MEMORANDUM

TO: All Holders of Pennsylvania State Handbooks

FROM: Politech Corporation

SUBJECT: Update and Correction of Information

The following pages update and correct the corresponding pages in the UMTRAP Pennsylvania State Book.

Delete:	Add:
A-1 (10/01/79)	A-1 (10/01/80)
Regulations Regarding Licensing Radioactive Materials - Dept. of Environmental Resources	Title 25 Rules and Regulations, Part I Department of Environmental Resources, Subpart D. Environmental Health & Safety Article V Radiological Health
	Solid Waste Management Act, No. 1980-97 (H.B. 1840) 1980 Pa. Laws
	UMTRAP Authorization, No. 1980-87 (H.B. 1899) 1980 Pa. Laws

CONTENTS OF APPENDIX

TITLE 25. RULES AND REGULATIONS
PART I. DEPARTMENT OF ENVIRONMENTAL RESOURCES
Subpart D. ENVIRONMENTAL HEALTH AND SAFETY
ARTICLE V. RADIOLOGICAL HEALTH

CHAPTER 221. GENERAL PROVISIONS

Authority

The provisions of this Chapter 221 issued under act of January 28, 1966, P.L. 1625 § 301 (73 P.S. § 1301).

Source

The provisions of this Chapter 221 adopted February 1, 1972, effective March 1, 1972, 2 Pa. B. 212.

MISCELLANEOUS

§ 221.1. Definitions.

The following words and terms, when used in this Article, shall have the following meanings, unless the context clearly indicates otherwise:

(1) *Act* - The Atomic Energy Development and Radiation Control Act (73 P.S. § 1001 *et seq.*).

(2) *Activity* - The number of nuclear disintegrations occurring in a given quantity of material per unit time.

(i) Curie (Ci) is the special unit of activity. One curie equals 3.7×10^{10} disintegrations per second exactly, except as provided in subparagraph (iii) of this paragraph.

(ii) The daughter activity concentration in the following table are considered equivalent to 10^{-7} microcuries of Radon-222 per milliliter of air in equilibrium with the daughters RaA, RaB, RaC, and RaC', and are equivalent to one "working level:"

Lapsed Time Between Collection And Measurement (Hours)*	Observed Alpha-Emitting Daughter Activity Collected Per Milliliter of Air	
	microcuries per ml	total alpha disintegrations per minute per ml
0.5	7.2×10^{-8}	0.16
1.0	4.5×10^{-8}	0.10
2.0	1.3×10^{-8}	0.028
3.0	0.3×10^{-8}	0.0072

* The duration of sample collection and the duration of measurement shall be sufficiently short compared to the time between collection and measurement, so as not to have a statistically significant effect upon the results.

(iii) Natural uranium and natural thorium. One curie of natural uranium means the sum of 3.7×10^{10} disintegrations per second from U-238 plus 3.7×10^{10} dps from U-234 plus 9×10^{8} dps from U-235. One curie of natural thorium means the sum of 3.7×10^{10} dps from Th-232 plus 3.7×10^{10} dps from Th-228. For the purpose of this Chapter, one curie of natural uranium is equivalent to 3,000 kilograms, or 6,615 pounds of natural uranium; and one curie of natural thorium is equivalent to 9,000 kilograms or 19,850 pounds of natural thorium.

(3) *Agreement state* - Any state which has entered into an agreement with the United States Atomic Energy Commission under § 274b of the Atomic Energy Act of 1954, as amended (73 Stat. 689).

(4) *Airborne radioactive material* Any radioactive material dispersed in the air in the form of dusts, fumes, mists, vapors or gases.

(5) *Byproduct material* - Any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

(6) *Calendar quarter* - A period not less than 12 and not more than 14 consecutive weeks, with the periods so arranged that no day in any year is omitted from inclusion within a calendar quarter. No person shall change the method observed by him of determining calendar quarters for the purpose of this Article except at the beginning of the calendar year.

(7) *Department* - The Department of Environmental Resources of the Commonwealth.

(8) *Exposure* - A measure of the ionization produced in air by x or gamma radiation. The special unit of exposure is the roentgen. One roentgen (R) is the exposure required to produce in air 2.58×10^{-4} Coulomb of ions of either sign per kilogram of air.

(9) *High radiation area* - Any area, accessible to individuals, in which there exists radiation at such levels that an individual could receive in any one hour a dose to a major portion of the body in excess of 100 millirems.

(10) *Human use* - The internal or external administration of radiation or radioactive materials to human beings.

(11) *Individual* - Any human being.

(12) *Ionizing radiation* - Any radiation consisting of directly ionizing charged particles (electrons, protons, alpha particles and the like), having sufficient kinetic energy to produce ionization by collision or consisting of indirectly ionizing uncharged particles (neutrons, photons, and the like) which can liberate directly ionizing particles or can initiate a nuclear transformation.

(13) *License* - A license issued pursuant to the provisions of Chapter 225 of this Title (relating to licensing of radioactive material), except where otherwise specified.

(14) *Occupational dose* - A radiation dose received by an individual either in a restricted area or in the course of employment in which the individual's duties involve exposure to radiation. The term shall not be deemed to include any exposure of an individual to radiation for the purpose of medical diagnosis or medical therapy of such individual.

(15) *Person* - Any individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, agency, political subdivision of this Commonwealth, any other state or political subdivision or agency thereof, and any legal successor, representative, agent or agency of the foregoing, other than the U.S. Atomic Energy Commission, or any successor thereto, and other than Federal government agencies licensed by the U.S. Atomic Energy Commission or any successor thereto.

(16) *Personnel monitoring device* - A device worn or carried by an individual for the purpose of monitoring his radiation environment. (For example, film badges, pocket dosimeters, film rings).

(17) *Qualified expert* - With reference to radiation protection, a person having the knowledge, training and experience to measure ionizing radiation, to evaluate safety techniques and to advise regarding radiation protection needs, (for example, relevant certification by the American Board of Radiology, the American Board of Health Physics or the American Board of Industrial Hygiene). With reference to the calibration of radiation therapy equipment, a person having, in addition to the above qualifications, training and experience in the applications of radiation physics to radiation therapy, (for example, relevant certification in Radiological Physics or X-ray and Radium Physics by the American Board of Radiology).

(18) *Radiation* - Ionizing radiation.

(19) *Radiation area* - Any area, accessible to individuals, in which there exists radiation at such levels that a major portion of the body could receive in any one hour

a dose in excess of five millirems, or in any five consecutive days a dose in excess of 100 millirems.

(20) *Radiation dose* - Dose equivalent is the product of absorbed dose in rads and certain modifying factors to express on a common scale, for all ionizing radiation, the irradiation incurred by exposed persons. The special unit of dose equivalent is the rem.

(i) Absorbed dose is the energy imparted to matter in a volume element by ionizing radiation divided by the mass of irradiated material in that volume element. The rad is the special unit of absorbed dose. One rad equals 100 ergs/gram.

(ii) For radiation protection purposes, the following shall be considered to be the equivalent of one rem:

(A) One roentgen due to x [illegible] gamma radiation.

(B) One rad due to x, gamma, or beta radiation.

(C) One-tenth rad due to neutrons or high energy protons.

(D) Five one-hundredth rad due to particles heavier than protons and with sufficient energy to reach the lens of the eye.

(E) If it is more convenient to measure the neutron flux or equivalent than to determine the neutron dose in rads, one rem of neutron radiation may be assumed to be equivalent to 14 million neutrons per square centimeter incident upon the body, or if there exists sufficient information to estimate the approximate distribution in energy of the neutrons, the incident number of neutrons per square centimeter equivalent to one rem may be estimated from the following table:

Neutron Energy (Mev)	Number Of Neutrons Per Square Centimeter Equivalent To A Dose Of One Rem (n/cm^2)	Average Flux Density To Delivery 100 Millirem In 40 Hours (n/cm^2 per second)
2.5×10^{-8} (thermal)	980×10^6	680
1×10^{-7}	980×10^6	680
1×10^{-6}	810×10^6	560
1×10^{-5}	810×10^6	560
1×10^{-4}	840×10^6	580
1×10^{-3}	980×10^6	680
1×10^{-2}	1000×10^6	700
1×10^{-1}	165×10^6	115
5×10^{-1}	39×10^6	27
1	27×10^6	19
2.5	29×10^6	20
5	23×10^6	16
7	24×10^6	17
10	24×10^6	17
14	17×10^6	12
20	16×10^6	[illegible]
40	14×10^6	10
60	16×10^6	11
1×10^2	20×10^6	14
2×10^2	19×10^6	13
3×10^2	16×10^6	11
4×10^2	14×10^6	10

(21) *Radiation producing machines or equipment* - Any apparatus capable of producing ionizing radiation, except devices which produce ionizing radiation only from radioactive material.

(22) *Radiation source* - Any apparatus or a material emitting or capable of emitting ionizing radiation.

(23) *Radioactive material* - Any material (solid, liquid or gas) of which one or more constituents exhibits radioactivity.

(24) *Restricted area* - Any area which is controlled by a licensee or registrant for purposes of protecting individuals from exposure to radiation or radioactive materials. The term shall not include any areas used for residential quarters except upon authorization by the Department.

(25) *Sealed source* - A radioactive source sealed in a container or having a bonded cover where the container or cover has sufficient mechanical strength to prevent contact with and dispersion of the radioactive material under the conditions of use and wear for which it was designed.

(26) *Source material* - Uranium or thorium or any combination thereof, in any physical or chemical form or ore which contains by weight 0.05% or more of either uranium, thorium or any combination of uranium and thorium. The term shall not include special nuclear material.

(27) *Special nuclear material in quantities not sufficient to form a critical mass* - Uranium enriched in the isotope U-235 in quantities not exceeding 350 grams of contained U-235; U-233 in quantities not exceeding 200 grams; plutonium in quantites not exceeding 200 grams; or any combination of them in accordance with the following formula: For each kind of special nuclear material, determine the ratio between the quantity of that special nuclear material and the quantity specified above for the same kind of special nuclear material. The sum of such ratios for all of the kinds of special nuclear material in combination shall not exceed one (unity). For example, the following quantities in combination would not exceed the limitation and are within the formula, as follows:

$$\frac{175 \text{ (grams contained U-235)}}{350} + \frac{50 \text{ (grams U-233)}}{200} + \frac{50 \text{ (grams Pu)}}{200} = 1$$

(28) *Survey* - An evaluation of the hazard potential associated with a specified set of conditions incident to the production, use, release, storage or presence of radiation sources.

(29) *Unrefined* and *unprocessed ore* - Ore in its natural form prior to any processing, such as grinding, roasting, beneficiating or refining.

(30) *Unrestricted area* - Any area to which access is not controlled by the licensee or registrant for purposes of protecting individuals from exposure to radiation or radioactive materials, and any area used for residential quarters.

(31) *Whole body* - The whole body, or head and trunk, or active blood forming organs, or lens of eye, or gonads.

(32) *Working level* - Defined in 41 CFR Part 50-204.36 (Radiation Standards for Mining) as any combination of radon daughters in one liter of air which will result in the ultimate emission of 1.3×10^5 million electron volts of potential alpha energy. The numerical value of the "working level" is derived from the alpha energy released by the total decay of short-lived radon daughter products in equilibrium with 100 pico curies of Radon-222 per liter of air.

§ 221.2. Purpose.

The provisions of this Article shall establish the requirements for the protection of public health and safety as related to radiation sources.

§ 221.3. Scope.

(a) The provisions of this Article, except as otherwise specifically provided herein or in the act, shall apply to all persons who use, manufacture, produce, transport, transfer, receive, acquire, possess or dispose of any radiation source.

(b) The failure of a person to obtain a license for or to register, when required, radiation sources in his possession or control, shall not relieve that person of responsibility for compliance with the act or with this Article.

RIGHTS AND RESPONSIBILITIES OF THE DEPARTMENT

§ 221.11. Inspections.

The Department or its duly authorized representatives shall have the power to enter at all reasonable times upon any private or public property for the purpose of determining whether or not there is compliance with or violation of the provisions of this Article.

§ 221.12. Tests.

Each person shall perform, upon instruction from the Department, and shall permit a Department representative to perform, whatever reasonable tests as the Department may deem appropriate or necessary.

§ 221.13. Availability of records.

The following Department records shall generally not be available for public inspection, unless their disclosure is in the public interest and is necessary for the Department to carry out its duties under the act:

(1) Trade secrets, secret industrial processes, or commerical or financial information customarily held in confidence.

(2) Personnel and medical files, and similar files, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

(3) Files containing the names of individuals who have received exposure to radiation.

(4) Any proprietary data identified as such by the person submitting it, until the person submitting it has been notified of its proposed disclosure and has been afforded a period of at least one week to take any appropriate action to protect it.

§ 221.14. Additional requirements.

The Department may impose upon any person any requirements in addition to those established in this Article which it may deem reasonable and necessary to protect the public health and safety.

PROHIBITIONS AND RESTRICTIONS

§ 221.21. Sale or installation of radiation sources.

No person shall sell or install within this Commonwealth any radiation source which does not meet the requirements of this Article.

§ 221.22. Penalties.

Section 401 of the act (73 P.S. § 1401) provides that any person who violates any of the provisions of this Article shall be guilty of a misdemeanor and shall on conviction thereof be subject to a fine of not more than $500; and for a second or subsequent offense shall be subjected to a fine of not more than $5,000 or imprisonment for a period of not more than one year, or both.

§ 221.23. Prohibited use.

No person shall operate or maintain within this Commonwealth any fitting devices or machines which use fluoroscopic, X-ray or radiation principles for the pupose of selling footwear through commerical outlets.

§ 221.24. Human use.

No human use of radiation sources shall be permitted except in accordance with the provision of this Article, and the following:

(1) Medical Practice Act, Act of June 3, 1911, P.L. 639, as amended (63 P.S. § 401 *et seq.*).

(2) Act of February 2, 1956, P.L. (1955) 997, as amended (63 P.S. § 265 *et seq.*).

(3) Chiropractic Registration Act, Act of August 10, 1951, P.L. 1182, as amended (63 P.S. § 601 *et seq.*).

(4) Dental Law, Act of May 1, 1933, P.L. 216, as amended (63 P.S. § 120 *et seq.*).

(5) Podiatry Act, Act of March 2, 1956, P.L. (1955) 1206, as amended (63 P.S. § 42.1 *et seq.*).

EXEMPTIONS

§ 221.31. Granting exemptions.

The Department may, upon application therefor or upon its own initiative, grant exemptions or exceptions from the requirements of this Article when it determines they are authorized by law and the results will not constitute a significant risk to the health and safety of the public.

§ 221.32. Transportation.

Common and contract carriers shall be exempt from the provisions of this Article to the extent that they transport sources of radiation in the regular course of their carriage for another or storage incident thereto, provided they comply with applicable regulations of the Hazardous Substances Transportation Board of the Commonwealth and the U.S. Department of Transportation.

§ 221.33. Exemption qualifications.

The following sources, uses, types of sources and types of users shall be exempt from the provisions of Chapters 223, 225, 227, 229, 231, 233 and 235 of this Title (relating to specific radiological health requirements):

(1) Any U.S. Atomic Energy Commission contractor or subcontractor of the following categories operating within this Commonwealth to the extent that such contractor or subcontractor under this contract receives, possesses, uses, transfers, owns or acquires sources of radiation:

(i) Prime contractors performing work for the AEC at U.S. Government owned or controlled sites.

(ii) Prime contractors performing research in, or development, manufacture, storage, testing or transportation of atomic weapons or components thereof.

(iii) Prime contractors using or operating nuclear reactors or other nuclear devices in a U.S. Government owned vehicle or vessel.

(iv) Any other prime contractor or subcontractor when the Commonwealth and the AEC jointly determine that, under the terms of the contract or subcontract, there is adequate assurance that the work thereunder can be accomplished without undue risk to the public health and safety and that the exemption of such contractor or subcontractor is otherwise appropriate.

(2) Federal government agencies.

(3) Electrical equipment that produces radiation incidental to its operation for other purposes if the dose rate at five centimeters from any surface is less than 0.5 mrem per hour when averaged over an area of ten square centimeters. Such equipment shall not be exempt when operated without adequate shielding during testing and servicing if radiation levels exceed those specified. Electron beam welders and electron microscopes shall not be exempt.

(4) Radiation producing machines or equipment in transit or in storage incident thereto.

(5) Any material, product or use specifically exempted from licensing requirements by the U.S. Atomic Energy Commission or authorized for distribution to persons exempt from license requirements.

(6) The receipt, acquisition, possession, use and transfer of not more than 15 pounds of source material at any one time and not more than a total of 150 pounds of source material in one calendar year by persons in the following categories:

(i) Pharamacists using source material for pharmaceutical purposes.

(ii) Physicians using source material for medicinal purposes.

(iii) Persons receiving possession of source material from pharmacists and physicians in the form of medicinals or drugs.

(iv) Commerical, industrial, educational, research and medical institutions or firms, for research, educational, development or commerical purposes.

(7) The receipt, acquisition, possession, use and transfer of radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in § 221.34 of this Title (relating to exempt quantities) if the person does not:

(i) produce, package, repackage or import the radioactive material for purposes of commerical distribution; and does not

(ii) incorporate the radioactive material into products intended for commerical distribution.

(8) The receipt, acquisition, possession, use and transfer of products or material containing radioactive material in concentrations not in excess of those listed in § 221.35 of this Title (relating to exempt concentrations), provided that no person may introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to an unlicensed person.

(9) Timepieces or timepiece hands or dials containing radium which were obtained prior to February 9, 1970.

(10) Timepieces or timepiece hands or dials, except pocket watches, obtained on or after February 9, 1970 and manufactured under a license issued by the Department or any other state, and containing not more than the radium activities shown in the following table:

Timepiece Unit	Radium Activity (in microcuries)
Each watch	0.15
Each watch hand	0.03
Each watch dial	0.09
Each clock	0.20
Each clock hand	0.04
Each clock dial	0.12

§ 221.34. Exempt quantities.

Radioactive materials, certain quantities of which shall be exempt from the provisions of Chapters 223, 225, 227, 229, 231, 233 and 235 of this Title (relating to specific radiological health requirements), are shown in the following table:

Radioactive Material	Column 1 Not As A Sealed Source (microcuries)	Column 2 As A Sealed Source (microcuries)
Antimony 124 (Sb 124)	1	10
Arsenic 76 (As 76)	10	10

Radioactive Material	Column 1 Not As A Sealed Source (microcuries)	Column 2 As A Sealed Source (microcuries)
Arsenic 77 (As 77)	10	10
Barium 140 - Lanthanum 140 (BaLa 140)	1	10
Beryllium 7 (Be 7)	50	50
Cadmium 109 - Silver 109 (CdAg 109)	10	10
Calcium 45 (Ca 45)	10	10
Carbon 14 (C 14)	50	50
Cerium 144 - Praseodymium 144 (CePr 144)	1	10
Cesium 137 - Barium 137 (CsBa 137)	1	10
Chlorine 36 (Cl 36)	1	10
Chromium 51 (Cr 51)	50	50
Cobalt 60 (Co 60)	1	10
Copper 64 (Cu 64)	50	50
Europium 154 (Eu 154)	1	10
Fluorine 18 (F 18)	50	50
Gallium 72 (Ga 72)	10	10
Germanium 71 (Ge 71)	50	50
Gold 198 (Au 198)	10	10
Gold 199 (Au 199)	10	10
Hydrogen 3 (Tritium) (H 3)	250	250
Indium 114 (In 114)	1	10
Iodine 131 (I 131)	10	10
Iridium 192 (Ir 192)	10	10
Iron 55 (Fe 55)	50	50
Iron 59 (Fe 59)	1	10
Lanthanum 140 (La 140)	10	10
Manganese 52 (Mn 52)	1	10
Manganese 56 (Mn 56)	50	50
Molybdenum 99 (Mo 99)	10	10
Nickel 59 (Ni 59)	1	10
Nickel 63 (Ni 63)	1	10
Niobium 95 (Nb 95)	10	10
Palladium 109 (Pb 109)	10	10
Palladium 103 - Rhodium 103 (PdRh 103)	50	50
Phosphorus 32 (P 32)	10	10
Polonium 210 (Po 210)	0.1	1
Potassium 42 (K 42)	10	10
Praseodymium 143 (Pr 143)	10	10
Promethium 147 (Pm 147)	10	10
Radium 226 (Ra 226)	0.1	1
Rhenium 186 (Re 186)	10	10
Rhodium 105 (Rh 105)	10	10
Rubidium 86 (Rb 86)	10	10
Ruthenium 106 - Rhodium 106 (RuRh 106)	1	10
Samarium 153 (Sm 153)	10	10
Scandium 46 (Sc 46)	1	10
Silver 105 (Ag 105)	1	10
Silver 111 (Ag 111)	10	10
Sodium 22 (Na 22)	10	10
Sodium 24 (Na 24)	10	10
Strontium 89 (Sr 89)	1	10
Strontium 90 - Yttrium 90 (Sr Y 90)	0.1	1
Sulfur 35 (S 35)	50	50
Tantalum 182 (Ta 182)	10	10
Technetium 96 (Tc 96)	1	10
Technetium 99 (Tc 99)	1	10

Radioactive Material	Column 1 Not As A Sealed Source (microcuries)	Column 2 As A Sealed Source (microcuries)
Tellurium 127 (Te 127)	10	10
Tellurium 129 (Te 129)	1	10
Thallium 204 (Tl 204)	50	50
Tin 113 (Sn 113)	10	10
Tungsten 181 (W 181)	10	100
Tungsten 185 (W 185)	10	10
Vanadium 48 (V 48)	1	10
Yttrium 90 (Y 90)	1	10
Yttrium 91 (y 91)	1	10
Zinc 65 (Zn 65)	10	10
Alpha-emitting radioactive material, other than special nuclear material, not listed above	0.1	1
Beta and/or gamma-emitting radioactive material not listed above	1	10

§ 221.35. Exempt concentration.

