

24th April 2006



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Subject: Bushfire Protection Assessment for
Proposed Residential Sub Division
Lot 2 DP250984 Grandfathers Gully Rd Lilli Pilli.

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*Bushfire Protection Planning &
Assessment Services*

*Member of the Australian Bushfire
Assessment Consultants Group.*

Dear David,

Please find attached bush fire protection & construction standard assessment report and recommendations for compliance for the proposed residential sub division development of Lot 2 DP250984 Grandfathers Gully Rd Lilli Pilli.

Unless otherwise stated within the following report, all recommendations for bushfire safety compliance are based upon NSW Rural Fire Service Planning for Bushfire Protection Guidelines, 2001.

Please note, this report and recommendations contained herein do not constitute automatic approval and issue of a Bushfire Safety Authority under Section 100B of the NSW Rural Fires Act.

Also attached is an invoice for this work to date.

Sincerely

Matt Jones

Bushfire Protection Planning
& Assessment Consultant

BAppSc Environmental Health

Grad. Dip Design for Bushfire Prone Areas

BPAD-A Certified Practitioner BPD-PA-09336

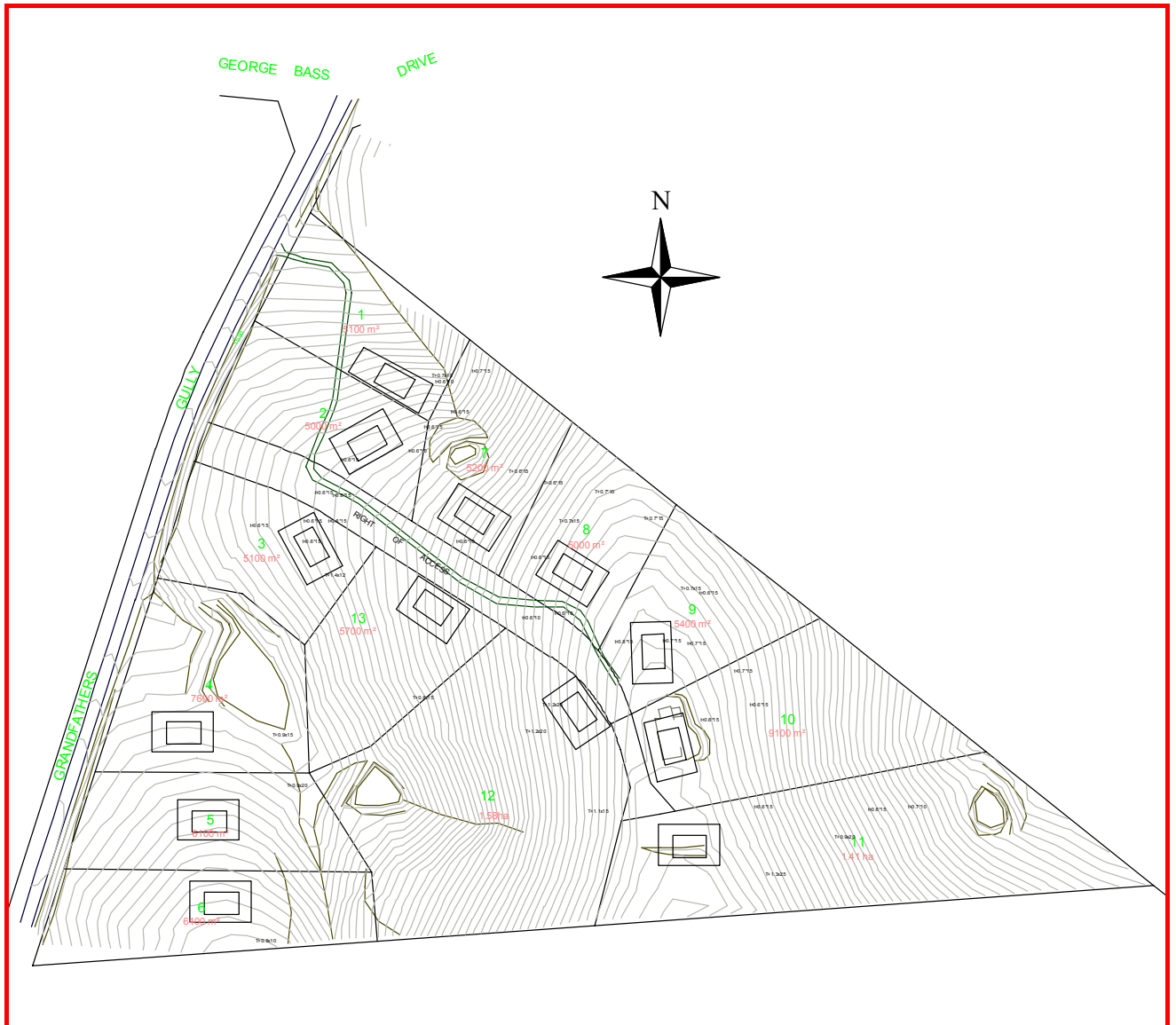
Member No. 9336 Fire Protection Association Australia

cc. Conway Burrows & Hancock Consulting Surveyors – Allan Burrows.

Bushfire Protection and Compliance Assessment



Proposed Residential Sub Division Lot 2 DP250984 Grandfathers Gully Rd Lilli Pilli.



**Grandfathers Gully Rd, Lilli Pilli (Lot 2 DP 250984)
Proposed Residential Sub Division Development
Bushfire Protection & Compliance Assessment.**



The following report outlines a bushfire protection assessment of the proposed residential subdivision development located Lot 2 DP250984 Grandfathers Gully Road Lilli Pilli and at least 140m beyond - herewith 'the study area' (denoted maps 1 & 2).

Report content and detail are outlined as per requirements set out in clause 46 of the Rural Fires Regulation 2002.

Methodology for this site assessment for bushfire attack and recommended mitigation measures are based on Planning for Bushfire Protection (PBP) guidelines (Appendix 2 & 3).

Asset protection zone estimations are based upon the minimum specifications for asset protection zones for Residential Purposes in Bushfire-prone areas.

Proposed & adjusted sitings, as denoted on the attached maps, are located to best demonstrate how the proposed new allotments can collectively facilitate residential dwellings constructed to AS3959 & does not necessarily indicate the final location / siting of a proposed new residential dwelling.

Vegetation extent within the study area is derived from aerial photo interpretation (api) and our understanding of the surrounding residential development (either approved or proposed) likely to occur within the near future.

Slope analysis is derived from 5m grid digital elevation modelling, numerous site inspections & surveyed spot height contour analysis.

A comprehensive literature review and site survey for natural or cultural assets potentially effected by the proposed development, and associated bushfire mitigation measures, has not been undertaken as part of this assessment.

(a) Property / Development Description & Address:

The current address of the subject property is 9 Grandfathers Gully Rd Lilli Pilli, being Lot 2 in Deposited Plan 250984 (herewith, '*the subject land*').

The subject land is located approximately 3.5 km by road NNW of the Malua Bay shop precinct or 1.6km SE of the Surf Beach shop precinct, and is generally bounded by partly forested rural residential land to the S & W and forested Council / Public Reserve to the NE (denoted maps 1 & 2).

The area of the subject land is approximately 10.2ha and almost entirely cleared. Previously, the majority of subject land was used to intensively farm deer and other various grazing livestock.

The subject land and adjoining private lands (including private lands directly opposite side of Grandfathers Gully Rd) are currently zoned Rural 1c.

The subject land currently contains an existing residential dwelling. However, as advised by the proponent, the existing dwelling is in significant disrepair will be demolished and replaced with a new residential dwelling.

The proposed development is for 13 new residential allotments, labelled 1 to 13 (for the purposes of this report), to be accessed direct from Grandfathers Gully Rd or via a proposed public access road extension running off Grandfathers Gully Rd (denoted maps 3a & 3b).

The proposed road reserve area to service the subject land being approximately 300m in length, 20m wide (for the most part) tapering to 10m wide [variable] at around Lots 9-11, then widening (max. 25m) at its end most point to facilitate a turning area for larger vehicles.

The area of each proposed new allotment is estimated to be;

- Lot 1 – 0.51 ha,
- Lot 2 – 0.5 ha,
- Lot 3 – 0.51 ha,
- Lot 4 – 0.76 ha,
- Lot 5 – 0.61 ha,
- Lot 6 – 0.64 ha,
- Lot 7 – 0.52 ha,
- Lot 8 – 0.5 ha,
- Lot 9 – 0.54 ha,
- Lot 10 – 0.91 ha,
- Lot 11 – 1.41 ha,
- Lot 12 – 1.58 ha, &
- Lot 13 – 0.57 ha.

(b) Vegetation Classification:

The primary bushfire vegetation within the study area has been assessed as Group 1 Forest as per PBP guidelines (denoted Map 2).

The surrounding natural forest communities have been assessed to include:

- Coastal Lowlands Cycad/Shrub Dry Forest – *C. maculata* (Grp 1 Forest)

Given the potential extent of bushfire vegetation likely to be persist within the study area within the foreseeable future, the proposed development site would be subject to significant bushfire attack primarily from the NE to W and to a lesser extent from neighbouring forest / remnant vegetation to the S-E.

However, given the level of residential development occurring on the Far South Coast of NSW and the respective zoning of surrounding land (Rural 1c), it is reasonable to assume forested private land to the W & S of the subject land may be further fragmented or reduced of available bushfire vegetation / fuel within the foreseeable future.

