



Shoalhaven City Council

West Nowra Resource Recovery Park

Bushfire Assessment

October 2015

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1. Introduction

1.1 Purpose of this report

Shoalhaven City Council (Council) proposes to construct and operate a resource recovery park (RRP) at West Nowra (referred to in this report as 'the proposal'). This report has been prepared by GHD Pty Ltd to provide an assessment of bushfire risks associated with the proposal as an input to the environmental impact statement. Council is the proponent of the proposal and the environmental impact statement is being prepared by GHD in accordance with the requirements of Part 4 of the NSW Environmental Planning and Assessment Act 1979 (the EP&A Act).

The report addresses the requirements of the Secretary of the NSW Department of Planning and Environment (the Secretary's Environmental Assessment Requirements (SSD 15_7015), dated 13 May 2015).

1.2 Staged project approval

The West Nowra RRP is proposed to be assessed in stages under Section 83B of the EP&A Act. The EIS provides an assessment of the concept proposal for the whole project and a detailed assessment of Stage 1 works.

The Concept Proposal for the whole West Nowra RRP project includes two stages:

- Stage 1 – clearing of land and provision of basic infrastructure on the nominated site, which would be undertaken by Council or contractors appointed by Council as part of early construction works.
- Stage 2 – construction and operation of a RRP and would be undertaken by an alternative waste technology provider/facility operator, who would be selected by a tendering process to provide the specialised resource recovery facilities.

The EIS assesses both stages at a concept proposal level and provides detailed environmental assessment of the Stage 1 works.

The remainder of the RRP Master Plan including the composting facility, materials recovery facility and C&D sorting and recovery facility technology/processes, buildings, services and internal roadways and weighbridges has been developed as a concept proposal only (so far).

The staged approach would enable construction of Stage 1 of the West Nowra RRP to commence (subject to planning approval) while a contractor is appointed and the details of Stage 2 are determined via the tendering and design process.

1.3 Concept proposal description

The West Nowra RRP would comprise a range of waste and resource processing activities aimed at maximising resource recovery and minimising the amount of waste destined for landfill disposal.

The proposal is defined as the construction and operation of a RRP with combined capacity to receive and process up to 130,000 tonnes of waste per year, comprising:

- A composting facility to process up to 65,000 tonnes of waste per year from both domestic and commercial waste sources.
- A materials recovery facility for sorting up to 40,000 tonnes of dry (non-putrescible) solid wastes per year from both domestic and commercial waste sources.

- A sorting and recovery facility for approximately 15,000 tonnes per year of construction and demolition (C&D) waste
- Other areas for processing and storing approximately 10,000 tonnes per year of other recyclable materials, such as green waste, scrap steel and concrete.

The proposal also includes ancillary infrastructure including:

- Circulation roadways and weighbridges for entering and exiting vehicles
- Offices and amenities
- Sediment / detention basins
- Car parking for up to 30 staff vehicles and 10 visitor vehicles
- Security fencing around the perimeter of the site
- Asset protection zones (APZs).

A preliminary Master Plan, including footprints of potential processing buildings, has been prepared for the purpose of concept proposal level assessment in the EIS and to indicate how the proposed facilities and infrastructure items would be integrated with related activities on the site. This is shown in Figure 1.1.

Stage 1 would include:

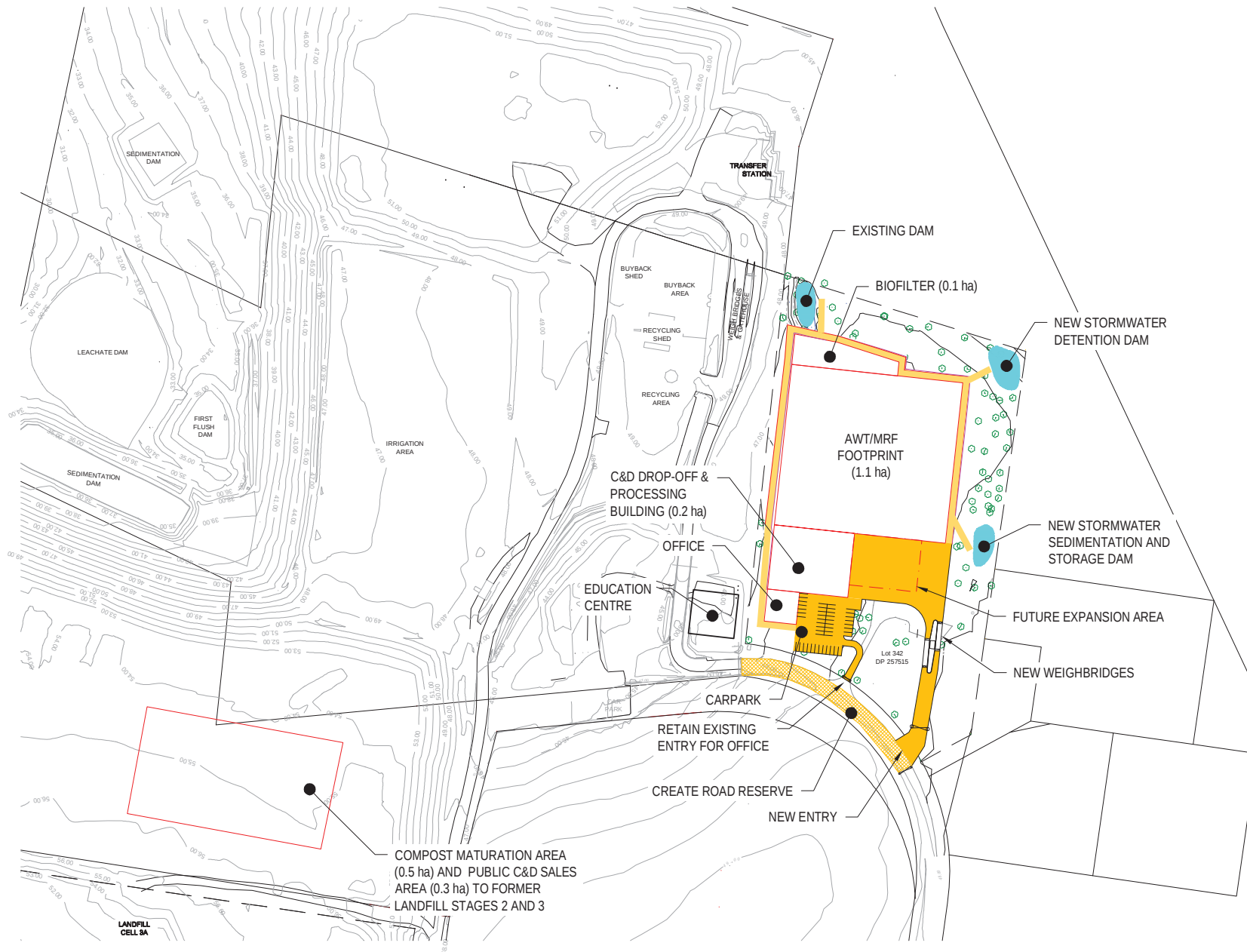
- Clearing of land (including demolition of existing buildings)
- Site grading and preparation
- Provision of basic infrastructure including drainage works, sediment/detention basins, roads, utilities and security fencing and gates.

