OFFSITE DOSE CALCULATION MANUAL
FOR
GASEOUS AND LIQUID EFFLUENTS
FROM THE
TURKEY POINT PLANT UNITS 3 AND 4

Florida Power and Light Company

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1.0 Introduction

This Manual describes acceptable methods of calculating radioactivity concentrations in the environment and the potential resultant doses* offsite** that are associated with liquid and gaseous effluents from the Turkey Point Nuclear Plant. The radioactivity concentrations and dose estimates are used to demonstrate compliance with Technical Specifications required by 10 CFR 50.36. The methodology stated in this Manual is acceptable for use in demonstrating operational compliance with 10 CFR 20.106, 10 CFR 50 Appendix I, and 40 CFR 190. Only the dose attributable to the Turkey Point Units 3 and 4 is considered in demonstrating compliance with 40 CFR 190 since no other nuclear facility exists within 50 miles of the Plant.

Monthly calculations are made to guide the management of station effluents and to verify that potential radioactivity concentrations and doses offsite satisfy the Technical Specifications. The receptor is described such that the exposure of any resident near the plant is unlikely to be underestimated. Even more conservative conditions (e.g. location and/or exposure pathways expected to yield higher computed doses) than appropriate for the maximally exposed person may be assumed when calculating the concentration or dose.

Monthly calculations made to assure that air dose and dose commitment specifications are not exceeded are based on atmospheric dispersion and deposition of gaseous effluents derived from reference meteorological conditions.*** Calculations made to assess the radioactive noble gas dose to air are based on the location offsite that could be occupied by a person where the maximum air dose is expected.

Calculations of dose committed from radioactive releases over extended time (3 and 12 months) are also made for the purpose of verifying compliance with regulatory limits on offsite dose. For these calculations the receptor is selected on the basis of the combination of applicable exposure pathways identified in the land use census and the maximum ground level X/Q at a residence, or on the basis of more conservative conditions such that the dose to any resident near the Plant is unlikely to be underestimated.

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* Dose is commonly used to mean personal dose equivalent commitment.

** Offsite means outside the exclusion area.

*** Reference meteorological conditions are annual averaged conditions during years 1976 and 1977.

2.0 Liquid Effluent

2.1 Radioactivity Concentration In Liquid Waste

The concentration of radionuclides in liquid waste is determined by sampling and analysis in accordance with Table 3.9-1 of the Technical Specifications. When a radionuclide concentration is below the lower limit of detection (LLD) for the analysis, it is not reported as being present in the sample.

2.2 Radioactivity Concentration in Water at the Restricted Area Boundary

Technical Specification 3.9.1.a requires that the concentration of radioactive material, other than noble gases, in liquid effluent released into an unrestricted area not exceed the concentration specified in 10CFR Part 20, Appendix B, Table 2, Column 2. A maximum concentration, $.2 \times 10^{-4}$ μCi/ml, of noble gas in aqueous releases into an unrestricted area applies separately since the potential exposure route, immersion in water, differs from that upon which Part 20, Appendix B is based.

Radioactive material in liquid effluent is diluted by condenser cooling water from fossil units 1 and 2 and from nuclear units 3 and 4 in the condenser cooling water mixing basin. Water in the basin flows into a closed cooling canal system onsite. Liquid effluent does not actually leave the site in a surface discharge. For the purpose of compliance with Technical Specification 3.9.1.a, the total condenser cooling water flow from operating condenser cooling water pumps at the four units is assumed for dilution and the restricted area boundary is assumed to be at the end of the condenser cooling water mixing basin where water enters the cooling canal system.

Some liquid effluents from both Units 3 and 4, discharge through a common liquid radwaste release point. To assure that the effluents are within allowable limits per reactor, the measured releases from the common release point are apportioned to each unit on a ratio equal to the ratio of specific isotopic concentrations in the primary coolant in the two reactors.

Sections 2.2.2 and 2.2.3 describe methods used to assess compliance with Technical Specification 3.9.1.a. Effluent monitor alarm/trip setpoints are computed on the same basis, as is described in section 2.4. As long as an alarm/trip setpoint is not exceeded, aqueous effluents are deemed to comply with Technical Specification 3.9.1.a.

2.2.1 Aqueous Concentration

The diluted concentration of radionuclide i in the condenser cooling water mixing basin outflow is estimated with the equation

$$C_{zi} = C_i \cdot \frac{F_1}{F_2} \qquad (1)$$

where:

C_{zi} = concentration of radionuclide i in the water in the condenser cooling water mixing basin outflow (μCi/ml)

C_i = concentration of radionuclide i in liquid radwaste released (μCi/ml)

F_1/F_2 = dilution

F_1 = flow in radioactive liquid discharge line (gal/min)*

F_2 = total condenser cooling water flow (gal/min).* Value not greater than the rated total condenser cooling water flow from operating condenser cooling water pumps at the four units.

2.2.2 Batch Release

A sample of each batch of liquid radwaste is analyzed before release for I-131 and other principal gamma emitters, or for total gross β-γ activity concentration. With the activity concentration in a batch sample b based on the total isotopic activity or gross β-γ activity, the fraction of the unrestricted area MPC due to a batch release is estimated by

$$FMPC_b = \frac{C_b}{3 \times 10^{-8}} \qquad (2)$$

where:

$FMPC_b$ = fraction of the unrestricted area MPC present in the condenser cooling water mixing basin outflow due to a batch release

$C_b = \sum_i C_{zi}$ (μCi/ml)

3×10^{-8} = unrestricted area MPC for unidentified radionuclides in water (μCi/ml)

Alternately, the fraction of the unrestricted area MPC can be derived using the ratio of the individual isotopic concentrations and their related MPCs. $FMPC_b$ is estimated with the equation

$$FMPC_b = \sum_i \frac{C_{zi}}{MPC_i} \div E_b \qquad (3)$$

* F_1 and F_2 may have any suitable but identical units of flow (volume/time).

where:

MPC_i = activity concentration limit in water of radionuclide i according to 10 CFR 20, Appendix B, Table 2, Column 2 (μCi/ml)

E_b = Quarterly average of the fraction of MPC in the batch tank due to I-131 and principal gamma emitters / Quarterly average of the fraction of MPC in the batch tank due to all radionuclides measured

E_b is an adjustment to account for radionuclides not measured prior to release but measured in the monthly and quarterly sample per Technical Specification Table 3.9-1. The value of E_b has been determined based on past operating data and is

$$E_b = 0.8$$

2.2.3 Continuous Release

Continuous aqueous discharges are sampled and analyzed according to the schedule in Technical Specifications Table 3.9-1. The fraction of the unrestricted area MPC present in a continuously discharged radioactive stream, $FMPC_c$, is derived either from isotopic analyses or from gross β-γ analysis. With the activity concentration in a continuous radioactive release stream based on the total isotopic or gross β-γ activity alone, the fraction of the unrestricted area MPC due to a continuous release is estimated with

$$FMPC_c = \frac{C_c}{3 \times 10^{-8}} \qquad (4)$$

where:

$FMPC_c$ = fraction of the unrestricted area MPC present in the condenser cooling water mixing basin outflow due to a continuous release

$$C_c = \sum_i C_{zi} \ (\mu Ci/ml)$$

Alternately, the fraction of the unrestricted area MPC can be derived using the ratio of the individual isotopic concentrations and their related MPCs. $FMPC_c$ is estimated with the equation

$$FMPC_c = \sum_i \frac{C_{zi}}{MPC_i} \div E_c \qquad (5)$$

C6:1

where:

E_C = Quarterly average fraction of MPC due to I-131 and principal gamma emitters measured in weekly samples of continuous releases during the quarter / Quarterly average fraction of MPC due to all radionuclides measured in samples of continuous releases

E_C is an adjustment to account for radionuclides not measured in weekly samples of continuous releases but measured in the monthly and quarterly composite samples per Technical Specifications Table 3.9-1. The value of E_C has been determined based on past operating data and is

$$E_C = 0.9$$

2.3 Cumulative Dose

Technical Specification 3.9.1.b requires that the dose or dose commitment per reactor to a member of the public due to radioactive material released in liquid effluent to an unrestricted area shall be limited, during any calendar quarter, to $\leq$1.5 mrem to the total body and to $\leq$5 mrem to any organ, and, during any calendar year, to $\leq$3 mrem to the total body and $\leq$10 mrem to any organ.

Technical Specification 3.9.1.b.1 requires the dose or dose commitment to a member of the public due to radioactive material released in liquid effluent to be calculated on a cumulative basis at least once per month. The condenser cooling water basin and closed canal system which receives aqueous effluent is entirely on FP and L property, without surface discharge offsite, and FP and L does not permit members of the public to use the water. As a result, potential exposure of a member of the public to radioactive material originating in aqueous effluent is limited to irradiation of campers by canal shoreline deposits.

Technical Specification 3.9.1.b.1 is satisfied by calculating the cumulative total body dose to a person who may be irradiated by radionuclides deposited on the cooling canal shoreline from radioactive liquid effluent. Compliance with the organ dose limit is assured as long as the total body dose is below its limit.

The model that is used to evaluate doses due to radioactivity in liquid effluents is

$$D = 0.23 \sum_k \sum_i A_i^{shoreline} \cdot \frac{C_{ik} \cdot F_{1k}}{V \cdot \lambda_i^e} \cdot t_k \qquad (6)$$

where:

D = total body dose due to irradiation by radionuclides on the shoreline which originated in a liquid effluent release (mrem)

0.23 = units conversion constant = $\frac{1 \text{ Ci}}{10^6 \text{ } \mu\text{Ci}} \times 60 \frac{\text{min}}{\text{hr}} \times 3785 \frac{\text{ml}}{\text{gal}}$

A_i = transfer factor relating a unit aqueous concentration of radionuclide i (μCi) to dose commitment rate to the total body of an exposed person tabulated in Appendix A (mrem/Ci · min/gal)

C_{ik} = the concentration of radionuclide i in the undiluted liquid waste to be discharged that is represented by sample k (μCi/ml)

F_{1k} = liquid waste discharge flow during release represented by sample k (gal/min)

V = cooling canal effective volume, approximately 3.75×10^9 gallons

λ_i^e = effective decay constant ($minute^{-1}$) for nuclide i = $(\lambda_i + F_3/V)$

where: λ_i = the radioactive decay constant

F_3 = canal-ground water interchange flow, approximately 2.25×10^5 gal/min

t_k = period of time (hours) during which liquid waste represented by sample k is discharged

Radionuclide concentrations (C_{ik}) in effluent are measured by the sampling and analysis program specified in Technical Specification Table 3.9-1. Typically, more than 90 percent of the potential irradiation from radionuclides deposited along the shoreline is due to Mn-54, Co-58, Co-60, Cs-134, and Cs-137. Of these radionuclides, Co-60 has the maximum dose transfer factor, A_i. Thus, for the purpose of assessing compliance with Technical Specification 3.9.1.b.1, the radioactive effluent source term may be either:

a) principal gamma emitters measured by the effluent sampling and analysis program, or
b) Mn-54, Co-58, Co-60, Cs-134, and Cs-137 measured by the effluent sampling and analysis program and other identified gamma emitters assumed to be Co-60, or
c) all gamma emitters measured by the effluent sampling and analysis program assumed to be Co-60.

2.4 Method of Establishing Alarm and Trip Setpoints

Technical Specification 3.9.1.c requires the radioactive liquid effluent monitoring instrumentation channel to be operable with its alarm/trip setpoints set to ensure the limit of Specification 3.9.1.a is not exceeded.

The alarm/trip setpoint for each liquid effluent radiation monitor is derived from the concentration limit provided in 10 CFR Part 20, Appendix B, Table 2, Column 2 applied in the condenser cooling water mixing basin outflow. Radiation monitoring and isolation points are located in the steam generator blowdown lines, R-3-19, R-4-19, and the liquid waste disposal system line, R-18, through which radioactive waste effluent is eventually discharged into the canal basin. See Figure 2-1.

The alarm setpoint for each liquid effluent monitor is based upon the measurements of radioactivity in a batch of liquid to be released or in the continuous aqueous discharge. Sample measurements are performed according to Technical Specification Table 3.9-1.

2.4.1 Setpoint for a Batch Release

The liquid radwaste effluent line radiation monitor alarm setpoint for a batch release is determined with the equation below or a method which gives a lower setpoint value.

$$S_b = \frac{A_b}{FMPC_b} \cdot g_b + Bkg \qquad (7)$$

where:

S_b = radiation monitor alarm setpoint (cpm) for a batch release

A_b = laboratory counting rate (cpm/ml) or activity concentration (μCi/ml) of sample from batch tank

$FMPC_b$ = fraction of unrestricted area MPC present in the condenser cooling water mixing basin outflow due to a batch release; determined in section 2.2.2.

g_b = ratio of effluent radiation monitor counting rate to laboratory counting rate or activity concentration in a given batch sample (cpm per cpm/ml or cpm per μCi/ml)

Bkg = background (cpm)

2.4.2 Setpoint for a Continuous Release

The liquid effluent line radiation monitor alarm setpoint, for a continuous release, is determined with the equation below or by a method which gives a lower setpoint value.

$$S_c = \frac{A_c}{FMPC_c} \cdot g_c + Bkg \qquad (8)$$

where:

S_c = radiation monitor alarm setpoint (cpm) for a continuous release

A_c = laboratory counting rate (cpm/ml) or activity concentration (μCi/ml) of sample from continuous release

$FMPC_c$ = fraction of unrestricted area MPC present in the condenser cooling water mixing basin outflow due to a continuous release; determined in section 2.2.3.

g_c = ratio of effluent radiation monitor counting rate to laboratory counting rate or activity concentration in a given continuous release sample (cpm per cpm/ml or cpm per μCi/ml)

2.5 Projected Dose

Technical Specification 3.9.1.d requires that appropriate subsystems of the liquid radwaste treatment system shall be used to reduce the radioactive materials in liquid wastes prior to their discharge when the projected doses to unrestricted areas due to liquid effluents, when averaged monthly, would exceed 0.06 mrem to the total body or 0.2 mrem to any organ.

Technical Specification 3.9.1.d.1 requires the doses, to unrestricted areas, due to radioactive material released in liquid effluent to be projected at least once per month unless the liquid radwaste treatment system is being used.

This requirement is satisfied by extrapolating the dose to date during the current month to include the entire month. The dose to date is calculated as described in section 2.3.

The dose is projected with the relation:

$$P = \frac{31 \cdot D}{X} \qquad (9)$$

where:

P = the projected total body dose during the month (mrem)

31 = number of days in a calendar month (days)

X = number of days in current month to date represented by available radioactive effluent sample (days)

D = dose to date during current month calculated according to section 2.3 (mrem)

Alternatively, the monthly dose may be projected by computing the doses to the total body and most exposed organ accumulated during the most recent month and assuming the result represents the projected doses for the current month. The dose during the preceeding month will be computed as described in section 2.3.

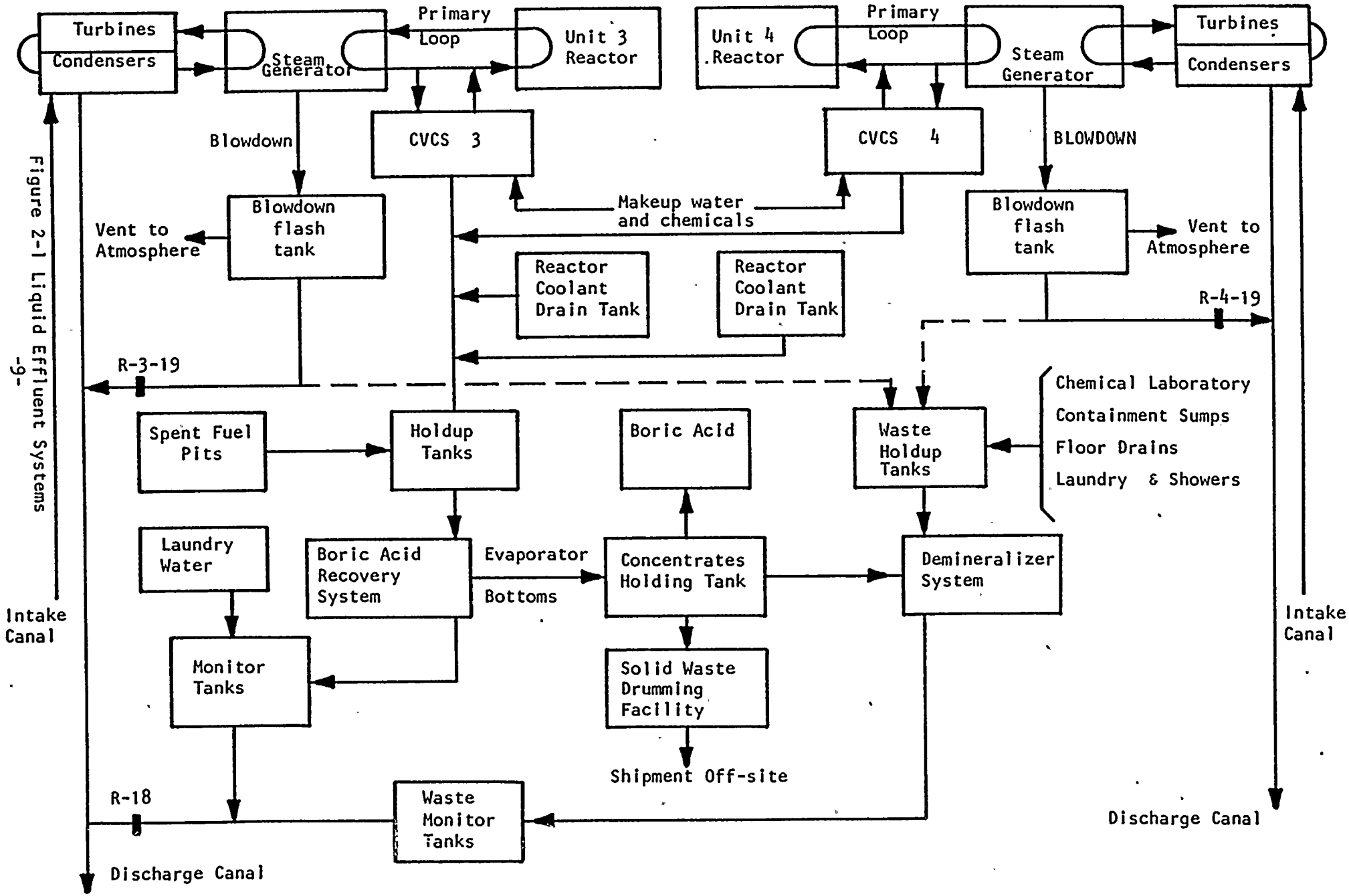


Figure 2-1 Liquid Effluent Systems

3.0 Gaseous Effluent

3.1 Introduction

Units 3 and 4 discharge gaseous effluent through the plant vent, Unit 3 Spent Fuel Pit vent and air ejector vents. These gaseous effluent streams, radioactivity monitoring points, and effluent discharge points are illustrated schematically in Figure 3-1. When calculating atmospheric dispersion of gaseous effluent, gaseous discharges from Units 3 and 4 are treated as a mixed mode ground-level release from a single composite vent.

3.2 Radioactivity in Gaseous Effluent

For the purpose of estimating offsite radionuclide concentrations and radiation doses, measured radionuclide concentrations in gaseous effluents from the Plant are relied upon. Table 3.9-3 in the Technical Specifications identifies specific radionuclides in gaseous discharges for which sampling and analysis is done.

In addition, the quantity of radioactive noble gas discharged during an interval of time and not accounted for by the above samples may be determined by integrating the release rate measurement of each effluent noble gas monitor identified in Figure 3-1. The total measured radioactivity discharged via a stack or vent during a counting interval is determined by the relation

$$Q_j = \frac{N_j \cdot F}{3.53 \times 10^{-5} \cdot h} \qquad (10)$$

where:

Q_j = total measured gaseous radioactivity release via a stack or vent during counting interval j (μCi)

N_j = counts accumulated during counting interval j (counts)

F = discharge rate of gaseous effluent stream (ft^3/min)

3.53×10^{-5} = conversion constant (ft^3/cm^3)

h = effluent noble gas monitor calibration or counting rate response for noble gas gamma radiation, $\frac{cpm}{\mu Ci/cm^3}$

The distribution of radioactive noble gases in a gaseous effluent stream is determined by gamma spectrum analysis of gas samples from that stream. Results of previous analyses may be averaged to obtain a representative distribution.

In the event the radioactive noble gas distribution is not obtainable from sample(s) taken during the current period the distribution will be obtained from recently available data or from Table 3-2.

If f_i represents the fraction of radionuclide i in a given effluent stream, based on the isotopic distribution of that stream, then the quantity of radionuclide i. released in a given gaseous effluent stream during counting interval j is estimated by the relation

$$Q_{ij} = Q_j \cdot f_i \qquad (11)$$

where:

Q_{ij} = quantity of radionuclide i released in a given gaseous effluent stream during counting interval j (μCi)

f_i = the fraction of radionuclide i released in a given effluent stream

Some gaseous effluents from both Units 3 and 4, whose sources are identified in Table 3-2, discharge in common through the Plant Vent. To assure that the effluents are within allowable limits per reactor, the measured release from the Plant Vent is apportioned to each unit on a ratio equal to the ratio of specific isotopic concentrations in the primary coolant in the two reactors. Iodine and particulate release contributions will also be adjusted to account for specific containment purge releases.

3.3 Dose Rate Due to Gaseous Effluent

Technical Specification 3.9.2.a provides that the dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to the following: ≤500 mrem/year to the total body and ≤3000 mrem/year to the skin due to noble gases and ≤1500 mrem/year to any organ due to I-131, I-133, tritium and for all radioactive materials in particulate form with half-lives greater than 8 days.

Compliance with the limits on dose rate from noble gases is demonstrated by establishing gaseous effluent monitor alarm setpoints such that an alarm will occur at or before a dose rate limit for noble gases is reached. If an alarm occurs when the monitor setpoint is at or below its limit, compliance may be assessed by comparing the monitor record with the setpoint (limit) calculated in accordance with section 3.6 or a more conservative method. In the event an alarm occurs and the monitored release exceeds the setpoint limit, then compliance may be evaluated by calculating dose rates in accordance with Sections 3.3.1 and 3.3.2.

Since Xe-133 has comprised most of the effluent noble gas radioactivity historically, alarm setpoints may be derived on the basis of Xe-133, an historical spectrum dominated by Xe-133, or on a measured spectrum. As long as Xe-133 is the dominant radioactive gas in airborne effluent, the gamma dose rate to a person's body is expected to be a larger fraction of the limit, 500 mrem/year, than is the beta plus gamma dose rate to skin, 3000 mrem/yr. In that case, a gaseous effluent monitor setpoint may be derived on the basis of gamma dose rate to a person's body alone; such that an alarm occurs at or before the total body dose rate off-site exceeds 500 mrem/year as given in Specification 3.9.2.a.

3.3.1 Total Body Dose Rate

The total body dose rate from radioactive noble gases may be calculated at any location off-site by assuming a person is immersed in and irradiated by a semi-infinite cloud of the noble gases. The dose rate may be calculated with the equation

$$\dot{D} = \frac{X}{Q} \cdot \frac{1}{t} \sum_i Q_i \cdot P_{\gamma i} \qquad (12)$$

where:

$\dot{D}$ = Dose rate to total body from noble gases (mrem/year)

X/Q = atmospheric dispersion factor at the off-site location of interest (sec/m^3)

t = Averaging time of release, i.e., increment of time during which Q_i was released (year)

Q_i = quantity of noble gas radionuclide i released during the averaging time (μCi)

$P_{\gamma i}$ = factor converting time integrated concentration of noble gas radionuclide i at ground-level, to total body dose,
$\frac{\text{mrem}}{\mu Ci \cdot sec/m^3}$; See Reference Table 3-4

Since dose rate limits for airborne effluents apply everywhere off-site, compliance is assessed and alarm setpoints determined at the site boundary where the minimum atmospheric dispersion from the plant (maximum X/Q) occurs. Ordinarily, that location is selected on the basis of reference meteorology data in Appendix A. According to those data, the minimum dispersion off-site occurs at the site boundary 1950 meters SSE of the plant where $X/Q = 5.8 \times 10^{-7}$ sec/m^3. Alternatively, averaged meteorology data coincident with the period of release being evaluated may be used.

3.3.2 Skin Dose Rate

The dose rate to skin from radioactive noble gases may be calculated at any location off-site by assuming a person is immersed in and irradiated by a semi-infinite cloud of the noble gases. The dose rate to skin may be calculated with the equation

$$\dot{D} = \frac{X}{Q} \cdot \frac{1}{t}\left[\sum_i Q_i \cdot S\beta_i + 1.11 \sum_i Q_i \cdot A\gamma_i\right] \qquad (13)$$

where:

$\dot{D}$ = dose rate to skin from radioactive noble gases (mrem/year)

$S\beta_i$ = factor converting time integrated concentration of noble gas radionuclide i at ground-level, to skin dose from beta radiation, $\frac{\text{mrem}}{\mu\text{Ci} \cdot \text{sec/m}^3}$; Reference Table 3-4

1.11 = ratio of tissue dose equivalent to air dose in a radiation field (mrem/mrad)

$A\gamma_i$ = factor for converting time integrated concentration of noble gas radionuclide i in a semi-infinite cloud, to air dose from its gamma radiation, $\frac{\text{mrad}}{\mu\text{Ci} \cdot \text{sec/m}^3}$; listed in Table 3-3

Since dose rate limits for airborne effluents apply everywhere off-site, compliance is assessed and alarm setpoints determined at the site boundary where the minimum atmospheric dispersion from the plant (maximum X/Q) occurs. Ordinarily, that location is selected on the basis of reference meteorology data in Table 3-6. According to those data, the minimum dispersion off-site occurs at the site boundary 1950 meters SSE of the plant where $X/Q = 5.8 \times 10^{-7}$ sec/m^3. Alternatively, averaged meteorology data coincident with the period of release being evaluated may be used.

3.3.3 H-3, I-131, I-133, and Particulate Dose Rate

The dose rate due to H-3, I-131, I-133, and radioactive material in particulate form with a half-life of more than 8 days is calculated with the equation

$$\dot{D}_{anp} = \frac{1}{3600\ t} \cdot \frac{X_d}{Q} \sum_k \sum_i Q_{ik} \cdot TA_{anip} \qquad (14)$$

where:

$\dot{D}_{anp}$ = dose equivalent rate to body organ n (most exposed organ) of a person in age group a (adult) exposed via pathway p (inhalation) to radionuclide i identified in analysis k of effluent air (mrem/year)

3600 = conversion constant (sec/hr)

t = period of time over which the effluent releases are averaged (hr)

X_d/Q = atmospheric dispersion factor, adjusted for depletion by deposition (sec/m^3). (Alternatively X/Q, unadjusted, may be used.)

Q_{ik} = quantity of radionuclide i released during time increment t based on analysis k (μCi).

TA_{anip} = a factor relating the airborne concentration time integral of radionuclide i to the dose equivalent to organ n of a person in age group a (adult) exposed via pathway p (inhalation),
$\frac{\text{mrem/yr}}{\mu Ci/m^3}$; See Appendix A

When the dose rate due to H-3, I-131, I-133, and radionuclides in particulate form is calculated for the purpose of assessing compliance with Specification 3.9.2.a, a hypothetical adult located at the site boundary where the minimum atmospheric dispersion from the plant occurs is assumed as the receptor.

Ordinarily, the dose rate calculation will be based on the maximum X_d/Q (minimum dispersion) according to reference meteorology data in Table 3.7. The maximum X_d/Q at or beyond the site boundary which will be used to calculate the dose rate is $X_d/Q = 5.0 \times 10^{-7}$ sec/m^3. According to those data, the minimum dispersion off-site occurs at the Site Boundary 1950 meters SSE of the plant. That location is identified in Figure 3-2. Alternatively, averaged meteorological dispersion data coincident with the period of release may be used to evaluate the dose rate.

Assuming exposure of an adult by inhalation is appropriate, because it is also the basis of maximum permissible concentration (limits) for airborne radionuclides in unrestricted areas as given in 10 CFR Part 20, Appendix B. These radionuclides in airborne effluents are measured according to the sample and analysis schedule in Technical Specification Table 3.9-3. The averaging time of the measured releases used to evaluate compliance will not exceed 98 days for Sr-89 and Sr-90 and will not exceed 9 days for the other radionuclides.

3.4 Dose - Noble Gases

Technical Specification 3.9.2.b requires that the air dose per reactor at and beyond the site boundary due to noble gases released in gaseous effluents shall be limited, during any calendar quarter, to ≤5 mrad for gamma radiation and ≤10 mrad for beta radiation and, during any calendar year, to ≤10 mrad for gamma radiation and ≤20 mrad for beta radiation.

3.4.1 Noble Gas Gamma Radiation Dose

Specification 3.9.2.b.1 requires an evaluation be performed monthly to verify that the accumulated air dose due to gamma radiation does not exceed the limits as given in 3.4 above.

The gamma radiation dose to air offsite as a consequence of noble gas discharged from each unit can be calculated with the equation

$$D_\gamma = \frac{1}{0.8} \cdot \frac{X}{Q} \cdot A_{\gamma eff} \cdot \sum_j Q_j \qquad (15)$$

where:

D_γ = noble gas gamma dose to air due to a mixed-mode release (mrad)

0.8 = a conservatism factor which, in effect, increases the estimated dose to compensate for variability in radionuclide distribution

X/Q = atmospheric dispersion factor for a mixed-mode discharge (sec/m^3)

$A_{\gamma eff}$ = effective gamma air dose factor converting time-integrated, ground-level, total activity concentration of radioactive noble gas, to air dose due to gamma radiation. This factor has been derived from noble gas radionuclide distributions in routine operational releases. Refer to Appendix D for a detailed explanation. The effective gamma air dose factor derived is:

$$A_{\gamma eff} = 1.4 \times 10^{-5} \ \frac{\text{mrad}}{\mu\text{Ci} \cdot \text{sec/m}^3}$$

Q_j = the measured gaseous radioactivity released via a stack or vent during a single counting interval j (μCi)

Specification 3.9.2.b.1 is satisfied by calculating the noble gas gamma radiation dose to air at the location identified in Figure 3-2. At that location, 1950 meters SSE of the Plant, the reference atmospheric dispersion factor to be used is X/Q = 5.8×10^{-7} sec/m^3.

Alternately, Specification 3.9.2.b.1 may be satisfied by calculating the gamma dose to air with the equation

$$D_\gamma = \frac{X}{Q} \sum_j \sum_i Q_j \cdot f_i \cdot A_{\gamma i} \qquad (16)$$

where:

f_i = the fraction of radionuclide i released in a given effluent stream

$A_{\gamma i}$ = factor converting time integrated, ground-level concentration of noble gas radionuclide i to air dose from gamma radiation, listed in Table 3-3; $\frac{\text{mrad}}{\mu\text{Ci} \cdot \text{sec/m}^3}$

3.4.2 Noble Gas Beta Radiation Dose

Technical Specification 3.9.2.b.1 requires an evaluation be performed monthly to verify that the accumulated air dose due to beta radiation does not exceed the limits as given in 3.4 above.

The beta radiation dose to air offsite as a consequence of noble gas discharged from each unit can be calculated with the equation

$$D_\beta = \frac{1}{0.8} \cdot \frac{X}{Q} \cdot A_{\beta_{eff}} \cdot \sum_j Q_j \qquad (17)$$

where:

D_β = noble gas beta dose to air due to a mixed-mode release (mrad)

0.8 = a conservatism factor which, in effect, increases the estimated dose to compensate for variability in radionuclide distribution

$A_{\beta_{eff}}$ = effective beta air dose factor converting time-integrated, ground-level, total activity concentration of radioactive noble gas to air dose due to beta radiation. This factor has been derived from noble gas radionuclide distributions in routine operational releases. Refer to Appendix D for a detailed explanation. The effective beta air dose factor derived is:

$$A_{\beta_{eff}} = 3.4 \times 10^{-5} \frac{\text{mrad}}{\mu\text{Ci} \cdot \text{sec/m}^3}$$

Specification 3.9.2.b.1 is satisfied by calculating the noble gas beta radiation dose to air at the location identified in Figure 3-2. At that location, 1950 meters SSE of the Plant, the reference atmospheric dispersion factor to be used is $X/Q = 5.8 \times 10^{-7}$ sec/m^3.