(a) Elements, certain concentrations of which shall be exempt from the provisions of Chapters 223, 225, 227, 229, 231, 233 and 235 of this Title, (relating to specific radiological health requirements) are shown in the following table:

Element (Atomic Number)	Isotope	Column I Gas Concentration uCi/ml	Column II Liquid and Solid Concentration uCi/ml uCi/gram for solids
Antimony (51)	Sb 122		3×10^{-4}
	Sb 124		2×10^{-4}
	Sb 125		1×10^{-3}
Argon (18)	A 37	1×10^{-3}	
	A 41	4×10^{-7}	
Arsenic (33)	As 73		5×10^{-3}
	As 74		5×10^{-4}
	As 76		2×10^{-4}
	As 77		8×10^{-4}
Barium (56)	Ba 131		2×10^{-3}
	Ba 140		3×10^{-4}
Beryllium (4)	Be 7		2×10^{-2}
Bismuth (83)	Bi 206		4×10^{-4}
Bromine (35)	Br 82	4×10^{-7}	3×10^{-3}
Cadmium (48)	Cd 109		2×10^{-3}
	Cd 115m		3×10^{-4}
	Cd 115		3×10^{-4}
Calcium (20)	Ca 45		9×10^{-5}
	Ca 47		5×10^{-4}
Carbon (6)	C 14	1×10^{-6}	8×10^{-3}
Cerium (58)	Ce 141		9×10^{-4}
	Ce 143		4×10^{-4}

Element (Atomic Number)	Isotope	Column I Gas Concentration uCi/ml	Column II Liquid and Solid Concentration μCi/ml μCi/gram for solids
	Ce 144		1×10^{-4}
Cesium (55)	Cs 131		2×10^{-2}
	Cs 134m		6×10^{-2}
	Cs 134		9×10^{-5}
Chlorine (17)	Cl 38	9×10^{-7}	4×10^{-3}
Chromium (24)	Cr 51		2×10^{-2}
Cobalt (27)	Co 57		5×10^{-3}
	Co 58		1×10^{-3}
	Co 60		5×10^{-4}
Copper (29)	Cu 64		3×10^{-3}
Dysprosium (66)	Dy 165		4×10^{-3}
	Dy 166		4×10^{-4}
Erbium (68)	Er 169		9×10^{-4}
	Er 171		1×10^{-3}
Europium (63)	Eu 152 (9.2 h)		6×10^{-4}
	Eu 155		2×10^{-3}
Fluorine (9)	F 18	2×10^{-6}	8×10^{-3}
Gadolinium (64)	Gd 153		2×10^{-3}
	Gd 159		8×10^{-4}
Gallium (31)	Ga 72		4×10^{-4}
Germanium (32)	Ge 71		2×10^{-2}
Gold (79)	Au 196		2×10^{-3}
	Au 198		5×10^{-4}
	Au 199		2×10^{-3}
Hafnium (72)	Hf 181		7×10^{-4}
Hydrogen (1)	H 3	5×10^{-6}	3×10^{-2}
Indium (49)	In 113m		1×10^{-2}
	In 114m		2×10^{-4}
Iodine (53)	I 126	3×10^{-9}	2×10^{-5}
	I 131	3×10^{-9}	2×10^{-5}
	I 132	8×10^{-8}	6×10^{-4}
	I 133	1×10^{-8}	7×10^{-5}
	I 134	2×10^{-7}	1×10^{-3}
Iridium (77)	Ir 190		2×10^{-3}
	Ir 192		4×10^{-4}
	Ir 194		3×10^{-4}
Iron (26)	Fe 55		8×10^{-3}
	Fe 59		6×10^{-4}
Krypton (36)	Kr 85m	1×10^{-6}	
	Kr 85	3×10^{-6}	
Lanthanum (57)	La 140		2×10^{-4}
Lead (82)	Pb 203		4×10^{-3}
Lutetium (71)	Lu 177		1×10^{-3}
Manganese (25)	Mn 52		3×10^{-4}
	Mn 54		1×10^{-3}
	Mn 56		1×10^{-3}
Mercury (80)	Hg 197m		2×10^{-3}
	Hg 197		3×10^{-3}
	Hg 203		2×10^{-4}
Molybdenum (42)	Mo 99		2×10^{-3}
Neodymium (60)	Nd 147		6×10^{-4}
	Nd 149		3×10^{-3}
Nickel (28)	Ni 65		1×10^{-3}

Element (Atomic Number)	Isotope	Column I Gas Concentration uCi/ml	Column II Liquid and Solid Concentration uCi/ml uCi/gram for solids
Niobium (Columbium) (41)	Nb 95		1×10^{-3}
	Nb 97		9×10^{-3}
Osmium (76)	Os 185		7×10^{-4}
	Os 191m		3×10^{-2}
	Os 191		2×10^{-3}
	Os 193		6×10^{-4}
Palladium (46)	Pd 103		3×10^{-3}
	Pd 109		9×10^{-4}
Phosphorus (15)	P 32		2×10^{-4}
Platinum (78)	Pt 191		1×10^{-3}
	Pt 193m		1×10^{-2}
	Pt 197m		1×10^{-2}
	Pt 197		1×10^{-3}
Polonium (84)	Po 210	2×10^{-10}	7×10^{-6}
Potassium (19)	K 42		3×10^{-3}
Praseodymium (59)	Pr 142		3×10^{-4}
	Pr 143		5×10^{-4}
Promethium (61)	Pm 147		2×10^{-3}
	Pm 149		4×10^{-4}
Radium (88)	Ra 226	1×10^{-11}	1×10^{-7}
	Ra 228	2×10^{-11}	3×10^{-7}
Rhenium (75)	Re 183		6×10^{-3}
	Re 186		9×10^{-4}
	Re 188		6×10^{-4}
Rhodium (45)	Rh 103m		1×10^{-1}
	Rh 105		1×10^{-3}
Rubidium (37)	Rb 86		7×10^{-4}
Ruthenium (44)	Ru 97		4×10^{-3}
	Ru 103		8×10^{-4}
	Ru 105		1×10^{-3}
	Ru 106		1×10^{-4}
Samarium (62)	Sm 153		8×10^{-4}
Scandium (21)	Sc 46		4×10^{-4}
	Sc 47		9×10^{-4}
	Sc 48		3×10^{-4}
Selenium (34)	Se 75		3×10^{-3}
Silicon (14)	Si 31		9×10^{-3}
Silver (47)	Ag 105		1×10^{-3}
	Ag 110m		3×10^{-4}
	Ag 111		4×10^{-4}
Sodium (11)	Na 24		2×10^{-3}
Strontium (38)	Sr 89		1×10^{-4}
	Sr 91		7×10^{-4}
	Sr 92		7×10^{-4}
Sulfur (16)	S 35	9×10^{-8}	6×10^{-4}
Tantalum (73)	Ta 182		4×10^{-4}
Technetium (43)	Tc 96m		1×10^{-1}
	Tc 96		1×10^{-3}
Tellurium (52)	Te 125m		2×10^{-3}
	Te 127m		6×10^{-4}
	Te 127		3×10^{-3}
	Te 129m		3×10^{-4}
	Te 131m		6×10^{-4}
	Te 132		3×10^{-4}

Element (Atomic Number)	Isotope	Column I Gas Concentration uCi/ml	Column II Liquid and Solid Concentration μCi/ml μCi/gram for solids
Terbium (65)	Tb 160		4×10^{-4}
Thallium (81)	Tl 200		4×10^{-3}
	Tl 201		3×10^{-3}
	Tl 202		1×10^{-3}
	Tl 204		1×10^{-3}
Thulium (69)	Tm 170		5×10^{-4}
	Tm 171		5×10^{-3}
Tin (50)	Sn 113		9×10^{-4}
	Sn 125		2×10^{-4}
Tungsten (Wolfram) (74)	W 181		4×10^{-3}
	W 187		7×10^{-4}
Vanadium (23)	V 48		3×10^{-4}
Xenon (54)	Xe 131m	4×10^{-6}	
	Xe 133	3×10^{-6}	
	Xe 135	1×10^{-6}	
Ytterbium (70)	Yb 175		1×10^{-3}
Yttrium (39)	Y 90		2×10^{-4}
	Y 91m		3×10^{-2}
	Y 91		3×10^{-4}
	Y 92		6×10^{-4}
	Y 93		3×10^{-4}
Zinc (30)	Zn 65		1×10^{-3}
	Zn 69m		7×10^{-4}
	Zn 69		2×10^{-2}
Zirconium (40)	Zr 95		6×10^{-4}
	Zr 97		2×10^{-4}
Beta and/or gamma emitting radioactive material not listed above with half-life less than 3 years		1×10^{-10}	1×10^{-6}

(b) Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations listed in subsection (a) of this section, the activity stated shall be that of the parent isotope, and shall take into account the daughter isotopes.

(c) For purposes of the provisions of § 221.33 (8) of this Title (relating to exemption qualifications), where there is involved a combination of isotopes, the limit for the combination shall be derived in the following manner: Determine for each isotope in the product the ratio between the concentration present in the product and the exempt concentration, established in the table of subsection (a) of this section, for the specific isotope when not in combination. The sum of such ratios shall not exceed one (unity):

$$\frac{\text{Concentration of Isotope A in Product}}{\text{Exempt concentration of Isotope A}} + \frac{\text{Concentration of Isotope B in Product}}{\text{Exempt concentration of Isotope B}} = 1$$

§ 221.41. Address.

All communications and reports concerning the provisions of this Article and applications filed thereunder shall be addressed to the Office of Radiological Health, Pennsylvania Department of Environmental Resources, P.O. Box 2351, Harrisburg, Pennsylvania 17120.

TITLE 25. RULES AND REGULATIONS
PART I. DEPARTMENT OF ENVIRONMENTAL RESOURCES
Subpart D. ENVIRONMENTAL HEALTH AND SAFETY
ARTICLE V. RADIOLOGICAL HEALTH

CHAPTER 225. LICENSING OF RADIOACTIVE MATERIAL

Authority

The provisions of this Chapter 225 issued under act of January 28, 1966, P.L. 1625 § 301 (73 P.S. § 1301).

Source

The provisions of this Chapter 225 adopted February 1, 1972, effective March 1, 1972, 2 Pa. B. 212.

LICENSES

§ 225.1. General requirement.

No person shall use, manufacture, produce, transport, transfer, receive, acquire, possess or dispose of any radioactive material except as authorized in a license issued pursuant to the provisions of this Chapter, unless specifically exempted.

§ 225.2. Filing of application.

(a) Applications for licenses shall be filed on a form prescribed by the Department. Such application shall contain all pertinent information required to permit the Department to evaluate the requirements specified in this Chapter.

(b) The Department may at any time require further information to enable it to determine whether to grant, modify, deny or revoke a license.

(c) Each application shall be signed by the applicant or a person authorized by the applicant.

(d) Applications and other documents submitted to the Department may be made available for public inspection, except that the Department may withhold any document or part thereof from public inspection if requested by the applicant and if disclosure of its contents is not required in the public interest and would adversely affect the interest of a person concerned. If the Department denies the specific request of an applicant to withhold information from public inspection, the Department shall give the applicant the opportunity to withdraw his application.

§ 225.3. Approval.

A license application shall be approved if the Department determines that the following conditions are met:

(1) The applicant is qualified by training and experience to use the material in question for the purposes requested in accordance with the provisions of this Article.

(2) The proposed equipment, facilities and procedures are adequate.

(3) The issuance of the license shall not constitute a significant risk to the health and safety of the public.

(4) The applicant satisfies all applicable requirements in this Chapter.

§ 225.4. Issuance.

Upon a determination that an applicant meets the requirements of this Article, a license shall be issued containing such conditions and limitations as are needed to protect the public health and safety as determined by the Department.

§ 225.5. Terms and conditions.

(a) Each license issued pursuant to this Chapter shall be subject to all the provisions of the act and to all rules, regulations and orders of the Department.

(b) Neither the license nor any right under the license shall be assigned or otherwise transferred without the approval of the Department.

§ 225.6. Expiration.

Except as provided in § 225.7 of this Title (relating to renewal), each license shall expire on the day, month and year stated therein.

§ 225.7. Renewal.

(a) Applications for renewal of licenses shall be filed in accordance with § 225.2 of this Title (relating to filing of applications).

(b) If a renewal application is filed prior to 30 days before the expiration of a license, the existing license shall not expire until definitive notice has been given by the Department of its action on the renewal license. Similar provisions shall apply to new license applications incorporating other licenses.

§ 225.8. Amendment at request of licensee.

Applications for amendment of a license shall be filed in accordance with § 225.2 of this Title (relating to filing of applications).

§ 225.9. Modification, revocation and termination.

(a) The terms and conditions of all licenses shall be subject to amendment, revision or modification, or the license may be suspended or revoked by reason of amendments to the act, or by reason of rules, regulations and orders issued by the Department.

(b) Any license may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application or any statement of fact required under provisions of the act, or because of conditions revealed by the application or statement of fact or any report, record or inspection or other means which would warrant the Department to refuse to grant a license on an original application, or for violation of or failure to observe any of the terms and conditions of the act, or the license, or of any rule, regulation or order of the Department.

(c) Except in cases of willful violation of these regulations or those cases in which the public health, interest, or safety requires otherwise, no license shall be modified, suspended, or revoked unless, prior to the institution of proceedings thereto, facts or conduct which may warrant the action shall have been called to the attention of the licensee in writing and the licensee shall have been accorded an opportunity to demonstrate or achieve compliance with all lawful requirements.

(d) The Department may terminate a license upon request submitted by the licensee to the Department in writing.

RESPONSIBILITIES OF LICENSEES

§ 225.21. Records.

Each licensee shall keep records relating to the receipt, storage, transfer and disposal of licensed radioactive materials.

§ 225.22. Transfer of material.

No licensee may transfer radioactive material except to:

(1) a person licensed or otherwise authorized to receive such material by the

Department, the U.S. Atomic Energy Commission or any agreement state;

(2) the U.S. Atomic Energy Commission;

(3) the Department, with the specific approval of the Department; and

(4) a person exempt from this Chapter to the extent permitted under such exception.

§ 225.23. Reciprocal recognition of licenses.

(a) Subject to the provisions of this Chapter, any out-of-State person who possesses a license issued by the U.S. Atomic Energy Commission or any agreement state, other than the Commonwealth, may conduct the activities authorized in the license within this Commonwealth for a period not in excess of 20 days in any period of 12 consecutive months without obtaining a license from the Department, provided that the following conditions are met;

(1) The license shall not limit the activity to specified installations or locations.

(2) The out-of-State licensee shall notify the Department in writing at least two days prior to engaging in such activity. Such notification shall indicate the location, period and type of proposed possessions and use within this Commonwealth, and shall be accompanied by a copy of the license. If, for a specific case, the two day period would impose an undue hardship on the out-of-State licensee, he may, upon application to the Department, obtain permission to proceed sooner.

(3) The out-of-State licensee shall comply with all applicable regulations of the Department and with all the terms and conditions of his license, except any such terms and conditions which may be inconsistent with applicable regulations of the Department.

(4) The out-of-State licensee shall supply such other information as the Department may request.

(b) Notwithstanding the provisions of subsection (a) of this section any person who holds a license issued by the U.S. Atomic Energy Commission or an agreement state authorizing the manufacture, transfer, installation or servicing of devices described in § 225.64 of this Title (relating to other devices), may transfer, install and service such devices in this Commonwealth subject to the following conditions:

(1) Licensees shall file a report with the Department within 30 days after the end of each calendar quarter in which any device is transferred to, installed or relocated in this Commonwealth. The report shall identify each recipient by name and address, the type of device transferred or installed and the quantity and type of radioactive material contained in the device.

(2) The device shall have been manufactured, labeled, installed and serviced in accordance with applicable provisions of the specific license or equivalent licensing document issued to such person by the U.S. Atomic Energy Commission or an agreement state.

(3) Licensees shall assure that any labels required to be affixed to the device under regulations of the authority which licensed manufacture of the device bear the statement: "Removal of this label is prohibited."

(4) Licensees shall furnish to each person to whom they transfer a device or on whose premises they install a device a copy of the requirements contained in § 225.64 of this Title (relating to other devices).

(c) The Department may withdraw, limit, or qualify its acceptance of any license issued by another agency, or any product distributed pursuant to a license, upon determining that the action is necessary in order to prevent undue hazard to public health and safety or property.

SPECIAL LICENSE REQUIREMENTS

§ 225.31. Human use.

(a) *Individual physician license.* In addition to the requirements set forth in § 225.3 of this Title (relating to license approval), this license shall be issued only if the applicant has access to a hospital possessing adequate facilities to hospitalize and monitor the applicant's radioactive patients whenever it is advisable. The applicant shall have

experience in the handling and administration of radioactive materials and, where applicable, in the clinical management of patients to whom radioactive materials have been administered.

(b) *Institutional license.* In addition to the requirements set forth in § 225.3 of this Title (relating to licensed approval), a license shall be issued to an institution only if the following conditions are met:

(1) The applicant institution shall have appointed a human use committee of at least three members to evaluate all proposals for research, diagnostic and therapeutic use of radioactive materials within that institution.

(2) The applicant institution shall possess adequate facilities for handling of radioactive materials and for clinical care of patients to whom radioactive materials have been administered.

(3) The physician designated on the application as the individual user shall have substantial experience in the handling and administration of radioactive materials and, where applicable, the clinical management of patients.

(4) If the application is for a license to use unspecified quantities or multiple types of radioactive material, the applicant's staff shall have substantial experience with a variety of radioactive materials for a variety of human uses.

§ 225.32. Distribution of devices.

In addition to the requirements set forth in § 225.3 of this Title (relating to license approval), a license to distribute certain devices of the types enumerated in § 225.64 of this Title (relating to other devices) to persons exempt from licensing, shall be issued only if the following conditions are met:

(1) The applicant shall submit sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling, proposed uses and potential hazards of the device to provide reasonable assurance that:

(i) the radioactive material contained in the device shall not be lost;

(ii) no individual shall receive a radiation exposure to a major portion of his body in excess of 0.5 rem in a year under ordinary circumstances of use;

(iii) the device may be safely operated by individuals not having training in radiation protection; and

(iv) the radioactive material within the device shall not be accessible to unauthorized individuals.

(2) The applicant shall indicate those instructions and precautions which may be necessary to assure safe operations of the device. Such instructions and precautions shall be contained on labels bearing the statement: "Removal of this label is prohibited."

(3) If the applicant desires that the device be tested for proper operation of the on-off mechanism and indicator, if any, and for leakage of radioactive material, subsequent to the initial tests required by § 225.64 (a)(6)(ii) of this Title (relating to other devices), at intervals longer than six months but not exceeding three years, he shall include in his application sufficient information to demonstrate that such longer interval is justified by performance characteristics of the device or similar devices, and by design features which have a significant bearing on the probability or consequences of leakage of radioactive material from the device.

(4) The applicant shall agree to report to the Department all transfers within thirty (30) days after the end of each calendar quarter. Transfer reports shall identify each person by name and address, the type of device transferred and the quantity and type of radioactive material involved.

(5) The applicant shall agree to furnish to each person in this Commonwealth to whom he transfers a device a copy of the requirements contained in § 225.64 of this Title (relating to other devices).

§ 225.33. Industrial radiography.

In addition to the requirements set forth in § 225.3 of this Title (relating to license approval), a license for the use of sealed sources in industrial radiography shall be issued only if the following conditions exist:

(1) The applicant has an adequate program for training radiographers and radiographers' assistants and submits to the Department for approval a schedule or description of such program which specifies the:

(i) Initial, periodic and on-the-job training;

(ii) Means used by the licensee to determine the radiographer's knowledge and understanding of and ability to comply with the Department's regulations and the operating and emergency procedures of the applicant; and

(ii) Means to be used by the licensee to determine the radiographers' assistant's knowledge and understanding of and ability to comply with the operating and emergency procedures of the applicant.

(2) The applicant submits to the Department a description of his overall organization structure pertaining to the radiography program, including specific delegations of authority and responsibility for operation of the program.

(3) The applicant has established and submits to the Department satisfactory written operating and emergency procedures covering the requirements of § 233.42 of this Title (relating to operating and emergency procedures).

(4) The applicant has an adequate internal inspection or other control system to assure that license provisions, regulations and operating and emergency procedures are followed.

(5) The applicant who desires to conduct his own sealed source leak tests has established adequate procedures to be followed and submits to the Department a description of such procedures, including:

(i) instrumentation to be used;

(ii) method of performing tests, such as, points on equipment to be smeared and method of taking smear; and

(iii) pertinent experience of the person who will perform the tests.

§ 225.34. Radioactive materials for use in processing.

(a) In addition to the requirements set forth in § 225.3 of this Title (relating to license approval), a license for radioactive material for use in processing for distribution to other authorized persons shall be issued only if the following conditions are met:

(1) The applicant's staff had adequate experience in the use of radionuclides for processing and distribution.

(2) The applicant has appointed a radiation safety officer who shall administer the radiation safety program.

(b) Authority to transfer possession or control by the manufacturer, processor or producer of any equipment, device, commodity or other product containing source, by-product or special nuclear material intended for use by persons exempt from licensing requirements may be obtained only from the U.S. Atomic Energy Commission, Division of Licensing and Regulation, Washington, D.C. 20545.

§ 225.35. Introduction into exempt products.