All other vegetation communities (mainly grassland) within the study area have been either cleared or actively managed by grazing / slashing (the subject site previously being a Deer farm). Although most of the subject land is free and clear of Group 1 forest, some areas previously cleared for grazing purposes have minor areas of regrowth (juvenile Acacia and Eucalypt Spp. ect) or severely disturbed remnants (see attached photos).

Considering the extent of regrowth / severely disturbed remnant areas within the subject site, these areas are considered equivalent to Group 3 vegetation as per PBP guidelines.

The bushfire vegetation effecting the subject land is denoted map 2.

(c) Slope Assessment:

Based on indicative residential building sitings denoted by this report, the effective* slope surrounding or effecting the development area, primarily influencing bushfire behaviour, has been assessed as predominantly 5-18 degrees, occasionally exceeding 18 degrees (mostly effecting Lots 10 - 12).

Significant areas of slope within the study area have been assessed to exceed 18 degrees slope. The above is more accurately shown map 4.

Given the location of these steeper areas in relation to the proposed or adjusted sitings denoted by this report and proposed public access roads, these steeper areas should generally not restrict the proposed development with respect building sitings and proposed access roadways.

However, significant areas of steeper slope exceeding 18 degrees will intersect prescribed minimum asset protection zones / setbacks areas for indicative sitings on lots 10 - 12. Justification for compliance in this respect is further addressed part (g)(i) of this report.

** effective slope being an assessment of relief from the building envelope, over an average distance of 100m towards the bushfire vegetation hazard.*

(d) Significant Environmental Features:

Apart from some minor areas of remnant regrowth / shrub occurring within the subject land, no other significant environmental features have been noted, recorded or advised of as part of this assessment.

In general, the past use of the subject land for intensive deer farming has significantly altered / degraded the natural state of the subject land.

(e) Threatened Species, Population or Ecological Community:

No threatened species, populations or ecological communities have been noted, recorded or advised of as part of this assessment.

On advice from the proponent, we understand a flora and fauna assessment of the subject land has been undertaken to facilitate the respective development application.

(f) Detail & Location of any known Aboriginal Relic or Place:

No known Aboriginal relics or places have been noted, recorded or advised of as part of this assessment.

On advice from the proponent, we understand an archaeological assessment of the subject land has been undertaken to facilitate the respective development application.

(g) Bushfire Assessment Methodology:

Methodology for this site assessment for bushfire attack and recommended mitigation measures are based on Planning for Bushfire Protection (PBP) guidelines (Appendix 2 & 3).

(g)(i) Development Setback & Asset Protection Zone (APZ):

The APZ / setback areas required for the above parameters, as determined from PBP guidelines, would be a minimum;

- 20m (20m IPA* only) from any adjacent Grp 1 bushfire vegetation >5 degrees upslope or Grp 3 remnant vegetation,
- 30m (20m IPA + 10m OPA**) from any adjacent Grp 1 bushfire vegetation <5 degrees upslope or on level ground,
- 40-70m (30-60m IPA + 10m OPA) from adjacent Grp 1 bushfire vegetation down slope.

* IPA - Inner Protection Area as defined 4.2.2(b) PBP Guidelines

** OPA - Outer Protection Area as defined 4.2.2(a) PBP Guidelines

A more detailed analysis of estimated APZ / Setback distances (based on indicative sitings denoted by this report) are described table 1.

Table 1 – Estimated Minimum APZ / Setback Distances for PBP Compliance

Lot	Direction (TN)	APZ (m)	IPA (m)	OPA (m)	Effective Slope (degrees)	Vegetation Type	Effected Area Description
1	NW-N	50	40	10	5-10 down slope	Group 1	Lot 1 only
	NE-E	30	20	10	5-0 Flat	Group 1	Lot 1 only
	SE-SW	20	20	-	5-0 up slope	Group 1-3	Lot 1 & Lot 2 minimum APZ area
	W	30	20	10	5-0 Flat	Group 1	Lot 1 & Lot 2 minimum APZ area
2	NW-N	50	40	10	5-10 down slope	Group 1	Lot 2 & Lot 1 minimum APZ area
	NE-E	30	20	10	5-0 Flat	Group 1	Lot 2 & Lot 1 & 7 minimum APZ area
	SE	20	20	-	5-0 up slope	Group 1-3	Lot 2 & Lot 7 minimum APZ area
	S	30	20	10	5-0 Flat	Group 1-3	Lot 2 & Proposed Public Access Road
	SW-W	40	30	10	0-5 down slope	Group 1-3	Lot 2 & Proposed Public Access Road & lot J minimum APZ area
3	W-NW	50	40	10	5-10 down slope	Group 1-3	Lot 3 only
	NW-NE & S-SW	40	30	10	0-5 down slope	Group 1-3	Lot 3, Proposed Public Access Road & Lot B2 minimum APZ area, & <u>part Lot 4</u>
	NE-SE	20	20	-	5-0 up slope	Group 1-3	Lot 3 & Proposed Public Access Road
4	W-N	40	30	10	0-5 down slope	Group 1-3	Lot 4 & formed Public Access Road (Grandfathers Gully Rd)
	NE-E & SW	30	20	10	5-0 Flat	Group 1-3	Lot 4 & formed Public Access Road (Grandfathers Gully Rd)
	SW-SE	20	20	-	5-0 up slope	Group 1-3	Lot 4 & Lot 5 minimum APZ area
5	W-NW	50	40	10	5-10 down slope	Group 1-3	Lot 5 & Lot 4 minimum APZ area
	NW-E	40	30	10	0-5 down slope	Group 1-3	Lot 5 & Lot 4 minimum APZ area
	SW & SE	30	20	10	5-0 Flat	Group 1-3	Lot 5 & Lot 6 minimum APZ area
	S	20	20	-	5-0 up slope	Group 1-3	Lot 5 & Lot 6 minimum APZ area
6	W-NE	50	40	10	5-10 down slope	Group 1-3	Lot 6 & Lot 5 minimum APZ area
	NE-ESE	40	30	10	0-5 down slope	Group 1-3	Lot 5 & Lot 4 minimum APZ area
	SE-SW	20	20	-	5-0 up slope	Group 1-3	Lot 6 only
7	NW	50	40	10	5-10 down slope	Group 1-3	Lot 7 & Lot 2 minimum APZ area
	N-NE	40	30	10	0-5 down slope	Group 1	Lot 7 only
	ENE-SE	20	20	-	5-0 up slope	Group 1-3	Lot 7 & Lot 8 minimum APZ area
	S	30	20	10	5-0 Flat	Group 1-3	Lot 7 & Proposed Public Access Road
	SW-W	50	40	10	5-10 down slope	Group 1-3	Lot 7, Proposed Public Access Road, lot 13 & 3 minimum APZ area
8	NW	50	40	10	5-10 down slope	Group 1-3	Lot 8 & Lot 7 minimum APZ area
	N-NE	40	30	10	0-5 down slope	Group 1	Lot 8 only
	ENE-SE	20	20	-	5-0 up slope	Group 1-3	Lot 8 & Lot 9 minimum APZ area
	S	30	20	10	5-0 Flat	Group 1-3	Lot 8 & Proposed Public Access Road
	SW-W	50	40	10	5-10 down slope	Group 1-3	Lot 8, Proposed Public Access Road, lot 12 & 13 minimum APZ area
9	W, NW, N, NE, E	60	50	10	10-15 down slope	Group 1-3	Lot 9, Proposed Public Access Road, lot 8 & 10 & 12 minimum APZ area
	SE & SW	40	30	10	0-5 down slope	Group 1-3	Lot 9, Proposed Public Access Road, lot 10 & 12 minimum APZ area
	S	30	20	10	5-0 Flat	Group 1-3	Lot 9 & Lot 10 minimum APZ area
10	SW-NW & NE-SE	70	60	10	15-18 down slope	Group 1-3	Lot 10, Proposed Public Access Road, lot 12 minimum APZ area
	NW-NE	40	30	10	0-5 down slope	Group 1-3	Lot 10, Proposed Public Access Road, lot 9 minimum APZ area
	SW-SE	30	20	10	5-0 Flat	Group 1-3	Lot 10, Proposed Public Access Road, lot 11 minimum APZ area
11	NE-SE	70	60	10	15-18 down slope	Group 1-3	Lot 11 & lot 10 minimum APZ area
	SSE-SW	30	20	10	5-0 Flat	Group 1-3	Lot 11 & part of neighbouring Lot 3 DP250984 existing APZ area
	SW-NW	40	30	10	0-5 down slope	Group 1-3	Lot 11 & <u>part lot 12</u>
	NW-NNE	40	30	10	0-5 down slope	Group 1-3	Lot 11, Proposed Public Access Road & lot 10 minimum APZ area

Lot	Direction (TN)	APZ (m)	IPA (m)	OPA (m)	Effective Slope (degrees)	Vegetation Type	Effected Area Description
12	SW-W	70	60	10	15-18 down slope	Group 1-3	Lot 12 only
	W-NW	60	50	10	10-15 down slope	Group 1-3	Lot 12 & Lot 13 minimum APZ area
	NW-N	40	30	10	0-5 down slope	Group 1-3	Lot 12, Proposed Public Access Road & lot 8 minimum APZ area
	N-NE & S	30	20	10	5-0 Flat	Group 1-3	Lot 12, Proposed Public Access Road & lot 8 & 9 minimum APZ area
	NE-SE	20	20	-	5-0 up slope	Group 1-3	Lot 12 & Proposed Public Access Road
13	SW-W	50	40	10	5-10 down slope	Group 1-3	Lot 13 & Lot 3 minimum APZ area
	NW-N & S	40	30	10	0-5 down slope	Group 1-3	Lot 13, Proposed Public Access Road & lot 3 & 2 minimum APZ area
	N-NE	30	20	10	5-0 Flat	Group 1-3	Lot 13 & Proposed Public Access Road
	NE-SE	20	20	-	5-0 up slope	Group 1-3	Lot 13 & Proposed Public Access Road

The proposed development sites location, layout (based on indicative sitings with some minor adjustment; sitings Lots 11 & 3), lot size and proximity to adjacent bushfire vegetation can collectively facilitate the required minimum or recommended APZ / setback from off-site and potentially unmanaged bushfire vegetation (denoted map 5).

