

BUSHFIRE PROTECTION ASSESSMENT

FOR THE WEST NOWRA RECYCLING AND WASTE FACILITY

PROPOSED STAGE 4 LANDFILL EXTENSION

FLATROCK ROAD, MUNDAMIA

FOR SHOALHAVEN CITY COUNCIL

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Report Number	Document	Preparation Date	Issue Date	Directors Approval
B152597 - 2	Final	11.07.2017	14.11.2017	<i>G.L.Swain</i>

EXECUTIVE SUMMARY

Shoalhaven City Council (SCC) proposes to extend the existing landfill at the West Nowra Recycling and Waste Facility (the Facility). The Stage 4 landfill extension (the Proposal) would occur on the Proposal Site which is located on Flatrock Road, Mundamia.

The Proposal would involve:

- Clearing of native vegetation to enable establishment of the landfill extension site
- Progressive construction, operation and rehabilitation of the landfill, with the development of six sub-cells as shown on Figure 2 (refer to Concept Design Report Figure 8) to provide approximately 1.9M cubic metres of additional landfill capacity
- Construction of access tracks
- Earthworks for cell formation including extraction and stockpiling of materials and the reapplication to form the leachate barrier (cell liner) as well as for daily, intermediate and final cover
- Installation of leachate management structures including the leachate barrier, collection, storage and disposal system
- Construction of a rising main to transfer leachate to the existing leachate management system at the Facility
- Installation of a stormwater management system
- Progressively increasing the annual waste acceptance rate at the landfill
- Signage and other ancillary works
- Rehabilitation of closed cells
- Delineation and ongoing management of a biodiversity corridor and conservation area along the southern and eastern boundaries of the Proposal Site.

The Stage 4 Proposal was referred for Secretary's Environmental Assessment Requirements (SEARs) to support EIS development and was assigned Reference SSD 15_ 7187. An amended SEARs was issued on the 11th July 2017.

SCC is seeking approval for the Proposal under Part 4.1 (State Significant Development) of the Environmental Planning and Assessment Act 1979 (EP&A Act).

This Bushfire Assessment Report has been prepared as an appendix to the Environmental Impact Statement (EIS) being developed to support the application for approval.

The Proposal Site and adjoining vacant land contains forest vegetation which has been recorded on the SCC Bushfire Prone Land Map as Category 1 Bushfire Prone Vegetation. Therefore, the bushfire threat to the Proposal Site is high and the Proposal may be subject to the impact from future bushfires that could occur in this vegetation and consideration must be given to bushfire protection measures.

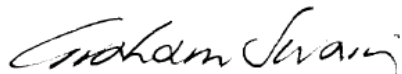
Planning for Bushfire Protection 2006 provides specific deemed-to-satisfy provisions on the bushfire protection measures necessary for rural & residential subdivisions, the construction of “*Special Fire Protection Purpose Developments*” and the construction of Class 1, 2, 3 & 4 buildings in Bushfire Prone areas.

The document also identifies limited advice on the bushfire protection measures required for Class 5 to 10 structures, as defined by the Building Code of Australia. The Proposal does not include the construction of buildings or fixed assets therefore the Proposal is not classified by the Building Code of Australia (BCA).

This Bushfire Protection Assessment undertakes an assessment of the bushfire risk to the Proposal and examines the:

- ❖ Adequacy of the setbacks (defendable spaces) to the landfill cells from the bushfire prone vegetation;
- ❖ Fire-fighting access;
- ❖ Provision of fire-fighting water supplies; and
- ❖ Fuel management protocols and other matters considered necessary to mitigate any potential bushfire threat to persons, property and the environment.

The characteristics of the Site as discussed in this report, together with the recommendations contained in this assessment, confirms that the Site is suitable in terms of its intended use.



Graham Swain,
Australian Bushfire Protection Planners Pty Limited.

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SECTION 1

INTRODUCTION

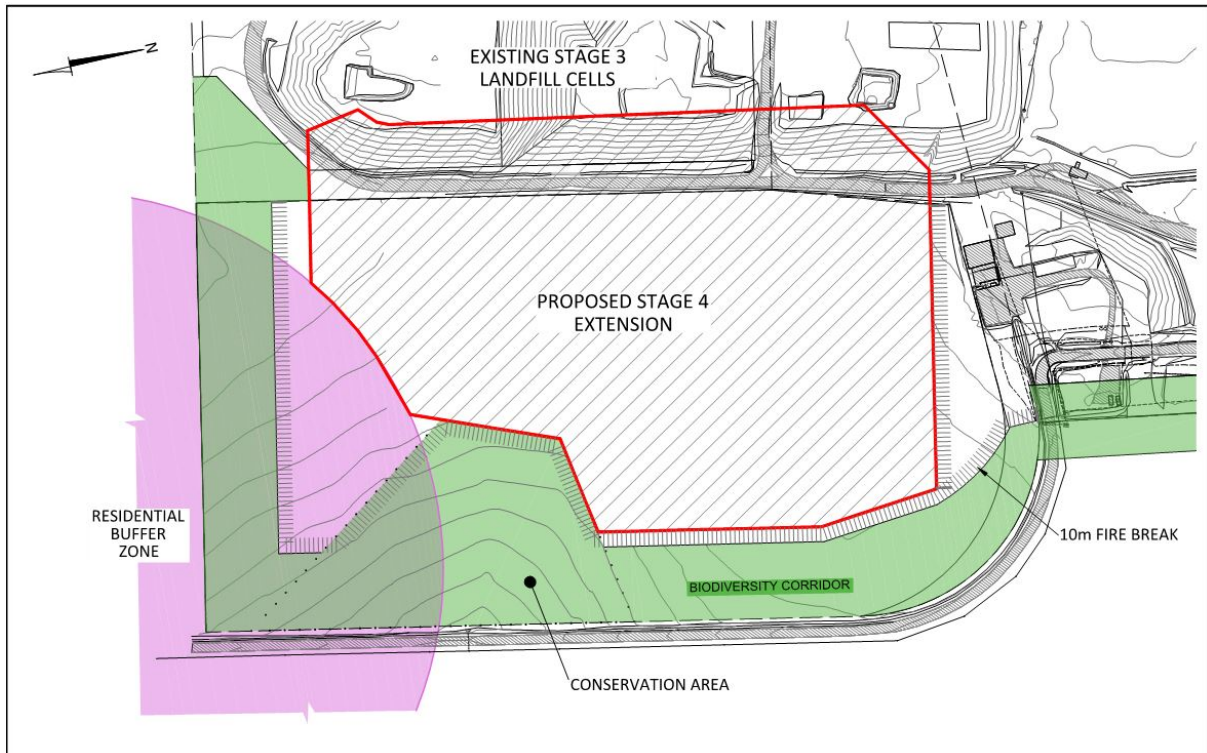
1.1 Development Proposal.