A schematic of Stage 1 is shown in

Figure 1.2.

1.4 Location of the proposal

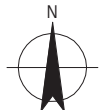
The proposal would be located at 114 Flatrock Road in Mundamia (City of Shoalhaven), specifically, a 3.6 hectares (ha) site which currently operates as an animal shelter (Lot 342 DP 257515). The proposal site is approximately 5 kilometres (km) west of the Nowra Central Business District, and adjacent to the existing West Nowra Recycling and Waste Facility. (Refer Figure 1.3)



NOTES:

1. AWT CONTRACTOR TO PROVIDE AMENITIES (SHOWERS, TOILETS, LUNCHROOM ETC.) TO STAFF WITHIN AWT BUILDING
2. OFFICE TO CONTAIN RECEPTION AREA, MEETING ROOM, OFFICES (MIN. OF 2) AND AMENITIES (TOILETS ETC.)
3. COMPOST MATURATION AREA TO BE LOCATED ON FORMER LANDFILL STAGES 2 AND 3
4. PUBLIC C&D SALES AREA TO BE LOCATED ON FORMER LANDFILL STAGES 2 AND 3

0 25 50 75m
SCALE 1:2500 AT ORIGINAL SIZE



SHOALHAVEN CITY COUNCIL
WEST NOWRA RRP

PRELIMINARY MASTER PLAN

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Revision | B
Date | SEPT 2015

Figure 1.1



0 15 30 45m
SCALE 1:1500 AT ORIGINAL SIZE



SHOALHAVEN CITY COUNCIL
WEST NOWRA RRP

PROPOSED STAGE 1 WORKS

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Date | SEPT 2015

Figure 1.2



LEGEND

Site boundary

Major Roads

Highways

Paper Size A4

0 160 320 640 960 1,280

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56



Shoalhaven City Council
West Nowra Resource Recovery Park

Job Number	21-22855
Revision	0
Date	14 Sep 2015

Proposal Site Location

Figure 1.3

1.5 Secretary's Environmental Assessment Requirements

The specific Secretary's Environmental Assessment Requirements (SEARs) (13 May 2015) addressed in this report are summarised in Table 1.1.

Table 1.1 Secretary's Environmental Assessment Requirements

Assessment requirements	Where addressed in report
Hazards and bushfire risk – including: - bushfire protection measures that comply with RFS guidelines; - a preliminary risk screening undertaken in accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33) and Applying SEPP 33 (DoP, 2011), and if necessary, a Preliminary Hazard Analysis (PHA).	This report is a bushfire assessment of the West Nowra RRP. The potential exposure of the site to fire hazards has been outlined in: - the potential impacts section (Section 4) Mitigation options which may be used to manage and contain fire risk are presented in: - the mitigation measures section (Section 5) Note: - a preliminary risk screening and assessment in accordance with SEPP 33 has been provided in the Hazards Report.

In addition to the SEARs, the Rural Fire Service through its Development Assessment and Planning division (27 April 2015) outlined the following requirement to be addressed within the EIS:

1. *The assessment will need to address the bushfire protection measure of a 30 m asset protection zone along the eastern and southern boundaries of the site.*

1.6 Scope and structure of the report

1.6.1 Scope of report

The report is a bushfire assessment which seeks to identify the potential fire and incident risks, constraints on the proposal given its identified site location, and the acceptable solutions required to mitigate fire and incident risk to gain development approval. It is the intention that this assessment may be used as part of the design process to allow for the incorporation of mitigation options during the construction of the new facilities at West Nowra RRP. The report includes an assessment of compliance of the development in relation to the standards presented in Section 79BA of the EP&A Act and Section 4 of *Planning for Bushfire Protection* (PBP) (NSW RFS 2006a) and *Addendum: Appendix 3* of the PBP (NSW RFS 2010).

This report can be used for its intended purpose only. The recommendations made in this report relating to any clearing or modification of vegetation to meet setback requirements do not constitute approval or authority to modify or remove vegetation.

This report specifically relates to the bushfire risk associated with the construction of the:

- Alternative Waste Technology (AWT) / Materials Recovery Facility (MRF)
- Construction and Demolition (C&D) Processing Area

as outlined within the proposed concept Master Plan / RRP site plan.