Alternately, Specification 3.9.2.b.1 may be satisfied by calculating the beta radiation dose to air with the equation

$$D_\beta = \frac{X}{Q} \sum_j \sum_i Q_j \cdot f_i \cdot A_{\beta i} \qquad (18)$$

where:

$A_{\beta i}$ = factor converting time-integrated, ground-level concentration of noble gas radionuclide i to air dose from beta radiation, listed in Table 3-3; $\frac{\text{mrad}}{\mu\text{Ci} \cdot \text{sec/m}^3}$

3.5 Dose Due to Iodine, Tritium, and Particulates in Gaseous Effluents

Technical Specification 3.9.2.c requires that the dose per reactor to a member of the public due to I-131, I-133, tritium, and particulates with half-lives greater than 8 days in airborne effluents released to areas at or beyond the site boundary shall not exceed 7.5 mrem to any organ during any calendar quarter and shall not exceed 15 mrem to any organ during any calendar year.

3.5.1 Determining the Quantity of Iodine, Tritium, and Particulates

Radionuclides other than noble gases in gaseous effluents that are measured by the radioactive gaseous waste sampling and analysis program described in Technical Specification Table 3.9-3 are used as the release term in dose calculations. Airborne releases are discharged either via a stack above the top of the containment building or via other vents and are treated as a mixed mode release from a single location. Releases of steam from the blowdown flash tank concurrent with primary to secondary leakage will also result in the release of activity to the atmosphere. Using a blowdown sample analysis, it is assumed that 5% of the I-131 and I-133 and 33% of the tritium in the blowdown stream become airborne with the remainder staying in the liquid phase. For each of these release combinations, samples are analyzed weekly, monthly, quarterly, or for each batch release according to Table 3.9-3.

Each sample provides a measure of the concentration of specific radionuclides, C_i, in gaseous effluent discharged at flow, F, during a time increment Δt. Thus, each release is quantified according to the relation

$$Q_{ik} = C_{ik} \cdot \sum_j F_j \cdot \Delta t_j \qquad (19)$$

where:

Q_{ik} = the quantity of radionuclide i released in a given effluent stream based,on analysis k (μCi)

C_{ik} = concentration of radionuclide i in gaseous effluent identified by analysis k (μCi/cc)

F_j = effluent stream discharge rate during time increment Δt_j(cc/sec)

Δt_j = time increment j during which radionuclide i at concentration C_{ik} is being discharged (sec)

3.5.2 Calculating the Dose Due to Iodine, Tritium, and Particulates

A person may be exposed directly to an airborne concentration of radioactive material discharged in an effluent gaseous stream and indirectly via pathways involving deposition of radioactive material onto the ground. Dose estimates should account for the exposure via the following pathways:

1) direct radiation from airborne radionuclides except noble gases
2) inhalation
3) direct radiation from ground plane deposition
4) fruits and vegetables
5) air-grass-cow-meat
6) air-grass-cow-milk

Of all these pathways, the air-grass-cow-milk pathway is by far the controlling dose contributor. The radioiodines contribute essentially all of the dose, by this pathway, with I-131 typically contributing greater than 95%. The dose transfer factors for the radioiodines are much greater than for any of the other radionuclides. The critical organ is the infant's thyroid. For this reason, the potential critical organ dose via airborne effluents can be estimated by determining an effective dose transfer factor for the radioiodines based on the typical radioactive effluent distribution, the air-grass-cow-milk pathway, and the infant thyroid as the receptor. Then for conservatism the total cumulative release of all radioiodines and particulates can be used along with the effective dose transfer factor to determine a conservative estimate of the infant thyroid dose.

Technical Specification 3.9.2.c.1, requires an evaluation be performed monthly to verify that the accumulated total body or organ dose commitment does not exceed the limit. Dose commitment due to iodines and particulates may be calculated by using the following equation

$$DM_k = \frac{3.17 \times 10^{-8}}{0.8} \cdot \frac{D}{Q} \cdot TG_{131} \cdot \sum_i Q_{ik} \qquad (20)$$

where:

DM_k = the dose commitment to an infant's thyroid received from exposure via the air-grass-cow-milk pathway and attributable to iodines identified in analysis k of effluent air, (mrem)

3.17×10^{-8} = conversion constant (yr/sec)

0.8 = a conservatism factor which, in effect, increases the estimated dose to compensate for variability in the radionuclide distribution

D/Q = relative deposition rate onto ground from a mixed mode atmospheric release (m^{-2})

TG_{131} = factor converting ground deposition of radioiodines to the dose commitment to an infant's thyroid exposed via the air-grass-cow-milk pathway, $\frac{\text{mrem/yr}}{\mu\text{Ci}/(m^2 \cdot \text{sec})}$

Q_{ik} = The quantity of radionuclide i (I-131 and I-133) released in a given effluent stream based on a single analysis k (μCi)

Specification 3.9.2.c.1 is satisfied by calculating the dose to a person from iodine and particulates discharged as airborne effluents via the air-grass-cow-milk pathway and is evaluated by assuming a cow on pasture 4.5 miles west of the plant. (There are no milch or meat animals within 5 miles.) At that location the reference atmospheric deposition factor is $D/Q = 5 \times 10^{-10}\ m^{-2}$.

When equation 20 is used to estimate the critical organ dose commitment, the effective dose transfer factor is:

$$TG_{131} = 6.5 \times 10^{11}\ \frac{\text{mrem/yr}}{\mu\text{Ci}/(m^2 \cdot \text{sec})}$$

The reference data from which TG_{131} was derived are summarized in Table D-2 of Appendix D.

Alternately, the requirement of Specification 3.9.2.c.1, to perform monthly determinations of dose commitments due to radioiodine, tritium and radioactive particulates in effluent air may be made by using equations (21), (22), (23), and (24).

The dose commitment from exposure to airborne concentrations of radioactive material other than noble gas from a release, Q_{ik}, via the inhalation and irradiation pathways is calculated with the equation

$$D_{ank} = 3.17 \times 10^{-8} \cdot \frac{X_d}{Q} \cdot \sum_i Q_{ik} \cdot \sum_p TA_{anip} \qquad (21)$$

where:

D_{ank} = the dose commitment to organ n of a person in age group a due to radionuclides identified in analysis k of an air effluent, (mrem)

3.17×10^{-8} = conversion constant (yr/sec)

X_d/Q = atmospheric dispersion factor for a mixed mode release, adjusted for depletion by deposition (sec/m^3)

Q_{ik} = The quantity of radionuclide i released in a given effluent stream based on analysis k (μCi)

TA_{anip} = a factor converting airborne concentration of radionuclide i to dose commitment to organ n of a person in age group a where exposure is directly to airborne material via pathway p (inhalation, or external exposure to the plume),
$\frac{\text{mrem/yr}}{\mu\text{Ci/m}^3}$; See Appendix A

The dose to a person from iodine and particulates discharged as airborne effluents via the inhalation and irradiation pathways is evaluated at the nearest garden (with residence assumed) 3.6 miles west northwest of the plant. At that location, the reference atmospheric dispersion factor adjusted for depletion by deposition is $X_d/Q = 1 \times 10^{-7}$ sec/m^3.

The dose commitment via exposure pathways involving radionuclide deposition from the atmosphere onto vegetation or the ground is calculated with the equation

$$D_{ank} = 3.17 \times 10^{-8} \cdot \frac{D}{Q} \cdot \sum_i Q_{ik} \cdot \sum_p TG_{anip} \qquad (22)$$

where:

D/Q = relative deposition rate onto ground from a mixed mode atmospheric release (m^{-2})

TG_{anip} = factor converting ground deposition of radionuclide i to dose commitment to organ n of a person in age group a where exposure is due to radioactive material via pathway p (direct radiation from ground plane deposition, fruits and vegetables, air-grass-cow-meat, or air-grass-cow-milk),
$\frac{\text{mrem/yr}}{\mu\text{Ci/(m}^2 \cdot \text{sec)}}$; See Appendix A

The dose to a person from iodine and particulates discharged as airborne effluents via the air-grass-cow-milk pathway is evaluated by assuming a cow on pasture 4.5 miles west of the plant. (There are no milch or meat animals within 5 miles). At this location, the reference atmospheric deposition factor is $D/Q = 5 \times 10^{-10}$ m^{-2}.

The concentration of tritium in vegetation is a function of the airborne concentration rather than the deposition. Thus the dose commitment from airborne tritium via vegetation (fruit and vegetables), air-grass-cow-milk, or air-grass-cow-meat pathways is calculated with the equation

$$D_{ank} = 3.17 \times 10^{-8} \cdot \frac{X}{Q} \cdot \sum_i Q_{ik} \cdot \sum_p TA_{anip} \qquad (23)$$

where:

X/Q = atmospheric dispersion factor for a mixed mode release (sec/m^3)

The dose to a person from tritium via the vegetation (fruit and vegetables), air-grass-cow-milk, or air-grass-cow-meat pathways is evaluated at the nearest garden (with residence assumed) 3.6 miles west northwest of the plant. At that location, the reference atmospheric dispersion factor is $X/Q = 1 \times 10^{-7}$ sec/m^3.

The dose commitment via a given pathway as a result of measured discharges from a release point is accumulated with

$$D_{an} = \sum_{k} D_{ank} \qquad (24)$$

where:

D_{an} = the dose commitment to organ n of a person in age group a

k = the counting index; it may represent either

p, analysis of a grab sample
w, a weekly sample analysis
m, a monthly composite analysis, or
q, a quarterly composite analysis

3.6 Effluent Noble Gas Monitor Alarm Setpoint

Technical Specification 3.9.2.d requires the radioactive gaseous effluent monitoring instrumentation channels to be operable with their alarm setpoints set to ensure the limits of Specification 3.9.2.a are not exceeded.

Each radioactive noble gas effluent monitor setpoint is derived either on the basis of total body dose equivalent rate or noble gas concentration, in the unrestricted area beyond the exclusion area boundary. The setpoint derivations assume that noble gas releases occur at ground-level.

For the purpose of deriving a setpoint, the distribution of radioactive noble gases in an effluent stream may be determined in one of the following ways:

1. Preferably, the radionuclide distribution is obtained by gamma spectrum analysis of identifiable noble gases in effluent gas samples. Results of analyses of one or more samples may be averaged to obtain a representative spectrum.
2. In the event a representative distribution is unobtainable from measurements by the radioactive gaseous waste sampling and analysis program, it may be based upon a historical spectrum appearing in Table 3-2.
3. Alternatively, the total activity concentration of radioactive noble gases may be assumed to be Xe-133.

3.6.1 Setpoint Based on Dose Rate

A noble gas effluent monitor setpoint, based on dose rate, is calculated with the equation below or a method which gives a lower setpoint value.

$$S = 1.06 \frac{h}{f \cdot X/Q} \frac{\sum_i C_i}{\sum_i C_i \cdot DF_i} + Bkg \qquad (25)$$

where:

S = The alarm setpoint (cpm)

1.06 = 500 mrem/yr·60 sec/min·35.37 ft^3/m^3·1 $m^3/10^6 cm^3$

h = monitor response to activity concentration of effluent, $\frac{cpm}{\mu Ci/cm^3}$

C_i = relative concentration of noble gas radionuclide i in effluent at the point of monitoring ($\mu Ci/cm^3$)

f = flow of gaseous effluent stream, i.e., flow past the monitor (ft^3/min)

X/Q = atmospheric dispersion from point of ground-level or split-wake release to the location of potential exposure (sec/m^3)

DF_i = factor converting ground-level or split-wake release of radionuclide i to the total body dose equivalent rate at the location of potential exposure, $\frac{mrem}{yr \cdot \mu Ci/m^3}$

Bkg = monitoring instrument background (cpm)

Each monitoring channel has a unique response, h, which is determined by the instrument calibration.

Atmospheric dispersion depends upon the local atmospheric conditions. For the purpose of calculating a radioactive noble gas effluent monitor setpoint, the atmospheric dispersion factor, X/Q, will be based on prevailing meteorological conditions or on reference meteorological conditions. The minimum atmospheric dispersion off-site derived from reference meteorological conditions at the site boundary is 5.8×10^{-7} sec/m^3 at a location 1950 meters south southeast of the Plant.

The applicable dose conversion factors, DF_i, for deriving setpoints are in Table 3-5.

3.6.2 Setpoint Based on Concentration

A noble gas effluent monitor setpoint, based on concentration, is calculated with the equation below or a method which gives a lower setpoint value.

$$S = \frac{MPC \cdot h}{4.7 \cdot 10^{-4} \cdot f \cdot X/Q} + Bkg \qquad (26)$$

where:

S = alarm setpoint (cpm)

MPC = unrestricted area maximum permissible concentration for the effluent noble gas mixture. The MPC for noble gas is calculated from the distribution of noble gases in the release with the equation

$$MPC = \sum_i C_i \div \sum_i \frac{C_i}{MPC_i}$$

where:

C_i = relative concentration of noble gas radionuclide i in a gaseous release ($\mu Ci/cm^3$)

MPC_i = 10 CFR Part 20, Appendix B, Table 2, Column 1 value

h = effluent noble gas monitor counting rate response or calibration for noble gas, $\frac{cpm}{\mu Ci/cm^3}$

4.7×10^{-4} = conversion constant $\frac{1\ m^3}{35.37\ ft^3} \times \frac{1\ min}{60\ sec}$

f = discharge rate of gaseous effluent (ft^3/min)

X/Q = atmospheric dispersion from release point to unrestricted area (sec/m^3)

Bkg = monitoring instrument background (cpm)

The value of atmospheric dispersion used to derive a setpoint based on concentration is the reference atmospheric dispersion value from the discharge point to the location of maximum potential exposure off-site. The applicable value is 5.8×10^{-7} sec/m^3 at a location 1950 meters south southeast of the Plant.

In the event the distribution of radioactive noble gases is based on a historically measured distribution appearing in Table 3-2 or on Xe-133 alone, the MPC for the noble gas is 3×10^{-7} $\mu Ci/cm^3$.

3.7 Projected Dose for Gaseous Effluents

Technical Specification 3.9.2.e requires that the gas decay tank system shall be used to reduce radioactive materials in gaseous waste prior to their discharge if the projected gaseous effluent dose per reactor due to gaseous effluent releases to areas at and beyond the site boundary when averaged over a month exceeds 0.2 mrad for gamma radiation and 0.4 mrad for beta radiation, and the ventilation exhaust treatment system shall be used to reduce radioactive materials in gaseous waste prior to their discharge if the projected gaseous effluent dose per reactor due to gaseous effluent releases to areas at and beyond the site boundary when averaged over a month exceeds 0.3 mrem to any organ.

Technical Specification 3.9.2.e.1 requires the doses, to areas at and beyond the site boundary, due to radioactive material released in gaseous effluent to be projected at least once per month.

This requirement is satisfied by extrapolating the dose to date during the current month to include the entire month. The dose to date is calculated as described in sections 3.4.1, 3.4.2, and 3.5.2.

The dose is projected with the relation:

$$P = \frac{31 \cdot D}{X} \qquad (27)$$

where:

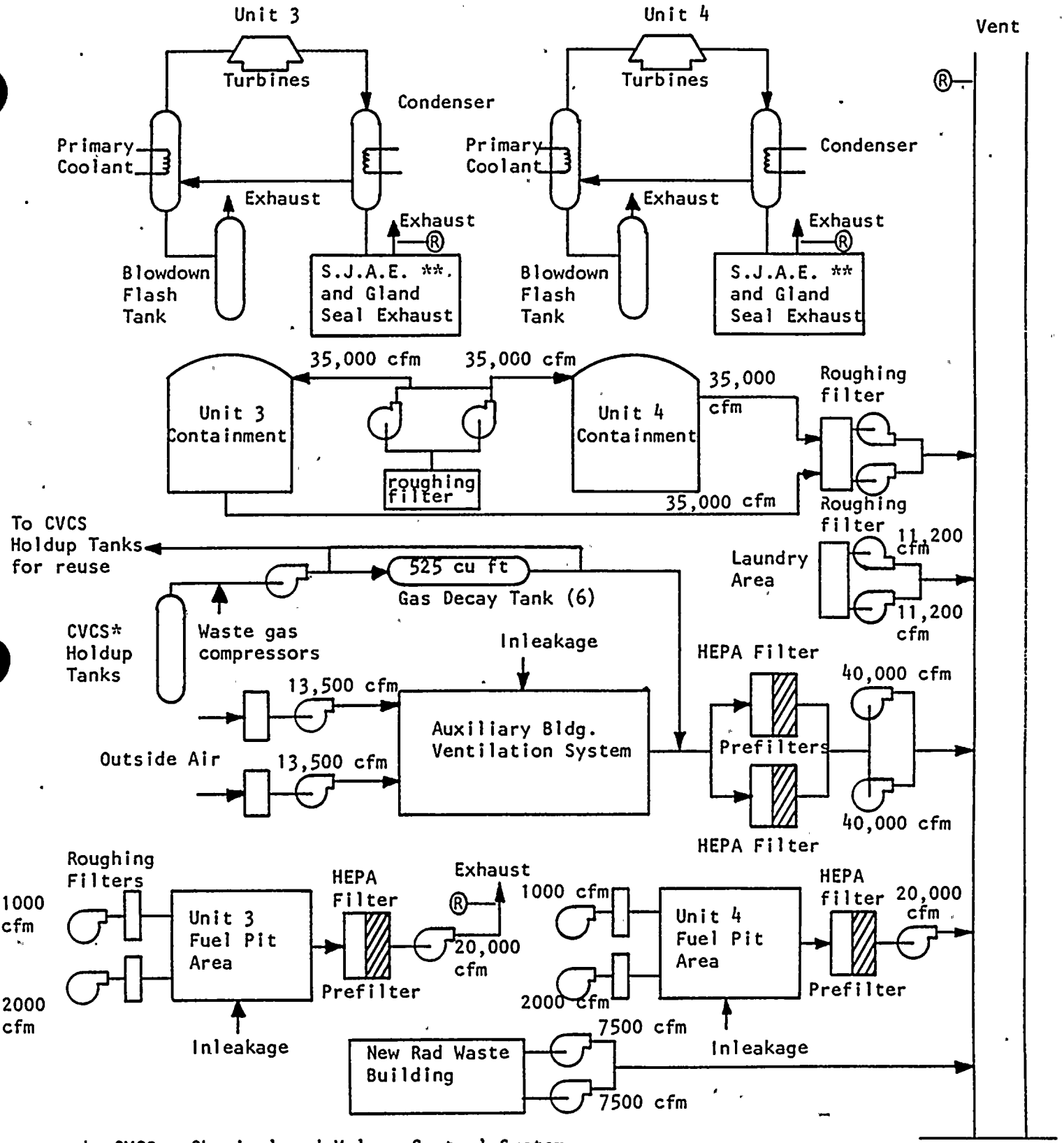
P = the projected dose during the month (mrem)

31 = number of days in a calendar month (days)

X = number of days in current month to date represented by available radioactive effluent sample (days)

D = dose to date during current month calculated according to sections 3.4.1, 3.4.2, and 3.5.2 (mrem)

Alternatively, the monthly dose may be projected by computing the dose accumulated during the most recent month and assuming the result represents the projected dose for the current month. The dose during the preceeding month will be computed as described in sections 3.4.1, 3.4.2, and 3.5.2.



* CVCS - Chemical and Volume Control System
** SJAE - Steam Jet Air Ejector
Ⓡ — - Effluent Monitoring Instrumentation

Figure 3-1 Gaseous Effluent Systems

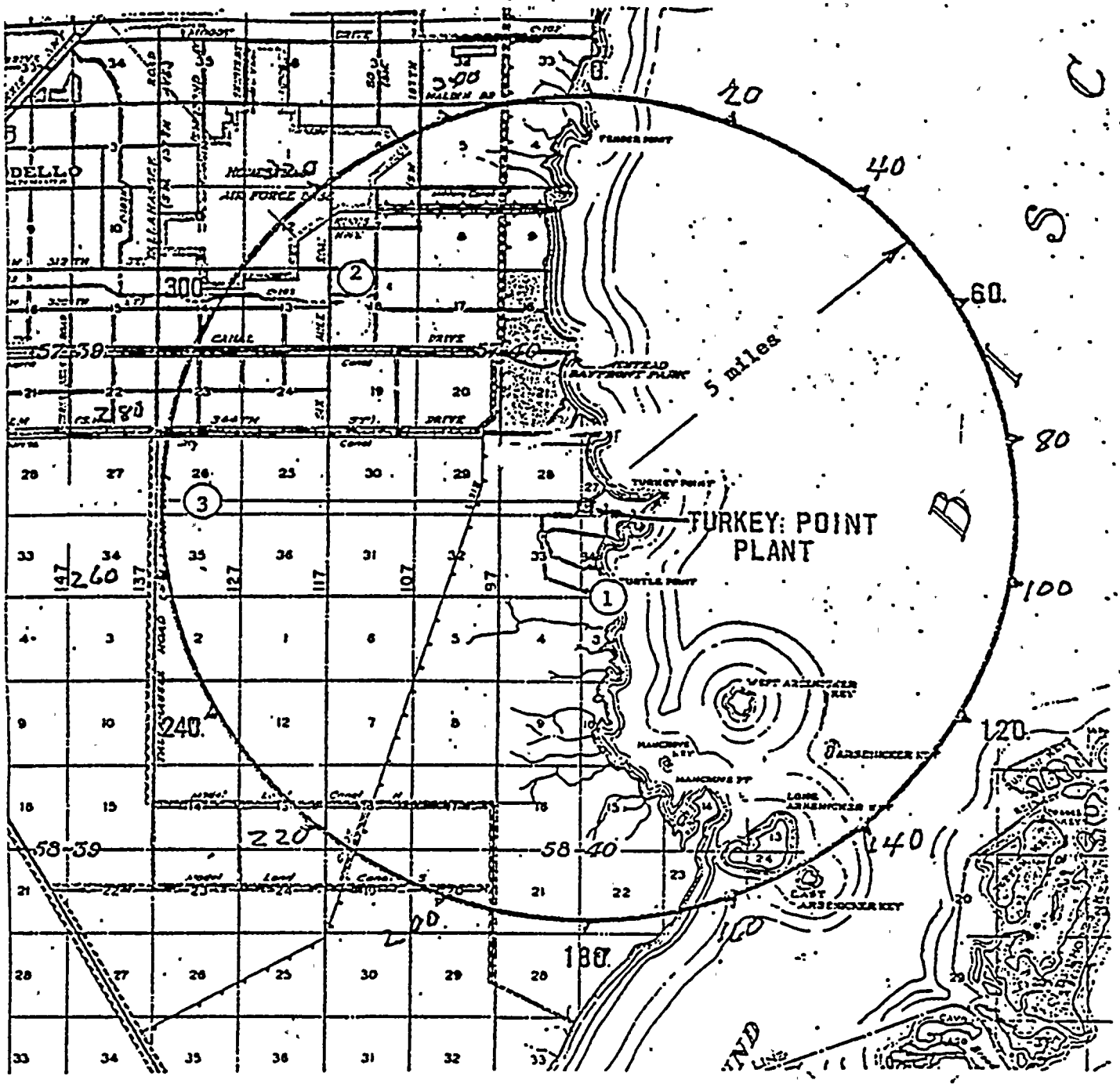


Figure 3-2

Locations At Which Doses Due to Airborne Effluents From the Turkey Point Plant are Calculated

1. Beta and Gamma Doses to Air, 1950 m SSE
2. Maximally Exposed Person, 5800 m/WNW
3. Assumed Beef and Milch Cow, 7250 m W

4.0 Dose Commitment from Releases over Extended Time

4.1 Releases during 12 Months

Technical Specification 3.9.2.h implements 40 CFR Part 190.102. It requires the annual (calendar year) dose or dose commitment to any member of the public from all uranium fuel cycle to be limited to less than or equal to 75 mrem to the thyroid and 25 mrem to the total body or any other organ.

Fuel cycle sources or nuclear power reactors other than the Turkey Point Plant itself do not measurably or significantly increase the radioactivity concentration in the vicinity of the Plant; therefore, only radiation and radioactivity in the environment attributable to the Plant itself are considered in the assessment of compliance with 40 CFR Part 190.102.

In the event a dose calculated for the purpose of assessing compliance with Specification 3.9.1.b, 3.9.2.b, or 3.9.2.c, exceeds 2 times the limit stated therein, then a calculation should be made to determine whether any limit in Specification 3.9.2.h has been exceeded. The calculation should be made on the basis of radioactive effluents during the year to date and reference meteorological data or averaged meteorological data during completed quarters of the year to date.

Separately, an evaluation of doses due to effluents during the year is performed annually and reported in the Semiannual Radioactive Effluent Release Report submitted within 60 days after the end of the year. This evaluation uses annual averaged meteorological data concurrent with the annual gaseous releases to evaluate atmospheric dispersion, deposition,and plume gamma exposure.

To assess compliance with Technical Specification 3.9.2.h, evaluations of dose due to liquid and gaseous effluent are calculated as described by the equations for:

1. total body dose due to liquid effluent via irradiation by radionuclides deposited on cooling canal shoreline as in section 2.3
2. total body dose due to noble gas γ as in section 3.4.1
3. skin dose due to noble gas β as in section 3.4.2
4. total body and maximally exposed organ doses due to gaseous effluents other than noble gases* as in section 3.5.2.

The doses are calculated on the basis of liquid and gaseous effluents from the Plant, sampled and analyzed in accord with Technical Specification Tables 3.9-1 and 3.9-3.

* Radioactive I-131, I-133, tritium, and radioactive material in particulate form having a half-life greater than 8.0 days.

The receptor of the dose is described such that the dose to any resident near the Plant is not likely to be underestimated. The receptor is selected on the basis of the combination of applicable pathways of exposure to gaseous effluent identified in the annual land use census and maximum ground level X/Q at the residence. Conditions more conservative than appropriate for the maximally exposed person may be assumed in the dose assessment.

Environmental pathway-to-dose transfer factors used in the dose calculations appear in Appendix A.

4.2 Environmental Measurements

When assessing compliance with 40 CFR 190 or 10 CFR Part 50 Appendix I dose limits, Radiological Environmental Monitoring Program results may be used to indicate actual radioactivity levels in the environment attributable to the Turkey Point Plant as an alternate to calculating the concentrations from radioactive effluent measurements. The measured environmental activity levels may thus be used to supplement the evaluation of doses to real persons for assessing compliance with 40 CFR Part 190 or 10 CFR Part 50 Appendix I.

4.3 Dose to a Person from Noble Gases

Technical Specification 3.9.2.h requires the calculation of the annual (calendar year) dose or dose commitment to a person off-site exposed to radioactive liquid and gaseous effluents from the plant. One component of personal dose is total body irradiation by gamma rays from noble gases. Another is irradiation of skin by beta and gamma radiation from noble gases. The methods for calculating these doses are presented in sections 4.3.1 and 4.3.2.

The amount of radioactive noble gas discharges is determined in the manner described in section 3.2.

4.3.1 Gamma Dose to Total Body

The gamma radiation dose to the whole body of a member of the public as a consequence of noble gas released from the Plant is calculated with the equation:

$$D_\gamma = \sum_i Q_i \cdot \frac{X}{Q} \cdot P_{\gamma i} \qquad (28)$$

where:

D_γ = noble gas gamma dose to total body (mrem)

Q_i = quantity of radioactive noble gas i discharged in gaseous effluent (μCi)

X/Q = meteorological dispersion factor (sec/m^3)

$P_{\gamma i}$ = factor converting time integrated, ground level concentration of noble gas nuclide i to total body dose from gamma radiation listed in Table 3-4,

$$\frac{\text{mrem}}{\mu\text{Ci} \cdot \text{sec/m}^3}$$

When the total body dose due to gamma radiation from noble gas required by Technical Specification 3.9.2.h is calculated, the most exposed receptor is located 3.6 miles west northwest of the plant where the reference meteorological dispersion factor, X/Q, is 1×10^{-7} sec/m^3.

4.3.2 Dose to Skin

The radiation dose to the skin of a member of the public due to noble gas released from the Plant may be calculated with the equation:

$$D = \frac{X}{Q}\left[\sum_i Q_i \cdot S_{\beta i} + 0.56 \sum_i Q_i \cdot A_{\gamma i}\right] \qquad (29)$$

where:

D = dose to skin due to noble gases (mrem)

$S_{\beta i}$ = factor converting time integrated ground-level concentration of noble gas to skin dose from beta radiation listed in Table 3-4,

$$\frac{\text{mrem}}{\mu\text{Ci} \cdot \text{sec/m}^3}$$

0.56 = 1.11 · 0.5 (mrem/mrad)

where 1.11 = ratio of tissue dose equivalent to air dose in a radiation field (mrem/mrad)

0.5 = factor for shielding by a building

$A_{\gamma i}$ = factor for converting time integrated, ground-level concentration of noble gas radionuclide i to air dose from its gamma radiation listed in Table 3-3,

$$\frac{\text{mrad}}{\mu\text{Ci} \cdot \text{sec/m}^3}$$

When the skin beta dose due to noble gas required by Specification 3.9.2.h is calculated, the most exposed receptor is located 3.6 miles west northwest of the Plant where the reference meteorological dispersion factor, X/Q, is 1×10^{-7} sec/m^3.

The total dose to the skin from noble gases is approximately equal to the beta radiation dose to the skin plus the gamma radiation dose to the total body.

APPENDIX A
PATHWAY-DOSE TRANSFER FACTORS

Environmental pathway transfer factors, usage factors, and dose commitment factors appropriate for each exposure pathway, age, and organ are combined into integrated environmental concentration-to-dose factors for each radionuclide. This appendix includes tables of values of the transfer factors calculated in accord with equations and values recommended in NUREG-0133[1] for individual environmental pathways. In the event a single, composite transfer factor is desired for a given organ and age group, it can be obtained by summing the factors for appropriate pathways. Appropriate transfer factors from Appendix A are used in performing dose assessment calculations prescribed in the ODCM.

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[1] J. Boegli, et al., eds., 1978, Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants, NUREG-0133, USNRC, Office Nuclear Reactor Regulation.

