Planning Proposal

No. 425 Bent Street, South Grafton
Part Lot 400 DP 1153969

18/05/2016
A.Fletcher & Associates Pty Ltd
PO Box 1213, Grafton 2460
Our Ref: 7520/1

This Planning proposal has been prepared in accordance with the NSW Department of Planning document "A Guide to Preparing Planning Proposals" on behalf of the owner of the subject land, namely Grafton District Golf Club Ltd.

Prepared by:

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Date: 18th May, 2016

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R. Donges, Consultant

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R.A. Fletcher, Sole Director

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1. Background

1.1 Introduction

This planning proposal constitutes a document referred to in Section 55 of the Environmental Planning & Assessment Act 1979. It has been prepared and structured in accordance with the Department of Planning & Environments "A Guide to preparing Planning Proposal" (October 2012). A gateway determination under Section 56 of the Act is requested.

1.2 Summary

This planning proposal applies to Part of Lot 400 DP 1153969 Bent Street, South Grafton. See Figure 1.
The site is owned by the Grafton District Golf Club Ltd and has an area of 3.566ha.
The Planning Proposal seeks to amend Clarence Valley Council Lot Size Map to increase the number of permitted lots on the subject site from 9 to 16.

Figure 1. Locality Map

Table of Contents

1.3 Property Description & Current Zoning

The subject land forms part of the Grafton District Golf Course. In August 2011 it was rezoned from 6(b) Open Space (Recreation – Special Purposes) under the Grafton LEP 1988 to 1 (c) Rural (Residential).
Under the Clarence Valley Local Environmental Plan 2011 (CVLEP 2011) it is now zoned R5 Large Lot Residential.
The 2011 rezoning was specifically intended to permit the subject portion of the Golf Course to be subdivided into 8 x 4000m^2 lots and 1 x 3653m^2 lot.
Consequent to the creation of CVLEP 2011 the associated Lot Size Map was adopted. The subject land was classified: W: Minimum Lot Size 4000m^2

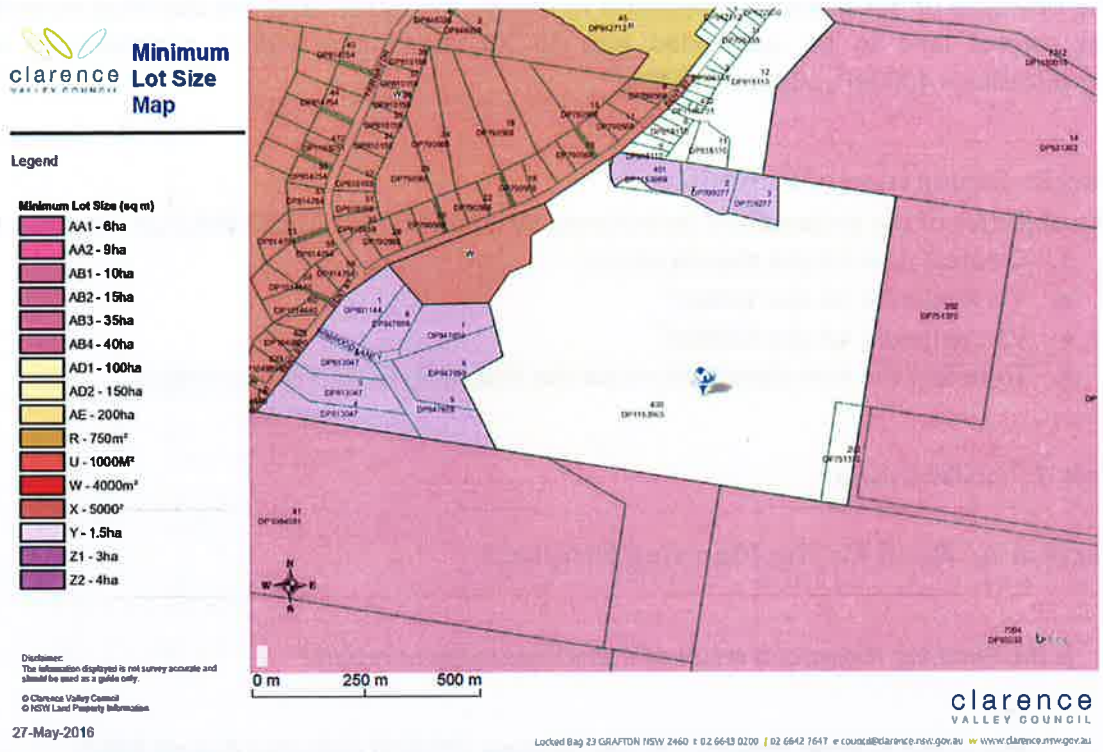


Figure 2 – Minimum Lot Size Map

1.4 Site & Locality

The subject land fronts Bent Street and previously formed part of the golf course proper (being Holes 10 & 11) but, a rearrangement of the course has now left it unused and vacant. The Golf Course is located to the south and east of the site. To the south is an 8 lot subdivision with a minimum lot size of 1.5ha, while on the northern side of Bent Street is the Fairway Estate, covering a substantial area and forming the bulk of the

South Grafton Heights Precinct with a minimum lot size of 4000m^{22}. (See Figure 1- Locality Map).

1.5 Development Concept (See Appendix C)

It is proposed to develop a 16 lot subdivision on the subject land consisting of:-

- Lots 1 to 11: minimum lot size 1500m^2
- Lots 12 to 14: minimum lot size 1800m^2
- Lots 15/16: minimum lot size 4000m^2

2. Planning Proposal

Part 1: Objectives & Intended Outcomes

The objective of this planning proposal is to amend the CVLEP 2011 Lot Size Map to enable the subject land to be subdivided into 16 R5 zoned lots with 3 minimum lot size classifications: 4000m^2, 1800m^2, 1500m^2

Part 2: Explanation of Provisions

The objective of the proposal will be achieved by amending the CVLEP 2011 Lot Size Map to:

1. Create 2 new lot size classifications:
   - V1: minimum lot size 1500m^2
   - V2: minimum lot size 1800m^2
2. To reflect the new classifications on the Map as indicated in Appendix B.

Part 3: Justification

Section A: Need for the Planning Proposal

1. *Is the Planning Proposal a result of a strategic study or report?*

   Yes.
   The South Grafton Heights Precinct Strategy (SGHPS) (adopted August 2007; amended 2011) is a detailed strategy intended to assist the implementation of the Clarence Valley Settlement Strategy (CVSS) and the Mid North Coast Regional Strategy (MNCRS) at the local level.
   The 2011 amendments to the SGHPS specifically incorporated the 2011 rezoning of the subject land into the strategy.
   The Precinct Strategy is discussed in detail at (4) below.

2. *Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?*

   Yes.

The proposed subdivision cannot proceed unless the CVLEP 2011 Lot Size Map is amended to reflect proposed minimum lot sizes.

3. *Is there a net community benefit?*

The Grafton District Golf Club Ltd, which owns and operates the golf course, provides an important social and recreational focus for South Grafton and the wider Grafton District. It is a district-level facility being the major golf course in the Grafton area which has a population of approximately 25,000.

The costs involved in maintaining and improving the golf course verge on prohibitive, and the Club struggles financially as a result. The proposed subdivision increases the lot yield from 9 to 16 with a commensurate increase in the financial return to the Club from the sale of lots.

As a "not for profit" community organisation, all profits from the development will be used by the Club for the benefit of the Grafton district community through golf course maintenance and upgrades.

There will be no deleterious impact on the golf course or its users as sections of the golf course have been reconstructed so that the subject site no longer forms part of the course proper.

Section B: Relationship to Strategic Planning Framework

4. *Is the Planning Proposal consistent with the objectives and actions contained within the applicable regional or sub-regional strategy?*

Mid North Coast Regional Strategy

The MNCRS (March 2009) is the applicable regional strategy.

The proposal is consistent with the Urban Settlement & Rural Residential Development components of the Strategy's Settlement & Housing Section. It is located adjacent to the Proposed Future Urban Release Area (Growth Areas Map 2 Clarence South). It is not located in the coastal zone, has access to all services and is connected to the road network with public transport available.

The impact of the potential bushfire hazard has been assessed and adequate complying protection can be provided.

The environmental impact in respect of flora and fauna has been assessed and has been determined to be acceptable.

In general terms the proposal complies with the broad strategies of:-

- containing urban sprawl
- efficiently utilising existing services and infrastructure
- protecting areas of high conservation value

Draft North Coast Regional Plan (DNCRP)

The DNCRP was released in March 2016 and is intended to be the State Governments blue print for the region for the next 20 years. It focuses on generating jobs, providing houses and protecting the regions natural environment.

"Goal 3: Housing choice, with homes that meet the needs of changing communities.

Direction 3.1: Provide sufficient housing supply to meet the demands of the North Coast"

The proposal, which will increase the subdivision yield on the subject site from 9 lots to 16 lots, will meet the direction albeit in a very minor manner.

NSW 2021 (NSW State Plan)

The proposal will contribute to achieving Goal 3 of the Plan – *"drive economic growth in regional NSW"*, also in a minor manner.

5. *Is the Planning Proposal consistent with the local Council's Community Strategic Plan, or other local strategic plan?*

The relevant local strategic plans are:

- Our Community Plan 2015-2024
- South Grafton Heights Precinct Strategy (SGHPS)
- Clarence Valley Settlement Strategy (CVSS)

Our Community Plan 2015-2024

The plan embraces the broad objectives of growing the local economy and maintaining a healthy, natural environment.
The proposal achieves both of these objectives.

South Grafton Heights Precinct Strategy

The subject site is included in the Precinct and the Strategy was specifically amended in 2011 to incorporate the initial rezoning that permits the previous 9 lot subdivision proposal. Further amendment to the Strategy would appear to be required should the Proposal be approved.

The Strategy contains 21 strategies and 57 associated actions. The strategies and actions relevant to the proposal are assessed at Appendix E.

Clarence Valley Settlement Strategy

The CVSS includes an urban land release strategy for the valley. The objectives of the Strategy include:-

"accommodate further growth in suitable locations so as to minimise social, environmental and economic costs to State and local government and to the wider community"

Increasing the subdivision density on the subject land from 9 lots to 16 lots will allow additional future growth in the existing suitably located residential precinct. All costs associated with the subdivision will be met by the Grafton District Golf Club Ltd and those associated with future dwellings by individual owners.

6. *Is the Planning Proposal consistent with the applicable State Environment Planning Policies (S.E.P.P.'s)?*

   Yes.

   See Appendix D for detailed assessment

7. *Is the Planning Proposal consistent with applicable Ministerial Directions (S117 directions)?*

   Yes.

   See Appendix F for detailed assessment.

Section C – Environmental, Social & Economic Impacts

8. ***Is there any likelihood that critical habitat or threatened species, populations or ecological communities or their habitats, will be adversely affected as a result of the proposal?***

   A Flora & Fauna Assessment (Land & Fire Assessments Pty Ltd May 2015) is attached at Appendix G.
   The Report concludes that there are no threatened species, populations or Endangered Ecological Communities on the site and that provided the recommended mitigation measures are implemented, the rezoning as proposed, will have no significant impact. The full list of conclusions is at page 24 of the report.

9. ***Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?***

   The subject site contains land designated as "Vegetation Categories 1" and "Buffer" on the Clarence Valley Bushfire Prone Land Map. The proposed residential subdivision is therefore considered a "high risk" development.
   Accordingly, a Bushfire Constraints Assessment" (Land & Fire Assessments Pty Ltd, May 2015) has been prepared and is attached at Appendix H.

The Report concludes that the Planning Proposal complies with S117 Direction 4.4 Planning for Bushfire Protection and is capable of complying with Planning for Bushfire Protection 2006.
The full list of conclusions is at page 21 of the Report.
There are no other likely environmental impacts as a result of the proposal.

10. How has the Planning Proposal adequately addressed any social or economic effects?

The introduction of 16 additional dwellings (or 7 more than currently permissible under the existing Lot Size Map), and, in particular, the dwellings on the 11 lots fronting Bent Street, will have some level of impact on residences on the north side of that street facing what is currently open space. However most of the dwellings on these existing lots are oriented towards the views over the valley to the north and Grafton with all their private open space on the northern side of their dwellings. In addition, all existing and any future dwellings have a minimum setback of 10 metres to Bent Street. Furthermore, it is proposed to retain the existing trees along the Bent Street frontage of the subject land, apart from any removal required for the driveways (see Appendix C).
The impact on existing amenity must be weighed against the need for the Golf Club to remain financially viable and continue to provide a social and community benefit. Should the Golf Club fail or the Golf Course close, the potential impact on the amenity of the locality could be significantly greater.
Traffic generated from the 16 future dwellings will be insignificant compared to current traffic movements on Bent Street in this location.
The proposed 16 lot subdivision which will result from this Planning Proposal will represent a more efficient use of the site at a density which is still identifiable as large lot residential as distinct from low density residential.
The works involved in construction of the subdivision and subsequent construction of dwellings will generate economic activity in the local community.
The development will utilise existing services infrastructure and any upgrading/extensions will be at the Golf Club's cost.
All relevant Council contributions will be paid.

Section D: State and Commonwealth Interests

11. Is there adequate public infrastructure for the planning proposal?

Yes.

The site has frontage to Bent Street, a fully formed bitumen sealed road which links directly to South Grafton and Grafton.
Water, sewer and telecommunications are available in the vicinity and will be extended to serve the proposed development.

12. What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway determination?

This section will be completed following consultation with the relevant authorities should the Planning Proposal proceed and those authorities are identified. As such, no consultation with such agencies has occurred to date.

Part 4: Community Consultation

This planning proposal has outlined the proposed amendments to the Clarence Valley Local Environmental Plan 2011 Lot Size Map to allow for a logical lot intensification within the South Grafton Heights Precinct, under the current R5 Large Lot Residential Zoning of the subject land.

This proposal is considered to be a relatively minor amendment which is in accordance with the Mid North Coast Regional Strategy, the Clarence Valley Settlement Strategy and the South Grafton Heights Precinct Strategy. Minimal impacts are foreseen as a result of this amendment, however, it is likely that this planning proposal will require public exhibition.

The Gateway Determination will specify the community consultation that must be undertaken on this Planning Proposal. The consultation will be tailored to specific proposals generally on the basis of a 14 day exhibition period for low impact Planning Proposals and a 28 day exhibition for all other planning proposals.

Low Impact Planning Proposal means a Planning Proposal that, in the opinion of the person making the Gateway Determination: is consistent with the pattern of surrounding land use zones and/or land uses; is consistent with the strategic planning framework; presents no issues with regard to infrastructure servicing; is not a principal Local Environmental Plan; and does not reclassify public land.

Having regard to the definition of Low Impact Planning Proposals and the scale, nature and issues relating to this Planning Proposal, it is submitted that it would be defined as a Low Impact Planning Proposal. Community consultation will be commenced by the placing of a public notice in the local newspapers and on the website of the Clarence Valley Council and/or Department of Planning. In addition, adjoining landowners will be notified in writing.

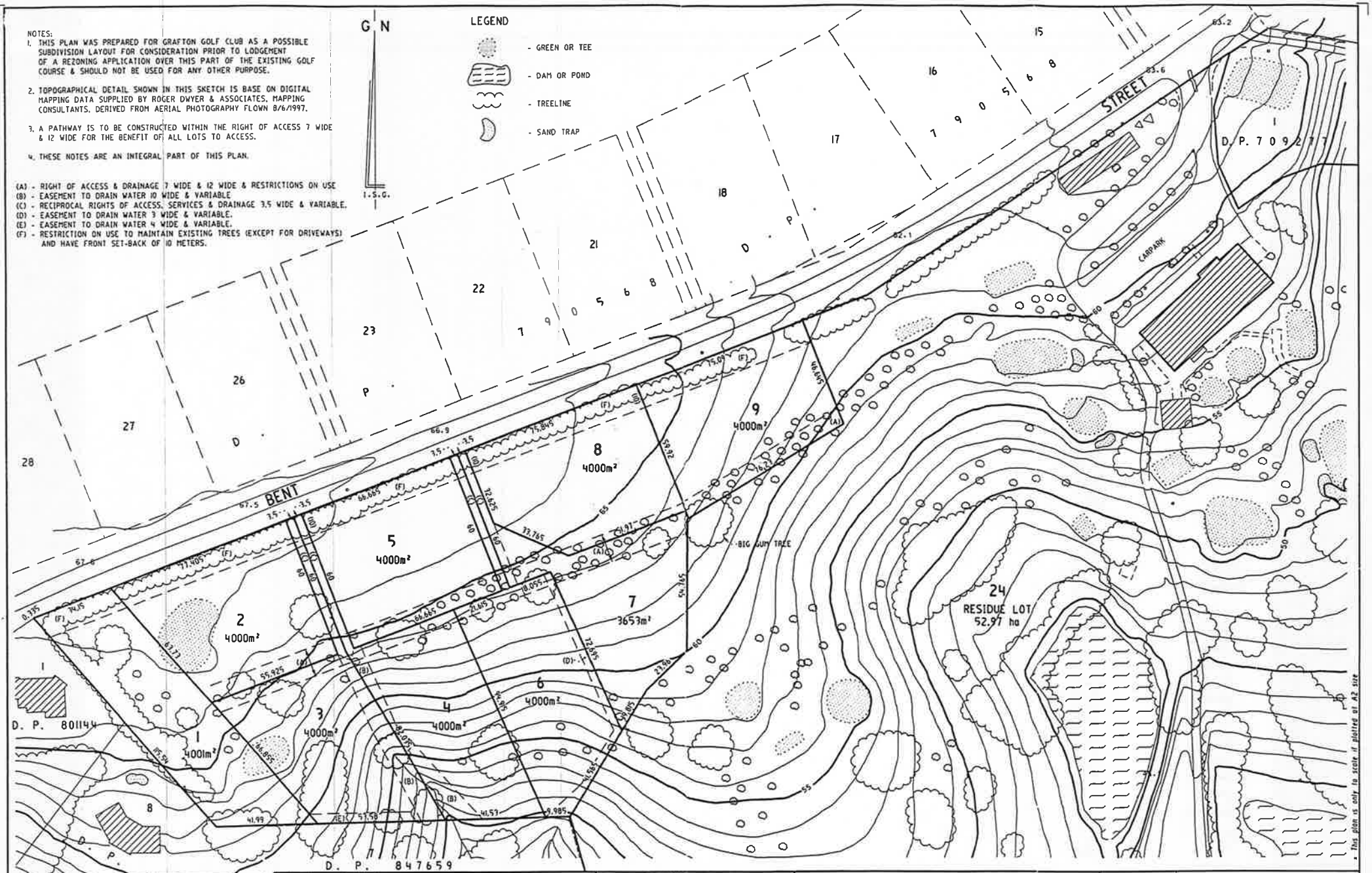
Normal exhibition material will be made available by the relevant planning authority during the exhibition period. The community consultation process will be completed when the relevant planning authority has considered any submissions received concerning the proposed Local Environmental Plan and has forwarded those reports to the Department of Planning for final consideration by the Minister.

Part 5: Mapping

The proposed seeks to amend the current Lot Size Map for the subject site as indicated in Appendix B.

