorsed standards) and that the screens are checked annually; and
- Maintain evaporative air conditioners regularly as per DFES recommendations, refer to the DFES website for further details: http://www.dfes.wa.gov.au

5.2.6 Individual Fire Plan

Residents should prepare their own individual fire plans, as they need to make a commitment to develop a bushfire survival plan detailing preparations and actions to take if a bushfire threatens. By compiling information as outlined above, the individual lot owner can be prepared for their response in a bushfire emergency. Homeowners should not rely on emergency personnel to attend to their home, it is stressed to prepare an individual bushfire emergency plan regarding their intentions and property. This Bushfire Management Plan is not an individual bushfire emergency plan. More information can be accessed from the DFES website (s):

www.dfes./wa.gov.au

www.emergency.wa.gov.au

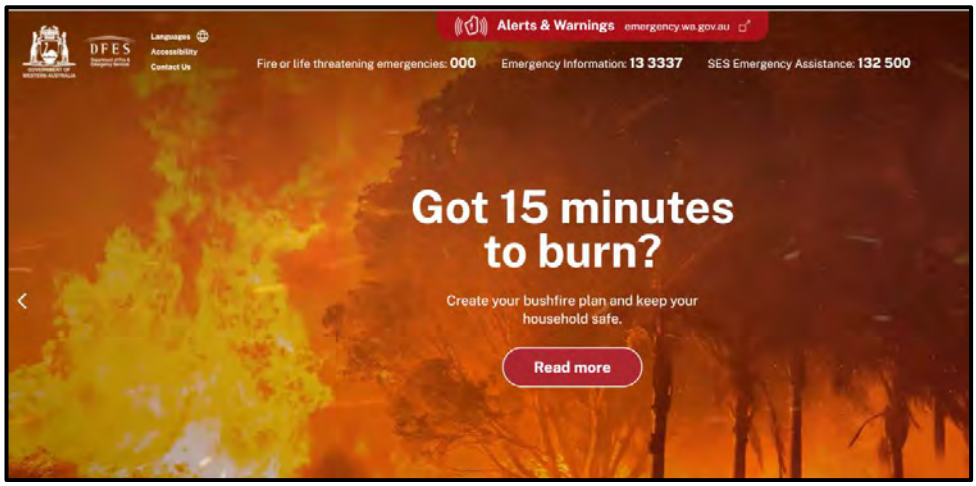

Figure 12: DFES Emergency Access Plan home page (DFES, 2024)

The DFES FDR ratings and warning systems are shown below in Figure 13.

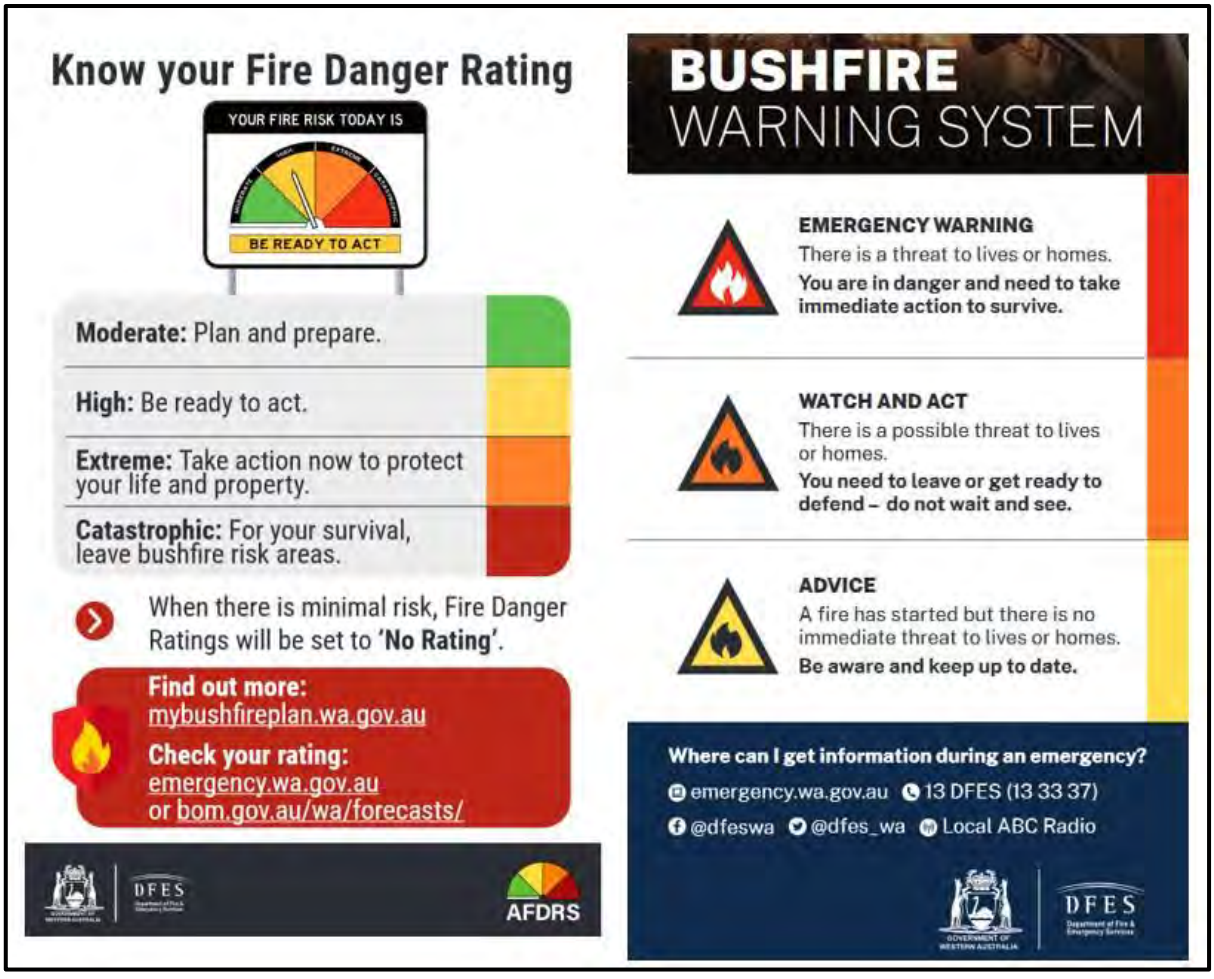

Figure 13: DFES Warning Systems (DFES, 2024)

6 Implementation Actions

This section outlines the responsibilities that apply at this strategic planning stage and identifies the bushfire management actions that will be addressed in more detail at future planning stages. Detailed implementation measures, including APZ establishment, vegetation modification, road construction and water supply installation, will be determined through a future subdivision application supported by a BAL Contour Plan and a subdivision-level Bushfire Management Plan. The responsibilities of the developer and landowner are summarised in Tables 9, 10 and 11.

6.1 Future Planning Requirements

The following bushfire assessment and reporting may be required at subsequent planning stages.

Table 9: Future Planning Requirements

No	Implementation Action
1	A BAL Contour Plan at the subdivision stage to confirm that proposed lots can achieve BAL-29 or lower.
2	Update the BMP to support the WAPC subdivision application, addressing APZ requirements, lot layout, water supply, vegetation modification and ongoing management requirements.
3	Following subdivision approval, all future habitable dwellings will require an individual BAL assessment at the development application stage.
4	A notification on title may be required at the subdivision stage under Section 165 of the Planning and Development Act 2005, advising purchasers that the land is in a designated Bushfire Prone Area and subject to bushfire planning and building requirements.

6.2 Current Landowner Responsibility (Ongoing Management)

The current landowner is responsible for the following until subdivision occurs.

Table 10: Implementation Responsibilities – Landowner (Ongoing Management)

No	Implementation Action
1	Managing the site in accordance with the current City of Albany Fire Management Notice.
2	Ensuring any proposed landscaping, planting or revegetation does not increase bushfire risk and is reviewed by an Accredited Level 2 Bushfire Practitioner.
3	Maintaining existing low-fuel areas in their current condition to ensure the bushfire risk is not increased while the subdivision application is being progressed.

6.3 Future Mitigation Measures to Be Considered at Subdivision Stage

The following bushfire mitigation measures will be addressed at the subdivision stage and are not required at this rezoning stage.

Table 11: Subdivision Stage Considerations

No	Implementation Action
1	Continue to manage the site in accordance with the current City of Albany Fire Management Notice.
2	Provide a plan of subdivision indicating the lot and road layout.
3	Define onsite future low fuel areas to achieve BAL-29 or lower across all future lots.
4	Prepare a BAL Contour Plan to form part of the BMP supporting the subdivision application.
5	Design all new internal public roads in accordance with the minimum technical requirements established by the guidelines (see Figure 11: Vehicular Access Technical Requirements). Approval from the City of Albany is required at the WAPC subdivision approval stage.
6	Provision of reticulated water supply and hydrants in accordance with Water Corporation standards.
7	Detailed landscaping design that maintains low-threat vegetation within POS and drainage areas. Species selection should follow low-flammability principles as outlined in Section 5.2.3: Fuel Reduction and APZ Management. Additional guidance is available in the DFES Firewise Gardening Guide (DFES, 2024).
8	Ensure an Accredited Level 2 Bushfire Practitioner reviews and approves any proposed planting, landscaping or revegetation to confirm it does not increase bushfire risk or create classifiable vegetation.
9	Vegetation management requirements to be determined at the subdivision stage in accordance with the finalised subdivision layout and indicative BAL Contour Plan.
10	If WAPC subdivision approval is obtained, certification from an Accredited Bushfire Practitioner confirming that bushfire mitigation measures have been implemented may be required.
11	A notification on title may be required at the subdivision stage under Section 165 of the Planning and Development Act 2005, advising purchasers that the land is in a designated Bushfire Prone Area and subject to bushfire planning and building requirements.
12	Ensure any proposed fencing installed as part of the subdivision process is non-combustible within areas required to be maintained in a low-threat state, or ensure buyers are advised of fencing requirements before installation.
13	Provide certification of the BAL Contour Plan and associated works as a separate document once subdivisional works are complete.

7 Disclaimer

The recommendations and measures contained in this assessment report are based on the information available at the time of writing following the instructions of the regulatory authorities and following the requirements of the Australian Standards 3959-2018 – Building in Bushfire Prone Areas, WAPC State Planning Policy 3.7 (WAPC, 2024a), WAPC Planning for Bushfire Guidelines (WAPC, 2024b), and applying best practice as described by Fire Protection Association Australia. These are considered the minimum standards required to balance the protection of the dwellings and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire, people injured, or fatalities occur either at the site or while evacuating. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed development are made in good faith based on the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the bushfire consultant has no control. Notwithstanding anything contained within, the consultant/s will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the bushfire consultant) arising out of the services rendered by the consultant.

AS 3959-2018 disclaimer: It should be borne in mind that the measures contained within this Standard (AS 3959-2018) cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather conditions.

Building to AS 3959-2018 is a standard primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire, thus giving a measure of protection to the building occupants (until the fire front passes) as well as the building itself (AS 3959, 2018).

8 Certification

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level (s) stated in this document have been prepared in accordance with the requirements of AS 3959-2018 and the Planning for Bushfire Guidelines (WAPC, 2024b).

SIGNED, ASSESSOR: DATE: 4/05/2026

Kathryn Kinnear, Bio Diverse Solutions

Accredited Level 2 Bushfire Practitioner (Accreditation No: BPAD-30794)

BIO DIVERSE SOLUTIONS
Environmental & Bushfire Consultants
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BPAD
Bushfire
Planning & Design
Accredited Practitioner
Level 2

9 Revision Record

Revision	Prepared By	Summary	Reviewed By	Date
Draft Id	Michelle Gray	Internal QA review	Leanne Shilton	14/04/2026
Final Id	Michelle Gray	Internal Technical Review	Kathryn Kinnear	15/04/2026
Final Id V1.0	Kathryn Kinnear	Final Review	Jason Benson	30/04/2026
Final Id V2.0	Jason Benson	Minor Text Updates	Michelle Gray	4/05/2026

10 References

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Aurora Environmental (2026) Environmental Assessment Report – Lot 39 Elizabeth Street, Bayonet Head. Unpublished document prepared for DevelopmentWA.

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11 Appendices

Appendix A: Vegetation Classifications to AS 3959-2018

Appendix B: Siting and Design Explanatory Notes

Appendix C: City of Albany Fire Management Notice (CoA, 2025/26)

Appendix D: Lot 39 Elizabeth Street, Bayonet Head Landscape Masterplan – Emerge Associates (2026)

Appendix A

Vegetation Classification to AS 3959-2018

Vegetation classification to AS3959-2018

Site Details			
Address:	Lot 39 Elizabeth Street		
Suburb:	Bayonet Head	State:	W.A.
Local Government Area:	City of Albany		
Stage of WAPC Planning:	Subdivision Application		

BMP Plan Details			
Report / Job Number:	DLTWA010	Report Version:	Final
Assessment Date:	25 February 2026	Report Date:	15 April 2026
BPAD Practitioner:	Jason Benson (Level 2)	Accreditation No:	BPAD-37893

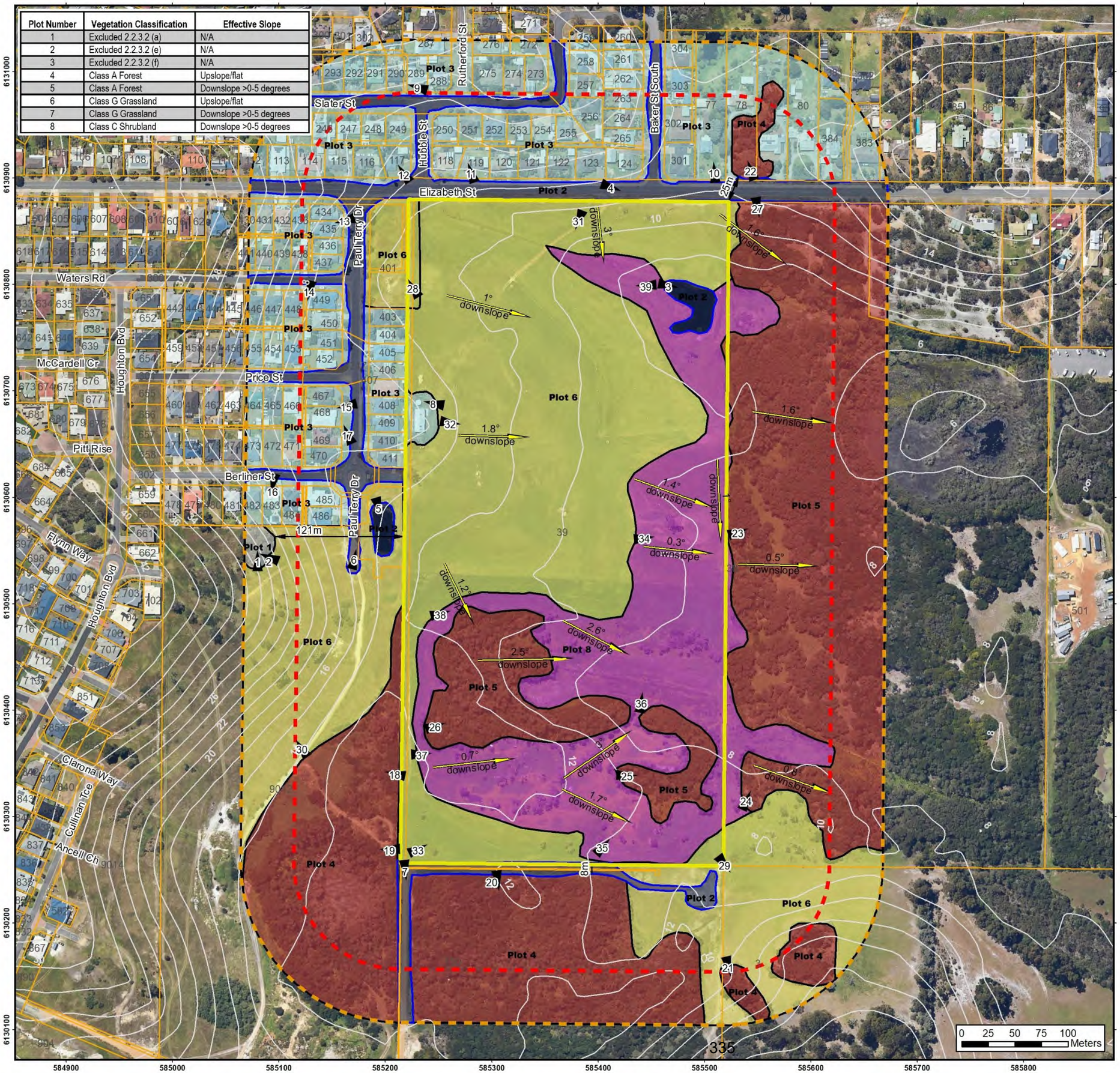
Vegetation Classification

Site assessment occurred on the 25 February 2026 by Jason Benson (BPAD-37893). All vegetation within 150m of the site/proposed development was classified in accordance with Clause 2.2.3 of AS3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified in the following pages and shown on the Vegetation Classes Map Page 3.

Table 1: Vegetation Classification Table (in accordance with AS3959-2018) of the subject site

Plot Number	Vegetation Classification	Slope (Table 2.4.3)
1	Excluded 2.2.3.2 (a)	N/A
2	Excluded 2.2.3.2 (e)	N/A
3	Excluded 2.2.3.2 (f)	N/A
4	Class A Forest	Upslope/flat
5	Class A Forest	Downslope >0-5 degrees
6	Class G Grassland	Upslope/flat
7	Class G Grassland	Downslope >0-5 degrees
8	Class C Shrubland	Downslope >0-5 degrees

Plot Number	Vegetation Classification	Effective Slope
1	Excluded 2.2.3.2 (a)	N/A
2	Excluded 2.2.3.2 (e)	N/A
3	Excluded 2.2.3.2 (f)	N/A
4	Class A Forest	Upslope/flat
5	Class A Forest	Downslope >0-5 degrees
6	Class G Grassland	Upslope/flat
7	Class G Grassland	Downslope >0-5 degrees
8	Class C Shrubland	Downslope >0-5 degrees



Albany Office:
29 Hercules Crescent
Albany, WA 6330
(08) 9842 1575

Perth Office:
Suite 2/73 Troy Terrace
Jolimont, WA 6014
(08) 9842 1575

Esperance Office:
2A/113 Dempster Street
Esperance, WA 6450
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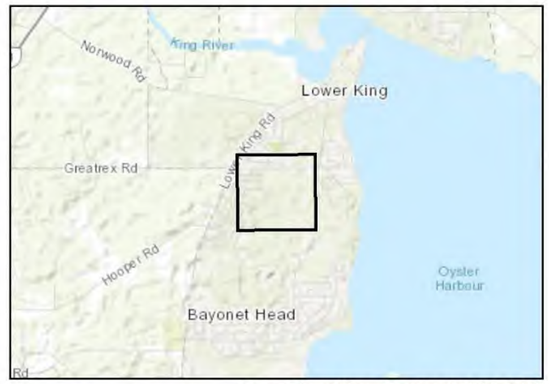
BPAD Bushfire Planning & Design



Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 2m Contours (DPIRD-072)
- Separation Distance
- Effective Slope
- Photo Point
- Vegetation Classification Border Exclusion (e)
- Vegetation Classification Border

Classified Vegetation

- A Forest
- C Shrubland
- G Grassland

Excluded Vegetation

- Clause 2.2.3.2 (a), (b), (c) and (d)
- Clause 2.2.3.2 (e) non-vegetated
- Clause 2.2.3.2 (f) low threat vegetation

N

Scale
1:3,500 @ A3
GDA MGA 2020 Zone 50

Data Sources
Overview Map: World Topographic Map (Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community)
Cadastral, Roads and Aerial Imagery Data © 2026 Western Australian Land Information Authority (Landgate)
"Location information data licensed from Western Australian Land Information Authority (WALIA) trading as Landgate. Copyright in the location information data remains with WALIA. WALIA does not warrant the accuracy or completeness of the location information data or its suitability for any particular purpose."

Client
DevelopmentWA
Lot 39 Elizabeth Street
Bayonet Head WA 6330

Vegetation Classification Map

Prepared by	Accreditation Level	Accreditation Number
JRB	2	BPAD-37893
QA Check	**Drawn by**	**Status**
MKG	GSK	FINAL
File	**Date**	**Aerial**
DLTWA010	15/04/2026	October 2024

Plot	1	Classification or Exclusion Clause	Excludable - 2.2.3.2(a) >100m from site
			Location: West of the subject site. Separation Distance: 121m. Description: Classifiable vegetation of any type that is more than 100m from the subject site. Excluded as per AS3959 exclusion clause 2.2.3.2 (a).
Photo Id 1: View to the north towards vegetation, located more than 100 metres from the subject site to the west.			
Plot	1 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(a) >100m from site
			Additional Photo of Plot 1.
Photo Id 2: View to the west-northwest towards vegetation, located more than 100 metres from the subject site to the west.			

Plot	2	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas

Location: Internal to the subject site in the northeast and external in the north, south and west.

Description: Roads, driveways, buildings, dams and other non-vegetated areas.

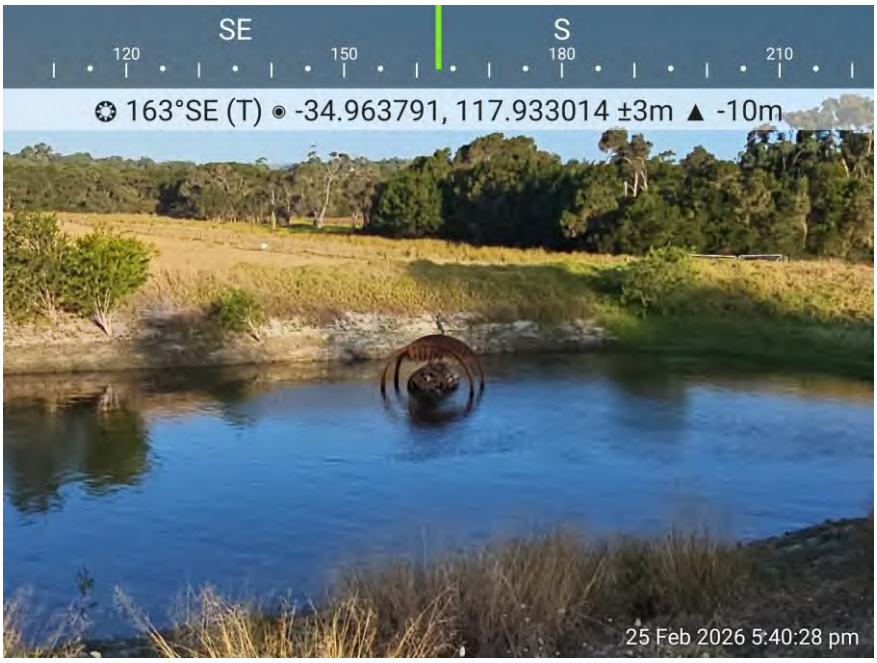
As per exclusion clause 2.2.3.2 (e) of AS3959-2018.

Photo Id 3: View to the east-southeast towards a dam, located within the subject site near the northeast corner.

Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas

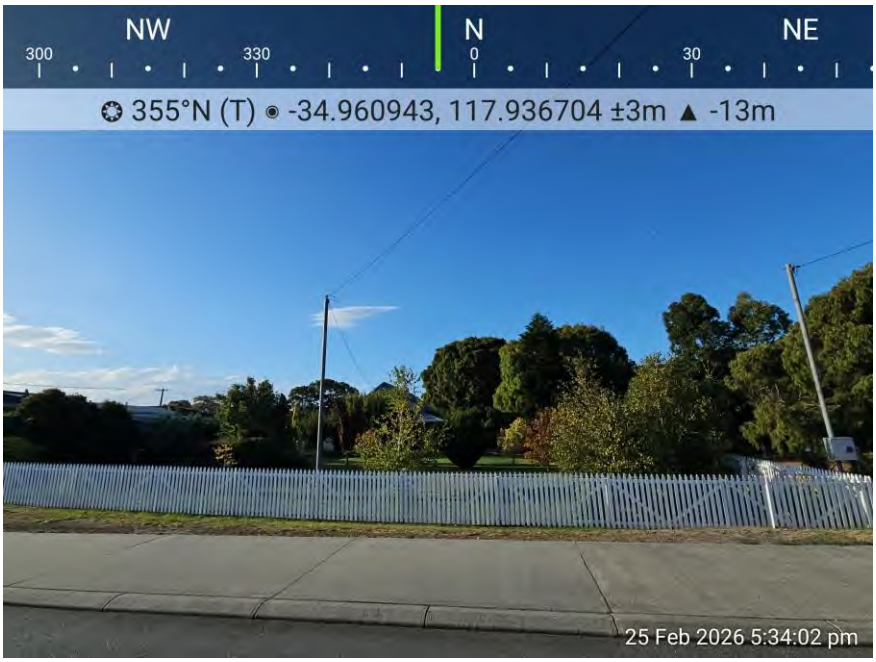
Additional Photo of Plot 2.

Photo Id 4: View facing east-southeast along Elizabeth Street, to the north of the subject site.

Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas
			Additional Photo of Plot 2.
Photo Id 5: View facing south-southeast towards a dam, located to the west of the subject site.			
Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas
			Additional Photo of Plot 2.
Photo Id 6: View to the north-northeast along Paul Terry Drive, located to the west of the subject site.			

Plot	2 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(e) Non Vegetated Areas
			Additional Photo of Plot 2.
Photo Id 7: View facing south along a gravel access road, located to the south of the subject site.			
Plot	3	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Location: Internal to the subject site in the west and external in the north, northeast and west. Description: Maintained gardens and lawns in Asset Protection Zone (APZ) areas surrounding existing buildings in an existing residential area, vacant lot managed in a lot threat state, firebreaks and managed road reserves. Excluded as per AS3959 exclusion clause 2.2.3.2 (f). Available fuel loading: <2 t/ha.
Photo Id 8: View facing west towards an existing shed surrounded by an APZ area, located to the west within the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.
Photo Id 9: View facing west-northwest towards an APZ surrounding an existing building, located to the northwest of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.
Photo Id 10: View facing north towards an APZ surrounding an existing building, located to the northeast of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.
Photo Id 11: View facing north-northwest towards an APZ surrounding an existing building, located to the north of the subject site.			
Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.
Photo Id 12: View facing northwest towards an APZ surrounding an existing building, located to the northwest of the subject site.			

Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.

Photo Id 13: View facing west-southwest towards an APZ surrounding an existing building, located to the west of the subject site.

Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.

Photo Id 14: View facing south towards an APZ surrounding an existing building, located to the west of the subject site.

Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.
Photo Id 15: View facing west towards an APZ surrounding an existing building, located to the west of the subject site.			
Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.
Photo Id 16: View facing south towards an APZ surrounding an existing building, located to the west of the subject site.			

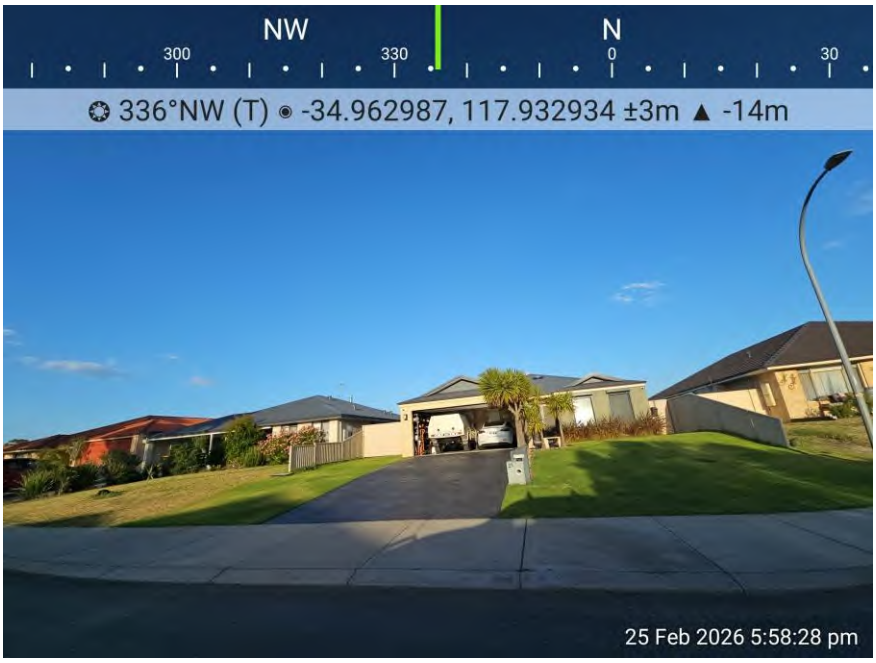
Plot	3 cont.	Classification or Exclusion Clause	Excludable - 2.2.3.2(f) Low Threat Vegetation
			Additional Photo of Plot 3.

Photo Id 17: View facing north-northwest towards an APZ surrounding an existing building, located to the west of the subject site.

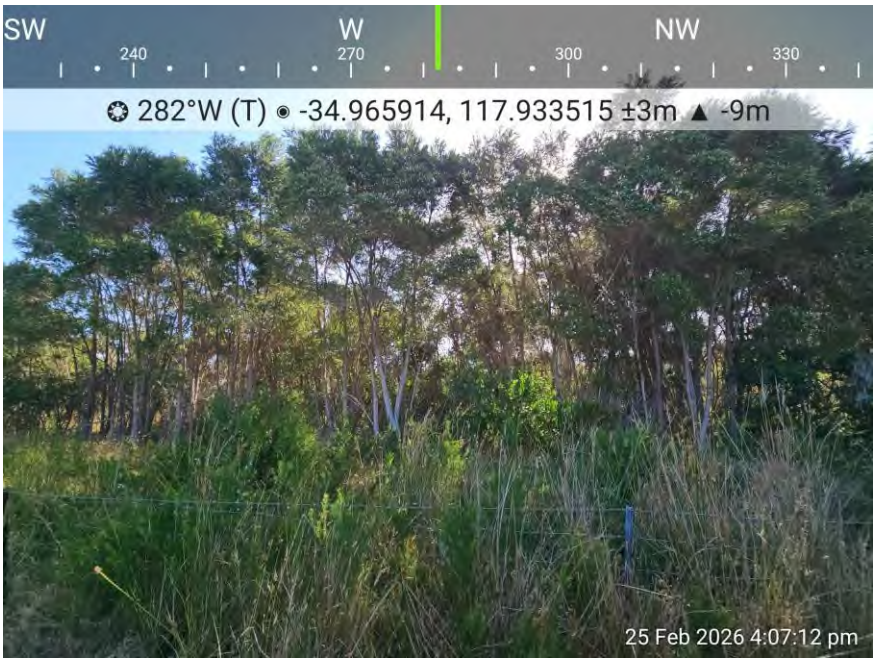
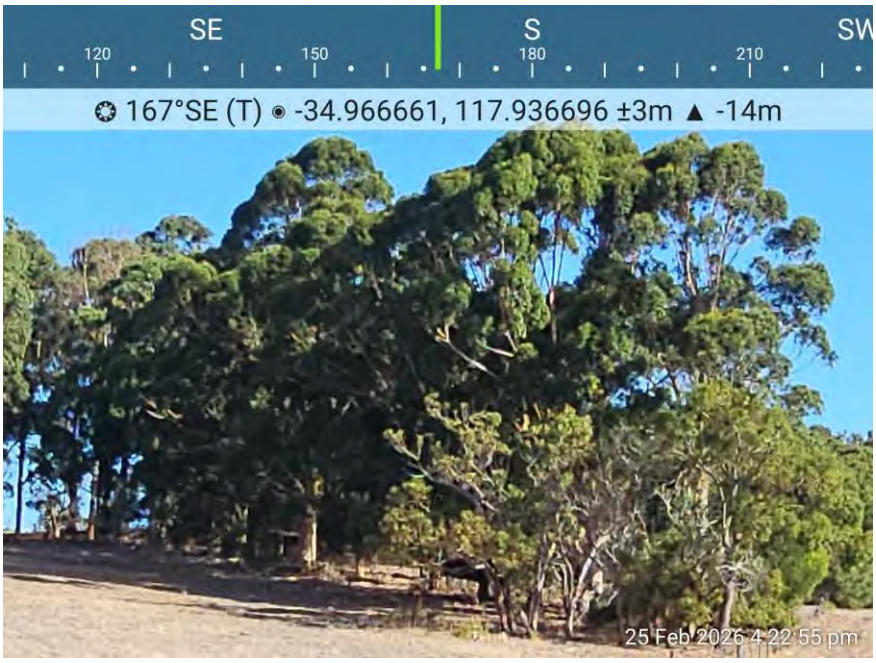
Plot	4	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Location: Northeast, southeast, south, southwest and west of the subject site. Separation Distance: 25m to the northeast, 8m to the south, 0m to the west. Description: Forest vegetation consisting of Warren River cedar, Callistachys, Sydney golden wattle, Melaleuca, peppermint, and occasional Eucalyptus trees. Dense canopy cover with a multilayered scrub understorey of tea tree, Acacia, Taylorina, weeds, sedges and rushes. Average vegetation height: 4-10m. Vegetation Coverage: >30-70% foliage cover. Available fuel loading: 25-35t/ha. Effective slope: Upslope/flat.

Photo Id 18: View facing west towards forest vegetation, located to the west of the subject site.

Plot	4 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 4.
Photo Id 19: View facing west towards forest vegetation, located adjacent to the southwest corner of the subject site.			
Plot	4 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 4.
Photo Id 20: View facing south towards forest vegetation, located to the south of the subject site.			

Plot	4 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 4.
Photo Id 21: View facing south towards forest vegetation, located to the southeast of the subject site. *Note: Photo taken from a distance due to a lack of access.*			
Plot	4 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 4.
Photo Id 22: View facing north-northwest towards forest vegetation, located adjacent to the northeast corner of the subject site.			

Plot	5	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Location: External to the east, and internal to the east and south of the subject site. Separation Distance: 0m from the subject site boundary. Description: Forest vegetation consisting of Warren River cedar, Callistachys, Sydney golden wattle, Melaleuca, peppermint, and occasional Eucalyptus trees. Dense canopy cover with a multilayered scrub understorey of tea tree, Acacia, Taylorina, weeds, sedges and rushes. Average vegetation height: 4-10m. Vegetation Coverage: >30-70% foliage cover. Available fuel loading: 25-35t/ha. Effective slope: Downslope >0-5 degrees.

Photo Id 23: View facing east-northeast towards forest vegetation, located to the east of the subject site.

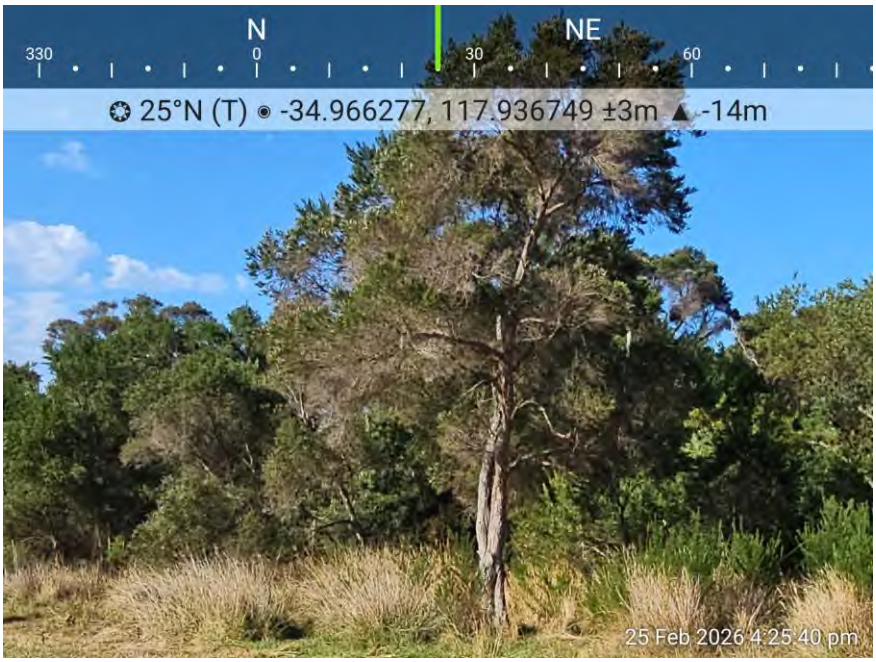
Plot	5 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 5.

Photo Id 24: View facing north-northeast towards forest vegetation, located near the southeast corner of the subject site.

Plot	5 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 5.
Photo Id 25: View facing east towards forest vegetation, located internally near the southeast corner of the subject site.			

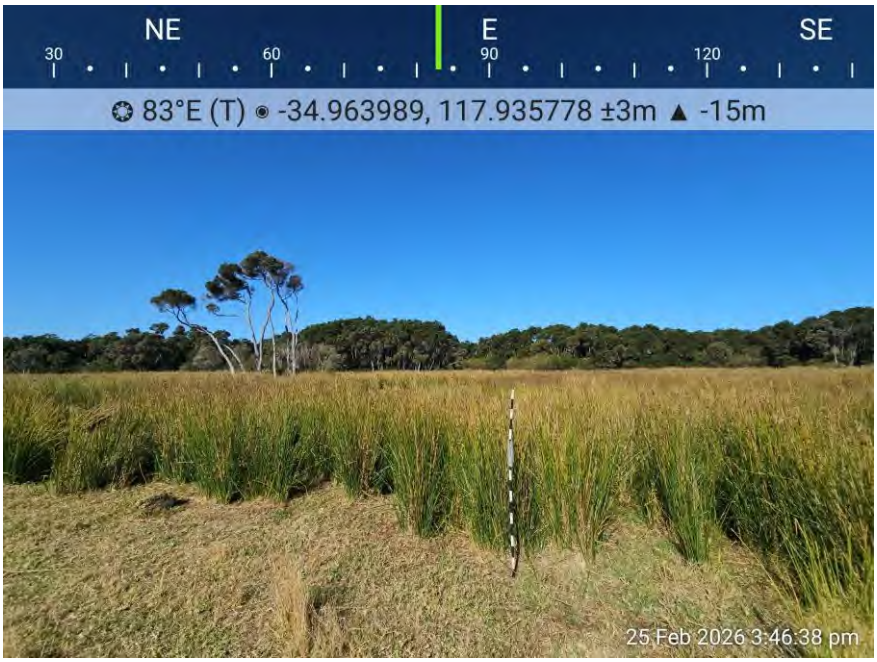
Plot	5 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 5.
Photo Id 26: View facing east-northeast towards forest vegetation, located internally to the subject site in the southwest.			

Plot	5 cont.	Classification or Exclusion Clause	Class A Forest - Low open forest A-04
			Additional Photo of Plot 5.
Photo Id 27: View facing south towards forest vegetation, located adjacent to the northeast corner of the subject site.			
Plot	6	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			Location: Southeast, west and northwest of the subject site. Separation Distance: 0m from the subject site boundary. Description: Mixed unmanaged grasses, sedges and weeds in open areas. Some trees are present, with less than 10% canopy cover noted. Average vegetation height: 100-300mm. Vegetation Coverage: <10% Trees. Available fuel loading: 4.5t/ha. Effective slope: Upslope/flat.
Photo Id 28: View facing northwest towards grassland vegetation, located in the northwest corner of the subject site.			

Plot	6 cont.	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			Additional Photo of Plot 6.
Photo Id 29: View facing southeast towards grassland vegetation, located at the southeast corner of the subject site.			

Plot	6 cont.	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			Additional Photo of Plot 6.
Photo Id 30: View facing northwest towards grassland vegetation, located to the west of the subject site.			

Plot	7	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			Location: Internal to the subject site. Separation Distance: 0m from the subject site boundary. Description: Mixed unmanaged grasses, sedges and weeds in open areas. Some trees are present, with less than 10% canopy cover noted. Average vegetation height: 100-300mm. Vegetation Coverage: <10% Trees. Available fuel loading: 4.5t/ha. Effective slope: Downslope >0-5 degrees.
Photo Id 31: View facing south-southwest towards grassland vegetation, located centrally to the north within the subject site.			
Plot	7 cont.	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			Additional Photo of Plot 7.
Photo Id 32: View facing east towards grassland vegetation, located to the west within the subject site.			

Plot	7 cont.	Classification or Exclusion Clause	Class G Grassland – Sown pasture G-26
			Additional Photo of Plot 7.
Photo Id 33: View facing east-northeast towards grassland vegetation, located within the southwest corner of the subject site.			
Plot	8	Classification or Exclusion Clause	Class C Shrubland - Low shrubland C-12
			Location: Internal to the subject site in the east, south and west, and externally in the east. Separation Distance: 0m from the subject site boundary. Description: Grasses and reeds in a seasonally wet area. Average vegetation height: 1-2m. Vegetation Coverage: >30% foliage cover. Available fuel loading: 15t/ha. Effective slope: Downslope >0-5 degrees.
Photo Id 34: View facing east towards shrubland vegetation, located centrally east within the subject site. *Note: 1.8m tall staff in the photo for reference.*			

Plot	8 cont.	Classification or Exclusion Clause	Class C Shrubland - Low shrubland C-12
			Additional Photo of Plot 8.
Photo Id 35: View facing northeast towards shrubland vegetation, located centrally to the south within the subject site. *Note: 1.8m tall staff in the photo for reference.*			
Plot	8 cont.	Classification or Exclusion Clause	Class C Shrubland - Low shrubland C-12
			Additional Photo of Plot 8.
Photo Id 36: View facing north towards shrubland vegetation, located internal to the subject site to the south. *Note: 1.8m tall staff in the photo for reference.*			

Plot	8 cont.	Classification or Exclusion Clause	Class C Shrubland - Low shrubland C-12

Additional Photo of Plot 8.

Photo Id 37: View facing east towards shrubland vegetation, located near the western boundary of the subject site.

Note: 1.8m tall staff in the photo for reference.

Plot	8 cont.	Classification or Exclusion Clause	Class C Shrubland - Low shrubland C-12

Additional Photo of Plot 8.

Photo Id 38: View facing east towards shrubland vegetation, located to the west within the subject site.

Note: 1.8m tall staff in the photo for reference.

Plot	8 cont.	Classification or Exclusion Clause	Class C Shrubland - Low shrubland C-12
			Additional Photo of Plot 8.
Photo Id 39: View facing west towards shrubland vegetation, located near the northeast corner within the subject site. *Note: 1.8m tall staff in the photo for reference.*			

COMMENTS ON VEGETATION CLASSIFICATIONS:

- Distances from vegetation were made based on surface fuels to edge of lot (subject site) boundary;
- Effective slopes were measured in the field using a Nikon Forestry Pro and represented on the respective plots;
- Method 1 (AS3959-2018) Simplified procedure was used for vegetation classification Assessment process;
- All vegetation was classified within the subject site and within 150m of the lot boundaries to AS3959 Table 2.3; and
- The perimeter of the vegetation was measured using field GPS and notations on field GIS maps.

CERTIFICATION

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level stated above in accordance with the requirements of AS3959-2018.

SIGNED, ASSESSOR: ..... DATE: 15/04/2026

Jason Benson, Bio Diverse Solutions

Accredited Level 2 BAL Assessor (Accreditation No: BPAD-37893)

REVISION RECORD

Revision	Prepared By	Summary	Reviewed By	Date
Final Id	Jason Benson	Internal QA Review	Michelle Gray	27/03/2026
Final Id	Kathryn Kinnear	Issued to the client		15/04/2026

Appendix B

Siting and Design Explanatory Notes
(Extract from current and endorsed guidelines on APZ standards)

B.2: SITING AND DESIGN

State Planning Policy outcome for Element 2: Siting and design

Ensure siting and design solutions:

- **manage or mitigate the bushfire risk to people, property and infrastructure; and**
- **avoid, or where unavoidable, minimise clearing of native vegetation.**

B.2.1 IDENTIFYING AN ASSET PROTECTION ZONE

An Asset Protection Zone (APZ) is a low fuel area, maintained around a building to increase the likelihood a building will survive a bushfire, by reducing the potential for direct flame contact, radiant heat exposure and ember attack. The APZ allows emergency services access and provides an area for firefighters and home-owners to defend their property.

The width of an APZ should ensure the radiant heat impact does not exceed 29 kW/m^2 for a habitable building, or 10 kW/m^2 where a building is identified for use as an on-site shelter. Where a building or development site achieves a radiant heat impact of 29k W/m^2 or lower in its pre-development state (prior to any vegetation clearing or modification), an APZ is generally not required.

However, providing for the ongoing management of an APZ in perpetuity, as low threat vegetation, within the implementation section of the BMP and/or condition of development approval, will ensure the BAL rating of the building does not increase over time.

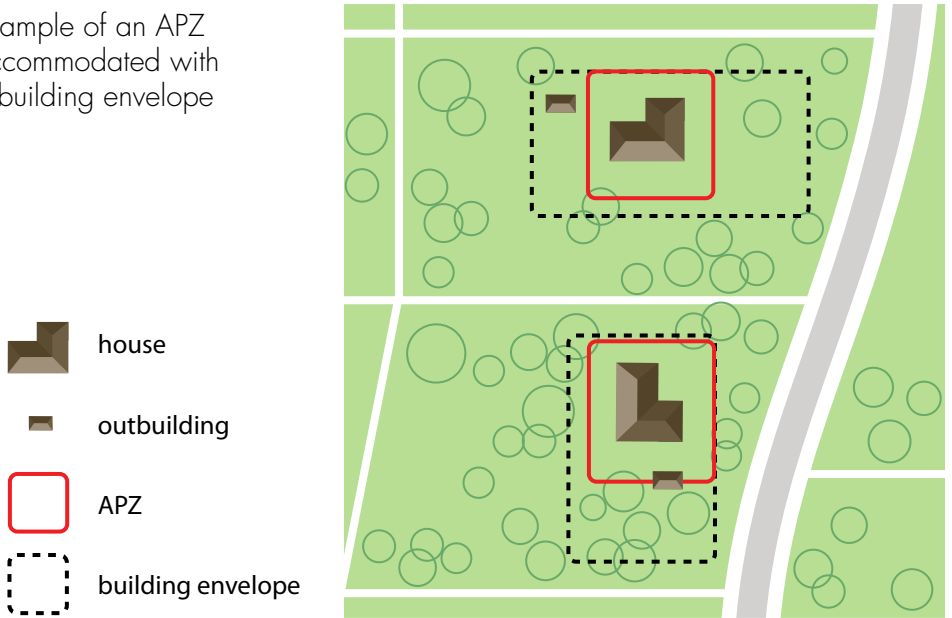
Clearing or modification of native vegetation to reduce the radiant heat impact below 29 kW/m^2 is generally not supported.

At the subdivision stage where a lot contains a building envelope, and the development site(s) is yet to be determined, the BMP should demonstrate the lot(s) can achieve an indicative development site(s) with a radiant heat impact not exceeding 29 kW/m^2, within the building envelope (**Figure 24**).

It may not be necessary for an entire building envelope to achieve 29 kW/m^2 or lower, where this results in unnecessary clearing or modification of native vegetation.

An APZ should be contained within the boundaries of the lot on which the building is situated, except in instances where it is demonstrated the vegetation on the adjoining land is, and will continue to be, low threat as per cl. 2.2.3.2 of AS 3959, or the vegetation on the adjoining lot is, and will remain in perpetuity, non-vegetated. However, it should be noted there is no requirement for a neighbouring landowner or land manager (public or private) to be party to a legal agreement to undertake ongoing management of vegetation as low threat, in perpetuity.

Figure 24: Example of an APZ accommodated with a building envelope



Exclusion of vegetation on adjoining land, which is covered by a local government firebreak notice, issued under section 33 of the *Bushfires Act 1954*, may occur in limited circumstances at the development application stage. Where it is evident the adjoining landowner is managing the vegetation in accordance with the firebreak notice, a copy of the firebreak notice and photographic evidence of the managed vegetation should be included in a BMP. It will also be necessary to seek written confirmation from the local government, to confirm support for the exclusion.

B.2.2 DESIGNING AN ASSET PROTECTION ZONE

An APZ should not be seen as an area entirely cleared of vegetation, but as a strategically designed space that considers how existing and future mature vegetation, and combustible and non-combustible features interact with and affect the building's resilience to bushfire.

An APZ should provide the greatest level of vegetation management within at least three metres of a habitable building, to ensure adequate unobstructed defendable space for emergency services to operate. This area should contain minimal vegetation and be free of combustible materials and obstructions. Within the remainder of the APZ, planting of vegetation can increase as you move farther away from the building.

The placement 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 vegetation within an APZ supporting a bushfire. It is important to consider the plant density and final structure and form of plants in their mature state.

Strategic landscaping measures can be applied, such as replacing weeds with low flammability vegetation to create horizontal and vertical separations between the retained vegetation.

Mulches used within the APZ should be non-combustible. The use of stone, gravel, shells, rock and crushed mineral earth is encouraged. Very fine or light mulch (such as shredded pine bark, pine needles, or poplar woodchips) less than five millimeters in diameter should be avoided. It is recommended that wood mulch is used in garden beds or areas where the moisture level is higher by regular irrigation, and these areas are separated with non-combustible elements, such as pathways and open spaces.

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 or the use of non-combustible fencing materials such as iron, brick, limestone, metal post and wire is encouraged within an APZ.