(a) In addition to the requirements set forth in § 225.3 of this Title (relating to license approval), a license authorizing the introduction of radioactive material into a product or material owned by, or in possession of, the licensee or another, to be transferred to persons exempt under the provisions of § 221.33 (8) of this Title (relating to exemption qualifications), shall be issued only if the following conditions are met:

(1) The applicant shall submit to the Department:

(i) a description of the product or material into which the radioactive material will be introduced;

(ii) the intended use of the radioactive material and of the product or material into which it is introduced;

(iii) the method of introduction;

(iv) the initial concentration of the radioactive material in the product or material;

(v) the control methods used to assure that no more than the specified concentration is introduced into the product or material;

(vi) the estimated time interval between introduction and transfer of the product or material; and

(vii) the estimated concentration or quantity of radioactive material in the product or material at the time of transfer.

(2) The applicant shall provide reasonable assurance to the Department that the concentration of the radioactive material at the time of transfer shall not exceed the limits in § 221.35 of this Title (relating to exempt concentrations); that such limits are not likely to be exceeded; that the product or material is not likely to be inhaled by, ingested by, or applied to, humans; and that the use of lower concentrations or quantities is not feasible.

(b) Each person licensed under the provisions of this section shall file an annual report with the Department, describing the type and quantity of radioactive material introduced into each product or material, and the name and address of the owner of such product and material.

§ 225.36. Radium in timepieces or timepiece hands or dials.

(a) In addition to the requirements set forth in § 225.3 of this Title (relating to license approval), a license to apply radium to timepieces or timepiece hands or dials in quantities not exceeding those listed in § 221.33 (10) of this Title (relating to timepieces or timepiece hands or dials) except pocket watches, shall be issued only if the following conditions are met:

(1) The applicant shall submit sufficient information regarding the product pertinent to evaluation of the potential radiation exposure, including:

(i) chemical and physical form and maximum quantity of radium in each product;

(ii) details of construction and design of each product;

(iii) details of the method of incorporation and binding of the radium in the product;

(iv) procedures for and results of prototype testing to demonstrate that the material shall not become detached from the product and that the radium shall not be released to the environment under the most severe conditions likely to be encountered in normal use of the product;

(v) quality control procedures to be followed in the fabrication of production lots of the product to demonstrate that the product will meet the specifications established by the Department for such product; and

(vi) any additional information, including experimental studies and tests, required by the Department to facilitate determination of the safety of the product.

(2) The Department shall determine that:

(i) the method of incorporation and binding of the radium in the product is such that the radioactive material shall not be released or be removed from the product under the most severe conditions which are likely to be encountered in normal use and handling; and

(ii) the product has been subjected to and meets the requirements of the prototype tests.

(b) Each person licensed under the provisions of subsection (a) of this section shall:

(1) maintain quality control in the manufacture of the part or product, or the installation of the part into the product;

(2) subject production lots to such quality control tests as may be required as a condition of the lisense issued under this section; and

(3) visually inspect each device in production lots and reject any device which has an observable physical defect that may affect containment of radium.

LICENSES OF BROAD SCOPE

§ 225.41. Type A license.

Type A licenses shall authorize receipt, acquisition, possession, use and transfer of any chemical or physical form of the radioactive material specified in the license, but

not exceeding quantities specified in the license, for any authorized purpose. The quantities specified shall usually be in the multicurie range.

§ 225.42. Type B license.

Type B licenses shall authorize receipt, acquisition, possession, use and transfer of any chemical or physical form of radioactive material specified in Table I in § 225.55 of this Title (relating to quantities of radioactive materials) for any authorized purpose. The possession limit for a Type B broad license, if only one radionuclide is possessed thereunder, shall be the quantity specified for that radionuclide in Column I of such Table I. If two or more radionuclides are possessed under a Type B license, the possession limit for each shall be determined as follows:

(1) For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in Column I of Table I for that radionuclide.

(2) The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

§ 225.43. Type C license.

Type C licenses shall authorize receipt, acquisition, possession, use and transfer of any chemical or physical form of radioactive material specified in Table I in § 225.55 of this Title (relating to quantities of radioactive materials), for any authorized purpose. The possession limit, if only one radionuclide is possessed, shall be the quantity specified for that radionuclide in Column II of such Table I. If two or more radionuclides are possessed, the possession limit shall be determined as follows:

(1) For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in Column II of such Table I for that radionuclide.

(2) The sum of the ratios for all radionuclides possessed under the license shall not exceed unity.

BROAD LICENSE APPLICATIONS AND RESTRICTIONS

§ 225.51. Type A application.

An application for a Type A license of broad scope shall be approved if the following conditions are met:

(1) The applicant shall satisfy the general requirements specified in § 225.3 of this Title (relating to license approval).

(2) The applicant shall have engaged in a reasonable number of activities involving the use of radioactive material.

(3) The applicant shall have established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting and management review that are necessary to assure safe operations, including:

(i) the establishment of a radiation safety committee composed of such persons as a radiation safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive materials;

(ii) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection and who is available for service and assistance on radiation safety matters; and

(iii) the establishment of appropriate administrative procedures to assure control of procurement and use of radioactive material; completion of safety evaluations of proposed uses of radioactive material which takes into consideration matters such as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and review, approval and recording by the radiation safety committee of safety evaluation of proposed uses prior to use of the radioactive material.

§ 225.52. Type B application.

An application for a Type B license of broad scope shall be approved if the following conditions are met:

(1) The applicant shall satisfy the general requirements specified in § 225.3 of this Title (relating to license approval).

(2) The applicant shall have established administrative controls and provisions relating to organization and management, procedures, record keeping, material control and accounting and management review that is necessary to assure safe operations, including:

(i) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection and who is available for advice and assistance on radiation safety matters; and

(ii) the establishment of appropriate admininstrative procedures to assure control of procurement and use of radioactive material; completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures; and review, approval, and recording by the radiological safety officer of safety evaluations of proposed uses prior to use of the radioactive material.

§ 225.53. Type C application.

An application for a Type C license of broad scope shall be approved if the following conditions are met:

(1) The applicant shall satisfy the general requirements specified in § 225.3 of this Title (relating to license approval).

(2) The applicant shall submit a statement that radioactive material shall be used only by, or under the direct supervision of, individuals who have received:

(i) a college degree at the Bachelor level, or equivalent training in the physical or biological sciences, or in engineering;

(ii) at least 40 hours of training and experience in the safe handling of radioactive materials, and in the characteristics of ionizing radiation, units of radiation, dose and quantities, radiation detection instrumentation, and biological hazards of exposure to radiation, and biological hazards of exposure to radiation appropriate to the type and forms of radioactive material to be used.

(3) The applicant shall have established administrative controls and provisions relating to procurement of radioactive material, procedures, recordkeeping, material control and accounting, and management review necessary to assure safe operations.

§ 225.54. License restriction.

Licenses of broad scope shall be subject to the following conditions:

(1) Persons holding broad scope licenses shall not:

(i) conduct tracer studies in the environment involving direct release of radioactive material;

(ii) receive, acquire, own, possess, use or transfer devices containing 100,000 curies or more of radioactive material in sealed sources used for irradiation of materials;

(iii) conduct activities for which a specific license issued by the Department under § 225.3 of this Title (relating to license approval) is required; or

(iv) add or cause the addition of radioactive material to any food, beverage, cosmetic, drug, or other product designed for ingestion or inhalation by, or application to, a human being.

(2) Each Type A license of broad scope issued under this Chapter shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety committee.

(3) Each Type B license of broad scope issued under this Chapter shall be

subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiological safety officer.

(4) Each Type C license of broad scope issued under this Chapter shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals who satisfy the requirements of § 225.53 of this Title (relating to Type C applications).

§ 225.55. Quanities of radioactive materials.

For the purpose of determining certain permissible quantities of radioactive materials, the following table shall be used:

Table I

Radioactive material	column I - curies	column II - curies
Antimony-122	1	0.01
Antimony-124	1	0.01
Antimony-125	1	0.01
Arsenic-73	10	0.1
Arsenic-74	1	0.01
Arsenic-76	1	0.01
Arsenic-77	10	0.1
Barium-131	10	0.1
Barium-140	1	0.01
Beryllium-7	10	0.1
Bismuth-210	0.1	0.001
Bromine-82	10	0.1
Cadmium-109	1	0.01
Cadmium-115m	1	0.01
Cadmium-115	10	0.1
Calcium-45	1	0.01
Calcium-47	10	0.1
Carbon-14	100	1.0
Cerium-141	10	0.1
Cerium-143	10	0.1
Cerium-144	0.1	0.001
Cesium-131	100	1.0
Cesium-134m	100	1.0
Cesium-134	0.1	0.001
Cesium-135	1	0.01
Cesium-136	10	0.1
Cesium-137	0.1	0.001
Chlorine-36	1	0.01
Chlorine-38	100	1.0
Chromium-51	100	1.0
Cobalt-57	10	0.1
Cobalt-58m	100	1.0
Cobalt-58	1	0.01
Cobalt-60	0.1	0.001
Copper-64	10	0.1
Dysprosium-165	100	1.0
Dysprosium-166	10	0.1
Erbium-169	10	0.1
Erbium-171	10	0.1
Europium-152 9.2 h	10	0.1
Europium-152 13 y	0.1	0.001

Table I

Radioactive material	column I - curies	column II - curies
Europium-154	0.1	0.001
Europium-155	1	0.01
Fluorine-18	100	1.0
Gadolinium-153	1	0.01
Gadolinium-159	10	0.1
Gallium-72	10	0.1
Germanium-71	100	1.0
Gold-198	10	0.1
Gold-199	10	0.1
Hafnium-181	1	0.01
Holmium-166	10	0.1
Hydrogen-3	100	1.0
Indium-113m	100	1.0
Indium-114m	1	0.01
Indium-115m	100	1.0
Indium-115	1	0.01
Iodine-125	0.1	0.001
Iodine-126	0.1	0.001
Iodine-129	0.1	0.001
Iodine-131	0.1	0.001
Iodine-132	10	0.1
Iodine-133	1	0.01
Iodine-134	10	0.1
Iodine-135	1	0.01
Iridium-192	1	0.01
Iridium-194	10	0.1
Iron-55	10	0.1
Iron-59	1	0.01
Krypton-85	100	1.0
Krypton-87	10	0.1
Lanthanum-140	1	0.01
Lutetium-177	10	0.1
Manganese-52	1	0.01
Manganese-54	1	0.01
Manganese-56	10	0.1
Mercury-197m	10	0.1
Mercury-197	10	0.1
Mercury-203	1	0.01
Molybdenum-99	10	0.1
Neodymium-147	10	0.1
Neodymium-149	10	0.1
Nickel-59	10	0.1
Nickel-63	1	0.01
Nickel-65	10	0.1
Niobium-93m	1	0.01
Niobium-95	1	0.01
Niobium-97	100	1.0
Osmium-185	1	0.01
Osmium-191m	100	1.0
Osmium-191	10	0.1
Osmium-193	10	0.1
Palladium-103	10	0.1
Palladium-109	10	0.1
Phosphorus-32	1	0.01
Platinum-191	10	0.1
Platinum-193m	100	1.0

Table I

Radioactive material	column I - curies	column II - curies
Platinum-193	10	0.1
Platinum-197m	100	1.0
Platinum-197	10	0.1
Polonium-210	0.01	0.0001
Potassium-42	1	0.01
Praseodymium-142	10	0.1
Praseodymium-143	10	0.1
Promethium-147	1	0.01
Promethium-149	10	0.1
Rhenium-186	10	0.1
Rhenium-188	10	0.1
Rhodium-103m	1,000	10.0
Rhodium-105	10	0.1
Rubidium-86	1	0.01
Rubidium-87	1	0.01
Ruthenium-97	100	1.0
Ruthenium-103	1	0.01
Ruthenium-105	10	0.1
Ruthenium-106	0.1	0.001
Samarium-151	1	0.01
Samarium-153	10	0.1
Scandium-46	1	0.01
Scandium-47	10	0.1
Scandium-48	1	0.01
Selenium-75	1	0.01
Silicon-31	10	0.1
Silver-105	1	0.01
Silver-110m	0.1	0.001
Silver-111	10	0.1
Sodium-22	0.1	0.001
Sodium-24	1	0.01
Strontium-85m	1,000	10.0
Strontium-85	1	0.01
Strontium-89	1	0.01
Strontium-90	0.01	0.0001
Strontium-91	10	0.1
Strontium-92	10	0.1
Sulphur-35	10	0.1
Tantalum-182	1	0.01
Technetium-96	10	0.1
Technetium-97m	10	0.1
Technetium-97	10	0.1
Technetium-99m	100	1.0
Technetium-99	1	0.01
Tellurium-125m	1	0.01
Tellurium-127m	1	0.01
Tellurium-127	10	0.1
Tellurium-129m	1	0.01
Tellurium-129	100	1.0
Tellurium-131m	10	0.1
Tellurium-132	1	0.01
Terbium-160	1	0.01
Thallium-200	10	0.1
Thallium-201	10	0.1
Thallium-202	10	0.1
Thallium-204	1	0.01
Thulium-170	1	0.01

Table I

Radioactive material	column I - curies	column II - curies
Thulium-171	1	0.01
Tin-113	1	0.01
Tin-125	1	0.01
Tungsten-181	1	0.01
Tungsten-185	1	0.01
Tungsten-187	10	0.1
Vanadium-48	1	0.01
Xenon-131m	1,000	10.0
Xenon-133	100	1.0
Xenon-135	100	1.0
Ytterbium-175	10	0.1
Yttrium-90	1	0.01
Yttrium-91	1	0.01
Yttrium-92	10	0.1
Yttrium-93	1	0.01
Zinc-65	1	0.01
Zinc-69m	10	0.1
Zinc-69	100	1.0
Zirconium-93	1	0.01
Zirconium-95	1	0.01
Zirconium-97	1	0.01
Any radioactive material not listed above except special nuclear materials and alpha emitters.	0.1	0.001

EXEMPTIONS FROM LICENSING

§ 225.61. General.

(a) The use of radioactive material in this Commonwealth pursuant to a license issued by the U.S. Atomic Energy Commission shall be exempt from the licensing requirements of this Chapter.

(b) The sources, uses, kinds of sources, or kinds of users set forth in the provisions of § § 225.62 - 225.65 of this Title (relating to exemptions) shall be exempt from the requirements of a license under this Chapter, provided the persons using those devices comply with the specific requirements for each particular source. The manufacturing or assembly, however, of such devices shall not be exempt from licensing.

§ 225.62. Aircraft devices.

The receipt, acquisition, possession and use of tritium in instrument dials and other safety devices for use in aircraft and promethium-147 in safety devices other than instrument dials for use in aircraft shall be exempt, if the following conditions are met:

(1) Each device shall contain not more than ten curies of tritium or 300 millicuries of promethium-147.

(2) Each device shall have been manufactured, assembled or imported in accordance with a license issued in accordance with § 225.3 of this Title (relating to license approval), or an equivalent document issued by the U.S. Atomic Energy Commission or an agreement state.

(3) There shall have been no disassembly or repair of the device.

(4) Each person who receives, acquires, possesses or uses the device shall report losses or incidents as required by § § 227.92 and 227.93 of this Title (relating to reports of loss and notification of incidents).

§ 225.63. Ice detection devices.

The receipt, acquisition, possession, use and transfer of strontium-90 contained in ice detection devices shall be exempt, if the following conditions are met:

(1) Each device shall contain not more than 50 microcuries of strontium-90.

(2) Each device shall have been manufactured or imported under a license issued in accordance with § 225.3 of this Title (relating to license approval), or an equivalent document issued by the U.S. Atomic Energy Commission or an agreement state.

(3) Each person who receives, acquires, possesses, uses or transfers strontium-90 in ice detection devices shall:

(i) Upon occurrence of observable damage, such as a bend or crack or discoloration from overheating to the device, discontinue use or withhold transfer of the device until it has been inspected, tested for leakage and repaired by a person holding a license to manufacture or service such devices; or shall dispose of the device pursuant to the provisions of § § 227.81 - 227.85 of this Title (relating to waste disposal).

(ii) assure that all labels affixed to the device at the time of receipt, and which bear a statement which prohibits removal of the labels, shall be maintained thereon;

(iii) report loss and incidents as required by § § 227.92 and 227.93 of this Title (relating to reports of loss and notification of incidents); and

(iv) not maufacture, assemble, disassemble or repair ice detection devices containing strontium-90.

§ 225.64. Other devices.

(a) The acquisition, receipt, possession and use of radioactive material when contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation leakage, qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere, when such devices are manufactured in accordance with the specifications contained in a specific license issued in accordance with § 225.3 of this Title (relating to license approval), or an equivalent document issued by the U.S. Atomic Energy Commission or an agreement state authorizing distribution, if the following conditions are met:

(1) Such devices are labeled in accordance with the provisions of the license.

(2) Such devices bear a label containing the following or a substantially similar statement:

"The receipt, possession, use, and transfer of this device, Model _____, Serial No. _____, are subject to a general license or the equivalent and the regulations of the United States Atomic Energy Commission or of a state with which the Atomic Energy Commission has entered into an agreement for the exercise of regulatory authority. Removal of this label is prohibited.

CAUTION - RADIOACTIVE MATERIAL

_____
(Name of Supplier)"

(3) The model, serial number, and name of supplier may be omitted from the label if they are elsewhere specified in the labeling affixed to the device.

(4) If required by the label such devices shall be installed on the premises by a person authorized to install such devices under a license. This requirement shall not apply while the devices are held in storage in the original shipping container pending installation by a specific licensee.

(5) All labels affixed to the device at the time of receipt and bearing the

statement, "Removal of this [illegible]s prohibited," shall be maintained thereon and compliance with all instructions on such labels shall be assured.

(6) Persons who receive, acquire, possess or use a device pursuant to this section shall be subject to the following additional restrictions:

(i) Devices shall not be transferred, abandoned, relocated or disposed of, except by transfer to a person duly authorized to receive such device by a license.

(ii) The device shall be tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at the time of installation of the device or replacement of the radioactive material on the premises of the person. Thereafter tests shall be made at no longer than six month intervals or at such longer intervals as specified by the manufacturer on the label, but not to exceed three years. Devices containing only tritium need not be tested for any purpose, and devices containing only krypton need not be tested for leakage.

(iii) All required tests and all other required services involving the radioactive material, its shielding and containment, shall be performed by the supplier or other person duly licensed by the Department, the U.S. Atomic Energy Commission or any agreement state, to manufacture, install or service such devices.

(iv) Records shall be maintained of all tests performed on the device as required under this section, including the dates and results of the tests and the names and addresses of the persons conducting the tests.

(v) Upon the occurrence of a failure of or damage to, or any indication of a possible failure of or damage to, the shielding or containment of the radioactive material or the on-off mechanism or indicator, operation of the device shall be immediately suspended until it has been repaired by a person holding a license issued by the Department, the U.S. Atomic Energy Commission, or any agreement state to manufacture, install or service such devices, or dispose of by transfer to a person holding a license to receive the radioactive material contained in the device.

(vi) Loss and incidents shall be reported as required by § § 227.92 and 227.93 of this Title (relating to reports of loss and incidents).

(b) The acquisition, receipt, possession, use and transfer of radioactive material incorporated in the following devices or equipment which have been manufactured, tested and labeled by the manufacturer in accordance with a license issued by the Department, the U.S. Atomic Energy Commission, or any agreement state, and authorizing distribution under the requirements of this paragraph or its equivalent shall be exempt:

(1) *Static elimination device.* Devices designed for use as static eliminators which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 500 microcuries of polonium-210 per device.

(2) *Light meter.* Devices designed for use in measuring or determining light intensity which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 200 microcuries of strontium-90 per device.

(3) *Ion generating tube.* Devices designed for ionization of air which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 500 microcuries of polonium-210 per device or consisting of a total of not more than 50 millicuries of hydrogen-3 (tritium) per device.

TITLE 25. RULES AND REGULATIONS
PART I. DEPARTMENT OF ENVIRONMENTAL RESOURCES
Subpart D. ENVIRONMENTAL HEALTH AND SAFETY
ARTICLE V. RADIOLOGICAL HEALTH

CHAPTER 227. STANDARDS FOR CONTROL OF RADIATION EXPOSURE

Authority

The provisions of this Chapter 227 issued under act of January 28, 1966, P.L. 1625 § 301 (73 P.S. § 1301).

Source

The provisions of this Chapter 227 adopted February 1, 1972, effective March 1, 1972, 2 Pa. B. 212.

GENERAL PROVISIONS

§ 227.1. Scope.

The provisions of this Chapter shall apply to all persons who use, manufacture, produce, transport, transfer, receive, acquire, possess or dispose of any radiation source, unless specifically exempted in § § 221.31 - 221.35 of this Title (relating to exemptions in general).

§ 227.2. Responsibilities of licensees and registrants.

(a) Each licensee or registrant shall have a radiation safety program.

(b) Each licensee or registrant shall designate an individual as radiation safety officer to head the radiation safety program.

(c) The radiation safety program shall include at least the following:

(1) Informing individuals working in or frequenting any portion of a restricted area of the occurrence of radiation or radiation sources in those portions of the restricted area.

(2) Instruction of such individuals concerning the attendant radiation and contamination hazards and safe working practices.

(3) Provision of necessary auxiliary devices as may be necessary for such individuals and the adequate instruction in their use.

(4) Informing such individuals in the applicable provisions of these regulations for the protection of personnel from exposure to radiation or radioactive materials.

(5) Notification of appropriate officials of the existence of any conditions or situations that may become a hazard under special or unusual circumstances, for instance, during a fire.

(d) Each licensee or registrant shall make available a current copy of this Article and a copy of the current license or registration for examination by employes upon request.

