**Form for the collection of information on PFOS, its salts, PFOSF and their related chemicals to be used in the evaluation of the continued need for the various acceptable purposes and specific exemptions**

**Note:**

This form is to be used by Parties and observers for submitting information on PFOS, its salts, PFOSF and their related chemicals,[[1]](#footnote-2) which will be considered in the evaluation pursuant to paragraphs 5 and 6 of part III of Annex B to the Convention to be undertaken by the Conference of the Parties at its ninth meeting in 2019.

The information submitted by Parties and observers will be compiled and made available on the website of the Stockholm Convention. In accordance with decision SC-8/5 and the process set out in the annex to decision SC-6/4, the information submitted by Parties and observers in this form, together with the information submitted by Parties in the process of reporting pursuant to Article 15, will be used by the Persistent Organic Pollutants Review Committee in its preparation of the report on the assessment of alternatives to PFOS, its salts and PFOSF and by the Secretariat in its preparation of the report on the evaluation of PFOS, its salts and PFOSF.

The following guidance contains information that may be useful in filling out this format:

1. Consolidated guidance on alternatives to PFOS and its related chemicals (2017);[[2]](#footnote-3)
2. Guidance for the inventory of PFOS and related chemicals listed under the Stockholm Convention (2017); [[3]](#footnote-4)
3. Guidance on best available techniques and best environmental practices for the use of PFOS and related chemicals listed under the Stockholm Convention (2017);[[4]](#footnote-5)
4. General guidance on considerations related to alternatives and substitutes for listed persistent organic pollutants and candidate chemicals (2009);[[5]](#footnote-6)
5. Recommendations on risk reduction for PFOS, its salts and PFOSF set out in the annex to decision POPRC-6/2 (2010).[[6]](#footnote-7)

The information should preferably be submitted in English.

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| Submitter information | |
| Name of the submitting Party/observer | Canada |
| Contact details (name, telephone, e‑mail) of the submitting Party/observer | Jean-François Ferry  819-938-4305  [jean-françois.ferry@canada.ca](mailto:jean-françois.ferry@canada.ca) |
| Date of submission | February 15, 2018 |