Appendix A

Current Proposed 9 Lot Subdivision Plan (Dwg. No. 7520SKT4)



WATER	SEWER	DRAINAGE	TELECOM	GAS	ELEC.
CHKD	CHKD	CHKD	CHKD	CHKD	CHKD

REVISIONS					
Rev.	Date	Drn.	Chk.	Description	
A	20.11.07	JG	AF	ISSUED FOR COMMENT	

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Land and Engineering Surveyors
Development Consultants
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Ph (02) 6642 3300, Fax (02) 6642 5990
Email: afletcher@tay.net.au

PLAN OF PROPOSED SUBDIVISION OF LOT 4 DP 1013989
OPTION 4: RURAL RESIDENTIAL
GRAFTON GOLF COURSE, BENT STREET
SOUTH GRAFTON

CLIENT: GRAFTON DISTRICT GOLF CLUB LTD

SURVEY:	
DESIGN: AF	
DRAWN: JG	
DATE: 20.11.07	
SCALE: 1:1000	

DRAWING No. 7520SKT4

ORIGIN:
DATUM: A.H.D.
C.I.: 1.0m

Sheet No. 1 of 1 Sheets

CAD REFERENCE
Z:\7520\DGN\7520SKT4.dgn

Revision: A

Appendix B

Proposed Lot Size Map

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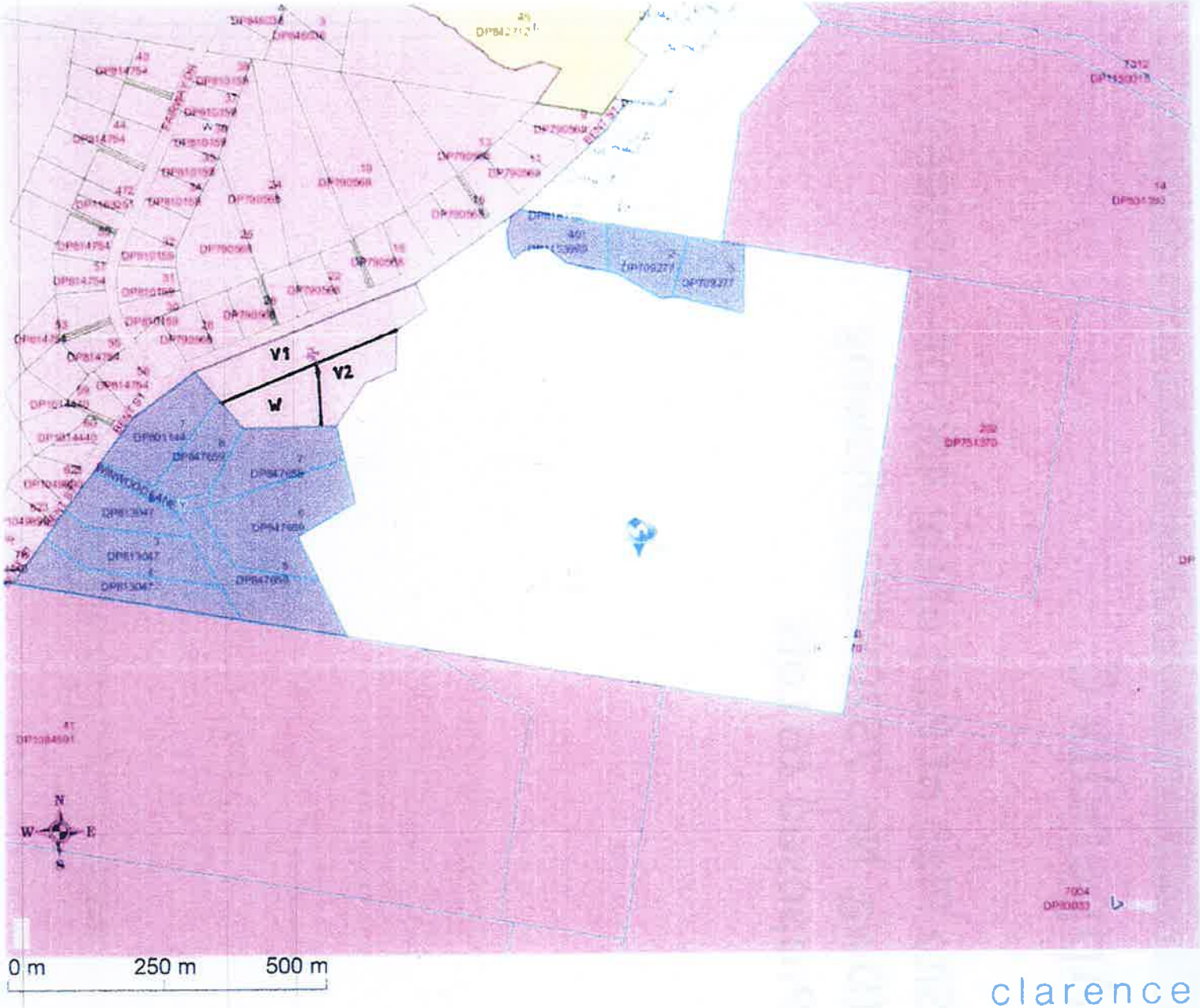
Proposed Minimum Lot Size Map

Legend

Minimum Lot Size (sq m)

- AA1 - 6ha
- AA2 - 9ha
- AB1 - 10ha
- AB2 - 15ha
- AB3 - 35ha
- AB4 - 40ha
- AD1 - 100ha
- AD2 - 150ha
- AE - 200ha
- R - 750m²
- U - 1000M²
- W - 4000m²
- X - 5000²
- Y - 1.5ha
- Z1 - 3ha
- Z2 - 4ha
- V1 - 1500m²
- V2 - 1800m²



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The information displayed is not survey accurate and should be used as a guide only.

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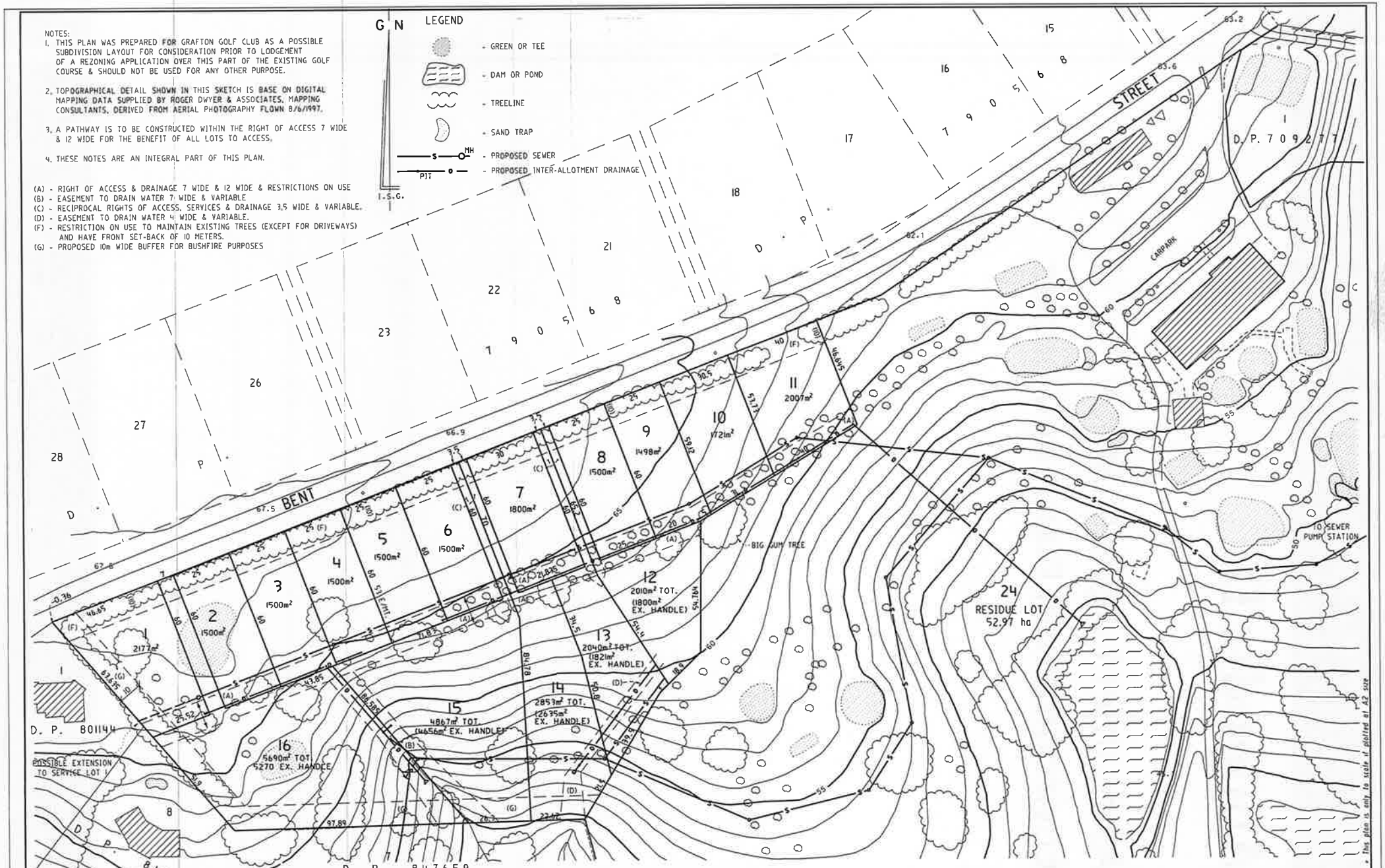
27-May-2016

Appendix C

Site Plan of Part of Lot 400 DP 1153969 (Dwg. No. 7520REZ2) showing Proposed 16 Lots



REVISIONS					
E	27-5-16	BF	AF	LOTS 17-19 DELETED TO GET LOT 16 LAYOUT
D	1.10.13	BF	AF	AMMEND LOTS 1,2,17,18,19 (LOTS 20-22 DELETED)
C	16.9.13	BF	AF	ALL LOTS AMENDED (EXCEPT LOTS 10-14) & EASEMENTS ADJUSTED
B	2.12.04	BPS	AF	SERVICES & EASEMENTS ADDED
A	8.5.03	BPS	AF	FIRST ISSUE
Rev.	Date	Drn.	Chk.	Description

WATER	SEWER	DRAINAGE	TELECOM	GAS	ELEC.
CHKD	CHKD	CHKD	CHKD	CHKD	CHKD

Liability limited by a scheme approved under Professional Standards Legislation.

A. FLETCHER & ASSOCIATES Pty. Ltd.
Land and Engineering Surveyors
Development Consultants
86 Victoria Street, P.O. Box 1213, Grafton, 2460
Ph.(02) 6642 3300. Fax (02) 6642 5990
Email: afletch@holkey.net.au

PLAN OF PROPOSED SUBDIVISION OF LOT 400 DP 1153969
OPTION REZONING 1
GRAFTON GOLF COURSE, BENT STREET
SOUTH GRAFTON

CLIENT: GRAFTON DISTRICT GOLF CLUB LIMITED

SURVEY:	
DESIGN: AF	
DRAWN: BPS	
DATE: 8-5-03	
SCALE: 1:1000	
ORIGIN: DATUM: A.H.D. C.I.: 1.0m	
CAD REFERENCE Z:\7520\Dgn\7520REZ2.dgn	

DRAWING No. 7520REZ2
Sheet No. 1 of 2 Sheets
Revision: E

Appendix D

Assessment Against State Environmental Planning Policies

Assessment Against State Environmental Planning Policies

Name of SEPP	Relevant?	Comment/statement of consistency
The following State Environmental Planning Policies (SEPPs) are current and are applicable to the Clarence Valley LGA and are required to be considered whether applicable or not in a particular circumstance.		
State Environmental Planning Policy No 1 - Development Standards	No	N/A
State Environmental Planning Policy No 14 - Coastal Wetlands	No	N/A
State Environmental Planning Policy No 15 - Rural Landsharing Communities	No	N/A
State Environmental Planning Policy No 19 - Bushland in Urban Areas	No	Clarence Valley Council not included
State Environmental Planning Policy No 21 - Caravan Parks	No	N/A
State Environmental Planning Policy No 26 - Littoral Rainforests	No	N/A
State Environmental Planning Policy No 29 - Western Sydney Recreation Area	No	N/A
State Environmental Planning Policy No 30 - Intensive Agriculture	No	N/A
State Environmental Planning Policy No 32 - Urban Consolidation (Redevelopment of Urban Land)	No	N/A
State Environmental Planning Policy No 33 - Hazardous and Offensive Development	No	N/A
State Environmental Planning Policy No 36 - Manufactured Home Estates	No	N/A
State Environmental Planning Policy No 39 - Spit Island Bird Habitat	No	N/A
State Environmental Planning Policy No 44 - Koala Habitat Protection	No	Although not a DA, the Flora and Fauna Assessment Report concludes that a Koala Management Plan is not required
State Environmental Planning Policy No 47 - Moore Park Showground	No	N/A

Name of SEPP	Relevant?	Comment/statement of consistency
State Environmental Planning Policy No 50 - Canal Estate Development	No	N/A
State Environmental Planning Policy No 52 - Farm Dams and Other Works in Land and Water Management Plan Areas	No	N/A
State Environmental Planning Policy No 55 - Remediation of Land	Yes	Complies. A list of fertilisers and pesticides used on the 10th green (being part of site) from 2004 to its closure in October, 2014 is attached at Appendix I. There is unlikely to be any residue from the chemicals which would require remediation.
State Environmental Planning Policy No 59 - Central Western Sydney Regional Open Space and Residential	No	N/A
State Environmental Planning Policy No 62 - Sustainable Aquaculture	No	N/A
State Environmental Planning Policy No 64 - Advertising and Signage	No	N/A
State Environmental Planning Policy No 65 - Design Quality of Residential Flat Development	No	N/A
State Environmental Planning Policy No 70 - Affordable Housing (Revised Schemes)	No	N/A
State Environmental Planning Policy No 71 - Coastal Protection	No	N/A
State Environmental Planning Policy (Affordable Rental Housing) 2009	No	N/A
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004	No	All future dwellings will comply
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008	No	N/A
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004	No	N/A
State Environmental Planning Policy	No	N/A

Name of SEPP	Relevant?	Comment/statement of consistency
(Infrastructure) 2007		
State Environmental Planning Policy (Kosciuszko National Park - Alpine Resorts) 2007	No	N/A
State Environmental Planning Policy (Kurnell Peninsula) 1989	No	N/A
State Environmental Planning Policy (Major Development) 2005	No	N/A
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007	No	N/A
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007	No	N/A
State Environmental Planning Policy (Penrith Lakes Scheme) 1989	No	N/A
State Environmental Planning Policy (Rural Lands) 2008	No	N/A
State Environmental Planning Policy (SEPP 53 Transitional Provisions) 2011	No	N/A
State Environmental Planning Policy (State and Regional Development) 2011	No	N/A
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	No	N/A
State Environmental Planning Policy (Sydney Region Growth Centres) 2006	No	N/A
State Environmental Planning Policy (Three Ports) 2013	No	N/A
State Environmental Planning Policy (Urban Renewal) 2010	No	N/A
State Environmental Planning Policy (Western Sydney Employment Area) 2009	No	N/A
State Environmental Planning Policy (Western Sydney Parklands) 2009	No	N/A
Deemed SEPP North Coast Regional Environmental Plan	No	Does not include Clarence Valley Council

Appendix E

South Grafton Heights Precinct Strategy

South Grafton Heights Precinct Strategy

Strategy	Action	Comments
A. Areas of Development		
A.1: New Urban residential development to be located adjacent to existing urban development, transport nodes and services, infrastructure, employment opportunities, business and community services before spreading to more remote locations	A.5: New urban residential development areas should be serviced by bus transport to provide options for residents to access shops, employment, business and community services in South Grafton and Grafton (Strategy A.1 and C.7	Regular bus services run along Bent Street past the subject site.
	A9. New urban residential subdivision will not be released until such time as Council is satisfied that necessary infrastructure, services and capacity are either provided or secured by appropriate contribution or similar arrangement	Necessary infrastructure is available to the site and appropriate contributions will be paid
A.2: Council should encourage increased residential development in existing urban areas compatible with local character, amenity and infrastructure requirements		Not directly applicable to this proposal, but it will result in increased large lot residential development
A.3 The provision of new infrastructure and services, or upgrading to capacity, should be paid by developers, where reasonable		The Golf Club will be responsible for all costs involved in providing infrastructure to fully service the site
A.4 Urban development should avoid land containing prime agricultural lands, deposits of significant resources, natural hazards (acid sulphate soils, bushfire risk, flooding etc.) major infrastructure (e.g. transmission lines, sewerage treatment plants etc.), contaminated land, significant cultural heritage values, significant natural features or environmental values	A12: The Grafton Bush Fire Prone Land Map should be modified in consultation with the NSW Rural Fore Service to more accurately reflect bush fire hazard in the precinct (Strategy A4)	The Bushfire Constraints Assessment Report (Appendix H) concludes that the proposal complies with the relevant controls.
	A14. The Bushfire Constraints Assessment Report (Appendix H) concludes that the proposed development is capable of complying with APZ requirements	The Bushfire Constraints Assessment Report (Appendix H) concludes that the proposed development is capable of complying with APZ requirements.

Strategy	Action	Comments
B. Local Character & Amenity		
B.1: The density and character of new urban residential and rural residential development should be compatible with the existing development of that type in the Precinct	B.1a: Any future rural-residential subdivision of the golf course land (subject to rezoning application/planning proposal) should maintain a frontage of all allotments fronting Bent Street, excluding battle-axe allotments, in the order of 40 metres (Strategy B.1)	The proposed 16 lot subdivision associated with the proposal includes 11 lots fronting Bent Street, 9 of which have 25 metre frontages, 1 of 30.5m and 1 of 40m. These frontages are required to achieve the desired outcome of a more efficient and viable development with higher densities along the prime street frontage. Action B.1a may need to be reviewed to reflect the subdivision pattern proposed. There are currently some 14 R5 lots with areas less than 4000m^2 (the majority around 2000m^2) within the Fairway Estate. In each instance Council accepted the smaller R5 lots were appropriate development and provided a mix of lot sizes in the locality without compromising its character. The same conclusion can be drawn about the proposed 16 lot subdivision which would result from approval of this proposal.
B.2: Lands should be developed efficiently to avoid wastage of valuable land resources and reduce the urban footprint of South Grafton		The smaller lots proposed in the 16 lot subdivision represent a more efficient use of a valuable land resource
B.3: Incompatible, or potentially conflicting land uses should be separated by appropriate buffers		Appropriate bushfire APZ's have been provided in the proposed 16 lot layout. See Appendix C. The subdivision is not incompatible with adjoining land uses.
B.4: Natural habitat should be enhanced and incorporated into corridors that allow for multiple uses		The Flora and Fauna Assessment Report (Appendix G) recommends mitigative measures to protect identified ecological features found at or in proximity of the site, including minimising the removal of native trees
B.5 New Urban		N/A
C. Legislation & Guidelines		
Do not directly relate to this Planning Proposal; compliance of the proposed subdivision with relevant Strategies and Actions will be assessed at the Development Application stage		

Strategy	Action	Comments
D. Input into Regional Strategy		
D1: Planning should be compatible with the **outcomes** of the Mid North Coast Regional Strategy	D1. This strategy should be incorporated into the local growth management strategy for the Clarence Valley LGA prepared in accordance with the Mid North Coast Regional Strategy (Strategy D.1)	The proposal is compatible with the outcome of the MNCRS. See Section B.4 in the proposal. This is an action for Council

Appendix F

Assessment Against S117 Ministerial Directions

Assessment Against S117 Ministerial Directions

Section 117 Direction	Applies?	Comments
1. Employment and Resources		
1.1 Business and Industrial Zones	No	
1.2 Rural Zones	No	
1.3 Mining, Petroleum Production and Extractive Industries	No	
1.4 Oyster Aquaculture	No	
1.5 Rural Lands	No	
2. Environment and Heritage		
2.1 Environmental Protection Zones	No	
2.2 Coastal Protection	No	
2.3 Heritage Conservation	No	
2.4 Recreation Vehicle Areas	No	
3. Housing, Infrastructure and Urban Development		
3.1 Residential Zones	Yes	The Direction objectives encourage a variety of housing types, efficient use of infrastructure and services and minimising the impact of residential development on the environment and resources. The Proposal complies with all 3 objectives. Complies
3.2 Caravan Parks and Manufactured Home Estates	No	
3.3 Home Occupations	No	
3.4 Integrated Land Use and Transport	Yes	The Direction objectives encourage access to public transport, cycling & walking to reduce dependence on cars. The site is located on a bus route and the road network links directly to commercial and employment centres in the locality Complies
3.5 Development Near Licensed Aerodromes	No	
4. Hazard and Risk		
4.1 Acid Sulfate Soils	No	The Acid Sulphate Soil map indicates no A.S.S's on the site
4.2 Mine Subsidence and Unstable Land	No	

Section 117 Direction	Applies?	Comments
4.3 Flood Prone Land	No	
4.4 Planning for Bushfire Protection	Yes	The Bushfire Constraints Assessment Report (Appendix H) concludes that the proposed subdivision will comply with all relevant controls including APZ requirements.
5. Regional Planning		
5.1 Implementation of Regional Strategies	Yes	The proposal is considered consistent with the MNCRS, see Section B.4.
5.2 Sydney Drinking Water Catchments	No	
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	No	
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	No	
5.5 Development in the Vicinity of Ellalong, Paxton and Milifield (Cessnock LGA)	No	
5.6 Sydney to Canberra Corridor	No	
5.7 Central Coast	No	
5.8 Second Sydney Airport: Badgerys Creek	No	
6. Local Plan Making		
6.1 Approval and Referral Requirements	No	No referral or concurrence requirements proposed by the proposal
6.2 Reserving Land for Public Purposes	No	
6.3 Site Specific Provisions	No	
7. Metropolitan Planning		
7.1 Implementation of the Metropolitan Plan for Sydney 2036	No	

Appendix G

Flora & Fauna Assessment by Land & Fire Assessments, dated May, 2015

Land & Fire Assessments Pty Ltd

PO BOX 104
Wardell
NSW 2477
ACN 160 897 343
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Flora and Fauna Assessment

For Proposed Rezoning of Part Lot 400 DP1153969, 425 Bent Street, SOUTH GRAFTON, NSW

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Land & Fire Assessments Pty Ltd
For: Grafton District Golf Club Limited
Project No.: LFA15007
Date: 11 May 2015

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Revision List

Revision No.	Revision date	Report Title	Report Author	Field work by	Status
00	05.05.2015	Flora and Fauna Assessment For Proposed Rezoning of Part Lot 400 DP1153969, 425 Bent Street, SOUTH GRAFTON, NSW	Principal Author: Tony Coyle (Senior Ecologist – 0427 483 099)	Tony Coyle	Draft for review
01	11.05.15		Review & Edits: Paola Rickard (Senior Environmental Planner – 0427 809 352)		Final

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TABLE OF CONTENTS

1. Introduction and Background

1.1 Introduction

Land & Fire Assessments Pty Ltd (LFA) has been commissioned by the Grafton District Golf Club Limited to undertake a Flora and Fauna Assessment for a rezoning submission of Part Lot 400 DP1153969, 425 Bent Street, South Grafton, NSW.