(e) Each licensee or registrant shall conspicuously post the Department's "Notice to Employes" in a sufficient number of places in every establishment where employes are employed in activities licensed or registered, pursuant to Chapters 223 and 225 of this Title (relating to registration and licensing) by the Department, to permit employes working in or frequenting any portion of a restricted area to observe a copy on the way to or from their place of employment.

(f) Copies of "Notice to Employes" may be obtained from the Department upon written request.

EXPOSURE TO RADIATION IN RESTRICTED AREAS

§ 227.11. Maximum exposure limits.

Except as provided in § 227.12 of this Title (relating to exceptions to limits), no licensee or registrant shall possess, use, receive or transfer sources of radiation in such a manner as to cause any individual in a restricted area to receive, from all sources of radiation in the licensee's or registrant's possession, a dose in excess of the limits specified in the following table:

Part of Body	Rems per Calendar Quarter	Rems per Year
Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads.	3	5
Hands and forearms; feet and ankles.	25	75
Skin of whole body.	10	30

§ 227.12. Exceptions to limits.

A licensee or registrant may permit an individual in a restricted area to receive a dose to the whole body greater than that permitted under § 227.11 of this Title (relating to maximum exposure limits), if the following conditions are met:

(1) During any calendar quarter the dose of the whole body from sources of radiation in the licensee's or registrant's possession shall not exceed three rems.

(2) The dose of the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed five (N-18) rems where "N" equals the individual's age in years at his last birthday.

(3) The licensee or registrant shall have determined the individuals's accumulated occupational dose to the whole body on Department Form H 702.002 or on a clear and legible record containing all the information required in that form and has otherwise complied with the requirements of § 227.13 of this Title (relating to Form H 702.002). "Dose to the whole body" shall include any dose to the whole body, gonads, active blood-forming organs, head and trunk, or lens of eye.

§ 227.13. Form H 702.002.

Before permitting any individual in a restricted area to receive exposure to radiation in excess of the limits specified in § 227.11 of this Title (relating to maximum exposure limits) each licensee or registrant shall do the following:

(1) Obtain a certificate on Department Form H 702.002 or on a clear and legible record containing all the information required on that form, signed by the individual, showing each period of time the individual received an occupational dose of radiation.

(2) Calculate on Department Form H 702.002, in accordance with the instructions appearing therein, or on a clear and legible record containing all the information required on that form, the previously accumulated occupational dose received by the individual and the additional dose allowed for that individual under § 227.12 (2) of this Title (relating to exceptions to limits).

(3) Make a reasonable effort to obtain reports of the individual's previously accumulated occupational dose. For each period for which the licensee obtains such reports, he shall use the dose shown in the report in preparing the form.

(4) In any case where a licensee is unable to obtain reports of the individual's occupational dose for a previous complete calendar quarter, it shall be assumed that the

individual has received the occupational dose specified in whichever of the following columns apply:

Part of Body	Column I - Assumed Dose in Rems for Calendar Quarters Prior to January 1, 1961	Column II - Assumed Dose in Rems for Calendar Quarters Beginning on or After January 1, 1961
Whole body, gonads, active blood-forming organs, head and trunk, lens of eye	3.75	1.25

(5) The licensee or registrant shall retain and preserve records used in preparing Department Form H 702.002. If calculation of the individual's accumulated occupational dose for all periods prior to January 1, 1961, yields a result higher than the applicable accumulated dose value for the individual as of that date, as specified in § 227.12 of this Title (relating to exceptions to limits), the excess may be disregarded.

EXPOSURE TO CONCENTRATIONS OF RADIOACTIVE MATERIAL IN RESTRICTED AREAS

§ 227.21. General.

(a) No licensee shall possess, use, receive, or transfer radioactive material in such a manner as to cause an individual in a restricted area to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Table A of § 227.25 of this Title (relating to table of concentrations). As used in this Chapter, exposed shall mean that an individual is present in an airborne concentration.

(b) No allowance shall be made for the use of protective clothing or equipment, or particle size, except as authorized by the Department, pursuant to § 227.23 of this Title (relating to protective clothing).

§ 227.22. Use of table.

(a) The limits given in Table A in § 227.25 of this Title (relating to table of concentrations) shall be based upon exposure to the concentrations specified for 40 hours in any period of seven consecutive days.

(b) In any such period where the number of hours of exposure is less than 40, the limits specified in the table may be increased proportionately.

(c) In any such period where the number of hours of exposure is greater than 40, the limits specified in the table shall be decreased proportionately.

§ 227.23. Protective clothing.

(a) Except as authorized by the Department pursuant to this section, no allowance shall be made for particle size or the use of protective clothing or equipment in determining whether an individual is exposed to an airborne concentration in excess of the limits specified in Table A of § 227.25 of this Title (relating to table of concentrations).

(b) The Department may authorize a licensee to expose an individual in a restricted area to airborne concentrations in excess of the limits specified in Table A upon receipt by the Department of an application demonstrating that the concentration is composed in whole or in part of particles of such size that the particles are not respirable and that the individual will not inhale the concentrations in excess of the limits established in Table A. Each application under this Chapter shall include an analysis of particle sizes in the concentrations and a description of the methods used in determining the particle sizes.

(c) The Department may authorize a licensee to expose an individual in a restricted area to airborne concentrations in excess of the limits specified in Table A upon receipt of an application demonstrating that the individual will wear appropriate protective equipment and that the individual will not inhale, ingest, or absorb quantities of radioactive material in excess of those which might otherwise be permitted under this Chapter for individuals in restricted areas during a 40 hour week. Each application under this Chapter shall contain the following information:

(1) A description of the protective equipment to be employed, including the efficiency of the equipment for the material involved.

(2) Procedures for the fitting, maintenance and cleaning of the protective equipment.

(3) Procedures governing the use of the protective equipment, including supervisory procedures and length of time the equipment shall be used by the individuals in each work week. The proposed periods for use of the equipment by any individual shall not be of such duration as would discourage observance by the individual of the proposed procedure.

(4) The average concentrations present in the areas occupied by individuals.

§ 227.24. Exposure of minors.

(a) No licensee or registrant shall possess, use or transfer sources of radiation in such a manner as to cause any individual within a restricted area, who is under 18 years of age, to receive in any period of one calendar quarter from all sources of radiation in such licensee's or registrant's possession a dose in excess of 10% of the limits specified in § 227.11 of this Title (relating to maximum exposure limits).

(b) No licensee shall possess, use or transfer radioactive material in such a manner as to cause any individual within a restricted area, who is under 18 years of age, to be exposed to airborne radioactive material in an average concentration in excess of the limits specified in Table B in § 227.25 of this Title (relating to table of concentrations). For purposes of this subsection, concentrations may be averaged over periods not greater than a week.

(c) The provisions of § 227.23 of this Title (relating to protective clothing), shall apply to exposures subject to subsection (b).

§ 227.25. Table of concentrations.

(a) For the purpose of this Chapter, the following table of concentrations in air and water above natural background shall be used:

Element (atomic number)	Isotope	soluble (S) insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
Actinium (89)	Ac 227	S	2×10^{-12}	6×10^{-5}	8×10^{-14}	2×10^{-6}
		I	3×10^{-11}	9×10^{-3}	9×10^{-13}	3×10^{-4}
	Ac 228	S	8×10^{-8}	3×10^{-3}	3×10^{-9}	9×10^{-5}
		I	2×10^{-8}	3×10^{-3}	6×10^{-10}	9×10^{-5}
Americium (95)	Am 241	S	6×10^{-12}	1×10^{-4}	2×10^{-13}	4×10^{-6}
		I	1×10^{-11}	8×10^{-4}	4×10^{-12}	2×10^{-5}
	Am 242 m	S	6×10^{-12}	1×10^{-4}	2×10^{-13}	4×10^{-6}
		I	3×10^{-10}	3×10^{-3}	9×10^{-12}	9×10^{-5}
	Am 242	S	4×10^{-8}	4×10^{-3}	1×10^{-9}	1×10^{-4}
		I	5×10^{-8}	4×10^{-3}	2×10^{-9}	1×10^{-4}
	Am 243	S	6×10^{-12}	1×10^{-4}	2×10^{-13}	4×10^{-6}
		I	1×10^{-10}	8×10^{-4}	4×10^{-12}	3×10^{-5}
	Am 244	S	4×10^{-6}	1×10^{-1}	1×10^{-7}	5×10^{-3}
		I	2×10^{-5}	1×10^{-1}	8×10^{-7}	5×10^{-3}

Element (atomic number)	Isotope soluble (S)		insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
Antimony (51)	Sb	122	S	2×10^{-7}	8×10^{-4}	6×10^{-9}	3×10^{-5}
			I	1×10^{-7}	8×10^{-4}	5×10^{-9}	3×10^{-5}
	Sb	124	S	2×10^{-7}	7×10^{-4}	5×10^{-9}	2×10^{-5}
			I	2×10^{-8}	7×10^{-4}	7×10^{-10}	2×10^{-5}
	Sb	125	S	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	3×10^{-8}	3×10^{-3}	9×10^{-10}	1×10^{-4}
Argon (18)	A	37	Sub	6×10^{-3}	——	1×10^{-4}	——
	A	41	Sub	2×10^{-6}	——	4×10^{-8}	——
Arsenic (33)	As	73	S	2×10^{-6}	1×10^{-2}	7×10^{-8}	5×10^{-4}
			I	4×10^{-7}	1×10^{-2}	1×10^{-8}	5×10^{-4}
	As	74	S	3×10^{-7}	2×10^{-3}	1×10^{-8}	5×10^{-5}
			I	1×10^{-7}	2×10^{-3}	4×10^{-9}	5×10^{-5}
	As	76	S	1×10^{-7}	6×10^{-4}	4×10^{-9}	2×10^{-5}
			I	1×10^{-7}	6×10^{-4}	3×10^{-9}	2×10^{-5}
	As	77	S	5×10^{-7}	2×10^{-3}	2×10^{-8}	8×10^{-5}
			I	4×10^{-7}	2×10^{-3}	1×10^{-8}	8×10^{-5}
Astatine (85)	At	211	S	7×10^{-9}	5×10^{-5}	2×10^{-10}	2×10^{-6}
			I	3×10^{-8}	2×10^{-3}	1×10^{-9}	7×10^{-5}
Barium (56)	Ba	131	S	1×10^{-6}	5×10^{-3}	4×10^{-8}	2×10^{-4}
			I	4×10^{-7}	5×10^{-3}	1×10^{-8}	2×10^{-4}
	Ba	140	S	1×10^{-7}	8×10^{-4}	4×10^{-9}	3×10^{-5}
			I	4×10^{-8}	7×10^{-4}	1×10^{-9}	2×10^{-5}
Berkelium (97)	Bk	249	S	9×10^{-10}	2×10^{-2}	3×10^{-11}	6×10^{-4}
			I	1×10^{-7}	2×10^{-2}	4×10^{-9}	6×10^{-4}
	Bk	250	S	1×10^{-7}	6×10^{-3}	5×10^{-9}	2×10^{-4}
			I	1×10^{-6}	6×10^{-3}	4×10^{-8}	2×10^{-4}
Beryllium (4)	Be	7	S	6×10^{-6}	5×10^{-2}	2×10^{-7}	2×10^{-3}
			I	1×10^{-6}	5×10^{-2}	4×10^{-8}	2×10^{-3}
Bismuth (83)	Bi	206	S	2×10^{-7}	1×10^{-3}	6×10^{-9}	4×10^{-5}
			I	1×10^{-7}	1×10^{-3}	5×10^{-9}	4×10^{-5}
	Bi	207	S	2×10^{-7}	2×10^{-3}	6×10^{-9}	6×10^{-5}
			I	1×10^{-8}	2×10^{-3}	5×10^{-10}	6×10^{-5}
	Bi	210	S	6×10^{-9}	1×10^{-3}	2×10^{-10}	4×10^{-5}
			I	6×10^{-9}	1×10^{-3}	2×10^{-10}	4×10^{-5}
	Bi	212	S	1×10^{-7}	1×10^{-2}	3×10^{-9}	4×10^{-4}
			I	2×10^{-7}	1×10^{-2}	7×10^{-9}	4×10^{-4}
Bromine (35)	Br	82	S	1×10^{-6}	8×10^{-3}	4×10^{-8}	3×10^{-4}
			I	2×10^{-7}	1×10^{-3}	6×10^{-9}	4×10^{-5}
Cadmium (48)	Cd	109	S	5×10^{-8}	5×10^{-3}	2×10^{-9}	2×10^{-4}
			I	7×10^{-8}	5×10^{-3}	3×10^{-9}	2×10^{-4}
	Cd	115 m	S	4×10^{-8}	7×10^{-4}	1×10^{-9}	3×10^{-5}
			I	4×10^{-8}	7×10^{-4}	1×10^{-9}	3×10^{-5}
	Cd	115	S	2×10^{-7}	1×10^{-3}	8×10^{-9}	3×10^{-5}
			I	2×10^{-7}	1×10^{-3}	6×10^{-9}	4×10^{-5}
Calcium (20)	Ca	45	S	3×10^{-8}	3×10^{-4}	1×10^{-9}	9×10^{-6}
			I	1×10^{-7}	5×10^{-3}	4×10^{-9}	2×10^{-4}
	Ca	47	S	2×10^{-7}	1×10^{-3}	6×10^{-9}	5×10^{-5}
			I	2×10^{-7}	1×10^{-3}	6×10^{-9}	3×10^{-5}
Californium (98)	Cf	249	S	2×10^{-12}	1×10^{-4}	5×10^{-14}	4×10^{-6}
			I	1×10^{-10}	7×10^{-4}	3×10^{-12}	2×10^{-5}
	Cf	250	S	5×10^{-12}	4×10^{-4}	2×10^{-13}	1×10^{-5}
			I	1×10^{-10}	7×10^{-4}	3×10^{-12}	3×10^{-5}
	Cf	251	S	2×10^{-12}	1×10^{-4}	6×10^{-14}	4×10^{-6}
			I	1×10^{-10}	8×10^{-4}	3×10^{-12}	3×10^{-5}
	Cf	252	S	2×10^{-11}	7×10^{-4}	7×10^{-13}	2×10^{-5}

Element (atomic number)	Isotope soluble (S)		insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
			I	1×10^{-10}	7×10^{-4}	4×10^{-12}	2×10^{-5}
	Cf	253	S	8×10^{-10}	4×10^{-3}	3×10^{-11}	1×10^{-4}
			I	8×10^{-10}	4×10^{-3}	3×10^{-11}	1×10^{-4}
	Cf	254	S	5×10^{-12}	4×10^{-6}	2×10^{-13}	1×10^{-7}
			I	5×10^{-12}	4×10^{-6}	2×10^{-13}	1×10^{-7}
Carbon (6)	C	14	S	4×10^{-6}	2×10^{-2}	1×10^{-7}	8×10^{-4}
	(CO_2)		Sub	5×10^{-5}	——	1×10^{-6}	——
Cerium (58)	Ce	141	S	4×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-5}
			I	2×10^{-7}	3×10^{-3}	5×10^{-9}	9×10^{-5}
	Ce	143	S	3×10^{-7}	1×10^{-3}	9×10^{-9}	4×10^{-5}
			I	2×10^{-7}	1×10^{-3}	7×10^{-9}	4×10^{-5}
	Ce	144	S	1×10^{-8}	3×10^{-4}	3×10^{-10}	1×10^{-5}
			I	6×10^{-9}	3×10^{-4}	2×10^{-10}	1×10^{-5}
Cesium (55)	Cs	131	S	1×10^{-5}	7×10^{-2}	4×10^{-7}	2×10^{-3}
			I	3×10^{-6}	3×10^{-2}	1×10^{-7}	9×10^{-4}
	Cs	134 m	S	4×10^{-5}	2×10^{-1}	1×10^{-6}	6×10^{-3}
			I	6×10^{-6}	3×10^{-2}	2×10^{-7}	1×10^{-3}
	Cs	134	S	4×10^{-8}	3×10^{-4}	1×10^{-9}	9×10^{-6}
			I	1×10^{-8}	1×10^{-3}	4×10^{-10}	4×10^{-5}
	Cs	135	S	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	9×10^{-8}	7×10^{-3}	3×10^{-9}	2×10^{-4}
	Cs	136	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	9×10^{-5}
			I	2×10^{-7}	2×10^{-3}	6×10^{-9}	6×10^{-5}
	Cs	137	S	6×10^{-8}	4×10^{-4}	2×10^{-9}	2×10^{-5}
			I	1×10^{-8}	1×10^{-3}	5×10^{-10}	4×10^{-5}
Chlorine (17)	Cl	36	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	8×10^{-5}
			I	2×10^{-8}	2×10^{-3}	8×10^{-10}	6×10^{-5}
	Cl	38	S	3×10^{-6}	1×10^{-2}	9×10^{-8}	4×10^{-4}
			I	2×10^{-6}	1×10^{-2}	7×10^{-8}	4×10^{-4}
Chromium (24)	Cr	51	S	1×10^{-5}	5×10^{-2}	4×10^{-7}	2×10^{-3}
			I	2×10^{-6}	5×10^{-2}	8×10^{-8}	2×10^{-3}
Cobalt (27)	Co	57	S	3×10^{-6}	2×10^{-2}	1×10^{-7}	5×10^{-4}
			I	2×10^{-7}	1×10^{-2}	6×10^{-9}	4×10^{-4}
	Co	58 m	S	2×10^{-5}	8×10^{-2}	6×10^{-7}	3×10^{-3}
			I	9×10^{-6}	6×10^{-2}	3×10^{-7}	2×10^{-3}
	Co	58	S	8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
			I	5×10^{-8}	3×10^{-3}	2×10^{-9}	9×10^{-5}
	Co	60	S	3×10^{-7}	1×10^{-3}	1×10^{-8}	5×10^{-5}
			I	9×10^{-9}	1×10^{-3}	3×10^{-10}	3×10^{-5}
Copper (29)	Cu	64	S	2×10^{-6}	1×10^{-2}	7×10^{-8}	3×10^{-4}
			I	1×10^{-6}	6×10^{-3}	4×10^{-8}	2×10^{-4}
Curium (96)	Cm	242	S	1×10^{-10}	7×10^{-4}	4×10^{-12}	2×10^{-5}
			I	2×10^{-10}	7×10^{-4}	6×10^{-12}	3×10^{-5}
	Cm	243	S	6×10^{-12}	1×10^{-4}	2×10^{-13}	5×10^{-6}
			I	1×10^{-10}	7×10^{-4}	3×10^{-12}	2×10^{-5}
	Cm	244	S	9×10^{-12}	2×10^{-4}	3×10^{-13}	7×10^{-6}
			I	1×10^{-10}	8×10^{-4}	3×10^{-12}	3×10^{-5}
	Cm	245	S	5×10^{-12}	1×10^{-4}	2×10^{-13}	4×10^{-6}
			I	1×10^{-10}	8×10^{-4}	4×10^{-12}	3×10^{-5}
	Cm	246	S	5×10^{-12}	1×10^{-4}	2×10^{-13}	4×10^{-6}
			I	1×10^{-10}	8×10^{-4}	4×10^{-12}	3×10^{-5}
	Cm	247	S	5×10^{-12}	1×10^{-4}	2×10^{-13}	4×10^{-6}
			I	1×10^{-10}	6×10^{-4}	4×10^{-12}	2×10^{-5}
	Cm	248	S	6×10^{-13}	1×10^{-5}	2×10^{-14}	4×10^{-7}
			I	1×10^{-11}	4×10^{-5}	4×10^{-13}	1×10^{-6}
	Cm	249	S	1×10^{-5}	6×10^{-2}	4×10^{-7}	2×10^{-3}