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| 1. Information on PFOS, its salts and PFOSF | |
| **1. Production of PFOS, its salts and PFOSF**  Please provide the chemical names/CAS numbers of the chemicals produced.  Please specify the purpose of the production and the years in which the chemicals were produced.  Please provide the quantities in kg/year. | PFOS was never produced in Canada.  The *Prohibition of Certain Toxic Substances Regulations* prohibit the import, manufacture, use, sale and offer for sale of PFOS, and products containing PFOS, with a limited number of exemptions. |
| **2. Import of PFOS, its salts and PFOSF**  Please provide the chemical names/CAS numbers of the chemicals imported.  Please specify the purpose of the import, the countries from which the chemicals were imported and the years in which the chemicals were imported.  Please provide the quantities in kg/year. | Importation of PFOS, its salts and compounds that contain one of the following groups: C8F17SO2, C8F17SO3 or C8F17SO2N (PFOS) in Canada is prohibitedby the *Prohibition of Certain Toxic Substances Regulations*, with a limited number of exemptions.  The Regulations do not prohibit:   * The import of PFOS or a product containing it, if PFOS is incidentally present * The import of PFOS or a product containing it if it is designed for use in photoresists or anti-reflective coatings for photolithography process or photographic films, papers and printing plates * The import of PFOS in aqueous film forming foam present in a military vessel or military fire-fighting vehicle contaminated during a foreign military operation   Canada has no specific information on the quantity that could have been imported from the uses mentioned above.  However, the World Semiconductor Council (WSC) announced in 2017 that the use of PFOS in semiconductor manufacturing had completely ceased[[7]](#footnote-8). |
| **3. Export of PFOS, its salts and PFOSF**  Please provide the chemical names/CAS numbers of the chemicals exported.  Please specify the purpose of the export, countries to which the chemicals were exported and the years in which the chemicals were exported.  Please provide the quantities in kg/year. | Since 2012, the *Export of Substances on the Export Control List Regulations* establish restrictions on the exports of perfluorooctane sulfonates, perfluorooctane sulfonamides and perfluorooctane sulfonyls, which are listed on Part 2 of the Export Control List (ECL). A prior notification of export is required for all exports of substances listed on the ECL.  No notification of any export of Perfluorooctane sulfonates, perfluorooctane sulfonamides and perfluorooctane sulfonyls have been received, therefore the quantity exported from Canada is 0 kg. |
| **4. Use of PFOS, its salts and PFOSF**  Please provide the chemical names/CAS numbers of the chemicals used.  Please specify the purpose of the use and the years in which the chemicals were used.  Please provide the quantities in kg/year. | Use of PFOS, its salts and compounds that contain one of the following groups: C8F17SO2, C8F17SO3 or C8F17SO2N (PFOS) in Canada is prohibited by the *Prohibition of Certain Toxic Substances Regulations*, with a limited number of exemptions.  The Regulations do not prohibit:   * The use of PFOS or a product containing it, if PFOS is incidentally present * The use of PFOS or a product containing it if it is designed for use in photoresists or anti-reflective coatings for photolithography process or photographic films, papers and printing plates * The use of PFOS in aqueous film forming foam (AFFF) present in a military vessel or military fire-fighting vehicle contaminated during a foreign military operation and the use of AFFF at a concentration less than or equal to 10 ppm. * The use of manufactured items containing PFOS if they were manufactured or imported before May 29, 2008   Canada has no specific information on the quantity that could have been used from the uses mentioned above.  Globally, it is also expected that the use of PFOS in the photographic sector is declining rapidly as users move further towards digital imaging.  AFFF containing PFOS have not been manufactured in the U.S. or Europe since 2002.[[8]](#footnote-9) The major suppliers of AFFF in Canada were recently interviewed and they all indicated they no longer use C8 fluorosufactants in their production process. It is estimated that these manufacturers have 90-100% of the firefighting foam market in Canada. |
| **5. Continued need for acceptable purposes and specific exemptions**  If your country is currently registered for any of the acceptable purposes or specific exemptions for PFOS, its salts and PFOSF, please provide information on the review of the continued need for those acceptable purposes or specific exemptions. | Canada supports evaluating the progress that Parties have made towards achieving the ultimate objective of elimination of PFOS and to review the continued need for the specific exemptions and acceptable purposes.  Canada has prohibited all specific exemptions and many of the acceptable purposes.  As such, Canada can support the removal of all specific exemptions and a number of acceptable purposes. |
| **6. Progress in eliminating PFOS, its salts and PFOSF**  Please provide information on the progress in eliminating PFOS, its salts and PFOSF. | Canada has prohibited all specific exemptions and many of the acceptable purposes.  Since 2008, PFOS has been restricted in Canada through the *Perfluorooctane Sulfonate and its Salts and Other Compounds Regulations*, with a limited number of exemptions.  In 2016, PFOS was added to the *Prohibition of Certain Toxic Substances Regulations*, 2012. These regulations include more limited exemptions than the previous regulations. |
| **7. Progress in building the capacity of countries to transfer safely to reliance on alternatives**  Please provide information on the progress in building the capacity of countries to transfer safely to reliance on alternatives. | Canada has been an active contributor through several POPRC and COP intersessional work items and has participated in the development of several documents in relation to PFOS including the *Guidance on alternatives to perfluorooctane sulfonic acid and its salts, perfluorooctane sulfonyl fluoride and their related chemicals.*  Canada has an expert on the best available techniques and best environmental practices (BAT/BEP) committee. This expert group recently developed guidance on BAT/BEP for the use of PFOS and related chemicals listed under the Stockholm Convention.  Canada is also part of the OECD/UNEP Global Perfluorinated Chemicals (PFC) Group which manage the OECD Portal on per and poly-fluorinated chemicals. This portal focuses specifically on per- and polyfluoroalkyl substances (including PFOS) in order to support a global transition towards safer alternatives.  <http://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/alternatives/> |
| **8. Research/development of safe alternatives**  Please provide information on research on and development of safe alternatives to PFOS, its salts and PFOSF as stipulated in paragraph 4 (c) of part III of Annex B to the Convention. | Canada has prohibited all specific exemptions and many of the acceptable purposes.  Alternatives to PFOS substances that are not on the Domestic Substances List are subject to the *New Substances Notification Regulations* under the *Canadian Environmental Protection Act, 1999* (CEPA 1999). These Regulations were created to ensure that no new substances are introduced into the Canadian marketplace before an assessment of whether they are potentially toxic has been completed and any appropriate or required control measures have been taken.  Alternatives to PFOS have already been developed for the majority of uses as a result of the phase-out in production by the major manufacturer between 2000 and 2002. Significant global effort is already being put into the development of alternatives.  Canada has been an active contributor through several POPRC and COP intersessional work items and participated in the development of several document in relation to PFOS including the *Guidance on alternatives to perfluorooctane sulfonic acid and its salts, perfluorooctane sulfonyl fluoride and their related chemicals*.  Canada is also part of the OECD/UNEP Global Perfluorinated Chemicals (PFC) Group which manage the OECD Portal on per and poly-fluorinated chemicals. This portal focuses specifcally on per- and polyfluoroalkyl substances (including PFOS) in order to support a global transition towards safer alternatives.  http://www.oecd.org/chemicalsafety/portal-perfluorinated-chemicals/alternatives/ |

