Australian Government
Department of Health, Disability and Ageing
Australian Industrial Chemicals Introduction Scheme

Halons listed on the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989

Evaluation statement (EVA00200)

16 December 2025

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AICIS evaluation statement (EVA00200)

Subject of the evaluation

Halons listed on the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*

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Methane, bromochlorodifluoro-	353-59-3
Ethane, dibromotetrafluoro-	25497-30-7

Reason for the evaluation

Evaluation is needed to provide information on environmental risks.

Parameters of evaluation

The chemicals are a group of halons that are listed on the Australian Inventory of Industrial Chemicals (the Inventory). These chemicals have been assessed as a group as they are listed on Schedule 1 of the *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989* (OPSGG Act) under the following chemical names:

1. Bromochlorodifluoromethane (Halon-1211) (CAS RN 353-59-3)
2. Bromotrifluoromethane (Halon-1301) (CAS RN 75-63-8)
3. Dibromotetrafluoroethane (Halon-2402) (CAS RN 124-73-2; 25497-30-7).

The risk posed to the environment associated with the industrial use of these chemicals has been evaluated according to the following parameters:

- Introduction and use of the chemicals in line with the requirements of the OPSGG Act and associated *Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995* (OPSGG Regulations), administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

These chemicals are internationally recognised as hazardous to the atmosphere. Evaluation according to persistence, bioaccumulation, and toxicity criteria is not relevant and has not

been performed. While hazards and exposure have both been considered in this evaluation, 'predicted no effect concentrations' have not been calculated.

In this evaluation, 'halon' is used as a generic term for any singular chemical in the group, and 'halons' is used as a collective term.

Summary of evaluation

Summary of introduction, use and end use

Chemicals in this evaluation are halons predominately used as fire extinguishing agents in Australia. Use of these chemicals results in release to the atmosphere.

The chemicals in this evaluation are listed on Annex A of the Montreal Protocol on Substances that Deplete the Ozone Layer (UNEP 1987), and Schedule 1 of the OPSGG Act. The Montreal Protocol is a multilateral environmental agreement that aims to phase out the production and consumption of ozone depleting substances, including halons. The OPSGG Act implements Australia's obligations under the Montreal Protocol (DCCEEW 2019).

All introduction and use of chemicals in this evaluation are subject to the OPSGG Act and associated OPSGG Regulations. The controls under the OPSGG Act manage the exposure of the environment to halons by restricting the allowed uses of halons to essential uses, and by enforcing licensing requirements.

Use of halon in Australia is currently restricted to critical fire protection systems used in the aviation, shipping and defence sectors (DCCEEW 2019). Under the OPSGG Act, these uses are regulated by a national system of licensing and permits supported by active compliance monitoring.

Australia effectively ceased introducing new halon at the end of 1993. Used halon continues to be imported under licence into Australia, but mainly to be destroyed, reprocessed and/or re-exported (DCCEEW 2024). Small amounts of halon 1301 and 1211 are also imported into Australia under licence in pre-charged equipment, but these imports have declined in recent years (DCCEEW 2024). Halon 2402 is uncommon and not actively imported into Australia, with the chemical having only limited use in military fire protection systems (FPA Australia 2018).

Australia maintains stocks of halons through the National Halon Bank (NHB) (DCCEEW n.d.-a). Halon held by the NHB generally originates from waste halon and halon recovered from decommissioned systems. Consistent with OPSGG Regulations, the NHB only makes halon available under permit for essential uses without alternatives. Contaminated halon is generally destroyed (DCCEEW 2019).

Australian emissions of halons follow a general downwards trend (DCCEEW 2019). For example, estimated Australian emissions were 63 tonnes of halon 1301 and 1211 in 2022, down from 136 tonnes in 2001 (CSIRO 2024). These emissions are expected to continue declining as the remaining essential uses are phased out.

Environment

Summary of environmental hazards

Chemicals in this evaluation are hazardous to the environment. These halon chemicals break down in the stratosphere releasing reactive bromine that degrades the ozone layer (DCCEEW 2019). Degradation of the ozone layer exposes the environment to higher levels of harmful ultraviolet (UV-B) radiation from the sun (DCCEEW n.d.-b). This can lead to significant and widespread adverse effects in the environment. For example, elevated UV-B radiation can disrupt the development and survival of aquatic organisms in surface water, and may affect biogeochemical cycles, which are important for regulating atmospheric concentrations of greenhouse and chemically important trace gases (EEAP 2023).

Environmental hazard classification

Chemicals in this evaluation satisfy the criteria for classification according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) (UNECE 2017). These halon chemicals are listed in the Annexes to the Montreal Protocol and meet the criteria as follows. This evaluation does not consider classification of physical and health hazards:

Environmental Hazard	Hazard Category	Hazard Statement
Hazardous to the ozone layer	H420	Harms public health and the environment by destroying ozone in the upper atmosphere.

Summary of environmental risk

Chemicals in this evaluation are hazardous to the environment. The use of these chemicals results in release to the atmosphere. These halon chemicals degrade the ozone layer, which can lead to significant and widespread environmental harm.

Chemicals in this evaluation are restricted in Australia to a limited number of essential uses. Introduction and use of these chemicals is controlled through a national system of licensing and permits established under the OPSGG Act and Regulations. This limits the potential releases of the chemicals into the environment.

While significant hazards exist with the chemicals in this evaluation, controls are in place through the OPSGG Act and Regulations to manage environmental exposure and subsequent risk to the environment from introduction and use of the chemicals.

Conclusions

The Executive Director is satisfied that the identified risks to the environment from the introduction and use of these industrial chemicals can be managed.

