



UK Health  
Security  
Agency

# Hydrogen Fluoride (HF) and Hydrofluoric Acid

## Incident management

This document provides information needed for response to a chemical incident, such as physicochemical properties, health effects and decontamination advice.

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## Main points

### General

Hydrogen fluoride is a colourless gas or a fuming liquid. It readily dissolves in water to form hydrofluoric acid.

Hydrogen fluoride and the aqueous form hydrofluoric acid are highly corrosive and react violently with many compounds including bases causing fire and explosion hazard.

They attack metals, glass and some forms of plastic.

### Health

Hydrogen fluoride is highly corrosive and readily penetrates intact skin, nails and deep tissue layers, causing severe chemical burns.

Ingestion may cause burning of the mouth and throat with retrosternal and abdominal pain; there is often hypersalivation, vomiting, haematemesis and hypotension.

Irritation of eyes and nose with sore throat, cough, chest tightness, headache, ataxia, confusion, dyspnoea and stridor may follow inhalation.

Contact with the eyes may cause conjunctivitis, conjunctival oedema, corneal epithelial coagulation and necrosis.

Exposure to hydrogen fluoride may cause systemic effects including cardiotoxicity, secondary to hypocalcaemia, hypomagnesaemia and metabolic acidosis.

## Casualty decontamination at the scene

Hydrogen fluoride is a highly corrosive substance. Burns following exposure to lower concentrations may be delayed for up several hours. If exposure to hydrogen fluoride is known to have taken place, decontamination should still be carried out even in the absence of symptoms. Therefore, following disrobe, improvised wet decontamination should be considered.

### Antidotes

Calcium gluconate gel should be applied to affected areas of skin. For detailed clinical management advice on the use of calcium gluconate see [TOXBASE](#).



## Environment

Inform the [Environment Agency](#) where appropriate and avoid release into the environment.

Spillages, contaminated fire and decontamination run-off should be prevented from entering drains and watercourses.

## Hazard identification

**Table 1a. Standard (UK) dangerous goods emergency action codes for hydrogen fluoride, anhydrous**

<b>UN</b>		1052	Hydrogen fluoride, anhydrous	
<b>EAC</b>		2XE	Use fine water spray. Wear chemical protective clothing with liquid-tight connections for whole body in combination with breathing apparatus [note 1].  Spillages, contaminated fire and decontamination run-off should be prevented from entering drains and surface and groundwaters. There may be a public safety hazard outside the immediate area of the incident [note 2]	
<b>APP</b>		B	Gas-tight chemical protective clothing with breathing apparatus [note 3]	
<b>Hazards</b>	<b>Class</b>	8	Corrosive substance	
	<b>Sub-risks</b>	6.1	Toxic substance	
<b>HIN</b>		886	Highly corrosive substance, toxic	

### Abbreviations

UN = United Nations number.

EAC = emergency action code.

APP = additional personal protection.

HIN = hazard identification number.

### Note to Table 1a

Note 1: Chemical protective clothing with liquid tight connections for whole body (Type 3) conforming to the relevant standards such as BS 8428 or EN 14605 in combination with breathing apparatus conforming to BS EN 137.

Note 2: People should be warned to stay indoors with all doors and windows closed, preferably in rooms upstairs and facing away from the incident. Ignition sources should be



eliminated and ventilation stopped. Effects may spread beyond the immediate vicinity. All non-essential personnel should be instructed to move at least 250 m away from the incident.

Note 3: Chemical protective clothing should be gas-tight conforming to BS EN 943 part 2 in combination with breathing apparatus conforming to BS EN 137.

#### Reference

National Chemical Emergency Centre, part of Ricardo-AEA. '[Dangerous Goods Emergency Action Code List](#)'. The Stationery Office 2023

**Table 1b. Standard (UK) dangerous goods emergency action codes for hydrofluoric acid with more than 60% hydrogen fluoride, packaging group I**

<b>UN</b>		1790	Hydrofluoric acid with more than 60% hydrogen fluoride, packing group I	
<b>EAC</b>		2W	Use fine water spray. Wear chemical protective clothing with liquid-tight connections for whole body in combination with breathing apparatus [note 1].  Spillages, contaminated fire and decontamination run-off should be prevented from entering drains and surface and ground waters. Substance can be violently or explosively reactive	
<b>APP</b>		B	Gas-tight chemical protective clothing with breathing apparatus [note 2]	
<b>Hazards</b>	<b>Class</b>	8	Corrosive substance	
	<b>Sub-risks</b>	6.1	Toxic substance	
<b>HIN</b>		886	Highly corrosive substance, toxic	

### Abbreviations

UN = United Nations number.

