AUSTRALIAN SUSTAINABLE BUSINESS GROUP'S

Submission on

Fire Safety in Waste Facilities

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TABLE OF CONTENTS

EXECUTIVE SUMMARY ii

RECOMMENDATIONS iv

1 OVERVIEW 1

2 SCOPE AND APPLICATION 2

2.1 Scope 2

2.1.1 Guideline or Requirement? 2

2.1.2 Combining the Effectiveness of Control Measures 2

2.1.3 Application – One Size Fits All? 3

2.1.4 Application to Existing Waste Facilities 3

2.1.5 What is Combustible Waste Material? 4

2.1.6 Sources of Waste Ignition 5

3 COMMENTS ON CHAPTER 7 6

3.1 Overview 6

3.1.1 Separation Distances 6

3.1.2 Existing Facilities 6

3.1.3 Orders to Upgrade 7

3.1.4 Emergency Vehicle Access 7

3.1.5 Quarantine Area 8

3.1.6 Smoke Control 8

3.1.7 Fire detection and alarm systems 8

3.1.8 Fire water run-off containment 9

4 CHAPTER 8 ISSUES FACILITY OPERATION AND MANAGEMENT 10

4.1 Stockpiles and Separation 10

4.1.1 Stockpile movement 10

4.1.2 Spontaneously Combustible Wastes 11

4.1.3 Stockpile Size 12

4.1.4 Minimum separation distance 12

5 CONCLUSION 15

EXECUTIVE SUMMARY

The Australian Sustainable Business Group (ASBG) is pleased to comment on Fire and Rescue's Fire Safety in Waste Facilities (FSWF) with this submission.

Overall FSWF should be rewritten to provide a list of risk issues which can be used and referred to by a fire assessment or equivalent in the preparation of a fire study for new facilities. FSWF should emphasise its preference for a fire study, using its default criteria for such encouragement or if a facility chooses not to undertake a fire study.

This 'guideline' document establishes a confusing mix of prescriptive and site specific criteria to new and also existing waste facilities, which store combustible waste materials. FSWF prescribes what is considered an ultra conservative criteria for waste facilities. Clear examples of this appear when compared to Australian Standards covering Dangerous Goods. In general separation distances in FSWF are larger than that required for flammable solids class 4.2 PG III, and combustible liquids under Australian Standards. Table 3 compares separation distances, indicating the FSWF separation criteria can only be described as ultra conservative.

Table 3: Comparison of AS 1940, AS/NZS 5026 and Fire Safety in Waste Facilities s8.1 Separation distances in meters

	AS 5026	AS 1940			Fire Safety in Waste Facilities s8.1			
Quantity tonne/kL	**4.2 PG III**	**PGII**	**C1**	**C2**	**LP S HRR**	**BP S HRR**	**LP H HRR**	**BP H HRR**
120	9	17^	7.2^	6.1^	7	**13**	**20**	**24**
200	10	21^	9	7	9	**15**	**24**	**31**
440	14.8+	28^	12	9.3^	11	**20**	**30**	**38**
600	16.6+	33^	14	10.8^	12^	**21.5**^	not acceptable*	not acceptable
760	17.6+	36^	15.1^	11.9^	13	**23**	not acceptable	not acceptable

+ Extrapolated from set separation distances

^ Used split differences to obtain the separation distances, generally rounded up

* *Not acceptable* is because the maximum stockpile size is 20 x50m and due to the low density of the material is unlikely to exceed 550 tonnes

For example, storing 120,000 litres of diesel (a C1 combustible liquid) requires a separation distance from the bund wall of 7.2 metres. In contrast, storing 120 tonnes of bailed plastic waste (approximately 600 m^3) under FSWF requires 20 or 24 meters of separation. Prima face diesel is a Dangerous Good and as expected has a far higher fire risk, but requires 1/3 of the separation distance. Putting it another way under ANZS 1940, 24 m separation allows for about 290,000 litres of petrol, about twice the mass permitted for plastic under the FSWF. Many of FSWF prescribed requirements, such as these separation distances, were established in isolation based on the assumption there are *no other fire control measures* other than separation. Use of these separation distances is substantially excessive if other relatively simple control measures are also applied.

In most cases FSWF assumes combustible waste material is uniform across all waste facilities with no delineation between highly variable combustible properties. As a result FSWF is poorly drafted such as not putting such default controls in context, nor recommending a fire study be used as the first desired option.

FSWF also differs from the two main reference documents Victoria's Management and storage of combustible recyclable and waste materials – guideline (MCWM) and UK's Waste Industry Safety and Health Forum - Reducing fire risk at waste management sites - New fire guidance (UK WISH). Both these document make it clear that there are two options:

- Preferably undertaking a fire study and implementing the recommendations or
- Following the default very conservative and prescriptive criteria.

This distinction is lacking or poorly explained in the FSWF documents, where use of a fire study appears as an add-on not an alternative option. Consequently, it is strongly recommended that the FSWF clearly identify that there are the same two options available for affected waste facilities.

In addition, there is confusion over the application of FSWF to existing facilities. Clarification is required as to how the FSWF is to apply and which parts are optional. Existing waste facilities should not be required to retrospectively comply with FSWF default criteria or even parts of it. Most sites will not have the land required nor be able to afford the costs required. A different approach is required for existing sites.

ASBG recommends that for such compliance on existing facilities a level of reasonable and feasible criteria should apply. This should be similar to other requirements to upgrade existing buildings and infrastructure when new building codes and rules are introduced. Centre to this approach is again use of a fire study, which is risk-based and considered reasonable and feasible changes based on best risk management for the lowest cost to achieve an outcome.

