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Introduction.

The airborne radioactive material from the Chernobyl accident reached Sweden on 27 April 1986. In situ measurements were started by the Nuclear Detection Group of the National Defence Research Establishment (FOA 212) on 28 April 1986. Two high-resolution gamma-spectrometric systems were available for the project and it was decided to use one for mobile measurements in order to cover the affected parts of Sweden whereas the other was used to follow the rate of change at one location in the Stockholm area.

The radioactive deposition in Sweden mainly occurred in two periods, the first from 27th to 29th of April and the second from 7th to 10th of May. In the first period the most affected regions were the eastern and central parts of Sweden, in particular the wet-deposition area along the coast of the Gulf of Bothnia and westwards to the mountain regions in Northern Sweden. During the second period, the deposition levels were much lower and mainly affecting the Southern and Southwestern parts of Sweden.

Some results of the in situ and soil gamma measurements have been reported earlier (Edvarson 1989,1991). In this report the results from measurements in the years 1986 to 1988 are reported.

Measurements and data analysis.

The detector used for the mobile measurements was a rugged High Purity Germanium (HPGe)detector. It's gamma efficiency for a point source at 25 cm with the energy 1332.5 keV was 35 percent relative to a 3 in. diameter by 3 in. long NaI crystal and the energy resolution was 1.90 keV. The detector was connected to a portable multichannel analyzer, with built-in peak search used for obtaining preliminary result in the field. The final analysis was made on a microVAX with Nuclear Data spectral analysis programs. When analyzing the gamma-ray spectra great care was taken not to use gamma-ray energies which are common to several nuclides. In cases where this was not possible the contribution from interfering nuclides have been accounted for.

A HPGe-detector with 12 percent efficiency relative to a 3 in. x 3 in. NaI crystal and 1.80 keV energy resolution was used for continuous measurements outside the Stockholm laboratory.

The detectors were calibrated according to Finck et al 1976. The cali-

bration factors are calculated for an infinite surface source distribution and we estimate that the systematic error in gamma efficiency is less than ten percent. The deposition density values reported here are not corrected for depth penetration of the nuclides, surface roughness etc. In order to indicate that, they have been called surface equivalent deposition densities.

The statistical errors varied widely depending on radionuclide, deposition density and radionuclide composition. The normal measuring time was 15 minutes and then the statistical errors were of the order one to five percent or better for such nuclides as ^{95}Zr, ^{131}I, ^{132}Te, ^{134}Cs, and ^{137}Cs, provided that the deposition density was more than a few kBq/m^2 . For some nuclides, in particular ^{106}Rh and ^{144}Ce, the statistical error is quite high, sometimes above fifty percent and in general the deposition density estimates for these nuclides should be regarded as tentative. When the statistical error is larger than 10 percent this has been indicated in the tables by the letters A (10 - 20 %), B (20 - 33 %), and C (> 33 %).

The locations chosen were grass surfaces well away from buildings and large trees. Single or repeated in situ measurements were made at about fifty locations during April and June 1986. Measurements at these locations were normally repeated later in 1986 and in 1987-88. Measurements at a number of additional locations were made in 1986 to 1988 so that the total number of locations in the data base is 92.

Soil samples were taken at about twenty of the locations in 1986 and the sampling was repeated in 1987 and 1988 at most of these places. The soil samples were taken using a steel auger. The cores had a diameter of 56 mm and a length of 100 mm. They were air-dried, crushed, homogenized and analyzed by Ge-gammaspectrometry.

Results.

The nuclide composition of the radioactive deposit varied considerably over Sweden. It was found that the country could be divided into seven regions, each with a characteristic mix of nuclide ratios (Edvarson 1991). The regions are summarized in Table 1. The results of the measurements have been arranged accordingly and are given in Tables 2 to 8. For each region the locations are given in the order north to south. In Table 9 the ratio between soil core and in situ measurements are given. Table 10 gives the

No.	Region	Counties
1.	N. of wet-deposition.	BD
2.	Wet-deposition.	C,U,X,Y,AC
3.	W. and SW. of wet-deposition.	N,O,P,S,T,W,Z
4.	E. of wet-deposition.	AB,C
5.	Stockholm, North Gotland.	AB,I
6.	South Gotland, Öland, SE.coast.	I,H
7.	SE. and S. Sweden.	E,F,G,H,K,L,M

