

# FIRE PREVENTION PLAN: A PAPER SECTOR GUIDE



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## 1. INTRODUCTION

This is a guide to producing a Fire Prevention Plan (FPP) for the Paper Sector. It has been produced to assist the Sector in meeting the objectives of the current Environment Agency Fire Prevention Plan Guidance (EA FPP Guidance).

This Sector Guide has been prepared by the Confederation of Paper Industries (CPI) with input and strong support from CPI Members and stakeholders including the Environment Agency (EA), Natural Resources Wales (NRW) and the National Fire Chiefs Council (NFCC), and with reference to the Waste Industry Safety and Health Forum's (WISH) waste fires guidance WISH WASTE 28.

Advice and contributions are also acknowledged and appreciated from the Wood Recyclers' Association (WRA) and the RDF Industry Group. Parts of the RDF Industry Group's FPP Guidance and the WRA FPP Guidance has been reproduced here with their permission.

The Sector Guide is aimed at managers who have responsibility for fire safety, the environment or for managing permitting applications. It offers advice on good practices directed at minimising the outbreak and spread of fire and ensuring the safety of personnel and minimising any environmental impact in the event of fire.

It is applicable to all sites that currently hold a permit which includes handling and storing paper for recycling, and for any other site that may require a permit in the future.

Sites storing paper for recycling (over specified thresholds) must hold an Environmental Permitting Regulations (EPR) permit. This includes storage areas at paper mills (where requirements form part of the overall site EPR permit); stockpiles at multi-purpose sorting sites; and stand-

alone depots. The EPR permit includes a requirement for mitigation measures to prevent fires, and provisions for safe management in the case of a fire. All sites will have a clause requiring a FPP to be approved by the regulator (existing paper mill sites may have this requirement deferred until required to do so by the regulator). Any new permit applications or major variations to a permit, involving paper for recycling, will automatically require a FPP.

The principles in this Sector Guide can also be used to support the preparation of Fire Prevention and Mitigation Plans in Wales and Scotland, but it must be noted that the regulation in terms of standards required, e.g. separation distances, may differ. Please refer to specific guidance produced by the relevant environment regulator.

The Sector Guide offers examples of alternative measures which could be used in FPPs where appropriate.

**Note: The Sector Guide is not a legal requirement and therefore not compulsory to use. It should be considered as a tool to assist you in preparing a FPP which is a regulatory requirement.**

### Fire Prevention Plan Legal Requirements

There is a legal requirement for operators that accept any amount of combustible waste to have in place a FPP, and while the direct references in this document relate specifically to the EA FPP Guidance, the principles and measures for preventing fires are of relevance to all sites, permitted or not.

The EA FPP Guidance (latest version on .GOV website) is a regulatory document and currently in effect.

The EA FPP Guidance sets out a series of measures that should meet the following three objectives:

- Minimise the likelihood of a fire happening.
- Aim for a fire to be extinguished within 4 hours.
- Minimise the spread of fire within the site and to neighbouring sites.

For some sites, applying the prescriptive measures in the EA FPP Guidance maybe difficult to achieve, therefore when developing your FPP, it should be proportionate to the size of the site and complexity of your operation. Not all sites will present the same level of fire risk. The regulator will assess each FPP on a site-by-site basis, based on the nature and scale of the waste management activity and its associated risks. Providing you can demonstrate that the measures and controls you have in place will satisfy the three objectives above, you can propose alternative measures. This Sector Guide provides some examples of alternative measures for consideration.

**Note: Where you may choose to implement alternative measures, you should consider the knock-on implications for any other measures within your plan.**

The Sector Guide does not replace any statutory requirements including the requirement to undertake a suitable and sufficient fire risk assessment under the Regulatory Reform (Fire Safety) Order 2005, Fire (Scotland) Act 2005 or other applicable legislation.

### Regulators

There is a legal requirement under the Regulatory Reform (Fire Safety) Order

2005, Fire (Scotland) Act 2005 and other applicable legislation, for all businesses to undertake a fire risk assessment. All fire risk assessments are open to review for compliance by the Fire and Rescue Service (FRS).

For many recycled paper depots, the local FRS will be responsible for enforcing general fire safety; therefore, you should liaise with them on general fire advice.

Specific regulations and specific risks such as Dangerous Substances and Explosive Atmospheres will fall within the remit of the Health and Safety Executive (HSE) as does fire precautions relating to the process. Environmental risks including fire, are covered by the environment regulator (EA, SEPA and NRW).

Having a fire prevention control measure in agreement with one regulator may not satisfy one or more of the other regulators; therefore, you must ensure that you have covered all aspects of fire management in your assessments and plans.

Your fire risk assessment, as required under the (Fire Safety) Order 2005, whilst being the basis of your FPP, will not satisfy all the requirements needed for an approved FPP.

Although not regulators as such, other interested stakeholders are your insurers. It would be advisable to involve them when developing your FPP.

### Structure of the Sector Guide

This Sector Guide draws on the experience of CPI Members who accept recycled paper and operate permitted sites. Using examples of current good practices, it is structured to follow the EA FPP Guidance and each section begins by outlining what the EA FPP Guidance requires, (in red text) before going on to provide examples of discussion and advice on how recycled paper operators can comply with these requirements and manage their overall fire risk. (See Table 1).

Table 1: How the EA's FPP Guidance sections correlate to sections in this Sector Guide.

EA Fire Prevention Plan Guidance	Paper Sector Fire Prevention Plan Guide	
2. Who this guidance applies to.	1. Introduction	
3. Who this guidance does not apply to.	2. Scope	3-8
4. Types of combustible waste.	3. Material definitions	
1. Fire prevention objectives	4.Environment Agency fire prevention objectives	9
5. Using your fire prevention plan	5. Using your fire prevention plan	11
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7. Manage common causes of fire	10. Managing common causes of fire	19-24
8. Prevent self-combustion	11. Material storage times	25-26
	12. Monitoring and temperature control	27
9. Manage waste piles	13. Material pile management	28-29
10. Where maximum pile sizes do not apply	14. Where maximum pile sizes do not apply	29
11. Prevent fire spreading	15. Prevent fire spreading	30-31
12. Quarantine area	16. Quarantine area	32-33
13. Detecting fires	17. Detecting fires	34
14. Suppressing fires	18. Suppressing fires	34-35
15. Firefighting techniques	19. Firefighting techniques	36-37
16. Water supplies	20. Water supplies	38-39
17. Managing firewater	21. Managing firewater	40
18. During and after an incident	22. Contingency for during and after an incident	41
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## 2. SCOPE

This Sector Guide:

- explains the rationale behind regulatory decisions;
- provides suggestions, hints and tips for developing your FPP;
- poses questions you may want to consider regarding your site; and
- gives examples based on the experience of those working in the recycled paper industry.

It provides advice on what you could do, but **does not tell you what you should do**, as this is dependent upon the context of your own specific site and the arrangements you have in place for collecting, handling, processing and storing material. It is intended to be used in the development of FPPs for the storage and handling of recycled paper and board (although other recycling streams may be required) in relation to the three objectives of the EA FPP Guidance.

This Sector Guide applies to fire risks associated with the storage of combustible wastes. It does not provide detailed guidance on reducing fire risk from production process issues, ancillary facilities on sites such as welfare facilities, offices and similar or specific fire risks such as diesel storage tanks, gas cylinder storage and similar. You should, however, consider these as part of your FPP as they can cause or increase the impact of a fire on site.

It is important to note that the views and policies held by insurers may be different from those expressed in the Sector Guide, and you are advised to consult with your insurer to ensure they are involved in your decision-making process, assessments and plans.

Other materials and substances outside of the scope, but still needing to be considered if they impact on your operations, include:

- other recyclable combustible materials (i.e. plastics, wood)
- dangerous substances stored under COMAH
- Dangerous Substances and Explosive Atmospheres regulations (DSEAR)
- Liquefied Petroleum Gas (LPG)
- landfilling
- biowaste treatment (wet anaerobic digestion)
- biowaste use (land spreading)
- hazardous wastes - excluding waste electrical and electronic equipment (WEEE), but including hazardous waste batteries accepted as a separate waste stream, covered by *Sector Guidance Note 5.06*
- non-waste materials such as gas cylinders, aerosols and combustible liquids, covered by *Guidance for the storage and treatment of aerosol canisters and similar packaged wastes*

Operators need to be aware of the other relevant guidance and standards, and of the need for specific assessments to tailor solutions to their specific situation and operations. Further information on these subjects can be found on the HSE website.

## 3. MATERIAL DEFINITIONS

Paper for Recycling (PFR) is delivered to reprocessing sites either in loose form or in bales. Baled material makes it easier to handle, transport and store. Typically, a bale weighs between 400kg and 1 tonne, is bound with metallic baling wire, and is formed in a high-pressure baling machine. Sometimes bales arrive with nylon string binding. These emanate from lower pressure "shop balers" and are smaller, lighter and much less stable to stack.

The source of PFR impacts the risk from those grades whereby:

- material delivered loose may have been collected from households at the kerbside or from commercial premises and may be delivered directly for reprocessing (paper mill), or recovered paper depot or a sorting facility where typically it will be processed and baled;
- material collected from commercial premises is typically less contaminated

because commercial operations seek to maximise the value of their by-products and know that contamination reduces the market value of material; and

- material collected from households is typically of lower quality because many householders are poorly informed about recycling and many local authority collection systems encourage co-mingling of materials, giving rise to the possibility that paper materials may be contaminated with non-paper components such as plastics, glass, batteries and aerosols.

Material collection is an important factor in developing your FPP, and depending upon your site intake of material, you will need to consider the fire risks associated with each, for example, a discarded lithium battery is more likely to appear in a household collection than from a commercial collection (see Table 2).