EAC = emergency action code.

APP = additional personal protection.

HIN = hazard identification number.

### Notes to Table 1b



Note 1: Chemical protective clothing with liquid-tight connections for whole body (Type 3) conforming to relevant standards such as BS 8428 or EN 14605, in combination with breathing apparatus BS EN 137.

Note 2: Chemical protective clothing should be gas-tight conforming to BS EN 943 part 2 in combination with breathing apparatus conforming to BS EN 137.

### Reference

National Chemical Emergency Centre, part of Ricardo-AEA. '[Dangerous Goods Emergency Action Code List](#)'. The Stationery Office 2023

**Table 1c. Standard (UK) dangerous goods emergency action codes for hydrofluoric acid with more than 60% hydrogen fluoride, packaging group II**

<b>UN</b>		1790	Hydrofluoric acid with more than 60% hydrogen fluoride, packing group II	
<b>EAC</b>		2X	Use fine water spray. Wear chemical protective clothing with liquid-tight connections for whole body in combination with breathing apparatus [note 1].  Spillages, contaminated fire and decontamination run-off should be prevented from entering drains and watercourses.	
<b>APP</b>		–	–	
<b>Hazards</b>	<b>Class</b>	8	Corrosive substance	
	<b>Sub-risks</b>	6.1	Toxic substance	
<b>HIN</b>		86	Corrosive or slightly corrosive substance, toxic	

### Abbreviations

UN = United Nations number.

EAC = emergency action code.

APP = additional personal protection.

HIN = hazard identification number.

### Notes to Table 1c




Note 1: Chemical protective clothing with liquid-tight connections for whole body (Type 3) conforming to relevant standards such as BS 8428 or EN 14605, in combination with breathing apparatus BS EN 137.

### Reference

National Chemical Emergency Centre, part of Ricardo-AEA. '[Dangerous Goods Emergency Action Code List](#)'. The Stationery Office 2023



**Table 2a. The GB classification, labelling and packaging (CLP) regulation for hydrofluoric acid at varying concentrations**

<b>Hazard class and category</b>	Acute Tox. 2	Acute toxicity, category 2 (ingestion, inhalation)	
	Acute Tox. 1	Acute toxicity, category 1 (skin contact)	
	Skin Corr. 1A	Skin corrosion, category 1A	
<b>Hazard statement</b>	H330	Fatal if inhaled	
	H300	Fatal if swallowed	
	H314	Causes severe skin burns and eye damage	
	H310	Fatal in contact with skin	
<b>Signal words</b>	DANGER		




**Table 2b. The GB classification, labelling and packaging (CLP) regulation specific concentration limits for hydrofluoric acid at varying concentrations**

Concentration	Hazard class and category	Hazard statement	
$1\% \leq C < 7\%$	Skin Corr. 1B	H314	Causes severe skin burns and eye damage
$C \geq 7\%$	Skin Corr. 1A	H314	Causes severe skin burns and eye damage
$0,1\% \leq C < 1\%$	Eye Irrit. 2	H319	Causes serious eye irritation

#### Reference

The Health and Safety Executive (HSE). '[GB CLP Regulation](#)' (viewed September 2024)

**Table 3. The GB classification, labelling and packaging (CLP) regulation for hydrogen fluoride**

<b>Hazard class and category</b>	Acute Tox. 2	Acute toxicity, category 2 (ingestion, inhalation)	
	Acute Tox. 1	Acute toxicity, category 1 (skin contact)	
	Skin Corr. 1A	Skin corrosion, category 1A	
<b>Hazard statement</b>	H300	Fatal if swallowed	
	H310	Fatal in contact with skin	
	H314	Causes severe skin burns and eye damage	
	H330	Fatal if inhaled	
<b>Signal words</b>	Danger		

**Reference**

The Health and Safety Executive (HSE). '[GB CLP Regulation](#)' (viewed September 2024)

