

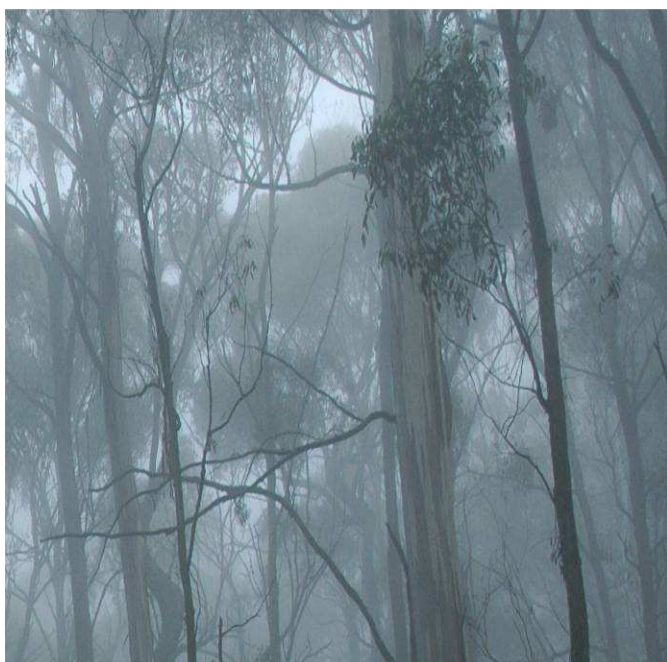


BUSHFIRE PROTECTION ASSESSMENT

Proposed Wet n' Wild Waterpark
Reservoir Road, Prospect

Prepared for
Prospect Aquatic Investments Pty Ltd

14 January 2011





Bushfire Protection Assessment


**Proposed Wet n' Wild Waterpark:
Reservoir Road, Prospect**

PREPARED FOR	Prospect Aquatic Investments Pty Ltd
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1 Property and proposal

Name:	Prospect Aquatic Investments Pty Ltd c/- JBA Urban Planning Consultants		
Postal address:	PO Box 375, North Sydney NSW 2059		
Street or property Name:	427 Reservoir Road		
Suburb, town or locality:	Prospect	Postcode:	2148
Local Government Area:	Blacktown City Council		
Type of area:	Urban		
Type of development:	Commercial		

1.1 DESCRIPTION OF PROPOSAL

The proposed development is to be constructed at 427 Reservoir Road, Prospect (hereafter known as the subject land) which is located in Western Sydney as shown in Figure 1. The proposed development is shown in Figure 2 and consists of the construction of a large 'Wet n' Wild Waterpark' including associated infrastructure such as car parks, amenities buildings, water-based rides and pools, shade structures and other non-habitable buildings.

1.2 LOCATION AND DESCRIPTION OF THE SUBJECT LAND

The proposed development is located between the M4 Motorway and Reservoir Road, Prospect, and is located north of Prospect Reservoir and its surrounds.

The subject land is largely cleared and was historically cleared for agricultural purposes. There are small remnants of Cumberland Plain Woodland (CPW) within the site and more extensive CPW to the south of the site across Reservoir Road leading down onto the northern shores of Prospect Reservoir.

Bushfire Protection Assessment
Proposed Wet n' Wild Waterpark
Reservoir Road, Prospect