Shoalhaven City Council (SCC) proposes to extend the existing landfill at the West Nowra Recycling and Waste Facility (the Facility). The Stage 4 landfill extension (the Proposal) would occur on the Proposal Site which is located on Flatrock Road, Mundamia.

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Figure 1 – Master Plan – West Nowra Recycling and Waste Facility.



1.2 Aim of this Assessment.

The aim of this Bushfire Protection Assessment is to identify the bushfire risk to the Proposal and the risk posed by the operation of the Proposal in order to address the aim & objectives of *Planning for Bushfire Protection 2006* including:

- Determine the classification of the vegetation on and surrounding the site in accordance with the vegetation classification system contained in *Planning for Bushfire Protection 2006*;
- Undertake an assessment to determine the slope of the land on and surrounding the Proposal Site;
- Undertake a Bushfire Protection Assessment to determine bushfire protection strategies for the Proposal that address the following matters:
 - (i) The provision of setbacks (Defendable Space) from vegetated areas;
 - (ii) Fire fighting water supplies;
 - (iii) Access requirements for emergency service vehicles;

- (iv) Land management responsibilities;
- (v) Evacuation management; and
- (vi) Identification of mitigation measures.

1.3 Statutory Requirements.

This Bushfire Assessment has been prepared having regard to the following legislative and planning requirements:

1.3.1 Secretaries Environmental Assessment Requirements (SEARs).

'Key Issues' identified in SEARs identify under Hazard & Risks the requirement to examine the risk from bushfire and reference is made to *'Planning for Bushfire Protection (NSW Rural Fire Service)*.

This document provides deemed-to-satisfy requirements in relation to the provision of bushfire protection measures for rural residential/residential subdivision and the construction of *'Special Fire Protection Purpose Development'* in bushfire prone areas.

The document also provides guidance on the protection of industrial, commercial and retail development subject to the risk of bushfires.

The amended SEARs requires technical information on environmental protection equipment to be installed on the premises such as – fire – including location of fire hydrants and water flow rates at the hydrant, management and containment measures. The location of the hydrant was assessed during the site inspection and it was determined that the suite of measures outline in Section 6.8 of this report adequately address the provision of fire-fighting water supply.

The SEARs also requires consultation with the NSW Rural Fire Service.

1.3.2 Rural Fires Act 1997

The objectives of the *Rural Fires Act* are to provide:

- The prevention, mitigation and suppression of fires;
- Coordination of bushfire fighting and prevention;
- Protection of people and property from fires; and
- Protection of the environment.

Sections 63(1) and 63(2) require public authorities and owners / occupiers of land to take all practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bushfires.

1.3.3 Biodiversity Conservation Act 2016.

The Biodiversity Conservation Act 2015 replaces the Threatened Species Conservation (TSC) Act and aims to maintain a healthy, productive and resilient environment for the greatest well-being of the community, consistent with the principles of ecologically sustainable development.

1.3.4 Native Vegetation Act 2003 (NV Act).

The *NV Act* states indigenous vegetation within 20 metres of the bed or bank of a river or lake, or on slopes over 18 degrees, requires clearing consent under the *NV Act*, unless during an emergency fire event as authorised under the *Rural Fires Act 1997*.

1.4 Documentation Reviewed.

The following documents were reviewed in the preparation of this Bushfire Assessment:

- Secretary's Environmental Assessment Requirements (SEARs) to support EIS development and was assigned Reference SSD 15_ 7187 – 19th August 2015;
- Amended Secretary's Environmental Assessment Requirements (SEARs) to support EIS development and was assigned Reference SSD 15_ 7187 – 11th July 2017
- Landfill Master Plan prepared by SLR, February 2017;
- Landfill Environmental Management Plan prepared by SLR, June 2017;
- Concept Design for Stage 4 Landfill Extension prepared by SLR, June 2017;
- Pollution Incident Response Plan (PIRMP) prepared by Shoalhaven City Council;
- Aerial Photograph of the Site;
- SCC Certified Bushfire Prone Land Map;
- *Planning for Bushfire Protection 2006* - NSW Rural Fire Service.

1.5 Site Inspection.

Graham Swain of *Australian Bushfire Protection Planners Pty. Limited* inspected the development property on the 15th March 2016 to assess the topography, slopes, vegetation classification and land use within and adjoining the Proposal Site. Visual assessment was undertaken to determine likely fire runs, influence of terrain on wind patterns within the bushfire prone vegetation and an assessment of access and egress to the Proposal Site. Adjoining properties were also inspected to determine the surrounding land use / land management.

SECTION 2

DESCRIPTION OF PROPOSAL SITE

2.1 Location and Description.

The only primary solid waste landfill that services the Shoalhaven Local Government Area is the West Nowra Recycling and Waste Facility (Facility), and it is located at 120 Flatrock Road, Mundamia, approximately 7.5km west of Nowra.

The Facility is operated by Shoalhaven City Council (Council). The Facility currently receives waste from nine waste transfer stations and a domestic waste collections service, as well as public and commercial drop-off direct to the Facility. The location of the Facility can be found in **Figure 2**.