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| 1. Information on sulfluramid   Please skip this section if you are not producing or using sulfluramid. | |
| **1. Production of sulfluramid**  Please specify the purpose of the production and the years in which the chemicals were produced.  Please provide the quantities in kg/year. | Sulfluramid is not produced in Canada.  In Canada, sulfluramid is not registered under the *Pest Control Products Act* (PCPA)*.*Any pesticide imported into, sold or used in Canada must first be registered under the PCPA. |
| **2. Import of sulfluramid**  Please specify the purpose of the import, the countries from which the chemicals were imported and the years in which the chemicals were imported.  Please provide the quantities in kg/year. | Sulfluramid is not imported into Canada.  In Canada, sulfluramid is not registered under the *Pest Control Products Act* (PCPA)*.*Any pesticide imported into, sold or used in Canada must first be registered under the PCPA. |
| **3. Export of sulfluramid**  Please specify the purpose of the export, countries to which the chemicals were exported and the years in which the chemicals were exported.  Please provide the quantities in kg/year. | Sulfluramid is not exported from Canada.  In Canada, sulfluramid is not registered under the *Pest Control Products Act* (PCPA)*.*Any pesticide imported into, sold or used in Canada must first be registered under the PCPA. |
| **4. Use of sulfluramid**  Please specify the purpose of the use and the years in which the chemicals were used.  Please provide the quantities in kg/year. | Sulfluramid is not used in Canada.  In Canada, sulfluramid is not registered under the *Pest Control Products Act* (PCPA). Any pesticide imported into, sold or used in Canada must first be registered under the PCPA.  Canada supports the gathering of information in relation to sulfluramid to determine the global use pattern and to identify and develop suitable alternative chemical and non-chemical approaches. Furthermore, Canada supports discussion regarding the inclusion of sulfluramid as a PFOA related compound due to its potential to degrade to PFOA. |
| **5. Local monitoring of releases of PFOS from the use of sulfluramid**  Please provide information if such local monitoring is conducted. | Since there is no use of sulfluramid in Canada, there is no local monitoring of releases from the use of sulfluramid. |