01/18/79

PATHWAY - DISCHARGE CANAL SHORLINE DEPOSITS

AGE GROUP - ADULT

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	3.69E-01	3.69E-01	3.69E-01	3.69E-01	3.69E-01	3.69E-01	4.36E-01	3.69E-01
MN--54	1.09E+02	1.09E+02	1.09E+02	1.09E+02	1.09E+02	1.09E+02	1.28E+02	1.09E+02
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	2.17E+01	2.17E+01	2.17E+01	2.17E+01	2.17E+01	2.17E+01	2.55E+01	2.17E+01
CO--58	3.00E+01	3.00E+01	3.00E+01	3.00E+01	3.00E+01	3.00E+01	3.51E+01	3.00E+01
CO--60	1.69E+03	1.69E+03	1.69E+03	1.69E+03	1.69E+03	1.69E+03	1.99E+03	1.69E+03
ZN--65	5.86E+01	5.86E+01	5.86E+01	5.86E+01	5.86E+01	5.86E+01	6.74E+01	5.86E+01
RB--86	7.11E-01	7.11E-01	7.11E-01	7.11E-01	7.11E-01	7.11E-01	8.12E-01	7.11E-01
SR--89	1.71E-03	1.71E-03	1.71E-03	1.71E-03	1.71E-03	1.71E-03	1.98E-03	1.71E-03
SR--90	4.23E-01	4.23E-01	4.23E-01	4.23E-01	4.23E-01	4.23E-01	4.99E-01	4.23E-01
Y---91	8.54E-02	8.54E-02	8.54E-02	8.54E-02	8.54E-02	8.54E-02	9.61E-02	8.54E-02
ZR--95	3.96E+01	3.96E+01	3.96E+01	3.96E+01	3.96E+01	3.96E+01	4.62E+01	3.96E+01
ZR--97	4.32E-01	4.32E-01	4.32E-01	4.32E-01	4.32E-01	4.32E-01	5.04E-01	4.32E-01
NB--95	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.27E+01	1.08E+01
MO--99	4.66E-01	4.66E-01	4.66E-01	4.66E-01	4.66E-01	4.66E-01	5.37E-01	4.66E-01
RU-103	8.69E+00	8.69E+00	8.69E+00	8.69E+00	8.69E+00	8.69E+00	1.01E+01	8.69E+00
RU-106	3.30E+01	3.30E+01	3.30E+01	3.30E+01	3.30E+01	3.30E+01	3.97E+01	3.30E+01
AG110M	2.82E+02	2.82E+02	2.82E+02	2.82E+02	2.82E+02	2.82E+02	3.29E+02	2.82E+02
SB-124	4.72E+01	4.72E+01	4.72E+01	4.72E+01	4.72E+01	4.72E+01	5.45E+01	4.72E+01
SB-125	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02	1.81E+02	2.05E+02	1.81E+02
TE125M	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.22E-01	1.68E-01	1.22E-01
TE127M	6.94E-02	6.94E-02	6.94E-02	6.94E-02	6.94E-02	6.94E-02	7.68E-02	6.94E-02
TE129M	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.04E+00	3.57E+00	3.04E+00
TE131M	8.41E-01	8.41E-01	8.41E-01	8.41E-01	8.41E-01	8.41E-01	3.68E+01	8.41E-01
TE-132	3.66E+00	3.66E+00	3.66E+00	3.66E+00	3.66E+00	3.66E+00	4.31E+00	3.66E+00
I--131	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.65E+00	1.36E+00
I--133	1.95E-01	1.95E-01	1.95E-01	1.95E-01	1.95E-01	1.95E-01	2.36E-01	1.95E-01
CS-134	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.51E+02	5.51E+02	6.43E+02	5.51E+02
CS-136	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.18E+01	1.33E+01	1.18E+01
CS-137	8.13E+02	8.13E+02	8.13E+02	8.13E+02	8.13E+02	8.13E+02	9.48E+02	8.13E+02
BA-140	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.32E+01	1.58E+01	1.32E+01
LA-140	1.52E+00	1.52E+00	1.52E+00	1.52E+00	1.52E+00	1.52E+00	1.72E+00	1.52E+00
CE-141	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.08E+00	1.22E+00	1.08E+00
CE-143	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	1.82E-01	2.07E-01	1.82E-01
CE-144	8.94E+00	8.94E+00	8.94E+00	8.94E+00	8.94E+00	8.94E+00	1.03E+01	8.94E+00
NP-239	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.35E-01	1.56E-01	1.35E-01

REV.1: 12/19/84

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - SALT WATER FISH

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	1.27E+00	1.27E+00	1.27E+00	1.27E+00	1.27E+00	0.	1.27E+00
P---32	5.03E+07	3.53E+06	0.	0.	0.	6.33E+06	0.	2.18E+06
CR--51	0.	0.	6.55E+00	2.42E+00	1.43E+01	2.76E+03	0.	1.10E+01
MN--54	0.	2.05E+04	0.	7.88E+03	0.	8.11E+04	0.	5.40E+03
FE--55	1.96E+05	8.83E+05	0.	0.	1.02E+06	3.45E+05	0.	2.32E+05
FE--59	1.35E+05	3.21E+05	0.	0.	8.92E+04	1.06E+06	0.	1.22E+05
CO--58	0.	7.80E+02	0.	0.	0.	1.58E+04	0.	1.75E+03
CO--60	0.	2.27E+03	0.	0.	0.	6.24E+04	0.	4.98E+03
ZN--65	1.02E+05	3.24E+05	0.	2.17E+05	0.	2.04E+05	0.	1.47E+05
RU--06	0.	1.78E+03	0.	0.	0.	3.51E+02	0.	8.31E+02
SR--89	8.43E+03	0.	0.	0.	0.	1.03E+03	0.	1.84E+02
SR--90	1.61E+05	0.	0.	0.	0.	8.29E+03	0.	3.93E+04
Y---91	3.68E+01	0.	0.	0.	0.	2.87E+04	0.	9.86E-01
ZR--95	1.01E+02	4.14E+01	0.	5.30E+01	0.	1.90E+05	0.	2.21E+01
ZR--97	8.03E+00	1.96E+00	0.	2.38E+00	0.	8.95E+04	0.	7.42E-01
NB--95	1.93E+03	1.07E+03	0.	1.07E+03	0.	6.52E+05	0.	4.22E+02
MO--99	1.85E-02	3.55E+02	0.	8.86E+02	2.50E-02	8.54E+02	0.	6.82E+01
RU-103	5.76E+00	0.	0.	2.20E+01	0.	0.72E+02	0.	2.48E+03
RU-106	8.69E+01	0.	0.	1.68E+02	0.	5.03E+03	0.	1.10E+01
AG110M	5.36E+03	5.14E+03	0.	1.81E+04	0.	2.10E+06	0.	3.80E+03
SB-124	1.17E+03	2.21E+01	2.03E+00	0.	9.10E+02	3.32E+04	0.	4.03E+02
SB-125	9.42E+02	1.04E+01	1.05E+00	2.07E+00	9.83E+04	8.31E+03	0.	1.09E+02
TE125M	2.88E+02	1.02E+02	8.42E+01	1.14E+03	0.	1.12E+03	0.	3.74E+01
TE127M	7.28E+02	2.52E+02	1.88E+02	2.92E+03	0.	3.13E+03	0.	8.87E+01
TE129M	1.19E+03	4.46E+02	4.12E+02	4.97E+03	0.	5.99E+03	0.	1.89E+02
TE131M	1.31E+02	8.94E+01	1.29E+04	5.76E+02	0.	6.99E+03	0.	8.43E+01
TE-132	2.18E+03	1.88E+02	8.43E+03	1.43E+03	0.	6.59E+03	0.	1.48E+02
I--131	4.03E+02	5.77E+02	1.83E+03	9.88E+02	0.	1.52E+02	0.	3.30E+02
I--133	8.46E+01	1.19E+02	2.28E+04	2.07E+02	0.	1.04E+02	0.	3.62E+01
CS-134	2.02E+04	8.24E+04	0.	2.03E+04	8.71E+03	1.09E+03	0.	5.10E+04
CS-136	2.61E+03	1.03E+04	0.	5.72E+03	7.05E+02	1.17E+03	0.	7.41E+03
CS-137	3.37E+04	4.00E+04	0.	1.57E+04	5.19E+03	8.87E+02	0.	3.02E+04
BA-140	2.03E+03	2.06E+00	0.	4.68E-01	1.43E+00	1.22E+04	0.	1.34E+02
LA-140	4.36E-01	2.20E-01	0.	0.	0.	1.61E+04	0.	5.03E-02
CE-141	1.08E-01	8.55E-01	0.	3.06E-01	0.	2.50E+03	0.	7.46E-02
CE-143	1.59E-01	7.78E+01	0.	5.68E-02	0.	3.32E+03	0.	1.33E-02
CE-144	5.15E+01	2.25E+01	0.	1.27E+01	0.	1.74E+04	0.	2.70E+03
NP-239	3.59E-02	3.49E-03	0.	2.69E-02	0.	1.69E+03	0.	3.12E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - SALT WATER SHELL FISH

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.13E-01	3.13E-01	3.13E-01	3.13E-01	3.13E-01	0.	3.13E-01
P---32	1.39E+07	8.69E+05	0.	0.	0.	1.50E+06	0.	5.37E+05
CR--51	0.	0.	7.80E+00	2.88E+00	1.73E+01	3.28E+03	0.	1.30E+01
MN--54	0.	4.58E+03	0.	1.35E+03	0.	1.40E+04	0.	8.76E+02
FE--55	3.11E+05	1.40E+05	0.	0.	1.62E+05	5.47E+05	0.	3.00E+05
FE--59	2.15E+05	5.10E+05	0.	0.	1.42E+05	1.68E+06	0.	1.94E+05
CO--58	0.	1.80E+03	0.	0.	0.	3.76E+04	0.	4.10E+03
CO--60	0.	5.40E+03	0.	0.	0.	1.01E+05	0.	1.19E+04
ZN--65	6.08E+05	1.93E+06	0.	1.29E+06	0.	1.22E+06	0.	8.73E+05
RU--103	0.	8.69E+02	0.	0.	0.	1.71E+02	0.	4.05E+02
SR--89	1.53E+04	0.	0.	0.	0.	2.45E+03	0.	4.39E+02
SR--90	3.83E+05	0.	0.	0.	0.	6.36E+04	0.	9.35E+04
Y---91	3.50E+02	0.	0.	0.	0.	1.93E+05	0.	9.39E+00
ZR--95	6.08E+00	1.96E+00	0.	3.08E+00	0.	6.13E+03	0.	1.35E+00
ZR--97	1.32E-01	2.63E-02	0.	4.03E-02	0.	7.93E+03	0.	1.23E-02
NB--95	1.54E+00	8.53E-01	0.	8.45E-01	0.	5.17E+03	0.	3.35E-01
MO--99	2.20E-02	8.46E+01	0.	1.93E+02	3.05E-02	2.33E+02	0.	1.09E+01
RU-103	4.57E+02	0.	0.	1.75E+03	0.	5.34E+04	0.	1.97E+02
RU-106	8.30E+03	0.	0.	1.33E+04	0.	4.47E+05	0.	8.73E+02
AG110M	1.32E+03	1.22E+03	0.	2.41E+03	0.	5.00E+05	0.	7.28E+02
SB-124	3.49E+01	6.58E-01	8.43E-02	0.	2.71E+01	9.87E+02	0.	1.38E+01
SB-125	2.97E+01	9.11E-01	5.31E-01	6.83E+00	2.93E+03	2.54E+02	0.	5.80E+00
TE125M	6.80E+02	2.42E+02	2.80E+02	2.71E+03	0.	2.86E+03	0.	6.32E+01
TE127M	1.71E+03	6.00E+02	4.49E+02	6.96E+03	0.	7.45E+03	0.	2.11E+02
TE129M	2.84E+03	1.06E+03	9.79E+02	1.18E+04	0.	1.43E+04	0.	4.95E+02
TE131M	2.78E+02	1.67E+02	1.54E+04	1.29E+03	0.	1.19E+04	0.	1.66E+02
TE-132	5.16E+03	3.90E+02	7.84E+03	3.30E+03	0.	1.57E+04	0.	3.31E+02
I--131	4.80E+02	6.87E+02	2.65E+05	1.18E+03	0.	1.81E+02	0.	3.93E+02
I--133	8.14E+01	1.41E+02	2.71E+04	2.46E+02	0.	1.24E+02	0.	4.31E+01
CS-134	3.90E+03	9.29E+03	0.	3.81E+03	9.98E+02	1.65E+02	0.	7.60E+03
CS-135	3.88E+02	1.53E+03	0.	8.32E+02	1.17E+02	1.74E+02	0.	1.10E+03
CS-137	5.01E+03	6.85E+03	0.	2.33E+03	7.73E+02	1.32E+02	0.	4.49E+03
BA-140	4.83E+03	7.11E+00	0.	2.07E+00	3.48E+00	8.05E+06	0.	3.19E+02
LA-140	4.15E+00	2.69E+03	0.	0.	0.	1.54E+05	0.	5.95E-01
CE-141	1.38E+01	9.36E+00	0.	4.54E+00	0.	3.57E+06	0.	1.00E+00
CE-143	2.40E+00	1.11E+03	0.	6.97E-01	0.	4.34E+04	0.	1.67E-01
CE-144	7.36E+02	3.07E+02	0.	1.82E+02	0.	2.48E+05	0.	3.94E+01
NP-239	4.82E-02	5.75E-03	0.	9.53E-03	0.	4.49E+02	0.	1.82E-03

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.68E+06	4.68E+06	4.68E+06	4.68E+06	4.68E+06	4.68E+06	5.53E+06	4.68E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.62E+09	1.38E+09
FE--59	2.75E+08	2.75E+08	2.75E+08	2.75E+08	2.75E+08	2.75E+08	3.23E+08	2.75E+08
CO--57	1.89E+08	1.89E+08	1.89E+08	1.89E+08	1.89E+08	1.89E+08	2.08E+08	1.89E+08
CO--58	3.80E+08	3.80E+08	3.80E+08	3.80E+08	3.80E+08	3.80E+08	4.45E+08	3.80E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.52E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.43E+08	7.43E+08	7.43E+08	7.43E+08	7.43E+08	7.43E+08	8.54E+08	7.43E+08
RB--86	9.01E+06	9.01E+06	9.01E+06	9.01E+06	9.01E+06	9.01E+06	1.03E+07	9.01E+06
SR--89	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.51E+04	2.17E+04
SR--90	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	6.33E+06	5.35E+06
Y---91	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.22E+06	1.08E+06
ZR--95	5.01E+08	5.01E+08	5.01E+08	5.01E+08	5.01E+08	5.01E+08	5.86E+08	5.01E+08
NB--95	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.61E+08	1.36E+08
RU-103	1.10E+08	1.10E+08	1.10E+08	1.10E+08	1.10E+08	1.10E+08	1.28E+08	1.10E+08
RU-106	4.19E+08	4.19E+08	4.19E+08	4.19E+08	4.19E+08	4.19E+08	5.03E+08	4.19E+08
AG110M	3.54E+09	3.58E+09	3.58E+09	3.58E+09	3.58E+09	3.53E+09	4.17E+09	3.58E+09
CD115M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	1.37E+06	0.
SN-126	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.76E+10	5.16E+10
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	2.38E+09	2.38E+09	2.38E+09	2.38E+09	2.38E+09	2.38E+09	2.59E+09	2.38E+09
TE125M	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	2.13E+06	1.55E+06
TE127M	8.79E+05	8.79E+05	8.79E+05	8.79E+05	8.79E+05	8.79E+05	9.74E+05	8.79E+05
TE129M	3.85E+07	3.85E+07	3.85E+07	3.85E+07	3.85E+07	3.85E+07	4.52E+07	3.85E+07
I--130	5.53E+06	5.53E+06	5.53E+06	5.53E+06	5.53E+06	5.53E+06	6.71E+06	5.53E+06
I--131	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	2.09E+07	1.72E+07
I--132	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.47E+06	1.25E+06
I--133	2.48E+06	2.48E+06	2.48E+06	2.48E+06	2.48E+06	2.48E+06	3.01E+06	2.48E+06
I--134	4.50E+05	4.50E+05	4.50E+05	4.50E+05	4.50E+05	4.50E+05	5.35E+05	4.50E+05
I--135	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.99E+06	2.56E+06
CS-134	6.99E+09	6.99E+09	6.99E+09	6.99E+09	6.99E+09	6.99E+09	8.15E+09	6.99E+09
CS-136	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.69E+08	1.49E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
BA-140	1.68E+08	1.68E+08	1.68E+08	1.68E+08	1.68E+08	1.68E+08	1.98E+08	1.68E+08
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.31E+08	1.13E+08
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	8.48E+06	8.48E+06	8.48E+06	8.48E+06	8.48E+06	8.48E+06	1.02E+07	8.48E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - INHALATION AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.07E+03	1.07E+03	1.07E+03	1.07E+03	1.07E+03	0.	1.07E+03
C---14	1.32E+04	3.42E+03	3.42E+03	3.42E+03	3.42E+03	3.42E+03	0.	3.42E+03
P---32	1.32E+06	7.72E+04	0.	0.	0.	8.64E+04	0.	5.02E+04
CR--51	0.	0.	5.95E+01	2.28E+01	1.44E+04	3.32E+03	0.	1.00E+02
MN--54	0.	3.96E+04	0.	9.84E+03	1.40E+06	7.74E+04	0.	6.30E+03
FE--59	1.19E+04	2.78E+07	0.	0.	1.82E+06	1.88E+05	0.	1.06E+04
CO--57	0.	6.92E+02	0.	0.	3.70E+05	3.14E+04	0.	6.71E+02
CO--58	0.	1.58E+03	0.	0.	9.28E+05	1.06E+05	0.	2.07E+03
CO--60	0.	1.15E+04	0.	0.	5.98E+06	2.85E+05	0.	1.48E+04
NI--63	4.32E+05	3.14E+04	0.	0.	1.78E+05	1.34E+04	0.	1.45E+04
ZN--65	3.24E+04	1.03E+05	0.	6.98E+04	8.72E+05	5.34E+04	0.	4.66E+04
RB--86	0.	1.35E+05	0.	0.	0.	1.66E+04	0.	5.90E+04
SR--89	3.04E+05	0.	0.	0.	1.40E+06	3.58E+05	0.	8.72E+03
SR--90	9.92E+07	0.	0.	0.	9.68E+06	7.22E+05	0.	6.18E+06
Y---91	4.62E+05	0.	0.	0.	1.70E+06	3.85E+05	0.	1.24E+04
ZR--95	1.07E+05	3.44E+04	0.	5.42E+04	1.78E+06	1.58E+05	0.	2.33E+04
NB--95	1.41E+04	7.32E+03	0.	7.74E+03	5.86E+05	1.84E+05	0.	4.21E+03
RU-103	1.53E+03	0.	0.	5.83E+03	5.86E+05	1.18E+05	0.	6.58E+02
RU-106	6.91E+04	0.	0.	1.34E+05	9.44E+06	9.12E+05	0.	8.72E+03
AG110M	1.08E+04	1.20E+04	0.	1.97E+04	4.64E+06	3.82E+05	0.	5.94E+03
CD115M	0.	1.97E+05	0.	1.58E+05	1.41E+06	3.84E+05	0.	6.36E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - INHALATION AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SB-123	2.42E+05	5.33E+03	4.53E+03	0.	2.30E+06	3.14E+05	0.	7.86E+03
SN-126	1.26E+06	3.34E+04	9.84E+03	0.	9.36E+06	1.27E+05	0.	4.89E+04
SN-124	3.12E+04	5.89E+02	7.55E+01	0.	2.48E+06	4.06E+05	0.	1.24E+04
SN-125	8.61E+04	7.13E+02	5.87E+01	0.	2.28E+06	1.81E+05	0.	1.33E+04
TE125M	3.42E+03	1.58E+03	1.05E+03	1.24E+04	3.14E+05	7.86E+04	0.	4.67E+02
TE127M	1.26E+04	5.62E+03	3.29E+03	4.54E+04	9.60E+05	1.58E+05	0.	1.57E+03
TE129M	9.76E+03	4.67E+03	3.44E+03	3.66E+04	1.16E+06	3.83E+05	0.	1.53E+03
I--130	4.53E+03	1.34E+04	1.74E+06	2.09E+04	0.	7.69E+03	0.	5.29E+03
I--131	2.52E+04	3.58E+04	1.19E+07	6.14E+04	0.	6.28E+03	0.	2.05E+04
I--132	1.16E+03	3.26E+03	4.38E+05	5.19E+03	0.	4.06E+02	0.	1.16E+03
I--133	6.64E+03	1.49E+04	2.91E+06	2.60E+04	0.	8.72E+03	0.	4.54E+03
I--134	6.45E+02	1.73E+03	2.30E+05	2.75E+03	0.	1.01E+08	0.	6.16E+02
I--135	2.69E+03	6.99E+03	9.36E+05	1.11E+04	0.	5.25E+03	0.	2.58E+03
CS-134	3.74E+05	8.48E+05	0.	2.88E+05	9.76E+04	1.84E+04	0.	7.29E+05
CS-136	1.91E+04	1.46E+05	0.	8.56E+04	1.28E+04	1.17E+04	0.	1.11E+05
CS-137	4.70E+05	6.22E+05	0.	2.22E+05	7.53E+04	8.48E+03	0.	4.29E+05
BA-140	3.90E+04	4.90E+01	0.	1.67E+01	1.27E+06	2.18E+05	0.	2.57E+03
CE-141	1.99E+04	1.35E+04	0.	6.26E+03	3.62E+05	1.23E+05	0.	1.53E+03
CE-144	3.43E+06	1.43E+06	0.	4.48E+05	7.78E+06	8.16E+05	0.	1.84E+05
PR-143	9.36E+03	3.75E+03	0.	2.16E+03	2.81E+05	2.08E+05	0.	4.63E+02
ND-147	5.27E+03	6.10E+03	0.	3.56E+03	2.21E+05	1.73E+05	0.	3.65E+02

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.13E+02	4.13E+02	4.13E+02	4.13E+02	4.13E+02	0.	4.13E+02
C---14	3.33E+05	6.67E+04	6.67E+04	6.67E+04	6.67E+04	6.67E+04	0.	6.67E+04
P---32	4.67E+09	2.93E+08	0.	0.	0.	5.25E+08	0.	1.81E+08
CR--51	0.	0.	4.23E+03	1.56E+03	9.38E+03	1.78E+06	0.	7.87E+03
MN--54	0.	9.18E+06	0.	2.73E+06	0.	2.81E+07	0.	1.75E+06
FE--59	2.67E+08	6.33E+08	0.	0.	1.76E+08	2.89E+09	0.	2.41E+08
CO--57	0.	5.64E+06	0.	0.	0.	1.43E+08	0.	9.38E+06
CO--58	0.	1.83E+07	0.	0.	0.	3.78E+08	0.	4.09E+07
CO--61	0.	7.55E+07	0.	0.	0.	1.41E+09	0.	1.66E+08
NI--63	1.49E+09	1.31E+08	0.	0.	0.	2.73E+07	0.	6.33E+07
ZN--65	3.56E+08	1.13E+09	0.	7.57E+08	0.	7.13E+08	0.	5.12E+08
RB--86	0.	4.89E+08	0.	0.	0.	9.64E+07	0.	2.28E+08
SR--89	3.93E+08	0.	0.	0.	0.	4.84E+07	0.	8.67E+06
SR--90	1.25E+10	0.	0.	0.	0.	1.45E+09	0.	3.05E+09
Y---91	1.14E+06	0.	0.	0.	0.	6.26E+08	0.	3.05E+04
ZR--95	1.78E+06	1.67E+06	0.	2.01E+06	0.	8.30E+09	0.	6.26E+05
NB--95	2.33E+06	1.28E+06	0.	1.27E+06	0.	7.75E+09	0.	5.02E+05
RU-103	1.06E+08	0.	0.	4.06E+08	0.	1.24E+10	0.	4.59E+07
RU-106	2.90E+09	0.	0.	5.41E+09	0.	1.81E+11	0.	3.54E+08
AG110M	6.71E+06	6.21E+06	0.	1.22E+07	0.	2.53E+09	0.	3.69E+06
CD115M	0.	1.46E+06	0.	1.16E+06	0.	6.15E+07	0.	4.67E+04

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.93E+02	1.93E+02	2.44E+02	1.93E+02	1.93E+02	0.	1.93E+02
C---14	5.23E+04	5.23E+04	5.23E+04	3.94E+04	5.23E+04	5.23E+04	0.	5.23E+04
P---32	2.76E+09	1.73E+08	0.	0.	0.	3.18E+08	0.	1.07E+08
CR--51	0.	0.	2.50E+03	9.22E+02	5.55E+03	1.85E+06	0.	4.18E+03
MN--54	0.	5.42E+06	0.	1.61E+06	0.	1.66E+07	0.	1.04E+06
FE--59	1.58E+08	3.74E+08	0.	0.	1.04E+08	1.24E+09	0.	1.42E+08
CO--57	0.	3.33E+06	0.	0.	0.	8.45E+07	0.	5.54E+06
CO--58	0.	1.44E+07	0.	0.	0.	1.94E+08	0.	3.27E+07
CO--60	0.	5.73E+07	0.	0.	0.	6.87E+08	0.	1.31E+08
NI--63	1.12E+09	7.74E+07	0.	0.	0.	1.61E+07	0.	3.74E+07
ZN--65	2.11E+04	6.69E+08	0.	4.47E+08	0.	4.21E+08	0.	3.03E+08
RB--86	0.	2.89E+08	0.	0.	0.	5.69E+07	0.	1.35E+08
SR--89	2.66E+08	0.	0.	0.	0.	2.89E+07	0.	7.64E+06
SR--90	1.01E+10	0.	0.	0.	2.79E+08	1.82E+09	0.	2.49E+09
Y---91	9.34E+05	0.	0.	0.	0.	3.59E+08	0.	2.49E+04
ZR--95	2.67E+06	1.24E+06	0.	1.18E+06	0.	4.20E+09	0.	7.61E+05
NB--95	1.50E+06	9.51E+05	0.	7.48E+05	0.	3.88E+09	0.	5.37E+05
RU-103	4.05E+07	0.	0.	2.40E+08	0.	6.28E+09	0.	3.60E+07
RU-106	2.40E+09	0.	0.	3.20E+09	0.	1.09E+11	0.	3.02E+08
AG110M	3.97E+06	3.67E+06	0.	7.21E+06	0.	1.50E+09	0.	2.18E+06
CD115M	2.	8.64E+05	0.	6.85E+05	0.	3.63E+07	0.	2.76E+04

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION.

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.10E+10	2.18E+08	6.38E+07	0.	3.82E+06	3.66E+09	0.	3.14E+08
SB-124	1.17E+07	2.21E+05	2.84E+04	0.	9.11E+06	3.32E+08	0.	4.64E+06
SB-125	5.81E+07	1.31E+07	1.02E+07	1.03E+08	1.47E+09	2.25E+08	0.	7.68E+06
TE125M	3.03E+08	1.08E+08	8.55E+07	8.63E+08	0.	8.47E+08	0.	4.02E+07
TE127M	6.64E+08	2.34E+08	1.77E+08	2.69E+09	0.	3.35E+09	0.	8.28E+07
TE129M	9.73E+08	3.63E+08	3.13E+08	2.83E+09	0.	3.41E+09	0.	1.53E+08
I--130	1.41E-06	4.16E-06	5.30E-04	6.47E-06	0.	3.57E-06	0.	1.64E-06
I--131	8.54E+06	1.21E+07	3.48E+09	1.56E+07	0.	2.28E+06	0.	7.19E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	3.69E-01	6.26E-01	1.14E+02	7.08E-01	0.	4.55E-01	0.	1.93E-01
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	5.09E-02	4.69E-02	0.	1.78E-02	5.34E-03	1.10E-03	0.	2.08E-02
CS-134	5.03E+08	1.21E+09	0.	3.00E+08	1.47E+08	1.48E+07	0.	5.66E+08
CS-136	6.99E+06	2.76E+07	0.	1.54E+07	2.11E+06	3.14E+06	0.	1.99E+07
CS-137	6.92E+08	9.31E+08	0.	2.40E+08	1.24E+08	1.24E+07	0.	3.27E+08
BA-140	2.37E+07	2.93E+04	0.	7.28E+03	1.95E+04	9.19E+06	0.	1.53E+06
CE-141	1.12E+04	7.51E+03	0.	2.61E+03	0.	2.83E+07	0.	8.61E+02
CE-144	1.24E+06	5.23E+05	0.	2.14E+05	0.	3.08E+08	0.	6.76E+04
PR-143	1.26E+04	5.07E+03	0.	2.92E+03	0.	5.52E+07	0.	6.26E+02
ND-147	1.01E+04	5.49E+03	0.	3.92E+03	0.	2.44E+07	0.	5.18E+02

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	9.93E+02	9.93E+02	1.26E+03	9.93E+02	9.93E+02	0.	9.93E+02
C---14	1.25E+05	1.25E+05	1.25E+05	9.39E+04	1.25E+05	1.25E+05	0.	1.25E+05
P---32	2.21E+10	1.38E+09	0.	0.	0.	2.48E+09	0.	8.54E+08
CR--51	0.	0.	2.21E+04	8.15E+03	4.90E+04	9.29E+06	0.	3.69E+04
MN--54	0.	1.09E+07	0.	3.23E+06	0.	3.33E+07	0.	2.07E+06
FE--59	3.84E+07	9.12E+07	0.	0.	2.53E+07	3.81E+08	0.	3.47E+07
CO--57	0.	1.65E+06	0.	0.	0.	4.19E+07	0.	2.75E+06
CO--58	0.	6.10E+06	0.	0.	0.	1.10E+08	0.	1.85E+07
CO--60	0.	2.73E+07	0.	0.	0.	3.27E+08	0.	6.23E+07
NI--63	4.68E+09	6.02E+08	0.	0.	0.	1.26E+08	0.	2.91E+08
ZN--65	1.77E+09	5.63E+09	0.	3.77E+09	0.	3.55E+09	0.	2.55E+09
RB--86	0.	3.35E+09	0.	0.	0.	6.61E+08	0.	1.56E+09
SR--89	2.80E+09	0.	0.	0.	0.	3.83E+08	0.	8.83E+07
SR--90	3.29E+10	0.	0.	0.	3.38E+06	1.76E+09	0.	2.05E+10
Y---91	1.54E+04	0.	0.	0.	0.	5.93E+06	0.	4.12E+02
ZR--95	4.78E+04	2.94E+04	0.	2.25E+04	0.	1.15E+08	0.	1.60E+04
NB--95	1.24E+05	7.46E+04	0.	5.87E+04	0.	3.05E+08	0.	4.21E+04
RU-103	1.69E+03	0.	0.	5.04E+03	0.	1.32E+05	0.	7.56E+02
RU-106	3.93E+04	0.	0.	5.89E+04	0.	1.73E+06	0.	4.81E+03
AG110M	7.53E+07	6.97E+07	0.	1.37E+08	0.	2.84E+10	0.	4.14E+07
CD115M	0.	1.61E+06	0.	1.28E+06	0.	6.77E+07	0.	5.14E+04

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SB-127	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.12E+09	4.21E+07	1.24E+07	0.	6.03E+06	1.41E+09	0.	6.37E+07
SR-129	3.31E+07	6.29E+05	8.05E+04	0.	2.59E+07	9.43E+08	0.	1.32E+07
SB-125	3.45E+07	9.58E+05	5.05E+05	4.80E+06	3.43E+09	2.95E+08	0.	6.82E+06
TE125M	1.09E+07	1.08E+07	8.47E+06	8.55E+07	0.	8.39E+07	0.	3.98E+06
TE127M	6.32E+07	2.11E+07	1.59E+07	2.43E+08	0.	3.02E+08	0.	7.45E+06
TE129M	1.13E+08	4.18E+07	3.61E+07	3.27E+08	0.	3.93E+08	0.	1.78E+07
I--130	5.51E+05	1.63E+06	2.07E+08	2.53E+06	0.	1.48E+06	0.	6.41E+05
I--131	5.12E+08	7.24E+08	2.09E+11	9.38E+08	0.	1.37E+08	0.	4.31E+08
I--132	2.16E-01	5.76E-01	7.59E+01	9.19E-01	0.	1.88E-01	0.	2.85E-01
I--133	7.33E+06	1.24E+07	2.26E+09	1.56E+07	0.	9.82E+06	0.	3.83E+06
I--134	0.	0.	1.29E-09	0.	0.	0.	0.	0.
I--135	1.81E+04	4.77E+04	6.24E+06	7.58E+04	9.79E-02	5.34E+04	0.	1.75E+04
CS-134	9.44E+09	2.28E+10	0.	5.63E+09	2.76E+09	2.63E+08	0.	1.86E+10
CS-136	3.37E+08	1.33E+09	0.	7.41E+08	1.02E+08	1.51E+08	0.	9.58E+08
CS-137	1.28E+10	1.72E+10	0.	4.43E+09	2.28E+09	2.29E+08	0.	6.84E+09
BA-140	4.84E+07	5.95E+04	0.	1.48E+04	3.98E+04	9.16E+06	0.	3.11E+06
CE-141	5.05E+04	3.39E+04	0.	1.18E+04	0.	9.18E+07	0.	3.89E+03
CE-144	4.10E+06	1.68E+06	0.	6.87E+05	0.	9.65E+08	0.	2.17E+05
PR-143	2.05E+02	8.25E+01	0.	4.75E+01	0.	8.98E+05	0.	1.82E+01
ND-147	1.49E+02	1.44E+02	0.	8.74E+01	0.	6.82E+05	0.	9.48E+00