The land, as shown on Figs. 1 and 2, is located in the Clarence Valley Council (CVC) Local Government Area. This assessment is required to accompany a proposed planning proposal to increase the density of the currently zoned 'R5 - Large Lot Residential' portion of the golf course from 9 lots to 16 lots as shown on Fig. 2.

Native vegetation on the Site comprises linear strips of mature trees and shrubs that are found either side of two open grassland areas that comprised former fairways of the golf course.

The assessment will describe the potential impacts on both flora and fauna posed by the rezoning, and if required will recommend mitigation measures to ameliorate impacts.

This assessment is in three parts:

- The first part (Sections 1 to 4) outlines the sites geophysical and zoning characteristics, the methodology, the site assessments undertaken, and the results of the relevant desktop searches and findings.
- The second part (Section 5) addresses relevant environmental legislation, which must be addressed in future proposals to develop the site.
- The third part (Sections 6 to 7) addresses the ecological values of the site and identifies ecological constraints of relevance to any rezoning process, provides a summary assessment of potential impacts of rezoning the site, outlines recommended ameliorative measures, and presents a conclusion statement and a reference list.

1.2 Subject Site

The Subject Site (or the Site) for the purpose of this assessment is Part Lot 400 DP1153969, 425 Bent Street, South Grafton NSW, as shown on Fig. 2. The combined area of the Site is 3.3963 ha. The Site occurs on the southern-western edge of South Grafton. Landuse in the general locality comprises large residential allotments and rural holdings.

Native vegetation in the locality comprises linear strips of trees and shrubs associated with fairways of the Grafton District Golf Course and scattered areas of remnant forest and woodland associated with rural and residential properties. The scattered remnant and regrowth native vegetation in the locality comprises a loose corridor that connects more extensive areas of forest to the east and west of Grafton.

1.3 Proposed Development

The planning proposal comprises the rezoning of land currently zoned R5 - Large Lot Residential (CVLEP 2011). The proposal will see the creation of 16 Lots ranging in size from 1,498 m^2 to 5,690m^2 (refer Fig. 3). Removal of native vegetation associated with the proposal would be limited to the removal of trees along the edge of the Site adjacent to Bent Street to allow the creation of driveway access points, and removal of vegetation (if required) associated with creating necessary asset protection zones for dwellings.

Figure 1. Subject Site relative to other locations in the broader locality (Source: SixMaps 2015)

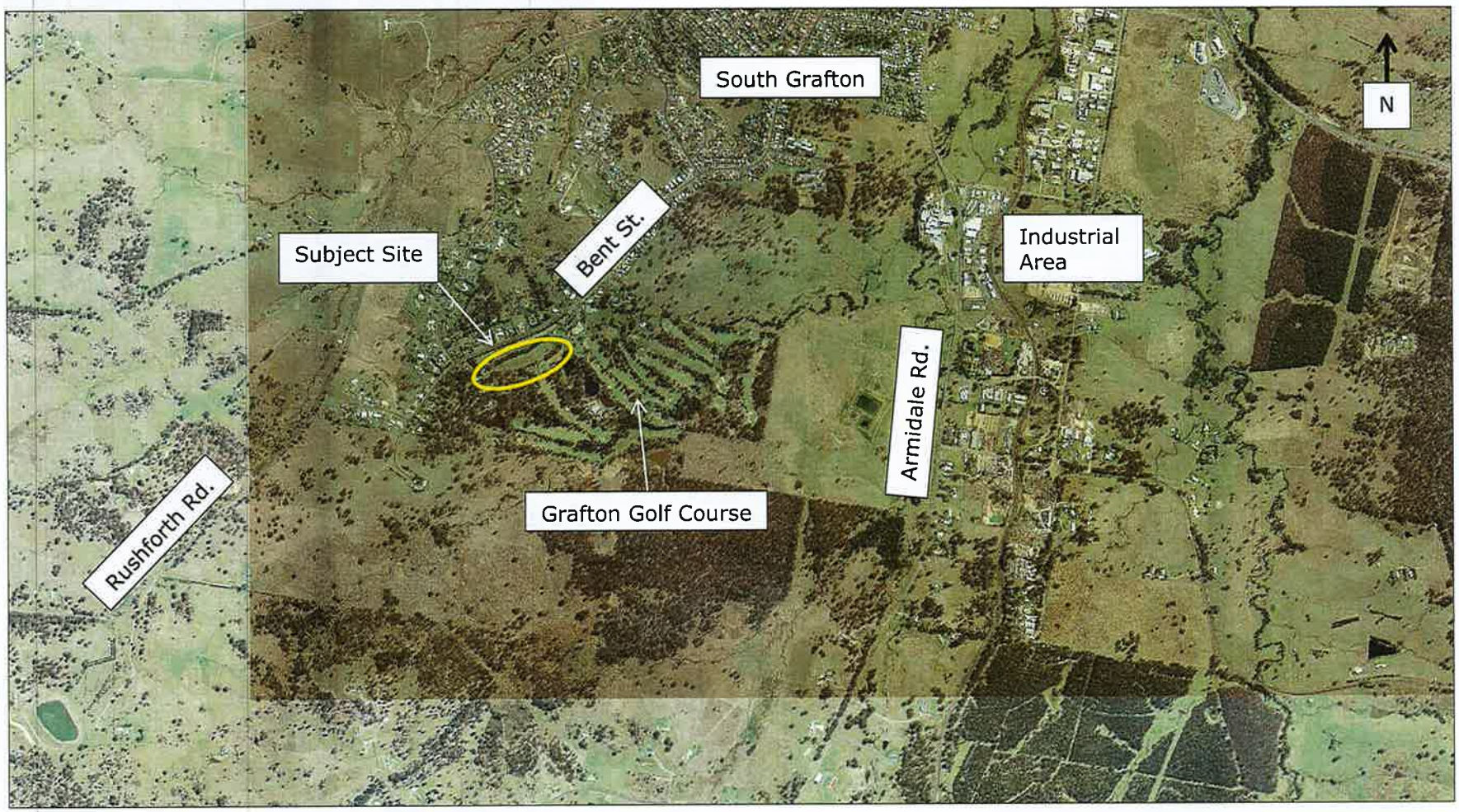

Figure 2. Subject Site relative to surrounding landuse and main roads (Source: SixMaps 2015)

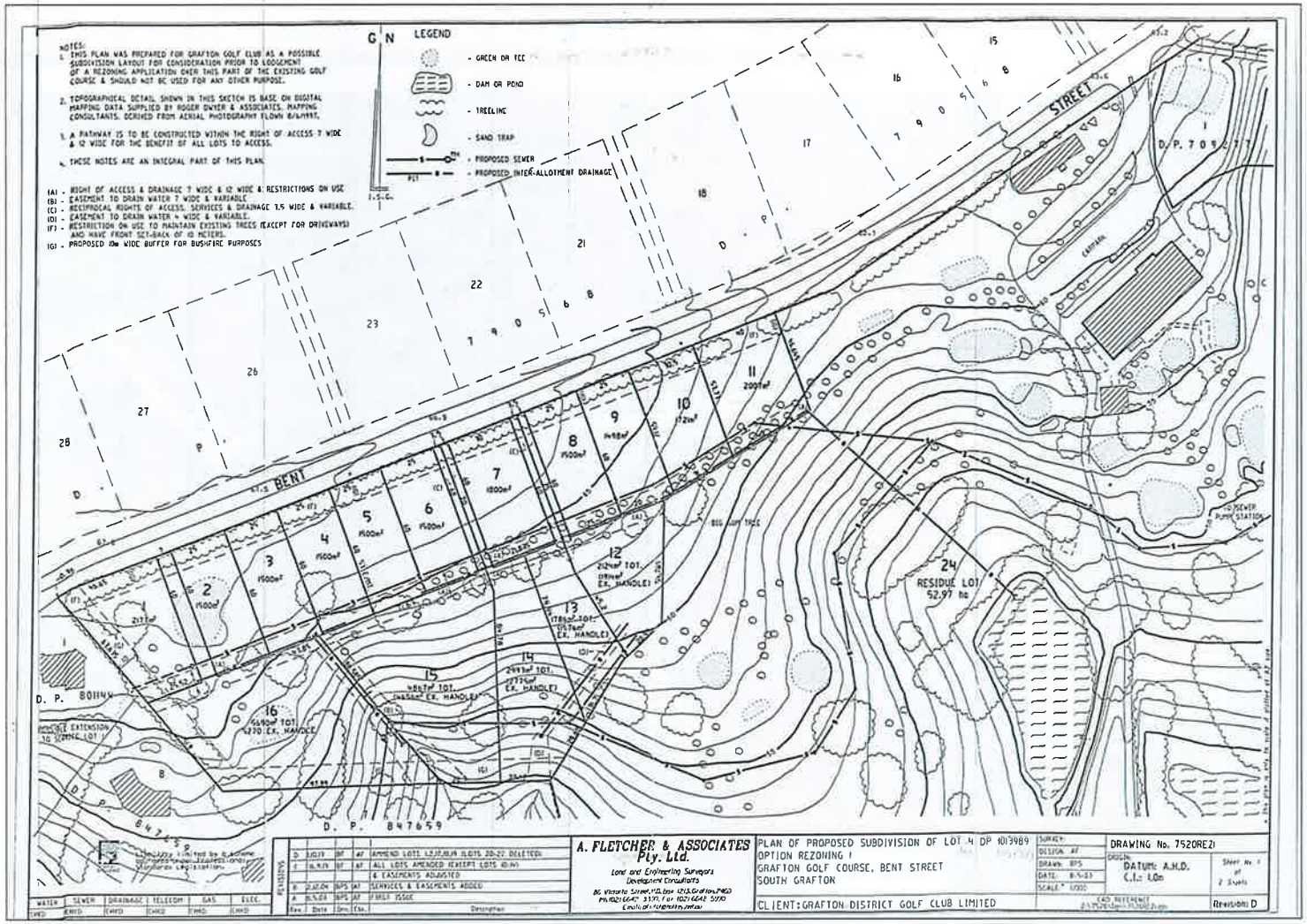

Figure 3. Proposed site layout (Source: A. Fletcher & Associates 2015)

2. Methods

2.1 General Investigation Methodology

The methodology used to conduct this assessment included the following:

1. Review of the NSW Office of Environment and Heritage Wildlife Atlas records (NSW OEH 2015) for the Koala, Endangered Populations and other species listed as threatened in the NSW *Threatened Species Conservation Act 1995* (TSC Act)
2. Search of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters database (SEWPAC 2015)
3. Walking survey of the Site to identify and describe flora communities present and to search for threatened flora, Endangered Ecological Communities (EECs) and threatened fauna habitat
4. Undertake five Spot Assessment Technique (SAT) plots (Phillips and Callaghan 2008)
5. Identification of possible adverse impacts from the proposed rezoning on existing flora and fauna, and the development of mitigation measures.

2.2 General Field Survey Approach and Effort

Field surveys were undertaken by Tony Coyle and Paola Rickard on 24 Aprilth 2015.

2.2.1 Flora Survey

An initial desktop review (refer s.3.1) was undertaken to identify threatened flora and EECs previously recorded on the NSW Wildlife Atlas within a 10 x 10 km area of the site. Vegetation mapping available through VIS Classification was accessed to provide an indication of plant community types within the locality. Aerials images available on GoogleMaps and SixMaps were reviewed to cross reference VIS Classification vegetation mapping prior to the Site visit.

The aim of the field survey was to identify and describe plant community occurrence and to search for threatened flora and EECs. Site surveys comprised meandering transects across the Site and the recording of floristic data from the vegetation communities present and directly adjacent.

Total field effort for the meandering transects was 2 person hours, which also included fauna habitat surveys (refer s.2.2.2).

2.2.2 Fauna Habitat Survey

An initial desktop review (refer s.3.2) was undertaken to identify threatened fauna previously recorded on the NSW Wildlife Atlas within a 10 x 10 km area of the site, or with potential to occur at the Site based on a review of aerial images of the Site.

Field inspections were undertaken in order to determine the likelihood of threatened species occurring based on the available habitat. Opportunistic observations of fauna species were recorded also. The full extent of the Site was traversed as far as practical.

Koala Habitat Searches

Spot Assessment Technique (SAT) plots were undertaken on approximately 150 m x 150 m grid centres across the Site. Five SAT plots were undertaken (refer to Fig. 4).

Figure 4. Location of SAT plots, habitats and the Grey-crowned Babbler nest near the Site. (Source: SixMaps 2015)

3. Results – Desktop Review

3.1 Threatened Flora

Four threatened plant species have been recorded previously on the *NSW Wildlife Atlas* within the 10 x 10 km search area. These species and their threatened listing status under the TSC ACT and the EPBC Act are listed in Table 1, as well as a brief discussion on the potential to occur at the Site.

Table 1. Threatened flora species recorded previously on the NSW Wildlife Atlas (V = Vulnerable; E= Endangered)

Common Name	Scientific Name	TSC Status	EPBC Status	Habitat Requirements	Likelihood To Occur at the Site
Spiny Mint-Bush	*Prostanthera spinosa*	V	n/a	Occurs on elevated sites with shallow soils derived from sandstone and on deeper alluvial sands besides watercourses	**Low** – site is elevated, however soils are not shallow. Understorey is cleared
Sandstone Rough-barked Apple	*Angophora robur*	V	V	Dry open forest in sandy or skeletal soils on sandstone, or occasionally granite, with frequent outcrops of rock	**Low** –soils are not skeletal. Conspicuous tree, not detected
Square-fruited Ironbark	*Eucalyptus tetrapleura*	V	V	Dry or moist eucalypt forest on moderately fertile soil, often in low areas with poor drainage	**Low** – Conspicuous tree, not detected
Rusty plum	*Neimeyera whitei*	V	n/a	Rainforest and adjoining moist eucalypt forest	**Low** – no suitable habitat on site

No threatened plant populations or Endangered Ecological Communities were recorded on the Atlas.

Based on a review of the plant species listed in the Atlas relative to the habitat that occurs at the Site, none of the four species are considered likely to occur at the Site or on adjoining land (refer to Table 1).

3.2 Threatened Fauna

Thirty-eight threatened fauna species and one endangered population have been recorded previously on the *NSW Wildlife Atlas* within the 10 x 10 km search area. These species, the endangered population and their threatened listing status under the TSC ACT and the EPBC Act are listed in Table 2, as well as a brief discussion on the potential to occur at the Site or on adjoining land.

Table 2. Threatened fauna species and populations recorded previously on the NSW Wildlife Atlas (V = Vulnerable; E= Endangered)

Common Name	Scientific Name	TSC Status	EPBC Status	Habitat Requirements	Likelihood To Occur at the Site
Aves					
Red Goshawk	*Erythrotriorchis radiatus*	E	V	Along or near watercourses, swamp forest and woodlands on the coastal plain	**Medium** – the Site and adjoining areas comprises woodland/open forest
Little Eagle	*Hieraaetus*	V	n/a	Open eucalypt forest,	**Medium** – the Site

Common Name	Scientific Name	TSC Status	EPBC Status	Habitat Requirements	Likelihood To Occur at the Site
	morphnoides			woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used	and adjoining areas comprises woodland/open forest
Square-tailed Kite	*Lophoictinia isura*	V	n/a	Dry woodland and open forest, particularly along major rivers and belts of trees in urban or semi-urban areas. Home range can extend over at least 100 km^2	**Medium** – the Site and adjoining areas comprises woodland/open forest
Eastern Osprey	*Pandion cristatus* (formerly *Pandion haliaetus)*	V	n/a	Forage for fish in fresh, brackish or saline waters of rivers, lakes, estuaries with suitable nesting sites nearby	**Low** - no suitable habitat present on or adjoining the Site
Magpie Goose	*Anseranas semipalmata*	V	n/a	Shallow wetlands (<1 m deep), large swamps and dams with dense growth of rushes or sedge	**Low** - no suitable habitat present on or adjoining the Site
Bush Stone-curlew	*Burhinus grallarius*	E	n/a	Lightly timbered open forest and woodland, and partly cleared farmland with woodland remnants, preferring areas with dry leaf-litter, fallen timber and sparse ground cover	**Medium** – suitable habitat is limited on Site due to the cleared understorey and maintained grounds, however suitable habitat does occur in the locality
Emu population in the NSW North Coast Bioregion and Port Stephens LGA	*Dromaius novaehollandiae*	E	n/a	Open forest, woodland, coastal heath, coastal dunes, wetland areas, tea tree plantations and open farmland, and occasionally in littoral rainforest	**Low** - suitable habitat is limited on Site due to the cleared understorey and maintained grounds
Black-necked Stork	*Ephippiorhynchus asiaticus*	E	n/a	Swamps, mangroves, mudflats, dry floodplains	**Low** - no suitable habitat present on or adjoining the Site
Brown Tree Creeper	*Climacteris picumnus*	V	n/a	Eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range, and less commonly on coastal plains and ranges	**Medium** – the Site and adjoining areas comprises woodland/open forest
Diamond Firetail	*Stagonopleura guttata*	V	n/a	Grassy eucalypt woodlands, open forest, mallee, temperate grassland, and secondary grassland derived from other communities, riparian areas, and sometimes in lightly wooded farmland	**Medium** – the Site and adjoining areas comprises woodland/open forest
Pied Oystercatcher	*Haematopus longirostris*	E	n/a	Open beaches, intertidal flats, sandbanks and occasionally rocky headlands	**Low** - no suitable habitat present on or adjoining the Site
Comb-crested	*Irediparra*	V	n/a	Among vegetation floating on	**Low** – no suitable

Common Name	Scientific Name	TSC Status	EPBC Status	Habitat Requirements	Likelihood To Occur at the Site
Jacana	*gallinacea*			slow-moving rivers and permanent lagoons, swamps, lakes and dams	habitat on Site, however suitable habitat could occur in the locality on golf course/farm dams etc
White Tern	*Gygis alba*	V	n/a	Marine environments, coastal tall open forest up to 1 km inland	**Low** - no suitable habitat present on or adjoining the Site
Sooty Tern	*Sterna fuscata*	V	n/a	Breeds in large colonies in sand or coral scrapes on offshore islands and cays including Lord Howe and Norfolk Islands	**Low** - no suitable habitat present on or adjoining the Site
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V	n/a	Drier open forests or woodlands dominated by box and ironbark eucalypts, and open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees	**Medium** – the Site and adjoining areas comprises woodland/open forest with Ironbark and Grey Box as co-dominant tree species
Varied Sittella	*Daphoenositta chrysoptera*	V	n/a	Inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland	**Medium** – the Site and adjoining areas comprises woodland/open forest
Speckled Warbler	*Pyrrholaemus saggitatus*	V	n/a	Eucalyptus dominated communities with sparse shrubs and grassy understorey. Favours deep, permanent, well vegetated freshwater swamps especially with beds of *Typha* sp	**Medium** – the Site and adjoining areas comprises woodland/open forest with sparse understorey
Flame Robin	*Petroica phoenicea*	V	n/a	Dry forests, open woodlands,, pastures, native grasslands and occasionally occurs in temperate rainforest, herbfields, heathlands, shrublands and sedgelands at high altitudes	**Medium** – the Site and adjoining areas comprises woodland/open forest with sparse understorey
Scarlet Robin	*Petroica boodang*	V	n/a	Dry eucalypt forests and woodlands, usually with an open grassy understorey with few scattered shrubs. An abundance of logs and fallen timber appear to be an important habitat feature for this species	**Medium** – the Site and adjoining areas comprises woodland/open forest with sparse understorey, however there is a lack of fallen debris and logs at the Site
Grey-crowned Babbler	*Pomatostomus temporalis temporalis*	V	n/a	Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains	**Detected** – a nesting pair observed utilising trees and grassland in the golf

