# DEVELOPMENT PLAN AMENDMENT

DAMPIER ROAD, BAYNTON

SHIRE OF ROEBOURNE

PREPARED BY:

burgess design group TOWN PLANNING + URBAN DESIGN

### **Dampier Road, Baynton**

## Shire of Roebourne

#### **DEVELOPMENT PLAN AMENDMENT**

Issue 1: August 2011

Prepared for:

LandCorp

Prepared by:

Burgess Design Group

351 Newcastle Street, Northbridge W.A. 6003

PO Box 374, Northbridge W.A. 6865

Telephone:

(08) 9328 6411

Facsimile:

(08) 9328 6511

Website:

www.burgess design group.com.au

Email:

reception@burgessdesigngroup.com.au

Project Planner:

R Van Santen

Job code:

LCP BAY

File reference:

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Revision No:

1

# FORMAL ADOPTION OF THE AMENDED DEVELOPMENT PLAN FOR DAMPIER ROAD, BAYNTON, SHIRE OF ROEBOURNE

SHIRE OR OF ROEBOURNE FINAL APPROVAL
Adopted for final approval, pursuant to the Shire of Roebourne Town Planning Scheme No. 8, by resolution of the Council of the Shire of Roebourne at the meeting held on the day of March 2011.
Marioca
MAYOR
CHIEF EXECUTIVE OFFICER
WESTERN AUSTRALIAN PLANNING COMMISSION ENDORSEMENT
Endorsed, pursuant to the Shire of Roebourne Town Planning Scheme No.8, by resolution of the Western Australian Planning Commission on the
Signed for, and on behalf of, the Western Australian Planning Commission
Cusanders

by an officer of the Commission duly authorised by the Commission for that purpose.









AMENDED DEVELOPMENT PLAN DAMPIER ROAD, **BAYNTON WEST, KARRATHA** 

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#### 1. INTRODUCTION

Burgess Design Group has been appointed by LandCorp for the provision of town planning and urban design consultancy services for the preparation of a modification to the existing Development Plan for Baynton West and the coordination of the subsequent subdivision over the new additional 3.6ha area of land (the "site").

The subject site forms a north-central wedge within the Development Plan locality of Baynton West in the suburb of Baynton and is bounded by Dampier Road to the north, the existing suburban development front to the west and south and a drainage reserve to the immediate east. Upon approval, the amended Development Plan for Baynton West will facilitate the subdivision and development of the subject land wedge for residential and drainage purposes.

The following report provides an overview of the proposal and should be read in conjunction with the original Development Plan report for the overall Baynton West area dated 2008.

The Development Plan modification has been formulated by Burgess Design Group, on behalf of LandCorp, in collaboration with a team of specialist consultants, who have provided technical input in relation to matters as follows:

Wood and Grieve Civil Engineering and Drainage requirements & infrastructure

JDA Hydrologists Drainage and local water management

Whelans Surveying and land tenure

360 Environmental Environmental assessment for the additional subject amendment

area, a copy of which was contained in the related Scheme

Amendment No.20.

#### 2. SITE DESCRIPTION

#### 2.1 LEGAL DESCRIPTION

The greater Baynton West Development Plan prepared on behalf of LandCorp to facilitate the subdivision and development of the Baynton West residential estate comprised of 93 hectares of what was previously unallocated crown land known as Lot 501 (previously Lot 300 on Deposited Plan 46450). This land however has subsequently received subdivision approval and has incrementally been developed in accordance with the Development Plan, with a multitude of new residential lots (primarily single residential) and new individual landowners now created and owned across the estate. The undeveloped portion of the existing Development Plan for Baynton West adjoining the proposed additional development area is currently known as Lot 9007 and referred to as part of Stage 8 of the development of Baynton West.

The land portion that is the subject of this amendment to the Development Plan is known as Lot 530 on Deposited Plan 67211. A copy of the Certificate of Title for Lot 530 is contained at Appendix 1.

The overall Development Plan site now comprises a total area of 96ha, being 93ha of the original Development Plan plus 3.6ha of new additional land for inclusion in the Development Plan as now proposed.

#### 2.2 LOCATION

The site is located within the suburb of Baynton generally located at the western extent of the Karratha townsite in the Shire of Roebourne, immediately south of Dampier Road.

The amendment site has an area of 3.6ha and gains direct road access from the west via Bajamalu Drive, Bardurra Street and Jadura Crescent, all constructed and gazetted roads. No vehicular access is available from Dampier Road.

#### 2.3 EXISTING AND HISTORICAL USE

The subject land (being the amendment area) is currently vacant, having historically been reserved for drainage purposes and zoned as such under the town planning schemes.