The Facility is bordered to the south by rural residential properties, with the closest being approximately 65m from the site boundary. Other surrounding land is predominantly undeveloped bushland, including the Bamarang Nature Reserve and neighbouring properties to the east of the site.

The Facility is located on parcels of land owned by Council and includes 14.5ha of undeveloped land, part of which is proposed for the Stage 4 extension of the existing landfill, as well as for environmental offsets.

The proposed Stage 4 landfill extension area is on Lot 1 DP 1104402, which is to the east of the stages 2 (Lot 1 DP 847203) and 3 (Lot 1 DP 870268) as can be seen in **Figure 4**.

The footprint of the proposed Stage 4 landfill extension (the Proposal) is limited by a number of existing features, including existing Facility infrastructure, a biodiversity corridor, environmental conservation areas and a residential buffer zone.

The development of the Proposal footprint is shown in **Figure 3** and the Master Plan Layout shown in **Figure 5**.

Figure 2 – Location of the West Nowra Recycling and Waste Facility



Figure 3 – Location of the Proposal Site

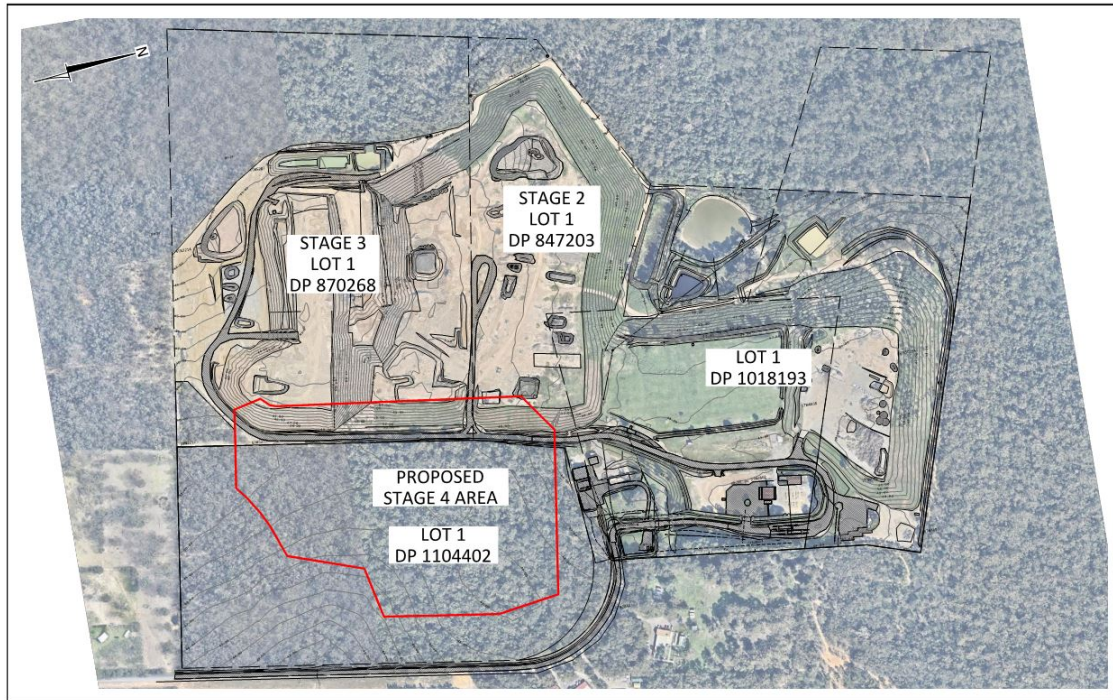
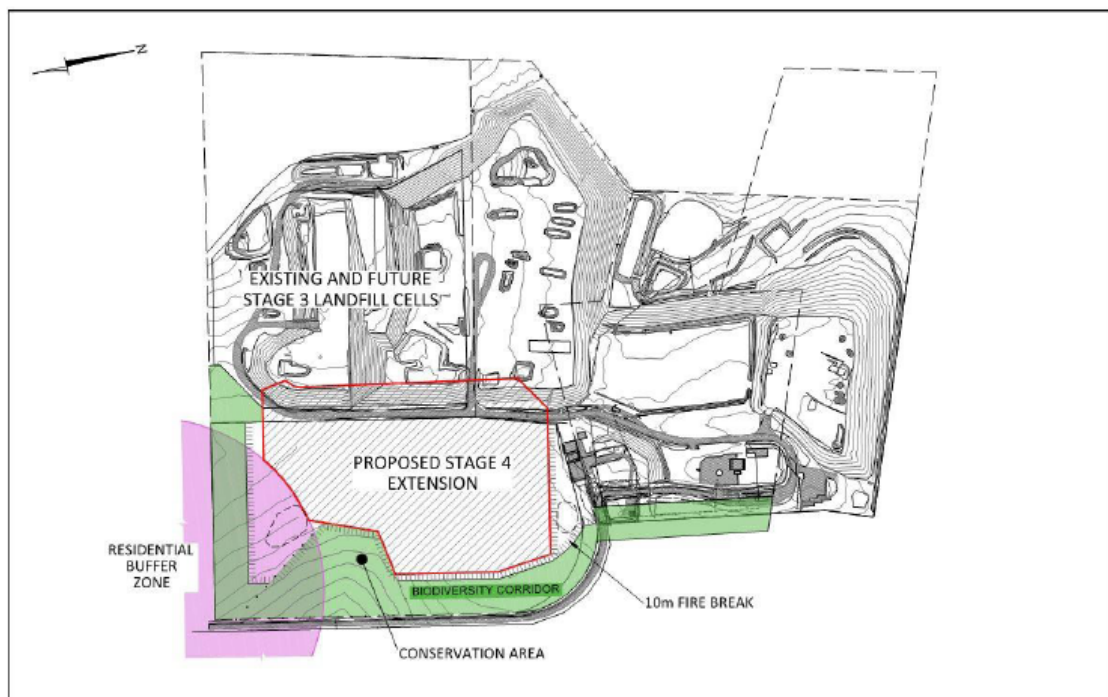