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH AND STORED FRUITS AND VEGETABLES AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.57E+03	2.57E+03	3.24E+03	2.57E+03	2.57E+03	0.	2.57E+03
C---14	2.71E+05	2.71E+05	2.71E+05	2.03E+05	2.71E+05	2.71E+05	0.	2.71E+05
P---32	1.13E+09	7.06E+07	0.	0.	0.	1.27E+08	0.	4.36E+07
CR--51	0.	0.	2.74E+04	1.81E+04	6.08E+04	1.15E+07	0.	4.58E+04
MN--54	0.	3.52E+08	0.	1.05E+08	0.	1.08E+09	0.	6.72E+07
FE--59	1.34E+08	3.18E+08	0.	0.	8.88E+07	1.05E+09	0.	1.21E+08
CO--57	0.	1.31E+07	0.	0.	0.	3.34E+08	0.	2.19E+07
CO--58	0.	4.45E+07	0.	0.	0.	6.82E+08	0.	1.02E+08
CO--60	0.	2.44E+08	0.	0.	0.	2.93E+09	0.	5.57E+08
NI--63	1.18E+10	8.18E+08	0.	0.	0.	1.71E+08	0.	3.96E+08
ZN--65	3.57E+08	1.14E+09	0.	7.57E+08	0.	7.13E+08	0.	5.12E+08
RB--86	0.	1.94E+08	0.	0.	0.	3.83E+07	0.	9.06E+07
SR--89	1.58E+10	0.	0.	0.	0.	1.72E+09	0.	4.55E+08
SR--90	9.40E+11	0.	0.	0.	3.36E+09	2.97E+10	0.	2.33E+11
Y---91	7.69E+06	0.	0.	0.	0.	2.95E+09	0.	2.06E+05
ZR--95	1.87E+06	7.03E+05	0.	7.90E+05	0.	1.86E+09	0.	4.66E+05
NB--95	1.69E+05	1.82E+05	0.	8.00E+04	0.	4.15E+08	0.	5.73E+04
RU-103	6.46E+06	0.	0.	1.93E+07	0.	5.84E+08	0.	2.49E+06
RU-106	1.15E+08	0.	0.	4.20E+08	0.	1.43E+10	0.	3.96E+07
AG110M	1.19E+07	1.10E+07	0.	2.17E+07	0.	4.58E+09	0.	6.56E+06
CD115M	0.	5.41E+07	0.	4.29E+07	0.	2.28E+09	0.	1.73E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY -- FRESH AND STORED FRUITS AND VEGETABLES AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	9.25E-06	1.53E-07	1.22E-07	0.	0.	1.33E-05	0.	2.28E-07
SN-126	7.79E+09	1.54E+08	4.53E+07	0.	6.01E+07	1.82E+10	0.	2.54E+08
SB-124	1.12E+08	2.11E+06	2.71E+05	0.	8.69E+07	3.17E+09	0.	4.42E+07
SB-125	2.33E+08	1.66E+07	1.16E+07	1.15E+08	2.81E+10	1.82E+09	0.	4.40E+07
TE125M	1.40E+08	5.30E+07	4.10E+07	4.22E+08	0.	4.14E+08	0.	1.97E+07
TE127M	3.84E+08	1.36E+08	1.03E+08	1.56E+09	0.	1.95E+09	0.	4.81E+07
TE129M	3.74E+08	1.39E+08	1.20E+08	1.88E+09	0.	1.31E+09	0.	5.98E+07
I--130	2.58E+05	7.64E+05	9.72E+07	1.19E+06	0.	6.55E+05	0.	3.08E+05
I--131	7.33E+07	1.03E+08	2.99E+10	1.34E+08	0.	1.96E+07	0.	6.17E+07
I--132	3.65E+01	9.77E+01	1.29E+04	1.56E+02	0.	1.84E+01	0.	3.47E+01
I--133	1.94E+06	3.36E+06	6.10E+08	4.23E+06	0.	2.44E+06	0.	1.04E+06
I--134	6.75E-05	1.83E-04	2.38E-02	2.92E-04	0.	1.68E-07	0.	6.56E-05
I--135	2.65E+04	7.00E+04	9.15E+06	1.11E+05	7.12E-02	7.84E+04	0.	2.57E+04
CS-134	6.84E+09	1.65E+10	0.	4.88E+09	2.88E+09	1.98E+08	0.	7.69E+09
CS-136	3.25E+07	1.28E+08	0.	7.13E+07	9.78E+06	1.46E+07	0.	9.23E+07
CS-137	9.68E+09	1.31E+10	0.	3.35E+09	1.73E+09	1.74E+08	0.	4.57E+09
BA-140	1.31E+05	1.78E+05	0.	4.22E+04	1.13E+05	4.96E+06	0.	8.86E+06
CE-141	2.64E+05	1.79E+05	0.	6.25E+04	0.	4.87E+08	0.	2.87E+04
CE-144	5.47E+07	2.25E+07	0.	9.17E+06	0.	1.29E+10	0.	2.91E+06
PR-143	5.90E+04	2.02E+04	0.	1.16E+04	0.	2.19E+08	0.	2.49E+03
ND-147	9.40E+04	3.55E+04	0.	2.97E+04	0.	1.45E+08	0.	4.50E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.68E+06	4.68E+06	4.68E+06	4.68E+06	4.68E+06	4.68E+06	5.53E+06	4.68E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.62E+09	1.38E+09
FE--59	2.75E+08	2.75E+08	2.75E+08	2.75E+08	2.75E+08	2.75E+08	3.23E+08	2.75E+08
CO--57	1.89E+08	1.89E+08	1.89E+08	1.89E+08	1.89E+08	1.89E+08	2.08E+08	1.89E+08
CO--58	3.80E+08	3.80E+08	3.80E+08	3.80E+08	3.80E+08	3.80E+08	4.45E+08	3.80E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.52E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.43E+08	7.43E+08	7.43E+08	7.43E+08	7.43E+08	7.43E+08	8.54E+08	7.43E+08
RB--86	9.01E+06	9.01E+06	9.01E+06	9.01E+06	9.01E+06	9.01E+06	1.03E+07	9.01E+06
SR--89	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.51E+04	2.17E+04
SR--90	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	6.33E+06	5.35E+06
Y---91	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.22E+06	1.08E+06
ZR--95	5.01E+08	5.01E+08	5.01E+08	5.01E+08	5.01E+08	5.01E+08	5.86E+08	5.01E+08
NB--95	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.61E+08	1.36E+08
RU-103	1.10E+08	1.10E+08	1.10E+08	1.10E+08	1.10E+08	1.10E+08	1.28E+08	1.10E+08
RU-106	4.19E+08	4.19E+08	4.19E+08	4.19E+08	4.19E+08	4.19E+08	5.03E+08	4.19E+08
AG110M	3.54E+09	3.58E+09	3.58E+09	3.58E+09	3.58E+09	3.58E+09	4.17E+09	3.58E+09
CD115M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	1.37E+06	0.
SN-126	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.76E+10	5.16E+10
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	2.30E+09	2.30E+09	2.30E+09	2.30E+09	2.30E+09	2.30E+09	2.59E+09	2.30E+09
TE125M	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	2.13E+06	1.55E+06
TE127M	8.79E+05	8.79E+05	8.79E+05	8.79E+05	8.79E+05	8.79E+05	9.74E+05	8.79E+05
TE129M	3.85E+07	3.85E+07	3.85E+07	3.85E+07	3.85E+07	3.85E+07	4.52E+07	3.85E+07
I--130	5.53E+06	5.53E+06	5.53E+06	5.53E+06	5.53E+06	5.53E+06	6.71E+06	5.53E+06
I--131	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	2.09E+07	1.72E+07
I--132	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.47E+06	1.25E+06
I--133	2.48E+06	2.48E+06	2.48E+06	2.48E+06	2.48E+06	2.48E+06	3.01E+06	2.48E+06
I--134	4.50E+05	4.50E+05	4.50E+05	4.50E+05	4.50E+05	4.50E+05	5.35E+05	4.50E+05
I--135	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.99E+06	2.56E+06
CS-134	6.99E+09	6.99E+09	6.99E+09	6.99E+09	6.99E+09	6.99E+09	8.15E+09	6.99E+09
CS-136	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.69E+08	1.49E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
BA-140	1.69E+08	1.68E+08	1.69E+08	1.68E+08	1.68E+08	1.68E+08	1.98E+08	1.68E+08
CE-1-1	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.31E+08	1.13E+08
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	8.48E+06	8.48E+06	8.48E+06	8.48E+06	8.48E+06	8.48E+06	1.02E+07	8.48E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - INHALATION AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	2.79E+04	6.14E+02	4.92E+02	0.	3.91E+06	3.13E+05	0.	9.20E+02
SN-126	1.26E+06	3.34E+04	9.84E+03	0.	9.36E+06	1.27E+05	0.	4.88E+04
SB-124	3.12E+04	5.99E+02	7.55E+01	0.	2.48E+06	4.06E+05	0.	1.24E+04
SB-125	6.61E+04	7.13E+02	5.87E+01	0.	2.20E+06	1.81E+05	0.	1.33E+04
TE125M	4.07E+02	1.66E+02	1.17E+02	1.24E+04	5.36E+05	7.88E+04	0.	5.53E+01
TE127M	1.26E+04	5.62E+03	3.29E+03	4.58E+04	9.68E+05	1.50E+05	0.	1.57E+03
TE129M	1.19E+03	5.64E+02	3.90E+02	3.66E+04	2.83E+06	3.84E+05	0.	1.92E+02
I--130	4.58E+03	1.34E+04	1.74E+06	2.09E+04	0.	7.69E+03	0.	5.29E+03
I--131	3.37E+04	4.72E+04	1.39E+07	6.14E+04	0.	5.96E+03	0.	2.82E+04
I--132	1.16E+03	3.26E+03	4.38E+05	5.19E+03	0.	4.06E+02	0.	1.16E+03
I--133	1.23E+04	2.06E+04	3.83E+06	2.68E+04	0.	1.88E+04	0.	6.34E+03
I--134	6.45E+02	1.73E+03	2.30E+05	2.75E+03	0.	1.81E+03	0.	6.16E+02
I--135	2.69E+03	6.99E+03	9.36E+05	1.11E+04	0.	5.25E+03	0.	2.58E+03
CS-134	4.83E+05	1.10E+06	0.	2.98E+05	1.44E+05	8.96E+03	0.	5.44E+05
CS-136	3.91E+04	1.46E+05	0.	8.56E+04	1.20E+04	1.17E+04	0.	1.11E+05
CS-137	6.42E+05	8.24E+05	0.	2.22E+05	1.18E+05	7.68E+03	0.	3.03E+05
BA-140	5.30E+03	4.85E+00	0.	1.67E+01	2.82E+06	2.12E+04	0.	3.42E+02
CE-141	2.27E+03	1.52E+03	0.	6.26E+03	5.83E+05	1.14E+05	0.	1.74E+02
CE-144	4.19E+05	1.74E+05	0.	8.48E+05	1.38E+07	8.48E+05	0.	2.24E+04
PR-143	3.36E+03	3.75E+03	0.	2.16E+03	2.81E+05	2.00E+05	0.	4.63E+02
ND-147	5.27E+03	6.10E+03	0.	3.56E+03	2.21E+05	1.73E+05	0.	3.65E+02

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - INHALATION AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	7.51E+02	7.51E+02	4.96E+02	7.51E+02	7.51E+02	0.	7.51E+02
C---14	6.25E+03	6.25E+03	6.25E+03	1.58E+03	6.25E+03	6.25E+03	0.	6.25E+03
P---32	6.11E+05	3.57E+04	0.	0.	0.	4.88E+04	0.	2.32E+04
CR--51	0.	0.	2.75E+01	1.06E+01	6.66E+03	1.54E+03	0.	4.63E+01
MN--54	0.	1.83E+04	0.	4.55E+03	6.48E+05	3.58E+04	0.	2.91E+03
FE--59	5.44E+03	1.28E+07	0.	0.	4.78E+05	8.78E+04	0.	4.88E+03
CO--57	0.	3.28E+02	0.	0.	1.71E+05	1.45E+04	0.	3.18E+02
CO--58	0.	1.52E+02	0.	0.	1.13E+06	3.62E+04	0.	2.68E+02
CO--60	0.	1.07E+03	0.	0.	6.92E+06	9.36E+04	0.	1.88E+03
NI--63	2.00E+05	1.45E+04	0.	0.	8.25E+04	6.10E+03	0.	6.78E+03
ZN--65	1.50E+04	4.77E+04	0.	3.19E+04	4.83E+05	2.47E+04	0.	2.15E+04
SB--96	0.	6.25E+04	0.	0.	0.	7.78E+03	0.	2.73E+04
SR--89	5.37E+04	0.	0.	0.	2.24E+06	1.69E+05	0.	1.54E+03
SR--90	1.64E+07	0.	0.	0.	1.48E+07	3.45E+05	0.	9.99E+05
Y---91	7.44E+04	0.	0.	0.	2.55E+06	1.78E+05	0.	1.98E+03
ZR--95	1.41E+04	3.28E+03	0.	2.51E+04	2.12E+06	5.74E+04	0.	2.98E+03
NB--95	1.70E+01	7.25E+02	0.	3.58E+03	5.85E+05	3.32E+04	0.	5.33E+02
RU-103	2.16E+02	0.	0.	2.70E+03	6.33E+05	4.22E+04	0.	8.73E+01
RU-106	1.15E+04	0.	0.	6.18E+04	1.45E+07	4.37E+05	0.	1.44E+03
AG110M	5.00E+03	4.63E+03	0.	9.10E+03	2.15E+06	1.48E+05	0.	2.75E+03
CD115M	0.	9.10E+04	0.	7.33E+04	6.51E+05	1.78E+05	0.	2.94E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS · FOR GASEOUS DISCHARGES

PATHWAY - INHALATION AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	3.35E+04	6.44E+02	6.A1E+02	0.	3.50E+06	1.49E+05	0.	1.27E+03
SN-126	5.35E+05	1.55E+04	4.55E+03	0.	4.33E+06	5.40E+04	0.	2.22E+04
SB-124	1.44E+04	2.72E+02	3.49E+01	0.	1.15E+06	1.08E+05	0.	5.74E+03
SB-125	3.96E+04	3.30E+02	2.72E+01	0.	1.02E+06	4.66E+04	0.	6.14E+03
TE125M	5.62E+02	1.94E+02	1.61E+02	5.74E+03	4.81E+05	3.39E+04	0.	7.62E+01
TE127M	5.85E+03	2.60E+03	1.52E+03	2.12E+04	4.44E+05	6.92E+04	0.	7.25E+02
TE129M	1.64E+03	5.85E+02	5.48E+02	1.69E+04	1.88E+06	1.82E+05	0.	2.60E+02
I--130	2.12E+03	6.22E+03	8.07E+05	9.66E+03	0.	3.56E+03	0.	2.45E+03
I--131	4.55E+04	4.63E+04	1.54E+07	2.84E+04	0.	2.65E+03	0.	3.50E+04
I--132	5.37E+02	1.51E+03	2.03E+05	2.48E+03	0.	1.88E+02	0.	5.37E+02
I--133	1.60E+04	2.05E+04	5.03E+06	1.28E+04	0.	5.55E+03	0.	8.03E+03
I--134	2.91E+02	7.99E+02	1.06E+05	1.27E+03	0.	4.66E-01	0.	2.85E+02
I--135	1.24E+03	3.23E+03	4.33E+05	5.14E+03	0.	2.43E+03	0.	1.19E+03
CS-134	6.22E+05	9.95E+05	0.	1.33E+05	1.19E+05	3.77E+03	0.	2.23E+05
CS-136	1.81E+04	6.77E+04	0.	3.96E+04	5.55E+03	5.48E+03	0.	5.14E+04
CS-137	8.66E+05	7.99E+05	0.	1.03E+05	1.08E+05	3.41E+03	0.	1.25E+05
BA-140	7.14E+03	4.66E+00	0.	7.73E+08	1.74E+06	9.92E+03	0.	4.22E+02
CE-141	3.13E+03	1.57E+03	0.	2.98E+03	5.14E+05	5.44E+04	0.	2.33E+02
CE-144	5.41E+05	1.42E+05	0.	3.92E+05	1.23E+07	4.80E+05	0.	3.10E+04
PR-143	4.33E+03	1.74E+03	0.	9.99E+02	1.38E+05	9.25E+04	0.	2.14E+02
ND-147	2.44E+03	2.42E+03	0.	1.65E+03	1.02E+05	7.99E+04	0.	1.69E+02

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.33E+02	2.33E+02	1.54E+02	2.33E+02	2.33E+02	0.	2.33E+02
C---14	9.87E+04	9.87E+04	9.87E+04	2.49E+04	9.87E+04	9.87E+04	0.	9.87E+04
F---18	1.74E+09	1.89E+08	0.	0.	0.	1.96E+08	0.	6.73E+07
CR--51	0.	0.	1.58E+03	5.82E+02	3.50E+03	6.63E+05	0.	2.64E+03
MN--54	0.	1.42E+06	0.	1.82E+06	0.	1.85E+07	0.	6.54E+05
FE--59	9.95E+07	2.36E+08	0.	0.	6.55E+07	7.79E+08	0.	8.98E+07
CO--57	0.	2.18E+06	0.	0.	0.	5.33E+07	0.	3.50E+06
CO--58	0.	1.69E+07	0.	0.	0.	1.88E+08	0.	5.10E+07
CO--60	0.	6.77E+07	0.	0.	0.	3.75E+08	0.	2.03E+08
NI--63	7.04E+08	4.88E+07	0.	0.	0.	1.02E+07	0.	2.36E+07
ZN--65	1.33E+08	4.22E+08	0.	2.82E+08	0.	2.66E+08	0.	1.91E+08
RB--86	0.	1.82E+08	0.	0.	0.	3.59E+07	0.	8.50E+07
SR--89	5.04E+08	0.	0.	0.	0.	1.88E+07	0.	1.44E+07
SR--90	1.05E+10	0.	0.	0.	0.	7.02E+08	0.	2.67E+09
Y---91	1.76E+06	0.	0.	0.	0.	2.33E+08	0.	4.69E+04
ZR--95	4.62E+06	1.51E+06	0.	7.47E+05	0.	2.22E+09	0.	1.20E+06
NB--95	2.68E+06	1.15E+06	0.	4.72E+05	0.	1.98E+09	0.	8.41E+05
RU-103	1.45E+08	0.	0.	1.51E+08	0.	3.81E+09	0.	5.87E+07
RU-106	4.51E+09	0.	0.	2.82E+09	0.	7.81E+10	0.	5.61E+08
AG110M	2.50E+06	2.31E+06	0.	4.55E+06	0.	9.44E+08	0.	1.38E+06
CD115M	0.	5.45E+05	0.	4.32E+05	0.	2.29E+07	0.	1.74E+04

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	6.92E+09	1.37E+08	4.02E+07	0.	2.41E+06	2.31E+09	0.	1.98E+08
SB-124	7.40E+06	1.40E+05	1.79E+04	0.	5.74E+06	2.10E+08	0.	2.93E+06
SB-125	7.66E+07	1.84E+07	1.98E+07	6.47E+07	9.26E+08	1.44E+08	0.	1.08E+07
TE125M	5.69E+08	1.54E+08	1.60E+08	5.44E+08	0.	5.49E+08	0.	7.59E+07
TE127M	4.40E+08	1.51E+08	1.24E+08	1.78E+09	0.	2.54E+09	0.	5.61E+07
TE129M	1.84E+09	5.12E+08	5.87E+08	1.78E+09	0.	2.21E+09	0.	2.84E+08
I--130	3.47E-07	2.63E-06	3.34E-04	4.08E-06	0.	2.25E-06	0.	1.03E-06
I--131	1.58E+07	1.62E+07	5.25E+09	9.86E+06	0.	1.38E+06	0.	1.22E+07
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	6.86E-01	8.47E-01	2.04E+02	4.97E-01	0.	3.43E-01	0.	3.33E-01
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	3.21E-02	2.96E-02	0.	1.12E-02	3.37E-03	6.92E-04	0.	1.32E-02
CS-134	9.83E+08	1.49E+09	0.	1.89E+08	1.65E+08	8.04E+06	0.	3.16E+08
CS-136	4.41E+06	1.74E+07	0.	9.69E+06	1.33E+06	1.98E+06	0.	1.25E+07
CS-137	1.27E+09	1.23E+09	0.	1.51E+08	1.44E+08	7.58E+06	0.	1.84E+08
BA-140	4.37E+07	3.84E+04	0.	4.59E+03	2.29E+04	6.03E+06	0.	2.57E+06
CE-141	2.10E+04	1.05E+04	0.	1.65E+03	0.	1.32E+07	0.	1.57E+03
CE-144	2.34E+06	7.46E+05	0.	1.35E+05	0.	1.94E+08	0.	1.27E+05
PR-143	7.96E+03	3.20E+03	0.	1.84E+03	0.	3.48E+07	0.	3.95E+02
ND-147	6.40E+03	3.47E+03	0.	2.48E+03	0.	1.53E+07	0.	3.27E+02

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	1.57E+03	1.57E+03	1.04E+03	1.57E+03	1.57E+03	0.	1.57E+03
C---14	3.08E+05	3.08E+05	3.08E+05	7.75E+04	3.08E+05	3.08E+05	0.	3.08E+05
P---32	1.82E+10	1.14E+09	0.	0.	0.	2.05E+09	0.	7.05E+08
CR--51	0.	0.	1.82E+04	6.72E+03	4.04E+04	7.66E+06	0.	3.05E+04
MN--54	0.	8.96E+06	0.	2.67E+06	0.	2.74E+07	0.	1.71E+06
FE--59	1.17E+07	7.52E+07	0.	0.	2.09E+07	2.48E+08	0.	2.86E+07
CO--57	0.	1.36E+06	0.	0.	0.	3.46E+07	0.	2.27E+06
CO--58	0.	1.25E+07	0.	0.	0.	7.41E+07	0.	3.76E+07
CO--60	0.	4.22E+07	0.	0.	0.	2.31E+08	0.	1.27E+08
NI--63	7.16E+09	4.97E+08	0.	0.	0.	1.04E+08	0.	2.48E+08
ZN--65	1.46E+09	4.65E+09	0.	3.11E+09	0.	2.93E+09	0.	2.18E+09
RB--86	0.	2.77E+09	0.	0.	0.	5.45E+08	0.	1.29E+09
SR--89	6.92E+09	0.	0.	0.	0.	2.58E+08	0.	1.98E+08
SR--90	1.13E+11	0.	0.	0.	0.	1.52E+09	0.	2.87E+10
Y---91	3.80E+04	0.	0.	0.	0.	5.85E+06	0.	1.01E+03
ZR--95	1.06E+05	4.47E+04	0.	1.86E+04	0.	7.60E+07	0.	3.29E+04
NB--95	2.75E+05	1.18E+05	0.	4.84E+04	0.	2.03E+08	0.	8.63E+04
RU-103	3.99E+03	0.	0.	4.16E+03	0.	1.85E+05	0.	1.61E+03
RU-106	9.39E+04	0.	0.	4.20E+04	0.	1.46E+06	0.	1.17E+04
AG110M	6.21E+07	5.75E+07	0.	1.13E+08	0.	2.35E+10	0.	3.42E+07
CD115M	0.	1.33E+06	0.	1.05E+06	0.	5.58E+07	0.	4.24E+04

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.75E+09	3.48E+07	1.01E+07	0.	4.97E+06	1.16E+09	0.	5.25E+07
SB-124	2.75E+07	5.19E+05	6.64E+04	0.	2.13E+07	7.78E+06	0.	1.09E+07
SB-125	1.13E+07	1.41E+06	1.18E+06	3.96E+06	2.83E+09	2.43E+08	0.	5.99E+06
TE125M	7.38E+07	2.88E+07	2.07E+07	7.85E+07	0.	7.12E+07	0.	9.84E+06
TE127M	5.18E+07	1.78E+07	1.46E+07	2.08E+08	0.	2.99E+08	0.	6.60E+06
TE129M	2.77E+08	7.73E+07	8.85E+07	2.78E+08	0.	3.33E+08	0.	4.28E+07
I--130	4.54E+05	1.35E+06	1.71E+08	2.09E+06	0.	1.15E+06	0.	5.29E+05
I--131	1.24E+09	1.27E+09	4.12E+11	7.74E+08	0.	1.89E+08	0.	9.56E+08
I--132	1.78E-01	4.76E-01	6.26E+01	7.58E-01	0.	8.93E-02	0.	1.69E-01
I--133	1.73E+07	2.20E+07	5.30E+09	1.29E+07	0.	8.98E+06	0.	8.63E+06
I--134	0.	0.	1.06E-09	0.	0.	0.	0.	0.
I--135	1.49E+04	3.94E+04	5.15E+06	6.26E+04	8.07E-02	4.41E+04	0.	1.44E+04
CS-134	2.17E+10	3.65E+10	0.	4.65E+09	4.06E+09	1.97E+08	0.	7.76E+09
CS-136	2.78E+09	1.18E+09	0.	6.11E+08	8.37E+07	1.25E+08	0.	7.98E+08
CS-137	3.08E+10	2.98E+10	0.	3.66E+09	3.49E+09	1.81E+08	0.	4.44E+09
BA-140	1.17E+08	1.02E+05	0.	1.22E+04	6.89E+04	7.75E+06	0.	6.84E+06
CE-141	1.24E+05	6.22E+04	0.	9.72E+03	0.	7.60E+07	0.	9.26E+03
CE-144	1.00E+07	3.14E+06	0.	5.67E+05	0.	8.15E+08	0.	5.34E+05
PR-143	1.69E+02	6.80E+01	0.	3.92E+01	0.	7.41E+05	0.	8.40E+08
ND-147	1.23E+02	1.19E+02	0.	7.21E+01	0.	5.63E+05	0.	7.81E+00