The final issue is for capturing firewater. There is no requirement under the MCWM or UK WISH document to capture 4 hours of firewater assuming worst case flow rates. Firewater capture has been attempted before in the mid 1990's to poor result. While capture of firewater is worth considering, it is recommended this be assessed using a fire study and apply only to new sites at the planning level. The 4 hour default lacks evidence and research this is an ideal amount and should be changed to a reasonable and feasible outcomes based approach.

Overall the FSWF requires a major review with ongoing discussions with the waste sector to develop a reasonable and feasible set of outcomes.

RECOMMENDATIONS

R1 ASBG Recommends the FSWF:

- Clearly clarifies its role as a guideline document
- Promotes the use fire study
- Lists risk areas to be considered in a fire study

R2 ASBG Recommends the FSWF acknowledges that prescriptive criteria are default values, where most are considered in isolation from other controls, but should only be used as a maximum backstop when no fire study or no other controls are undertaken.

R3 ASBG Recommends the FSWF acknowledges there are considerable differences between recycling sectors and in waste combustible material largely associated with each. This promotes the case-by-case fire study approach rather than the use of default generic criteria.

R4 ASBG Recommends the FSWF carefully reconsider how it will apply to existing sites, potentially developing a risk-based approach developed in consultation with the waste sector.

R5 ASBG Recommends the FSWF clearly specifies when a waste material is considered a combustible waste material or not using scientific measurement approaches and it also consider the large variations in the fire risks of different combustible waste materials.

R6 ASBG Recommends the NSW Government implement improved education, regulation and controls on generators of waste, including households to reduce the risks of contamination by ignition sources of collected waste streams for recycling and disposal.

R7 ASBG Recommends the FSWF remove the mandatory requirement to use the separation distances in section 8.3, referring to them as default distances only to be used when no fire study has been conducted or no other controls have been undertaken.

R8 ASBG Recommends for existing facilities re-write section 7.2 to:

- Remove the retrospective application of all of the mandatory requirements it contains.
- Develop, with stakeholder involvement, a publically available risk assessment process be used to identify existing sites that require a fire study.
- Identify which agencies apart from Fire and Rescue can also apply this risk assessment.
- Be based on a principle of reasonable and feasible fire control methods similar to that used in the compliance of buildings for fire controls.

R9 ASBG Recommends the FSWF recognise that while quarantine areas are desirable from a fire-fighting perspective, they may not be feasible for most existing sites and also for some new urban waste facilities

R10 ASBG Recommends the FSWF remove the default 4 hour firewater capture requirement, replacing with a fire study where fire water capture is to be considered.

R11 ASBG Recommends the FSWF promote the use of a fire study allowing for a range of flexible approaches considered on a case-by-case basis for the management of waste stockpiles. Use of Australian Standards and other methods, which achieve a reasonable level of risk management to that required under WHS Regulation be used in principle.

R12 ASBG Recommends the FSWF omit section 8.2.1 as it is considered too restrictive to the production and processes in the recycling sectors assuming all have compostable or spontaneously combustible waste materials.

R13 ASBG Recommends the FSWF omit section 8.3.3 as it is considered too restrictive, assuming all combustible waste material has the same density and fire risks.

R14 ASBG Recommends the FSWF clarifies the separation distances in s 8.4 are of guidance only where no other control methods are used and that a fire study be preferably used to ascertain appropriate separation distances when considered in combination with other fire control methods.

1 OVERVIEW

The Australian Sustainable Business Group (ASBG) is pleased to comment on Fire and Rescue NSW's draft Fire Safety in Waste Facilities (FSWF).

ASBG agrees there is a need to improve fire standards, but also that the existing standard and requirements need to be better enforced. Too often in the waste sector a criminal element which intentionally evades legal controls, sets poor examples of what can occur. Deliberate waste fires are becoming more common to avoid increasingly more expensive waste disposal and treatment processes. Too often the waste sector is subjected to increasing controls due to the actions of a few deliberate criminal operators. However, this criminal action is a result of rapid and now very high waste management costs, exacerbated by international markets and significant red tape. Environmental protection also plays a strong role as its standards increase the cost of operating recycling activities becomes less viable, due to the wastes from the processes and also the higher quality required by the regulators and the market on the product produced. Criminal avoidance of the law can only be addressed by better policing, not by increasing the controls and conditions on all operators in that sector.

If there is evidence that waste facility fires have increased due to non-criminal issues then some changes to increase oversight and rules are in order. However, a more surgical regulatory approach is preferable over a blunt method. The aim should be to encourage innovative low costs approaches to reduce risk.

FSWF draws on the work undertaken in UK by the Waste Industry Safety and Health Forum – Reducing Fire Risk at Waste Management Sites (KU WHISH). Unfortunately, much of the criteria used in the UK WHISH was adopted in FSWF without consideration of its qualifying information. For example, UK WISH's separation distances are adopted as standard design criteria in FSWF, but this is not the case in UK WHISH. For example, the Standard Separation Distances and Stack Sizes (UK WISH Appendix 1 Section 4) are provided as:

- An option to a fire study
- Only be used where sites have a basic level of fire provision.

Yet FSWF adopts these separation and stack sizes as virtually mandatory requirements, offering little flexibility.

UK WISH offers considerable guidance criteria, well thought through and aimed at assisting fire studies at such waste facilities. ASBG members would prefer the adoption of the UK WISH document over the draft FSWF as it is far more practical, flexible and provides many reasonable and feasible solutions and options. In contrast FSWF is far more prescriptive, in many criteria, such as separation distances and stockpile layout, but vague in the application of FSWF on existing facilities and its guideline, rather than rule status. Overall UK WHISH is a far superior document, but the separation distances provided are inconsistent with standards covering flammable and combustible dangerous goods and as such UK WHISH distances are highly questionable.