Common Name	Scientific Name	TSC Status	EPBC Status	Habitat Requirements	Likelihood To Occur at the Site
					course carpark.
Little Lorikeet	*Glossopsitta pusilla*	V	n/a	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri	**Medium** – the Site and adjoining areas comprises woodland/open forest with sparse understorey
Masked Owl	*Tyto novaehollandiae*	V	n/a	Dry eucalypt forest and woodlands	**Medium** – the Site and adjoining areas could be utilised as foraging habitat. No tree hollows observed onsite for nesting
Mammals					
Spotted-tailed Quoll	*Dasyurus maculatus maculatus*	V	E	Dry and moist eucalypt forests and rainforests, fallen hollow logs, large rocky outcrops	**Medium** – the Site and adjoining areas comprises woodland/open forest with sparse understorey. No suitable denning habitat onsite
Brush-tailed Phascogale	*Phascogale tapoatafa*	V	n/a	Drier forests and woodlands with hollow-bearing trees and sparse ground cover	**Medium** – the Site and adjoining areas could be utilised as foraging habitat. No tree hollows observed onsite for nesting/shelter
Koala	*Phascolarctos cinereus*	V	V	Appropriate food trees in forests and woodlands, and treed urban areas.	**High** – Known to occur in the locality, particularly along the creekline at the southern end of the golf course
Squirrel Glider	*Petaurus norfolcensis*	V	n/a	Blackbutt, bloodwood and ironbark eucalypt forest with heath understorey in coastal areas, and box-ironbark woodlands and River Red Gum forest inland.	**Medium** - the Site and adjoining areas could be utilised as foraging habitat. No tree hollows observed on Site for nesting/shelter
Rufous Bettong	*Aepyprymnus rufescens*	V	n/a	Tall moist eucalypt forest to open woodland with tussock grass understorey.	**Low** – no suitable habitat on Site due to cleared understorey. Potentially would utilise nearby habitat with tall grassy understorey
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	n/a	Forages in a variety of habitats, roosts in tree hollows and buildings.	**Medium** – the Site and adjoining areas could be utilised as

Common Name	Scientific Name	TSC Status	EPBC Status	Habitat Requirements	Likelihood To Occur at the Site
					foraging habitat. No tree hollows observed onsite for roosting
Eastern Freetail-bat	*Micronomus norfolkensis*	V	n/a	Occurs in dry sclerophyll forest and woodland east of the Great Dividing Range. Roosts in tree hollows.	**Medium** – the Site and adjoining areas could be utilised as foraging habitat. No tree hollows observed on Site for roosting
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops	**High** – likely to utilise trees on Site during flowing episodes
Hoary Wattled Bat	*Chalinolobus nigrogriseus*	V	n/a	Dry open eucalypt forest dominated by spotted gum, boxes and ironbarks. Also healthy coastal forests where Red Bloodwood and Scribbly Gum are common. Naturally sparse understorey is favourable	**Medium** – suitable foraging habitat present. No tree hollows observed on Site for roosting
Little Bentwing-bat	*Miniopterus australis*	V	n/a	Moist eucalypt forest, rainforest and dense coastal scrub	**Medium** – suitable foraging habitat present. No caves or rock overhangs present for roosting
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	V	n/a	Forest or woodland, roost in caves, old mines and stormwater channels.	**Medium** – suitable foraging habitat present. No caves or rock overhangs present for roosting
Southern Myotis	*Myotis macropus*	V	n/a	Bodies of water, rainforest streams, large lakes, reservoirs.	**Medium** – no suitable foraging habitat present on Site, however suitable habitat at the dam on the golf course. No caves, rock overhangs or structures present on Site for roosting
Greater Broad-nosed Bat	*Scoteanax rueppellii*	V	n/a	Woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest	**Medium** – suitable foraging habitat present. No tree hollows observed on Site for roosting
Eastern Cave Bat	*Vespadelus troughtoni*	V	n/a	Cave roosting species found in dry open forest and woodland near cliffs and rocky overhangs	**Medium** – suitable foraging habitat present. No caves or rock overhangs present for roosting

Common Name	Scientific Name	TSC Status	EPBC Status	Habitat Requirements	Likelihood To Occur at the Site
Amphibians					
Wallum Froglet	*Crinia tinnula*	V	n/a	Acid paperbark and sedge swamps known as 'wallum', this is a banksia-dominated lowland heath ecosystem characterised by acidic waterbodies	**Low** – no suitable habitat present on or adjoining the Site
Reptiles					
White-crowned Snake	*Cacophis harriettae*	V	n/a	Low to mid-elevation dry eucalypt forest and woodland with well-developed litter layer	**Low** - understorey cleared at the Site
Pale-headed Snake	*Hoplocephalus bitorquatus*	V	n/a	Dry eucalypt forests and woodlands, cypress woodland and occasionally in rainforest or moist eucalypt forest. Favours streamside areas, particularly in drier habitats	**Low** - understorey cleared at the Site
Three-toed Snake-tooth Skink	*Coeranoscincus reticulatus*	V	V	Rainforest and occasionally moist eucalypt forest, on loamy or sandy soils	**Low** – no suitable habitat on Site

3.3 Fauna Corridors for North East NSW

Neither the Site nor adjoining land is mapped as a fauna corridor under the *Fauna Corridors for North East NSW*. The nearest corridor occurs south of the Site along the southern boundary of the Golf Course. The mapped corridor links Bom Bom State forest with extensively forested areas to the west.

4. Results - Site Assessment

4.1 Flora

4.1.1 Vegetation Description

Vegetation at the Site consists of two rows of planted trees comprising predominantly Slash Pine (*Pinus elliotii*), Tallowwood (*Eucalyptus microcorys*) and Ironbark (*E. siderophloia*). Callistemon and Melaleuca shrubs are planted intermittently amongst the trees. As the Site was previously the 10th and 11th holes of the golf course, groundcover is limited to maintained grassland (refer to Plates 1 & 2). Flora species list is provided in Appendix A.

Plate 1. View looking east along the northern boundary with Bent Street

Plate 2. View looking south-west along the southern boundary and central portion of the Site

A number of large and small remnant trees also occur including Forest Red Gum (*E. tereticornis*), Spotted Gum (*Corymbia henryi*) and Grey Box (*E. moluccana*). The location of these trees generally coincides with the planted rows as described above. The southern portion of the Site comprises a moderate slope to the west that supports remnant/regrowth open forest/woodland comprising

Spotted Gum, Ironbark, Grey Box and Forest Red Gum. The understorey in this area contains a mixture of native and introduced grasses and weeds including Lantana (*Lantana camara*) and Farmers Friends (*Bidens pilosa*) (refer Plates 3 & 4)

Plate 3. View looking south-east at the remnant/regrowth open forest/woodland

Plate 4. View looking south-west at the remnant/regrowth open forest/woodland

4.1.2 Conservation Significance

No threatened flora species or Endangered Ecological Communities (EECs) were detected on or adjacent to the Site.

4.2 Fauna

4.2.1 Habitat Description

Fauna habitats at the Site are shown in Fig. 4 and include the following:

Maintained Open Grassland
Mixed mown grasses.

Windrows of planted trees/shrubs and mature remnant/regrowth
Two windrows of trees and shrubs that comprise predominantly planted Slash Pine, Tallowwood and Ironbark and remnant/regrowth Spotted Gum, Forest Red Gum and Grey Box with a very short understorey of maintained grass. No fallen timber or bush rock.

Regrowth/Remnant Open Forest/Woodland
Remnant/regrowth Spotted Gum, Ironbark, Forest Red Gum and Grey Box. Trees mostly small to medium in size. No tree hollows observed. Understorey of mixed grasses and weeds.

4.2.2 Fauna Occurrence and Usage

Fauna recorded at the Site are listed in Appendix B.

Birds
The grassland at the Site offers foraging habitat for several common bird species such as magpies and mudlarks, however due to the lack of structural features such as scattered shrubs in the understorey, grass tussocks, fallen timber and leaf litter, woodland/forest birds are unlikely to utilise the Site on a regular basis. These features would otherwise provide foraging habitat for a number of threatened woodland birds recorded previously in the locality such as the Bush Stone-Curlew, Brown Treecreeper, Rose Robin, Flame Robin, Speckled Warbler, Diamond Firetail and Varied Sittella.

Pair of threatened Grey Crowned Babbler birds were observed attending a nest and foraging in the carpark area of the Golf Club (Plates 5 & 6 and Fig. 4), which is located to the east of the Site. Two babblers were also observed moving through the trees within the Site during the site survey, however no nests were observed.

Plate 5 (Left). Grey Crowned Babbler birds in carpark area
Plate 6 (Below). Grey Crowned Babblers' nest in the carpark

Nesting opportunities for birds is limited to nest building species, as no tree hollows were observed on Site or on land directly adjoining the Site. The only nest observed was that of the Grey Crowned Babbler, the nest being located offsite within the Golf Course carpark area.

The variety of mature trees provides foraging resource for nectar feeding birds throughout the year/seasons. It is possible that groups of threatened species such as the Black-chinned Honeyeater and Little Lorikeet would utilise the trees at the Site periodically, particularly during flowering events.

The Site does offer foraging habitat for a number of threatened birds of prey, including the Masked Owls, Red Goshawk, Square Tailed Kite and Little Eagle. All of these birds have very large territories; therefore, the Site would contribute only a very small portion to any given foraging territory. No habitat features such as very large old growth trees or large tree holes occur at the Site that would offer suitable nesting opportunities for any of these species.

There is a low likelihood of Emus occurring at the Site, due to the limited habitat features required by the species such as a diversity of native flowering/fruiting plants, grass seeds or habitat supporting insects such as grasshoppers.

Ground-dwelling Mammals

The grassland areas of the Site does offer suitable grazing habitat for the Eastern Grey Kangaroo (Plate 7) and other species known to utilise modified grasslands such wallabies, bandicoots, rabbits and hares. The lack of tall grass at the Site limits the likely occurrence of threatened macropods such as the Rufous Bettong.

Plate 7. Eastern Grey kangaroo foraging at the Site

The lack of habitat features such as fallen logs and rock shelves limits the potential for threatened species such as Spotted-tailed Quolls to attend the Site. The potential remains however due to the Sites loose connection with larger forested areas via scattered woodland and open forests further to the south, and the large home range of this species.

Arboreal Mammals

Threatened species with the potential to utilise trees on the Site include the Brush-tailed Phascogale, Squirrel Glider and Koala. The open understorey at the Site would be attractive to Phascogales; however, the absence of tree hollows for nesting reduces its likely occurrence. Utilisation of the Site by Squirrel Gliders would be opportunistic at best due to the absence of banksia and acacia as an understorey stratum, as well as the absence of large mature trees with hollows for nesting.

Koalas

Koalas are known to occur in the locality, and are sighted occasionally further to the south in trees occurring along the creekline. Two neighbouring property owners reported to LFA that they have seen a Koala in trees at the western end of the Site and to the north across Bent Street.

Five SAT plots were undertaken across the Site, resulting in the search for Koala scats at the base of 150 trees within the Site and just over the eastern Site boundary. This number of trees comprised

approximately 90% of all trees within the Site boundary with a diameter at breast height (DBH) >10cm. A single Koala scat was detected from the base of two separate trees from within SAT 1 (Tallowwood dbh: 30cm) and SAT 3 (Forest Red Gum dbh: 110 cm) (refer to Fig. 4). Applying the methods described by Phillips and Callaghan (2008), the resulting activity level for SAT 1 and SAT 3 would be determined as 3% (i.e. 1/30 = 0.03 = 3 percent). As per Table 2 of Phillips and Callaghan (2008), this is considered to be 'low use'.

Additional to the scat data, scratches were observed on a number of the smooth-barked trees, however none of the scratches appeared to be obviously those of a Koala, and the number of scratches observed was limited to very occasional.
Of the 150 trees surveyed, Tallowwood and Forest Red Gum are considered 'primary Koala food tree' species (SEPP 44_Circular NoB35). Fifty-nine Tallowwood and five Forest Red Gum trees were recorded amongst the 150 trees surveyed. Although both species are considered 'primary food trees', the minimal usage of these trees, indicated by the lack of scats (and scratches), as well the minimal number of sightings (particularly by golfers and neighbours) in proximity of the Site, suggests that a sedentary population of Koalas does not occur at the or near to the Site. More so, the occasional Koala that does utilise the Site is likely to either be in transit from other areas supporting a sedentary population, or is utilising the remnant open forest habitat that connects the south-west corner of the Site to the creekline habitat along the southern boundary of the Golf course, where Koalas are occasionally observed.

The locations of the SAT plots are provided in Fig. 4, and the results of the SAT plots are provided in Appendix C.

Flying Foxes and Microbats
Eight threatened microbat species and the Grey-headed Flying-fox have been detected in the locality previously as detailed on Table 2. The Site offers primarily foraging habitat for a number of these species, with the lack of habitat features such as tree hollows, large timber structures (e.g. bridges, towers) and caves restricting roosting opportunities at the Site.

Foraging activity is likely to increase when trees at the Site are flowering, particularly when flowering coincides with warmer humid conditions and insect activity also increases.

No flying-fox camps occur at or adjacent to the Site.

Reptiles and Amphibians
Three threatened reptiles and one threatened frog species has been recorded previously in the locality (Table 2). None of the threatened reptiles are likely to utilise the Site due to the absence of suitable habitat or habitat features. The absence of ground cover such as leaf litter is a limiting factor for all species.

The Wallum Froglet is an acid frog that utilises wallum habitat, which does not occur at or adjacent to the Site.

5. Statutory Requirements

5.1 Introduction

This Section identifies relevant environmental legislation, which must be addressed in future proposals to develop the Site:

- The State Environmental Planning Policy No. 44 – Koala Habitat Protection;
- The *Environmental Planning and Assessment Act 1979*, specifically:
  - Section *5A – Significant effect on threatened species, populations or ecological communities, or their habitats*; and
  - Section *5C – Application of Act with respect to threatened species conservation—fish and marine vegetation*;
- The *Threatened Species Conservation Act 1995*;
- The *Fisheries Management Act 1994*;
- The *Native Vegetation Act 2003*; *and*
- The *Environment Protection and Biodiversity Conservation Act 1999*

The following review identifies whether the rezoning as proposed can satisfy the relevant legislative requirements.

5.2 NSW Environmental Planning and Assessment Act 1979

5.2.1 State Environmental Planning Policy No. 44 – Koala Habitat Protection

SEPP 44 encourages the conservation and management of natural vegetation areas that provide habitat for Koalas to ensure permanent free-living populations will be maintained over their present range. Local councils cannot approve development in an area affected by the policy without an investigation of core Koala habitat. The following questions are set out in the policy in order to identify whether core koala habitat is found within the proposal area.

Does the subject land occur in a Local Government Area identified in Schedule 1?

The Site is located in the Clarence Valley Council Local Government Area, which is listed in Schedule 1.

Is the land to which the development application applies smaller than 1 hectare in area?

Lot 400 DP 1153696 is >1 ha in area.

Does the site contain areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15 percent of the total number of trees in the upper or lower strata of the tree component?

Two trees (Tallowwood and Forest Red Gum) listed in Schedule 2 occur and constitute a total of >15% of trees in the upper or lower strata of the tree component. In terms of applying the criteria as described in the Circular B35, the Site does constitute 'potential ' Koala habitat due to the total number of trees in the upper or lower strata of the tree component comprising less than 15% of those tree species listed in Schedule 2.

Is the land potential Koala habitat?

As per the Policy definitions (DUAP 1995), the land comprising Lot 400 does comprise potential Koala habitat.

Is there core habitat on the subject land?

Core koala habitat is defined as "...an area of land with a resident population of koalas, evidenced by attributes such as breeding females...and recent sightings of and historical records of a population".

Based on the paucity of Koala records for the locality and the lack of Koala scats detected during the Site survey, the vegetation on Site would not be considered 'core Koala habitat'.

Is there a requirement for the preparation of a Plan of Management for identified core Koala habitat?

Since no '*identified core Koala habitat*' as defined in the Policy was found on Site, the preparation of a Koala Plan of Management (KPoM) is not required.

Importantly, the application of SEPP 44 does not apply to the rezoning process. Regardless, the questions set out in the policy are useful in identifying whether core koala habitat is found within the proposal area and, if so, whether it could present a significant constraint to the rezoning.

This assessment found that although Koala feed trees listed under Schedule 2 of SEPP 44 occur at the Site, Koala usage of the Site is considered to be 'low', and a sedentary population of Koalas does not occur at the Site.

Therefore, based on these findings and provided that mitigation measures are incorporated in future development proposals to minimise impact on the Koala, the rezoning as proposed is unlikely to have a significant impact on this species. Nevertheless, the SEPP 44 assessment will need to be undertaken at the development application stage. Thus, final determination of whether a KPoM is required will be reassessed at that point.

5.2.2 Section 5A of the Environmental Planning and Assessment Act

The *Threatened Species Conservation Amendment Act 2002* established the Assessment of Significance (7-part test) in Section 5A of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act), Section 94 of the *Threatened Species Conservation Act 1995* and Section 220ZZ of the *Fisheries Management Act 1994*. The Assessment of Significance is to be considered when determining whether a proposed action (development) is likely to have a significant effect upon listed threatened species, populations or ecological communities, or their habitats, therefore determining if a Species Impact Statement is required.

Two threatened fauna species were detected on the Site during the Site inspection (refer s. 4.2) (i.e. Koala via scat and Grey-crowned Babbler). No EECs are present on the Site.

A preliminary impact assessment for a number of threatened species has been undertaken in Section 6 and a number of mitigating measures have been put forward (refer to s. 6.1). Provided that these recommendations are implemented, the rezoning as proposed is unlikely to have a significant effect on these identified threatened species.

Nevertheless, an Assessment of Significance (7-part test) for these species, with regard to the provisions of Section 5A of the EP&A Act, will need to be undertaken once detailed and specific development plans are prepared.

5.2.3 Section 5C of the Environmental Planning and Assessment Act

Section 5C of the EP&A Act requires the application of an Assessment of Significance under the Fisheries Management Act (1994; Section 220ZZ). This is addressed in Section 5.4.

5.3 NSW Threatened Species Conservation Act 1995

The objectives of the TSC Act are:

- To conserve biological diversity and promote ecologically sustainable development;
- To prevent the extinction and promote the recovery of threatened species, populations and ecological communities;
- To protect the critical habitat of those threatened species, populations and ecological communities that are endangered;
- To eliminate or manage certain processes that threaten the survival or evolutionary development of threatened species, populations and ecological communities;
- To ensure that the impact of any action affecting threatened species, populations and ecological communities is properly assessed; and
- To encourage the conservation of threatened species, populations and ecological communities by the adoption of measures involving co-operative management.

The *Threatened Species Conservation Amendment Act 2002* established the Assessment of Significance in Section 5A of the EP&A Act, Section 94 of the *Threatened Species Conservation Act 1995* and Section 220ZZ of the *Fisheries Management Act 1994*. The Assessment of Significance is to be considered when determining whether a proposed action (development) is likely to have a significant effect upon listed threatened species, populations or ecological communities, or their habitats, therefore determining if a Species Impact Statement is required.

The appropriate provisions prescribed in Section 94 are identical to those found in the EP&A Act and have been discussed in s. 5.2.2 of this report.

5.4 NSW Fisheries Management Act 1994

The *Fisheries Management Act 1994* (FM Act) aims to protect fish and fish stocks and protect threatened species, populations and ecological communities of fish and marine vegetation. No habitat suitable for utilisation by any species listed under the FM Act occurs on or adjacent to the Site and therefore assessment under the provisions of Section 220ZZ of the *Fisheries Management Act 1994* and Section 5C of the EP&A Act has not been undertaken.

5.5 Native Vegetation Act 2003

The *Native Vegetation Act 2003* (NV Act) regulates the clearing of native vegetation on all land in NSW except for land listed in Schedule 1 of the Act. Excluded land falls into the following categories:

- National Parks and other conservation areas
- State Forests and reserves, and
- Urban areas.

Urban areas include areas zoned residential (but not rural residential), village, township, industrial or business.

The proposal occurs on land zoned R5 - Large Lot Residential to (CVLEP 2011). Therefore, the provisions of the NV Act and the *Native Vegetation Regulations 2005* do not need to be considered under the current zoning.

5.6 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth mechanism for national environment protection and biodiversity conservation is the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act provides for:

- Identification and listing of Threatened Species and Threatened Ecological Communities;
- Development of Recovery Plans for listed species and ecological communities;
- Recognition of Key Threatening Processes; and where appropriate; and
- Reducing these processes through Threat Abatement Plans.

The EPBC Act states that a person must not, without approval under the act, take an action that has or will have, or is likely to have a significant impact on a matter of National Environmental Significance (NES). NES matters include:

- The world heritage value of a declared World Heritage property;
- The national heritage value of a National Heritage Place;
- The ecological character of a declared Ramsar wetland;
- An action in a Commonwealth Marine Area;
- A Threatened Ecological Community listed under the Act;
- A Threatened Species listed under the Act; and
- A Migratory Species listed under the Act.

The EPBC Act also identifies a number of Other Matters it protects. These include:

- Commonwealth Lands;
- Commonwealth Heritage Places;
- Places on the Register of the National Estate;
- Listed Marine Species;
- Whales and other Cetaceans;
- Critical Habitats, and
- Commonwealth Reserves.

Table 3 summarises the assessment of the proposed rezoning with regard to NES and Other Matters listed under the EPBC Act, based on a search using the Protected Matters Search tool within 1km of the Site.

