National Operational Guidance

Hazard

Firefighting with foam

NFCC National Fire Chiefs Council

Developed and maintained by the NFCC

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Hazard - Firefighting with foam

Hazard Knowledge

Firefighting foam causes water pollution. This should not stop fire and rescue services from using foam where there is an operational need. In most cases, preventive action can be taken to limit any impact. Using foam can also have environmental benefits such as reducing water use and extinguishing a fire more quickly.

The main environmental effects of firefighting foams are:

- They can lead to the de-oxygenation of water
- They can be toxic to aquatic life and present risks to drinking water supplies
- Some compounds in them do not break down in the environment and can accumulate in plants and animals

The type of foam used should be appropriate for the task in hand and the minimum quantity used. Using foam is a trigger for notifying environment agencies of an incident. This includes the use of compressed air foam systems. Extra care should be taken when using firefighting foam close to water sources or sensitive environmental areas. Some sites have oil separators in drainage systems. Firefighting foam run-off should not be allowed to enter an oil separator because it will pass through it unaffected and may also flush oil into the drainage system. See Section 3.9, Environmental Protection Handbook.

Control measure - Containment (Foam)

Control measure knowledge

The ability to contain foam run-off is preferable to allowing uncontrolled discharge of foam run-off to drains. Foam containment and run-off are the same as those for fire water run-off. See Fire water run-off.

Strategic actions

Fire and rescue services should:

- Develop foam procedures, which must include:
    - Containment of foam run-off
    - Environmental considerations
- Ensure that the impacts of using foam is included for operations in and around protected sites (for example Sites of Special Scientific Interest)
- Where appropriate, consult with local environment agencies, sewerage companies, and nature conservation bodies where it can be reasonably expected that the use of foam may be considered

Tactical actions

Incident commanders should:

- Make every effort to prevent firefighting foam entering surface and groundwater during an incident
- Consider the availability of pollution control equipment and/or pollution containment facilities on site
- Consider the need to prevent foam run-off entering drains, including during make up activity
- Consider the risk to the environment caused by the use of foam verses the benefits (rapid control of the fire)
- Consider the legal exemptions. See Environmental legislation
- Consider carrying out an environmental analytical risk assessment
- Consider informing the following organisations of the use of foam and the quantities involved:
    - Relevant environment agency
    - Sewerage companies (where foam is likely to enter the sewerage system)

Control measure - Substitution

Control measure knowledge

Using foam may have an environmental benefit as fires can be quickly extinguished and fire water run-off is reduced. Consider, too, the type of foam. For example, compressed air foam systems (CAFS) will usually need less concentrate and water to produce adequate foam for fighting. The reduced levels of concentrate and run-off produced are likely to result in run-off being easier to contain, and if it does enter a water body it will have less of an impact.

Strategic actions

Fire and rescue services should:

- Identify where alternative methods of extinguishing fire should be considered within a foam strategy
- When procuring foam concentrate, identify the environmental impact and adjust procedures accordingly

Tactical actions

Incident commanders should:

- Where foam has been applied and there is a significant risk to the environment, evaluate:
    - Alternative types of foam (if available)
    - Using a different extinguishing media
    - High-pressure water fogging systems (if available)
    - Adopting a controlled burn strategy. See Controlled burn

Control measure - Reduction

Control measure knowledge

The amount of water used can be reduced by using water sprays instead of jets and by using hand-held jets instead of ground monitors. This will reduce the amount of fire water run-off.

Strategic actions

Fire and rescue services should:

- Consider maintaining a stock of hand controlled branches capable of producing a fire fighting jet and/or water spray at reduced levels of flow

Tactical actions

Incident commanders should:

- Consider identifying areas of operation where a reduced use water strategy can be initiated without significantly increasing the risk of fire spread or compromising safety
- Consider the impact of fire water run off on compacted materials and ground conditions
- Consider a controlled burn strategy; see Controlled burning

Control measure - Disposal

Control measure knowledge

During the early stages of an incident when the fire service activities are more dynamic, it may not always be possible to contain fire water safely. In these circumstances use of the foul sewer should be considered for disposal. The flow rate should be controlled to avoid the foul sewer overflowing. Failure to control the flow could result in polluting water entering the water environment. See Fire water run-off.

At some incidents, the foul sewage system may be the best disposal option. If this is the case, the sewerage company must be contacted. They will consider the request and take account of the likely

impact if they do not approve the discharge. Agreement from the appropriate environment agency must be obtained before any release takes place. This can be obtained by telephone but must be applied for and confirmed in writing later. See Section 1.6.6, Environmental Protection Handbook.

For further information see Section 3.10.3 Environmental Protection Handbook: The movement of hazardous waste by the fire and rescue service in emergencies.

For further information see Section 3.2.8 Environmental Protection Handbook.

Strategic actions

Fire and rescue services should:

- Be aware of their legal responsibilities and possible defences for the disposal of fire water under the Environmental Permitting Regulations 2010 and Environmental Damage (Prevention and Remediation) Regulations 2015 (EDR 2015)

- Develop plans for the disposal of contaminated fire water run off which include plans for:
    - Use off-site storage within drainage infrastructure e.g. balancing ponds
    - Use of foul water drainage
    - Contingencies for where the responsibility for disposal cannot be identified

Tactical actions

Incident commanders should:

- Ensure that waste products created by the fire and rescue service are disposed of both legally and responsibly. The Environmental Permitting (England and Wales) Regulations 2010 (EPR 2010) provides two exceptions for the emergency disposal of contaminated fire water runoff where the primary focus of fire and rescue service actions is saving life:
    - Emergency discharge and subsequent contamination of the water environment
    - The removal of waste by a fire and rescue services using fire and rescue service equipment or vehicles
- Consider the legal exceptions. see Environmental Legislation
- Ensure that the relevant environment agency is informed of the incident as soon as possible and is be involved in the decision to discharge
- Inform sewerage undertakers if discharge is to foul the water sewerage system

- Identify if the responsibility for disposal of waste produced at an incident can be delegated to a third party based on location, material and quantities involved. Namely:
    - Local authority - Playing fields, public open spaces, beaches and some roads
    - Landowner or owner / occupier - Private property
    - Highways agency - (Road Service in Northern Ireland) - Major roads
- Identify if there are any alternative methods of disposal:
    - Suitable site arrangements for a waste disposal
    - Tankering away the contaminated water
- Identify potential drainage routes for fire water run-off and released vehicle content
- Ensure that waste products created by the fire and rescue service are disposed of legally and responsibly

Control measure - Operational risk information plan

Control measure knowledge

Operational risk information plans are prepared in accordance with the Fire and Rescue Services Act 2004 and focus on firefighter safety. The plans should also include information on pollution, prevention and control where a risk to the environment is identified at an incident.

For further information see:

- DCLG operational risk information guidance
- Section 2.2 and 2.3, Environmental Protection Handbook
- National Operational Guidance: Operations Identify foreseeable risk
- National Operational Guidance: Incident Command

Strategic actions

Fire and rescue services should:

- Include environmental risk information within operational risk plans

Tactical actions

Incident commanders should:

- Consider pollution prevention information contained within site specific risk plans
- Carry out an environmental risk assessment
- Implement the environmental protection measures identified in operational risk information
- Monitor the impact of fire and rescue service tactics on the identified environmental risk
- Identify operation and effectiveness of fixed installations and pollution prevention measures