2 SCOPE AND APPLICATION

2.1 Scope

To clearly convey the areas captured by any regulatory document requires the scope of its application to be well defined. Vagueness, will simply lead to the regulatory officer, especially in another department making their own mind up on how to interpret the document, which can swing widely. As a consequence, the scope of FSWF requires being clear to minimise miss-interpretation ensuring the regulators and the regulated but understand what the rules are.

This section considers the main areas scoping FSWF and provides advice on how to improve its clarity.

2.1.1 Guideline or Requirement?

There is confusion over the application of the Guidelines as in section 2 it states:

This guideline details Fire and Rescue NSW (FRNSW) requirements for:

Is the intent that FSWF is a guideline or a requirement? ASBG is somewhat confused if the requirements such as presented in sections 7, 8 and 9 can be interpreted as mandatory. FSWF should be a guideline covering the issues to be considered din a fire study with a default set of conditions to be used in the lack of a proper fire study.

Clarification of the use, status of this document, how it is applied and where it is required to achieve a better understanding on how it should be used. FSWF will be used by multiple stakeholders including Councils, EPA, SafeWork NSW and other associated government agencies as well as the waste sector. Most critical is the flexibility in which the FSWF is to be applied. ASBG members report their experience that most NSW government agencies will interpret a confused message as a hard line mandatory requirement. As a consequence, only if the intent of the document is mandatory, unambiguous language must be used to ensure alternatives are available options. Unfortunately this document, while mentioning use of fire studies and their recommendations, does not portray this to be a preferred approach, with the default arrangements used in the absence of such.

NSW's Government's Guidance for Regulators to Implement Outcomes and Risk-based Regulation requires what is stated in its title. As a consequence, prescriptive regulation and policy should be written in terms of outcomes using a risk based approach. Considering the financial impacts of the control measures in FSWF ASBG considers that a Better Regulation Statement is required to support it.

R1 ASBG Recommends the FSWF:

- ***Clearly clarifies its role as a guideline document***
- ***Promotes the use fire study***
- ***Lists risk areas to be considered in a fire study***

2.1.2 Combining the Effectiveness of Control Measures

The scope also outlines a common issue ASBG has with FSWF in it requires a set of combined control; fire safety systems, ignition detection, storage and stockpiling controls etc. Together these combined conrols are an effective methods to best manage fire risk and are used by most Australian Standards dealing with the storage and handling of flammable and combustible material. However, FSWF deals with each major

control method in isolation and appears not to consider the fire risk reduction when they are combined. This is a major issue with FSWF and discussed further in the document.

R2 ASBG Recommends the FSWF acknowledges that prescriptive criteria are default values, where most are considered in isolation from other controls, but should only be used as a maximum backstop when no fire study is undertaken or no other controls are undertaken.

2.1.3 Application – One Size Fits All?

Application of FSWF applies to any waste facility in NSW involved *in the storage, processing, resource recovery and land application of combustible waste material.* This is a one size fits all approach that focuses on the higher fire risk types of waste facilities.

There are large differences in the fire risk between different recycling and waste management operations. Waste facilities should be broken down into it industry sub-groups including:

- Landfills → putrescible and non-putrescible
- Transfer stations
- CRC Recycling → where household hazardous waste is collected and sorted and properly stored
- Paper recycling → Industry specific design requirements should be separate from this document as this sector has a good fire safety records
- Plastic recycling
- IT recycling
- Metal recycling → Ferrous and non ferrous
- Energy from Waste facilities
- Green waste and wood processing
- Food waste processing
- Composting
- MRFs
- Oil recycling
- Hazardous waste treatment and processing → Covered under other Dangerous Goods fire controls including AS 1940 etc.

FSWF discusses the Special hazards associated with waste facilities that store combustible material. Again these special hazards vary considerably to the subset type of waste facility as listed above. There are many reasons why the fire risk has increased at certain waste facilities such as new ignition source contamination (e.g. Li-ion batteries), negatively valued product, arson, avoidance of disposal fees.

Significant variation occurs between waste facility type, so again a one size fits all approach is a very blunt method, which should only be used where no effective fire study has been undertaken.

R3 ASBG Recommends the FSWF acknowledges there are considerable differences between recycling sectors and in waste combustible material largely associated with each. This promotes the case-by-case fire study approach, based on the risks of each subsector, rather than the use of default generic criteria.

2.1.4 Application to Existing Waste Facilities

Application of the FSWF requirements to existing operating waste facilities again requires clarification. In the scope section (a) it discusses *planning, design, assessment and operation of the facility.* This along with other similar vague reference will be interpreted by Councils, EPA and other agencies as need to be applied to existing sites.

ASBG expects like the UK WISH documents that existing facilities may require to undertake a fire study, but they will not be required to uptake all the requirements under the FSWF.

Most existing waste facilities storing combustible materials does not have the land area in which to comply with the prescriptive default requirements of the FSWF. Enforcement will simply close many sites, which should not the intent of the document. Additionally, application to existing sites breaches the common law provision on the presumption against retrospective legislation. Consequently, affected waste facilities should not be subject to the FSWF without appropriate forewarning and reasonable time period to review their fire safety requirements. To do otherwise can be considered a retrospective application. As the FSWF is a policy document, it should not be made retrospective. As a consequence, the FSWF should only apply to proposes sites and then only during the development process. This is also discussed in section 3.1.2 of this submission.

