



Français	Contact us	Help	Search	Canada Site
Home	About us	History	FAQ	Site Map



[Notice](#)

Quick Search

Vol. 140, No. 50 — December 16, 2006

- [News and announcements](#)
- [Mandate](#)
- [Consultation](#)
- [Recent Canada Gazette publications](#)
- [Part I: Notices and proposed regulations](#)
- [Part II: Official regulations](#)
- [Part III: Acts of Parliament](#)
- [Learn more about the Canada Gazette](#)
- [Publishing information](#)
- [Publishing requirements](#)
- [Deadline schedule](#)
- [Insertion rates](#)
- [Request for insertion forms](#)
- [Subscription information](#)
- [Useful links](#)
- [Archives \(1998-2005\)](#)

Perfluorooctane Sulfonate and its Salts and Certain Other Compounds Regulations

Statutory authority

Canadian Environmental Protection Act, 1999

Sponsoring department

Department of the Environment

REGULATORY IMPACT ANALYSIS STATEMENT

(This statement is not part of the Regulations.)

Description

The proposed *Perfluorooctane Sulfonate and its Salts and Certain Other Compounds Regulations* (hereinafter referred to as the proposed Regulations) are to be made under subsection 93(1) and section 319 of the *Canadian Environmental Protection Act, 1999* (CEPA 1999). The purpose of the proposed Regulations is to prevent the risks posed to Canada's environment from the use and release of perfluorooctane sulfonate, its salts and certain other compounds that contain the C₈F₁₇SO₂, C₈F₁₇SO₃ or C₈F₁₇SO₂N group (referred to hereinafter as PFOS) by those that either use the substance as such or use certain products containing the substance (referred to hereinafter as "user" or "users"). The proposed Regulations would prohibit the manufacture, use, sale, offer for sale and import of PFOS, as well as manufactured items containing PFOS, other than a limited number of exemptions outlined in the proposed Regulations.

The proposed Regulations will come into force on the day they are registered by the Clerk of the Privy Council.

Background

On July 1, 2006, the Ministers of the Environment and of Health published their final decision on the screening assessment of PFOS in the *Canada Gazette*, Part I, and proposed to recommend that PFOS be added to the List of Toxic Substances in Schedule 1 to CEPA 1999. On July 1, 2006, an order was published in the *Canada Gazette*, Part I, proposing that PFOS be added to the List of Toxic Substances in Schedule 1 of CEPA 1999. The screening assessment report concluded that PFOS meets the criteria set out in paragraph 64(a) of CEPA 1999 and is or may be entering the environment in a quantity or concentration or under conditions that have or may have an immediate or long-term harmful effect on the environment or its biological diversity. However, the human health screening assessment report concluded that current levels of exposure for PFOS are below levels which might affect human health.

PFOS, its salts and certain other compounds belong to the larger class of fluorochemicals referred to as perfluorinated alkyl (PFA) compounds which contain carbons that are completely saturated by fluorine. It is the strength of the carbon-fluorine bonds that contributes to the extreme stability and unique properties of these perfluorochemicals.

Use profile

PFOS substances are not manufactured in or exported from Canada, but in the past, were typically imported as raw chemicals, in products and formulations and in manufactured items. During the 1997 to 2000 time period, approximately 600 tonnes of PFA compounds were imported into Canada, with all PFOS substances accounting for 43% of imported PFA compounds. The primary uses of these substances were applications involving water, oil, soil and grease repellents for fabric, leather, packaging and rugs and carpets, as well as additives in firefighting foams and paints and coatings.

Between 2000 and 2002, the primary international manufacturer of PFOS voluntarily phased out its production of PFOS. The use trend in Canada, therefore, significantly dropped after 2002. Background information collected in support of these Regulations indicates that, since 2002, imports of PFOS as raw chemicals, in products or formulations into Canada have essentially ceased. This finding was then confirmed by a use pattern survey published on January 15, 2005, under the authority of CEPA 1999. The survey targeted manufacturers, exporters and importers of PFOS in amounts exceeding 100 kg and in concentrations of greater than 10 g/kg for the 2004 calendar year. In summary, the survey results indicate that

- There are no manufacturers or exporters of PFOS in Canada;
- Approximately 3 tonnes of PFOS were imported in 2004 for use as a surfactant in fume suppressants for the metal plating sector; and
- With the exception of an estimated 300 tonne stockpile of aqueous film forming foam (AFFF) [representing approximately 3 tonnes of PFOS] used for firefighting, it is very likely that most inventories of PFOS in all other sectors have been depleted.

Based on these survey results, the use of PFOS in areas of concern is discussed below:

Metal plating sector. The chromium electroplating, anodizing and reverse etching sector in Canada represents the largest use of PFOS fume suppressants in Canada. This sector

consists of approximately 219 users, located in British Columbia (29), the Prairie Provinces (43), Ontario (91), Quebec (48), and Atlantic Canada (8). About half of these facilities use fume suppressants that contain PFOS.

PFOS-based surfactants are used in the chromium electroplating, chromium anodizing, reverse etching, electroless nickel-polytetrafluoroethylene plating and in the etching of plastic substrates prior to metallization operations. PFOS may enter the environment via the rinse water that may be discharged to the municipal sewer systems from these operations. PFOS is not removed from wastewater in conventional treatment facilities and has been observed in effluent from primary and secondary wastewater treatment facilities and in the sewage sludge that is generated by wastewater treatment facilities. PFOS is also contained in the metal sludge that is sent off-site to hazardous waste or metal recycling facilities.