It should be noted that the bushfire assessment for the development at West Nowra RRP has been written according to the standards outlined within Section 79BA of the EP&A Act, Section 4 of *Planning for Bushfire Protection* (PBP) (NSW RFS 2006a) and *Addendum: Appendix 3* of

the PBP (NSW RFS 2010). All mitigation options outlined within Section 5 have been developed to manage fire spread across the West Nowra RRP boundaries and risk to the new non-residential asset (Class 8¹). Consideration has been made of currently available assets and future asset requisition and site access that are required for the provision of firefighting services in the event of a bushfire incident.

1.6.2 Structure of report

The report is presented in the following sections:

- Section 2: describes the existing environment for the proposal
- Section 3: outlines the methodology used to conduct the bushfire assessment
- Section 4: details the factors which will affect bushfire impact
- Section 5: details the mitigation measures which can be put in place during the construction and operation of the proposed facilities to minimise bushfire impact
- Section 6: provides a brief conclusion and overall compliance table to assess the alignment of mitigation measures with the requirements established under Section 79BA of the EP&A Act and PBP.

¹ Classified according to the building classes outlined by the Building Code of Australia

2. Existing environment

The landscape surrounding the proposed RRP contains continuous fire-prone vegetation which has the potential to carry large high intensity bushfire under adverse weather conditions. The Shoalhaven Bushfire Management Committee (BFMC) area has on average 600 bushfires per year of which 20 can be considered as major fires (SBFMC 2010). Susceptibility of the existing site is impacted by the following factors:

- Vegetation surrounding the subject lands is near-contiguous forest or heath vegetation cover, which has the potential to carry large, high intensity bushfires. The parcel of forest vegetation surrounding the subject land may carry spot fires and generate embers due to the presence of stringybark species;
- The subject lands are located downwind of the hot dry north westerly winds which typically carries the most severe bushfire behaviour;
- Large parcels of private native vegetation and state forests surrounding the subject lands are managed by other land users and as such are reliant on hazard reduction practices undertaken by these land managers; and
- The potential for the site to provide ignition sources through spontaneous combustion of waste materials, hot works conducted during days of elevated fire danger or through arson due to the proximity of the site to public roads and large tracts of vegetated land.

Given the existing site environmental conditions and the known susceptibility of the area to bushfire attack, it is important to incorporate mitigation measures in to the building design, construction and ongoing operation to minimise the potential impacts caused by bushfire. This report aims to identify the potential impacts and solutions that may be implemented to minimise or overcome the consequences associated with bushfire.

3. Methodology

To conduct the bushfire assessment a desktop review, field assessment, consultation and analysis phases were completed. These phases are outlined further below.

3.1 Desktop review

Prior to carrying out the field assessment, a desktop review was undertaken to investigate:

- The current proposal for the concept master plan to determine the location of the development, new roads to be constructed and the suggested boundaries of the APZ;
- Vegetation cover and flora and fauna habitat features using the results obtained from ecologist studies of the subject area;
- Fire history of the immediate area; and
- Site topography to indicate any potential constraints imposed by slope.

These environment, topographical and construction features were used to form the basis of field maps for the site and allowed for selection of the most appropriate areas to assess the bushfire hazard potential at the new facilities and required mitigation measures.

3.2 Field assessment

An inspection of the site and its bordering vegetation was conducted on 3 December 2013 (in conjunction with the assessment of the previous site) to identify fire and incident safety issues and determine any measures that are required or are appropriate for mitigation of these risks. The assessment was conducted in accordance with Planning for Bushfire Protection (NSWRFS, 2006) and included consideration of:

- Vegetation features (vegetation type, predominant canopy height, percentage cover, and understorey)
- Slope; and
- Overall fuel hazard.

3.3 Consultation

Following the original site inspection, GHD attended the Shoalhaven Fire Control Centre (SFCC) to obtain fire history information and consult with staff regarding the proposed planned mitigation measures at the West Nowra site. Steve McKinnon of the SFCC was able to provide information on bushfire history and hazard reduction burns.

The site which now forms the West Nowra RRP was subject to bushfire events in 1961, 1965 and 1980. Bushfire events occurred in 1951 on land to the south of Yalwal Road leading in to Nowra and in 1964 on the parcel of land bounded by George Evans Road and Yalwal Road. Anecdotal evidence indicates that there have been numerous small fire events in the vicinity of the West Nowra RRP facility however none have been significant in size to be mapped by the SFCC.

GHD was directed to the Batemans Bay Customer Service Centre (BBCSC) which handles all enquiries relating to development planning and assessment under PBP. Personnel at the BBCSC directed GHD to Planning for Bushfire Protection Clause 4.3.6 Section F which outlines the requirements for buildings of Class 5–8 and 10 in the Building Code of Australia. GHD discussed the approaches that could be used to manage bushfire risk on the subject land, including the use of an APZ to be applied to the building structures, available water sources and

access roads to surround the facilities. Personnel at BBCSC indicated that these were in line with the recommendations of PBP, and as such these mitigation measures have been incorporated within this report.

3.4 Analysis

Following field assessment and stakeholder consultation, GHD contacted the Fire Mitigation Coordinator at Shoalhaven City Council to obtain copies of the Emergency and Bushfire Management plans which are in operation over the West Nowra RRP facility. Additional background information used to inform the analysis of the subject land included Bushfire Prone Land Mapping from Shoalhaven City Council.

The PBP was used as a guide to assess considerations including:

- Access – public roads, property access roads and fire trails;
- Water and services – including electricity and gas;
- Emergency planning;
- Landscaping / vegetation management;
- Asset Protection Zone Setbacks; and
- Restrictions in place over the intended development.