Application of even parts of the FSWF could be challenged as retrospective. So to improve the fire safety at existing sites it would appear that either a new document is required or that a reasonable set of desirable improvements are provided along with a reasonable time frame in which to comply.

As a consequence, a fire study required on an existing site would need to take into consideration the area and location of the site when considering the types of control methods, which can be reasonably installed. Use of the terms reasonably and economically feasible would need to be included into such new policy documentation.

Finally, ASBG member often are subject to new rules being retrospectively applied. While there are legal processes for this, many times these are imposed, usually by other agencies interpreting such documents, without such parliamentary backing. To prevent the misuse of FSWFs being retrospectively applied, it must clearly state it's to be only applied at the planning approval stage of an affected waste facilities. Application to existing facilities should be subject to additional public consultation processes and if required a new policy developed.

R4 ASBG Recommends the FSWF carefully reconsider how it will apply to existing sites, potentially developing a risk-based approach developed in consultation with the waste sector.

2.1.5 What is Combustible Waste Material?

All flammable and combustible liquids Australian Standards for storage and handling of dangerous goods contain a detailed laboratory test method to assess such properties. The list in FSWF is vague and unscientific — '*any solid waste material that can ignite and burn*… and *(e) any other waste material which may pose a fire risk…'*

There is a considerable difference between combustible solid and flammable and combustible liquids under the Australian Dangerous Goods Code 7.6ed. Fire risk of a flammable (solid, liquid or gas) and a combustible liquid is based on its ease of ignition. Flammable and combustible liquids use the flash point test method. Flammable solids uses a laboratory test method outlined in section 2.4.2.2.1 Definitions and properties. The closest Dangerous Good classification class to combustible waste is 4.2 Flammable Solid – Spontaneously combustible, though Class 4.1 could apply. Nevertheless, the combustible waste material referred to in FSWF falls far short of the Dangerous Goods classifications.

Use of Standard HRR and High HRR, may make it simple for fire-fighting issues, but over simplifies the risks of a large variety of combustible waste materials used across the waste sectors. Also it only considers the fire risk during combustion and not the ease of ignition, which is the focus of Dangerous Goods risk management for fire.

R5 ASBG Recommends the FSWF clearly specifies when a waste material is considered a combustible waste material or not using scientific measurement approaches and it also consider the large variations in the fire risks of different combustible waste materials.

2.1.6 Sources of Waste Ignition

The issue then becomes if combustible waste material has become a recent high risk storage issue why recently? Changes to the domestic waste composition and the market forces in the waste sector are the main culprits including:

- Disposal of Li-ion batteries are identified by the waste sector as a major risk as one cell can caused a significant ignition source. Also Li-ion batteries, within goods or alone were recently listed as a dangerous good with UN Nos. 3090, 3091, 3480 or 3481.
- Aerosol cans are commonly disposed of in domestic and commercial waste and recycling streams. Aerosols are Dangerous Goods class 2.1 flammable gas, charged with LPG. Puncturing of cans in waste management equipment releases LPG which can be easily ignited.

Contamination of recycling bins is increasing as the cost of waste disposal increases. As a consequence, many use recycling bins as an alternative waste disposal method. Given there are no penalties applied for the addition of illegal wastes including flammable dangerous goods even asbestos in recycling there is little incentive for generators of waste to properly arrange for the separation and more costly, in time and or money. in contrast the fine for littering of a cigarette butt is $200 in NSW, but at worst contaminating your recycling bin may cause it not be emptied. Even if it caused a fire in the recycling truck there is no environmental fine applying to such high risk behaviour for residents.

Risk associated with these ignition sources is greatest at the unloading of the vehicles at the waste facility. At the tipping point there are many proprietary[1] and in-house developed ignition detection and extinguishing processes available. Punchering of containers in a mixed waste stream (e.g a Li-ion battery would catch on fire) is where the fire risk is the highest due to this ignition source. The further the waste progresses through a waste processing or disposal operation generally the lower the fire risk. This common risk profile is not considered in FSWF, but would be picked up in a fire study for such a site.

Market forces also play a role, as the cost of disposal increases and the demand from both the customers and government agencies require a higher quality and standards, margins are squeezed. Additionally market fluctuations can make a stockpile worth a few million dollars to be a multi-million dollar liability in less than a few days.

For example a criminal waste operator deliberately gain fire approvals, then quickly after stacked the warehouse with highly flammable wastes and deliberated burned the waste[2] to avoid paying the high cost of waste treatment and disposal. There is little that anyone can do to prevent such outcomes if there is criminal intent to by-pass safety systems, controls and government oversight. Using these types of fires as a basis for forming fire standards is a flawed approach as they

R6 ASBG Recommends the NSW Government implement improved education, regulation and controls on generators of waste, including households to reduce the risks of contamination by ignition sources of collected waste streams for recycling and disposal.

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1 See for example Do Not Let the Ignition Source Take the Initiative http://global-recycling.info/archives/824

2 Tottenham Victoria, 30 August 2018 one of the worst industrial fires occurred since the Coode Island fire in 1991

3 COMMENTS ON CHAPTER 7

3.1 Overview

Chapter 7 FSWF deals with the development considerations, largely at the planning level, but also includes existing facilities. This section also calls up the UK WISH document *Reducing fire risk at waste management sites.* However, FSWF document is far less flexible and reasonable, tending to mandate criteria, which is simple and easy to enforce, but very blunt, costly and in many cases is unnecessary to achieve reasonable levels of fire risk and is unfair as it does not apply to most other industry sectors.