With respect to APZ areas extending over slope exceeding 18 degrees, this assessment notes the majority of the subject property is mostly cleared and managed (slashed). Based on our assessment (5m DEM Analysis) of slope exceeding 18 degrees (32.5%), the majority of slope >18 degrees within the subject property is currently cleared of remnant bushfire vegetation; any grass and shrub re-growth being regularly slashed.

Considering the managed and fuel reduced state of remnant forest or shrub vegetation within the subject site, and the minimal ground disturbance required to maintain this area as an APZ (primarily slashing or pruning), any ongoing maintenance of the minimum required APZ areas over slope > 18 degrees should not have a significant impact upon the soil stability for the development site.

Furthermore, given the relatively larger lots sizes (ie. >5'000sqm) proposed for the subject development, where small isolated remnant vegetation (Group 3) may be retained on areas of slope >18 Degrees, building sitings potentially effected by steeper slope (eg. Lot 12) could be easily adjusted so as to be separated by at least 20m from isolated remnant (Group 3) bushfire vegetation.

Development Setback / APZ Recommendation:

1. *Based on the indicative sitings denoted by this report, at least the APZ areas denoted by this report be constructed and maintained, within the bounds of the respective new allotment, for the life of the building.*
2. *Where a minimum required APZ area extends beyond the perimeter of its respective allotment and the effected section of the neighbouring allotment is not yet developed, that section of the effected neighbouring allotment have a temporary easement placed upon it to ensure the maintenance of the minimum required APZ until such time as the effected neighbouring allotment is developed.*
3. *Where a minimum required APZ area extends over unmanaged vegetation on slopes exceeding 18 degrees, the effected areas be managed to OPA standards only.*

(g)(ii) Fire Fighting Water Supply:

The subject site is likely not be serviced with reticulated town water.

PBP guidelines recommend rural and rural residential developments in bushfire prone areas must maintain a water supply reserve dedicated for fire fighting purposes.

PBP guidelines recommend a 10,000L water supply is sufficient to protect a house using hoses.

Water Recommendations:

4. *Each future / proposed new residential dwelling constructed within the subject development incorporate an additional water storage tank/supply that maintains at least a 10,000L* reserve capacity at all times, dedicated for fire fighting purposes. or as otherwise deemed to comply by the Consent Authority.*

The supply of water can be an amalgam of minimum fresh / rain water quantities as otherwise prescribed by the local consent for new residential building approval.

5. *Water storage tanks should preferably be constructed of non-combustible material or otherwise sited to ensure they are not damaged or destroyed by radiant heat, and where raised, have their stands constructed of non combustible material or be fully protected from radiant heat and ignition.*
6. *Water storage tanks include additional fittings of 65mm Stortz outlet with gate or ball valve, or as otherwise compatible with the relevant Fire Fighting Authority.*
7. *Water storage tanks are sited so as to be easily and safely accessible by Category 1 Fire Tankers or Pumpers.*
8. *Each future / proposed new residential dwelling maintain a portable powered pump (Preferably diesel) > 3kW (5hp) with compatible hoses and fittings for water storage tank/supply.*

** where the proposed new allotments will be serviced with a reticulated mains town water supply, the additional water storage/supply can be reduced (ie. recommended 5,000L reserve capacity), or as otherwise deemed to comply by the consent authority in considering the potential for a mains supply to fail during a wildfire event.*

(g)(iii) Public Road Capacity to Handle Increased Traffic Volume:

Grandfathers Gully Road is a well formed and sealed public access road proving two-way access for most types of traffic. Grandfathers Gully Rd would easily facilitate the safe passage of Category 1 Fire Tankers or Urban Pumpers (see attached photos).

Grandfathers Gully Rd is easily accessed from George Bass Drive (see attached photos).

George Bass Drive is a wide & well formed main public access road proving two-way access for most types of traffic. George Bass Drive would easily facilitate the safe passage of Category 1 Fire Tankers or Urban Pumpers (see attached photos).

The existing public access roads (within the study area) servicing the subject development and neighbouring development do not exceed 10 degrees slope.

The subject development site is proposed to be accessed via a proposed public access road extension linked from Grandfathers Gully Rd. The proposed road reserve width for public access within the subject development site is approximately 20m wide (for the most part) tapering to 10m wide [variable] at around Lots 9 - 11. The proposed public access road generally does not exceed 12 degrees gradient.

Where the proposed public access road to service the subject development is designed, constructed and maintained to the minimum PBP guidelines, it should easily have the capacity to handle an increase in traffic as a result of the subject new residential development or bushfire emergency impacting upon the subject area.

Grandfathers Gully Rd and George Bass Drive should currently & easily have the capacity to handle the increase in traffic.

(g)(iv) Public Road Links to Fire Trail Network and Two-Way Access:

All existing & proposed public access roads within the study area will provide two-way access.

This assessment notes one fire trail (running adjacent the NE boundary of the subject land, within the Public Reserve) which may potentially be used for fire suppression or mitigation purposes within the study area (see attached photos).

(g)(v) Access & Egress from Development Site for Emergency Response:

A proposed public access road extension linked direct to Grandfathers Gully Rd, measuring approximately 300m in length, on a 20-10m wide road reserve, will service the subject development (denoted attached map 6). The proposed public access road generally does not exceed 12 degrees gradient.

Based on the indicative sitings denoted by this report, all future residential dwellings are easily sited within 65m of their respective public road access point.

However, the indicative sitings for proposed allotments 9 - 12 will be >200m from the primary access point of Grandfathers Gully Rd (the indicative siting for Lot 11 being 330m from Grandfathers Gully Rd).

Whilst the proposed extension road will provide public access in either direction for the subject development, the proposed public access road system to service the subject development will not facilitate through or loop access for the subject development.

PBP guidelines recommends;

- public roads should be through roads, but where unavoidable, should not be more than 200m in length, incorporate a minimum 12m radius turning circle, and should be clearly sign posted as dead ends, &
- dwellings not sited within 200m of the road system should have an alternative access road providing emergency egress to the through road system (considering the chance of a bushfire cutting part of the road system).

Whilst an alternate / emergency access way could potentially be constructed along the S boundary (linking Lot 11 back to Grandfathers Gully Rd) to facilitate emergency access for the subject development, we would propose the primary access trail should provide a guaranteed means of vehicular access (during a bushfire event). Considering the future locations of new residential buildings and their respective (and collective) APZ areas, it is reasonable to suggest the location of the proposed new public access roadway is unlikely to be cut by a bushfire considering it will be generally bounded by at least 50m of APZ areas, on either side, for almost its entire length. In this respect, alternative vehicular access should not be warranted.

Furthermore, considering the surrounding vegetation along the adjacent sections of Grandfathers Gully Rd or George Bass Dr, evacuation from the subject property along any of the routes may be unsafe during a significant wildfire event. In our considered opinion (considering what will eventually be large areas of cleared and managed land within the subject property) refuge within the subject property may be as safe or safer than attempting to evacuate the subject area via the adjoining public road system.

In the event any of the proposed property or public access roads are cut by fire, it is reasonable to assume other areas along Grandfathers Gully Road or George Bass Drive are potentially also being impacted by wildfire. Persons and/or vehicles located along Grandfathers Gully Road or George Bass Drive under these circumstances risk being trapped, over-run by wildfire or being injured by falling trees / debris associated with a potential fire storm.

Where the future proposed residential development incorporates at least the recommended APZ areas, residential dwelling construction standards and water supply / delivery, persons or fire fighters electing to remain within the subject property during a fire storm have a reasonable chance of survival and would more than likely provide the best defence for property protection in this situation.

Based on the indicative sitings denoted by this report, the size and terrain of each proposed new allotment can easily facilitate PBP requirements for property access roads.

It is also recommended a vehicle turning area, of at least 12m formed radius or otherwise to facilitate the safe turn around Category 1 Fire Fighting Tankers, is incorporated at the end of the proposed access road extension and the extension is clearly sign posted (at the Grandfathers Gully Rd intersection) as dead end or no through access.

Where the future proposed public & property access roads / drives and emergency access trails are designed and constructed as per the PBP guidelines, category 1 fire tankers or bushfire fighting vehicles should easily access the subject new lots and proposed future dwellings.

