NFCC National Fire Chiefs Council

Ref no.:

Fire contaminants risk assessment –

Operational frontline appliances and other vehicles

Issue date:		Review date:		Issue no:	

Description of activity/task/environment/role assessed

These risk assessments are provided as a suite, to support services to identify hazards related to fire contaminants, assess the level of risk, and implement appropriate control measures to reduce exposure to a level that is as low as reasonably practicable (ALARP). Each fire and rescue service remains legally responsible for undertaking and maintaining its own suitable and sufficient risk assessments. When creating their own risk assessments, services should take into account local risk, operational context and incident type.

This risk assessment has been developed by the NFCC Fire Contaminants Working Group and has been subject to an independent quality assurance process undertaken by a qualified occupational hygienist from Bureau Veritas. This process has provided additional professional scrutiny of the assessment, including the identified hazards, exposure risks and proposed control measures.

NFCC recommends that this document is used as risk assessment guidance, in line with your service contaminants risks, and reviewed in accordance with your risk assessment procedures.

Fire contamination is defined as a mixture of toxic, irritant and carcinogenic chemicals, the composition of which varies depending on the specific materials burning and the fire conditions. They can be released in the form of particles which will include aerosols, dust, fibres, gases, and vapours.

Contaminants can move from the incident ground through a chain of environments, increasing the risk of secondary exposure if not controlled. This chain includes incident ground, fire appliances and equipment, premises, internal workplaces, welfare facilities (showers, kitchens, rest areas), personal vehicles, and ultimately homes. Breaking this chain relies on effective management controls.

Frontline appliances and operational vehicles include fire appliances, specialist response vehicles, multi-role vehicles (MRVs), officer vehicles, and other fleet assets used by operational personnel to respond to incidents and support operational activities. These vehicles may become contaminated through attendance at incidents, contact with contaminated environments, and the transport of contaminated personnel, equipment, PPE, and incident-related materials. This contamination creates the potential for exposure to fire contaminants.

For the purposes of this risk assessment, PPE is defined as follows:

- **Standard full PPE:** Disposable nitrile gloves (double up), overalls, safety boots and eye protection. Disposable overalls to be considered dependant on task.
- **Structural firefighting PPE**: Firefighting tunic and leggings, firefighting boots, fire gloves, fire hood and fire helmet.
- **Lighter firefighting PPE:** Firefighting tunic and leggings, firefighting boots, fire gloves and fire helmet.
- **Respiratory protective equipment (RPE):** This is defined as self-contained breathing apparatus (SCBA), or a FFP3-rated mask. Tight-fitting RPE must be face fit tested, as per HSE INDG479 guidance.

The most effective way to manage contaminant risk is to prevent exposure in the first place.

Relevant legislation

- Health and Safety at Work etc Act
- Health and Safety at Work (Northern Ireland) Order
- The Workplace (Health, Safety and Welfare) Regulations
- Workplace (Health, Safety and Welfare) Regulations (Northern Ireland)
- Provision and Use of Work Equipment Regulations(PUWER)
- Provision and Use of Work Equipment Regulations (Northern Ireland)
- Management of Health and Safety at Work Regulations
- Management of Health and Safety at Work Regulations (Northern Ireland)
- PPE (Personal Protective Equipment) regulations

- Personal Protective Equipment at Work Regulations (Northern Ireland)
- The Personal Protective Equipment at Work (Amendment) Regulations
- Personal Protective Equipment at Work (Amendment) Regulations (Northern Ireland)
- Control of Substances Hazardous to Health Regulations (COSHH)
- Control of Substances Hazardous to Health Regulations (Northern Ireland)
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR)
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland)

Activity / task / environment	Hazard and outcome	Risk groups	Best-practice control measures	Level of risk			Additional control measures to consider to further reduce risk
				L	S	R	
1. Mobilising to incident	Exposure (including secondary exposure) to contaminants in service vehicles by inhalation, ingestion or absorption. **Acute health effects:** Immediate or short-term ill	A, B	Maintain vehicles to a visibly clean standard and clean them regularly as part of normal station routines. Ensure the windows and ventilation systems of attending vehicles are closed before arrival. This also includes doors and lockers. Plan a safe approach route and rendezvous point: Ensure vehicles approach the incident upwind and uphill. Ensure vehicles are parked a safe distance away from the incident.				

