

3.2 Data reported on discharges from other non-nuclear sectors

Contracting Parties have been invited to report the estimated discharges from the following other non-nuclear sources of radioactive substances:

- a. the medical sector (I-131);
- b. universities and research centres (H-3, C-14, P-32, S-35, Cr-51, I-125);
- c. phosphate industry (Pb-210, Po-210, Ra-226);
- d. titanium dioxide pigment manufactures (Pb-210, Po-210, Ra-226, Ra-228);
- e. primary steel manufacture (Pb-210, Po-210);
- f. radiochemical production (H-3, C-14, S-35, Cr-51, I-125, Pb-210, Po 210).

Table 3.2 shows the data reported from non-nuclear sector other than offshore oil and gas.

Table 3.2. Discharges from non-nuclear sector other than offshore oil and gas in 2012, in terabecquerel (TBq). Shaded boxes are not applicable.

Sector	CP	OSPAR Region ¹	Discharges of specified radionuclides (TBq)													Total Alpha	Total Beta/ Gamma
			I-131	H-3	C-14	P-32	S-35	Cr-51	I-125	Pb-210	Po-210	Ra-226	Ra-228	Th-228	Am-241		
Medical Sector ^{(BE1) (DK1) (CH1) (NL1) (ES1) (UK1)}	BE	II	0.00E+00														
	CH	II	8.10E-03														
	DK	II	2.15E+00														
	IE	III	6.19E-01														
	IE	V	1.11E-01														
	NO	I	4.32E-01														
	NO	II	7.86E-01														
	SE	II	8.14E-01														
	UK	II	6.74E+00														
UK	III	2.86E+00															
Universities & Research centres ^{(BE2) (IE1) (IE2) (LU1) (UK2)}	BE	II		5.79E-03	2.89E-03	0.00E+00	0.00E+00	0.00E+00	1.76E+00								
	CH	II		9.00E-03	1.40E-03												
	IE	III		7.57E-04	6.22E-04	1.76E-06	2.60E-14	0.00E+00	1.05E-04								
	IE	V		2.90E-06	0	7.40E-05	0	0	0								
	LU	II		2.00E-04	1.50E-04	5.00E-06	4.00E-06		2.50E-05								
	NO	I		1.92E-04	7.09E-06	1.00E-07	0.00E+00	0.00E+00	3.00E-06								
	NO	II		3.86E-05	1.33E-05	1.00E-06	5.00E-08	2.00E-06	3.00E-12								
	ES	V		1.94E-03	9.20E-04	4.63E-03	2.82E-02	1.11E-03	7.30E-04								
	SE	II		6.00E-04	1.20E-04	1.54E-04	4.00E-06	1.00E-04	1.00E-04								
	UK	II		4.65E-02	7.40E-02	1.84E-02	1.88E-02	1.82E-03	3.44E-02								
UK	III		2.47E-01	9.81E-03	3.15E-03	4.42E-03	4.30E-05	2.65E-04									
Phosphate industry ^{(BE3) (ES2) (UK3)}	NL	II															
Titanium dioxide pigment manufacturers ^{(ES3) (UK4)}	NL	II								3.70E-03	3.70E-03	3.70E-03	1.30E-03				
	ES	IV								3.00E-05	3.00E-05	2.00E-05	<5.00E-03				
Primary steel manufacture ^{(BE4) (ES4) (UK5)}	NL	II															
Rare Earth ^{(BE5) (ES5)}	FR																
Radiochemical production ^{(CH2) (ES5)}	CH	II		2.37E-02													
	SE	II		1.35E-01	6.00E-03				3.00E-05								
	UK	II		1.13E-04	1.02E-01		n/d	2.65E-05	n/d	n/d	n/d				9.30E-06	1.04E-03	
	UK	III		1.14E-02	1.01E-03		n/d	n/d	0.00E+00	n/d	n/d				n/d	n/d	

Further details on the data reported in Table 3.2 are given below.

1. The five OSPAR sub-regions are:

- (I) The Arctic,
- (II) The Greater North Sea (including the English Channel),
- (III) The Celtic seas,
- (IV) The Bay of Biscay/Golfe de Gascogne and Iberian coastal waters, and
- (V) The wider Atlantic.

The definitions of these and a map are given in the Strategy for the Joint Assessment and Monitoring Programme.

Belgium

- BE1 I-131: Holding tanks are used to reduce concentrations of I-131 in the liquid discharges to below 10 Bq/l.
- BE2 Holding tanks are used to reduce concentrations of P-32, S-35 and Cr-51.
- BE3 Pb-210 and Po-210 are not monitored.
- BE4 Belgium notes that release of Pb-210/Po-210 from the steel industry would rather affect atmospheric discharge.
- BE5 There are no primary rare earth production in Belgium. Production only occurs on basis of recycling what makes a significant release of natural nuclides unlikely.