Access Recommendations:

9. *As applicable, the proposed 'public access road' to service the subject new allotment be constructed & maintained to at least the minimum design criteria as outline in PBP guidelines, section 4.3.1(b) or as otherwise prescribed or amended # by the consent authority, including (but not limited to);*

- *at least 8m wide formed road / driveway + 1m cleared verge either side,*
- *at least 6m vertical clearance,*
- *a 12m radius or turning area to facilitate the safe turn around of heavy fire fighting vehicles being incorporated at the end of the proposed access road extension,*
- *the proposed public access road extension being clearly sign posted (at the Grandfathers Gully Rd intersection) as dead end or no through access.*
- *generally avoiding (or traverse) any grades >10 degrees [must not exceed 15 degrees], &*
- *of a standard to facilitate the safe passage of at least a fully loaded Category 1 Fire Tanker or Emergency Services Vehicles in wet or dry conditions.*

Rural Fire Service public road access provisions as amended

1. *All public access roads 8m wide shall locate services outside of parking reserves to ensure accessibility to reticulated water for fire suppression.*
2. *All public access roads between 8 and 7m wide shall be No Parking on one side with services (hydrants) located opposite parking side to ensure accessibility to reticulated water for fire suppression.*
3. *All public access roads between 7m and 5.5m wide shall provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.*
4. *No two way public access roads are permitted less than 5.5m wide.*
5. *One way only public access roads shall be no less than 4m wide and provide parking within parking bays and locate services outside of the parking bays to ensure accessibility to reticulated water for fire suppression.*
6. *All access roads directly interfacing the bushfire hazard vegetation shall provide roll top kerbing to the hazard side of the road.*
7. *All provisions for public access roads, other than where modified by the above provisions (1-6), detailed within Section 4.3 of Planning for Bushfire Protection 2001 shall be complied with.*
8. ***All access roads servicing more than 4 dwellings are considered public access roads.***

9. Fire trails shall comply with 4.3.3 of Planning for Bushfire Protection 2001.

10. Public access roads are to provide for; safe and timely access to a bushfire or other emergency; safe evacuation of residents and fire fighters; the capacity to safely pass vehicles; unobstructed access to services; and a safe working space about an emergency vehicle.

10. Future proposed 'property access roads' to service the new residential development be constructed & maintained to the minimum design criteria as outline in PBP guidelines, section 4.3.2(b) (or as otherwise deemed to comply by the consenting authority), including (but not limited to);

- at least 4m wide formed road / driveway + 1m cleared verge either side,
- at least 6m vertical clearance,
- avoiding (or traverse) any grades >10 degrees, &
- of a standard to facilitate the safe passage of at least a fully loaded Category 1 Fire Tanker or Emergency Services Vehicles in wet or dry conditions.

(g)(vi) Development Site Bushfire Maintenance Plans & Fire Emergency Procedures:

No additional advice or information regarding bushfire maintenance plans & fire emergency procedures has been provided by the proponent.

Should a bushfire emergency impact upon this area, the implementation of the existing Eurobodalla Sect. 52 Operations & Risk Plan should be adequate for bushfire suppression, hazard management and maintenance.

(g)(vii) Development Construction Standards for Building Elements:

Based on the above assessment, the proposed new allotments will collectively provide sufficient separation for future sitings / residential dwellings to comply with the application of AS3959-1999 for buildings constructed within a bushfire prone area.

Based upon the indicative sitings and the minimum required APZ dimensions denoted by this report (see map 5 & Table 1.0), and given the distances the proposed sitings can be separated from unmanaged and off-site bushfire vegetation, future proposed residential development on the subject lots would technically be considered to be within an 'Extreme-Medium' category for potential bushfire attack.

PBP guidelines recommends residential dwellings potentially exposed to an;

- 'Extreme' bushfire attack event be constructed to a Level 3 Standard,
 - 'High' bushfire attack event be constructed to a Level 2 Standard,
 - 'Medium' bushfire attack event be constructed to a Level 1 Standard,
- as specified by AS3959 Construction of Buildings in Bushfire Prone Areas.

In the event of a significant wild fire impacting upon the subject site, future residential dwellings constructed within the subject property would most likely be impacted by significant ember attack and some radiant heat from most directions.

Construction Recommendations:

11. Based on the individual minimum required APZ area (described Table 1.0), each proposed / future dwelling constructed on the new allotments incorporate AS3959 Level 3 design & construction standards.

Note: Lower AS3959 construction standards may be achievable where APZ areas are collectively shared across the new allotments and/or proposed building envelopes are adjusted to increase their respective separation from unmanaged forested areas.

(g)(viii) Sprinkler Systems & Other Fire Protection Measures to be Incorporated:

No additional fire protection measures (above and beyond recommendations stated above) or sprinkler systems would be required for compliance with PBP guidelines.

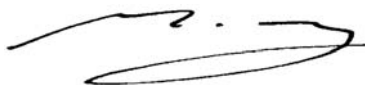
(h) General Assessment of Compliance with Planning for Bushfire Protection (Chapter 4):

- The proposed development and potential sitings for future residential dwellings can facilitate the minimum required APZ on the hazard side of the development. All new allotments should collectively provide adequate separation from bushfire vegetation to facilitate the application of AS3959 or BCA Housing Provisions for a residential building constructed within a bushfire prone area.
- Where the public access roadway is constructed and maintained as recommended by this report, access and egress for the proposed development site should be easily achievable for all types of vehicles (incl. Category 1 Tankers) via the existing and proposed road network. The proposed new public & property access road/drives can easily meet PBP guidelines.
- Design, staging & siting of the development is relatively simple and generally addresses the suggested issues described in PBP guidelines section 4.4.
- The available area on each proposed new allotment to store additional water (water supply tank) should ensure provision of an appropriate water supply and availability during times of bushfire emergency

Conclusion:

Based on the above 11 recommendations to protect persons and property from the danger that may arise from a bushfire, the Consent Authority may determine that this development proposal complies with Planning for Bushfire protection 2001 as required under section 100B of the Rural Fires Act 1997.

Should any the above information need clarification or further discussion, please contact the author.