B.2.3 MANAGEMENT OF AN ASSET PROTECTION ZONE

Ongoing maintenance of an APZ is usually enforced through a condition of a development approval, which should refer to **Table 9** APZ technical requirements within this Appendix.

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

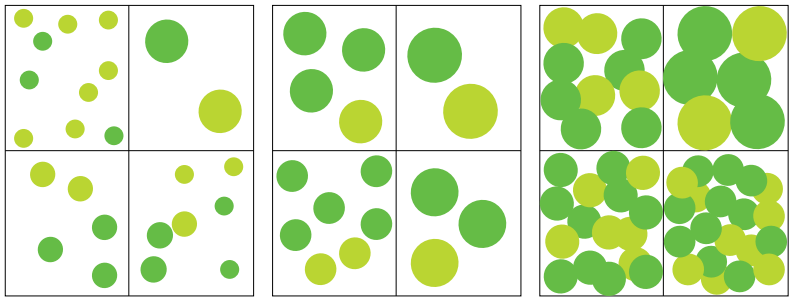
- ensuring gutters are free from vegetation
- installing gutter guards or plugs
- regular cleaning of underfloor spaces, or enclosing them to prevent gaps
- trimming and removing dead plants or leaf litter
- pruning climbing vegetation (such as vines) on a trellis, to ensure it does not connect to a 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
- following the requirements of the relevant local government firebreak 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. 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 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
- firewood stacks
- flammable sculptures
- playground equipment and children's toys.

APPENDIX B

Table 9: Asset Protection Zone (APZ) technical requirements

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 less than 6 mm in thickness)	• Should be managed and removed on a regular basis to be maintained as low threat vegetation • Should be maintained at less than two tonnes per hectare (on average) • Mulches should be non-combustible such as stone, gravel, shells, rock or crushed mineral earth or wood mulch more than five millimetres in thickness.
Trees* (more than 6 m 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 less than 15 per cent of the total APZ area • Tree canopies at maturity should be at least 5 m apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided the total canopy cover within the APZ does not exceed 15 per cent and is not connected to the tree canopy outside the APZ. Tree canopy cover – ranging from 15 to 70 per cent at maturity  15% 30% 70%

APPENDIX B

OBJECT	REQUIREMENT
Shrub* and scrub* (0.5 m to 6 m in height). Shrub and scrub more than 6 m 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 more than five square metres in area • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground cover*(less than 0.5 m in height. Ground cover more than 0.5 m in height is to be treated as shrub)	• 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 more than 100 mm in height.
Grass	• Grass should be maintained at a height of 100 mm 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 free from vegetation but can include ground cover, grass and non- combustible mulches as prescribed above.
Liquid petroleum gas cylinders	• Should be located on the side of a building farthest 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.

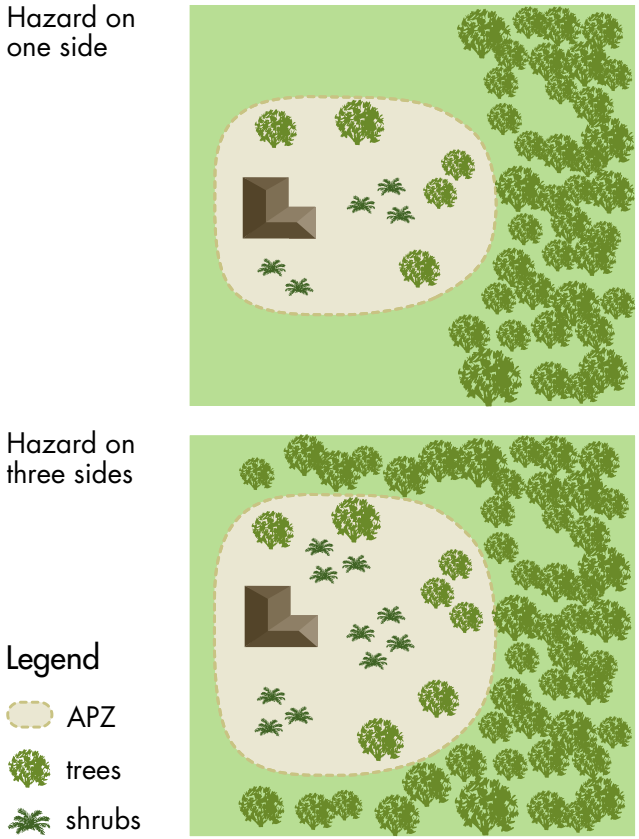
Notes:
** Plant flammability, landscaping design and maintenance should be considered – refer to following explanatory notes*

Fine fuel load is the combustible, dead or dry vegetation matter on the ground, near ground, or elevated. Fine fuel includes grass, leaves, bark and twigs less than six millimetres in diameter that ignite readily and are burnt rapidly when dry.

Fine fuel should be maintained at less than 2t/ha. 100gm/m² equates to 1t/ha. To estimate a fuel load (in t/ha), collect the dry fine fuel from a representative one square meter and weigh (in grams using kitchen scales) and multiply the weight by 0.01.

APPENDIX B

Figure 25: Design of an Asset Protection Zone



Regardless of whether an Asset Protection Zone exists in accordance with the acceptable solutions and is appropriately maintained, it should be noted that fire fighters are not obliged to protect an asset if they think the separation distance between the dwelling and vegetation is unsafe.

B.2.4 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, which 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 can absorb more of the heat of the approaching bushfire without burning, compared to more flammable plants.
- **Fire wise** – plants that have been identified and selected based on their low flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of the 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 threatened 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
- will not become a weed in the area.

Appendix C

City of Albany Fire Management Notice (CoA, 2025/2026)

FIRE MANAGEMENT NOTICE 2025/26

FIRST AND FINAL NOTICE IS HEREBY SERVED TO OWNERS AND OCCUPIERS OF LAND IN THE CITY OF ALBANY

This notice constitutes the City of Albany Fire Management Notice pursuant to Section 33 of the *Bush Fires Act 1954.*

You are required to prepare and maintain your property for the fire season. This Notice specifies the actions you must take on the land that you own and/or occupy, and with respect to any matter which is on the land that you own or occupy.

All fire mitigation measures must be in place by and maintained for the following periods:

North East Sector	1 October 2025 to 30 April 2026
South West Sector	1 December 2025 to 14 May 2026

City of Albany officers are authorised to enter and remain upon private property, without notice to the owner, to inspect and confirm compliance with this Notice. If you fail to comply with the requirements contained within this Notice, penalties under the *Bush Fire Act 1954* may apply.

The owner or occupier of land who has received notice under Section 33(1) of the *Bush Fires Act 1954* and who fails or neglects in any respect duly to comply with the requirements of the notice is guilty of an offence and liable to a fine of $5000.

ALL LAND WITH TOTAL AREA LESS THAN 1000M² (0.1HA)

The owner or occupier must reduce any fire hazard on their land by:

- Slashing, mowing or trimming all *flammable** matter on the entire property (noting this does not include living trees, shrubs, plants and reticulated lawns under cultivation) to a height of no greater than 50mm.
- Remove dead shrubs, plants, and vegetation cuttings/swath across the entire property
- Creating and maintaining *Building Protection Zones**

ALL LAND WITH TOTAL AREA LESS THAN 4000M² (0.4HA)

The owner or occupier must reduce any fire hazard on their land by:

- Reducing and/or maintaining *fine fuel load and/or ground fuel** over the whole land to no greater than 50mm in height
- Creating and maintaining *hazard specific fire breaks**
- Creating and maintaining *Building Protection Zones**

ALL LAND WITH AN AREA 4000M² (0.4HA) TO 500,000M2 (50HA)

The owner or occupier must reduce any fire hazard on their land by:

- Creating and maintaining *perimeter fire breaks**
- Maintaining *fine fuel load** over all grassland to an average of eight (8) tonnes per hectare
- Creating and maintaining *hazard specific fire breaks**
- Creating and maintaining *Building Protection Zones**

*See Definitions

NON-AGRICULTURAL NON-CROPPING NON-STOCK LAND OVER 500,000M² (50HA)

The owner or occupier must reduce any fire hazard on their land by:

- Creating and maintaining *perimeter fire breaks**
- Maintaining *fine fuel load** over all grassland to an average of eight (8) tonnes per hectare
- Creating and maintaining *hazard specific fire breaks**
- Creating and maintaining *Building Protection Zones**

AGRICULTURAL CROPPING AND/OR STOCK GRAZING LAND OVER 500,000M² (50HA)

The owner or occupier must reduce any fire hazard on their land by:

- Creating and maintaining *perimeter fire breaks** are not compulsory but recommended
- Creating and maintaining *hazard specific fire breaks**
- Creating and maintaining *Building Protection Zones**
- Cropping paddocks must be broken into compartments not exceeding 250 hectares in area, each separated by internal trafficable

PLANTATION LOTS / TREE FARMS

Owners and lessees of plantation lots / tree farms must comply with the Department of Fire and Emergency Services (DFES) *Guidelines for Plantation Fire Protection (the guidelines)* in addition to this fire management notice. The guidelines are available from the DFES website: publications.dfes.wa.gov.au.

*See Definitions

Perimeter Fire Breaks - are a continuous (no dead ends) trafficable access track that has standard dimensions of 3 metres wide with 4 metres vertical clearance, located within 20 metres of the property boundary. It can be created by ploughing, cultivating, scarifying, burning or otherwise clearing including slashing and maintaining vegetation length below 50mm.

Hazard Specific Fire Breaks - are a 3 metre low fuel area around flammable hazards with vegetation maintained below 50mm with no overhanging tree canopy. Includes but is not limited to; haystacks, non-dwelling sheds, green electricity power domes, electricity power poles and fuel storage areas.

Fine Fuel Load - are grasses, and other dead combustible vegetation matter up to 6mm in diameter. It does not include processed mulch below an average depth of 50mm.

A fuel load depth of 125mm (fine fuels) to the mineral earth is indicative of approximately 8 tonnes per hectare.

The more fuel load, the higher the flame height and increased fire intensity.

Ground Fuels - are a leaf litter and scrub fuel, which is a combination of branches, twigs, sticks, seed pods and other woody materials, found on the ground in remnant bushland.

Flammable - means accumulated fuel such as dry grass, leaf litter, twigs, branches, trash, bush, dead trees, firewood, stored fuels and scrub that can be easily ignited or is likely to catch fire and burn. It includes any other thing deemed by an Authorised Officer to be likely to catch fire but excludes living standing trees, growing bushes and plants in gardens and/or lawn areas under cultivation.

Building Protection Zone - is a defendable space immediately adjacent to a building no less than three metres wide, clear of flammable vegetation and material.

Combustible objects, plants, garden supplies such as mulches should be avoided within 10 metres of the building and vegetation kept to a minimum and kept in a low fuel state.

From 10 metres to 20 metres of the building, land must be parkland cleared and in low fuel state. The *building protection zone* may reduce the likelihood and impact that direct flame contact, radiant heat or ember attack may have on buildings in the event of a bushfire.

Gutters, roofs, and walls of all buildings to be free of flammable matter and maintained.

Trafficable - means the capacity to allow a firefighting truck or other firefighting vehicle to safely navigate the interior perimeter of the property safely without impediment.

INFORMATION SUBSIDIARY TO THE FIRE MANAGEMENT NOTICE

Variation to the requirements of the Fire Management Notice:

If you cannot meet these fire management notice requirements, you must apply for a variation.

Applications for variations must be submitted to the City of Albany by the 01 October 2025.

Please contact the City of Albany on 6820 3000 or visit the City's website www.albany.wa.gov.au.

City approved treatment plans:

All properties and/or land subject to an approved Bushfire Management Plan (BMP) or an approved Bushfire Attack Level assessment (BAL), because of subdivision, development application or City approved treatment plan, must comply with the listed requirements and conditions in their entirety. Compliance with additional plans does not constitute compliance with this notice.

The City will only accept a BMP or BAL completed by an accredited Bush Fire Planning and Design Practitioner. A BMP can encompass single or multiple properties. All properties covered by a BMP or BAL must comply with all conditions of the BMP or BAL. Property owners and/or occupiers must still comply with all requirements in this notice and with ALL additional requirements outlined within the BMP, BAL or treatment plan.

To check your property zone and subdivision mitigation requirements please contact City of Albany Planning Services on 6820 3000 or email compliance@albany.wa.gov.au.

USEFUL INFORMATION

A guide to preparing property in bushfire prone areas can be obtained from the Department of Fire and Emergency Services and accessed at publications.dfes.wa.gov.au.

SIGNIFICANT DATES

NORTH EAST SECTOR FIRE SEASON

1 October 2025 – 14 November 2025	**Restricted Burning permits required**
15 November 2025 - 15 February 2026	**BURNING PROHIBITED**
16 February 2026 - 30 April 2025	**Restricted Burning permits required**

SOUTH WEST SECTOR FIRE SEASON

1 November 2025 – 14 December 2025	**Restricted Burning permits required**
15 December 2025 - 14 March 2026	**BURNING PROHIBITED**
15 March 2026 - 14 May 2026	**Restricted Burning permits required**

These dates are subject to change. Any changes will be published in the local newspapers and on the City of Albany website at www.albany.wa.gov.au.

Bush Fire Brigade Boundaries

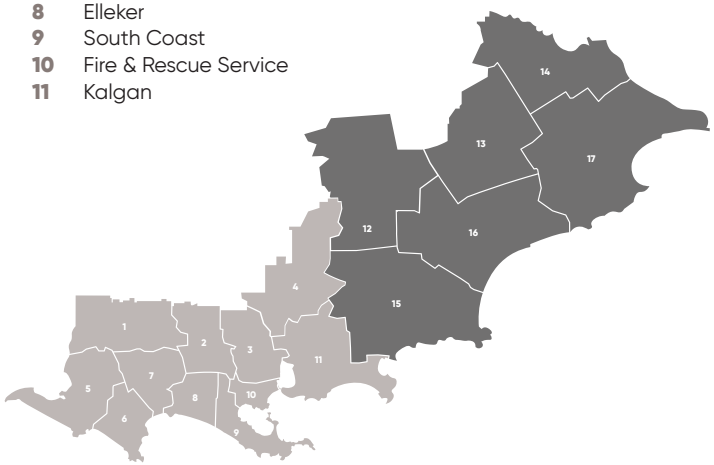
Please refer to the City of Albany website for volunteer Brigade contacts:
www.albany.wa.gov.au/volunteer-bushfire-brigades

South West

1 Redmond
2 Highway
3 King River
4 Napier
5 Youngs Siding
6 Bornholm
7 Torbay
8 Elleker
9 South Coast
10 Fire & Rescue Service
11 Kalgan

North East

12 South Stirling
13 Kojaneerup
14 Gnowellen
15 Manypeaks
16 Green Range
17 Wellstead



Fire Danger Rating

Fire Danger Ratings (FDRs) tell you how dangerous a fire would be if one started. The higher the FDR, the more severe the bushfire will be. They are based on weather conditions forecast by the Bureau of Meteorology.

Fire Danger Rating	Fire Behaviour	Action required
Moderate Plan and prepare	Most fires can be controlled	Stay up to date and be alert for fires in your area
High Be ready to act	Fires can be dangerous	Decide what you will do if a fire starts
Extreme Take action now to protect life and property	Fires will spread quickly and be extremely dangerous	Put your bushfire plan into action
Catastrophic For your survival, leave bushfire risk areas	If a fire starts and takes hold, lives are likely to be lost	Homes cannot withstand fires in these conditions. Stay safe by going to a safer location early in the morning or the night before.

When there is minimal risk, Fire Danger Ratings will be set to '**No Rating**". At this level, fires are not expected to spread in a fast or life-threatening way.

DISCLAIMER:

Environmental Conditions
The requirement to clear a fire break under this notice exempts an owner or occupier from needing a permit to clear native vegetation under the *Environmental Protection Act 1986* however it does not authorise an owner or occupier to carry out excessive clearing. Clearing or removal of native vegetation beyond the requirements of this notice will require permission from other State Legislative Authorities.

Any land subject to environmental value such as, but not limited to, Threatened Ecological Communities (TEC), Aboriginal sites as defined in the Aboriginal Heritage Act, Bush Forever Sites, Conservation covenant, Riparian vegetation or Declared Flora and Fauna should seek further information about what activities can or cannot be done prior to carrying out the requirements under this notice.

Owners and/or Occupiers must contact the relevant State Government agency which include but are not limited to: *Department of Primary Industries and Regional Development, Department of Biodiversity, Conservation and Attractions, Department of Planning, Lands and Heritage, and Department of Water and Environmental Regulation.*

Failure to comply with this Notice
Failure or neglect to comply with this notice is an offence and can result in a penalty of up to $5000.

City of Albany officers, servants, workers or contractors engaged by the City of Albany and any vehicles, appliances and machinery are authorised to enter and remain upon private property, without notice to the owner, to carry out the requirements of this notice that are not complied with by the date specified in this notice and any expenses, included court related costs, may be recovered from the owner and/or occupier of the property.

The City may vary a requirement or condition of this Notice at its discretion.

Any 'variation to requirements' approval you hold may be declared void at any time by the City.

This notice is issued and authorised by:

Andrew Sharpe
Chief Executive Officer

PHONE: 08 6820 3000
EMAIL: STAFF@ALBANY.WA.GOV.AU
ADDRESS: 102 NORTH RD, YAKAMIA, ALBANY WA, 6331
WEBSITE: ALBANY.WA.GOV.AU

Appendix D

Lot 39 Elizabeth Street, Bayonet Head Landscape Masterplan – Emerge Associates (2026)

LOT 39 ELIZABETH STREET, BAYONET HEAD

LANDSCAPE MASTERPLAN (CONCEPTUAL ONLY)

DWG OH-03- 01
REV B
DATE APRIL 2026
SCALE 1 : 2000 @ A3
0 10 20 30 40 50 m

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emerge ASSOCIATES

SHADE SAILS

LIMESTONE RETAINING WALLS

LOCAL STONE SEATING WALLS TO KEY AREAS

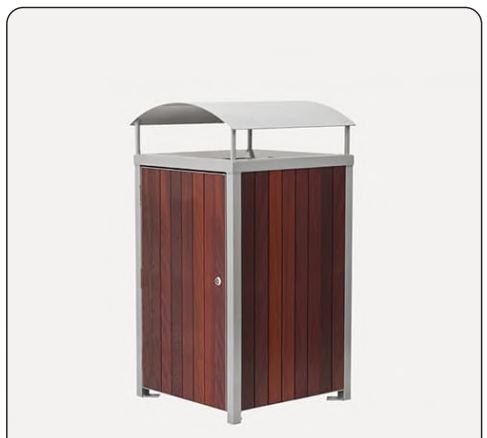
COLOURED CONCRETE TO FOCAL POINTS

RUBBER SOFTFALL

MULCH SOFTFALL

IRONCLAD ILLAWARRA SHELTER SHELTER

CHRISTIE DOUBLE BBQ



BIN ENCLOSURE

DRINK FOUNTAIN

COMPOSITE TIMBER PICNIC SETTING

COMPOSITE TIMBER BENCH SEAT WITH BACK REST

DWG **OH-03- 02**
REV **B**
DATE **APRIL 2026**
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emerge ASSOCIATES

SERVICING REPORT

Lot 39 Elizabeth Street,
Bayonet Head, Albany

JDS262526 April 2026 Rev2

Prepared for:
DevelopmentWA

JDSi CONSULTING ENGINEERS

P: 08 9227 0595
F: 08 9227 8617

Level 1, 432 Murray St,
Perth WA 6000

PO Box 7483
Cloisters Square PO
WA 8650

jdsi.com.au

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DOCUMENT REVIEW				
Revision	**Date Issued**	**Issue Type**	**Written By**	**Approved By**
Rev 1	13/04/2026	Initial issue	RAM	RAM
Rev 2	21/04/2026	Final issue	RAM	RAM

APPENDICES

APPENDIX A DEVELOPMENT CONCEPT LAYOUT

1 Executive Summary

JDSi Consulting Engineers has been engaged by DevelopmentWA to undertake a high-level assessment of external infrastructure servicing requirements associated with the proposed rezoning of Lot 39 Elizabeth Street, Bayonet Head, Albany (herein referred to as the Site), and to identify any likely upgrades, constraints or abnormal cost triggers.

The Site forms part of the broader Bayonet Head urban expansion area within the City of Albany, approximately 10 km north-east of the Albany CBD on the western side of Oyster Harbour. The land adjoins existing Oyster Harbour residential development and has frontage to Elizabeth Street, with convenient access to the established Bayonet Head surroundings.

This report does not address the detailed subdivisional, building services or built form development requirements.

DevelopmentWA provided JDSi with a concept layout for the Site, which is shown in **Appendix A – Development Concept Layout.**

The Site does not appear to exhibit any obvious fatal servicing flaws.

The servicing complexity is considered moderate, with relatively low-level risks primarily in the areas of power supply and groundwater management.

The information within this report has been provided by relevant servicing Authorities and high-level investigations by the Project team. Actual capacities of networks and the availability of and connection to existing services will be subject to application to service providers during the subdivisional design stage(s).

2 Introduction

DevelopmentWA have requested JDSi to assess the engineering constraints and opportunities associated with proposed rezoning of the site to "Residential", to facilitate a future subdivision comprising a total of approximately 133 residential lots with designated "public open space" (*Figure 1*).

The purpose of this report is to:

- Identify key infrastructure servicing opportunities and constraints
- Provide a preliminary view of potential offsite upgrade requirements and abnormal cost triggers
- Assist DevelopmentWA with feasibility, internal decision making and early engagement with servicing authorities.

The assessment draws upon:

- Preliminary Underground Power and Communications Servicing Advice prepared by UPD
- Preliminary geotechnical fieldwork by Douglas Partners, including 20 test pits and 3 in situ permeability tests across the Site
- Desktop review of planning information including the Bayonet Head Outline Development Plan (ODP)
- JDSi's experience with comparable residential subdivision projects in regional Western Australia.

For the purpose of this report, the proposed development is assumed to comprise:

- Approximately 130 standard residential lots
- An internal local road network, providing primary access from Elizabeth Street and connections to the existing Oyster Harbour development to the west;
- Public Open Space (POS) areas integrated with local drainage and landscaping; and
- Utility corridors and service reserves required to accommodate essential infrastructure.

This report focuses on external servicing and key engineering constraints. Detailed design of internal subdivision works, building services and public realm treatments are outside the scope of this assessment.

Figure 1: Site

JDSi have considered roads, wastewater, potable water, power, communications and gas services, with a particular emphasis on the existing service capacity, potential connection locations and the potential infrastructure upgrades required to support the proposed development.

The report has been based on a desktop study of existing services information, aerial imagery, preliminary advice from various service authorities, industry standards/policies and JDSi's experience.

The information is current as of April 2026.

3 Study Area

The Site lies within the suburb of Bayonet Head, approximately 10 km north east of the Albany CBD, within the City of Albany local government area.

Lot 39 is located on the eastern side of the existing Bayonet Head residential area, with road frontage to Elizabeth Street and proximity to Paul Terry Drive and the wider urban network.

The Site is included within the Bayonet Head Outline Development Plan (ODP) area, which establishes the spatial planning framework for the future urban development and conservation of several lots, including Lot 39 Elizabeth Street.

Adjacent land uses include:

- Established residential development to the west/north west;
- Areas of bushland / conservation and lower lying land trending towards Oyster Harbour to the east and south; and
- Existing community and local centre facilities within the broader Bayonet Head urban fabric.

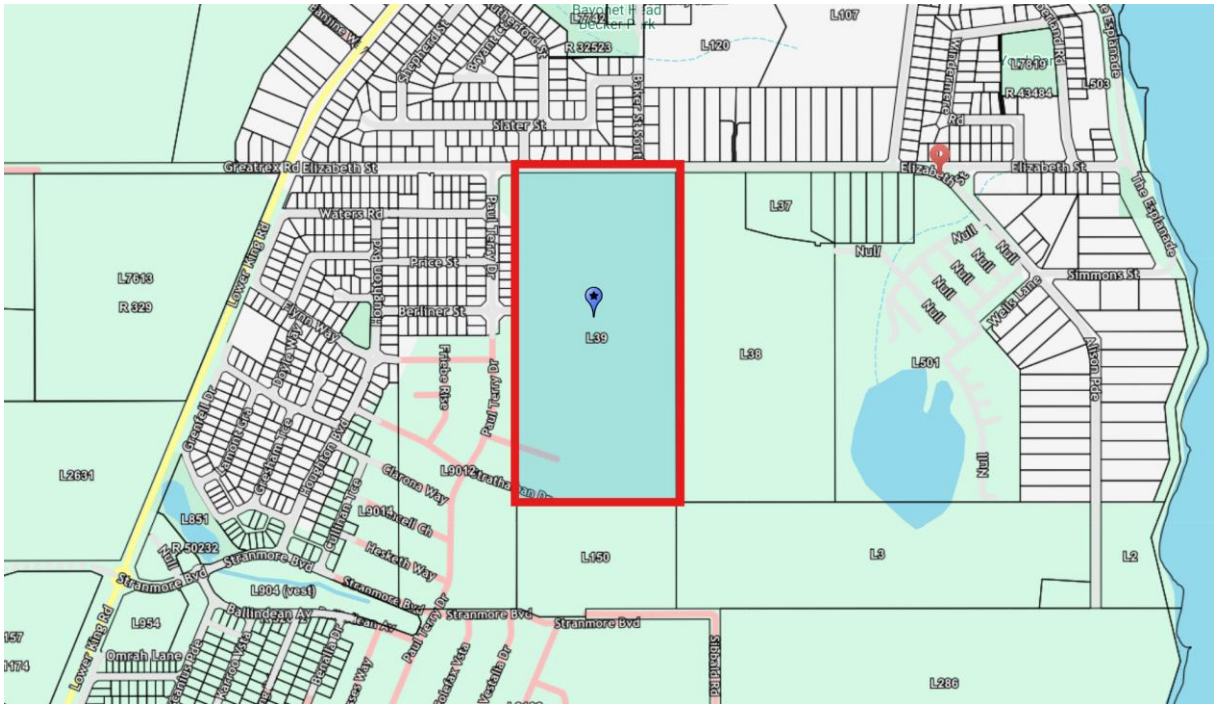


Figure 2: Site Location

3.1 Topography

Based on available survey information, the Site is moderately undulating:

- Surface elevations range from approximately 6–7 m AHD at the lower eastern portions of the Site to around 15 m AHD toward the western boundary.
- The land generally falls from west to east and northwest to southeast, reflecting the broader catchment draining towards Oyster Harbour.
- The topography is favourable for residential subdivision and allows:
  - Roads to be graded to follow natural contours with moderate earthworks;
  - Gravity flow for local drainage and sewer reticulation, subject to network tie in levels

The Site is undulating, with surface elevations ranging from approximately 49.5m AHD in the central area of the site down to 46.0m AHD in the northwest and 37.5m AHD in the southeast of the site.

Figure 3: Topography

4 Geotechnical

Douglas Partners undertook fieldwork on 13 February 2026 comprising 20 test pits (TP01–TP20) and three infiltration tests at depths between 0.5 m and 1.0 m.

The **general stratigraphy** is summarised as follows:

- Topsoil / Organic Layer
    - Organic sandy topsoil typically 0.1–0.2 m thick across most locations.
- Fill
    - Localised FILL identified at TP02 and TP07, comprising variable SAND (SP-SM), Gravelly SAND (GP-GM) and Clayey SAND (SC) to depths of approximately 0.9–1.1 m.
- Sand Units
    - Predominantly SAND (SP and SP-SM) (fine to medium, trace silt), generally pale grey with some dark grey-brown and brown horizons.
- Cemented “Coffee Rock”
    - Cemented silty SAND (SM), colloquially “coffee rock”, encountered at several locations (TP01, TP03, TP04, TP06, TP08–TP13, TP17) from depths of around 0.9–1.7 m, with localised hard digging and refusal conditions.
- Clayey Materials
    - Occasional Clayey SAND (SC), Clayey Silty SAND (SC-SM) and Clayey SILT (ML) at TP02, TP03, TP05–TP07, TP11 and TP12 from depths of ~0.9–2.6 m.

Groundwater:

- Shallow groundwater or seepage was observed in several test pits, with initial groundwater recorded between approximately 0.8 m and 2.8 m depth at lower-lying locations (e.g. TP10, TP13, TP14, TP16–TP20).
- In higher parts of the Site (e.g. TP03, TP06, TP08, TP09, TP12), no free groundwater was observed to the test depths.

In-situ Permeability:

Infiltration tests (falling head method) were carried out adjacent to TP10, TP15 and TP20. Results are summarised below:

- TP10 (0.5 m depth): ~1.5 m/day (dense SP sand, trace silt).
- TP15 (1.0 m depth): >20 m/day (medium dense SP sand, trace silt).
- TP20 (0.6 m depth): ~5 m/day (dense SP sand, trace silt).

The lower permeability at TP10 is likely influenced by the shallow groundwater (0.8 m) at that location.

Development Considerations:

- The predominance of sand is favourable for typical slab-on-ground residential construction and infiltration-based stormwater management, particularly in higher parts of the Site.
- Coffee rock may present localised challenges for trenching of deep services (e.g. sewer, drainage) and may require rock excavation allowances and some flexibility in alignment selection.

- Shallow groundwater in low-lying areas implies:
    - Careful setting of finished lot levels to maintain adequate separation for footings;
    - Potential need for controlled fill to achieve appropriate clearance to groundwater
    - Localised dewatering during the construction of deeper services in susceptible areas.

A full geotechnical report will be required at detailed design stage to confirm:

- Site classification for residential footings;
- Earthworks and compaction requirements;
- Detailed groundwater modelling and seasonal variation; and
- Any specific treatment for expansive or compressible soils where clayey units are present.

Figure 4 below shows test pit locations over previous concept layout which was current at the time of geotechnical investigations. Concept layout has now been revised as shown in Appendix A.

Figure 4: Test Pit Locations over previous concept layout

5 Roadworks

The surrounding road network is under the control of the City of Albany and Main Roads, and as such all works on and abutting the public roads will be subject to their approvals.

As typically conditioned in a WAPC subdivision approval, the roads fronting the development are required to provide suitable access and egress and be designed for the intended traffic volumes. Any new road network will need to be designed in accordance with the City of Albany standards & guidelines and Local Government Guidelines for Subdivisional Development (IPWEA).

Road design will be consistent with standard development practises including kerbed and asphalted pavements and road cross-sections designed to align with the existing landform. In all cases the road cross sections will be designed to cater for utility services on standard verge alignments and appropriate stormwater management strategies.

5.1 Existing Road Network and Access

- **Elizabeth Street**
  - Serves as the primary frontage and connection for Lot 39.
  - Connects westwards into the established Bayonet Head suburban grid, with onward access to Lower King Road and the broader Albany network.
- **Paul Terry Drive and Berliner Street**
  - Provide secondary connectivity within the adjacent residential area and an alternative frontage for future staging.

6 Sewer Reticulation

Water Corporation operates a gravity sewerage network in the area surrounding the Site, with the locations of their existing infrastructure depicted in *Figure 5*.

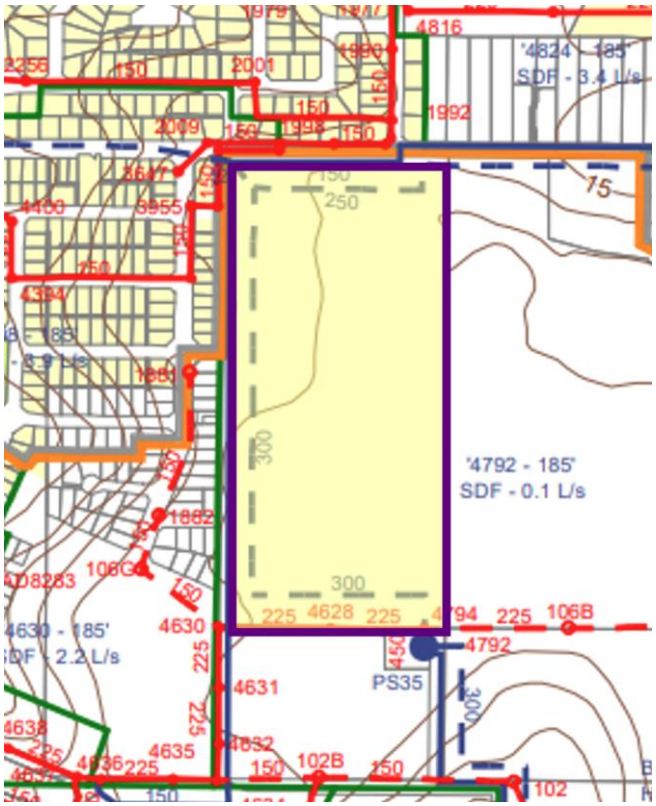


Figure 5: Existing Sewer Network

6.1 Sewer Servicing Advice

The following summary of has been provided by the Water Corporation.

To service the northern portion of the site the following will be required:

- Lot 39 Elizabeth St will be serviced by a new DN300 gravity sewer to be constructed by the developer along the eastern boundary of the site.

- The sewer is sized as a DN300 because it will be the future discharge location for Shirley St Pump Station, and a future pump station in the area. The sewer will connect to an existing DN300 sewer stub at access chamber 4794 adjacent to Hooper St pump station. The invert level of the sewer stub is 2.4m AHD.

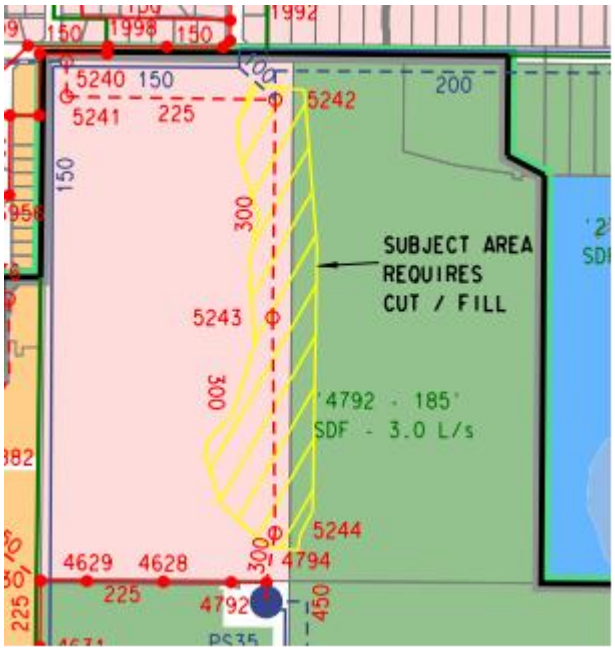


Figure 6: Sewer Scheme Planning

6.2 Existing Sewer

There is an existing 150dia sewer pressure main along the western edge of the proposed development site. This pressure main originates from the existing Shirley Street pump station to the north-east and conveys flows to the existing pump station to the south of the site.

The existing asbestos pressure main will need to be decommissioned, with a new pressure main constructed within proposed road reserves of the future development.

Any connection into the existing gravity system will need to be designed, approved and constructed in accordance with standard Water Corporation requirements.

7 Water Reticulation

The Water Corporation owns and maintains the potable water reticulation system in the vicinity of the Site. Any connection into this system will need to be designed, approved and constructed in accordance with standard Water Corporation requirements. It would be expected that a standard development condition addressing the above will be included on any WAPC approval.

The Water Corporation has advised that supply to the site will be from the existing 250AC main within Elizabeth Street as shown (*Figure 7*).

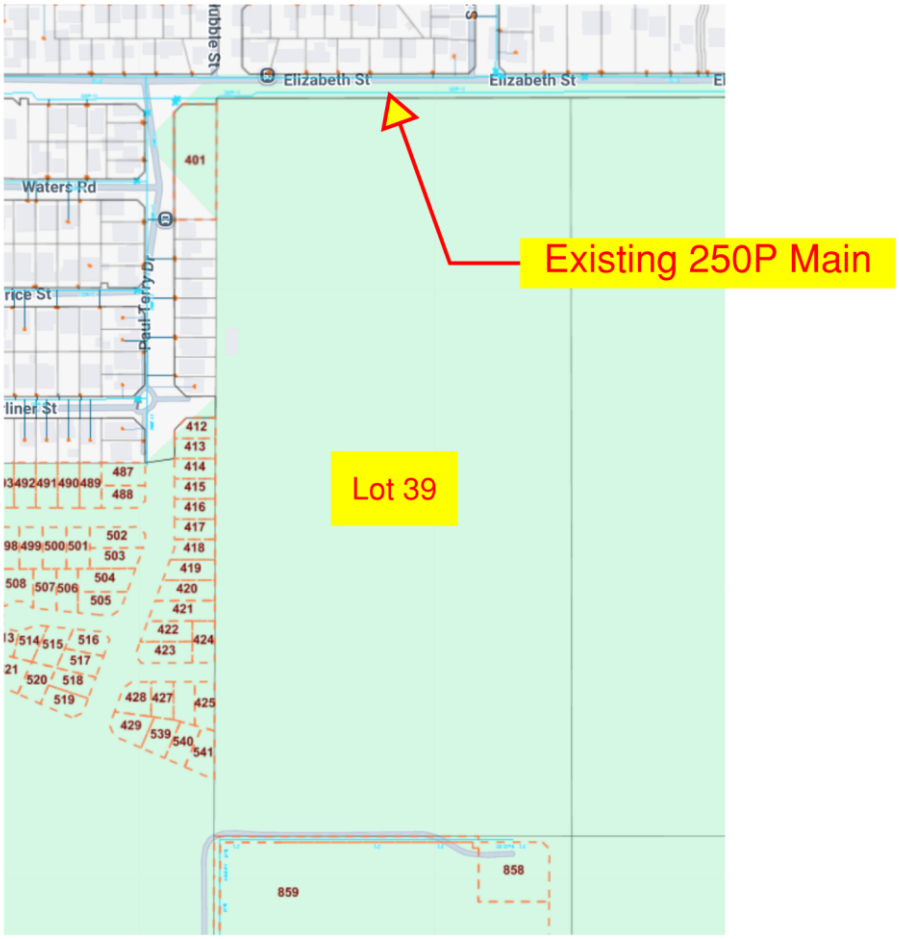


Figure 7: Existing Water Corporation water supply infrastructure (Esinet)

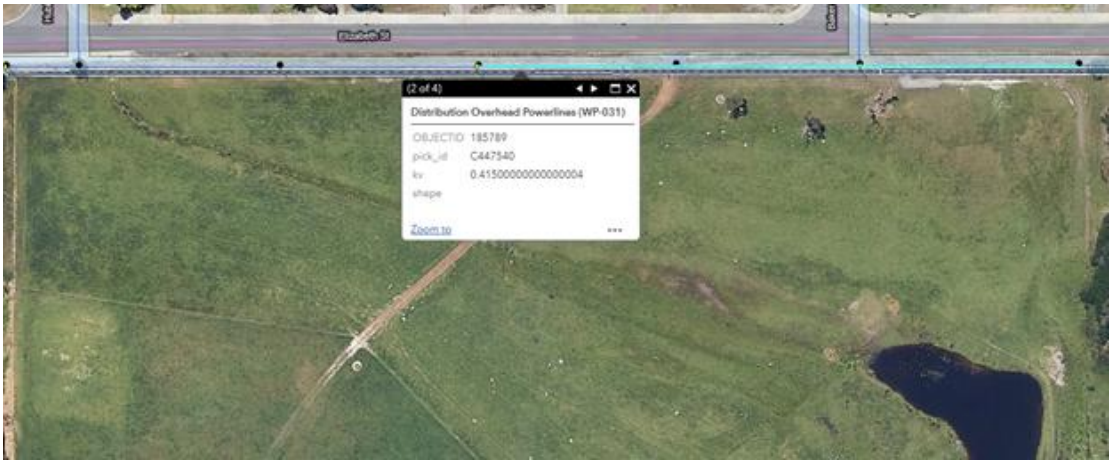
All water mains required for the development site will be laid within the existing and proposed road reserves, on the correct alignment and in accordance with the Utility Providers Code of Practice and Water Corporations Water Reticulation Guidelines.

8 Power Supply

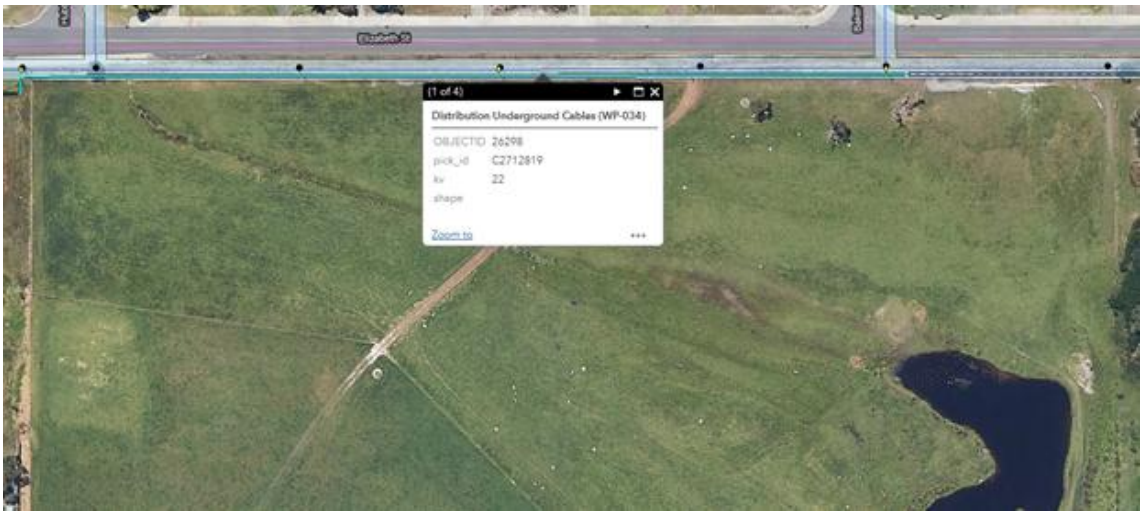
Western Power owns and operates all electrical supply network assets within the development area and therefore all new electrical supply equipment and cables will need to be installed in accordance with Western Power, WAER (West Australian Electrical Requirements), AS3000 specifications and Standards.

8.1 Existing Power Infrastructure

- **Low Voltage (LV) Network:** There is an existing overhead LV distribution line situated on the southern verge of Elizabeth Street. In alignment with Western Power's typical subdivision requirements, it is anticipated that this overhead asset must be decommissioned and replaced with an underground LV reticulation system to service the proposed lots to the north.

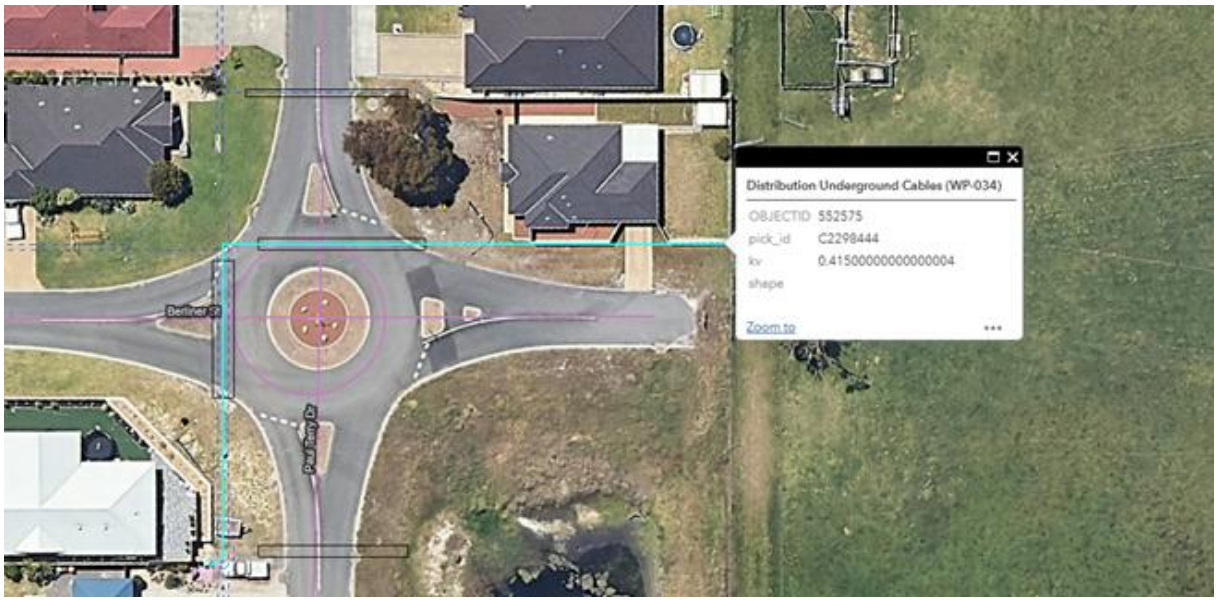


- **High Voltage (HV) Network:** An underground HV distribution cable is located along the southern side of Elizabeth Street.
- Feeder Identification: ALB 512.0
- Available Capacity: The network currently indicates a remaining capacity of less than 5MVA. Based on an estimated development load of ~0.5MVA, this is expected to meet Western Power's connection requirements. However, it is recommended that this capacity be formally verified via a Feasibility Study or Design Information Package (DIP) prior to project commencement.

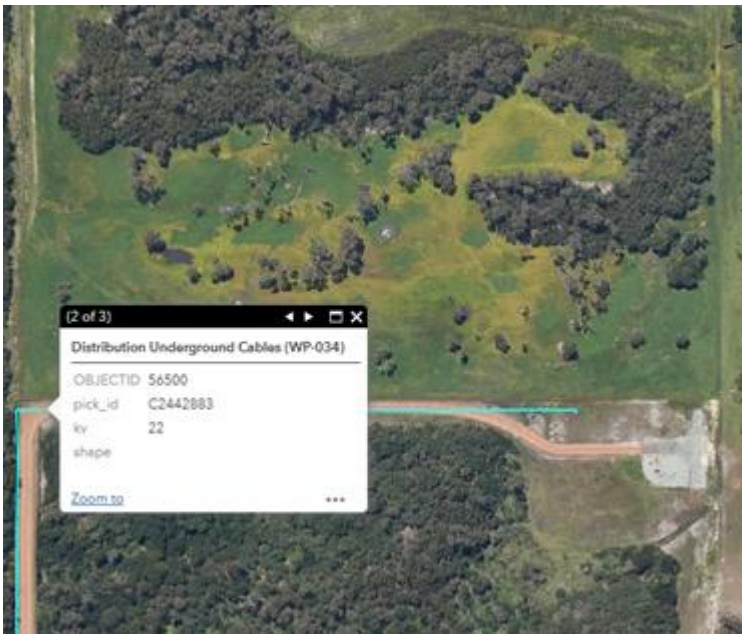


- **HV Reticulation (Paul Terry Drive):** An underground HV cable runs along the eastern verge of Paul Terry Drive, extending south from Elizabeth Street to Price Street. It continues along the northern side of Price Street to the rear of Lot 452, where it terminates at existing switchgear.

- **LV Reticulation (Berliner Street):** An underground LV circuit terminates at the rear of Lot 411 at the current Berliner Street cul-de-sac. This cable is estimated to be 25mm², suggesting it lacks the thermal capacity for interconnection without significant upgrades. Further technical assessment is required to determine its suitability for the proposed network.



- **HV Asset (Southern Boundary):** An underground HV line runs along the southern boundary of the development, likely dedicated to a low-capacity transformer servicing a pump station. Utilising this asset is deemed unfeasible as the cable route would traverse a designated Resource Enhancement Wetland to reach the proposed residential stages.



8.2 Proposed Upgrades

Current assessments suggest that major HV network upgrades are unlikely to be required. However, to confirm these assumptions and obtain a formal "Preliminary Network Access Solution," a Design Information Package (DIP) must be lodged with Western Power. Should any HV works be mandated, they would likely be classified as "HV Reworks" or "HV Reinforcements," the scope of which will be defined upon receipt of the DIP.

8.3 Network Capacity Assessment

Load Calculation: Based on an allocation of 4.7kVA per lot for 130 lots, the total estimated demand is 611VA. To provide a conservative buffer for auxiliary loads (e.g., pump stations and Public Open Space irrigation/lighting), a total load of 0.65MVA has been adopted for planning purposes.

Substation Requirements: The development will require the installation of a new HV switchgear unit and a distribution transformer substation. Ideally, this infrastructure should be located within a designated Public Open Space (POS) area, specifically to the north-east of the site. Preliminary assessments suggest this location will provide sufficient coverage to all proposed lots.

Feeder Constraints: As noted, the primary source of supply is the ALB 512.0 feeder, which currently has less than 5MVA of spare capacity. While Western Power is expected to approve the connection, should the load exceed available limits, the developer may be liable for the costs associated with a feeder upgrade or reinforcement.