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C----14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH AND STORED FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.98E+03	3.98E+03	2.62E+03	3.98E+03	3.98E+03	0.	3.98E+03
C---14	6.54E+05	6.54E+05	6.54E+05	1.65E+05	6.54E+05	6.54E+05	0.	6.54E+05
P---32	7.89E+08	4.94E+07	0.	0.	0.	8.87E+07	0.	3.05E+07
CR--51	0.	0.	2.10E+04	7.76E+03	4.67E+04	8.84E+06	0.	3.51E+04
MN--54	0.	2.84E+08	0.	8.45E+07	0.	8.78E+08	0.	5.42E+07
FE--59	1.05E+08	2.50E+08	0.	0.	6.95E+07	8.26E+08	0.	9.52E+07
CO--57	0.	1.96E+07	0.	0.	0.	2.69E+08	0.	1.77E+07
CO--58	0.	6.62E+07	0.	0.	0.	3.94E+08	0.	2.88E+08
CO--60	0.	3.69E+08	0.	0.	0.	2.85E+09	0.	1.11E+09
NI--63	9.54E+09	6.62E+08	0.	0.	0.	1.38E+08	0.	3.20E+08
ZN--65	2.83E+08	9.12E+08	0.	6.10E+08	0.	5.75E+08	0.	4.13E+08
SR--16	0.	1.43E+08	0.	0.	0.	2.82E+07	0.	6.66E+07
SR--89	3.76E+10	0.	0.	0.	0.	1.40E+09	0.	1.08E+09
SR--90	1.26E+12	0.	0.	0.	0.	2.54E+10	0.	3.19E+11
Y---91	1.92E+07	0.	0.	0.	0.	2.42E+09	0.	4.87E+05
ZR--95	4.15E+06	1.09E+06	0.	6.33E+05	0.	1.32E+09	0.	9.43E+05
NB--95	3.55E+05	1.51E+05	0.	6.24E+04	0.	2.62E+08	0.	1.11E+05
RU-103	1.45E+07	0.	0.	1.51E+07	0.	3.81E+08	0.	5.86E+06
RU-106	7.57E+08	0.	0.	3.38E+08	0.	1.10E+10	0.	9.42E+07
AG110M	9.61E+06	8.89E+06	0.	1.75E+07	0.	3.63E+09	0.	5.29E+06
CD115M	0.	4.26E+07	0.	3.38E+07	0.	1.79E+09	0.	1.36E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH AND STORED FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	1.71E-05	2.14E-07	2.26E-07	0.	0.	8.50E-06	0.	4.21E-07
SN-126	6.29E+09	1.25E+08	3.66E+07	0.	4.91E+07	8.33E+09	0.	2.86E+08
SB-124	8.90E+07	1.68E+06	2.15E+05	0.	6.90E+07	2.52E+09	0.	3.51E+07
SB-125	2.54E+08	2.86E+07	2.80E+07	9.47E+07	1.62E+10	1.46E+09	0.	4.44E+07
TE125M	3.50E+08	9.50E+07	9.84E+07	3.35E+08	0.	3.38E+08	0.	4.67E+07
TE127M	3.25E+08	1.12E+08	9.15E+07	1.26E+09	0.	1.07E+09	0.	4.14E+07
TE129M	8.69E+08	2.42E+08	2.77E+08	8.43E+08	0.	1.05E+09	0.	1.34E+08
I--130	1.60E+05	4.73E+05	6.02E+07	7.35E+05	0.	4.85E+05	0.	1.86E+05
I--131	1.36E+04	1.39E+08	4.52E+10	8.48E+07	0.	1.19E+07	0.	1.05E+08
I--132	2.26E+01	6.85E+01	7.97E+03	9.65E+01	0.	1.14E+01	0.	2.15E+01
I--133	3.61E+06	4.46E+06	1.08E+09	2.62E+06	0.	1.81E+06	0.	1.75E+06
I--134	4.10E-05	1.14E-04	1.47E-02	1.81E-04	0.	9.49E-08	0.	4.06E-05
I--135	1.64E+04	4.33E+04	5.67E+06	6.89E+04	5.75E-02	4.85E+04	0.	1.59E+04
CS-134	1.54E+10	2.59E+10	0.	3.29E+09	2.88E+09	1.40E+08	0.	5.51E+09
CS-136	2.23E+07	8.80E+07	0.	4.98E+07	6.72E+06	1.80E+07	0.	6.34E+07
CS-137	2.28E+10	2.21E+10	0.	2.72E+09	2.59E+09	1.34E+08	0.	3.29E+09
BA-140	2.76E+08	2.54E+05	0.	2.89E+04	1.44E+05	3.66E+08	0.	1.62E+07
CE-141	6.21E+05	3.10E+05	0.	4.85E+04	0.	3.89E+08	0.	4.62E+04
CE-144	1.31E+08	4.10E+07	0.	7.39E+06	0.	1.06E+10	0.	6.97E+06
PR-143	3.43E+04	1.40E+04	0.	8.03E+03	0.	1.52E+08	0.	1.72E+03
ND-147	7.61E+04	2.46E+04	0.	2.17E+04	0.	9.88E+07	0.	3.40E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.68E+06	4.68E+06	4.68E+06	4.68E+06	4.68E+06	4.68E+06	5.53E+06	4.68E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.62E+09	1.38E+09
FE--59	2.75E+08	2.75E+08	2.75E+08	2.75E+08	2.75E+08	2.75E+08	3.23E+08	2.75E+08
CO--57	1.89E+08	1.89E+08	1.89E+08	1.89E+08	1.89E+08	1.89E+08	2.08E+08	1.89E+08
CO--58	3.80E+08	3.80E+08	3.80E+08	3.80E+08	3.80E+08	3.80E+08	4.45E+08	3.80E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.52E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.43E+08	7.43E+08	7.43E+08	7.43E+08	7.43E+08	7.43E+08	8.54E+08	7.43E+08
RB--86	9.81E+06	9.81E+06	9.81E+06	9.81E+06	9.81E+06	9.81E+06	1.03E+07	9.81E+06
SR--89	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.17E+04	2.51E+04	2.17E+04
SR--90	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	6.33E+06	5.35E+06
Y---91	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.08E+06	1.22E+06	1.08E+06
ZR--95	5.81E+08	5.81E+08	5.81E+08	5.81E+08	5.81E+08	5.81E+08	5.86E+08	5.81E+08
NB--95	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.36E+08	1.61E+08	1.36E+08
RU-103	1.18E+08	1.18E+08	1.18E+08	1.18E+08	1.18E+08	1.18E+08	1.28E+08	1.18E+08
RU-106	4.19E+08	4.19E+08	4.19E+08	4.19E+08	4.19E+08	4.19E+08	5.03E+08	4.19E+08
AG110M	3.58E+09	3.58E+09	3.58E+09	3.58E+09	3.58E+09	3.58E+09	4.17E+09	3.58E+09
CD115M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	1.37E+06	0.
SN-126	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.16E+10	5.7EE+10	5.16E+10
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	2.30E+09	2.30E+09	2.30E+09	2.30E+09	2.30E+09	2.30E+09	2.59E+09	2.30E+09
TE125M	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	2.13E+06	1.55E+06
TE127M	8.79E+05	8.79E+05	8.79E+05	8.79E+05	8.79E+05	8.79E+05	9.74E+05	8.79E+05
TE129M	3.85E+07	3.85E+07	3.85E+07	3.85E+07	3.85E+07	3.85E+07	4.52E+07	3.85E+07
I--130	5.53E+06	5.53E+06	5.53E+06	5.53E+06	5.53E+06	5.53E+06	6.71E+06	5.53E+06
I--131	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	2.09E+07	1.72E+07
I--132	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.47E+06	1.25E+06
I--133	2.48E+06	2.48E+06	2.48E+06	2.48E+06	2.48E+06	2.48E+06	3.01E+06	2.48E+06
I--134	4.50E+05	4.50E+05	4.50E+05	4.50E+05	4.50E+05	4.50E+05	5.35E+05	4.50E+05
I--135	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.56E+06	2.99E+06	2.56E+06
CS-134	6.99E+09	6.99E+09	6.99E+09	6.99E+09	6.99E+09	6.99E+09	8.15E+09	6.99E+09
CS-136	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.69E+08	1.49E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
BA-140	1.64E+08	1.64E+08	1.64E+08	1.64E+08	1.64E+08	1.64E+08	1.90E+08	1.64E+08
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.31E+08	1.13E+08
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	8.48E+06	8.48E+06	8.48E+06	8.48E+06	8.48E+06	8.48E+06	1.82E+07	8.48E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - INHALATION AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.38E+02	4.38E+02	1.88E+02	4.38E+02	4.38E+02	0.	4.38E+02
C---14	5.04E+03	4.28E+03	4.28E+03	5.98E+02	4.28E+03	4.28E+03	0.	4.28E+03
P---32	2.31E+05	1.15E+04	0.	0.	0.	1.51E+04	0.	8.78E+03
CR--51	0.	0.	1.84E+01	3.99E+00	2.52E+03	5.81E+02	0.	1.75E+01
MN--54	0.	6.93E+03	0.	1.72E+03	2.45E+05	1.35E+04	0.	1.18E+03
FE--59	2.06E+03	4.86E+06	0.	0.	1.78E+05	3.29E+04	0.	1.85E+03
CO--57	0.	1.21E+02	0.	0.	6.47E+04	5.58E+03	0.	1.18E+02
CO--58	0.	1.18E+02	0.	0.	8.79E+05	1.21E+04	0.	1.68E+02
CO--60	0.	8.48E+02	0.	0.	5.57E+06	3.28E+04	0.	1.17E+03
NI--63	7.56E+04	5.49E+03	0.	0.	3.12E+04	2.34E+03	0.	2.53E+03
ZN--65	5.67E+03	1.81E+04	0.	1.21E+04	1.53E+05	9.35E+03	0.	8.15E+03
RB--86	0.	2.37E+04	0.	0.	0.	2.91E+03	0.	1.83E+04
SR--89	4.31E+04	0.	0.	0.	2.31E+06	6.88E+04	0.	1.24E+03
SR--90	1.32E+07	0.	0.	0.	1.53E+07	1.39E+05	0.	8.86E+05
Y---91	5.99E+04	0.	0.	0.	2.63E+06	7.17E+04	0.	1.60E+03
ZR--95	1.08E+04	2.73E+03	0.	9.48E+03	1.81E+06	1.41E+04	0.	1.95E+03
NB--95	1.28E+03	5.75E+02	0.	1.35E+03	4.77E+05	1.21E+04	0.	3.37E+02
RU-103	1.69E+02	0.	0.	1.82E+03	5.66E+05	1.58E+04	0.	5.85E+01
RU-106	9.31E+03	0.	0.	2.34E+04	1.58E+07	1.76E+05	0.	1.14E+03
AG110M	1.69E+03	1.75E+03	0.	3.44E+03	8.12E+05	5.29E+04	0.	1.84E+03
CD115M	0.	3.44E+04	0.	2.77E+04	2.46E+05	6.72E+04	0.	1.11E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - INHALATION AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-121	1.11E+04	6.45E+02	6.45E+02	0.	3.61E+06	5.99E+04	0.	1.02E+03
SN-126	2.21E+05	5.85E+03	1.72E+03	0.	1.64E+06	2.23E+04	0.	8.40E+03
SB-124	5.46E+03	1.83E+02	1.32E+01	0.	4.34E+05	7.11E+04	0.	2.17E+03
SB-125	1.16E+04	1.25E+02	1.03E+01	0.	3.85E+05	1.76E+04	0.	2.32E+03
TE125M	4.54E+02	1.95E+02	1.51E+02	2.17E+03	4.96E+05	1.36E+04	0.	6.16E+01
TE127M	2.21E+03	9.03E+02	5.75E+02	8.81E+03	1.68E+05	2.62E+04	0.	2.74E+02
TE129M	1.32E+03	5.08E+02	5.08E+02	6.48E+03	1.83E+06	7.32E+04	0.	2.06E+02
I--130	4.02E+02	2.35E+03	3.85E+05	3.65E+03	0.	1.35E+03	0.	9.25E+02
I--131	3.63E+04	4.27E+04	1.41E+07	1.87E+04	0.	1.07E+03	0.	2.51E+04
I--132	2.03E+02	5.70E+02	7.67E+04	9.89E+02	0.	7.11E+01	0.	2.03E+02
I--133	1.34E+04	1.93E+04	4.66E+06	4.55E+03	0.	2.28E+03	0.	5.87E+03
I--134	1.13E+02	3.02E+02	4.02E+04	4.42E+02	0.	1.76E-01	0.	1.08E+02
I--135	4.70E+02	1.22E+03	1.64E+05	1.95E+03	0.	9.18E+02	0.	4.51E+02
CS-134	4.80E+05	8.25E+05	0.	5.84E+04	1.81E+05	1.37E+03	0.	7.32E+04
CS-136	6.85E+03	2.56E+04	0.	1.58E+04	2.18E+03	2.04E+03	0.	1.95E+04
CS-137	6.86E+05	7.31E+05	0.	3.89E+04	9.45E+04	1.32E+03	0.	4.41E+04
BA-140	5.70E+03	4.27E+00	0.	2.93E+00	1.64E+06	3.88E+03	0.	2.95E+02
CE-141	2.52E+03	1.55E+03	0.	1.18E+03	5.24E+05	2.86E+04	0.	1.81E+02
CE-144	4.68E+05	1.82E+05	0.	1.48E+05	1.27E+07	1.61E+05	0.	2.49E+04
PR-143	1.64E+03	6.57E+02	0.	3.78E+02	4.91E+04	3.58E+04	0.	8.11E+01
ND-147	9.23E+02	1.07E+03	0.	6.23E+02	3.86E+04	3.82E+04	0.	6.38E+01

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN ANG A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.37E+03	2.37E+03	1.04E+03	2.37E+03	2.37E+03	0.	2.37E+03
C---14	6.55E+05	6.55E+05	6.55E+05	7.75E+04	6.55E+05	6.55E+05	0.	6.55E+05
P---32	1.32E+10	1.14E+09	0.	0.	0.	2.85E+09	0.	7.05E+08
CR--51	0.	0.	1.82E+04	6.72E+03	4.84E+04	7.66E+06	0.	3.05E+04
MN--54	0.	8.96E+06	0.	2.67E+06	0.	2.74E+07	0.	1.71E+06
FE--59	3.17E+07	7.52E+07	0.	0.	2.89E+07	2.48E+08	0.	2.86E+07
CO--57	0.	1.36E+06	0.	0.	0.	3.46E+07	0.	2.27E+06
CO--58	0.	2.55E+07	0.	0.	0.	6.68E+07	0.	6.24E+07
CO--60	0.	8.73E+07	0.	0.	0.	2.16E+08	0.	2.09E+08
NI--63	7.16E+09	4.97E+08	0.	0.	0.	1.84E+08	0.	2.40E+08
ZN--65	1.46E+09	4.65E+09	0.	1.11E+09	0.	2.93E+09	0.	2.18E+09
RB--86	0.	2.77E+09	0.	0.	0.	5.45E+08	0.	1.29E+09
SR--89	1.47E+10	0.	0.	0.	0.	2.75E+08	0.	4.22E+08
SR--90	1.65E+11	0.	0.	0.	0.	1.61E+09	0.	4.21E+10
Y---91	8.12E+04	0.	0.	0.	0.	5.37E+06	0.	2.16E+03
ZR--95	2.12E+05	9.41E+04	0.	1.86E+04	0.	7.47E+07	0.	5.56E+04
NB--95	5.49E+05	2.47E+05	0.	4.84E+04	0.	1.98E+08	0.	1.45E+05
RU-103	4.13E+03	0.	0.	4.16E+03	0.	1.84E+05	0.	2.86E+03
RU-106	2.01E+05	0.	0.	4.28E+04	0.	1.56E+06	0.	2.46E+04
AG110M	6.21E+07	5.75E+07	0.	1.13E+08	0.	2.35E+10	0.	3.42E+07
CD115M	0.	1.13E+06	0.	1.85E+06	0.	5.58E+07	0.	4.24E+04

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.75E+09	3.48E+07	1.01E+07	0.	4.97E+06	1.16E+09	0.	5.25E+07
SB-124	2.75E+07	5.19E+05	6.64E+04	0.	2.13E+07	7.78E+08	0.	1.09E+07
SB-125	3.59E+07	3.27E+06	2.93E+06	3.96E+06	2.83E+09	2.43E+08	0.	6.62E+06
TE129M	1.57E+08	5.38E+07	5.18E+07	7.05E+07	0.	7.57E+07	0.	2.10E+07
TE127M	5.54E+07	1.93E+07	1.73E+07	2.88E+08	0.	3.24E+08	0.	7.38E+06
TE129M	5.47E+08	2.02E+08	2.21E+08	2.78E+08	0.	3.54E+08	0.	8.95E+07
I--130	4.54E+05	1.35E+06	1.71E+08	2.89E+06	0.	1.15E+06	0.	5.29E+05
I--131	2.59E+09	3.89E+09	9.94E+11	7.74E+08	0.	1.16E+08	0.	1.41E+09
I--132	1.78E-01	4.76E-01	6.26E+01	7.58E-01	0.	8.93E-02	0.	1.69E-01
I--133	3.75E+07	5.48E+07	1.38E+10	1.29E+07	0.	9.74E+06	0.	1.66E+07
I--134	0.	0.	1.06E-09	0.	0.	0.	0.	0.
I--135	1.49E+04	3.94E+04	5.15E+06	6.26E+04	8.87E-02	4.41E+04	0.	1.44E+04
CS-134	4.43E+10	7.97E+10	0.	4.65E+09	9.12E+09	1.98E+08	0.	6.75E+09
CS-136	2.78E+08	1.18E+09	0.	6.11E+08	8.37E+07	1.25E+08	0.	7.98E+08
CS-137	6.44E+10	7.21E+10	0.	3.66E+09	8.69E+09	1.86E+08	0.	4.14E+09
BA-140	2.45E+08	2.47E+05	0.	1.22E+04	1.51E+05	8.13E+06	0.	1.27E+07
CE-141	2.65E+05	1.62E+05	0.	9.72E+03	0.	7.87E+07	0.	1.98E+04
CE-144	2.18E+07	8.29E+06	0.	5.67E+05	0.	8.66E+08	0.	1.13E+06
PR-143	1.69E+02	6.80E+01	0.	3.92E+01	0.	7.41E+05	0.	8.48E+08
ND-147	1.23E+02	1.19E+02	0.	7.21E+01	0.	5.63E+05	0.	7.81E+08

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

PATHWAY - DISCHARGE CANAL SHORLINE DEPOSITS

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.06E+00	2.43E+00	2.06E+00
MN--54	6.09E+02	6.09E+02	6.09E+02	6.09E+02	6.09E+02	6.09E+02	7.15E+02	6.09E+02
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.21E+02	1.21E+02	1.21E+02	1.21E+02	1.21E+02	1.21E+02	1.42E+02	1.21E+02
CO--58	1.67E+02	1.67E+02	1.67E+02	1.67E+02	1.67E+02	1.67E+02	1.96E+02	1.67E+02
CO--60	9.45E+03	9.45E+03	9.45E+03	9.45E+03	9.45E+03	9.45E+03	1.11E+04	9.45E+03
ZN--65	3.27E+02	3.27E+02	3.27E+02	3.27E+02	3.27E+02	3.27E+02	3.76E+02	3.27E+02
RB--86	3.97E+00	3.97E+00	3.97E+00	3.97E+00	3.97E+00	3.97E+00	4.65E+00	3.97E+00
SR--89	9.54E-03	9.54E-03	9.54E-03	9.54E-03	9.54E-03	9.54E-03	1.11E-02	9.54E-03
SR--90	2.36E+00	2.36E+00	2.36E+00	2.36E+00	2.36E+00	2.36E+00	2.79E+00	2.36E+00
Y---91	4.77E-01	4.77E-01	4.77E-01	4.77E-01	4.77E-01	4.77E-01	5.35E-01	4.77E-01
ZR--95	2.21E+02	2.21E+02	2.21E+02	2.21E+02	2.21E+02	2.21E+02	2.58E+02	2.21E+02
ZR--97	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.82E+00	2.41E+00
NB--95	6.01E+01	6.01E+01	6.01E+01	6.01E+01	6.01E+01	6.01E+01	7.07E+01	6.01E+01
MO--99	2.60E+00	2.60E+00	2.60E+00	2.60E+00	2.60E+00	2.60E+00	3.00E+00	2.60E+00
RU-103	4.85E+01	4.85E+01	4.85E+01	4.85E+01	4.85E+01	4.85E+01	5.66E+01	4.85E+01
RU-106	1.85E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02	1.85E+02	2.21E+02	1.85E+02
AG110M	1.58E+03	1.58E+03	1.58E+03	1.58E+03	1.58E+03	1.58E+03	1.84E+03	1.58E+03
SB-124	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	2.64E+02	3.04E+02	2.64E+02
SB-125	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.01E+03	1.14E+03	1.01E+03
TE125M	6.84E-01	6.84E-01	6.84E-01	6.84E-01	6.84E-01	6.84E-01	8.38E-01	6.84E-01
TE127M	3.87E-01	3.87E-01	3.87E-01	3.87E-01	3.87E-01	3.87E-01	4.29E-01	3.87E-01
TE129M	1.70E+01	1.70E+01	1.70E+01	1.70E+01	1.70E+01	1.70E+01	1.99E+01	1.70E+01
TE131M	4.69E+00	4.69E+00	4.69E+00	4.69E+00	4.69E+00	4.69E+00	2.05E+02	4.69E+00
TE-132	2.05E+01	2.05E+01	2.05E+01	2.05E+01	2.05E+01	2.05E+01	2.41E+01	2.05E+01
I--131	7.59E+00	7.59E+00	7.59E+00	7.59E+00	7.59E+00	7.59E+00	9.22E+00	7.59E+00
I--133	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.09E+00	1.33E+00	1.09E+00
CS-134	3.08E+03	3.08E+03	3.08E+03	3.08E+03	3.08E+03	3.08E+03	3.59E+03	3.08E+03
CS-136	6.57E+01	6.57E+01	6.57E+01	6.57E+01	6.57E+01	6.57E+01	7.44E+01	6.57E+01
CS-137	4.54E+03	4.54E+03	4.54E+03	4.54E+03	4.54E+03	4.54E+03	5.29E+03	4.54E+03
BA-140	7.38E+01	7.38E+01	7.38E+01	7.38E+01	7.38E+01	7.38E+01	8.58E+01	7.38E+01
LA-140	8.40E+00	8.40E+00	8.40E+00	8.40E+00	8.40E+00	8.40E+00	9.59E+00	8.40E+00
CE-141	6.02E+00	6.02E+00	6.02E+00	6.02E+00	6.02E+00	6.02E+00	6.79E+00	6.02E+00
CE-143	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.02E+00	1.16E+00	1.02E+00
CE-144	4.99E+01	4.99E+01	4.99E+01	4.99E+01	4.99E+01	4.99E+01	5.70E+01	4.99E+01
NP-239	7.52E-01	7.52E-01	7.52E-01	7.52E-01	7.52E-01	7.52E-01	8.71E-01	7.52E-01

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - SALT WATER FISH — AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	7.07E-01	7.07E-01	9.78E-01	7.07E-01	7.07E-01	0.	7.07E-01
P-32-32	4.29E+07	2.09E+08	0.	0.	0.	4.82E+06	0.	1.00E+03
CR--51	0.	0.	4.99E+03	1.46E+03	1.11E+01	2.10E+03	0.	8.35E+00
MN--54	0.	2.02E+04	0.	6.00E+03	0.	6.18E+04	0.	3.05E+03
FE--55	1.50E+05	6.73E+03	0.	0.	7.79E+03	2.03E+05	0.	1.77E+03
FE--59	1.03E+05	2.49E+05	0.	0.	6.79E+04	8.08E+05	0.	9.31E+04
CO--58	0.	7.98E+02	0.	0.	0.	1.07E+04	0.	1.08E+03
CO--60	0.	2.22E+03	0.	0.	0.	2.60E+04	0.	2.00E+03
ZN--65	7.78E+04	2.47E+05	0.	1.65E+05	0.	1.56E+05	0.	1.17E+05
KR--85	0.	1.36E+03	0.	0.	0.	2.68E+02	0.	0.33E+02
SR--89	7.30E+03	0.	0.	0.	0.	7.92E+02	0.	2.03E+02
SR--90	1.07E+05	0.	0.	0.	1.72E+03	8.54E+03	0.	4.13E+04
Y---91	3.89E+01	0.	0.	0.	0.	1.50E+04	0.	1.04E+03
ZR--95	9.27E+01	3.98E+01	0.	4.06E+01	0.	1.25E+05	0.	2.52E+01
ZR--97	6.13E+00	1.50E+00	0.	1.81E+00	0.	8.83E+04	0.	5.63E-01
NB--95	1.71E+03	1.03E+03	0.	8.11E+02	0.	4.21E+04	0.	5.81E+02
MO--99	1.41E-02	2.70E+02	0.	6.14E+02	1.93E-02	8.51E+02	0.	2.19E+01
RU-103	2.02E+00	0.	0.	1.68E+01	0.	4.49E+02	0.	2.51E+00
RU-106	3.63E+01	0.	0.	1.29E+02	0.	4.36E+03	0.	1.21E+01
AG110M	4.24E+03	3.92E+03	0.	7.78E+03	0.	1.00E+04	0.	2.33E+03
SB-124	8.94E+02	1.09E+01	2.16E+00	0.	6.93E+02	2.53E+04	0.	3.53E+02
SB-125	7.18E+02	8.00E+00	8.54E-01	2.19E+00	7.49E+04	6.33E+03	0.	1.44E+02
TE125M	3.04E+02	1.09E+02	8.58E+01	8.66E+02	0.	8.50E+02	0.	9.84E+01
TE127M	5.52E+02	1.33E+02	1.45E+02	2.23E+03	0.	2.01E+03	0.	6.81E+01
TE129M	1.31E+03	4.00E+02	4.20E+02	3.79E+03	0.	4.57E+03	0.	2.67E+02
TE131M	1.07E+02	7.77E+01	1.15E+04	4.39E+02	0.	3.80E+03	0.	5.55E+01
TE-132	2.45E+02	1.80E+02	4.93E+03	1.09E+03	0.	5.21E+03	0.	1.49E+02
I---131	4.11E+02	5.81E+02	1.08E+05	7.53E+02	0.	1.18E+04	0.	3.43E+02
I---133	7.39E+01	1.75E+02	2.28E+04	1.58E+02	0.	9.10E+01	0.	3.80E+01
CS-134	2.59E+04	8.24E+04	0.	1.54E+04	7.55E+03	7.22E+02	0.	6.91E+03
CS-136	1.99E+03	7.04E+03	0.	4.36E+03	5.96E+02	6.91E+02	0.	5.04E+03
CS-137	3.44E+04	4.03E+04	0.	1.19E+04	8.14E+03	8.18E+02	0.	1.02E+04
BA-140	2.10E+03	2.70E+03	0.	8.01E-01	1.78E+00	8.68E+03	0.	1.33E+02
LA-140	4.03E-01	2.23E-01	0.	0.	0.	1.26E+04	0.	8.05E-02
CE-141	9.92E-01	8.00E-01	0.	2.31E-01	0.	1.80E+03	0.	7.84E-02
CE-143	1.52E-01	5.93E+01	0.	4.27E-02	0.	2.53E+05	0.	1.01E-02
CE-144	5.79E+01	2.30E+01	0.	9.71E+00	0.	1.36E+04	0.	3.07E+03
HF-234	7.34E-02	7.28E-03	0.	2.28E-02	0.	1.44E+03	0.	3.92E-03

Table 3-8

REFERENCE METEOROLOGY
ANNUAL AVERAGED RELATIVE DEPOSITION RATE

$$\frac{D}{Q} \quad \frac{1}{m^2}$$

D/Q are annual averaged factors representing the fraction of a mixed mode airborne release from the Turkey Point Plant which is deposited on a square meter area of land at a given distance and direction from the Plant.
Period of Record: 01/01/76 to 12/31/77

BASE DISTANCE IN MILES / KILOMETERS

AFTO SECT	DESIGN DIST MI	.25 .40	.75 1.21	1.50 2.41	2.50 4.02	3.50 5.63	4.50 7.24	5.50 8.85	7.00 11.26
NNE	0.	6.4E-09	1.5E-09	4.7E-10	2.0E-10	9.1E-11	5.5E-11	4.1E-11	2.7E-11
NE	0.	3.5E-09	8.7E-10	2.8E-10	1.2E-10	6.4E-11	4.3E-11	2.5E-11	1.7E-11
ENE	0.	2.8E-09	5.1E-10	2.1E-10	7.6E-11	4.1E-11	2.9E-11	1.9E-11	1.2E-11
E	0.	2.7E-09	6.6E-10	2.4E-10	1.1E-10	5.8E-11	3.7E-11	2.5E-11	1.6E-11
ESE	0.	1.6E-09	4.2E-10	1.9E-10	7.7E-11	4.0E-11	2.7E-11	1.8E-11	1.0E-11
SE	0.	5.3E-09	1.2E-09	3.7E-10	1.6E-10	9.0E-11	5.4E-11	4.2E-11	2.9E-11
SSE	0.	2.6E-08	5.2E-09	1.8E-09	6.8E-10	3.5E-10	2.5E-10	1.9E-10	1.0E-10
S	0.	1.2E-08	2.1E-09	6.7E-10	3.0E-10	2.0E-10	1.2E-10	9.1E-11	5.8E-11
SSW	0.	2.3E-09	7.2E-10	2.4E-10	1.2E-10	5.3E-11	4.0E-11	2.8E-11	2.0E-11
SW	0.	1.1E-08	2.7E-09	1.0E-09	4.3E-10	2.3E-10	1.2E-10	9.6E-11	5.5E-11
WSW	0.	2.3E-08	5.0E-09	1.5E-09	6.1E-10	3.2E-10	2.0E-10	1.4E-10	8.5E-11
W	0.	5.7E-08	1.2E-08	3.5E-09	1.4E-09	7.6E-10	4.9E-10	3.3E-10	2.1E-10
WNW	0.	4.1E-08	9.6E-09	2.7E-09	1.0E-09	5.7E-10	3.4E-10	2.4E-10	1.4E-10
NW	0.	2.4E-08	6.2E-09	1.7E-09	6.1E-10	3.1E-10	1.8E-10	1.3E-10	8.5E-11
NNW	0.	1.2E-08	3.0E-09	9.5E-10	3.6E-10	2.0E-10	1.1E-10	7.5E-11	4.2E-11
N	0.	5.8E-09	1.6E-09	4.8E-10	1.8E-10	9.6E-11	5.8E-11	4.0E-11	2.5E-11

BASE DISTANCE IN MILES / KILOMETERS

AFTO SECT	DESIGN DIST MI	9.00 14.48	11.00 17.70	.79 1.27	5.00 8.04	1.00 1.61	2.00 3.22	2.75 4.42	4.30 6.92
NNE	0.	1.6E-11	9.3E-12	1.4E-09	4.7E-11	9.6E-10	2.8E-10	1.6E-10	6.2E-11
NE	0.	9.9E-12	6.2E-12	8.1E-10	3.2E-11	5.6E-10	1.8E-10	1.1E-10	4.6E-11
ENE	0.	8.1E-12	5.2E-12	5.0E-10	2.3E-11	3.6E-10	1.2E-10	6.4E-11	3.0E-11
E	0.	1.0E-11	6.6E-12	5.9E-10	3.0E-11	4.3E-10	1.5E-10	8.8E-11	3.9E-11
ESE	0.	7.5E-12	5.8E-12	4.1E-10	2.2E-11	3.1E-10	1.2E-10	6.5E-11	2.8E-11
SE	0.	1.8E-11	1.3E-11	1.1E-09	4.7E-11	7.1E-10	2.3E-10	1.3E-10	6.0E-11
SSE	0.	6.6E-11	4.5E-11	4.9E-09	2.1E-10	3.4E-09	1.1E-09	5.8E-10	2.6E-10
S	0.	3.4E-11	2.3E-11	1.9E-09	1.0E-10	1.4E-09	4.4E-10	2.7E-10	1.3E-10
SSW	0.	1.0E-11	6.6E-12	6.7E-10	3.6E-11	4.5E-10	1.7E-10	9.7E-11	4.8E-11
SW	0.	3.5E-11	2.2E-11	2.5E-09	1.1E-10	1.9E-09	6.3E-10	3.6E-10	1.4E-10
WSW	0.	5.5E-11	3.8E-11	4.6E-09	1.6E-10	3.2E-09	9.7E-10	4.9E-10	2.2E-10
W	0.	1.2E-10	8.7E-11	1.1E-08	3.9E-10	7.4E-09	2.2E-09	1.2E-09	5.0E-10
WNW	0.	8.8E-11	6.1E-11	8.7E-09	2.8E-10	5.7E-09	1.6E-09	9.0E-10	3.8E-10
NW	0.	4.5E-11	3.2E-11	5.6E-09	1.5E-10	3.7E-09	9.5E-10	5.0E-10	2.0E-10
NNW	0.	2.5E-11	1.8E-11	2.7E-09	8.8E-11	1.8E-09	5.4E-10	3.0E-10	1.2E-10
N	0.	1.7E-11	1.1E-11	1.4E-09	4.8E-11	1.0E-09	2.7E-10	1.5E-10	6.5E-11

NUMBER OF VALID OBSERVATIONS = 16538
NUMBER OF INVALID OBSERVATIONS = 1006
NUMBER OF CALMS LOWER LEVEL = 195
NUMBER OF CALMS UPPER LEVEL = 383

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - SALT WATER SHELL FISH

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.00E-01	1.00E-01	2.38E-01	1.00E-01	1.00E-01	0.	1.00E-01
P---32	1.03E+07	6.61E+05	0.	0.	0.	1.19E+06	0.	4.08E+05
CR--51	0.	0.	3.92E+00	2.13E+00	1.32E+01	2.49E+03	0.	9.91E+00
MN--54	0.	3.48E+03	0.	1.06E+03	0.	1.07E+06	0.	6.00E+02
FE--55	2.37E+05	1.07E+06	0.	0.	1.23E+06	4.10E+05	0.	2.80E+05
FE--59	1.03E+05	3.87E+05	0.	0.	1.08E+05	1.28E+06	0.	1.47E+05
CO--58	0.	1.00E+03	0.	0.	0.	2.53E+04	0.	4.27E+03
CO--60	0.	5.27E+03	0.	0.	0.	6.32E+04	0.	1.28E+04
ZN--65	4.02E+05	1.47E+06	0.	9.81E+05	0.	9.24E+05	0.	6.64E+05
RU--80	0.	6.00E+02	0.	0.	0.	1.30E+02	0.	3.00E+02
SR--89	1.73E+04	0.	0.	0.	0.	1.00E+03	0.	4.97E+02
SR--90	3.97E+05	0.	0.	0.	1.04E+04	5.59E+04	0.	9.82E+03
Y---91	3.70E+02	0.	0.	0.	0.	1.42E+05	0.	9.87E+00
ZR--95	5.65E+00	1.90E+00	0.	2.34E+00	0.	4.12E+03	0.	1.32E+00
ZR--97	1.01E-01	2.05E-02	0.	3.06E-02	0.	6.03E+03	0.	9.33E-03
NB--95	1.36E+00	4.16E-01	0.	6.42E-01	0.	3.33E+03	0.	4.01E-01
MO--99	1.67E-02	6.42E-01	0.	1.47E+02	2.32E-02	1.77E+02	0.	1.28E+01
RU-103	4.45E+02	0.	0.	1.33E+03	0.	3.47E+04	0.	1.99E+02
RU-106	7.63E+03	0.	0.	1.81E+04	0.	3.45E+05	0.	9.53E+02
AG110M	1.01E+03	9.30E+02	0.	1.83E+03	0.	3.88E+05	0.	5.53E+02
SB-124	2.05E+01	5.00E-01	6.61E-02	0.	2.06E+01	7.51E+02	0.	1.05E+01
SB-125	2.31E+01	8.82E-01	5.33E-01	5.19E+00	2.22E+03	1.93E+02	0.	4.52E+00
TE125M	7.23E+02	2.59E+02	2.04E+02	2.06E+03	0.	2.02E+03	0.	9.59E+01
TE127M	1.31E+03	4.50E+02	3.44E+02	5.23E+03	0.	5.21E+03	0.	1.00E+02
TE129M	3.12E+03	1.15E+03	9.97E+02	9.00E+03	0.	1.09E+04	0.	4.89E+02
TE131M	2.21E+02	1.38E+02	1.36E+04	9.82E+02	0.	9.01E+03	0.	1.04E+02
TE-132	5.64E+02	3.80E+02	6.04E+03	2.51E+03	0.	1.23E+04	0.	3.03E+02
I--130	4.88E+02	6.90E+02	1.99E+05	8.96E+02	0.	1.31E+02	0.	4.11E+02
I--131	8.78E+01	1.49E+02	2.70E+04	1.87E+02	0.	1.08E+02	0.	9.58E+01
CS-134	3.84E+03	9.26E+03	0.	2.29E+03	1.12E+03	1.07E+02	0.	4.31E+03
CS-136	2.45E+02	1.10E+03	0.	6.47E+02	6.87E+01	1.32E+02	0.	8.38E+02
CS-137	5.11E+03	6.88E+03	0.	1.77E+03	9.12E+02	9.17E+01	0.	2.91E+03
BA-140	5.12E+03	7.30E+03	0.	1.57E+00	4.22E+00	6.03E+04	0.	3.29E+02
LA-140	4.39E+00	2.17E+00	0.	0.	0.	1.20E+05	0.	2.75E-01
CE-141	1.41E+01	9.49E+00	0.	3.30E+00	0.	2.57E+04	0.	1.09E+00
CE-143	1.82E+00	8.45E+02	0.	5.23E-01	0.	3.48E+04	0.	1.27E-01
CE-144	8.25E+02	3.38E+02	0.	1.38E+02	0.	1.94E+05	0.	4.38E+01
HF-249	4.09E-02	5.06E-03	0.	7.24E-03	0.	3.41E+02	0.	1.35E-03