Aqueous film forming foams (AFFF) for fire fighting: AFFF is primarily used for fuel-related fires at industrial facilities, in municipalities, military establishments and airports. Releases of PFOS may occur when foam is discharged during testing and training exercises, when fighting fuel fires, during accidental releases or when out-of-date AFFF must be retired and sent for disposal. These activities may result in the direct discharge of AFFF to surface water, groundwater and land. Depending on the nature of the activity, it is not always possible to collect and pre-treat or contain the AFFF residual for proper disposal. With the voluntary phase-out in production by the largest international PFOS manufacturer between 2000 and 2002, PFOS-based AFFF can no longer be purchased. Alternative non-PFOS-based AFFFs now dominate the marketplace. However, since the average useful service life of AFFF can be in the order of 25 years or longer, the existing PFOS-based AFFF stockpiles estimated at 300 tonnes must be addressed. These stockpiles are located at military, petroleum and petrochemical facilities, airports, municipalities and first responder organizations across Canada.

Imported manufactured items: PFOS may also be contained in imported manufactured items. As discussed above, the majority of past PFOS use was as water, oil, soil and grease repellents (e.g. on fabric, leather, paper, packaging, rugs and carpets) and as surfactants (e.g. coating additives). Before the announcement by the largest international PFOS manufacturer in May 2000 to phase out the production of PFOS between 2000 and 2002, approximately 80% of Canadian imports of manufactured items containing PFOS were produced in the United States, with the remaining 20% of the imports coming mainly from Germany and the East Asian countries, namely China and India. The risk of PFOS-related substances being imported into Canada has significantly decreased since the United States and the European Union (EU), which represent a major source of all Canadian imports of products that historically contain PFOS, are currently restricting or planning to restrict PFOS production, use and importation. However, the increasing rate of growth of Asian imports, especially of apparel products, highlights a compliance concern associated with imported products which may contain PFOS. Therefore, despite the voluntary phase-out of PFOS production by the major global manufacturer, and the current low level of PFOS imports, the potential does exist for PFOS and PFOS-containing products and manufactured items to be imported into Canada in greater quantities in the future, as some PFOS production has been identified in other countries.

Environmental objective

The screening assessment report concluded that PFOS substances are entering into the environment in a quantity or concentration or under conditions that have or may have an

immediate or long-term harmful effect on the environment or its biological diversity. Furthermore, the screening assessment report concluded that PFOS and its salts are persistent and a potential risk may occur through bioaccumulation and biomagnification of PFOS in wildlife.

PFOS is present in the environment primarily as a result of human activity and has been detected in animals worldwide. In Canada, PFOS has been detected in species such as fish, fish-eating birds, and Arctic marine mammals far from known sources or manufacturing facilities.

Given the conclusions of the screening assessment report, PFOS, its salts and certain other compounds will be managed as a group under the provisions of CEPA 1999 with the objective of achieving the lowest level of releases to the environment that is technically and economically feasible from all sources.

International actions on PFOS

As detailed below, a number of countries and organizations have either put in place or are proposing management measures to control the manufacture, import, use and releases of PFOS and manufactured articles containing PFOS.

(a) The United States Environmental Protection Agency (US EPA) has adopted federal Significant New Use Rules (SNURs) for 88 PFOS substances which applies to new manufacturers and for new uses of these substances. A SNUR for 183 perfluoroalkyl sulfonate substances was posted in April 2006 for public consultations, and the final publication of the SNUR is expected to be published in 2007. The SNURs require manufacturers and importers to notify the US EPA at least 90 days before new manufacture or import of these substances. This provides the US EPA with the necessary time to evaluate the intended new use and prohibit or limit the new activity, if necessary. While the SNURs do not require current manufacturers to stop manufacturing or selling the substances, the primary manufacturer in the United States voluntarily discontinued production between 2000 and 2002. Therefore, once existing stocks are depleted, the SNURs essentially restrict all manufacture and importation of PFOS. Certain critical use exemptions on manufacturing and imports are provided for in the SNURs, including

- use in aviation hydraulic fluids;
- as a component of a photoresist substance, or as a component of an anti-reflective coating used in a photomicroolithography process to produce semiconductors or similar components of electronic or other miniaturized devices;
- in coatings for surface tension, static discharge, and adhesion control for analog or digital imaging films, papers and printing plates; and
- as an intermediate only to produce other chemical substances to be used solely for the uses listed above.

(b) The Commission of the European Union published a proposed directive relating to restrictions on the marketing and use of PFOS on December 5, 2005. The European Parliament proposed amendments to this directive in June 2006 and approved the final text in October 2006. The restriction will now be introduced as an amendment to the EU legislation on dangerous substances and preparations (Directive 76/769/EEC) and will eventually be incorporated in the Registration, Evaluation and Authorization of Chemicals (REACH) program when it comes into force. The restrictions include the following:

- PFOS and related substances will be banned as substances or constituents of preparations in concentrations equal to or higher than 0.005%, in semi-finished products and articles at a level of 0.1% except for textiles or coated materials in which the restricted amount of PFOS will be 1 µg/m². Exemptions will be considered for PFOS used in anti-reflective coatings for photolithography process, industrial photographic coating, mist suppressants for chromium plating and other electroplating applications, as well as aviation hydraulic fluids;
- stocks of PFOS-based AFFF supplied in the 12 months before the legislation comes into force may be used for a period of 54 months.

(c) Australia has produced two Alerts concerning PFOS through its National Industrial Chemicals Notification and Assessment Scheme (NICNAS). The first Alert indicated the phasing-out of water, oil, soil and grease repellent products containing PFOS by September 2002. As well, the use of PFOS for leather products was to be phased out by March 2003. All other products containing PFOS, including firefighting foams and industrial additives, were to be phased out in Australia by December 2003. The second Alert makes recommendations regarding PFOS, perfluorosulfonates (PFAS) and perfluorooctanic acid (PFOA). These recommendations include

- that PFOS (and PFAS-based chemicals) be used only for essential uses for which there is no suitable alternative, such as certain class B firefighting foams, but not for use in fire training exercises; and
- that caution be used in selecting PFOA as an alternative for PFOS since PFOA may show the same environmental and health concerns as PFOS.