4. Potential impacts

The potential exposure of the subject land to bushfire risk at the construction and operation phase is impacted by the following:

- The level of access of the development to water and services
- The surrounding environment i.e. classification of adjoining lands in relation to bushfire prone lands, vegetation type, slope and fire weather² which impact on the level of bushfire risk level; and
- The nature of the proposal whereby considerations during the construction phase may impact on the susceptibility of the building to ember attack and the level of defensible space provided for the purposes of firefighting.

The impacts of these factors are discussed in the Sections below.

4.1 Access of the development to water and services

Factors such as vehicle access and design and availability of water and services may impact on:

- Ability of staff to safely evacuate the site;
- Ability of fire-fighting crews to adequately defend the proposal in the event of a bushfire;
- Provision of a control line from which bushfires suppression and protection activities can be conducted;
- Availability of suitable water resources to suppress a bushfire outbreak or spotfires; and
- Risk of additional fire outbreak associated with ignitions caused by inappropriate use, location or design of services.

4.1.1 Access

Site access is via Flatrock Road which is a sealed road heading north from Yalwal Road (see Figure 1.3). This public road is two way access and is equivalent to 'Fire Trail – Category 1' standard (BFCC 2003). As part of the proposal it is intended that a 6 m wide access road will be built around the perimeter of the AWT/MRF and C&D Processing area, with dual entry points to Flatrock Road (see Figure 1.1).

A section of 10 m two way access will be provided to the south of the C&D processing area to allow for improved vehicle access and enable vehicle manoeuvres. This new road will facilitate alternative property access and will not traverse land subject to periodic inundation (except in the event of a storm surge).

4.1.2 Services (water, electricity and gas)

The Master Plan (Figure 1.1) identifies the following sources of water which may be used to suppress a bushfire outbreak:

- Two detention basins located within the proposal site
- An existing dam

The West Nowra Waste Depot has existing access to main town water supply. For the proposal, installation of ring fire main with fire hydrants points is proposed in accordance with the relevant

² Such as temperature, humidity, wind and dryness

Australian Standards. Fire hydrants will provide access to the reticulated water supply in the event of a bushfire. This may be particularly valuable for the protection of the AWT/MRF building and should installation proceed it is recommended that these be located in proximity to the biofilter. The biofilter uses a large volume of mulch based material and may be susceptible to ember attack. Where firefighting water supply outlets are fitted they should have suitable coupling for firefighting services, be located next to car parks and not located within a carriageway.

For the provision of new electricity and gas services for the AWT/MRF building and C&D drop-off and processing area the following are acceptable solutions which should be implemented during construction to minimise the potential impacts of bushfire attack:

- Electrical transmission lines would be located underground or where aboveground have a pole spacing of 30 m;
- Reticulated or bottled gas would be installed and maintained in accordance with AS 1596 and the requirements of relevant authorities;
- Fixed gas cylinders would be located at a minimum distance of 10 m from all flammable materials and are to be shielded from radiant heat; and
- Gas release valves would be located a minimum of 2 m from combustible material and be directed away from buildings. All gas connections are to be metal.

4.2 Surrounding environment

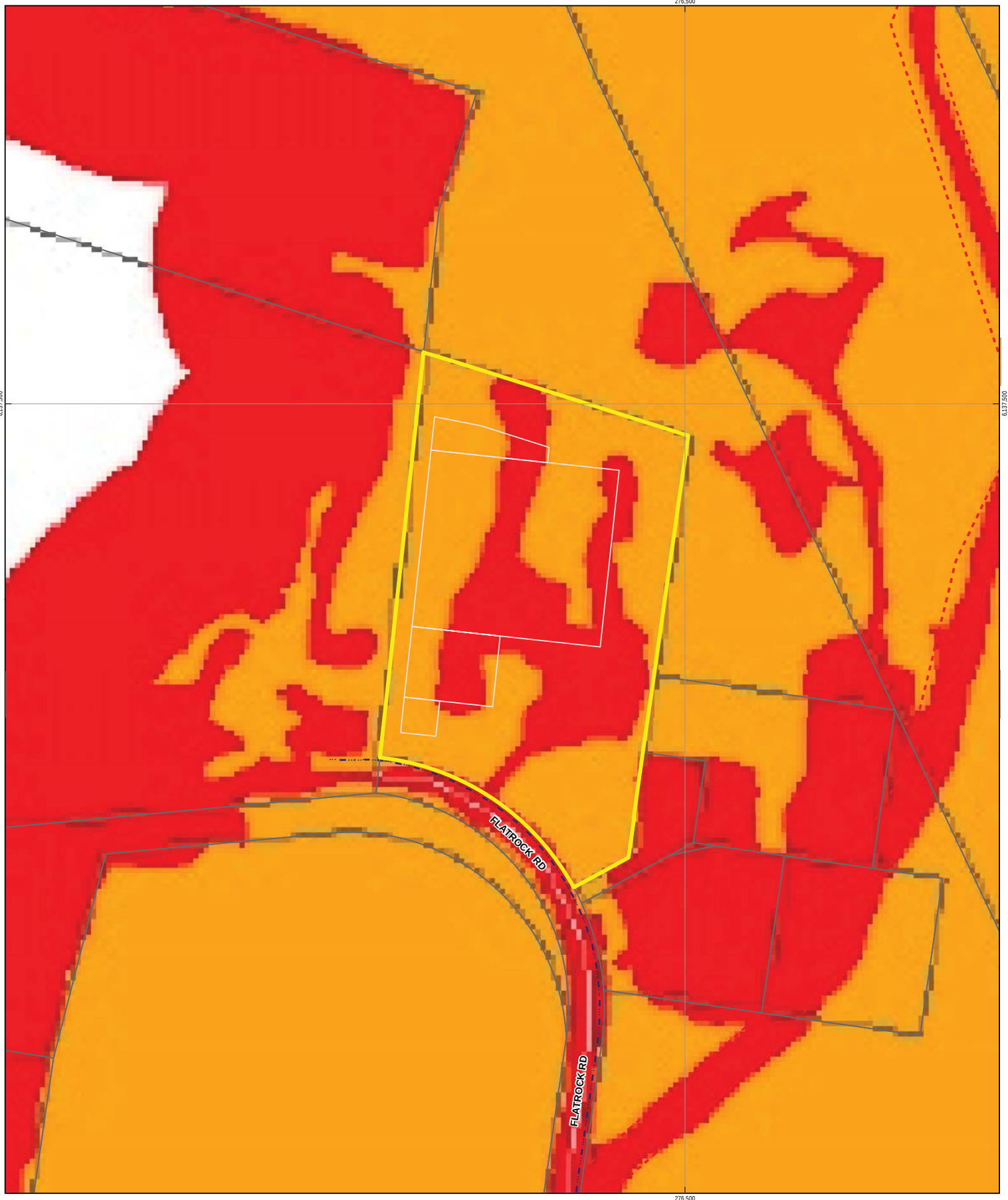
The surrounding environment will impact the level of available fuels and the ability of an area to carry and sustain a bushfire. Factors which contribute to the susceptibility of a building include classification of land as bushfire prone, the fire danger index level, vegetation type and slope. These are discussed further below.