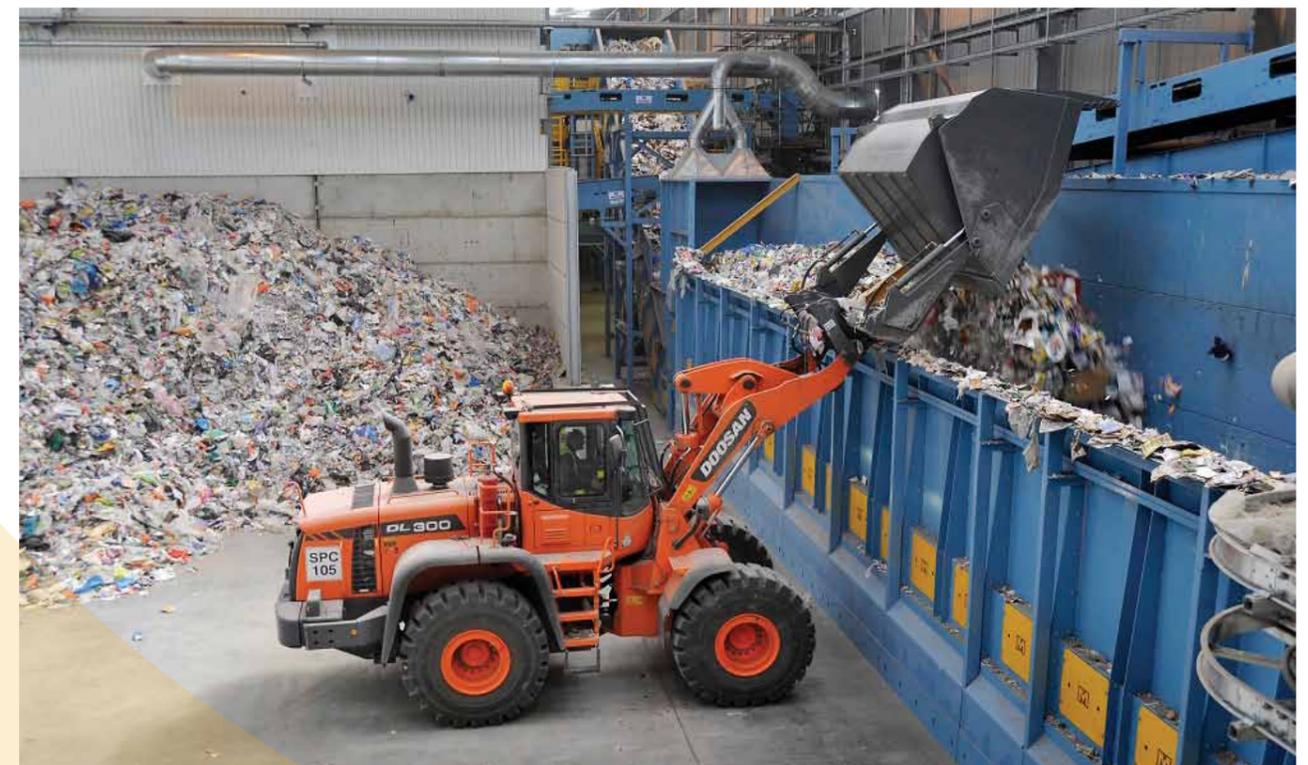


Table 2: Fire Risk Assessment example for baled and loose collection methods

Sourced material	Material quality	Fire risk before control	Examples of controls	Fire risk after control
<b>Baled Material</b> In-house bales - reprocessed broke material generated by the paper mill for recycling	Excellent No contamination Moisture content less than 10%	Low Med →	Acceptance procedure in place Storage <3 months Stored inside Checked and thermal monitored	Low
Commercial bales - collected from businesses / commercial reprocessing premises	Good to very good Minimum contamination Moisture content less than 10%	Low Med →	Acceptance procedure in place. Pre-quality checks (moisture). Reject procedure in operation. Storage time <3 months. Checked and thermal monitored mixed materials e.g. news / graphic / OCC etc.	Low Med →
Bales with high contamination and high moisture content	Poor quality Moisture above 10%	Med High →	Odour and decay can be an indication of mould, rot, high moisture or old age.  If the recovered paper load smells rotten or appears to have the brightness or condition of the material affected by decay, the load is tested for moisture.  A bad stench may also be a indication of prohibited materials or chemicals such as consumer waste of flammable substances.  Recovered paper will be tested visually for unacceptable material. The company reserves the right to downgrade or reject material that does not meet the required quality requirements.	Med Low →
<b>Loose Material</b> Commercial loose material collection	Good Minimum risk of contaminants Moisture content less than 10%	Low Med →	All the above plus: Minimum storage time by either processing material direct e.g. feeding material into the papermaking process or converting loose material into bales.  System in place for separating loose material.	Low Med →
Household loose material collection	Good to poor Risk of contaminants i.e. lithium batteries, oily rags, materials that are easily oxidised, aerosols etc. Moisture content less than 10%	Med High →	All the above plus: Minimum storage time by either processing material direct e.g. feeding material into the papermaking process or converting loose material into bales.  System in place for separating loose material.	Low Med →

## 4. Environment Agency Fire Prevention Plan Objectives

The EA FPP Guidance requires you to develop a FPP which meets the following three objectives:

- **Minimise the likelihood of a fire happening.**
- **Aim for a fire to be extinguished within 4 hours.**
- **Minimise the spread of fire within the site and to neighbouring sites.**

This Sector Guide looks at how you can evaluate your site-specific fire risks to help you develop suitable measures for fire prevention, detection and suppression and accommodate your operational requirements, including storage time and stack size for recycled paper.

**Note: The objective to extinguish a fire within 4 hours is based upon the premise that this is a safe period of time for which people can shelter from a fire before toxicity levels in the air become too high. Where possible measures should be in place to extinguish a fire in less than 4 hours.**

The requirement for a FPP should be viewed as an opportunity to review the fire risks on your site and implement measures (physical and procedural) to minimise the impact in the event of a fire.

The EA does not expect you to protect against every eventuality but to undertake a realistic fire assessment of your site to identify reasonably foreseeable risks. Your FPP should be proportionate to your site risk. When determining risk, you should take into account factors such as:

- waste acceptance criteria
- throughput at your site
- amount of storage at any one time
- operational procedures
- location (e.g. risk of arson)
- waste composition (e.g. risk of self-heating)
- process risks

If you can apply the measures set out in the EA FPP Guidance and meet the three objectives, it is likely your FPP will be approved with minimal update requests



from the EA. However, for many sites there will be aspects of the EA FPP Guidance which cannot be directly adhered to.

Alternative measures can be used providing you can demonstrate the three objectives of the guidance can still be met.

**Note:** You must ensure that you address all sections of the EA FPP Guidance in your plan. If a particular section does not apply to your site or activity, then you must explain why this is not applicable in the details of your plan. For example, if the question asks, 'do you have appropriate suppression systems in your building?', or 'do you have a storage building on site?', do not simply put "not applicable", instead state that you have no storage buildings on site.

If your FPP has incomplete information, this may result in delays in processing your application. It is also advisable to follow the layout of the EA FPP Guidance. If the information is not clearly presented (and the Permitting Office can only go by what they have been given) it can also result in delays. If this is not clear, EA Permitting will issue Schedule 5 notices (maximum of three) for additional information which will delay your application.

Should you wish to include evidence or details in your FPP which are confidential, these can be added as an appendix, and

upon request the EA will omit these details from the published file when the application is made.



## 5. Using Your Fire Prevention Plan

**Your FPP forms part of your management system. It sets out the fire prevention measures and procedures you must put in place and use on your site.**

The measures set out in both the EA FPP Guidance and this Sector Guide are interdependent. Changes to one measure is likely to have an impact on one or more of the other measures. If you propose alternative measures, you must consider this interdependency and ensure that the three objectives in the EA FPP Guidance are met in relation to your site.

In addition, you must demonstrate that your FPP is easily accessible and understood by staff and contractors working on site. Your FPP should be a live document which manages and controls your fire risk and therefore reflects the current situation for your operations and procedures.

It should be a single, standalone document which can be accessed quickly when needed to ensure all information is readily available on request. If the FPP refers to documents

outside of the plan, these must be included in the appendices.

Staff will need to be provided with information, instruction and training on how to prevent fires on site and how to respond if a fire occurs. All training records and tests should be documented within your FPP and Management System. You may be asked to demonstrate that your plan has been tested and is achievable. As a minimum, annual drills / testing of your FPP should be conducted to ensure the plan remains fit for purpose.

It is important that appropriate training is provided to all staff including employees who do not have English as their first language or may be working on short-term or temporary contracts. All staff need to understand the fire prevention and mitigation measures to be used on site and how to react should a fire incident occur.



## 6. Activities on your Site

*The EA FPP Guidance requires you to provide details of the activities that take place on your site. This includes: material tipping, sorting, processing and collection, as well as operational activities such as vehicle maintenance.*

The risk of a fire breaking out in a particular place and spreading rapidly will depend largely, but not exclusively, on the following:

- process activities such as material in baled / loose, collection methods commercial / kerbside etc.
- site activities such as hot work, vehicle movement, smoking, etc.
- site location and site layout
- site security
- material contamination
- storage time
- fire suppression systems available
- weather conditions
- housekeeping standards
- training of employees
- contractor control

Operators in the sector should therefore ensure they have adequate controls in place to manage the risks identified to prevent fires and, should a fire occur, that the risks to human life, health and the environment are minimised.