	health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health, including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.						
2. Activities in external vehicle areas, including stowage areas	Exposure (including secondary exposure) to contaminants in service vehicles by inhaling, ingestion,	A, B, F, H	**For associated control measures, please also refer to the following fire contaminant risk assessments:** • **At operational incidents risk assessment** • **Equipment risk assessment** Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level				

	absorption or injection. **Acute health effects:** Immediate or short-term ill health including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		PPE whenever cleaning or handling any contaminated items, including equipment, PPE and clothing.				
3. Activities taking place	Exposure (including secondary	A, B	Ensure vehicle design minimises the transfer of contaminants and facilitates effective cleaning.				

inside of a vehicle.	exposure) to contaminants in service vehicles could be by inhaling/ingestion/absorption/injection. **Acute health effects:** Immediate or short-term ill health including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health including respiratory disease, skin disorders, organ damage, and other life-limiting		Develop and adhere to a local process for cleaning the inside of a vehicle. Ensure personnel who are contaminated do not enter the vehicle cab until appropriate decontamination has been carried out. Use wipeable or disposable seat covers where seats have cloth or fabric coverings. Ensure seat covers are cleaned or replaced regularly. Take into account the stowage of contaminated equipment and firefighting PPE during the initial procurement stage for new vehicles.				

	or fatal health conditions.						
4. Being released from incident	Exposure (including secondary exposure) to contaminants in service vehicles by inhalation ingestion, absorption or injection. **Acute health effects:** Immediate or short-term ill health, including irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health,	A, B	**For associated control measures, please also refer to the following fire contaminant risk assessments:** • **At operational incidents risk assessment** Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE whenever handling any contaminated items, including equipment, PPE and clothing. Carry out on-scene decontamination of contaminated equipment, including vehicle-mounted equipment, to remove gross or loose contamination. If further cleaning is required, bag and seal equipment – if possible, before transporting it back to the workplace. Carry out a final clean at the workplace. Bag and seal any PPE, RPE, clothing and equipment that cannot be effectively decontaminated at the incident. Place the sealed bag into an appliance locker, transport vehicle or compartment away from the main vehicle cab or passenger compartment.				

	including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		Dispose of any disposable items used for decontamination appropriately. Develop and adhere to a local process for transporting contaminated PPE, clothing and equipment. Develop and adhere to local decontamination and cleaning procedures. Use suitable containers to transport any contaminated items.				
5. Vehicle cleaning and decontamination at station.	Exposure (including secondary exposure) to contaminants in service vehicles by inhaling, ingestion, absorption or injection. **Acute health effects:** Immediate or short-term ill health, including	A, B	Develop and adhere to a local process for cleaning vehicles. Wash down any vehicle that has driven through a contaminated area outside the building before it enters the appliance bay or building. This includes washing the undercarriage, chassis and cab and lockers. Clean vehicles in a suitable location to avoid any cross-contamination with other water sources, such as water pits. Clean the internal surfaces of the vehicle to reduce secondary exposures, including the dashboard, steering wheel and seatbelts.				

	irritation, breathing difficulties, toxic effects, infection, serious injury or death. **Chronic health effects:** Long-term ill health, including respiratory disease, skin disorders, organ damage, and other life-limiting or fatal health conditions.		Clean lockers that contained contaminated equipment or other contaminated items on return to the station. Dry decontaminated equipment in a suitable, clean, and well-ventilated environment away from potential fire contaminants. Ventilate appliances after returning from a fire incident, for example by leaving windows open. Clean lockers that contained contaminated equipment or other contaminated items on return to the station. Clean the external surfaces of a vehicle to a visibly clean standard after attending an incident. Dispose of any disposable items used for decontamination appropriately. Replenish any decontamination items used. Carry out routine cleaning to maintain vehicle cleanliness and operational readiness. Regularly vacuum vehicles stowage using a class H vacuum and clean surfaces remove visible signs of contaminants. Wear, as a minimum, a half mask with FFP3 filters or FFP3 dust mask with standard-level PPE				

			whenever cleaning any contaminated equipment. Regularly check and maintain any air-conditioning and other filters in line with fleet management procedures. Ensure station managers verify that cleaning processes are completed.				