4.2.1 Bushfire prone land

The subject land is zoned bushfire prone (Vegetation Category One) according to a Bushfire Prone Land map certified by the Commissioner of the NSW Rural Fire Service for the Shoalhaven City Council (Figure 4–1). Vegetation Category One is assigned to forests, woodlands, heathlands, pine plantations and wetlands and requires a 100 m buffer zone due to the likelihood of bushfire attack. The parcels adjoining the subject land are encompassed within the 100 m buffer zone or are likewise classified as bushfire prone (Vegetation Category One).

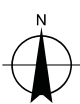
Development of land classified as bushfire prone land is subject to a number of bushfire related planning controls under the NSW EP&A Act and the *NSW Rural Fires Act 1997*. The specific planning controls are detailed in PBP (NSW RFS 2006a) and *Addendum: Appendix 3 and 4* of PBP (NSW RFS 2010).

The aims and objectives of *Planning for Bushfire Protection* (NSW RFS 2006a and 2010) apply to non-residential developments and have been used to develop suitable mitigation measures.



LEGEND			
	Study Area		Bushfire prone lands
	Building footprint		Vegetation Category 1
	Cadastral		Vegetation Category 2
			100m & 30m Buffer
			Easement
			Water main
			Waterways

Paper Size A4
0 10 20 40 60 80
Metres
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56



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Bushfire prone lands

Figure 4.1

4.2.2 Vegetation type

Predominant vegetation formations were determined in accordance with A2.3 of PBP (NSW RFS 2006a) and *Table A2.1 Classification of vegetation formation* (NSW RFS 2010). Modelled vegetation maps indicated that the subject land is predominantly covered by Currumbene-Batemans Lowlands Forest and Illawarra Gully Forest (Figure 4-2)

Based on the field assessment this modelled vegetation is most likely to correspond to:

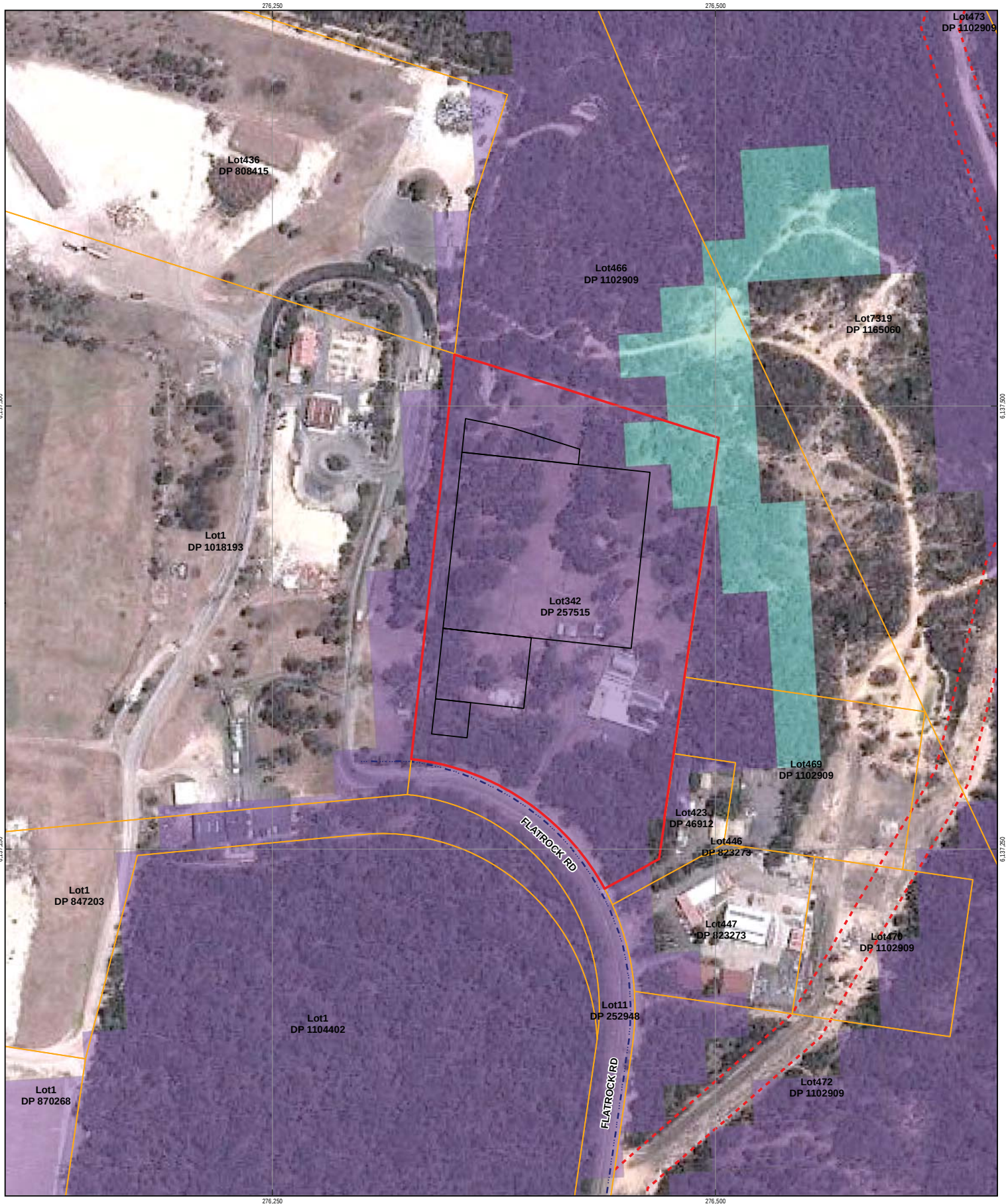
- Red Bloodwood – Grey Gum – White Stringybark – Scribbly Gum Forest (Shrubby understorey)