You should provide a description of the activities that occur on site and explain where they take place. It is also worth clearly setting out in a table or a flow diagram:

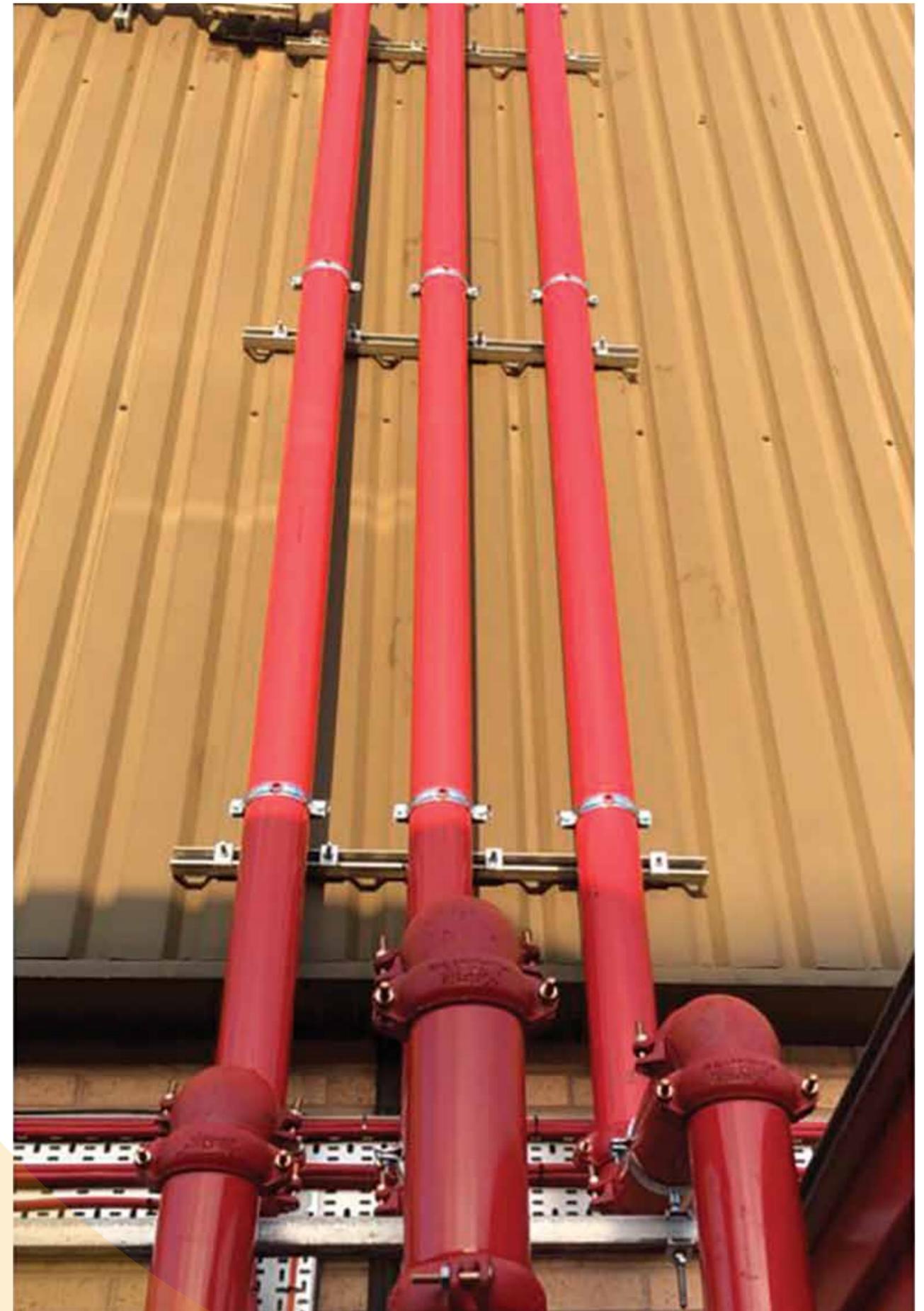
- what combustible materials are accepted on site;

- your storage and handling operations (including your material acceptance procedures);
- how much is received each day and each year;
- how much is stored at any one time;
- what form the material is in e.g. baled or loose;
- is material stored to move on, or stored for processing;
- how the material will be processed on site; and
- how you store / process any other materials other than recovered paper.

**You will need to fill in the details as relevant to your particular operation and you could do it for the whole site or for each material stream. Be specific about your mixed material acceptance procedures.**

If you have an existing environmental permit, give its reference number and maximum storage and throughput limits.

Throughput is generally high and consistent, especially within the papermaking process, which keeps storage time to a minimum. Where there is seasonal variation or market demand which impacts the material flow coming in and going out, this needs to be taken into account. Your FPP should detail how stock streams are managed, controlled and storage time minimised.





See Table 3 for an example of how you could record this information.

If your site experiences seasonal fluctuations in the volumes of material stored, it would be beneficial to illustrate the flow of material by month. This will allow the EA to see the expected peak times and the anticipated volume of material to be stored during this

period. Undertaking this exercise will also allow you to consider additional measures you may need to implement to mitigate the additional fire risk during periods of high material storage volumes (e.g. additional pile monitoring, sheltering materials from direct heat).

**Table 3: Typical example material storage profile**

	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
<b>Material In</b>	5000	4500	4600	4300	4000	4500	5000	4600	5000	500	5400	5000
<b>Material Out</b>	5500	4700	4300	4400	4200	4500	4800	4500	4900	5000	5000	5600
<b>Stock on site</b>	<b>500</b>	<b>300</b>	<b>600</b>	<b>500</b>	<b>300</b>	<b>300</b>	<b>500</b>	<b>600</b>	<b>700</b>	<b>1200</b>	<b>1600</b>	<b>1000</b>

Consideration should be given to the collection of mixed recycled paper materials, which can lead to contamination and

potentially an increasing fire risk. Your FPP plan should detail material acceptance procedures.

### Typical Grades of Paper and Board for Recycling (PfR)

Grades of recycled paper and board suitable for recycling and commonly traded are defined in BS EN643:2014 Paper and board - European list of standard grades of paper and board for recycling, which describes approximately 95 different grades of PfR.

This grade list is widely used in Europe and Internationally to describe the type of material being traded between the buyer and seller. A broad grade description is as follows:

**Table 4: Typical grades of paper**

Grade One	Ordinary Grades	Including grades of paper often suitable for use in packaging or graphics
Grade Two	Medium Grades	Including materials suitable for inclusion in newsprint and magazine papers
Grade Three	High Grades	Including materials suitable for use in graphical or tissue papers, sometimes as a pulp substitute
Grade Four	Kraft Grades	Usually off cuts of virgin (kraft) material
Grade Five	Special Grades	Often used by paper mills requiring particular fibre characteristics or with specialist reprocessing capability

**Note: These grades should not be confused with EWC codes which are required when transporting waste material either within Europe or Internationally. These codes will also need to be specified in your permit as grades you are permitted to accept.**

### EWC Codes

Any controlled waste that is collected in the UK must, under the producer's Duty of Care, be covered by a Waste Transfer Note. One requirement of this document is to describe the waste under a European Waste Catalogue (EWC) code. This is a list produced by the EU to standardise the description of waste across Europe and to

enable waste to be recorded, monitored and controlled effectively. Each delivered consignment should be covered by a Waste Transfer Note containing the EWC Codes specified in your permit as permitted wastes for acceptance. This material may then be further defined under the EN643 grade list.

## 7. Material Acceptance Procedure

Irrespective of where you source your material, all material should be considered as a potential fire hazard and on that basis, taking into account the size and complexity of your operation, the same principles of control need to be applied. **You should ensure you have a material acceptance procedure to prevent unauthorised material being accepted.**

Your material acceptance procedure should also include fire checks as the material is deposited. These checks can either be made visually or through the use of thermal scanners. The procedure should also acknowledge the limitations of these methods to see into the pile and how this will be mitigated (e.g. using further visual or thermal checks as the material is moved into the pile and / or regularly turned).

Of course, no matter how good your material acceptance procedure is, you can't guarantee 100% compliance, 100% of the time, therefore, you should also have in place an internal procedure, detailing the steps to be followed if:

- a hot load is deposited; or
- a load contains contamination which may provide an ignition source.

Your material acceptance procedure should consider where the material comes from and therefore its composition and what ignition or fire risks this poses. You should also consider engaging with the source provider of the materials to minimise the risk of contamination.

You should have clear policies, guidance and training programmes, where employees are instructed to be vigilant and look out for fires, hot loads, hazardous materials (e.g. gas cylinders, batteries or containers of flammable liquids, which can

subsequently cause a fire), smoke and signs of smouldering. Policies, guidance and training should also cover action to take if any of the above are spotted. Examples of actions include the use of heavy mobile plant to move suspect loads to a designated quarantine area (see section 16 of this Guide), dousing suspect loads with water from a fire hose etc.).

If taking in loose paper, consider instructing your mobile plant operators to spread material out upon receipt of a load to make identification of smoulders and hazardous items easier. Consider provision of an 'emergency / quarantine area' for suspect loads.

If you do discover a hot load, your first action should be to isolate the material and extinguish the load in a controlled area.

Loads containing hazardous materials or rogue contaminants will still need to be isolated pending rejection as per your acceptance procedure.

In all cases you should attempt to trace this back to the customer and take appropriate action to reduce the risk of reoccurrence. You should also check your environmental permit / licence conditions, as you may need to report such loads to your environmental regulator.

If you do store hazardous materials on site, you need to ensure they are properly contained (in a locked cage or sealed container) and you are aware of where they are stored. During a fire incident, if you store combustible materials on site but cannot demonstrate to the fire service that you know where they are and that they are stored correctly, then (if there is no risk to life) they are likely to choose to take a defensive stance rather than attacking the fire. This

is due to the life risk hazardous materials can cause to fire fighters. In this instance the fire is likely to spread and cause more damage to your site and the neighbouring environment.

To allow the local fire service to develop a more informed approach to tackling an incident on site, it is advised that you engage

with the fire service when developing your FPP to discuss the risks and hazards associated with your site and operation. If required, following this engagement, the fire service can record site specific information on their internal systems which could inform their firefighting tactics on the site and help with early resolution of an incident.

## 8. Site Plans and Maps

***The EA FPP Guidance requires you to include scaled site plans. A full list of what should be included is in the latest EA FPP Guidance.***

The purpose of providing site plans and maps is to assist EA Officers and fire fighters attending the site during an incident to familiarise themselves with the surroundings and understand the different risks around the site. This information is likely to be used to inform the firefighting approach to a fire incident on site.

***Note: Firefighting under powerlines can cause problems especially where you have an extremely carbonaceous fuel producing black smoke as the electricity can discharge through the smoke plume to earth. Ideally you wouldn't want to have large stacks positioned under powerlines.***

It is recommended that if you do have powerlines on site, minimum clearance heights and distances are maintained to minimise the risk of a fire on site. These distances should be confirmed with the National Grid.

Your maps can be presented as one detailed 'emergency plan' or a series of plans which are clearly labelled to show what information they include. If you have buildings on your site, you must also include an internal layout of these facilities.

## 9. Sensitive Receptors

*The EA FPP Guidance requires you to produce a map showing all sensitive receptors within a 1km radius of your site that could be affected by a fire. A full list of types of sensitive receptors is available in the EA FPP Guidance.*

The purpose of the sensitive receptor map is to identify potential sensitive receptors to your site and how vulnerable they are to the impacts of a site fire. It should look at the following receptors (see EA FPP Guidance for full list):

- social (housing, schools, hospitals, places of worship, etc.)
- economic (workplaces, industrial areas, shops, etc.)
- environmental (rivers, woodlands, boreholes, etc.)