The land is relatively flat with over-ground drainage from the Karratha hills, located to the south, flowing northwards towards Nickol Bay via an existing culvert under Dampier Road. An Environmental Assessment by 360 Environmental was undertaken in support of the associated rezoning of the proposed addition to the Development Plan area which confirmed the suitability of the subject 3.6ha of new urban land as suitable for residential development with no features or environmental constraints that would suggest otherwise.

Land to the north, south, east and west of the amendment area is, or shall soon be, developed for residential development and public open space with a drainage reserve still to remain on the sites immediate northern and eastern boundary for dedicated drainage purposes.

The Aerial Plan at Figure 1 identifies the additional Development Plan area in the context of the balance of the Baynton West estate.







Legend

Subject Area



**Additional Development** 



NORTH

Planner: LCP BAY 10-01 BAYNTON WEST, KARRATHA
Cilent: LANDCORP

**AERIAL PLAN** DAMPIER ROAD

burgess design group

FO BOX 374 Northbridge WA 6865

FOWN PLANNING + URBAN DESIGN

WWW.burgessdesigngroup.com.du

F (08) 9328 6511

Dafe: 04.08.11 Plan No: LCP BAY T0-01

SHIRE OF ROEBOURNE

#### 3. PLANNING STATUS

The original Development Plan for Baynton West was prepared by LandCorp and subsequently endorsed by Council and the Western Australian Planning Commission over the entire Bayton West cell located immediately east of the existing suburb of Baynton, south of Dampier Road, in 2008 (excluding the subject amendment area). The endorsed Development Plan identified the majority of Baynton West for residential purposes at R10, R17.5, R30 and R40 densities plus a large primary school, 3 areas of public open space, 1 community purpose site and one 'Special Use R60' site as well as a network of local streets and drainage reserves and all consistent with the Shire of Roebourne Town Planning Scheme 'Urban Development' zoning boundary applicable to the area.

A subdivision application (WAPC Ref. 136245) was then lodged and approved over the majority of Baynton West in accordance with the Development Plan, resulting in the approval of some 800 residential lots plus the school site and the public open space areas. LandCorp has been progressively constructing this subdivision, the subject land parcel generally forming part of Stages 8A and 8B of these subdivision works and both the road network and the street naming already therefore generally established.

During the structure planning process, approximately 3.6ha of land forming part of an existing drainage reserve flowing north from the Baynton West subdivision to Dampier Road was identified as excess to the drainage requirements, as confirmed by the project engineers in consultation with the Shire of Roebourne. This land was therefore flagged on the Development Plan as being suitable for future urban development and hatched on the 2008 endorsed plan accordingly, it was not however cleared of Native Title nor reserved for anything other than drainage. As such, this 3.6ha strip of land did not form part of the original subdivision of Baynton West but the adjoining subdivision was designed to subsequently extend in a logical manner to include it if later required.

During 2010, the 3.6ha excess drainage land was negotiated with the Ngarluma native title holders to establish thier agreement to clear it of Native Title and rezone it from 'Parks, Recreation and Drainage' reserve to 'Urban Development' zone so as to facilitate its conversion to residential lots. A Native Title agreement was finalised, a separate green title lot was created for the land (Lot 530) and Scheme Amendment No.20 was advertised for public/agency comment during January 2011 and adopted by Council in February 2011.

In anticipation of the Scheme Amendment No.20 being finalised by the Minister for Planning, it was then thought timely to submit an amended copy of the Development Plan (Figure 2) reflecting the extension of the Baynton West residential subdivision into the excess drainage land and also submit a subdivision application accordingly.

#### 4. AMENDED STRUCTURE PLAN

#### 4.1 LAND USE

The requested amendment to the Baynton West Development Plan applies predominantly to Lot 530, and in a limited way also to Lot 9007 (being the as yet undeveloped portion of the wider Baynton West Development Plan) given it impacts on the approved street network within Lot 9007. The amendment is summarised as follows:

## PROPOSED SCHEME MAP

SHIRE OF ROEBOURNE TPS No:8 Amd No. 20 DAMPIER ROAD, KARRATHA



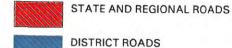
**EXISTING ZONING** 



PROPOSED ZONING

#### **LEGEND**

LOCAL SCHEME RESERVES







ED EDUCATION

#### **ZONES**

RESIDENTIAL

TRANSIENT WORKFORCE ACCOMMODATION

URBAN DEVELOPMENT

TOURISM

RURAL

RURAL RESIDENTIAL

OTHER

R20 R CODES

A A A A A AIRPORT OBSTACLE HEIGHT LIMITATION AREA SCA

A A A A AIRPORT NOISE RESTRICTION SCA



DWG: LCP NIC-7-03A DATE: 25.05.10

- Deletion of approximately 3.6ha of land previously identified as 'Possible Future Expansion Area' on the 2008 endorsed Development Plan;
- Inclusion of an additional area of 'Residential R17.5' to facilitate an additional 16-20 single residential lots;
- Inclusion of an additional 3,000m<sup>2</sup> of 'Residential R40' to facilitate a larger grouped housing site (was previously 5265m<sup>2</sup> and is now proposed at 8372m<sup>2</sup>);
- Addition of approximately 9,000m<sup>2</sup> of dedicated drainage still required for drainage purposes; and,
- Modification to the previously approved road network (Bajamalu Drive, Bardurra Street and Jadura Crescent) to extend each further westwards, in effect retaining the previous street pattern and road widths but extending the length of each street.