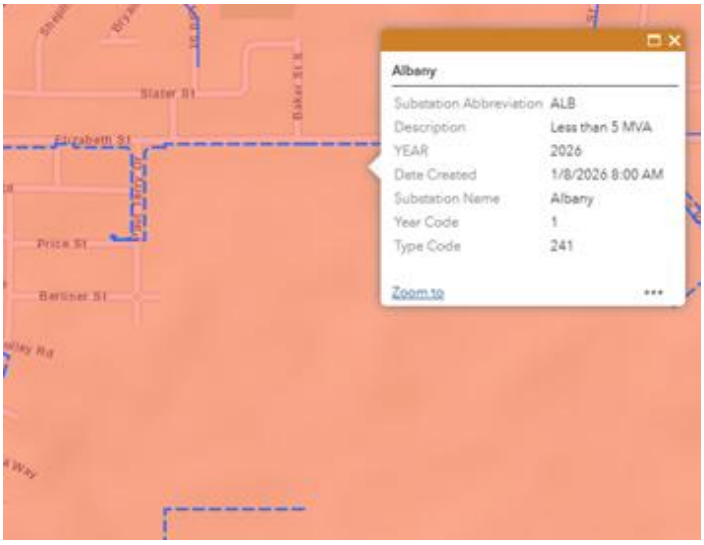


Figure 8: Network Capacity Mapping tool

9 Telecommunications

The proposed development will require a fibre ready pit and conduit network to be installed at the Developer's cost. The pit and conduit will be designed in accordance with the relevant providers standards and will be installed in the telecommunications alignment within the internal road reserves.

Once installed and inspected, ownership of the pit and conduit network will be transferred to the relevant provider.

- The proposed development will require a fiber ready pit and conduit network to be installed at the developer's cost.

- The pit and conduit will be designed in accordance with NBN standards and will be installed in the telecommunications alignment within the internal road reserves. Once installed and inspected, ownership of the pit and conduit network will be transferred to NBN.

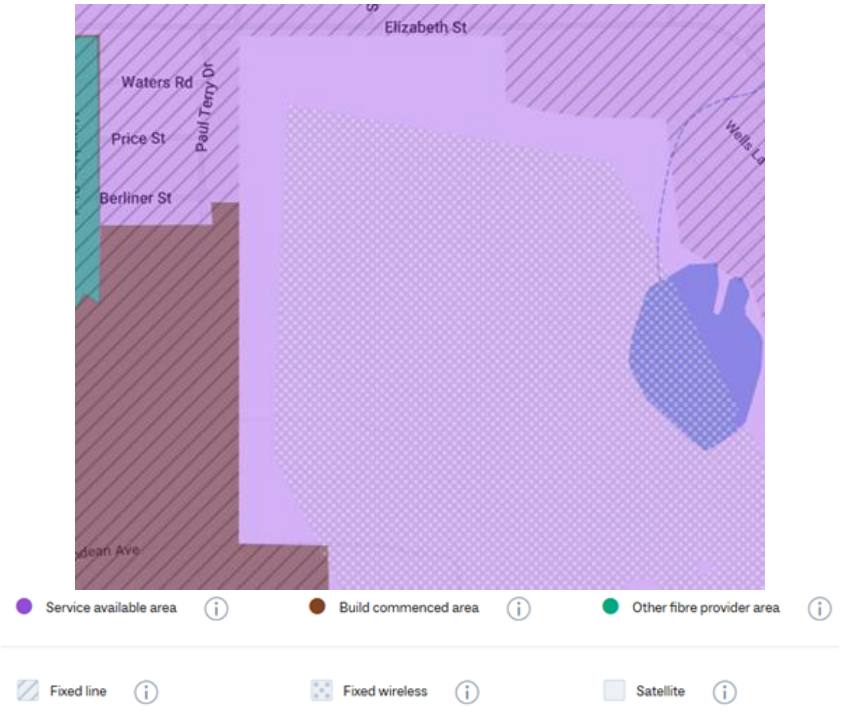


Figure 9: NBN Service Available Area

9.1 Existing infrastructure

- There is existing NBN infrastructure along the north side of Elizabeth Street for the full frontage of the development.
- NBN also exists along the Eastern side of Paul Terry Drive, which could be utilised as a secondary connection from the roundabout entry to the proposed development along Berliner Street.

10 Gas

Supagas has advised there are existing gas mains adjacent the site for future connection based on the concept plan provided to them.

Capacity of their network would need to be checked closer to the proposed timing of development.

To service the proposed development, extensions as shown in yellow below would be required.

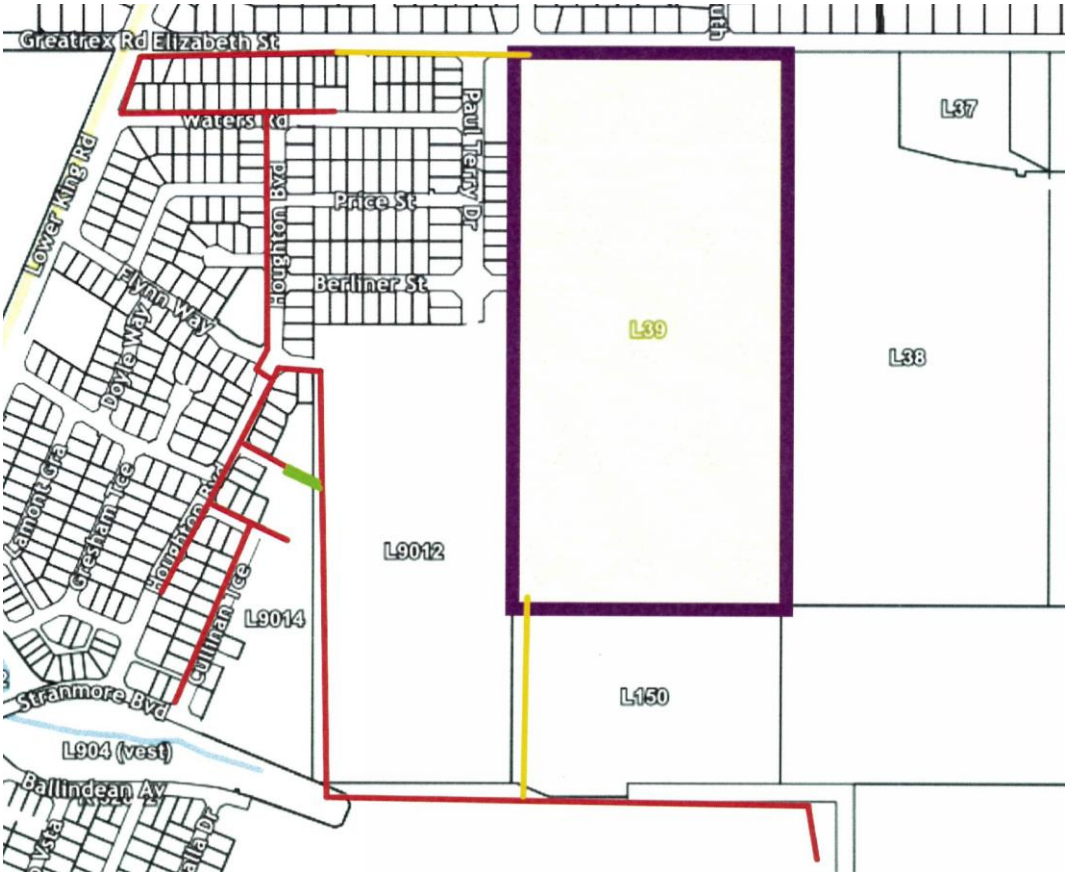


Figure 10: Existing Gas Network

11 Disclaimer

This Servicing Report has been prepared by JDSi Consulting Engineers for DevelopmentWA, specifically in relation to the proposed subdivision of Lot 39 Elizabeth Street, Bayonet Head, Albany.

The assessment is based on:

- A desktop review of publicly available mapping and planning information
- Preliminary power and communications advice provided by UPD
- Preliminary Sewer and Water Reticulation advice provided by the Water Corporation
- Preliminary Sewer and Water Reticulation advice provided by the Water Corporation
- Preliminary geotechnical information provided by Douglas Partners, including draft test pit logs and infiltration test results
- JDSi's experience with similar land development projects in Western Australia.

While JDSi has taken reasonable care in compiling this report, it is provided as an indicative, desktop-level summary of engineering servicing requirements and risks.

JDSi accepts no responsibility for decisions made based solely on this report without appropriate further investigations and authority consultation.

APPENDIX A

DEVELOPMENT CONCEPT LAYOUT

DESIGN FEATURES

1. Adjoining natural bushland contributes to the characteristics of the development
2. Public Open Space configured to incorporate established stormwater flood path and landform
3. Topographical responsive street design minimises earthworks and maximises view corridors east
4. Entry boulevard incorporating central swale median
5. Heritage tree retention within road reserve
6. Public Open Space featuring drainage swale at bottom of drainage catchment
7. Diverse range of lot sizes to respond to landform, bushfire management and household diversity, ranging 300m² - 600m²
8. Moderate sized lots located in vicinity of open space amenity
9. Roadside drainage swales to accommodate pre development stormwater requirements including drainage pits

LEGEND

- Concept plan boundary
- Residential R30
- Rural zoned area
- Public open space and drainage
- Established drainage swale to be retained
- Anticipated BAL29 setback
- Illustrative street tree locations
- Heritage tree to be retained
- Indicative shared path alignment
- Indicative footpath alignment

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Scale	Date	Plan	Drawn
1:2000@A3 1:1000@A1	7/04/2026	25/057/004B	MH
		Grid MGA2020-50	Approved MB

0 10 20 30 40 N

Development Concept

LOT 39 ELIZABETH STREET, BAYONET HEAD

A DevelopmentWA Project

TBB PLANNING

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Douglas PARTNERS

GROUNDED EXPERTISE

Report on Preliminary Geotechnical Investigation

Proposed Residential Development

Lot 39 Elizabeth Street, Bayonet Head, WA

Prepared for DevelopmentWA

Project 240409.00

30 March 2026

Douglas Partners Pty Ltd
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Revision 0	Huijian Gao and Brendan Divilly	Frederic Verheyde	30 March 2026

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Revision 0	Naomi Lawrance, DevelopmentWA

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature		Date
Author		30 March 2026
Reviewer		30 March 2026

bsi ISO 9001 Quality Management Systems CERTIFIED
FS604853

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

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Appendix A: About This Report

Appendix B: Drawing 1 – Test Location Plan

Test Pit Logs

Appendix C: Geotechnical Laboratory Test Reports

Appendix D: Acid Sulfate Soil Laboratory Test Reports

Report on Preliminary Geotechnical Investigation
Proposed Residential Development
Lot 39 Elizabeth Street, Bayonet Head, WA

1. Introduction

This report, prepared by Douglas Partners Pty Ltd (Douglas), presents the results of a preliminary geotechnical investigation undertaken for a proposed residential development at Lot 39 Elizabeth Street, Bayonet Head, WA (the site). The investigation was commissioned in a letter dated 4 February 2026 by DevelopmentWA and was undertaken in accordance with Douglas' proposal P240409.00.P.001.Rev1 dated 3 February 2026.

It is understood that the site will be developed into a residential subdivision, with residential lots, pavement, retaining walls, underground services and areas of public open space (POS).

The purpose of this preliminary geotechnical investigation is to assess the subsurface conditions beneath the site and thus provide preliminary comments on:

- The geotechnical suitability of the site for the proposed development.
- The subsurface conditions across the site, including the possible presence of any geotechnically problematic or compressible soils.
- The site classification in accordance with the Australian Standard (AS 2870, 2011) and site preparation measures to improve the site classification.
- Site preparation, earthworks and compaction requirements, including the possible re-use of site soils as controlled fill.
- Excavation conditions and temporary batter slopes for shallow excavations.
- Geotechnical parameters for retaining wall design.
- A design California bearing ratio (CBR) for pavement subgrade materials based on observations made in the field, limited laboratory testing and Douglas' experience.
- The permeability of the encountered site soils and suitability for on-site stormwater disposal.
- The depth to groundwater if encountered.
- The presence or absence of acid sulfate soil across the site together with recommendations for further investigation following completion of detailed design.
- Recommendations on additional geotechnical investigation.

The investigation included the excavation of 20 test pits, in situ infiltration at three locations, and laboratory testing of selected samples. The details of the field work are presented in this report, together with comments and recommendations on the items listed above.

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

2. Site Description

The site, Lot 39 Elizabeth Street in Bayonet Head, WA, comprises a rectangular shaped area of approximately 18.9 ha. The development footprint and investigation area cover the northern half of the lot, approximately 10.2 ha in size. The site is bordered by Elizabeth Street to the north, Paul Terry Drive to the northwest, and by pastoral land and bushland elsewhere.

At the time of the investigation, the site was generally vacant and comprised cleared pastoral land. A workshop was located at the centre-western part of the site and a pond in the northeastern corner. A drainage gully runs from the northwestern corner of the site into the pond. Review of historical photos indicates that the pond and open drain were man-made sometime between 1977 and 1988, with ground disturbance visible up to about 30 m around these features. The site was separated by fences and a gravelly track connects Elizabeth Street to the workshop.

Vegetation across the site comprised long grass with both small groups and singular mature trees at isolated locations within the paddocks, surrounding the pond, and near the workshop. Tall grass, approximately 1 m to 1.5 m in height was observed within the gully and towards the southeastern corner of the site.

The ground surface across the site generally falls to the east, with surface levels of around RL 13 (relative to AHD) on the western boundary to approximately RL 6 on the eastern boundary.

The Albany 1:50,000 Environmental Geology Map indicates the subsurface conditions across the site to generally comprise alluvial sand. Areas mapped as laterite are noted in close proximity to the site.

Based on published acid sulfate soil risk mapping, the site is mapped as 'high to moderate risk of acid sulfate soils occurring within 3 m of natural soil surface. This risk mapping, shown in Figure 1, is generally supported by a historical aerial image of the site from 1961 shown in Figure 2. The historical imagery indicates possible swampy ground on the site which may have been covered with fill.

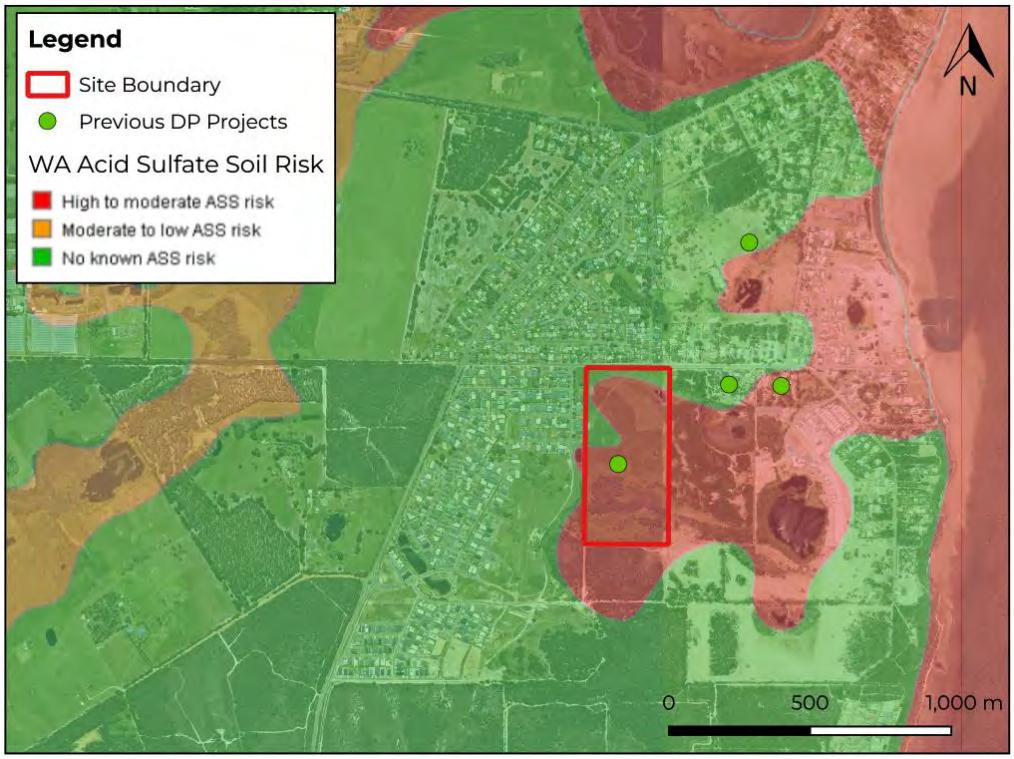

Figure 2: Acid Sulfate Soil Risk Mapping

Figure 1: Site Location Historical Imagery from October 1961.

3. Field Work Methods

Field work for the investigation was carried out between 12 and 13 February 2026, and comprised:

- The excavation of 20 test pits (TP01 to TP20).
- Perth sand penetrometer (PSP) testing adjacent to each test pit.
- In situ infiltration testing at three locations (adjacent to TP10, TP15 and TP20).

The test pits were excavated to depths of up to 3.0 m using an 8-tonne excavator equipped with a 600 mm wide toothed bucket. Ground conditions were logged in accordance with the Australian Standard (AS 1726, 2017) by a geotechnical engineer from Douglas. Soil samples were recovered for subsequent geotechnical laboratory testing.

Soil samples for assessment of acid sulfate soils were collected at 0.5 m intervals from 12 selected test pits (TP01, TP03, TP05, TP06, TP09, TP10, TP11, TP13, TP15, TP16, TP17 and TP20). All soil samples were placed into a snap-lock bag and chilled in the field and transported to the laboratory under a chain-of custody.

The PSP testing was carried out in accordance with the Australian Standard (AS 1289.6.3.3, 1997), adjacent to each test pit, to assess the density of the shallow soils. The results of these PSP tests are presented on the test pit logs in Appendix B.

Permeability testing was performed using the falling head test at depths of between 0.5 m and 1.0 m adjacent to locations TP10, TP15, and TP20.

Test locations were determined using a differential GPS and are marked on Drawing 1, Appendix B. Surface elevations at each test pit were surveyed using a differential GPS with a reported accuracy of 0.1 m.

4. Field Work Results

4.1 Ground Conditions

Detailed logs of the ground conditions and results of the field testing are presented in Appendix B, together with notes defining descriptive terms and classification methods, in Appendix A.

A summary of the ground conditions encountered at the test locations is given below:

- **Topsoil and Organic SAND SP-SM** – dark grey-brown and grey-brown sandy topsoil, trace or with silt, rootlets and organics, between 0.1 m and 0.45 m thick at all test locations. The organic soil layer was also present under the fill at test locations TP02 and TP07.
- **Fill (SAND, Gravelly SAND, Clayey SAND) SP-SM, SC** – grey-brown, orange-brown and grey, low to medium plasticity clay, fine to coarse gravel, encountered at test locations TP02 and TP07, to depths of between 0.9 m and 1.1 m. Review of historical photo suggest that this filling possibly results from the excavation of the existing pond and open drain, and thus possibly occurs in their vicinity.

- **SAND SP and SP-SM** – fine to medium grained, grey, pale grey and pale brown, underlying the topsoil and fill material, encountered at each test location, to depths of between 0.9 m and test pit termination depth of 2.7 m.
- **Cemented Silty SAND/COFFEE ROCK SM** – dark brown, weakly to strongly cemented coffee rock, encountered at locations TP01, TP03, TP04, TP06, TP08 to TP13 and TP17 from depths between 0.9 m to 1.7 m. Test pit refusal occurred within the strongly cemented coffee rock at several locations when utilising an 8-tonne excavator.
- **Clayey materials including Clayey SAND SC, Clayey Silty SAND SC-SM, Clayey SILT ML** – pale grey, grey and green-grey, low to medium plasticity, underlying the silty sand material at test locations TP02, TP03, TP05, TP06, TP11 and TP12, from depths of between 1.45 m and 2.6 m and extending to the test termination depths of 3.0 m.

4.2 Groundwater

Groundwater was encountered within several test pits during the field work between 12 and 13 February 2026. The depth and level of groundwater is shown in Table 1. The test pits were backfilled immediately following soil sampling and logging which prevented long-term monitoring of groundwater levels.

Table 1: Summary of Groundwater Levels Observed between 12 and 13 February 2026

Test Location	Ground Surface Level[1] (AHD)	Groundwater Depth (m)	Groundwater Level[2] (AHD)
TP01	11.1	1.4	9.7
TP02	8.9	2.5	6.4
TP04	11.6	2.0	9.6
TP05	9.5	1.9	7.6
TP07	7.2	2.8	4.4
TP10	6.5	0.8	5.7
TP11	8.4	1.65	6.75
TP13	9.2	1.7	7.5
TP14	7.2	1.6	5.6
TP15	11.0	2.3	8.7
TP16	8.6	2.1	6.5
TP17	7.4	1.0	6.4
TP18	6.6	1.4	5.2
TP19	7.2	1.6	5.6
TP20	6.5	2.2	4.3

Notes for Table 1: [1]: Surface level measured using a differential GPS.
[2]: Groundwater Level = Surface Level – Groundwater Depth.

It should be noted that groundwater levels are affected by climatic conditions and land usage and will therefore vary with time.

4.3 Permeability

Three in-situ permeability tests using the falling head method were carried at a depth of between 0.5 m and 1.0 m at locations TP10, TP15 and TP20. A permeability value has been estimated using a calculation derived from a method based on Hvorslev (Hvorslev, 1951). Results of the permeability analysis are summarised in Table 2.

Table 2: Summary of Permeability Analysis

Location	Depth (m)	Measured Permeability (m/day)	In situ Conditions of Tested Material
TP10	0.5	1.5	SAND SP, trace silt, medium dense, groundwater seepage at 0.8 m
TP15	1.0	>20	SAND SP, trace silt, medium dense
TP20	0.6	5	SAND SP, trace silt, medium dense

5. Laboratory Testing

5.1 Geotechnical Laboratory Testing

A geotechnical laboratory testing programme was carried out by a NATA accredited laboratory and comprised the following assessments:

- The particle size distribution of eight samples.
- The Atterberg limits of four samples.
- The organic content of four samples.
- The California bearing ratio (CBR) and modified maximum dry density (MMDD) of two samples.

Results of the testing are summarised in Table 3 and the test certificates are presented in Appendix C.

Table 3: Results of Laboratory Testing for Soil Identification

Test Location	Depth (m)	Fines (%)	Sand (%)	Gravel (%)	OC (%)	LL (%)	PL (%)	PI (%)	LS (%)	Material
TP02	2.2	-	-	-	0.9	-	-	-	-	SAND SP-SM
TP05	0.1	-	-	-	25.0	-	-	-	-	TOPSOIL/Organic SAND
TP06	0.55 – 1.05	19	71	10	-	-	-	-	-	Silty SAND SM, trace gravel
TP06	1.7	15	82	3	-	22	14	8	1.5	Clayey Silty SAND SC-SM, trace gravel, low plasticity
TP06	2.2	75	25	0	-	28	24	4	1.5	Clayey SILT ML, with sand, low plasticity
TP07	1.0	15	85	0	10.8	NO	NP	NP	0.5	Organic Silty SAND SM
TP11	0.5	8	92	0	-	-	-	-	-	SAND SP-SM, with silt
TP11	1.8	-	-	-	1.6	-	-	-	-	Silty SAND SM, with organics
TP17	0.5	10	90	0	0.1	-	-	-	-	SAND SP-SM, with silt
TP20	0.3	11	89	0	11.6	NO	NP	NP	0	Organic SAND SP-SM
TP20	0.6	5	95	0	-	-	-	-	-	SAND SP, trace silt

Notes : The % fines is the amount of particles smaller than 75 µm.
The % sand is the amount of particles larger than 75 µm and smaller than 2.36 mm.
The % gravel is the amount of particles larger than 2.36 mm and smaller than 63 mm.
OC – Organic content LL – Liquid Limit PL – Plasticity Limit
PI – Plasticity Index LS – Linear Shrinkage
NO – Not Obtainable NP – Non-Plastic

The CBR tests were undertaken at a target compaction level of 95% of modified maximum dry density. The samples were soaked for 4 days prior to testing under a confining surcharge of 4.5 kg. The results are presented in Table 4 below.

Table 4: Results of Laboratory Testing for Pavement Design Parameters

Test Location	Depth (m)	MMDD (t/m³)	OMC (%)	CBR (%)	Swell (%)	Material
TP06	0.55 – 1.05	1.67	18.5	20	0.0	Silty SAND SM, trace gravel
TP11	0.5	1.59	19.5	20	0.0	SAND SP-SM, with silt

5.2 Acid Sulfate Soil Laboratory Testing

Acid sulfate soil screening tests were undertaken by MPL Laboratories Pty Ltd (MPL) on soil samples retrieved from selected test pits at the site. The screening tests compromised measurement of pH of the soil in water (pH_F) and the pH of the soil after oxidation within a 30%

solution of hydrogen peroxide (pH_{FOX}). The results of these tests provide an indication of the presence of actual or potential acid sulfate soils and should be considered as qualitative only.

Following a review of the screening test results, selected soil samples were submitted to MPL to undergo the chromium suite of testing. This laboratory test quantifies the existing acidity and potential acidity derived from sulfide oxidation which is reported as net acidity. Soil samples were selected for laboratory analysis with due consideration of the following:

- Screening results, with a particular focus on the lowest reported pH_F or pH_{FOX} within a soil stratum at each location;
- Reported reaction strength; and
- Visual identification of the soils encountered.

The acid sulfate soil laboratory results are presented in Table D-1 in Appendix D, together with the laboratory reports and associated chain-of-custody reports.

The laboratory results indicate the following:

- The results of pH_F are not indicative of actual acid sulfate soils conditions at the sampling locations to a maximum depth of 3 m;
- The results of the pH_{FOX} are indicative of potential acid sulfate soils conditions at seven of 12 sampling locations sampling locations and at varying depths. The indications of potential acid sulfate soils conditions are generally located in the eastern portion of the site; and
- The calculated net acidity was reported above the adopted action criterion of 0.03%S for 5 out of 18 samples submitted for chromium suite analysis, including TP01, TP09, TP13, TP16 and TP17. The maximum net acidity was 0.13%S at TP01.

It should be noted that the exceedances of the action criterion are generally attributed to a higher result reported for the titratable actual acidity (TAA) component of net acidity, which is a measure of the soils existing acidity. Given the published acid sulfate soil risk mapping indicates a “high to moderate risk”, it is possible that the elevated TAA is attributed to previous oxidation of acid sulfate soils.

6. Proposed Development

The proposed development comprises a residential subdivision with lots, pavement, retaining walls, underground services and areas of POS. Owing to nature of the site, it is considered likely that the site will be filled to reach design surface levels.

7. Comments

7.1 Site Suitability

The investigation indicates that the site is generally underlain by variable soil conditions which include fill, topsoil, sand coffee rock and clayey materials, as described in Section 4.1 above.

The ground conditions are generally considered suitable for the proposed residential development.

Geotechnical constraints imposed by the ground conditions for the proposed development include:

- Uncontrolled fill such as encountered at TP02 and TP07, likely occurring along the existing pond and open drain, and possibly elsewhere across the site.
- The relatively impermeable nature of the shallow coffee rock and clayey soils, which may require raising site levels and placement of sand fill to assist site drainage.
- Perched groundwater at shallow depths is anticipated and may impact potential excavations and earthworks at the site, depending on the timing of the works.
- Hard excavation conditions should also be expected in areas where coffee rock materials were encountered, as outlined in Section 4.1.
- Earthworks are recommended to take place in the summer months, before the start of the winter rains.

Suitable site preparation should include the removal of the uncontrolled fill and deleterious materials including vegetation and topsoil, and test rolling of the site. A suitable separation between finished surface level and groundwater should be maintained, which is likely to require filling the site with sand fill. There may also be the requirement to implement a sub-soil drainage network.

Overall, from a geotechnical standpoint, the land is physically capable of development provided that the provisions outlined in the subsequent subsections of the report are incorporated in the development plans.

7.2 Site Classification

The shallow ground conditions beneath the site generally comprise medium dense to dense sandy soils overlying coffee rock and clayey materials in some locations. Based on a visual and tactile assessment, combined with laboratory testing, the clayey materials are assessed to be slightly reactive.

The majority of the test locations encountered at least 1.5 m of non-reactive and non-organic soils from surface and can be classified as 'Class A', following suitable site preparation as outlined in Section 7.3. Soils considered non-reactive and non-organic include 'Sand' and 'Silty Sand' classified as 'SP', 'SP-SM', and 'SM' with no organics, in the logs in Appendix B.

Test locations with clayey materials within 1.5 m of surface (such as TP06) are currently classified as 'Class S', in accordance with the Australian Standard (AS 2870, 2011). Examples of soils that are considered reactive include the 'Clayey Sand', 'Çlayey Silty Sand', and 'Clayey Silt' classified as 'SC', 'SC-SM', 'ML' on the logs in this report. Owing to the presence of uncontrolled fill and buried organic layers (e.g. 'Organic Silty Sand' and 'Sand with organics'), test locations TP02 and TP07 should be classified as 'Class P' in current conditions.

It is generally considered that the entire development area could be re-classified as 'Class A' in accordance with the Australian Standard (AS 2870, 2011), following suitable site preparation and filling the site with controlled sand fill to maintain a minimum clearance of at least 1.5 m from the finished surface to any clayey materials (such as soils classified as 'SC', 'SC-SM', 'ML' on the logs). Suitable site preparation is outlined in Section 7.3, and in particular includes the removal of all uncontrolled fill and organic soils, followed by replacement with controlled sand fill.

7.3 Site Preparation

7.3.1 Site Stripping

All vegetation, topsoil and organic sand should be stripped from building envelopes and pavement areas, and either removed from site or stockpiled for possible re-use if applicable (see Section 7.5). Topsoil and organic sand were encountered at the majority of the site to depths of between 0.1 m and 0.45 m. Buried organic soils were also present underlying the fill at TP02 and TP07.

Tree roots remaining from any clearing operations should be completely removed, and the excavations backfilled with material of similar geotechnical properties to the surrounding ground and compacted to achieve a dry density ratio of not less than 95% relative to modified compaction for granular subgrade.

Uncontrolled fill, such as encountered at TP02 to a depth of 0.9 m, and at TP07 to a depth of 1.1 m, and likely occurring elsewhere across the site specifically near the existing pond and open drain, should be stripped from the proposed development areas. It is inferred that the encountered uncontrolled fill mostly results from the historical excavation of the existing pond and associated open drain and thus comprise a mix of excavated shallow topsoil and organics, shallow sand and deeper clayey soils. Based on observations of the test pit conditions, it is anticipated that the granular portions of uncontrolled fill would be suitable for re-use, from a geotechnical standpoint. It is suggested that the granular component of the uncontrolled fill be attempted to be separated from the other soil types during its excavation, with the subsequent objective to assess and re-use this fraction as structural fill with no impact on site classification. However, it should be acknowledged that this approach might not be practical and successful during construction, depending on the condition of the fill. Granular and clayey materials should be stockpiled separately for geotechnical assessment.

Organic soils occurring at the base of the uncontrolled fill (such as encountered at TP02 and TP07) should be removed beneath proposed development areas.

It is recommended that all site works be undertaken under the supervision of an experienced geotechnical engineer. In particular, the geotechnical engineer should assess the results of topsoil stripping and inspect the site to identify areas of uncontrolled fill, prior to placement of any fill.

7.3.2 Test Rolling

Following the site stripping (Section 7.3.1), it is recommended that the exposed ground be test rolled with a heavy smooth drum roller (say minimum 14 tonne deadweight) in vibrating mode. Care should be taken not to operate heavy vibrating plant immediately adjacent to existing buildings and services. Areas in proximity to adjacent structures or services should be rolled in static mode.

Any areas that show signs of excessive deformation during compaction should be compacted until deformation ceases or, alternatively, the poor-quality material should be excavated and replaced with suitable structural fill and compacted to achieve a dry density ratio of not less than 95% relative to modified compaction for granular subgrade.

Following test rolling to confirm suitable foundation material, the site should be assessed by Douglas.

7.3.3 Imported Filling

If required, imported filling should comprise free draining, cohesionless, well graded sand that:

- contains less than 5% by weight of particles less than 75 microns in size.
- contains no particles greater than 150 mm in size.
- is free of organic and other deleterious materials.
- has a permeability of no less than 5 m/day on a sample compacted to 95% MMDD.

It is recommended that test certificates are reviewed and approved by Douglas prior to importing material to site.

Other materials could be considered, provided they are granular and non-reactive, and following review by Douglas.

7.3.4 Fill Placement

Fill should be placed in a controlled manner as outlined in the Guidelines on Earthworks for Commercial and Residential Development (AS 3798, 2007), in near horizontal layers of uniform thickness.

The thickness of each layer should be appropriate for the type of compaction equipment utilised, although typically should not exceed 400 mm loose thickness for granular materials. Each layer should be compacted near optimum moisture content (+/- 2%) to achieve a dry density ratio of not less than 95% relative to modified maximum dry density.

7.3.5 Compaction Testing

Compaction control of the sand fill could be carried out using a Perth sand penetrometer (PSP) test in accordance with the Australian Standard test method (AS 1289.6.3.3, 1997). All areas within the proposed building and pavement envelopes should be compacted to achieve a minimum blow count of 8 blows per 300 mm penetration to a depth of not less than 1.0 m below foundation or subgrade level.

During construction, some loosening of the surface sands in foundation excavations is expected. Therefore, the top 300 mm in the base of any excavation should be re-compacted using a vibratory plate compactor prior to construction of any footings.

7.4 Excavations

7.4.1 Excavation Conditions

The encountered ground conditions generally comprise medium dense natural sand overlying coffee rock, encountered from depths between 0.9 m and 1.7 m, and clayey materials encountered from 1.45 m to 2.6 m depth.

Conventional earthmoving equipment (such as excavators) should be suitable for excavations across the majority of the site within the granular soils or stiff clayey materials. Excavations in coffee rock may require powerful excavators (say 20 t) possibly equipped with ripping tynes or rock breaker attachments for limited excavations or ripping with dozers (say D9 and heavier) for large excavations, with associated low excavation rates.

7.4.2 Safe Batter Slopes

It is recommended that temporary batter slopes in sand are maintained flatter than 1.5:1 (H:V) if not retained, to a maximum depth of 2 m. Long term batter slopes in sand should be maintained flatter than 2:1 (H:V) if not retained, to a maximum depth of 2 m. These batter angles are valid provided no surcharge loads (including live loads such as vehicles and machinery) apply at the top of the slope. Any excavation that is adjacent to existing buildings or below the level of existing footings should be supported, or the footings underpinned.

It is also emphasised that the abovementioned angles are not applicable if water emanates from the excavation slopes. In such conditions, there is potential for instability no matter how flat the batter angle. If loads are applied at the top of the batter (for example, excavated soil or equipment), or if there is any groundwater influence, then a site-specific assessment of stability should be undertaken.

7.5 Geotechnical Suitability for Re-Use of In Situ Materials

7.5.1 Topsoil and Organic Soils

Topsoil and organic soils were encountered across the site to depths between 0.1 m and 0.45 m, and underlying the uncontrolled fill (e.g. TP02 and TP07).

Owing to the high organic content of the topsoil material and other organic soils, it is generally considered that these materials are unsuitable for re-use as structural fill. It is recommended that following stripping, the topsoil and other organic soils are either stockpiled for re-use in non-structural applications such as landscaping or disposed of off-site.

7.5.2 Uncontrolled Fill

The uncontrolled fill encountered at TP02 and TP07 appears to be variable. Any uncontrolled fill should be stockpiled prior to re-use for geotechnical assessment. Granular and clayey materials should be stockpiled separately, where possible, as discussed in Section 7.3.1.

Generally, any uncontrolled fill that comprises sand and should be geotechnically suitable for re-use, provided it is free from organic matter and particles greater than 150 mm in size. Depending on the possible presence of oversized particles, screening or raking of the fill may be required. Clayey materials may be re-used, noting some limitations to their re-use, as discussed in Section 7.5.5.

7.5.3 Natural Sand

The encountered natural sand is considered geotechnically suitable for reuse as structural fill material provided it is free from organic matter and particles greater than 150 mm in size. It is

recommended that a geotechnical engineer inspects cut to fill operations, to confirm the suitability of the materials being utilised.

Sand with silt (noted as SP-SM on the attached logs) will have a lower soil permeability compared to clean sand. Therefore, some consideration should be given to possible adverse implications on site drainage, if sand with silt (SP-SM) is re-used as shallow fill.

7.5.4 Coffee Rock

Excavated coffee rock is likely suitable to be re-used as deep fill following suitable crushing and blending with clean sand. It is suggested that owing to the marginal organic content of the coffee rock, that once excavated and crushed (no particles greater than 150 mm), the excavated coffee rock should be blended with clean sand at a ratio of 1:1, prior to re-use as deep fill. Blending with clean sand will also aid in the compaction of the crushed coffee rock material. Owing to the likely high fines of the blended coffee rock material, it is likely that this material will be of relatively low soil permeability. Implications on site drainage should be considered prior to its re-use.

7.5.5 Clayey Materials

Clayey materials could be re-used as fill however their reactivity and lower permeability will impact site classification and site drainage. Difficulties in handling and compacting clayey soils should also be considered, prior to their re-use. Earthworks plans and construction methodology should be assessed by a geotechnical engineer prior to any re-use of clayey materials as structural fill.

7.6 Soil Retention

The design of flexible or rigid walls should be undertaken using a triangular pressure distribution and the earth pressure parameters given in Table 5. In addition to the soil pressure, wall design should also allow for external loads such as buildings, live loads, hydrostatic pressure or construction activities.

Table 5: Soil Parameters for Retaining Wall Design

Soil Type	Soil Unit Weight Above Water γ (kN/m^3)	Drained Angle of Friction Φ' (Degrees)	Undrained Shear Strength C_U (kPa)	Coefficient of Earth Pressure – Active K_a	Coefficient of Earth Pressure – at Rest K_0	Coefficient of Earth Pressure – Passive K_p
Compacted Fill or Natural Sand (Medium dense)	20	32	0	0.31	0.47	3.2

Clayey materials – stiff and stronger	20	-	75	0.3	0.5	2

Safe batter slopes were discussed in Section 7.4.2.

7.7 Pavement Design Parameters

Based on field observations, laboratory testing and Douglas' experience a subgrade California bearing ratio (CBR) of 10% is recommended for pavement design for subgrades in the natural sand at this site, provided the subgrade is compacted to not less than 95% of modified maximum dry density to a depth of at least 0.5 m below subgrade level.

7.8 Stormwater Drainage and Permeability

Results of the permeability testing in Section 4.3 indicate a field permeability value of between 1.5 m/day and in excess of 20 m/day for the shallow sand encountered beneath the site.

The lower infiltration at location TP10 is likely influenced by a shallow clearance to groundwater at this location (groundwater encountered at a depth of 0.8 m at TP10).

The relatively shallow groundwater across the site would generally preclude the use of soakwells and sumps for stormwater disposal. However, soakwells could be considered if a suitable thickness of free-draining sand fill is placed across the site to increase the clearance to groundwater or any low permeability layers/impermeable layers, such as coffee rock or clayey materials. A minimum clearance of 0.5 m is recommended between the base of soakwells and groundwater or impermeable layers such as coffee rock or clayey materials. It should be noted that groundwater levels are transient and can be higher during the winter periods.

The infiltration capability commonly reduces over time due to silt build up at the base of soakwells and therefore the soakwells must be cleaned and maintained on a regular basis. Soakwells should preferably be positioned at a distance from all buildings, retaining walls and boundaries by not less than 2 m.

7.9 Acid Sulfate Soils

Based upon the results of the preliminary investigation, Douglas concludes that acid sulfate soils are present beneath the site to depths of at least 3 m. As such, a works-specific acid sulfate soil management will be required to manage potential environmental impacts associated with future ground disturbing activities (including dewatering).

In this regard, Douglas recommends that following completion of detailed design (i.e. when excavation depths and alignments are known), detailed acid sulfate soil and groundwater investigations, targeting proposed excavations, be undertaken. The investigations should be undertaken with reference to DWER endorsed guidelines and aim to determine the extent and severity of acid sulfate soils within the proposed areas of disturbance.

7.10 **Additional Geotechnical Investigation**

Additional geotechnical investigation should be undertaken prior to detailed design. An increased frequency of test pits should be undertaken across the site, as well as well as additional permeability tests across the site and at any critical drainage locations. In particular, additional test pits should be undertaken to assess the extent of the uncontrolled fill.

8. References

AS 1289.5.2.1. (2017). *Methods of testing soils for engineering purposes - Soil compaction and density tests - Determination of the density/moisture content relation of a soil using modified compactive effort.* Standards Australia.

AS 1289.6.3.3. (1997). *Methods for testing soils for engineering purposes - Soil strength and consolidation tests - Determination of the penetration resistance of a soil - Perth sand penetrometer test.* Reconfimed 2013: Standards Australia.

AS 1726. (2017). *Geotechnical Site Investigations.* Standards Australia.

AS 2870. (2011). *Residential Slabs and Footings.* Standards Australia.

AS 3798. (2007). *Guidelines on Earthworks for Commercial and Residential Developments.* Standards Australia.

Hvorslev, M. J. (1951). *Time lag and soil permeability in groundwater observations.* US Army Corps of Engineers Waterways Experiment Observation Station, Bulletin 36, Vicksburg, Mississippi.

9. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Lot 39 Elizabeth Street, Bayonet Head, WA in line with Douglas' proposal dated 3 February 2026 and acceptance received from Naomi Lawrance of DevelopmentWA dated 4 February 2026. The work was carried out under DevelopmentWA's Engineering Consultancy Services Panel Contract # 2023/01. This report is provided for the exclusive use of DevelopmentWA for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

The scope of work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

Appendix A

About this Report

Terminology, Symbols and Abbreviations

Soil Descriptions

Sampling, Testing and Excavation Methodology

About this Report

October 2024

Introduction

These notes have been provided to amplify Douglas' report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

Douglas' reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, Douglas will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, Douglas cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, Douglas will be pleased to assist with investigations or advice to resolve the matter.

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, Douglas requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. Douglas would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style XW. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:

The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

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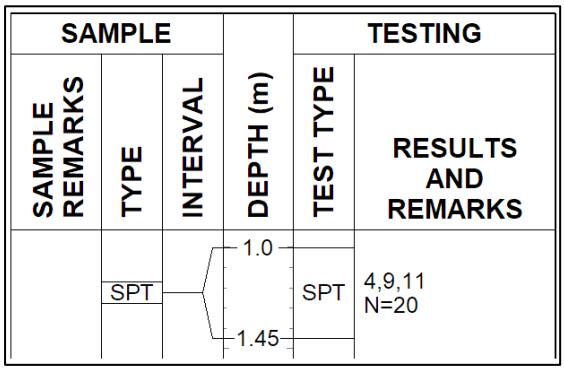
Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Driven Tube sample	DT
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U[1]
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =*x* blows for *y* mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP9/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150
Dynamic probe super heavy, followed by blow count penetration increment in mm	DPSH/100

Groundwater Observations

	water seepage/inflow
	water seepage/outflow
	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Air Track	AT
Diatube	DT[1]
Hand auger	HA[1]
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA[1]
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT[1]
Ripping tyne/ripper	R
Rock roller	RR[1]
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON[1]
Mud/blade bucket	MB[1]
Toothed bucket	TB[1]
Vibrocore	VC[1]
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB[1]

[1] – numeric suffixes indicate tool diameter/width in mm

Appendix B

Drawing 1 – Test Location Plan

Test Pit Logs

NOTE:
Test locations are approximate only and were located using differential GPS.

Douglas PARTNERS	TITLE: **Test Location Plan** **Proposed Residential Development** **Lot 39 Elizabeth Street, Bayonet Head, WA**			OFFICE: Perth DRAWN BY: GG DATE: 27.March.2026
CLIENT: DevelopmentWA	PROJECT No: 240409.00	DRAWING No: 1	REVISION: 0	SCALE: 1:1400 @A3

DP.QGIS.A3PortraitDrawingLayout.Rev2 -P:\240409.00 - BAYONET HEAD, Lot 39 Elizabeth Street\1.0 Project Management\1.1 Proposal\QGIS\240409.00.qgz

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.1 AHD
COORDINATE: E:585278.6, N:6130852.3
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP01
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Groundwater observed at 1.4 m depth 13/02/26	11 / 0.20	TOPSOIL / organic SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS TS TS T	TOP				D		0.10	PSP/150	5 10 15
	10 / 1	SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD	M		ASS/B		0.50		
	1.50	Silty SAND (SM): dark grey-brown; fine to medium; moderately to strongly cemented, "Coffee Rock".	× × × × ×	AEO	(MD) / (D) to (VD)			ASS		1.00		
	9 / 2	Test Pit discontinued at 2.00m depth. (Hard digging / Collapsing conditions).						ASS		1.50		
	8 / 3									2.00		

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater observed at 1.4 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 8.9 AHD
COORDINATE: E:585395.3, N:6130837.0
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP02
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
	8	0	FILL / SAND (SP-SM) with silt trace gravel: grey-brown, brown and grey; fine to medium; trace pockets of Clayey SAND SC.		FILL	D / VD					1	PSP/150	Refusal 30
		1.10											
		1.20	SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium; with organics.		AEO	(MD)	M						
	7	2	SAND (SP) trace silt: pale grey; fine to medium.		AEO	D to VD					2	PSP/150	Refusal 30
		2.10	SAND (SP-SM) with silt: dark grey; fine to medium.		AEO				D		2.20		
▼ 13/02/26		2.60	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay. From 2.90m: - becoming dark grey		ALV	(F) to (St)	w=PL		D		2.70		
Groundwater seepage at 2.5 m depth	6	3	Test Pit discontinued at 3.00m depth. (Target depth).										
	5												

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.5 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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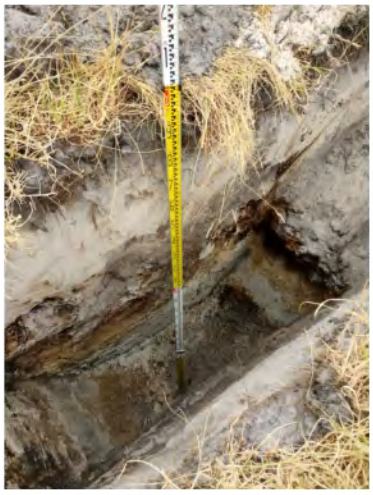
TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 9.3 AHD
COORDINATE: E:585457.1, N:6130858.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP03
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	9 / 0.10	TOPSOIL / SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS	TOP								
		SAND (SP) trace silt: grey; fine to medium. From 0.20m: - becoming pale grey		AEO	MD			ASS		0.50	PSP/150	5 10 15
	0.90 / 1 / 8	Silty SAND (SM): dark brown; fine to medium; moderately cemented, "Coffee Rock". From 1.30m: - becoming yellow-brown, weakly to moderately cemented		AEO	MD to D	M		ASS		1.00		
								ASS		1.50		
	2 / 7							ASS		2.00		
	2.30	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay.		ALV	F to St	w=PL		ASS/D		2.50	PP	100-150kPa
	3 / 6	Test Pit discontinued at 3.00m depth. (Target depth).						ASS		3.00		



NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log with Photo

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.6 AHD
COORDINATE: E:585250.9, N:6130797.7
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP04
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.10	TOPSOIL / SAND (SP) trace rootlets trace silt: grey-brown; fine to medium.	TS	TOP								
		SAND (SP) trace silt: grey; fine to medium.										
		From 0.50m: - becoming pale brown		AEO	MD						PSP/150	5 10 15
	1.00	Silty SAND (SM): dark grey-brown; fine to medium; moderately to strongly cemented, hard digging at the western portion of the pit, "Coffee Rock".				M				1		
▼ 13/02/26 Groundwater seepage at 2.0 m depth	2	1.90m: - becoming brown, SAND SP-SM at the eastern portion of the pit		AEO	(D) to (VD)					2		
	3	Test Pit discontinued at 2.60m depth. (Very slow digging).										

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.0 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 9.5 AHD
COORDINATE: E:585342.3, N:6130809.1
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP05
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.20	TOPSOIL / organic SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS TS TS T	TOP				D		0.10		
	0.35	SAND (SP-SM) with silt: dark brown and brown; fine to medium.		AEO				ASS		0.50		
	1	SAND (SP) trace silt: grey; fine to medium.		AEO	D	M		ASS		1.00		
	1.50	SAND (SP-SM) with silt: dark brown and dark brown; fine to medium.		AEO	(D)			ASS		1.50		
Groundwater seepage at 1.9 m depth 13/02/26	2							ASS		2.00		
	2.20	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay.		ALV	St to VSt	w=PL		ASS/D		2.50	PP	150-200kPa
	3	Test Pit discontinued at 3.00m depth. (Target depth).						ASS		3.00		

PSP/150: 5, 10, 15

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.9 m depth

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log with Photo

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.9 AHD
COORDINATE: E:585438.8, N:6130810.3
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP06
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	0.20	TOPSOIL / organic SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS	TOP	MD			ASS		0.50		
	0.40	SAND (SP-SM) with silt: dark grey-brown; fine to medium; with organics.		AEO								
	0.55	SAND (SP) trace silt: grey; fine to medium.		AEO						0.55		
	1	Silty SAND (SM) trace gravel: brown; fine to medium. 0.75m-0.90m: - becoming weakly to moderately cemented, "Coffee Rock"		AEO	D	M		B				
	1.05	SAND (SP) trace silt: pale grey; fine to medium.		AEO	D			ASS		1.00 1.05		
	1.45	Clayey Silty SAND (SC-SM) trace gravel: green-grey; fine to medium; low plasticity clay; low plasticity silt.		ALV	St to VSt			ASS		1.50		
	2.00	Clayey SILT (ML) with sand: green-grey; low plasticity.		ALV		w=PL		D		1.70		
								ASS		2.00		
								D		2.20	PP	200-250kPa
								ASS		2.50		
					F to St			D		2.70	PP	200kPa
	3	Test Pit discontinued at 3.00m depth. (Target depth).						ASS		3.00	PP	100-150kPa

PSP/150: 5, 10, 15

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG

METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log with Photo

TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.2 AHD
COORDINATE: E:585499.6, N:6130817.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP07
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	7 / 0.30	FILL / Gravelly SAND (SP-SM) with silt: grey-brown; fine to medium; fine to coarse gravel.		FILL	VD	D to M					PSP/150	5 10 15 30
	0.50	FILL / Clayey SAND (SC) trace gravel: orange-brown; fine to medium; low to medium plasticity clay.		FILL								
		FILL / SAND (SP-SM) with silt: grey-brown and grey; fine to medium.		FILL				D		0.70		
	0.90 / 1	Organic Silty SAND (SM) trace rootlets: dark grey-brown; fine to medium; low plasticity silt.		ALV	F	w=PL		D		1.00	PSP/150	5 10 15 Refusal 30
Groundwater seepage at 2.8 m depth 13/02/26	6 / 1.20	SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD to VD	M						
	5 / 2				(D) to (VD)					2		
	2.60	SAND (SP-SM) with silt: dark grey and dark brown; fine to medium.		AEO		W						
	4 / 3	Test Pit discontinued at 3.00m depth. (Target depth).										