In the first instance, your local EA Officer may be able to advise you on how to obtain a plan that can help identify sensitive receptors that may be affected by a fire at your site. However, the responsibility to identify all sensitive receptors on your plan remains with you. You may find google maps or interactive maps such as Natural England's "Magic" useful in assisting with identification of sensitive receptors in your area.

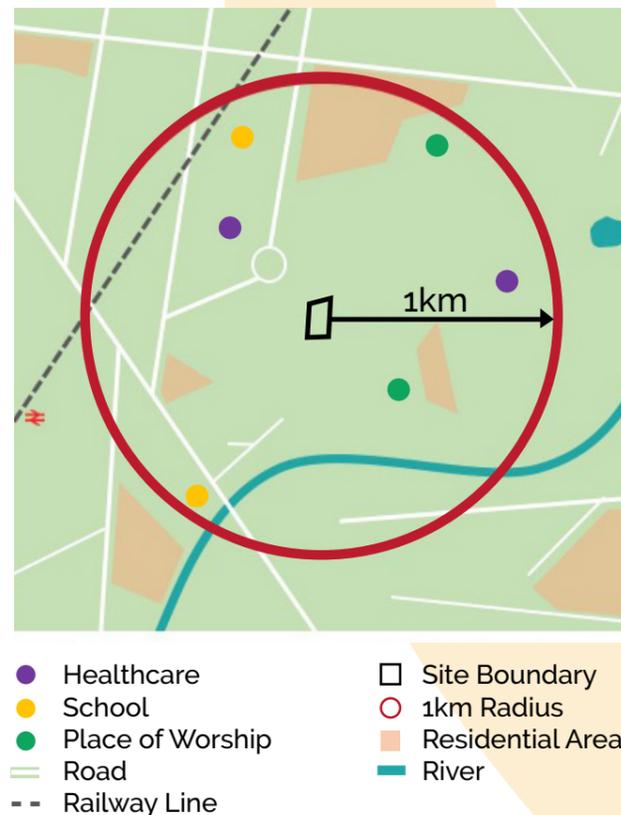
**Note:** It is valuable to have identified which receptors are higher risk and the measures which could be used to communicate with each receptor, e.g. if you share a boundary with a site dependent on air conditioning units, it will be important for you to notify these sites as soon as a fire starts on your site, so they are able to shut off the fans to prevent any damage to their equipment or a reduction in air quality inside their buildings.

A review of sensitive receptors identified should be undertaken, assessing the likelihood of them being impacted, taking into account the prevailing wind direction.

Undertaking a mapping exercise is one way you could identify sensitive receptors within 1km.

Once you know who your sensitive receptors are you should consider their proximity to your site and the action you will need to take if a fire breaks out. For example, if your site is located near to a railway line, in the event of a fire the line may need to be temporarily closed due to reduced visibility. If you're able to present this information to the fire service on arrival at the site, they can take the appropriate steps to communicate with the appropriate stakeholder.

Figure 1: Example of a Sensitive Receptor Map



Source: RDF Industry Group Residual Waste FPP Guidance

## 10. Managing Common Causes of Fire

*The EA FPP Guidance requires you to understand the common causes of fire and the measures you can take to reduce the risk of a site fire occurring.*

The easiest way to address this section of the Guidance is to use a table. Table 5 below outlines the common causes of fire specified by the EA (such as arson, self-heating, contamination, electrical faults, etc.) and additional guidance on the information that you should look to provide in your FPP. If you do not have a risk present on site, (e.g. you

do not undertake any hot work), you should clearly state 'hot work' is not undertaken on site'.

As well as the list identified by the EA, it is also important that you consider additional potential ignition sources which are specific to your site.

A good place to start is to take each of your site activities in turn and assess the risks they present and the control measures / procedures you have in place to mitigate against these risks.

Table 5: Potential Ignition Sources, Risks and Control Measures

Potential Ignition Source	Risk on Site	Control Measures / Procedures
Arson	<p>Combustible materials stored on site are potentially at risk from arson.</p> <p>It is possible that the site could be broken into outside of operational hours and an act of vandalism causing an ignition source or an act of arson committed.</p>	<p>What security fencing do you have installed around the site perimeter? Do you have procedures in place to regularly check the fence integrity and repair it if damaged?</p> <p>Do you have CCTV on site, can you provide the specification, what areas of the site does it cover and what are its operational hours? If something is detected on the CCTV out of hours what procedures need to be followed?</p> <p>When the site is closed, is there any security in place? Do security guards on site have a duty task list which includes undertaking fire checks? Are there any measures in place to check these are taking place (e.g. security tag systems)?</p> <p>What close down procedures do you have at the end of each working day, including checking the site is secure and a fire watch is undertaken?</p> <p>Do you have intruder alarms on site? If so, do you have the specification of the system? If the system triggers what procedures are followed?</p>

Potential Ignition Source	Risk on Site	Control Measures / Procedures
Plant and Equipment Failure	A fault or electrical failure on site or on equipment could provide an ignition source.	<p>Where applicable is all plant on site fitted with fire extinguishers? Are portable fire extinguishers located throughout the site? If so, can you describe or show where these are on a plan?</p> <p>Has any of your purchased or hired plant got an integrated suppression system? Are there any early detection systems installed on plant or around the site?</p> <p>What are the servicing arrangements for your plant and equipment? Do you conform to the manufacturer's instructions or do you have your own programme? If you hire plant what are the maintenance arrangements?</p> <p>Do you undertake daily checks to make sure there is no material trapped within the equipment or plant that could cause a fault? If trapped material or a build-up of dust / material is identified what are the clean down processes followed (e.g. wetting or clearing build-up of dust / material)?</p> <p>Do you have daily procedures to check for plant and equipment defaults? What action do you take if a fault is identified (again specify if this is different for owned and hired plant)?</p> <p>What evidence of your procedures taking place do you keep? Service receipts, hire agreements or fault logs for example.</p>
Deposited Hot Loads	Hot work undertaken on site could provide an ignition source due to sparks or residual heat in the material being treated.	<p>Do your material acceptance procedures include checking for hot loads? Do staff undertake additional visual checks for fire, hot loads, smoke and signs of smoulder in the material piles throughout the day?</p> <p>What action do staff take if a hot load is identified? Do they isolate the material within the pile or move the material to the quarantine area? How long do they monitor the hot load for? What do they do if the pile ignites?</p>
Reaction Between Materials	A reaction between incompatible or unstable material could provide an ignition source.	<p>What action do you take to prevent a reaction between materials within the same material pile?</p> <p>Do you store materials as single streams?</p> <p>What procedures do your staff follow if contamination is identified within a load or material pile, for example is the contamination removed to a quarantine bay for separate disposal?</p>

Potential Ignition Source	Risk on Site	Control Measures / Procedures
Mobile Equipment	<p>Material build up around hot parts of mobile equipment.</p> <p>Friction from mobile plant buckets, forks etc on the ground causing an ignition source.</p>	<p>Most sites use heavy mobile plant, such as loading shovels, grabs and telescopic handlers, used primarily for moving material, much of which may be combustible. Mobile plant can pose ignition risks to the material they come into contact with:</p> <p>Hot exhausts and engine parts can ignite materials trapped near them. You should instruct plant operators of this risk and ensure that materials are cleared from around exhausts and other hot parts at the end of each shift.</p> <p>Mobile plant should be fitted with fire extinguishers, and you may wish to fit automatic fire extinguishing equipment under plant engine bonnets and other high-risk areas (your insurer may insist on this and you would be wise to check).</p> <p>You should ensure that mobile plant is well maintained to a specified schedule, in particular electrical systems which may be a source of fires.</p> <p><b>Note: Maintenance schedules specified by suppliers may not be adequate for recycled material management use and you should consider whether you need to put in place more frequent maintenance.</b></p> <p>Mobile plant should be parked after use away from material stacks and other places where materials may be present.</p> <p>Do you store mobile plant over six metres from combustible material when not in use? If this is not possible, consider alternative measures such as introducing plant / equipment shut-down procedures to reduce the risk of material ignition.</p> <p>Mobile plant shovels, blades and exposed wires on bales may produce sparks such as when scraped along a concrete or metal surface / wall. You should consider this during your assessment.</p> <p>Providing operators are trained and competent, and the vehicle is suitable for the task, (enclosed cabs, fire and heat protected hydraulic systems) heavy mobile equipment may also be useful in tackling fires, such as:</p> <ul style="list-style-type: none"> <li>• Spreading materials out so that fire can be easily tackled.</li> <li>• Removing materials which are not on fire away from the location of a fire to prevent fire spreading.</li> <li>• Pushing soil or other inert material over a fire to starve it of oxygen.</li> </ul> <p>For high-risk areas and materials, you may even want to consider precautions such as specialist coatings for mobile plant shovels and blades to limit or prevent the generation of sparks.</p>

Potential Ignition Source	Risk on Site	Control Measures / Procedures
Electrical Faults	Electrical equipment, such as heaters and lighting, located on site could cause an ignition source.	<p>Is electrical equipment stored at least six metres away from combustible material? If electrical equipment is stored within six metres of combustible material, consider alternative measures such as switching it off when no staff are present.</p> <p>Are procedures in place to make sure the last person leaving an area checks all electrical equipment is off before exiting the area?</p> <p>Is electrical equipment regularly tested by a competent person?</p> <p>What maintenance procedures are in place? Do you have copies of testing certificates or maintenance reports?</p>
Discarded Smoking Materials	Combustible materials could be ignited through discarded cigarettes or other smoking material.	<p>Discarded smoking materials are a major ignition source, and you should apply a no smoking policy or ensure a suitable designated smoking area is provided. Any smoking area should be positioned away from the storage of any combustible material streams or material operations. All smoking materials should be safely disposed of in a suitable, sealed container.</p> <p>Have you ensured that all contractors and non-employees are familiar with the site rules for smoking?</p> <p>Where appropriate have you translated this information into other languages?</p>
Hot Work	Hot work undertaken on site could provide an ignition source due to sparks or residual heat in the material being treated.	<p>Do you undertake hot work on site? If yes, do you have procedures in place to ensure activities take place at least six metres away from any combustible materials? Do your procedures include the provision for a fire watch for at least an hour after hot work has been undertaken?</p> <p>If you are not able to undertake hot work more than six metres away from combustible material, what alternative measures could you use?</p> <p>Could you place a fire blanket over the material within six metres to reduce the risk of material ignition? Is it possible to relocate the combustible material until the hot work is complete?</p> <p>Do you implement a hot work permit which covers all pre and post work measures and controls? Is there a system in place for monitoring compliance with the permit?</p>