Therefore the predominant vegetation type on or within 140 m of the site is determined as *dry sclerophyll forests: shrubby sub formation*. This vegetation type is broadly described as containing the following features:

Dry sclerophyll forests: shrubby sub formation

- Dominated by eucalypts 10-30 m with crowns that touch or overlap (foliage cover in many areas is 20-50%);
- Prominent layer of hard-leaved shrubs;
- Occurring in areas where rainfall exceeds 500 mm
- Understorey dominated by shrubs including banksias, spider flowers, gum trees, tea-trees; and
- Sparse groundcover.

This vegetation classification is synonymous with AUSLIG (1990) Forest and Scrub classifications (respectively) utilised by A3959-2009 – *Construction of Buildings in Bushfire Prone Areas*.



LEGEND

 Study Area	 Easement	Tozer 2010
 Cadastre	 Water mains	 Currumbene-Batemans Lowlands Forest
	 Waterways	 Illawarra Gully Wet Forest

Paper Size A4
0 10 20 40 60 80
Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56



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Vegetation and habitat features

Figure 4.2

4.2.3 Effective slope

Slope classes across the subject lands are presented in Figure 4.3. Effective slope will significantly influence fire behaviour for the site, and have been used to confirm the APZ width (Table 6.1).

The site development footprint is located on a slope class of 0–5 degrees (Figure 4.3). The adjoining land parcels to the east, north, west and south are predominantly located also on a slope class of 0–5 degrees. Note: To the west of the site development footprint (within the existing West Nowra Waste Depot) there are some areas where slope classes range from 10–20 degrees. This is due to site modification undertaken to cater for the existing waste facilities.

4.2.4 Fire weather

The subject land is located within the Illawarra/Shoalhaven NSW Fire Area and has a corresponding Fire Danger Index rating of 100 (Table A2.3, NSW RFS 2006a).

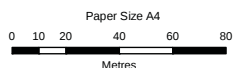
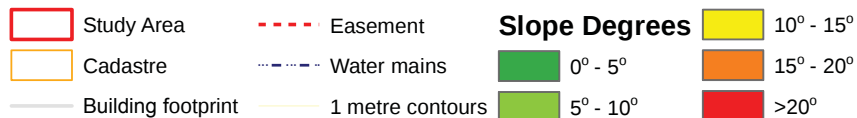
4.3 Construction standards

As the proposal is a non-residential building the bushfire specific construction standards as set out in AS 3959 do not apply. However given the biofilter operates on a mulch based system it is proposed that the biofilter is enclosed by a protective structure to minimise the risk of potential ember attack and spread of fire in to the AWT/MRF building. Air would be vented from the biofilter via a stack. It is recommended that metal sheeting would be the most appropriate material to use for the purposes of protection against ember attack.

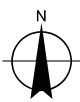
The susceptibility of the proposal may be impacted by proximity of combustible materials / vegetation to the building, accessibility for emergency services and availability of water resources. Mitigation measures that may be implemented to reduce susceptibility of the building to bushfire attack are outlined in Section 5.



LEGEND



Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56



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Slope

Figure 4.3

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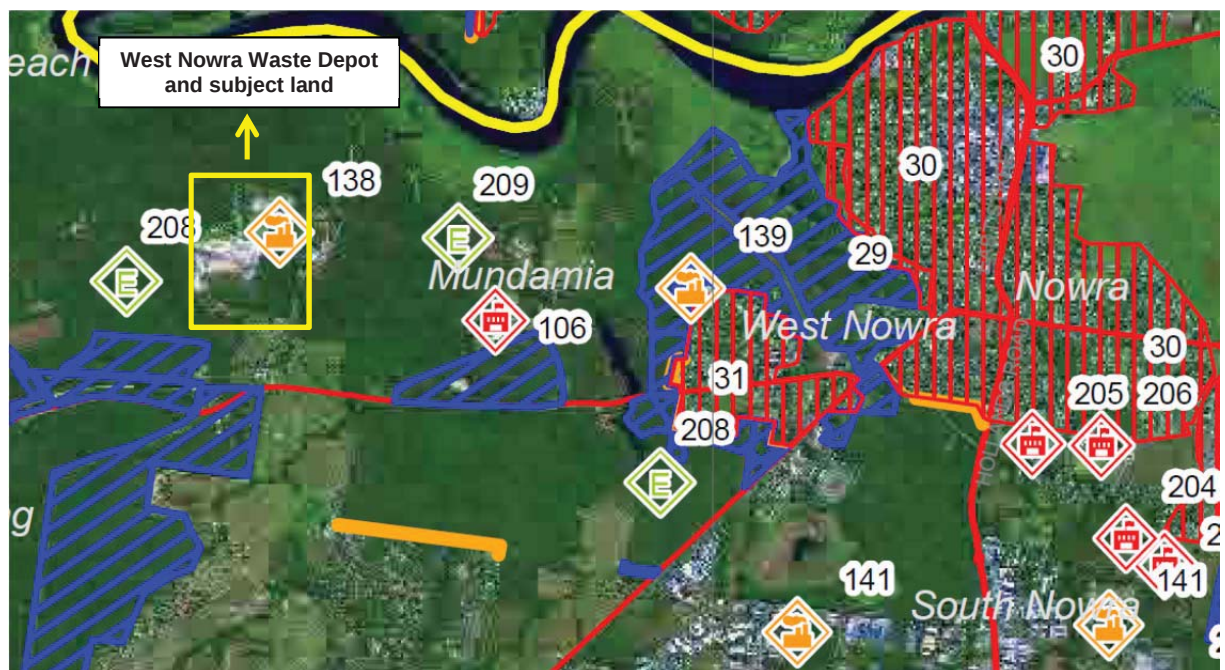
Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E svdmail@ghd.com.au W www.ghd.com.au