Element (atomic number)	Isotope soluble (S) insoluble (I)		TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
		I	1×10^{-5}	6×10^{-2}	4×10^{-7}	2×10^{-3}
Dysprosium (66)	Dy 165	S	3×10^{-6}	1×10^{-2}	9×10^{-8}	4×10^{-4}
		I	2×10^{-6}	1×10^{-2}	7×10^{-8}	4×10^{-4}
	Dy 166	S	2×10^{-7}	1×10^{-3}	8×10^{-9}	4×10^{-5}
		I	2×10^{-7}	1×10^{-3}	7×10^{-9}	4×10^{-5}
Einsteinium (99)	Es 253	S	8×10^{-10}	7×10^{-4}	3×10^{-11}	2×10^{-5}
		I	6×10^{-10}	7×10^{-4}	2×10^{-11}	2×10^{-5}
	Es 254 m	S	5×10^{-9}	5×10^{-4}	2×10^{-10}	2×10^{-5}
		I	6×10^{-9}	5×10^{-4}	2×10^{-10}	2×10^{-5}
	Es 254	S	2×10^{-11}	4×10^{-4}	6×10^{-13}	1×10^{-5}
		I	1×10^{-10}	4×10^{-4}	4×10^{-12}	1×10^{-5}
	Es 255	S	5×10^{-10}	8×10^{-4}	2×10^{-11}	3×10^{-5}
		I	4×10^{-10}	8×10^{-4}	1×10^{-11}	3×10^{-5}
Erbium (68)	Er 169	S	6×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-5}
		I	4×10^{-7}	3×10^{-3}	1×10^{-8}	9×10^{-5}
	Er 171	S	7×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
		I	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
Europium (63)	Eu 152 (T/2=9.2 hrs)	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
		I	3×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
	Eu 152 (T/2=13 yrs)	S	1×10^{-8}	2×10^{-3}	4×10^{-10}	8×10^{-5}
		I	2×10^{-8}	2×10^{-3}	6×10^{-10}	8×10^{-5}
	Eu 154	S	4×10^{-9}	6×10^{-4}	1×10^{-10}	2×10^{-5}
		I	7×10^{-9}	6×10^{-4}	2×10^{-10}	2×10^{-5}
	Eu 155	S	9×10^{-8}	6×10^{-3}	3×10^{-9}	2×10^{-4}
		I	7×10^{-8}	6×10^{-3}	3×10^{-9}	2×10^{-4}
Fermium (100)	Fm 254	S	6×10^{-8}	4×10^{-3}	2×10^{-9}	1×10^{-4}
		I	7×10^{-8}	4×10^{-3}	2×10^{-9}	1×10^{-4}
	Fm 255	S	2×10^{-8}	1×10^{-3}	6×10^{-10}	3×10^{-5}
		I	1×10^{-8}	1×10^{-3}	4×10^{-10}	3×10^{-5}
	Fm 256	S	3×10^{-9}	3×10^{-5}	1×10^{-10}	9×10^{-7}
		I	2×10^{-9}	3×10^{-5}	6×10^{-11}	9×10^{-7}
Fluorine (9)	F 18	S	5×10^{-6}	2×10^{-2}	2×10^{-7}	8×10^{-4}
		I	3×10^{-6}	1×10^{-2}	9×10^{-8}	5×10^{-4}
Gadolinium (64)	Gd 153	S	2×10^{-7}	6×10^{-3}	8×10^{-9}	2×10^{-4}
		I	9×10^{-8}	6×10^{-3}	3×10^{-9}	2×10^{-4}
	Gd 159	S	5×10^{-7}	2×10^{-3}	2×10^{-8}	8×10^{-5}
		I	4×10^{-7}	2×10^{-3}	1×10^{-8}	8×10^{-5}
Gallium (31)	Ga 72	S	2×10^{-7}	1×10^{-3}	8×10^{-9}	4×10^{-5}
		I	2×10^{-7}	1×10^{-3}	6×10^{-9}	4×10^{-5}
Germanium (32)	Ge 71	S	1×10^{-5}	5×10^{-2}	4×10^{-7}	2×10^{-3}
		I	6×10^{-6}	5×10^{-2}	2×10^{-7}	2×10^{-3}
Gold (79)	Au 196	S	1×10^{-6}	5×10^{-3}	4×10^{-8}	2×10^{-4}
		I	6×10^{-7}	4×10^{-3}	2×10^{-8}	1×10^{-4}
	Au 198	S	3×10^{-7}	2×10^{-3}	1×10^{-8}	5×10^{-5}
		I	2×10^{-7}	1×10^{-3}	8×10^{-9}	5×10^{-5}
	Au 199	S	1×10^{-6}	5×10^{-3}	4×10^{-8}	2×10^{-4}
		I	8×10^{-7}	4×10^{-3}	3×10^{-8}	2×10^{-4}
Hafnium (72)	Hf 181	S	4×10^{-8}	2×10^{-3}	1×10^{-9}	7×10^{-5}
		I	7×10^{-8}	2×10^{-3}	3×10^{-9}	7×10^{-5}
Holmium (67)	Ho 166	S	2×10^{-7}	9×10^{-4}	7×10^{-9}	3×10^{-5}
		I	2×10^{-7}	9×10^{-4}	6×10^{-9}	3×10^{-5}
Hydrogen (1)	H 3	S	5×10^{-6}	1×10^{-1}	2×10^{-7}	3×10^{-3}
		I	5×10^{-6}	1×10^{-1}	2×10^{-7}	3×10^{-3}
		Sub	2×10^{-3}	——	4×10^{-5}	——
Indium (49)	In 113 m	S	8×10^{-6}	4×10^{-2}	3×10^{-7}	1×10^{-3}

Element (atomic number)	Isotope soluble (S) insoluble (I)				TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
				I	7×10^{-6}	4×10^{-2}	2×10^{-7}	1×10^{-3}
	In	114	m	S	1×10^{-7}	5×10^{-4}	4×10^{-9}	2×10^{-5}
				I	2×10^{-8}	5×10^{-4}	7×10^{-10}	2×10^{-5}
	In	115	m	S	2×10^{-6}	1×10^{-2}	8×10^{-8}	4×10^{-4}
				I	2×10^{-6}	1×10^{-2}	6×10^{-8}	4×10^{-4}
	In	115		S	2×10^{-7}	3×10^{-3}	9×10^{-9}	9×10^{-5}
				I	3×10^{-8}	3×10^{-3}	1×10^{-9}	9×10^{-5}
Iodine (53)	I	125		S	5×10^{-9}	4×10^{-5}	8×10^{-11}	2×10^{-7}
				I	2×10^{-7}	6×10^{-3}	6×10^{-9}	2×10^{-4}
	I	126		S	8×10^{-9}	5×10^{-5}	9×10^{-11}	3×10^{-7}
				I	3×10^{-7}	3×10^{-3}	1×10^{-8}	9×10^{-5}
	I	129		S	2×10^{-9}	1×10^{-5}	2×10^{-11}	6×10^{-8}
				I	7×10^{-8}	6×10^{-3}	2×10^{-9}	2×10^{-4}
	I	131		S	9×10^{-9}	6×10^{-5}	1×10^{-10}	3×10^{-7}
				I	3×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
	I	132		S	2×10^{-7}	2×10^{-3}	3×10^{-9}	8×10^{-6}
				I	9×10^{-7}	5×10^{-3}	3×10^{-8}	2×10^{-4}
	I	133		S	3×10^{-8}	2×10^{-4}	4×10^{-10}	1×10^{-6}
				I	2×10^{-7}	1×10^{-3}	7×10^{-9}	4×10^{-5}
	I	134		S	5×10^{-7}	4×10^{-3}	6×10^{-9}	2×10^{-5}
				I	3×10^{-6}	2×10^{-2}	1×10^{-7}	6×10^{-4}
	I	135		S	1×10^{-7}	7×10^{-4}	1×10^{-9}	4×10^{-6}
				I	4×10^{-7}	2×10^{-3}	1×10^{-8}	7×10^{-5}
Iridium (77)	Ir	190		S	1×10^{-6}	6×10^{-3}	4×10^{-8}	2×10^{-4}
				I	4×10^{-7}	5×10^{-3}	1×10^{-8}	2×10^{-4}
	Ir	192		S	1×10^{-7}	1×10^{-3}	4×10^{-9}	4×10^{-5}
				I	3×10^{-8}	1×10^{-3}	9×10^{-10}	4×10^{-5}
	Ir	194		S	2×10^{-7}	1×10^{-3}	8×10^{-9}	3×10^{-5}
				I	2×10^{-7}	9×10^{-4}	5×10^{-9}	3×10^{-5}
Iron (26)	Fe	55		S	9×10^{-7}	2×10^{-2}	3×10^{-8}	8×10^{-4}
				I	1×10^{-6}	7×10^{-2}	3×10^{-8}	2×10^{-3}
	Fe	59		S	1×10^{-7}	2×10^{-3}	5×10^{-9}	6×10^{-5}
				I	5×10^{-8}	2×10^{-3}	2×10^{-9}	5×10^{-5}
Krypton (36)	Kr	85	m	Sub	6×10^{-6}	——	1×10^{-7}	——
	Kr	85		Sub	1×10^{-5}	——	3×10^{-7}	——
	Kr	87		Sub	1×10^{-6}	——	2×10^{-8}	——
	Kr	88		Sub	1×10^{-6}	——	2×10^{-8}	——
Lanthanum (57)	La	140		S	2×10^{-7}	7×10^{-4}	5×10^{-9}	2×10^{-5}
				I	1×10^{-7}	7×10^{-4}	4×10^{-9}	2×10^{-5}
Lead (82)	Pb	203		S	3×10^{-6}	1×10^{-2}	9×10^{-8}	4×10^{-4}
				I	2×10^{-6}	1×10^{-2}	6×10^{-8}	4×10^{-4}
	Pb	210		S	1×10^{-10}	4×10^{-6}	4×10^{-12}	1×10^{-7}
				I	2×10^{-10}	5×10^{-3}	8×10^{-12}	2×10^{-4}
	Pb	212		S	2×10^{-8}	6×10^{-4}	6×10^{-10}	2×10^{-5}
				I	2×10^{-8}	5×10^{-4}	7×10^{-10}	2×10^{-5}
Lutetium (71)	Lu	177		S	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
				I	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
Manganese (25)	Mn	52		S	2×10^{-7}	1×10^{-3}	7×10^{-9}	3×10^{-5}
				I	1×10^{-7}	9×10^{-4}	5×10^{-9}	3×10^{-5}
	Mn	54		S	4×10^{-7}	4×10^{-3}	1×10^{-9}	1×10^{-4}
				I	4×10^{-8}	3×10^{-3}	1×10^{-9}	1×10^{-4}
	Mn	56		S	8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
				I	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
Mercury (80)	Hg	197	m	S	7×10^{-7}	6×10^{-3}	3×10^{-8}	2×10^{-4}
				I	8×10^{-7}	5×10^{-3}	3×10^{-8}	2×10^{-4}
	Hg	197		S	1×10^{-6}	9×10^{-3}	4×10^{-8}	3×10^{-4}

Element (atomic number)	Isotope			soluble (S)	insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
					I	3×10^{-6}	1×10^{-2}	9×10^{-8}	5×10^{-4}
	Hg	203		S		7×10^{-8}	5×10^{-4}	2×10^{-9}	2×10^{-5}
					I	1×10^{-7}	3×10^{-3}	4×10^{-9}	1×10^{-4}
Molybdenum (42)	Mo	99		S		7×10^{-7}	5×10^{-3}	3×10^{-8}	2×10^{-4}
					I	2×10^{-7}	1×10^{-3}	7×10^{-9}	4×10^{-5}
Neodymium (60)	Nd	144		S		8×10^{-11}	2×10^{-3}	3×10^{-12}	7×10^{-5}
					I	3×10^{-10}	2×10^{-3}	1×10^{-11}	8×10^{-5}
	Nd	147		S		4×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
					I	2×10^{-7}	2×10^{-3}	8×10^{-9}	6×10^{-5}
	Nd	149		S		2×10^{-6}	8×10^{-3}	6×10^{-8}	3×10^{-4}
					I	1×10^{-6}	8×10^{-3}	5×10^{-8}	3×10^{-4}
Neptunium (93)	Np	237		S		4×10^{-12}	9×10^{-5}	1×10^{-13}	3×10^{-6}
					I	1×10^{-10}	9×10^{-4}	4×10^{-12}	3×10^{-5}
	Np	239		S		8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
					I	7×10^{-7}	4×10^{-3}	2×10^{-8}	1×10^{-4}
Nickel (28)	Ni	59		S		5×10^{-7}	6×10^{-3}	2×10^{-8}	2×10^{-4}
					I	8×10^{-7}	6×10^{-2}	3×10^{-8}	2×10^{-3}
	Ni	63		S		6×10^{-8}	8×10^{-4}	2×10^{-9}	3×10^{-5}
					I	3×10^{-7}	2×10^{-2}	1×10^{-8}	7×10^{-4}
	Ni	65		S		9×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
					I	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
Niobium (Columbium) (41)	Nb	93	m	S		1×10^{-7}	1×10^{-2}	4×10^{-9}	4×10^{-4}
					I	2×10^{-7}	1×10^{-2}	5×10^{-9}	4×10^{-4}
	Nb	95		S		5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
					I	1×10^{-7}	3×10^{-3}	3×10^{-9}	1×10^{-4}
	Nb	97		S		6×10^{-6}	3×10^{-2}	2×10^{-7}	9×10^{-4}
					I	5×10^{-6}	3×10^{-2}	2×10^{-7}	9×10^{-4}
Osmium (76)	Os	185		S		5×10^{-7}	2×10^{-3}	2×10^{-8}	7×10^{-5}
					I	5×10^{-8}	2×10^{-3}	2×10^{-9}	7×10^{-5}
	Os	191	m	S		2×10^{-5}	7×10^{-2}	6×10^{-7}	3×10^{-3}
					I	9×10^{-6}	7×10^{-2}	3×10^{-7}	2×10^{-3}
	Os	191		S		1×10^{-6}	5×10^{-3}	4×10^{-8}	2×10^{-4}
					I	4×10^{-7}	5×10^{-3}	1×10^{-8}	2×10^{-4}
	Os	193		S		4×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
					I	3×10^{-7}	2×10^{-3}	9×10^{-9}	5×10^{-5}
Palladium (46)	Pd	103		S		1×10^{-6}	1×10^{-2}	5×10^{-8}	3×10^{-4}
					I	7×10^{-7}	8×10^{-3}	3×10^{-8}	3×10^{-4}
	Pd	109		S		6×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-5}
					I	4×10^{-7}	2×10^{-3}	1×10^{-8}	7×10^{-5}
Phosphorus (15)	P	32		S		7×10^{-8}	5×10^{-4}	2×10^{-9}	2×10^{-5}
					I	8×10^{-8}	7×10^{-4}	3×10^{-9}	2×10^{-5}
Platinum (78)	Pt	191		S		8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
					I	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
	Pt	193	m	S		7×10^{-6}	3×10^{-2}	2×10^{-7}	1×10^{-3}
					I	5×10^{-6}	3×10^{-2}	2×10^{-7}	1×10^{-3}
	Pt	197	m	S		6×10^{-6}	3×10^{-2}	2×10^{-7}	1×10^{-3}
					I	5×10^{-6}	3×10^{-2}	2×10^{-7}	9×10^{-4}
	Pt	197		S		8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
					I	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
Plutonium (94)	Pu	238		S		2×10^{-12}	1×10^{-4}	7×10^{-14}	5×10^{-6}
					I	3×10^{-11}	8×10^{-4}	1×10^{-12}	3×10^{-5}
	Pu	239		S		2×10^{-12}	1×10^{-4}	6×10^{-14}	5×10^{-6}
					I	4×10^{-11}	8×10^{-4}	1×10^{-12}	3×10^{-5}
	Pu	240		S		2×10^{-12}	1×10^{-4}	6×10^{-14}	5×10^{-6}
					I	4×10^{-11}	8×10^{-4}	1×10^{-12}	3×10^{-5}

Element (atomic number)	Isotope		soluble (S) insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
	Pu	241	S	9×10^{-11}	7×10^{-3}	3×10^{-12}	2×10^{-4}
			I	4×10^{-8}	4×10^{-2}	1×10^{-9}	1×10^{-3}
	Pu	242	S	2×10^{-12}	1×10^{-4}	6×10^{-14}	5×10^{-6}
			I	4×10^{-11}	9×10^{-4}	1×10^{-12}	3×10^{-5}
	Pu	243	S	2×10^{-6}	1×10^{-2}	6×10^{-8}	3×10^{-4}
			I	2×10^{-6}	1×10^{-2}	8×10^{-8}	3×10^{-4}
	Pu	244	S	2×10^{-12}	1×10^{-4}	6×10^{-14}	4×10^{-6}
			I	3×10^{-11}	3×10^{-4}	1×10^{-12}	1×10^{-5}
Polonium (84)	Po	210	S	5×10^{-10}	2×10^{-5}	2×10^{-11}	7×10^{-7}
			I	2×10^{-10}	8×10^{-4}	7×10^{-12}	3×10^{-5}
Potassium (19)	K	42	S	2×10^{-6}	9×10^{-3}	7×10^{-8}	3×10^{-4}
			I	1×10^{-7}	6×10^{-4}	4×10^{-9}	2×10^{-5}
Praseodymium (59)	Pr	142	S	2×10^{-7}	9×10^{-4}	7×10^{-9}	3×10^{-5}
			I	2×10^{-7}	9×10^{-4}	5×10^{-9}	3×10^{-5}
	Pr	143	S	3×10^{-7}	1×10^{-3}	1×10^{-8}	5×10^{-5}
			I	2×10^{-7}	1×10^{-3}	6×10^{-9}	5×10^{-5}
Promethium (61)	Pm	147	S	6×10^{-8}	6×10^{-3}	2×10^{-9}	2×10^{-4}
			I	1×10^{-7}	6×10^{-3}	3×10^{-9}	2×10^{-4}
	Pm	149	S	3×10^{-7}	1×10^{-3}	1×10^{-8}	4×10^{-5}
			I	2×10^{-7}	1×10^{-3}	8×10^{-9}	4×10^{-5}
Protoactinium (91)	Pa	230	S	2×10^{-9}	7×10^{-3}	6×10^{-11}	2×10^{-4}
			I	8×10^{-10}	7×10^{-3}	3×10^{-11}	2×10^{-4}
	Pa	231	S	1×10^{-12}	3×10^{-5}	4×10^{-14}	9×10^{-7}
			I	1×10^{-10}	8×10^{-4}	4×10^{-12}	2×10^{-5}
	Pa	233	S	6×10^{-7}	4×10^{-3}	2×10^{-8}	1×10^{-4}
			I	2×10^{-7}	3×10^{-3}	6×10^{-9}	1×10^{-4}
Radium (88)	Ra	223	S	2×10^{-9}	2×10^{-5}	6×10^{-11}	7×10^{-7}
			I	2×10^{-10}	1×10^{-4}	8×10^{-12}	4×10^{-6}
	Ra	224	S	5×10^{-9}	7×10^{-5}	2×10^{-10}	2×10^{-6}
			I	7×10^{-10}	2×10^{-4}	2×10^{-11}	5×10^{-6}
	Ra	226	S	3×10^{-11}	4×10^{-7}	3×10^{-12}	3×10^{-8}
			I	5×10^{-11}	9×10^{-4}	2×10^{-12}	3×10^{-5}
	Ra	228	S	7×10^{-11}	8×10^{-7}	2×10^{-12}	3×10^{-8}
			I	4×10^{-11}	7×10^{-4}	1×10^{-12}	3×10^{-5}
Radon (86)	Rn	220	S	3×10^{-7}	——	1×10^{-8}	——
	Rn	222	S	1×10^{-7}	——	3×10^{-9}	——
Rhenium (75)	Re	183	S	3×10^{-6}	2×10^{-2}	9×10^{-8}	6×10^{-4}
			I	2×10^{-7}	8×10^{-3}	5×10^{-9}	3×10^{-4}
	Re	186	S	6×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-5}
			I	2×10^{-7}	1×10^{-3}	8×10^{-9}	5×10^{-5}
	Re	187	S	9×10^{-6}	7×10^{-2}	3×10^{-7}	3×10^{-3}
			I	5×10^{-7}	4×10^{-2}	2×10^{-8}	2×10^{-3}
	Re	188	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
			I	2×10^{-7}	9×10^{-4}	6×10^{-9}	3×10^{-5}
Rhodium (45)	Rh	103 m	S	8×10^{-5}	4×10^{-1}	3×10^{-6}	1×10^{-2}
			I	6×10^{-5}	3×10^{-1}	2×10^{-6}	1×10^{-2}
	Rh	105	S	8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
			I	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
Rubidium (37)	Rb	86	S	3×10^{-7}	2×10^{-3}	1×10^{-8}	7×10^{-5}
			I	7×10^{-8}	7×10^{-4}	2×10^{-9}	2×10^{-5}
	Rb	87	S	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	7×10^{-8}	5×10^{-3}	2×10^{-9}	2×10^{-4}
Ruthenium (44)	Ru	97	S	2×10^{-6}	1×10^{-2}	8×10^{-8}	4×10^{-4}
			I	2×10^{-6}	1×10^{-2}	6×10^{-8}	3×10^{-4}