Denmark

- DK1 Denmark has not collected data on releases of isotopes from the medical sector in 2012; the reported activities are calculated by projection of the data from 2010 and 2011.

Ireland

- IE1 Region III: The significant decrease in C-14 discharges between 2011 to 2012 is due to the reduction in the discharges from one particular licensee from 5,1E-03 to 7,57E-04 TBq. In the past, this licensee had stockpiled significant quantities of C-14 waste originating from a particular hospital. As the continued storage of this waste was not a viable long-term option, RPII's regulatory service has put pressure on this licensee to deal with this waste. It is likely that the majority of this waste has been disposed of in 2011, and in subsequent years we will continue to see significant reductions in the amount of C-14 being discharged by this licensee.
- IE2 Region V: The discharges from the educational sector is likely to vary from year to year and is highly dependent on the specific research projects that are currently being undertaken by the colleges that use unsealed radionuclides. In this regard, almost all the discharges of P-32 originated in 2012 from one particular licensee, and between 2011 to 2012 their discharges decreased from 1,27E-04 to 7,4E-05 TBq.

Luxembourg

- LU1 Discharges from research premises in Luxembourg are made into the Moselle, a tributary of the Rhine. The maximum activities estimated to be discharged annually are given.

The Netherlands

NL1 In the Netherlands, delay tanks are used. For the years prior to 2008, the reported estimate of discharges from the medical sector is based on the number of therapeutic and diagnostic procedures, reported to the RIVM institute by the hospitals in the context of a yearly survey, and the recommended activity per procedure.

Spain

ES1 There are holding tanks to reduce the concentration of I-131 in the liquid discharges to below 10 Bq/l.

ES2 Two plants process phosphates and produce both phosphoric acid and phosphate fertiliser. The residual phosphogypsum is piled and no radioactive liquid effluents are released into the river because the system works as a closed circuit.

ES3 There is only one titanium dioxide plant that is located on the South West coast. According to current Spanish legislation, NORM industries are not obliged to report on radioactive discharges. The provided activity values have been estimated from a study that is being carried out by the Sevilla and Huelva Universities. Therefore they are generic values.

ES4 According to the available information, in Spain there are no integrated steel plants. The Spanish steel making plants (conversion of pig iron to steel) operate a dry gas cleaning process and, for this reason, no discharges of Pb-210 and Po-210 take place.

ES5 Not present.

Switzerland

CH1 Discharges from holding tanks in hospitals.

CH2 Manufactures of gaseous Tritium Light Devices (GTLD) and tritium-labelling service of various organic compounds.

United Kingdom

UK1 Medical Sector: This sector has been interpreted as being hospitals, clinics and medically related laboratories. Only I-131 is required to be reported for this sector in 2012.

UK1 Universities and Research Centres: This has been interpreted to include all universities, educational establishments, medical research facilities and research institutes. This category also includes operators involved in pharmaceutical research and the manufacture of pharmaceuticals, as well as non-medical commercial laboratories (laboratories associated with medical activities are included in the Medical Sector). The percentage of the discharge due to the pharmaceutical, commercial laboratories and non-commercial (other) sectors from England and Wales and Scotland are as follows:

■ **Table: Percentage contribution to universities & research sector discharges**

Radionuclide	Region II			Region III		
	Others*	Pharmaceuticals	Laboratories	Others ^a	Pharmaceuticals	Laboratories
H-3	74,2%	22,1%	3,7%	2,2%	97,8%	0,1%
C-14	2%	91,9%	6,0%	2,2%	83,9%	11,6%
P-32	98%	0,5%	1,4%	100%	0,0%	0,0%
S-35	81%	14,7%	4,2%	96,9%	3,1%	0,0%
Cr-51	98,9%	1,1%	0,0%	100%	0,0%	0,0%
I-125	19,4%	79,1%	1,6%	100%	0,0%	0,0%

[*] includes universities, educational establishments and medical research facilities

Due to the range of facilities, the method of estimation and origin is not uniform. Information from previous reviews suggests the majority of organisations determine discharges through direct measurement.

UK3 Phosphate Industry: No longer present in the UK.

UK4 Titanium Dioxide Industry: One operator reported discharges of total alpha and total beta/gamma (excluding tritium) in 2012, however these releases were in the form of transfers to the UK's Low Level Waste Repository at Drigg and are not required to be reported in the OSPAR reporting procedures.

UK5 Primary Steel Manufacturing: There are three primary steel manufacturing plants in the UK, two on the east coast of England (sub-region II) and one in Wales (sub-region III). However, the plants operate a dry gas cleaning process and any dust removed from the stack is either retained, recycled or sent to landfill. There are no liquid discharges arising from this process.

UK6 Rare Earth production: There is no rare earth production in the UK.



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