Potential Ignition Source	Risk on Site	Control Measures / Procedures
Industrial Heaters	Industrial heaters on site could present an ignition source.	<p>If you use industrial heaters on site, where are they located and how frequently are they used?</p> <p>These should always be located at least six metres away from combustible waste where possible.</p> <p>If industrial heaters are used within six metres of combustible material, you will need to put in place alternative measures to mitigate the fire risk. You could consider using fire blankets over the material, altering the direction of heat flow from the units, staff monitoring etc.</p>
Hot Exhausts	Dust that has settled on exhausts and engine and machinery parts could create an ignition source.	<p>Do you undertake regular visual checks throughout the day to check for dust build up? If staff identify a build-up of dust what action do they then take (e.g. removal of dust, cleaning of equipment)?</p> <p>Could you introduce fire watches throughout the day / before the end of the working shift by a member of staff?</p>
Leaks and Spills of Oil and Fuels	There is the potential for fuel / oil to leak from site vehicles or fuel tanks.	<p>What procedures do you have on site for addressing oil or fuel spills?</p> <p>Where are your spill kits stored on site? If staff identify a spill what action do they then take?</p> <p>If you have fuel or oil tanks on site are these bunded? Do you have procedures in place for regularly checking container integrity and clearing the surrounding storage area?</p>
Build-up of Loose Combustible Material, Dust and Fluff	Build-up of loose combustible material, dust and fluff on site could create an ignition source.	<p>How do you prevent the build-up of loose material, dust and fluff around the site and on plant and electrical equipment? Do you undertake site inspections throughout and at the end of the day? What action is taken if a build-up of material is identified? Who is responsible for making sure the site is clean?</p> <p>Introduce a regular maintenance and cleaning programme for the whole site including around machinery. Levels of dust, loose paper and other combustible materials in buildings should be kept to a minimum.</p> <p>Ensure that flammable materials, such as oils, greases, fuels and paints etc. are always stored correctly and put back into store after use.</p>

Potential Ignition Source	Risk on Site	Control Measures / Procedures
Self-combustion	Chemical reactions within a material pile could lead to self-combustion.	<p>How is your site operated to reduce the risk of material self-combusting? Do you have a high turnover of material? If material is stored on site for more than a few days, do you have pile temperature monitoring and turning procedures in place appropriate to the risk? If you intend to turn piles have you checked there is sufficient space on site for pile turning to take place?</p> <p>What mitigation measures do you have in place if a pile does self-combust? Are you using separation distances or firewalls?</p> <p>State the maximum time that combustible materials will be stored on site (this helps to show your level of risk, the lower the better).</p>

Source: adapted from RDF Industry Group FPP Guidance

## 11. Material Storage Times

*The EA FPP Guidance requires you to specify the maximum storage time for all material on site and the stock rotation procedures in place to demonstrate how you are preventing material from self-combusting.*

This section of your FPP should be used to quantify the risk of material storage on site. If you want to make the case that you are low risk, you need to clearly demonstrate that you have low material storage times, good stock rotation, and measures in place for preventing heating from chemical reactions and contamination. A simple approach to demonstrating risk level is to include a table detailing each material stream, how long it will be stored on site, and how it will be managed whilst on site.

Your site should operate on a first-in, first-out basis. This could be as simple as tipping the newest material at one end of the pile or bay, with the oldest material being moved out from the other end of the pile or bay. However, you will need to include details of how this is managed on site and what evidence is available to demonstrate the procedure is correctly applied.

Some materials can spontaneously combust, and the risk generally increases when materials are stored for prolonged periods. In addition, and in general, the smaller the particle size the higher the risk, although this may not always be the case. Ambient weather conditions, density and other factors can also play a role.

The longer you store baled material on site, the greater the possibility that the integrity of the bale could be compromised, for example, through the introduction of oxygen which increases the likelihood of self-combustion.

*The EA FPP Guidance states that you must not store combustible material for longer than six months.*

Material storage time limits relate to the total storage time from the point of production. You should be informed as to how 'old' the material is when it arrives at your site as it will reduce your storage times (see following note). For example, if the material is directly delivered from source to your site, the storage clock starts on arrival. However, if the material is stored on another site for three weeks prior to arriving at your site, the total amount of time that material can be stored is reduced. You should also consider any additional storage time that is required after the material leaves your site.

If you have any periods of time where the site is not operational but material is still stored, you will need to have procedures in place to make sure the site is still checked, pile storage times are adhered to and, if piles are stored for longer than three months, appropriate monitoring is in place and implemented.

Your FPP must detail how long materials will be stored, taking into account the six month storage period. Details of how you minimise storage on site, including rapid turnover, should be included.

**Note: It is important to understand where your material has come from and how old it is. For example, if you are producing material for export, it may be a week old when it arrives on your site and require dockside storage for two weeks prior to shipping. This would reduce your site storage time. You may also wish to include additional contingency to account for delayed shipments (such as due to bad weather) to prevent exceeding the three or six month storage limits.**

You must use good stock rotation (i.e. you must show how you will follow the 'first-in, first-out' principle) and show you have a clear method to record and manage the storage of all material on site. Include in your plan contingency measures for planned / unplanned down time and alternative storage methods.

Recording systems should be updated frequently to ensure that they reflect current stock levels.

Evidence of material storage duration may include documents on site detailing when material arrives and leaves the site. If you have on site processing, documentation might include notice boards detailing the date the material was stored in each bay / area and when it arrived on site.

If you store material in bays, consider how you would remove the oldest material first, e.g. if it remained after a shipment, would you separate it and make sure it was included in the next shipment, and if so, do you have the space to do this?

You may also wish to consider whether enhanced fire monitoring and suppression / extinguishing systems may allow you to extend recycled paper storage times. But you should seek competent advice before making this decision and be prepared to prove that your thinking is sound and supported by good technical evidence rather than opinion or general experience (previous experience may not be an adequate indicator of future events).

If baled material is likely to exceed the above time limits, you may consider breaking the bales and re-baling them to reduce fire risk.

Likewise, you may want to consider whether the turning of loose stockpiles would reduce the risk of self-heating. Care should be taken when breaking bales or turning loose piles / stockpiles, however, as breaking bales and turning loose stacks may itself cause a fire. Self-heating may be occurring within a stack, but because of the lack of oxygen a fire has not yet occurred. When you open the bale / turn the stack you may introduce sufficient oxygen to the material to initiate a fire.

When breaking bales and turning stacks you should have fire-fighting equipment, such as hoses, at the scene to enable you to deal with a fire more quickly if one occurs (hand-held extinguishers are unlikely to be sufficient). Likewise, you should consider breaking bales away from any combustible wastes, such as in a quarantine area, and, for loose stacks, moving other materials away from the area before turning them.

If you have one on site, the use of a thermal imaging camera when breaking bales or turning stacks may assist in being able to identify any rapid rise in temperature which may indicate a fire is about to start.

Considering the potential risks associated with breaking bales and turning loose stacks, the best approach may be to simply ensure that materials are stored for the minimum practical time on your site.

Acceptance procedures should identify any previously stored recycled paper and account for any additional resultant fire risk, and you should communicate with both your material supplier and appropriate onward transfer operator.

## 12. Monitoring and Temperature Control

*The EA FPP Guidance requires you to show how you will control heat within your material piles to prevent self-combustion.*

If your piles are **within** the maximum pile sizes of the guidance and you store the material on site for **less than three months**, then there is **no** requirement for monitoring to take place.

However, if you have larger material piles and / or the material is stored for longer than three months then you will need to have a temperature monitoring programme in place.

There are various methods for doing this, such as thermal probes, thermographic cameras and fixed heat detecting systems. There are pros and cons for each, and as part of your fire risk assessment, you need to consider whether you are monitoring loose or baled material, taking into account the practicalities of physically measuring internal temperatures.

The method you use will depend on the types of material you are storing and their

configuration, such as loose or baled. It is beyond the scope of this guidance to determine which system should be used, and you should consider seeking expert advice. However, it should be noted that none of these are completely accurate at measuring internal temperatures in large loose material stacks.

You should include details of all temperature monitoring systems. If you have automatic systems, give details of the system you have, how warnings are received, and response to warnings. For manual systems, give responsibilities, how warnings are given, by whom, and the response required.

Clear, written procedures for monitoring should be in place including trigger levels. You should include how you ensure your staff are trained to detect and manage hotspots, and list all persons holding responsibilities on site. It is also advisable to have back up manual checks to support any automated system.

## 13. Material Pile Management

*The EA FPP Guidance sets out maximum pile sizes and volumes by each material stream. The aim of these restrictions is to limit the scale of a fire if one occurs and to reduce the risk of self-combustion.*

The total amount of combustible material stored at your site, and how it is stored will influence the likelihood, size, duration, and impact of a fire should one occur. As part of your fire risk assessment you should assess the maximum safe amounts of material you can store.

The EA restriction on stack / pile length and depth is to limit the amount of material within each stack / pile and to allow the fire service sufficient access to all areas of the piles during a fire incident.

The restriction on stack / pile height is to reduce the risk of mass self-heating within a stack / pile. The taller a material stack / pile, the more the material becomes compacted allowing a build-up of heat within the material. As there is less airflow to dissipate the heat, the temperature can continue to rise to the point of self-ignition. Restrictions to stack sizes are also about the size of the fire should it occur and the ability of the fire service to tackle the fire.

The restrictions that the EA have placed on pile height are to reduce the risk of site fires. The higher your material pile, the greater the level of compaction that occurs within the pile. This can raise the internal temperature of the pile, increasing the likelihood of self-combustion.

Where possible you should adhere to the maximum waste piles included in the EA FPP Guidance. If you are able to reduce the pile sizes further, you will lessen your fire risk as well as potentially reducing the amount of

water that would be required to tackle a fire if one occurred.