Figure 4 – Proposed Stage 4 Extension Footprint



The site plan illustrates a complex waste management facility layout. Key features include:

- Existing Landfill Stage 2 (Lot 1 DP 847205):** Located in the upper central part, containing a vehicle stockpile area, cold waste stockpile area, green waste processing area, and a pond area.
- Stage 4 Landfill Extension (Lot 1 DP 1104462):** A large central area divided into six cells (Cell 1 to Cell 6), featuring a sedimentation dam and a conservation area.
- Lot 1 DP 1018193:** Situated to the right of the central area, including a non-ferrous collection area (with bridges), a tyre collection area, an access ramp to stockpile areas, a wash down bay, a storm water treatment system, a storage shed, a landfill gas generator, a site office, a recycling area, a refuse area, a transfer station area, and a steel waste stockpile and processing area.
- Other Infrastructure:** Includes a sedimentation dam, pump house, buffer zone between boundaries and active area, term stockpile area, pavement materials stockpile area, active landfill disposal area, dry cell, green waste stockpile and processing area, and various fire breaks (10m and 20m).

2.2 Adjoining Land Use.

The land to the south of the Proposal Site is privately owned and contains rural residential development.

The land to the east of the Proposal Site, beyond Flatrock Road is vacant with the National Park & Wildlife Office and Depot located to the northeast.

The Shoalhaven City Council Animal Shelter is located to the north of Flatrock Road.

2.3 Topography.

Appendix 2 of *Planning for Bushfire Protection 2006* states that slopes should be assessed, over a distance of at least 100 metres and that the gradient of the land should be determined which will most significantly influence the fire behaviour on the Site.

The Proposal Site is located to southwest of the Shoalhaven River and is located on the eastern side of a ridge line, and is predominantly flat. There are several drainage features that border the Site, with the area being predominantly drained by Cabbage Tree Creek, which flows northward to the Shoalhaven River.

The undisturbed site area that is being investigated for the Proposal has an approximate area of 14.52 Ha (of which 9.94 ha is proposed to be disturbed).

The lowest point of the site is approximately RL 41 metres and the highest point of the site approximately RL 50 metres. The topography of the Site is relatively flat.

The land to the east, which contains the primary bushfire hazard to the Proposal, falls to the east at 0 – 5 degrees into Cabbage Tree Creek. Refer to Topographic Map in **Figure 6**.

Figure 6 – Topographic Map of Proposal Site and adjoining lands.



Source – Six Viewer – accessed September 2016

2.4 Vegetation Communities on the land within the Proposal Site.

Appendix A2.3 of *Planning for Bushfire Protection 2006* provides a methodology for determining the predominant bushfire prone vegetation for at least 140 metres in all directions from the proposed building. Vegetation is classified using Table A2.1 of *Planning for Bushfire Protection 2006*, which classifies vegetation types into the following groups:

- (a) Forests (wet & dry sclerophyll forests);
- (b) Woodlands;
- (c) Plantations – being pine plantations not native plantations;
- (d) Forested Wetlands;
- (e) Tall Heaths;
- (f) Freshwater Heaths;
- (g) Short Heaths;

- (h) *Alpine Complex;*
- (i) *Semi – arid Woodlands;*
- (j) *Arid Woodlands; and*
- (k) *Rainforests.*

The Proposal Site was identified by GHD as containing one main vegetation type – Red Bloodwood – Grey Gum – Stringybark – Scribbly Gum Forest (SR592) with the majority of the Proposal Site dominated by a diverse suite of sclerophyllus shrub species including *Hakea* and *Banksia* species.

2.5 Vegetation Communities adjoining the Proposal Site.

The primary bushfire hazard located to the east of Flatrock Road also consists of Red Bloodwood – Grey Gum – Stringybark – Scribbly Gum Forest.

The rural residential land to the south of the Proposal Site contains shade trees and managed pasture grass.

The Nature Reserve to the southeast of Stage 4 contains Dry Sclerophyll Tall Open Forest.

2.6 Significant Environmental Features on the land within the Proposal Site.

The Proposal Site does not contain any significant environmental features such as SEPP 14 – Coastal Wetlands; SEPP 26 Littoral Rainforests; SEPP 44 – Koala Habitat; Areas of Geological interest; Steep Lands (>18 degrees); Land slip areas or National Parks Estate. An ephemeral drainage line (a tributary of Cabbage Tree Creek) extends to the east from the central eastern portion of the Proposal Site.

2.7 Known Threatened Species, Populations, Endangered Ecological Communities or Critical Habitat on the land within the Proposal Site.

The ephemeral drainage line (a tributary of Cabbage Tree Creek) contains a vegetation community of conservation significance (*Nowra Heath Myrtle*) which requires poorly drained or periodically waterlogged soils.

SECTION 3

FIRE MANAGEMENT RESPONSIBILITIES

Fire management within the Proposal Site is the responsibility of:

3.1 Shoalhaven City Council (SCC).

SCC has responsibility, under Section 66 of the *Rural Fires Act*, to issue a notice in writing requiring an owner / occupier of any land within the Local Government Area (LGA) to carry out bushfire hazard reduction works on that land. Section 100E of the *Rural Fires Act* requires Council to issue bushfire hazard reduction certificates for hazard reduction to be undertaken on private lands.

Management of the bushfire protection measures within the Proposal Site remains the responsibility of the owner of the land/operator.

3.2 New South Wales Rural Fire Service.

The NSW Rural Fire Service (RFS) has the responsibility for undertaking fire suppression activities, hazard management activities and other functions relative to emergency management, within its areas of operation. *Section 73* of the *Rural Fires Act (1997)* enables the Commissioner to carry out bush fire hazard reduction works on any land as required by a bush fire risk management plan if the work has not been carried out satisfactorily. Incurred costs can be recovered as a debt owed to the Crown.