Table 1: The seven regions of Sweden that can be identified, each with a characteristic radionuclide composition

results for the Stockholm location, where repeated measurements were made from 29 April until middle of October 1986. The radioactivity values have been decay corrected to 28 April 1986. The locations are identified by the geographic coordinates and a code name where the first one or two letters indicate the county. The geographic location of the sampling places is given in Appendix. The coordinates are given in the Swedish national system (2.5 gon W RT38). This is an orthogonal system with meter as the basic unit. The 6th digit corresponds to a distance of 10 m. The parameters found useful to characterize the regions were deposition density ratios of the nuclides ^{95}Zr, ^{103}Ru, and ^{131}I to ^{134}Cs and the ratio ^{132}Te to ^{131}I. The ratios have been summarized in Table 11. Notable features in this table are the extreme depletion of ^{95}Zr and ^{103}Ru relative to ^{134}Cs in the wet-deposition area (No 2).

References.

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Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
BDKIRU	753397	169398	86-05-23	16C		566	123C	9C			4260		138		603	90C	59C	113C
			86-09-24			422C	200C						141		648			
			87-06-12										164A		621			
			88-09-14										174A		578			
BDARJE	732980	159494	86-05-24			272A					4890		238	116C	418	308C		
			86-09-24				204C						219		415			
			87-06-12										225		389			
			88-09-16										192A		371			
BDKALL	728600	179100	86-05-23	99C		1040	409C				3270A		151A	264C	348			
			86-09-23			819B	345C						141A		316			
			87-06-12										128A		289			
			88-09-13										153A		306			

Table 2: Surface equivalent deposition densities (Bq/m^2) **north of wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
ACSTOR	724020	154787	86-05-24			1440		136B			22700		5390	2190	9380	4740A	481B	
			86-09-24			1450B		130A					4850		8250			
			87-06-13					181C	299C				4450		7870			
			88-09-16										3740		6340			
ACVIL1	717004	152892	86-05-24	529A		4500		307A			94300		13900	5710	23800	16800	688B	
			86-09-24			5220A	372A	1140C					11500		20000			
ACVIL3	717004	152892	87-06-13					395A					10300		17100			
			88-09-17										9520		15700			
ZGADD	715608	142003	86-05-24	688A		11700	4090A	718A		7380C	212000		41700	15700	71200	41300	1730A	
			86-09-24	659B		11300	2830A	667	1080A				32600		55500			
			86-09-25[a]	1150B		5030A		502					22100		36600			
			87-06-13				2860A	718A	1060A				33700		56600			
			88-09-18						705C				30100		49500			
ACVIND	713243	169211	86-05-23			1910		183B			35900		6980	2820	11900	5540		
			86-09-23			1600B		115B					6270		10600			
			87-06-12										6080		10600			
			88-09-11										5850		10200			

[a]Ground covered with 8 cm of snow

Table 3: Surface equivalent deposition densities (Bq/m^2), **wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
ACFOA4	709025	172275	86-05-23	288A		2950	1280B	267A			27100		6650	2590	11100	5840A		
			88-09-12										6280		10200			
YBJO1	704825	163643	86-05-23	510A		9200	3250B	614		11200A	179000	74700A	20300	8000	34500	24500	818B	
			87-06-11				1720B	273B	431B				10900		18600			
			88-09-11										7600		11900			
YBJO2	704825	163643	86-09-23			5360A	1120C	317A	560B				11600		20200			
YDROM	701730	162325	87-06-11				1230C	501A	630B				12500		21400			
			88-09-11						441C				10300		18000			
YLILL	697038	159330	86-09-23	653C		14100	3610A	1120	883B				25100		42400			
			87-06-11				3030B	967A	1050B				26600		44800			
			88-09-10				4910C						23400		42100			
YATTM	690905	156562	87-06-11				2210B	341B	325C				9270		15900			
			88-09-10						533B				7020		13300			
XHORN	684200	158900	86-09-23	1380B		14500	4150A	1240	1090B				35800		60600			
			87-06-11				3770B	1250	1280B				37400		64800			
XF15S	679530	156910	87-06-11					295C					11200		19300			
XLILL	673334	157526	87-09-30					622B					17000		30100			
			88-09-09					700C					18500		32600			