Table 3. Assessment of Impacts on NES and Other Matters as Described in the EPBC Act

Matter	Impact	Comment
National Environmental Significance		
World Heritage Properties	None	The Site is not a recorded World Heritage Property and none are listed as occurring within 1 km of the Site.
National Heritage Places	None	The Site is not a recorded National Heritage Place and none are recorded within 1 km of the Site.
Ramsar Sites	None	The Site is not a Ramsar wetland, or located within 1 km of a Wetland of International Significance.
Commonwealth Marine Areas	None	The Site is not a Commonwealth Marine Area, or located within 1 km of a Commonwealth Marine Area.
Threatened Ecological Communities	None	The results from the EPBC Act Protected Matters Report indicate that one Threatened Ecological Community, Lowland Rainforest of Subtropical Australia, may occur within a 2 km radius of the site. The results of the Site inspection indicate this community does not occur on the Site and has not been detected in the locality.
Threatened Species	Not Significant	The results from the EPBC Act Protected Matters Report indicate that 21 threatened species may occur within a 2 km radius of the Site. The

Matter	Impact	Comment
		EPBC listed species which appeared in the *NSW Wildlife Atlas* are listed on Tables 1 & 2 The requirement to assess those species, which might utilise the Site on an opportunistic basis and are listed under the *TSC Act 1995* is addressed with regard to the TSC Act in s.5.3. The preliminary impact assessment undertaken in s.6 notes that the rezoning as proposed is unlikely to have a significant impact these species, provided that the recommended management measures listed in s.6.2 are implemented in future Development Applications
Migratory Species	Not Significant	A search of the Protected Matters database indicates that habitat for 13 migratory species may occur in the vicinity of the Site
Other		
Commonwealth Land	None	The proposal is not on Commonwealth Land
Commonwealth Heritage Places	None	No Commonwealth Heritage Places occur recorded within 1 km of the Site.
Places on the RNE	None	The Site is not a Place on the RNE
Marine Species	None	The proposal is unlikely to result in any potential impacts to any marine species
Whales and Cetaceans	None	No species of Whales and Cetaceans may occur in proximity to the Site
Critical habitats	None	There are no Critical Habitats recorded at, or within 1 km of the Site
Commonwealth Reserves	None	There are no Commonwealth Reserves recorded at, or within 1 km of the Site

Table 3 demonstrates that the proposed rezoning is unlikely to have a significant impact on NES or Other Matters as described under the EPBC Act. Therefore, referral to the Minister for the Environment for future approval is unlikely.

6. Impact Assessment

6.1 Discussion of Constraints

Native vegetation present on Site does not include any threatened flora species, populations or EECs.

Threatened fauna species habitat is restricted to foraging resources and to the occurrence of 'potential' Koala habitat only. Nevertheless, although the identified ecological features found at or in proximity of the Site are limited, they still provide potential constraints to the future development of the Site. The actual constraints presented and, if required, the means to mitigate potential future development impacts on these identified ecological features are discussed as follows.

Native vegetation and associated fauna habitat at the Site is essentially limited to the occurrence of planted and regrowth/remnant trees. Utilisation of these trees by native fauna, in particular threatened fauna species is considered to be very limited.

Koala usage of the Site is 'low' based on the results of the SAT surveys undertaken, and information provided by neighbours and golf course staff. Potential exists for Koalas to utilise the regrowth/remnant open forest/woodland that occurs in the south-west portion of the Site, more so than the remainder of the Site. This habitat extends down an ephemeral drainage line to the creek along the southern boundary of the golf course where Koalas are occasionally sighted by golfers. This habitat supports Forest Red Gums which are likely to be one of the primary food trees being utilised by Koalas in the locality. It should be noted that the Tallowwood, which is the other 'primary' food tree that occurs commonly on the Site, does not occur naturally in the locality. The results of the SAT survey undertaken for this investigation indicates the Tallowwood receive very limited visitation by Koalas, which is potentially a result of the nutrient deficient substrate. Therefore, based on the results of the SAT survey, Tallowwood at the Site do not appear to be an important food source for Koalas in the area.

The location of native trees at the Site generally, coincides with the northern and southern boundaries of the proposed lots, additional to the area of open forest/woodland occurring in the north-west portion of the Site. There are also numerous mature planted Slash Pines that occur along the northern Site boundary fronting Bent Street.

The trees contribute greatly to the amenity of the locality and only a very small number of these trees will need to be removed to allow the creation of driveway access points from Bent Street. It is also likely that if trees are required to be removed to construct driveway accesses, preference can be given to the removal of the exotic Slash Pines over the removal of native tree species. Regardless, the loss of a nominal number (i.e. <10) of native trees fronting Bent Street would not have a significant impact on any threatened fauna species, including the Grey-crowned Babbler which was recorded nesting on land adjacent to the Site.

Potential exists for Grey Crowned Babblers to nest within the Site; however, similar habitat occurs throughout the Golf Course and adjoining land, which is just as likely to be utilised by the species. The grassland area and scattered trees at the Site and around the golf course generally, appears to offer suitable foraging habitat for this threatened woodland bird species. As noted in s.4.2.2, a pair of Grey Crowned Babblers happily nests in the carpark to the north of the clubhouse and are unperturbed by the movement of cars and people using the carpark.

Direct impacts on the remnant/regrowth open forest/woodland that occurs on the slope in the south-west of the Site are unlikely as a result of the rezoning, as the proposed block sizes that encompass this habitat are large (i.e. Lot 15: 4867 m^2 and Lot 16: 5690 m^2). Additionally, the slope

that occurs in the location supporting the open forest area is such that dwellings built on the lots will occur on the more level portion further to the north and away from the vegetation.

The maintenance of access for Koalas to trees on proposed Lots 15 and 16 would be beneficial, hence if boundary fences are to be installed in the future, consideration should be given to designs that allow free Koala movement. Consideration of fence design should also be given in terms of restricting Koalas gaining access to lots with dogs.

If native trees are required to be removed in the future from the Site, consideration should be given to maintaining remnant and regrowth trees such as Forest Red Gum, Grey Box and Spotted Gum over the planted trees such as Tallowwood and Ironbark.

Potential impacts on the grassland habitat at the Site are considered minimal. To some degree this habitat will remain available to native fauna, particularly on the larger lots, as boundary fences do not appear to have been used widely in the adjoining residential areas. Regardless, areas of open grassland are very common elsewhere throughout the golf course, and also occur widely on land throughout the locality.

6.2 Recommendations

In summary, the following measures are recommended to mitigate potential future development impacts on the identified ecological features found at or in proximity of the Site:

1. Minimise removal of native trees at the Site generally, in particular remnant/regrowth trees comprising Forest Red Gum, Grey Box and Spotted Gum.
2. If trees are required to be removed, preference should be given to the removal of Slash Pine over the removal of native tree species.
3. Consider future options for fencing ton lots 15 and 16 to allow Koala access to existing 'potential' Koala habitat that occurs there.

Provided that the mitigation measures outlined above are implemented, the rezoning as proposed is unlikely to have a significant effect on locally occurring threatened species, populations and EECs.

7. Summary & Conclusion

Land & Fire Assessments Pty Ltd (LFA) has been commissioned by the Grafton District Golf Club Limited to undertake a Flora and Fauna Assessment for a rezoning submission of Part Lot 400 DP1153969, 425 Bent Street, South Grafton, NSW. It is submitted that:

- No threatened flora species, populations or Endangered Ecological Communities occur on the Site.
- Native vegetation comprises 'potential' Koala habitat based on the occurrence of a total of >15% of trees in the upper or lower strata of the tree component. **However, the preliminary review of the criteria contained in SEPP 44 has been addressed and a Koala Management Plan is not deemed required.** This will however need to be reviewed at the Development Application stage.
- Five SAT plots were undertaken comprising searches for koala faecal pellets under 150 trees (approx. 90% of trees at the Site with a dbh>10cm). One faecal pellet was found in each of two SAT plots, indicating 'low use' Koala activity level.
- Based on SAT plot results, distribution of remnant vegetation communities/corridors and information provided by neighbours and golf course staff, Koala usage of trees at the Site appears to be limited to the remnant/regrowth open forest/woodland in the south-west of the Site.
- One scat was found under one of the 59 Tallowwood trees surveyed. Consequently, it has been established that Tallowwood trees at the Site receive very limited visitation by Koalas, which is potentially a result of the nutrient deficient substrate.
- Fauna habitat at the Site is restricted to foraging resources for more mobile species. Significant habitat features such as tree hollows are not found on Site.
- An Assessment of Significance (7-part test) for all threatened flora and fauna with potential to utilise the Site, with regard to the provisions of Section 5A of the EP&A Act, will need to be undertaken once detailed and specific development plans are prepared. However, provided that the mitigation measures outlined in s. 6 are implemented, **the rezoning as proposed is unlikely to have a significant effect on locally occurring threatened species, populations and EECs.**
- A preliminary impact assessment has been undertaken in s. 6 and a number of mitigating/management measures have been put forward (refer to s. 6.1 & 6.2). Provided that these recommendations are implemented, this assessment findings do not preclude the rezoning of the Site.
- The NV Act provisions do not preclude the rezoning of the land.
- The proposed rezoning is unlikely to have a significant impact on NES or Other Matters as described under the EPBC Act. Therefore, referral to the Minister for the Environment for future approval is unlikely; and
- The management measures described in Section 6 should be implemented as part of future development proposal for the Site.

References

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NSW Office of Environment and Heritage (NSW OEH) 2015, *NSW Office of Environment and Heritage Wildlife Atlas*. http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/atlasreport.aspx. Accessed 29th April 2015.

Phillips and Callaghan, 2008. *The Spot assessment Technique: a toll for determining levels of localised habitat use by Koalas Phascolarctos cinereus*. Australian Koala Foundation, Brisbane Queensland.

Appendices

Appendix A – Flora Species List

Family	Scientific Name	Common Name
ASTERACEAE	*Bidens pilosa**	Farmers Friends
ASTERACEAE	*Ageratum houstonianum**	Blue Billy Goat Weed
BIGNONIACEAE	*Pandorea pandoreana*	Wonga Wonga Vine
CASUARINACEAE	*Allocasuatina littoralis*	Black She-oak
COMMELINACEAE	*Commelina benghalensis**	Hairy Commelina
CONVOLVULACEAE	*Ipomoea cairica**	Coastal Morning Glory
DENNSTAEDTIACEAE	*Pteridium esculentum*	Bracken
FABACEAE	*Glycine sp.*	Glycine
LAURACEAE	*Cinnamomum camphora*[4]	Camphor Laurel
LOBELIACEAE	*Pratia purperescens*	White Root
LUZURIAGACEAE	*Eustruphus latifolius*	Wombat Berry
LUZURIAGACEAE	*Geitonoplesium cymosum*	Scrambling Lily
MYRTACEAE	*Callistemon linearfolius*	Bottlebrush
MYRTACEAE	*Callistemon salignus*	Weeping Bottlebrush
MYRTACEAE	*Corymbia intermedia*	Pink Bloodwood
MYRTACEAE	*Corymbia henryi*	Spotted Gum
MYRTACEAE	*Eucalyptus microcorys*	Tallowwood
MYRTACEAE	*Eucalyptus moluccana*	Grey Box
MYRTACEAE	*Eucalyptus siderophloia*	Ironbark
MYRTACEAE	*Eucaluptus tereticornis*	Forest Red Gum
MYRTACEAEA	*Melaleuca quinquenervia*	Broad-leaved Paperbark
PINACEAE	*Pinus elliotii**	Slash pine
POACEAE	*Andropogon virginicus**	Whiskey grass
POACEAE	*Chloris gayana**	Rhodes Grass
POACEAE	*Imperata cylindrica*	Bladey Grass
POACEAE	*Sporobolos sp.**	a grass
POACEAE	*Paspalum dilatatum**	Paspalum
POACEAE	*Melinis repens**	Red Natal Grass
SOLANACEAE	*Solanum mauritianum*	Tobacco Bush
VERBENACEAE	*Lantana campara*[4]	Lantana
VERBENACEAE	*Verbena bonariensis*	Purpletop

Key:

* non-endemic and or environmental weed

4 Class 4 *Noxious Weeds Act 1993*: Plants that pose a potentially serious threat to primary production, the environment or human health, are widely distributed in an area to which the order applies and are likely to spread in the area or to another area.

Appendix B – Fauna Species List

Group	Scientific Name	Common Name	Status
Aves	*Gymnorhina tibicen*	Australian Magpie	-
	Platycercus eximius	Eastern Rosella	-
	Eolophus roseicapillus	Galah	-
	Pomatostomus temporalis	Grey-crowned Babbler	Vulnerable (TSC Act)
	Grallina cyanoleuca	Magpie-lark	-
	Manorina melanocephala	Noisy Minor	-
	Anas superciliosa	Pacific Black Duck	-
	Trichloglossus haematodus	Rainbow Lorikeet	-
	Corvus orru	Torresian Crow	-
Mammals	*Macopus gigantus*	Eastern Grey Kangaroo	-
	Gymnorhina tibicen	Australian Magpie	-

Appendix C – SAT Plot Data

SAT 1	Easting: 492232.37 m E	Northing: 6710909.32 m S	
Tree No	Species	Size (dbh) (cm)	Occurrence of Faecal Pellet
1	Ironbark	31	x
2	Spotted Gum	34	x
3	Spotted Gum	34	x
4	Ironbark	37	x
5	Spotted Gum	24	x
6	Tallowwood	30	√
7	Spotted Gum	27	x
8	Spotted Gum	25	x
9	Spotted Gum	32	x
10	Tallowwood	17	x
11	Spotted Gum	23	x
12	Tallowwood	17	x
13	Ironbark	25	x
14	Spotted Gum	45	x
15	Tallowwood	25	x
16	Tallowwood	30	x
17	Tallowwood	30	x
18	Spotted Gum	36	x
19	Tallowwood	30	x
20	Tallowwood	30	x
21	Tallowwood	30/16	x
22	Ironbark	25	x
23	Spotted Gum	38	x
24	Tallowwood	24	x
25	Spotted Gum	43	x
26	Tallowwood	21	x
27	Spotted Gum	32	x
28	Spotted Gum	16	x
29	Spotted Gum	38	x
30	Ironbark	24	x

SAT 2	Easting: 492083.53 m E	Northing: 6710849.31 m S	
Tree No	**Species**	**Size (dbh) (cm)**	**Occurrence of Faecal Pellet**
1	Spotted Gum	28	x
2	Spotted Gum	38	x
3	Ironbark	18	x
4	Spotted Gum	18	x
5	Tallowwood	28	x
6	Spotted Gum	27	x
7	Spotted Gum	24	x
8	Spotted Gum	32	x
9	Spotted Gum	30	x
10	Spotted Gum	21	x
11	Tallowwood	21	x
12	Spotted Gum	28	x
13	Spotted Gum	40	x
14	Ironbark	24	x
15	Spotted Gum	37	x
16	Spotted Gum	33	x
17	Spotted Gum	37	x
18	Tallowwood	20	x
19	Spotted Gum	36	x
20	Spotted Gum	30	x
21	Ironbark	34	x
22	Spotted Gum	37	x
23	Spotted Gum	20	x
24	Spotted Gum	30	x
25	Spotted Gum	36	x
26	Spotted Gum	30	x
27	Spotted Gum	45	x
28	Spotted Gum	32	x
29	Spotted Gum	25	x
30	Spotted Gum	25	x

SAT 3	Easting: 492162.40 m E	Northing: 6710748.76 m S	
Tree No	**Species**	**Size (dbh) (cm)**	**Occurrence of Faecal Pellet**
1	Forest Red Gum	110	√
2	Spotted Gum	700	x
3	Grey Box	700	x
4	Broad-leaved Paperbark	34/12/24	x
5	Tallowwood	30	x
6	Tallowwood	30/30	x
7	Tallowwood	40	x
8	Tallowwood	30	x
9	Tallowwood	27	x
10	Forest Red Gum	27	x
11	Spotted Gum	90	x
12	Grey Box	40	x
13	Grey Box	48	x
14	Spotted Gum	60	x
15	Tallowwood	34	x
16	Spotted Gum	80	x
17	Spotted Gum	20	x
18	Grey Box	12	x
19	Spotted Gum	12	x
20	Spotted Gum	15	x
21	Grey Box	70	x
22	Grey Box	13	x
23	Grey Box	13	x
24	Forest Red Gum	60	x
25	Grey Box	14	x
26	Spotted Gum	26	x
27	Spotted Gum	26	x
28	Spotted Gum	18	x
29	Grey Box	40	x
30	Grey Box	28	x

SAT 4	Easting: 492166.00 m E	Northing: 6710817.00 m S	
Tree No	**Species**	**Size (dbh) (cm)**	**Occurrence of Faecal Pellet**
1	Spotted Gum	100	x
2	Tallowwood	30	x
3	Tallowwood	23	x
4	Tallowwood	29	x
5	Tallowwood	26	x
6	Tallowwood	30	x
7	Forest red Gum	38	x
8	Tallowwood	28	x
9	Tallowwood	33	x
10	Tallowwood	22	x
11	Spotted Gum	50	x
12	Tallowwood	28	x
13	Tallowwood	28	x
14	Tallowwood	26	x
15	Tallowwood	23	x
16	Tallowwood	26	x
17	Tallowwood	12/12/2014	x
18	Tallowwood	25/16	x
19	Tallowwood	22	x
20	Tallowwood	23/21/22	x
21	Forest red Gum	29	x
22	Spotted Gum	42	x
23	Tallowwood	46	x
24	Tallowwood	24	x
25	Tallowwood	37	x
26	Forest red Gum	60	x
27	Tallowwood	22	x
28	Tallowwood	23/28	x
29	Tallowwood	22/21	x
30	Tallowwood	30	x

SAT 5	Easting: 492259.00 m E	Northing: 6710857.00 m S	
Tree No	**Species**	**Size (dbh) (cm)**	**Occurrence of Faecal Pellet**
1	Tallowwood	20	x
2	Tallowwood	20/30	x
3	Tallowwood	18	x
4	Tallowwood	23/14	x
5	Tallowwood	20/20	x
6	Tallowwood	22	x
7	Tallowwood	20	x
8	Spotted Gum	45	x
9	Bloodwood	18/50/22	x
10	Willow Bottlebrush	15	x
11	Tallowwood	23	x
12	Tallowwood	23	x
13	Spotted Gum	110	x
14	Tallowwood	16	x
15	Tallowwood	30	x
16	Tallowwood	22/17/35	x
17	Tallowwood	26/01/1900	x
18	Tallowwood	27	x
19	Tallowwood	26	x
20	Tallowwood	29	x
21	Tallowwood	22	x
22	Tallowwood	45	x
23	Tallowwood	37	x
24	Tallowwood	24	x
25	Tallowwood	14/13	x
26	Tallowwood	60	x
27	Tallowwood	32	x
28	Tallowwood	32	x
29	Tallowwood	32	x
30	Tallowwood	24/27	x

Appendix H

Bushfire Constraints Appraisal by Land & Fire Assessments, dated May, 2015

Land & Fire Assessments Pty Ltd

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BUSHFIRE CONSTRAINT ASSESSMENT

For Proposed Rezoning of Part Lot 400 DP1153969, 425 Bent Street, SOUTH GRAFTON, NSW

BPAD Bushfire Planning & Design
Accredited Practitioner
Level 3

Prepared By: Paola Rickard
BPAD – Level 3 Accredited Practitioner – BPD-PA-21855
Land & Fire Assessments Pty Ltd
For: Grafton District Golf Club Limited
Project No.: LFA15007
Date: 11 May 2015

Disclaimer

Land & Fire Assessments Pty Ltd (LFA) have conducted work concerning the environmental status of the site, which is the subject of this report, and has prepared this report on the basis of that assessment. The work was conducted, and the report has been prepared, in response to specific instructions from the client or a representative of the client and in reliance on certain data and information made available to LFA. The analysis, evaluations, opinions and conclusions presented in this report are based on that information, and they could change if the information is in fact inaccurate or incomplete.

Due consideration has been given to site conditions and to appropriate legislation and documentation available at the time of preparation of the report. As these elements are liable to change over time, the report should be considered current at the time of preparation only. Should further information become available regarding the conditions at the site, LFA reserves the right to review the report in the context of the additional information. LFA has made no allowance to update this report and has not taken into account events occurring after the time its assessment was conducted.