3.3 Fire & Rescue New South Wales.

The Fire & Rescue NSW has the responsibility for undertaking fire suppression activities, and other functions relative to emergency management, within its area of operation and through Mutual Aid Agreements, provide assistance to the NSW Rural Fire Service, particularly for structural fire operations within the NSW Rural Fire Brigade Districts. Hazmat management within New South Wales is the responsibility of Fire & Rescue NSW.

3.4 Shoalhaven Bush Fire Management Committee.

The Shoalhaven Bushfire Management Committee has the responsibility for planning for coordinated fire fighting activities / hazard management activities on a local government level. It is not an operational organisation, a fire fighting organisation or a funding source for fire management activities.

The Bush Fire Management Committee is supported by the following provisions of the *Rural Fires Act 1997*:

- **Section 52** requires each Bush Fire Management Committee to prepare and submit a draft bush fire risk management plan and a plan of operations.
- **Section 54** of the Act specifies that a draft bush fire risk management plan is to 'set out schemes for the reduction of bush fire hazards in the rural fire district or other part of the State'.

A draft bush fire risk management plan may also restrict or prohibit the use of fire or other fire hazard reduction activities in all or specified circumstances or places to which the plan applies.

3.5 Public Authorities & owners/occupiers of land.

The Rural Fires Act, 1997 provides several legislative opportunities to require Public Authorities, land owners and occupiers to manage hazardous fuels. These include:

- **Section 63(1)** states that it is the duty of a public authority to take any practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of a bushfire on or from:
 - (a) any land vested in or under its control or management, or
 - (b) any highway, road, street, land or thoroughfare, the maintenance of which is charged on the authority.
- **Section 63(2)** states that 'it is the duty of the owner or occupier of land to take the notified steps (if any) and any other practicable steps to prevent the occurrence of fires on, and to minimise the danger of the spread of fires on or from that land'.

SECTION 4

BUSHFIRE HAZARD ASSESSMENT

4.1 Definitions.

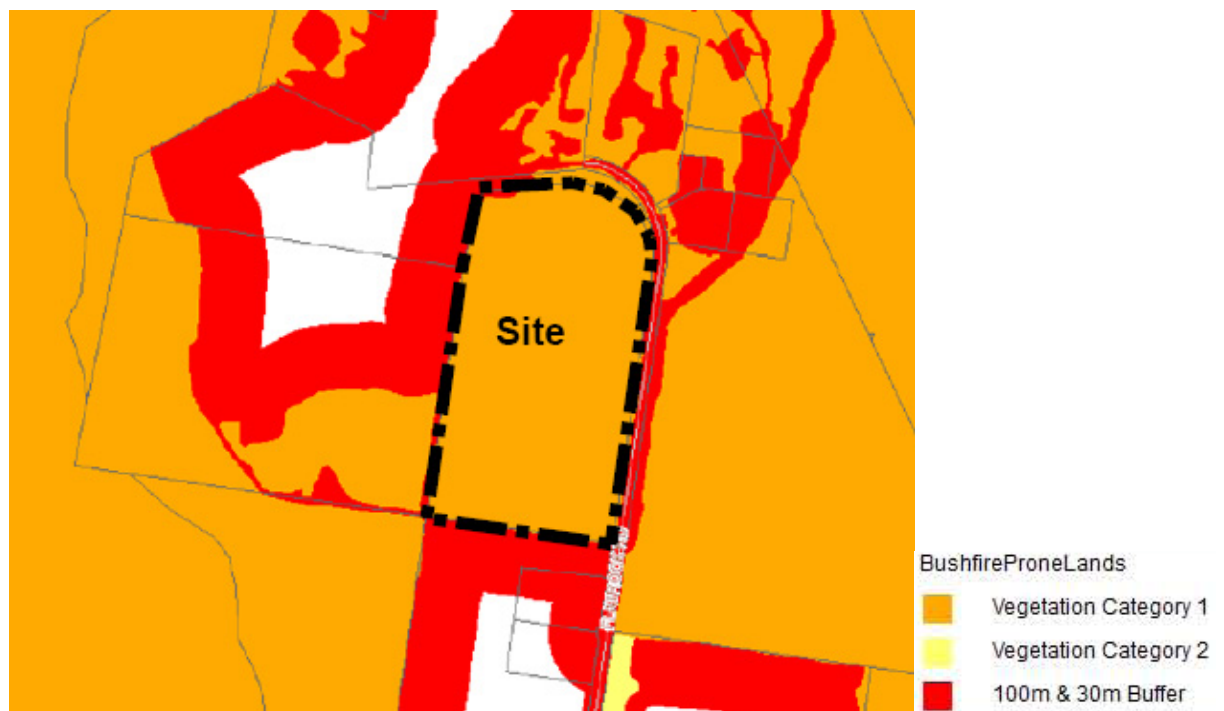
Planning for Bushfire Protection 1991 defines *Bushfire Hazard* as the “availability of fuel”. The document also defines threat as being a “measure of the scale of impact or significance in terms of hazard and risk”.

Planning for Bushfire Protection 2006 defines bushfire risk as “the chance of a bushfire igniting, spreading and causing damage to assets of value to the community. Risk may be rated as extreme, major, moderate, minor or insignificant and is related to the vulnerability of the asset”.

4.2 Bushfire Prone Land Map.

SCC has prepared a Bushfire Prone Land Map under the provisions of Section 146 of the *Environmental Planning & Assessment Act 1979*. An extract of this map is provided as Figure 7 below and shows that the Proposal Site contains Category 1 (forest) Bushfire Prone Vegetation. The site inspection undertaken on the 15th March 2016 confirmed the accuracy of the Bushfire Prone Land Map.

Figure 7 – Extract of the SCC Bushfire Prone Land Map.



Note: The white area is not bushfire prone land.