01/18/79

PATHWAY - DISCHARGE CANAL SHORELINE DEPOSITS

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (AREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.30E-01	4.30E-01	4.30E-01	4.30E-01	4.30E-01	4.30E-01	5.09E-01	4.30E-01
MN--54	1.27E+02	1.27E+02	1.27E+02	1.27E+02	1.27E+02	1.27E+02	1.49E+02	1.27E+02
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	2.53E+01	2.53E+01	2.53E+01	2.53E+01	2.53E+01	2.53E+01	2.98E+01	2.53E+01
CO--58	3.50E+01	3.50E+01	3.50E+01	3.50E+01	3.50E+01	3.50E+01	4.10E+01	3.50E+01
CO--60	1.97E+03	1.97E+03	1.97E+03	1.97E+03	1.97E+03	1.97E+03	2.32E+03	1.97E+03
ZN--65	6.84E+01	6.84E+01	6.84E+01	6.84E+01	6.84E+01	6.84E+01	7.87E+01	6.84E+01
RB--86	8.29E-01	8.29E-01	8.29E-01	8.29E-01	8.29E-01	8.29E-01	9.47E-01	8.29E-01
SR--89	1.99E-03	1.99E-03	1.99E-03	1.99E-03	1.99E-03	1.99E-03	2.31E-03	1.99E-03
SR--90	4.93E-01	4.93E-01	4.93E-01	4.93E-01	4.93E-01	4.93E-01	5.83E-01	4.93E-01
Y---91	9.96E-02	9.96E-02	9.96E-02	9.96E-02	9.96E-02	9.96E-02	1.12E-01	9.95E-02
ZR--95	4.02E+01	4.02E+01	4.02E+01	4.02E+01	4.02E+01	4.02E+01	5.39E+01	4.02E+01
ZR--97	5.03E-01	5.03E-01	5.03E-01	5.03E-01	5.03E-01	5.03E-01	5.88E-01	5.03E-01
NB--95	1.26E+01	1.26E+01	1.26E+01	1.26E+01	1.26E+01	1.26E+01	1.48E+01	1.26E+01
MO--99	5.43E-01	5.43E-01	5.43E-01	5.43E-01	5.43E-01	5.43E-01	6.27E-01	5.43E-01
RU-103	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.01E+01	1.16E+01	1.01E+01
RU-106	3.86E+01	3.86E+01	3.86E+01	3.86E+01	3.86E+01	3.86E+01	4.85E+01	3.86E+01
AG110M	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.29E+02	3.84E+02	3.29E+02
SB-124	5.51E+01	5.51E+01	5.51E+01	5.51E+01	5.51E+01	5.51E+01	6.35E+01	5.51E+01
SB-125	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.11E+02	2.39E+02	2.11E+02
TE125M	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.43E+01	1.90E+01	1.43E+01
TE127M	8.09E-02	8.09E-02	8.09E-02	8.09E-02	8.09E-02	8.09E-02	9.97E-02	8.09E-02
TE129M	3.54E+00	3.54E+00	3.54E+00	3.54E+00	3.54E+00	3.54E+00	4.10E+00	3.54E+00
TE131M	9.80E-01	9.80E-01	9.80E-01	9.80E-01	9.80E-01	9.80E-01	4.28E+01	9.80E-01
TE-132	4.28E+00	4.28E+00	4.28E+00	4.28E+00	4.28E+00	4.28E+00	5.05E+00	4.28E+00
I--131	1.59E+00	1.59E+00	1.59E+00	1.59E+00	1.59E+00	1.59E+00	1.93E+00	1.59E+00
I--133	2.28E-01	2.28E-01	2.28E-01	2.28E-01	2.28E-01	2.28E-01	2.77E-01	2.28E-01
CS-134	6.43E+02	6.43E+02	6.43E+02	6.43E+02	6.43E+02	6.43E+02	7.50E+02	6.43E+02
CS-136	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.37E+01	1.60E+01	1.37E+01
CS-137	9.48E+02	9.48E+02	9.48E+02	9.48E+02	9.48E+02	9.48E+02	1.11E+03	9.48E+02
BA-140	1.54E+01	1.54E+01	1.54E+01	1.54E+01	1.54E+01	1.54E+01	1.75E+01	1.54E+01
LA-140	1.77E+00	1.77E+00	1.77E+00	1.77E+00	1.77E+00	1.77E+00	2.00E+00	1.77E+00
CE-141	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.26E+00	1.47E+00	1.26E+00
CE-143	2.13E-01	2.13E-01	2.13E-01	2.13E-01	2.13E-01	2.13E-01	2.47E-01	2.13E-01
CE-144	1.04E+01	1.04E+01	1.04E+01	1.04E+01	1.04E+01	1.04E+01	1.20E+01	1.04E+01
NP-239	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.57E-01	1.82E-01	1.57E-01

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - SALT WATER FISH

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	0.34E-01	0.34E-01	0.18E-01	0.34E-01	0.34E-01	0.	0.34E-01
P---32	1.03E+07	1.10E+06	0.	0.	0.	2.08E+06	0.	7.10E+05
CR--51	0.	0.	2.15E+00	7.96E-01	4.78E+00	9.05E+02	0.	3.00E+00
MN--54	0.	0.78E+03	0.	2.53E+03	0.	2.06E+04	0.	1.00E+03
FE--55	0.45E+04	2.90E+05	0.	0.	0.46E+05	1.13E+05	0.	7.62E+04
FE--59	0.45E+04	1.06E+05	0.	0.	2.93E+04	0.48E+05	0.	0.02E+04
CO--58	0.	0.35E+02	0.	0.	0.	0.78E+03	0.	1.92E+03
CO--60	0.	1.79E+03	0.	0.	0.	0.92E+03	0.	0.37E+03
ZN--65	0.35E+04	1.07E+05	0.	7.12E+04	0.	0.71E+04	0.	0.02E+04
RB--86	0.	0.85E+02	0.	0.	0.	1.15E+02	0.	2.73E+02
SR--89	0.44E+03	0.	0.	0.	0.	0.52E+02	0.	0.70E+02
SR--90	1.19E+05	0.	0.	0.	0.	0.97E+03	0.	0.02E+04
Y---91	0.01E+01	0.	0.	0.	0.	0.00E+03	0.	1.34E+03
ZR--95	1.10E+02	0.32E+01	0.	1.74E+01	0.	0.59E+04	0.	0.73E+01
ZR--97	2.64E+00	0.44E-01	0.	7.03E-01	0.	2.95E+04	0.	2.44E-01
ND--95	1.09E+03	0.49E+02	0.	0.58E+02	0.	1.47E+06	0.	0.23E+02
MO--99	0.00E-03	1.17E+02	0.	2.66E+02	0.41E-03	2.00E+02	0.	2.24E+01
RU-103	0.93E+00	0.	0.	7.28E+00	0.	1.02E+02	0.	2.00E+00
RU-106	1.24E+02	0.	0.	5.52E+01	0.	1.92E+03	0.	1.26E+01
AG110M	1.03E+03	1.09E+03	0.	3.32E+03	0.	0.00E+05	0.	1.00E+03
SB-124	3.05E+02	7.27E+00	9.31E-01	0.	2.99E+02	1.09E+04	0.	1.22E+02
SB-125	0.10E+02	0.00E+00	5.52E-01	9.48E-01	0.23E+04	2.73E+03	0.	0.22E+01
TE125M	0.91E+02	1.00E+02	1.10E+02	0.76E+02	0.	0.77E+02	0.	5.21E+01
TE127M	2.47E+02	0.51E+01	6.04E+01	9.00E+02	0.	1.00E+03	0.	0.10E+01
TE129M	1.00E+03	4.00E+02	5.30E+02	1.03E+03	0.	2.04E+03	0.	2.00E+02
TE131M	0.92E+01	5.25E+01	1.17E+04	1.09E+02	0.	1.04E+03	0.	4.00E+01
TE-132	2.02E+02	1.42E+02	2.25E+03	4.00E+02	0.	2.21E+03	0.	1.50E+02
I--130	5.19E+02	5.31E+02	1.73E+05	3.23E+02	0.	4.35E+01	0.	4.01E+02
I--131	0.39E+01	1.10E+02	2.00E+04	0.00E+01	0.	4.70E+01	0.	4.50E+01
CS-134	0.11E+04	5.23E+04	0.	6.05E+03	5.01E+03	2.03E+02	0.	1.11E+04
CS-136	0.25E+02	0.00E+03	0.	1.00E+03	2.50E+02	0.04E+02	0.	2.40E+03
CS-137	4.33E+04	4.19E+04	0.	5.13E+03	4.91E+03	2.05E+02	0.	0.20E+03
BA-140	2.71E+03	2.40E+00	0.	2.05E-01	1.42E+00	0.00E+03	0.	1.09E+02
LA-140	5.79E-01	2.02E-01	0.	0.	0.	5.73E+03	0.	0.00E-02
CE-141	1.20E+00	0.00E-01	0.	9.90E-02	0.	0.01E+02	0.	9.51E-02
CE-144	0.55E-02	2.56E+01	0.	1.00E-02	0.	1.09E+03	0.	0.33E-03
CE-144	7.40E+01	2.02E+01	0.	0.19E+00	0.	0.02E+03	0.	3.94E+00
NP-239	0.19E-02	0.10E-03	0.	0.49E-03	0.	0.20E+02	0.	1.09E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CFM WITH NO ADDITIONAL DILUTION

PATHWAY - SALT WATER SHELL FISH

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.01E-01	1.01E-01	1.07E-01	1.01E-01	1.01E-01	0.	1.01E-01
P---32	4.71E+00	2.90E+05	0.	0.	0.	2.30E+05	0.	1.82E+03
CR--51	0.	0.	2.65E+00	9.78E-01	5.48E+00	1.12E+03	0.	4.93E+00
MN--54	0.	1.56E+03	0.	4.64E+02	0.	4.77E+03	0.	2.38E+02
FE--55	1.03E+05	4.78E+05	0.	0.	2.52E+05	1.80E+05	0.	1.25E+05
FE--59	7.38E+04	1.73E+05	0.	0.	4.81E+04	2.72E+05	0.	0.00E+00
CO--58	0.	1.57E+03	0.	0.	0.	9.31E+03	0.	4.72E+03
CO--60	0.	4.42E+03	0.	0.	0.	2.44E+04	0.	1.32E+04
ZN--65	2.07E+05	0.50E+05	0.	4.33E+05	0.	4.13E+05	0.	2.97E+03
RU--86	0.	2.95E+02	0.	0.	0.	5.82E+01	0.	1.38E+02
SR--89	2.33E+04	0.	0.	0.	0.	6.68E+02	0.	0.00E+00
SR--90	2.94E+05	0.	0.	0.	0.	2.73E+04	0.	7.45E+04
I---91	4.94E+02	0.	0.	0.	0.	6.50E+04	0.	1.32E+01
ZR--95	7.06E+00	1.05E+00	0.	1.03E+00	0.	1.71E+03	0.	1.50E+00
ZR--97	4.50E-02	9.17E-03	0.	1.37E-02	0.	2.74E+03	0.	4.16E-03
NB--95	1.63E+00	0.37E-01	0.	2.87E-01	0.	1.21E+03	0.	5.12E-01
MO--99	7.49E-03	2.87E+01	0.	6.56E+01	1.04E-02	7.91E+01	0.	5.74E+00
RU-103	5.09E+02	0.	0.	5.96E+02	0.	1.52E+04	0.	2.30E+02
RU-106	1.82E+04	0.	0.	4.59E+03	0.	1.58E+05	0.	1.20E+03
AG110M	4.50E+02	4.10E+02	0.	8.18E+02	0.	1.78E+05	0.	2.44E+02
SB-124	1.19E+01	2.24E-01	2.87E-02	0.	9.21E+00	3.36E+02	0.	4.09E+00
SB-125	1.20E+01	7.01E-01	6.90E-01	2.32E+00	9.93E+02	8.64E+01	0.	2.23E+00
TE125M	9.63E+02	2.01E+02	2.78E+02	9.20E+02	0.	9.23E+02	0.	1.48E+02
TE127M	0.07E+02	2.09E+02	1.09E+02	2.36E+03	0.	3.27E+03	0.	7.60E+01
TE129M	4.14E+03	1.10E+03	1.32E+03	4.03E+03	0.	4.99E+03	0.	0.42E+02
I21I31M	1.27E+02	8.51E+01	1.45E+04	4.39E+02	0.	4.03E+03	0.	0.75E+01
TE-132	7.11E+02	3.33E+02	3.00E+03	1.12E+03	0.	2.43E+03	0.	3.81E+02
I---131	6.33E+02	0.55E+02	2.13E+05	4.08E+02	0.	2.61E+01	0.	4.96E+00
I---133	1.16E+02	1.43E+02	3.44E+04	8.38E+01	0.	5.79E+01	0.	2.01E+01
CS-134	4.78E+03	8.05E+03	0.	1.02E+03	8.96E+02	4.35E+01	0.	1.71E+03
CS-136	1.32E+02	5.21E+02	0.	2.98E+02	3.37E+01	2.31E+01	0.	3.73E+02
CS-137	0.00E+03	0.45E+03	0.	7.92E+02	7.50E+02	3.43E+01	0.	9.01E+02
BA-140	0.09E+03	0.00E+00	0.	7.03E-01	3.90E+00	2.84E+04	0.	3.93E+02
LA-140	2.71E+00	1.99E+00	0.	0.	0.	2.85E+04	0.	0.72E-01
CE-141	1.89E+01	9.44E+00	0.	1.43E+00	0.	1.18E+04	0.	1.41E+00
CE-143	4.15E-01	3.78E+02	0.	2.37E-01	0.	1.54E+04	0.	5.69E-02
CE-144	1.09E+03	3.43E+02	0.	0.13E+01	0.	8.90E+04	0.	2.83E+01
HF-181	2.24E-02	2.02E-03	0.	3.26E-03	0.	2.53E+02	0.	7.87E-04

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE). AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.83E+03	2.83E+03	2.56E+03	2.83E+03	2.83E+03	0.	2.83E+03
C---14	1.25E+05	1.25E+05	1.25E+05	9.39E+04	1.25E+05	1.25E+05	0.	1.25E+05
P---32	2.65E+10	1.66E+09	0.	0.	0.	2.98E+09	0.	1.63E+09
CR--51	0.	0.	2.65E+03	9.78E+02	5.84E+03	1.11E+06	0.	4.41E+03
MN--54	0.	1.30E+06	0.	3.88E+05	0.	3.99E+06	0.	2.49E+05
FE--59	4.99E+05	1.19E+06	0.	0.	3.29E+05	3.91E+06	0.	4.51E+05
CO--57	0.	1.98E+05	0.	0.	0.	5.83E+06	0.	3.38E+05
CO--58	0.	9.72E+05	0.	0.	0.	1.31E+07	0.	2.22E+06
CO--60	0.	3.28E+06	0.	0.	0.	3.93E+07	0.	7.48E+06
NI--63	1.04E+09	7.23E+07	0.	0.	0.	1.51E+07	0.	3.49E+07
ZN--65	2.13E+08	6.76E+08	0.	4.52E+08	0.	4.26E+08	0.	3.06E+08
RB--86	0.	4.02E+08	0.	0.	0.	7.93E+07	0.	1.88E+08
SR--89	5.37E+09	0.	0.	0.	0.	6.37E+08	0.	1.69E+08
SR--90	1.74E+11	0.	0.	0.	4.85E+05	3.68E+09	0.	4.38E+10
Y---91	1.45E+03	0.	0.	0.	0.	7.11E+05	0.	4.94E+01
ZR--95	5.74E+03	1.41E+03	0.	2.70E+03	0.	1.38E+07	0.	1.93E+03
MO--99	1.43E+04	0.96E+03	0.	7.85E+03	0.	3.66E+07	0.	5.85E+03
RU-103	2.03E+02	0.	0.	6.85E+02	0.	1.58E+04	0.	9.08E+01
RU-106	4.59E+03	0.	0.	6.11E+03	0.	2.88E+05	0.	5.70E+02
AG110M	9.04E+06	8.36E+06	0.	1.64E+07	0.	3.41E+09	0.	4.97E+06
CD115M	0.	1.93E+05	0.	1.53E+05	0.	8.12E+06	0.	6.17E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.54E+08	5.05E+06	1.41E+06	0.	7.23E+05	1.69E+08	0.	7.64E+06
SN-124	4.08E+06	7.54E+04	9.66E+03	0.	3.10E+06	1.13E+08	0.	1.58E+06
SB-125	4.14E+06	1.15E+05	6.06E+04	5.77E+05	4.12E+08	3.54E+07	0.	8.19E+05
TE125M	3.61E+06	1.29E+06	1.02E+06	1.03E+07	0.	1.01E+07	0.	4.78E+05
TE127M	7.23E+06	2.52E+06	1.91E+06	2.92E+07	0.	3.63E+07	0.	8.94E+05
TE129M	1.35E+07	5.02E+06	4.34E+06	3.92E+07	0.	4.72E+07	0.	2.13E+06
I--130	6.61E+05	1.96E+06	2.49E+08	3.04E+06	0.	1.68E+06	0.	7.69E+05
I--131	6.15E+08	8.68E+08	2.53E+11	1.13E+09	0.	1.64E+08	0.	5.17E+08
I--132	2.59E-01	6.92E-01	9.11E+01	1.10E+08	0.	1.30E-01	0.	2.46E-01
I--133	9.79E+06	1.49E+07	2.71E+09	1.08E+07	0.	1.08E+07	0.	4.59E+06
I--134	0.	0.	1.55E-09	0.	0.	0.	0.	0.
I--135	2.17E+04	5.73E+04	7.49E+06	9.10E+04	2.94E-01	6.41E+04	0.	2.10E+04
CS-134	2.03E+10	6.93E+10	0.	1.69E+10	8.27E+09	7.08E+08	0.	3.19E+10
CS-136	1.01E+09	3.99E+09	0.	2.22E+09	3.85E+08	4.54E+08	0.	2.07E+09
CS-137	3.04E+10	5.16E+10	0.	1.33E+10	6.85E+09	6.08E+08	0.	1.81E+10
BA-140	5.91E+06	7.14E+03	0.	1.70E+03	4.70E+03	1.10E+06	0.	3.73E+05
CE-141	6.06E+03	4.07E+03	0.	1.41E+03	0.	1.10E+07	0.	4.66E+02
CE-144	4.92E+05	2.02E+05	0.	8.24E+04	0.	1.16E+08	0.	2.61E+04
PR-143	2.46E+01	9.98E+00	0.	5.70E+00	0.	1.00E+05	0.	1.22E+00
ND-147	1.79E+01	1.73E+01	0.	1.05E+01	0.	8.19E+04	0.	1.14E+00

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.73E+03	3.73E+03	2.46E+03	3.73E+03	3.73E+03	0.	3.73E+03
C---14	6.14E+05	6.14E+05	6.14E+05	1.55E+05	6.14E+05	6.14E+05	0.	6.14E+05
P---32	3.67E+08	2.38E+07	0.	0.	0.	4.13E+07	0.	1.42E+07
CR--51	0.	0.	1.63E+04	6.03E+03	3.63E+04	6.87E+06	0.	2.73E+04
MN--54	0.	2.64E+08	0.	7.86E+07	0.	8.89E+08	0.	5.04E+07
FE--59	9.66E+07	2.15E+08	0.	0.	5.97E+07	7.18E+08	0.	8.18E+07
CO--57	0.	9.85E+06	0.	0.	0.	2.58E+08	0.	1.64E+07
CO--58	0.	5.93E+07	0.	0.	0.	3.53E+08	0.	1.79E+08
CO--60	0.	3.46E+08	0.	0.	0.	1.92E+09	0.	1.04E+09
NI--63	8.95E+09	6.21E+08	0.	0.	0.	1.29E+08	0.	3.00E+08
ZN--65	2.67E+08	8.46E+08	0.	5.66E+08	0.	5.33E+08	0.	3.83E+08
RB--86	0.	9.00E+07	0.	0.	0.	1.78E+07	0.	4.28E+07
SR--89	3.28E+10	0.	0.	0.	0.	1.22E+09	0.	9.38E+08
SR--90	1.18E+12	0.	0.	0.	0.	2.39E+10	0.	2.99E+11
Y---91	1.61E+07	0.	0.	0.	0.	2.14E+09	0.	4.38E+05
ZR--95	3.74E+06	9.93E+05	0.	5.72E+05	0.	1.21E+09	0.	8.55E+05
NB--95	2.93E+05	1.25E+05	0.	5.15E+04	0.	2.16E+08	0.	9.17E+04
RU-103	1.23E+07	0.	0.	1.28E+07	0.	3.22E+08	0.	4.95E+06
RU-106	7.05E+08	0.	0.	3.15E+08	0.	1.18E+10	0.	8.77E+07
AG110M	8.92E+06	8.25E+06	0.	1.62E+07	0.	3.37E+09	0.	4.91E+06
CD115M	0.	3.64E+07	0.	2.89E+07	0.	1.53E+09	0.	1.16E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	5.91E+09	1.18E+08	3.44E+07	0.	4.73E+07	7.99E+09	0.	1.94E+08
SB-124	7.88E+07	1.49E+06	1.91E+05	0.	6.11E+07	2.23E+09	0.	3.11E+07
SB-125	2.42E+08	2.79E+07	2.73E+07	9.26E+07	1.52E+10	1.37E+09	0.	4.21E+07
TE125M	3.09E+08	8.38E+07	8.69E+07	2.96E+08	0.	2.98E+08	0.	4.12E+07
TE127M	2.96E+08	1.02E+08	8.34E+07	1.15E+09	0.	1.71E+09	0.	3.77E+07
TE129M	7.12E+08	1.98E+08	2.27E+08	6.92E+08	0.	8.57E+08	0.	1.10E+08
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	1.17E+07	1.20E+07	3.90E+09	7.33E+06	0.	1.03E+06	0.	9.05E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	5.14E-01	4.74E-01	0.	1.80E-01	5.40E-02	1.11E-02	0.	2.11E-01
CS-134	1.44E+10	2.42E+10	0.	3.08E+09	2.69E+09	1.31E+08	0.	5.15E+09
CS-136	9.82E+06	3.48E+07	0.	1.94E+07	2.66E+06	3.96E+06	0.	2.51E+07
CS-137	2.14E+10	2.87E+10	0.	2.55E+09	2.43E+09	1.26E+08	0.	3.09E+09
BA-140	1.06E+08	9.79E+04	0.	1.11E+04	5.52E+04	1.52E+08	0.	6.20E+06
CE-141	5.94E+05	2.52E+05	0.	3.94E+04	0.	3.16E+08	0.	3.75E+04
CE-144	1.22E+08	3.81E+07	0.	6.87E+06	0.	9.89E+09	0.	6.48E+06
PR-143	1.51E+04	6.06E+03	0.	3.49E+03	0.	6.68E+07	0.	7.49E+02
ND-1-7	6.19E+04	1.06E+04	0.	1.33E+04	0.	3.19E+07	0.	2.49E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.47E+02	2.47E+02	1.63E+02	2.47E+02	2.47E+02	0.	2.47E+02
C---14	4.04E+04	4.04E+04	4.04E+04	1.02E+04	4.04E+04	4.04E+04	0.	4.04E+04
P---32	4.22E+08	2.64E+07	0.	0.	0.	4.74E+07	0.	1.63E+07
CR--51	0.	0.	4.68E+03	1.73E+03	1.04E+04	1.97E+06	0.	7.83E+03
MN--54	0.	1.98E+07	0.	5.89E+06	0.	6.87E+07	0.	3.78E+06
FE--59	1.4dE+07	3.51E+07	0.	0.	9.75E+06	1.16E+08	0.	1.34E+07
CO--57	0.	7.53E+05	0.	0.	0.	1.91E+07	0.	1.25E+06
CO--58	0.	6.94E+06	0.	0.	0.	4.13E+07	0.	2.09E+07
CO--60	0.	2.33E+07	0.	0.	0.	1.29E+08	0.	6.98E+07
NI--63	5.90E+08	4.09E+07	0.	0.	0.	8.53E+06	0.	1.98E+07
ZN--65	2.08E+07	6.59E+07	0.	4.41E+07	0.	4.15E+07	0.	2.98E+07
RB--86	0.	5.28E+07	0.	0.	0.	1.04E+07	0.	2.46E+07
SR--89	4.84E+09	0.	0.	0.	0.	1.81E+08	0.	1.39E+08
SR--90	7.79E+10	0.	0.	0.	0.	1.52E+09	0.	1.98E+10
Y---91	2.12E+06	0.	0.	0.	0.	2.82E+08	0.	5.65E+04
ZR--95	4.86E+05	9.87E+04	0.	6.87E+04	0.	1.88E+08	0.	8.81E+04
NB--95	6.20E+04	2.64E+04	0.	1.89E+04	0.	4.58E+07	0.	1.94E+04
RU-103	2.24E+06	0.	0.	2.34E+06	0.	5.88E+07	0.	9.05E+05
RU-106	5.19E+07	0.	0.	2.32E+07	0.	8.87E+08	0.	6.46E+06
AG110M	6.87E+05	6.36E+05	0.	1.25E+06	0.	2.59E+08	0.	3.78E+05
CD115M	0.	6.20E+06	0.	4.92E+06	0.	2.61E+08	0.	1.98E+05

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	1.71E-05	2.14E-07	2.26E-07	0.	0.	8.58E-06	0.	4.21E-07
SN-126	3.47E+08	7.68E+06	2.25E+06	0.	1.75E+06	3.44E+08	0.	1.19E+07
SB-124	1.02E+07	1.93E+05	2.47E+04	0.	7.93E+06	2.89E+08	0.	4.84E+06
SB-125	1.22E+07	6.99E+05	6.22E+05	2.09E+06	1.84E+09	9.82E+07	0.	2.29E+06
TE125M	4.12E+07	1.12E+07	1.16E+07	3.94E+07	0.	3.97E+07	0.	5.49E+06
TE127M	2.88E+07	9.98E+06	8.89E+06	1.11E+08	0.	1.65E+08	0.	3.67E+06
TE129M	1.56E+08	4.35E+07	4.99E+07	1.51E+08	0.	1.88E+08	0.	2.41E+07
I--130	1.68E+05	4.73E+05	6.82E+07	7.35E+05	0.	4.85E+05	0.	1.86E+05
I--131	1.24E+08	1.27E+08	4.13E+10	7.75E+07	0.	1.89E+07	0.	9.58E+07
I--132	2.26E+01	6.05E+01	7.97E+03	9.65E+01	0.	1.14E+01	0.	2.15E+01
I--133	3.61E+06	4.46E+06	1.08E+09	2.62E+06	0.	1.81E+06	0.	1.75E+06
I--134	4.18E-05	1.14E-04	1.47E-02	1.81E-04	0.	9.89E-06	0.	4.86E-05
I--135	1.64E+04	4.33E+04	5.67E+06	6.89E+04	3.51E-03	4.85E+04	0.	1.59E+04
CS-134	9.97E+08	1.68E+09	0.	2.14E+08	1.87E+08	9.88E+06	0.	3.57E+08
CS-136	1.35E+07	5.32E+07	0.	2.96E+07	4.36E+06	6.85E+06	0.	3.83E+07
CS-137	1.41E+09	1.37E+09	0.	1.68E+08	1.68E+08	8.34E+06	0.	2.04E+08
BA-140	1.78E+08	1.56E+05	0.	1.78E+04	8.87E+04	2.88E+08	0.	9.96E+06
CE-141	1.17E+05	5.84E+04	0.	9.13E+03	0.	7.33E+07	0.	8.69E+03
CE-144	9.23E+06	2.89E+06	1.	5.22E+05	0.	7.51E+08	0.	4.92E+05
PR-143	1.97E+04	7.89E+03	0.	4.54E+03	0.	8.68E+07	0.	9.75E+02
ND-147	1.42E+04	1.39E+04	0.	8.42E+03	0.	6.61E+07	0.	9.88E+02

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.20E+03	3.20E+03	2.11E+03	3.20E+03	3.20E+03	0.	3.20E+03
C---14	3.08E+05	3.88E+05	3.88E+05	7.75E+04	3.88E+05	3.88E+05	0.	3.88E+05
P---32	2.19E+10	1.37E+09	0.	0.	0.	2.46E+09	0.	8.46E+08
CR--51	0.	0.	2.19E+03	8.07E+02	4.85E+03	9.19E+05	0.	3.66E+03
MN--54	0.	1.88E+06	0.	3.28E+05	0.	3.29E+06	0.	2.05E+05
FE--59	4.12E+05	9.78E+05	0.	0.	2.72E+05	3.23E+06	0.	3.72E+05
CO--57	0.	1.64E+05	0.	0.	0.	4.15E+06	0.	2.72E+05
CO--58	0.	1.58E+06	0.	0.	0.	8.98E+06	0.	4.51E+06
CO--60	0.	5.86E+06	0.	0.	0.	2.88E+07	0.	1.52E+07
NI--63	8.60E+08	5.96E+07	0.	0.	0.	1.24E+07	0.	2.88E+07
ZN--65	1.76E+08	5.57E+08	0.	3.73E+08	0.	3.51E+08	0.	2.52E+08
RB--86	0.	3.12E+08	0.	0.	0.	6.54E+07	0.	1.55E+08
SR--89	1.45E+10	0.	0.	0.	0.	5.43E+08	0.	4.16E+08
SR--90	2.37E+11	0.	0.	0.	0.	3.16E+09	0.	6.82E+10
Y---91	4.56E+03	0.	0.	0.	0.	6.06E+05	0.	1.22E+02
ZR--95	1.27E+04	5.37E+03	0.	2.23E+03	0.	9.22E+06	0.	3.96E+03
NB--95	1.30E+04	1.41E+04	0.	5.81E+03	0.	2.44E+07	0.	1.84E+04
RU-103	4.79E+02	0.	0.	4.99E+02	0.	1.26E+04	0.	1.94E+02
RU-106	1.13E+04	0.	0.	5.04E+03	0.	1.75E+05	0.	1.48E+03
AG110M	7.45E+06	6.90E+06	0.	1.36E+07	0.	2.81E+09	0.	4.18E+06
CD115M	0.	1.59E+05	0.	1.26E+05	0.	6.78E+06	0.	5.09E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.19E+03	4.17E+06	1.22E+06	0.	5.97E+05	1.40E+08	0.	6.10E+06
SN-124	1.30E+06	6.22E+04	7.97E+03	0.	2.56E+06	9.33E+07	0.	1.30E+06
SB-125	1.75E+06	1.70E+05	1.43E+05	4.76E+05	3.40E+08	2.92E+07	0.	7.19E+05
TE 125M	8.85E+06	2.40E+06	2.49E+06	8.46E+06	0.	8.54E+06	0.	1.14E+06
TE 127M	6.21E+06	2.14E+06	1.75E+06	2.48E+07	0.	3.58E+07	0.	7.92E+05
TE 129M	3.32E+07	9.27E+06	1.06E+07	3.23E+07	0.	4.08E+07	0.	5.15E+06
I--130	5.45E+05	1.61E+06	2.05E+08	2.51E+06	0.	1.38E+06	0.	6.35E+05
I--131	1.48E+09	1.52E+09	4.94E+11	9.28E+08	0.	1.38E+08	0.	1.15E+09
I--132	2.13E-01	5.71E-01	7.51E+01	9.10E-01	0.	1.07E-01	0.	2.93E-01
I--133	2.14E+07	2.64E+07	6.36E+09	1.55E+07	0.	1.07E+07	0.	1.94E+07
I--134	0.	0.	1.27E-09	0.	0.	0.	0.	0.
I--135	1.79E+04	4.72E+04	6.10E+06	7.51E+04	2.42E-01	5.29E+04	0.	1.73E+04
CS-134	6.50E+10	1.10E+11	0.	1.39E+10	1.22E+10	5.92E+08	0.	2.33E+10
CS-136	8.34E+08	3.29E+09	0.	1.83E+09	2.51E+08	3.74E+08	0.	2.37E+09
CS-137	9.23E+10	8.93E+10	0.	1.18E+10	1.85E+10	5.44E+08	0.	1.33E+10
BA-140	1.43E+07	1.23E+04	0.	1.47E+03	7.31E+03	9.30E+05	0.	8.21E+05
CE-141	1.49E+04	7.46E+03	0.	1.17E+03	0.	9.36E+06	0.	1.11E+03
CE-144	1.20E+06	3.76E+05	0.	6.88E+04	0.	9.78E+07	0.	6.41E+04
PR-143	2.03E+01	8.16E+00	0.	4.70E+00	0.	8.89E+04	0.	1.01E+00
ND-147	1.47E+01	1.42E+01	0.	4.66E+00	0.	6.75E+04	0.	9.38E-01