Table 3(cont.): Surface equivalent deposition densities (Bq/m^2), **wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
XLIMO	673300	158400	86-05-20	4670		46400	13500A	2730	1940B	67200	784000	619000	74100	29600	125000	143000	5740	4430C
XAVAN	673160	157460	87-09-30				4650C	1500A	1840B				42700		71600			
XGAV1	673060	157433	86-05-13	1460A		27100	8060B	1660		48800	524000	496000	48000	18700	81400	75700		
XKAS1	673052	157874	87-09-29				5810B	1390A					32600		56300			
			88-09-09				6390B	1140B	1510B				26300		48200			
XKAS2	673052	157874	87-09-29										21500		37400			
XESPL	672987	157292	86-06-16	937A		8460	2790B	1170		9870C			22100		43600		1920B	
			87-06-03				4610A	743A	750A				22900		40000			
			87-09-30				3180C	859A	853C				20300		35100			
XNYNA	672982	157266	87-09-30										7520		13000			
XGAV3	672940	157326	87-10-01				3250C	561B					21000		35800			
XGAV4	672934	157311	86-05-20	758A		5050	1770B	416A		15900A	35500	16700	18200	7780	30300	29700	808B	
			87-10-01										4810		8150			
XGAV2	672915	157236	86-05-20	1180		21400	5460A	1200		46700	386000	373000	35300	14300	60000	51200	1190B	
			87-06-03				1980C	830A	617B				18800		31700			
XI14I	672912	157130	87-06-03				4830A	933A	903B				25200		44600			
XRIKS	672912	157130	86-06-05	1280A		17700	5330A	1080		38200A	338000		32300	14800	57700	49600	2030B	

Table 3(cont.): Surface equivalent deposition densities (Bq/m^2), **wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
XMASB	672876	157556	87-09-29				4780B	1740A	1160B				30500		52000			
XJAR1	672706	157566	87-09-29				4120B	1070A					18300		30900			
XJAR2	672706	157566	87-09-29				4950B	1180A					30800		52500			
XMURU	672701	158355	86-05-13	3490		46300	6810B	2530		69400	919000	795000	67400	28000	120000	121000	3610A	
			86-06-05	4630		55600	15100	2960	1950B	73200	1030000	651000C	75900	33000	127000	136000	5280A	4300B
			87-06-02					2490	1300B				51500		107000			
XTORS	672515	157918	86-05-13	2700		27100	6150B	1700		42200A	523000	377000	43500	18500	74000	78700	3380A	
XVALB	672504	156584	87-09-30										9070		16100			
XALG1	672310	157696	87-09-30				5090B	1550A	1380B				37400		64700			
XALG2	672310	157696	87-09-30				2970C	1150A					25600		44800			
CTIE1	669035	159203	86-05-13	3680		10100	3230A	324A		9100B	155000	98800	10900	4560	18900	21000	3440	
CTIE2	669035	159203	87-10-01					345C					4820		8520			
UTAO1	667370	155512	86-07-08	1270A		13100	3050B	923			130000B		23800	12100A	42400	32600A	1830B	
UTAS3	667112	156100	86-05-08	1570A	14300A	15000	4800B	956		27600A	287000	295000	31300	12300	54000	52500		
			86-07-08	1420A		17600	4940A	1050			291000A		31300	13300A	52300	60400B	2050B	
UTAS2	667108	156103	86-05-0[illegible]	1640A		15400	3630B	1080A		29100A	289000	298000	31500	12300	53600	52700	1670A	
			86-07-08	1510		16600	4420A	1030	1150B	18000C	286000A		30300	15500A	51300	62900B	2120B	