(d) In April 2005, Norway proposed major reductions in releases of PFOS by 2010.

(e) Sweden proposed the listing of PFOS and its precursors in Annex A of the Stockholm Convention on Persistent Organic Pollutants (POPs) in June 2005. At the November 2005 meeting of the Persistent Organic Pollutants Review Committee, it was decided that the screening criteria of the Convention had been fulfilled for PFOS and that an ad hoc working group under the Convention would be established to review the proposal further and to prepare a draft risk profile.

(f) In October 2005, the United Kingdom published a proposed national action plan that would restrict the use and marketing of PFOS and substances that degrade to it.

(g) In December 2005, the Parties to the United Nations Economic Commission for Europe (UNECE) Long-Range Transboundary Air Pollution (LRTAP) Convention's Protocol on POPs agreed that PFOS should be considered as a nominated substance under consideration as a persistent organic pollutant. The Convention will explore management strategies in 2006.

Canadian actions on PFOS

To date, Canada has not regulated the use, manufacture, import or release of PFOS. These proposed Regulations are being taken to protect the environment and in support of international action on PFOS.

The proposed Regulations

The proposed Regulations for PFOS will

- prohibit the manufacture, use, sale, offer for sale and import of PFOS or products containing these substances;
- exempt the use of PFOS-based AFFF manufactured or imported before the coming into force of the proposed Regulations for a period of five years after the coming into force of the proposed Regulations (but this AFFF may not be used for training or testing purposes);
- exempt the use of PFOS-based fume suppressants, and sale, offer for sale and import for that use, for a period of five years after the coming into force of the Regulations for chromium electroplating, chromium anodizing, reverse etching, electroless nickel-polytetrafluoroethylene plating and etching of plastic substrates prior to their metallization;
- exempt the use, sale, offer for sale and import of the following manufactured items: semiconductor or similar components of electronic or other miniaturized devices and photographic films, papers and printing plates;
- exempt the use, sale and offer for sale of manufactured items, that were manufactured or imported before the coming into force of the proposed Regulations; and
- provide standard exemptions for laboratories, scientific research and laboratory analytical standards.

Importers of PFOS-based fume suppressants will be required to submit annual reports detailing types, quantities, sales and end uses for the substances that are imported.

Alternatives

There are a number of alternatives considered to achieve the objective of the proposed Regulations.

Status quo

The presence of PFOS in the environment is primarily due to human activity and evidence indicates that the substance is harmful to wildlife and ecosystem health. In Canada, PFOS are not regulated in any jurisdiction and, therefore, federal action is required to prevent further increases of PFOS concentrations in the Canadian environment.

With the phase-out of PFOS production by the largest global manufacturer between 2000 and 2002, its use has declined significantly in Canada. With the exception of the use of fume suppressants in the chromium electroplating sector, and the expected continued use of large existing stocks of PFOS-based fire fighting foam purchased prior to 2003, in Canada, all other known uses of PFOS have been discontinued and all other existing stockpiles have been depleted. However, the potential for future import, sale, manufacture and use of PFOS in Canada, along with subsequent environmental releases, will continue to exist if the status quo is allowed to continue and control measures are not implemented. Therefore, in order to prevent the re-entry of PFOS into Canada and subsequent PFOS releases to the environment, the status quo cannot be maintained.

Voluntary measures

Since the phase-out of PFOS production by the largest global manufacturer between 2000 and 2002, PFOS use has declined significantly in Canada. Existing inventories of PFOS-based AFFF and the continued use of PFOS-based fume suppressants in chromium electroplating, as well as the possible presence of PFOS in imported manufactured items, are the main areas of continued concern. The use of voluntary measures like Environmental Performance Agreements (EPAs) requires agreement by all stakeholders on the terms of the EPA to ensure their participation. Given the diverse characteristics of the stakeholders and the large numbers of AFFF users, electroplaters and possible importers of manufactured articles containing PFOS, EPAs are not considered an effective tool for phasing out existing uses.

Other voluntary measures (such as the Responsible Care Program, Environmental Leadership Initiatives) were also not considered viable options, as they do not provide sufficient incentives to encourage existing PFOS users to shift away from the substance.

In addition, voluntary tools cannot provide the certainty in achieving the proposed risk management objective. Voluntary measures do not ensure an effective reduction in environmental risks and would not ensure a fair and level playing field. Therefore, the option of voluntary measures is not being considered any further.

Market-based instruments

Market-based tools, which include emission trading programs, financial incentives, deposit-refund systems, environmental charges and other market-based tools, were given due consideration. Tradable units systems were considered neither effective nor practical, as the quantity of PFOS in use is small and establishing an elaborate system of tradeable permits would be an ineffective use of resources. The costs associated with establishing a trading regime for a five-year period prior to the prohibitions coming into force would be high. The efficiency gains from trading over a short time period would be outweighed by the cost of establishing the trading system. For imported manufactured items, manufacturers are outside Canada's jurisdiction and a trading system could not be enforced.

Similarly, deposit-refund systems were also not considered an effective option as PFOS is released during the service life of the consumer product. In some cases, by the end of the product life very small quantities of PFOS remain in the product matrix. Moreover, PFOS cannot be recovered from a product and this makes a deposit-refund scheme inapplicable.

Other market-based tools were also given due consideration. PFOS uses in Canada, other than AFFF, are relatively small and the cost of subsidies is not the most effective way of reducing PFOS use. Environmental charges were not considered to be effective, since the risk management objective is to achieve the lowest level of release to the environment that is technically and economically feasible from all release sources of PFOS, and the ability of a charge rate to achieve this effective prohibition would be highly uncertain. This is particularly the case in the metal plating sector where some firms could continue to pay a charge in order to use the product. A charge rate could be implemented in advance of the proposed Regulations coming into force. However, the number of metal plating and AFFF using facilities is small and, therefore, there could be a risk of high

transaction costs. A charge is feasible for imported manufactured items containing PFOS, but the compliance costs associated with monitoring and verifying the content of PFOS in manufactured items in order to calculate the charge would likely be cost-prohibitive.