## Physicochemical properties

**Table 4. Physicochemical properties**

<b>CAS number</b>	7664-39-3
<b>Molecular weight</b>	20.0
<b>Formula</b>	HF
<b>Common synonyms</b>	Hydrofluoric acid, anhydrous hydrofluoric acid
<b>State at room temperature</b>	Colourless gas or colourless fuming liquid
<b>Volatility</b>	Vapour pressure: 917 mmHg at 25°C
<b>Specific gravity</b>	1.0 (water = 1) liquid at 4°C
<b>Vapour density</b>	0.7 at 65°C to 2.6 at 20°C to
<b>Flammability</b>	Not flammable
<b>Lower explosive limit</b>	-
<b>Upper explosive limit</b>	-
<b>Water solubility</b>	Soluble in water
<b>Reactivity</b>	<p>The gas is heavier than air. Reacts violently with many compounds generating a fire and explosion hazard. Reacts violently with bases and is corrosive to most common metals forming a flammable/explosive gas. Attacks glass, some forms of plastic, rubber and coatings.</p> <p>When heated to decomposition it produces highly corrosive fumes of hydrogen fluoride</p>
<b>Odour</b>	Strong, irritating odour
<b>Structure</b>	H-F

### References

International Programme on Chemical Safety. 'International chemical safety card entry for hydrogen fluoride'. ICSC 0283 2017

National Library of Medicine (US), National Center for Biotechnology Information. '[PubChem Compound Summary for CID 14917, Hydrofluoric acid](#)'. 2004-.

## Reported effect levels from authoritative sources

**Table 5. Exposure by inhalation**

ppm	mg/m <sup>3</sup>	Signs and symptoms	Reference
0.5-4.5	0.32-2.9	Very mild eye irritation	a
30-50	19.4-32.3	Mild eye irritation	a
100	64.5	Marked irritation	a

Values relate to fluorine which forms hydrofluoric acid in contact with the moisture on eyes and skin.

These values give an indication of levels of exposure that can cause adverse effects. They are not health protective standards or guideline values.

### Reference

a. Agency for Toxic Substances and Disease Registry (ATSDR). '[Toxicological profile for Fluorides, Hydrogen Fluoride, and Fluorine](#)'. U.S. Department of Health and Human Services 2003

**Table 6. Exposure by skin**

%	Signs and symptoms	Reference
<20	Delayed onset of potentially severe burns (up to 24 hours)	a
>20	Systemic effects may develop	a
>40	Rapid onset of effects, immediate pain and skin damage	a
70	Death by cardiac arrest has been reported	a

These values give an indication of levels of exposure that can cause adverse effects. They are not health protective standards or guideline values.

### Reference

a. International Programme on Chemical Safety. '[Poisons Information Monograph 268: Hydrogen fluoride](#)'. World Health Organization 1995

## Published emergency response guidelines

**Table 7. Acute exposure guideline levels (AEGLs)**

	Concentration (ppm)				
	10 min	30 min	60 min	4 hours	8 hours
<b>AEGL-1</b> [note 1]	1.0	1.0	1.0	1.0	1.0
<b>AEGL-2</b> [note 2]	95	34	24	12	12
<b>AEGL-3</b> [note 3]	170	62	44	22	22

### Notes to Table 7

Note 1: Level of the chemical in air at or above which the general population could experience notable discomfort.

Note 2: Level of the chemical in air at or above which there may be irreversible or other serious long-lasting effects or impaired ability to escape.

Note 3: Level of the chemical in air at or above which the general population could experience life-threatening health effects or death.

### Reference

US Environmental Protection Agency. '[Acute Exposure Guideline Levels](#)' (viewed in September 2024)

## Exposure standards, guidelines or regulations

**Table 7. Occupational standards**

	LTEL (8-hour reference period)		STEL (15-min reference period)	
	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
<b>WEL</b>	1.8	1.5	3	2.5

### Abbreviations

WEL = workplace exposure limit.

LTEL = long-term exposure limit.

STEL = short-term exposure limit.

### Reference

HSE. '[EH40/2005 Workplace Exposure Limits](#)'. Fourth Edition (2020)

**Table 9. Public health guidelines and standards**

<b>Drinking water standard</b>	No standard available
<b>WHO guideline for drinking water quality</b>	No guideline available
<b>WHO air quality guideline</b>	No guideline available

## Health effects

Dermal, eye and inhalation exposure are more common than exposure via ingestion. Systemic toxicity may follow dermal exposure, ingestion or inhalation.