5. Mitigation measures

The subject land is zoned as bushfire prone (Section 4). The subject land has not been assigned specific zoning requirements under the *Bushfire Risk Management Plan (BFRMP)* (Shoalhaven Bushfire Management Committee (SBFMC) 2010) (Figure 5.1). However the existing waste facility has been identified as an important economic commercial asset, exposed to high bushfire risk. According to the BFRMP this triggers a requirement for inspection and maintenance of APZ's in proximity to the asset.

The aims and objectives of PBP (NSW RFS 2006a) and *Addendum: Appendix 3* (NSW RFS 2010) can be applied to non-residential buildings (BCA classes 5–8 and 10). Specifically Clause 4.3.6 Section F of PBP indicates that conditions of access, water and services, emergency planning and landscaping and vegetation management should be addressed in order to meet objectives of asset protection. These factors, along with the implementation of APZs, have been addressed within the following mitigation measures section. These measures will assist in minimising potential impacts from bushfire during construction and operation of the proposal.

Figure 5.1 Bushfire management zones as designated by the SBFMC



5.1 Construction

5.1.1 Asset protection zones

An APZ is an area surrounding a residential development or asset, managed to reduce bushfire hazard to an acceptable level. PBP provides a consistent and transparent basis for determining minimum requirements for APZs for residential or special purpose developments in bushfire prone areas in NSW.

While the proposed works are not residential (the proposal is classified as class 8), APZ setbacks have been developed to meet the aims and objectives of PBP with *Addendum: Appendix 3* used as a guide. Non-residential developments are not required to achieve the APZ requirements for a residential or special purposes development sited at the same location, and the construction standards of non-residential buildings serve to reduce the impacts of bushfire.

In order to protect the building asset within the proposal an APZ width of 30 m has been applied (as also recommended by the NSW RFS) to the northern, southern and eastern portions to offer protection for the AWT/MRF building. Security fences surrounding the development are to be constructed at the boundary of the APZ.

APZs for the site are to:

- Be maintained as cleared or slashed;
- Be of sufficient width between the building interface and boundary to provide space for fire crews to work within; and
- Have multiple entry and exit points.

Standards for Asset Protection Zones (NSW RFS 2005) identifies the following requirements to reduce fuels in APZs:

- Raking or removal of surface and near surface fine fuels (fallen leaves and twigs <6 mm diameter) by hand or mechanical means;
- Maintenance of grass (through mowing or grazing) in a short state, and preferably green; and
- Pruning of trees, shrubs and understorey to ensure the tree crown canopy is not continuous (separation between 2-5 m) and native trees and shrubs are retained as clumps occupying no more than 20% of the area.

5.1.2 Access

A new main access road and perimeter road will be constructed as part of the proposal. It is recommended that this new main access road be constructed to facilitate all weather access as dictated by the property access requirements within PBP. Additional recommendations to maintain safe property access includes:

- a crossfall of less than 10 degrees
- a minimum distance between inner and outer curves of 6 metres; and
- a maximum grade of <15 degrees (for sealed roads) and <10 degrees (for unsealed roads).

As adequate site access and property access requirements will be fulfilled through Flatrock Road (Public Access) and new two-way main access roads there is no requirement for the additional development of fire trails.

In addition to road access the new development will include construction of a 40 space car park. The current location as outlined in the masterplan to the east of the AWT/MRF building is suitable as it allows for the establishment of a defensible space for firefighting purposes and hard stand surfaces within the APZ which will reduce the level of combustible materials in proximity to the asset.

5.1.3 Emergency planning

To minimise the potential for ignition sources during construction it is recommended that the SFCC be notified of the construction dates. This is particularly important for any dates during which 'hot works' are to be conducted and will enable personnel from the SFCC to advise where weather conditions are not appropriate to carry out the works proposed.

5.1.4 Landscaping and vegetation management

During the landscaping phase of construction it is recommended that garden beds avoid the use of mulch based landscaping materials (rock is a better non-combustible landscaping alternative). It is also recommended that landscaping should avoid planting shrubs, and laying woodchips, within 10 m of an exposed window or door.

5.1.5 Hot works

All hot works (such as welding, grinding etc) at the site during construction and operation should be managed through hot works permits or equivalent which include escalating provisions to reduce or eliminate the risk of accidental ignitions with elevated fire danger (very high, severe, extreme to catastrophic fire danger).

5.2 Operation

A number of additional recommendations are suggested for bushfire protection during operation of the new building facilities. They include emergency planning and ongoing landscaping and vegetation management and are detailed below.