Table 3(cont.): Surface equivalent deposition densities (Bq/m^2), **wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
UTAS1	667103	156095	86-05-08	1570A	14000A	15400	4530B	1100A		30300A	284000	285000	30500	11900	50700	53400	1630A	
			86-07-08	1620		14700	3300B	949	894B	17300	278000A		25700	9990A	44703	42900B	1910C	
UTAR1	667010	156125	86-05-08	1360A	22500	18800	7540A	907A	1140B	23500A	315000	306000	29800	11600	50100	47500	1610A	
			86-05-20	1410		18900	4170B	1170	883B	29300A	317000	301000	29000	11700	48700	46900	2120A	
			86-07-08	1450		18700	5890A	1120	904B		242000A		28900	12300	48200		2210B	
			86-10-20	1490B		16200	3980A	1030	1200A				24400		41000			
			87-06-02				4140B	1050	1070A				25600		42800			
UTAR2	666945	156100	86-04-30	750B	11100	11800	4110C	700B		22500A	192000	222000	20900	8890	34200	36300		
			86-05-08	1400A	7870B	15600	5910A	970		22900A	241000	252000	25800	10300	42700	44100	1440A	
CULLB	665035	158770	86-05-20	5880		14600	3980A	508A		19600A	179000	142000	14400	5960	24700	25600	5860	3650B
CSUN1	664625	159650	86-09-17	1830A		9000	2000A	337A	605B				9100		15000		6290B	1730C
CSUND	664624	159650	86-09-15	1120B		6410A	2830B	274B					7260		11900			
CGEOG	663817	160198	86-07-03	1270		9870	2780A	433A	528B	21200A	101000		10600	6120A	18300	11600C	1160B	
			87-05-26				1960B	335B	346C				8460		13200			
UHALL	661000	152700	86-04-30[a]	934	4060	3410		119C			62200	51100	5600	2320	10800	10100	566B	
			86-09-25	1330		5420A	1120B	218A					5610		9290			1460C
			87-06-16					186C					4090		7280			

[a] Also detected: ^{239}Np 8020 Bq/m^2

Table 3(cont.): Surface equivalent deposition densities (Bq/m^2), **wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
ZOSTE	701030	143410	86-05-24	98C		810	480B				13100		705	383B	1450	843B		
			86-09-25			671B							438		1030			
			88-09-19										379		852			
ZROGE	691430	132580	86-05-24	187B		2580	686B				14000		830	508B	1810	1350B		
WKRYP	684370	136730	86-09-25	374B		3550	1160						424		980			
			87-06-14										325		827			
			88-09-20										283		721			
WBORL	670100	148400	86-05-25	324A		2330	760C				9550		337		696	937C	448B	
			86-09-25	429C		2100A							325		767			
			87-06-14										332		761			
SKARL	658431	136730	86-05-25	352		1710					9170		316		1010			
PDALS	653820	127580	86-05-25	240B		7250	1970A			2460C	16900		1000		1940	1800B		
TFOLK	653113	146540	86-05-26	432A		2050	487C				8700		322		785	1210B		
			86-11-09			1850B	610B						282		610			
			87-06-16				659C						212		633			
OSAVE	641000	126500	87-06-18				998C						369		1180			
			88-10-18										391		1190			

Table 4: Surface equivalent deposition densities (Bq/m^2), west and southwest of wet deposition area

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
NFJAR	637690	128004	86-05-25	55C		3670	1020B			2550B	9610		623	447B	1280	954C		
			87-06-17				843C						469		942			
NMELL	626757	132486	86-05-25	91C		2960	867B			1070C	8760		545	394B	1100	903C		
			86-11-05			1330C	536C						275		715			
			87-06-17										315		718			
			88-08-07										186B		552			

Table 4(cont.): Surface equivalent deposition densities (Bq/m^2), **west and southwest of wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
COSTH	668590	164180	86-09-01	863A		3240	630B	108B					1930		3480			

Table 5: Surface equivalent deposition densities (Bq/m^2), **east of wet deposition area**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
ABHAGA	658430	162680	86-05-28	1260		990					5740		140		582	1270B	1140	767B
			86-09-10	1010A		1030A							117A		493			
			87-06-23										94A		368			
ABROSL	658390	162790	86-05-14	1360		1460	282A				6460	3090	176	66B	523	1690	1370	837
			86-09-18	1320		1380	293B						132		538			
			86-10-14	1320A		1520B							134A		530			
			87-05-25										166A		488			
			88-07-20												505			
ABGRIN	655200	161580	86-07-09	1070		1290							287		743		1080A	760B
IKA03	642010	169290	86-04-28[a]	1270	686A	1020					6910	2640	124B		631	1570A	1230	1640B
			86-05-07[b]	1640	1740A	1450	866B				12000	2810	247	127B	787	2210A	1570	984B
			86-09-30	1310		1590A	401C						226		771		4050B	897B
			87-08-10				499C						192		717			914B