As in section 2 of this submission certain sections of the FSWF are considered and commented on with recommendations being made where appropriate.

3.1.1 Separation Distances

7.1.5 The maximum sizes and minimum separations of all stockpiles of combustible waste material are to comply with section 8.3 and be detailed in an operations plan that is prepared for the waste facility (refer to section 8.7). The operations plan should be made a condition of consent by the relevant authority.

ASBG addresses the issues with separation distances in section 4.1.4, but the key issues include:

- While listed by WISH, these are guidelines values and should be only a default value used where no fire study has been undertaken and no other control measures implemented
- Assumes all combustible waste is at least a Class 4.2 Flammable Solid Spontaneously Combustible, which is very conservative
- In consistent with other AS on Dangerous Goods:
  - Does not consider or make provision for fire walls
  - Does not consider or make provision for other control methods
- Use of Standard and High HRR rating is again only a default setting and considered too simple due to large variations in fuel load, fire intensity and temperature of different waste types and ignores ignition risk.

R7 ASBG Recommends the FSWF remove the mandatory requirement to use the separation distances in section 8.3, referring to them as default distances only to be used when no fire study has been conducted or no other controls have been undertaken.

3.1.2 Existing Facilities

7.2.1 The owner or PCBU should undertake an assessment of the design and performance of their existing waste facility against the requirements specified within this guideline and provide to the relevant consent or regulatory authority for determination.

Application to existing sites to the requirements of these guidelines is clearly retrospective and suggests the default provisions are mandatory. Most existing affected waste facilities cannot comply due to lack of land and extremely high costs especially for:

- Separation
- Fire water capture
- Dedicated quarantined spread areas

Recently the recycler SKM in Victoria had its operating licence to accept recyclates, mainly paper and plastics, suspended because it did not meet the Victorian Waste Management Plan (VWMP). The VWMP calls up the Management and Storage of Combustible Recyclable and Waste Materials – Guideline, which is the Victorian equivalent to the NSW FSWF document. While there are fire issues at SKM, the issue here is that already since the October 2018 Guideline document was introduced it has been enforced on an existing facility. There is no doubt other NSW regulators, especially the NSW EPA will enforce FSWF. Consequently, further detailed consideration of how the FSWF document will apply to existing facilities is required. This should be similar to how fire controls are upgraded on older buildings when fire standards for new buildings change. Use of grandfathering, reasonable and practicable control measures should be applied as many existing sites, simply will not have the land area and or be subject to unreasonable capital cost expenses.

Compliance with NSW's Better Regulations conditions requires the application of FSWF be outcome based. Feasible and reasonable upgrades to existing facilities should be the basis for this approach. Expecting all affected waste facilities to be upgraded is inconsistent with a risk-based approach. Here the NSW Government needs to develop a risk assessment process, developed with public consultation, which identifies fire risks of waste facilities based on a clear set of criteria including facility types, combustible waste materials used, process methods, history and existing fire controls.

3.1.3 Orders to Upgrade

7.2.2 If the assessment determines that an upgrade is required to address a deficiency in the design or performance, the relevant authority should impose an appropriate condition (e.g. licensing) or direction (e.g. issue an Order) on the owner.

Such orders may render such sites unviable due to high cost and or insurance rates will either not be able to be obtained or excessively costly. Sites with large stores of wastes will become subject to clean up notices, but may then not be able to afford the waste disposal costs. This can increase the risk of arson. This can increase the risk of becoming an orphan contaminated site. Consequently, EPA, Fire and Rescue and SafeWork NSW need to coordinate activities to avoid such outcomes if orders are issued.

R8 ASBG Recommends for existing facilities re-write section 7.2 to:

- ***Remove the retrospective application of all of the mandatory requirements it contains.***
- ***Develop, with stakeholder involvement, a publically available risk assessment process be used to identify existing sites that require a fire study.***
- ***Identify which agencies apart from Fire and Rescue can also apply this risk assessment.***
- ***Be based on a principle of reasonable and feasible fire control methods similar to that used in the compliance of buildings for fire controls.***

3.1.4 Emergency Vehicle Access

7.3.3 Enhanced emergency vehicle access is to be provided for the special hazards of the facility, including a perimeter ring road around buildings and access roads between external storage stockpiles.

This may not be possible for existing sites. This is a prescriptive requirement and should be put in a performance based requirement which can consider a range of approaches.

7.3.4 The facility should cater for a large emergency service response (e.g. multiple alarm and multiple agency) if the potential hazard may result in a large emergency.
***Note:** This includes from any pollution event requiring a protracted hazardous materials response (e.g. contain and remove fire water run-off).*

The scale of the emergency can be determined by an appropriate fire study. The outcomes of this study can determine the likely needed response scale and design accordingly.

3.1.5 Quarantine Area

7.3.5 A dedicated external quarantine area is to be provided to extinguish the largest sized internal stockpile of combustible waste material stored within any building.
***Note:** A very large surface area will be required to receive, breakdown and extinguish a large stockpile.*

To make a dedicated very large surface area for such indoor sites is only achievable where there is ample land on which to make available. This may apply to landfill sites which have recycling facilities at the same site, but not achievable at many other recycling sites.

Most transfer stations, Material Recycling Facilities (MRF) and other recycling facilities operate in-doors in urban areas. In many cases the building takes up the entire block of land. This provision will not be applied to such existing sites.

In addition, new transfer stations and MRFs in particular for traffic and energy efficiency reasons need to be located in urban areas, which are limited in land availability.