This report is intended for the sole use of the client and only for the purpose for which it was prepared. Any representation contained in the report is made only to the client unless otherwise noted in the report. Any third party who relies on this report or on any representation contained in it does so at his or her own risk

Revision List

Revision No.	Revision Date	Report Title	Report Author	Field Survey By	Status
00	07.05.15	Bushfire Constraint Assessment For Proposed Rezoning of Part Lot 400 DP1153969, 425 Bent Street, SOUTH GRAFTON, NSW	Main Author: Paola Rickard (LFA - Senior Environmental Planner & BPAD – Level 3 Accredited Practitioner – no. BPD-PA-21855)	Paola Rickard	Draft for review
01	11.05.15				Final

LFA contact details: Paola Rickard: 0427 809 352 and Tony Coyle: 0427 483 099

TABLE OF CONTENTS

1. Introduction

1.1 Background

This Bushfire Constraint Assessment report has been prepared by Land & Fire Assessments Pty Ltd (LFA) in accordance with the relevant provisions of Planning for Bushfire Protection (PBP) (RFS 2006) on behalf of Grafton District Golf Club Limited for a rezoning submission of Part Lot 400 DP1153969, 425 Bent Street, South Grafton, NSW (refer to Figs. 1, 2, 3 & 4).

This Bushfire Assessment is required because:

- The site contains land designated as 'Vegetation Categories 1' and 'Buffer' on the Clarence Valley Council Bushfire Prone Land Map, hence the site occurs on bushfire prone land (refer Fig. 1); and
- Future development proposed for the site is considered a 'high risk' development as it will involve a residential subdivision.

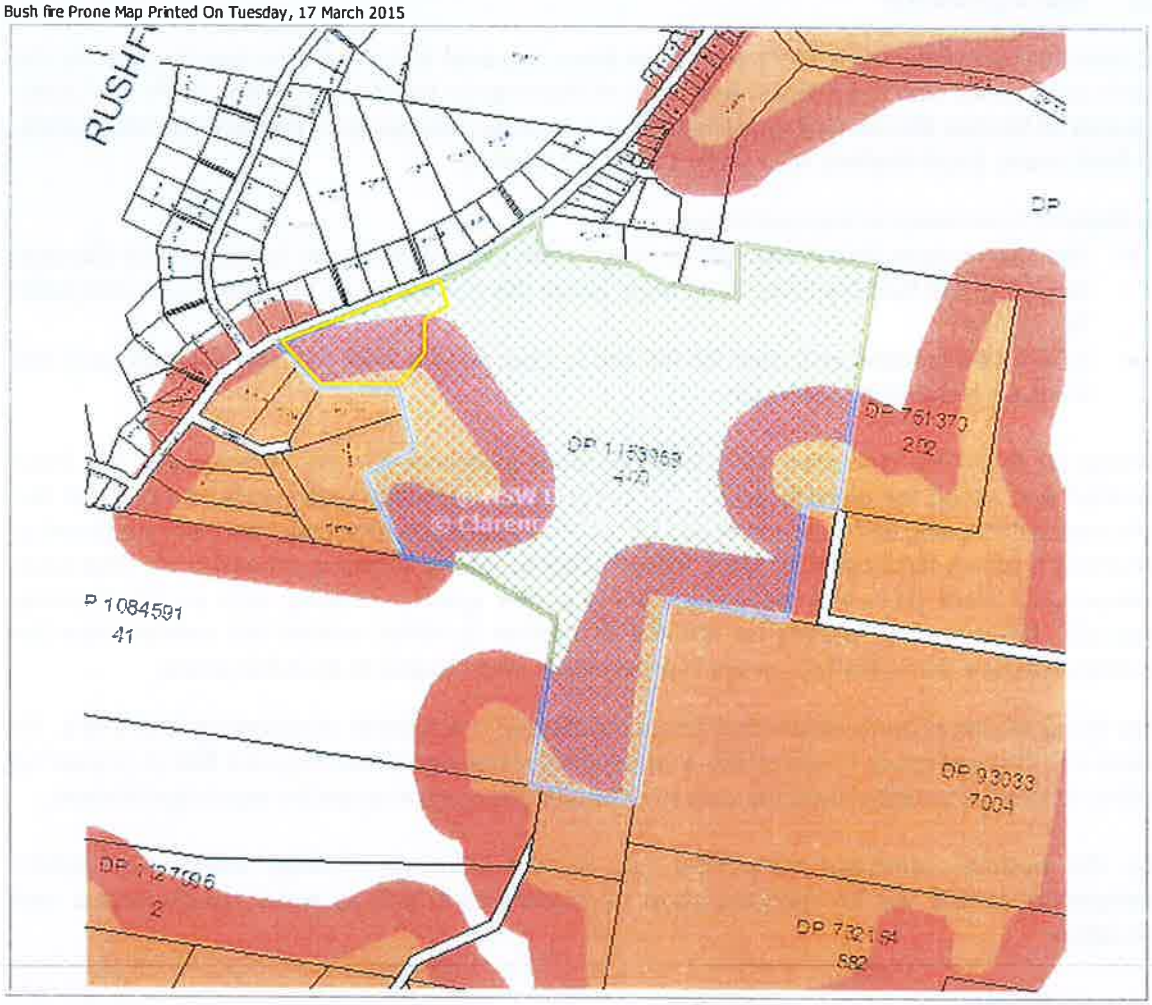
Planning for Bush Fire Protection 2006 (PBP) provides guidelines for use once an area has been identified and zoned for development. The Minister for Planning, under section 117(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) issues directions that relevant planning authorities (such as local councils) must follow when preparing planning proposals for new Local Environmental Plans (LEP) and amending LEPs (e.g. site specific rezoning such as this Planning Proposal). Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for planning proposals that will affect, or are in proximity to land mapped as bush fire prone.

A key principle should be to ensure that future development is capable of complying with (PBP). To achieve this it is necessary to undertake a constraint assessment of the Proposal Site in respect to bushfire to identify potential bush fire risks to individual sites and proposed forms of development.

Thus this bushfire constraint assessment will identify elements (if any), which may restrict development or that will be impacted upon by development such as water supply, access and evacuation.

clarence VALLEY COUNCIL

Bush fire Prone Map Printed On Tuesday, 17 March 2015



NORTH

BUSH FIRE PRONE LAND LEGEND

- Vegetation Buffer - 100m & 30m
- Vegetation Category 1
- Vegetation Category 2

Map Zoom:1.841 km
Map Scale:1:12,300
Map Centre:492,539.3126291:6,710,491.7798987
Coord Sys:MGA Zone 56 (GDA 94) [EPSG 28356]

Disclaimer: The information displayed is not survey accurate and should be used as a guide only. Council accepts no responsibility for for any errors or ommisions.Any feedback on ommisions or errors would be appreciated.

Note:
Data supplied by various stakeholders under ANZLIC* guidelines
The information contained herein has been provided in good faith.
Effort has been made to ensure its accuracy and completeness.
The stakeholders take no responsibility for errors or omissions
nor any loss or damage that may result from the use of this information
*Australia New Zealand Land Information Council
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Figure 1. Bushfire mapping for the Subject Site (Yellow Boundary). Source: Clarence Valley Council, March 2015

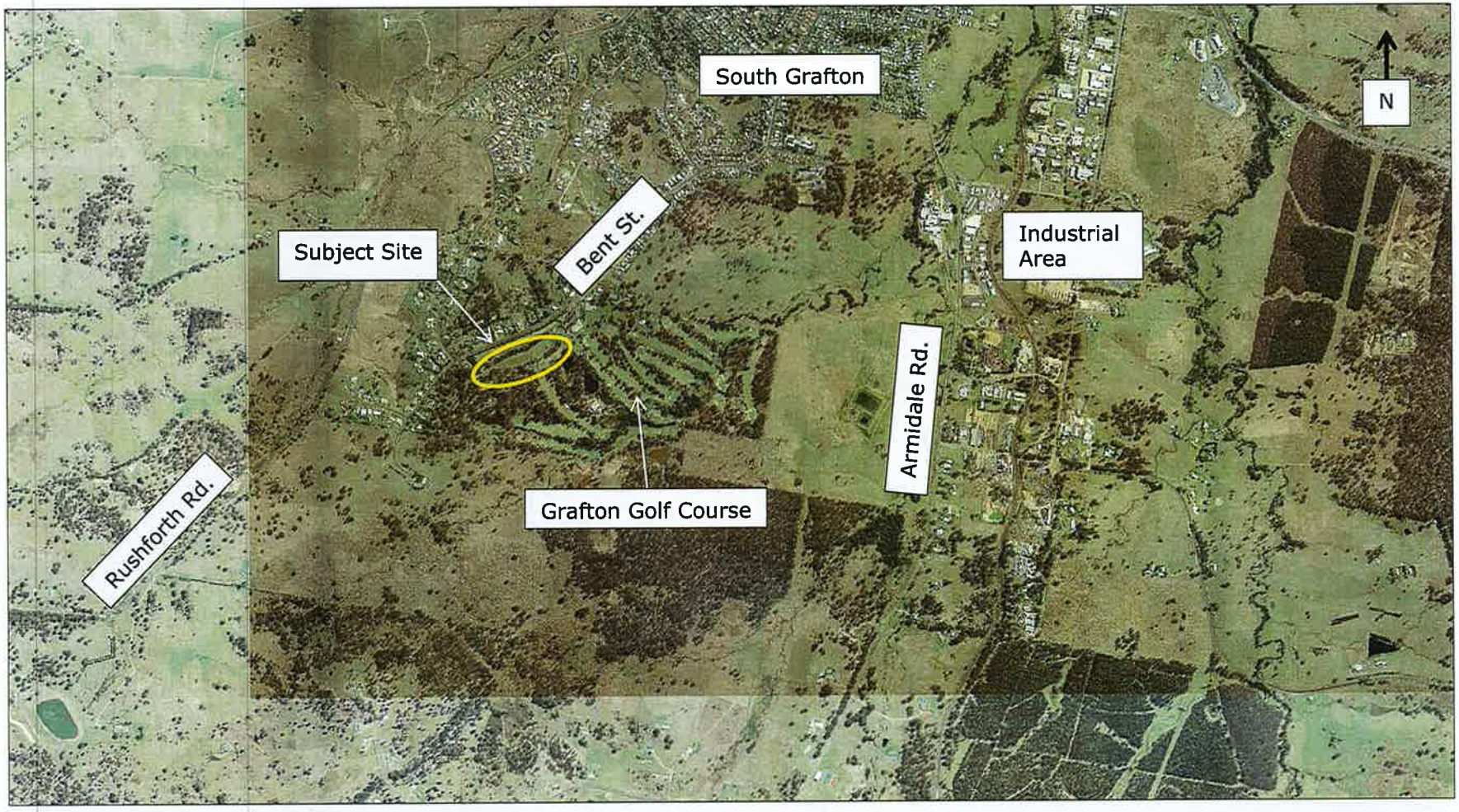

Figure 2. Locality plan and Subject Site. Source: http://maps.six.nsw.gov.au/

Figure 3. Close up of Lot 400 DP1153969 (Grafton Golf Course) and proposal site (i.e. the Subject Site). Source: http://maps.six.nsw.gov.au/

Figure 4. Approximate location (red boundary) of Part Lot 400 proposal site (i.e. the Subject Site) and slope. Source: http://maps.six.nsw.gov.au/

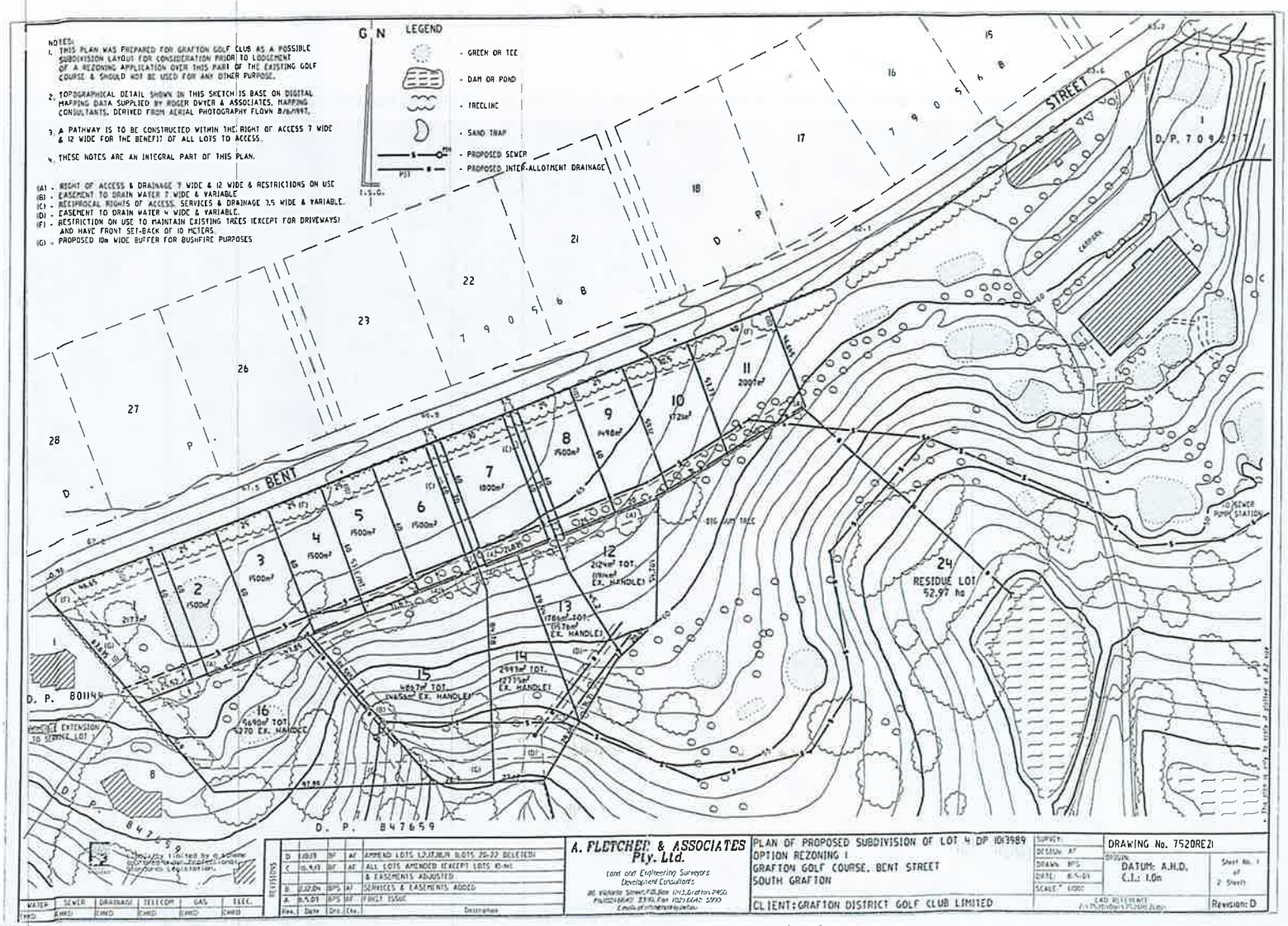

Figure 5. Subject Site- proposed 16 lots layout, subject of the planning proposal. Source: A Fletcher & Associates

1.2 The Subject Site

The Subject Site (or the Site) for the purpose of this assessment is Part Lot 400 DP1153969, 425 Bent Street, South Grafton NSW, as shown on Figs. 1-4. The remainder of Lot 400 is occupied by the Grafton District Golf Club (Figs. 2 & 3). The Site occurs on the southern-western edge of South Grafton. Landuse in the general locality comprises large residential allotments and rural holdings. The Site is located in the Clarence Valley Council Local Government Area.

The Site is ~3.39ha in area and forms part of the former 10th and 11th holes of the golf course (Plate 1). These 2 holes are no longer in use with the recent opening of 2 new holes (14th & 15th) at the southern end of the golf course.

Native vegetation on the Site comprises linear strips of mature trees and shrubs that occur either side of two open grassland areas that comprised former fairways of the golf course. No structures are present within the proposal Site.

The Site is bound by Bent Street to the north, residential development to the west and the Grafton Golf Club to east and south. Part Lot 400 DP1153969 is zoned R5 - Large Lot Residential in the Clarence Valley Local Environmental Plan 2011.

Plate 1. Grafton District Golf Club grounds and approximate location of Subject Site - looking west

1.3 Proposed Development

The proposal involves the rezoning submission (i.e. Planning Proposal) of Part Lot 400 DP1153969 (i.e. the Subject Site) which is shown on Figs. 3 & 4, to increase the density of the currently zoned 'R5 - Large Lot Residential' portion of the golf course from 9 lots to 16 lots as shown on Fig. 5. Thus, the proposal will see the creation of 16 Lots ranging in size from 1,498 m^2 to 5,690m^2 (refer Fig. 5).

Removal of native vegetation associated with the proposal would be limited to the removal of trees along the edge of the Site adjacent to Bent Street to allow the creation of driveway access points, and removal of vegetation (if required) associated with creating necessary asset protection zones for dwellings.

1.4 Site Topography and Slope

The majority of the proposal Site is flat, it then grades to a gentle slope to the south ranging from 3.55^0 to 8.5^0 as shown on Fig. 4. Elevations within the Subject Site range between approximately 60m AHD on the central portion of the Site to 50m AHD to the south.

1.5 Significant Environmental Features

Native vegetation present on Site does not include any threatened flora species, populations or Endangered Ecological Communities. Threatened fauna species habitat is restricted to foraging resources and to the occurrence of 'potential' Koala habitat only. Native vegetation and associated fauna habitat at the Site is essentially limited to the occurrence of planted and regrowth/remnant trees. Utilisation of these trees by native fauna, in particular threatened fauna species is considered to be very limited.

Koala usage of the Site is 'low' based on the results of the LFA (2015) survey undertaken, and information provided by neighbours and golf course staff. Potential exists for the threatened Grey Crowned Babblers to nest within the Site; however, similar habitat occurs throughout the Golf Course and adjoining land, which is just as likely to be utilised by the species. The grassland area and scattered trees at the Site and around the golf course generally, appears to offer suitable foraging habitat for this threatened woodland bird species. A pair of Grey Crowned Babblers happily nests in the carpark to the north of the clubhouse and are unperturbed by the movement of cars and people using the carpark.

The Site does not occur in proximity (5km radius) to a World Heritage Property, National Heritage Place, Wetland of International Significance, Commonwealth Marine Area or Commonwealth Heritage Place considered a Matter of National Significance under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

No searches have been conducted with regards to Aboriginal Cultural heritage sites or artefacts.

2. Risk Assessment and Consultant Qualifications

As noted in s. 1.2, the Site occurs within the manicured lawns (fairways) and planted windrows of the Grafton District Golf Club and it is surrounded by residential development. To the south west of the Site are scattered eucalyptus trees and woodland associated with residential properties. Beyond the scattered vegetation are predominantly cleared lands, as shown on Figs. 2 & 3. Therefore, the Site is considered to have a low bushfire risk.

This report has been prepared by Paola Rickard.

The Fire Protection Association Australia (FPA) **has in place the Bushfire Planning and Design Accreditation Scheme (BPAD), which is recognised by the NSW Rural Fires Services (RFS).** Paola Rickard is a **BPAD - Level 3 Accredited Practitioner** (Accreditation no. BPD-PA-21855, valid to 2/08/2015) and is listed on the FPA Australia web site register.

BPAD- Level 3 Accredited Practitioner can perform the following:

- *BPAD- Level 3 Accredited Practitioner meet specific requirements in relation to identifying bushfire prone land, assessing potential bushfire impact, and submitting designs and plans, both deemed to satisfy and alternate solution, to meet the performance requirements of the Building Code of Australia and the specific state or territory legislation, for subdivisions, new buildings or modification to existing buildings aiming to minimise the risk to future developments, their occupants and responding emergency services from a bushfire event.*

Paola holds a Graduate Diploma in Design for Bush Fire Prone Areas with Distinction from the University of Western Sydney and is a bronze corporate member of the Fire Protection Association Australia (FPA Australia). She is a participating **member of the FPA Technical Advisory Committee (TAC) /20 Bushfire Safety**. The TAC provides a nationally focussed forum for discussion between practitioners, fire services and regulators on the design and construction of property in areas prone to bushfires.

Paola has been recently appointed as a **BPAD member to the NSW Bushfire Working Group (NSWBWG)** set up by FPA Australia. The NSWBWG provide a forum to discuss the application, interpretation and periodic review of NSW Government-based bushfire related regulatory requirements governing land use planning and building construction in areas subject to bushfire impact

Paola also holds a Bachelor Degree in Applied Science, a Certificate in Bushland Regeneration, and is a member of the Australian Association Bush Regenerators. She has 18 years of experience in flora surveys and vegetation management issues, and has been undertaking bushfire assessments since 2003.

Paola has attended the "NSW Consulting Planners Bushfire Training Course" in Sydney in 2003 and has attended the "Planning for Bushfire Protection Short Course" held by the University of Technologies (UTS) Sydney in 2007. She has obtained certification for the short course. In November 2010, Paola attended the "One-day Planning for Bushfire Prone Areas Update Course" conducted by the Centre for Local Government UTS, Sydney. Additionally, Paola has a 'Basic Bush Fire Awareness' certificate and has experience in fire control and planning while living on a rural land sharing community.