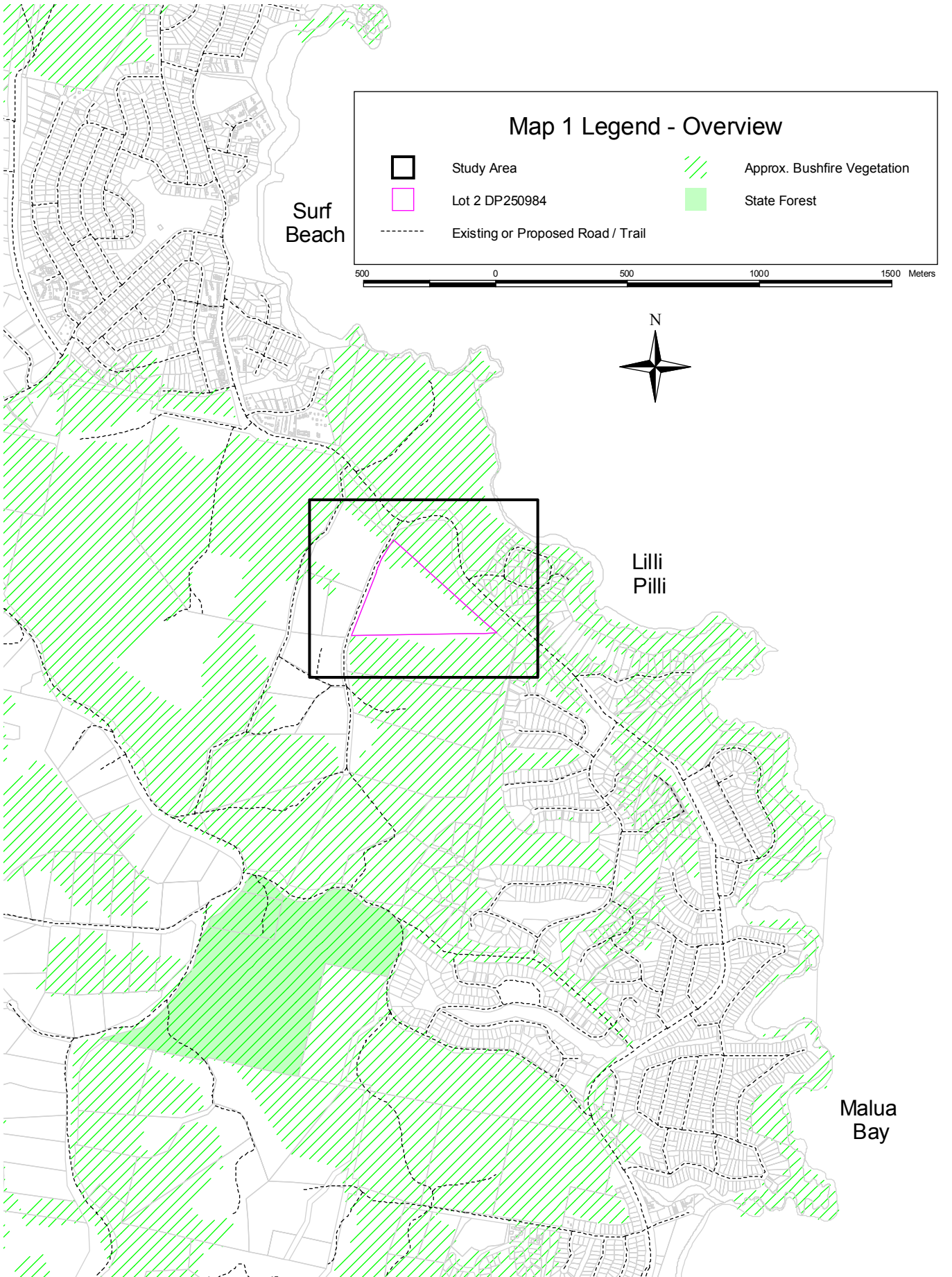
Matt Jones

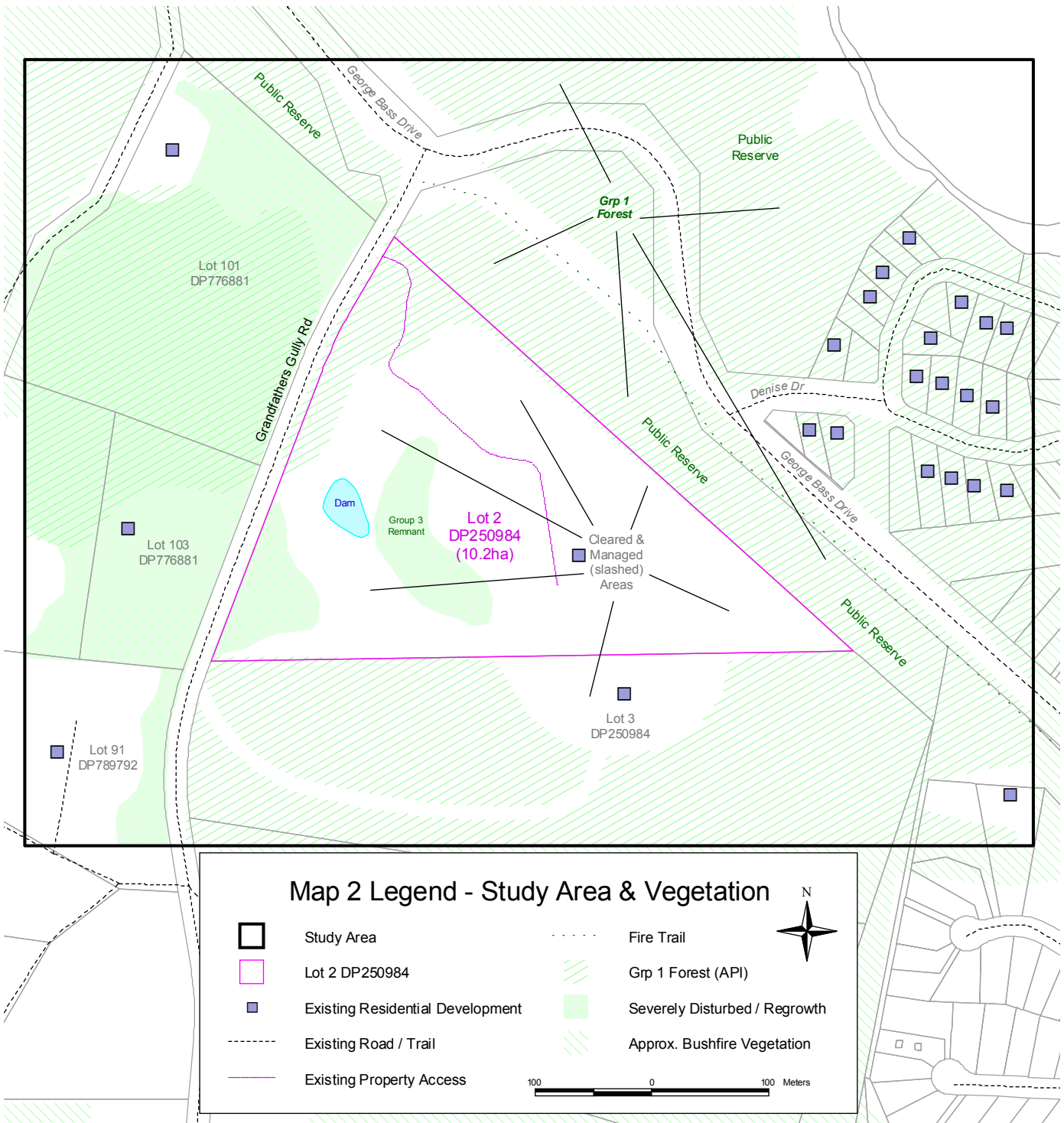
Bushfire Protection Planning
& Assessment Consultant