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.8 m depth

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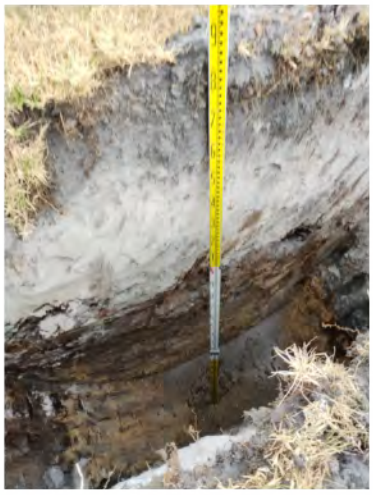
TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 12.3 AHD
COORDINATE: E:585249.9, N:6130734.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP08
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	12 / 0.20	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS TS TS T	TOP								
		SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD			B		0.50	PSP/150	5 10 15
	11 / 1.00	Silty SAND (SM): dark brown; fine to medium; moderately cemented, "Coffee Rock".				M				1		
		From 2.20m: - becoming yellow-brown, weakly to moderately cemented		AEO	(MD) to (D)					2		
	10 / 2	From 2.50m: - trace clay						D		2.70		
	9 / 3	Test Pit discontinued at 3.00m depth. (Target depth).										



NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 10.6 AHD
COORDINATE: E:585313.0, N:6130749.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP09
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/25 No free groundwater observed	10.6 / 0.00	TOPSOIL / SAND (SP-SM) with silt: grey-brown; fine to medium.	TS	TOP				D		0.10	PSP/150	5 10 15
	10 / 0.20	SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD	M		ASS		0.50		
	9 / 1				(MD)			ASS		1.00		
	9 / 1.50	Silty SAND (SM): dark brown; fine to medium; moderately to strongly cemented, "Coffee Rock".		AEO	(VD)			ASS		1.50		
	8 / 2	Test Pit discontinued at 1.80m depth. (Hard digging, refusal on "Coffee Rock") .						ASS		1.80		
	7 / 3											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.5 AHD
COORDINATE: E:585486.6, N:6130721.7
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP10
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Groundwater seepage at 0.8 m depth 16/02/26	0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS	TOP								
	0.40	Organic Silty SAND (SM): dark grey-brown; fine to medium; low plasticity silt.		AEO	D	M		ASS/B		0.50	PSP/150	5 10 15
		SAND (SP) trace silt: grey and pale grey; fine to medium.						ASS		1.00		
	1	From 0.90m: - becoming pale brown		AEO		M to W		ASS		1.50		
	2.00	SAND (SP-SM) with silt: dark grey; fine to medium; weakly cemented.		AEO	(D)			ASS		2.00		
								ASS		2.50		
		Test Pit discontinued at 2.70m depth. (Collapsing conditions).						ASS		2.70		

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 0.8 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 8.4 AHD
COORDINATE: E:585394.9, N:6130738.1
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP11
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
	8	0.15	TOPSOIL / SAND (SP-SM) with rootlets with silt: dark grey-brown; fine to medium.	TS	TOP								
			SAND (SP-SM) with silt: grey; fine to medium.		AEO	D	M		ASS		0.50		
	1					MD			ASS		1.00		
	7	1.60				MD to D			ASS		1.50		
▼ 13/02/26 Groundwater seepage at 1.65 m depth			Silty SAND (SM): dark brown; fine to medium; weakly to moderately cemented, with organics, "Coffee Rock".		AEO				D		1.80		
		2.00	SAND (SP-SM) with silt: dark brown and brown; fine to medium.		AEO		M to W		ASS		2.00		
	6	2.30	Clayey SAND (SC): pale grey; fine to medium; medium plasticity clay.		ALV	St to VSt	w=PL		ASS/D		2.50	PP	150-200kPa
						F to St	w<PL						
	3		Test Pit discontinued at 3.00m depth. (Target depth).						ASS		3.00	PP	50-100kPa
	5												

PSP/150: 5, 10, 15

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.65 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.2 AHD
COORDINATE: E:585296.8, N:6130679.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP12
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[*] / DENSITY.[*]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
13/02/26 No free groundwater observed	11 / 0.20	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS TS TS T	TOP								
		SAND (SP) trace silt: pale grey; fine to medium.		AEO	MD							
	1 / 1.10							D		1.00		
	10	Silty SAND (SM): dark brown and brown; fine to medium; moderately to strongly cemented, "Coffee Rock"; strongly cemented, hard digging cemented Silty SAND observed at the southern portion of the pit.		AEO	MD to VD	M						
	9 / 2	From 2.20m: - becoming pale yellow-brown, weakly to moderately cemented								2		
	2.50	Clayey Silty SAND (SC-SM): grey; fine to medium; low to medium plasticity clay; low to medium plasticity silt.		ALV	F to St	w=PL		D		2.70	PP	100kPa
	3 / 8	Test Pit discontinued at 3.00m depth. (Target depth).										

PSP/150: 5, 10, 15

NOTES: [#] Soil origin is "probable" unless otherwise stated. [*] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 9.2 AHD
COORDINATE: E:585366.4, N:6130663.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP13
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.15	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS	TOP				D		0.10		
		SAND (SP) trace silt: grey; fine to medium. From 0.35m: - becoming pale grey		AEO	MD	M		ASS		0.50	PSP/150	5 10 15
	1							ASS		1.00		
					(MD)			ASS		1.50		
▼ Groundwater seepage at 1.7 m depth 13/02/26	1.70	SAND (SP-SM) with silt: dark grey-brown; fine to medium; weakly cemented.		AEO	(MD) to (D)	M to W		ASS/D		2.00		
	2							ASS		2.50		
		Test Pit discontinued at 2.50m depth. (Collapsing conditions).										
	3											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.7 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.2 AHD
COORDINATE: E:585475.7, N:6130668.9
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP14
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
	7	0.15	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS TS T	TOP								
		0.45	SAND (SP-SM) with silt: dark grey-brown; fine to medium; with organics.		AEO								
			SAND (SP) trace silt: pale grey; fine to medium.			D	M						
		1									1	PSP/150	5 10 15
▼ 13/02/26	6		From 1.30m: - becoming grey		AEO								
Groundwater seepage at 1.6 m depth						(D)	M to W		D				
	5	2									2.00		
		2.30	SAND (SP-SM) with silt: dark grey; fine to medium.		AEO								
	4		Test Pit discontinued at 2.50m depth. (Collapsing conditions).										
		3											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.6 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 11.0 AHD
COORDINATE: E:585283.9, N:6130624.0
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP15
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN[#]	CONSIS.[^] / DENSITY.[^]	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.10	TOPSOIL / SAND (SP-SM) with silt trace rootlets: dark grey-brown; fine to medium.	TS	TOP								
		SAND (SP) trace silt: grey; fine to medium.										
		From 0.25m: - becoming pale grey			MD			ASS/B		0.50	PSP/150	5 10 15
	10 1					M		ASS/D		1.00		
				AEO								
								ASS		1.50		
					(MD)							
	9 2							ASS		2.00		
▼ 13/02/26 Groundwater encountered at 2.3 m depth						M to W						
						W						
		Test Pit discontinued at 2.50m depth. (Collapsing conditions).						ASS/D		2.50		
	8 3											

NOTES: [#] Soil origin is "probable" unless otherwise stated. [^] Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater encountered at 2.3 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 8.6 AHD
COORDINATE: E:585372.6, N:6130594.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP16
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	RESULTS AND REMARKS
		0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS TS TS T	TOP				D		0.10	PSP/150	5 10 15
	8		SAND (SP) trace silt: grey; fine to medium.			D			ASS		0.50		
	1						M		ASS/D		1.00		
			From 1.20m: - becoming pale grey		AEO								
	7								ASS		1.50		
▼ 13/02/26 Groundwater seepage at 2.1 m depth						(D)							
	2								ASS		2.00		
		2.40	SAND (SP-SM) with silt: grey and dark grey; fine to medium.		AEO		M to W		ASS		2.50		
	6		Test Pit discontinued at 2.70m depth. (Collapsing conditions).						ASS		2.70		
	3												
	5												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.1 m depth

Douglas PARTNERS

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.4 AHD
COORDINATE: E:585422.7, N:6130632.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP17
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
Groundwater seepage at 1.0 m depth 13/02/26	7 / 0.15	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS	TOP / AEO	MD	M		ASS/B		0.50	PSP/150	5 10 15
	0.30	Organic Silty SAND (SM): dark grey-brown; fine to medium; low plasticity silt.										
		SAND (SP-SM) with silt: grey; fine to medium.										
		From 0.50m: - becoming pale grey			D			ASS		1.00		
	6 / 1	From 1.00m: - becoming dark grey and brown, weakly cemented		AEO	(MD) to (D)	M to W		ASS/D		1.50		
								ASS		2.00		
	5 / 2							ASS		2.50		
	2.50	Silty SAND (SM): brown; fine to medium; weakly to moderately cemented, "Coffee Rock".		AEO				ASS		2.80		
	4 / 3	Test Pit discontinued at 2.80m depth. (Collapsing conditions).										

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG

METHOD: test pit

REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.0 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.6 AHD
COORDINATE: E:585501.0, N:6130619.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP18
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
	6	0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS TS TS T	TOP	D	M		D		1.00	PSP/150	5 10 15
			SAND (SP) trace silt: grey; fine to medium. From 0.30m: - becoming pale grey		AEO								
▼ 13/02/26 Groundwater seepage at 1.4 m depth	5	1.40	SAND (SP-SM) with silt: dark brown and dark grey-brown; fine to medium; trace pockets of pale brown SAND SP. From 2.30m: - trace pockets of weakly to moderately cemented cemented Silty SAND SM		AEO	(D)	M to W		D		2.50		
	4	2									2		
	3	3	Test Pit discontinued at 2.70m depth. (Collapsing conditions).										
	2												
	1												

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 1.4 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 7.2 AHD
COORDINATE: E:585432.0, N:6130559.5
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP19
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
undwater seepage at 1.6 m depth 13/02/26	7.2 / 0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS	TOP	MD			D		0.10	PSP/150	5 10 15
	6.2 / 1	SAND (SP) trace silt: pale grey; fine to medium.		AEO	D	M				1		
	5 / 2				(MD) to (D)	M to W				2		
	4 / 3	Test Pit discontinued at 2.50m depth. (Collapsing conditions).										

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. undwater seepage at 1.6 m depth

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TEST PIT LOG

CLIENT: DevelopmentWA
PROJECT: Proposed Residential Development
LOCATION: Lot 39 Elizabeth Street, Bayonet Head, WA

SURFACE LEVEL: 6.5 AHD
COORDINATE: E:585503.0, N:6130568.8
DATUM/GRID: MGA2020 Zone 50
DIP/AZIMUTH: 90°/---°

LOCATION ID: TP20
PROJECT No: 240409.00
DATE: 13/02/26
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.20	TOPSOIL / organic Silty SAND (SM) with rootlets: dark grey-brown; fine to medium; low plasticity silt.	TS	TOP				D		0.30	PSP/150	5 10 15
	0.45	Organic SAND (SP-SM) with silt: dark grey-brown; fine to medium.		AEO				ASS		0.50		
		SAND (SP) trace silt: pale grey; fine to medium.			D			D		0.60		
	1					M		ASS		1.00		
				AEO				ASS		1.50		
▼ 13/02/26 Groundwater seepage at 2.2 m depth	2				(D)			ASS		2.00		
						M to W		ASS		2.50		
		Test Pit discontinued at 2.70m depth. (Collapsing conditions).						ASS		2.70		
	3											

NOTES: (#) Soil origin is "probable" unless otherwise stated. (*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 8 t excavator, with 600 mm wide toothed bucket
OPERATOR: A.D Contractors (Dwayne)
LOGGED: GG
METHOD: test pit
REMARKS: The location and surface elevation at each test location was surveyed by Douglas using a differential global positioning system (dGPS) with variable accuracy depending on satellite coverage. Groundwater seepage at 2.2 m depth

Refer to explanatory notes for symbol and abbreviation definitions

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Appendix C

Geotechnical Laboratory Test Results

WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - ASTM D2974-20 (Test Method A)

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3387-3396_1_ORG
Project:	Proposed Residential Development	*Sample No.*	WG26.3387-3396
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	Various - see below	*Date Tested:*	4/03/2026

TEST RESULTS - Organic Content

Sampling Method: Sampled by Client, Tested as Received

Testing Completed By: WGLS - LC

Furnace Temperature (°C): 434

Sample Number	Sample Identification	Ash Content (%)	Organic Content (%)
WG26.3387	TP02 (2.2m)	99.1	0.9
WG26.3388	TP05 (0.1m)	75.0	25.0
WG26.3392	TP07 (1.0m)	89.2	10.8
WG26.3394	TP11 (1.8m)	98.4	1.6
WG26.3395	TP17 (0.5m)	99.9	0.1
WG26.3396	TP20 (0.3m)	88.4	11.6

Comments:

Approved Signatory: M Colley

Name: Mia Colley

Date: 06/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

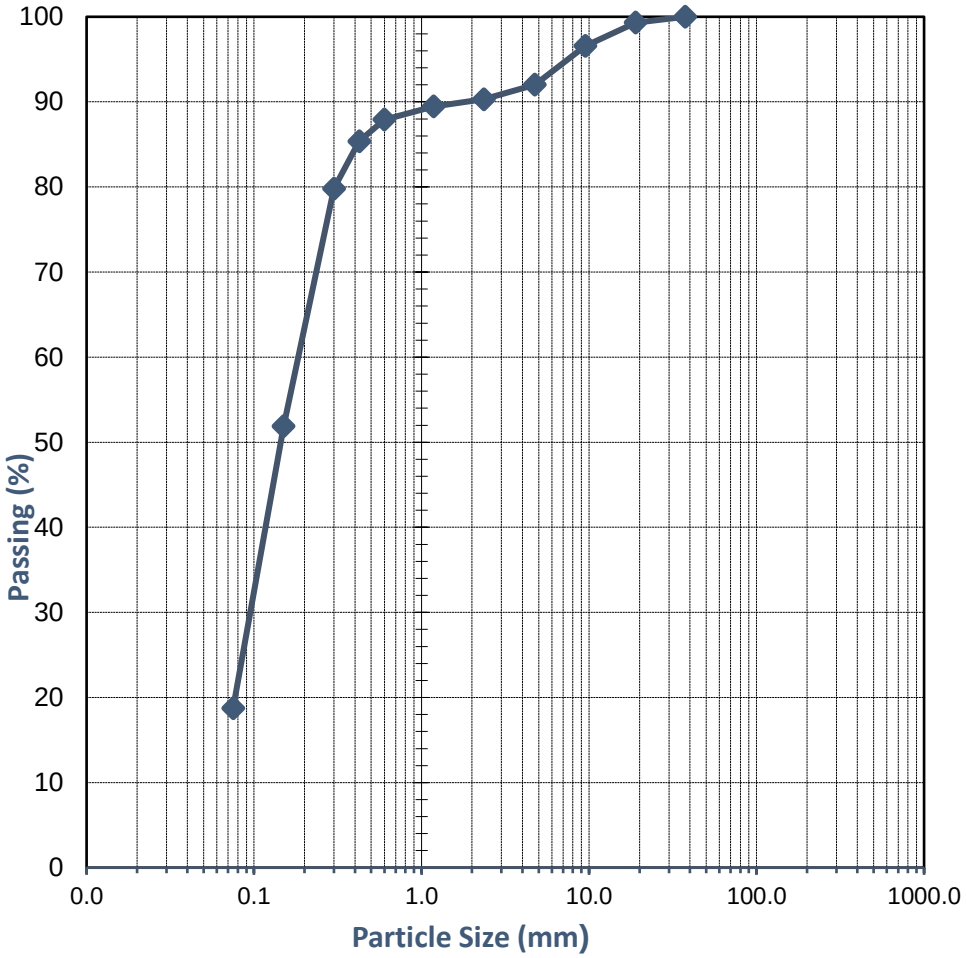
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3389_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3389
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (0.55-1.05m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	100
19.0	99
9.5	97
4.75	92
2.36	90
1.18	89
0.600	88
0.425	85
0.300	80
0.150	52
0.075	19



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 06/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

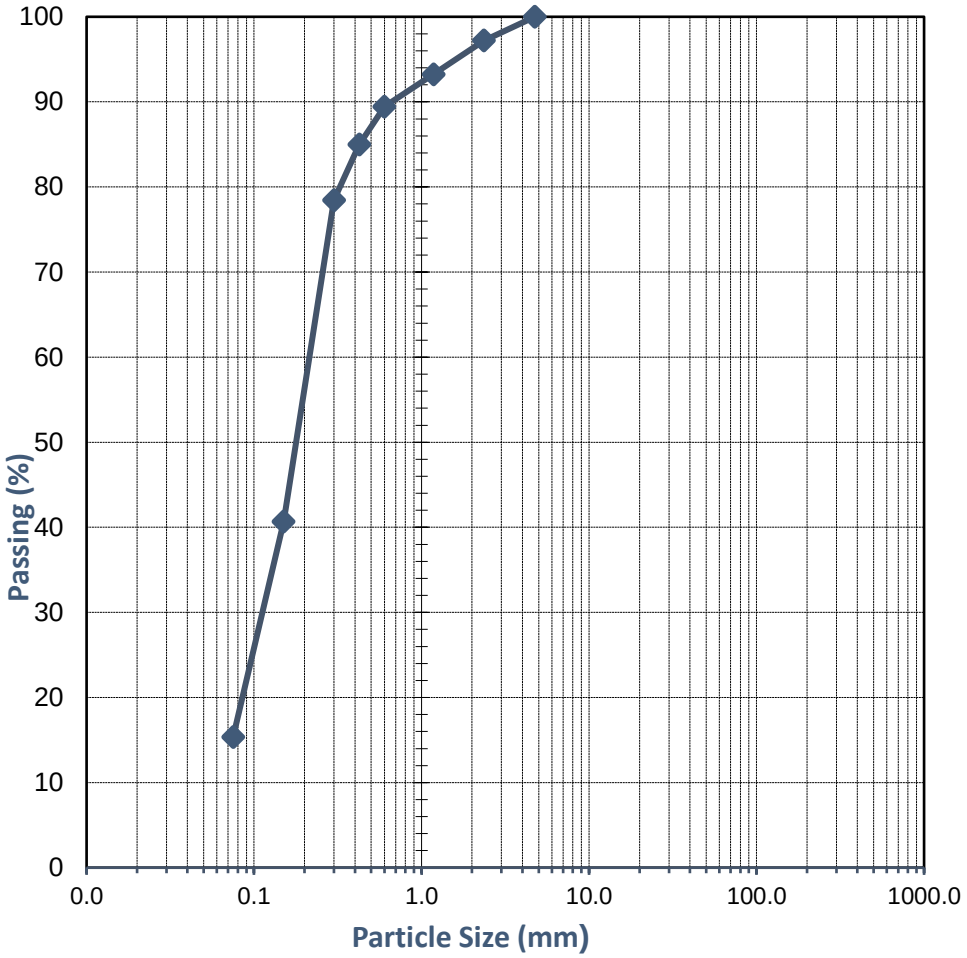
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3390_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3390
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (1.7m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	97
1.18	93
0.600	89
0.425	85
0.300	78
0.150	41
0.075	15



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 06/March/2026

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3390_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3390
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (1.7m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**22**
AS 1289.3.2.1	**Plastic Limit (%)**	**14**
AS 1289.3.3.1	**Plasticity Index (%)**	**8**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**1.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3389_1_MMDD
Project:	Proposed Residential Development	*Sample No.*	WG26.3389
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (0.55-1.05m)	*Date Tested:*	4/03/2026

TEST RESULTS - Modified Maximum Dry Density

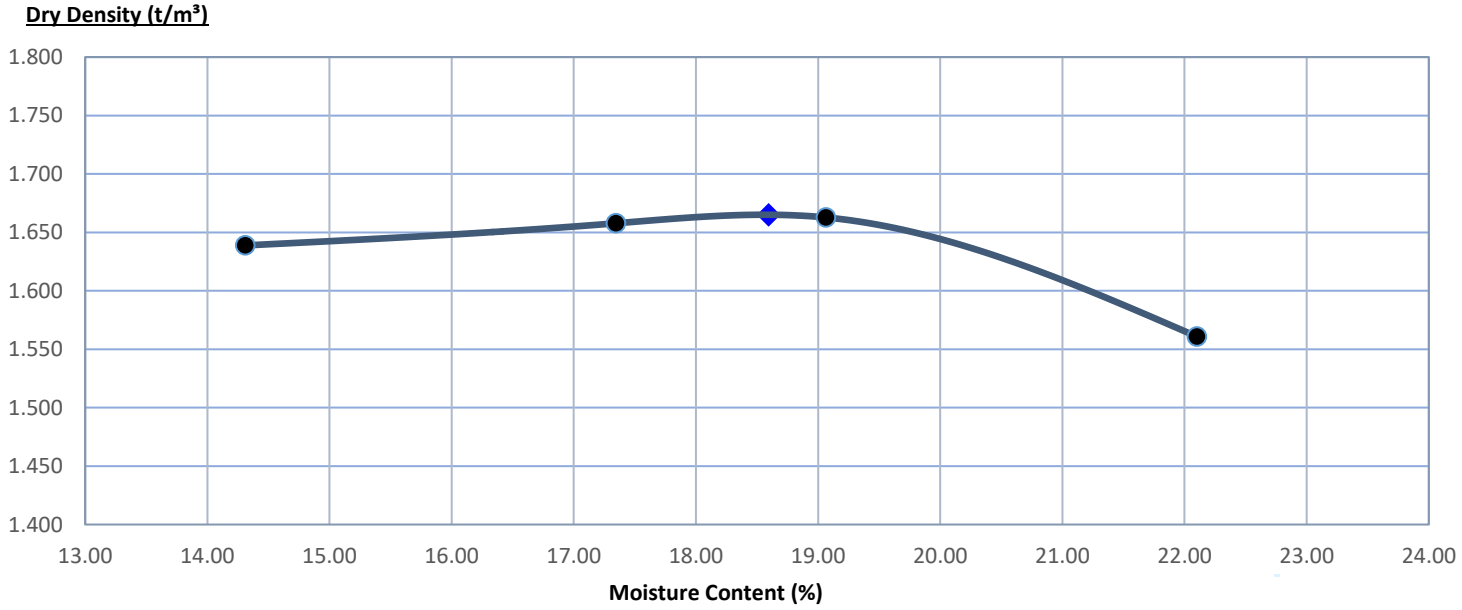
Sampling Method: Sampled by Client, Tested as Received

Sample Curing Time (Hours): >2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 1 **Material + 37.5mm (%)** -

Moisture Content (%)	14.3	17.3	19.1	22.1	
Dry Density (t/m³)	1.639	1.658	1.663	1.561	



Modified Maximum Dry Density (t/m³) **1.67**

Optimum Moisture Content (%) **18.5**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 05/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

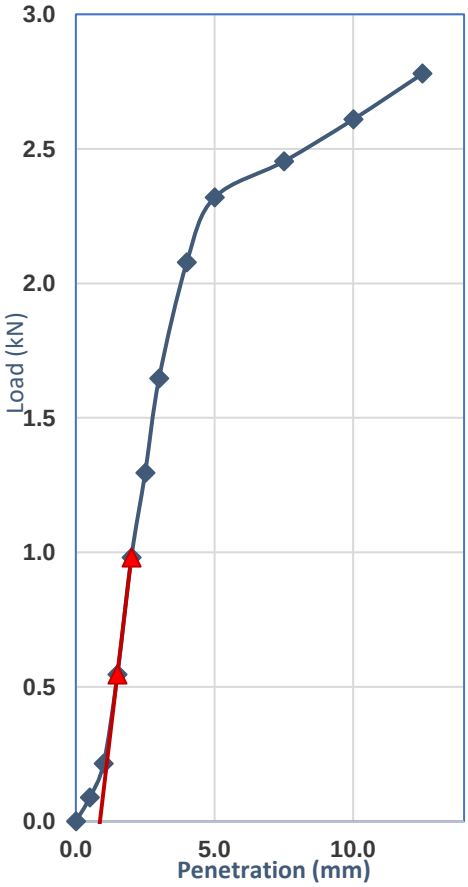
Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3389_1_SCBR
Project:	Proposed Residential Development	*Sample No.*	WG26.3389
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (0.55-1.05m)	*Date Tested:*	4/03 - 10/03/26

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Silty Sand trace Gravel

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>24
% Retained 19.0mm	1	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.67	Optimum Moisture (%)	18.5
Target Dry Density Ratio (%)	95	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.58	Moisture Content (%)	18.9
Density Ratio (%)	94.5	Moisture Ratio (%)	101.5

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.57	Dry Density Ratio (%)	94.5
Moisture Content (%)	22.4	Moisture Ratio (%)	120.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	21.1	Remaining Depth (%)	21.7

Correction applied to Penetration: 0.9mm

Determined at a Penetration of: 2.5mm

California Bearing Ratio (CBR): 14%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 11/March/2026

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3391_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3391
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (2.2m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**28**
AS 1289.3.2.1	**Plastic Limit (%)**	**24**
AS 1289.3.3.1	**Plasticity Index (%)**	**4**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**1.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 11/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

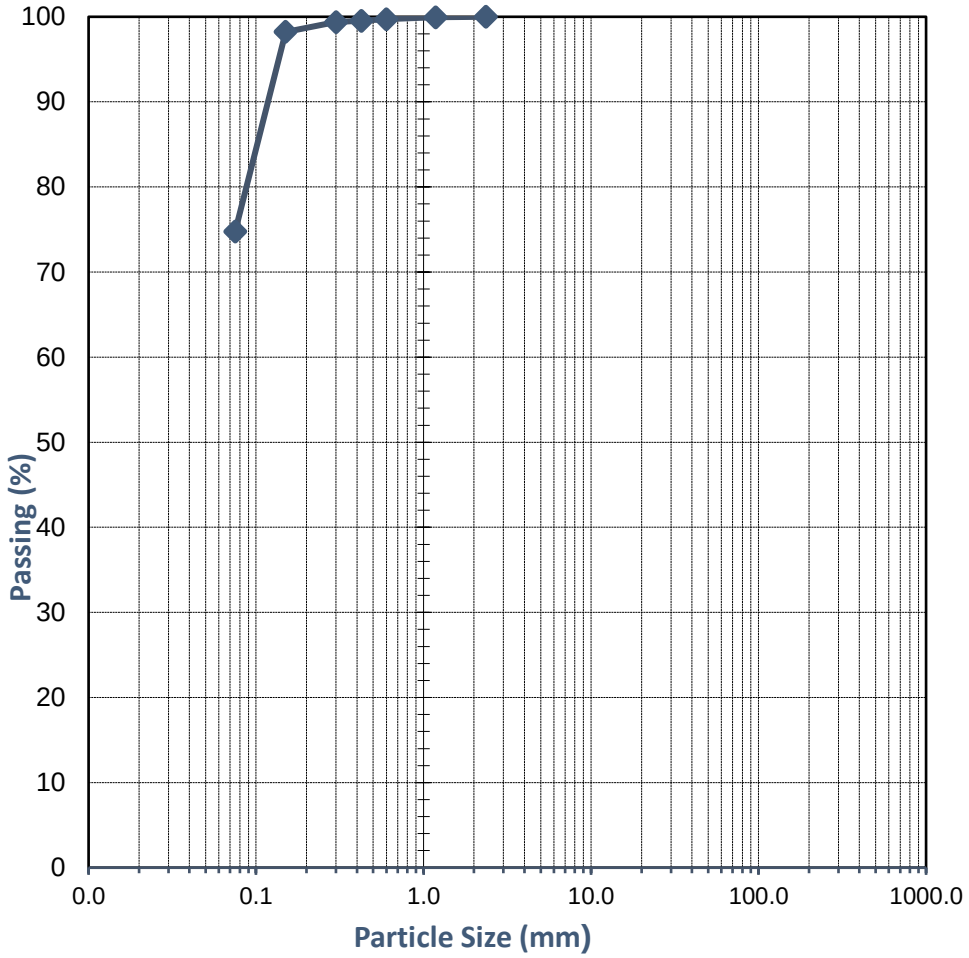
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3391_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3391
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP06 (2.2m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	100
0.425	100
0.300	99
0.150	98
0.075	75



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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WESTERN GEOTECHNICAL & Laboratory Services

SOIL | AGGREGATE | CONCRETE | CRUSHING

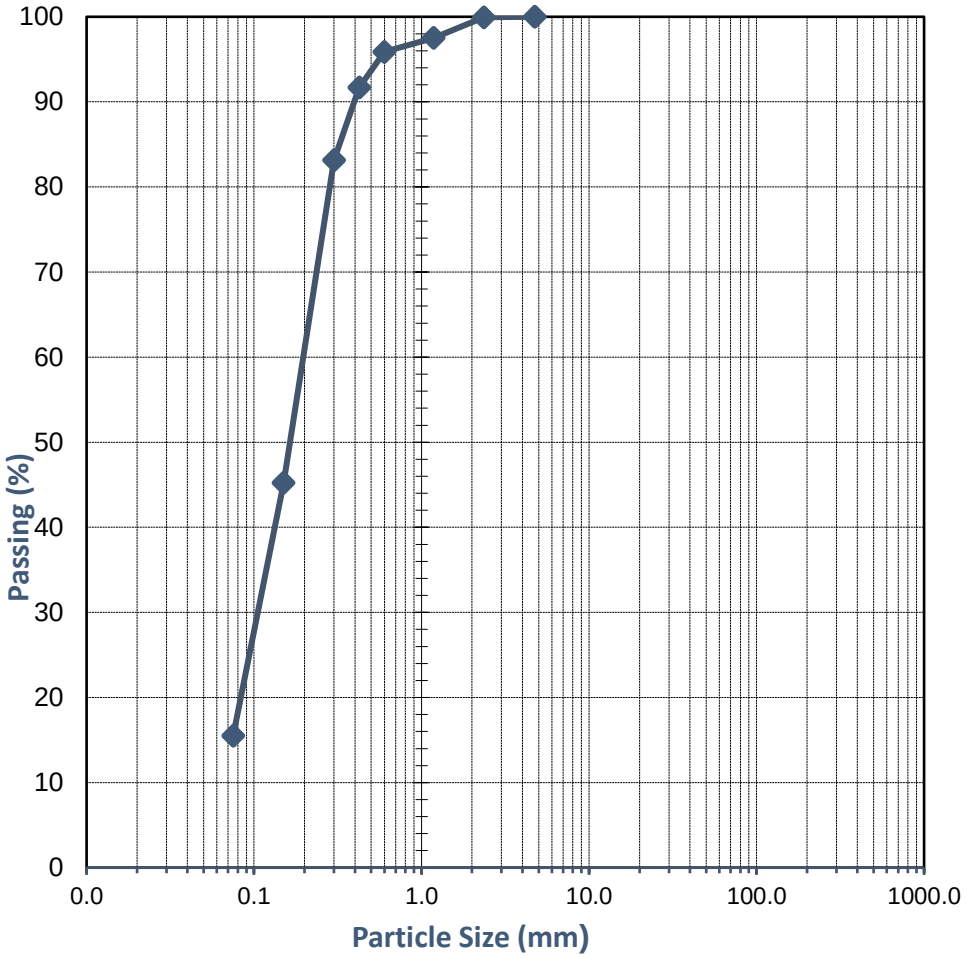
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3392_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3392
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (1.0m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	98
0.600	96
0.425	92
0.300	83
0.150	45
0.075	15



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 06/March/2026

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3392_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3392
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP07 (1.0m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.5**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 11/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

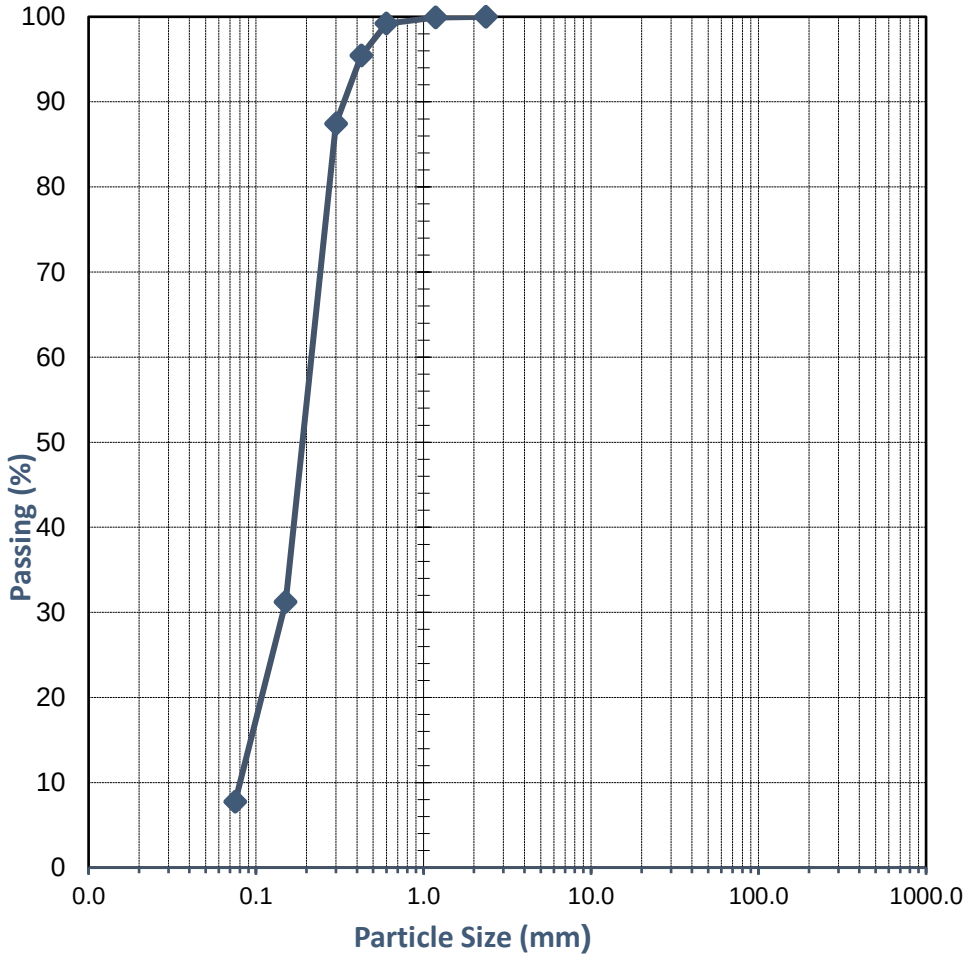
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3393_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3393
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (0.5m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	99
0.425	95
0.300	87
0.150	31
0.075	8



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.5.2.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3393_1_MMDD
Project:	Proposed Residential Development	*Sample No.*	WG26.3393
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (0.5m)	*Date Tested:*	4/03/2026

TEST RESULTS - Modified Maximum Dry Density

Sampling Method: Sampled by Client, Tested as Received

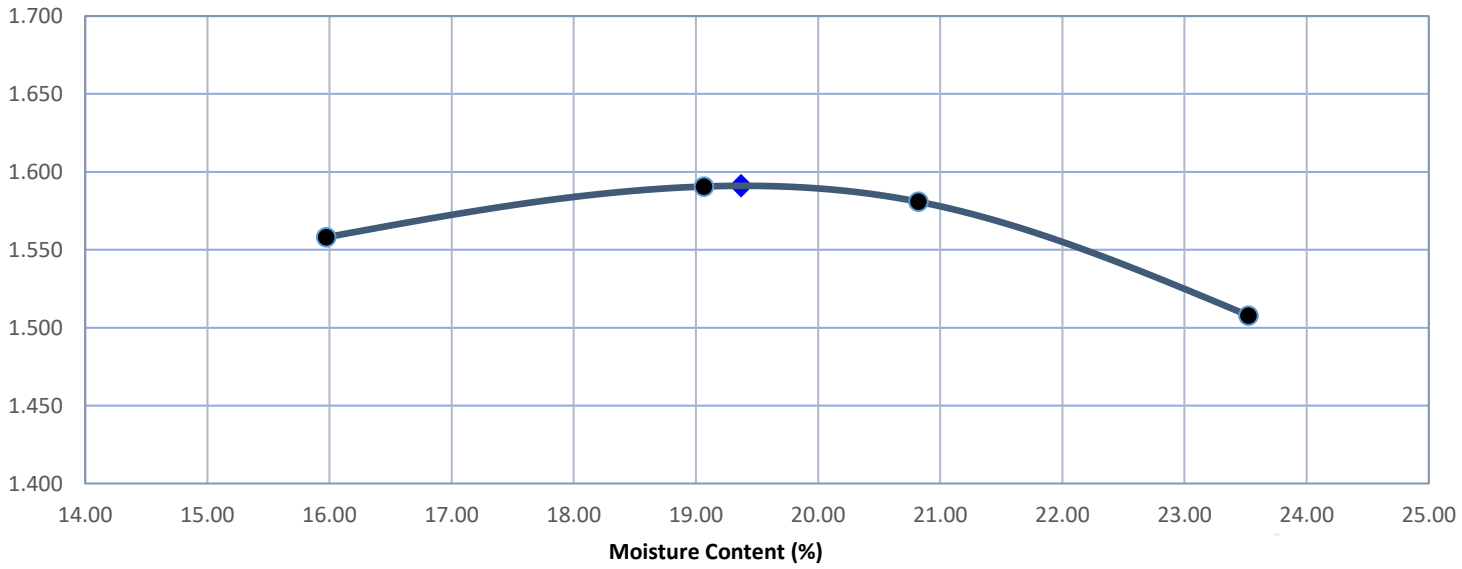
Sample Curing Time (Hours): >2

Method used to Determine Liquid Limit: Visual / Tactile Assessment by Competent Technician

Material + 19.0mm (%): 0 **Material + 37.5mm (%)** -

Moisture Content (%)	**16.0**	**19.1**	**20.8**	**23.5**	
Dry Density (t/m³)	**1.558**	**1.591**	**1.581**	**1.508**	

Dry Density (t/m³)



Modified Maximum Dry Density (t/m³) **1.59**

Optimum Moisture Content (%) **19.5**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 05/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

TEST REPORT - AS 1289.6.1.1

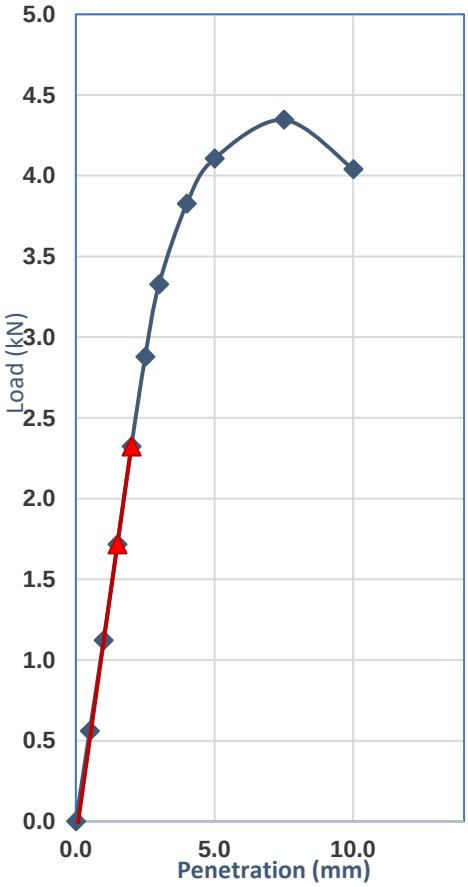
Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3393_1_SCBR
Project:	Proposed Residential Development	*Sample No.*	WG26.3393
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP11 (0.5m)	*Date Tested:*	4/03 - 10/03/26

TEST RESULTS - CALIFORNIA BEARING RATIO

Sample Description: Sand

Sampling Method: Sampled by Client, Tested as Received

Load Penetration Curve



Compaction Details			
Compaction Method	AS 1289.5.2.1	Hammer Type	Modified
Plasticity Determined by	Estimated	Curing Time (Hours)	>24
% Retained 19.0mm	0	Excluded/Replaced	Excluded
Maximum Dry Density (t/m^3)	1.59	Optimum Moisture (%)	19.5
Target Dry Density Ratio (%)	95	Target Moisture Ratio (%)	100

Specimen Conditions At Compaction			
Dry Density (t/m3)	1.50	Moisture Content (%)	19.3
Density Ratio (%)	94.5	Moisture Ratio (%)	99.5

Specimen Conditions After Soak			
Soaked or Unsoaked	Soaked	Soaking Period (days)	4
Surcharges Applied (kg)	4.50	Measured Swell (%)	0.0
Dry Density (t/m³)	1.50	Dry Density Ratio (%)	94.5
Moisture Content (%)	21.1	Moisture Ratio (%)	108.5

Specimen Conditions After Test			
Top 30mm Moisture (%)	20.0	Remaining Depth (%)	21.0

Correction applied to Penetration: 0.1mm

Determined at a Penetration of: 2.5mm

California Bearing Ratio (CBR): 20%

Comments:

Approved Signatory:

Name: Connor Budimir

Date: 11/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

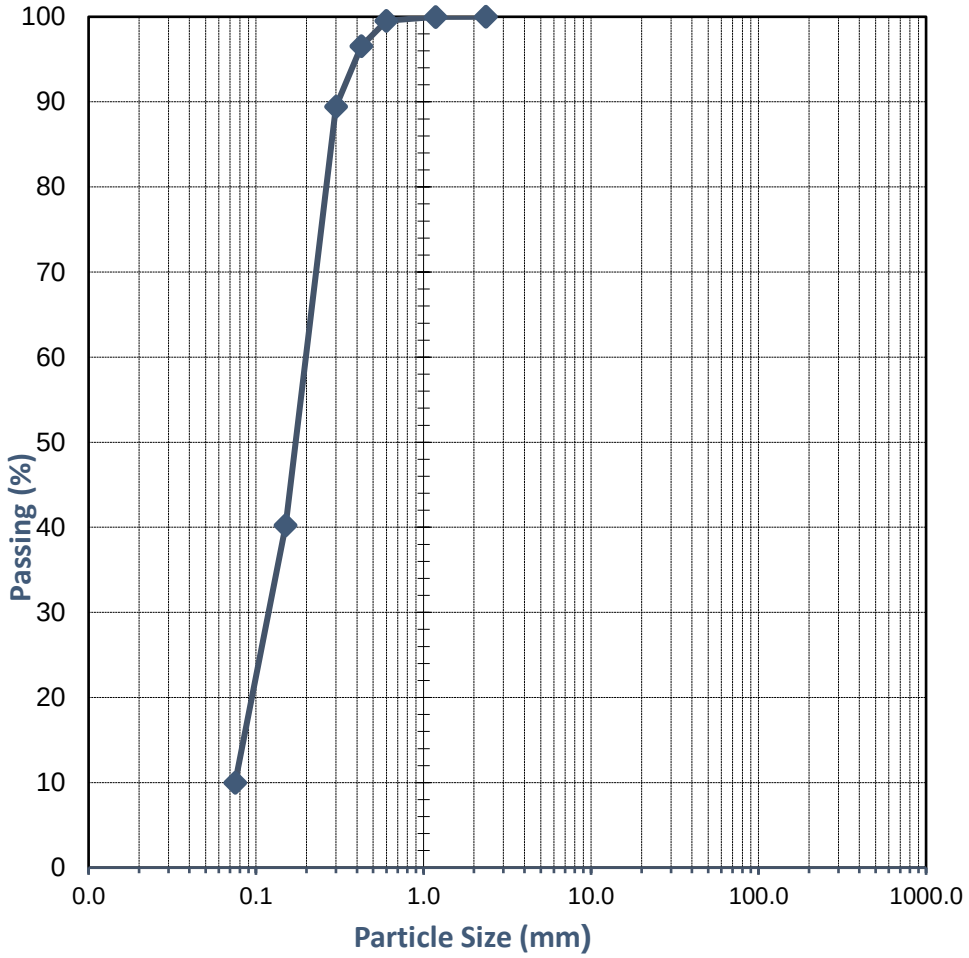
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3395_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3395
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP17 (0.5m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	100
0.600	100
0.425	97
0.300	89
0.150	40
0.075	10



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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SOIL | AGGREGATE | CONCRETE | CRUSHING

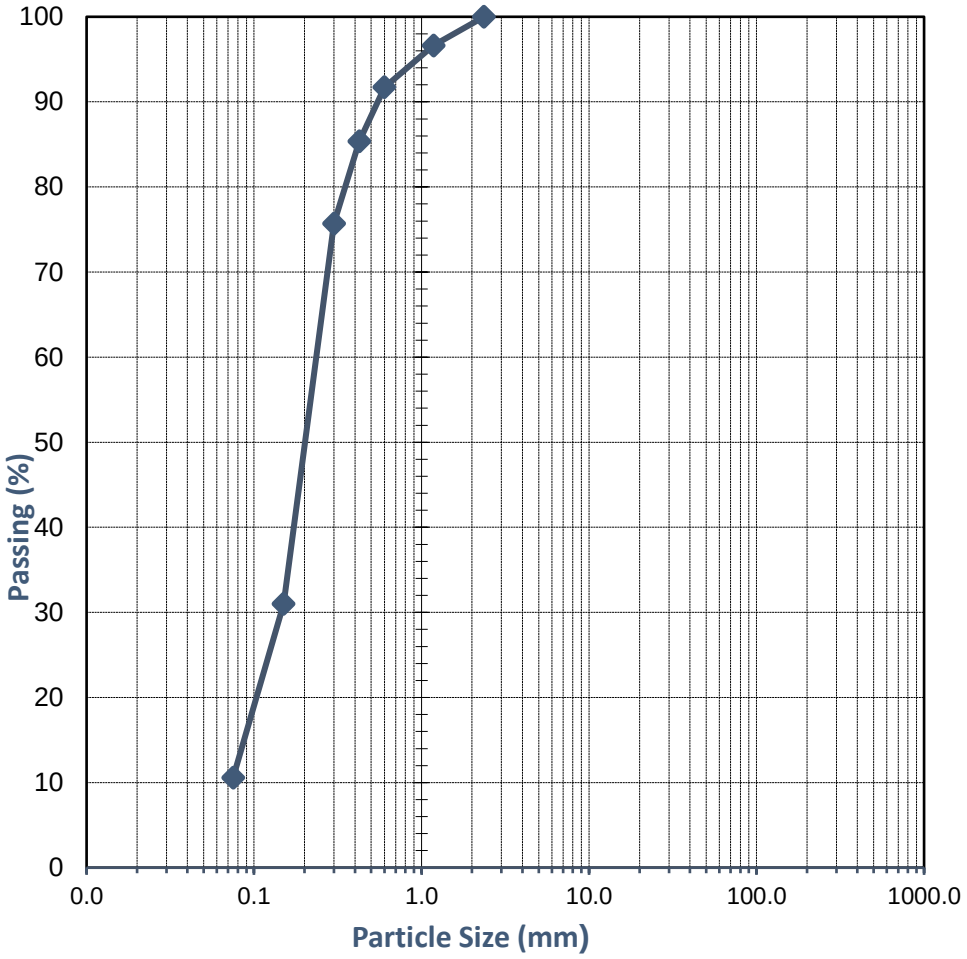
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3396_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3396
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP20 (0.3m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	
2.36	100
1.18	97
0.600	92
0.425	85
0.300	76
0.150	31
0.075	11



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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TEST REPORT - AS 1289.3.1.1, 3.2.1, 3.3.1 & 3.4.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3396_1_PI
Project:	Proposed Residential Development	*Sample No.*	WG26.3396
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP20 (0.3m)	*Date Tested:*	6/03/2026

TEST RESULTS - Consistency Limits (Casagrande)

Sampling Method:	**Sampled by Client, Tested as Received**
History of Sample:	**Oven Dried <50°C**
Method of Preparation:	**Dry Sieved**

AS 1289.3.1.1	**Liquid Limit (%)**	**Not Obtainable**
AS 1289.3.2.1	**Plastic Limit (%)**	**Non-Plastic**
AS 1289.3.3.1	**Plasticity Index (%)**	**Non-Plastic**
AS 1289.3.4.1	**Linear Shrinkage (%)**	**0.0**
AS 1289.3.4.1	**Length of Mould (mm)**	**250**
AS 1289.3.4.1	**Condition of Dry Specimen:**	**-**

Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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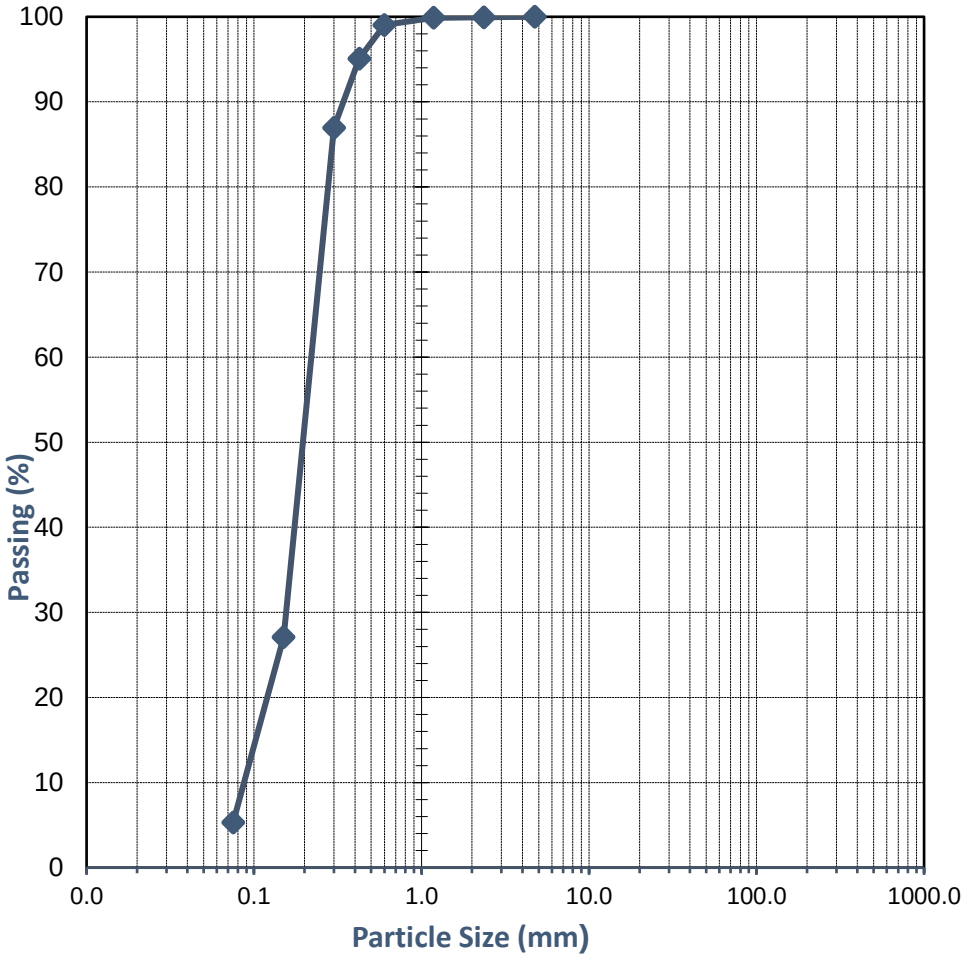
TEST REPORT - AS 1289.3.6.1

Client:	Development WA	*Ticket No.*	S20728
Client Address:	-	*Report No.*	WG26.3397_1_PSD
Project:	Proposed Residential Development	*Sample No.*	WG26.3397
Location:	Lot 39 Elizabeth Street, Bayonet, WA	*Date Sampled:*	Not Specified
Sample Identification:	TP20 (0.6m)	*Date Tested:*	05/03 - 06/03/2026

TEST RESULTS - Particle Size Distribution of Soil

Sampling Method: Sampled by Client, Tested as Received

Sieve Size (mm)	Percent Passing Sieve (%)
150.0	
100.0	
75.0	
37.5	
19.0	
9.5	
4.75	100
2.36	100
1.18	100
0.600	99
0.425	95
0.300	87
0.150	27
0.075	5



Comments:

Approved Signatory:

Name: Danielle Reynolds

Date: 09/March/2026

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Appendix D

Acid Sulfate Soil Laboratory Certifications

Douglas PARTNERS

Table D-1: Summary of Acid Sulfate Soil Laboratory Results

Test Location	Depth (m)	Soil Description	Screening Tests [1]				Chromium Suite of Testing					
			pH_F	pH_{FOX}	Reaction [2] Strength	Δ pH [3]	pH_{KCl}	TAA [4] (%S)	S_{CR} (%S) [5]	S_{NAS} (%S) [6]	ANC (%S) [7]	Net [8] Acidity (%S)
Assessment Criteria			**<4**	**<3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**>0.03**
TP01	0.5	Sand trace silt - pale grey	6.7	4.8	Low	1.9	-	-	-	-	-	-
TP01	1.0	Sand trace silt - pale grey	6.3	4.6	Low	1.7	-	-	-	-	-	-
TP01	1.5	Sand trace silt - pale grey	5.7	3.2	Low	2.5	4.9	0.12	0.0092	NT	NT	**0.13**
TP01	2.0	Silty Sand - dark grey-brown	5.6	3.7	Low	1.9	-	-	-	-	-	-
TP03	0.5	Sand trace silt - pale grey	6.0	3.7	Low	2.3	6.3	<0.010	<0.0050	NT	NT	<0.0050
TP03	1.0	Silty Sand - dark brown	6.0	4.0	Low	2	-	-	-	-	-	-
TP03	1.5	Silty Sand - yellow-brown	6.1	3.3	Medium	2.8	-	-	-	-	-	-
TP03	2.0	Silty Sand - yellow-brown	6.1	3.3	Medium	2.8	5.5	0.011	<0.0050	NT	NT	0.015
TP03	2.5	Clayey sand - pale grey	6.1	4.6	Low	1.5	-	-	-	-	-	-
TP03	3.0	Clayey sand - pale grey	6.0	4.2	Low	1.8	-	-	-	-	-	-
TP05	0.5	Sand trace silt - grey	5.9	4.2	Low	1.7	-	-	-	-	-	-
TP05	1.0	Sand trace silt - grey	6.2	4.8	Low	1.4	-	-	-	-	-	-
TP05	1.5	Sand trace silt - grey	5.7	3.6	Low	2.1	5.3	0.023	<0.0050	NT	NT	0.025
TP05	2.0	Sand with silt - dark brown	5.6	4.0	Low	1.6	-	-	-	-	-	-
TP05	2.5	Clayey Sand - pale grey	6.1	4.1	Low	2	-	-	-	-	-	-
TP05	3.0	Clayey Sand - pale grey	6.2	4.4	Low	1.8	-	-	-	-	-	-
TP06	0.5	Sand trace silt - grey	6.0	**2.0**	Medium	4	5.4	0.011	<0.0050	NT	NT	0.013
TP06	1.0	Silty Sand - brown	6.0	**2.9**	Medium	3.1	-	-	-	-	-	-
TP06	1.5	Clayey Silty Sand trace gravel - green-grey	6.3	**2.8**	Medium	3.5	-	-	-	-	-	-
TP06	2.0	Clayey Silt with sand - green-grey	6.6	**2.8**	Medium	3.8	5.5	0.013	<0.0050	NT	NT	0.015
TP06	2.5	Clayey Silt with sand - green-grey	6.9	3.4	Medium	3.5	-	-	-	-	-	-
TP06	3.0	Clayey Silt with sand - green-grey	6.6	3.2	Medium	3.4	-	-	-	-	-	-
TP09	0.5	Sand trace silt - pale grey	6.9	4.4	Medium	2.5	-	-	-	-	-	-
TP09	1.0	Sand trace silt - pale grey	5.9	4.6	Low	1.3	-	-	-	-	-	-
TP09	1.5	Sand trace silt - pale grey	6.1	4.7	Medium	1.4	-	-	-	-	-	-
TP09	1.8	Silty Sand - dark brown	5.6	3.5	Medium	2.1	5.1	0.088	0.0059	NT	NT	**0.094**
TP10	0.5	Sand trace silt - grey and pale grey	5.9	3.6	Medium	2.3	-	-	-	-	-	-
TP10	1.0	Sand trace silt - pale brown	5.8	3.3	Low	2.5	-	-	-	-	-	-
TP10	1.5	Sand trace silt - pale brown	5.7	3.3	Low	2.4	-	-	-	-	-	-
TP10	2.0	Sand trace silt - pale brown	5.6	**2.8**	Low	2.8	5.1	0.015	<0.0050	NT	NT	0.017
TP10	2.5	Sand with silt - dark grey	5.8	**2.9**	Low	2.9	-	-	-	-	-	-
TP10	2.7	Sand with silt - dark grey	5.7	3.1	Low	2.6	5.3	0.011	<0.0050	NT	NT	0.011
TP11	0.5	Sand trace silt - grey	4.5	3.3	Medium	1.2	5.6	<0.010	<0.0050	NT	NT	0.0085
TP11	1.0	Sand trace silt - grey	5.4	4.0	Medium	1.4	-	-	-	-	-	-
TP11	1.5	Sand trace silt - grey	5.8	3.9	Low	1.9	-	-	-	-	-	-
TP11	2.0	Silty Sand - dark brown	6.3	**2.5**	Low	3.8	5.6	<0.010	0.0055	NT	NT	0.014

Test Location	Depth (m)	Soil Description	Screening Tests [1]				Chromium Suite of Testing					
			pH_F	pH_{FOX}	Reaction [2] Strength	Δ pH [3]	pH_{KCl}	TAA [4] (%S)	S_{CR} (%S) [5]	S_{NAS} (%S) [6]	ANC (%S) [7]	Net [8] Acidity (%S)
Assessment Criteria			**<4**	**<3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**>0.03**
TP11	2.5	Clayey Sand - pale grey	6.2	**2.6**	Low	3.6	-	-	-	-	-	-
TP11	3.0	Clayey Sand - pale grey	5.9	3.1	Low	2.8	-	-	-	-	-	-
TP13	0.5	Sand trace silt - pale grey	4.7	**2.9**	Medium	1.8	4.9	0.041	<0.0050	NT	NT	**0.041**
TP13	1.0	Sand trace silt - pale grey	5.2	4.0	Low	1.2	-	-	-	-	-	-
TP13	1.5	Sand trace silt - pale grey	5.3	3.9	Low	1.4	-	-	-	-	-	-
TP13	2.0	Sand with silt - dark grey-brown	5.6	4.0	Low	1.6	-	-	-	-	-	-
TP13	2.5	Sand with silt - dark grey-brown	5.7	4.4	Low	1.3	5.4	0.015	<0.0050	NT	NT	0.017
TP15	0.5	Sand trace silt - pale grey	5.3	4.2	Low	1.1	-	-	-	-	-	-
TP15	1.0	Sand trace silt - pale grey	4.6	3.9	Low	0.7	5.9	<0.010	<0.0050	NT	NT	<0.0050
TP15	1.5	Sand trace silt - pale grey	6.0	4.6	Low	1.4	-	-	-	-	-	-
TP15	2.0	Sand trace silt - pale grey	6.1	4.8	Low	1.3	-	-	-	-	-	-
TP15	2.5	Sand trace silt - pale grey	5.7	4.9	Low	0.8	-	-	-	-	-	-
TP16	0.5	Sand trace silt - grey	6.2	4.5	Medium	1.7	-	-	-	-	-	-
TP16	1.0	Sand trace silt - grey	6.1	4.5	Low	1.6	-	-	-	-	-	-
TP16	1.5	Sand trace silt - pale grey	6.0	4.2	Low	1.8	-	-	-	-	-	-
TP16	2.0	Sand trace silt - pale grey	5.4	3.4	Low	2	-	-	-	-	-	-
TP16	2.5	Sand with silt - grey and dark grey	5.4	3.4	Low	2	-	-	-	-	-	-
TP16	2.7	Sand with silt - grey and dark grey	5.5	**2.7**	Low	2.8	5.0	0.049	0.010	NT	NT	**0.059**
TP17	0.5	Sand trace silt - grey	5.1	**2.9**	Low	2.2	5.6	<0.010	<0.0050	NT	NT	<0.0050
TP17	1.0	Sand trace silt - pale grey	5.4	3.2	Low	2.2	-	-	-	-	-	-
TP17	1.5	Sand with silt - dark grey-brown and brown	5.3	3.3	Low	2	-	-	-	-	-	-
TP17	2.0	Sand with silt - dark grey-brown and brown	5.6	3.2	Low	2.4	-	-	-	-	-	-
TP17	2.5	Sand with silt - dark grey-brown and brown	5.6	2.7	Low	2.9	5.4	0.035	0.021	NT	NT	**0.056**
TP17	2.8	Silty Sand - brown	5.6	3.0	Low	2.6	-	-	-	-	-	-
TP20	0.5	Sand trace silt - pale grey	5.1	3.0	Medium	2.1	-	-	-	-	-	-
TP20	1.0	Sand trace silt - pale grey	5.5	3.1	Low	2.4	-	-	-	-	-	-
TP20	1.5	Sand trace silt - pale grey	5.6	**2.9**	Low	2.7	-	-	-	-	-	-
TP20	2.0	Sand trace silt - pale grey	5.5	3.4	Low	2.1	5.6	<0.010	<0.0050	NT	NT	<0.0050
TP20	2.5	Sand trace silt - pale grey	5.6	3.7	Low	1.9	-	-	-	-	-	-
TP20	2.7	Sand trace silt - pale grey	5.2	3.0	Low	2.2	-	-	-	-	-	-

Note:

1. Screening Tests undertaken by MPL Laboratories
2. Low – indicates no or slight effervescence in hydrogen peroxide
   Medium – indicates moderate effervescence in hydrogen peroxide
3. Δ pH – pH_F - pH_{FOX}
4. TAA – titratable actual acidity
5. S_{CR} – chromium reducible sulfur
6. S_{NAS} – retained acidity (reported for pH_{KCl} < 4.5)

Test Location	Depth (m)	Soil Description	Screening Tests [1]				Chromium Suite of Testing					
			pH_F	pH_{FOX}	Reaction[2] Strength	Δ pH[3]	pH_{KCl}	TAA [4] (%S)	S_{CR} (%S) [5]	S_{NAS} (%S) [6]	ANC (%S) [7]	Net [8] Acidity (%S)
Assessment Criteria			**<4**	**<3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**>0.03**

7. ANC – acid neutralising capacity (reported for pH_{KCl} > 6.5)
8. Net Acidity = TAA + S_{CR} + S_{NAS}. (It should be noted that ANC is excluded as per WA Guidelines)

NT Not Tested

Envirolab Services (WA) Pty Ltd trading as MPL Laboratories
ABN 53 140 099 207
7-11 Catalano Road Canning Vale WA 6155
ph +61 8 9317 2505
lab@mpl.com.au
www.mpl.com.au

Sample Receipt Advice PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Attention	Gary Gao

Sample Login Details

Your Reference	240409.00 - Proposed Residential Development
Envirolab Reference	PHB1781
Date Sample Received	26/02/2026
Date Instructions Received	26/02/2026
Date Final Results Expected	06/03/2026

Sample Condition

Samples received in appropriate condition for analysis	See Comments
Number of Samples	66 Soil
Turnaround Time	5 Days
Temperatures / Cooling Methods	5.0°C No Cooling

Additional Info

Sample storage - waters are routinely disposed at approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Where no sampling date has been supplied for some or all samples, the date of sample receipt has been used as the associated sampling date. The sampling dates are used to assess compliance to recommended Technical Holding Times.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default).

Please direct any queries to:

Sally Harbrow

Phone 08 9317 2505
Email lab@mpl.com.au

Paul Nottle

Phone 08 9317 2505
Email lab@mpl.com.au

Analysis underway, details on the following page

Sample Receipt Advice PHB1781

Analysis Grid

The • indicates the testing you have requested. ***THIS IS NOT A REPORT OF THE RESULTS.***

	ASS Field
PHB1781-01 Soil | 13/02/2026 TP01, 0.5 m	•
PHB1781-02 Soil | 13/02/2026 TP01, 1.0 m	•
PHB1781-03 Soil | 13/02/2026 TP01, 1.5 m	•
PHB1781-04 Soil | 13/02/2026 TP01, 2.0 m	•
PHB1781-05 Soil | 13/02/2026 TP03, 0.5 m	•
PHB1781-06 Soil | 13/02/2026 TP03, 1.0 m	•
PHB1781-07 Soil | 13/02/2026 TP03, 1.5 m	•
PHB1781-08 Soil | 13/02/2026 TP03, 2.0 m	•
PHB1781-09 Soil | 13/02/2026 TP03, 2.5 m	•
PHB1781-10 Soil | 13/02/2026 TP03, 3.0 m	•
PHB1781-11 Soil | 13/02/2026 TP05, 0.5 m	•
PHB1781-12 Soil | 13/02/2026 TP05, 1.0 m	•
PHB1781-13 Soil | 13/02/2026 TP05, 1.5 m	•
PHB1781-14 Soil | 13/02/2026 TP05, 2.0 m	•
PHB1781-15 Soil | 13/02/2026 TP05, 2.5 m	•
PHB1781-16 Soil | 13/02/2026 TP05, 3.0 m	•

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-17 Soil | 13/02/2026 TP06, 0.5 m	•
PHB1781-18 Soil | 13/02/2026 TP06, 1.0 m	•
PHB1781-19 Soil | 13/02/2026 TP06, 1.5 m	•
PHB1781-20 Soil | 13/02/2026 TP06, 2.0 m	•
PHB1781-21 Soil | 13/02/2026 TP06, 2.5 m	•
PHB1781-22 Soil | 13/02/2026 TP06, 3.0 m	•
PHB1781-23 Soil | 13/02/2026 TP09, 0.5 m	•
PHB1781-24 Soil | 13/02/2026 TP09, 1.0 m	•
PHB1781-25 Soil | 13/02/2026 TP09, 1.5 m	•
PHB1781-26 Soil | 13/02/2026 TP09, 1.8 m	•
PHB1781-27 Soil | 13/02/2026 TP10, 0.5 m	•
PHB1781-28 Soil | 13/02/2026 TP10, 1.0 m	•
PHB1781-29 Soil | 13/02/2026 TP10, 1.5 m	•
PHB1781-30 Soil | 13/02/2026 TP10, 2.0 m	•
PHB1781-31 Soil | 13/02/2026 TP10, 2.5 m	•
PHB1781-32 Soil | 13/02/2026 TP10, 2.7 m	•

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-33 Soil | 13/02/2026 TP11, 0.5 m	•
PHB1781-34 Soil | 13/02/2026 TP11, 1.0 m	•
PHB1781-35 Soil | 13/02/2026 TP11, 1.5 m	•
PHB1781-36 Soil | 13/02/2026 TP11, 2.0 m	•
PHB1781-37 Soil | 13/02/2026 TP11, 2.5 m	•
PHB1781-38 Soil | 13/02/2026 TP11, 3.0 m	•
PHB1781-39 Soil | 13/02/2026 TP13, 0.5 m	•
PHB1781-40 Soil | 13/02/2026 TP13, 1.0 m	•
PHB1781-41 Soil | 13/02/2026 TP13, 1.5 m	•
PHB1781-42 Soil | 13/02/2026 TP13, 2.0 m	•
PHB1781-43 Soil | 13/02/2026 TP13, 2.5 m	•
PHB1781-44 Soil | 13/02/2026 TP15, 0.5 m	•
PHB1781-45 Soil | 13/02/2026 TP15, 1.0 m	•
PHB1781-46 Soil | 13/02/2026 TP15, 1.5 m	•
PHB1781-47 Soil | 13/02/2026 TP15, 2.0 m	•
PHB1781-48 Soil | 13/02/2026 TP15, 2.5 m	•

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-49 Soil | 13/02/2026 TP16, 0.5 m	•
PHB1781-50 Soil | 13/02/2026 TP16, 1.0 m	•
PHB1781-51 Soil | 13/02/2026 TP16, 1.5 m	•
PHB1781-52 Soil | 13/02/2026 TP16, 2.0 m	•
PHB1781-53 Soil | 13/02/2026 TP16, 2.5 m	•
PHB1781-54 Soil | 13/02/2026 TP16, 2.7 m	•
PHB1781-55 Soil | 13/02/2026 TP17, 0.5 m	•
PHB1781-56 Soil | 13/02/2026 TP17, 1.0 m	•
PHB1781-57 Soil | 13/02/2026 TP17, 1.5 m	•
PHB1781-58 Soil | 13/02/2026 TP17, 2.0 m	•
PHB1781-59 Soil | 13/02/2026 TP17, 2.5 m	•
PHB1781-60 Soil | 13/02/2026 TP17, 2.8 m	•
PHB1781-61 Soil | 13/02/2026 TP20, 0.5 m	•
PHB1781-62 Soil | 13/02/2026 TP20, 1.0 m	•
PHB1781-63 Soil | 13/02/2026 TP20, 1.5 m	•
PHB1781-64 Soil | 13/02/2026 TP20, 2.0 m	•

Sample Receipt Advice PHB1781

Analysis Grid *(Cont.)*

	ASS Field
PHB1781-65 Soil | 13/02/2026 TP20, 2.5 m	•
PHB1781-66 Soil | 13/02/2026 TP20, 2.7 m	•

Suite Details

Suite Name	Suite Analyses
ASS Field |Soil	pH F, pH FOX, Reaction Rate

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Work Amendment Advice PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Attention	Gary Gao

Sample Login Details

Your Reference	240409.00 - Proposed Residential Development
Envirolab Reference	PHB1781
Date Sample Received	26/02/2026
Date Instructions Received	03/03/2026
Date Final Results Expected	10/03/2026

Sample Condition

Samples received in appropriate condition for analysis	See Comments
Number of Samples	66 Soil
Turnaround Time	5 Days
Temperatures / Cooling Methods	5.0°C No Cooling

Additional Info

Sample storage - waters are routinely disposed at approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Where no sampling date has been supplied for some or all samples, the date of sample receipt has been used as the associated sampling date. The sampling dates are used to assess compliance to recommended Technical Holding Times.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default).

Please direct any queries to:

Sally Harbrow

Phone 08 9317 2505
Email lab@mpl.com.au

Paul Nottle

Phone 08 9317 2505
Email lab@mpl.com.au

Analysis underway, details on the following page

Analysis Grid

The • indicates the testing you have requested. ***THIS IS NOT A REPORT OF THE RESULTS.***

	SCr Suite	ASS Field
PHB1781-01 Soil | 13/02/2026 TP01, 0.5 m		•
PHB1781-02 Soil | 13/02/2026 TP01, 1.0 m		•
PHB1781-03 Soil | 13/02/2026 TP01, 1.5 m	•	•
PHB1781-04 Soil | 13/02/2026 TP01, 2.0 m		•
PHB1781-05 Soil | 13/02/2026 TP03, 0.5 m	•	•
PHB1781-06 Soil | 13/02/2026 TP03, 1.0 m		•
PHB1781-07 Soil | 13/02/2026 TP03, 1.5 m		•
PHB1781-08 Soil | 13/02/2026 TP03, 2.0 m	•	•
PHB1781-09 Soil | 13/02/2026 TP03, 2.5 m		•
PHB1781-10 Soil | 13/02/2026 TP03, 3.0 m		•
PHB1781-11 Soil | 13/02/2026 TP05, 0.5 m		•
PHB1781-12 Soil | 13/02/2026 TP05, 1.0 m		•
PHB1781-13 Soil | 13/02/2026 TP05, 1.5 m	•	•
PHB1781-14 Soil | 13/02/2026 TP05, 2.0 m		•
PHB1781-15 Soil | 13/02/2026 TP05, 2.5 m		•
PHB1781-16 Soil | 13/02/2026 TP05, 3.0 m		•

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-17 Soil | 13/02/2026 TP06, 0.5 m	●	●
PHB1781-18 Soil | 13/02/2026 TP06, 1.0 m		●
PHB1781-19 Soil | 13/02/2026 TP06, 1.5 m		●
PHB1781-20 Soil | 13/02/2026 TP06, 2.0 m	●	●
PHB1781-21 Soil | 13/02/2026 TP06, 2.5 m		●
PHB1781-22 Soil | 13/02/2026 TP06, 3.0 m		●
PHB1781-23 Soil | 13/02/2026 TP09, 0.5 m		●
PHB1781-24 Soil | 13/02/2026 TP09, 1.0 m		●
PHB1781-25 Soil | 13/02/2026 TP09, 1.5 m		●
PHB1781-26 Soil | 13/02/2026 TP09, 1.8 m	●	●
PHB1781-27 Soil | 13/02/2026 TP10, 0.5 m		●
PHB1781-28 Soil | 13/02/2026 TP10, 1.0 m		●
PHB1781-29 Soil | 13/02/2026 TP10, 1.5 m		●
PHB1781-30 Soil | 13/02/2026 TP10, 2.0 m	●	●
PHB1781-31 Soil | 13/02/2026 TP10, 2.5 m		●
PHB1781-32 Soil | 13/02/2026 TP10, 2.7 m	●	●

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-33 Soil | 13/02/2026 TP11, 0.5 m	●	●
PHB1781-34 Soil | 13/02/2026 TP11, 1.0 m		●
PHB1781-35 Soil | 13/02/2026 TP11, 1.5 m		●
PHB1781-36 Soil | 13/02/2026 TP11, 2.0 m	●	●
PHB1781-37 Soil | 13/02/2026 TP11, 2.5 m		●
PHB1781-38 Soil | 13/02/2026 TP11, 3.0 m		●
PHB1781-39 Soil | 13/02/2026 TP13, 0.5 m	●	●
PHB1781-40 Soil | 13/02/2026 TP13, 1.0 m		●
PHB1781-41 Soil | 13/02/2026 TP13, 1.5 m		●
PHB1781-42 Soil | 13/02/2026 TP13, 2.0 m		●
PHB1781-43 Soil | 13/02/2026 TP13, 2.5 m	●	●
PHB1781-44 Soil | 13/02/2026 TP15, 0.5 m		●
PHB1781-45 Soil | 13/02/2026 TP15, 1.0 m	●	●
PHB1781-46 Soil | 13/02/2026 TP15, 1.5 m		●
PHB1781-47 Soil | 13/02/2026 TP15, 2.0 m		●
PHB1781-48 Soil | 13/02/2026 TP15, 2.5 m		●

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-49 Soil | 13/02/2026 TP16, 0.5 m		●
PHB1781-50 Soil | 13/02/2026 TP16, 1.0 m		●
PHB1781-51 Soil | 13/02/2026 TP16, 1.5 m		●
PHB1781-52 Soil | 13/02/2026 TP16, 2.0 m		●
PHB1781-53 Soil | 13/02/2026 TP16, 2.5 m		●
PHB1781-54 Soil | 13/02/2026 TP16, 2.7 m	●	●
PHB1781-55 Soil | 13/02/2026 TP17, 0.5 m	●	●
PHB1781-56 Soil | 13/02/2026 TP17, 1.0 m		●
PHB1781-57 Soil | 13/02/2026 TP17, 1.5 m		●
PHB1781-58 Soil | 13/02/2026 TP17, 2.0 m		●
PHB1781-59 Soil | 13/02/2026 TP17, 2.5 m	●	●
PHB1781-60 Soil | 13/02/2026 TP17, 2.8 m		●
PHB1781-61 Soil | 13/02/2026 TP20, 0.5 m		●
PHB1781-62 Soil | 13/02/2026 TP20, 1.0 m		●
PHB1781-63 Soil | 13/02/2026 TP20, 1.5 m		●
PHB1781-64 Soil | 13/02/2026 TP20, 2.0 m	●	●

Work Amendment Advice PHB1781

Analysis Grid *(Cont.)*

	SCr Suite	ASS Field
PHB1781-65 Soil | 13/02/2026 TP20, 2.5 m		●
PHB1781-66 Soil | 13/02/2026 TP20, 2.7 m		●

Suite Details

Suite Name	Suite Analyses
SCr Suite |Soil	a-ANCBT, a-CRS, ANCBT, a-Net Acidity, a-Net Acidity w/out ANCE, a-SNAS, Chromium Reducible Sulfur, Fineness Factor, Liming rate, Liming rate without ANCE, pH kcl, s-ANCBT, SHCl, SKCl, SNAS, s-Net Acidity, s-Net Acidity w/out ANCE, s-SNAS, s-TAA, TAA
ASS Field |Soil	pH F, pH FOX, Reaction Rate

Work Order Amendment History

Revision	Reason for Amendment
R-01	Additional analysis requested 3.3.26

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Certificate of Analysis PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Contact	Gary Gao
Address	36 O'Malley St, OSBORNE PARK, WA, 6017

Sample Details

Your Reference	240409.00 - Proposed Residential Development
Number of Samples	66 Soil
Date Samples Received	26/02/2026
Date Instructions Received	03/03/2026

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Final Results Expected	10/03/2026
Date of Reissue	10/03/2026 - This report supercedes previous report, see amendment history for details

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Authorisation Details

Results Approved By	Stacey Hawkins, ASS/AMD Supervisor
Laboratory Manager	Michael Kubiak

Report Amendment History

Revision	Reason for Amendment
R-01	Additional analysis requested 3.3.26

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PHB1781-01	TP01, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-02	TP01, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-03	TP01, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-04	TP01, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-05	TP03, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-06	TP03, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-07	TP03, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-08	TP03, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-09	TP03, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-10	TP03, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-11	TP05, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-12	TP05, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-13	TP05, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-14	TP05, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-15	TP05, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-16	TP05, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-17	TP06, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-18	TP06, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-19	TP06, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-20	TP06, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-21	TP06, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-22	TP06, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-23	TP09, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-24	TP09, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-25	TP09, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-26	TP09, 1.8 m	Soil	13/02/2026	03/03/2026
PHB1781-27	TP10, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-28	TP10, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-29	TP10, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-30	TP10, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-31	TP10, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-32	TP10, 2.7 m	Soil	13/02/2026	03/03/2026
PHB1781-33	TP11, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-34	TP11, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-35	TP11, 1.5 m	Soil	13/02/2026	03/03/2026

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PHB1781-36	TP11, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-37	TP11, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-38	TP11, 3.0 m	Soil	13/02/2026	03/03/2026
PHB1781-39	TP13, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-40	TP13, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-41	TP13, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-42	TP13, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-43	TP13, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-44	TP15, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-45	TP15, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-46	TP15, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-47	TP15, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-48	TP15, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-49	TP16, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-50	TP16, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-51	TP16, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-52	TP16, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-53	TP16, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-54	TP16, 2.7 m	Soil	13/02/2026	03/03/2026
PHB1781-55	TP17, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-56	TP17, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-57	TP17, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-58	TP17, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-59	TP17, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-60	TP17, 2.8 m	Soil	13/02/2026	03/03/2026
PHB1781-61	TP20, 0.5 m	Soil	13/02/2026	03/03/2026
PHB1781-62	TP20, 1.0 m	Soil	13/02/2026	03/03/2026
PHB1781-63	TP20, 1.5 m	Soil	13/02/2026	03/03/2026
PHB1781-64	TP20, 2.0 m	Soil	13/02/2026	03/03/2026
PHB1781-65	TP20, 2.5 m	Soil	13/02/2026	03/03/2026
PHB1781-66	TP20, 2.7 m	Soil	13/02/2026	03/03/2026

Acid Sulfate Soils (Soil)

Envirolab ID	Units	PQL	PHB1781-01	PHB1781-02	PHB1781-03	PHB1781-04	PHB1781-05
Your Reference			TP01, 0.5 m	TP01, 1.0 m	TP01, 1.5 m	TP01, 2.0 m	TP03, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.7	6.3	5.7	5.6	6.0
pHFOX (field peroxide test)*	pH units		4.8	4.6	3.2	3.7	3.7
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-06	PHB1781-07	PHB1781-08	PHB1781-09	PHB1781-10
Your Reference			TP03, 1.0 m	TP03, 1.5 m	TP03, 2.0 m	TP03, 2.5 m	TP03, 3.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.0	6.1	6.1	6.1	6.0
pHFOX (field peroxide test)*	pH units		4.0	3.3	3.3	4.6	4.2
Reaction Rate*	-		Low	Medium	Medium	Low	Low

Envirolab ID	Units	PQL	PHB1781-11	PHB1781-12	PHB1781-13	PHB1781-14	PHB1781-15
Your Reference			TP05, 0.5 m	TP05, 1.0 m	TP05, 1.5 m	TP05, 2.0 m	TP05, 2.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.9	6.2	5.7	5.6	6.1
pHFOX (field peroxide test)*	pH units		4.2	4.8	3.6	4.0	4.1
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-16	PHB1781-17	PHB1781-18	PHB1781-19	PHB1781-20
Your Reference			TP05, 3.0 m	TP06, 0.5 m	TP06, 1.0 m	TP06, 1.5 m	TP06, 2.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.2	6.0	6.0	6.3	6.6
pHFOX (field peroxide test)*	pH units		4.4	2.0	2.9	2.8	2.8
Reaction Rate*	-		Low	Medium	Medium	Medium	Medium

Envirolab ID	Units	PQL	PHB1781-21	PHB1781-22	PHB1781-23	PHB1781-24	PHB1781-25
Your Reference			TP06, 2.5 m	TP06, 3.0 m	TP09, 0.5 m	TP09, 1.0 m	TP09, 1.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.9	6.6	6.9	5.9	6.1
pHFOX (field peroxide test)*	pH units		3.4	3.2	4.4	4.6	4.7
Reaction Rate*	-		Medium	Medium	Medium	Low	Medium

Envirolab ID	Units	PQL	PHB1781-26	PHB1781-27	PHB1781-28	PHB1781-29	PHB1781-30
Your Reference			TP09, 1.8 m	TP10, 0.5 m	TP10, 1.0 m	TP10, 1.5 m	TP10, 2.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.6	5.9	5.8	5.7	5.6
pHFOX (field peroxide test)*	pH units		3.5	3.6	3.3	3.3	2.8
Reaction Rate*	-		Medium	Medium	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-31	PHB1781-32	PHB1781-33	PHB1781-34	PHB1781-35
Your Reference			TP10, 2.5 m	TP10, 2.7 m	TP11, 0.5 m	TP11, 1.0 m	TP11, 1.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.8	5.7	4.5	5.4	5.8
pHFOX (field peroxide test)*	pH units		2.9	3.1	3.3	4.0	3.9
Reaction Rate*	-		Low	Low	Medium	Medium	Low

Envirolab ID	Units	PQL	PHB1781-36	PHB1781-37	PHB1781-38	PHB1781-39	PHB1781-40
Your Reference			TP11, 2.0 m	TP11, 2.5 m	TP11, 3.0 m	TP13, 0.5 m	TP13, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.3	6.2	5.9	4.7	5.2
pHFOX (field peroxide test)*	pH units		2.5	2.6	3.1	2.9	4.0

Acid Sulfate Soils (Soil)

Envirolab ID	Units	PQL	PHB1781-36	PHB1781-37	PHB1781-38	PHB1781-39	PHB1781-40
Your Reference			TP11, 2.0 m	TP11, 2.5 m	TP11, 3.0 m	TP13, 0.5 m	TP13, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
Reaction Rate*	-		Low	Low	Low	Medium	Low

Envirolab ID	Units	PQL	PHB1781-41	PHB1781-42	PHB1781-43	PHB1781-44	PHB1781-45
Your Reference			TP13, 1.5 m	TP13, 2.0 m	TP13, 2.5 m	TP15, 0.5 m	TP15, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.3	5.6	5.7	5.3	4.6
pHFOX (field peroxide test)*	pH units		3.9	4.0	4.4	4.2	3.9
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-46	PHB1781-47	PHB1781-48	PHB1781-49	PHB1781-50
Your Reference			TP15, 1.5 m	TP15, 2.0 m	TP15, 2.5 m	TP16, 0.5 m	TP16, 1.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.0	6.1	5.7	6.2	6.1
pHFOX (field peroxide test)*	pH units		4.6	4.8	4.9	4.5	4.5
Reaction Rate*	-		Low	Low	Low	Medium	Low

Envirolab ID	Units	PQL	PHB1781-51	PHB1781-52	PHB1781-53	PHB1781-54	PHB1781-55
Your Reference			TP16, 1.5 m	TP16, 2.0 m	TP16, 2.5 m	TP16, 2.7 m	TP17, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		6.0	5.4	5.4	5.5	5.1
pHFOX (field peroxide test)*	pH units		4.2	3.4	3.4	2.7	2.9
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-56	PHB1781-57	PHB1781-58	PHB1781-59	PHB1781-60
Your Reference			TP17, 1.0 m	TP17, 1.5 m	TP17, 2.0 m	TP17, 2.5 m	TP17, 2.8 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.4	5.3	5.6	5.6	5.6
pHFOX (field peroxide test)*	pH units		3.2	3.3	3.2	2.7	3.0
Reaction Rate*	-		Low	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-61	PHB1781-62	PHB1781-63	PHB1781-64	PHB1781-65
Your Reference			TP20, 0.5 m	TP20, 1.0 m	TP20, 1.5 m	TP20, 2.0 m	TP20, 2.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pHF (field pH test)*	pH units		5.1	5.5	5.6	5.5	5.6
pHFOX (field peroxide test)*	pH units		3.0	3.1	2.9	3.4	3.7
Reaction Rate*	-		Medium	Low	Low	Low	Low

Envirolab ID	Units	PQL	PHB1781-66
Your Reference			TP20, 2.7 m
Date Sampled			13/02/2026
pHF (field pH test)*	pH units		5.2
pHFOX (field peroxide test)*	pH units		3.0
Reaction Rate*	-		Low

Chromium Reducible Sulfur Suite (Soil)

Envirolab ID	Units	PQL	PHB1781-03	PHB1781-05	PHB1781-08	PHB1781-13	PHB1781-17
Your Reference			TP01, 1.5 m	TP03, 0.5 m	TP03, 2.0 m	TP05, 1.5 m	TP06, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		4.9	6.3	5.5	5.3	5.4
TAA	moles H+/t	5.0	72	<5.0	6.6	14	6.6
s-TAA	% w/w S	0.010	0.12	<0.010	0.011	0.023	0.011
Chromium Reducible Sulfur	% w/w	0.0050	0.0092	<0.0050	<0.0050	<0.0050	<0.0050
a-Chromium Reducible Sulfur	moles H+/t	3.0	5.8	<3.0	3.1	<3.0	<3.0
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	0.13	<0.0050	0.015	0.025	0.013
a-Net Acidity	moles H+/t	5.0	78	<5.0	9.6	15	7.8
Liming rate	kg CaCO3/t	0.75	5.9	<0.75	<0.75	1.2	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.13	<0.0050	0.015	0.025	0.013
a-Net Acidity without ANCE	moles H+/t	5.0	78	<5.0	9.6	15	7.8
Liming rate without ANCE	kg CaCO3/t	0.75	5.9	<0.75	<0.75	1.2	<0.75

Envirolab ID	Units	PQL	PHB1781-20	PHB1781-26	PHB1781-30	PHB1781-32	PHB1781-33
Your Reference			TP06, 2.0 m	TP09, 1.8 m	TP10, 2.0 m	TP10, 2.7 m	TP11, 0.5 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		5.5	5.1	5.1	5.3	5.6
TAA	moles H+/t	5.0	7.8	55	9.1	6.6	5.3
s-TAA	% w/w S	0.010	0.013	0.088	0.015	0.011	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	<0.0050	0.0059	<0.0050	<0.0050	<0.0050
a-Chromium Reducible Sulfur	moles H+/t	3.0	<3.0	3.7	<3.0	<3.0	<3.0
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	0.015	0.094	0.017	0.011	0.0085
a-Net Acidity	moles H+/t	5.0	9.2	58	11	7.1	5.3
Liming rate	kg CaCO3/t	0.75	<0.75	4.4	0.79	<0.75	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	0.015	0.094	0.017	0.011	0.0085
a-Net Acidity without ANCE	moles H+/t	5.0	9.2	58	11	7.1	5.3
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	4.4	0.79	<0.75	<0.75

Chromium Reducible Sulfur Suite (Soil)

Envirolab ID	Units	PQL	PHB1781-36	PHB1781-39	PHB1781-43	PHB1781-45	PHB1781-54
Your Reference			TP11, 2.0 m	TP13, 0.5 m	TP13, 2.5 m	TP15, 1.0 m	TP16, 2.7 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		5.6	4.9	5.4	5.9	5.0
TAA	moles H+/t	5.0	5.3	26	9.1	<5.0	31
s-TAA	% w/w S	0.010	<0.010	0.041	0.015	<0.010	0.049
Chromium Reducible Sulfur	% w/w	0.0050	0.0055	<0.0050	<0.0050	<0.0050	0.010
a-Chromium Reducible Sulfur	moles H+/t	3.0	3.4	<3.0	<3.0	<3.0	6.3
SHCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	0.014	0.041	0.017	<0.0050	0.059
a-Net Acidity	moles H+/t	5.0	8.7	26	10	<5.0	37
Liming rate	kg CaCO3/t	0.75	<0.75	1.9	0.78	<0.75	2.8
s-Net Acidity without ANCE	% w/w S	0.0050	0.014	0.041	0.017	<0.0050	0.059
a-Net Acidity without ANCE	moles H+/t	5.0	8.7	26	10	<5.0	37
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	1.9	0.78	<0.75	2.8

Envirolab ID	Units	PQL	PHB1781-55	PHB1781-59	PHB1781-64
Your Reference			TP17, 0.5 m	TP17, 2.5 m	TP20, 2.0 m
Date Sampled			13/02/2026	13/02/2026	13/02/2026
pH KCl	pH units		5.6	5.4	5.6
TAA	moles H+/t	5.0	<5.0	22	<5.0
s-TAA	% w/w S	0.010	<0.010	0.035	<0.010
Chromium Reducible Sulfur	% w/w	0.0050	<0.0050	0.021	<0.0050
a-Chromium Reducible Sulfur	moles H+/t	3.0	<3.0	13	<3.0
SHCl	% w/w S	0.0050	NT	NT	NT
SKCl	% w/w S	0.0050	NT	NT	NT
SNAS	% w/w S	0.0050	NT	NT	NT
a-SNAS	moles H+/t	5.0	NT	NT	NT
s-SNAS	% w/w S	0.010	NT	NT	NT
Fineness Factor	-	1.5	1.5	1.5	1.5
ANCBT	% CaCO3	0.010	NT	NT	NT
a-ANCBT	moles H+/t	5.0	NT	NT	NT
s-ANCBT	% w/w S	0.010	NT	NT	NT
s-Net Acidity	% w/w S	0.0050	<0.0050	0.056	<0.0050
a-Net Acidity	moles H+/t	5.0	<5.0	35	<5.0
Liming rate	kg CaCO3/t	0.75	<0.75	2.6	<0.75
s-Net Acidity without ANCE	% w/w S	0.0050	<0.0050	0.056	<0.0050
a-Net Acidity without ANCE	moles H+/t	5.0	<5.0	35	<5.0
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	2.6	<0.75

Method Summary

Method ID	Methodology Summary
INORG-063	pH- measured using pH meter and electrode. Solids are oxidised with Hydrogen Peroxide or extracted with water. To ensure accurate results these tests are recommended to be done in the field as pH may change with time thus these results may not be representative of true field conditions. There is no documented official holding time, we have assigned an arbitrary 180 days to frozen samples.
INORG-068	Determination of Chromium Suite analysis - a sample is analysed by traditional titration method as well as ICP-OES analysis. Ideally samples should be received in the laboratory at <4oC. Please refer to SRA for sample temperature on receipt. Samples should also ideally be received within 24 hrs of sampling, otherwise there is the potential for oxidation to occur (as indicated by the lowering of the pH). Freezing the samples may help mitigate the potential for oxidation. Neutralising value (NV) of 100% is assumed for liming rate. The recommendation that the SHCL concentration be multiplied by a factor of 2 to ensure retained acidity is not underestimated, has not been applied in the SHCL result. However, it has been applied in the SNAS calculation: SNAS % = (SHCL-SKCL)x2".

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, and is determined by processing solvents and reagents in exactly the same manner as for samples.