3. Site Vegetation and Classification

3.1 Site & Surrounding Vegetation

Vegetation at the Site consists of two rows (bounding the fairways) of planted trees comprising predominantly Slash Pine (*Pinus elliotii*), Tallowwood (*Eucalyptus microcorys*) and Ironbark (*E. siderophloia*). Callistemon and Melaleuca shrubs are planted intermittently amongst the trees. As the Site was previously the 10th and 11th holes of the golf course, groundcover is limited to maintained grassland (refer to Plates 2 to 7). Main vegetation communities are shown on Fig. 6.

Plates 2- 5 (Above clockwise). (2) Looking south west along central windrow. (3) looking west along central fairway. (4) looking east area - fairway between the two windrows. (5) looking south east

Plate 6 (right). Looking west along fairway and towards neighbouring houses

A number of large and small remnant trees also occur including Forest Red Gum (*E. tereticornis*), Spotted Gum (*Corymbia henryi*) and Grey Box (*E. moluccana*). The location of these trees generally coincides with the planted rows as described above. The southern portion of the Site comprises a moderate slope to the west that supports scattered remnant/regrowth open forest comprising Spotted Gum, Ironbark, Grey Box and Forest Red Gum. The understorey in this area contains a mixture of native and introduced grasses and weeds including Lantana (*Lantana camara*) and Farmers Friends (*Bidens pilosa*) (refer Plates 8 to 10). This vegetation is modified and open (as it is part of the managed Golf Course) and behaves more as Woodland.

Native vegetation in the locality comprises linear strips of trees and shrubs associated with fairways of the Grafton District Golf Course and scattered areas of remnant forest and woodland associated with rural and residential properties. The scattered remnant and regrowth native vegetation in the

locality comprises a loose corridor that connects more extensive areas of forest to the east and west of Grafton.

Plate 7. Looking east across central portion of Site from western boundary

Plate 8 (above). Looking north along western boundary- note neighbouring dwelling and landscaped garden

Plate 9 (right). Neighbouring dwelling to the south west

Plate 10. Looking north east from the southwestern corner of the Site

Figure 6. Close up of predominant vegetation at the Site

4. Planning Proposal - Bushfire Information Requirements

4.1 Introduction

The Rural Fire Service (RFS) requires specific information to accompany a Planning Proposal relating to Bushfire Prone Land. These are detailed as follows:

Part 1 – Objectives or Intended Outcomes relating to bush fire prone land that is:
Protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and encourage sound management of bush fire prone areas.

Part 2 – Explanation of the Provisions - The identified objectives can be achieved by ensuring that new controls imposed on development will:

- not increase the risk to life from bush fire
- not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard
- ensure that appropriate bush fire protection measures can be afforded to property at risk of bushfire
- minimise negative impacts on the surrounding environment,
- ensure that provision are made for adequate evacuation/shelter options for the community, and
- ensure that development is capable of complying with Planning for Bush Fire Protection 2006 (PBP).

Part 3 – Justification - The level of justification should be proportionate to the impact that the planning proposal will have.

The following sections will also discuss the acceptable solution for each applicable BPMs so to ensure that development is capable of complying with PBP. Thus, the Bushfire Constraint Assessment will address the following:

- Asset Protection Zones/Separation Distance;
- Siting & Design;
- Construction Standards
- Access;
- Services; and
- Landscaping and Maintenance

4.2 Asset Protection Zones

4.2.1 General Requirement for Asset Protection Zones

Asset Protection Zones (APZs) are buffer areas between development and a fire hazard, which aim to protect human life and property. The APZ comprises an Inner Protection Area (IPA) and an Outer Protection Area (OPA). These areas are to be managed to reduce the bushfire hazard. The general requirements for APZs are described in Tables 1 and 2.

Table 1. Inner Protection Area (IPA) General Requirements

Specifications and Management	
Location	The IPA extends from the edge of the OPA to the development.
Purpose	Ensures that the presence of fuel, which could become involved in fire, is minimised.
Depth	Varies from 10 to 100 metres.
Fuel Loading	Minimum fine fuel at ground level, which could be set alight by bushfire.
Vegetation Requirements	Do not touch or overhang the building; Are well spread out and do not form a continuous canopy; Are not species that retain dead material or deposit excessive quantities of ground fuel in a short period; and Are located far enough away from the house so that they will not ignite the house by direct flame contact or radiated heat emissions.
Uses Within the Area	Tennis courts, swimming pools and gardens are permitted. Woodpiles, wooden sheds, combustive material storage areas, large quantities of garden mulch, stacked flammable building materials are not permitted.
Maintenance	This Area should be regularly mowed and all fuel removed e.g. fallen branches, leaf build-up.

Table 2. Outer Protection Area (OPA) General Requirements

Specifications and Management	
Location	Located adjacent to the hazard. Originally the OPA would have formed part of the bushfire hazard but becomes an area where the fuel loadings are reduced.
Purpose	Reduction of fuel in this area substantially decreases the intensity of an approaching fire and restricts the pathway of crown fuels; reducing the level of direct flame, radiant heat and ember attack on the IPA.
Depth	Varies from 0 to 25 metres.
Fuel Loading	Fine fuel loads should be kept to a level where the fire intensity expected will not impact on adjacent developments. In the absence of any policy to the contrary, 8 tonnes per hectare of fuel is commonly used. In grasslands, fuel height should be maintained below 10 centimetres.
Vegetation Requirements	Any trees and shrubs should be maintained in such a manner that the vegetation is not continuous.
Maintenance	This Area should be regularly mowed and all excess fuels should be removed e.g. fallen branches, leaf build-up.

4.2.2 Applicable Asset Protection Zones/Separation Distance

As noted, the predominant vegetation is manicured lawn within the Site, and to the east and south east. Planted windrows are also found as two rows within the Site. To the north is Bent Street and beyond it is Residential development. Residential development is also found to the west. The only area of scattered remnant vegetation is found to the south west. This vegetation is modified and open (as it is part of the managed Golf Course) and behaves more as Woodland. Thus, to the north, east, west and south east the Site is surrounded by residential development and managed/ landscaped vegetation, which is classified as low threat vegetation and non- vegetation areas. The

only classified vegetation, which is a potential bushfire hazard, is the Woodland from the south western corner.

Based on the predominate slope (7.8^0- refer to Fig. 4) and the Classified Woodland vegetation, Appendix 2 of PBP requires a **15m wide APZ**. The APZ would apply to the southern boundaries of proposed lots 13, 14, 15 & 16.

It is noted that these affected allotments are rather large (ref to Fig. 5) and thus there is ample room to accommodate a 15m wide APZ. Furthermore, final width of APZ can be further reduced if the portions of the Woodland within the Golf Club grounds and to the south of the affected allotments were managed by keeping the undergrowth maintained and lower branches of trees pruned. **In any case, and assuming the Planning proposal is approved, final APZ will be determined at the Development Application stage for the subdivision.**

In summary, the proposed development is capable of complying with the APZ requirements set in Appendix 2 of PBP.

Furthermore, there is enough room in lots 13, 14, 15 & 16 to accommodate the setback required to accommodate future dwellings which would meet Bushfire Attack Level (BAL) 29 construction requirement. Construction standards applicable to the proposal are discussed in more detail in s.4.3.1 & s.4.3.2.

4.3 Siting, Design and Construction Standards

4.3.1 Siting & Design

According to PBP, the required performance criterion in regard to siting and design is that *"Buildings are sited and designed to minimise the risk of bushfire attack"*.

The Acceptable Solution to meet such criteria is that *"Buildings are designed and sited in accordance with the siting and design principles in Section 4.3.5 of PBP"*. Thus, it is recommended that the design principles outlined in s.4.3.5 of PBP are adopted whenever possible in the future buildings design.

These principles are summarised as follows:

- The higher the building the greater its exposure of the building to radiant heat, wind turbulence and ember attack.
- Avoid building on ridge tops and saddles. Build on level ground whenever possible.
- Where buildings must be constructed on sloping land, they are built on cut-in benches.
- Avoid raised floors, utilise concrete slabs .
- Some cladding material such as brickwork are more robust
- Intricate forms of design can trap debris and influence wind turbulence. Re-entrant corners readily accumulate debris.
- Simplify the design of buildings to reduce the number of re-entrant corner. Provide more simplified rooflines Use of gutters on two storey buildings makes debris removal more difficult. Installation of leafless gutters enhances building performance
- The use of box gutters, flat roof and variation in the angle of the roof should be avoided
- Some design features can enhance the protection of a building, including limiting glazing on exposed façade and providing barriers (eg. BBQ areas, courtyards, fenced off areas for gardens and the like)
- When garages are located under the roofline of the main building, garage doors are to be ember proofed and employ ember traps or brushes to prevent entry of embers into the garage area
- Locate habitable buildings near the property entrance for easier access/egress entrance

4.3.2 Construction Standards - General

In NSW, the Building Code of Australia (BCA) bush fire protection provisions are applied to (via a NSW State variation to the BCA) Class 1, 2, 3 buildings, Class 4 parts of buildings, some Class 10 structures and Class 9 buildings that are Special Fire Protection Purposes (SFPPs). The BCA 2010 references AS3959-2009 - construction of buildings in bushfire-prone areas as the deemed-to-satisfy (DTS) solution for construction requirements in bushfire prone areas for NSW (RFS 2010a).

In order to clarify the NSW development approval process, the RFS has issued an addendum to PBP, namely Addendum: Appendix 3 (RFS 2010b), which replaces the existing Appendix 3. The addendum aligns PBP Appendix 3 with the BCA DTS separation distance requirements for the Bushfire Attack Levels (BAL) of AS3959-2009. It also maintains ember protection consistent with current requirements (RFS 2010a). **All development on bushfire prone land in NSW must comply with the requirements of this amended Appendix and other bushfire protection measures identified within PBP (RFS 2010b).**

Table 2.4.3 of AS3959-2009 (Standards Australia 2011, p. 31) determines the category of bushfire attack for FDI 80 according to the vegetation formation of the hazard and the distance from the hazard. Set back distance to a given vegetation increases with slope steepness and available fuel load because slope and fuel load are determining factors in calculating fire intensity. Additionally, when flame characteristics are computed with slope, distance and height of radiation receiving point, the Radiant Heat Flux can be calculated for a receiver. Thus, setback distances can be calculated to achieve a given Radiant Heat Flux threshold. The applicable Bushfire Attack Levels or BALs are as follows:

- **BAL–LOW** = risk is **very low**; no specific construction requirements
- **BAL–12.5** = risk is **low,** there is a risk of ember attack; construction elements are expected to be exposed to a radiant heat flux not greater than 12.5kW/m^2
- **BAL-19** = risk is **moderate**, there is a risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to radiant heat; construction elements are expected to be exposed to a radiant heat flux not greater than 19kW/m^2
- **BAL-29** = risk is **high,** there is an increased risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to an increased level of radiant heat; construction elements are expected to be exposed to a radiant heat flux not greater than 29kW/m^2
- **BAL-40 =** risk is **very high,** there is a much increased risk of ember attack and burning debris ignited by windborne embers, and a likelihood of exposure to a high level of radiant heat, and some likelihood of direct exposure to flames from the fire front; construction elements are expected to be exposed to a radiant heat flux not greater than 40kW/m^2

Note: *An Alternative Solution will be required if the building exceeds the specification of BAL-40 of AS 3959 (i.e.>40 kW/m2) in which case it is considered to be within the 'Flame Zone'. NSW has made a State based variation to the BCA. This variation excludes BAL-FZ (Flame Zone) as a deemed-to-satisfy solution.*

4.3.3 Construction Standards - Applicable to Proposal

In summary Bushfire Attack Levels (BAL) decrease with increased separation from hazard. Determination of the category of bushfire attack according to the vegetation formation of the hazard and the distance from the hazard are in accordance with Table 2.4.3 of AS3959-2009.

The APZs calculated in s.4.2.2 of this report for proposed lots 13, 14, 15 & 16 requires a minimum 15m setback, which is in accordance with Appendix 2 of PBP. However, there is a discrepancy between Appendix 2 of PBP and the BAL Construction Standards setback requirements prescribed in AS3959-2009. Furthermore, the RFS requires that new subdivision are planned to accommodate building construction to a minimum BAL-29. **Thus, the minimum separation required to achieve BAL-29 from the vegetation dripline to future dwellings on proposed lots 13, 14, 15 & 16 is 21m.** This has been determined using the Newcastle Bushfire Consulting (NBC) Bushfire Attack Calculator; the full report is enclosed as Appendix A.

Still, there is more than sufficient cleared area to position the future dwellings within the affected lots to achieve the minimum BAL-29 Construction requirement. In summary, the proposed development is capable of complying with the construction requirements set in 'Addendum: Appendix 3' (RFS 2010b), which replaces the existing Appendix 3 of PBP and AS3959-2009.

4.4 Access

4.4.1 Public Roads

The Site is accessed from the north from Bent Street. Thus Bent Street complies with the relevant requirements of PBP which state that public roads should:

- Be two wheel drive;
- Be all weather;
- Be two way, that is, at least two traffic lane widths (8m minimum) with shoulders on each side, allowing traffic to pass in opposite directions.;
- Be limited in terms of the use of speed humps and chicanes to control traffic;
- Be through roads;
- Have sufficient capacity to carry fully loaded fire fighting vehicles;
- Have curves with a minimum inner radius of 6m and minimum distance between inner and outer curves of 6m;
- Not exceed a gradient of 10°;
- Have a minimum vertical clearance of 6m;
- Roads should provide sufficient width to allow fire fighting vehicle crew to work with fire fighting equipment about the vehicle;
- Be clearly sign posted; and
- Not traverse areas of inundation.

4.4.2 Property Access Roads

All future lots 1 to 11 will have short direct access from Bent Street, whilst future lots 12 to 16 will also have longer driveway access from Bent Street as shown on Fig. 5. Regardless all driveway will be less than 200m long. **Thus it is purported that access to the future dwellings on proposed Site can comply with Section 4.1.3 of PBP.**

4.5 Water, Gas and Electricity Supply

Services are already available to the Site; if any upgrades are required for the provision of services to this development will need to comply with acceptable solutions to address performance criteria of s.4.1.3 of PBP, which are reproduced in Table 3.

Table 3. Performance criteria for water, gas and electricity supply (as per s.4.1.3 PBP)

Performance Criteria	Acceptable Solutions
Reticulated water supplies Water supplies are easily accessible and located at regular intervals	• Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. • Fire hydrant spacing, sizing and pressures comply with AS2419.1 – 2005. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles. • Hydrants are not located within any road carriageway. • All above ground water and gas service pipes external to the building are metal, including, and up to any taps. • The provisions of parking on public roads are met.

Performance Criteria	Acceptable Solutions
Electricity Services Location of electricity services limits the possibility of ignition of surrounding bushland or the fabric of buildings. Regular inspection of lines is undertaken to ensure they are not fouled by branches.	• Where practicable, electrical transmission lines are underground. • Where overhead electrical transmission lines are proposed: o lines are installed with short pole spacing (30 metres), unless crossing gullies, gorges or riparian areas; and o no part of a tree is closer to a power line than the distance set out in accordance with the specifications in 'Vegetation Safety Clearances' issued by Energy Australia (NS179, April 2002).
Gas Services Location of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	• Reticulated or bottled is installed and maintained in accordance with AS1596 and the requirements of relevant authorities. Metal piping is to be used. • All fixed gas cylinders are kept clear of all flammable materials to a distance of 10 metres and shielded on the hazard side of the installation. • If gas cylinders need to be kept close to the building, the release valves are directed away from the building and at least 2 metres away from any combustible material, so that they do not act as a catalyst to combustion. Connections to and from gas cylinders are metal. • Polymer sheathed flexible gas supply lines to gas metres adjacent to buildings are not used.

4.6 Landscaping and Property Maintenance

4.6.1 Landscaping Features & Principles

Bushland vegetation provides the fuel which feeds wildfires; however, by providing adequate separation distance between the bush and buildings will effectively prevent the spread of bushfire. Still vegetation is not always the foe when it comes to bushfires and it is possible to use managed vegetation as a tool to reduce fire risk. According to many practitioners and researchers (Ramsay & Rudolph 2006; CFA 2004; RFS 2006; Queensland Government 2000; RFS 2008b), a well-designed garden can reduce bushfire hazard near buildings. In summary, homes and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time.

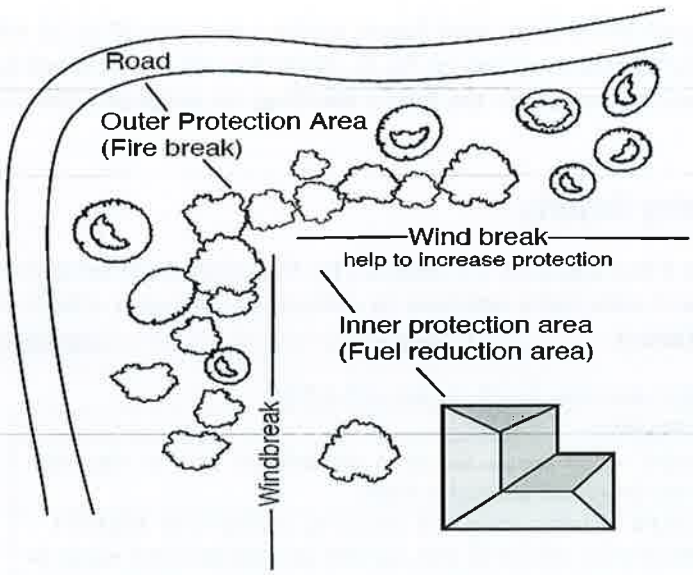

Figure 7. Example of landscaped design aimed at minimising the impact of fire. Source RFS (2008)

According to the RFS (2008), this can be achieved by providing an effective Asset Protection Zone (APZ), which incorporates features such as fire resistant plants, radiant heat barriers and windbreaks in the landscape layout as shown on Fig. 7. The key features required when using landscaping as tool to reduce bushfire risk are summarised as follows (Ramsay & Rudolph 2006; RFS 2008b; RFS 2006):

- Plants with low flammability are selected (eg. broad leaves with high moisture and mineral content, smooth-trunk species with high branches, etc.)
- Vegetation does not provide a continuous path to the house
- Vegetation is located far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission
- Planted (or cleared) vegetation is into clumps rather than continuous rows
- Planted or retained species possesses attributes which makes them a good barrier against bushfire and wind attack
- Low branches are pruned two metres from the ground to prevent a ground fire from spreading into trees
- Lawn is planted and maintained around the future dwellings as this will slow the fire and reduce fire intensity. Alternatively, non-flammable pathways directly around the dwelling are provided
- Shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non-flammable ground cover such as pebbles and crush tile
- Brush type fencing and planting "pencil pine" type trees next to buildings are avoided, as these are highly flammable.

Therefore, the features noted above and the principles listed in the following section should be applied to the landscaping and property maintenance for future dwellings.

4.6.2 Vegetation Management

Vegetation management is the responsibility of individual landowners and should, as per PBP, include:

- *Maintaining a low cut lawn;*
- *Keeping areas around the garden free of fuel;*
- *Utilising non-combustible fencing materials;*
- *Breaking up tree and shrub canopies by defining garden beds;*
- *Using non-flammable mulch;*
- *Ensuring tree branches do not overhang roofs;*
- *Ensuring tree canopies are not continuous; and*
- *Installing windbreaks in the direction from which fires are likely to approach.*

4.6.3 Property Maintenance

Property maintenance should, as per PBP, include:

- *Removal of material such as litter from the roof and gutters;*
- *Ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps;*
- *Check pumps and water supplies are available and in working order;*
- *Driveways are in good condition with trees not being too close and forming an obstacle during smoky conditions;*
- *Check tiles and roof lines for broken tiles or dislodged roofing materials;*
- *Screens on windows and doors are in good condition without breaks or holes in flyscreen material and frames are well fitting into sills and window frames;*
- *Drenching or spray systems are regularly tested before the commencement of the fire season;*
- *Hoses and hose reels are not perished and fittings are tight and in good order;*
- *Doors are fitted with draught seals and well maintained;*
- *Mats are of non-combustible material or in areas of low potential exposure; Woodpiles, garden sheds and other combustible materials are located downslope and well away from the house; and*

- *Trees and other vegetation in the vicinity of power lines and tower lines should be managed and trimmed in accordance with the specifications in "Vegetation Safety Clearances" issued by Energy Australia (NS179 April 2002).*

4.6.4 Property & Vegetation Maintenance Recommendations

Appropriate landscaping and property maintenances detailed in s.4.6.1, s.4.6.2 & s.4.6.3 can be achieved via appropriate species selection, plant location, plating density and ongoing maintenance. In regard to the proposal such property management and landscaping principles can be incorporated in the future development of the Site.

As noted in s. 4.2.2, it would be advantageous to the future development of the Site if the portions of the Woodland vegetation within the Golf Club grounds and directly to the south- south west of proposed lots 13, 14, 15 & 16 were managed by keeping the undergrowth maintained and lower branches of trees pruned.