5.2.1 Emergency planning

It is recommended that the relevant site management plan be updated/created to identify bushfire prevention measures to be implemented in the event of a bushfire or fire incident on site, formal bushfire warning being issued or escalating fire danger. This site management plan should include but is not limited to:

- Actions to be taken on site where a formal bushfire alert is issued. Management should consider the necessary actions required for “Advice”, “Watch and Act” and “Emergency Warning” alerts.
- Emergency and operational protocols to be taken in response to an escalation of fire weather conditions (e.g. very high, severe, extreme or catastrophic fire danger ratings). This may include the termination of works that involve a risk of ignition during days where a total fire ban is in place;
- Bushfire suppression equipment that is available on site and its location (both fixed and mobile including plant); and
- Appropriate storage and maintenance of fuels and other flammable materials on site should occur. For suitable storage of hazardous materials please refer to the hazard analysis section of the EIS.

It is recommended that emergency procedures should be clearly made available to all personnel located on site, with information such as evacuation points provided to all visitors as part of the induction process.

The Shoalhaven City Council has a Local Disaster Plan in place which in the event of a bushfire will trigger the action by the NSW RFS. Where a large bushfire event occurs coordination will involve the Local Emergency Operations Controller with the NSW RFS to provide a liaison officer by request.

5.2.2 Landscaping and vegetation management

In addition to ongoing maintenance of the APZ it is important that trees are regularly inspected and maintained in proximity to aboveground electrical powerlines at the site. It is recommended that an annual inspection prior to the commencement of the bushfire season which in the Shoalhaven region typically operates from September to March each year.

It is also recommended that retained vegetation within the site (outside the identified APZs) and adjoining the development site is managed in accordance with the draft *Bushfire Risk Management Plan* (SBFMC 2010). The burning intervals of relevance to the site for dry sclerophyll forests: shrubby sub formation is 10 years with occasional intervals of greater than 25 years desirable (SBFMC 2010), however where overall fuel hazard reaches high or greater earlier than this interval this, prescribed burning should be conducted to reduce bushfire risk.

6. Conclusions

To enable the development to assess whether all bushfire protection measures have been assessed according to the compliance standards dictated by Section 79BA of the EP&A Act and Section 4 of PBP (NSW RFS 2006a) an assessment table has been provided below.

Table 6.1 Assessment of compliance

Measure	Assessment of compliance
Asset protection zones	The proposal can achieve the performance criteria by complying with the acceptable solutions, i.e.: • APZs are provided with regard to the Aims and Objectives of Planning for Bushfire Protection 2006 (Section 5.1.1); • The APZ is wholly within the boundaries of the development site (Section 5.1.1); • The APZ will be managed in accordance with the objectives of Standards for Asset Protection Zones (RFS 2005) (Section 5.1.1); and • The APZ is located on lands with slopes predominantly less than 18 degrees (Section 4.2.3).
Public roads and property access roads	The proposal can achieve the performance criteria by complying with the acceptable solutions, i.e.: • Public roads and perimeter fire trails are two-wheel drive (Section 3) and: • Do not have a crossfall or average road grade exceeding 10 degrees (Section 4.1.1); • Include turning circles of sufficient dimensions (Section 4.1.1); • Curves are minimal and have the required dimensions (Section 4.1.1); • Trail and road capacity is greater than 15 tonnes (Section 4.1.1); • Hydrants will be located outside of parking areas; and • Fire suppression vehicles will operate from internal property access or the public road.
Services – water, electricity and gas	The proposal will achieve the performance criteria, and aims and objectives of PBP by complying with the following acceptable solutions: • Water supply on site are adequate to meet the needs of fire fighters (and others assisting) (Section 4.1.2); • Electricity will be underground (Section 4.1.2); and • Gas supplies will be installed in accordance with AS 1596.

The proposal consists of the construction of waste management buildings, drop-off and processing areas, detention basins, access roads and carparks. The construction of these buildings, infrastructure and associated APZ will result in modification of native vegetation and ground disturbance.

The proposal is subject to an elevated bushfire risk given its proximity to large tracts of native forest. The bushfire protection measures incorporated into this assessment comply with the *Aims and Objectives*, and the *Acceptable Solutions* of the performance criteria, identified in *Planning for Bushfire Protection* (NSW RFS 2006a and 2010).

Specifically this report seeks to address the criteria as established in Clause 4.3.6 Section F and will go beyond the requirements for a non-residential building due to the establishment of a 30 m APZ to the north and east of the proposal. Any vegetation retained within this APZ is to be managed in accordance with the requirements of *Planning for Bushfire Protection* (NSW RFS 2006a) and other relevant legislation. The mitigation measures as detailed within the bushfire

assessment seek to minimise the impact associated with a fire event and provide protection for the proposal.

7. References

Bushfire Coordinating Committee (BFCC). 2007. *BFCC Policy No. 2/2007 – Fire Trails*, adopted by the NSW Bushfire Coordinating Committee – Minute No. 26/2007

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NSW RFS (2006b) *Bushfire Environmental Code for NSW*. Prepared by NSW Rural Fire Service

NSW RFS (2010) *Addendum: Appendix 3 of the Planning for Bushfire Protection*

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Standards Australia 2009. *AS3959 – 2009 Construction of Buildings in Bushfire-prone areas*. Standards Australia, Sydney

Standards Australia 2002 *AS/NZS 1596 The Storage and Handling of LP Gas*.

Standards Australia 2005. *AS2419.1 – 2005 Fire Hydrant installations – System design, installation and commissioning*

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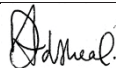
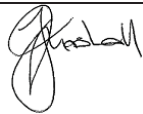
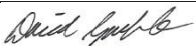
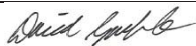
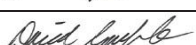
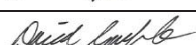
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