Element (atomic number)	Isotope soluble (S)		insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
	Ru	103	S	5×10^{-7}	2×10^{-3}	2×10^{-8}	8×10^{-5}
			I	8×10^{-8}	2×10^{-3}	3×10^{-9}	8×10^{-5}
	Ru	105	S	7×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	5×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
	Ru	106	S	8×10^{-8}	4×10^{-4}	3×10^{-9}	1×10^{-5}
			I	6×10^{-9}	3×10^{-4}	2×10^{-10}	1×10^{-5}
Samarium (62)	Sm	147	S	7×10^{-11}	2×10^{-3}	2×10^{-12}	6×10^{-5}
			I	3×10^{-10}	2×10^{-3}	9×10^{-12}	7×10^{-5}
	Sm	151	S	6×10^{-8}	1×10^{-2}	2×10^{-9}	4×10^{-4}
			I	1×10^{-7}	1×10^{-2}	5×10^{-9}	4×10^{-4}
	Sm	153	S	5×10^{-7}	2×10^{-3}	2×10^{-8}	8×10^{-5}
			I	4×10^{-7}	2×10^{-3}	1×10^{-8}	8×10^{-5}
Scandium (21)	Sc	46	S	2×10^{-7}	1×10^{-3}	8×10^{-9}	4×10^{-5}
			I	2×10^{-8}	1×10^{-3}	8×10^{-10}	4×10^{-5}
	Sc	47	S	6×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-5}
			I	5×10^{-7}	3×10^{-3}	2×10^{-8}	9×10^{-5}
	Sc	48	S	2×10^{-7}	8×10^{-4}	6×10^{-9}	3×10^{-5}
			I	1×10^{-7}	8×10^{-4}	5×10^{-9}	3×10^{-5}
Selenium (34)	Se	75	S	1×10^{-6}	9×10^{-3}	4×10^{-8}	3×10^{-4}
			I	1×10^{-7}	8×10^{-3}	4×10^{-9}	3×10^{-4}
Silicon (14)	Si	31	S	6×10^{-6}	3×10^{-2}	2×10^{-7}	9×10^{-4}
			I	1×10^{-6}	6×10^{-3}	3×10^{-8}	2×10^{-4}
Silver (47)	Ag	105	S	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	8×10^{-8}	3×10^{-3}	3×10^{-9}	1×10^{-4}
	Ag	110 m	S	2×10^{-7}	9×10^{-4}	7×10^{-9}	3×10^{-5}
			I	1×10^{-8}	9×10^{-4}	3×10^{-10}	3×10^{-5}
	Ag	111	S	3×10^{-7}	1×10^{-3}	1×10^{-8}	4×10^{-5}
			I	2×10^{-7}	1×10^{-3}	8×10^{-9}	4×10^{-5}
Sodium (11)	Na	22	S	2×10^{-7}	1×10^{-3}	6×10^{-9}	4×10^{-5}
			I	9×10^{-9}	9×10^{-4}	3×10^{-10}	3×10^{-5}
	Na	24	S	1×10^{-6}	6×10^{-3}	4×10^{-8}	2×10^{-4}
			I	1×10^{-7}	8×10^{-4}	5×10^{-9}	3×10^{-5}
Strontium (38)	Sr	85 m	S	4×10^{-5}	2×10^{-1}	1×10^{-6}	7×10^{-3}
			I	3×10^{-5}	2×10^{-1}	1×10^{-6}	7×10^{-3}
	Sr	85	S	2×10^{-7}	3×10^{-3}	8×10^{-9}	1×10^{-4}
			I	1×10^{-7}	5×10^{-3}	4×10^{-9}	2×10^{-4}
	Sr	89	S	3×10^{-8}	3×10^{-4}	3×10^{-10}	3×10^{-6}
			I	4×10^{-8}	8×10^{-4}	1×10^{-9}	3×10^{-5}
	Sr	90	S	1×10^{-9}	1×10^{-5}	3×10^{-11}	3×10^{-7}
			I	5×10^{-9}	1×10^{-3}	2×10^{-10}	4×10^{-5}
	Sr	91	S	4×10^{-7}	2×10^{-3}	2×10^{-8}	7×10^{-5}
			I	3×10^{-7}	1×10^{-3}	9×10^{-9}	5×10^{-5}
	Sr	92	S	4×10^{-7}	2×10^{-3}	2×10^{-8}	7×10^{-5}
			I	3×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
Sulfur (16)	S	35	S	3×10^{-7}	2×10^{-3}	9×10^{-9}	6×10^{-5}
			I	3×10^{-7}	8×10^{-3}	9×10^{-9}	3×10^{-4}
Tantalum (73)	Ta	182	S	4×10^{-8}	1×10^{-3}	1×10^{-9}	4×10^{-5}
			I	2×10^{-8}	1×10^{-3}	7×10^{-10}	4×10^{-5}
Technetium (43)	Tc	96 m	S	8×10^{-5}	4×10^{-1}	3×10^{-6}	1×10^{-2}
			I	3×10^{-5}	3×10^{-1}	1×10^{-6}	1×10^{-2}
	Tc	96	S	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	2×10^{-7}	1×10^{-3}	8×10^{-9}	5×10^{-5}
	Tc	97 m	S	2×10^{-6}	1×10^{-2}	8×10^{-8}	4×10^{-4}
			I	2×10^{-7}	5×10^{-3}	5×10^{-9}	2×10^{-4}

Element (atomic number)	Isotope soluble (S)		insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
	Tc	97	S	1×10^{-5}	5×10^{-2}	4×10^{-7}	2×10^{-3}
			I	3×10^{-7}	2×10^{-2}	1×10^{-8}	8×10^{-4}
	Tc	99 m	S	4×10^{-5}	2×10^{-1}	1×10^{-6}	6×10^{-3}
			I	1×10^{-5}	8×10^{-2}	5×10^{-7}	3×10^{-3}
	Tc	99	S	2×10^{-6}	1×10^{-2}	7×10^{-8}	3×10^{-4}
			I	6×10^{-8}	5×10^{-3}	2×10^{-9}	2×10^{-4}
Tellurium (52)	Te	125 m	S	4×10^{-7}	5×10^{-3}	1×10^{-8}	2×10^{-4}
			I	1×10^{-7}	3×10^{-3}	4×10^{-9}	1×10^{-4}
	Te	127 m	S	1×10^{-7}	2×10^{-3}	5×10^{-9}	6×10^{-5}
			I	4×10^{-8}	2×10^{-3}	1×10^{-9}	5×10^{-5}
	Te	127	S	2×10^{-6}	8×10^{-3}	6×10^{-8}	3×10^{-4}
			I	9×10^{-7}	5×10^{-3}	3×10^{-8}	2×10^{-4}
	Te	129 m	S	8×10^{-8}	1×10^{-3}	3×10^{-9}	3×10^{-5}
			I	3×10^{-8}	6×10^{-4}	1×10^{-9}	2×10^{-5}
	Te	129	S	5×10^{-6}	2×10^{-2}	2×10^{-7}	8×10^{-4}
			I	4×10^{-6}	2×10^{-2}	1×10^{-7}	8×10^{-4}
	Te	131 m	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
			I	2×10^{-7}	1×10^{-3}	6×10^{-9}	4×10^{-5}
	Te	132	S	2×10^{-7}	9×10^{-4}	7×10^{-9}	3×10^{-5}
			I	1×10^{-7}	6×10^{-4}	4×10^{-9}	2×10^{-5}
Terbium (65)	Tb	160	S	1×10^{-7}	1×10^{-3}	3×10^{-9}	4×10^{-5}
			I	3×10^{-8}	1×10^{-3}	1×10^{-9}	4×10^{-5}
Thallium (81)	Tl	200	S	3×10^{-6}	1×10^{-2}	9×10^{-8}	4×10^{-4}
			I	1×10^{-6}	7×10^{-3}	4×10^{-8}	2×10^{-4}
	Tl	201	S	2×10^{-6}	9×10^{-3}	7×10^{-8}	3×10^{-4}
			I	9×10^{-7}	5×10^{-3}	3×10^{-8}	2×10^{-4}
	Tl	202	S	8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
			I	2×10^{-7}	2×10^{-3}	8×10^{-9}	7×10^{-5}
	Tl	204	S	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	3×10^{-8}	2×10^{-3}	9×10^{-10}	6×10^{-5}
Thorium (90)	Th	228	S	9×10^{-12}	2×10^{-4}	3×10^{-13}	7×10^{-6}
			I	6×10^{-12}	4×10^{-4}	2×10^{-13}	1×10^{-5}
	Th	230	S	2×10^{-12}	5×10^{-5}	8×10^{-14}	2×10^{-6}
			I	1×10^{-11}	9×10^{-4}	3×10^{-13}	3×10^{-5}
	Th	232	S	3×10^{-11}	5×10^{-5}	1×10^{-12}	2×10^{-6}
			I	3×10^{-11}	1×10^{-3}	1×10^{-12}	4×10^{-5}
	Th	natural	S	3×10^{-11}	1×10^{-5}	1×10^{-12}	1×10^{-6}
			I	3×10^{-11}	3×10^{-4}	1×10^{-12}	1×10^{-5}
	Th	234	S	6×10^{-8}	5×10^{-4}	2×10^{-9}	2×10^{-5}
			I	3×10^{-8}	5×10^{-4}	1×10^{-9}	2×10^{-5}
Thulium (69)	Tm	170	S	4×10^{-8}	1×10^{-3}	1×10^{-9}	5×10^{-5}
			I	3×10^{-8}	1×10^{-3}	1×10^{-9}	5×10^{-5}
	Tm	171	S	1×10^{-7}	1×10^{-2}	4×10^{-9}	5×10^{-4}
			I	2×10^{-7}	1×10^{-2}	8×10^{-9}	5×10^{-4}
Tin (50)	Sn	113	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	9×10^{-5}
			I	5×10^{-8}	2×10^{-3}	2×10^{-9}	8×10^{-5}
	Sn	125	S	1×10^{-7}	5×10^{-4}	4×10^{-9}	2×10^{-5}
			I	8×10^{-8}	5×10^{-4}	3×10^{-9}	2×10^{-5}
Tungsten (Wolfram) (74)	W	181	S	2×10^{-6}	1×10^{-2}	8×10^{-8}	4×10^{-4}
			I	1×10^{-7}	1×10^{-2}	4×10^{-9}	3×10^{-4}
	W	185	S	8×10^{-7}	4×10^{-3}	3×10^{-8}	1×10^{-4}
			I	1×10^{-7}	3×10^{-3}	4×10^{-9}	1×10^{-4}
	W	187	S	4×10^{-7}	2×10^{-3}	2×10^{-8}	7×10^{-5}
			I	3×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}

Element (atomic number)	Isotope soluble (S)		insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
Uranium (92)	U	230	S	3×10^{-10}	1×10^{-4}	1×10^{-11}	5×10^{-6}
			I	1×10^{-10}	1×10^{-4}	4×10^{-12}	5×10^{-6}
	U	232	S	1×10^{-10}	8×10^{-4}	3×10^{-12}	3×10^{-5}
			I	3×10^{-11}	8×10^{-4}	9×10^{-13}	3×10^{-5}
	U	233	S	5×10^{-10}	9×10^{-4}	2×10^{-11}	3×10^{-5}
			I	1×10^{-10}	9×10^{-4}	4×10^{-12}	3×10^{-5}
	U	234	S	6×10^{-10}	9×10^{-4}	2×10^{-11}	3×10^{-5}
			I	1×10^{-10}	9×10^{-4}	4×10^{-12}	3×10^{-5}
	U	235	S	5×10^{-10}	8×10^{-4}	2×10^{-11}	3×10^{-5}
			I	1×10^{-10}	8×10^{-4}	4×10^{-12}	3×10^{-5}
	U	236	S	6×10^{-10}	1×10^{-3}	2×10^{-11}	3×10^{-5}
			I	1×10^{-10}	1×10^{-3}	4×10^{-12}	3×10^{-5}
	U	238	S	7×10^{-11}	1×10^{-3}	3×10^{-12}	4×10^{-5}
			I	1×10^{-10}	1×10^{-3}	5×10^{-12}	4×10^{-5}
	U	240	S	2×10^{-7}	1×10^{-3}	8×10^{-9}	3×10^{-5}
			I	2×10^{-7}	1×10^{-3}	6×10^{-9}	3×10^{-5}
	U	natural	S	7×10^{-11}	5×10^{-4}	3×10^{-12}	2×10^{-5}
			I	6×10^{-11}	5×10^{-4}	2×10^{-12}	2×10^{-5}
Vanadium (23)	V	48	S	2×10^{-7}	9×10^{-4}	6×10^{-9}	3×10^{-5}
			I	6×10^{-8}	8×10^{-4}	2×10^{-9}	3×10^{-5}
Xenon (54)	Xe	131 m	Sub	2×10^{-5}	——	4×10^{-7}	——
	Xe	133 m	Sub	1×10^{-5}	——	3×10^{-7}	——
	Xe	133	Sub	1×10^{-5}	——	3×10^{-7}	——
	Xe	135	Sub	4×10^{-6}	——	1×10^{-7}	——
Ytterbium (70)	Yb	175	S	7×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
			I	6×10^{-7}	3×10^{-3}	2×10^{-8}	1×10^{-4}
Yttrium (39)	Y	90	S	1×10^{-7}	6×10^{-4}	4×10^{-9}	2×10^{-5}
			I	1×10^{-7}	6×10^{-4}	3×10^{-9}	2×10^{-5}
	Y	91 m	S	2×10^{-5}	1×10^{-1}	8×10^{-7}	3×10^{-3}
			I	2×10^{-5}	1×10^{-1}	6×10^{-7}	3×10^{-3}
	Y	91	S	4×10^{-8}	8×10^{-4}	1×10^{-9}	3×10^{-5}
			I	3×10^{-8}	8×10^{-4}	1×10^{-9}	3×10^{-5}
	Y	92	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
			I	3×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
	Y	93	S	2×10^{-7}	8×10^{-4}	6×10^{-9}	3×10^{-5}
			I	1×10^{-7}	8×10^{-4}	5×10^{-9}	3×10^{-5}
Zinc (30)	Zn	65	S	1×10^{-7}	3×10^{-3}	4×10^{-9}	1×10^{-4}
			I	6×10^{-8}	5×10^{-3}	2×10^{-9}	2×10^{-4}
	Zn	69 m	S	4×10^{-7}	2×10^{-3}	1×10^{-8}	7×10^{-5}
			I	3×10^{-7}	2×10^{-3}	1×10^{-8}	6×10^{-5}
	Zn	69	S	7×10^{-6}	5×10^{-2}	2×10^{-7}	2×10^{-3}
			I	9×10^{-6}	5×10^{-2}	3×10^{-7}	2×10^{-3}
Zirconium (40)	Zr	93	S	1×10^{-7}	2×10^{-2}	4×10^{-9}	8×10^{-4}
			I	3×10^{-7}	2×10^{-2}	1×10^{-8}	8×10^{-4}
	Zr	95	S	1×10^{-7}	2×10^{-3}	4×10^{-9}	6×10^{-5}
			I	3×10^{-8}	2×10^{-3}	1×10^{-9}	6×10^{-5}
	Zr	97	S	1×10^{-7}	5×10^{-4}	4×10^{-9}	2×10^{-5}
			I	9×10^{-8}	5×10^{-4}	3×10^{-9}	2×10^{-5}
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than two hours.			Sub	1×10^{-6}	——	3×10^{-8}	——

Element (atomic number)	Isotope soluble (S)	Isotope insoluble (I)	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than two hours.			3×10^{-9}	9×10^{-5}	1×10^{-10}	3×10^{-6}
Any single radionuclide not listed above, which decays by alpha emission or spontaneous fission.			6×10^{-13}	4×10^{-7}	2×10^{-14}	3×10^{-8}

(b) The term "Sub," in the table shall mean that values given are for submersion in a semi-spherical infinite cloud of airborne material.

(c) In any case where there is a mixture in air or water of more than one radionuclide, the limiting values for purposes of this section shall be determined as follows:

(1) If the identity and concentration of each radionuclide in the mixture are known, the limiting values shall be derived as follows: Determine, for each radionuclide in the mixture, the ratio between the quantity present in the mixture and the limit otherwise established in subsection (a) for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed one (unity), as in the following example:

If radionuclides a, b, and c are present in concentrations C_a, C_b, and C_c, and if the applicable MPC's are MPC_a, and MPC_b, and MPC_c, respectively, then the concentrations shall be limited so that following relationship exists:

$$\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \frac{C_c}{MPC_c} \leq 1$$

(2) If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of subsection (a) shall be the following:

(i) For purposes of Column 1, Table A - 6×10^{-13} Ci/ml.

(ii) For purposes of Column 2, Table A - 4×10^{-7} Ci/ml.

(iii) For purposes of Column 1, Table B - 2×10^{-14} Ci/ml.

(iv) For purposes of Column 2, Table B - 3×10^{-8} Ci/ml.

(3) If any of the following conditions are met the corresponding values specified may be used in lieu of those specified in paragraph (2) of this subsection:

(i) If the identity of each radionuclide in the mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the concentration limit for the mixture shall be the limit specified in subsection (a) for the radionuclide in the mixture having the lowest concentration limit.

(ii) If the identity of each radionculide in the mixture is not known but it is known that certain radionuclides specified in subsection (a) are not present in the mixture, the concentration limit for the mixture is the lowest concentration limit specified in subsection (a) for any radionuclide which is not known to be absent from the mixture.

(iii) The following table may be used for determining MCP's for mixtures for the purposes of this paragraph:

Element and Isotope	TABLE A Column 1 Air (μCi/ml)	TABLE A Column 2 Water (μCi/ml)	TABLE B Column 1 Air (μCi/ml)	TABLE B Column 2 Water (μCi/ml)
If it is known that Sr-90, I-125, I-126 I-129, I-131, (I-133, Table B only), Pb-210, Po-210, At-211, Ra-223, Ra-224, Ra-226, Ac-227, Ra-228, Th-230, Pa-231, Th-232, Th-nat, Cm-248, Cf-254, and Fm-256 are not present	——	9×10^{-5}	——	3×10^{-6}
If it is known that Sr-90, I-125, I-126, I-129, (I-131, I-133, Table B only), Pb-210, Po-210, Ra-223, Ra-226, Ra-228, Pa-231, Th-nat, Pa-228, Cm-248, Cf-254 and Fm-256 are not present	——	6×10^{-5}	——	2×10^{-6}
If it is known that Sr-90, I-129, (I-125, I-126, I-131, Table B only), Pb-210, Ra-226, Ra-228, Cm-248, and Cf-254 are not present	——	2×10^{-5}	——	6×10^{-7}
If it is known that (I-129, Table B only), Ra-226, and Ra-228 are not present	——	3×10^{-6}	——	1×10^{-7}
If it is known that alpha-emitters and Sr-90, I-129, Pb-210, Ac-227, Ra-228, Pa-230, Pu-241 and Bk-249 are not present	3×10^{-9}	——	1×10^{-10}	——
If it is known that alpha-emitters and Pb-210, Ac-227, Ra-228, and Pu-241 are not present	3×10^{-10}	——	1×10^{-11}	——
If it is known that alpha-emitters and Ac-227 are not present	3×10^{-11}	——	1×10^{-12}	——
If it is known that Ac-227, Th-230, Pa-231, Pu-238, Pu-239. Pu-240, Pu-242, Pu-244, Cm-248, Cf-249, and Cf-251 are not present	3×10^{-12}	——	1×10^{-13}	——

(4) If the mixture of radionuclides consists of uranium and its daughter products in ore dust prior to chemical processing of the uranium ore, the following values may be used in lieu of those determined in accordance with paragraph (1) of this subsection, or those specified in paragraphs (2) and (3) of this subsection:

(i) For purposes of Column 1, Table A of subsection (a) of this section, 1×10^{-10} μCi/ml gross alpha activity; or 2.5×10^{-11} μCi/ml natural uranium; or 75 micrograms per cubic meter of air natural uranium.

(ii) For purposes of Column 1, Table B of subsection (a) of this section, 3×10^{-12} μCi/ml gross alpha activity; or 8×10^{-13} μCi/ml natural uranium; or three micrograms per cubic meter of air natural uranium.

(5) For purposes of this subsection, a radionuclide may be considered as not present in a mixture if the following conditions are met:

(i) The ratio of the concentration of that radionuclide in the mixture (C_a) to the concentration limit for that radionuclide specified in Table B of subsection (a) of this section (MPC_a) does not exceed 1/10,

$$\frac{C_a}{MPC_a} \leq \frac{1}{10}$$

(ii) The sum of such ratios for all radionuclides considered as not present in the mixture does not exceed 1/4,

$$\frac{C_a}{MPC_a} + \frac{C_b}{MPC_b} + \ldots\ldots \leq = \frac{1}{4}$$

PERMISSIBLE LEVELS FROM EXTERNAL SOURCES IN UNRESTRICTED AREAS

§ 227.31. General.

No licensee or registrant shall possess, use or transfer sources of radiation in such a manner as to create the following conditions in any unrestricted area from such sources of radiation in his possession:

(1) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of two millirems in any one hour.

(2) Radiation levels which, if an individual were continuously present in the area, could result in his receiving a dose in excess of 100 millirems in any seven consecutive days.

(3) Radiation levels which could result in an individual receiving a dose in excess of 0.5 rem in any period of one calendar year.

§ 227.32. Application for exceptions.

(a) Any person may apply to the Department for proposed limits of levels of radiation in unrestricted areas in excess of those specified in § 227.31 (1) and (2) of this Title (relating to permissible levels) resulting from the applicant's possession or use of sources of radiation. Such applications shall include information as to anticipated average radiation levels and anticipated occupancy times for each unrestricted area involved.

(b) The Department shall approve the proposed limits if the applicant demonstrates to the satisfaction of the Department that the proposed limits are not likely to cause any individual to receive a dose to the whole body in any period of one calendar year in excess of 0.5 rem.

CONCENTRATION IN EFFLUENTS TO UNRESTRICTED AREAS

§ 227.41. General restriction.

(a) No person shall possess, use or transfer radioactive material so as to release to an unrestricted area radioactive material in concentrations which exceed the limits specified in Table B in § 227.25 of this Title (relating to table of concentrations), except as authorized pursuant to § § 227.42 and 227.82 of this Title (relating to application for higher limits and approval of proposed procedures).

(b) For purposes of this section, concentrations may be averaged over a period not greater than one year.

§ 227.42. Application for higher limits.

An application to the Department for a license or amendment may include proposed limits higher than those specified in § 227.41 of this Title (relating to general restriction on effluents). The Department shall approve the proposed limits if the applicant demonstrates the following:

(1) That the applicant has made a reasonable effort to minimize the radioactivity contained in effluents to unrestricted areas.

(2) That it is not likely that radioactive material discharged in the effluent would result in the exposure of an individual to concentrations of radioactive material in air or water exceeding the limits specified in Table B of § 227.25 of this Title (relating to table of concentrations).

§ 227.43. Application information.

An application pursuant to § 227.42 of this Title (relating to applications for higher limits) shall include information demonstrating that the applicant has made a reasonable effort to minimize the radioactivity discharged in effluents to unrestricted areas. Such application shall conform with the following requirements:

(1) *Liquid effluents.* The application shall include the following information:

(i) Information as to flow rates, total volume of effluent, peak concentration of each nuclide in the effluent, and concentration of each radionuclide in the effluent averaged over a period of one year at the point of discharge.

(ii) A description of the properties of the effluent, including chemical composition, suspended solids content, and hydrogen ion concentration (pH) of the effluent and receiving stream.

(iii) A description of water uses downstream from the point of release of the effluent.

(iv) Information as to the highest concentration of each radionuclide in the water at points of use downstream from the point of release, including anticipated concentrations averaged over a period of one year.

(v) The background concentration of radionuclides in the receiving body of water prior to release of the liquid effluent.

(vi) A description of effluent monitoring equipment, and procedures and calculations to determine concentrations of radionuclides in the stream.