5. Conclusion

This Bushfire Constraint Assessment report has been prepared by Land & Fire Assessments Pty Ltd in accordance with the relevant provisions of Planning for Bushfire Protection (PBP) on behalf of Grafton District Golf Club Limited for a rezoning submission of Part Lot 400 DP1153969, 425 Bent Street, South Grafton, NSW. The proposal involves the rezoning submission (i.e. Planning Proposal) of Part Lot 400 DP1153969 to increase the density of the currently zoned 'R5 - Large Lot Residential' portion of the golf course from 9 lots to 16 lots.

The Minister for Planning, under s.117(2) of the EP&A Act issues directions that relevant planning authorities must follow when preparing planning proposals for new Local Environmental Plans (LEP) and amending LEPs (e.g. site specific rezoning such as this Planning Proposal). Direction 4.4 Planning for Bushfire Protection identifies matters for consideration for planning proposals that will affect, or are in proximity to land mapped as bush fire prone.

A key principle should be to ensure that future development is capable of complying with (PBP). To achieve this it was necessary to undertake a constraint assessment of the Proposal Site in respect to bushfire to identify potential bush fire risks to individual sites and proposed forms of development.

Thus this bushfire constraint assessment found that the Planning Proposal:

- will not increase the risk to life from bush fire
- will not introduce controls that place inappropriate developments in areas exposed to unacceptable bush fire hazard
- can provide for appropriate bush fire protection measures to properties at risk of bushfire
- does not have adverse impacts on the surrounding environment,
- does not place additional burden to current evacuation/shelter options for the community, and
- the proposed development is capable of complying with Planning for Bush Fire Protection 2006

In conclusion, this Bushfire Constraint Assessment demonstrates that the Planning Proposal complies with the Direction 4.4 Planning for Bushfire Protection and is capable of complying with PBP.

6. References

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Appendices

NBC Bushfire Attack Assessment Report V2.1

AS3959 (2009) Appendix B - Detailed Method 2

Printed: 7/05/2015 **Assessment Date:** 6/05/2015

FPA AUSTRALIA
Certified Business Bushfire Planning & Design

Site Street Address:	425 Bent Street, South Grafton		
Assessor:	Mr Admin; admin		
Local Government Area:	Clarence Valley	**Alpine Area:**	No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: South west

Vegetation Information

Vegetation Type:	Woodland	**Vegetation Group:**	Forest and Woodland
Vegetation Slope:	7.8 Degrees	**Vegetation Slope Type:**	Downslope
Surface Fuel Load(t/ha):	15	**Overall Fuel Load(t/ha):**	25

Site Information

Site Slope:	0 Degrees	**Site Slope Type:**	Level
Elevation of Receiver(m)	Default	**APZ/Separation(m):**	21

Fire Inputs

Veg./Flame Width(m):	100	**Flame Temp(K)**	1090

Calculation Parameters

Flame Emissivity:	95	**Relative Humidity(%):**	25
Heat of Combustion(kJ/kg	18600	**Ambient Temp(K):**	308
Moisture Factor:	5	**FDI:**	80

Program Outputs

Category of Attack:	HIGH	**Peak Elevation of Receiver(m):**	8.4
Level of Construction:	BAL 29	**Fire Intensity(kW/m):**	31860
Radiant Heat(kW/m2):	28.56	**Flame Angle (degrees):**	62
Flame Length(m):	19.03	**Maximum View Factor:**	0.446
Rate Of Spread (km/h):	2.47	**Inner Protection Area(m):**	21
Transmissivity:	0.842	**Outer Protection Area(m):**	0

Appendix A – Newcastle Bushfire Consulting (NBC) Bushfire Attack Calculator (BAL)

Appendix I

List of Fertilisers and Pesticides Applied to the 10th Green

Fertilizer and Pesticide applications to the 10th Green since 2004

Area of green 550m²

2004

3/2/04- Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m².

9/2/04- Fertilizer, Coron (35% N), @ 0.5lt/100m².

24/2/04- Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m².

26/3/04- Soluble N.P.K. Fertilizer, @2Kg/1oom².

8/4/04-Liquid N & K Fertilizer @0.8lt/100m²

28/4/04-Insecticide, Lipidex 500(500g/lt Trichlorfon), @12ml/100m²

24/5/04- Soluble N & K Fertilizer, @1Kg/100m².

18/6/04- Herbicide, Spearhead (300g/lt MCPA), @35ml/100m².

13/8/04- Liquid N & K Fertilizer @ 1lt/100m².

8/9/04- Fungicide, Rovral GT (250g/l Iprodione), @180ml/100m².

17/9/04- Liquid N & K Fertilizer @ 1lt/100m².

11/10/04- Insecticide, Merit (200g/lt Imidacloprid), @25ml/100m².

13/10/04- Liquid N & K Fertilizer @ 1lt/100m².

26/10/04- Fungicide, Baycor (300g/l Bitertanol), @ 50ml/100m².

11/11/04- Fungicide, Daconil (720g/lt Chlorothalonil), @150ml/100m²

12/11/04- Liquid N & K Fertilizer @ 1lt/100m².

13/12/04- Soluble N & K Fertilizer, @1Kg/100m².

22/12/04- Soluble N.P.K. Fertilizer, @2Kg/1oom².

2005

12/1/05 Liquid N & K fertilizer @ 1lt/100m^2

9/2/05 Liquid N & K fertilizer @ 1lt/100m^2

10/2/05 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

9/3/05 Liquid N & K fertilizer @ 1lt/100m^2

18/3/05 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

6/5/05 Liquid N & K fertilizer @ 1lt/100m^2

1/6/05 Herbicide Kerb(500g/lt propyzamide) @12g/100m^2

2/6/05 Liquid N & K fertilizer @ 1lt/100m^2

7/7/05 Liquid N & K fertilizer @ 1lt/100m^2

4/8/05 Liquid N & K fertilizer @ 1lt/100m^2

30/8/05 Herbicide, Spearhead (300g/lt MCPA), @35ml/100m^2.

14/9/05 Fungicide Heritage (Asoxstrobin 95g/lt) @60ml/100m^2

29/9/05 Liquid N & K fertilizer @ 1lt/100m^2

17/10/05 Fungicide, Rovral GT (250g/l Iprodione), @180ml/100m^2.

21/10/05 Insecticide, Meridian(250g/kg THlamethoxam) @1.2Kg/Ha

1/11/05 Liquid N & K fertilizer @ 1lt/100m^2

14/11/05 Fungicide, Baycor (300g/l Bitertanol), @ 50ml/100m^2.

24/11/05 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha.

12/12/05 Soluble N.P.K. Fertilizer, @2Kg/1oom^2.

23/12/05 Soluble N & K Fertilizer, @1Kg/100m^2.

11/10/06 Insecticide, Meridian(250g/kg THlamethoxam) @1.2Kg/Ha

1/11/06 Soluble N & K Fertilizer, @1Kg/100m

2006

6/1/06 Liquid N Fertilizer, @0.5l/100 m^2.

3/2/06 Liquid N Fertilizer, @0.5l/100 m^2.

13/2/06 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

1/3/06 Liquid N & K fertilizer @ 1lt/100$m^{2.}$

13/3/06 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

31/3/06 Soluble N & K Fertilizer, @1Kg/100m^2.

12/4/06 Liquid N & K fertilizer @ 1lt/100$m^{2.}$

26/4/06 Insecticide, Lipidex 500(500g/lt Trichlorfon), @12ml/100m^2

10/5/06 Liquid N & K fertilizer @ 1lt/100$m^{2.}$

15/5/06 Herbicide, Spearhead (300g/lt MCPA), @35ml/100m^2.

21/6/06 Liquid N & K fertilizer @ 1lt/100m^2

25/7/06 Liquid N & K fertilizer @ 1lt/100m^2

8/8/06 Liquid N & K fertilizer @ 1lt/100m^2

12/9/06 Liquid N & K fertilizer @ 1lt/100m^2

11/10/06 Insecticide, Meridian(250g/kg THlamethoxam) @1.2Kg/Ha

1/11/06 Soluble N & K Fertilizer, @1Kg/100m

21/11/06 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha.

1/12/06 K-Tech poultry manure @10Kg/100m^2

6/12/06 Soluble N & K Fertilizer, @1Kg/100m

21/12/06 Liquid N & K fertilizer @ 1lt/100$m^{2.}$

2007

24/1/07 Liquid N Fertilizer, @0.5l/100 m^2.

29/1/07 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

7/2/07 Insecticide, Permashield, (500g/lt Permethrin), @2ml/100m^2

22/2/07 Soluble N & K Fertilizer, @1Kg/100m

26/2/07 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

22/3/07 Soluble NPK fertilizer, @1Kg/1oom^2

2/4/07 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha.

20/4/07 Insecticide, Permashield, (500g/lt Permethrin), @2ml/100m^2

24/4/07 Fertilize Granular NPK @2Kg/100m^2

28/5/07 Herbicide Kerb(500g/lt propyzamide) @12g/100m^2

18/6/07 Liquid N Fertilizer, @0.5l/100 m^2.

26/7/07 Herbicide, Spearhead (300g/lt MCPA), @35ml/100m^2.

1/8/07 Liquid N & K fertilizer @ 1lt/100$m^{2.}$

24/8/07 Fungicide, Heritage Maxx (95g/l azoxystrobin),@60ml/100m^2

3/10/07 Insecticide, Meridian(250g/kg THlamethoxam) @1.2Kg/Ha

22/11/07 Soluble NPK fertilizer 1Kg/100m^2

5/12/07 Liquid N Fertilizer, @0.5l/100 m^2.

2008

2/1/08 Liquid N & K fertilizer @ 1lt/100m^2

23/1/08 Insecticide, Permashield, (500g/lt Permethrin), @2ml/100m^2

30/1/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

11/3/08 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha.

17/3/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

27/3/08 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha.

10/4/08 Fertilize Granular NPK @2Kg/100m^2

1/4/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

9/5/08 Fungicide, Heritage Maxx (95g/l azoxystrobin),@60ml/100m^2

15/5/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

11/6/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

16/6/08 Herbicide Kerb(500g/lt propyzamide) @12g/100m^2

19/6/08 Fungicide, Banner Maxx (155g Propiconazole), @ 50ml/100m^2.

2/7/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

31/7/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

21/8/08 Herbicide, Spearhead (300g/lt MCPA), @35ml/100m^2.

8/9/08 Fungicide, Heritage Maxx (95g/l azoxystrobin),@60ml/100m^2

12/9/08 Soluble NPK fertilizer 1Kg/100m^2

9/10/08 Insecticide, Meridian(250g/kg THlamethoxam) @1.2Kg/Ha

15/10/08 Fertilize Granular NPK @2Kg/100m^2

27/10/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

14/11/08 Liquid N & K fertilizer @ 1lt/100m$^{2.}$

21/11/08 Fungicide, Banner Maxx (155g Propiconazole), @ 50ml/100m^2.

1/12/08 Fertilize Granular NPK @2Kg/100m^2

8/12/08 Soluble NPK fertilizer 1Kg/100m^2

18/12/08 Soluble NPK fertilizer 1Kg/100m^2

2009

5/1/09 Insecticide, Permashield, (500g/lt Permethrin), @2ml/100m^2

23/1/09 Fertilizer N & K liquid 20lt/Ha

30/1/09 Granular Fertilize @2.2 Kg/100m^2

6/2/09 Insecticide, Permashield, (500g/lt Permethrin), @2ml/100m^2

9/2/09 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

17/2/09 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha.

2/3/09 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha

6/3/09 Fertilizer N & K liquid 20lt/Ha

9/3/09 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

23/3/09 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha

1/4/09 Fertilize Granular NPK @2Kg/100m^2

3/4/09 Fungicide Spin(500g/L Carbendazim)5L/Ha,and Daconil (Chlorothalonil 72%W/V)10L/Ha.

6/4/09 Fertilize Granular NPK @2Kg/100m^2

11/4/09 fertilize granular K 1.2Kg/100M^2

27/5/09 Herbicide, Spearhead (MCPA 300g/L) 3.5L/Ha

11/6/09 Herbicide Kerb(500g/lt propyzamide) @12g/100m^2

15/6/09 Fertilize liquid N 40L/Ha

29/6/09 Fungicide, Heritage Maxx (95g/l azoxystrobin),@60ml/100m^2

20/7/09 Fertilize liquid N 40L/Ha

14/8/09 Fungicide, Rovral GT (250g/L Iprodione) @15L/Ha

25/8/09 Fertilize Granular NPK @2Kg/100m^2

21/10/09 Insecticide, Meridian(250g/kg THlamethoxam) @1.2Kg/Ha

26/10/09 Fertilize Granular NPK @2Kg/100m^2

16/11/09 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha

2/12/09 Fertilize (organic NPK) 4Kg/100M^2

23/12/09 Fertilize Granular NPK @2Kg/100m^2

2010

3/2/10 Granular organic fertilizer, NPK 2Kg/100M^2

8/2/10 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

2/3/10 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

17/3/10 Insecticide senator (200g/L imidacloprid) 2.5L/Ha

24/3/10 Soluble fertilizer NPK 2Kg/100M^2

7/4/10 Granular NPK fertilizer 2.2Kg/100M^2

5/5/10 Biological insecticide Dipel (Bacillus thuringensis) @2Kg/Ha.

10/5/10 Liquid Fertilizer @ 60L/Ha

24/5/10 Fungicide, Heritage Maxx (95g/l azoxystrobin),@60ml/100m^2

9/6/10 Herbicide Kerb(500g/lt propyzamide) @12g/100m^2

11/6/10 Fertilize liquid N&K @ 80L/Ha

28/7/10 soluble fertilizer @ 40Kg/Ha

9/8/10 liquid fertilizer @40L/Ha

6/9/10 Fungicide Rovral GT (250g/L Iprodione) @15L/Ha

8/9/10 Insecticide senator (200g/L imidacloprid) 2.5L/Ha

13/9/10 Granular NPK fertilizer 2.2Kg/100M^2

11/10/10 soluble fertilizer PK @20Kg/Ha

27/10/10 Granular NPK fertilizer 2.2Kg/100M^2

28/10/10 Biological insecticide Dipel (Bacillus thuringensis) @2Kg/Ha.

10/11/10 Herbicide DSMA Clear (220g/L DSMA) 165ml/100M^2

19/11/10 Herbicide DSMA Clear (220g/L DSMA) 165ml/100M^2

3/12/10 soluble NPK fertilizer 100Kg/100M^2

15/12/10 Granular NPK fertilizer 2.2Kg/100M^2

31/12/10 Insecticide, Lepidex (500g/L trichloron) @ 1.2L/Ha

2011

12/1/11 Fungicide, Dacogreen Weathershield (720g/L chlorothalonil) @200ml/100M^2

2/2/11 Granular NPK fertilizer 2.2Kg/100M^2

28/2/11 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

10/3/11 soluble fertilizer N&K @75Kg/Ha

23/3/11 soluble fertilizer N&K @75Kg/Ha

28/3/11 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

6/4/11 Insecticide Chlorpyrifos (550g/L chlorpyrifos) @ 7ml/100M^2

7/4/11 soluble NPK fertilizer 100Kg/100M^2

15/4/11 Granular NPK fertilizer 2.2Kg/100M^2

6/5/11 soluble NPK fertilizer 85Kg/100M^2

11/5/11 Fungicide, Heritage Maxx (95g/l azoxystrobin),@60ml/100m^2

30/5/11 Herbicide Kerb(500g/lt propyzamide) @12g/100m^2

13/6/11 liquid fertilizer @40L/Ha

22/7/11 liquid fertilizer @40L/Ha

5/9/11 Granular NPK fertilizer 2.2Kg/100M^2

15/9/11Fungicide, dedicate (250g/l iprodione) @2L/Ha

13/10/11 Insecticide, Acelepryne(200 g/L CHLORANTRANILIPROLE) @ 1.5L/Ha

24/10/11 Granular NPK fertilizer 2.2Kg/100M^2

7/11/11 Herbicide, Daconate (800g/lt MSMA) @3lt/Ha

30/11/11 Granular NPK fertilizer 2.2Kg/100M^2

8/12/11 Granular NPK fertilizer 2Kg/100M^2

19/12/11 Granular NPK fertilizer 2Kg/100M^2

2012

30/1/12 Granular NPK fertilizer 2.2Kg/100M^2

20/2/12 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

14/3/12 Soluble NPK fertilizer 40Kg/Ha

19/3/12 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

28/3/12 Soluble NPK fertilizer 40Kg/Ha

30/3/12 Soluble NPK fertilizer 40Kg/Ha

13/4/12 Granular NPK fertilizer 2.2Kg/100M^2

3/5/12 Fungicide, Heritage Maxx (95g/l azoxystrobin),@60ml/100m^2

30/5/12 Herbicide Pronamide(500g/lt propyzamide) @12g/100m^2

9/8/12 fertilizer liquid N @ 20L/Ha

28/8/12 Granular NPK fertilizer 2.2Kg/100M^2

15/10/12 Granular NPK fertilizer 2.2Kg/100M^2

22/10/12 Insecticide Acelapryne(200g/L Chlorantraniliprole) @ 1500ml/Ha

15/11/12 Herbicide DSMA Clear (220g/L DSMA) 200ml/100M^2

28/11/12 Granular NPK fertilizer 2.2Kg/100M^2

10/12/12 Granular NPK fertilizer 2.2Kg/100M^2

2013

8/2/13 Granular NPK fertilizer 2.2Kg/100M^2

14/3/13 Fungicide Headway Maxx (Azoxystrobin 62g/L, Propiconazole 104g/L) 9L/Ha

18/3/13 Herbicide DSMA Clear (220g/L DSMA) 200ml/100M^2

27/3/13 Soluble NPK fertilizer 40Kg/Ha

3/4/13 Soluble NPK fertilizer 40Kg/Ha

4/4/13 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2.

17/4/13 Granular NPK fertilizer 2.2Kg/100M^2

7/6/13 Herbicide Pronamide(500g/lt propyzamide) @12g/100m^2

12/6/13 fertilizer liquid N @ 20L/Ha

4/7/13 fertilizer liquid N @ 20L/Ha

2/8/13 fertilizer liquid N @ 20L/Ha

26/8/13 Granular NPK fertilizer 2.2Kg/100M^2

26/9/13 fertilizer liquid N @ 30L/Ha

2/10/13 Fungicide Headway Maxx (Azoxystrobin 62g/L, Propiconazole 104g/L) 10L/Ha

10/10/13 Insecticide Acelapryne(200g/L Chlorantraniliprole) @ 1500ml/Ha

11/10/13 Granular NPK fertilizer 2.2Kg/100M^2

14/11/13 Soluble NPK fertilizer 40Kg/Ha

15/11/13 Herbicide DSMA Clear (220g/L DSMA) 200ml/100M^2

27/11/13 Granular NPK fertilizer 2.2Kg/100M^2

2014

24/1/14 Soluble NPK fertilizer 40Kg/Ha

29/1/14 Granular NPK fertilizer 2.2Kg/100M^2

7/2/14 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2

26/2/14 Fungicide Headway Maxx (Azoxystrobin 62g/L, Propiconazole 104g/L) 10L/Ha

5/3/14 Granular NPK fertilizer 2.2Kg/100M^2

17/3/14 Fungicide, Banner Maxx (155g Propiconazole), @ 100ml/100m^2

19/3/14 Soluble NPK fertilizer 50Kg/Ha

2/4/14 Soluble NPK fertilizer 50Kg/Ha

10/4/14 Herbicide DSMA Clear (220g/L DSMA) 200ml/100M^2

16/4/14 Granular NPK fertilizer 2.2Kg/100M^2

2/5/14 Fungicide, Instrata (chlorothalonil 362g/L,propiconazole57g/L,fludioxynil14.5g/L)@18L/Ha

5/5/14 Fertilize, liquid NPK @14L/Ha

14/5/14 Fertilize, liquid NPK @56L/Ha

30/5/14 Fungicide, Banner Maxx (155g Propiconazole), @ 5L/Ha

2/6/14 Herbicide Pronamide(500g/lt propyzamide) @12g/100m^2

4/6/14 Fungicide Transact Pro (iprodione 500g/L) @14L/Ha

6/6/14 Fertilize liquid N&K@ 40L/Ha

3/7/14 fertilize, liquid N&K@50L/Ha

4/7/14 Fungicide Mancoflo (Mancozeb 750g/L) @2.75Kg/Ha

30/7/14 Fertilize, liquid N&K @35L/Ha

14/8/14 Insecticide, Chlorpyrifos 500ec(chorpyrifos 500g/L)@1L/Ha

3/9/14 Granular NPK fertilizer 2.2Kg/100M^2

22/9/14 Insecticide Acelapryne(200g/L Chlorantraniliprole) @ 1500ml/Ha

2/10/14 Miticide, Thumper(abamectin 20g/L) @1L/Ha

9/10/14 Fungicide Headway Maxx (Azoxystrobin 62g/L, Propiconazole 104g/L) 10L/Ha