4.3 Bushfire Hazard Assessment.

Planning for Bushfire Protection 2006 does not provide a methodology for determining bushfire hazard – it defers instead to Bushfire Prone Land determined in accordance with the “*Bushfire Prone Land Mapping Guideline*”, issued by the Rural Fire Service on the 7th April 2004.

To be able to undertake a bushfire hazard assessment the *Department of Planning* document *Circular C10 (1983)* provides a suitable methodology. This methodology rates the vegetation and slope and provides an index value to each.

The overall Bushfire Hazard Score is determined by multiplying the Vegetation Index by the Slope Index.

4.3.1 Assessment to Determine the Bushfire Hazard to the Proposal.

The vegetation that presents the potential bushfire threat to the Proposal is the forest retained within the biodiversity corridor on the Proposal Site and on the adjoining land to the east of Flatrock Road.

The forest vegetation has a vegetation index score of 2.8. The effective slope of the land adjoining the Proposal Site is downslope 5% - 10% to the east.

The slope index for downslope land is 1.5.

Therefore the Bushfire Hazard Score for the forest vegetation on the land adjacent to the Proposal Site is $2.8 \times 1.5 = 4.2$, which equates to a numerical bushfire hazard rating of high.

4.4 Assessment of Bushfire Threat.

Bushfire Threat is the “*measure of scale of impact or significance in terms of hazard and risk*”.

The bushfire hazard to the Proposal Site, from the forest vegetation on the land adjoining the site, has been determined to be high, using the methodology provided by *Circular No. C10* prepared by the Department of Planning (1983).

The bushfire threat to the Proposal Site is High.

SECTION 5

BUSH FIRE PROTECTION ASSESSMENT

5.1 Introduction.

Chapter 1 of *Planning for Bushfire Protection 2006* states that the aim of the document is to use the NSW development assessment system to provide for protection of human life (including firefighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, onsite amenity and protection of the environment.

The objectives of the document are:

- Afford occupants of any building adequate protection from exposure to the impacts of a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- Ensure that safe operational access/egress for emergency service personnel and occupants relocating is provided and/or available;
- Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads within the Asset Protection Zone/s; and
- Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bushfire fighting operations).

Chapter 1, Section 1.3 of *Planning for Bushfire Protection 2006* states that the construction of Class 5 – 10 buildings on bushfire prone land, or land impacted by bushfire prone land, must meet the aim and objectives of the document.

Chapter 4, Section 4.3.6(f) discusses the bushfire protection to buildings of Class 5 to 8 and 10b of the Building Code of Australia.

The Proposal does not include the construction of buildings or fixed assets and therefore the building related bushfire protection measures recommended by *Planning for Bushfire Protection 2006* do not apply.

5.2 Assessment of Bushfire Risk to the Proposal.

5.2.1 Likely Bushfire Scenarios.

An assessment of the fire scenarios likely to affect the Proposal has been undertaken, based on the potential fire paths identified during the site inspection.

These scenarios are:

Scenario 1:

A bushfire burning through the forest vegetation in the biodiversity corridor on the Proposal Site and beyond Flatrock Road and spreading, upslope, under north-easterly winds.

This fire occurrence is likely during fire seasons when conditions are such that the vegetation has not been managed to remove the fuel hazard, the Fire Danger Index is Extreme (FDI > 50) and the prevailing wind is from the northeast.

Scenario 2:

A bushfire burning through the forest vegetation in the biodiversity corridor on the Proposal Site and beyond Flatrock Road and spreading, upslope, under south-easterly winds.

This fire occurrence is likely during fire seasons when conditions are such that the vegetation has not been managed to remove the fuel hazard, the Fire Danger Index is Extreme (FDI > 50) and the prevailing wind is from the southeast.

Scenario 3:

Vegetation in the biodiversity corridor, landfill waste and landfill gas emissions ignited by burning embers given off by local/remote bushfires.

Scenario 4:

Ignition of the landfill waste/gas emissions and vegetation in the biodiversity corridor by embers from fires burning to the northwest, west and southwest of the Proposal Site.

5.2.2 Risk Statement.

Table 1 provides a qualitative risk analysis matrix – used to determine the level of risk in Table 2.

Table 2 provides a statement of risk for the potential fire scenarios (prior to mitigation measures being adopted/implemented) and assigns risk levels reflecting identified levels of likelihood and consequences for a ‘catastrophic’ fire occurrence during severe fire weather conditions.

Table 1 – Qualitative risk analysis matrix – used to determine the level of risk in Table 2

Likelihood	Consequence					
		<i>Minimal</i>	<i>Minor</i>	<i>Moderate</i>	<i>Major</i>	<i>Catastrophic</i>
	<i>Remote</i>	Negligible	Negligible	Very low	Low	Medium
	<i>Unlikely</i>	Negligible	Very low	Low	Medium	High
	<i>Possible</i>	Very low	Low	Medium	High	Very high
	<i>Likely</i>	Low	Medium	High	Very high	Significant
	<i>Almost certain</i>	Medium	High	Very high	Significant	Significant

Table 2 – Bushfire Risk Register – Severe Bushfire Event – if high levels of combustible fuels / unmanaged vegetation exists.

The Risk What can happen?	The consequences & likelihood of an event happening		Consequence Rating	Likelihood Rating	Level of Risk
	Consequences	Likelihood			
Scenario 1: Fire burning in unmanaged forest vegetation in the biodiversity corridor/land to the east of Flatrock Road, spreading across the landscape under north-easterly winds	Ignition of exposed waste and unmanaged vegetation.	Likely to occur during severe / catastrophic fire danger periods	Moderate	Likely	High
Scenario 2: Fire burning in unmanaged forest vegetation in the biodiversity corridor/land to the east of Flatrock Road, spreading across the landscape under south-easterly winds	Ignition of exposed waste and unmanaged vegetation.	Likely to occur during severe/ catastrophic fire danger periods	Moderate	Likely	High
Scenario 3: Fire burning in landfill waste, spreading into the adjoining forest vegetation within the facility or on the adjoining lands	Ignition of unmanaged vegetation.	May occur if a fire within the landfill material is not immediately extinguished during severe fire danger periods	Moderate	Possible	Medium
Scenario 4: Ignition of the landfill waste/gas emissions and vegetation in the biodiversity corridor by embers from fires burning to the northwest, west and southwest of the Proposal Site	Ignition of waste/gas/ vegetation.	May occur during severe/ catastrophic fire danger periods	Moderate	Possible	Medium

5.2.3 Summary of Bushfire Risk.

Table 2 identifies the potential level of risk to the Proposal, prior to the implementation of bushfire protection measures.