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| 1. Information on alternatives to PFOS, its salts, PFOSF and their related chemicals (chemical/non-chemical alternatives or processes)   If you are submitting information on several alternatives, please replicate this table and provide information for each alternative. Please provide information with references if available. | | |
| **1. Application**  Please select the relevant application of the alternative. | Acceptable purpose  **X** Photo-imaging  **X** Photo-resist and anti-reflective coatings for semi‑conductors  **X** Etching agent for compound semi-conductors and ceramic filters  **X** Aviation hydraulic fluids | **X** Metal plating (hard metal plating) only in closed-loop systems  **X** Certain medical devices  **X** Fire-fighting foam  Insect baits for control of leaf-cutting ants from *Atta spp.* and *Acromyrmex spp.* |
| Specific exemptions   * Photo masks in the semiconductor and liquid crystal display industries * Metal plating (hard metal plating) * Metal plating (decorative plating) * Electric and electronic parts for some colour printers and colour copy machines | * Insecticides for control of red imported fire ants and termites * Chemically driven oil production * Carpets * Leather and apparel * Textiles and upholstery * Paper and packaging * Coatings and coating additives * Rubber and plastics |
| * Other use (please specify) | |
| **2. Description of alternative**  Please provide the chemical name, CAS number and trade names of the alternative.  Please specify the name of the chemical substituted.  Please provide quantities of production and use of the alternative in kg/year, where relevant.  For non-chemical alternatives or processes, please describe the characteristics of the alternative. | As no Party to the Stockholm Convention is registered for specific exemptions, viable and suitable alternatives exist.  Photo-imaging  To our knowledge, product changes to remove PFOS and major shifts in the photographic industry led to very low quantities of PFOS still being used in that sector. Globally, it is also expected that the use of PFOS in the photographic sector is declining rapidly as users move towards digital imaging.  Several alternatives to PFOS in photography and imaging applications have been identified, and these include digital techniques, telomer-based products of various perfluoroalkyl chain lengths, C3- and C4-perfluorinated compounds, hydrocarbon surfactants and silicone products.[[9]](#footnote-10)  Semi-Conductors Industry  Historically PFOS has been one of the main PFAS used in top anti-reflective coatings. In May 2017, the World Semiconductor Council indicated that their membership had completely phased out PFOS. [[10]](#footnote-11) It is expected that the majority of the sector worldwide has ceased using PFOS.  Aviation hydraulic fluids  Information gathered through consultation indicated that no PFOS is intentionally added to aviation hydraulic fluids.  Metal plating (hard metal plating) only in closed-loop systems  This use was prohibited in Canada in 2008.  Certain medical devices  It is our understanding that use of alternative substances has been implemented such as Poly-para-xylylene (Parylene).  Fire-fighting foam  Foams containing PFOS have not been manufactured in the U.S. or Europe since 2002. Substitutes to the use of PFOS in firefighting foams include C6 fluorotelomers as well as fluorine-free solutions. The actual C6 (or below) fluorosurfactants contained in AFFF formulations are considered proprietary by AFFF manufacturers.  Furthermore, after 2000, significant developments were made to produce a new generation of firefighting foams that were fluorine-free. They contain water-soluble non-fluorinated polymer additives and increased levels of hydrocarbon detergents. Several types of fluorine-free foams are now available commercially in the marketplace.[[11]](#footnote-12) | |
|  | Some manufacturers and end-users have indicated that fluorine-free firefighting foams do not have comparable extinguishing effects as foams with fluorosurfactants. Compared to fluorine-based firefighting foams approximately twice as much water and foam concentrate are needed when extinguishing liquid fires. Some analysis has indicated that fluorine-free firefighting foams may offer less protection against re-ignition, which makes it impossible to apply this alternative for some operations.[[12]](#footnote-13)  It has been estimated that the cost of fluorine-free alternatives is approximately 5-10% higher than for fluorosurfactant foams. Based on information provided by a manufacturer of the fluorine-free alternatives, the cost would fall as market size increases.13 | |
| **3.** **Is the alternative economically viable?**  Please provide information as to whether the alternative is economically viable.  Please provide information on cost-effectiveness, including environmental, health and socio-economic costs.  Please provide information on the general price of the alternative (e.g. USD/kg). | Canada has no further information to provide. | |
| **4. Is the alternative technically feasible? What is its efficacy?**  Please provide information as to whether the alternative has demonstrated equivalent function and provides similar product performance characteristics.  Please provide information on efficacy, including performance, benefits and limitations of the alternative.  Please specify whether the alternative has actually been implemented or is at the trial or proposal stage. | Canada has no further information to provide. | |
| **5. Is the alternative available on the market? How accessible is it?**  Please specify whether the alternative is on the market and ready for immediate use.  Are there geographic, legal or other limiting factors affecting whether the alternative can be used? | Canada has no further information to provide. | |
| **6. Health/environmental effects including POPs characteristics and other hazards**  Please specify the classification according to the Global Harmonization System or other systems, if relevant.  Please provide data used for assessing POPs characteristics (persistence, bioaccumulation, potential for long-range environmental transport, adverse effects) or other hazards.  Please provide information on exposure (e.g. monitoring data) and environmental fate of the chemical. | The following studies pertain to short-chain per- and polyfluoro alkyl substances which are often used as alternatives to PFOS:   * Chu, S.G., J. Wang, G. Leong, L.A. Woodward, R.J. Letcher, Q.X. Li. 2015. Perfluoroalkyl sulfonates and carboxylic acids in liver, muscle and adipose of black-footed albatross *(Phoebastria nigripes)* from Midway Island, North Pacific Ocean. *Chemosphere* 138-60-66. (DOI: 10.1016/j.chemosphere.2015.05.043 * D’Agostino L., S.A. Mabury. 2017. Certain perfluoroalkyl and polyfluoroalkyl substances associated with aqueous film forming foam are widespread in Canadian surface water. Environ.Sci.Technol..( DOI : 10.1021/acs.est.7b03994) * Gobelius, L., J. Lewis, L. Ahrens. 2017. Plant uptake of per- and polyfluoroalkyl substances at a contaminated fire training facility to evaluate the phytoremediation potential of various plant species. Environ.Sci.Technol..( DOI : 10.1021/acs.est.7b02926) * Government of Canada (GOC). 2013. Second Report on Human Biomonitoring of Environmental Chemicals in Canada : Results of the Canadian Health Measures Survey Cycle 2 (2009-2011). <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/environmental-contaminants/second-report-human-biomonitoring-environmental-chemicals-canada-tables-13-1-1-15-12-6.html#tbl-13.8.1> * Kaboré, H.A., S. V. Duy, G. Munoz, L. Méité, M. Desrosiers, J. Liu, T.K. Sory, S. Sauvé. 2017. Worldwide drinking water occurrence and levels of newly-identified perfluoroalkyl and polyfluoroalkyl substances. Sci. Total Environ. 1089-1100:616-617. (DOI: 10.1016/j.scitotenv.2017.10.210) * Letcher, R.J. ,A.D. Morris, M. Dyck, E. Sverko, E. Reiner, D.A.D. Blair, S.G. Chu, L. Shen. 2018. Legacy and new halogenated persistent organic pollutants in polar bears from a contamination hotspot in the Arctic, Hudson Bay Canada. Sci. Total Environ. 610-611:121-136. (DOI: 10.1016/j.scitotenv.2017.08.035 | |
| **7. Risks, taking into account the criteria in Annex D for POPs characteristics and other hazard indicators**  Please provide information on whether the alternative has been thoroughly tested or evaluated to avoid inadvertently increasing risks to human health/environment. | Canada has no further information to provide. | |
| **8. Socio-economic considerations**  Please provide information on socio-economic impacts associated with the alternative. | Canada has no further information to provide. | |
| **9. Any other information** | Canada has no further information to provide. | |