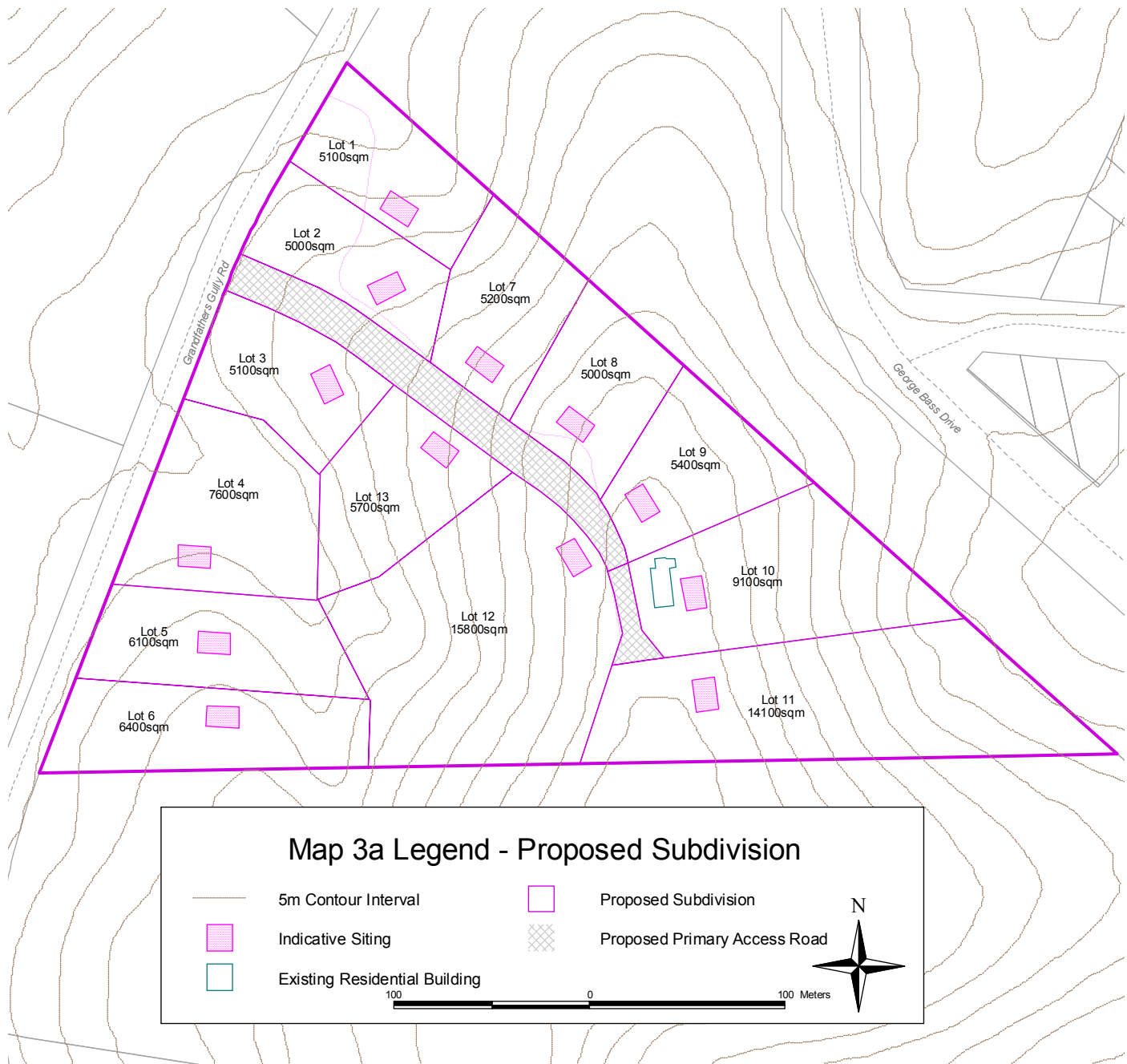
BAppSc Environmental Health

Grad. Dip Design for Bushfire Prone Areas

Member No. 9336 BPAD-A Accredited, Fire Protection Association Australia

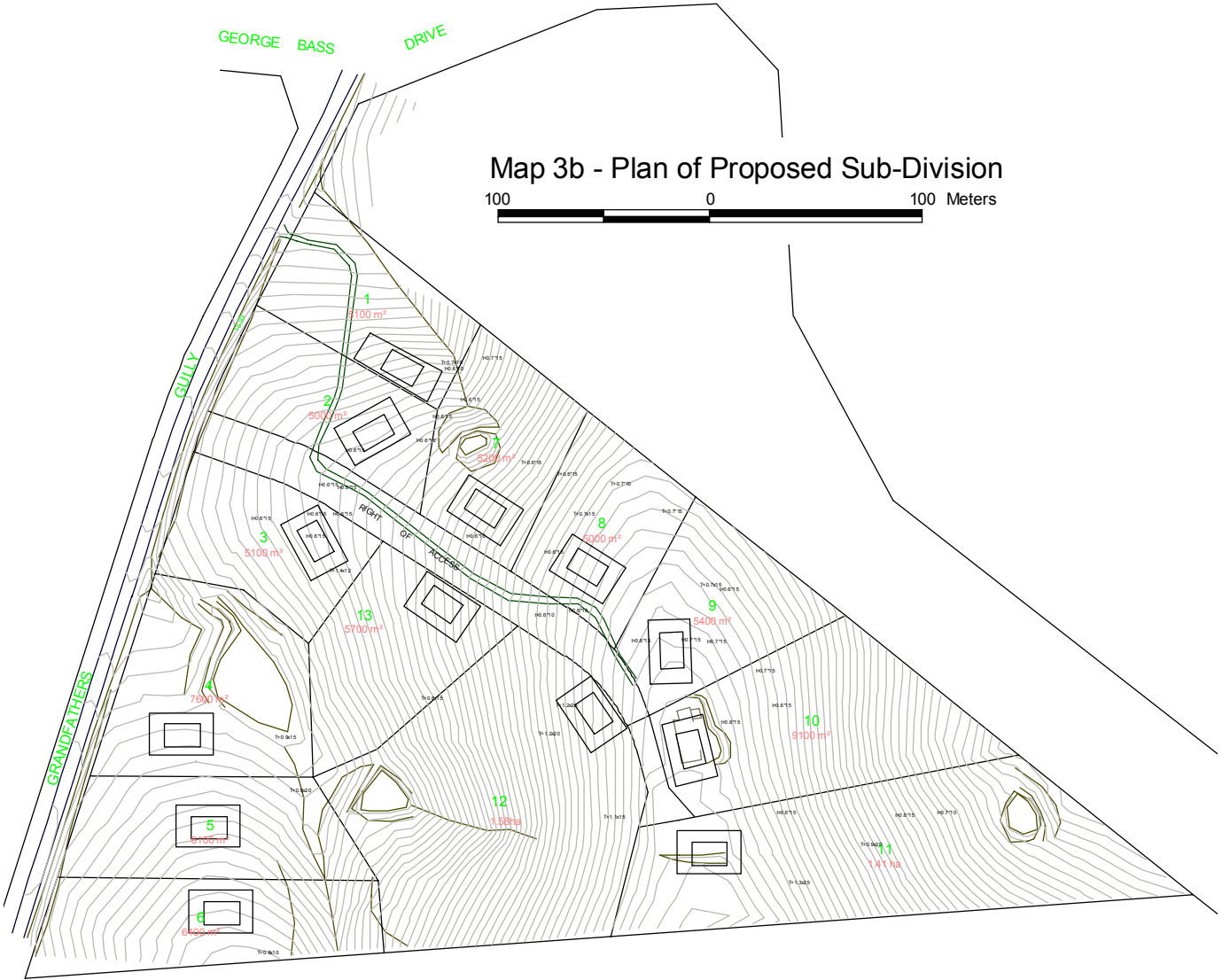


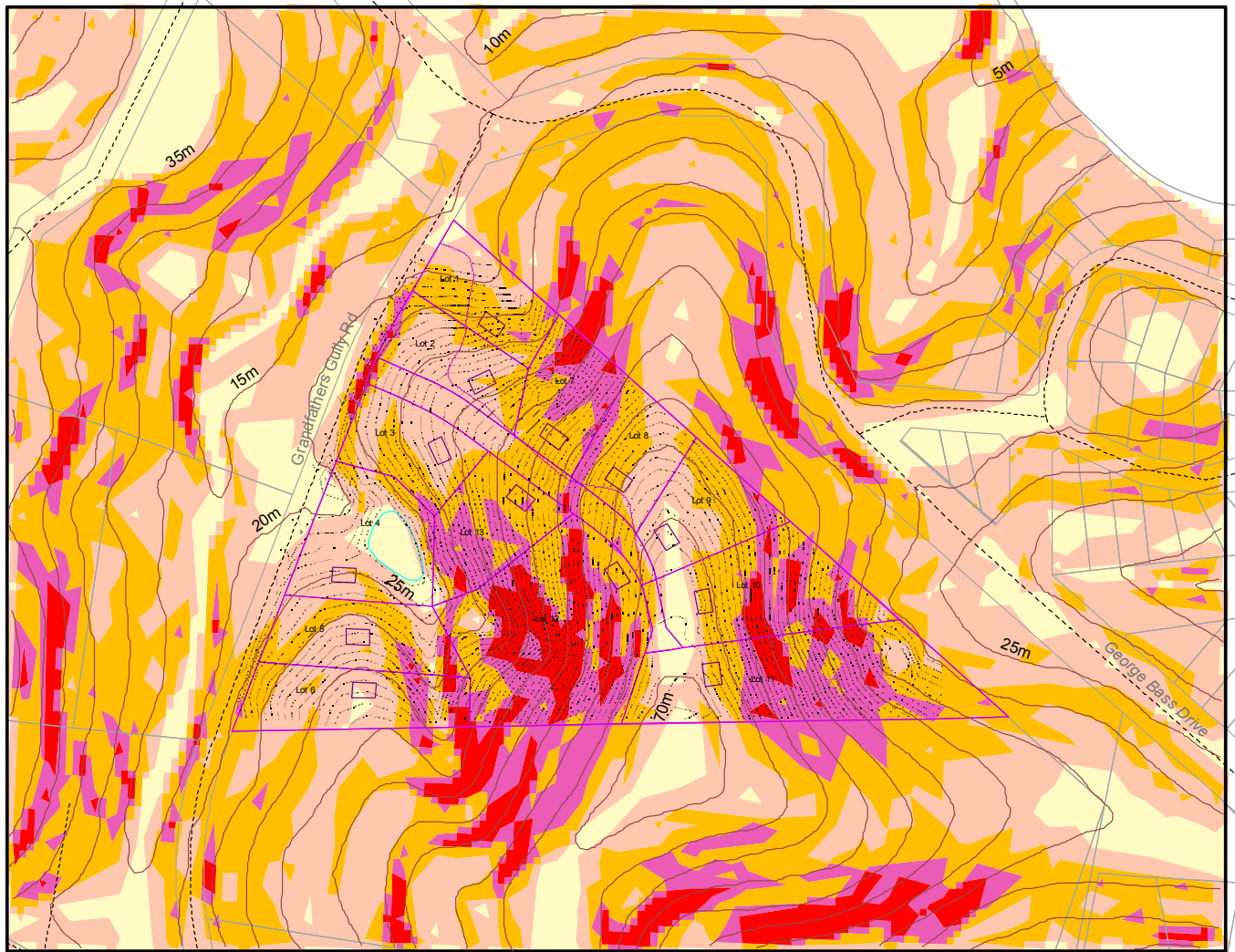




Map 3a Legend - Proposed Subdivision

<p> 5m Contour Interval</p> <p> Indicative Siting</p> <p> Existing Residential Building</p>	<p> Proposed Subdivision</p> <p> Proposed Primary Access Road</p>	 <p>100 0 100 Meters</p>
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Map 4 Legend - Slope

Slope (Degrees) (5m DEM Analysis)