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AIR AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.84E+03	4.84E+03	2.11E+03	4.84E+03	4.84E+03	0.	4.84E+03
C---14	6.55E+05	6.55E+05	6.55E+05	7.75E+04	6.55E+05	6.55E+05	0.	6.55E+05
P---32	2.19E+10	1.37E+09	0.	0.	0.	2.46E+09	0.	0.46E+08
CR--51	0.	0.	2.19E+03	8.07E+02	4.85E+03	9.19E+05	0.	3.66E+03
MN--54	0.	1.08E+06	0.	3.20E+05	0.	3.29E+06	0.	2.05E+05
FE--59	4.12E+05	9.78E+05	0.	0.	2.72E+05	3.23E+06	0.	3.72E+05
CO--57	0.	1.64E+05	0.	0.	0.	4.15E+06	0.	2.72E+05
CO--58	0.	3.06E+06	0.	0.	0.	7.92E+06	0.	7.49E+06
CO--60	0.	1.85E+07	0.	0.	0.	2.59E+07	0.	2.51E+07
NI--63	4.60E+08	5.96E+07	0.	0.	0.	1.24E+07	0.	2.88E+07
ZN--65	1.76E+04	5.57E+08	0.	3.73E+08	0.	3.51E+08	0.	2.52E+08
KR--36	0.	3.32E+08	0.	0.	0.	6.54E+07	0.	1.55E+08
SR--89	3.09E+10	0.	0.	0.	0.	5.77E+08	0.	8.87E+08
SR--90	3.46E+11	0.	0.	0.	0.	3.35E+09	0.	8.83E+10
Y---91	9.74E+03	0.	0.	0.	0.	6.45E+05	0.	2.68E+02
ZR--95	2.54E+04	1.13E+04	0.	2.23E+03	0.	8.95E+06	0.	6.67E+03
NB--95	6.59E+04	2.97E+04	0.	5.81E+03	0.	2.37E+07	0.	1.75E+04
RU-103	9.96E+02	0.	0.	4.99E+02	0.	1.24E+04	0.	3.43E+02
RU-106	2.41E+04	0.	0.	5.84E+03	0.	1.87E+05	0.	2.96E+03
AG110M	7.45E+06	6.90E+06	0.	1.36E+07	0.	2.81E+09	0.	4.10E+06
CD115M	0.	1.59E+05	0.	1.26E+05	0.	6.78E+06	0.	5.09E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.10E+08	4.17E+06	1.22E+06	0.	5.97E+05	1.40E+08	0.	6.30E+06
SB-124	3.30E+06	6.22E+04	7.97E+03	0.	2.56E+06	9.33E+07	0.	1.30E+06
SB-125	4.31E+06	3.92E+05	3.52E+05	4.76E+05	3.48E+08	2.92E+07	0.	7.94E+05
TE125M	1.89E+07	6.36E+06	6.21E+06	8.46E+06	0.	9.09E+06	0.	2.52E+06
TE127M	6.64E+06	2.31E+06	2.15E+06	2.48E+07	0.	3.88E+07	0.	8.85E+05
TE129M	7.05E+07	2.42E+07	2.66E+07	3.23E+07	0.	4.25E+07	0.	1.87E+07
I--130	5.45E+05	1.61E+06	2.05E+08	2.51E+06	0.	1.38E+06	0.	6.35E+05
I--131	3.11E+09	3.70E+09	1.19E+12	9.28E+08	0.	1.39E+08	0.	2.17E+09
I--132	2.13E-01	5.71E-01	7.51E+01	9.18E-01	0.	1.87E-01	0.	2.63E-01
I--133	4.50E+07	6.57E+07	1.55E+10	1.55E+07	0.	1.17E+07	0.	1.99E+07
I--134	0.	0.	1.27E-09	0.	0.	0.	0.	0.
I--135	1.79E+04	4.72E+04	6.18E+06	7.51E+04	2.42E-01	5.29E+04	0.	1.73E+04
CS-134	1.33E+11	2.39E+11	0.	1.39E+10	2.74E+10	5.69E+08	0.	2.02E+10
CS-136	8.34E+08	3.29E+09	0.	1.43E+09	2.51E+08	3.74E+08	0.	2.37E+09
CS-137	1.93E+11	2.16E+11	0.	1.10E+10	2.61E+10	5.59E+08	0.	1.24E+10
BA-140	2.95E+07	2.96E+04	0.	1.47E+03	1.81E+04	9.76E+05	0.	1.52E+06
CE-141	3.17E+04	1.95E+04	0.	1.17E+03	0.	9.44E+06	0.	2.28E+03
CE-144	2.52E+06	9.95E+05	0.	6.88E+04	0.	1.04E+08	0.	1.36E+05
PR-143	2.03E+01	8.16E+00	0.	4.78E+08	0.	8.89E+04	0.	1.01E+08
ND-147	1.47E+01	1.42E+01	0.	8.66E+08	0.	6.75E+04	0.	9.38E-01

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL-BODY
H----3	0.	2.46E+03	2.46E+03	2.46E+03	2.46E+03	2.46E+03	0.	2.46E+03
C---14	7.72E+05	1.55E+05	1.55E+05	1.55E+05	1.55E+05	1.55E+05	0.	1.55E+05
P---32	3.67E+08	2.38E+07	0.	0.	0.	4.13E+07	0.	1.42E+07
CR--51	0.	0.	1.63E+04	6.03E+03	3.63E+04	6.87E+06	0.	2.73E+04
MN--54	0.	2.64E+08	0.	7.86E+07	0.	8.89E+08	0.	5.04E+07
FE--59	9.86E+07	2.15E+08	0.	0.	5.97E+07	7.10E+08	0.	8.18E+07
CO--57	0.	9.85E+06	0.	0.	0.	2.58E+08	0.	1.64E+07
CO--58	0.	2.39E+07	0.	0.	0.	4.84E+08	0.	5.36E+07
CO--60	0.	1.44E+08	0.	0.	0.	2.69E+09	0.	3.16E+08
NI--63	4.95E+09	6.21E+08	0.	0.	0.	1.29E+08	0.	3.08E+08
ZN--65	2.67E+08	4.46E+08	0.	5.66E+08	0.	5.31E+08	0.	3.83E+08
RB--86	0.	9.80E+07	0.	0.	0.	1.78E+07	0.	4.20E+07
SR--89	7.34E+09	0.	0.	0.	0.	1.17E+09	0.	2.18E+08
SR--90	5.22E+11	0.	0.	0.	0.	1.48E+10	0.	1.28E+11
Y---91	3.88E+06	0.	0.	0.	0.	2.14E+09	0.	1.04E+05
ZR--95	1.11E+06	4.04E+05	0.	5.72E+05	0.	1.59E+09	0.	2.42E+05
NB--95	9.35E+04	5.19E+04	0.	5.15E+04	0.	3.15E+08	0.	2.04E+04
RU-103	3.34E+06	0.	0.	1.28E+07	0.	3.98E+08	0.	1.44E+06
RU-106	1.61E+08	0.	0.	3.15E+08	0.	1.06E+10	0.	2.06E+07
AG1104	4.92E+06	9.25E+06	0.	1.62E+07	0.	3.37E+09	0.	4.91E+06
CD115M	0.	1.64E+07	0.	2.89E+07	0.	1.53E+09	0.	1.16E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SB-129	0.	0.	0.	0.	0.	0.	0.	0.
SB-126	5.41E+09	1.18E+08	3.44E+07	0.	4.73E+07	7.99E+09	0.	1.96E+08
SB-124	7.48E+07	1.49E+06	1.93E+05	0.	6.11E+07	2.23E+09	0.	3.11E+07
SB-125	1.61E+08	3.84E+06	6.99E+06	9.26E+07	1.52E+18	1.37E+09	0.	3.23E+07
TE-129M	7.27E+07	2.64E+07	2.19E+07	2.96E+08	0.	2.98E+08	0.	9.74E+06
TE-127M	2.82E+08	9.37E+07	7.41E+07	1.15E+09	0.	1.28E+09	0.	3.48E+07
TE-129M	1.65E+08	6.20E+07	5.72E+07	6.92E+08	0.	8.32E+08	0.	2.63E+07
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	2.99E+06	4.28E+06	1.40E+09	7.33E+06	0.	1.13E+06	0.	2.45E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	5.14E-01	4.74E-01	0.	1.08E-01	5.40E-02	1.11E-02	0.	2.11E-01
CS-134	3.99E+09	9.50E+09	0.	3.08E+09	1.32E+09	1.66E+08	0.	7.76E+09
CS-136	4.02E+06	3.48E+07	0.	1.94E+07	2.66E+06	3.96E+06	0.	2.51E+07
CS-137	5.49E+09	7.48E+09	0.	2.55E+09	8.44E+08	1.44E+08	0.	4.91E+09
BA-140	2.60E+07	3.45E+04	0.	1.11E+04	1.87E+04	1.89E+08	0.	1.71E+06
CE-141	1.26E+05	8.58E+04	0.	3.94E+04	0.	3.24E+08	0.	9.63E+03
CE-144	2.78E+07	1.16E+07	0.	6.87E+06	0.	9.37E+09	0.	1.49E+06
PR-143	1.51E+04	6.86E+03	0.	3.49E+03	0.	6.68E+07	0.	7.49E+02
ND-147	6.19E+04	1.06E+04	0.	1.33E+04	0.	3.19E+07	0.	2.49E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN ANG A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	4.02E+02	4.02E+02	4.02E+02	4.02E+02	4.02E+02	0.	4.02E+02
C---14	1.25E+05	2.50E+04	2.50E+04	2.50E+04	2.50E+04	2.50E+04	0.	2.50E+04
P---32	1.04E+09	6.51E+07	0.	0.	0.	1.17E+08	0.	4.02E+07
CR--51	0.	0.	1.15E+04	4.25E+03	2.56E+04	4.05E+06	0.	1.93E+04
MN--54	0.	4.07E+07	0.	1.45E+07	0.	1.49E+08	0.	9.31E+06
FE--59	3.64E+07	8.64E+07	0.	0.	2.48E+07	2.85E+08	0.	3.29E+07
CO--57	0.	1.85E+06	0.	0.	0.	4.78E+07	0.	3.08E+06
CO--58	0.	6.89E+06	0.	0.	0.	1.48E+08	0.	1.54E+07
CO--60	0.	2.38E+07	0.	0.	0.	4.46E+08	0.	5.23E+07
NI--63	1.45E+09	1.01E+08	0.	0.	0.	2.18E+07	0.	4.87E+07
ZN--65	5.11E+07	1.62E+08	0.	1.89E+08	0.	1.02E+08	0.	7.34E+07
RB--86	0.	1.38E+08	0.	0.	0.	2.56E+07	0.	6.06E+07
SR--89	2.67E+09	0.	0.	0.	0.	4.26E+08	0.	7.64E+07
SR--90	8.49E+10	0.	0.	0.	0.	2.14E+09	0.	2.07E+10
Y---91	1.26E+06	0.	0.	0.	0.	6.92E+08	0.	3.37E+04
ZR--95	2.93E+05	9.82E+04	0.	1.49E+05	0.	3.34E+08	0.	6.38E+04
NB--95	4.37E+04	2.71E+04	0.	2.68E+04	0.	1.64E+08	0.	1.06E+04
RU-103	1.50E+06	0.	0.	5.75E+06	0.	1.76E+08	0.	6.49E+05
RU-106	2.95E+07	0.	0.	5.71E+07	0.	1.91E+09	0.	3.74E+06
AG110M	1.69E+06	1.56E+06	0.	3.08E+06	0.	6.38E+08	0.	9.30E+05
CD115M	0.	1.53E+07	0.	1.21E+07	0.	6.42E+08	0.	4.84E+05

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	1.03E-05	1.66E-07	1.41E-07	0.	0.	2.84E-05	0.	2.45E-07
SN-126	4.52E+08	1.89E+07	5.54E+06	0.	4.31E+06	8.46E+08	0.	2.94E+07
SB-124	2.52E+07	4.75E+05	6.04E+04	0.	1.95E+07	7.12E+08	0.	5.94E+06
SB-125	2.54E+07	7.23E+05	4.03E+05	5.14E+06	2.56E+09	2.22E+08	0.	5.18E+06
TE125M	2.38E+07	8.65E+06	7.17E+06	9.69E+07	0.	9.51E+07	0.	3.19E+06
TE127M	6.75E+07	2.36E+07	1.77E+07	2.73E+08	0.	3.86E+08	0.	8.32E+06
TE129M	6.93E+07	3.34E+07	3.04E+07	3.73E+08	0.	4.49E+08	0.	1.42E+07
I--130	3.93E+05	1.16E+06	1.44E+06	1.41E+06	0.	9.98E+05	0.	4.58E+05
I--131	7.78E+07	1.12E+08	3.65E+10	1.91E+08	0.	2.94E+07	0.	6.38E+07
I--132	5.57E+01	1.49E+02	1.96E+04	2.38E+02	0.	2.88E+01	0.	5.29E+01
I--133	2.13E+06	3.69E+06	7.13E+08	6.44E+06	0.	3.24E+06	0.	1.13E+06
I--134	1.03E-04	2.79E-04	3.63E-02	4.45E-04	0.	2.43E-07	0.	9.99E-05
I--135	4.04E+04	1.07E+05	1.40E+07	1.70E+05	8.65E-03	1.19E+05	0.	3.91E+04
CS-134	6.82E+08	1.62E+09	0.	5.26E+08	1.74E+08	2.64E+07	0.	1.33E+09
CS-136	1.32E+07	1.31E+08	0.	7.29E+07	9.99E+06	1.49E+07	0.	9.43E+07
CS-137	8.90E+08	1.22E+09	0.	4.14E+08	1.37E+08	2.34E+07	0.	7.58E+08
BA-140	1.03E+08	1.35E+05	0.	4.39E+04	7.38E+04	6.65E+08	0.	6.77E+06
CE-141	7.16E+04	4.85E+04	0.	2.25E+04	0.	1.85E+08	0.	5.49E+03
CE-144	5.19E+06	2.17E+06	0.	1.29E+06	0.	1.75E+09	0.	2.78E+05
PR-143	4.84E+04	1.94E+04	0.	1.12E+04	0.	2.12E+08	0.	2.40E+03
ND-147	3.49E+04	3.43E+04	0.	2.87E+04	0.	1.63E+08	0.	2.24E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN - DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.99E+03	1.99E+03	1.99E+03	1.99E+03	1.99E+03	0.	1.99E+03
C---14	3.63E+05	7.28E+04	7.28E+04	7.28E+04	7.28E+04	7.28E+04	0.	7.28E+04
F---32	2.05E+10	1.29E+09	0.	0.	0.	2.31E+09	0.	7.94E+08
CR--51	0.	0.	2.05E+03	7.58E+02	4.56E+03	8.64E+05	0.	3.43E+03
MN--54	0.	1.01E+06	0.	3.88E+05	0.	3.89E+06	0.	1.93E+05
FE--59	1.47E+05	9.18E+05	0.	0.	2.55E+05	3.83E+06	0.	3.58E+05
CO--57	0.	1.54E+05	0.	0.	0.	3.98E+06	0.	2.55E+05
CO--58	0.	5.67E+05	0.	0.	0.	1.15E+07	0.	1.27E+06
CO--60	0.	1.98E+06	0.	0.	0.	3.78E+07	0.	4.34E+06
NI--63	8.07E+08	5.60E+07	0.	0.	0.	1.17E+07	0.	2.71E+07
ZN--65	1.65E+08	5.24E+08	0.	3.50E+08	0.	3.38E+08	0.	2.37E+08
RU--96	0.	3.12E+06	0.	0.	0.	6.15E+07	0.	1.45E+06
SR--89	3.66E+09	0.	0.	0.	0.	4.89E+08	0.	8.76E+07
SR--90	9.87E+10	0.	0.	0.	0.	1.32E+09	0.	2.41E+10
Y---91	1.03E+03	0.	0.	0.	0.	5.68E+05	0.	2.77E+01
ZR--95	3.82E+03	2.10E+03	0.	2.10E+03	0.	1.26E+07	0.	8.34E+02
NB--95	9.92E+03	5.51E+03	0.	5.46E+03	0.	3.34E+07	0.	2.17E+03
RU-103	1.23E+02	0.	0.	4.69E+02	0.	1.43E+06	0.	5.30E+01
RU-106	2.45E+03	0.	0.	4.73E+03	0.	1.58E+05	0.	3.10E+02
AG110M	7.00E+06	6.40E+06	0.	1.27E+07	0.	2.64E+09	0.	3.85E+06
CD115M	0.	1.50E+05	0.	1.19E+05	0.	6.29E+06	0.	4.78E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.97E+08	3.92E+06	1.15E+06	0.	5.61E+05	1.31E+08	0.	5.92E+06
SB-124	3.10E+06	5.85E+04	7.49E+03	0.	2.48E+06	8.77E+07	0.	1.22E+06
SB-125	3.16E+06	7.28E+04	3.58E+04	4.47E+05	3.19E+08	2.74E+07	0.	6.29E+05
TE125M	1.96E+06	7.18E+05	5.89E+05	7.95E+06	0.	7.81E+06	0.	2.62E+05
TE127M	5.57E+06	1.94E+06	1.47E+06	2.26E+07	0.	2.52E+07	0.	6.86E+05
TE129M	7.27E+06	2.72E+06	2.51E+06	3.04E+07	0.	3.65E+07	0.	1.15E+06
I--130	5.12E+05	1.52E+06	1.93E+08	2.36E+06	0.	1.38E+06	0.	5.96E+05
I--131	3.56E+08	5.10E+08	1.67E+11	8.72E+08	0.	1.34E+08	0.	2.92E+08
I--132	2.01E-01	5.36E-01	7.06E+01	8.55E-01	0.	1.81E-01	0.	1.91E-01
I--133	4.80E+06	8.32E+06	1.68E+09	1.45E+07	0.	7.32E+06	0.	2.54E+06
I--134	0.	0.	1.28E-09	0.	0.	0.	0.	0.
I--135	1.61E+04	4.44E+04	5.88E+06	7.85E+04	2.28E-01	4.97E+04	0.	1.63E+04
CS-134	1.74E+10	4.04E+10	0.	1.31E+10	4.34E+09	7.66E+08	0.	3.30E+10
CS-136	7.44E+08	3.89E+09	0.	1.72E+09	2.36E+08	3.52E+08	0.	2.23E+09
CS-137	2.22E+10	3.83E+10	0.	1.83E+10	3.42E+09	5.83E+08	0.	1.99E+10
BA-140	3.23E+06	4.05E+03	0.	1.38E+03	2.32E+03	6.84E+06	0.	2.13E+05
CE-141	3.49E+03	2.36E+03	0.	1.10E+03	0.	9.82E+06	0.	2.68E+02
CE-144	2.58E+05	1.09E+05	0.	6.39E+04	0.	8.71E+07	0.	1.38E+04
PR-143	1.91E+01	7.67E+00	0.	4.42E+00	0.	8.35E+04	0.	9.47E-01
ND-147	1.39E+01	1.34E+01	0.	8.13E+00	0.	6.35E+04	0.	8.81E-01

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

01/25/79

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.36E+03	2.36E+03	2.98E+03	2.36E+03	2.36E+03	0.	2.36E+03
C---14	2.49E+05	2.49E+05	2.49E+05	1.87E+05	2.49E+05	2.49E+05	0.	2.49E+05
P---32	4.45E+08	2.79E+07	0.	0.	0.	5.88E+07	0.	1.72E+07
CR--51	0.	0.	1.93E+04	7.31E+03	4.48E+04	8.33E+06	0.	3.31E+04
MN--54	0.	3.28E+08	0.	9.52E+07	0.	9.88E+08	0.	6.11E+07
FE--59	1.10E+08	2.61E+08	0.	0.	7.23E+07	8.68E+08	0.	9.91E+07
CO--57	0.	1.19E+07	0.	0.	0.	3.83E+08	0.	1.99E+07
CO--58	0.	3.45E+07	0.	0.	0.	5.21E+08	0.	8.78E+07
CO--60	0.	2.24E+08	0.	0.	0.	2.69E+09	0.	5.11E+08
NI--63	1.08E+10	7.52E+08	0.	0.	0.	1.57E+08	0.	3.64E+08
ZN--65	3.23E+08	1.83E+09	0.	6.86E+08	0.	6.46E+08	0.	4.64E+08
RB--86	0.	1.89E+08	0.	0.	0.	2.15E+07	0.	5.89E+07
SR--89	1.32E+10	0.	0.	0.	0.	1.44E+09	0.	3.88E+08
SR--90	4.64E+11	0.	0.	0.	3.12E+09	2.74E+10	0.	2.14E+11
Y---91	6.54E+06	0.	0.	0.	0.	2.51E+09	0.	1.75E+05
ZR--95	1.61E+06	6.21E+05	0.	6.92E+05	0.	1.67E+09	0.	4.18E+05
NB--95	1.32E+05	7.93E+04	0.	6.24E+04	0.	3.24E+08	0.	4.47E+04
RU-103	5.19E+06	0.	0.	1.55E+07	0.	4.85E+08	0.	2.32E+06
RU-106	2.47E+08	0.	0.	3.42E+08	0.	1.38E+10	0.	3.61E+07
AG110M	1.08E+07	1.00E+07	0.	1.97E+07	0.	4.88E+09	0.	5.95E+06
CD115M	0.	4.41E+07	0.	3.58E+07	0.	1.86E+09	0.	1.41E+06

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - TEENAGER

NUCLID:	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	7.16E+09	1.42E+08	4.17E+07	0.	5.73E+07	9.67E+09	0.	2.35E+08
SB-124	9.55E+07	1.90E+06	2.31E+05	0.	7.41E+07	2.70E+09	0.	3.77E+07
SB-125	2.15E+08	1.60E+07	1.13E+07	1.12E+08	1.84E+10	1.67E+09	0.	4.06E+07
TE125M	1.26E+08	4.50E+07	3.55E+07	3.58E+08	0.	3.52E+08	0.	1.67E+07
TE127M	3.43E+08	1.21E+08	9.09E+07	1.30E+09	0.	1.73E+09	0.	4.26E+07
TE129M	2.90E+08	1.07E+08	9.27E+07	8.38E+08	0.	1.81E+09	0.	4.56E+07
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	4.45E+06	6.45E+06	1.93E+09	4.88E+06	0.	1.30E+06	0.	4.08E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	6.23E-01	5.75E-01	0.	2.18E-01	6.55E-02	1.34E-02	0.	2.55E-01
CS-134	6.26E+09	1.51E+10	0.	3.73E+09	1.83E+09	1.74E+08	0.	7.04E+09
CS-136	1.07E+07	4.22E+07	0.	2.35E+07	3.22E+06	4.79E+06	0.	3.84E+07
CS-137	8.90E+09	1.20E+10	0.	3.08E+09	1.59E+09	1.68E+08	0.	4.20E+09
BA-140	4.33E+07	5.70E+04	0.	1.34E+04	3.61E+04	1.75E+08	0.	2.82E+06
CE-141	2.35E+05	1.37E+05	0.	4.78E+04	0.	3.72E+08	0.	1.58E+04
CE-144	4.97E+07	2.04E+07	0.	8.33E+06	0.	1.17E+10	0.	2.64E+06
PR-143	1.83E+04	7.35E+03	0.	4.23E+03	0.	8.08E+07	0.	9.07E+02
ND-147	7.51E+04	1.29E+04	0.	1.61E+04	0.	3.86E+07	0.	3.03E+03

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	2.09E+02	2.09E+02	2.64E+02	2.09E+02	2.09E+02	0.	2.09E+02
C---14	2.18E+04	2.18E+04	2.18E+04	1.64E+04	2.18E+04	2.18E+04	0.	2.18E+04
F---32	6.81E+08	4.27E+07	0.	0.	0.	7.66E+07	0.	2.64E+07
CR--51	0.	0.	7.56E+03	2.79E+03	1.68E+04	3.18E+06	0.	1.27E+04
MN--54	0.	3.20E+07	0.	9.52E+06	0.	9.88E+07	0.	6.11E+06
FE--59	2.39E+07	5.67E+07	0.	0.	1.57E+07	1.87E+08	0.	2.16E+07
CO--57	0.	1.22E+06	0.	0.	0.	3.89E+07	0.	2.82E+06
CO--58	0.	6.81E+06	0.	0.	0.	8.12E+07	0.	1.37E+07
CO--60	0.	2.81E+07	0.	0.	0.	2.41E+08	0.	4.58E+07
NI--63	9.52E+08	6.61E+07	0.	0.	0.	1.38E+07	0.	3.19E+07
ZN--65	1.35E+07	1.06E+08	0.	7.12E+07	0.	6.70E+07	0.	4.82E+07
ZN--69	0.	8.52E+07	0.	0.	0.	1.68E+07	0.	3.97E+07
SR--89	2.61E+09	0.	0.	0.	0.	2.83E+08	0.	7.48E+07
SR--90	7.61E+10	0.	0.	0.	2.41E+08	2.31E+09	0.	1.88E+10
Y---91	1.15E+06	0.	0.	0.	0.	4.41E+08	0.	3.06E+04
ZR--95	2.35E+05	8.19E+04	0.	9.81E+04	0.	1.92E+08	0.	5.61E+04
NB--95	1.72E+04	2.24E+04	0.	1.76E+04	0.	9.14E+07	0.	1.26E+04
RU-103	1.27E+06	0.	0.	3.77E+06	0.	9.87E+07	0.	5.66E+05
RU-106	2.82E+07	0.	0.	3.75E+07	0.	1.28E+09	0.	3.54E+06
AG110M	1.11E+06	1.03E+06	0.	2.82E+06	0.	4.19E+08	0.	6.10E+05
CD115M	0.	1.80E+07	0.	7.94E+06	0.	4.21E+08	0.	3.20E+05

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR GASEOUS DISCHARGES

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS, (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
SN-123	4.25E-06	1.53E-07	1.22E-07	0.	0.	1.33E-05	0.	2.28E-07
SN-126	6.25E+08	1.24E+07	3.64E+06	0.	2.83E+06	5.55E+08	0.	1.94E+07
SB-124	1.65E+07	3.12E+05	3.99E+04	0.	1.28E+07	4.67E+08	0.	6.53E+06
SB-125	1.71E+07	5.97E+05	3.48E+05	3.38E+06	1.68E+09	1.45E+08	0.	3.40E+06
TE125M	2.23E+07	7.99E+06	6.38E+06	6.36E+07	0.	6.24E+07	0.	2.96E+06
TE127M	9.46E+07	1.55E+07	1.18E+07	1.48E+08	0.	2.23E+08	0.	5.51E+06
TE129M	9.46E+07	3.14E+07	2.71E+07	2.45E+08	0.	2.95E+08	0.	1.33E+07
I--130	2.58E+05	7.64E+05	9.72E+07	1.19E+06	0.	6.55E+05	0.	3.88E+05
I--131	6.84E+07	9.66E+07	2.79E+10	1.25E+08	0.	1.83E+07	0.	5.76E+07
I--132	1.65E+01	9.77E+01	1.29E+04	1.56E+02	0.	1.84E+01	0.	3.47E+01
I--133	1.94E+06	3.36E+06	6.10E+08	4.23E+06	0.	2.44E+06	0.	1.04E+06
I--134	6.75E-05	1.83E-04	2.38E-02	2.92E-04	0.	1.60E-07	0.	6.56E-05
I--135	2.65E+04	7.00E+04	9.15E+06	1.11E+05	5.67E-03	7.84E+04	0.	2.57E+04
CS-134	5.79E+08	1.40E+09	0.	3.45E+08	1.69E+08	1.61E+07	0.	6.52E+08
CS-136	2.14E+07	8.60E+07	0.	4.78E+07	6.56E+06	9.77E+06	0.	6.19E+07
CS-137	7.83E+08	1.05E+09	0.	2.72E+08	1.48E+08	1.41E+07	0.	3.78E+08
BA-140	9.38E+07	1.21E+05	0.	2.88E+04	7.73E+04	3.19E+08	0.	6.84E+06
CE-141	6.32E+04	4.24E+04	0.	1.47E+04	0.	1.15E+08	0.	4.86E+03
CE-144	5.31E+06	2.06E+06	0.	8.43E+05	0.	1.19E+09	0.	2.67E+05
PR-143	1.17E+04	1.28E+04	0.	7.34E+03	0.	1.39E+08	0.	1.58E+03
ND-147	2.29E+04	2.26E+04	0.	1.36E+04	0.	1.86E+08	0.	1.47E+03

*BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

APPENDIX D

Technical Bases for A_{eff}

Overview

The evaluation of doses due to releases of radioactive material to the atmosphere can be simplified by the use of effective dose transfer factors instead of using dose factors which are radionuclide specific. These effective factors, which are based on the typical radionuclide distribution in the releases, can be applied to the total radioactivity released to approximate the dose in the environment, ie, instead of having to sum the isotopic distribution multiplied by the isotope specific dose factor only a single multiplication (A_{eff} times the total quantity of radioactive material released) would be needed. This approach provides a reasonable estimate of the actual dose while eliminating the need for a detailed calculational technique.

Determination of A_{eff}

The effective dose transfer factor is based on past operating data. The radioactive effluent distribution for the past years can be used to derive a single effective factor by the following equation.

$$A_{eff} = \sum_i A_i \cdot f_i \qquad \text{(D-1)}$$

where A_{eff} = the effective dose transfer factor

A_i = the dose transfer factor for radionuclide i

f_i = the fractional abundance of radionuclide i in the radioactive effluents

This equation yields a single dose factor, weighted by the typical radionuclide distribution.

To determine the appropriate effective factor to be used and to evaluate the degree of variability, the atmospheric radioactive effluents for the past 3 years have been evaluated. An effective dose transfer factor has been determined for the gaseous effluents for all pathways of interest. Tables D-1 and D-2 present the results of this evaluation.

For the radioiodines and particulates with half-lives greater than 8 days, the effective dose transfer factor is based solely on the radioiodines (I-131, 133, and 135). This approach was selected because the radioiodines contribute essentially all of the dose to the infant's thyroid via the cow-milk pathway. The infant's thyroid and the cow-milk pathway are the critical organ and controlling pathway, respectively, for the releases of radioiodine and particulates. All other particulates contribute less than 1% of the dose. The effective dose transfer factor is determined by applying equation D-1 to the radioiodines. However, in determining the dose, this effective dose transfer factor should be applied to the total release of all radioiodines and to particulates with half lives greater than 8 days. This uniform application is conservative in providing reasonable assurance that the actual dose will not be underestimated by the use of this simplified method.

The determination of A_{eff} was limited to the past three years (1978, 1979, and 1980) because of the changes that have occurred in the waste processing system. A demineralizer system replaced the previously used evaporator in the liquid waste processing system.

As can be seen from Tables D-1 and D-2, the effective dose transfer factor varies little from year to year. The maximum observed variability from the average value is 13% for the noble gases and 25% for the radioiodines. This variability is minor considering other areas of uncertainty and conservatism inherent in the environmental dose calculational models.

