

**Estimated historic discharges of PFOS from the use of AFFF fire-fighting foams in the oil industry on the Norwegian Shelf .**

- **By company and oil field.** This summary note is made by marine biologist Per-Erik Schulze, Friends of The Earth Norway (FoEN), August 2005, based on recent letters from the oil companies to the Norwegian Pollution Control Authority (SFT). Some numbers are adjusted and some missing numbers calculated by FOEN based on an overall assessment of the available information.

Company	STATOIL										
Oil Field	Åsgård A	Åsgård B	Åsgård C	Petrojarl	Gullfaks A	Gullfaks B	Gullfaks C	Heidrun	Huldra	Kristin	
Foam concentrate held aboard(Itr)	62500	34965	7900	4000	100000	36900	80400	29620	500	30000	
Annual consume/release (Itr)	5333	8750	100	75	22667	13167	10000	360	700		
Years in operation before 2003	4	3	4	17	17	15	13	8	2	0	
Total discharge of PFOS-foam (Itr)	34665	48125	650	1463	442007	230423	155000	3780	3150	0	
Annual discharge of pure PFOS(kg)	96	333	2	1	408	237	180	14	25		
<b>Total historic discharge PFOS (kg)</b>	<b>624</b>	<b>1829</b>	<b>12</b>	<b>26</b>	<b>7956</b>	<b>4148</b>	<b>2790</b>	<b>144</b>	<b>110</b>		
Comments	aff3%	aff1%			aff3%	aff3%	aff3%	aff1%	4:13, 3%:1%		
PFOS still aboard,kg	209	875	26	69	497	284	304	1072	2	0	
PFOS releases 2000-2005,kg	432	1496	8	6	1836	1067	810	62	110	0	

Company	STATOIL										
Oil Field	Kvitebjørn	Norne	Polar Pioneer	Sleipner A	Sleipner B	Sleipner T	Snorre A	Snorre B	Statfjord A	Statfjord B	
Foam concentrate held aboard(Itr)	18140	46000	4630	12740	450	1200	17280	9100	28000	36900	
Annual consume/release (Itr)		6000		4503	60	100	5155	3125	16043	21500	
Years in operation before 2003	0	5	3	10	6	6	10	2	23	20	
Total discharge of PFOS-foam (Itr)	0	45000	0	56287,5	510	850	64437,5	14062,5	409096,5	483750	
Annual discharge of pure PFOS(kg)	0	108	0	81	1	1,8	196	119	289	387	
<b>Total historic discharge PFOS (kg)</b>	<b>0</b>	<b>810</b>	<b>0</b>	<b>1013</b>	<b>9</b>	<b>15,3</b>	<b>2449</b>	<b>534</b>	<b>7364</b>	<b>8708</b>	
Comments	new foam	aff3%	mobile unit	aff3%	aff3%		aff1%	aff1%	aff3%	aff3%	
PFOS still aboard,kg	0	341	12	63	8	33	376	133	254	202	
PFOS releases 2000-2005,kg	0	486	0	365	5	8,1	882	534	1299	1742	

Company	STATOIL						HYDRO			
Oil Field	Statfjord C	Stena D	Troll A	Veslefrikk A	Veslefrikk B	Visund	Brage	Grane	Heimdal	Njord A
Foam concentrate held aboard(Itr)	30000	2155	1900	500	4000	17000	32000		26000	30000
Annual consume/release (Itr)	13120		93	60	2867	2154	4513		498	2647
Years in operation before 2003	17		6	13	13	4	9	0	18	6
Total discharge of PFOS-foam (Itr)	255840	0	790,5	930	44438,5	14001	51900		10206	22500
Annual discharge of pure PFOS(kg)	236	0	2	1	52	82	171		9	101

<b>Total historic discharge PFOS (kg)</b>	<b>4605,12</b>	<b>0</b>	<b>14,23</b>	<b>16,74</b>	<b>799,89</b>	<b>532,04</b>	<b>1972</b>		<b>184</b>	<b>855</b>
<b>Comments</b>	aff3%	mobile unit	aff3%	aff3%	aff3%	aff1%	aff 1%	aff1%	FoEN added from before -91. Aff3%	aff1%
PFOS still aboard,kg	171	68	67	unknown	35	384	950	0	0	1140
PFOS releases 2000-2005,kg	1063	0	8	5	232	368	772	0	40	453