The remainder of the overall Baynton West Development Plan shall be retained in its approved state, reflective also of the approved subdivision application(s) and staging of construction.

A summary of the overall land use allocation across the entire Baynton West Development Plan area following inclusion of the subject amendment area is therefore as follows and as reflected on the Amended Development Plan at Figure 3:

Table 1: Land Use Summary

Land Use	Area
Baynton West original Development Plan site area	92.7ha
Subject Amendment Area	3.6ha
Baynton West total Development Plan site area (note some overlap occurs in regards to drainage area)	The state of the s
Primary School	4.5ha
Community Purpose Site	0.85ha
Special Use Site	4.12ha
Residential R10	2.01ha
Residential R17.5	31.74ha
Residential R30	10.78ha
Residential R40	2.71ha
Residential R40/80	0.92ha
Dedicated Drainage Reserves	8.55ha

POS 1	3.22ha
POS 2	1.40ha
POS 3	0.53ha
POS 4 (50% credit as part drainage function)	1.99ha
Total POS	7.15ha
Total POS with Community Site as credit	7.95ha
Total Subdivisible Area (less deductions of dedicated drainage and school site)	83.25ha

#### 4.2 LOT LAYOUT AND ORIENTATION

Lot layout and orientation is based on the following principles:

- The creation of regular shaped lots, capable of accommodating standard residential dwellings with direct access to a public street in predominantly a north-south orientation;
- The provision of some housing choice by incorporating an expanded grouped housing site designed to overlook the drainage area and adjoining streets;
- Continuation of a previously agreed street network and road interface to the drainage reserve;
- Opportunity for overland drainage to continue to flow in an west to east and south to north direction into the retained drainage areas; and,
- Minimal impact on the previously approved subdivision design and land use allocation across the wider Baynton West area.

#### 4.3 PUBLIC OPEN SPACE

In modifying the Development Plan to facilitate additional residential development opportunities, it is recognised that there are implications on the public open space contributions as previously resolved under the original Development Plan. In extending the Development Plan over Lot 530 to include an additional 3.6ha of land, 2.7ha of which is for residential purposes, an additional 2,701m² of public open space (POS) shall be required. Given there are two POS areas within a direct (less than 400m) walk of the subject land, the intention is to address the POS shortfall by way of a cash in lieu contribution as a condition of the subdivision process. This land allocation and POS shortfall is summarised in the table below.

**Table 2: Additional POS required** 

Additional	Less deductions	Additional	POS Contribution required
Development	(dedicated	Subdivisible	
Plan Land	drainage)	Area	
3.6148ha	0.9134ha	2.7013ha	0.2701ha

Note that the POS allocation for Lot 9007 and balance of Baynton West was previously resolved and ceded under WAPC Ref. 136245. A shortfall of 0.07ha was calculated as part of the original subdivision clearance across Baynton West Development Plan area, paid as cashin-lieu.

#### 4.4 DRAINAGE

In facilitating additional residential land, some reduction to the existing drainage reserve has been required, narrowing the original drainage channel by approximately 65m in parts though in doing so still retaining a drainage reserve width of 50m or greater. The adequacy of the retained drainage reserve width has been confirmed by the project engineer and hydrologist in consultation with the Shire of Roebourne and more recently also the Department of Water as part of the Draft Karratha Coastal Vulnerability Study.

The resolution from both a hydrology and civil engineering view is that the retained drainage reserve and the existing drainage infrastructure is adequate for accommodating 1 in 100 year storm events as also outlined in Appendix 2 and 3. Any further detailed design of drainage can be addressed by way of conditions of subdivision approval such as a standard stormwater infrastructure condition and/or urban water management plan if deemed necessary.

#### 4.5 SERVICING

The additional residential land included in the modified Development Plan abuts a developed (and developing) part of Karratha where an extension to all normal services and facilities can readily be made available including power, water, sewer and telecommunications infrastructure. Whilst it is noted that Karratha is experiencing some constraint on the availability of reticulated water and sewer allocations, the Development Plan amendment only facilitates approximately 18 new lots in a location surrounded by new connections and mains. It is understood that the Baynton West allocation of water and sewer connections shall accommodate the proposed development site.