Highly corrosive and readily penetrates intact skin, nails and deep tissue layers, causing severe chemical burns.

**Table 9. Signs or symptoms of acute exposure**

Route	Signs and symptoms
<b>Inhalation</b>	Irritation of eyes and nose with sore throat, cough, chest tightness, headache, ataxia and confusion. Dyspnoea and stridor due to laryngeal oedema may follow. Haemorrhagic pulmonary oedema with increasing breathlessness, wheeze, hypoxia and cyanosis may take up to 36 hours to develop.
<b>Ingestion</b>	Burning of the mouth and throat with retrosternal and abdominal pain. The larynx may also be affected causing oedema, airway obstruction and difficulty in clearing bronchial secretions. There is often hypersalivation, vomiting, haematemesis and hypotension. Oesophageal or gastric perforation may occur.
<b>Eyes</b>	Conjunctivitis, conjunctival oedema, corneal epithelial coagulation, corneal opacity and necrosis may develop.
<b>Dermal</b>	<p>The severity of the hydrofluoric acid-induced burn is generally proportional to the concentration of the acid, the duration of exposure and the rapidity of treatment with calcium gluconate. Severe skin burns may result from even one minute of untreated exposures to concentrated solutions.</p> <p>Even low concentration exposures can produce severe burns if left untreated. For example, if a contaminated shoe is not removed and treatment not given, even after a low concentration exposure, a deep and penetrating ulcer may develop.</p> <p>Pain is often disproportionate to the size of the burn and may be delayed by several hours. There may be a blue-grey discolouration of the skin or ulceration and necrosis in severe cases. Severe and deep burns are extremely painful and difficult to heal.</p>
<b>Systemic features</b>	<p>Hypocalcaemia, hypomagnesaemia and metabolic acidosis. Hyperkalaemia is also common.</p> <p>Myoclonus, tetany, convulsions, CNS depression, cardiac conduction.</p>

Route	Signs and symptoms
	disturbances and arrhythmias (prolonged QT interval, ventricular tachycardia and ventricular fibrillation) may occur secondary to hypocalcaemia and other electrolyte disturbances.

Reference

[TOXBASE](#). Hydrofluoric acid (Hydrogen fluoride), November 2022 (viewed September 2024)



## Decontamination at the scene

### Chemical specific advice

The approach used for decontamination at the scene will depend upon the incident, location of the casualties and the chemicals involved. Therefore, a risk assessment should be conducted to decide on the most appropriate method of decontamination.

Hydrogen fluoride is a highly corrosive substance. Burns following exposure to lower concentrations may be delayed for up to several hours. If exposure to hydrogen fluoride is known to have taken place, decontamination should still be carried out even in the absence of symptoms. Therefore, following disrobe, improvised wet decontamination should be considered.

People who are processed through improvised decontamination should subsequently be moved to a safe location, triaged and subject to health and scientific advice. Based on the outcome of the assessment, they may require further decontamination.

Emergency services and public health professionals can obtain further advice from the UK Health Security Agency (UKHSA) Radiation, Chemicals and Environment Directorate using the 24-hour chemical hotline number: 0344 892 0555.

### Disrobe

The disrobe process is highly effective at reducing exposure to HAZMAT/CBRN material when performed within 15 minutes of exposure.

Therefore, disrobe must be considered the primary action following evacuation from a contaminated area.

Where possible, disrobing should be conducted at the scene and by the casualty themselves. Disrobing should be systematic to prevent transfer of contaminant from clothing to skin. Clothing should not be pulled over the head if possible.

Clothing stuck to the casualty by the contaminant should not be forcefully removed, as this risks causing further harm.

Consideration should be given to ensuring the welfare and dignity of casualties as far as possible. Immediately after decontamination the opportunity should be provided to dry and dress in clean robes or clothes.

## Improvised decontamination

Improvised decontamination is an immediate method of decontamination prior to the use of specialised resources. This should be performed on all contaminated casualties unless medical advice is received to the contrary. Improvised dry decontamination should be considered for an incident involving chemicals unless the agent appears to be corrosive or caustic.