The use of economic instruments, therefore, does not present itself as an effective option.

Regulations

To achieve the stated risk management objective, regulatory measures were found to be the most effective and efficient option. Based on a review of the regulatory measures available under CEPA 1999, regulations respecting substances on the List of Toxic Substances were considered to be the most effective. Regulations are able to address various aspects of substance life-cycles, including manufacture, use, sale, offer for sale, import as well as prescribing emissions levels. In addition, exemptions for critical uses can also be provided for specified time frames, especially for uses where technically viable options to the use of specified substances are not yet available. The proposed regulatory measures prohibit the manufacture, use, sale, offer for sale and import of PFOS and specifies the deadlines for the eventual elimination of PFOS use. These proposed regulatory measures are a timely and efficient mechanism to achieve the stated risk management objective.

Benefits and costs

The key assumptions used in the cost-benefit analysis include

Regulatory time frame: The proposed Regulations would come into force in 2008, with the exemption for AFFF and the metal plating sector expiring 5 years later in 2012;

Time span for analysis: A time frame of 25 years is selected to account for the life span of PFOS containing AFFF as well as the service life of metal plating equipment. Thus, the analysis time frame is 2008 to 2032;

Cost and benefit perspective: Only those costs and benefits which directly or indirectly affect Canadians are included in the analysis; and

Discount rate: A discount rate of 5.5%, and all monetized costs and benefits are expressed in 2006 dollars.

The specific costs and benefits of the proposed Regulations are described below.

Costs to the industry

Aqueous film forming foam

The costs associated with prohibiting AFFF will fall upon both public and private sector entities including airports, military facilities and refineries. These costs will relate to the safe disposal of existing stocks of PFOS-based AFFF, as well as the incremental cost of replacing the stock with alternatives. The use of PFOS-based AFFF for training and testing purposes will be prohibited.

Cost assumptions include the following:

- The starting stock of PFOS-based AFFF in 2006 is 300 tonnes of which 1% or 3 tonnes is PFOS. This stock will not increase as PFOS-based AFFF has not been available since 2002-2003. During the 5-year exemption period, the stock of PFOS-based AFFF is expected to decrease marginally at an annual rate in the order of 1% through use and accidental losses. It is also anticipated that users will dispose of their stock during the exemption period (2008 to 2012). This accelerated disposal is attributable to the proposed Regulations. It is assumed that during the exemption period 5% of the stock will be sent annually for thermal destruction. This means that approximately 65 tonnes of AFFF foam containing 0.65 tonnes of PFOS will be disposed of in the 2008 to 2012 exemption period;
- Based on the proposed regulatory schedule, regulatees would have to phase out their use of PFOS-based AFFF by January 1, 2013. Since AFFF has a life span in the order of 25 years, it is reasonable to assume that the entire stock of PFOS-based AFFF will be disposed of and replaced in 20 years (2013 to 2032) after the 5-year exemption period (2008 to 2012). For the cost-benefit analysis, it is assumed that with the prohibition in force, the remaining stock not sent for thermal destruction will be disposed of at a constant rate starting in 2013 until it is entirely depleted in 2032;
- The average disposal costs (thermal destruction) are estimated to be \$1.65 per kg. This is a standard cost for disposing of hazardous waste at a licensed disposal facility using thermal destruction; and
- Actual replacement costs for PFOS-free AFFF have been estimated between \$3.12 per kg and \$3.85 per kg with an average cost of \$3.50 per kg for concentrate based on the prices that are available to large quantity users.

Based on these assumptions, it is estimated that the proposed Regulations would reduce the release of PFOS-based AFFF into the environment in the order of 2.83 tonnes over the 2008 to 2032 period (see Table 1). The present value of the disposal and replacement costs experienced by airports, military facilities and refineries would be in the order of approximately \$727,501 (in 2006 \$) discounted at 5.5% over the 25-year time period.

Table 1: Quantity of PFOS-based AFFF Disposed and the Associated Replacement and Disposal Costs

(Central Value, 25 Years at 5.5% in 2006 \$)

	Exemption Period 2008 to 2012	Prohibition Period 2013 to 2032	Entire Period 2008 to 2032
AFFF and PFOS inventory (tonnes)			
AFFF quantities disposed	65	218	283
PFOS contained in AFFF	0.65	2.18	2.83
Costs (NPV)			
Cost of disposal	\$81,836	\$148,835	\$230,671
Cost of replacement	\$176,263	\$320,567	\$496,830

Total cost	\$258,100	\$469,401	\$727,501
------------	-----------	-----------	-----------

Metal plating

Of the approximate 200 metal plating facilities in Canada, about 110 use fume suppressants, of which in the order of 100 use PFOS-based fume suppressants. Under the proposed Regulations these 100 facilities will either need to switch to non-PFOS-based fume suppressants or move to another control technology such as composite mesh pads or closed covers after the end of the proposed 5-year exemption (by 2013). While there are some alternative formulations of fume suppressants on the market that do not contain PFOS, the industry has been unable to develop formulations with the required performance characteristics to meet the range of technical specifications required in chromium electroplating, chromium anodizing and reverse etching, electroless nickel-polytetrafluoroethylene and etching of plastic prior to metallization. However, in most other PFOS use areas alternative formulations have emerged, as evidenced by the fact that continued PFOS-free alternatives are available in the market since the voluntary phase-out of PFOS between 2000 and 2002.