Surrogate Spike

Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

LCS (Laboratory Control Sample)

This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Matrix Spike

A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates can be downloaded from the Envirolab Resources website or obtained directly by contacting the laboratory.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PHB1781

Client Details

Client	Douglas Partners Pty Ltd (Perth)
Your Reference	240409.00 - Proposed Residential Development
Date Issued	10/03/2026

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PHB1781

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
pH F | Soil	1-66	13/02/2026	26/02/2026	27/02/2026	Yes
pH FOX | Soil	1-66	13/02/2026	26/02/2026	27/02/2026	Yes
Reaction Rate | Soil	1-66	13/02/2026	26/02/2026	27/02/2026	Yes
CRS Suite | Soil	3, 5, 8, 13, 17, 20, 26, 30, 32-33, 36, 39, 43, 45, 54-55, 59, 64	13/02/2026	04/03/2026	04/03/2026	Yes

Quality Control PHB1781

INORG-063|Acid Sulfate Soils (Soil) | Batch BHB4735

Analyte	Units	PQL	Blank	DUP1 PHB1781-01 Samp | QC | RPD %	DUP2 PHB1781-11 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			6.7 | 6.6 | 1.96	5.9 | 6.0 | 1.68	99.9
pHFOX (field peroxide test)	pH units			4.8 | 4.6 | 2.76	4.2 | 4.4 | 4.37	100
Reaction Rate	-			Low | Low | [NA]	Low | Low | [NA]	[NA]

Analyte	Units	PQL	Blank	DUP3 PHB1781-21 Samp | QC | RPD %	DUP4 PHB1781-31 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			6.9 | 6.8 | 1.75	5.8 | 5.8 | 0.347	100
pHFOX (field peroxide test)	pH units			3.4 | 3.5 | 2.03	2.9 | 3.0 | 4.10	99.9
Reaction Rate	-			Medium | Medium | [NA]	Low | Low | [NA]	[NA]

Analyte	Units	PQL	Blank	DUP5 PHB1781-41 Samp | QC | RPD %	DUP6 PHB1781-51 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			5.3 | 5.2 | 2.11	6.0 | 6.0 | 1.17	100
pHFOX (field peroxide test)	pH units			3.9 | 3.8 | 2.84	4.2 | 3.8 | 8.48	99.7
Reaction Rate	-			Low | Low | [NA]	Low | Low | [NA]	[NA]

Analyte	Units	PQL	Blank	DUP7 PHB1781-61 Samp | QC | RPD %	LCS %
pHF (field pH test)	pH units			5.1 | 4.9 | 4.20	100
pHFOX (field peroxide test)	pH units			3.0 | 3.0 | 2.32	100
Reaction Rate	-			Medium | Medium | [NA]	[NA]

INORG-068|Chromium Reducible Sulfur Suite (Soil) | Batch BHC0399

Analyte	Units	PQL	Blank	DUP1 PHB1781-03 Samp | QC | RPD %	DUP2 PHB1781-36 Samp | QC | RPD %	LCS %
pH KCl	pH units		NT	4.88 | 4.90 | 0.409	5.55 | 5.57 | 0.360	93.3
TAA	moles H+/t	5.0	<5.0	72.4 | 71.1 | 1.76	5.31 | <5.0 | [NA]	88.7
s-TAA	% w/w S	0.010	<0.010	0.116 | 0.114 | 1.76	<0.010 | <0.010 | [NA]	[NA]
Chromium Reducible Sulfur	% w/w	0.0050	<0.0050	0.00924 | 0.00964 | [NA]	0.00551 | 0.00531 | [NA]	103
a-Chromium Reducible Sulfur	moles H+/t	3.0	<3.0	5.77 | 6.01 | [NA]	3.43 | 3.31 | [NA]	[NA]
SHCl	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
SKCl	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
SNAS	% w/w S	0.0050	<0.0050	NT | NT | [NA]	NT | NT | [NA]	[NA]
a-SNAS	moles H+/t	5.0	<5.0	NT | NT | [NA]	NT | NT | [NA]	[NA]
s-SNAS	% w/w S	0.010	<0.010	NT | NT | [NA]	NT | NT | [NA]	[NA]
Fineness Factor	-	1.5	NT	1.50 | 1.50 | [NA]	1.50 | 1.50 | [NA]	[NA]
ANCBT	% CaCO3	0.010	<0.010	NT | NT | [NA]	NT | NT | [NA]	NT
a-ANCBT	moles H+/t	5.0	<5.0	NT | NT | [NA]	NT | NT | [NA]	[NA]
s-ANCBT	% w/w S	0.010	<0.010	NT | NT | [NA]	NT | NT | [NA]	[NA]
s-Net Acidity	% w/w S	0.0050	<0.0050	0.125 | 0.124 | 1.31	0.0140 | 0.0118 | [NA]	[NA]
a-Net Acidity	moles H+/t	5.0	<5.0	78.1 | 77.1 | 1.31	8.75 | 7.36 | [NA]	[NA]
Liming rate	kg CaCO3/t	0.75	<0.75	5.86 | 5.79 | 1.31	<0.75 | <0.75 | [NA]	[NA]
s-Net Acidity without ANCE	% w/w S	0.0050	<0.0050	0.125 | 0.124 | 1.31	0.0140 | 0.0118 | [NA]	[NA]
a-Net Acidity without ANCE	moles H+/t	5.0	<5.0	78.1 | 77.1 | 1.31	8.75 | 7.36 | [NA]	[NA]
Liming rate without ANCE	kg CaCO3/t	0.75	<0.75	5.86 | 5.79 | 1.31	<0.75 | <0.75 | [NA]	[NA]

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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Proposed Residential Development
Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

To: MPL Envirolab
Catalano Road, Canning vale, WA
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}										NOTES
1	TP01, 0.5 m	13/2/26	S	Freezer		Y	Y										
2	TP01, 1.0 m	13/2/26	S	Freezer		Y	Y										
3	TP01, 1.5 m	13/2/26	S	Freezer		Y	Y										
4	TP01, 2.0 m	13/2/26	S	Freezer		Y	Y										
5	TP03, 0.5 m	13/2/26	S	Freezer		Y	Y										
6	TP03, 1.0 m	13/2/26	S	Freezer		Y	Y										
7	TP03, 1.5 m	13/2/26	S	Freezer		Y	Y										
8	TP03, 2.0 m	13/2/26	S	Freezer		Y	Y										
9	TP03, 2.5 m	13/2/26	S	Freezer		Y	Y										
10	TP03, 3.0 m	13/2/26	S	Freezer		Y	Y										
11	TP05, 0.5 m	13/2/26	S	Freezer		Y	Y										
12	TP05, 1.0 m	13/2/26	S	Freezer		Y	Y										
	LOR (S)																
	LOR (W)																

mpl Laboratories ENVIROLAB GROUP
Job No.- PHB1781
Date Rec - 25 FEB 2026
Time Rec - 1500
Rec By - NL
TAT Req - SAME 1 / 2 / 3 / STD
Temp - cool / ambient
Cooling - Ice / Ice pack / None
Security Seal - Yes / No

LOR = Limit of Reporting, *As per Laboratory Method Detection Limit

Sampled By: Gary Gao Relinquished By: _____ Sign: _____ Date/Time: 19/02/2026
Received By: _____ Relinquished By: _____ Sign: _____ Date/Time: _____

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OSBORNE PARK 6017
Ph: (08) 9204 3511
Fax: (08) 9204 3522
Accounts: perth@douglaspartners.com.au

Project Name Proposed Residential Development
To: MPL Envirolab

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CHAIN OF CUSTODY DESPATCH SHEET

Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
13	TP05, 1.5 m	13/2/26	S	Freezer		Y	Y											
14	TP05, 2.0 m	13/2/26	S	Freezer		Y	Y											
15	TP05, 2.5 m	13/2/26	S	Freezer		Y	Y											
16	TP05, 3.0 m	13/2/26	S	Freezer		Y	Y											
17	TP06, 0.5 m	13/2/26	S	Freezer		Y	Y											
18	TP06, 1.0 m	13/2/26	S	Freezer		Y	Y											
19	TP06, 1.5 m	13/2/26	S	Freezer		Y	Y											
20	TP06, 2.0 m	13/2/26	S	Freezer		Y	Y											
21	TP06, 2.5 m	13/2/26	S	Freezer		Y	Y											
22	TP06, 3.0 m	13/2/26	S	Freezer		Y	Y											
23	TP09, 0.5 m	13/2/26	S	Freezer		Y	Y											
24	TP09, 1.0 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
25	TP09, 1.5 m	13/2/26	S	Freezer		Y	Y											
26	TP09, 1.8 m	13/2/26	S	Freezer		Y	Y											
27	TP10, 0.5 m	13/2/26	S	Freezer		Y	Y											
28	TP10, 1.0 m	13/2/26	S	Freezer		Y	Y											
29	TP10, 1.5 m	13/2/26	S	Freezer		Y	Y											
30	TP10, 2.0 m	13/2/26	S	Freezer		Y	Y											
31	TP10, 2.5 m	13/2/26	S	Freezer		Y	Y											
32	TP10, 2.7 m	13/2/26	S	Freezer		Y	Y											
33	TP11, 0.5 m	13/2/26	S	Freezer		Y	Y											
34	TP11, 1.0 m	13/2/26	S	Freezer		Y	Y											
35	TP11, 1.5 m	13/2/26	S	Freezer		Y	Y											
36	TP11, 2.0 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
37	TP11, 2.5 m	13/2/26	S	Freezer		Y	Y											
38	TP11, 3.0 m	13/2/26	S	Freezer		Y	Y											
39	TP13, 0.5 m	13/2/26	S	Freezer		Y	Y											
40	TP13, 1.0 m	13/2/26	S	Freezer		Y	Y											
41	TP13, 1.5 m	13/2/26	S	Freezer		Y	Y											
42	TP13, 2.0 m	13/2/26	S	Freezer		Y	Y											
43	TP13, 2.5 m	13/2/26	S	Freezer		Y	Y											
44	TP15, 0.5 m	13/2/26	S	Freezer		Y	Y											
45	TP15, 1.0 m	13/2/26	S	Freezer		Y	Y											
46	TP15, 1.5 m	13/2/26	S	Freezer		Y	Y											
47	TP15, 2.0 m	13/2/26	S	Freezer		Y	Y											
48	TP15, 2.5 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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CHAIN OF CUSTODY DESPATCH SHEET

Project No: 240409.00
DP Contact Person: Gary Gao
Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
49	TP16, 0.5 m	13/2/26	S	Freezer		Y	Y											
50	TP16, 1.0 m	13/2/26	S	Freezer		Y	Y											
51	TP16, 1.5 m	13/2/26	S	Freezer		Y	Y											
52	TP16, 2.0 m	13/2/26	S	Freezer		Y	Y											
53	TP16, 2.5 m	13/2/26	S	Freezer		Y	Y											
54	TP16, 2.7 m	13/2/26	S	Freezer		Y	Y											
55	TP17, 0.5 m	13/2/26	S	Freezer		Y	Y											
56	TP17, 1.0 m	13/2/26	S	Freezer		Y	Y											
57	TP17, 1.5 m	13/2/26	S	Freezer		Y	Y											
58	TP17, 2.0 m	13/2/26	S	Freezer		Y	Y											
59	TP17, 2.5 m	13/2/26	S	Freezer		Y	Y											
60	TP17, 2.8 m	13/2/26	S	Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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Project No: 240409.00
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Prior Storage: Esky

16 – 18 Hayden Court
Myaree
Ph: 9317 2505

	Sample ID	Sampling Time / Date	Sample Type S-soil W-water	Preservation	Lab ID	pH_F	pH_{FOX}											NOTES
61	TP20, 0.5 m	13/2/26	S	Freezer		Y	Y											
62	TP20, 1.0 m	13/2/26	S	Freezer		Y	Y											
63	TP20, 1.5 m	13/2/26	S	Freezer		Y	Y											
64	TP20, 2.0 m	13/2/26	S	Freezer		Y	Y											
65	TP20, 2.5 m	13/2/26	S	Freezer		Y	Y											
66	TP20, 2.7 m	13/2/26	S	Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
				Freezer		Y	Y											
	LOR (S)																	
	LOR (W)																	

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Received By: _____ Relinquished By: _____ Sign: _____ Date/Time: _____

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Fax: (08) 9204 3522
Accounts: perth@douglaspartners.com.au

Project Name: Proposed Residential Development

To: MPL Envirolab

Sally Harbrow

From: MPL Laboratory
Subject: FW: Additional Testing (Chromium Suite) - Proposed Residential Development 240409.00
Attachments: PE252519.pdf

From: Emily Stewart <Emily.Stewart@douglaspartners.com.au>
Sent: Tuesday, 3 March 2026 12:33 PM
To: MPL Laboratory <lab@mpl.com.au>
Cc: Genevieve Massam <GMassam@mpl.com.au>; Rob Shapland <Rob.Shapland@douglaspartners.com.au>; Mubashar Ahmed <Mubashar.Ahmed@douglaspartners.com.au>
Subject: Additional Testing (Chromium Suite) - Proposed Residential Development 240409.00

CAUTION: This email originated from outside of the organisation. Do not act on instructions, click links or open attachments unless you recognise the sender and know the content is authentic and safe.

Hi Gen,

Please find attached PO to undertake chromium suite testing for the following samples held under PHB1781

Test Location	Depth	
TP01	1.5	3
TP03	0.5	5
TP03	2.0	8
TP05	1.5	13
TP06	0.5	17
TP06	2.0	20
TP09	1.8	26
TP10	2.0	30
TP10	2.7	32
TP11	0.5	33
TP11	2.0	36
TP13	0.5	39
TP13	2.5	43
TP15	1.0	45
TP16	2.7	54
TP17	0.5	55
TP17	2.5	59
TP20	2.0	64

Kind Regards,

Proposed Scheme Amendment

Lot 39 Elizabeth Street, Bayonet Head
Transport Impact Assessment

PREPARED FOR:
Development WA C/- JDSI

April 2026

Document history and status

Author	Revision	Approved by	Date approved	Revision type
Waihin Tun	r01	B Bordbar	6/02/2026	Draft
Waihin Tun	r02	B Bordbar	13/04/2026	Final
Waihin Tun	r02a	B Bordbar	15/04/2026	Revised Final

File name: t26.017.wt.r02a

Author: Waihin Tun

Project manager: Waihin Tun

Client: Development WA C/- JDSI

Project: Lot 39 Elizabeth Street, Albany

Document revision: r02a

Project number: t26.017

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1 Introduction

This Transport Impact Assessment (TIA) has been prepared by Transcore on behalf of Development WA C/- JDSi with respect to the proposed Scheme Amendment for the northern portion of Lot 39 Elizabeth Street, Bayonet Head comprising 10.2299 hectares (the subject site) in the City of Albany.

The subject site is currently a vacant land, and is bounded by Elizabeth Street to the north, vacant lands with vegetation to the immediate east and south and existing residential properties to the immediate west. Please refer to **Figure 1** for more details.

The location of the subject site in its regional context within the Local Planning Scheme (LPS) is illustrated in **Figure 2**, sourced from Department of Planning, Lands and Heritage (DPLH). **Figure 3** shows the location of the subject site in the context of the City of Albany's Local Planning Scheme No. 2 which is currently zoned as "*Rural*" under City's LPS No. 2.

The proposal aims to change the existing zoning of the site from "*Rural*" to "*Residential R30*", to facilitate future subdivision comprising a total of 133 residential lots with designated "public open space".

In accordance with the WAPC's "*Transport Impact Assessment Guidelines, Volume 4 – Individual Developments (2016)*", a Transport Impact Assessment is required for developments that generate more than 100 vehicles per hour. Accordingly, a Transport Impact Assessment (TIA) is warranted in this case.

Key issues that will be addressed in this report include the traffic generation and distribution, and the movement patterns associated with the proposed Scheme Amendment (Development Concept Plan), and capacity analysis of the proposed new intersections on Elizabeth Street.

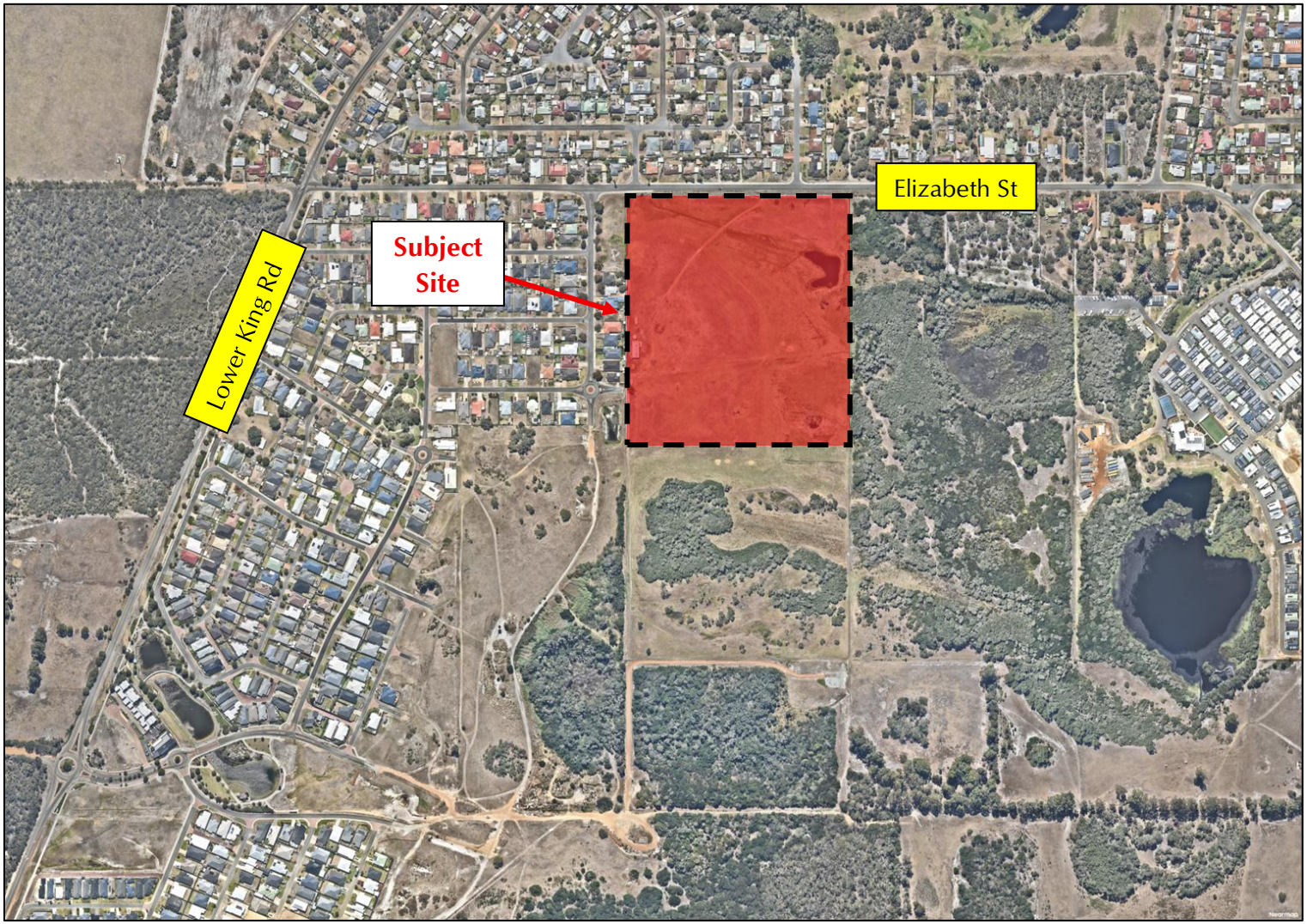

Figure 1. Location of the subject site

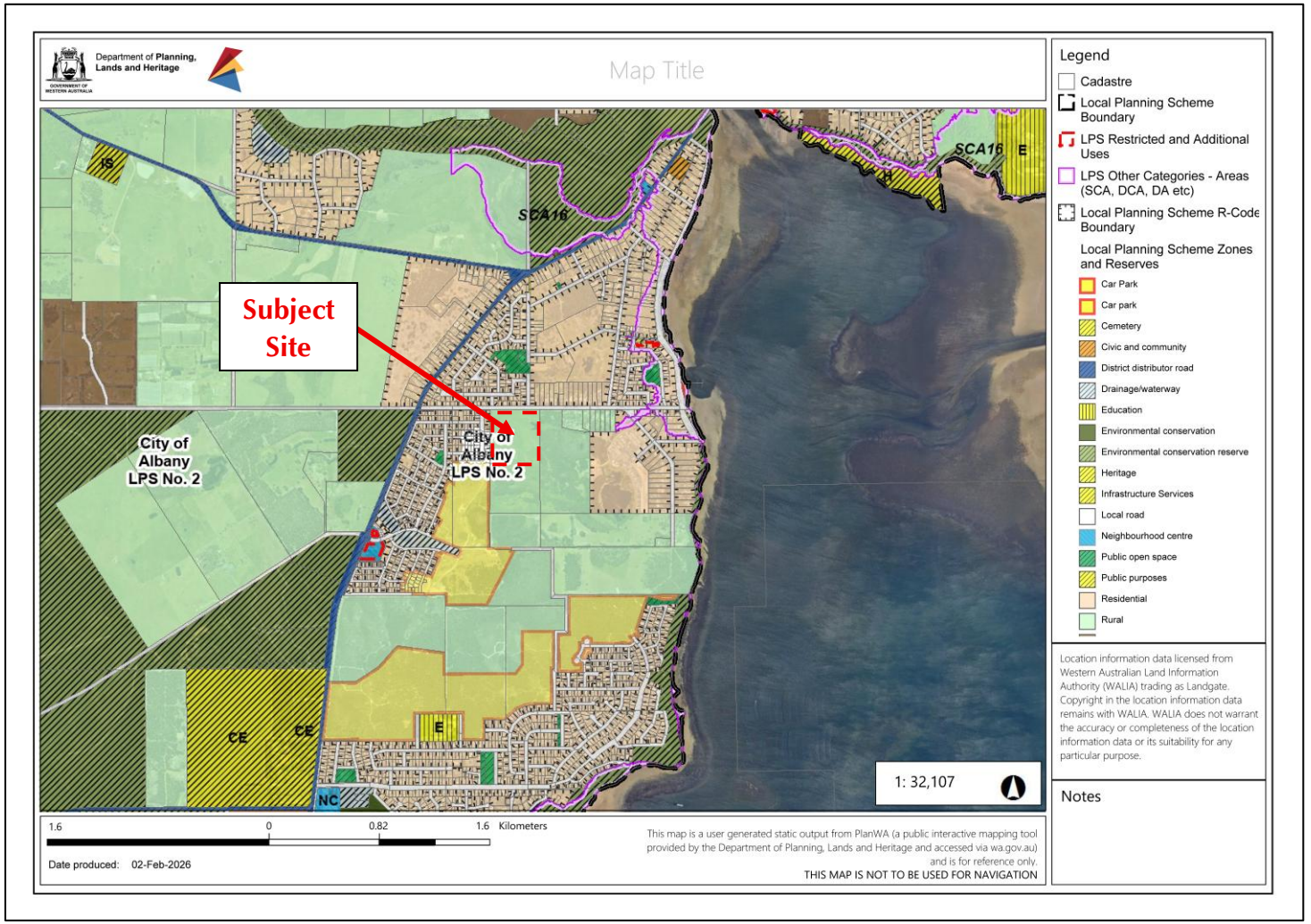

Figure 2. Subject site location under DPLH map

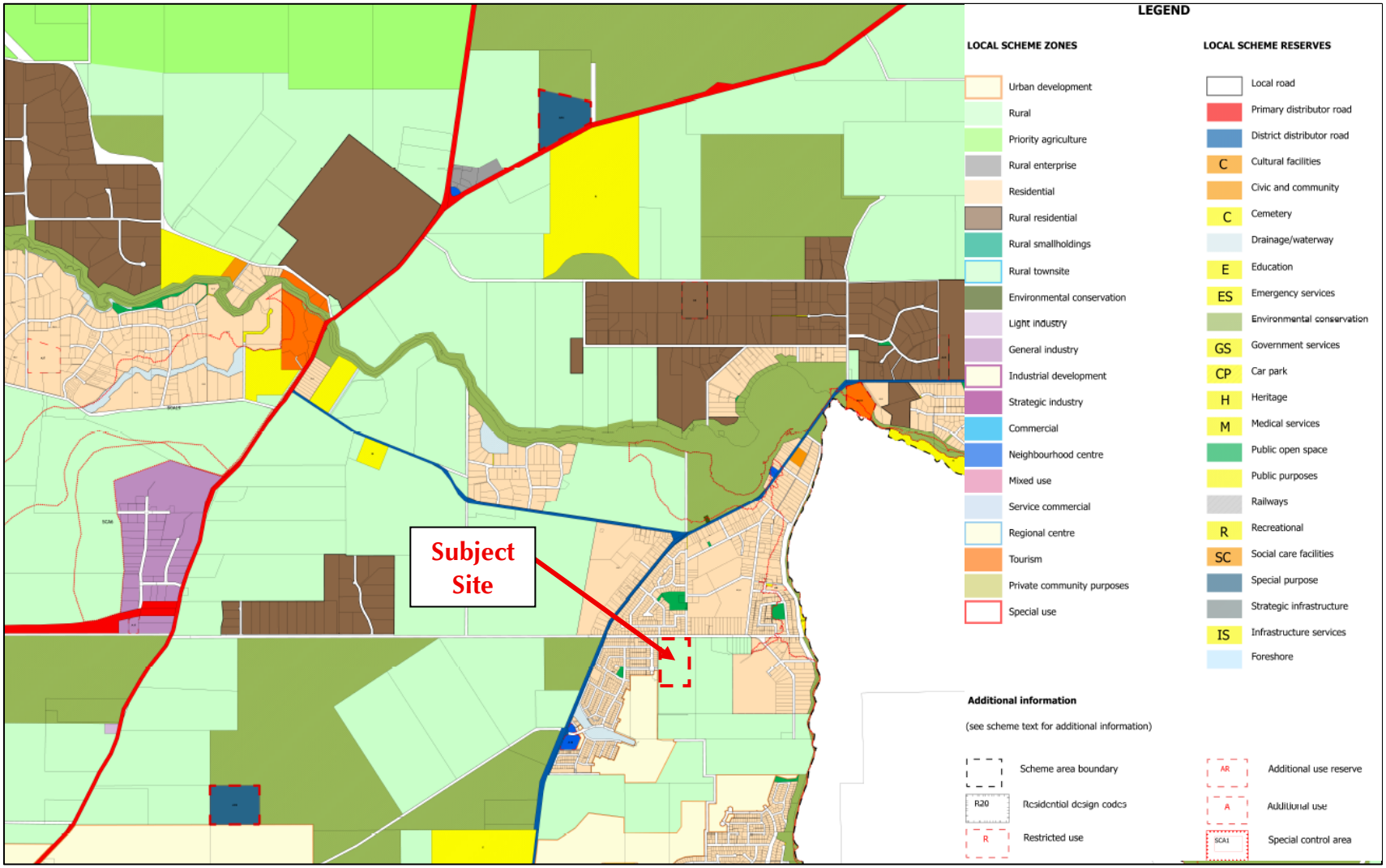

Figure 3. Location of the subject site in LPS No. 2 (source: City of Albany)

2 Proposed Scheme Amendment

The proposed Scheme Amendment seeks to rezone the subject site from "*Rural*" to "*Residential R30*" under the City of Albany Local Planning Scheme No. 2 (LPS 2).

Based on the information provided, it is understood that the subject site area is approximately 10.2299ha. The Development Concept Plan submitted in support of the Scheme Amendment Request comprises the following elements:

- 133 Residential lots with average lot size of 445m^2;
  (Minimum lot size is 312m^2 and the maximum lot size is 525m^2); and,
- Public Open Space with an area of 1.2776 ha ;

The layout of the proposed Scheme Amendment (Development Concept Plan) is included in **Appendix A**.

3 Existing Situation

3.1 Existing Land Use

The subject site is currently zoned as "*Rural*" in the City of Albany's *Local Planning Scheme No. 2*. The subject site is predominantly vacant, cleared pastoral land.

3.2 Existing Road Network

Elizabeth Street, north of the subject site, is constructed as single carriageway two lane divided road. Pedestrian footpath is available on the northern side of the road. Please refer to **Figure 4** for more details.

Elizabeth Street is classified as an *Access Road* in the Main Roads WA Metropolitan Functional Road Hierarchy and operates under the speed limit of 60km/h. Elizabeth Street forms a four-way intersection with Lower King Road at its western terminus and a 'T' intersection with Esplanade Road at its eastern terminus.

Figure 4. Eastbound view along Elizabeth Street

3.3 Existing Traffic Volume on Road

Based on the traffic count data provided by the City of Albany, Elizabeth Street carried approximately 1,242 vehicles per day (vpd) on a typical weekday in February 2024. The recorded weekday peak traffic periods occurred between 9:00am and 10:00am and between 4:00pm and 5:00pm, with corresponding traffic volumes of 107 and 107 vehicles per hour (vph), respectively.

3.4 Crash Records

The available crash record along the section of Elizabeth Street between Lower King Road to the west and Francis Street to the east within the last five-year period ending in December 2025 has been reviewed.

The result indicates that a total of four (4) crashes were recorded along the reviewed section of the road, including three (3) intersection crashes at the intersections of Elizabeth Street/Lower King Road and Elizabeth Street/ Hubble Street and one mid-block crash on Elizabeth Street. It is reported that the two crashes occurred at the intersection of Elizabeth Street and Lower King Road were classified as "Medical" and "Hospital" crashes.

3.5 Public Transport Access

According to the current Transperth bus network map, the subject site has direct access to the existing bus service operating on both Elizabeth Street and Paul Terry Drive, located to the west of the subject site.

The closet available bus service operating on both Elizabeth Street and Paul Terry Drive is bus route 804 with the nearest bus stop located on Elizabeth Street within the frontage of the subject site. In addition, another bus stop is also located on Paul Terry Drive approximately 200m walking distance from the subject site.

These bus routes provide direct links to Albany Health Campus and Albany Plaza.

Please refer to **Figure 5**, which shows the locations of the bus route and nearest available bus stops in the vicinity of the subject site. **Figure 5** also illustrates the existing walking and cycling network in the vicinity of the subject site, based on information from the Department of Transport (DoT), the City of Albany, and YourMove.

3.6 Pedestrian and Cyclist Facilities

As shown in **Figure 5**, a Shared Path for both pedestrians and cyclists is currently available to the north of the subject site. This path further connects to Lower King Road which is also classified as a Shared Path for pedestrians and cyclists. Additionally, Paul Terry Drive, located near the subject site, is also designated as a Shared Path.

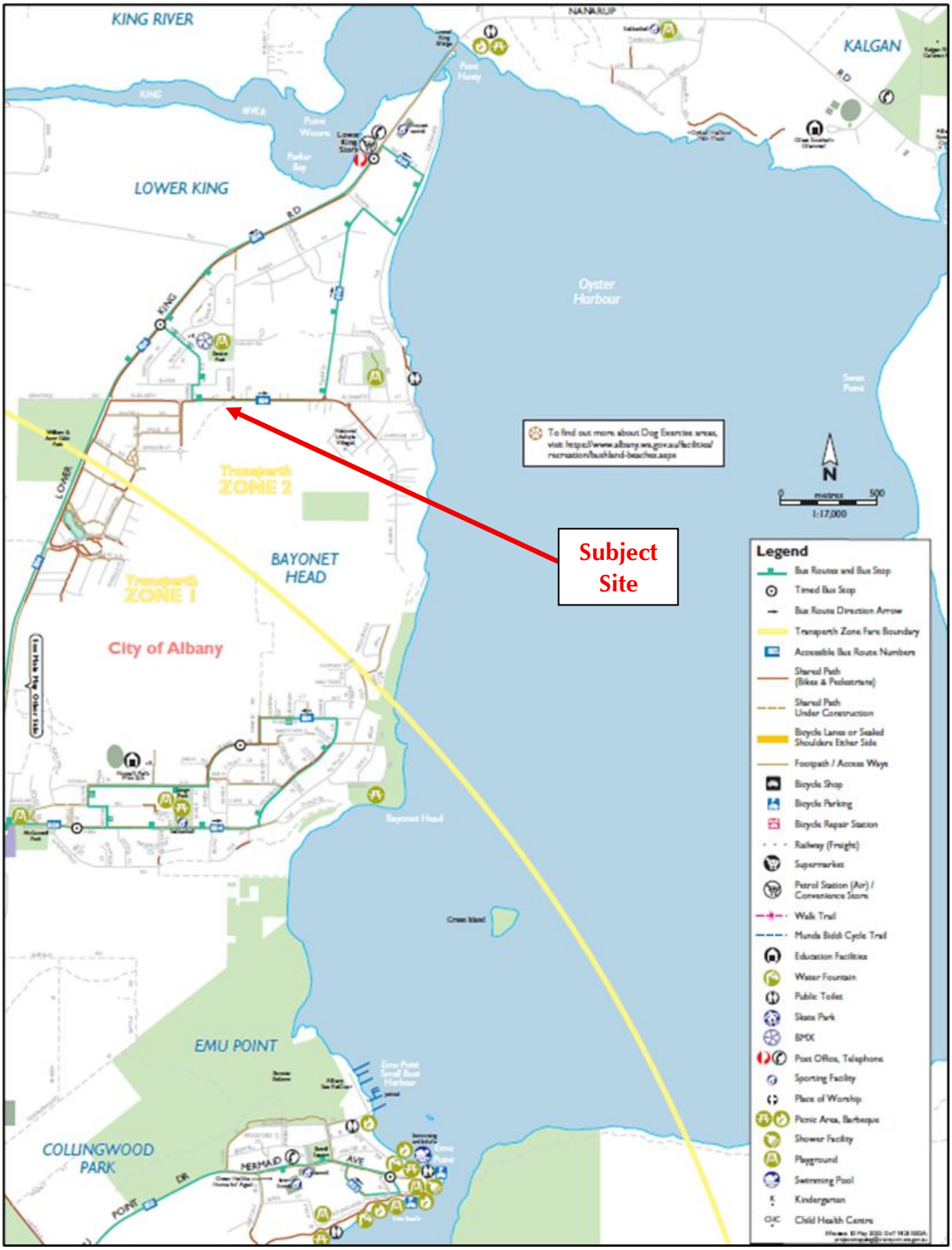

Figure 5. Albany Public Transport, Walking and Riding Guide (source: Department of Transport, City of Albany and YourMove)

4 Transport Network

4.1 Changes to Surrounding Transport Networks

As part of the proposed Scheme Amendment (Development Concept Plan), one (1) east-west road which is the extension of the existing Berliner Street will be constructed along the southern boundary and the portion of the eastern boundary of the proposed subdivision.

In addition, three (3) north-south roads, three (3) east-west internal subdivision roads and one loop road will also be constructed to provide accessibility and connectivity both within the proposed subdivision and the external road network including Elizabeth Street, located north of the proposed subdivision.

Accordingly, the proposed internal and external road layout will result in two (2) priority-controlled 'T' intersections along the extension of Berliner Street (*Intersections 1 and 2*), and four (4) priority-controlled 'T' intersections with Elizabeth Street (*Intersections 3 to 6*).

It should be noted that two (2) new T intersections on Elizabeth Street at the northeast corner of the subject site were formed due to the proposed loop road geometry and these two intersections are required as two points of vehicle accesses/egress in the event of bushfire (adjoining lot to the east is a high fire risk).

These proposed intersections and associated local road improvements are essential to accommodate the expected increase in traffic generated by the proposed subdivision, address emergency access/egress requirements and to ensure effective integration with the existing road network in the surrounding area.

The intersections locations as part of the proposed subdivision are shown in **Figure 6**.

Figure 6. Locations of the intersections

5 Proposed Internal Road Network

5.1 Traffic Flows

Daily traffic flows generated by the proposed Scheme Amendment (Development Concept Plan) have been estimated and assigned on the internal road network and the resultant total daily traffic flows on the internal road network are shown in **Figure 7**.

The layout of the proposed subdivision has been reviewed, and it is our understanding that the crossovers of the lots will be designed and positioned perpendicular to the roads.

Figure 7. Projected vehicle per daily (vpd) within the proposed subdivision

5.2 Road Hierarchy

Based on the estimated traffic projections discussed in **Section 6.2** of this report, all internal roads within the subject subdivision are expected to carry less than 600 vehicles per day (vpd). Accordingly, these roads can be classified as *Access Street* type *C* or *D* in accordance with the relevant Liveable Neighbourhoods guidelines.

Access Streets are to accommodate shared pedestrian, bike and vehicular movements. The project maximum volume for *Access Street C* is 3,000vpd with indicative street reserve width of 15.4m to 16m, whereas *Access Street D* is expected to carry maximum daily traffic volume of 1,000vpd with indicative street reserve width of 14.2m.

Most of the proposed road reserve widths are about 15.5m, except two roads which are fronting the POS with the reduced road reserve width of approximately 13.0m. It is noted that the verge adjacent to park may be reduced to 1.0m when fronting public parkland.

Typical cross sections of *Access Street C* and *D* are shown in **Figure 8** and **Figure 9**.

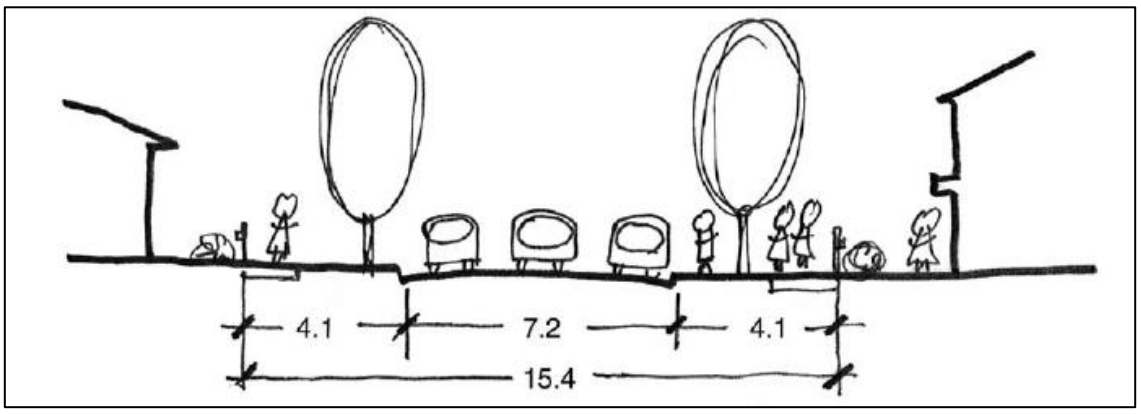

Figure 8. Typical cross section of Access Street type C Road

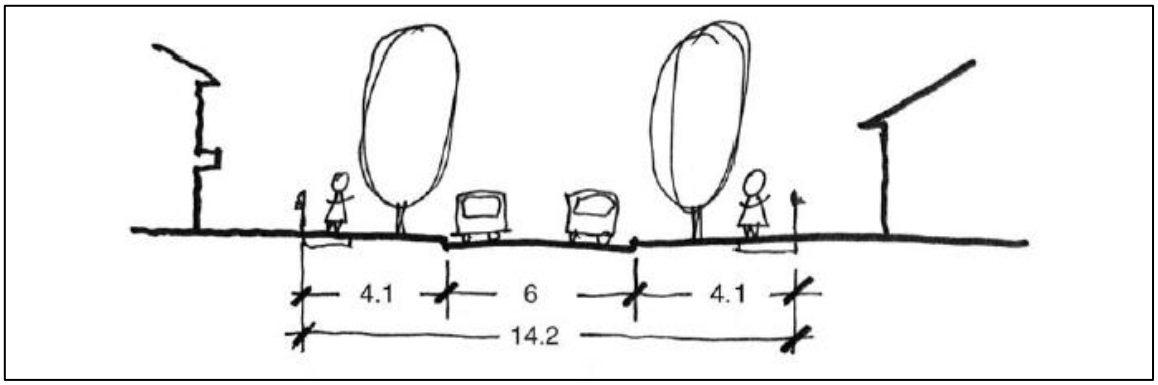

Figure 9. Typical cross section of Access Street type D Road

It is noted that the second road from the west which will form the 'T' *intersection 4* with Elizabeth Street has been designed as an Avenue type road with 4.0m wide median. Therefore, this road can be classified as an *Access Street type A (Avenue)* in accordance with the relevant Liveable Neighbourhood guidelines.

Access Street A is also designed to accommodate daily traffic volumes of up to 3,000vpd and typically has a road reserve width of 20m to 24m. The proposed road reserve width for this road is 21.0m including two 4.0m wide traffic lanes and 4.0m wide median. Typical cross-section of *Access Street A* is shown in **Figure 10**.

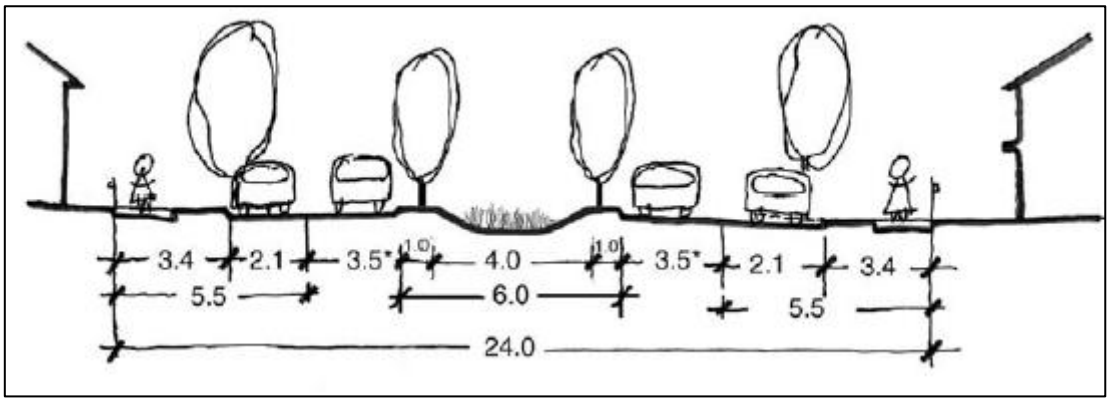

Figure 10. Typical cross section of Access Street type A Road

The proposed internal road network will therefore facilitate an efficient and balanced distribution of traffic throughout the proposed subdivision. The recommended road hierarchy for the proposed subdivision is shown in **Figure 11**, and has been developed based on the project traffic volumes shown in **Figure 7**, the proposed road reserves and the road classification criteria outlined in the WAPC Liveable Neighbourhood guidelines.

Figure 11. Recommended road hierarchy

5.3 Pathway Hierarchy (Pedestrian & Cyclist Facilities)

A 2.8m wide shared path is provided on the northern side of Elizabeth Street, connecting to Paul Terry Drive and Lower King Road to the west.

As part of the proposed scheme amendment (Development Concept Plan), it is intended to provide 2.5m wide shared paths on the southern side of Berliner Street extension, and eastern sides of second and third N-S roads as shown on the Development concept plan provided in **Appendix A**. The proposed shared paths will connect to the proposed public open space within the subject site and the existing shared path network along Elizabeth Street, ensuring that the subdivision's internal path system integrates seamlessly with the external network to form a comprehensive shared path network system in the locality.

In addition, footpaths are also proposed along most internal roads, providing direct connections between each other and to the proposed shared paths within the subdivision.

5.4 Waste Collection

It is anticipated that the waste collection services will follow the standard practice used for residential developments across City of Albany. This involves residents wheeling their bins to the verge for collection on designated collection days.

6 Daily Traffic Volumes and Vehicle Types

6.1 Existing Trip Generation

The subject site is currently a vacant land, and accordingly, the existing traffic generation is zero.

6.2 Proposed Development Concept Plan Trip Generation

Based on the information provided, it is understood that the proposed Scheme Amendment (Development Concept Plan) will yield a total of 133 new residential dwellings.

The traffic generation rate used for the proposed subdivision is 8.0 vehicular trips per day (vpd) per dwelling, which corresponds to peak hour trip generation rates of 0.8 vehicular trips per hour per dwelling as recommended in the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines (2016).*

Accordingly, it is calculated that the daily and peak hours traffic generation for the proposed subdivision are:

Residential Lots

- Daily vehicle trips: 133 x 8 = 1,064vpd.
- Weekday AM peak hour trips: 133 x 0.8 =107vph.
- Weekday PM peak hour trips: 133 x 0.8 = 107vph.

Accordingly, it is estimated that the proposed subdivision would generate a total of approximately **1,064** vehicular trips per regular weekday with about **107** trips during a typical weekday AM peak hour and **107** trips during the typical weekday PM peak hour. These totals include both inbound and outbound vehicle movements.

The traffic distribution detailed in **Table 1** was based on the following directional split assumptions (based on ITE guidelines) for peak hour periods:

- AM peak split estimated as 25%/75% (inbound/outbound trips); and,
- PM peak split estimated as 62.5%/37.5% (inbound/outbound trips).

Table 1. Directional splits for peak hours

Proposed subdivision	Direction	AM Peak	PM Peak
Residential Lots	*Inbound*	27	67
	Outbound	80	40
Total		**107**	**107**

6.3 Traffic Flow and Trip Distribution

With respect to the location of the subject site, permeability and layout of the surrounding road network and the existing and future intersections, the assumed distribution for traffic arriving/ departing the subject subdivision is assumed as follows:

- 70% to and from the west of Elizabeth Street
  (45% via the western intersection and 25% via the eastern intersection);
- 20% to and from the east of Elizabeth Street
  (10% via the western intersection and 10% via the eastern intersection); and,
- 10% to and from the west of Berliner Street.

For the simplicity of the analysis, about 7.5% of the total traffic generated from 10 residential lots to be located on the loop road that will form two intersections on Elizabeth Street are not included in the analysis but have been assigned to *Intersections 3 (western)* and *4 (eastern)* for the purpose of the robust assessment.

The directional morning and afternoon trip distribution of the proposed subdivision traffic are illustrated in **Figure 12**.

The combined base (existing traffic on Elizabeth Street) and the proposed subdivision traffic for the post development scenario are presented in **Figure 13**.

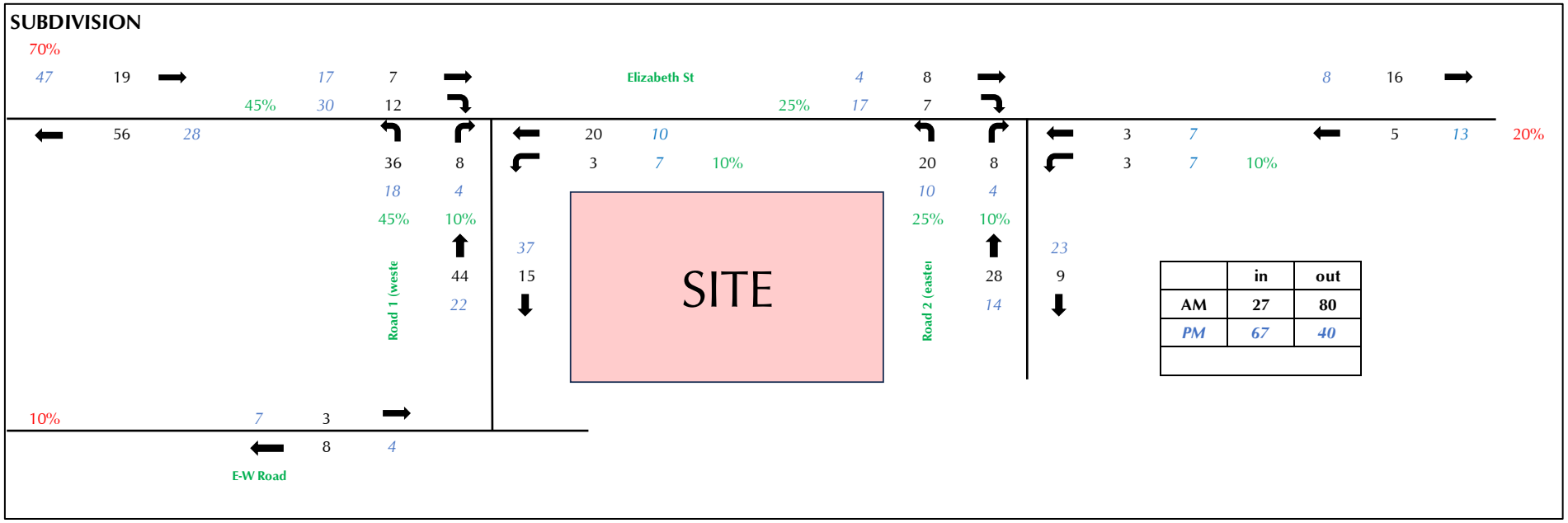

Figure 12. Peak hour traffic flows of the proposed Scheme Amendment (Development Concept Plan) – AM peak/ PM peak

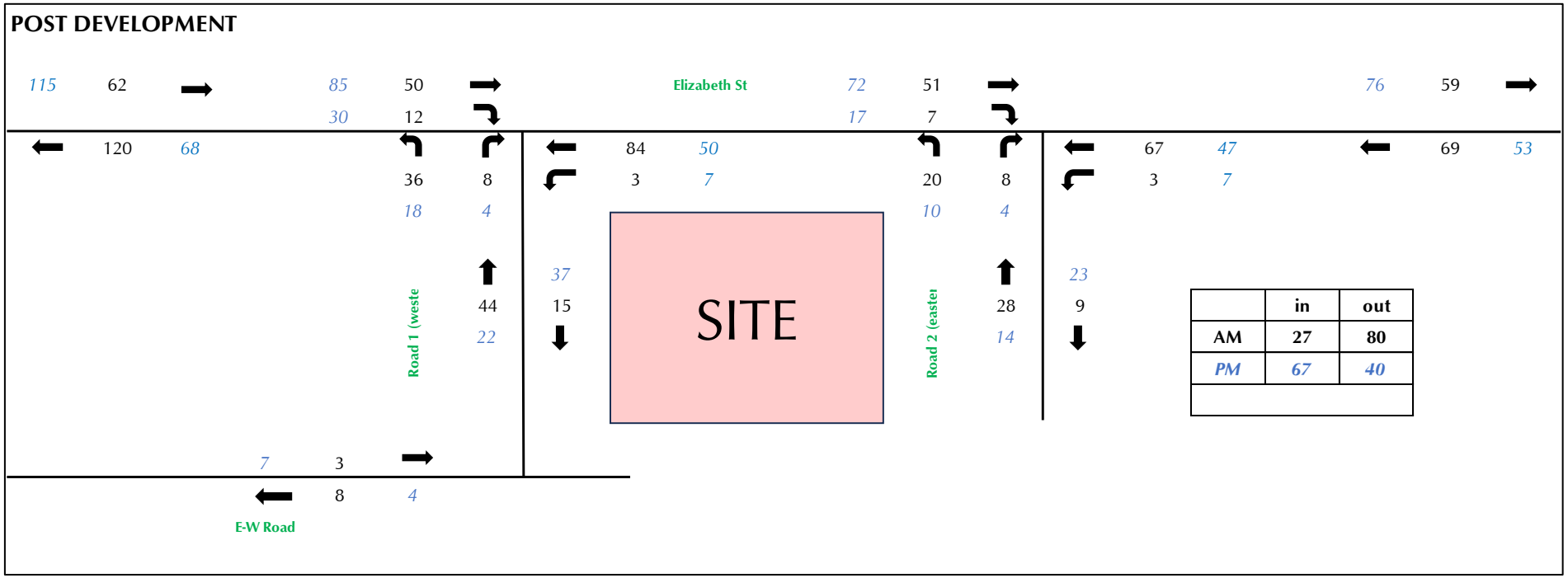

Figure 13. Peak hour traffic flows with full development – AM peak/ PM peak

6.4 Analysis of Intersections

SIDRA 10.0 intersection analysis has been undertaken for two key new priority-controlled 'T' intersections on Elizabeth Street in order to assess their operations in post development scenario for weekday AM and PM peak hours.

SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections. SIDRA outputs are presented in the form of Degree of Saturation, Level of Service, Average Delay and 95% Queue. These characteristics are defined as follows:

- **Degree of Saturation** is the ratio of the arrival traffic flow to the capacity of the approach during the same period. The Degree of Saturation ranges from close to zero for infrequent traffic flow up to one for saturated flow or capacity.
- **Level of Service** is the qualitative measure describing operational conditions within a traffic stream and the perception by motorists and/or passengers. In general, there are 6 levels of service, designated from A to F, with Level of Service A representing the best operating condition (i.e. free flow) and Level of Service F the worst (i.e. forced or breakdown flow).
- **Average Delay** is the average of all travel time delays for vehicles through the intersection.
- **95% Queue** is the queue length below which 95% of all observed queue lengths fall.

The modelled layout of the intersections is illustrated in **Figure 14**.

The SIDRA analysis has been undertaken in accordance with current MRWA operational modelling guidelines including separate input of different classes of heavy vehicles and the parameters specified by MRWA for those vehicle classes.

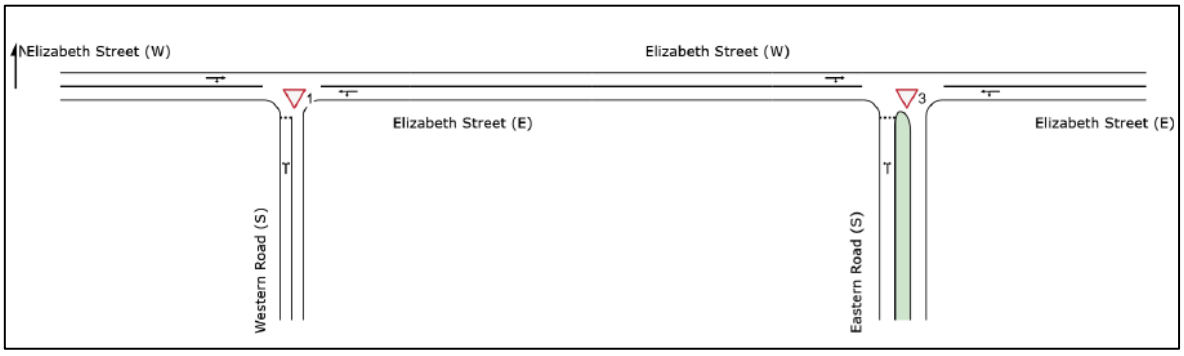

Figure 14. SIDRA network layout – Elizabeth Street

Priority-controlled 'T' intersections on Elizabeth Street (Intersections 3 and 4)

The SIDRA analysis indicates that both priority-controlled 'T' intersections will operate at a very good Level of Service (LoS) 'A' during both the AM and PM peak periods in the post development scenario. The results of the SIDRA analysis are presented in **Appendix B**.