Figure 1: Aerial photograph showing subject land



Figure 2: Site plan showing the proposed waterpark development

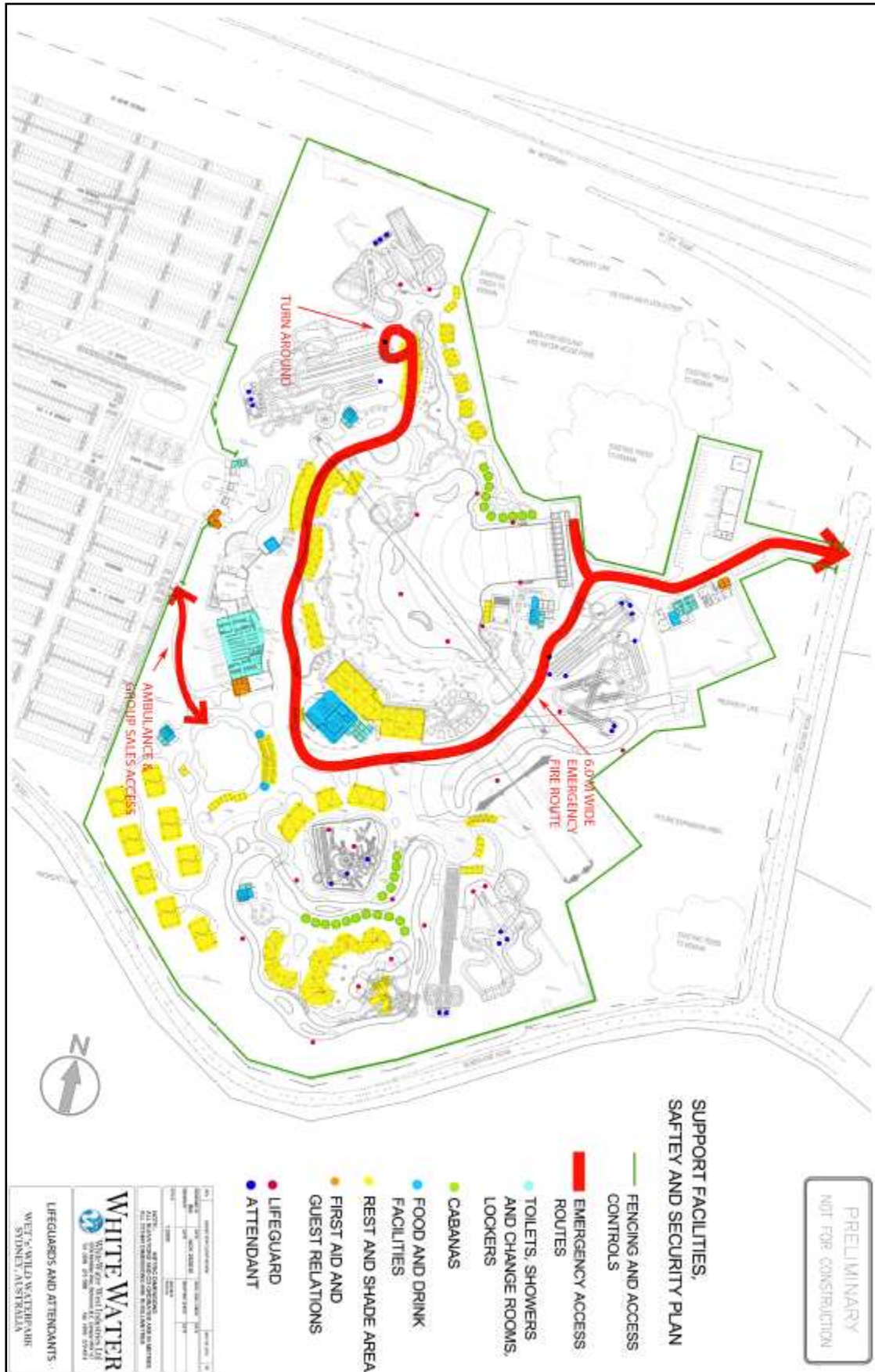


Figure 3: Site plan showing the proposed access to the development

2 Bushfire threat assessment

2.1 ASSESSMENT REQUIREMENTS

The southern side of the subject land is mapped as Bush Fire Prone Land by Blacktown City Council and the NSW Rural Fire Service (RFS). This bushfire protection assessment provides bushfire information relevant to the study area as per the NSW Department of Planning (DoP) Director General's Requirement (DGR) for bushfire as specified by NSW Rural Fire Service (RFS) to assist in assessing the proposed development under the provisions of Part 3A – Major Projects of the *Environmental Planning and Assessment Act 1979* (Ref MP 10_0190).

