Format for submitting pursuant to Article 8 of the Stockholm Convention the information specified in Annex E of the Convention

Introductory information	
Name of the submitting Party/observer	World Wild Fund for Nature (WWF)
Contact details (name, telephone, e-mail) of the submitting Party/observer	Lin Li, Senior Programme Officer Global Toxics Programme Tel: +1 202 778 9627 Fax: +1 202 530 0743 Lin.li@wwfus.org
Chemical name (as used by the POPS Review Committee (POPRC))	Perfluorooctane sulfonate (PFOS)
Date of submission	January 26, 2006

(a) Sources, including as appropriate (provide summary information and relevant references)	
(i) Production data: Quantity Location	
Other	
(ii) Uses	
(iii) Releases: Discharges Losses Emissions Other	

(b) Hazard assessment for endpoints of concern, including consideration of toxicological interactions involving multiple chemicals (provide summary information and relevant references)

(c) Environmental fate (provide summary information and relevant references)	
Chemical/physical properties	
Persistence	
How are chemical/physical properties and persistence linked to environmental transport, transfer within and between environmental compartments, degradation and transformation to other chemicals?	
Bio-concentration or bio-accumulation factor, based on measured values (unless monitoring data are judged to meet this need)	

(d) Monitoring data (provide summary information and relevant references)
• **In a study that WWF conducted to test chemicals in the blood of families of three generations from Europe, PFOS was found in 38 of total 39 tested, ranging from 0.1 to 35.3 ng/g blood in all three generations (WWF 2005a).** • **In a study that WWF conducted to test chemicals in the blood of Members of the European Parliament, PFOS was detected in 45 of 47 tested, with a range from 5.5 to 55 ng/g blood (Annex 3 page 56) (WWF 2004)** • **Both PFOS and PFOA were found in virtually every maternal blood serum sample in a number of biomonitoring studies Greenpeace and WWF have conducted in the UK and the Netherlands. Estimated serum concentrations ranged from 0.1 to 1.3 ng/g serum for PFOS. For PFOS both frequency and concentrations in cord blood were lower than those in maternal blood (WWF and Greenpeace 2005)** • **A WWF-UK Chemicals and Health campaign report indicated that PFOS was found in 5 of 33 tested, with a maximum of 19.16 ng/g whole blood (WWF-UK 2004)** • **PFOS has been found in the Baltic Sea mammals (WWF 2005b), with harbour porpoise containing 534 ng/g, ringed seal containing 92-242 ng/ml blood,16-230 ng/ml in plasma, and grey seal containing 14-76 ng/ml plasma, 25.5-43.9 ng/l blood, and 148-1140 ng/g wet weight in liver, according to various studies cited by the WWF report.** • **A study of PFOS in guillemot eggs from the Baltic Sea from 1968 to 2003 showed an almost 30-fold increase in PFOS concentrations, from 25 ng/g in 1968 to 614 ng/g in 2003 (ww) (Holmstrom et al 2005)** • **In Japan, PFOS was also found in maternal samples ranging from 4.9 to 17.6 ng/ml, whereas in fetal samples ranging from 1.6 to 5.3 ng/ml. It shows high correlation between PFOS concentrations in maternal and cord blood ($\gamma 2$=0.876) (Inoue et al 2004). PFOS was also found in blood samples from 26 people in Japan, ranging from 2.0 to 20.2 ng.ml whole blood (Masunaga et al 2002)** • **The mean serum concentration of PFOS in 263 employees of a perfluorooctanyl manufacturing location in Decatur, Alabama were 1.32 ppm, while level in 255 employees in Antwerp, Belgium was 50% lower (Olsen et al 2003)**

(e) Exposure in local areas (provide summary information and relevant references)	
- general	
- as a result of long-range environmental transport	• **PFOS was detected in rainwater in Canada with a concentration of 0.59 ng/L (Loewen et al 2005)** • **A study of perfluorinated alkylated substances in the Nordic countries showed that PFAS related chemicals are widely distributed in the Nordic environment. PFOS and PFOA dominated in sewage sludge samples. Measurable amounts of PFAS were found in all samples. The Nordic biota samples showed signals of species dependent distribution and levels. Highest PFAS levels were found in top predating Danish harbour seal (*Phoca vitulina*) samples with PFOS as predominant PFAS contaminant. In Faroe Island pilot whales (*Globicephala melas*), PFOSA and PFOS were dominating with up to 364 ng/g wet weight. Also Finnish and Norwegian pike samples (*Esox lucius*) are highly contaminated with PFOS (PFOS = 551 ng/g ww) demonstrating that also the freshwater ecosystem is contaminated with PFAS related chemicals. The patterns found in biota point towards both country specific release patterns and species depended up-take/ accumulation properties. The fact that PFOS and PFOSA were also detected in anadromous Arctic char in the Faroe Islands indicates that long-range transport in air and/or precipitation is occurring (Kallenborn et al 2004)** • **PFOS and its salts were detected in livers of fish, birds and marine mammals from Greenland and the Faroe Island. The greatest concentration of PFOS was found in liver of polar bear from east Greenland with mean=1285 ng/g wet weight, n=2, while PFOS was**