Unprotected first responders and members of the public should not approach casualties incapacitated by exposure to administer improvised decontamination, as they may be exposed to contaminants and become a casualty themselves.

Important note: Improvised decontamination should continue until more structured interventions such as Interim or Specialist Operational Response are present.

## Improvised dry decontamination

Improvised dry decontamination should be considered for an incident involving Hydrogen fluoride unless casualties are demonstrating obvious signs of chemical burns or skin irritation.

Any available dry absorbent material can be used such as kitchen towel, paper tissues (for example blue roll) and clean cloth.

Exposed skin surfaces should be blotted first and then rubbed, starting with the face, head, and neck, and moving down and away from the body.

Blotting and rubbing should not be too aggressive, as it could drive contamination further into the skin.

Casualties should also blow their nose to remove contaminants from the nasal cavities.

All waste material arising from decontamination should be left in situ, and ideally bagged, for disposal at a later stage.

## Improvised wet decontamination

Improvised wet decontamination should be considered for an incident involving hydrogen fluoride.

Water should only be used for decontamination where casualty signs and symptoms are consistent with exposure to caustic or corrosive substances such as acids or alkalis.

Wet decontamination may be performed using copious amounts of water from any available source such as taps, showers, water bottles, fixed installation hose-reels and sprinklers to gently rinse the affected skin. Other natural sources of water may be considered unless this creates greater risks to the individuals affected. Wet wipes or baby wipes may be used as an effective alternative.

Improvised decontamination should not involve overly aggressive methods to remove contamination as this could further damage affected tissues and drive the contamination further into the skin.

Where appropriate, seek professional advice on how to dispose of contaminated water and prevent run-off going into the water system.

## Additional notes

Following improvised decontamination, remain cautious and observe for signs and symptoms in the decontaminated person and in unprotected staff.

If water is used to decontaminate casualties this may be contaminated, and therefore hazardous, and a potential source of further contamination spread.

All materials (paper tissues and so on) used in this process may also be contaminated and, where possible, should not be used on new casualties.

The risk from hypothermia should be considered when disrobe and any form of wet decontamination is carried out.

People who are contaminated should not eat, drink or smoke before or during the decontamination process and should avoid touching their face.

When vulnerable people are affected by a hazardous substance, they may need additional support to remove themselves, their clothing or the substance.

Casualties should remain in the area and should not leave to seek care at a hospital, as this presents a contamination risk. Further care will be administered on site by the appropriate emergency services.

## Interim wet decontamination

Interim decontamination is the use of standard Fire and Rescue Service equipment to provide a planned and structured decontamination process prior to the availability of purpose-designed decontamination equipment.

## Decontamination at the scene references

Home Office. [‘Initial operational response to a CBRN incident.’](#) Version 2.0 (July 2015)

NHS England. [‘Emergency Preparedness, Resilience and Response \(EPRR\): Guidance for the initial management of self-presenters from incidents involving hazardous materials.’](#) (February 2019)

JESIP. [‘Initial Operational Response IOR to Incidents Suspected to Involve Hazardous Substances or CBRN Materials’](#) (June 2024)

## Clinical decontamination and first aid

Clinical decontamination is the process where trained healthcare professionals, using purpose-designed decontamination equipment, treat contaminated persons individually.

[Detailed information on clinical management](#) can be found on TOXBASE.

### Important notes

Calcium gluconate gel should be applied to affected areas of skin. For detailed clinical management advice on the use of calcium gluconate see [TOXBASE](#).

Once body surface contaminants have been removed or if your patient was exposed by ingestion or inhalation, the risk that secondary care givers may become contaminated is very low. Secondary carers should wear standard hospital PPE as a precaution against secondary contamination from vomit and body fluids.

If the patient has not been decontaminated following surface contamination, secondary carers must wear appropriate NHS PPE for chemical exposure to avoid contaminating themselves.

The area should be well ventilated.

For comprehensive clinical advice consult [TOXBASE](#) directly.

## Clinical decontamination following surface contamination

Avoid contaminating yourself.

Carry out decontamination after resuscitation. This should be performed in a well-ventilated area, preferably with its own ventilation system.

Contaminated clothing should be removed, double-bagged, sealed and stored safely.