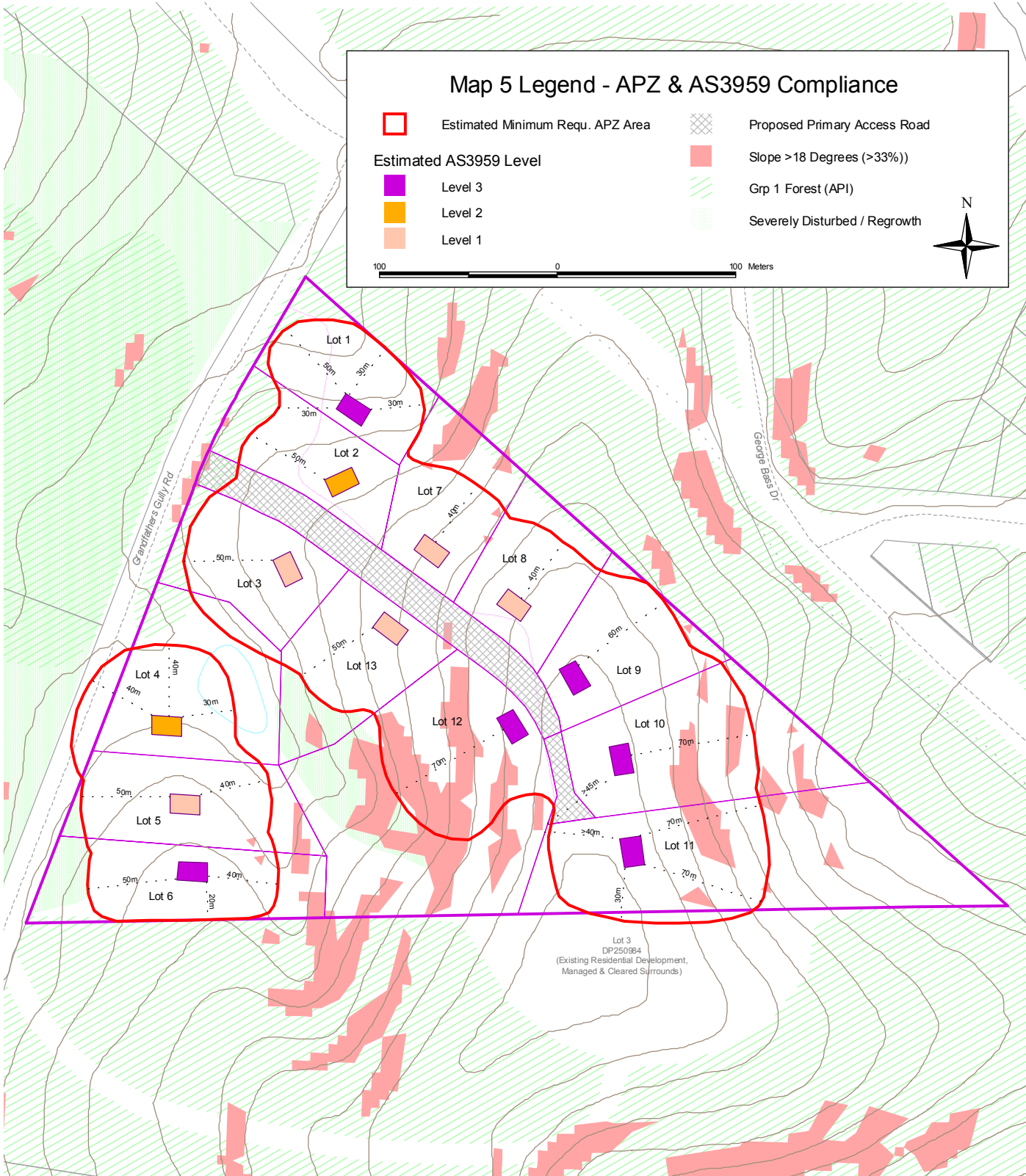
- 0-5
- 5-10
- 10-15

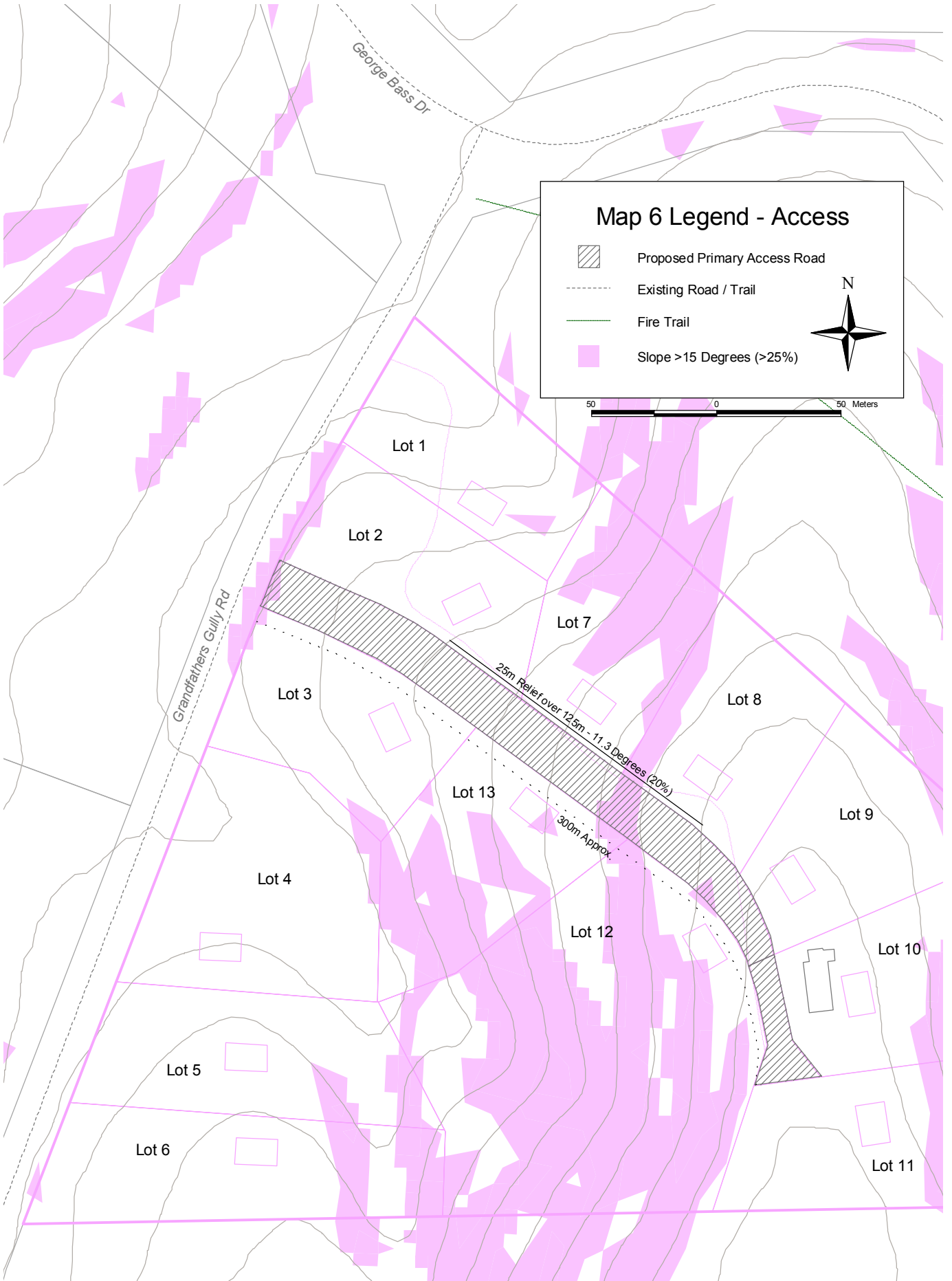
- 15-18
- >18

- 5m Contour Interval (5m DEM Analysis)
- 1m Contour Interval (Surveyed)

100 0 100 200 Meters







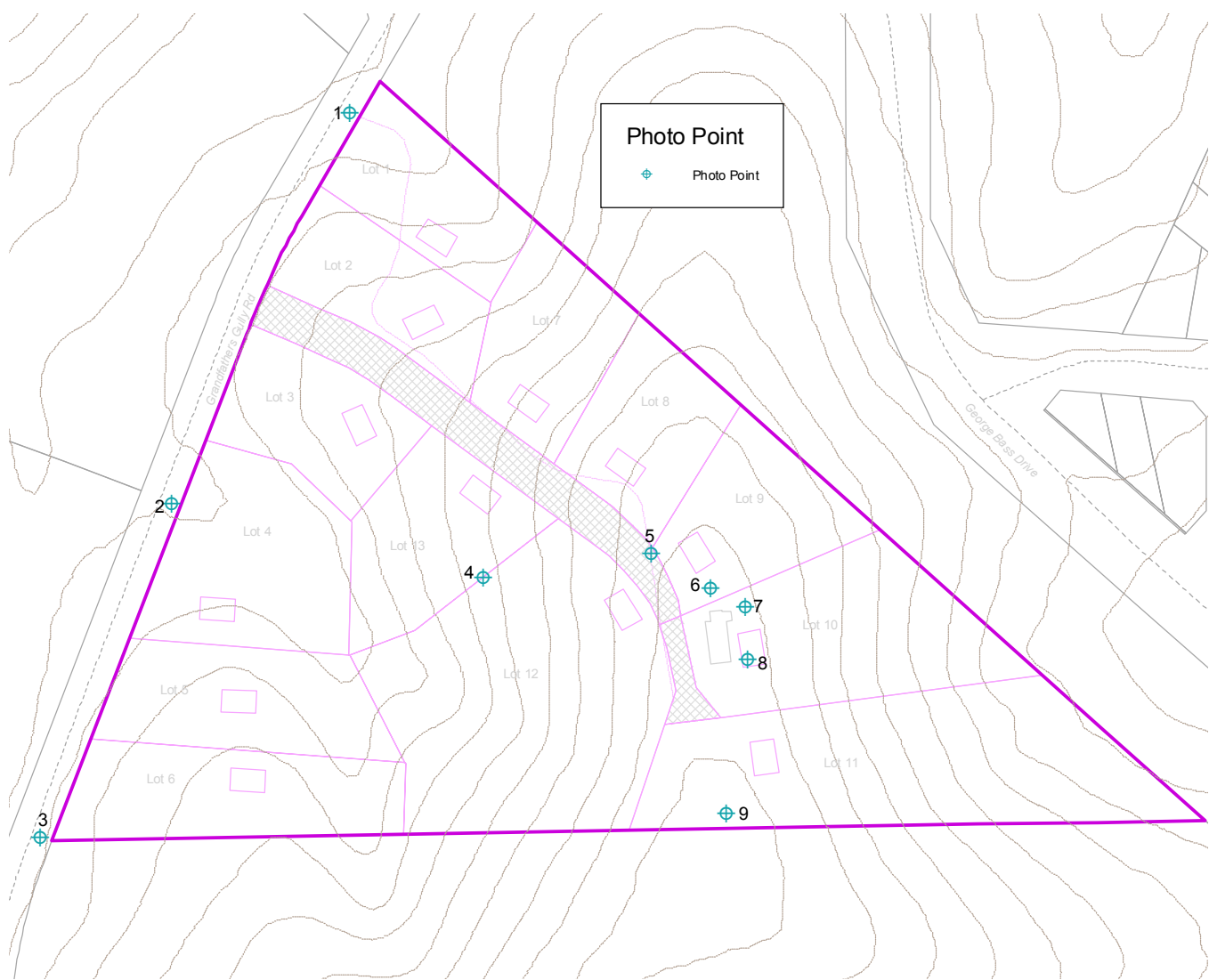




Photo Point 1.

Intersection of existing property access drive and Grandfathers Gully Rd.

Looking NNE along Grandfathers Gully Rd – towards George Bass Dr intersection.



Photo Point 1.

Intersection of existing property access drive and Grandfathers Gully Rd.

Looking SSW along Grandfathers Gully Rd.



Photo Point 1.

Intersection of existing property access drive and Grandfathers Gully Rd.

Looking WNW across Grandfathers Gully Rd – towards Lot 101 DP776881 (existing rural residential development)



Photo Point 2.

Approx. gully depression (below dam – proposed Lot 4) and frontage to Grandfathers Gully Rd.

Looking NNE along Grandfathers Gully Rd.



Photo Point 2.

Approx. gully depression (below dam – proposed Lot 4) and frontage to Grandfathers Gully Rd.

Looking SSW along Grandfathers Gully Rd.



Photo Point 2.

Approx. gully depression (below dam – proposed Lot 4) and frontage to Grandfathers Gully Rd.

Looking ESE towards existing dam (proposed Lot 4).



Photo Point 3.

SW Corner of subject property / approx. intersection of Grandfathers Gully Rd and proposed emergency access.

Looking NNE along Grandfathers Gully Rd.



Photo Point 3.

SW Corner of subject property / approx. intersection of Grandfathers Gully Rd and proposed emergency access.

Looking SSW along Grandfathers Gully Rd.



Photo Point 3.