#### 4.6 ACCESS

The traffic and access routes, intersection designs and road reserve widths are not intended to vary from the previously endorsed Development Plan, particularly as the road network has since been approved and predominantly constructed through the subdivision process. The only variations now proposed being the extension of the approved Bajamalu Drive, Bardurra Street and Jadura Crescent road reserves eastwards along their current alignment to facilitate the proposed additional residential lots, maintaining the same road interface to the adjoining drainage reserves as previously approved.

The Amended Development Plan also continues to reflect the proposed dual use path network as previously agreed through the original Development Plan approval process with an extension eastwards leading towards the drainage reserve. Should any further refinements to the path network be required, this can be undertaken as part of the more detailed subdivision design stage.

#### 5. CONCLUSION

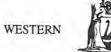
The proposed Development Plan modification is reflective of a previously flagged proposal to convert excess drainage land to residential development as notated on the originally endorsed 2008 Development Plan for Baynton West and as also now proposed for rezoning to 'Urban Development' as per Scheme Amendment No.20.

The land use allocation and road network reflected on the Amended Development Plan is logical in nature, simply extending a previously agreed road network and cell layout eastwards across new Lot 530, continuing to facilitate the north-south and east-west lot layout at lot sizes consistent with the adjoining approved subdivision. The drainage shall continue to flow down the roads in an easterly direction towards the remaining dedicated drainage and ensuring surveillance over the balance of the drainage reserve shall continue to occur.

Native Title and engineering matters have all been resolved and the rezoning of the subject land is nearing completion so as to then facilitate the creation of the proposed additional lots in a timely manner, with the corresponding subdivision application (WAPC Ref. 143689) also now lodged and ready for consideration to further illustrate the ability of the subject land to be subdivided and developed in a well planned manner.

The Development Plan change shall also help facilitate additional housing opportunities in a new suburb already offering a primary school, active parks and path network and all in close proximity to the facilities in Karratha townsite.





**AUSTRALIA** 

REGISTER NUMBER 530/DP67211 DATE DUPLICATE ISSUED DUPLICATE N/A N/A

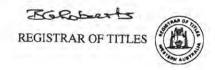
#### RECORD OF CERTIFICATE OF CROWN LAND TITLE

FOLIO 278 VOLUME LR3159

UNDER THE TRANSFER OF LAND ACT 1893 AND THE LAND ADMINISTRATION ACT 1997

#### NO DUPLICATE CREATED

The undermentioned land is Crown land in the name of the STATE of WESTERN AUSTRALIA, subject to the interests and Status Orders shown in the first schedule which are in turn subject to the limitations, interests, encumbrances and notifications shown in the second schedule.



#### LAND DESCRIPTION:

LOT 530 ON DEPOSITED PLAN 67211

### STATUS ORDER AND PRIMARY INTEREST HOLDER:

(FIRST SCHEDULE)

STATUS ORDER/INTEREST: UNALLOCATED CROWN LAND

PRIMARY INTEREST HOLDER: STATE OF WESTERN AUSTRALIA

#### LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS: (SECOND SCHEDULE)

1. L373294 TAKING ORDER. THE DESIGNATED PURPOSE OF SALE REGISTERED 13.7.2010.

A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required. Lot as described in the land description may be a lot or location.

#### -----END OF CERTIFICATE OF CROWN LAND TITLE-----

#### STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:

DP67211 [SHEET 1].

PREVIOUS TITLE:

LR3156-224.

PROPERTY STREET ADDRESS:

NO STREET ADDRESS INFORMATION AVAILABLE.

LOCAL GOVERNMENT AREA:

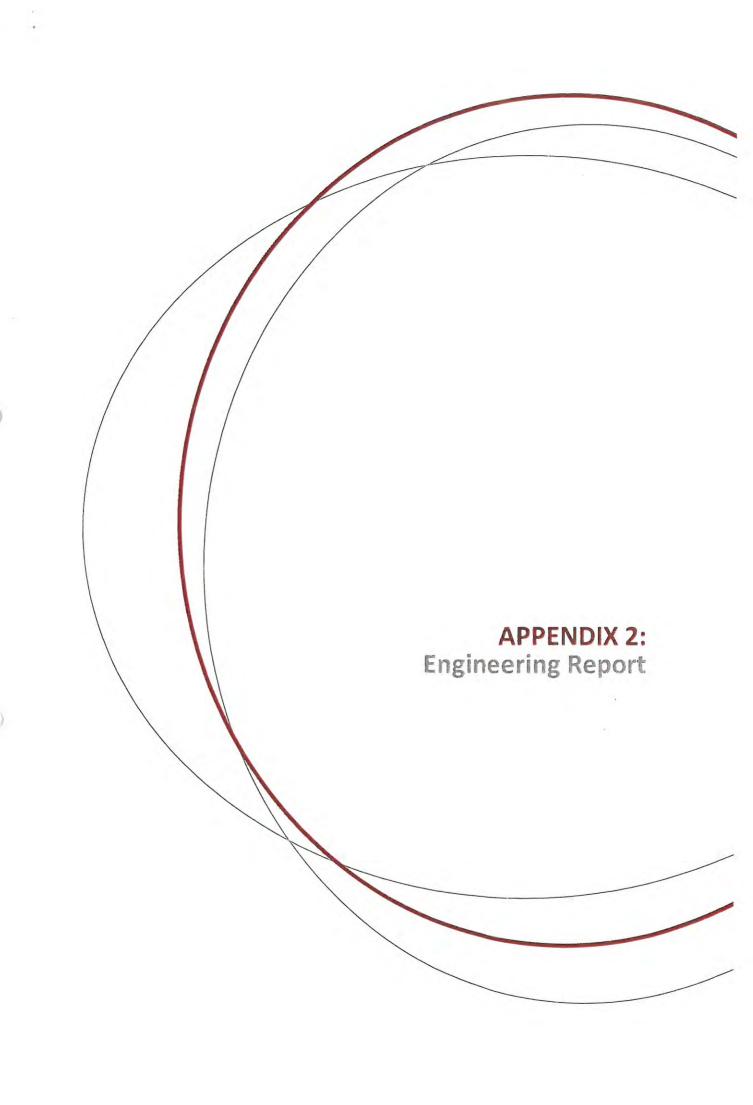
SHIRE OF ROEBOURNE.

RESPONSIBLE AGENCY:

DEPARTMENT OF REGIONAL DEVELOPMENT AND LANDS (SLSD).

NOTE 1: L373294

CORRESPONDENCE FILE 00001-2010-02RO





# Baynton West Stage 8 - Karratha Drainage Corridor Amendment Report

LandCorp

19 April 2011

Prepared by Jermayne Fabling Project Number: 17183C-BW8
Level 3, 3 Plain Street, East Perth WA 6004

Phone (08) 6222 7000 Fax (08) 6222 7100 Email wge@wge.com.au Web www.wge.com.au



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APPENDIX 1 Drainage Catchment Plan

APPENDIX 2

Figure 6: 100 year ARI Flood Extent – 2010 Climate Scenario
(Extract from "Draft Karratha Coastal Vulnerability Study: Interim Report for Mulataga and Karratha Town Centre" by JDA Consultant Hydrologists dated 13 April 2011).

#### 1. Introduction

This report has been prepared to provide background information on amendment of the official drainage corridor location for the existing open drain located between Baynton West Stage 7 and Baynton Stage 8, which will be amended as part of the Baynton West Stage 8B works.

Included within this report is confirmation of the capacity of the drain reserve both adjacent to the development site and downstream of the proposed development.

The Baynton West Stage 8B development is currently subject to assessment as part of WAPC Application Number 143689.

#### 2. Background

The official drainage reserve located between Baynton West Stage 7 and Baynton West Stage 8B, (for the purposes of this report is defined as Drain 1) was originally defined by default as part of the preparation of the Burrup & Maitland Industrial Estates Agreement (BMIEA), which was implemented by deed in 2003 to enable the State Government to compulsorily acquire Native Title rights and interests in the area of Burrup Peninsula and certain parcels of developable land within the Karratha Townsite.

The BMIEA agreement included arbitrary boundaries, which intern became cadastral boundaries for the limit of developable areas. Clearly the intent of the BMIEA agreement boundary between Baynton West Stage 7 and Baynton West Stage 8B was to exclude the existing large open drain from development. Unfortunately the survey for the creation of the BMIEA boundary was not accurate about the subject drain and only covers one half of the drain and higher ground to the West of the drain, rather than covering the whole drain itself.

As the BMIEA agreement areas were set, development of the Baynton West estate could not occur beyond the BMIEA boundary until such time as separate agreements were reached with the Ngarluma people who are the determined Native Title holders.

As time was of the essence in delivering the Baynton West project to the market, a subdivision plan was formulated that allowed for future expansion into the BMIEA area once agreements were established. Hence Baynton West Stage 8B is now the additional land area available for development.

The adjacent subdivision development has reflected the actual location of the existing drainage line and provided appropriate cadastral boundaries to ensure that it is contained within a proper reserve.

#### Drainage Catchment

The drainage catchment for Drain 1 incorporates components of the Baynton West subdivision, Hillcrest Estate subdivision and existing Baynton subdivision and extents to the top of the adjacent hills to the South of the site.