As a worst case scenario, if no drop-in fume suppressant substitutes become available, the metal plating sector would have to move to an emission control technique such as composite mesh pads or closed covers. Based on analysis conducted for the proposed *Chromium Electroplating, Chromium Anodizing and Reverse Etching Regulations* the incremental costs of moving from fume suppressants to composite mesh pads would vary by firm size, as indicated in Table 2. The distribution by firm size for the 100 metal platers that would need to upgrade to the new emission controls is also provided in Table 2. As indicated, the majority of facilities are in the medium category (52), followed by small (34) and large (14). This sector has been growing at an annual growth rate in the order of 0.8% and 1.4%, with an average of 1.1%. This range is used to grow the number of firms subject to the proposed Regulations over the 2008 to 2032 time period.

Costs are, therefore, either zero if drop-in substitutes become available at no incremental cost or equivalent to the upgrade emission control technology costs provided in Table 2.

Table 2: Incremental Cost per Firm

Upgrading to Improved Emission Controls (2006 \$)

Size	Move to Composite Mesh Pads (CMP)		Current Cost of Fume Suppressant		Additional Cost to Move to CMP	
	Capital Cost	Operations and Maintenance Cost	Capital Cost	Operations Cost	Capital Cost	Operations and Maintenance Cost
Small	\$46,499	\$2,981	\$0	\$1,822	\$46,499	\$1,159
Medium	\$96,320	\$10,965	\$0	\$6,011	\$96,320	\$4,954
Large	\$176,033	\$30,552	\$0	\$31,331	\$176,033	(\$779)

Based on this range of possible costs, the anticipated costs of the proposed Regulations by firm size are \$736,254 for 34 small firms, \$2,984,716 for 52 medium firms and \$773,645 for 14 large firms. The total estimated compliance costs for facilities using PFOS fume suppressants to comply with the proposed Regulations is approximately \$4.5 million (discounted at 5.5% over 25 years). This would result in a reduction in PFOS releases of approximately 86 tonnes over the 2013 to 2032 period.

Imported manufactured items

Import prohibitions are not anticipated to create impacts in Canada, as the European Union and the United States have put in place prohibitions on PFOS use, manufacture and import. Therefore, these impacts are not considered in this analysis. However, there is some concern that without the prohibition in place, some items containing PFOS would enter Canada, as some countries have not banned PFOS use or manufacture. Therefore, some benefits (discussed below) can be attributed to the prohibitions being placed on imported manufactured items in the proposed Regulations.

Costs to the Government

The costs incurred by the federal government would be as a result of enforcement and compliance promotion activities related to the proposed Regulations. For manufactured items, enforcement and compliance promotion activities are likely to benefit from international actions being taken to restrict the use of PFOS. Limited enforcement activities would still be required to ensure that products containing PFOS are not imported into Canada.

With respect to enforcement costs, for the first year following the coming into force of the proposed Regulations, a one-time amount of \$250,000 will be required for the training of enforcement officers. In addition, for the first year following the delivery of the training, the enforcement costs are estimated to require an annual budget of \$56,220 broken down as follows: \$37,750 for inspections (which includes operations and maintenance costs, transportation and sampling costs), \$14,330 for investigations and \$4,140 for measures to deal with alleged violations (including environmental protection compliance orders and injunctions).

For years two through five, the enforcements costs are estimated to require an annual budget of \$74,316 broken down as follows: \$37,750 for inspections (which includes operations and maintenance costs, transportation and sampling costs), \$14,330 for investigations, \$4,140 for measures to deal with alleged violations (including environmental protection compliance orders and injunctions) and \$18,096 for prosecutions.

For subsequent years (years 6 to 25), the enforcements costs are estimated to require an annual budget of \$5,552 for inspections (which includes operations and maintenance costs, transportation and sampling costs), \$85,980 for six investigations and \$18,096 for one prosecution over the 25-year time frame.

With respect to compliance promotion costs, the first year following the coming into force of the proposed Regulations is estimated to cost \$128,000. Activities could include mail-outs, information sessions, site visits, developing and distributing compliance promotion material, a Web site, presentations and trade shows, conferences and industry meetings,

responding to and tracking inquiries, and contributing to the compliance promotion database. Costs in years two through five are \$41,000, \$6,500, \$34,000 and \$6,500 respectively for a total five-year expenditure on compliance promotion activities of \$216,000. The increase in expenditures for year four is to increase compliance promotion activities in advance of the planned end of the five-year exemptions for the use of PFOS-based AFFF and fume suppressants. Note that a higher level of effort for compliance promotion may be required if, following enforcement activities, compliance with the Regulations is found to be low.

The present value of federal government enforcement costs over the 25-year time frame are in the order of approximately \$570,450, while compliance promotion costs are approximately \$176,203 (2006 \$ at a 5.5% discount rate). Total government costs are, therefore, estimated to be approximately \$746,653 (2006 \$ at a 5.5% discount rate).

Total costs of the proposed Regulations

The present value of total industry and government costs associated with the proposed Regulations over the 25-year period are estimated to be approximately \$5.97 million (2006 \$ discounted at 5.5%).

Benefits to Canadians

The benefits of prohibiting PFOS include

- the protection of wildlife and ecosystem health (including in remote locations such as the Canadian Arctic) from PFOS exposure, as a result of a reduction in the use of PFOS; and
- avoided costs for alternate water supply sources by avoiding contamination as a result of a reduction in the handling, release and use of PFOS.

Due to data limitations, not all of these benefits could be monetized and included in the analysis.

Ecosystem benefits

The scientific literature has identified that at current exposure levels, PFOS could harm certain wildlife organisms (e.g. polar bear, fish-eating birds), including those found in remote locations such as in the Canadian Arctic. The effects include growth inhibition of birds and aquatic invertebrates; liver and thyroid effects in mammals; lethality to fish and saltwater invertebrates; and changes in biodiversity. While PFOS is generally acknowledged to have the potential to cause serious, irreversible impacts (bioaccumulation and persistence), the current science is unable to accurately predict the ecological effects of these substances. The absence of specific impacts on the environment on which to model the economic value of reductions in current releases makes it difficult to quantify and monetize the benefits from the proposed Regulations. Although difficult to quantify, these benefits should be considered qualitatively in the assessment.