It should be noted that the roundabout intersection of Paul Terry Drive and Berliner Street, located near the southwestern corner of the proposed subdivision, has not been included in this assessment. This is because only a very small amount of subdivision traffic is expected to use this intersection and the existing roundabout is anticipated to have adequate capacity to accommodate this small traffic increase.

6.5 Impact on Surrounding Roads and Neighbouring Areas

The WAPC Transport Impact Assessment Guidelines (2016) provides the following guidance on the assessment of traffic impacts:

"As a general guide, an increase in traffic of less than 10 percent of capacity would not normally be likely to have a material impact on any particular section of road but increases over 10 percent may. All sections of road with an increase greater than 10 percent of capacity should therefore be included in the analysis. For ease of assessment, an increase of 100 vehicles per hour for any lane can be considered as equating to around 10 percent of capacity. Therefore, any section of road where development traffic would increase flows by more than 100 vehicles per hour for any lane should be included in the analysis."

The SIDRA network intersection analysis undertaken confirms the new intersections along Elizaeth Street would perform with satisfactory traffic operations with the proposed subdivision traffic.

6.6 Traffic Noise

The WAPC's State Planning Policy 5.4: Road and Rail Transport Noise and Freight Considerations in Land Use Planning requires assessment of noise impact on noise-sensitive developments when a road carries more than 20,000vpd in an urban area or 5,000vpd in a rural area.

The traffic generation of the proposed Scheme Amendment (Development Concept Plan will not increase the traffic flows on any surrounding roads near the abovementioned traffic thresholds, so no noise impacts on surrounding areas are anticipated.

6.7 Road Safety

No road safety issues have been identified in relation to the proposed Scheme Amendment (Development Concept Plan).

7 Public Transport Access

The existing bus services in this area have been noted in **Section 3.5** of this report.

8 Pedestrian and Cyclist Access

The existing pedestrian and cyclist facilities in this area have been noted in **Section 3.6** of this report and future pedestrian and cyclist access is discussed in **Section 5.3**.

9 Conclusions

This Transport Impact Assessment (TIA) has been prepared by Transcore on behalf of Development WA C/- JDSI with respect to the proposed Scheme Amendment for Lot 39 Elizabeth Street, Bayonet Head in the City of Albany. The subject site is currently a vacant land.

The proposal aims to change the existing zoning of the site from "*Rural*" to "*Residential R30*", accommodating the subdivision to deliver a total of 133 residential lots with a "public open space".

As part of the supporting Development Concept Plan , one (1) east-west external road which is the extension of the existing Berliner Street will be constructed along the southern boundary of the proposed subdivision. In addition, three (3) north-south roads, three (3) east-west internal subdivision roads and one loop road will also be constructed to provide accessibility and connectivity both within the subject site, the external road network including Elizabeth Street and to address emergency access/egress requirements.

The traffic analysis undertaken indicates that the proposed Scheme Amendment (Development Concept Plan) would generate traffic flows of about 1,064vpd with about 107vph during both AM and PM peak periods. These totals include both inbound and outbound vehicle movements.

The results of the SIDRA intersection network analysis confirms that the proposed new key intersections along Elizabeth Street will perform satisfactorily and operate at a very good Level of Service (LoS) 'A' during both the AM and PM peak periods in the post development scenario.

Accordingly, the traffic analysis undertaken shows that the traffic increase as a result of the proposed Scheme Amendment (Development Concept Plan) is not significant and as such would not have a significant impact on the surrounding road network.

It is finally concluded that the findings of this Transport Impact Assessment are supportive of the proposed Scheme Amendment (Development Concept Plan).

Appendix A

PROPOSED SCHEME AMENDMENT

(DEVELOPMENT CONCEPT PLAN)

DESIGN FEATURES

1. Adjoining natural bushland contributes to the characteristics of the development
2. Public Open Space configured to incorporate established stormwater flood path and landform
3. Topographical responsive street design minimises earthworks and maximises view corridors east
4. Entry boulevard incorporating central swale median
5. Heritage tree retention within road reserve
6. Public Open Space featuring drainage swale at bottom of drainage catchment
7. Diverse range of lot sizes to respond to landform, bushfire management and household diversity, ranging 300m² - 600m²
8. Moderate sized lots located in vicinity of open space amenity
9. Roadside drainage swales to accommodate pre development stormwater requirements including drainage pits

LEGEND

- Concept plan boundary
- Residential R30
- Rural zoned area
- Public open space and drainage
- Established drainage swale to be retained
- BAL29 — Anticipated BAL29 setback
- Illustrative street tree locations
- Heritage tree to be retained
- Indicative shared path alignment
- Indicative footpath alignment

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Date 7/04/2026
0 10 20 30 40 N
Plan 25/057/004B
Grid MGA2020-50
Drawn MH
Approved MB

Development Concept

LOT 39 ELIZABETH STREET, BAYONET HEAD

A DevelopmentWA Project

TBB PLANNING

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Appendix B

SIDRA ANALYSIS

MOVEMENT SUMMARY

Site: [1] Western Intersection - AM (Post Dev)
Network: [1] Post Dev - AM (Post Dev)
Output produced by SIDRA INTERSECTION Version: 10.0.9.250

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes **Site Scenario: 1 | Local Volumes**

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Road (S)															
1	L2	All MCs	38	0.0	38	0.0	0.032	4.8	LOS A	0.1	0.9	0.18	0.51	0.18	40.5
3	R2	All MCs	8	0.0	8	0.0	0.032	5.1	LOS A	0.1	0.9	0.18	0.51	0.18	40.5
Approach			46	0.0	46	0.0	0.032	4.9	LOS A	0.1	0.9	0.18	0.51	0.18	40.5
East: Elizabeth Street (E)															
4	L2	All MCs	3	0.0	3	0.0	0.048	5.2	LOS A	0.0	0.0	0.00	0.02	0.00	53.5
5	T1	All MCs	88	3.6	88	3.6	0.048	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.0
Approach			92	3.5	92	3.5	0.048	0.2	NA	0.0	0.0	0.00	0.02	0.00	58.6
West: Elizabeth Street (W)															
11	T1	All MCs	53	8.0	53	8.0	0.036	0.1	LOS A	0.1	0.5	0.08	0.13	0.08	48.5
12	R2	All MCs	13	0.0	13	0.0	0.036	5.7	LOS A	0.1	0.5	0.08	0.13	0.08	46.1
Approach			65	6.5	65	6.5	0.036	1.2	NA	0.1	0.5	0.08	0.13	0.08	47.3
All Vehicles			203	3.6	203	3.6	0.048	1.6	NA	0.1	0.9	0.07	0.17	0.07	47.6

MOVEMENT SUMMARY

Site: [2] Western Intersection - PM (Post Dev)
Network: [2] Post Dev - PM (Post Dev)
Output produced by SIDRA INTERSECTION Version: 10.0.9.250

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes **Site Scenario: 1 | Local Volumes**

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV %]	Arrival Flows [Total veh/h	HV %]	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist m]	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Western Road (S)															
1	L2	All MCs	19	0.0	19	0.0	0.016	4.7	LOS A	0.1	0.4	0.14	0.50	0.14	40.7
3	R2	All MCs	4	0.0	4	0.0	0.016	5.2	LOS A	0.1	0.4	0.14	0.50	0.14	40.8
Approach			23	0.0	23	0.0	0.016	4.8	LOS A	0.1	0.4	0.14	0.50	0.14	40.8
East: Elizabeth Street (E)															
4	L2	All MCs	7	0.0	7	0.0	0.032	5.2	LOS A	0.0	0.0	0.00	0.07	0.00	52.6
5	T1	All MCs	53	4.0	53	4.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	56.6
Approach			60	3.5	60	3.5	0.032	0.6	NA	0.0	0.0	0.00	0.07	0.00	55.6
West: Elizabeth Street (W)															
11	T1	All MCs	89	3.5	89	3.5	0.066	0.1	LOS A	0.2	1.3	0.08	0.17	0.08	46.4
12	R2	All MCs	32	0.0	32	0.0	0.066	5.6	LOS A	0.2	1.3	0.08	0.17	0.08	45.6
Approach			121	2.6	121	2.6	0.066	1.5	NA	0.2	1.3	0.08	0.17	0.08	46.0
All Vehicles			204	2.6	204	2.6	0.066	1.6	NA	0.2	1.3	0.06	0.18	0.06	47.1

MOVEMENT SUMMARY

Site: [3] Eastern Intersection - AM (Post Dev)
Network: [1] Post Dev - AM (Post Dev)
Output produced by SIDRA INTERSECTION Version: 10.0.9.250

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes **Site Scenario: 1 | Local Volumes**

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Eastern Road (S)															
1	L2	All MCs	21	0.0	21	0.0	0.021	4.8	LOS A	0.1	0.6	0.16	0.50	0.16	29.0
3	R2	All MCs	8	0.0	8	0.0	0.021	5.0	LOS A	0.1	0.6	0.16	0.50	0.16	32.3
Approach			29	0.0	29	0.0	0.021	4.8	LOS A	0.1	0.6	0.16	0.50	0.16	30.3
East: Elizabeth Street (E)															
4	L2	All MCs	3	0.0	3	0.0	0.039	4.9	LOS A	0.0	0.0	0.00	0.03	0.00	47.2
5	T1	All MCs	71	4.5	71	4.5	0.039	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	57.6
Approach			74	4.3	74	4.3	0.039	0.2	NA	0.0	0.0	0.00	0.03	0.00	56.6
West: Elizabeth Street (W)															
11	T1	All MCs	54	8.0	54	8.0	0.034	0.0	LOS A	0.0	0.3	0.04	0.08	0.04	55.4
12	R2	All MCs	7	0.0	7	0.0	0.034	5.3	LOS A	0.0	0.3	0.04	0.08	0.04	44.6
Approach			61	7.0	61	7.0	0.034	0.7	NA	0.0	0.3	0.04	0.08	0.04	53.7
All Vehicles			164	4.5	164	4.5	0.039	1.2	NA	0.1	0.6	0.05	0.13	0.05	48.2

MOVEMENT SUMMARY

Site: [4] Eastern Intersection - PM (Post Dev)
Network: [2] Post Dev - PM (Post Dev)
Output produced by SIDRA INTERSECTION Version: 10.0.9.250

NA
Site Category: Future Conditions 1
Give-Way (Two-Way)
Network Scenario: 1 | Local Volumes **Site Scenario: 1 | Local Volumes**

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Eastern Road (S)															
1	L2	All MCs	11	0.0	11	0.0	0.010	4.7	LOS A	0.0	0.3	0.14	0.50	0.14	29.3
3	R2	All MCs	4	0.0	4	0.0	0.010	5.0	LOS A	0.0	0.3	0.14	0.50	0.14	32.4
Approach			15	0.0	15	0.0	0.010	4.8	LOS A	0.0	0.3	0.14	0.50	0.14	30.5
East: Elizabeth Street (E)															
4	L2	All MCs	7	0.0	7	0.0	0.030	4.9	LOS A	0.0	0.0	0.00	0.08	0.00	45.7
5	T1	All MCs	49	4.3	49	4.3	0.030	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	53.4
Approach			57	3.7	57	3.7	0.030	0.6	NA	0.0	0.0	0.00	0.08	0.00	51.5
West: Elizabeth Street (W)															
11	T1	All MCs	76	4.2	76	4.2	0.051	0.0	LOS A	0.1	0.7	0.06	0.12	0.06	53.4
12	R2	All MCs	18	0.0	18	0.0	0.051	5.3	LOS A	0.1	0.7	0.06	0.12	0.06	43.4
Approach			94	3.4	94	3.4	0.051	1.0	NA	0.1	0.7	0.06	0.12	0.06	51.1
All Vehicles			165	3.2	165	3.2	0.051	1.2	NA	0.1	0.7	0.05	0.14	0.05	48.7

SCHEME AMENDMENT

Scheme Amendment Request Report

Lot 39 Elizabeth Street, Bayonet Head

Prepared for DevelopmentWA
Prepared by TBB Planning
June 2026

Document Information

Scheme Amendment Request Report

Lot 39 Elizabeth Street, Bayonet Head

DevelopmentWA

25/057

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Acknowledgement of country

TBB Planning acknowledges the Whadjuk people of the Noongar nation as the Traditional Custodians of the land on which we live and work, and recognises their continuing connection to land, waters and culture.

We also acknowledge the custodianship of the many lands and waters across which we design, plan and engage, and pay our respects to Elders past and present, who hold the traditions and culture that continue to guide us in planning for communities now and into the future.

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FORM 2A

Planning and Development Act 2005

RESOLUTION TO PREPARE AMENDMENT TO LOCAL PLANNING SCHEME

City of Albany Local Planning Scheme No. 2
Amendment No. 7

Resolved that the Local Government pursuant to section 75 of the *Planning and Development Act* 2005, amend the above Local Planning Scheme by:

1. Rezoning the northern portion of Lot 39 on Plan 033941 from the Rural zone to the Residential zone.
2. Applying a density code of R30 to the northern portion of Lot 39 on Plan 033941.
3. Amending the Local Planning Scheme No. 2 Map accordingly.

The amendment is standard under the provisions of the *Planning and Development (Local Planning Schemes) Regulations* 2015 for the following reason(s):

1. The proposed Scheme Amendment is consistent with the City of Albany Local Planning Strategy, which identifies Bayonet Head as an 'Urban Growth' area with existing residential development and capacity to accommodate additional dwellings.

2. The proposed Scheme Amendment seeks to rezone the site to 'Residential R30', requiring that the Residential Design Codes are read as part of the City of Albany Local Planning Scheme No.2.

3. The proposed Scheme Amendment will have minimal impact on other land in the scheme area. It is confined to the northern portion of Lot 39, which has been previously cleared and is contiguous with existing residential development. The Scheme Amendment represents a logical extension of the urban area and will integrate with surrounding land uses without introducing incompatible development.

4. The proposed Scheme Amendment is not expected to result in any significant environmental, social, economic or governance impacts on land within the scheme area.

5. The proposed amendment is neither a 'complex' amendment nor is it a 'basic' amendment.

Dated this _____ day of _____ 20___

1.0

Introduction

1.0 Introduction

1.1 Request for Amendment

TBB Planning has prepared this Scheme Amendment Request on behalf of DevelopmentWA to facilitate the rezoning of a portion of Lot 39 Elizabeth Street, Bayonet Head, comprising 10.23 hectares (**subject site**), from 'Rural' to 'Residential R30' under the City of Albany *Local Planning Scheme No. 2* (**LPS 2**).

The purpose of this report is to provide the City of Albany and the Western Australian Planning Commission (**WAPC**) with sufficient information to outline the proposal and justify the initiation of the amendment to the City of Albany LPS 2 over the subject site.

This report addresses the relevant planning, environmental and technical considerations and is accompanied by the following supporting documentation:

- **Appendix A** – Indicative Development Concept, prepared by TBB Planning
- **Appendix B** – Environmental Impact Assessment, prepared by Aurora Environmental
- **Appendix C** – Local Water Management Report, prepared by Emerge Associates
- **Appendix D** – Landscape Concept Plan, prepared by Emerge Associates
- **Appendix E** – Bushfire Management Plan, prepared by Biodiverse Solutions
- **Appendix F** – Engineering Services Report, prepared by JDSi
- **Appendix G** – Geotechnical Investigations Report, prepared by Douglas Partners
- **Appendix H** – Traffic Impact Assessment, prepared by Transcore

1.2 Report Format

This report has been prepared in accordance with the *Planning and Development (Local Planning Scheme) Regulations 2015* (**Regulations**). It sets out the context of the amendment to LPS 2 and provides an assessment that justifies the proposed rezoning of the land. The report is structured as follows:

- **Section 1.0 – Introduction** outlines the purpose of the scheme amendment request.
- **Section 2.0 – Project Background** provides an overview of the project vision and summarises pre-lodgement consultation with key stakeholders.
- **Section 3.0 – Site Context** outlines site details, locational context and relevant background information.
- **Section 4.0 – Planning Framework** outlines the relevant State planning strategies and policies and considers the applicable local planning strategy, scheme provisions and policies.
- **Section 5.0 – Proposed Amendment** describes the proposed changes to LPS 2, including the scheme map and text amendments.
- **Section 6.0 – Technical Justification** provides supporting technical assessments and planning justification, including an overview of the indicative development concept plan.

1.3 Scheme Amendment Classification

This Scheme Amendment is proposed to be classified as a 'standard' amendment in accordance with Section 34 in Part 5 of the Regulations. The Regulations outline the process for standard scheme amendments, in accordance with the provisions of the *Planning and Development Act 2005* (**PD Act**).

Refer to **Table 1** below for an assessment of the proposal against the definition of a standard amendment, which supports this classification.

Table 1 Scheme Amendment Classification Assessment

Regulations	Comment
Standard amendment *means any of the following amendments to a local planning scheme —*	
(a) an amendment relating to a zone or reserve that is consistent with the objectives identified in the scheme for that zone or reserve;	**Not Applicable** The amendment does not impact on the objectives of any existing zoning, other than to replace the Rural zone with Residential zone, and therefore replacing the zoning objectives altogether. In this respect the objectives of the existing Rural zone cease to be relevant.
(b) an amendment that is consistent with a local planning strategy for the scheme that has been endorsed by the Commission;	**Applicable.** The proposed Scheme Amendment is consistent with the City of Albany Local Planning Strategy, which identifies Bayonet Head as an 'Urban Growth' area with existing residential development and capacity to accommodate additional dwellings. The subject site satisfies the Strategy's criteria for urban development, as it adjoins the existing urban front, has been previously cleared, and can be serviced by existing infrastructure networks, with proportionate upgrades where required. A Local Water Management Report has been prepared to demonstrate that servicing and drainage requirements can be appropriately addressed. The Scheme Amendment will facilitate the orderly expansion of an existing growth area, contributing to housing supply in accordance with the Strategy, rather than extending development into new or unserviced areas.
(c) an amendment to the scheme so that it is consistent with a region planning scheme that applies to the scheme area, other than an amendment that is a basic amendment;	**Not appliable.** No region schemes apply to the subject site.
(ca) an amendment to the scheme to — *(i) include a provision in the scheme that a specified planning code is to be read as part of the scheme; or* *(ii) provide for the modification of a planning code that is to be read as part of the scheme;*	**Applicable**. The proposed Scheme Amendment seeks to rezone the site to 'Residential R30', requiring that the Residential Design Codes are read as part of the City of Albany Local Planning Scheme No.2.
(d) an amendment to the scheme map that is consistent with a structure plan or local development plan that has been approved under the scheme for the land to which the amendment relates if the scheme does not currently include zones of all the types that are outlined in the plan;	**Not appliable.** No structure plans or local development plans currently apply to the land.
(e) an amendment that would have minimal impact on land in the scheme area that is not the subject of the amendment;	**Applicable.**

	The proposed Scheme Amendment is confined to the northern portion of Lot 39, which has been previously cleared and is contiguous with existing residential development. The Scheme Amendment represents a logical extension of the urban area and will integrate with surrounding land uses without introducing incompatible development. The proposal has been designed to minimise off-site impacts by retaining the potential wetland (mapped only) and associated vegetation to the south, until such time that further planning is undertaken for this site. The wetland sits outside the amendment area. The site can be serviced by existing infrastructure networks, with no requirement for significant offsite upgrades, and stormwater management has been designed to maintain pre-development hydrological conditions.
(f) an amendment that does not result in any significant environmental, social, economic or governance impacts on land in the scheme area;	**Applicable.** The proposed Scheme Amendment is not expected to result in any significant environmental, social, economic or governance impacts on land within the scheme area. Technical investigations undertaken in support of the amendment, including environmental, bushfire, traffic and water management assessments, demonstrate that potential impacts can be appropriately managed. Environmental impacts are limited, with the site largely cleared and no conservation significant flora or fauna identified within the amendment area. Bushfire risk, drainage and servicing requirements can be addressed through subdivision design, while traffic impacts can be accommodated within the existing road network. Accordingly, the amendment facilitates residential development in a manner that is consistent with orderly and proper planning and does not give rise to significant adverse impacts.
(g) any other amendment that is not a complex or basic amendment.	**Applicable.** The proposed amendment is neither a 'complex' amendment nor is it a 'basic' amendment.

2.0

Project Background

2.0 Project Background

2.1 Purpose and Vision

This Scheme Amendment Request seeks to facilitate the timely delivery of additional residential land within the City of Albany in response to increasing housing demand. Like many regional centres, Albany is experiencing housing supply constraints, with demand for residential land exceeding supply, resulting in reduced housing choice and increased housing costs.

DevelopmentWA is seeking to accelerate the delivery of new housing, with the recent acquisition of Lot 39 representing a key step in achieving this objective. DevelopmentWA's ownership of landholdings within the broader area, including the existing residential subdivision immediately to the west of Lot 39, provides an opportunity to coordinate the design, staging and delivery of infrastructure, ensuring that future development integrates effectively with surrounding residential areas and planned urban growth.

The project aspires to facilitate a well connected and walkable neighbourhood, supported by efficient servicing, a fine grain urban structure, and a diversity of housing options to meet the needs of a range of households. The proposed planning and design are informed by the site's physical and environmental context, enabling the efficient delivery of developable land while establishing a high quality interface between urban development and the natural environment.

The project vision has therefore been set to deliver:

> *A contemporary neighbourhood where everyday life is oriented to nature – conserving the existing vegetation and landform, connecting people to trails and coastal landscapes, and delivering a compact, walkable residential community that embodies economic wellbeing, social inclusion, environmental integrity and design excellence.*

Importantly, the project has been guided by DevelopmentWA's sustainability pillars, which are reflected in the following project objectives:

- **Economic Wellbeing** – Support efficient construction, servicing and staging, and provides a diversity of lot sizes and housing products to meet market demand, while promoting cost efficiencies through climate responsive design and integrated water management.
- **Social Inclusion** – Enable access to parks, trails and shared spaces within a safe and walkable neighbourhood, with streets and public realm designed to be accessible for all ages and abilities.
- **Environmental Integrity** – Protect and integrate existing landscape features, including the heritage tree, contributing to local character and ensuring that future development integrates with the amenity of the surrounding area.
- **Design Excellence** – Establish a coherent urban structure with a legible street network, diverse housing outcomes and a well-defined public realm, contributing to a distinct neighbourhood character within the Albany coastal context.

The subject site represents a logical extension of existing residential development within Bayonet Head and is well positioned to support contiguous urban growth. Its location adjacent to existing residential subdivision, and its physical characteristics enable efficient servicing and integration with existing development, consistent with orderly and proper planning principles.

2.2 Pre-Lodgement Consultation

This Scheme Amendment has been prepared in consultation with key stakeholders, including the City of Albany and DPLH. The Scheme Amendment and its supporting technical inputs, assessments and reports, have been informed by the feedback provided by these stakeholders.

Table 2 below provides a summary of the outcomes resulting from the feedback and advice provided in the pre-lodgement consultation and engagement undertaken with these stakeholders.

Table 2 Pre-lodgement consultation summary

Date	Stakeholders	Engagement	Key Outcomes
4 March 2026	City of Albany – Jan van der Mescht, Kaysanne Knuckey and Arefe Mortazavirad DevelopmentWA – Naomi Lawrence TBB Planning – Mark Bancroft	**In-Person Meeting** To present the project vision, discuss the draft concept plan, and identify key technical information required to support the proposed scheme amendment.	The City of Albany provided the following feedback: • Confirmed support for the scheme amendment in principle, noting the site has historically been identified for residential development under a previous local structure plan, which did not proceed due to environmental constraints that were unresolved. • Identified key technical requirements to support rezoning, including traffic impact assessment, water management, bushfire assessment, and servicing investigations. • Supported an overall residential density of R30, subject to appropriate response to site context and amenity considerations. Requested that DevelopmentWA express density in terms of anticipated dwelling yield, in addition to the R-Code designation. • Recommended that public open space be designed with a focus on low-maintenance outcomes, incorporating open and highly visible areas, CPTED principles, and simple landscaping treatments (e.g. grass and trees).
1 October 2025	Department of Planning, Lands and Heritage (**DPLH**) – Mark Jendrzejczak and Kelsie Lewis	**Letter Correspondence** To seek in principle support for the proposed planning approach for the timely development of the subject site.	The DPLH provided officer level support for the proponent to proceed with a Residential R30 zoning over the northern portion of Lot 39, to be facilitated through an amendment to the City of Albany Local Planning Scheme No. 2.
2 September 2025	Department of Planning, Lands and Heritage (**DPLH**) – Mark Jendrzejczak and Kelsie Lewis City of Albany – Jan van der Mescht, Paul Camins and Adrian Nicholl	**In-Person Meeting** To discuss future planning for Oyster Harbour and Clydesdale Park more generally, and to discuss more immediate rezoning for Lot 39 Elizabeth Street to enable continued residential land supply.	Outcomes relevant to Lot 39 Elizabeth St – Agencies indicated in-principal support for proceeding via rezoning to Residential followed by a detailed subdivision application and an LDP/Density Code Plan. This was seen as an acceptable alternative to Development zone, with subsequent structure planning, given the single ownership and direct attachment to an existing residential subdivision. An indicative blanket density across the subdivision was generally supported for the site through the scheme amendment subject to additional details and lot mixes being detailed in the subdivision application.

3.0

Site Context

3.0 Site Context

3.1 Amendment Site Details

The site subject to this Scheme Amendment is 10.23 hectares in area, comprising the northern portion of Lot 39 as shown in **Figure 1**. The lot details and landownership of Lot 39 are outlined in **Table 3**.

Table 3 Lot Details

Lot No.	Volume/Folio	Plan	Total Lot Area	Registered Proprietor
39	323/16A	033941	18.8604	Western Australian Land Authority

Figure 1 Aerial Image of Subject Site

3.2 Regional and Local Context

The subject site is located within the Bayonet Head locality in the City of Albany. Albany is the primary regional centre of the Great Southern Region, providing key administrative, service and employment functions for a dispersed regional population, while accommodating planned urban growth.

Bayonet Head forms part of Albany's identified urban expansion corridor to the north-east of the CBD. The subject site adjoins established and emerging residential areas and is accessed via Elizabeth Street to the north and Berliner Street to the west. Elizabeth Street connects to the broader Albany road network, including Lower King Road, providing access south to the Albany CBD and north to the Lower King locality and Oyster Harbour.

Surrounding land uses are predominantly residential to the north and west, with rural land to the south and east. The Outlook Lifestyle Resort is located further east and comprises a retirement community and associated residential development adjacent to Oyster Harbour. A range of educational facilities are located within approximately 5 km of the site, including Lower King Community Kindy, Flinders Park Primary School, ALTA-1 Senior School and Bayonet Head Early Learning Centre.

3.3 Existing Land Use and Development

The subject site is predominantly vacant cleared pastoral land. A workshop building is located along the western boundary of the site, north of the Berliner Street access. Images from a site visit undertaken by the Project Team on 4 March 2026 are provided as **Figure 2**, **3 and 4** below.

A drainage gully extends from the northwestern corner of the site to a manmade pond located in the northeastern portion of the site. A review of historical aerial imagery indicates that the pond and associated drainage channel were constructed between 1977 and 1988, with ground disturbance evident within an area of approximately 30 metres surrounding these features (refer **Figure 5** and **Figure 6**).

Figure 2 Site Photo, View from Elizabeth Street (West) to Water Body

Figure 3 Site Photo, View from Elizabeth Street (East) to Water Body

Figure 4 Site Photo, Long View East from Corner of Paul Terry Drive

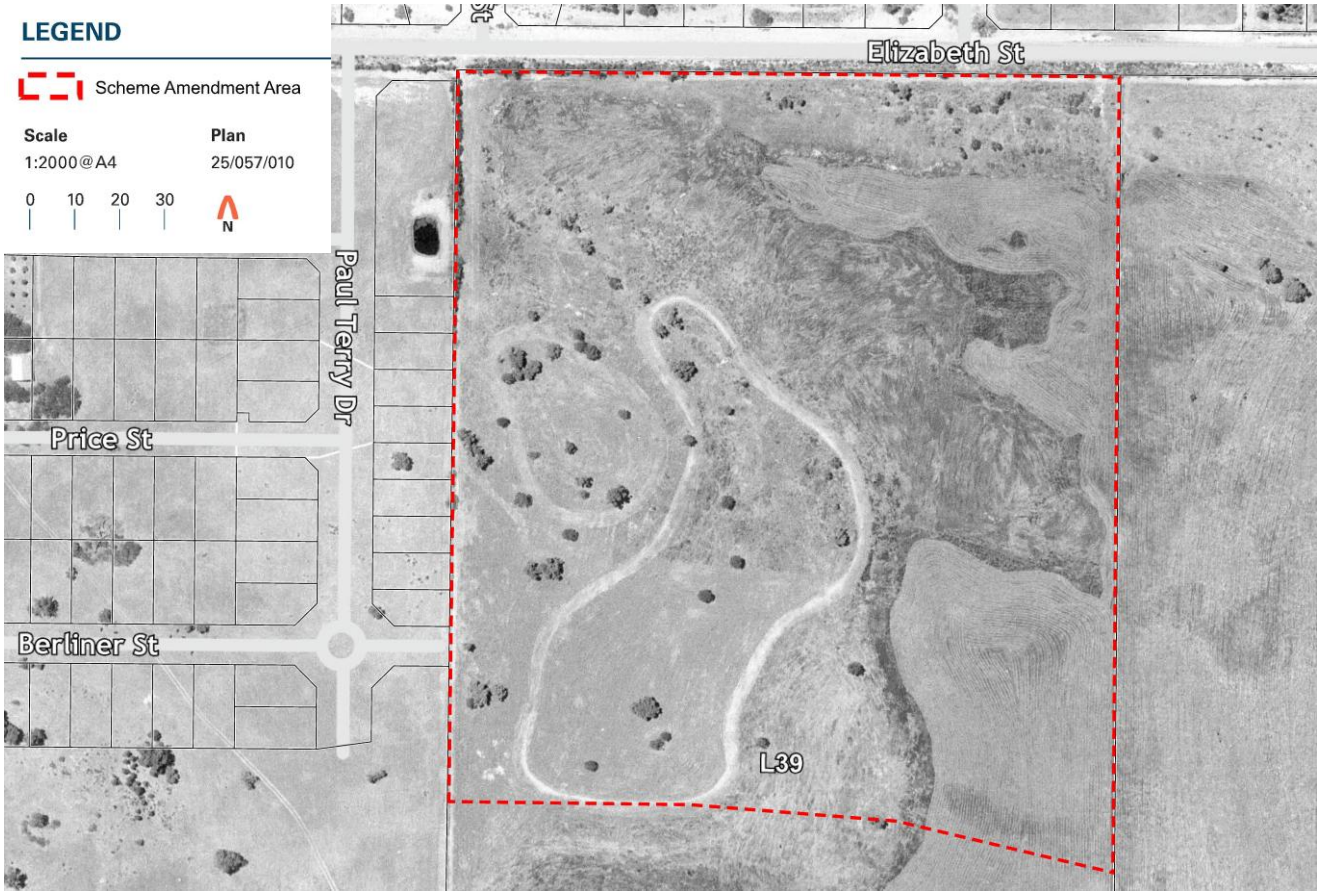


Figure 5 Historical Aerial Image dated 1977 (Extract from MNG)

Figure 6 Historical Aerial Image dated 1988 (Extract from MNG)

3.4 Physical Characteristics

3.4.1 Topography and Landform

The ground surface across the subject site generally falls to the east, with surface levels of around 16mAHD on the western boundary to approximately 6mAHD along the eastern boundary.

Regional geological mapping indicates the site is comprised of sands (S6), laterite (LA7) and sand (S14). The Albany Environmental Geology Map indicates the subsurface conditions across the site generally comprise alluvial sand. Geotechnical investigations generally aligned with the regional geological mapping further note the presence of gravels and cementation of some sands and coffee rock.

Infiltration rates varied between 20 m/day to 1.5 m/day, with the lower infiltration likely due to shallow groundwater.

3.4.2 Acid Sulphate Soils

Approximately 70 % of the subject site is mapped as 'high to moderate risk' of acid sulfate soils (**ASS**) occurring within 3 metres of the natural soil surface. Site observations and a review of historical aerial photographs support undertaken by Douglas and Partners and Aurora Environmental support this classification, with evidence of waterlogging and grey or dark grey organic rich soils in areas that are considered likely to have been former wetlands.

3.4.3 Site Contamination

The subject site is not identified as a known or suspected contaminated site under the *Contaminated Sites Act 2003* and is not registered on the Department of Water and Environmental Regulation's (**DWER**) Contaminated Sites database. The site has predominantly been used for low intensity agricultural purposes (livestock grazing), with limited evidence of potentially contaminating activities.

3.4.4 Flora, Vegetation and Fauna

The subject site has been extensively cleared and does not contain any areas of intact native vegetation or fauna habitat. Vegetation is predominantly limited to long grass, with scattered mature trees occurring in small groups or are isolated within paddocks, around the pond, and in proximity to the existing workshop. Taller grass, approximately 1 to 1.5 metres in height, is present within the drainage gully and towards the southeastern portion of the site.

No conservation significant flora, fauna or ecological communities have been identified within the subject site. Remnant native vegetation and fauna habitat are present in the southern portion of Lot 39; however, these areas are located outside the subject site.

The Environmental Assessment Report prepared by Aurora Environmental (refer **Appendix B**) indicates that while some conservation significant fauna species may occasionally traverse the subject site due to the presence of habitat in surrounding areas, none are expected to permanently reside within or rely upon the site.

3.4.5 Surface Water and Wetlands

There are no permanent surface water features or wetlands within the subject site. Surface runoff from the northern portion of the subject site is currently directed via a shallow open drain to a manmade dam or pond, in the northeastern portion of subject site. Surface water that is not detained or infiltrated within the subject site likely to enter the broader Albany drainage network and ultimately discharge to Oyster Harbour. The dam and open drain are the only surface water features within the subject site.

Within Lot 39 more broadly, a Wetland Assessment prepared by Coffey Environments (2008) in support of the Bayonet Head Outline Development Plan identified a wetland in the southern portion of the lot, known as Elizabeth Heights Wattie Swamp. This wetland was assessed as being commensurate with a Resource Enhancement management category, however, is not recorded within the Department of Biodiversity and Conservation (**DBCA**) Geomorphic Wetlands dataset and is located outside the subject site.

Furthermore, the Environmental Assessment Report prepared by Aurora Environmental note that the methodology adopted in the Coffey Environments (2008) Assessment has since been superseded and significant clearing has occurred at this wetland between 2022 and 2024, although portions of the site remain vegetated.

3.4.6 Groundwater

The subject site is located within the unproclaimed Karri Groundwater Area. The depth to groundwater beneath the subject site has not been confirmed through onsite monitoring but are expected to be shallow. It is suspected that the dam in the northeastern part of the subject site may intersect groundwater and therefore reflect local groundwater conditions. Water quality of the groundwater system beneath the subject site has not been investigated at this stage.

3.4.7 Aboriginal Heritage

The subject site does not intersect any registered, lodged or historic Aboriginal cultural heritage (**ACH**) sites.

3.5 Movement and Access

Elizabeth Street abuts the northern boundary of the subject site and is constructed as a single carriageway, two-lane road. Elizabeth Street is classified as an Access Road under the Main Roads WA (**MRWA**) Functional Road Hierarchy and operates with a posted speed limit of 60 km/h. The road forms a four-way intersection with Lower King Road at its western terminus and a T-intersection with Esplanade Road at its eastern end. A pedestrian footpath is provided along the northern side of Elizabeth Street.

The subject site has convenient access to public transport services operating along both Elizabeth Street and Paul Terry Drive, located to the west. Bus route 804 services the area, with the nearest stop located on Elizabeth Street directly adjacent to the site frontage. An additional bus stop is located on Paul Terry Drive approximately 200 metres walking distance from the site. These services provide direct connections to key destinations including Albany Health Campus and Albany Plaza.

3.6 Servicing Considerations

The subject site is capable of connection to existing water, electricity and telecommunications infrastructure (refer **Figure 7**).

Figure 7 Existing Services to Subject Site

3.7 Bushfire Risk

The eastern and southern most portions of the Scheme Amendment Area are designated as 'Bushfire Prone – Area 2' under the Department of Fire and Emergency Services (**DFES**) Map of Bushfire Prone Areas (refer **Figure 8**).

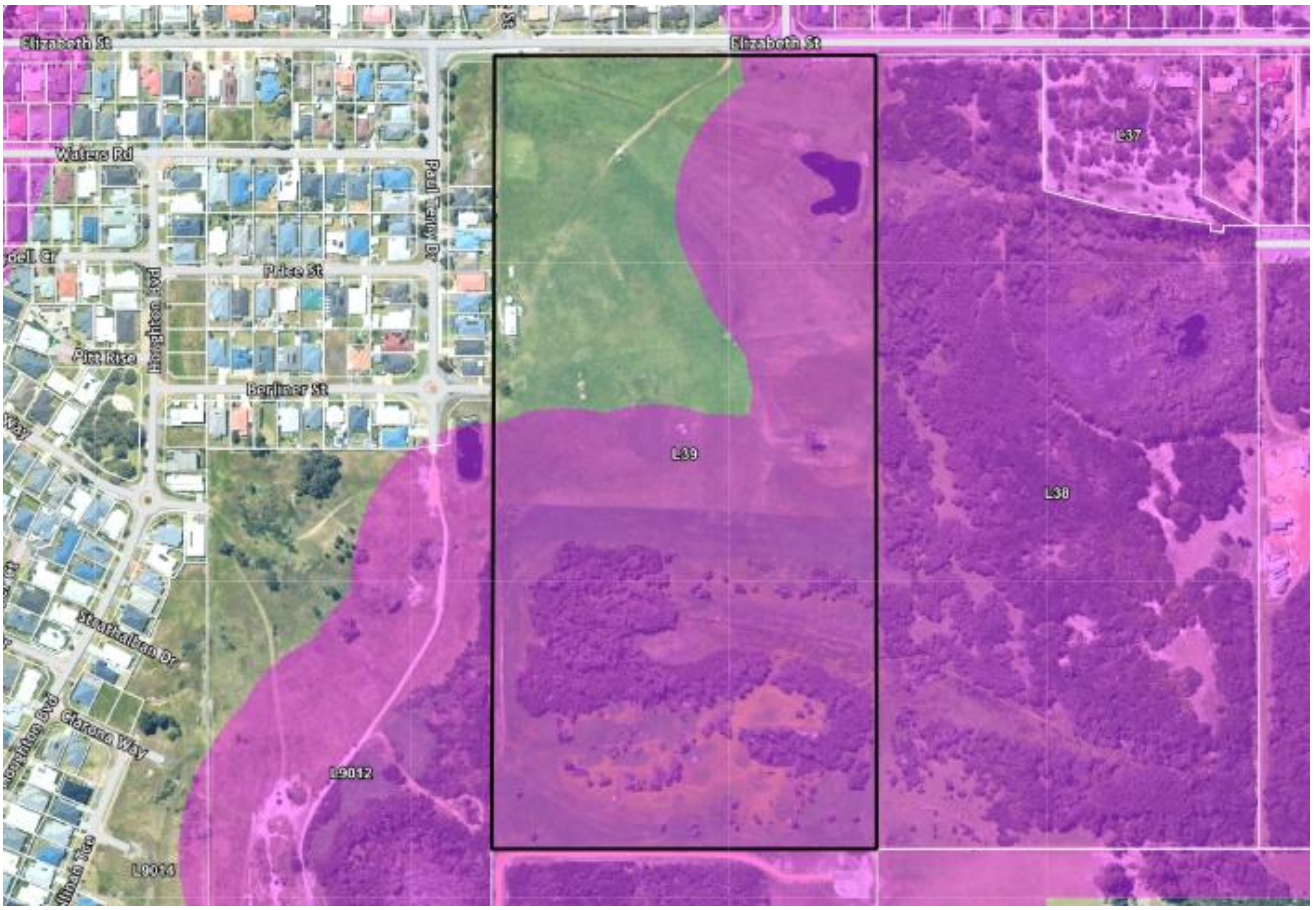
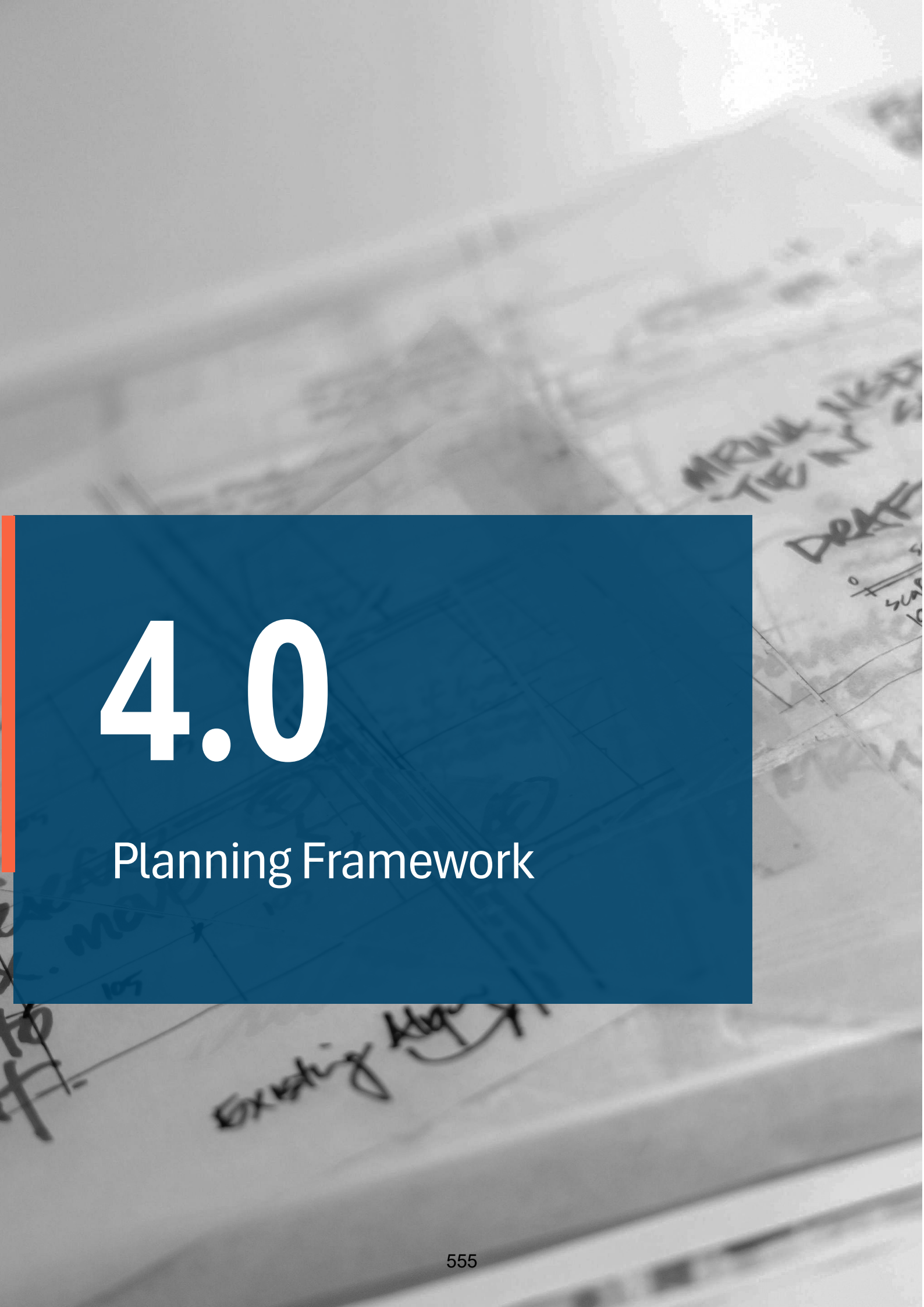


Figure 8 Map of Bushfire Prone Areas (Extract from MNG Access)



4.0

Planning Framework

4.0 Planning Framework

4.1 Strategic Planning Framework

4.1.1 State Planning Strategy 2050

The *State Planning Strategy 2050* (**SPS 2050**) is the State's lead strategic planning document. It provides an overarching strategic framework to integrate and coordinate land use planning and development across State, regional and local jurisdictions. The SPS 2050 is framed around a vision of sustainable growth and development, and is underpinned by six planning principles including community, infrastructure, economy, regional development, environment and governance.

SPS 2050 is intended to guide and align planning instruments at all levels. It establishes a number of high-level directions that are relevant to the project. While not prescriptive, the SPS 2050 provides guidance on the form, function and delivery of future urban areas, particularly in relation to coordinated growth, liveability and infrastructure provision.

The proposed Scheme Amendment presents an opportunity to address the key challenges and goals identified in the SPS and facilitate coordinated urban growth within an existing expansion area, supporting the efficient use of infrastructure and delivering a liveable residential neighbourhood that integrates environmental assets with urban development. The scheme amendment will provide appropriately zoned land and initiate the provision of housing to respond to market demands in the City of Albany.

4.1.2 Great Southern Regional Planning and Infrastructure Framework (2015)

The Great Southern Regional Planning and Infrastructure Framework (**GSRPIF**) provides a strategic framework to guide land use, infrastructure and economic development across the Great Southern region. It translates the high-level directions of the SPS 2050 into a regional context and informs decision-making at the local level, including structure planning and scheme amendments.

The GSRPIF identifies Albany as the regional centre and a key focus for future population growth, housing supply and economic activity within the Great Southern region. The region's population is projected to exceed 70,000 people by 2026, with most of the growth expected to be accommodated within Albany, Denmark and other coastal areas. It recognises the need to accommodate this growth through well-planned urban expansion areas supported by infrastructure, services and employment opportunities.

The GSRPIF promotes coordinated planning, efficient infrastructure delivery and the creation of liveable, connected communities. It encourages urban consolidation and more efficient use of land, including vacant and underutilised areas, to deliver greater diversity of lot sizes and dwelling types, responding to changing demographic trends, including an ageing population and an increase in smaller households (1 – 2 persons), and supporting more compact, mixed-use neighbourhoods.

The proposed Scheme Amendment seeks to bring forward land supply in the City of Albany and contribute to the delivery of additional housing, in a manner that promotes efficient use of serviced land and coordinated urban expansion. The rezoning of the subject site and eventual subdivision seeks to address the gaps within the current market and will provide increased housing and opportunities and housing diversity in an area close to the town centre, with the potential delivery of approximately 133 lots.

4.1.3 Lower Great Southern Strategy

The Lower Great Southern Strategy (**LBSS**) builds on the direction set by the GSRPIF and provides strategic direction for growth of the Lower Great Southern sub-region over the next 20 years, which includes the City of Albany. It responds to population

growth, economic change and environmental challenges, and establishes a coordinated approach to balancing development with environmental and infrastructure constraints.

It identifies Albany as the primary population and service centre within the region and supports accommodating future growth within Albany through well-planned and coordinated development supported by infrastructure, transport networks and community services. While it does not identify specific urban expansion areas, it reinforces the need for coordinated and infrastructure aligned development within Albany.

4.1.4 City of Albany Local Planning Strategy

The City of Albany Local Planning Strategy 2019 (**the Strategy**) provides the City's strategic direction for settlement growth and land use planning and establishes the strategic rationale that is intended to be implemented through the local planning scheme, local planning policies and structure planning processes.

The Strategy identifies Bayonet Head as an 'Urban Growth' area with partially developed residential estates and ongoing capacity to deliver additional dwellings (refer **Figure 9**). It directs new urban development to locations that extend existing serviced areas and emphasises efficient use of infrastructure. Rural land at Bayonet Head that historically formed part of a broader structure planning area is recognised as suitable to transition toward urban purposes when readiness criteria are satisfied.

For the subject site, those criteria can be demonstrated through the Scheme Amendment and future subdivision packages, noting the land has already been cleared, the land adjoins the urban front, the land can be serviced by existing networks with proportionate upgrades if needed, a Local Water Management Report has been prepared (refer **Appendix C**) and the land is not encumbered by Scheme based buffers or Special Control Areas that would preclude rezoning.

The proposed Scheme Amendment will respond to the Strategy's consolidation and housing supply objectives by completing an existing growth cell rather than opening new urban fronts. Future subdivision will contribute public open space, improve local connectivity, and support the catchment for community infrastructure flagged for Bayonet Head over the life of the Strategy.