As the Proposal does not include the construction of buildings, the risk to the landfill is ignition of exposed combustible materials, gas emissions and the vegetation in the biodiversity corridor by burning embers.

Staff and equipment may be exposed to high levels of radiant heat and smoke and therefore the procedures listed in Section 2.8 of the Site Emergency Procedures Manual – West Nowra Recycling & Waste Depot shall be followed.

5.2.4 Assessment of Bushfire Risk created by the Landfill operation.

Table 2 also identifies the potential level of risk from a fire which ignites within the landfill operations and escapes into the vegetation within the Facility biodiversity corridor with the potential to spread onto adjoining/adjacent lands.

The operation of the Stage 4 landfill will continue the current practices which include compaction of waste with heavy machinery and progressive covering of the face of the land fill.

SCC has provided advice that fire in the landfill occurs when ashes and other hot materials/acids etc are deposited in the waste material. Outbreaks of fire which may occur during operating hours will be extinguished using heavy machinery and water carts.

These facilities are maintained on 'stand-by' readiness during days of Total Fire Ban status.

The management of fire ignitions within the landfill reduces the risk of ignition of the forest vegetation in the adjoining biodiversity corridor.

However, work practices should be established in recognition of the likely risk of ignition of the retained vegetation on the Proposal Site and on adjoining lands by the operation of machinery such as slashers etc. These should include the provision of portable fire extinguishers during maintenance activities that involve cutting, grinding, welding and slashing etc.

Such operations should not occur in the open during periods of high fire danger and declared Total Fire Ban days.

SECTION 6

PROTECTION MEASURES TO BE IMPLEMENTED TO REDUCE THE BUSHFIRE RISK TO THE PROPOSAL.

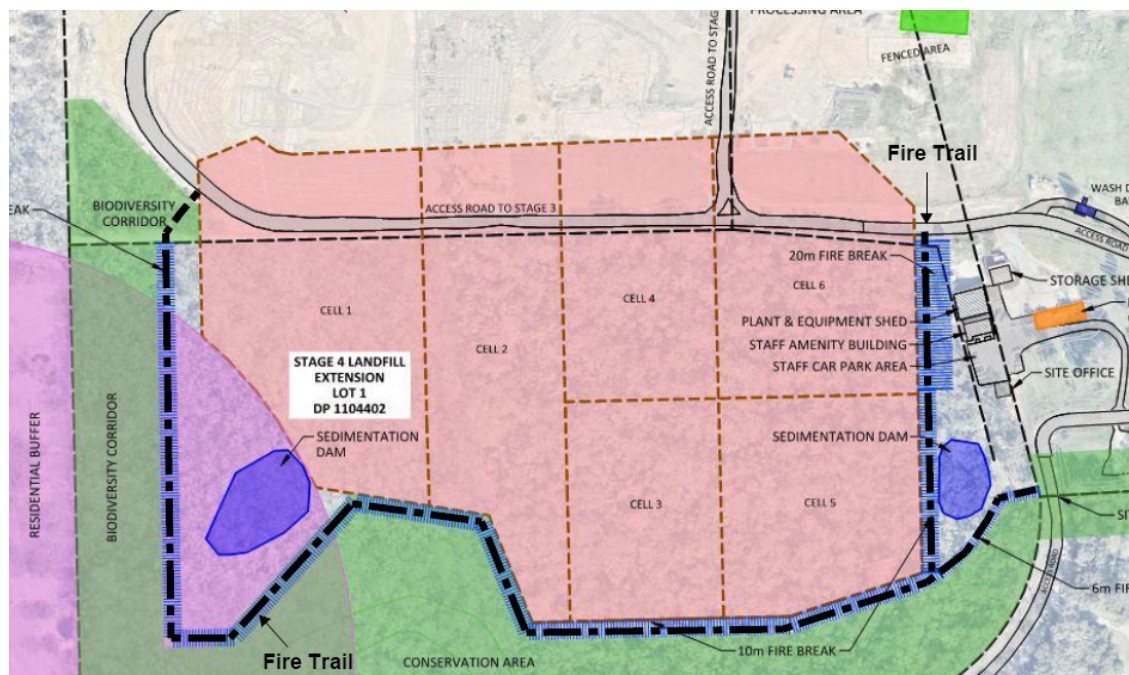
6.1 Provision of Fire Break to the outer edge of the Stage 4 Extension:

There shall be provided and maintained a 10 metre wide fire break to the outer edge of the Stage 4 extension – refer to **Figure 8**.

There shall be provided and maintained a 20 metre wide fire break to the south of the existing Site Office, Staff Amenity and Plant & Equipment buildings – refer to **Figure 8**.

This zone shall be managed in accordance with the prescriptions provided by the NSW Rural Fire Service's 'Environmental Assessment Code 2006'.

Figure 8 – Extract of the Master Plan showing the fire protection measures.



6.2 Provision of temporary Fire Break to landfill cells.

There shall be provided and maintained a 10 metre wide temporary slashed fire break to the outer edge of the incremental landfill cells.

6.3 Management of the residual vegetation within the Proposal Site:

The forest vegetation retained within each landfill stage, being the residual vegetation beyond the operating cell and also the vegetation within the biodiversity corridor shall be fuel managed by hazard reduction burning in accordance with the prescriptions provided by the NSW Rural Fire Service's 'Environmental Assessment Code 2006'.