12.Who could be exposed to the hazards? State identified persons at risk in column 3							
A: Firefighter	B: Officers	C: Instructors	D: Trainees	E: Control personnel	F: Non-operational personnel	G: Public	H: Other agencies

To be complete by fire and rescue services

Risk assessment sign-off	Name	Signature	Date	Review date
Risk assessment lead author				
Health and safety advisor				
Trade Union health and safety reps				
Accountable manager				

Risk calculator

Risk is the chance that harm will be caused by a hazard. It is measured in terms of severity, likelihood & population affected.

A simple approach to quantifying risk is to define measures of likelihood and severity such as the descriptors given below. This allows the construction of a risk matrix which can be used as the basis of identifying acceptable and unacceptable risk.

Likelihood x Severity = Risk

Risk matrix

	Likelihood				
Severity	**Rare (1)**	**Unlikely (2)**	**Possible (3)**	**Likely (4)**	**Almost certain (5)**
Catastrophic (5)	**5**	**10**	**15**	**20**	**25**
Major (4)	**4**	**8**	**12**	**16**	**20**
Serious (3)	**3**	**6**	**9**	**12**	**15**
Minor (2)	**2**	**4**	**6**	**8**	**10**
Negligible (1)	**1**	**2**	**3**	**4**	**5**

Risk bands and suggested response

Risk band	Score	Required response
Low	**1–2**	Manage through routine controls. Maintain controls and review if circumstances change.
Moderate	**3–4**	Proceed where existing controls are effective. Consider further reasonably practicable controls; record, monitor and review where appropriate.
High	**5–12**	Further risk reduction is required. Review controls and reduce risk so far as is reasonably practicable. Where a residual High risk remains, apply explicit management or command oversight and continue to review the risk.
Very high	**15–25**	Intolerable for planned or non-emergency activity: do not commence or continue until risk is reduced. At emergency incidents, only proceed in exceptional circumstances where there is a compelling operational benefit, no safer reasonable alternative, and the decision is appropriately authorised, recorded and continually reviewed.

Likelihood descriptors

Level	Category	Descriptor
5	**Almost certain**	Expected to occur repeatedly or in most comparable circumstances unless further controls are applied.
4	**Likely**	Expected to occur at some point in the activity or relevant exposure period; has occurred repeatedly in comparable circumstances.
3	**Possible**	Could occur; credible and reasonably foreseeable, including events known to have occurred in comparable fire and rescue operations.
2	**Unlikely**	Could occur, but is not expected where controls are effective; uncommon and normally dependent on a less common combination of circumstances or control failure.
1	**Rare**	Exceptionally uncommon but still reasonably foreseeable; would normally require unusual circumstances or multiple independent control failures.

Severity descriptors

Level	Category	Descriptor
5	**Catastrophic**	One or more fatalities; a health effect reasonably capable of causing death or materially shortening life; or multiple permanent, life-changing injuries or cases of ill health.
4	**Major**	Permanent or irreversible injury or ill health; significant long-term impairment or disability; or a serious non-fatal health effect requiring substantial treatment or prolonged recovery.
3	**Serious**	Significant but reversible injury or ill health requiring medical treatment beyond first aid, temporary absence or restricted duties, or a short- to medium-term health effect requiring clinical assessment or treatment.
2	**Minor**	Minor injury or ill health requiring first aid or limited treatment; short-lived symptoms; little or no time away from normal duties; full recovery expected.
1	**Negligible**	No injury or ill health, or transient discomfort requiring no treatment and causing no lost time or lasting health effect.