Within your FPP you will need to detail the separation distances between material storage areas and how this will be maintained. The distances should be adequate to prevent the spread of fire between stacks / piles and allow for the safe access of emergency vehicles and plant during an incident and / or to make fire breaks. Freeboard on firewalls is also important to prevent spread between stacks.

See section 11.1 of the EA FPP Guidance for guidance on the minimum distances. A minimum separation of six metres must be in place between stockpiles and the site perimeter, buildings or other combustible materials, unless you can demonstrate other separation means and measures are proposed.

### Exceeding Pile Sizes

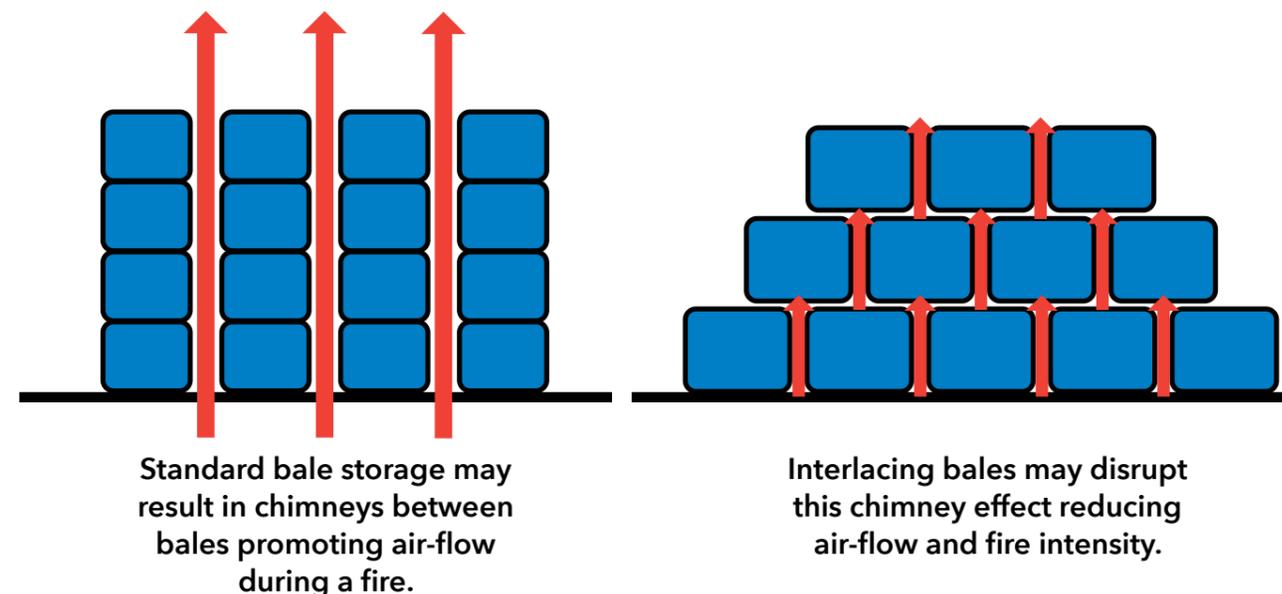
It may be possible to exceed the maximum pile sizes or volume in certain circumstances. If you wish to do this you must include alternative measures to reduce the overall site risk and have suitable procedures in place to make sure you operate on a first-in first-out basis, and that you do not exceed the prescribed storage times. In these instances, time could be an alternative measure, for example, you could increase the fire resistance of bay walls to provide longer protection.

If you are storing bales on site, you should consider the benefits of stacking bales in an interlocking formation (see Figure 2) over a column formation. Fire tests undertaken on behalf of the WISH Forum found that interlocking bales reduced how quickly a

fire spreads and also reduced the maximum burn temperatures obtained as flame vortices were not able to form in the same way as in column-stacked bales.

Full guidance around this topic can be found in WISH's WASTE-28 Guidance on Reducing Fire Risk at Waste Management Sites.

Figure 2: Bale Stacking Configurations



Source: WISH Guidance - WASTE 28 - Reducing fire risk at waste management sites issue 3 Feb 2020

**Note: While not directly a fire issue, interlacing bales will also have stability benefits. Bale stack collapses have resulted in serious and fatal injuries in the past, and bale stability is a significant risk area.**

## 14. Where Maximum Pile Sizes do not Apply

*The EA FPP Guidance clearly states the types of waste where maximum pile sizes do not apply; whole end-of-life vehicles, compost production and waste stored in containers.*

### Waste Stored in Containers

If you store waste in containers that can be moved then maximum pile sizes do not apply. Each container must be accessible

from at least one side so a fire can be extinguished. Examples of these types of containers include skips, roll-on roll-off skips, or shipping containers.

If you have a fire, you must be able to move containers as soon as is reasonably practicable to prevent the fire spreading. You must set out in your FPP the procedures for how and when you will move them.

# 15. Preventing Fire Spreading

*The EA FPP Guidance requires you to prevent the spread of fire on site. It provides two options, one of which needs to be used between combustible material piles, flammable materials, buildings and the site perimeter:*

- *six metre minimum separation distance on all sides of a pile; or*
- *firewalls with at least 2 hours fire resistance.*

The separation distances specified by the EA vary to those in the WISH guidance, as the latter's guidance is focused on mitigating against the heat radiation from a fire to reduce the spread of fire between piles and / or buildings, whereas the EA guidance is to ensure sufficient firefighting access with the aim of extinguishing the fire within 4 hours.

If you propose to use firewalls they should be stable, of sound integrity and able to prevent the transfer of heat through the wall. Freeboard is also important to try to prevent flames from travelling over the wall and impacting the other side, there should be at least one metre of clearance between the top of the material pile and the vertical

height of the wall, and also between the foot of the material pile and front end of the bay wall (i.e. the freeboard space), to help to limit fire spread during an incident.

## Bunkers and Firewalls

Bunkers and firewalls can be used to reduce the separation distances between piles, but to provide the same protection as the minimum separation distance they need to be properly designed, constructed, maintained and managed.

There are set standards for firewalls, and you should consult with your insurer to ensure you have selected the correct standard. Typically firewalls are rated by how long they will resist fire spread (30 minutes, 60 minutes, 2 hours etc.). A firewall properly constructed from interlocking concrete blocks will normally provide a minimum of 120 minutes of fire resistance.

The concrete blocks should be rated A1 fire resistant in accordance with clause 4.3.4.4 of EN 13369: 2018 *Common rules for pre-cast concrete products*.

**Note: Concrete is only Class A1 fire resistant if it does not contain any recycled materials or steel reinforcing. Any company claiming to have Class A1 fire resistant characteristics should not use recycled materials in their concrete.**

In addition, you need to detail, where appropriate:

- how material will be rotated within the bays to ensure the oldest material is removed (i.e. first-in, first-out policy) and details on how this will be recorded;
- if temperature monitoring is required, how will you check the temperatures of all the material within the bay, to ensure you carry out representative checks on the entire volume of the pile;
- how you have taken into account the calculation of flame height and radiation in preventing the spread of fire between piles;
- how you will prevent lighted material moving outside or over the bay walls and igniting other piles; and
- the specification and construction of the walls, how the joints are sealed and how they will provide an effective thermal barrier.

When considering the layout of piles or bays on site you also need to consider perimeter access. If you want to store combustible material up to your site boundary you could

use firewalls to prevent the spread of fire beyond your boundary.

Alternatively, you could leave a minimum six metres of clearance, and this separation distance could include an access road; the space does not necessarily have to be empty; it just needs to be clear of ignition sources and combustible material.

If you have existing bay walls on site but you are not aware of their fire rating, then first speak to the EA about this, as where the specification is not known it is possible to estimate the resistance from the type and thickness of concrete alone.

There are also companies that can undertake retrospective grading of the existing concrete to assess suitability. This can prevent the need for investment in new firewalls on site. It may also give you the option of re-coating the concrete to increase the walls' fire resistance in line with the guidance requirements.

**It is unlikely the EA will approve your plan if you do not achieve the required separation distances or use appropriate firewalls.**



## 16. Quarantine Areas

*The EA FPP Guidance requires a quarantine area to be located on site that can accommodate 50% of your largest material pile. In the event of a fire you will need to place either burning material or unaffected material into a designated area.*

Where practical, and clearly dependent upon the situation at the time, in order to minimise the risk of a fire spreading from one area to another by moving burning material (potentially creating two or more fires to deal with), in the first instance consideration should be given to moving unaffected material into the quarantine area and, where practical, continuing to extinguish the burning material in situ. The exception here would be if the burning materials were inside a building. It is more likely in this instance that the burning materials will need to be removed from the building. A quarantine area should, where possible, be provided in open air.

If you already have a quarantine area on site that you use for isolating contaminated loads you can use the same area during fire incidents, provided that it is large enough and with the right clearance procedures in place.

The quarantine area must be within the boundary of the site for which you hold a permit and can be located in more than one area of the site or other permitted sites. The area is also required to have a six metre separation distance around the pile perimeter. It may be more efficient on your site to use firewalls on one, two or three sides of the quarantine area to reduce the land-take required to provide the necessary separation.

You will need to provide detail on your quarantine provisions, which should be able to accommodate the material that would be moved in accordance with your FPP. The area(s) should be identified on the site plan.

If you intend to use your quarantine area for dousing or dampening down material, you will need to think about drainage for the area and making sure any water is stored or feeds into the foul drainage on site rather than the rainwater drainage system. If your site normally discharges foul water directly to the sewer, during an incident you will need to hold any firewater on site until the fire service has been able to obtain consent from the sewage company to discharge firewater. In some instances, discharge to sewers may not be possible and the firewater will need to be pumped and tankered from the site for disposal.

In certain circumstances a quarantine area on site is impractical. If you want to propose this solution to the EA, you will need to include details explaining why your site is low risk and what alternative measures you have in place to mitigate against not having a quarantine area. If you are using bay walls, you could consider increasing the fire resistance rating to prevent neighbouring material requiring movement.

For operational reasons, you can keep the location of the quarantine area flexible. If so, you must identify on your site plan all the areas you could potentially use.

You must keep at least one specified quarantine area clear at all times, unless it's being used in the event of a fire.