Avoided costs for alternate water supply

PFOS has been detected in surface water and sediment, in wastewater treatment plant effluent, sewage sludge and in landfill leachate. PFOS releases have been identified to cause groundwater contamination, and PFOS have been found to be detectable in groundwater at least five years after release. Among the indirect benefits, the proposed Regulations would prevent environmental and possible health impacts associated with water supply contamination resulting from the handling, release and use of PFOS.

As stated earlier, there are approximately 3 tonnes of PFOS contained in the 300 tonnes of AFFF inventories at airports, military facilities and refineries. The use of PFOS-based AFFF to fight actual fires and in training, and the risk of accidental releases will continue to pose a threat as long as the inventories of PFOS-based AFFF exist and its use remains uncontrolled. Although PFOS-based AFFF has not been available in the market since 2003, the existing inventories of PFOS-based AFFF continue to pose a risk over their service life (estimated to be 25 years) that could result in a major contamination event. Once the regulatory provisions for PFOS-based AFFF come into effect in 2013, the risk of a contamination event would be significantly reduced. Although the incidence rate of PFOS contamination to groundwater or surface water supply areas is not known, for analytical purposes it can be assumed that two extreme contamination events involving fuel fires (e.g. refinery fires, plane crash) could occur every 25 years in the absence of the proposed Regulations.

The avoided cost for alternate water supply sources is measured in terms of the probability of a contamination event at some point in the future, multiplied by the costs of alternate sources of water supply. The probability is simply the annual probability that a water contamination event will occur.

To address this type of contamination, affected municipalities may be required to incur expenses for the short-term provision of alternative water supplies, engineering studies and new infrastructure. Existing studies have estimated that the cost of providing alternate sources of water supply are in the order of \$2.2 and \$11 million, with a central value of \$6.6 million. ([see footnote 1](#)) The potential benefit from avoided alternate water supply expenditure attributable to the proposed Regulations is estimated to result in an average annual benefit of \$560,000 per year. It is recognized that this benefit is uncertain; however, the value can be used to approximate the benefits to be derived as a result of the proposed Regulations. Total benefits to Canadians are, therefore, estimated to be approximately \$6.35 million (2006 \$ at a 5.5% discount rate).

Net benefit of the Regulations

The total discounted cost to the private sector and federal government is estimated at \$5.97 million, while total benefits to Canadian society is estimated to be a minimum of \$6.35 million. Overall, the present value of the proposed Regulations are estimated to result in a net benefit to Canadian society of approximately \$384,410 (2006 \$, discounted at 5.5% over a 25-year period). The benefits to Canadians do not include non-quantified benefits such as value placed on ecosystem risk reduction associated with less PFOS use. The proposed Regulations are estimated to reduce PFOS releases by at least 89 tonnes (85.7 tonnes from metal finishing and 2.87 tonnes from AFFF) over the 25-year period.

As the benefits to the ecosystem could not be quantified due to data limitations and uncertainties, it is realistic to assume that the actual net benefit would be greater than the estimated \$384,410.

Consultation

All stakeholders were given the opportunity to comment during the 60-day public comment period following the July 1, 2006 publication in the *Canada Gazette*, Part I, of the proposed Order to add the substances to the List of Toxic Substances in Schedule 1 of CEPA 1999. The comments received were supportive of the proposal to add the substances to Schedule 1 of CEPA 1999.

The CEPA National Advisory Committee (CEPA NAC) and relevant federal government departments were consulted on the proposed Order as well as the proposed Risk Management Strategy (RMS) for PFOS. No concerns were raised by CEPA NAC.

Stakeholders were also consulted on the proposed RMS for PFOS through the posting of the RMS on Environment Canada's CEPA Registry Web site and a national mail-out to over 350 stakeholders. A total of 48 comments were received from industry representatives, industry associations, environmental nongovernment organizations and other government departments. While stakeholders are supportive of the proposed risk management approach, concern was raised about the approach to the proposed exemption for imported manufactured articles, as was originally stated in the strategy.

The comments and concerns raised by the various stakeholder meetings and Environment Canada's response to these are detailed below.

AFFF

Concern was raised on the proposed length of time allowed to phase out PFOS-based AFFF stockpiles. Some of the stakeholders advocated increasing the time frame while others proposed shortening the allowed phase-out time. The phase-out time frames for AFFF being proposed by stakeholders ranged from one year to ten years. In addition, stakeholders called for the inclusion of a financial incentive program to assist smaller firms in the proper disposal of expended AFFF; requirement to develop a Pollution Prevention (P2) Plan; and developing best practices for use, storage and disposal of AFFF.

After reviewing the comments, Environment Canada deems five years to be an appropriate time period to phase out existing AFFF stocks. With the voluntary discontinuation of production of PFOS by the global manufacturer between 2000 and 2002, users requiring new stocks have been able to purchase only PFOS-free products. Users would, therefore, have had approximately thirteen years to complete the phase-out of the existing stocks from the time the major manufacturer announced discontinuing PFOS production to the time the proposed five-year exemption period expires. In addition, replacement products are readily available at similar prices in the market. Moreover, the time frame is also consistent with the timelines being proposed in another jurisdiction.

With respect to the other concerns, Environment Canada is of the opinion that existing federal, provincial/territorial and municipal standards and protocols for fire response and prevention adequately define the operational use procedures for AFFF. As well, the safe disposal of AFFF is provided for under the existing federal and provincial hazardous

waste regulations. The disposal costs for AFFF would be similar to other hazardous waste material and as such does not warrant the development of an incentives or assistance program.

Imported manufactured articles

The majority of the comments received did not support exempting imported manufactured articles in the proposed Regulations, with the exception of one comment. A couple of comments called for developing complimentary measures for managing imported manufactured articles and developing better use pattern data on imported manufactured articles.