We have mapped the existing drainage catchment based on existing topographical survey by Whelans. A Drainage Catchment Plan is included as Appendix 1 within this report.

The proposed Baynton West Stage 8B subdivision plan does not amend the existing catchment boundaries of Drain 1 and is wholly contained within the Drain 1 catchment.

#### 4. Existing Ground Conditions & Runoff

The ground conditions about the Baynton West Development typically consist of clayey gravelly materials with a high shrink swell characteristic overlaying rock at depth. The very low permeability of the soil results in the majority of rainfall from storm events directly running off in the form of overland flow. Accordingly high drainage runoff coefficients in the order of 0.85 are utilised for calculation purposes.

Because of the very high pre-existing runoff coefficient the effect of urbanisation has minimal effect on the overall stormwater runoff, except for the concentration of flows down manmade roadways and structures. Accordingly drop structures are provided within the subdivision design to cater for the localised concentrated flows.

#### 5. Subdivision Works

While filling of the Baynton West subdivision was not particularly required for drainage purposes, significant filling was required to facilitate gravity sewer connections.

Although it is not needed, Section A-A shown within Appendix 1 illustrates that the effective capacity of Drain 1 has been increased by the additional of fill for sewer purposes to the adjacent Baynton West Stage 7 & 8 works.

#### 6. JDA Karratha Coastal Vulnerability Study 2011

To assist with preparation of this report, Landcorp has granted access to the draft outcomes of a coastal vulnerability study for Karratha, which covers the subject site catchment area and downstream catchments.

This report has utilised data and mapping over the subject site extracted from "Draft Karratha Coastal Vulnerability Study: Interim Report for Mulataga and Karratha Town Centre" by JDA Consultant Hydrologists dated 13 April 2011.

This report includes extensive 2D drainage modelling over the Karratha Townsite for 100 year ARI and 500 year ARI events for various climate change scenarios. For the purposes of this report we have solely considered the current 2010 100 year ARI scenario.

The JDA (2011) report is based on extensive site LiDAR survey of the Baynton West development and surrounding Karratha Townsite, completed by Whelans in 2010.

#### 7. Downstream Drainage Capacity

The extensive 2D drainage modelling of 100 year ARI and greater events by JDA (2011) clearly indicates that the Baynton West subdivision works are not impacting on downstream infrastructure. Figure 6: 100 year ARI Flood Extent, JDA (2011) contained within Appendix 2 confirms that the storm events are contained within the existing drainage reserves and road reserves.

While we have only discussed the 100 year ARI event for 2010 climate conditions in this report, we have also reviewed 100 year and 500 year ARI events for 2060 and 2110. These future predictions incorporating sea level rise and an increase in storm intensity also indicate the downstream drainage capacity and flood extent to be satisfactory.

#### 8. Conclusion

Based on the discussion and attachments included within this report which can be summarised as follows:

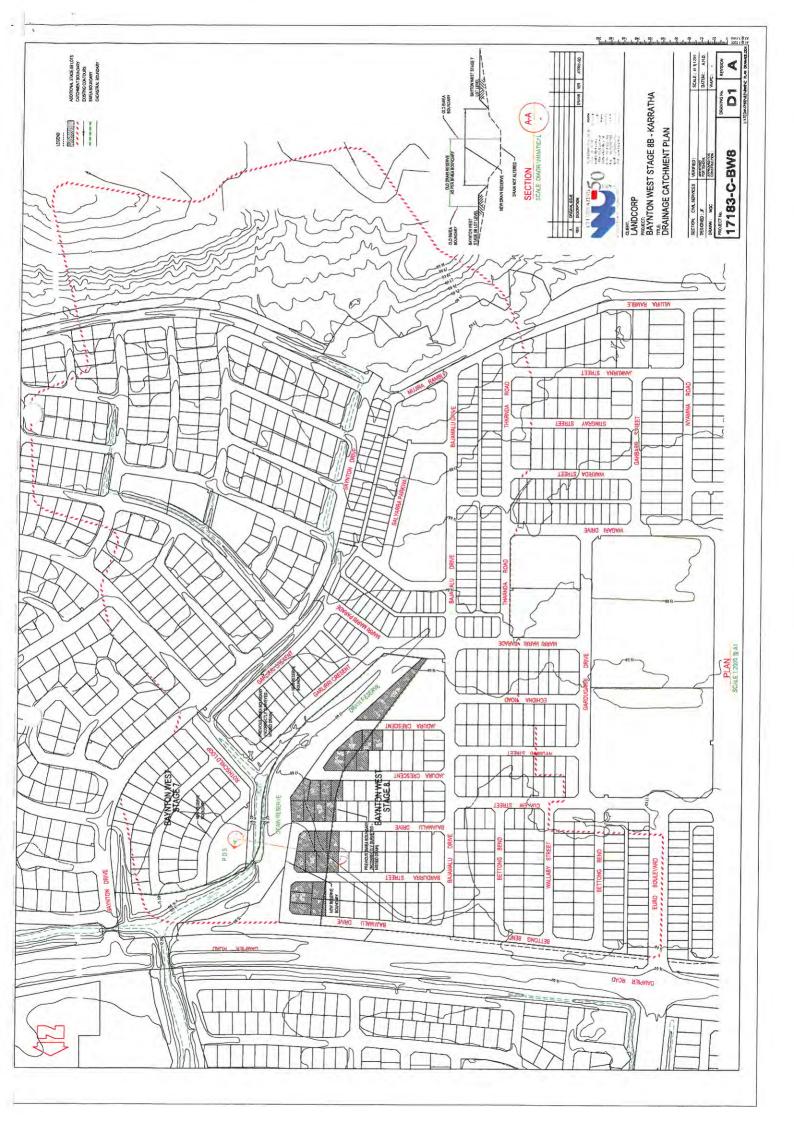
- 1. The existing drainage corridor cadastral boundary was inaccurately defined by the BMIEA Agreement boundary and did not reflect the actual position of Drain 1.
- 2. The creation of Baynton West Stage 8B does not increase the drainage catchment and consequently does not increase the outflow of Drain 1.
- 3. The effect of urbanisation has minimal effect on drainage runoff due to the very high pre-existing surface run off.
- 4. Adjacent subdivision works have increased the theoretical capacity of Drain 1, even though it is not required.
- 5. JDA (2011) two dimensional drainage modelling has confirmed that the Drain 1 has appropriate 100 year ARI capacity adjacent to Baynton West Stage 7 and 8B.
- 6. JDA (2011) two dimensional drainage modelling details that downstream infrastructure is not adversely effected by the Baynton West Stage 8B works.

Hence in overall conclusion we confirm that the proposed amendments to the drainage corridor incorporated within the Baynton West Stage 8B development are acceptable.