Decontaminate open wounds first and avoid contamination of unexposed skin. Any particulate matter adherent to skin should be removed and the patient washed with copious amounts of water under low pressure for at least 10 to 15 minutes, or until pH of skin is normal (pH of the skin is 4.5 to 6 although it may be closer to 7 in children, or after irrigation). The earlier irrigation begins, the greater the benefit.

Pay special attention to skin folds, fingernails and ears.

## Dermal exposure

Do not delay decontamination if the patient is responsive.

Remove contaminated clothing and footwear

Severe burns may result from even one minute of untreated exposures to concentrated solutions.

Decontaminate any exposed skin areas urgently by:

- irrigating contaminated areas with copious volumes of water for 1 minute
- applying calcium gluconate gel repeatedly, at least until pain has ceased - for detailed clinical management advice on the use of calcium gluconate see TOXBASE
- for burns to the hand the use of a surgical glove containing calcium gluconate may be effective at reducing pain

Water decontamination allows dilution and mechanical rinsing of hydrofluoric acid from the skin but may enhance penetration. Calcium gluconate binds and reduces absorption and penetration of hydrogen fluoride.

Monitor vital signs and cardiac rhythm. Check the capillary blood glucose.

Perform a 12-lead ECG in all patients who require assessment.

If skin contamination is extensive and clothing affected, be aware of the possibility of inhalation injury.

Carry out other supportive measures as indicated by the patient's clinical condition.

## Ocular exposure

Remove contact lenses if present.

Anaesthetise the eye with a topical local anaesthetic (for example, oxybuprocaine, amethocaine or similar). However, do not delay irrigation if local anaesthetic is not immediately available.

Immediately irrigate the affected eye thoroughly with 1,000mL 0.9% saline for at least 30 minutes or, if available, with Hexafluorine®. Experimental evidence suggests that Hexafluorine is of greater benefit than water in preventing or reducing ophthalmic damage.

Do not instil calcium gluconate in the eye, as evidence for its benefit is lacking, and it may be toxic to the conjunctiva.

Eyelid exposures can be treated with calcium gluconate gel. For detailed advice see [TOXBASE](#).

Any particles lodged in the conjunctival recesses should be removed.

Repeated instillation of local anaesthetics may reduce discomfort and help more thorough decontamination. However, prolonged use of concentrated local anaesthetics is damaging to the cornea.

Patients with corneal damage, those who have been exposed to strong concentrations and those whose symptoms do not resolve rapidly should be discussed urgently with an ophthalmologist.

Carry out other supportive measures as indicated by the patient's clinical condition.

## Ingestion

Maintain airway and ensure adequate ventilation.

Gut decontamination is contra-indicated.

Do not give neutralising chemicals as heat produced during neutralisation reactions may increase injury.

In severely affected patients, especially those with tachypnoea, stridor or upper airway damage, critical care input is essential with urgent assessment of the airway. A supraglottic-epiglottic burn with erythema and oedema is usually a sign that further oedema will occur that may lead to airway obstruction.

Children are at increased risk of airway obstruction.

Monitor vital signs and cardiac rhythm; check the capillary blood glucose.

Check and record pupil size.

Perform a 12-lead ECG in all patients who require assessment.

Carry out other supportive measures as indicated by the patient's clinical condition.

## Inhalation

Maintain a clear airway and ensure adequate ventilation.

Administer oxygen to achieve adequate oxygenation.

Urgent assessment of the airway is required.

In severely affected patients, especially those with tachypnoea, stridor or upper airway damage, critical care input is essential with urgent assessment of the airway. A supraglottic-epiglottic burn with erythema and oedema is usually a sign that further oedema will occur that may lead to airway obstruction.

Children are at increased risk of airway obstruction.

Monitor vital signs and cardiac rhythm. Check the capillary blood glucose.

Check and record pupil size.

Perform a 12-lead ECG in all patients who require assessment.

Carry out other supportive measures as indicated by the patient's clinical condition.

## Clinical decontamination and first aid references

[TOXBASE](#) (viewed September 2024)

[TOXBASE](#) Hydrofluoric acid (2022)



## About the UK Health Security Agency

UKHSA is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

UKHSA is an executive agency, sponsored by the Department of Health and Social Care.

This document from the UKHSA Radiation, Chemicals and Environment Directorate reflects understanding and evaluation of the current scientific evidence as presented and referenced here.

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