To provide an additional degree of conservatism, a factor of 0.8 is introduced into the dose calculational process when the effective dose transfer factor is used. This added conservatism provides additional assurance that the evaluation of doses by the use of a single effective factor will not significantly underestimate any actual doses in the environment.

Table D-1

Effective Dose Transfer Factors

Noble Gases—Air Dose

Year	$A_{\gamma}{}_{eff}$ mrad / $\mu Ci \cdot sec/m^3$	$A_{\beta}{}_{eff}$ mrad / $\mu Ci \cdot sec/m^3$
1978	1.3×10^{-5}	3.4×10^{-5}
1979	1.3×10^{-5}	3.4×10^{-5}
1980	1.6×10^{-5}	3.4×10^{-5}
Average	1.4×10^{-5}	3.4×10^{-5}

Table D-2

Effective Dose Transfer Factor for Air-Grass-Cow-Milk-Infant-Thyroid Pathway

Radionuclide	Annual Airborne Release (Ci)	Fraction	Dose Factor[a] $\left(\frac{\text{mrem/yr}}{\mu\text{Ci}/(\text{m}^2 \cdot \text{sec})}\right)$	Weighted Dose Factor $\left(\frac{\text{mrem/yr}}{\mu\text{Ci}/(\text{m}^2 \cdot \text{sec})}\right)$
		Year 1978		
I-131	0.381	0.688	9.9E11	
I-133	0.129	0.233	1.3E10	6.9E11
I-135	0.044	0.079	5.2E6	
		Year 1979		
I-131	0.0188	0.520	9.9E11	
I-133	0.0156	0.432	1.3E10	5.2E11
I-135	0.0018	0.048	5.2E6	
		Year 1980		
I-131	0.0518	0.756	9.9E11	
I-133	0.0124	0.181	1.3E10	7.5E11
I-135	0.0043	0.063	5.2E6	
			avg[b]	6.5E11

[a] air-grass-cow-milk-infant-thyroid dose transfer factor

[b] Effective dose commitment transfer factor is the average of weighted dose transfer factor over three years.

APPENDIX E
RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

It is the policy of Florida Power and Light Company (FPL) that the Turkey Point 3 and 4 and St. Lucie 1 and 2 Radiological Environmental Monitoring Programs are conducted by the State of Florida Department of Health and Rehabilitative Services (DHRS), pursuant to an Agreement between FPL and DHRS and; that coordination of the Radiological Environmental Monitoring Programs with DHRS and compliance with the Radiological Environmental Monitoring Program Technical Specifications are the responsibility of the Nuclear Energy Services Department.

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
DIRECT RADIATION	N-1	Convoy Point	TLD	Quarterly	2	N
DIRECT RADIATION	N-5	North of Hoody Dr.	TLD	Quarterly	6	N
DIRECT RADIATION	N-10	Old Cutler Rd. at S.W. 87th Ave.	TLD	Quarterly	12	N
DIRECT RADIATION	NNW-1	Turkey Point Entrance Road	TLD	Quarterly	<1	NNW
DIRECT RADIATION	NNW-10	Burr Rd. at Hainlin Mill Dr.	TLD	Quarterly	9	NNW
DIRECT RADIATION	NW/WNW-1	Turkey Point Entrance Road	TLD	Quarterly	1	WNW
DIRECT RADIATION	NW-5	Dolan's Farm on King's Highway	TLD	Quarterly	4	NNW
DIRECT RADIATION	NW-10	Intersection of Farm Life Rd. and Coconut Palm Dr.	TLD	Quarterly	10	NW

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
DIRECT RADIATION	W/WNW-5	Palm Drive at Tallahassee Rd.	TLD	Quarterly	5	W
DIRECT RADIATION	WNW-10	Homestead near vehicle inspection station	TLD	Quarterly	9	WNW
DIRECT RADIATION	W-1	On site near cooling tower	TLD	Quarterly	1	W
DIRECT RADIATION	W-10	Florida City near fire tower	TLD	Quarterly	10	W
DIRECT RADIATION	WSW-10	Old Hawk missile site south of Florida City	TLD	Quarterly	12	WSW
DIRECT RADIATION	SW/SSW-1	On site near land utilizaiton offices	TLD	Quarterly	1	SSW
DIRECT RADIATION	SW-10	U.S. 1 south of Florida City	TLD	Quarterly	10	SW
DIRECT RADIATION	SSW/SW-5	On site, southeast corner of cooling canals	TLD	Quarterly	5	SSW

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
DIRECT RADIATION	SSW-10	At Card Sound Bridge	TLD	Quarterly	10	SSW
DIRECT RADIATION	S-5	On site, south end of cooling canals	TLD	Quarterly	5	S
DIRECT RADIATION	S-10	Card Sound Rd. at Steamboat Creek	TLD	Quarterly	10	S
DIRECT RADIATION	SSE/S-1	Turtle Point	TLD	Quarterly	1	SSE
DIRECT RADIATION	SSE-10	Ocean Reef	TLD	Quarterly	8	SSE
AIRBORNE	T51	Homestead Bayfront Park	Radioiodine and particulates	Weekly	2	NNW
AIRBORNE	T57	Tree Nursery 316th Street	Radioiodine and particulates	Weekly	4	NW
AIRBORNE	T58	Turkey Point Entrance Rd.	Radioiodine and particulates	Weekly	1	NW

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

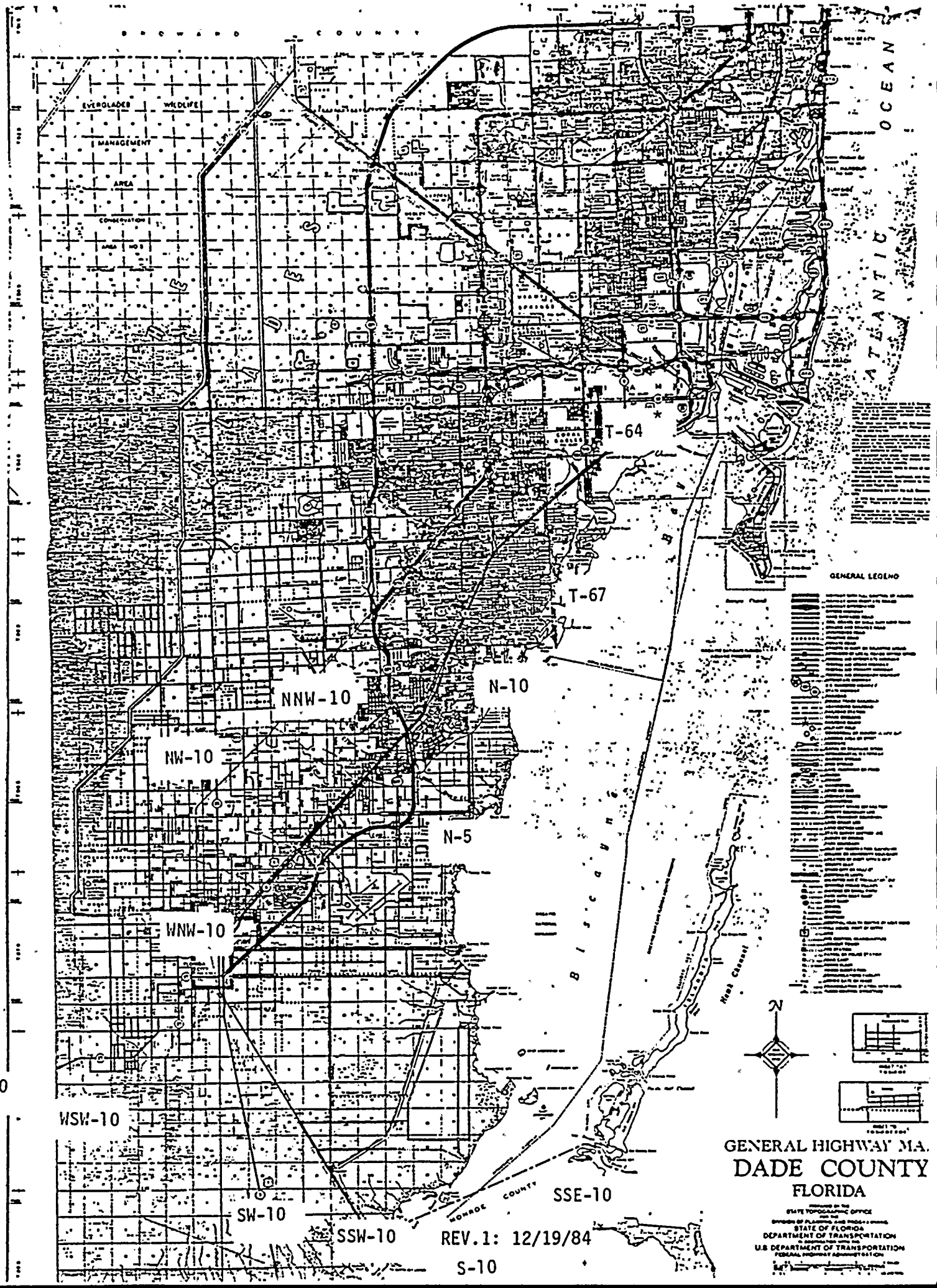
Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
AIRBORNE	T64*	Natoma Substation	Radioiodine and particulates	Weekly	22	NNE
AIRBORNE	T72	Turkey Point Boy Scout Camp	Radioiodine and particulates	Weekly	<1	WSW
WATERBORNE	T42	Biscayne Bay, at Turkey Point	Surface water Sediment from shoreline	Monthly Semi-annually	<1	ENE
WATERBORNE	T67*	Biscayne Bay, vicinity of Cutler Plant, north to Matheson Hammock Park	Surface water Sediment from shoreline	Monthly Semi-annually	13-18	N, NNE
WATERBORNE	T81	Card Sound, near mouth of old discharge canal	Surface water Sediment from shoreline	Monthly Semi-annually	6	S

* Denotes control sample.

RADIOLOGICAL ENVIRONMENTAL SURVEILLANCE
TURKEY POINT PLANT
Key to Sample Locations

Pathway	Location	Description	Samples Collected	Sample Collection Frequency	Approximate Distance (miles)	Direction Sector
FOOD PRODUCTS	T67*	Biscayne Bay, vicinity of Cutler Plant north to Matheson Hammock Park	Crustacea	Semi-annually	13-18	N, NNE
			Fish	Semi-annually		
FOOD PRODUCTS	T81	Card Sound, vicinity of Turkey Point Facility	Crustacea	Semi-annually	6	S
			Fish	Semi-annually		
FOOD PRODUCTS	T40	South of Palm Dr. on SW 117th St. extension	Broad leaf vegetation	Monthly	3	W
FOOD PRODUCTS	T41	Palm Dr. West of old missile site near the site boundary	Broad leaf vegetation	Monthly	2	WNW
FOOD PRODUCTS	T67	Near Biscayne Bay, vicinity of Cutler Plant north to Matheson Hammock Park	Broad leaf vegetation	Monthly	13-18	N, NNE

* Denotes Control Sample.


EVERGLADES
WILDLIFE
MANAGEMENT
AREA
ATLANTIC OCEAN
T-64
T-67
N-10
NNW-10
NW-10
N-5
WNW-10
W-10
WSW-10
SW-10
SSW-10
SSE-10
S-10
REV.1: 12/19/84
GENERAL LEGEND
GENERAL HIGHWAY MA
DADE COUNTY
FLORIDA
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
U.S DEPARTMENT OF TRANSPORTATION

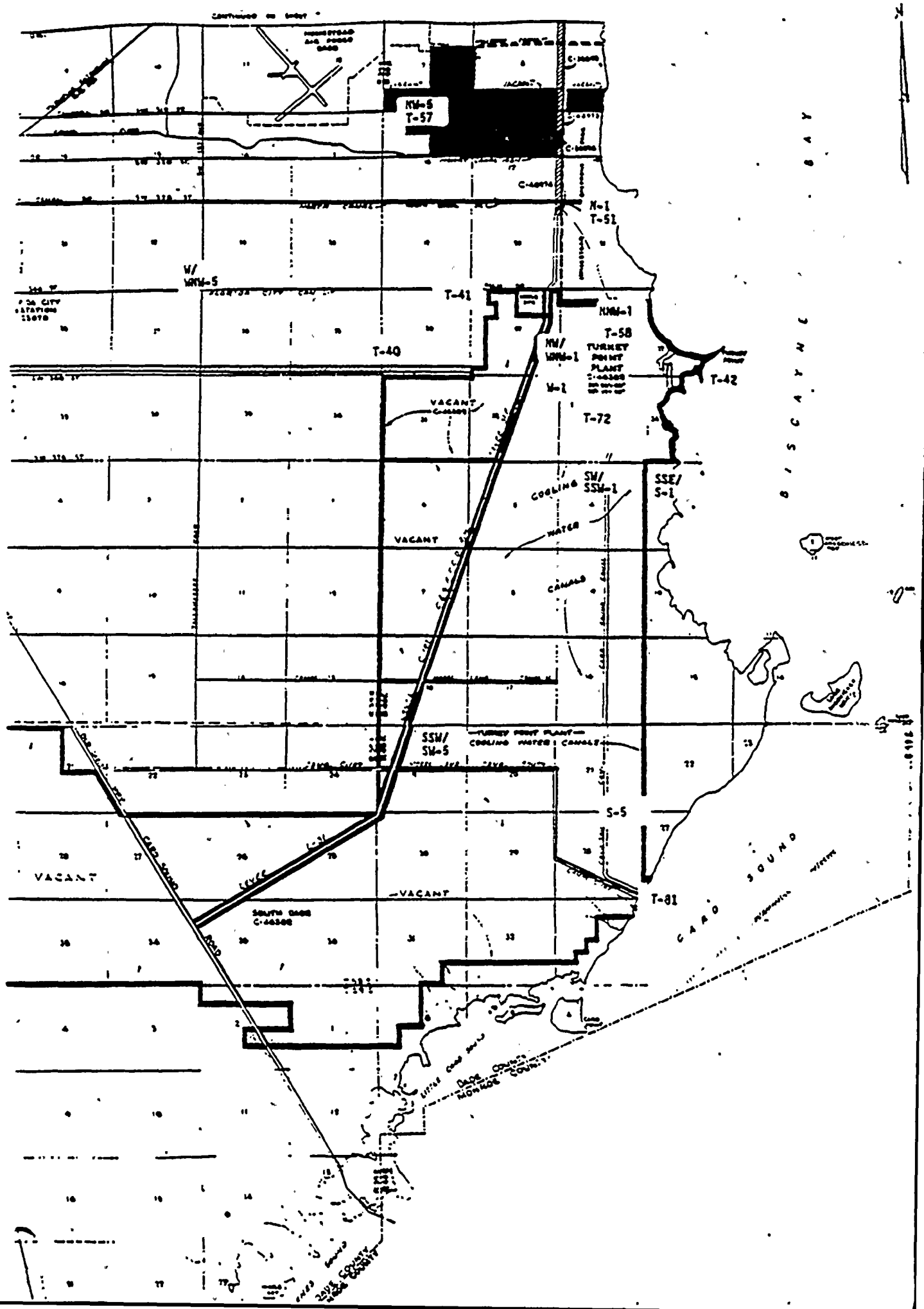

NW-5
T-57
N-1
T-51
W/
NNW-5
T-41
NNW-1
T-58
T-40
NW/
NNW-1
TURKEY
POINT
PLANT
T-42
W-1
VACANT
T-72
SW/
SSW-1
SSE/
S-1
COOLING
WATER
CANALS
VACANT
SSW/
SW-5
TURKEY POINT PLANT
COOLING WATER CANALS
S-5
VACANT
VACANT
T-81
CARD SOUND
CARD SOUND
BISCAYNE BAY
DADE COUNTY
MONROE COUNTY

Table 3-1

Atmospheric Gaseous Release Points
at the Turkey Point Units 3 and 4

Effluent Source	Release Point
Gas decay tanks	Plant vent
Radwaste Building	Plant vent
Auxiliary Building	Plant vent
Containment Purge	Plant vent
No. 4 spent fuel pit	Plant vent
No. 3 spent fuel pit	Spent fuel pit vent
Air ejectors	Turbine deck
Steam generator blowdown	Blowdown vent

Table 3-2

Distribution of Radioactive Noble Gases
in Gaseous Effluent from Turkey Point Units 3 & 4

Nuclide	Release fraction[a,b]
Ar-41	9.2E-3
Kr-83m	--
Kr-85m	2.5E-4
Kr-85	2.5E-4
Kr-87	1.6E-4
Kr-88	2.1E-4
Xe-131m	4.4E-4
Xe-133m	1.2E-3
Xe-133	0.99
Xe-135m	8.0E-4
Xe-135	3.4E-3
Xe-137	--
Xe-138	3.7E-4

[a] Based on measured discharge from Turkey Point Units 3 & 4 during 1978 thru 1980.

[b] To estimate radionuclide concentrations in a sample in which only the total activity concentration has been measured, multiply the total activity concentration by the fraction of respective radionuclides listed here.

Table 3-3

Transfer Factors for Maximum Offsite Air Dose

Radionuclide	Air Dose Transfer Factors	
	$A_{\gamma i}$ $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$	$A_{\beta i}$ $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$
Kr-83m	6.1E-7	9.1E-6
Kr-85m	3.9E-5	6.2E-5
Kr-85	5.4E-7	6.2E-5
Kr-87	2.0E-4	3.3E-4
Kr-88	4.8E-4	9.3E-5
Kr-89	5.5E-4	3.4E-4
Kr-90	5.2E-4	2.5E-4
Xe-131m	4.9E-6	3.5E-5
Xe-133m	1.0E-5	4.7E-5
Xe-133	1.1E-5	3.3E-5
Xe-135m	1.1E-4	2.3E-5
Xe-135	6.1E-5	7.8E-5
Xe-137	4.8E-5	4.0E-4
Xe-138	2.9E-4	1.5E-4
Ar-41	2.9E-4	1.0E-4

Ref: Regulatory Guide 1.109, Revision 1, Table B-1

Table 3-4

Transfer Factors for Maximum Dose to a Person Offsite due to Radioactive Noble Gases

Radionuclide	Dose Transfer Factors	
	$P_{\gamma i}$ $\left(\frac{\text{mrem}}{\mu\text{Ci sec/m}^3}\right)$	$S_{\beta i}$ $\left(\frac{\text{mrem}}{\mu\text{Ci sec/m}^3}\right)$
Kr-83m	2.4E-9	—
Kr-85m	3.7E-5	4.6E-5
Kr-85	5.1E-7	4.2E-5
Kr-87	1.9E-4	3.1E-4
Kr-88	4.7E-4	7.5E-5
Kr-89	5.3E-4	3.2E-4
Kr-90	4.9E-4	2.3E-4
Xe-131m	2.9E-6	1.5E-5
Xe-133m	8.0E-6	3.1E-5
Xe-133	9.3E-6	9.7E-6
Xe-135m	9.9E-5	2.3E-5
Xe-135	5.7E-5	5.9E-5
Xe-137	4.5E-5	3.9E-4
Xe-138	2.8E-4	1.3E-4
Ar-41	2.8E-4	8.5E-5

Ref: Regulatory Guide 1.109, Revision 1, Table B-1.

Table 3-5

Dose Conversion Factors for Deriving Radioactive Noble Gas Effluent Monitor Setpoints

Radionuclide	Factor DF_i for Ground-level or Split-Wake Release $\left(\frac{\text{area}}{\text{yr}\ \frac{\mu\text{Ci}}{\text{m3}}}\right)$
Kr83m	7.56 E-2
Kr85m	1.17 E3
Kr85	1.61 E1
Kr87	5.92 E3
Kr88	1.47 E4
Kr89	1.66 E4
Kr90	1.56 E4
Xe131m	9.15 E1
Xe133m	2.51 E2
Xe133	2.94 E2
Xe135m	3.12 E3
Xe135	1.81 E3
Xe137	1.42 E3
Xe138	8.83 E3
Xe139	5.02 E3
Ar41	8.84 E3

Table 3-6

REFERENCE METEOROLOGY
ANNUAL AVERAGE ATMOSPHERIC DISPERSION FACTORS

$\frac{X}{Q}$ $\frac{sec}{m^3}$

X/Q are annual averaged factors of atmospheric dispersion of a mixed mode gaseous release from the Turkey Point Plant.
Period of record: 01/01/76 to 12/31/77

BASE DISTANCE IN MILES / KILOMETERS

AFTO SECT	DESIGN DIST MI	.25 .40	.75 1.21	1.50 2.41	2.50 4.02	3.50 5.63	4.50 7.24	5.50 8.85	7.00 11.26
NNE	0.	8.9E-07	1.9E-07	8.3E-08	5.0E-08	3.0E-08	2.2E-08	1.9E-08	1.4E-08
NE	0.	6.9E-07	1.5E-07	6.3E-08	3.8E-08	2.5E-08	2.1E-08	1.3E-08	1.0E-08
ENE	0.	8.4E-07	1.4E-07	7.5E-08	3.9E-08	2.8E-08	2.3E-08	1.8E-08	1.3E-08
E	0.	8.6E-07	1.9E-07	9.1E-08	5.1E-08	3.6E-08	2.7E-08	2.2E-08	1.7E-08
ESE	0.	6.6E-07	1.5E-07	7.9E-08	4.5E-08	2.9E-08	2.3E-08	1.9E-08	1.2E-08
SE	0.	1.6E-06	2.8E-07	1.1E-07	6.1E-08	4.2E-08	3.0E-08	2.6E-08	2.1E-08
SSE	0.	4.9E-06	9.2E-07	3.6E-07	1.8E-07	1.1E-07	9.0E-08	7.1E-08	4.9E-08
S	0.	2.9E-06	4.6E-07	1.8E-07	1.0E-07	7.8E-08	5.4E-08	4.6E-08	3.3E-08
SSW	0.	6.5E-07	1.6E-07	6.5E-08	4.6E-08	2.4E-08	2.6E-08	1.8E-08	1.4E-08
SW	0.	1.5E-06	3.2E-07	1.4E-07	7.9E-08	4.9E-08	3.2E-08	2.7E-08	1.9E-08
WSW	0.	2.9E-06	6.3E-07	2.3E-07	1.3E-07	7.6E-08	5.5E-08	4.2E-08	3.1E-08
W	0.	6.3E-06	1.3E-06	5.2E-07	2.6E-07	1.7E-07	1.2E-07	9.2E-08	6.6E-08
WNW	0.	4.1E-06	8.7E-07	3.4E-07	1.7E-07	1.2E-07	8.1E-08	6.3E-08	4.2E-08
NW	0.	2.7E-06	6.0E-07	2.4E-07	1.2E-07	7.6E-08	5.1E-08	4.3E-08	3.2E-08
NNW	0.	1.4E-06	2.9E-07	1.2E-07	6.8E-08	4.5E-08	3.0E-08	2.4E-08	1.5E-08
N	0.	9.5E-07	2.1E-07	8.5E-08	4.5E-08	3.2E-08	2.2E-08	1.7E-08	1.3E-08

BASE DISTANCE IN MILES / KILOMETERS

AFTO SECT	DESIGN DIST MI	9.00 14.48	11.00 17.70	.79 1.27	5.00 8.04	1.00 1.61	2.00 3.22	2.75 4.42	4.30 6.92
NNE	0.	9.8E-09	6.6E-09	1.8E-07	2.0E-08	1.4E-07	6.2E-08	4.4E-08	2.3E-08
NE	0.	7.3E-09	5.4E-09	1.5E-07	1.6E-08	1.1E-07	4.8E-08	3.5E-08	2.1E-08
ENE	0.	1.1E-08	7.4E-09	1.4E-07	2.0E-08	1.0E-07	5.2E-08	3.6E-08	2.4E-08
E	0.	1.3E-08	9.8E-09	1.7E-07	2.4E-08	1.3E-07	6.3E-08	4.6E-08	2.8E-08
ESE	0.	1.1E-08	9.6E-09	1.4E-07	2.0E-08	1.2E-07	5.7E-08	4.0E-08	2.4E-08
SE	0.	1.5E-08	1.3E-08	2.7E-07	2.7E-08	1.9E-07	7.8E-08	5.5E-08	3.1E-08
SSE	0.	3.5E-08	2.7E-08	8.7E-07	7.9E-08	6.3E-07	2.5E-07	1.6E-07	9.4E-08
S	0.	2.3E-08	1.8E-08	4.2E-07	5.0E-08	3.1E-07	1.3E-07	9.5E-08	5.2E-08
SSW	0.	9.4E-09	7.1E-09	1.5E-07	2.1E-08	1.1E-07	5.4E-08	3.8E-08	2.5E-08
SW	0.	1.4E-08	1.0E-08	3.0E-07	2.9E-08	2.3E-07	1.0E-07	6.9E-08	3.5E-08
WSW	0.	2.2E-08	1.9E-08	5.5E-07	4.8E-08	4.3E-07	1.7E-07	1.0E-07	5.2E-08
W	0.	4.5E-08	3.5E-08	1.2E-06	1.0E-07	9.0E-07	3.5E-07	2.3E-07	1.3E-07
WNW	0.	2.9E-08	2.3E-08	8.1E-07	7.1E-08	5.9E-07	2.3E-07	1.6E-07	8.6E-08
NW	0.	2.0E-08	1.5E-08	5.6E-07	4.7E-08	4.1E-07	1.6E-07	1.0E-07	5.6E-08
NNW	0.	1.0E-08	8.3E-09	2.7E-07	2.6E-08	2.0E-07	9.1E-08	6.1E-08	3.2E-08
N	0.	1.0E-08	7.2E-09	1.9E-07	2.0E-08	1.5E-07	5.9E-08	4.0E-08	2.3E-08

NUMBER OF VALID OBSERVATIONS = 16538
NUMBER OF INVALID OBSERVATIONS = 1006
NUMBER OF CALMS LOWER LEVEL = 195
NUMBER OF CALMS UPPER LEVEL = 383

Table 3-7

REFERENCE METEOROLOGY

DEPOSITION DEPLETED ANNUAL AVERAGE ATMOSPHERIC DISPERSION FACTORS

$$\frac{X}{Q_d} \quad \frac{sec}{m^3}$$

X_d/Q are annual averaged factors of atmospheric dispersion of a mixed mode release from the Turkey Point Plant which have been corrected for depletion from the plume by fallout and deposition.
Period of Record: 01/01/76 to 12/31/77

BASE DISTANCE IN MILES / KILOMETERS

AFTD SECT	DESIGN DIST MI	.25 .40	.75 1.21	1.50 2.41	2.50 4.02	3.50 5.63	4.50 7.24	5.50 8.85	7.00 11.26
NNE	0.	8.7E-07	1.7E-07	7.3E-08	4.4E-08	2.7E-08	1.9E-08	1.6E-08	1.2E-08
NE	0.	6.9E-07	1.4E-07	5.5E-08	3.3E-08	2.2E-08	1.7E-08	1.2E-08	8.6E-09
ENE	0.	8.0E-07	1.2E-07	6.5E-08	3.4E-08	2.4E-08	2.0E-08	1.6E-08	1.2E-08
E	0.	8.6E-07	1.7E-07	7.6E-08	4.4E-08	3.1E-08	2.4E-08	1.9E-08	1.5E-08
ESE	0.	6.1E-07	1.3E-07	6.9E-08	3.9E-08	2.5E-08	2.0E-08	1.6E-08	1.1E-08
SE	0.	1.5E-06	2.6E-07	9.5E-08	5.2E-08	3.4E-08	2.4E-08	2.1E-08	1.7E-08
SSE	0.	4.7E-06	8.2E-07	3.1E-07	1.5E-07	9.2E-08	7.4E-08	5.8E-08	3.8E-08
S	0.	2.8E-06	4.2E-07	1.5E-07	8.5E-08	6.4E-08	4.4E-08	3.7E-08	2.6E-08
SSW	0.	6.1E-07	1.4E-07	5.6E-08	3.9E-08	2.0E-08	2.2E-08	1.5E-08	1.2E-08
SW	0.	1.3E-06	2.8E-07	1.3E-07	6.7E-08	4.2E-08	2.7E-08	2.3E-08	1.5E-08
WSW	0.	2.7E-06	5.6E-07	2.1E-07	1.0E-07	6.4E-08	4.6E-08	3.5E-08	2.6E-08
W	0.	5.9E-06	1.2E-06	4.4E-07	2.2E-07	1.4E-07	9.9E-08	7.6E-08	5.4E-08
WNW	0.	3.8E-06	7.7E-07	2.9E-07	1.5E-07	9.8E-08	7.0E-08	5.4E-08	3.6E-08
NW	0.	2.5E-06	5.4E-07	2.1E-07	1.1E-07	6.8E-08	4.5E-08	3.8E-08	2.8E-08
NNW	0.	1.4E-06	2.6E-07	1.1E-07	6.0E-08	4.0E-08	2.6E-08	2.0E-08	1.3E-08
N	0.	8.8E-07	1.9E-07	7.8E-08	3.9E-08	2.8E-08	1.9E-08	1.5E-08	1.1E-08

BASE DISTANCE IN MILES / KILOMETERS

AFTD SECT	DESIGN DIST MI	9.00 14.48	11.00 17.70	.79 1.27	5.00 8.04	1.00 1.61	2.00 3.22	2.75 4.42	4.30 6.92
NNE	0.	8.5E-09	6.0E-09	1.6E-07	1.8E-08	1.2E-07	5.5E-08	3.8E-08	2.1E-08
NE	0.	6.3E-09	4.5E-09	1.3E-07	1.4E-08	9.4E-08	4.2E-08	3.0E-08	1.8E-08
ENE	0.	9.0E-09	6.7E-09	1.2E-07	1.9E-08	9.1E-08	4.5E-08	3.1E-08	2.0E-08
E	0.	1.1E-08	7.9E-09	1.5E-07	2.1E-08	1.2E-07	5.5E-08	3.9E-08	2.4E-08
ESE	0.	8.8E-09	8.3E-09	1.3E-07	1.8E-08	1.0E-07	5.0E-08	3.4E-08	2.0E-08
SE	0.	1.3E-08	1.0E-08	2.4E-07	2.3E-08	1.7E-07	6.7E-08	4.7E-08	2.6E-08
SSE	0.	2.7E-08	2.1E-08	7.7E-07	6.4E-08	5.6E-07	2.2E-07	1.3E-07	7.7E-08
S	0.	1.9E-08	1.3E-08	3.8E-07	4.1E-08	2.7E-07	1.1E-07	7.8E-08	4.8E-08
SSW	0.	7.9E-09	5.7E-09	1.4E-07	1.8E-08	9.6E-08	4.7E-08	3.2E-08	2.2E-08
SW	0.	1.1E-08	8.6E-09	2.7E-07	2.4E-08	2.0E-07	9.1E-08	5.9E-08	2.9E-08
WSW	0.	1.8E-08	1.4E-08	5.2E-07	4.0E-08	3.5E-07	1.4E-07	8.7E-08	4.8E-08
W	0.	3.7E-08	2.8E-08	1.1E-06	8.6E-08	7.9E-07	3.1E-07	2.0E-07	1.0E-07
WNW	0.	2.5E-08	2.0E-08	7.3E-07	6.1E-08	5.1E-07	2.0E-07	1.4E-07	7.4E-08
NW	0.	1.8E-08	1.3E-08	5.1E-07	4.1E-08	3.6E-07	1.4E-07	9.9E-08	5.0E-08
NNW	0.	9.1E-09	6.9E-09	2.4E-07	2.3E-08	1.8E-07	7.7E-08	5.4E-08	2.8E-08
N	0.	8.7E-09	6.3E-09	1.8E-07	1.7E-08	1.3E-07	5.2E-08	3.5E-08	2.0E-08

NUMBER OF VALID OBSERVATIONS = 16538
NUMBER OF INVALID OBSERVATIONS = 1036
NUMBER OF CALMS LOWER LEVEL = 195
NUMBER OF CALMS UPPER LEVEL = 383