Car parks / drive-in areas can be used, but there must be a plan in place to remove vehicles or stop traffic in the event of an incident and this must be documented and practiced.

If you use your quarantine area to store material temporarily (for example, non-permitted material) you must make sure you remove those materials as soon as is practicable. In the event of a fire, you must remove it immediately. Your FPP must include details of the procedure you will use to do this.

You must set out how you will use your quarantine area in the event of a fire and how you will move material to the area as soon as possible. You must consider how you will do this if a fire starts when the site is unattended. The time taken to respond is a key consideration.

Your FPP must include details of how staff on site will be trained to safely move material to the area and the procedure you will use to clear the area if required.

Space is at a premium on some sites and a dedicated quarantine area may be difficult to achieve, however there are some alternative methods for consideration. These include:

- Have several smaller quarantine areas located around the site, providing they can collectively still store 50% of your largest material pile and would be easily accessible during a fire incident.
- If you can demonstrate that the whole stack is unlikely to catch fire, you can reduce your quarantine area accordingly.
- Where large areas of your site are used for fleet parking, where possible, establish an agreement with a neighbouring site whereby you move your fleet to an area on their site. If you are opting to use an area that needs clearing, you must be able to realistically clear it within one hour of a fire starting. You will need to consider how many members of staff such a measure would take to implement.
- Use a location outside of the building that you would normally use to store material.

It is also worth remembering that if you have a fire on site, your site will not be accepting or transferring any further material until the fire is extinguished. This could 'free-up' spaces that you would generally have to keep clear for operational movements.

## 17. Detecting Fires

*The EA FPP Guidance requires you to have procedures in place to detect a fire in its early stages so that its impact can be minimised. The detection system should be proportionate to the nature and scale of your operation and its associated risks.*

This FPP requirement relates to the detection of a fire, or early signs of a fire. It does not relate to heat detection equipment or pile temperature monitoring that may be used

on site to detect when a pile may need to be turned. The earlier you can detect a fire on site, the earlier it can be extinguished reducing the impacts of the incident.

Extinguishing a fire in its early stages reduces the impact on the environment, the demand on local fire service resources and is likely to limit the damage caused by the incident, thus improving your business continuity.

*Note: You can propose to use a system that is accredited by a scheme other than the United Kingdom Accreditation Service (UKAS). In this instance you will need to provide evidence of the equipment's suitability to be used on your site. For example, if the system has worked in a very similar situation, then it is likely to be suitable. If you want to use an alternative accreditation, it is likely to take longer to 'approve' your FPP than if you opt for a UKAS system. However, providing you can supply appropriate evidence, for example demonstrate the system works, it is likely it will be approved following discussions.*

## 18. Suppressing Fires

*The EA FPP Guidance requires you to install a fire suppression system if you store material in a building. The suppression system should be proportionate to the nature and scale of your operation and the associated risks.*

Whatever system you use, it needs to be able to extinguish a fire within 4 hours.

A full assessment should be undertaken that also accounts for the activities undertaken on site. It is also recommended that you liaise with your insurance providers when deciding on the suppression system to be used on site to understand their requirements. It is possible that their requirements are different to, or more specific than, those in the EA FPP Guidance.

When investigating the suppression system for your site, the system should be proportionate to the nature and scale of the activities you carry out and the associated risks. If you intend to use it to suppress a fire to allow active firefighting to be undertaken, making sure access can be safely gained to the building in the event of a fire, then a sprinkler system may be suitable. If you intend to try and extinguish a fire, including deep seated fires, a deluge system may be more appropriate.

Please note that a sprinkler system is unlikely to fully extinguish a fire within a material pile, however, it may prevent a fire from spreading if activated soon after ignition.

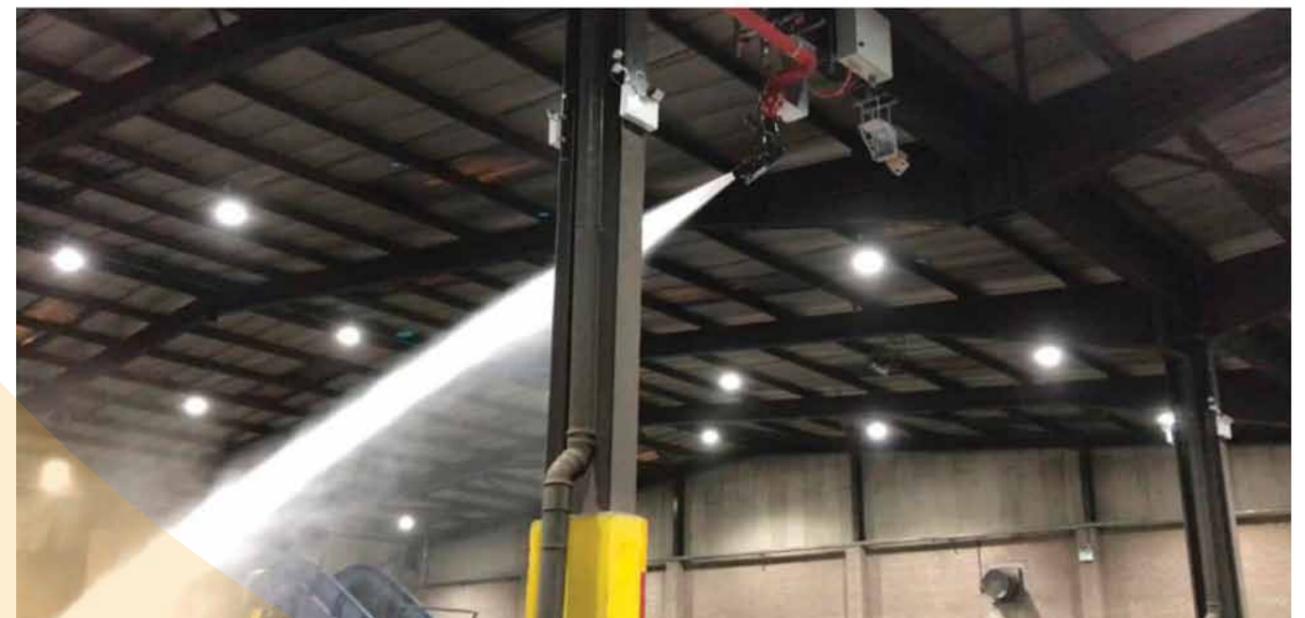
You also need to take into account the water supply at your site, and whether there is sufficient water to use in your proposed system. It may be that you need storage tanks on site, or to consider a system that uses less water, e.g. a foam system. It is worth considering UKAS accredited systems, as similarly to the detection system, if you wish to use an alternative accreditation scheme you will need to provide evidence that it is appropriate for use on your site and meets an equivalent or higher standard than UKAS.

As well as fixed systems, such as deluge or

sprinklers, you may also want to consider portable water cannons as these offer flexibility on site. Again, you will have to be able to demonstrate how the water supply will be provided for such equipment and the time it will take for the equipment to be deployed.

Manual systems may also be suitable, e.g. internal fire hose reels, fire extinguishers, and fire blankets. However, you will need to demonstrate how they will be used out of hours.

For any system, training implications will need to be fully considered.



# 19. Firefighting Techniques

*The EA FPP Guidance requires you to design your site and FPP to enable active firefighting. This does not mean your staff have to fight the fire but that the resources or equipment must be available at all times to fight a fire.*

Consider improvements you could make to your site layout to enable active firefighting to take place. This can include spacing around material piles or allowing sufficient space for firebreaks to be implemented.

You may want to train your staff to be able to support the fire service in the event of a fire (this can be part of an alternative measure).

**Note:** Before using any vehicle in a fire situation, ensure you check with the vehicle manufacturer / supplier and vehicle insurer, that the vehicle is safe to use, suitable for the task in question and is fully covered.

When developing your firefighting approach, you should seek to engage with your local Fire and Rescue Service (FRS) to understand how they would fight a fire on your site. This will give them the opportunity to discuss the resources available to the service and to update their predetermined attendance records. If you do engage with the FRS, you should include details of what is agreed within your FPP.

The FRS will only enter a building based upon the dynamic risk assessment (DRA) carried out by the FRS Incident Commander. The DRA will inform the firefighting tactics adopted. Therefore, if you are storing recovered paper in a building, you will be

Once in attendance the fire service will take control of the operation and may, if it is safe to do so, ask suitably trained staff to use on site heavy plant to move material to support the firefighting operations.

You should consider having arrangements in place for staff to attend the site out of hours to support the fire service during an incident. The final consideration is appropriate equipment, i.e. do you have fire resistant material handlers, floodlights, etc. or can you obtain these from a hire company 24 hours a day at short notice?

required to have some form of appropriate suppression system in place. You should detail the specification of the system and you must demonstrate that it could extinguish a fire within 4 hours.

Appropriate systems (e.g. sprinklers, water spray, water curtains, and fire blankets) should be proportionate to the nature and scale of the activities on site and their associated risks.

For all automated suppression equipment, the design, installation and maintenance must be covered by an appropriate accredited third-party certification scheme and evidence of this needs to be supplied in your FPP.

## Active Firefighting

You must detail what you will do in the event of a fire and demonstrate you have designed your site to allow for active firefighting. These procedures should work towards the aim of extinguishing any fire within 4 hours.

It is important to note that active firefighting doesn't mean that you or your staff must fight the fire. No one should put themselves at risk by trying to fight a fire. Active firefighting means having the resources available at all times to fight a fire and aid the FRS. The resources needed include:

- plant you can use to move material around the site, for example loaders, excavators, material handlers;
- staff;
- available water supply;
- finances.

Active firefighting can include, but is not limited to, any of the following, either separately or in conjunction:

- cessation of processing operations with no further material accepted for the duration of an incident. (Note: where appropriate, removal of part burned material may be through processing operations);

- the use of water or foam (via hoses or designed suppression system) and how you will use it, e.g. by quenching or spraying burning material or cooling unburnt material;
- breaking apart the burning pile to allow water / foam to penetrate;
- removing un-burnt material close to the fire to a location away from any fire;
- moving the burnt material to reduce the fuel available and allow material to be quenched (in hoses or in pools or tanks of water);
- installing fire breaks.