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1. Related chemicals refer to chemicals that contain the structural element of PFOS in their molecular structure and are/were produced from PFOSF as a starting material or an intermediate. [↑](#footnote-ref-2)
2. UNEP/POPS/POPRC.12/INF/15/Rev.1. [↑](#footnote-ref-3)
3. http://chm.pops.int/tabid/3169/Default.aspx. [↑](#footnote-ref-4)
4. http://chm.pops.int/tabid/3170/Default.aspx. [↑](#footnote-ref-5)
5. UNEP/POPS/POPRC.5/10/Add.1. [↑](#footnote-ref-6)
6. UNEP/POPS/POPRC.6/13, annex. [↑](#footnote-ref-7)
7. World Semiconductor Council, (2017), *Joint Statement of the 21st Meeting of World Semiconductor Council (WSC) –* May 18, 2017, Kyoto, Japan [↑](#footnote-ref-8)
8. Fire Fighting Foam Coalition (undated), *Fact Sheet on AFFF Fire Fighting Agents*. [↑](#footnote-ref-9)
9. United Nations Environment Programme (2015), *Guidance on Alternatives to Perfluorooctane Sulfonic Acid, its Salts, Perfluorooctane Sulfonyl Fluoride and their Related Chemicals*. [↑](#footnote-ref-10)
10. World Semiconductor Council, (2017), *Joint Statement of the 21st Meeting of World Semiconductor Council (WSC) – May 18, 2017, Kyoto, Japan.* [↑](#footnote-ref-11)
11. Sontake, Anant R. & Wagh, Sameer M., (2014), *The Phase-Out of Perfluorooctane Sulfonate (PFOS) and the Global Future of Aqueous Film Forming Foam (AFFF), Innovations in Fire Fighting Foam*, published in Chemical Engineering and Science. [↑](#footnote-ref-12)
12. United Nations Stockholm Convention on Persistent Organic Pollutants (June, 2017), Risk Management Evaluation of Pentadecafluorooctanoic Acid (CAS No: 335-67-1, PFOA, Perfluorooctanoic Acid), its Salts and PFOA-Related Compounds. [↑](#footnote-ref-13)