The comments were considered and, in the proposed Regulations, imported manufactured articles will not be exempt from the regulatory requirements. As described above, the global production and use data indicates that PFOS use is declining and alternatives to PFOS are readily available. The areas where the substance is still being used are the critical uses previously outlined, for which no viable alternative is available. Therefore, with viable alternatives available at similar costs and exemptions for critical uses, Environment Canada did not consider it necessary to provide exemptions for imported manufactured articles containing PFOS.

Critical use exemptions

Comments were also received on critical use exemptions being provided for under the proposed Regulations. Stakeholders voiced the concern that these exemptions should be justified on the basis of a specific set of criteria and supporting documentation. Moreover, the critical use exemptions should be time limited.

The critical use exemptions provided for under the proposed Regulations are for the use of existing stocks of PFOS-based AFFF and import and use of PFOS-based surfactants in chromium plating for a period of five years. Environment Canada, after taking into consideration the technical aspects, has determined that a period of five years is sufficient to manage the existing stocks of AFFF as well as identify alternatives for the specialized manufacturing operations. With the voluntary phase-out of PFOS by the major manufacturer between 2000 and 2002, PFOS-based AFFF has not been available and all AFFF is now PFOS free. The five-year phase-out period is considered essential to allow facilities to replace PFOS-based AFFF with alternative PFOS-free fire fighting foam. Similarly, the phase-out period for PFOS-based surfactants is required to allow the sector to develop alternatives. Similar exemptions are also proposed in other jurisdictions.

PFOS releases

A number of stakeholders were concerned about the issue of PFOS releases from landfills as well as the efficiency of waste water treatment facilities to remove PFOS.

With the voluntary phase-out of PFOS by the global manufacturer between 2000 and 2002, it is expected the use of PFOS in manufactured articles has steadily been declining and this is likely to have a positive impact on future releases of PFOS from landfills and waste water treatment facilities. Moreover, the proposed Regulations intend to prohibit the import, sale, manufacture and use of PFOS substances, including manufactured

articles. This measure is expected to reduce the future stream of PFOS releases.

General comments

Several comments were received on some of the more general aspects of the proposed Regulations, as specified in the risk management strategy. Stakeholders identified the following issues:

- Management of additional new PFOS type of substances;
- Impact of international actions on domestic initiatives to manage PFOS;
- Identification of safe alternatives to PFOS;
- Virtual elimination of PFOS substances;
- Provision of evidence to show why the use of weight of evidence approach was used with respect to bioaccumulation; and
- Identification by Chemical Abstracts Service numbers of the substances that will be subject to the proposed risk management actions.

The concerns expressed by stakeholders have been taken into consideration while drafting the proposed Regulations.

Compliance and enforcement

Since the Regulations will be made under CEPA 1999, enforcement officers will, when verifying compliance with the Regulations, apply the Compliance and Enforcement Policy implemented under the Act. The Policy also sets out the range of possible responses to violations, including warnings, directions, environmental protection compliance orders, ticketing, ministerial orders, injunctions, prosecution, and environmental protection alternative measures (which are an alternative to a court trial after the laying of charges for a CEPA 1999 violation). In addition, the Policy explains when Environment Canada will resort to civil suits by the Crown for costs recovery.

When, following an inspection or an investigation, an enforcement officer discovers an alleged violation, the officer will choose the appropriate enforcement action based on the following factors:

- *Nature of the alleged violation*: This includes consideration of the damage, the intent of the alleged violator, whether it is a repeat violation, and whether an attempt has been made to conceal information or otherwise subvert the objectives and requirements of the Act.
- *Effectiveness in achieving the desired result with the alleged violator*: The desired result is compliance within the shortest possible time and with no further repetition of the violation. Factors to be considered include the violator's history of compliance with the Act, willingness to co-operate with enforcement officers, and evidence of corrective action already taken.
- *Consistency*: Enforcement officers will consider how similar situations have been handled in determining the measures to be taken to enforce the Act.

Contacts

Greg Carreau, Chemicals Sector Division, Environment Canada, 351 Saint-Joseph

Boulevard, 13th Floor, Gatineau, Quebec K1A 0H3, 819-953-6072 (telephone), 819-994-0007 (fax), Greg. Carreau@ec.gc.ca (email); or Markes Cormier, Acting Senior Economist, Impact Analysis and Instrument Choice Division, Environment Canada, 10 Wellington Street, 24th Floor, Gatineau, Quebec K1A 0H3, 819-953-5236 (telephone), 819-997-2769 (fax), Markes.Cormier@ec.gc.ca (email).

PROPOSED REGULATORY TEXT

Notice is hereby given, pursuant to subsection 332(1) ([see footnote a](#)) of the *Canadian Environmental Protection Act, 1999* ([see footnote b](#)), that the Governor in Council proposes, pursuant to subsection 93(1) and section 319 of that Act, to make the annexed *Perfluorooctane Sulfonate and its Salts and Certain Other Compounds Regulations*.

Any person may, within 60 days after the date of publication of this notice, file with the Minister of the Environment comments with respect to the proposed Regulations or a notice of objection requesting that a board of review be established under section 333 of that Act and stating the reasons for the objection. All comments and notices must cite the *Canada Gazette*, Part I, and the date of publication of this notice, and be sent to the Director, Chemicals Sector Division, Pollution Prevention, Department of the Environment, Ottawa, Ontario K1A 0H3.

A person who provides information to the Minister may submit with the information a request for confidentiality under section 313 of that Act.

Ottawa, December 7, 2006

MARY O'NEILL
Assistant Clerk of the Privy Council

PERFLUOROOCTANE SULFONATE AND ITS SALTS AND CERTAIN OTHER COMPOUNDS REGULATIONS

APPLICATION

1. Subject to sections 2 and 3, these Regulations apply to the following substances that are specified on the List of Toxic Substances in Schedule 1 to the *Canadian Environmental Protection Act, 1999*:

(a) perfluorooctane sulfonate and its salts; and

(b) compounds that contain one of the following groups: C₈F₁₇SO₂, C₈F₁₇SO₃ or C₈F₁₇SO₂N.