You need to include details of how (once the fire is extinguished) you will dispose of solid and liquid wastes arising from a fire. You should detail that any discussions will be had with sewage / wastewater treatment sites and / or landfills prior to material being sent. It would be sensible to plan this prior to an incident and have arrangements in place for disposal.

## 20. Water Supplies

**The EA FPP Guidance requires you to provide 2,000 litres / a minute for a minimum of 3 hours for every 300m<sup>3</sup> of combustible material in your largest pile.**

This section of the guidance requires you to take a pragmatic approach to the amount of water that can be supplied to your site during a fire incident. There are many advantages to knowing how much water you will be able to obtain if a fire occurs.

When establishing the method to be used in tackling a fire, it is sensible to engage with your local fire service. They will be able to provide details of what equipment is available and their preferred approach for tackling a recycled paper fire.

You need to detail what water is available to actively fight a fire and by what means it will be available (e.g. via mains water, tanks, abstracted, hydrant). It is also advisable to check with the local FRS that the fittings on tanks etc. can marry up to the hoses used by the FRS and, if you are relying on hydrants, you should have them tested to demonstrate that the flow rate is achievable as this can vary in practice.

You must either have enough water available to manage a worst-case scenario, which is defined as your largest material stockpile catching fire, or be able to demonstrate how you would actively reduce stack size to therefore reduce the quantity of water / foam required.

The use of other firefighting equipment and control measures for minimising the spread of a fire will also be a factor in the amount of water required.

It is worth considering whether you can reduce the size of your largest recycled paper pile to reduce the water requirements in the event of a fire. Operationally this can have limitations, but it could reduce your water requirements to a more suitable level. Reducing a 900m<sup>3</sup> waste pile by 15% (135m<sup>3</sup>), would lower the amount of water needed to 5,100 litres a minute and 918,000 litres for 3 hours. This may be more manageable to supply and contain on site as fire water.

Even if you are able to reduce some of your pile sizes, it may be difficult to secure the water requirements needed. To obtain as much water as possible, you could ascertain if there are any public or private fire hydrants located on or near to the site.

Your local FRS should be able to help identify firefighting water sources and their suitability for use. A fire hydrant should comply with BS750 and be no more than 100m from the site entrance. A suitable hydrant should be subject to a testing and servicing regime. They may also be able to provide flow tests for any public hydrants in close proximity to your site to identify how much water is likely to be available during an incident.

**Note: Flow rates vary from night to day and this needs to be taken onto consideration. Water supplies should be within 100m of the site entrance (based on the lay of the hose not as the crow flies) and accessible. If it is a private hydrant, ownership will need to be identified, you will need to undertake a flow rate test and you should check there are the correct connections in place for the fire service to use the hydrant. Maintenance and the specification of private hydrants can vary significantly.**

If hydrants are not available or in close proximity to your site, or you cannot deliver the water requirements, you could consider:

- installing storage tanks or lagoons on site which can supply some water. If you propose this solution you will need to ensure you have the appropriate connections to allow the fire service to use these reserves. It may also be necessary to install filters to make sure any material within the lagoon / tanks which could affect the fire service's pumps are removed;
- installing a firewater recirculation system with pumps and filters. How suitable this solution is will depend on the activities you undertake on site and the materials you store. If this method is suitable on site, it should be acknowledged that there is a limit to the number of times water can be recirculated before it becomes too contaminated to use. The FRS should advise whether this is an approach they would be happy to use on site;
- working with your local FRS to establish what alternative firefighting techniques they can offer. Agreement in advance of a fire will allow the fire service to update their 'pre-determined attendance' to make sure they bring the correct equipment when arriving on site, increasing the likelihood of being able to undertake active firefighting more quickly. They could offer solutions such as using sprays instead of jets which can significantly reduce water demand; and

- talking to the EA about using a foam suppression system. Firefighting foams can reduce the amount of water used for firefighting, however they can cause pollution to site, ground and surface water if not properly contained. Where firefighting foams are proposed the Site Operator should ensure adequate environmental protection. Furthermore, foam concentrate has a limited shelf life and should be carefully stored, used and disposed of in accordance with recommended guidance. This includes maintaining good records of storage, use and disposal.

Whatever system you opt for, the EA would like to see a breakdown of the amount of water you can supply (even if it is below the minimum requirement) and evidence of proof of supply wherever possible.

## 21. Managing Firewater

*The EA FPP Guidance requires you to contain firewater run-off to prevent environmental pollution.*

Ideally your firewater containment should be considered alongside firewater supply as any water used to control a fire will have to be stored on site prior to disposal.

Water UK has directed that sites should not factor into their FPP discharging firewater to the foul sewer. Therefore, you need to establish how you will contain firewater on site, how you will prevent it entering the foul or rainwater drainage systems, and how you will eventually dispose of the firewater. It is possible, however, that your sewerage undertaker may be willing to accept firefighting water discharges to the foul sewer. If this is the case, you should have this confirmed in writing.

In terms of containment, you could use flood gates, drain covers, and shut off valves to contain the water within an impermeable area of the site. You could also look to increase kerb height around your site to maximise surface water storage, or install overflow tanks to hold the firewater. Using overflow tanks could provide the

opportunity to trickle feed your firewater to the sewage company over an agreed period of time as they are unlikely to be able to accept high volumes of water at any time.

Foam systems use significantly less water than water only systems. Foam could be considered to knock down the flames during an incident, however, it is unlikely to extinguish a large fire. Using foam to fight a fire also presents different challenges in terms of disposal.

The containment facilities and pollution equipment you need will depend on the size of your site, amount of material you store, and outlined firefighting strategy. Section 17 of the EA FPP Guidance outlines several secondary and tertiary containment facilities.

It may not be possible to get agreement from the utility company to accept firewater without testing following an incident. Consider whether you can get agreement from the utility company of what they are willing to accept in terms of pH and volumes or whether to pursue an alternative approach such as firewater being removed off site by a licensed contractor.

## 22. Contingency Measures for Issues During, and After, the Incident

*Your plan must have contingency measures in place for dealing with issues during and after a fire.*

These include diverting incoming material to alternative sites, timescales and notifying those who may be affected by a fire.

You also need to set out how you will clear and decontaminate the site and the required steps before the site can become operational again. Possible points to include are:

- a location to where incoming material can be diverted
- channels you will use to contact neighbouring properties
- alternative access to the FPP, emergency procedures, contact details and site plans if your site office or whole site is unavailable

## 23. Submit your Fire Prevention Plan

*If you are applying for a permit to carry out a recycled paper operation, you must send your FPP to the EA with your application.*

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Peter Buckley	Environment Agency
Raynor Davies	Marvin Owen Associates
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Mark Montgomery	Smurfit Kappa Recycling
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## 24. Glossary of Terms

Term	Definition
Alternative Measures	Fire prevention, detection or active firefighting measures adopted to deviate from standard EA FPP Guidance whilst still meeting the three objectives of the EA FPP Guidance.
Arson	Intentionally and maliciously setting fire to buildings and / or materials.
Bund	A type of secondary containment. Usually, an impermeable construction designed to hold polluting substances that leak or run off from a storage area.
Combustible materials	In the context of this document, solid materials that can ignite and burn, such as paper.
Competent Advice	<p>A person with enough training and experience or knowledge and other qualities to enable them properly to assist in undertaking the preventive and protective measures.</p> <p>Access to competent advice can also extend to your local Fire and Rescue Service (FRS), Regulators, i.e. EA, SEPA, NRW, and the HSE on specific issues such as DSEAR.</p> <p>Note: Different stakeholders such as insurers and regulators may have different priorities and you may need to consult with more than one type of competent advice to gain a full picture.</p>
Controlled Burn	An operational firefighting strategy where the application of firefighting media such as water or foam is restricted or avoided to minimise the damage to public health and the environment.
EA	Environment Agency
EA FPP Guidance	Guidance on preparing a Fire Prevention Plan produced by the English regulator, the Environment Agency, for operators that store any amount of combustible waste.
Environmental Permit / waste management licence	Permit issued by Environmental Regulator or Local Authority under the Environmental Permitting Regulations, that controls the environmental impact of your business activities. It has conditions you must follow to prevent your business harming the environment or human health.
Fire Risk Assessment	A structured and systematic examination of the premises / site / buildings etc. to identify the hazards from fire. Having identified hazards, assess who and / what is at risk and whether existing fire precautions are adequate so that the risk associated with the hazard is acceptably low. If the existing precautions are not adequate you must take additional actions to minimise the risk either by removing or reducing the hazard or by providing adequate control measures.

Term	Definition
Firewater run-off	Water that has been used to fight a fire, likely to be contaminated with products of combustion and unburnt materials that are washed off the site.
Flammable material	Materials that ignite easily and burn rapidly with a flame. Liquids and articles are usually defined as flammable if they possess a flashpoint of 60 degrees C or lower.
Flashpoint	The lowest temperature at which the liquid produces enough vapour to form an ignitable mixture in air.
Foul Sewer	Sewers or pipes that collect foul water (sewage and trade effluent) and convey it to a sewage treatment facility. They can be privately owned or owned by the local sewage treatment provider.
FPP	Fire Prevention Plan
Groundwater	Water that is below ground in the saturation zone. The saturation zone is where all the cracks in the rock and within the soil are filled with water. Abstraction from groundwater sources is used for both potable and non-potable water supplies.
Hot Spot	Area within a waste pile normally caused by localised ignition.
Protected Habitat	Examples include: Site of Special Scientific Interest (SSSI), Area of Special Scientific Interest (ASSI), Special Area of Conservation (SAC), Special Protected Area (SPA), National Nature Reserve, Sites of international conservation importance - RAMSAR Site, Area of Outstanding Natural Beauty (AONB), National Scenic Area.
Secondary Containment	A structure such as a bund that surrounds a storage unit, designed to contain pollutants in the event of fire or spillage.
Sensitive Receptor	Human receptors include hospitals, nursing homes, schools, residential areas, places of work, transport networks. Environmental Receptors include source protection zones (for drinking water supply), surface waters, potable abstractions, groundwater, protected habitats, fisheries.
Spontaneous combustion	Combustion which occurs without an external heat or ignition source being applied.
Surface water drain / sewer	Sewer or pipes that collect uncontaminated surface water only, from buildings, roads, yards, which usually discharges directly into rivers, the sea or groundwater.

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