R9 ASBG Recommends the FSWF recognise that while quarantine areas are desirable from a fire-fighting perspective, they may not be feasible for most existing sites and also for some new urban waste facilities.

3.1.6 Smoke Control

7.7.3 Natural low-level venting, either permanent or readily openable, is to be provided on not less than two opposing walls so that de-stratified (i.e. cooled) obscuring smoke can be vented and minimum visibility be maintained

This is likely to conflict with EPA requirements to control odour and dust from indoor waste facilities. Making a ventilation system which complied with minimising the emission of odour, noise and dust, but permitting smoke ventilation during a fire appears contrary in operation. While engineering solutions are available these will be of high cost. As such the smoke control requirements need to be assessed and balanced with environmental air emissions issues using the principle of reasonable and feasible.

3.1.7 Fire detection and alarm systems

Use of appropriate fire and alarm detection systems requires that a fire study and installation of its recommendations be used. Again there is much confusion within FSWF as to if a fire study plus the mandatory control measures are required together or should be separate actions. Give the highly conservative nature of the prescriptive control measures these should not be mandatory, but as a default alternative to the lack of a proper fire study.

3.1.8 Fire water run-off containment

7.8.1 The waste facility is to have effective and automatic means of containing fire water run-off, with primary containment having a net capacity not less than the total hydraulic discharge of the worst-case scenario.

***Note:** The total hydraulic discharge is the discharge from both the fire hydrant system and automatic fire sprinkler system for a duration of four hours. Failure to contain fire water run-off can result in pollution of the environment and require a protracted hazardous materials response.*

This is again a prescriptive requirement and one which has been tried in the past with poor uptake. After the 1990s fire at Diversey Chemicals in Seven Hills a draft requirement for fire water retention at all dangerous goods storage sites was recommended, but it's application was considered too costly and difficult for many sites to manage and was poorly enforced.

Making a large storage area to capture four hours of fire water creates its own issues:

- To be effective it must remain empty, but will fill with stormwater and requires management of such contaminated waters formed from normal operations.
- Such stormwater requires careful testing and potentially treating before it can be released off site or to sewer.
- EPA's approach is to require placing roofing over the catchment area, but this can lead to fire-fighting difficulties as then the areas will become indoors.

Need for worst case scenario assumes all waste facilities have the same fire risk. AS1940 requires capture of 20 min of fire water, not 4 hours, which is used for steel/structural cooling. This is added to the maximum bund capacity, which for flammable liquid dangerous goods, not solids. Australian standards also list multiple methods for secondary containment. With risk assessment work this can include the use of pits, pumps and other storage systems some distance from the pit. This is considered acceptable if the pit, pump and piping are suitably insulated/protected from fire.

In the UK WISH it recommends[3] the use of a controlled burn as part of the fire-fighting strategy to minimise firewater runoff and fire fighter safety. Fire water is also another aspect to be considered in a fire study of the site, with no mandatory minimum storage volumes cited.

Section 7.8 is overly prescriptive and should be re-written as outcome based or used only as a default example where no fire safety assessment has been performed. It appears as an environmental *ad hoc* addition with little consideration of how such capture volumes with be achieved. Also to minimise the capture of stormwater in such systems adds to the complexity and cost. NSW EPA's common approach to minimising bund waters is to roof the area. In practice this is not reasonable nor feasible, as well being potentially contrary to quarantine areas. Roofing also add complexities to the ability to fight fires, with roofing getting in the way of fire combat methods. Additionally, it will be very costly be applied to most existing sites due to lack of land to install such a large piece of infrastructure, such as underground capture tanks.

R10 ASBG Recommends the FSWF remove the default 4 hour firewater capture requirement, replacing with a fire study where fire water capture is considered.

The UK WISH document calls for consideration of the capture of fire water, but does not make any calls for 4 hours at worst case scenario. A similar approach should be adopted under the FSWF.

[3] UK WISH s 1.7.6 and Chapter 2.9

4 CHAPTER 8 ISSUES FACILITY OPERATION AND MANAGEMENT

There is an assumption that fire risk remains constant throughout a recycling or waste treatment process flow path. This is not the case. A major reason for the common occurrence of fires at waste facilities is because the waste collection process has little control over the contaminant levels in the waste stream. There is virtually no disincentive for a resident to place aerosol cans, containers of flammable liquid (e.g. nail polish remover, hair spray, paint thinners, etc). and ignition sources, such as hydrogen peroxide 30% solution in hair dye, Li-ion and other battery types and is also discussed in section 2.1.6 of this submission.

Placing all the risk management on the receival facility is poor practice, costly and unfair. A lot more could be done to regulate and police up stream contamination to greatly minimise fire and other risks in the recycling sector. Again an improved outcome for all would be achieved if the Guidance for Regulators to Implement Outcomes and Risk-based Regulation was used as a basis for the drafting of the FSWF.

4.1 Stockpiles and Separation

FSWF has been prepared using the most conservative controls assuming the worst case scenario conditions especially on stockpile management and separation distances. This section deals with select sections in FSWF and provides recommendations where appropriate.

4.1.1 Stockpile movement

8.1.2 The storage method and arrangement of stockpiles is to minimises the likelihood of fire spread and provide separation which permits access for fire fighting intervention.

***Note:** Fire separating masonry walls (e.g. bunkers) and automatic fire sprinkler systems may allow larger stockpile sizes and/or shorter separation distances.*

This section should be re-written allowing more flexibly and based on outcomes using the risk-based approach as per the Guidance for Regulators to Implement Outcomes and Risk-based Regulation. While Australian Standards on Dangerous Goods are referred to they are considered generic control methods, which in many cases cannot be complied with due to site limitations or other reasons including costs and practicability. To permit flexibility SafeWork NSW and its Hazardous Chemicals legislation permit variations to the AS DG requirements, provided they provide a similar or better level of risk management.