(vii) A description of the waste treatment facilities and procedures used to reduce the concentration of radionuclides in effluents prior to their release.

(2) *Atmospheric effluents.* The application shall include the following information:

(i) Information as to discharge rates, total volume of effluent, peak concentration of each radionuclide in the effluent, and concentration of each radionuclide in the effluent averaged over a period of one year at the point where the effluent is vented to the atmosphere.

(ii) A description of the properties of the emissions, including chemical composition, nature of the gas or aerosol, and size range of particulate emissions.

(iii) A description of the anticipated human occupancy in the unrestricted area where the highest concentration of radioactive material from the effluent is expected.

(iv) Information as to the highest concentration of each radionuclide in the unrestricted area in the air at any point of human occupancy, including anticipated concentrations averaged over one year.

(v) A description of stack monitoring and environmental monitoring equipment including system sensitivity, and procedures and calculations to determine concentrations of radionuclides in the unrestricted area, and possible reconcentrations of radionuclides.

(vi) A description of treatment facilities for airborne radioactivity and procedures used to reduce the concentration of radionuclides in effluents prior to release.

§ 227.44. Emission of effluents.

(a) For the purpose of this section, the concentration limits in Table B of § 227.25 of this Title (relating to table of concentrations), shall apply at the boundary of the restricted area. The concentration of radioactive material discharged through a stack, pipe or similar conduit may be determined with respect to the point where the material leaves the conduit. If the conduit discharges within the restricted area, the concentration at the boundary may be determined by applying appropriate factors for dilution, dispersion or decay between the point of discharge and the boundary.

(b) In addition to limiting concentrations in effluents, the Department may limit quantities of radioactive materials released in air or water during a specified period of time if it appears that the daily intake of radioactive material from air, water or food by a suitable sample of an exposed population group, averaged over a period not exceeding one year, would otherwise exceed the daily intake resulting from continuous exposure

to air or water containing one-third the concentration of radioactive materials specified in Table B of § 227.25 of this Title (relating to table of concentrations).

(c) The provisions of this Section shall not apply to disposal of radioactive material into sanitary sewerage systems, which is governed by § § 227.81 - 227.85 of this Title (relating to waste disposal).

SAFETY MEASURES AND SERVICES

§ 227.51. Bioassay, medical and expert services.

(a) Where necessary or desirable in order to aid in determining the extent of an individual's radiation exposure, the Department may incorporate license provisions or otherwise require a person to furnish appropriate bioassay services, medical services and the services of a qualified expert.

(b) A copy of the reports of such services shall be made available to the Department.

§ 227.52. Personnel monitoring devices.

Each licensee or registrant shall supply suitable personnel monitoring devices to the following individuals, and such individuals shall be required to use such devices:

(1) Each individual who entered a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 25% of the applicable value specified in § 227.11 of this Title (relating to maximum exposure limits).

(2) Each individual under 18 years of age who enters a restricted area under such circumstances that he receives, or is likely to receive, a dose in any calendar quarter in excess of 5% of the applicable value specified in § 227.11 of this Title (relating to maximum exposure limits).

(3) Any individual who enters a high radiation area.

§ 227.53. Surveys.

Each licensee or registrant shall make or cause to be made such surveys as may be necessary to insure that all activities are being conducted in compliance with this Article.

CAUTION SIGNS, LABELS AND SIGNALS

§ 227.61. Radiation symbol.

(a) Except as otherwise authorized by the Department, symbols prescribed by this section shall use the American National Standards Institute radiation colors (purple on yellow background). The symbol prescribed by this section is the American National Standards Institute symbol with the conventional three-bladed design:

(1) Black area shall be purple.

(2) Background shall be yellow.

(b) In addition to the contents of signs and labels prescribed in this section, a person may provide any additional information which may be appropriate in aiding individuals to minimize exposure to radiation.

§ 227.62. Radiation areas.

Each radiation area shall be conspicuously posted with a sign or signs bearing the radiation symbol and the following words:

CAUTION
RADIATION AREA

§ 227.63. High radiation areas.

(a) Each high radiation area shall be conspicuously posted with a sign or signs bearing the radiation symbol and the following words:

CAUTION
HIGH RADIATION AREA

(b) Except as exempted in Chapter 229 of this Article (relating to human use of radiation-producing machines or equipment), each high radiation area shall be equipped with a control device which shall either cause the level of radiation to be reduced below that at which an individual might receive a dose of 100 millirem in one hour upon entry into the area, or shall energize a conspicuous visible or audible alarm signal in such a manner that the individual entering and the supervisor of the activity are made aware of the entry. In the case of a high radiation area established for a period of 30 days or less, such control device is not required, but the user shall prohibit unauthorized entry.

§ 227.64. Airborne radioactivity areas.

(a) As used in this Chapter, "Airborne Radioactivity Area" shall be either of the following:

(1) Any room, enclosure or operating area in which airborne radioactive material exists in concentrations in excess of those specified in Column 1, Table A of § 227.25 of this Title (relating to table of concentrations).

(2) Any room, enclosure or operating area in which airborne radioactive material exists in concentrations which, averaged over the number of hours in any week during which individuals are in the area, exceed 25% of those specified in Column 1, Table A of § 227.25 of this Title (relating to table of concentrations).

(b) Each airborne radioactivity area shall be conspicuously posted with a sign or signs bearing the radiation symbol and the following words:

CAUTION
AIRBORNE RADIOACTIVITY AREA

§ 227.65. Radioactive material.

Each area or room in which any radioactive material is used or stored in an amount ten times the quanitity of radioactive material specified in § 227.71 of this Title (relating to table of quantities) shall be conspicuously posted with a sign or signs bearing the radiation symbol and the following words:

CAUTION
RADIOACTIVE MATERIAL

§ 227.66. Containers.

(a) Except as provided in subsection (c) of this section, each container of radioactive

material shall bear a durable, clearly visible label identifying the radioactive contents.

(b) (1) A label required pursuant to subsection (a) of this section shall bear the radiation caution symbol and the following words:

CAUTION
RADIOACTIVE MATERIAL

(2) Such labels shall also provide sufficient information to permit individuals handling or using the containers, or working in the vicinity thereof, to take precautions to avoid or minimize exposures.

(c) Notwithstanding the provisions of subsection (a) of this section, labeling shall not be required in the following situations:

(1) For containers which do not contain radioactive materials in quantities greater than the applicable quantities listed in § 227.71 of this Title (relating to table of quantities).

(2) For containers containing only natural uranium or thorium in quantities no greater than ten times the applicable quantities listed in § 227.71 of this Title (relating to table of quantities).

(3) For containers which do not contain radioactive materials in concentrations greater than the applicable concentrations listed in Column 2, Table A of § 227.25 of this Title (relating to table of concentrations).

(4) For containers when they are attended by an individual who takes the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established by the provisions in this Chapter.

(5) For containers when they are in transport and packaged and labeled in accordance with regulations published by the U.S. Department of Transportation or the Hazardous Substances Transportation Board of the Commonwealth.

(6) For containers which are accessible only to individuals authorized to handle or use them, or to work in the vicinity thereof, provided that the contents are identified to such individuals by a readily available written record.

(7) For manufacturing and processing equipment such as piping and tanks.

§ 227.67. Radiation-producing machines or equipment.

All radiation-producing machines or equipment shall be clearly labeled as follows:

CAUTION-RADIATION
THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED

§ 227.68. Removal of labels.

All radiation-hazard labels posted shall be removed when the source of radiation is no longer present.

§ 227.69. Storage of sources.

Radiation sources shall be secured against unauthorized removal from the place of storage.

§ 227.70. Exceptions to labeling requirements.

(a) A room or area shall not be required to be posted with a caution sign because of the presence of a sealed source, if the radiation level 12 inches from the surface of the source container or housing does not exceed five millirem per hour.

(b) Rooms or other areas in hospitals which contain only therapeutic X-ray machines operated at potentials of 150 kVp and below, diagnostic X-ray machines, or patients containing radioactive material, shall not be required to be posted with caution signs,

if there are personnel in attendance who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive material in excess of the limits established in this Chapter.

(c) Caution signs shall not be required to be posted at areas or rooms containing radioactive materials for a period of less than eight hours provided that the following conditions are met:

(1) The materials shall be constantly attended by an individual who shall take the precautions necessary to prevent the exposure of any individual to radiation or radioactive materials in excess of the limits established in this Chapter.

(2) The area or room shall be subject to the user's control.

§ 227.71. Table of quantities.

For the purposes of this Chapter, the following table shall be used to determine permissible quantities of various radioisotopes.

Material	Microcuries
Ag 105	1
Ag 111	10
As 76, As 77	10
Au 198	10
Au 199	10
Ba 140 + La 140	1
Be 7	50
C 14	50
Ca 45	10
Cd 109 + Ag 109	10
Ce 144 + Pr 144	1
Cl 36	1
Co 60	1
Cr 51	50
Cs 137 + Ba 137	1
Cu 64	50
Eu 154	1
F 18	50
Fe 55	50
Fe 59	1
Ga 72	10
Ge 71	50
H 3 (HTO or T_2O)	250
I 131	10
In 114	1
Ir 192	10
K 42	10
La 140	10
Mn 52	1
Mn 56	50
Mo 99	10
Na 22	10
Na 24	10
Nb 95	10
Ni 59	1
Ni 63	1
P 32	10
Pd 103 + Rh 103	50
Pd 109	10
Pm 147	10
Po 210	0.1

Material	Microcuries
Pr 143	10
Pu 239	1
Ra 226	0.1
Rb 86	10
Re 186	10
Rh 105	10
Ru 106 + Rh 106	1
S 35	50
Sb 124	1
Sc 46	1
Sm 153	10
Sn 113	10
Sr 89	1
Sr 90 + Y 90	0.1
Ta 182	10
Tc 96	1
Tc 99	1
Te 127	10
Te 129	1
Th (natural)	50
Tl 204	50
Tritium (see H 3)	250
U (natural)	50
U 233	1
U 234 - U 235	50
V 48	1
W 185	10
Y 90	1
Y 91	1
Zn 65	10
Unidentified radioactive materials or any of the above in unknown mixtures	0.1

WASTE DISPOSAL

§ 227.81. General.

No person shall dispose of any radioactive material except by:

(1) transfer to an authorized recipient as provided in Chapter 225 of this Title (relating to licensing of radioactive material); or

(2) authorization pursuant to § § 227.41 - 227.44 of this Title (relating to concentration of effluents) or § § 227.82 - 227.84 of this Title (relating to waste disposal).

§ 227.82. Approval of proposed procedures.

(a) Any person may apply to the Department for approval of proposed procedures to dispose of radioactive material in a manner not otherwise authorized in this Chapter.

(b) Each application shall include a description of the radioactive material, including the quantities and kinds of radioactive material and the levels of radioactivity involved, and the proposed manner and conditions of disposal.

(c) The application, where appropriate, shall also include:

(1) an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological and hydrological characteristics; use of ground and surface waters in the general area;

(2) the nature and location of other potentially affected facilities; and

(3) procedures to be observed to minimize the risk of unexpected hazardous exposures.

(d) The Department shall not approve any application for a license to receive radioactive material from other persons for disposal on land not owned by the Commonwealth or the Federal Government.

§ 227.83. Sanitary sewerage systems.

No person shall discharge radioactive material into a sanitary sewerage system unless the following conditions are met:

(1) The material shall be readily soluble or dispersible in water.

(2) The quantity of any radioactive material released into the system by the licensee in any one day shall not exceed whichever of the following is larger:

(i) The quantity which, if diluted by the average daily quantity of sewage released into the sewer by the licensee, shall result in an average concentration not greater than the limits specified in Column 2, Table A, of § 227.25 of this Title (relating to table of concentrations).

(ii) Ten times the quantity of such material specified in § 227.71 of this Title (relating to table of quantities).

(3) The quantity of any radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, shall not result in an average concentration exceeding the limits specified in Column 2, Table A, of § 227.25 of this Title (relating to table of concentrations).

(4) The gross quantity of radioactive material released into the sewerage system by the licensee shall not exceed one curie per year. Excreta from individuals undergoing medical diagnosis or therapy with radioactive material shall be exempt from any limitations contained in this section.

§ 227.84. Burial in soil.

No licensee shall dispose of radioactive material by burial in soil unless the following conditions are met:

(1) The burial shall take place on his property.

(2) The total quantity of radioactive materials buried at any one location and time shall not exceed, at the time of burial, 1,000 times the amount specified in § 227.71 of this Title (relating to table of quantities).

(3) Burial shall be at a minimum depth of four feet.

(4) Successive burials shall be separated by distances of at least six feet and not more than 12 burials shall be made in any year.

(5) The Department shall be notified in writing prior to such burial of the intent and location of proposed burial sites.

§ 227.85. Incineration.

No person shall incinerate radioactive material for the purpose of disposal or preparation for disposal except as specifically approved by the Department.

RECORDS, REPORTS AND NOTIFICATIONS

§ 227.91. Required records.

(a) Each licensee or registrant shall maintain personnel monitoring records for all individuals for whom personnel monitoring is required under § § 227.51 - 227.52 of this Title (relating to safety measures and services). Such information shall be kept on clear and legible records containing all the information required on Department Form H 702.003. The values entered on the forms or records shall be for periods of time not exceeding one calendar quarter.

(b) Each licensee or registrant shall maintain sufficient records in the same units used in this Chapter to demonstrate compliance with this Chapter and records of disposals

made under § § 227.81 - 227.85 of this Title (relating to waste disposal).

(c) Each registrant or licensee shall maintain records of the receipt, storage, transfer or disposal of all sources of radiation. In the case of receipts, initial registration shall be acceptable as proof of receipt of radiation-producing equipment received prior to February 9, 1970.

(d) Personnel monitoring records which shall be maintained pursuant to the provisions of subsection (a) of this section shall be retained for at least five years. At the end of five years, the registrant or licensee may summarize these records. The original records, except those involving overexposure investigations and reports, may be discarded upon Department approval of the summarization. The summarization may be retained by the registrant or licensee in lieu of the original records.

(e) The discontinuance of, or curtailment of activities, shall not relieve the licensee or registrant of responsiblity for retaining all records required by these regulations. In this case, a licensee or registrant may, however, request the Department to accept such records. The acceptance of the records by the Department relieves the licensee or registrant of subsequent responsibility only in respect to their preservation as required by this section.

§ 227.92. Reports of theft.

Each licensee or registrant shall report by telephone and telegraph to the Department the theft or loss of any radioactive source immediately after such occurrence becomes known.

§ 227.93. Notification of incidents.

(a) *Immediate notification.* Each licensee or registrant shall immediately notify the Department by telephone and telegraph of any incident involving any radiation source possessed by him which may have caused or may cause any of the following:

(1) Exposure to the whole body of any individual to 25 rems or more of radiation; exposure of the skin of the whole body of any individual of 150 rems or more of radiation; or exposure of the feet, ankles, hands or forearms of any individual to 375 rems or more of radiation.

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the limits specified for such materials in Table B of § 227.25 of this Title (relating to concentrations).

(3) A loss of one working week or more of the operation of any facilities affected.

(4) Damage to property in excess of $100,000.

(b) *Twenty-four hour notification.* Each licensee or registrant shall within 24 hours, notify the Department by telephone and telegraph of any incident involving any source of radiation possessed by him and which may have caused or may cause any of the following:

(1) Exposure of the whole body of any individual to five rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands, or forearms to 75 rems or more of radiation.

(2) The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limits specified for such materials in Table B of § 227.25 of this Title (relating to table of concentrations).

(3) A loss of one day or more of the operation of any facility affected.

(c) *Names of individuals.* Any report filed with the Department pursuant to this section shall be prepared in such a manner that names of individuals who have received exposure to radiation will be stated in a separate part of the report.

(d) *Detailed report.* The notifications outlined in subsections (a) and (b) of this section shall be followed within 30 days by a detailed report in writing to be submitted to the Department.

§ 227.94. Summary report to former employes.

(a) A licensee or registrant, at the written request of any individual formerly employed or associated with him, shall furnish to such individual a summary report of

his personnel monitoring record as maintained pursuant to § 227.91 of this Title (relating to required reports). The report shall be furnished within 30 days from the time the request is made in writing and shall cover each year of the individual's employment or association involving exposure to radiation, except for the current year which shall be reported by quarter. The report shall also include the results of any calculations and analyses of radioactive material deposited in the body of the individual. The report shall be in writing and contain the following statement:

"This report is furnished to you under the provisions of 25 Pa. Code, Chapter 227 (relating to radiation exposure)."

(b) The individual's request shall include appropriate identifying data, such as social security number, dates and locations of employment or association.

§ 227.95. Thirty-day reports.

(a) In addition to any notification required by § 227.93 of this Title (relating to notification of incidents), each licensee or registrant shall make a report in writing within 30 days to the Department of the following incidents:

(1) Each exposure of an individual to radiation or concentrations of radioactive material in excess of any applicable limit as set forth in this Chapter or as otherwise approved by the Department.

(2) Any incident for which notification is required by § 227.92 of this Title (relating to reports of theft).

(3) Levels of radiation or concentrations of radioactive material (not involving excessive exposure of any individual) in an unrestricted area in excess of ten times any applicable limit as set forth in this Chapter or as otherwise approved by the Department.

(b) Each report required under subsection (a) of this section shall describe:

(1) the extent of exposure of individuals to radiation or radioactive material;

(2) levels of radiation and concentration of radioactive material involved;

(3) the cause of the exposure, levels or concentrations; and

(4) corrective steps taken or planned to assure against a recurrence.

(c) In any case where a licensee or registrant is required pursuant to the provisions of this section to report to the Department any exposure of an individual to radiation or to concentrations or radioactive material, the licensee or registrant shall, not later than the making of such report to the Department, also notify such individual of the nature and extent of exposure. Such notice shall be in writing and shall contain the following statement:

"This report is furnished to you under the provisions of 25 Pa. Code, Chapter 227 (relating to radiation exposure)."

(d) Any report filed with the Department pursuant to this section shall be prepared in such a manner that names of individuals who have received exposure to radiation shall be stated in a separate part of the report.

§ 227.96. Notice to employes and others.

Each licensee or registrant, at the request of any individual employed or associated with him, shall advise the individual in writing both annually and upon termination of employment of the personnel monitoring results for that individual as shown in records maintained by the licensee or registrant pursuant to § 227.91 of this Title (relating to required records).

§ 227.97. Notice of vacated premises.

(a) Each licensee shall, no less than 30 days before vacating or relinquishing possession or control of premises which may be contaminated with radioactive material, notify the Department in writing of intent to vacate.

(b) The Department may require that the licensee decontaminate or have decontaminated the location to a degree consistent with subsequent use as an unrestricted area, the details to be specified in each case by the Department.

(c) This section shall not apply to the burial of radioactive material carried out under the terms of § 227.84 of this Title (relating to burial of radioactive material for disposal).

No. 1980-97

AN ACT

HB 1840

Providing for the planning and regulation of solid waste storage, collection, transportation, processing, treatment, and disposal; requiring municipalities to submit plans for municipal waste management systems in their jurisdictions; authorizing grants to municipalities; providing regulation of the management of municipal, residual and hazardous waste; requiring permits for operating hazardous waste and solid waste storage, processing, treatment, and disposal facilities; and licenses for transportation of hazardous waste; imposing duties on persons and municipalities; granting powers to municipalities; authorizing the Environmental Quality Board and the Department of Environmental Resources to adopt rules, regulations, standards and procedures; granting powers to and imposing duties upon county health departments; providing remedies; prescribing penalties; and establishing a fund.

TABLE OF CONTENTS

The General Assembly of the Commonwealth of Pennsylvania hereby enacts as follows:

ARTICLE I
GENERAL PROVISIONS

Section 101. Short title.

This act shall be known and may be cited as the "Solid Waste Management Act."

Section 102. Legislative finding; declaration of policy.

The Legislature hereby determines, declares and finds that, since improper and inadequate solid waste practices create public health hazards, environmental pollution, and economic loss, and cause irreparable harm to the public health, safety and welfare, it is the purpose of this act to:

(1) establish and maintain a cooperative State and local program of planning and technical and financial assistance for comprehensive solid waste management;

(2) encourage the development of resource recovery as a means of managing solid waste, conserving resources, and supplying energy;

(3) require permits for the operation of municipal and residual waste processing and disposal systems, licenses for the transportation of hazardous waste and permits for hazardous waste storage, treatment, and disposal;

(4) protect the public health, safety and welfare from the short and long term dangers of transportation, processing, treatment, storage, and disposal of all wastes;

(5) provide a flexible and effective means to implement and enforce the provisions of this act;

(6) establish the Pennsylvania Hazardous Waste Facilities Plan, which plan shall address the present and future needs for the treatment and disposal of hazardous waste in this Commonwealth;

(7) develop an inventory of the nature and quantity of hazardous waste generated within this Commonwealth or disposed of within this Commonwealth, wherever generated;

(8) project the nature and quantity of hazardous waste that will be generated within this Commonwealth in the next 20 years or will be disposed of within this Commonwealth, wherever generated;

(9) provide a mechanism to establish hazardous waste facility sites;

(10) implement Article I, section 27 of the Pennsylvania Constitution; and

(11) utilize, wherever feasible, the capabilities of private enterprise in accomplishing the desired objectives of an effective, comprehensive solid waste management program.

Section 103. Definitions.

The following words and phrases when used in this act shall have, unless the context clearly indicates otherwise, the meanings given to them in this section:

"Abatement." The restoration, reclamation, recovery, etc., of a natural resource adversely affected by the activity of a person, permittee or municipality.