The DGR for bushfire as specified by the RFS in their correspondence of 2 December 2010 is as follows:

1. *The development shall consider the aims and objectives of 'Planning for Bush Fire Protection 2006' in relation to matters such as:*
 - a. *Public access roads – both internal and external to the site;*
 - b. *Water supplies and other services;*
 - c. *Evacuation and emergency management/planning;*
 - d. *Asset Protection Zones and areas of defendable space; and*
 - e. *Vegetation management and landscaping.*

The Building Code of Australia (BCA) does not provide for any bushfire specific performance requirements for non-habitable buildings such as Class 5, 6, 7, 8 and 10 buildings (which include offices, factories, warehouses, commercial or industrial facilities, and sheds), and as such building construction standards under AS3959-2009 'Construction of buildings in bushfire-prone areas' do not apply as a set of deemed to satisfy provisions to the waterpark development.

The general fire safety construction provisions of the BCA are taken as acceptable solutions, but the aim and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning, and landscaping/vegetation management. An assessment of the proposed development of the Wet n' Wild Waterpark against the aim and objectives of PBP is contained in Section 3 of this report.

2.2 VEGETATION TYPES AND SLOPE

The vegetation and slope have been assessed in the direction of the bushfire hazard, that is, to the north and south.

The predominant bush fire hazard within 140 m of the subject land is the Cumberland Plains Woodland located south of Reservoir Road on the northern side of Prospect Reservoir. This vegetation has a shrubby understorey and is classified as 'forest' by PBP. The forest vegetation to the south is on moderate downslopes in the PBP slope category 'downslope >5-10 degrees'.

While the subject land is largely cleared of bush fire prone vegetation, two areas are currently proposed to be retained and/or regenerated to shrubby Cumberland Plains Woodland. One area is proposed to include a wetland and is located on the northern side of the site and the other is located in the south-eastern corner of the site as shown in Figure 2.

The northern remnant of CPW proposed to be retained/regenerated within the site will comprise a total of less than 1 ha made up of three small remnants of vegetation and is classified as 'low hazard vegetation' by PBP. Low hazard vegetation uses 'rainforest' setbacks and construction standards as a surrogate for the reduced fire behaviour expected from small and/or narrow areas of vegetation. The northern remnant surrounds a creek line so the effective slope of this vegetation will be slightly downslope in the PBP slope category 'downslope >0-5 degrees'.

There is also a small remnant (0.3 ha) of CPW vegetation in the south-east corner of the subject land. This CPW remnant is also classified as low hazard vegetation by PBP. This vegetation is either level with or slightly upslope from future development to the west or north in the PBP slope category 'all upslopes and flat land'.

3 Bushfire Protection Measures

This section discusses the assessment of the proposed Wet n' Wild Waterpark development against the aim and objectives of PBP as required for this type of development.

3.1 AIM OF PBP

The aim of PBP is to "use the NSW development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bushfire, while having due regard to the development potential, on-site amenity and protection of the environment."

The development proposal meets the aim of PBP by virtue of the nature of the development (commercial recreational facility) and the large separation from the nearby bushland. The proposal satisfies the aim of PBP as demonstrated below.

3.1.1 Objective 1

Objective 1 of PBP is to "afford occupants of any building adequate protection from exposure to bushfire".

It is not envisaged that any building within the Wet n' Wild Waterpark would need to afford occupants protection during a bushfire event although any enclosed buildings within 100 m of any bush fire prone vegetation will be constructed to BCA requirements.

A large portion of the Waterpark including the large western carpark will be located well over 100 m from the nearest bush fire prone vegetation and is not considered bush fire prone. Visitors/staff/contractors present on the site during a bushfire event may be safely evacuated either on-site to areas located outside the bush fire prone area, or off-site. This objective is satisfied.

3.1.2 Objective 2

Objective 2 of PBP is to “provide for defensible space to be located around buildings”.

Enclosed buildings within the proposed development need to have defensible space around them to facilitate safe firefighting. The only buildings with internal space that are proposed as part of this development are:

- Administration building;
- Machinery shed;
- Beer bar;
- Food and beverage area;
- Change room/locker area;
- Ticket booths at entrance; and
- Three satellite toilet blocks/food and beverage buildings.

The minimum APZs required for habitable buildings are recommended for the enclosed buildings within the Wet n' Wild development. These APZs will provide best practice defensible spaces and will reduce the Bushfire Attack Levels (BALs) required for the construction of these buildings as per Australian Standard 3959-2009.