Prior to 2005, WorkCover NSW required compliance with AS DGs, but were swamped with 5,000 variation applications a year due to site constraints. This old prescriptive approach was replaced with a performance based approach where AS DG are a reference guideline document, but the site occupier has the ability to undertake their own risk assessments and install alternative control systems to achieve a *similar or better level of risk management*. Hence stockpile design and layout for combustible waste materials needs to be assessed on a case-by-case basis with the use of a default model if this is not undertaken.

While the use of fire walls is a common method to permit closer storages of DGs, there are other methods. For example the use of thermal cameras, increased fire suppression systems in higher risk areas etc. However, FSWF does not consider these approaches in its requirements, breaking the flexible approach used by SafeWork NSW.

In fact if the requirements for storage and separation were used for other combustible materials, there would be considerable push back and disquiet. Coal, plastic, wood, furniture, many hardware types, even many Dangerous Goods would be far from compliant under the requirements in FSWF. Overall FSWF represents a major shift in fire control methods, which can set an extremely costly and largely unnecessary

set of tighter controls across most waste industry sectors. Such a scenario could also undermine Australian Standards covering flammable and combustible substances and drive up insurance premiums and the minimum required controls on a large range of industry types.

R11 ASBG Recommends the FSWF promote the use of a fire study allowing for a range of flexible approaches assessed and considered on a case-by-case basis for the management of waste stockpiles. Use of Australian Standards and other standards and methods which achieve a reasonable level of risk management to that required under WHS Regulation be used in principle.

4.1.2 Spontaneously Combustible Wastes

8.2.1 Stockpiles of combustible waste material are to be rotated to dissipate any generated heat and minimise risk of auto-ignition. The maximum duration of idle storage should not exceed six months, unless determined otherwise through risk assessment.

***Note:** Combustible waste material may oxidize and generate heat, which when confined, can cause a material to auto-ignite and combust.*

This section reflects what appears as an overall definition of combustible waste materials: It is erroneous to assume all combustible wastes act the same. While two levels are used (Standards and High HRR) this is considered too simply as there are vast differences in waste combustible material. FSWF uses the worst case scenario combustible waste and applies it across all sites. This is not a risk based approach. Also the worst case scenario seems to treat combustible wastes as if they have the same or similar properties to *Class 4.2 Flammable Solids – Spontaneously Combustible.* This is not the case, as apart from some Hazardous Waste with Dangerous Goods classifications, all other combustible wastes are not classed as DG 4.2.

Placing a maximum storage time will interfere with many recycling processes as the market they supply will require the large volumes very quickly. Requiring a 6 month maximum assumes a smooth material flow through the facilities, which are the exception and not normal market operation.

Section 8.2 overall needs to be applied only to certain types of waste materials which can be subject to spontaneous combustion outcomes, such as composting and paper. General Solid Waste, plastics, textiles, liquids etc do not require such controls.

Requiring the turning over of a stockpile of combustible waste material seems to assume all combustible waste materials must be treated as if it were compost. This is clearly not the case and overly simplifies the issue, assuming the worst case scenario applies for all combustible waste type. This is poor guidance, costly, blunt and from a fire risk perspective unnecessary in many cases. Again the individual fire risks of each type of combustible waste, of which there are many, should be considered based on their properties.

Temperature controls should only apply to combustible wastes that may be subject to self heating and spontaneous combustion. There are many standards and protocols for managing compost and similar waste types. These should be referred to and considered when undertaking a fire risk study or generic standards that apply to that type of process. Such controls should be considered on either a process-by-process basis. Process-by-process basis can, for example, capture standard green waste composting. But the site operator should have the choice of either compliance with this process standard or undertaking a case-by-case risk assessment by a fire risk or equivalent professional.

R12 ASBG Recommends the FSWF omit section 8.2.1 as it is considered too restrictive to the production and processes in the recycling sectors assuming all have compostable or spontaneously combustible waste materials.

4.1.3 Stockpile Size

8.3.3 The maximum internal stockpile size is to be limited to 450 m^3

Again this section assumes that all combustible waste are the same and at the worst case scenario. And again it sets a limit based on virtually no other control methods other than those in section 8. 450 m^3 is also extremely limiting when the density of waste materials are considered, which represents a stockpile of about 20 x 17 x 4 m, as discussed in Table 2 and preceding text.

R13 ASBG Recommends the FSWF omit section 8.3.3 as it is considered too restrictive, assuming all combustible waste material has the same density and fire risks.

4.1.4 Minimum separation distance

8.4.1 Minimum separation distances are to be maintained between external stockpiles, depending on pile method and HRR, as given in Table 1 below:
Note: *If two separation distances apply between different stockpiles (i.e. due to different lengths of stockpiles), the greatest distance is to be used.*

Table 1 – Extract table 8.4.1 from FSWF *Minimum separation between external stockpiles*

Length of Stockpile (m)	Standard HRR		High HRR	
	Loose Pile	**Baled**	**Loose Pile**	**Baled**
10	7	13	15	20
15	9	15	20	24
20	10	17	21	27
30	11	20	26	33
50	13	23	31	40

ASBG compared FSWF separation distances with similar Australian Standards for flammable and combustible liquids (AS 1940:2017) and Flammable Solids AZ/NZS 5025: 2012. Firstly the stockpile lengths were converted to tonnages as shown in Table 2.