[a] Also detected: ^{239}Np 736C Bq/m^2
[b] Also detected: ^{239}Np 6190C Bq/m^2

Table 6: Surface equivalent deposition densities (Bq/m^2), **Stockholm area and North Gotland**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
IVISB	639586	165135	86-05-07	1830	1590B	3140	1410B				56000	9320	991	426A	1640	3390	1770	1370C
			86-09-30	1350A		3040A	671B						834		1530			729C
			87-08-10				802C						579		1110			
			88-10-14										434		851			
IHEJD	639257	165750	86-05-07[a]	1760	2560B	3150	893C				96200	15300	1320	523A	2400	4370	1500	1100C
			86-09-30	994A		2330A	598B						733		1540			660C
			87-08-11				515C						496		1050			
IGEAB	639225	165038	87-08-10				768B						495		977			
			88-10-14										411		787			
IALVN	634500	165490	87-08-11										636		1250			
IALVA	534500	165490	86-09-30	1640		3900A	924B						962		1810			
			87-08-11										674		1370			
IHAMR	631926	165263	86-05-07[b]	2930	2690B	3790	1640A			2430C	97500	11900	1340	603	2380	5590	2750	2410B
			86-09-30	1960		3220	509C						739		1520			809B
			87-08-11				807B						592		1340			

[a] Also detected: ^{239}Np 7480C Bq/m^2
[b] Also detected: ^{239}Np 13100B Bq/m^2

Table 7: Surface equivalent deposition densities (Bq/m^2), **South Gotland**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
EKOLM	650450	153950	86-05-05	811	1760A	1750	1060C			1450C	32100	19600	1840	745	3260	4230	788A	
			87-07-21				1400B						1730		3050			
HGAML	641698	153568	86-05-05[a]	831	502C	885					12500	2390	307	168B	693	1390	905	733C
			86-11-12	556C									251		580			
			87-07-22										250		519			
			88-08-04										200B		395			
FJONK	640440	139680	86-05-26	309A		2110	620B				8370		453		1340	1000C	352B	
			86-11-08			1610B	670B						387		1180			
			87-06-17										322		910			
			87-07-24										368		1360			
			88-08-08										412		1370			
HOSKA	634450	153380	86-05-05	502A		640					12200	1560	256	147C	507	841A	291B	
			86-11-11										221		493			
			87-07-22										208A		442			
			88-08-04										172A		374			
HKAL1	633600	157250	86-05-05[b]	908	1020	1480	396C				40800	6150	954	416	1760	2450	812	
			87-07-22				798C						678		1970			
HKAL2	633580	157255	86-05-05	699	1060A	1450					33200	4950	753	315A	1710	1900	834	

[a] Also detected: ^{239}Np 23400 Bq/m^2
[b] Also detected: ^{239}Np 5200B Bq/m^2

Table 8: Surface equivalent deposition densities (Bq/m^2), **Southeast and South Sweden**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
HBING	628820	152550	86-05-04	494		480					13800	1650	344	128B	595	813A	339B	
HMOCK	628030	155386	86-05-04[a]	720	660C	904					40100	4400	818	342A	1570	1770	580A	
			86-11-11	755B		2110B							698		1620			
			87-07-22				562C						635		1480			
			88-08-05										400		998			
KGULE	624180	151300	86-05-04[b]	522		451					13500	1440	310	126B	650	646A	425A	
			87-07-23										238		571			
			88-08-05										201		464			
KKARL	622885	144517	86-05-04	175B		128B					2910	797A	106A		318		230B	
			86-11-10			1400C	778B						277		638			
			87-07-23										250		626			
			88-08-05										170B		400			
KRAMD	622821	149767	86-05-04[c]	328A		329A					7250	1110A	214A	138B	467	454B	227B	1210B
			86-11-11										204		499			
			87-07-23										193		320			

[a] Also detected: ^{239}Np 3100C Bq/m^2
[b] Also detected: ^{239}Np 1980C Bq/m^2
[c] Also detected: ^{239}Np 4330B Bq/m^2

Table 8(cont.): Surface equivalent deposition densities (Bq/m^2), **Southeast and South Sweden**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
LLJUN	621966	133947	86-06-12	122B		2790	787A				7360A		491	596B	1290			
			86-11-06			2350A	592A						329		1010			
			87-05-19				651C						329		887			
			88-10-17										222		849			
LKRIS	621350	140800	86-05-04	114A		76C					1370	338B	95B		363			
			86-11-10										140A		457			
			87-05-21										151		477			
			88-08-05										142A		380			
MRING	619300	136120	86-05-04	162B		200A					1330		43B		252A	296C	198B	
			86-06-12	191B		2120	508B				5280A		329		778			
MBARS	618320	132200	86-11-10			2320B	753A						684		1560			
			87-05-19				680C						606		1540			
MLUND	617588	133684	86-05-26	173A		4660	1780A			2860C	12500		832	448B	1660	1150C	308C	
			86-11-07	318C		4270	936A						650		1490			
			87-05-19				1380B						628		1380			
MDALB	617310	134680	86-06-12	142B		3210	898A			2170A	9820A		538		1050			
LVEMM	616300	140200	86-05-26	244A		786					3260		115A		571		201C	