- information regarding bio-availability	**found at concentrations above limit of quantification (10 ng/g ww) all samples from the Faro Island and in 13 out of 16 samples from Greenland (Bossi et al 2005).**

(f) National and international risk evaluations, assessments or profiles and labelling information and hazard classifications, as available (provide summary information and relevant references)

(g) Status of the chemical under international conventions

References:

Bossi, R., Riget, F.F., Dieta, R., Sonne, C., Fauser P., Dam, M., and Voorkamp, K. (2005) Preliminary screening of perfluoroocatane sulfonate (PFOS) and other fluorochemicals in fish, birds, and marine mammals from Green land and the Faro Islands. *Environmental Pollution* 136(2005) 323-329, available at http://www.panda.org/about_wwf/what_we_do/toxics/publications/index.cfm?uNewsID=22358

Holstrom, K.E., Jarnberg, U., and Bignert, A. (2005) Temporal trends of PFOS and PFOA in guillemot eggs from the Baltic Sea, 1968—2003. *Environ Sci Technol* 2005 Jan 1;39(1):80-4, available at http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=15667078&dopt=Citation

Inoue, K., Okada, F., Ito, R., Kato, S., Sasaki, S., Nakajima, S., Uno, A., Saijo, Y., Sata., F., Yoshimura, Y., Kishi, R., and Nakazawa, H. (2004) Perfluorooctane Sulfonate (PFOS) and Related Perfluorinated Compounds in Human Maternal and Cord Blood samples: Assessment of PFOS Exposure in a Susceptible Population during Pregnancy. *Environmental Health Perspective*. Volume 112, Number 11, August 2004: 1204-1207, available at http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1247483

Kallenborn, R., Berger, U., Järnberg, U. (2004) *Perfluorinated Alkylated Substances (PFAS) in the Nordic Environment.* Online publication available at the Norwegian Pollution Control Authority (SFT)' website http://www.sft.no/nyheter/dokumenter/pfas_nmr2004.pdf

Loewen, M., Halldorson, T., Wang, F., and Tomy, G., (2005) Fluorotelomer carboxylic acids and PFOS in rainwater from an urban center in Canada. *Environ Sci Technol.* 2005May 1;39(9):2944-51, available at http://pubs.acs.org/cgi-bin/abstract.cgi/esthag/2005/39/i09/abs/es048635b.html

Masunaga, S., Kannan, K., Doi, R., Nakanishi, J., and Giesy, J.P. (2002) Level of perfluorooctane sulfonate (PFOS) and other related compounds in the blood of Japanese people. *Organohalogen Compounds* Vol. 59(2002): 319-322, available at http://risk.kan.ynu.ac.jp/publish/masunaga/masunaga200208b.pdf

Olsen, G.W., Burris, J.M., Burlew, M.M., and Mandel, H.H. (2003) Epidemiologic Assessment of Worker Serum Perfluorooctanesulfonate (PFOS) and Perfluorooctanoate (PFOA) Concentrations and Medical Surveillance Examinations *Journal of Occupational & Environmental Medicine.* 45(3):260-270, March 2003, available at http://www.joem.org/pt/re/joem/abstract.00043764-200303000-00008.htm;jsessionid=DM8I3X7etTV4E1fjetOCP62sI4cVfIYOXIdb5ea2z2BCBWc8ut2R!1682352220!-949856144!9001!-1

WWF (2004) Chemical Check Up – An analysis of chemicals in the blood of Members of the European Parliament, attached

WWF (2005a) Generation X – Results of WWF's European Family Biomonitoring Survey. WWF 2005, available at http://www.panda.org/about_wwf/what_we_do/toxics/publications/index.cfm?uNewsID=23697

WWF (2005b) Clean Baltic within Reach? - How can a new chemical policy contribute the protection of the Baltic Sea?, available at http://www.panda.org/about_wwf/what_we_do/toxics/publications/index.cfm?uNewsID=18050

WWF and Greenpeace. (2005) A Present for Life -hazardous chemicals in umbilical cord blood. COLOFON © September 2005, available at http://www.panda.org/about_wwf/what_we_do/toxics/publications/index.cfm?uNewsID=23130

WWF-UK (2004) Contamination: the next generation - Results of the family chemical contamination survey (A WWF-UK Chemicals and Health campaign report in conjunction with The Cooperative Bank). October 2004, attached