Management of the combustible fuels shall be undertaken to maintain a Low – Moderate Overall Fuel Hazard, pursuant to the DSE Overall Fuel Hazard Guide.

6.4 Management of the risk of fire ignition within the Landfill Operation.

The Landfill resources such as water tankers and heavy earth moving plant shall be maintained on 'stand-by' readiness during days of Total Fire Ban status.

Work practices shall be established in recognition of the likely risk of ignition of the vegetation retained on the Proposal Site by the operation of machinery such as slashers etc.

These should include the provision of portable fire extinguishers during maintenance activities that involve cutting, grinding, welding and slashing etc.

6.5 Access.

There shall be provided in the defendable space to the perimeter of the Stage 4 extension a fire trail which connects to the existing internal access road/s. The fire trail shall have a width of 4.0 metres and be capable of carrying a fully laden NSW Rural Fire Service/State Forests Category 1 Tanker.

A locked gate shall be provided at the junction of the Main Entry Road and fire trail.

There shall be provided to the perimeter of each incremental landfill cell a temporary fire trail which connects to the existing/proposed perimeter/internal road/fire trail network. The temporary trail shall be capable of carrying a fully laden NSW Rural Fire Service Category 1 Tanker.

6.6 Provision of Portable Fire Fighting Equipment.

To mitigate the risk of ignition of the vegetation within the biodiversity corridor, staff/contractors undertaking drilling, cutting, grinding, welding and slashing operations on the site shall not undertake such works without the provision of a portable fire extinguisher – refer to Site Emergency Procedures Manual.

6.7 Works on Total Fire Ban Days.

Staff/contractors shall not undertake drilling, cutting, grinding, welding and slashing operations on Total Fire Ban days – unless during an emergency in which case a firefighting appliance shall be on stand-by at the facility.

6.8 Water Supplies for Fire-fighting Operations.

The provision of the existing water main with a hydrant located at the front gate, complimented by on-site fire-fighting water tanks, portable first aid firefighting equipment (fire hose reels/fire extinguishers) and heavy equipment, including bulk water trucks, address the provision of water supplies (and equipment) for fire-fighting operations.

6.9 Ongoing Fuel Management.

For the purpose of fuel reduction using hazard reduction burning, the following should be part of the ongoing management:

- All perimeter fire trails clear and maintained;
- Maintain a 20 metre wide Defendable Space (Fire Break) to the existing Office complex;
- Provide and maintain temporary fire trails and Defendable Spaces adjacent to each stage.

SECTION 7

ASSESSMENT OF RESIDUAL RISK

Table 3 provides a statement of risk for the potential fire scenarios (post mitigation measures have been adopted & implemented) and assigns risk levels reflecting identified levels of likelihood and consequences for a 'catastrophic' fire occurrence during severe fire weather conditions.

Table 3 – Bushfire Risk Register – Severe Bushfire Event – post implementation of mitigations measures.

The Risk What can happen?	The consequences & likelihood of an event happening, prior to mitigation measures		Consequence/L ikelihood Rating, prior to mitigation measures	Level of Risk, prior to mitigation measures	Risk Rating post implementation of mitigation measures
	Consequences	Likelihood			
Scenario 1: Fire burning in unmanaged forest vegetation in the biodiversity corridor/land to the east of Flatrock Road, spreading across the landscape under north- easterly winds	Ignition of exposed waste and unmanaged vegetation.	Likely to occur during severe / catastrophic fire danger periods	Moderate/ Likely	High	Moderate
Scenario 2: unmanaged forest vegetation in the biodiversity corridor/land to the east of Flatrock Road, spreading across the landscape under south- easterly winds	Ignition of exposed waste and unmanaged vegetation.	Likely to occur during severe/ catastrophic fire danger periods	Moderate/ Likely	High	Moderate
Scenario 3: Fire burning in landfill waste, spreading into the adjoining forest vegetation within the facility or on the adjoining lands	Ignition of unmanaged vegetation.	May occur if a fire within the landfill material is not immediately extinguished during severe fire danger periods	Moderate/ Possible	Medium	Low
Scenario 4: Ignition of the landfill waste/gas emissions and vegetation in the biodiversity corridor by embers from fires burning to the northwest, west and southwest of the Facility	Ignition of waste/gas/ vegetation.	May occur during severe/ catastrophic fire danger periods	Moderate/ Possible	Medium	Low

SECTION 8

CONCLUSION

The Proposal Site and adjoining land to the east contains unmanaged vegetation which is bushfire prone.

This assessment has reviewed the bushfire threat to the Proposal and made recommendations on the measures designed to mitigate the threat to the Proposal from fire entering the Proposal Site and fire escaping from the Proposal Site onto adjoining land.

Implementation of the strategies provided in Section 5.2.4 and Section 6 of this report are considered necessary to provide the level of protection required to the Proposal and to ensure compliance with legislative requirements in respect to the management of the land to prevent bushfires occurring within and escaping from the Proposal Site and the provision of access for fire-fighting operations.

The assessment of the bushfire protection requirements and potential levels of bushfire attack on the Proposal indicates that the development of the Proposal Site can be undertaken in a manner that balances development opportunities and the protection of life, property and the environment.



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REFERENCES:

- N.S.W Rural Fire Service – *Planning for Bushfire Protection* 2006;
- *Environmental Planning & Assessment Act* – 1979;
- *Rural Fires Act* – 1997;
- *Rural Fires and Environmental Assessment Legislation Amendment Act* 2002;
- *Rural Fires Regulation* 2013;
- NSW Rural Fire Service – *Guideline for Bushfire Prone Land Mapping* 2015;
- *Biodiversity Conservation Act* 2017;
- *Native Vegetation Act* 2003;
- *Bushfire Environmental Assessment Code* 2006;
- Building Code of Australia;
- Australian Standard A.S 3959 - 2009 “*Construction of Buildings in Bushfire Prone Areas*”;
- *Shoalhaven Bushfire Prone Land Map*.