Table 8(cont.): Surface equivalent deposition densities (Bq/m^2), **Southeast and South Sweden**

Location	North	East	Date	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{110m}Ag	^{125}Sb	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce
MSTUR	616200	134300	86-05-04	124A		90B					1090	266B	39C		370		175C	
			86-06-12	128B		3890	936A				8240A		685		1510		474A	
			86-11-10			2730B	1090B						533		1200			
			87-05-19										473		1120			
MABBE	614450	136167	86-06-13	179A		2210	585B				5030A		344		1130		234C	
MSMYG	613210	134486	86-06-13	143B		3270	1100A				10300A		577		1200		246C	
			87-05-19				861C						558		1140			

Table 8(cont.): Surface equivalent deposition densities (Bq/m^2), **Southeast and South Sweden**

Loc.	North East	^{134}Cs	S/I		
		kBq/m^2	1986	1987	1988
BDKIRU	753397 169398	0.14	1.15	0.99	0.94
BDARJE	732980 159494	0.24	2.13	2.27	2.38
ACSTOR	724020 154787	5.39	1.81	1.97	2.34
ACVIL1	717004 152892	13.9	2.73		
ACVIND	713243 169211	7.00	1.79	2.06	2.14
ACFOA4	709025 172275	6.65	2.07		2.19
YBJO1	704825 163643	20.3	1.26	2.35	3.37
YLILL	697038 159330	25.1	1.53	1.44	1.64
CSUN1	664625 159650	9.10	1.38		
IVISB	639586 165135	0.99	1.28	2.20	2.92
HMOCK	628030 155386	0.82	1.40	1.80	2.86
ZOSTE	701030 143410	0.71	1.70		3.6
WKRYP	684370 136730	0.42	1.88	2.45	2.81
NMELL	626757 132486	0.55	1.53	2.65	
EKOLM	650450 153950	1.84	1.31	1.39	
HGAML	641698 153568	0.31	1.58	1.95	2.43
FJONK	640440 139680	0.45	1.40	1.97	
HOSKA	634450 153380	0.26	1.58	1.94	2.35
KGULE	624180 151300	0.31	2.37	3.08	3.65
LLJUN	621966 133947	0.49	1.29	1.93	2.85

Table 9: Surface equivalent deposition density of ^{134}Cs and ratio between soil core (calculated as Bq/m^2) and in situ measurements (S/I).

Start of measurement	End of measurement	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce	^{239}Np
29-Apr-1986 15:37	29-Apr-1986 15:57	1640	1700	1360			7350	2800	182B		568A	2070A	2180	1680C	9690
29-Apr-1986 17:28	29-Apr-1986 21:18	1590	1480	1450	398C		7520	2690	211	90B	641	1800	1850	1260A	9750
29-Apr-1986 21 39	30-Apr-1986 09:18	1550	1460	1410	423B		7780	2570	186	60A	602	1880	1850	1070	9500
30-Apr-1986 11:20	30-Apr-1986 12:48	1600	1440	1470			8250	2560	233		601	2030	1810	1090	9670
30-Apr-1986 12:50	30-Apr-1986 14:05	1600	1490	1410	590C		8330	2560	228A		559	1860	1870	928	9480
30-Apr-1986 14:09	30-Apr-1986 16:52	1600	1480	1440			8470	2710	204	72C	564	1960	1800	988A	9860
30-Apr-1986 16:55	30-Apr-1986 19:56	1660	1470	1420	623B		8500	2670	201	65C	587	1810	1880	1010A	9810
30-Apr-1986 20:22	1-May-1986 08:38	1540	1440	1440	403B		8500	2570	201	55B	578	1890	1770	978	9540
1-May-1986 15:42	1-May-1986 20:22	1560	1540	1450			8330	2570	205	65B	616	1920	1870	1050A	9650
1-May-1986 20:31	2-May-1986 14:55	1540	1440	1370	367B	664B	8140	2500	189	60A	560	1780	1800	1060	9340
3-May-1986 09:17	3-May-1986 16:52	1600	1600	1380	296C		8190	2480	166		615	2080	1720	1160	9420
3-May-1986 17:11	4-May-1986 13:21	1550	1550	1400	393A		8030	2580	181	72A	597	1920	1740	1100	9520
4-May-1986 13:31	5-May-1986 09:58	1540	1540	1390	382A		7990	2570	182	61A	598	1890	1760	996	9060
5-May-1986 10:12	5-May-1986 18:37	1530	1530	1420	471A		7990	2500	191	56B	616	1860	1720	1080	10700
5-May-1986 18:40	6-May-1986 11:45	1510	1510	1380	353A		7980	2620	187	62A	594	1930	1740	954	8900
7-May-1986 07:41	7-May-1986 09:11	1510	1510	1370			8110	2680	204A	121C	621	2110	1780	876	8830B