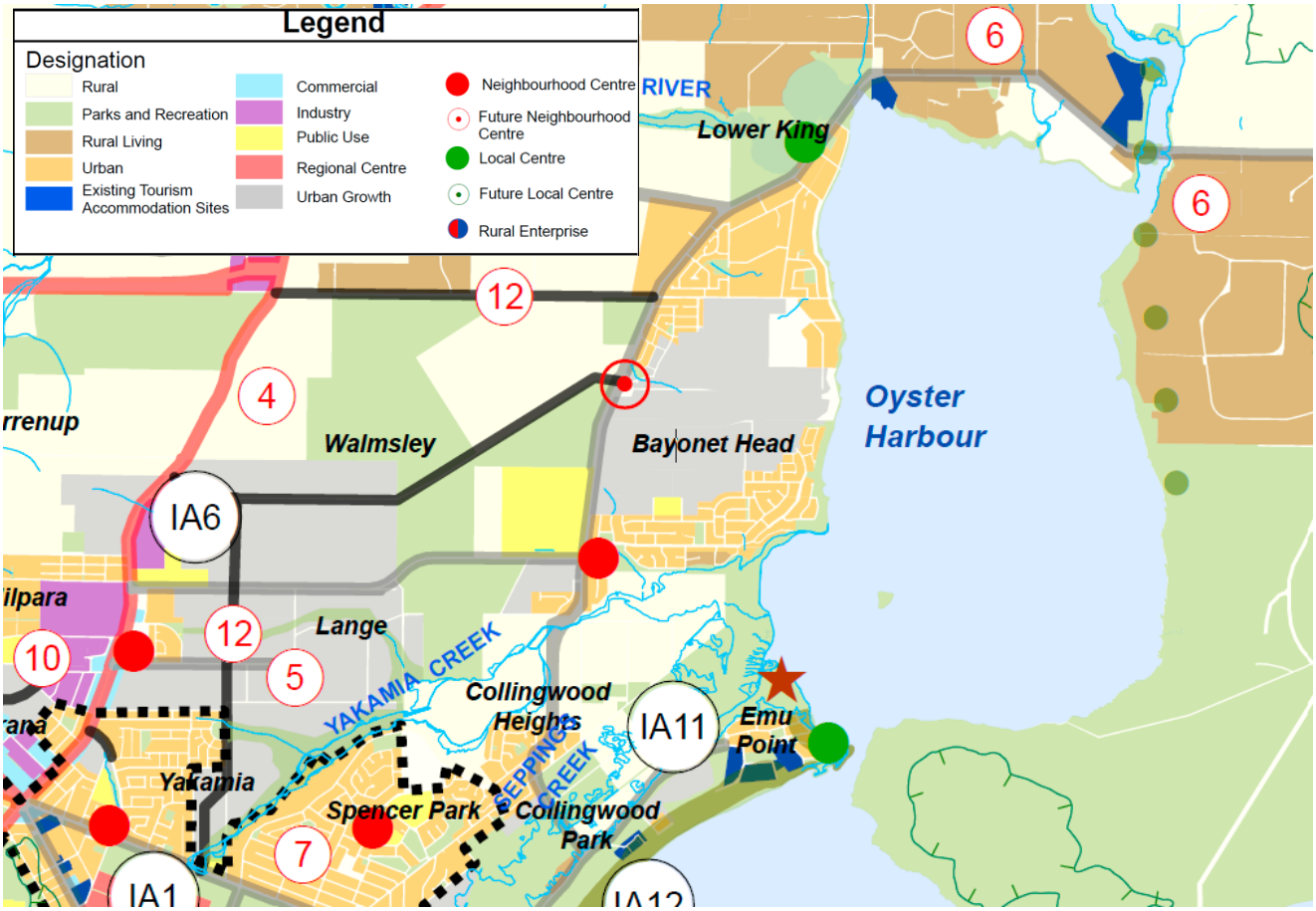


Figure 9 City of Albany Local Planning Strategy Extract

4.1.5 City of Albany Strategic Plans

The City maintains a range of local strategies and corporate plans that provide locally specific direction on place outcomes, infrastructure delivery, environmental management and community engagement. These strategies have been reviewed to identify the key elements to inform the Scheme Amendment and supporting Development Concept Plan.

4.1.5.1 Community Development Strategy

The City's Community Development Strategy (2019–2022) provides a framework to guide community development activity, aligned with themes in the City's Strategic Community Plan. The Strategy reinforces the importance of planning neighbourhoods that support social connection, inclusive community participation, and access to quality public spaces and local facilities that enable community life.

The proposed Scheme Amendment will facilitate the expansion of residential development in Bayonet Head and allows for the provision of public open space that provides accessible and flexible recreational opportunities that respond to the surrounding residential context and natural landscape setting.

4.1.5.2 Stormwater Management Strategy

The *City's Stormwater Management Strategy* provides objective criteria to guide local decision-making on stormwater planning and investment, founded on protecting infrastructure, managing public safety and protecting environmental assets. The strategy supports appropriately designed Water Sensitive Urban Design (**WSUD**) within new developments and subdivisions and emphasises integrated, interconnected open spaces that achieve amenity outcomes without sacrificing drainage function.

The proposed Scheme Amendment is supported by a Local Water Management Report and Development Concept Plan, which incorporate WSUD principles to manage stormwater in a manner consistent with the Strategy. This includes the retention and reshaping of the existing dam into a landscaped wetland, supported by vegetated swales and defined storage areas within the public open space network. These elements provide treatment and storage for minor and major rainfall events, and detention while contributing to biodiversity and visual amenity outcomes.

4.1.5.3 Draft Local Biodiversity Strategy

The Draft Albany Local Biodiversity Strategy (2025–2035) sets goals to retain and protect natural areas, learn about biodiversity interactions and threats, manage and enhance ecological condition and connectivity, and engage the community through partnerships. The strategy includes a stated target to strengthen the planning and development framework to retain and protect biodiversity values (including through scheme provisions, structure plans and planning policies), while balancing infrastructure needs.

The proposed Scheme Amendment area has been designed to maintain the existing resource enhancement wetland south of the subject site and associated vegetation, utilising this as a defining landscape element while contributing to ecological protection and connectivity while accommodating urban development in a balanced and sustainable manner.

4.1.5.4 Bush Fire Strategic Plan 2014 – 2019

The *City's Bush Fire Strategic Plan* (2014–2019) provides a local strategic framework for bushfire risk management, structured around focus areas for prevention, preparedness and response, and includes actions relating to community programs, volunteer bush fire brigade capability, and the City's responsibilities. While the Plan period has lapsed, it provides context on the City's established approach to bushfire management and highlights the importance of community preparedness and coordinated response arrangements.

The proposed Scheme Amendment is supported by a Bushfire Management Plan (**refer Appendix E**) and demonstrates that future residential subdivision and development can achieve a post-development bushfire hazard level of Moderate or Low.

4.1.5.5 Urban Tree Strategy

The City's Urban Tree Strategy (2017) sets a vision for a resilient, healthy, diverse and sustainable urban tree network and aims to promote long-term health benefits, enhance liveability, complement Albany's landscape character and mitigate climate

change impacts. The strategy identifies objectives including maintaining and protecting existing trees, recognising biodiversity green links, expanding greener urban street and pathway networks, and increasing canopy cover.

The proposed Development Concept Plan demonstrates that future residential subdivision and development can meet the objectives of the Urban Tree Strategy through the provision of generous street tree planting and landscaped public open space, contributing to increased canopy cover and walkability, heat mitigation, enhanced neighbourhood amenity and increased value of the streetscape and adjoining developments.

4.1.5.6 City of Albany Bike Plan

The *City's Bike Plan 2025–2030* provides a five-year framework to guide bike riding infrastructure and programs, with a vision for cycling to be safe and accessible for all ages and abilities.

The proposal supports the Bike Plan by incorporating a connected shared path network within the Development Concept Plan, facilitating safe and accessible cycling and pedestrian movement throughout the site and to surrounding areas. The Concept Plan provides an integrated network of shared and dual-use paths linking residential streets with public open space, encouraging active transport and supporting a walkable neighbourhood.

4.1.5.7 Draft Local Biodiversity Strategy

The *Draft Albany Local Biodiversity Strategy* (Summary) (2025–2035) sets goals to retain and protect natural areas, learn about biodiversity interactions and threats, manage and enhance ecological condition and connectivity, and engage the community through partnerships. The strategy includes a stated target to strengthen the planning and development framework to retain and protect biodiversity values (including through scheme provisions, structure plans and planning policies), while balancing infrastructure needs.

4.1.6 Bayonet Head Interim Outline Development Plan (2007)

The Bayonet Head Interim Outline Development Plan (**ODP**), prepared in 2007, identified the broader Bayonet Head locality for residential subdivision (refer **Figure 10**). The ODP indicates residential development adjacent to the site to the east and west at R25 density, and a mix of R25 and R30 densities across Lot 39, including the subject site.

While the ODP envisaged the subdivision of the entirety of Lot 39 for residential purposes, the current proposal seeks to rezone only the northern portion of the site. This approach reflects a staged development response that recognises the environmental and amenity values identified in the southern portion of Lot 39, that require more focussed assessment and allows for these areas to be appropriately considered through future planning processes.

The WAPC recently granted an extension of time to the ODP pursuant to clause 28, Part 4, Schedule 2 of the Planning and Development (Local Planning Schemes) Regs 2015 until October 2030.

In the meantime, DevelopmentWA has committed to preparing a new contemporary Local Structure Plan, which will be more reflective of current planning and environmental legislation and policy, that will ultimately replace the ODP.

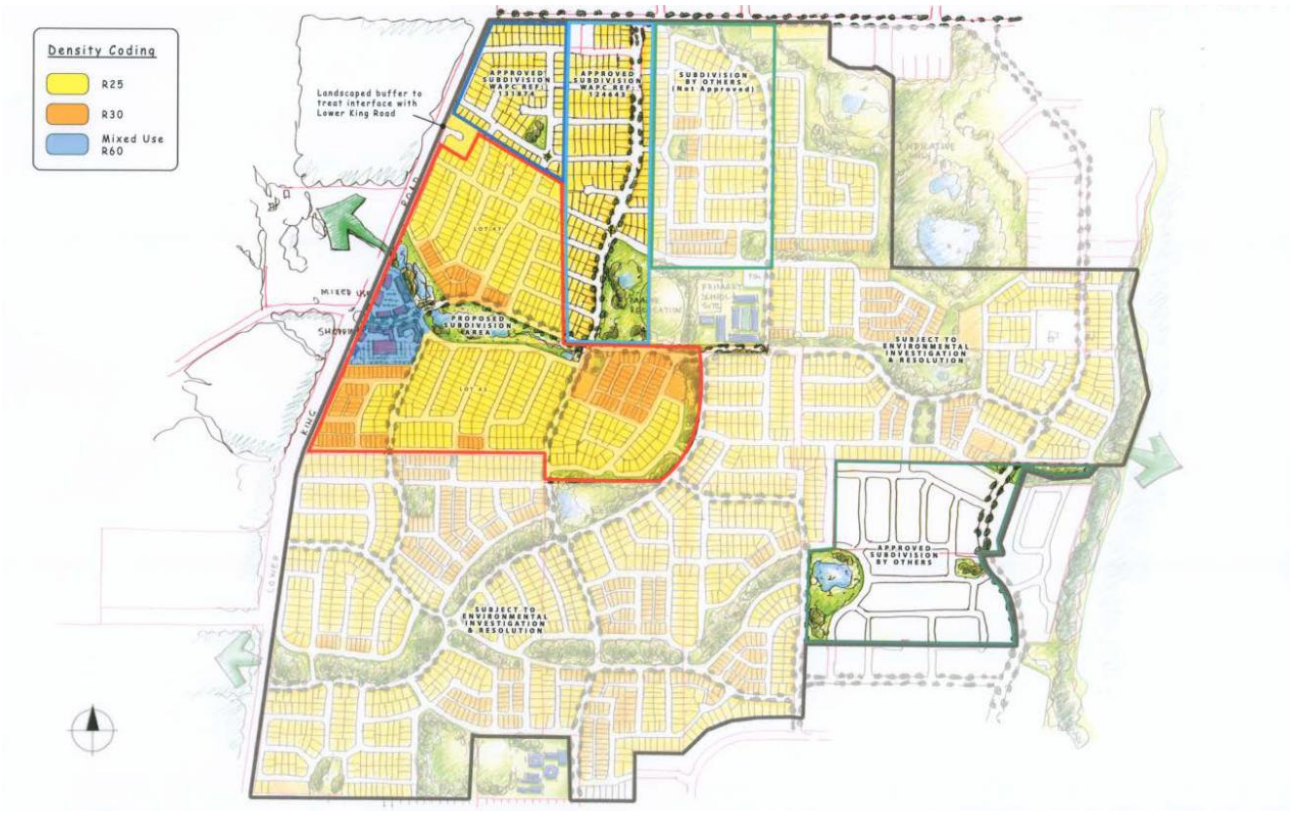


Figure 10 Bayonet Head Interim Outline Development Plan

4.2 Statutory Planning Framework

4.2.1 Planning and Development Act 2005

The *Planning and Development Act 2005* outlines that a local government may amend a local planning scheme with reference to any land within its district, by an amendment either:

a. prepared by the local government, approved by the Minister and published in the Gazette; or

b. proposed by all or any of the owners of any land in the scheme area, adopted, with or without modifications, by the local government, approved by the Minister and published in the Gazette.

This Scheme Amendment Report has been prepared on behalf of DevelopmentWA for the City's consideration for initiation as a standard amendment.

4.2.2 State Planning Policies

4.2.2.1 State Planning Policy 2.9 – Water

State Planning Policy 2.9 – Water (**SPP2.9)** and the supporting Planning for Water Guidelines became operational from 18 December 2025. SPP 2.9 outlines scheme amendment requests should demonstrate development capability and feasibility, water services requirements and area requirements for water resource management and protection.

A Local Water Management Report (**LWMR**) has been prepared by Emerge in support of the Scheme Amendment Request and is provided as **Appendix C**. The LWMR addresses pre-development and post-development site conditions. The LWMR aims for adequate protection of water resources, public health and the management of flood risk through the provision of appropriate design and infrastructure.

4.2.2.2 State Planning Policy 3.0 – Urban Growth and Settlement

State Planning Policy 3.0 – Urban Growth and Settlement (**SPP 3.0**) outlines State-level principles for accommodating urban growth in a manner that supports sustainable urban development patterns, makes efficient use of existing and planned infrastructure, and consolidates development in locations that can be serviced and integrated with established communities.

The Scheme Amendment is consistent with these policy outcomes, seeking to utilise readily available services and infrastructure, build on the existing Bayonet Head community and facilitate residential development in a manner that is compatible with the immediate locality.

4.2.2.3 State Planning Policy 3.7 – Bushfire

State Planning Policy 3.7 – Bushfire (**SPP 3.7**) establishes a risk-based approach to land use planning and development in bushfire prone areas. The policy prioritises avoidance of bushfire risk where possible and, where risk cannot be avoided, requires that risk be managed and mitigated to an acceptable level. SPP 3.7 is supported by the *Guidelines for Planning in Bushfire Prone Areas*, which set out the technical and procedural expectations for addressing bushfire matters at the structure plan stage and ensuring these considerations are appropriately translated into subdivision and development outcomes.

As previously outlined, the eastern and southern most portions of the Scheme Amendment Area are designated as 'Bushfire Prone – Area 2' under the DFES Map of Bushfire Prone Areas

SPP 3.7 and the Planning for Bushfire Guidelines (November 2024) require that areas identified for intensification and/or result in an increase in bushfire risk that are shown as Area 2 on the Map of Bush Fire Prone Areas should undertake a bushfire assessment, with a focus on demonstrating compliance with 'Element 1: Location' through an assessment of the broader landscape.

A Bushfire Management Plan (**BMP**) has been prepared by Biodiverse Solutions in support of the Scheme Amendment Request and is provided as **Appendix E**. The BMP confirms that compliance with the relevant bushfire protection criteria applicable to the subject site can be achieved, including access and egress requirements, availability of reticulated water supply and any modification to existing vegetation. Furthermore, the BMP sets out the future planning requirements for the site, including the preparation of a BAL Contour Plan at the subdivision stage to confirm that proposed lots can achieve a BAL-29 or lower.

4.2.3 Planning Codes

4.2.3.1 Residential Design Codes

Residential Design Codes (**R-Codes**) provide a comprehensive framework for the control of residential development throughout Western Australia. The R-Codes aim to respond to evolving design practices, promote sustainability, improve clarity and provide clear assessment pathways to achieve high quality residential outcomes.

To facilitate urban development of the subject site, a scheme amendment is required to rezone the land to 'Residential' and apply an appropriate density coding (R30 is proposed). The R30 code is proposed in order to enable diversity in land and housing choices within the precinct. Once coded, the R-Codes are read as part of the Scheme and apply to subdivision and development.

This enables the WAPC to assess subdivision proposals, including lot yield and layout, minimum and average lot sizes, streetscape outcomes, public open space provision and interface design, with detailed design requirements and site-specific matters addressed through subdivision conditions and subsequent development approvals.

4.2.4 City of Albany Local Planning Scheme No. 2

The City of Albany Local Planning Scheme No. 2 (**LPS2**) was gazetted on 27 February 2024, and provides the primary statutory basis for zoning, land uses and permissibility's, subdivision objectives and development controls within the City.

4.2.4.1 Zoning

The subject land is zoned 'Rural' under LPS 2 (refer **Figure 9**).

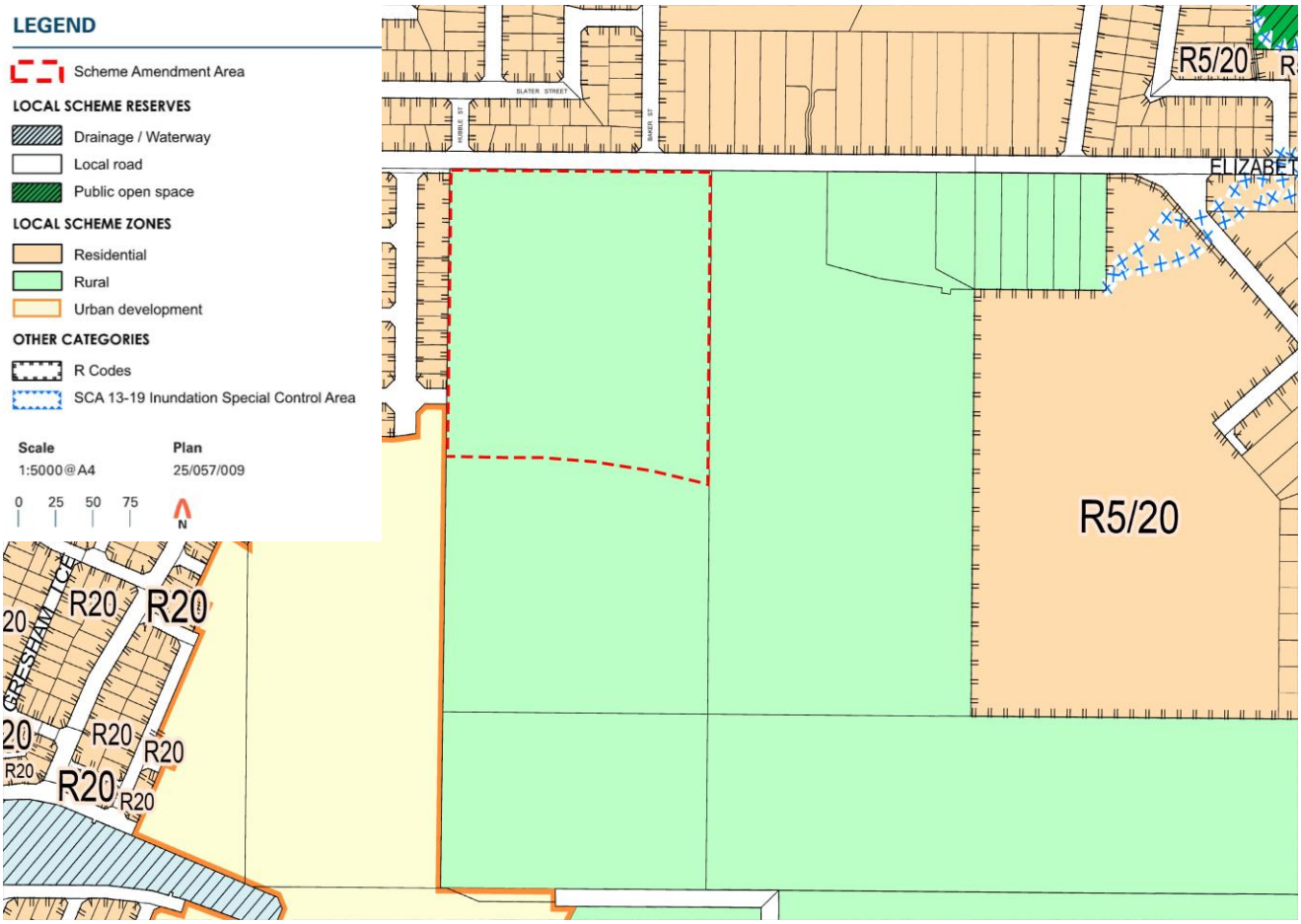


Figure 11 City of Albany LPS 2 Map

The Rural zone is intended to protect and support primary production and rural land uses; it does not contemplate urban-scaled residential subdivision. In practical terms, the Rural zone enables rural pursuits and a limited set of dwellings associated with rural land use, but it does not provide a residential density code and therefore offers no statutory basis to create R-Code lots or to assess an urban subdivision design.

As identified by the City's Strategy, the subject site is within an area earmarked for Urban Growth, implying that the Rural zoning of the land is no longer appropriate in the longer term, and that a more appropriate zoning should ultimately be considered to facilitate the urban development potential of the site.

To progress urban development, this Scheme Amendment seeks to change the zoning of the subject site to Residential and to assign an appropriate density code of R30.

Adoption of the 'Residential' is consistent with the objectives of the City's Local Planning Strategy and represents a logical continuation of the existing zoning immediately to the west. So, while the intended development of the subject site is not consistent with the existing Rural zone objectives, it should more logically be considered against the objectives of the Residential zone as outlined in **Table 4**.

Table 4 Zone Objective Compliance

Objective	Comment
To provide for a range of housing and a choice of residential densities to meet the needs of the community.	The proposed Scheme Amendment facilitates residential development at an R30 density, supporting a range of lot sizes and housing outcomes. The Development Concept Plan demonstrates lot sizes ranging from approximately 312m^2 to 525m^2, with an average of 445m^2, providing flexibility to accommodate a variety of household types. This responds to identified housing demand within Albany and supports increased housing choice within the Bayonet Head locality.
To facilitate and encourage high quality design, built form and streetscapes throughout residential areas.	The Development Concept Plan establishes a coherent and legible urban structure, including a connected street network, integrated public open space and a defined landscape framework. Streets are designed to support walkability and incorporate street tree planting, while development interfaces with public open space and the retained wetland are designed to enhance amenity. Detailed built form and streetscape outcomes will be guided by the R-Codes at subdivision and development stage.
To provide for a range of non-residential uses, which are compatible with and complementary to residential development.	While the Scheme Amendment primarily facilitates residential development, the proposal incorporates public open space, shared path networks and landscape elements that support passive recreation and community use. The site is also located within an established residential area with access to existing services, community facilities and public transport, ensuring that future residents can access a range of complementary non-residential uses
Maintain the character and amenity of established residential areas and ensure that new development, including alterations and additions, is sympathetic with the character and amenity of those areas.	The proposed Scheme Amendment represents a logical extension of existing residential development within Bayonet Head and is consistent with the prevailing suburban character. The retention of existing landscape features, including the heritage tree, contributes to local character and ensures that future development integrates with the amenity of the surrounding area.

4.2.5 Local Planning Policies

4.2.5.1 Local Planning Policy 1.5 – Public Parkland

Local Planning Policy 1.5 – Public Parkland (**LPP 1.5**) seeks to inform the community and guide developers and decision makers through the planning and provision of public open space, including its appropriate type, location and distribution. It aims to ensure that public open space is of sufficient size, accessible within a 400 metre walking distance, and equipped with a range of formal and informal recreational facilities to meet the needs of all age groups.

The concept plan supporting the proposed Scheme Amendment supports the intent of LPP 1.5 through the proposed provision of a well distributed and accessible public open space network, comprising two centrally located POS areas totalling approximately 1.34 hectares. The supporting plan ensures open space is within walking distance of future residents and provides a mix of formal and informal recreational opportunities. An integrated shared path network enhances connectivity and supports active transport, while the incorporation of WSUD elements ensures that drainage, environmental and recreational functions are delivered in a coordinated manner. This can be provided as a guide to future subdivision proposals.

No further local planning policies were identified as relevant to the proposed Scheme Amendment.

5.0

Proposed Amendment

5.0 Proposed Amendment

5.1 Scheme Amendment Request

This Scheme Amendment proposes to rezone the northern portion of Lot 39 from 'Rural' to 'Residential' under the City of Albany Local Planning Scheme No. 2 and apply a residential density coding of R30 as illustrated in the Scheme Amendment Map (refer **Figure 12**).

5.2 Proposed Council Resolution

It is proposed that the Local Government resolve to amend the City of Albany *Local Planning Scheme No. 2* by:

1. Rezoning the northern portion of Lot 39 on Plan 033941 from the Rural zone to the Residential zone.
2. Applying a density code of R30 to the northern portion of Lot 39 on Plan 033941.
3. Amending the Local Planning Scheme No. 2 Map accordingly.

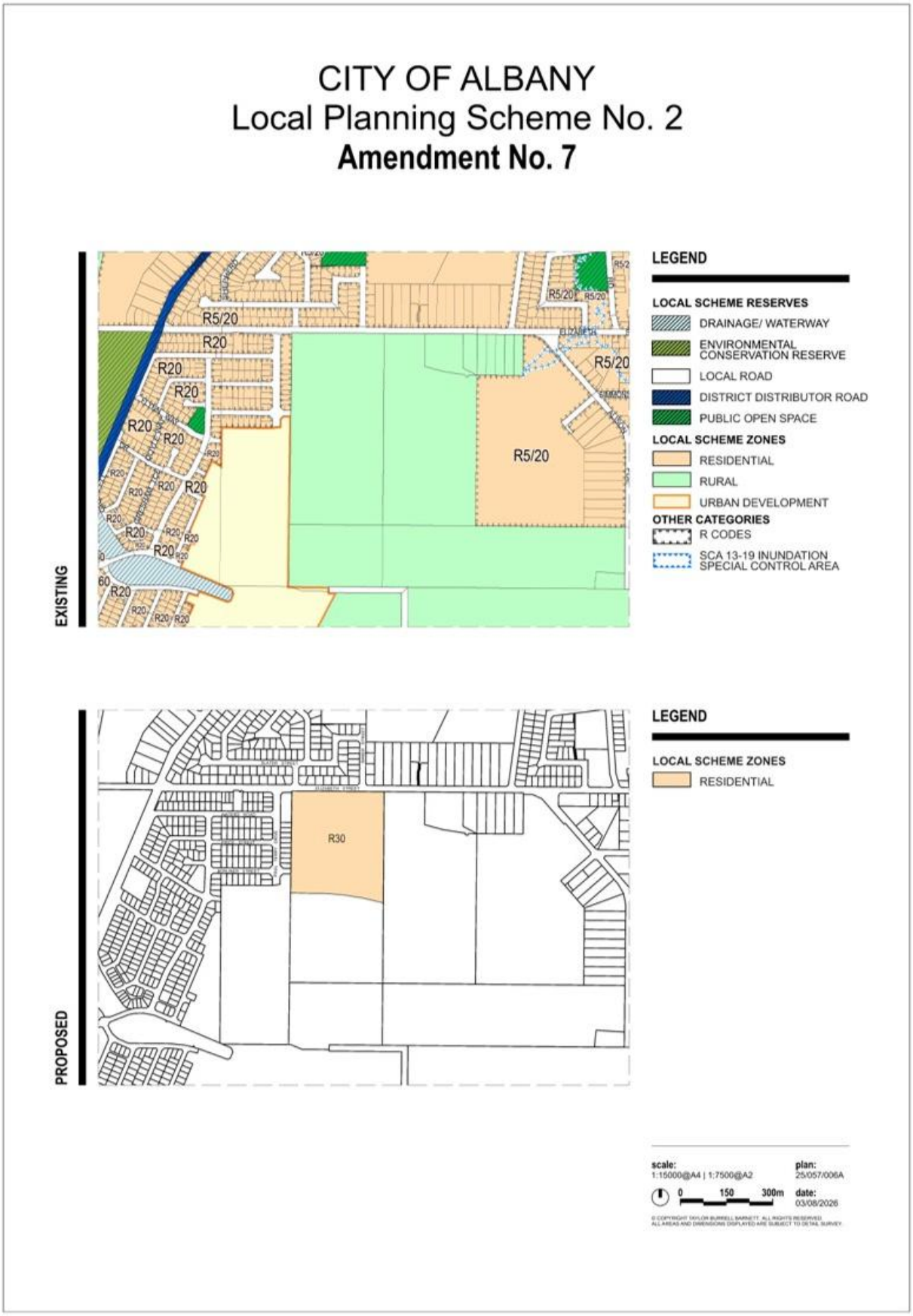


Figure 12 Proposed Scheme Amendment Map

6.0

Justification

6.0 Justification

6.1 Concept Plan

The Scheme Amendment Request has been supported by a Development Concept Plan (refer **Figure 13**) which illustrates the intended urban structure and key design principles for the site.

The Development Concept Plan is informed by the following key design objectives:

1. **Conserve and celebrate nature**
   Evaluate and seek to enhance the vegetation as the conservation-led heart of the neighbourhood, shaping the subdivision and open space network around its edge.

2. **Nature-edge trail and parkland interface**
   Deliver a continuous trail with small park nodes and multiple access points so every home has a safe, direct walk to nature and outlooks.

3. **Green, low-impact public realm**
   Integrate WSUD features, a coherent landscape palette and generous street tree canopy into streets and parks to support walkability and mitigate heat.

4. **Climate-responsive design**
   Orient lots and dwellings to optimise passive solar access, shade and natural ventilation, reducing energy demand and improving indoor comfort.

5. **Efficient urban structure**
   Arrange streets, lots and drainage to work with the natural sloping grade for cost-effective, land-efficient earthworks, servicing and long-term maintenance.

6. **Curated view lines**
   Align key streets and public spaces to capture and direct views to the southern and eastern vegetation areas, presenting a “green horizon” as the neighbourhood backdrop.

7. **Diverse housing typologies**
   Provide a mix of lot sizes ranging from 300m^2 to 600m^2, and dwelling types to support household choice, from downsizers and smaller households to family homes and everything in between.

8. **Simple, walkable neighbourhood structure**
   Organise the 10+ha residential area around a legible, low-speed street network with short blocks, legible connections and perimeter streets for bushfire safety.

9. **Contemporary Albany coastal vernacular**
   Promote a recognisable Albany coastal character in housing—roof forms, verandahs, lightweight claddings and integrated carports—secured through design guidelines and/or builder partnerships in key locations.

10. **Land value uplift through conservation**
    Use the conserved green interface and access to nature as a clear point of difference in the market, underpinning amenity-driven land and housing value uplift.

Figure 13 Development Concept Plan

6.2 Rationale

The proposed Scheme Amendment is also supported by a comprehensive suite of technical investigations and strategic planning considerations, which collectively demonstrate that the subject site is suitable for residential development and can be developed in a coordinated, efficient and environmentally responsive manner.

6.2.1 Housing Need and Supply

The Scheme Amendment responds to identified housing supply pressures within the City of Albany, where demand for residential land continues to exceed supply, limiting housing choice and increasing costs to the community.

The proposal will bring forward serviced and strategically located land that will facilitate the delivery of additional residential lots within an established urban area, contributing to housing supply in a timely manner. The Development Concept Plan reflects the intention to produce a range of lot sizes consistent with the proposed R30 density, enabling a diversity of housing outcomes suitable for a range of household types.

6.2.2 Alignment with the Planning Framework

The subject site represents a logical and orderly extension of existing residential development within the Bayonet Head locality. It is identified within the City of Albany Local Planning Strategy as part of an 'Urban Growth' area with capacity to accommodate additional dwellings, has been previously flagged for residential development under the Bayonet Head Interim ODP and has demonstrated the capacity to respond to the State and local statutory and strategic planning frameworks.

While the Bayonet Head ODP implies a more extensive potential for residential zoning and development of the subject site, it is recognised that this could not be reasonably supported under present-day planning and environmental requirements. As previously mentioned DevelopmentWA has committed to preparing a new contemporary Local Structure Plan, which will be more reflective of current planning and environmental legislation and policy, that will ultimately replace the ODP. However, the process of Structure Plan preparation, assessment and approval will take some time, while the need to continue providing land and housing supply in the City is more immediate.

This Scheme Amendment is intended to provide for continued urban land supply for the short-medium term as an interim measure. The amendment can be justified in its own right as it facilitates the extension of an existing growth area, rather than introducing new or isolated development fronts, allowing for the efficient use of existing urban services.

6.2.3 Project Staging and Amendment Extent

While the Bayonet Head ODP contemplated urban development across a broader area, the southern portion of Lot 39 contains remnant vegetation and environmental values that warrant more detailed investigation before future land use outcomes are determined.

The extent of the proposed Scheme Amendment has been deliberately limited to the northern 10.23 hectare portion of Lot 39. This is the portion of the site that has been deemed to be relatively unconstrained and immediately developable as an extension of the existing residential development directly to the west. The land is contiguous with established urban development, has favourable physical characteristics, and can be efficiently serviced through extensions of existing infrastructure networks. This is a sensible response to assist in filling the immediate need for additional residential land within the City of Albany, while recognising the broader strategic planning work currently being undertaken by DevelopmentWA across the Bayonet Head Urban Growth area.

In the meantime, DevelopmentWA and its Project Team have commenced work on the review of the planning framework for the balance of the Bayonet Head area, and has undertaken preliminary engagement with relevant State agencies, including the DPLH and the Environmental Protection Authority (**EPA**), to inform the long term planning direction for the broader precinct, including the southern balance of Lot 39. These discussions have focused on identifying the key planning and environmental considerations that will influence future urban development outcomes, including vegetation retention, wetland classification and management requirements, and bushfire risk.

The outcomes of these investigations and agency discussions will inform the preparation of a contemporary Local Structure Plan for the broader Bayonet Head Urban Growth area, including the balance of Lot 39 and adjoining land also owned by

DevelopmentWA. Through this process the ultimate land use outcome for the southern section of Lot 39 will be clarified and reflected in a future rezoning amendment. This could result in the land been classified as open space/conservation, or residential, or a mix of both. As this work is ongoing, the southern balance of Lot 39 is proposed to remain zoned Rural at this stage, until the more extensive review has been completed.

Importantly, the proposed approach does not prejudice the future potential of the balance of Lot 39 for either residential development or conservation, depending on the outcome of the broader review. DevelopmentWA's significant landholdings within the broader precinct provide the ability to coordinate future planning outcomes across Lot 38, the southern portion of Lot 39 and adjoining land in a comprehensive manner. Retaining the southern portion of Lot 39 within the Rural zone at this time provides flexibility for future planning to respond to the outcomes of environmental investigations and broader precinct planning, while ensuring the northern portion can progress without unnecessary delay.

6.2.4 Technical Considerations

The Development Concept Plan has been used as a basis to test the site's urban development capability through detailed technical assessment. This assessment has demonstrated that the site is readily capable of development, that all potential environmental, servicing and site constraints can be appropriately managed and will not result in adverse environmental or amenity impacts on surrounding land. The outcomes of the detailed assessments are summarised below.

6.2.4.1 Environmental Management

An Environmental Assessment Report (**EAR**) has been prepared by Aurora Environmental (refer **Appendix B**) to assess the environmental characteristics of the site and its suitability for development in accordance with the Development Concept Plan.

The EAR confirms that the subject site has been extensively cleared and does not contain any areas of intact native vegetation or significant fauna habitat. No conservation significant flora, fauna or ecological communities have been identified within the site. While remnant vegetation in the southern portion of Lot 39 provides habitat for species such as the Western Ringtail Possum and Quenda, these areas are located outside the scheme amendment area and will not be impacted by the proposal.

The site has historically been used for low-intensity agricultural purposes, with no evidence of contamination identified. Although approximately 70% of the site is mapped as having a high to moderate risk of acid sulphate soils, this constraint can be appropriately managed through standard subdivision and construction practices.

The environmental investigations demonstrate that the site is suitable for residential development and that identified constraints can be effectively managed without adverse environmental impact.

6.2.4.2 Hydrology and Stormwater Management

A Local Water Management Report (**LWMR**) has been prepared by Emerge Associated (refer **Appendix C**) in support of the proposal and demonstrates that the site can be developed in a manner that maintains pre-development hydrological conditions and protects downstream receiving environments.

Stormwater Management

The LWMR proposes a stormwater management strategy that seeks to ensure the pre-development hydrology of the site is maintained and demonstrates that post-development peak flow rates and discharge locations are consistent with the pre-development environment. This will be achieved by ensuring runoff is first managed as close to the source as possible by the use of a treatment train approach (i.e. treatment through interaction with vegetation and soils within the soakwells, BRAs and FSAs) with runoff up to the 1% AEP rainfall event detained before discharging off site at flow rates which mimic the existing hydrology.

Catchment and Drainage Integration

With regard to catchment and drainage integration, upstream catchment flows will be conveyed through the site via pipes and swales to existing storage areas, ensuring continuity of drainage patterns. Lot drainage is proposed to incorporate soakwells with overflow connections to the pipe network to account for variability in soil infiltration.

Runoff in excess of the capacity of the soakwells will be conveyed to the pipe network. The road drainage network will be sized to convey runoff up to the 20% event, thereby ensuring roads remain passable in storm events up to the 20% AEP event. In

events greater than the 20% event and up to the 1% AEP event, runoff will be conveyed by the pipe network, swales and road pavement to the downstream co-located basins (BRAs/FSAs) where detention will be provided before discharging offsite at rates equal to or less than the 1% AEP pre-development discharge. Management of the first 15 mm event will be provided within the BRAs located within the co-located basins.

Groundwater Management

Groundwater management measures aim to maintain the existing hydrology across the site, provide appropriate protection from groundwater inundation, and maintain or improve the existing groundwater quality. Management of groundwater quality within the site will occur both through stormwater quality management (i.e. WSUD) features that will treat runoff before it infiltrates, and by treating water intersected by subsoil drains within vegetated co-located basins and swales.

Consistent with the geotechnical conditions and hydrology, it is possible that infiltrated stormwater may perch on the clayey soils layer within portions of the site. Therefore, the groundwater management measures proposed across the site are:

- Use of subsoil drains beneath road reserves and within lots where it is expected to be within 1.2 m of the surface.
- Discharge of subsoil drains to the co-located basins or swales. Water quality treatment will be provided by the vegetation.
- Use of permeable sand fill above the low permeability soil layer to achieve finished lot levels.

6.2.4.3 Landscape

A Landscape Concept Plan has been prepared by Emerge Associates (refer **Appendix D**) to inform the design of POS within the subject site and demonstrate how recreational, drainage and environmental outcomes can be integrated within the future subdivision.

The Landscape Concept Plan provides for two POS areas totalling approximately 1.27 hectares, which are strategically located to maximise accessibility and distribution across the site. These spaces are designed to provide a mix of formal and informal recreational opportunities that respond to the surrounding residential context and natural landscape setting.

WSUD principles are embedded within the landscape through the retention and enhancement of the existing dam as a landscaped wetland, supported by vegetated swales and defined storage areas. These elements provide stormwater treatment and detention while contributing to biodiversity and visual amenity. Drainage infrastructure is integrated within the public open space network to maximise functional and recreational outcomes.

The planting strategy incorporates a mix of native and exotic species suited to local soil and climatic conditions, supporting long-term resilience and reinforcing neighbourhood character. Retention of the existing heritage tree at the site entry contributes to local identity, while street tree planting provides shade and spatial definition throughout the subdivision.

The primary POS (approximately 8,223m^2) is centrally located and is proposed to be designed to incorporate a fenced play space with shade structures, picnic settings, BBQ facilities and a drinking fountain. This space is complemented by passive turf areas and informal recreation space. A secondary POS (approximately 4,553m^2) provides an additional neighbourhood space with landscaped areas to support passive use.

An integrated network of 2.5 metre shared paths and 2.1 metre dual-use paths is incorporated throughout the subdivision, providing continuous pedestrian and cyclist connectivity between residential areas and open space. Path alignments through landscaped areas contribute to visual interest and reinforce the overall landscape character. A boardwalk connection across the drainage basin further supports connectivity.

Materials and park infrastructure will be selected for durability, maintenance efficiency and visual consistency, supporting a cohesive public realm outcome. Overall, the landscape design provides a cohesive and legible public open space network that balances recreation, drainage and environmental outcomes, contributing positively to community wellbeing and the quality of the public realm within Bayonet Head.

6.2.4.4 Movement Network

A Traffic Impact Assessment (**TIA**) has been prepared by Transcore (refer **Appendix H**) to assess traffic generation, distribution, and movement patterns associated with the Scheme Amendment Request and the supporting Development Concept Plan. The TIA also evaluates the capacity of the proposed new intersections on Elizabeth Street.

The proposed intersections, together with associated local road upgrades, are required to accommodate the anticipated increase in traffic generated by the subdivision, address emergency access and egress requirements, and ensure effective integration with the existing surrounding road network. The proposed internal road network will facilitate the efficient and balanced distribution of traffic throughout the subdivision.

Based on the TIA, the proposed subdivision is expected to generate approximately 1,064 vehicle trips on a typical weekday, including around 107 trips during both the AM and PM peak hours. These figures represent combined inbound and outbound movements.

SIDRA intersection modelling confirms that the proposed key intersections along Elizabeth Street will operate satisfactorily, achieving a high Level of Service (LoS 'A') during both the AM and PM peak periods under post development scenarios.

The proposed shared path network will connect to public open space within the site and link to the existing shared path along Elizabeth Street. This will ensure that the internal path network integrates seamlessly with the external network, contributing to a cohesive and accessible shared path system within the locality.

6.2.4.5 Engineering

An Engineering Services Report has been prepared by JDSi (refer **Appendix F**) to assess the ability for the site to be serviced by new and existing infrastructure networks to support the proposed Scheme Amendment and submitted Development Concept. This is outlined as follows:

- Infrastructure servicing is achievable, with standard connections available for sewer, water, power, telecommunications and gas, subject to detailed design and authority approvals.
- The site's topography is suitable for development, enabling gravity-fed sewer and drainage and road design that generally follows natural contours with moderate earthworks required.
- Sewer servicing is feasible, requiring construction of a new DN300 gravity sewer and the decommissioning and relocation of an existing pressure main.
- Water supply is available via an existing Water Corporation main in Elizabeth Street, with standard subdivision extensions required.
- Telecommunications infrastructure is readily available, with existing NBN along Elizabeth Street and extensions to be provided within the subdivision.
- Gas servicing is available adjacent to the site, with network extensions required and capacity to be confirmed at development stage.

It is noted that any detailed servicing design, capacity confirmation, and final connections will be subject to approvals and further investigation at the subdivision stage.

6.2.4.6 Bushfire

A Bushfire Management Plan has been prepared by Biodiverse Solutions (refer **Appendix E**) to assess bushfire risk and demonstrate compliance with SPP 3.7. The BMP confirms that compliance with the relevant bushfire protection criteria applicable to the subject site can be achieved, including requirements for access and egress, availability of a reticulated water supply, and the management or modification of existing vegetation.

The BMP recognises that the proposed Development Concept utilises wide road reserves to provide hazard separation along the eastern and southern boundaries of the site. This, in combination with proposed low threat areas within each lot and existing low-threat areas to the north and west, enables future dwellings to achieve BAL-29 or lower.

In relation to existing vegetation, the BMP notes that vegetation will be retained within POS areas and the drainage reserve, but will be managed in a low fuel, parkland cleared state, as illustrated in the Landscape Concept Plan.

With respect to access, the BMP identifies that the subject site currently has direct access from Elizabeth Street, with additional connections available via Francis Street, Lower King Road, Paul Terry Drive, and the surrounding public road network. These

roads provide access in multiple directions and connect to key routes, including Lower King Road, which links to the Albany CBD and the broader regional road network.

The Development Concept also proposes a new internal road network that integrates with the existing public road system. This will provide safe access and egress in at least two different directions to two suitable destinations, consistent with the relevant guidelines.

In terms of water supply, a reticulated system is available to the subject site. Existing hydrants are located along Elizabeth Street, providing coverage to the site boundary, with the capacity to install additional hydrants at the subdivision stage in accordance with Water Corporation design standards.

In considering the above, the BMP confirms that the proposed Development Concept Plan layout incorporates appropriate setbacks and design responses to achieve BAL-29 or lower ratings at the future subdivision stages, ensuring that bushfire risk can be managed to an acceptable level.

6.2.4.7 Geotechnical

A Geotechnical Investigations Report has been prepared by Douglas Partners (refer **Appendix G**) and confirm that the site is suitable for residential development, subject to standard construction practices. Identified soil and groundwater conditions, including the presence of clay layers and variable infiltration, can be appropriately managed through earthworks, drainage design and foundation solutions.

7.0

Conclusion

7.0 Conclusion

This Scheme Amendment report has outlined the rationale for a request to amend the City of Albany Local Planning Scheme No. 2 to rezone the northern portion of Lot 39 on Plan 033941 to a 'Residential R30' zone. It is considered that through this Scheme Amendment, future subdivision and development opportunities will be available to support the continued growth of the City of Albany.

It is considered that the Scheme Amendment is consistent with the overarching planning framework applicable to the site, is supported by technical reports and does not result in any adverse impacts to the natural environmental amenity of the site.

The Scheme Amendment warrants the City of Albany and WAPC approval for the following reasons:

- The Amendment is complementary and consistent with the surrounding context of the site;
- The Amendment creates no undue impacts to the amenity of the locality; and
- The Amendment responds to the requirements of the applicable local and regional planning framework.

Planning and Development Act 2005

RESOLUTION TO AMEND LOCAL PLANNING SCHEME

City of Albany Local Planning Scheme No. 2
Amendment No. 7

Resolved that the City of Albany pursuant to section 75 of the *Planning and Development Act* 2005, amend the above Local Planning Scheme by:

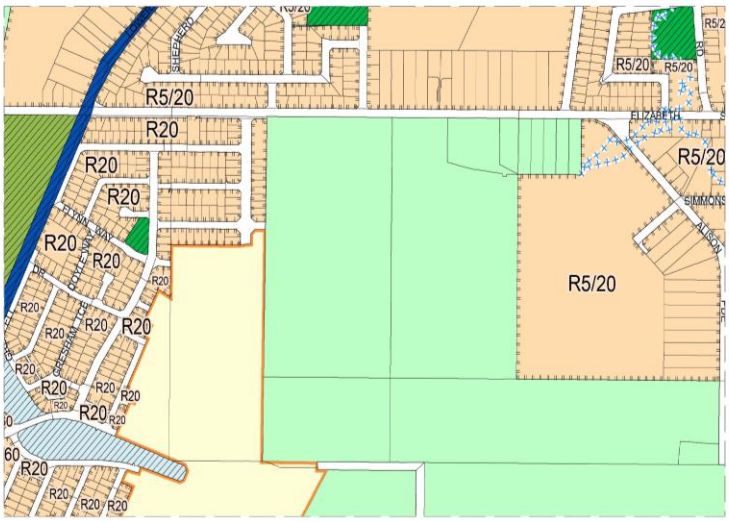
1. Rezoning the northern portion of Lot 39 on Plan 033941 from the Rural zone to the Residential zone.

2. Applying a density code of R30 to the northern portion of Lot 39 on Plan 033941.

3. Amending the Local Planning Scheme No. 2 Map accordingly.

CITY OF ALBANY
Local Planning Scheme No. 2
Amendment No. 7

EXISTING



LEGEND

LOCAL SCHEME RESERVES
- DRAINAGE/ WATERWAY
- ENVIRONMENTAL CONSERVATION RESERVE
- LOCAL ROAD
- DISTRICT DISTRIBUTOR ROAD
- PUBLIC OPEN SPACE

LOCAL SCHEME ZONES
- RESIDENTIAL
- RURAL
- URBAN DEVELOPMENT

OTHER CATEGORIES
- R CODES
- SCA 13-19 INUNDATION SPECIAL CONTROL AREA

PROPOSED

LEGEND

LOCAL SCHEME ZONES
- RESIDENTIAL

scale: 1:15000@A4 | 1:7500@A2
plan: 25/057/006A
0 150 300m
date: 03/08/2026

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ALL AREAS AND DIMENSIONS DISPLAYED ARE SUBJECT TO DETAIL SURVEY.

FORM 6A

COUNCIL ADOPTION

This Standard Amendment was adopted by resolution of the Council of the City of Albany at the [NAME] Meeting of the Council held on the [day] day of [month], 20[year].

.....

MAYOR/SHIRE PRESIDENT

.....

CHIEF EXECUTIVE OFFICER

COUNCIL RESOLUTION TO ADVERTISE

by resolution of the Council of the City of Albany at the [NAME] Meeting of the Council held on the [day] day of [month], 20[year], proceed to advertise this Amendment.

.....

MAYOR/SHIRE PRESIDENT

.....

CHIEF EXECUTIVE OFFICER

COUNCIL RECOMMENDATION

This Amendment is recommended [for support/ not to be supported] by resolution of the City of Albany at the [NAME] Meeting of the Council held on the [number] day of [month], 20[year] and the Common Seal of the City of Albany was hereunto affixed by the authority of a resolution of the Council in the presence of:

.....

MAYOR/SHIRE PRESIDENT

.....

CHIEF EXECUTIVE OFFICER

WAPC ENDORSEMENT (r.63)

.....

DELEGATED UNDER S.16 OF THE P&D ACT 2005

DATE.....

APPROVAL GRANTED

.....

MINISTER FOR PLANNING

DATE.....

Appendix A

Subdivision Concept

Appendix B

Environmental Assessment

Appendix C

Water Management Report

Appendix D

Landscape Concept Plan

Appendix E

Bushfire Management Plan

Appendix F

Engineering Services Report

Appendix G

Geotechnical Investigations Report

Appendix H

Traffic Impact Assessment