

Haeger, Allan R.

Release

From: Gumnick, John
 Sent: Thursday, December 08, 2005 11:34 AM
 To: Vickers, Robert G.; Thompson, David A.
 Cc: Rybak, Bohdan; Haeger, Allan R.; Ainger, Kenneth A.; Roberson, Jessie; Melberg, Peg; Hersey, Kevin K.
 Subject: Potential ODCM Pathways

Group,

Please review the following calculations.

Two credible dose pathways attributable to the Braidwood tritium plume are drinking water and consumption of sport fish. The conclusion is that dose to the public from drinking water and consumption of sport fish would be orders of magnitude below any applicable Federal limits.

Assumptions:

1. The tritium concentration in the fish body water is equal to 90% of the tritium concentration in the pond (From ODCM App.C Table C-8), which is assumed to be 2800 pCi/l, which equals 2.52E-10 mCi/g of fish.
2. A maximally exposed individual consumes 21 kg of fish a year, or 21,000 g/year. (From Reg Guide 1.109)

Calculating,

$$2.52E-10 \text{ mCi/g fish} \times 21,000 \text{ g fish/year} = 5.29 \text{ E-6 mCi/year total tritium ingested}$$

$$5.29E-6 \text{ mCi/year} \times 62.5 \text{ mrem/mCi (From NUREG 4013)} = 3.31 \text{ E-4 mrem/year ODCM} = 1.4E-3 \text{ mrem/yr}$$

For the drinking water pathway, the ODCM postulates a consumption of two liters per day. (From Reg Guide 1.109) The most contaminated drinking water well was 1280 pCi/l.

Calculating,

$$4 \text{ mrem/year}/20,000 \text{ pCi/l} \times 1280 \text{ pCi/l} = 0.256 \text{ mrem/year.}$$

0.0189 mrem/yr

730 l / yr

TABLE C-2

TEEN 8.78E-1 mrem/yr

This is considerably less than the performance indicator value of 1.5 mrem/quarter.

ADULT 1.25

All other credible pathways such as milk, recreation and irrigation would be small fractions of the drinking water dose.

Call me if you have any questions,

CHILD 1.69

INFANT 1.66

John Gumnick
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FISH $\frac{\text{mCi}}{\text{hr}} \frac{\text{ml}}{\text{ml}}$

ADULT 1.29E-1

TEEN 9.92E-2

CHILD 8.21E-2

INFANT

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