<b>Company</b>	<b>HYDRO</b>							<b>Shell</b>	<b>BP</b>		
<b>Oil Field</b>	Njord B	Oseberg C	Oseberg F	Oseberg S	Oseberg Ø	Troll B	Troll C	Draugen	Ula	Valhall	
Foam concentrate held aboard(Itr)	3500	27000	105600	18000	10000	136000	43000	26600	5825	35000	
Annual consume/release (Itr)	348	5169	8756	0	923	10017	6000	3000	300	5000	
Years in operation before 2003	6	15	15	3	4	7	4	11	17	21	
Total discharge of PFOS-foam (Itr)	2960	90450	153225		6000	95160	39000	40500	5850	117500	
Annual discharge of pure PFOS(kg)	6	196	158	0	35	180	228	90	9	150	
<b>Total historic discharge PFOS (kg)</b>	<b>53</b>	<b>3437</b>	<b>2758</b>		<b>228</b>	<b>1713</b>	<b>1482</b>	<b>1215</b>	<b>175,5</b>	<b>3525</b>	
<b>Comments</b>	aff3%	FoEN added from before -91 aff1%	aff3%	aff1%	aff1%	aff3%	aff1%	adjusted	3%aff	3%aff	
PFOS still aboard,kg	27	551	997	418	380	2376	1102	780	105	569	
PFOS releases 2000-2005,kg	28	884	709	0	158	811	1026	405	41	675	

Total known historic discharges of pure PFOS (kg) to the North Sea at the Norwegian Shelf:

<b>Company</b>	<b>Conoco</b>							<b>Phillips</b>
<b>Oil Field</b>	Frigg	Jotun A	Jotun B	Ringhorne	Balder	Gyda	Ekofisk	
Foam concentrate held aboard(Itr)	5050	25300	800	13250	18650	6600	29810	
Annual consume/release (Itr)	6000	3000	400	400	1500	300	4500(20.000*)	
Years in operation before 2003	23	3	4	1	4	14	30(20)	
Total discharge of PFOS-foam (Itr)	153000	16500	2600	1400	9750	4950	400000	
Annual discharge of pure PFOS(kg)	270	114	15	15	57	9	533	
<b>Total historic discharge PFOS (kg)</b>	<b>6885</b>	<b>627</b>	<b>99</b>	<b>53</b>	<b>371</b>	<b>149</b>	<b>12000</b>	
<b>Comments</b>	FoEN estim. hist. disch.	adjusted aff1%	aff1%	aff1%	aff1%	unknown aff	*	
PFOS still aboard,kg	112	759	0	504	570	186	0	

**82289**

FoEN loosely estimated historic discharges, for years before 1989 when company still used 3M products.

PFOS releases 2000-2005,kg	1215	513	68,4	68,4	257	41	0
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For Statoil is added the discharges after 2003, and for Hydro the discharges prior to 1991, as these were not given by the companies.

In the few cases where the oil company has not given information on the annual consume of foam, our estimate is based on a low median number for similar units

Statoil estimated their own PFOS releases as kg, the others' numbers on foam discharge are transformed to kg PFOS based on the following PFOS contents in the foam:

3M/Solberg Scandinavian AFFF 1% Lightwater	0,038kg/ltr
3M/Solberg Scandinavian AFFF 3% Lightwater	0.018kg/ltr
PFOS-Foam with no information on content	0.03kg/ltr

## SUMMARY, KEY NUMBERS

**SUM TOTAL kg PFOS, by company =**

Statoil	Hydro	Shell	BP	Total	Exxon	Talisman	Phillips	Pertra	Totalt
<b>44508</b>	<b>12682</b>	<b>1215</b>	<b>3701</b>	<b>6885</b>	<b>1150</b>	<b>149</b>	<b>12000 ?</b>		<b>82289 kg</b>
Of this releases after 2000 when PFOS was acknowledged as a Persistent Organic Pollutant									
12823	4881	405	716	1215	906	41	0		20986 kg
Still stockpiled aboard									
5485	7941	780	674	112	1833	186	0		17010 kg

For a map showing the location of the different oil fields, go to

[http://www.museumsnett.no/ntm/no/utstillingene/Jakten\\_oljen/bruksbilder/sokkelkart2003.gif](http://www.museumsnett.no/ntm/no/utstillingene/Jakten_oljen/bruksbilder/sokkelkart2003.gif)