# Appendix 1



Drainage Catchment Plan

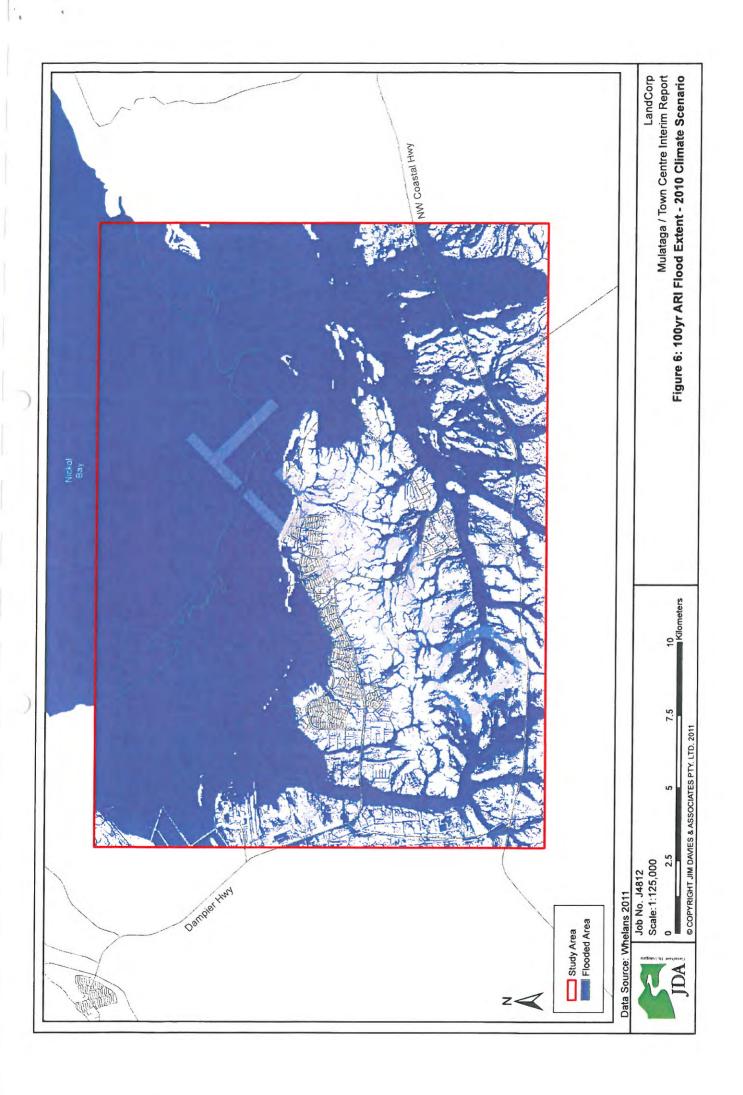


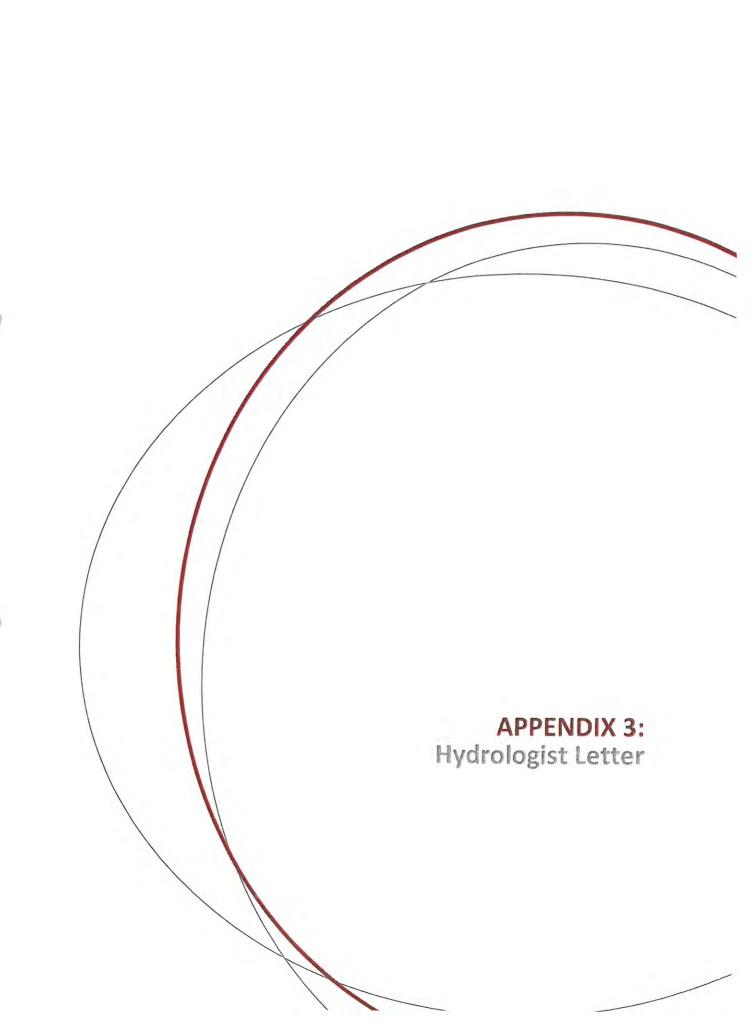
## Appendix 2



Figure 6: 100 year ARI Flood Extent – 2010 Climate Scenario

(Extract from "Draft Karratha Coastal Vulnerability Study: Interim Report for Mulataga and Karratha Town Centre" by JDA Consultant Hydrologists dated 13 April 2011)





Jim Davies & Associates Pty Ltd
ACN 067 295 569



Suite 1, 27 York Street, Subiaco PO Box 117, Subiaco WA 6008 Telephone (08) 9388 2436 Facsimile (08) 9381 9279 Email info@jdahydro.com.au www.jdahydro.com.au

Your Ref: WAPC #143689 Our Ref: J5018a

18 July 2011

Natalie Leach
Department of Water
Pilbara Region
PO Box 836
Karratha WA 6714

Dear Natalie,

#### BAYNTON WEST STAGE 8B: DAMPIER HIGHWAY CULVERT

The Draft Karratha Coastal Vulnerability Study undertaken by JDA (2011) provides flood data for the region over a number of storm events for present and future climate scenarios. To facilitate the progression of the Baynton West Stage 8B subdivision approval, WAPC Application No. 143689, please find following details of flood modelling for the Dampier Highway culvert, immediately downstream of Baynton West for the 100 year ARI event in 2010 and 2110 climate scenarios.

Figure 1 presents flow paths and flood extent for drainage from the Baynton West subdivision, via the Dampier Hwy culvert. Table 1 presents details of flood levels (headwater) and flow rates for the culvert loaction.

As demonstrated in Figure 1 the culvert beneath Dampier Hwy, providing passage for drainage from Baynton West, has adequate capacity for both the 2010 and 2110 100 year ARI events, with no flooding of Dampier Hwy in either event at this location. Further to this stormwater from the 100 Year ARI storm event, for both climate scenarios, is contained within proposed road reserves.

Based on the assumptions in Table 1 the conceptual flood modelling in JDA (2011) indicates that the Dampier Hwy culvert is not overtopped in the 100 year ARI event for both the 2010 and 2110 climate scenarios.



