

Prospective Dose Assessment – Faslane and Coulport

Model Used – PC Cream 2008 v1.2.0.44

Habit Survey(s) used – 2011 and 2006

Discharge data:

Coulport Gaseous: tritium (^3H) 20 GBq from a stack height of 14.5 metres above ground.

Faslane Liquid:	Cobalt-60 (^{60}Co)	125 MBq
	Tritium (^3H)	500 GBq
	Total beta	125 MBq
	Total alpha	50 MBq

Resulting Prospective Doses from Discharges to the Environment

Discharge Route	Annual Dose μSv		
	Adult	Child	Infant
Gaseous	0.0004	0.0005	0.0009
Liquid	0.0006	0.0005	0.0002
Totals	0.001	0.001	0.001

Note : The term dose is the sum of the dose due to external exposure from discharges plus the committed effective dose from intakes of radionuclides.

The maximum annual dose from direct radiation from Faslane is less than 0.05 microSieverts.

Discussion

Habit Data

Habit data has been taken from the 2006 and 2011 surveys. Habit surveys are a temporal snapshot. There are differences in the data and the highest figures have been used.

The terrestrial habit survey doesn't have distances for food production or occupancy. After examination of maps and discussion with the Site Inspector, a distance of 1000m from the gaseous discharge point was used for the receptor. This is pessimistic in that food production for sheep meat, beef and milk would require a significant area for production whereas vegetable could be grown in quite a small area.

There is no indication on whether high rate consumers in the terrestrial group are also high rate consumers and have high occupancies in the maritime group. Since the doses resulting from the assessment by simply summing the two high rate groups are very low, no attempt has been made to make the assessment more realistic.

Radionuclide data.

The liquid discharge limits have total alpha and total beta categories. PC CREAM needs radionuclide specific inputs. In this case total alpha has been input as ^{239}Pu and total beta as ^{90}Sr . These radionuclides were chosen on the basis of knowledge of the process involved and relative radiotoxicities.

Met data

A uniform wind rose with 65% D Category weather has been assumed.

Direct Radiation

Although the 2011 Habit survey reports occupancies up to 8200 hours per year, this is deceptive when taken in isolation since distance from the source is also important. Thus a number of locations were considered as shown in the table below. Although the occupancy is modest, the relatively short source to receptor distance for the South Gate Taxi Rank lead to these receptors incurring the highest dose by this route although it is still very low in absolute terms,

The maximum dose rate of $0.3 \mu\text{Sv h}^{-1}$ at 1 metre from the source includes background and thus will give an overestimate. This dose rate was reduced at the receptors by use of the inverse square law. No credit has been taken for the reduction of the dose rate by buildings. Overall, this gives a conservative assessment.

Location	Distance m	Annual Occupancy Hours	Occupancy x dose rate reduction factor	Annual Dose μSv
Taxi Rank	80	1000	0.16	0.05
Station Road residences	500	8200	0.033	0.01
Clyde Nursery	400	2351	0.015	0.004