The minimum APZs prescribed by PBP for habitable buildings around each of the retained areas of CPW vegetation within and adjacent the proposed development are:

1. Northern CPW remnant – based on slightly downslope low hazard vegetation – 10 m minimum APZ;
2. Southern CPW remnant – based on slightly flat or slightly downslope low hazard veg – 10 m minimum APZ; and
3. Southern CPW within Prospect Reservoir Reserve – ‘downslope >5-10 degrees’ forest – 35 m minimum APZ.

The minimum APZs are able to be met by all of the enclosed buildings proposed within the Wet n' Wild Waterpark development.

3.1.3 Objective 3

Objective 3 of PBP is to “provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition”.

Of all the buildings listed at 3.1.2 above, the following buildings are located within 100 m of the nearest bush fire prone vegetation:

- The southern most toilet blocks/food and beverage buildings;
- Beer bar;
- Machinery storage (northern and southern buildings); and
- Administrative building.

Consequently, these buildings will require construction to a Bushfire Attack Level (BAL) under Australian Standard AS 3959-2009 ‘Construction of buildings in bushfire-prone areas’ (Standards Australia). The BAL for each building will depend on the size of the APZ between the building and the nearby bush fire prone vegetation as indicated in Table 1 (overleaf)

The buildings in Table 1 below will also need to be constructed in accord with Section 3 'Construction General' of AS 3959-2009 and the ember protection provisions on Page 10 of the 2010 Appendix 3 Addendum to PBP where applicable.

Table 1 – Bushfire threat assessment for enclosed buildings within 100 m of bush fire prone vegetation

Direction from building	Slope ¹	Vegetation ²	PBP required APZ ³	Proposed APZ	AS3959 Construction Standard ⁴	Comments
Administrative building – vegetation to the north-west	>0-5° downslope	Low hazard vegetation (rainforest)	10 m	30 m	BAL-12.5	APZ in place within subject land
Machinery storage (north) – vegetation to the west				20 m	BAL-19	APZ in place within subject land
Machinery storage (south) – vegetation to the west				36 m	BAL-12.5	APZ in place within subject land
Beer bar – vegetation to the north				36 m	BLA-12.5	APZ in place within subject land
Southern satellite F/B	>5°-10° downslope	Forest	35 m	78 m	BAL-12.5	APZ in place within subject land and adjacent Reservoir Road reserve

¹ Slope most significantly influencing the fire behaviour of the site having regard to vegetation found. Slope classes are according to PBP.

² Predominant vegetation is identified, according to PBP and "Where a mix of vegetation types exist the type providing the greater hazard is said to be predominate".

³ Assessment according to PBP.

⁴ Assessment according to AS 3959-2009.

3.1.4 Objective 4

Objective 4 of PBP is to “*ensure that safe operation access and egress for emergency service personnel and residents is available*”.

The proposed access to and within the proposed Wet n' Wild development is shown in Figure 3.

Perimeter access between bushfire hazards and new development are normally required in bush fire prone areas. The three remnants on the northern side of the Wet n' Wild development are very small (less than 1 ha in total) and these remnants are located over 100 m from the nearest bush fire prone vegetation to the south across Reservoir Road. Consequently, these northern remnants are not required to be mapped as bush fire prone vegetation and the risk they pose to the proposed development is minimal.

Perimeter access is not considered necessary for this development and the proposed property access road shown in red in Figure 3 will satisfy the requirements of PBP provide the following recommendations are implemented:

- (i) the property access road it to be extended at the north-western end to connect to the car park to the west, thus providing through access for fire vehicles and other emergency services vehicles;
- (ii) PBP compliant passing bays (as outlined in Table 2 overleaf) should be constructed along the internal property access road to permit fire appliances to pass safely; and
- (iii) fire hydrants are to be installed along the property access road in accord with the requirements of AS2419.1 Fire hydrant installations - System design, installation and commissioning' (Standards Australia 2005).

Provided that the recommendations outlined above are implemented within the proposed development, this objective will be satisfied.

