RAS 7005 50-213-OLA Exhibit 35 Rec'd 3/11/03

CAN-20-Resnikoff

NUCLEAR REGULATORY COMMISSION
Docket No. 50-213-OLA Official Exh. No. 35
In the matter of
Staff IDENTIFIED 3/11 430 pm
Applicant RECEIVED 3/11 430 pm
Intervenor ✓ REJECTED
Other WITHDRAWN
Limited Witness
Clerk MRM

NCRP-123, "Screening Models for Releases of Radionuclides to Atmosphere, Surface Water and Ground," National Council on Radiation Protection and Measurements, Bethesda, MD.

Template=SECY-028

SECY-02

NCRP REPORT No. 123 I

SCREENING MODELS FOR RELEASES OF RADIONUCLIDES TO ATMOSPHERE, SURFACE WATER, AND GROUND

Recommendations of the
NATIONAL COUNCIL ON RADIATION
PROTECTION AND MEASUREMENTS

Issued January 22, 1996

National Council on Radiation Protection and Measurements
7910 Woodmont Avenue / Bethesda, MD 20814-3095

TABLE 6.1—*Element specific bioaccumulation factors (BF) and sorption adjustment factors (F_s) for sediment.*[a] *(Continued)*

Element	Freshwater Fish (L kg^{-1})	Marine Fish (L kg^{-1})	Marine Shellfish (L kg^{-1})	F_s[b]
Tb	25	25	1,000	10
Tc	20	10	1,000	0.1
Te	400	1,000	10,000	1
Th	100	10,000	1,000	10
Ti	1,000	1,000	1,000	1
Tl	10,000	10,000	15,000	1
Tm	25	25	1,000	10
U	10	1	10	1
V	200	400	500	1
W	12,000	30	30	1
Xe	0	0	0	0
Y	30	10	1,000	10
Yb	200	500	500	10
Zn	1,000	2,000	20,000	1
Zr	300	100	1,000	10

[a]Values derived from Copeland *et al.* (1973), Hoffman and Baes (1979), IAEA (1982; 1993), Killough and McKay (1976), Newman (1985), Poston and Klopfer (1986), Thompson *et al.* (1972) and Vanderploeg *et al.* (1975).

[b]Where two values of F_s are given, the first value is for freshwater sites, the second value for marine. When only one value is given, use it for both fresh and marine sites. F_s is used in Section 8.2.2 for doses from shoreline.

$$K = \frac{\lambda_b}{\lambda_r + \lambda_b} \qquad (6.2)$$

where

λ_b = biological decay constant = 0.693 t_b^{-1} (d^{-1})
λ_r = radiological decay constant = 0.693 t_r^{-1} (d^{-1})
t_b = biological half-life (d)
t_r = radiological half-life (d)

For screening t_b is assumed to be 30 d, yielding a value of 0.023 d^{-1} for λ_b.

7. Usage Factors

In screening models that are used to estimate radiation dose to people, the exposure to a contaminated environment and the consumption of contaminated drinking water and food must be considered in the calculations. For these calculations, it is necessary to estimate the length of time that individuals are exposed to the contaminated environment and the amount of drinking water and food consumed by individuals.

Evaluating the intake of radionuclides by the ingestion of contaminated water and food requires a detailed knowledge of the patterns of food consumption commonly referred to as usage factors. Site-specific data for usage factors are always preferable to the default values; however, in many cases, these data are not available or are difficult to obtain. For the purpose of initial screening, values for usage factors are provided in Table 7.1 for later use in Section 8. It

TABLE 7.1—*Annual individual usage factors used in screening models for external exposure, inhalation and consumption of foods.*

Pathways—External and Inhalation	Unit	Exposure[a]
Exposure to a contaminated surface	h y^{-1}	8,000[b]
Exposure to shoreline	h y^{-1}	2,000
Submersion in water	h y^{-1}	300
Submersion in air	h y^{-1}	8,000
Boating	h y^{-1}	200
Garden and ground exposure from irrigation	h y^{-1}	500
Inhalation	m^3 y^{-1}	8,000[b]
Pathways—Ingestion	**Unit**	**Intake**
Freshwater fish	kg y^{-1}	20[c]
Marine fish	kg y^{-1}	20[c]
Marine shellfish	kg y^{-1}	10[c]
Water and beverages	L y^{-1}	800
Fruit, vegetables and grain	kg y^{-1}	200[d]
Milk	L y^{-1}	300
Meat	kg y^{-1}	100
Soil	kg y^{-1}	0.365[b]

[a]Usage factors were derived from NCRP (1984), Rupp (1980), Rupp *et al.* (1980), and Yang and Nelson (1984).

[b]For ground screening factors these values should be reduced by a factor of four.

[c]Approximate 99 percentile of adult consumption in the United States (Rupp *et al.*, 1980).

[d]For ground screening factors this value reduced by a factor of two.