Table 10: Surface equivalent deposition densities (Bq/m^2), **Stockholm, Roslagsvägen**

Start of measurement	Stop of measurement	^{95}Zr	^{99}Mo	^{103}Ru	^{106}Rh	^{129m}Te	^{131}I	^{132}Te	^{134}Cs	^{136}Cs	^{137}Cs	^{140}Ba	^{141}Ce	^{144}Ce	^{239}Np
8-May-1986 11:03	8-May-1986 19:01	1490	1490	1450	404B	634B	8420	3000	175	83B	618	1930	1750	1020	8510B
8-May-1986 19:53	9-May-1986 10:47	1500	1500	1560	353A		9070	3320	198	89A	634	1900	1720	1070	8210A
9-May-1986 10:49	9-May-1986 20:36	1540	1540	1710	427B		9510	4080	210		648	1950	1770	1120	7110C
10-May-1986 10:00	10-May-1986 17:25	1530	1530	1630	382B		9330	3560	214	56C	652	1910	1740	1100A	8110C
10-May-1986 17:28	11-May-1986 15:31	1470	1470	1540	511A		8970	3350	184	68A	636	1740	1680	1040	6940C
12-May-1986 09:24	12-May-1986 16:59	1390	1140C	1420	396B		7890	2940	192	109B	551	1830	1500	947A	
12-May-1986 17:46	13-May-1986 13:31	1370	1370B	1450	307A		8190	3270	183	58B	551	1640	1590	929	
13-May-1986 18:10	14-May-1986 07:00	1280	1190C	1330	176C		8080	4010	183	78B	571	1650	1510	819A	
14-May-1986 07:05	14-May-1986 16:01	1412		1550	218C		8210	4190	195	98B	581	1650	1510	950	
14-May-1986 16:03	15-May-1986 16:05	1400	1700B	1530	415A		8300	3830	187		602	1860	1590	882	
15-May-1986 16:07	16-May-1986 10:32	1400	2770B	1530	442A		8180	4700	182	81B	597	1800	1610	1000	
16-May-1986 12:24	16-May-1986 15:02	1440		1470			8110	4450B	[illegible]		561	1640A	1570	902B	
10-Jul-1986 15:57	11-Jul-1986 09:33	1350		1510	317A				180		586		1400	795A	
14-Jul-1986 13:18	16-Jul-1986 13:29	1410		1540	340A				184		603		1400	852	
17-Jul-1986 12:48	18-Jul-1986 11:50	1400		1610	414A				196		605		1560	825	
18-Jul-1986 11:37	19-Jul-1986 11:58	1460		1570	412A				185		614		1520	950	
19-Jul-1986 11:59	20-Jul-1986 12:04	1490		1550	397A				189		605		1420	854	

Table 10(cont.): Surface equivalent deposition densities (Bq/m^2), **Stockholm, Roslagsvägen**

Area	County	R(95,134)	R(103,134)	R(131,134)	R(132,131)
1.	BD	0.1-0.6	1.2-6.0	20.-30.	
2.	AC,Z	<0.04	0.3-0.6	4.2-6.8	0.3-0.4
	X,Y	0.04-0.10	0.5-0.7	9.1-14.4	0.7-1.1
	C,U	0.10-0.40	0.6-1.0	9.8-14.8	0.9-1.1
3.	Z	0.20	1.0-3.0	17.	
	S,T,W	1.0-1.3	5.5-8.03	26.-30.	
	N,O,P	0.10-0.30	5.0-7.2	15.-17.	
	L,M	0.20-2.0	4.0-6.5	14.-28.	
4.	C	0.4	1.7		
5.	AB,I	3.3-6.5	4.4-6.2	31.-46.	0.3-0.5
6.	I,H	1.3-2.7	2.5-4.8	58.-75.	0.1-0.2
7.	H,K	1.3-2.7	1.0-6.0	24.-51	0.1-0.3
	E,F	0.7-1.0	1.0-4.7	19.	0.7

Table 11: Radioactivity ratios

Appendix.