SW Corner of subject property / approx. intersection of Grandfathers Gully Rd and proposed emergency access.

Looking SSE towards existing property access to Lot 3 DP250984.



Photo Point 4.

Approx. halfway along boundary between proposed Lot 12 & 13.

Looking S.

Note: steeper land >18° (32.5%) mostly cleared and slashed.



Photo Point 4.

Approx. halfway along boundary between proposed Lot 12 & 13.

Looking SE.

Note: steeper land >18° (32.5%) mostly cleared and slashed.



Photo Point 4.

Approx. halfway along boundary between proposed Lot 12 & 13.

Looking E.

Note: steeper land >18° (32.5%) mostly cleared and slashed.



Photo Point 4.

Approx. halfway along boundary between proposed Lot 12 & 13.

Looking N.



Photo Point 4.

Approx. halfway along boundary between proposed Lot 12 & 13.

Looking W – towards remnant regrowth.

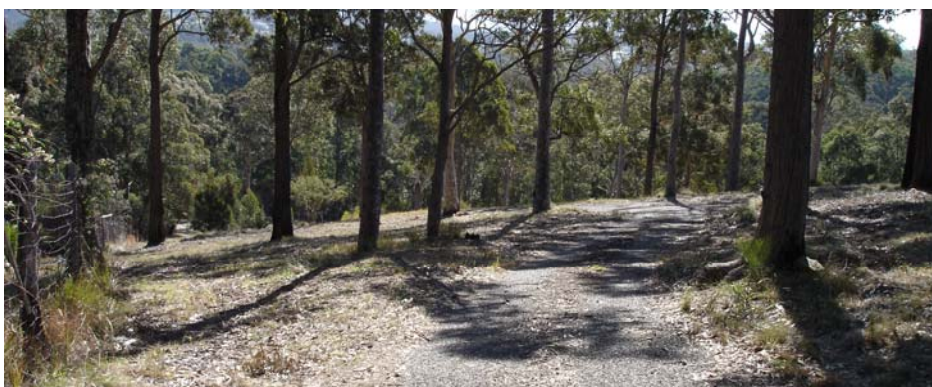


Photo Point 5.

Approx. S boundary corner between proposed Lot 8 & 9.

Looking NNW along existing property access drive.



Photo Point 5.

Approx. S boundary corner between proposed Lot 8 & 9.

Looking NW – approx. along proposed road reserve.



Photo Point 5.

Approx. S boundary corner between proposed Lot 8 & 9.

Looking WSW – towards proposed lot 12.



Photo Point 6.

Indicative building siting on proposed Lot 9.

Looking W.



Photo Point 6.

Indicative building siting on proposed Lot 9.

Looking N.



Photo Point 6.

Indicative building siting on proposed Lot 9.

Looking E.



Photo Point 6.

Indicative building siting on proposed Lot 9.

Looking S – towards existing residential building development (to be demolished and replaced) on proposed Lot 10.



Photo Point 7.

Approx. NE corner of existing residential building development (to be demolished and replaced) on proposed Lot 10.

Looking SSE.



Photo Point 8.

Approx. SE corner of existing residential building development (to be demolished and replaced) on proposed Lot 10.

Looking SSE – towards existing residential building development on neighbouring Lot 3 DP250984.



Photo Point 8.

Approx. SE corner of existing residential building development (to be demolished and replaced) on proposed Lot 10.

Looking ESE towards E corner of the subject property.



Photo Point 9.

Approx. S boundary of proposed Lot 11 (top of ridge).

Looking SE – towards existing residential building development on neighbouring Lot 3 DP250984.



Photo Point 9.

Approx. S boundary of proposed Lot 11 (top of ridge).

Looking SW – towards existing residential building development and access drive on neighbouring Lot 3 DP250984.

Airphoto 1 – 19/12/05



Airphoto 2 – 19/12/05



Addendum – PBP 2006 APZ Compliance

Supplementary Advice - Grandfathers Gully Rd, Lilli Pilli (Lot 2 DP 250984) Proposed Residential Sub Division Development Bushfire Protection & Compliance Assessment.



The following supplementary information outlines revised APZ / Setback distances required for statutory compliance for the proposed rural subdivision development of Lot 214 DP1059058 Grandfathers Gully Rd, Lilli Pilli.

Methodology for this revised site assessment for bushfire attack and recommended mitigation measures are based on NSW Planning for Bushfire Protection (PBP) 2006 (Appendices 2 & 3).

Minimum required asset protection zones are derived from distances outlined by PBP 2006 for a residential / rural residential development within an FDI 100* Fire Area (PBP Appendices 2 – A2.4 & A2.7). The Eurobodalla LGA is designated as potentially having an FDI of 100 as a 1:50 year event (PBP Appendices 2 – Table A2.3).

* FDI – Fire Danger Index

Vegetation extent and slope analysis is as previously described by our original assessment of the subject development dated 22nd February 2006 (herewith, '*previous report*').

Considering the proposed subdivision and application of PBP 2006, the minimum prescribed setback distances (including respective differences from PBP 2001 guidelines) are as outlined in the attached table.

In comparison to previous PBP 2001 guidelines, it should be noted that revised estimated PBP 2006 APZ / setback distances are generally on average 10-15m less in area/distance than previously described by our previous report. Where the APZ difference between PBP 2006 & 2001 has not changed (i.e. 20m setback from forest vegetation upslope), it should still be noted that the IPA extent is now halved to 10m – the permissible balance of the original APZ extent now being OPA (10m).

Considering the respective differences between the prescribed minimum APZ / setback areas, we would roughly estimate that the PBP 2006 APZ / setback distances would be on average 30-40% less in area than shown / recommended in our previous report.

In this respect, it is reasonable to suggest that PBP 2006 acceptable solutions for APZ compliance are easily facilitated, including that;

- the APZ is provided in accordance with the relevant tables / figures [within PBP 2006], &
- the APZ is wholly [contained] within the boundaries of the development site.

Furthermore, PBP 2006 performance criteria for APZ compliance could also easily and reasonably be facilitated, i.e. '*radiant heat levels at any point on a proposed building will not exceed 29 kW/m²*'.

With respect the future development of proposed Lots 4, 5 & 6, map 5b denotes the approximate APZ area (PBP 2006 Min. Spec.) and its extent in relation to an identified riparian area (40m wide, 20m either side of the gully line) affecting the subject development area.

Considering the indicative / approximate building sitings denoted by this advice and by our previous report, it is reasonable to suggest that the future proposed building sitings and associated minimum APZ area can be located within the subject allotments without significantly affecting the adjoining riparian area. Where the minimum specified APZ area is shown to affect the denoted riparian



area (i.e. proposed allotment 4), it is reasonable to suggest a site specific assessment of this allotment and future proposed building siting would demonstrate an acceptable building design and siting location mitigating any requirements to reduce or remove native vegetation (from within the riparian buffer area) for PBP compliance.

Furthermore, when considering the overall and completed development of the subject property, it would also be reasonable to suggest that the extent of persisting bushfire vegetation to the E-NE of proposed allotments 4-6 (i.e. over proposed allotments 3, 12 & 13) would only be equivalent to remnant bushfire vegetation. In this respect, the associated PBP 2006 APZ / Setback distances may only be 10-15m for compliance (either for PBP 2006 acceptable solutions or performance criteria).

Table - Estimated Minimum APZ / Setback Distances for PBP 2006 Compliance

Lot	Direction (TN)	Effective Slope (degrees)	Vegetation Formation	PBP 2006 Setback			PBP 2001 Setback			Difference
				APZ (m)	IPA (m)	OPA (m)	APZ (m)	IPA (m)	OPA (m)	
1	NW-N	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	NE-E	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	SE-SW	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
2	W	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	NW-N	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	NE-E	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	SE	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
3	S	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	SW-W	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	W-NW	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	NW-NE & S-SW	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	NE-SE	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
4	W-N	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	NE-E & SW	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	SW-SE	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
5	W-NW	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	NW-E	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	SW & SE	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	S	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
6	W-NE	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	NE-ESE	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	SE-SW	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
7	NW	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	N-NE	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	ENE-SE	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
	S	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	SW-W	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
8	NW	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	N-NE	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	ENE-SE	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
	S	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	SW-W	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
9	W, NW, N, NE, E	10-15 down slope	Forest	50	25	25	60	50	10	-25m IPA, +15m OPA (-10m APZ)
	SE & SW	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	S	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
10	SW-NW & NE-SE	15-18 down slope	Forest	60	30	30	70	60	10	-30m IPA, +20m OPA (-10m APZ)
	NW-NE	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	SW-SE	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
11	NE-SE	15-18 down slope	Forest	60	30	30	70	60	10	-30m IPA, +20m OPA (-10m APZ)
	SSE-SW	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	SW-NW	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	NW-NNE	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
12	SW-W	15-18 down slope	Forest	60	30	30	70	60	10	-30m IPA, +20m OPA (-10m APZ)
	W-NW	10-15 down slope	Forest	50	25	25	60	50	10	-25m IPA, +15m OPA (-10m APZ)
	NW-N	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	N-NE & S	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	NE-SE	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA
13	SW-W	5-10 down slope	Forest	35	20	15	50	40	10	-20m IPA, +5m OPA (-15m APZ)
	NW-N & S	0-5 down slope	Forest	25	15	10	40	30	10	-15m IPA (-15m APZ)
	N-NE	5-0 Flat	Forest	20	10	10	30	20	10	-10m IPA (-10m APZ)
	NE-SE	5-0 up slope	Forest	20	10	10	20	20	-	-10m IPA, +10m OPA