Table 2 - Performance criteria for proposed property access roads*1

Performance Criteria	Acceptable Solutions	Complies
The intent may be achieved where:		
<ul style="list-style-type: none"> access to properties is provided in recognition of the risk to fire fighters and / or evacuating occupants 	<ul style="list-style-type: none"> at least one alternative property access road is provided for individual dwelling (or groups of dwellings) that are located more than 200 metres from a public through road 	Not applicable (no dwellings proposed)
<ul style="list-style-type: none"> the capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles all weather access is provided 	<ul style="list-style-type: none"> bridges clearly indicate load rating and pavements and bridges are capable of carrying a load of 15 tonnes roads do not traverse a wetland or other land potentially subject to periodic inundation (other than a flood or storm surge) 	<p>Can comply</p> <p>Can comply</p>
<ul style="list-style-type: none"> road widths and design enable safe access for vehicles 	<ul style="list-style-type: none"> a minimum carriageway width of four metres for rural-residential areas, rural landholdings or urban areas with a distance of greater than 70 metres from the nearest hydrant point to the most external part of a proposed building (or footprint) in forest, woodland and heath situations, rural property access roads have passing bays every 200 metres that are 20 metres long by two metres wide, making a minimum trafficable width of six metres at the passing bay a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches internal roads for rural properties provide a loop road around any dwelling or incorporate a turning circle with a minimum 12 metre outer radius curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress the minimum distance between inner and outer curves is six metres the crossfall is not more than 10 degrees maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads <p><i>Note: Some short constrictions in the access may be accepted where they are not less than the minimum (3.5m), extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above</i></p> <ul style="list-style-type: none"> access to a development comprising more than three dwellings have formalised access by dedication of a road and not by right of way 	<p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Access to all structures is provided</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Can comply</p> <p>Not applicable</p>

*1 PBP page 23.

3.1.5 Objective 5

Objective 5 of PBP is to “*provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the asset protection zone (APZ)*”.

The APZ identified in Part 3.1.3 will be maintained as outlined in Section 4 of this report. This objective is satisfied.

3.1.6 Objective 6

Objective 6 of PBP is to “*ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting)*”.

The subject land will be serviced by reticulated water. The furthest point from any future buildings to a hydrant will be less than 70 m. The reticulated water supply will comply with the following acceptable solutions within Section 4.1.3 of PBP:

- Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads;
- Fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 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; and
- The [PBP] provisions of parking on public roads are met.

The electrical transmission line to the subject land is above ground. No part of a tree will be closer than 0.5 m of the powerline conductors. Any gas services are to be installed and maintained in accordance with AS/NZS 1596:2008.

As outlined above, the proposed utilities for this development satisfy this objective.

4 Asset Protection Zone Maintenance Plan

The APZ for the proposed development is already in place within the subject land and surrounding roads/allotments and no additional vegetation clearance or tree removal is required to support the proposed development.

Fuel management within the APZ is to be as follows:

- No tree or tree canopy is to occur within 2 m of building rooflines;

- The presence of a few shrubs or trees in the APZ is acceptable provided that they:
 - 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 or in a danger period; and
 - are located far enough away from the building so that they will not ignite the buildings by direct flame contact or radiant heat emission.
- Any landscaping or plantings should preferably be local endemic mesic species or other low flammability species; and
- A minimal ground fuel is to be maintained to include less than 4 tonnes per hectare of fine fuel (fine fuel means ANY dead or living vegetation of <6 mm in diameter e.g. twigs less than a pencil in thickness. 4 t/ha is equivalent to a 1 cm thick layer of leaf litter).

5 Environmental Issues

At the time of assessment, a Flora and Fauna Assessment (FFA) of the proposed development was prepared by Eco Logical Australia (ELA 2010). This FFA determined that there were no known significant environmental features, threatened species or Aboriginal relics identified under the *Threatened Species Conservation Act 1995* or the *National Parks Act 1974* that will affect or be affected by the bushfire protection proposals in this report.

The NSW Department of Planning is the determining authority for this development and they will assess more thoroughly any potential environmental and heritage issues.

6 Conclusion

In the author's professional opinions the recommendations within this report will provide an adequate standard of bushfire protection for the proposed Wet n' Wild Waterpark development that is consistent with Planning for Bushfire Protection requirements for commercial development (RFS 2006).



Susan Courtney
Senior Bushfire Planner

7 References

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