Name list for FOA in situ gamma spectrometric and soil sampling locatioons.

The first one or two characters in the location code indicate the county. In some cases the name only give a rough indication of the location. For a more precise definition of the site use the coordinates given in the tables.

1. North of wet-deposition area.

BDKIRU	Kiruna	**BDARJE**	Arjeplog
BDKALL	Kallax		

2. Wet-deposition area.

ACSTOR	Storuman	**ACVIL1**	Vilhelmina
ACVIL3	Vilhelmina	**ZGADD**	Gäddede
ACVIND	Vindeln	**ACFOA4**	Umeå, FOA4
YBJO1	Södra Björna	**YBJO2**	Södra Björna
YDROM	Drömme	**YLILL**	Lillsela
YATTM	Attmar	**XHORN**	Hornslandet
XF15S	Söderhamn, F15	**XLILL**	Gävle, Lillgården
XLIMO	Limön	**XAVAN**	Gävle, Avan
XGAV1	Gävle, Hamnen	**XKAS1**	Gävle, Kastvallen
XKAS2	Gävle, Kastvallen	**XESPL**	Gävle, Esplanaden
XNYNA	Gävle, Nynäs	**XGAV3**	Gävle, Rådhusplatsen
XGAV4	Gävla, Stora torget	**XGAV2**	Gävle, Strömvallen
XI14I	Gävle, Gustavsbro	**XRIKS**	Gävle, Gustavsbro
XMASB	Gävle, Måsberget	**XJAR1**	Gävle, Järvsta
XJAR2	Gävle, Järvsta	**XFURU**	Furuvik
XTORS	Furuvik	**XVALB**	Gävle, Valbo
XALG1	Gävle, Älgsjön	**XALG2**	Gävle, Älgsjön
CTIE1	Tierp	**CTIE2**	Tierp
UTAO1	Tärnsjö	**UTAS3**	Tärnsjö
UTAS2	Tärnsjö	**UTAS1**	Tärnsjö
UTAR1	Tärnsjö	**UTAR2**	Tärnsjö
CULLB	Ullbolsta	**CSUN1**	Sundbro
CSUND	Sundbro	**CGEOG**	Uppsala, Geografen
UHALL	Hallstahammar		

3. West and southwest of wet deposition area.

ZCSTE	Östersund	**ZROGE**	Rogen
WKRYP	Särna, Kryptjärn	**WBORL**	Borlänge
SKARL	Karlstad	**PDALS**	Dals Ed
TFOLK	Folketorp	**OSAVE**	Säve
NFJAR	Fjärås	**NMELL**	Mellbystrand

4. East of wet deposition area.

COSTH	Östhammar

5. Stockholm area and North Gotland

ABHAGA	Stockholm	**ABROSL**	Stockholm
ABGRIN	Grindsjön	**IKA03**	Fårön, KA3

6. South Gotland.

IVISB	Visby	**IHEJD**	Ö.Hejde
IGEAB	Visby	**IALVN**	Alva
IALVA	Alva	**IHAMR**	V.Hamra

7. Southeast and South Sweden.

EKOLM	Kolmården	**HGAML**	Gamleby
FJONK	Jönköping	**HOSKA**	Oskarshamn
HKAL1	Kvarnstad	**HKAL2**	Kvarnstad
HBING	Binge	**HMOCK**	Möckleby
KGULE	Gulemåla	**KKARL**	Karlshamn
KRAMD	Ramdala	**LLJUN**	Ljungbyhed
LKRIS	Kristianstad	**MRING**	Ringsjöstrand
MBARS	Barsebäck	**MLUND**	Lund
MDALB	Dalby	**LVEMM**	Ö.Vemmerlöv
MSTUR	Sturup	**MABBE**	Abbekås
MSMYG	Smygehuk		