Note:

1. Obligations to report additional information about hazards under section 100 of the *Industrial Chemicals Act 2019* apply.
2. A person introducing these chemicals should be aware of their obligations under environmental, workplace health and safety and poisons legislation as adopted by the relevant state or territory.

Supporting information

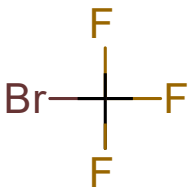
Grouping rationale

This evaluation considers the environmental risk of four halons. These chemicals have been assessed as a group as they are listed on Schedule 1 of the OPSGG Act under the following chemical names:

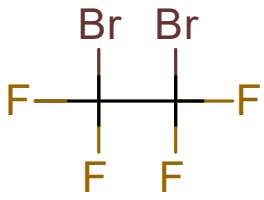
1. Bromochlorodifluoromethane (Halon-1211),
2. Bromotrifluoromethane (Halon-1301),
3. Dibromotetrafluoroethane (Halon-2402).

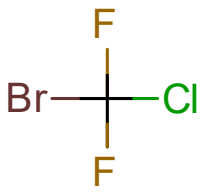
Dibromotetrafluoroethane (Halon-2402) can refer to any positional isomer of dibromotetrafluoroethane. Therefore, it captures both CAS RN 124-73-2 and CAS RN 25497-30-7 (see **Chemical identity**). CAS RN 27336-23-8 would also be captured by this entry, but this chemical is not listed on the Inventory.

Chemical identity

CAS number	75-63-8
CAS name	Methane, bromotrifluoro-
Molecular formula	$CBrF_3$
Associated names	Halon 1301
Molecular weight (g/mol)	148.91
SMILES (canonical/isomeric)	FC(F)(F)Br
Structural formula	

CAS number	124-73-2
CAS name	Ethane, 1,2-dibromo-1,1,2,2-tetrafluoro
Molecular formula	$C_2Br_2F_4$
Associated names	Halon 2402

Molecular weight (g/mol)	259.82
SMILES (canonical/isomeric)	FC(F)(Br)C(F)(F)Br
Structural formula	

CAS number	353-59-3
CAS name	Methane, bromochlorodifluoro-
Molecular formula	$CBrClF_2$
Associated names	Halon 1211
Molecular weight (g/mol)	165.36
SMILES (canonical)	FC(F)(Cl)Br
Structural formula	

CAS number	25497-30-7
CAS name	Ethane, dibromotetrafluoro-
Molecular formula	$C_2Br_2F_4$
Associated names	Halon 2402
Molecular weight (g/mol)	259.82
SMILES (canonical/isomeric)	FC(F)(Br)C(F)(F)Br & FC(Br)(Br)C(F)(F)F

Additional chemical identity information

The chemical contains 2 positional isomers, ethane, 1,1-dibromo-1,2,2,2-tetrafluoro- (CAS RN 27336-23-8) and ethane, 1,2-dibromo-1,1,2,2-tetrafluoro- (CAS RN 124-73-2).

International regulatory status

United Nations

Chemicals in this evaluation are listed as halons on Annex A of the Montreal Protocol on Substances that Deplete the Ozone Layer (UNEP 1987). The Montreal Protocol is an international agreement that aims to protect the ozone layer by phasing out the production and consumption of ozone depleting substances, such as chlorofluorocarbons (CFCs), and halons.

Existing Australian regulatory controls

Environment

Chemicals in this evaluation are listed as halons on Schedule 1 of the OPSGG Act. The OPSGG Act implements Australia's obligations under several international agreements, including the Montreal Protocol on Substances that Deplete the Ozone Layer (UNEP 1987).

Australia controls the introduction of halon and equipment containing halon through licensing under the OPSGG Act and Regulations. Introduction and use of halon is controlled through a national system of licensing and permits established under the OPSGG Regulations. These licences set out the allowable introduction, use and reporting requirements for the chemicals in Australia.

Use of halon is prohibited in Australia except for a small number of approved essential uses in the civil aviation, maritime and defence sectors, where no practical alternatives are available (DCCEEW 2019). Possession of halon requires a halon special permit or an appropriate special circumstances exemption, except for limited uses specified in the Regulations. Additional licences are required to handle or trade halon as a scheduled fire extinguishing agent.

Since no essential use exemption applications for the introduction of new halon have been submitted by Australia to the Montreal Protocol, introduction of new halon is effectively prohibited in Australia (DCCEEW 2019).

Import and export of used halon (as defined in the OPSGG Act) is also prohibited in Australia except where a used substances licence has been granted. Used substances licences are considered on a case-by-case basis considering Australia's international obligations, demand, and domestic phase-out policy (DCCEEW 2019).

Introduction and export of equipment containing halon is also prohibited in Australia except where an equipment licence has been granted, or an exemption or exception applies under the Act. These licences are only granted under specific circumstances (DCCEEW 2019):

- the equipment is essential for medical, veterinary, defence, industrial safety, or public safety, purposes, and no practical alternative exists to the use of scheduled substances in the operation or manufacture, as the case requires, of the equipment if it is to continue to be effective for such a purpose; or

- because of the requirements of a law concerning the manufacture or use of the equipment, there is no practical alternative to the use of scheduled substances in the operation or manufacture, as the case requires, of the equipment; or
- the equipment is for use in conjunction with the calibration of scientific, measuring or safety equipment.

References

CSIRO (Commonwealth Science and Industrial Research Organisation) (2024) *CSIRO report on Australian and global Synthetic Greenhouse Gas emissions 2024*, DCCEEW, accessed 18 July 2025.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2019) *The Australian Halon Management Strategy*, DCCEEW, accessed 18 July 2025.

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FPA Australia (Fire Protection Association Australia) (2018) *Gaseous Fire Suppression Systems in Australia (Stage 1)*, DCCEEW, accessed 9 September 2025.

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