The following assumptions were made:

- General household waste has a density of 500 kg/m^3
- Plastic waste at its highest density is 156 kg/m^3 which is similar to medium density paper[4]
- A 20 m wide stockpile was used to provide the maximum tonnages permitted, but stockpiles of 10m wide have the same separation distances under FSWF
- The side bevels were considered

As a result the following table converts the stockpiles into tonnes.

[4] Victorian EPA Waste Material Density Data

Table 2: Tonnes Per Stockpile Length							
Length	Height	Width	Block m^3	Bevel m^3	Total m^3	Total tonnes @ 500 kg/m^3	Total tonnes @ 156 kg/m^3
10	4	20	800	240	560	280	87
15	4	20	1200	280	920	460	144
20	4	20	1600	320	1280	640	200
30	4	20	2400	400	2000	1000	312
50	4	20	4000	560	3440	1720	537

Next a comparison table was used to compare the separation distances to those in the cited Australian Standards. Note AS permits splitting the differences between whole meters of separation to determine distances for in between volumes. AS 1940 uses kL and AS / NZS 5026 uses tonnes in table 2. The spilt differences were also applied to the 8.1 table to obtain comparable levels. Also AS/NZS 5026 requires that quantitative risk assessments be undertaken for quantities exceeding 200 tonnes. Here ASBG extended the separation distances according to a formula based on the provided distances and quantities for DG 4.2.

Table 3: Comparison of AS 1940, AS/NZS 5026 and Fire Safety in Waste Facilities s8.1 Separation distances in meters								
	AS 5026	**AS 1940**			**Fire Safety in Waste Facilities s8.1**			
Quantity tonne/kL	**4.2 PG III**	**PGII**	**C1**	**C2**	**LP S HRR**	**BP S HRR**	**LP H HRR**	**BP H HRR**
120	9	17	7.2^	6.1^	7	**13**	**20**	**24**
200	10	21	9	7	9	**15**	**24**	**31**
440	14.8+	28	12	9.3^	11	**20**	**30**	**38**
600	16.6+	33	14	10.8^	12^	**21.5**^	not acceptable*	not acceptable
760	17.6+	36	15.1^	11.9^	13	**23**	not acceptable	not acceptable

+ Extrapolated from prior separation distances

^ Used split differences to obtain the separation distances, generally rounded up

* Not acceptable is because the maximum stockpile size is 20 x50m and due to the low density of the material is unlikely to exceed 550 tonnes

The minimum separation distances are generally far more conservative than AS 1940: 2017 for C1 combustible liquids C1 and C2s. Also except for Standard HRR loose pile the distances are greater than under AS 5026: 2012 for Dangerous Goods Class 4.2 PG III flammable solids spontaneously combustible.

So why are these separation distances so much greater for combustible waste than for Dangerous Goods Classes 4.2, some Class 3s and C1 and C2 combustible liquids? The source of these separation distances is from the UK WISH document calculated these separation distances using radiative fire transfer models of stockpiles of combustible waste. They make it clear that these only apply to *sites which ONLY have a basic level of fire protection*[5]. This is why the Australian Standard's separation distances are much smaller, for more flammable goods, because there are other fire control systems also assumed to be in place. As a consequence, the separation distances should not be considered in isolation with other fire risk control systems. In fact most the FSWF document's prescriptive criteria are a list of individual control systems considered in isolation and not how they work as a combined set to reduce fire risk. Having one of the prescriptive systems such as separation, fire deluge system etc is enough by its self to manage the

[5] See Appendix 1, S4.1 WISH – Reducing Fire Risk at Waste Management Sites UK 2017

fire risk. Consider that installation of a simple radiation wall, which can be a simple sheet steel, would easily block radiation transition. Also increasing the level moisture in stockpiles can significantly decrease ignition risk. Control methods such as these are not considered in the FSWF.

Overall, the FSWF is oversimplified when it comes to separation distances is poorly reflects its reference material. In contrast, the UK WISH document is a far better document, but it still contains many flaws in comparison to other British and Australian Standards covering the storage and handling of flammable and combustible dangerous goods. These standards contain a rich range of alternative and additional control methods which are not considered in the UK WISH document, making it easy to misinterpret and misuse.

R14 ASBG Recommends the FSWF clarifies the separation distances in s 8.4 are of guidance only where no other control methods are used and that a fire study be preferably used to ascertain appropriate separation distances when considered in combination with other fire control methods.

5 CONCLUSION

Ideally the FSWF with a clear scope of what types of waste facilities, types of combustible waste, threshold volumes it will apply to. Also clarified is how the FSWF is to be used by other regulators. Clear identification by the use of Councils in planning applications will be provided. Also clear are the FSWF contains two options:

- Use default criteria, or
- Use a fire study undertaken by an expert

Given the blunt nature of the default criteria, most affected waste sites will be advised in the FSWF to use a consultant to undertake a fire study for new sites.

Existing affected waste sites will be considered on a risk based approach. This risk based approach will be developed with consultation with the waste sector and provide a reasonable method for the assessment of existing waste facilities based on their risk profile. If a site triggers further risk assessment a number of options will be provided including use of a consultant to undertake a fire study. This fire study will focus on reasonable and feasible fire controls. Existing facilities will not be required to achieve the same risk management as for new facilities, but strive to improve fire control to a reasonable and practical level.

The UK WHISH document will also be used as a major supporting document to improve the flexibility and range of issues which are to be covered in a fire study. There is a caveat with UK WISH's separation distances as they are to be used only when there are only simple fire controls in place and are very conservative and inconsistent with Australian, British and most other design standards dealing with flammable and combustible material storage.