EXCEPTIONS

2. These Regulations do not apply to any substance referred to in section 1 that is

(a) contained in a hazardous waste, hazardous recyclable material or non-hazardous

waste to which Division 8 of Part 7 of the *Canadian Environmental Protection Act, 1999* applies;

(b) contained in a pest control product within the meaning of subsection 2(1) of the *Pest Control Products Act*; or

(c) present as a contaminant in a chemical feedstock used in a process from which there are no releases of the substance and provided that the substance is destroyed or completely converted in that process to a substance other than one referred to in that section.

3. These Regulations do not apply to any substance referred to in section 1 or to any product containing such a substance that is for use

(a) in a laboratory for analysis;

(b) in scientific research; or

(c) as a laboratory analytical standard.

PROHIBITIONS

4. (1) In this section, "manufactured item" means a product that is formed into a specific physical shape or design during manufacture and that has, for its final use, a function or functions dependent in whole or in part on its shape or design.

(2) Subject to subsections (3) to (6), no person shall manufacture, use, sell, offer for sale or import any substance referred to in section 1 or a product containing any such substance.

(3) The use, sale or offer for sale of a manufactured item containing any substance referred to in section 1, if manufactured or imported before the coming into force of these Regulations, is permitted.

(4) The use, other than for testing or training purposes, of aqueous film forming foam containing any substance referred to in section 1, if manufactured or imported before the coming into force of these Regulations, is permitted for a period of five years from the day on which these Regulations come into force.

(5) The use of a substance referred to in section 1, or a product containing any such substance, as a fume suppressant in the following processes as well as their sale, offer for sale or import for those uses, is permitted for a period of five years from the day on which these Regulations come into force:

(a) chromium electroplating, chromium anodizing and reverse etching;

(b) electroless nickel-polytetrafluoroethylene plating; and

(c) etching of plastic substrates prior to their metalization.

(6) The use, sale, offer for sale or import of the following manufactured items containing any substance referred to in section 1 is permitted:

(a) semiconductors or similar components of electronic or other miniaturized devices; and

(b) photographic films, papers and printing plates.

ANALYSIS BY ACCREDITED LABORATORY

5. The presence of any substance referred to in section 1 shall be determined by a laboratory that is accredited under the International Organization for Standardization standard ISO/IEC 17025: 2005, entitled *General requirements for the competence of testing and calibration laboratories*, as amended from time to time, and whose accreditation includes the analysis of that substance within its scope of testing.

REPORTS

6. Every person that imports a substance or product referred to in subsection 4(5) shall submit to the Minister a report containing the information set out in the schedule no later than March 31 of the calendar year following the calendar year during which the substance or product was imported.

CERTIFICATION

7. (1) Any information required to be submitted to the Minister under these Regulations shall be submitted in a form determined by the Minister and accompanied by a certification, dated and signed by the person referred to in the applicable provisions, or the person's authorized representative, that the information is accurate and complete.

(2) The certification may be submitted either in writing or in an electronic format that is compatible with the one that is used by the Minister and it shall bear the written or electronic signature, as the case may be, of the person or their authorized representative.

RECORD KEEPING

8. (1) Every person that submits information to the Minister under these Regulations shall keep, in writing or in an electronic format that is compatible with the one used by the Minister, a copy of that information, the certification and any documents supporting the information for a period of at least five years beginning on the date of the submission of the information.

(2) The information, certification and supporting documents that are required to be kept by the person shall be kept at their principal place of business in Canada or at any other place in Canada where the information, certification, results and supporting documents can be inspected. If those records are kept at any place other than the person's principal place of business, the person shall provide the Minister with the civic address of the place where they are kept.

COMING INTO FORCE

9. These Regulations come into force on the day on which they are registered.

SCHEDULE (Section 6)

INFORMATION RELATED TO THE IMPORT OF CERTAIN FUME SUPPRESSANTS

1. Information respecting the importer:

(a) their name, the civic and postal addresses of their principal place of business, e-mail address, if any, telephone number and fax number, if any; and

(b) the name, title, civic and postal addresses, e-mail address, if any, telephone number and fax number, if any, of their authorized representative, if any.

2. Information respecting the substance or product:

(a) the name of the substance, alone or contained in a product;

(b) the total quantity of the substance, alone or contained in a product, imported by the importer in the calendar year for which the report is submitted, as well as the identification of that calendar year and the unit of measurement;

(c) the total quantity of the substance, alone or contained in a product, sold in Canada by the importer in the calendar year for which the report is submitted, as well as the identification of that calendar year and the unit of measurement; and

(d) the identification of the process referred to in paragraphs 4(5)(a) to (c) of these Regulations for which the substance or product is proposed to be used, if known.

3. An importer that submits a request, in accordance with section 313 of the *Canadian Environmental Protection Act, 1999*, that information submitted be treated as confidential must include with that request the identification of the following:

(a) any information that constitutes a trade secret;

(b) any information the disclosure of which would likely cause material financial loss to, or prejudice the competitive position of, the importer;

(c) any information the disclosure of which would likely interfere with contractual or other negotiations being conducted by the importer; and

(d) any financial, commercial, scientific or technical information that is confidential and is treated consistently in a confidential manner by the importer.

[Footnote 1](#)

Raven Beck Environmental Ltd. (1995)

[Footnote a](#)

S.C. 2004, c. 15, s. 31

[Footnote b](#)

S.C. 1999, c. 33

NOTICE:

The format of the electronic version of this issue of the *Canada Gazette* was modified in order to be compatible with hypertext language (HTML). Its content is very similar except for the footnotes, the symbols and the tables.


[Top of page](#)

Maintained by the [Canada Gazette Directorate](#)

Updated: 2006-12-15

[Important notices](#)