"Agricultural waste." Poultry and livestock manure, or residual materials in liquid or solid form generated in the production and marketing of poultry, livestock, fur bearing animals, and their products, provided that such agricultural waste is not hazardous. The term includes the residual materials generated in producing, harvesting, and marketing of all agronomic, horticultural, and silvicultural crops or commodities grown on what are usually recognized and accepted as farms, forests, or other agricultural lands.

"Captive facilities." Facilities which are located upon lands owned by a generator of hazardous waste and which are operated to provide for the treatment or disposal solely of such generator's hazardous waste.

"Commercial establishment." Any establishment engaged in nonmanufacturing or nonprocessing business, including, but not limited to, stores, markets, office buildings, restaurants, shopping centers and theaters.

"Commonwealth." The Commonwealth of Pennsylvania.

"Department." The Department of Environmental Resources of the Commonwealth of Pennsylvania and its authorized representatives.

"Disposal." The incineration, deposition, injection, dumping, spilling, leaking, or placing of solid waste into or on the land or water in a manner that the solid waste or a constituent of the solid waste enters the environment, is emitted into the air or is discharged to the waters of the Commonwealth.

"Food processing waste." Residual materials in liquid or solid form generated in the slaughtering of poultry and livestock, or in processing and converting fish, seafood, milk, meat, and eggs to food products; it also means residual materials generated in the processing, converting, or manufacturing of fruits, vegetables, crops and other commodities into marketable food items.

"Food processing wastes used for agricultural purposes." The use of food processing wastes in normal farming operations as defined in this section.

"Hazardous waste." Any garbage, refuse, sludge from an industrial or other waste water treatment plant, sludge from a water supply treatment plant, or air pollution control facility and other discarded material including solid, liquid, semisolid or contained gaseous material resulting from municipal, commercial, industrial, institutional, mining, or agricultural operations, and from community activities, or any combination of the above, (but does not include solid or dissolved

material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under § 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880) or source, special nuclear, or by-product material as defined by the U.S. Atomic Energy Act of 1954, as amended (68 Stat. 923)), which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

(1) cause or significantly contribute to an increase in mortality or an increase in morbidity in either an individual or the total population; or

(2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of or otherwise managed.

The term "hazardous waste" shall not include coal refuse as defined in the act of September 24, 1968 (P.L.1040, No.318), known as the "Coal Refuse Disposal Control Act." "Hazardous waste" shall not include treatment sludges from coal mine drainage treatment plants, disposal of which is being carried on pursuant to and in compliance with a valid permit issued pursuant to the act of June 22, 1937 (P.L.1987, No.394), known as "The Clean Streams Law."

"Industrial establishment." Any establishment engaged in manufacturing or processing, including, but not limited to factories, foundries, mills, processing plants, refineries, mines and slaughterhouses.

"Institutional establishment." Any establishment engaged in service, including, but not limited to, hospitals, nursing homes, orphanages, schools and universities.

"Management." The entire process, or any part thereof, of storage, collection, transportation, processing, treatment, and disposal of solid wastes by any person engaging in such process.

"Manifest system." A written record identifying the quantity, composition, origin, routing, and destination of hazardous waste from the point of generation to the point of disposal, treatment or storage.

"Mine." Any deep or surface mine, whether active, inactive or abandoned.

"Mining." The process of the extraction of minerals from the earth or from waste or stockpiles or from pits or banks.

"Municipality." A city, borough, incorporated town, township or county or any authority created by any of the foregoing.

"Municipal waste." Any garbage, refuse, industrial lunchroom or office waste and other material including solid, liquid, semisolid or contained gaseous material resulting from operation of residential, municipal, commercial or institutional establishments and from community activities and any sludge not meeting the definition of residual or hazardous waste hereunder from a municipal, commercial or institutional water supply treatment plant, waste water treatment plant, or air pollution control facility.

"Normal farming operations." The customary and generally accepted activities, practices and procedures that farms adopt, use, or engage in year after year in the production and preparation for market of poultry, livestock, and their products; and in the production, harvesting and preparation for market of agricultural, agronomic, horticultural, silvicultural and aquicultural crops and commodities; provided that such operations are conducted in compliance with applicable laws, and provided that the use or disposal of these materials will not pollute the air, water, or other natural resources of the Commonwealth. It includes the storage and utilization of agricultural and food process wastes for animal feed, and includes the agricultural utilization of septic tank cleanings and sewage sludges which are generated off-site. It includes the management, collection, storage, transportation, use or disposal of manure, other agricultural waste and food processing waste on land where such materials will improve the condition of the soil, the growth of crops, or in the restoration of the land for the same purposes.

"Person." Any individual, partnership, corporation, association, institution, cooperative enterprise, municipal authority, Federal Government or agency, State institution and agency (including, but not limited to, the Department of General Services and the State Public School Building Authority), or any other legal entity whatsoever which is recognized by law as the subject of rights and duties. In any provisions of this act prescribing a fine, imprisonment or penalty, or any combination of the foregoing, the term "person" shall include the officers and directors of any corporation or other legal entity having officers and directors.

"Point sources subject to permits under § 402 of the Federal Water Pollution Control Act." Point source discharges for which valid and current permits have been issued under § 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880) to the extent that such discharges are authorized by said permits.

"Pollution." Contamination of any air, water, land or other natural resources of the Commonwealth such as will create or is likely to create a public nuisance or to render such air, water, land or other natural resources harmful, detrimental or injurious to public health, safety or welfare, or to domestic, municipal, commercial, industrial, agricultural, recreational or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other life.

"Processing." Any technology used for the purpose of reducing the volume or bulk of municipal or residual waste or any technology used to convert part or all of such waste materials for off-site reuse. Processing facilities include but are not limited to transfer facilities, composting facilities, and resource recovery facilities.

"Residual waste." Any garbage, refuse, other discarded material or other waste including solid, liquid, semisolid, or contained gaseous materials resulting from industrial, mining and agricultural operations and any sludge from an industrial, mining or agricultural water supply treatment facility, waste water treatment facility or pollution control facility, provided that it is not hazardous. The term "residual waste" shall not include coal refuse as defined in the "Coal Refuse Disposal Control Act." "Residual waste" shall not include treatment sludges from coal mine drainage treatment plants, disposal of which is being carried on pursuant to and in compliance with a valid permit issued pursuant to "The Clean Streams Law."

"Secretary." The Secretary of the Department of Environmental Resources of the Commonwealth of Pennsylvania.

"Solid waste." Any waste, including but not limited to, municipal, residual or hazardous wastes, including solid, liquid, semisolid or contained gaseous materials.

"Storage." The containment of any waste on a temporary basis in such a manner as not to constitute disposal of such waste. It shall be presumed that the containment of any waste in excess of one year constitutes disposal. This presumption can be overcome by clear and convincing evidence to the contrary.

"Transportation." The off-site removal of any solid waste at any time after generation.

"Treatment." Any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any waste so as to neutralize such waste or so as to render such waste nonhazardous, safer for transport, suitable for recovery, suitable for storage, or reduced in volume. Such term includes any activity or processing designed to change the physical form or chemical composition of waste so as to render it neutral or nonhazardous.

Section 104. Powers and duties of the department.

The department in consultation with the Department of Health regarding matters of public health significance shall have the power and its duty shall be to:

(1) administer the solid waste management program pursuant to the provisions of this act;

(2) cooperate with appropriate Federal, State, interstate and local units of government and with appropriate private organizations in carrying out its duties under this act;

(3) develop a Statewide solid waste management plan in cooperation with local governments, the Department of Community Affairs, the Department of Commerce and the State Planning Board; emphasis shall be given to area-wide planning;

(4) provide technical assistance to municipalities including the training of personnel;

(5) initiate, conduct, and support research, demonstration projects, and investigations, and coordinate all State agency research programs, pertaining to solid waste management systems;

(6) regulate the storage, collection, transportation, processing, treatment and disposal of solid waste;

(7) issue permits, licenses and orders, and specify the terms and conditions thereof, and conduct inspections and abate public nuisances to implement the purposes and provisions of this act and the rules, regulations and standards adopted pursuant to this act;

(8) require the payment of a fee according to a standard uniform schedule of permit and license fees for the processing of any permit or license application. Permit and license fees shall be in an amount sufficient to cover the aggregate cost of reviewing all applications, acting on all applications, processing all renewals, and administering all the terms and conditions of all permits and all provisions of this act relating thereto;

(9) serve as the agency of the Commonwealth for the receipt of moneys from the Federal Government or other public agencies or private agencies and expend such moneys for studies and research with respect to, and for the enforcement and administration of, the purposes and provisions of this act and the rules and regulations promulgated thereunder;

(10) institute in a court of competent jurisdiction, proceedings against any person or municipality to compel compliance with the provisions of this act, any rule or regulation issued thereunder, any order of the department, or the terms and conditions of any permit;

(11) institute prosecutions against any person or municipality under this act;

(12) appoint such advisory committees as the secretary deems necessary and proper to assist the department in carrying out the provisions of this act. The secretary is authorized to pay reasonable and necessary expenses incurred by the members of such advisory committees in carrying out their functions;

(13) do any and all other acts and things not inconsistent with any provision of this act, which it may deem necessary or proper for the effective enforcement of this act and the rules or regulations which may be promulgated hereunder after consulting with the Department of Health regarding matters of public health significance;

(14) develop, prepare and submit to the Environmental Quality Board, within two years after the effective date of this act, its proposed Pennsylvania Hazardous Waste Facilities Plan;

(15) develop, prepare and publish in the Pennsylvania Bulletin six months after the effective date of this act its preliminary environmental, social and economic criteria and standards for siting hazardous waste treatment and disposal facilities;

(16) require the payment of such annual inspection fees and perform such inspections of hazardous waste treatment and disposal facilities as are provided for in the Environmental Quality Board guidelines adopted pursuant to section 105(e). This provision shall not be construed to limit or restrict the department's inspection powers as elsewhere set forth in this act; and

(17) administer funds collected by the United States Government and granted to Pennsylvania for the purpose of closing, maintaining or monitoring abandoned or closed hazardous waste storage, treatment or disposal sites and for the purpose of action to abate or prevent pollution at such sites. If Congress has not authorized the collection of such funds within one year after the effective date of this act, or if the department finds that the funding program authorized is inadequate, the department shall transmit to the General Assembly within 15 months after the effective date of this act a proposal for the establishment of a fund in Pennsylvania comprised of surcharges collected from users of hazardous waste storage, treatment and disposal facilities excluding captive facilities in the Commonwealth. Such fund shall be proposed for the purpose of closing, maintaining or monitoring hazardous waste storage, treatment or disposal sites excluding captive facilities which have been abandoned or which have been closed for at least 20 years, and for the purpose of taking action to abate or prevent pollution at such closed or abandoned sites.

Section 105. Powers and duties of the Environmental Quality Board.

(a) The Environmental Quality Board shall have the power and its duty shall be to adopt the rules and regulations of the department to accomplish the purposes and to carry out the provisions of this act, including but not limited to the establishment of rules and regulations relating to the protection of safety, health, welfare and property of the public and the air, water and other natural resources of the Commonwealth.

(b) The Environmental Quality Board shall, by regulation, set the term of expiration of permits and licenses appropriate to the category of the permit or license.

(c) The Environmental Quality Board shall have the power and its duty shall be to adopt rules and regulations and standards to provide for the coordination of administration and enforcement of this act between the Department of Environmental Resources and county health departments where they exist.

(d) The Environmental Quality Board shall have the power and its duty shall be to adopt a Pennsylvania Hazardous Waste Facilities Plan.

(e) The Environmental Quality Board shall have the power and its duty shall be to adopt guidelines which shall:

(1) Provide for the necessary inspection of hazardous waste treatment and disposal facilities considering the degree of hazard and the quantity of wastes handled.

(2) Establish an inspection fee based on the frequency of inspection provided for in paragraph (1).

(3) Encourage cooperative agreements between local communities and the hazardous waste facility operators to minimize local concerns regarding the operation of the facility.

(f) In addition to exercising its powers and duties under section 1920-A of the act of April 9, 1929 (P.L.177, No.175), known as "The Administrative Code of 1929," the Environmental Quality Board shall have the power and its duty shall be to assist in the implementation of the Pennsylvania Hazardous Waste Facilities Plan through the issuance of certificates of public necessity for the establishment of hazardous waste treatment or disposal facilities. Any person prior to applying for a certificate of necessity shall have obtained all permits from the department of the Federal agency authorized to issue such permits in the Commonwealth and shall have implemented all impact assessments and public participation programs. In issuing certificates of public necessity the Environmental Quality Board shall:

(1) Prescribe the form and content of applications for a certificate of public necessity to operate a hazardous waste treatment or disposal facility.

(2) Require the payment of a fee for the processing of any application for a certificate of public necessity. Fees shall be in an amount sufficient to cover the aggregate cost of reviewing the application and acting on it.

(3) Issue such certificates of public necessity for the operation of hazardous waste treatment and disposal facilities as are warranted by:

(i) the extent to which the facility is in conformance with the Pennsylvania Hazardous Waste Facilities Plan;

(ii) the impact of the proposed facility on adjacent populated areas and areas through which wastes are transported to such facility;

(iii) the impact on the borough, township, town or city in which the facility is to be located in terms of health, safety, cost and consistency with local planning; and

(iv) the extent to which the proposed facility has been the subject of a public participation program in which citizens have had a meaningful opportunity to participate in evaluation of alternate sites or technologies, development of siting criteria, socioeconomic assessment, and all other phases of the site selection process.

(4) Provide the public with opportunities to comment upon the application for certificate of public necessity and consider the comments submitted.

(5) Accept applications for certificates of public necessity only from persons or municipalities which have obtained the necessary solid waste treatment or disposal permits from the department or from the Federal agency authorized to issue such permits in the Commonwealth.

(g) In carrying out the powers and duties set forth in this subsection, the board may consult with any person and hold any hearings which it deems necessary and proper to enable it to render a decision to issue or deny the certificate of public necessity and in any such hearing the board shall be represented by a minimum of three members.

(h) Issuance of a certificate of public necessity under this section shall suspend and supersede any and all local laws which would preclude or prohibit the establishment of a hazardous waste treatment or disposal facility at said site, including zoning ordinances. The suspension and supersession is explicitly extended to any person to whom such certificates issued for the purpose of hazardous waste treatment or disposal, and to the successors and assigns of such person.

(i) During all deliberations of the board a representative of the county and township, borough or municipality affected will be invited to participate.

(j) Regulations promulgated under this section concerning the generation, transportation, storage, treatment and disposal of hazardous wastes may, to the extent consistent with Federal regulations promulgated under the Resource Conservation and Recovery Act, establish classes of hazardous wastes taking into account the relative availability to the environment of the hazardous constituents in waste materials and the degree of hazard thereby presented.

Section 106. Powers and duties of county health departments; limitation.

(a) The county health department where it exists of each of the counties of the Commonwealth may elect to administer and enforce any of the provisions of this act together with the department in accordance with the established policies, procedures, guidelines, standards and rules and regulations of the department. Where this program activity exceeds the minimum program requirements adopted by the Advisory Health Board under the provisions of the act of August 24, 1951 (P.L.1304, No.315), known as the "Local Health Administration Law," such activity may be funded through contractual agreements with the department. The department is authorized to provide funds to county health departments from funds appropriated for this purpose by the General Assembly.

(b) Notwithstanding the grant of powers in subsection (a), in any case where administration and enforcement of this act by a county health department shall conflict with administration and enforcement by the Department of Environmental Resources, administration and enforcement by the Department of Environmental Resources shall take precedence over administration and enforcement by a county health department.

Section 107. Legislative oversight.

At least 30 days prior to consideration by the Environmental Quality Board of draft regulations for proposed rule making, the department shall submit such draft regulations to the Senate Environmental Resources and House Conservation Committees of the General Assembly for their review and comment.

Section 108. Powers and duties of the Environmental Hearing Board.

In addition to exercising its powers and duties to hold hearings and issue adjudications or any order, permit, license or decision of the department according to the provisions of "The Administrative Code of 1929" and the Administrative Agency Law, the Environmental Hearing Board shall have the power and its duty shall be to hold, if requested to do so by any party to a duly perfected appeal of an oral order under section 602(d), to hold a hearing on any duly filed petition for supersedeas of such order within six business days of the receipt of such request by the board.

ARTICLE II
MUNICIPAL WASTE

Section 201. Submission of plans; permits.

(a) No person or municipality shall store, collect, transport, process, or dispose of municipal waste within this Commonwealth unless such storage, collection, transportation, processing or disposal is authorized by the rules and regulations of the department and no person or municipality shall own or operate a municipal waste processing or disposal facility unless such person or municipality has first obtained a permit for such facility from the department.

(b) Each municipality with a population density of 300 or more inhabitants per square mile and each municipality with a population density of less than 300 wherein the department has identified a waste problem or a potential waste problem shall submit to the department an officially adopted plan for a municipal waste management system or systems serving the areas within its jurisdiction within two years of the effective date of this section, and shall, from time to time, submit such revisions of said plan as it deems necessary or as the department may require. Nothing in this subsection shall prohibit such a municipality from requesting the county in which it is located, and the county or an agency it designates from agreeing, to perform this function in its behalf. Whenever a county prepares and adopts such a solid waste management plan and revisions thereto, it shall provide for the participation and review of all affected municipalities. Whenever a city, borough, incorporated town or township prepares its own solid waste management plan or revisions thereto, it shall provide for review by the county prior to adoption. All solid waste management plans and subsequent revisions shall become official upon formal adoption by the governing body of the municipality and approval and certification by the department.

(c) When more than one municipality has authority over an existing or proposed municipal waste management system or systems or any part thereof, the required plan or any revisions thereof shall be submitted jointly by the municipalities concerned or by an authority or county or by one or more of the municipalities with the concurrence of the affected municipalities.

(d) Every plan, and any revision thereof, shall delineate areas where municipal waste management systems are in existence and areas where the municipal waste management systems are planned to be available within a ten-year period.

(e) Every plan shall:

(1) Provide for the orderly extension of municipal waste management systems in a manner consistent with the needs and plans of the whole area, and in a manner which will not create a risk of pollution of the water, air, land or other natural resources of the Commonwealth, nor constitute a public nuisance, and shall otherwise provide for the safe and sanitary disposal of municipal waste.

(2) Take into consideration all aspects of planning, zoning, population estimates, engineering and economics so as to delineate with precision those portions of the area which may reasonably be expected to be served by a municipal waste management system within ten years of the submission of the plan, as well as those areas where it is not reasonably foreseeable that a municipal waste management system will be needed within ten years of the submission of the plan.

(3) Take into consideration any existing State plan affecting the development, use and protection of air, water, land or other natural resources.

(4) Set forth a time schedule and proposed methods for financing the development, construction and operation of the planned municipal waste management systems, together with the estimated cost thereof.

(5) Include a provision for periodic revision of the plan.

(6) Include such other information as the department shall require.

(f) The plan shall be reviewed by appropriate official planning agencies within a municipality, including a planning agency with area-wide jurisdiction, if one exists, the county, county planning commission, and county health department for consistency with programs of planning if one exists, of planning for the area, and all such reviews shall be transmitted to the department with the proper plan. In the event a review of any plan has not been transmitted by such planning agency or commission within 90 days of its submission to such agency or commission, then such agency or commission shall be deemed to have waived its right to review the plan, and the department shall then review the plan for approval in the absence of the reviews of such planning agency or commission.

(g) The department is hereby authorized to approve or disapprove plans for municipal waste management systems submitted in accordance with this act. Any plan which has not been disapproved within 120 days of the date of its submission shall be deemed an approved plan, unless notice of pending investigation is given to the applicant by the department before expiration of the 120-day period.

(h) The department is hereby authorized to approve or disapprove revisions of plans for municipal waste management systems submitted in accordance with this act.

(i) The department is authorized to provide technical assistance to counties, municipalities and authorities in coordinating plans for municipal waste management systems required by this act, including revisions of such plans.

(j) The department may establish priorities for the time within which plans shall be submitted and may, in appropriate cases, require the submission of joint plans.

(k) The department may issue any order or may institute any appropriate legal or equitable action to compel municipalities to submit plans in accordance with this act and the rules, regulations and procedures of the department.

(l) The department may order, or obtain an injunction requiring municipalities to implement the plans which they have submitted, in accordance with this act and the rules, regulations and procedures of the department.

Section 202. Powers and duties of municipalities.

(a) Each municipality shall be responsible for the collection, transportation, processing, and disposal of municipal waste which is generated or present within its boundaries and shall be responsible for implementing its approved plan as it relates to the storage, collection, transportation, processing, and disposal of its municipal wastes.

(b) In carrying out its responsibilities, any such municipality may adopt ordinances, regulations and standards for the storage and collection of municipal wastes which shall be not less stringent than, and not in violation of, the rules, regulations, standards, and procedures of the department for the storage, collection, transportation, processing and disposal of municipal waste. Any ordinances, regulations and standards so adopted shall be made a part of the plan required in section 201.

(c) Municipalities may contract with any person or other municipality to carry out their responsibilities for the collection, transportation, processing and disposal of municipal wastes, provided that the ultimate disposal is known to be at a site permitted to accept such waste, and provided, further, that no municipality may delegate the duties imposed by this section. In cases where the planning agency determines and the governing body approves that it is in the public interest for municipal wastes management and disposal to be a public function, the plan shall provide for the mechanisms. Municipalities are

authorized to require by ordinance that all municipal waste generated within their jurisdiction shall be disposed at a designated facility.

Section 203. Grants authorized.

(a) The department is authorized to assist municipalities by administering grants to pay 50% of the costs of preparing official plans for municipal waste management systems in accordance with the requirements of this act and the rules, regulations, and standards adopted pursuant to this act, and for carrying out related studies, surveys, investigations, inquiries, research and analyses.

(b) All grants shall be made from funds appropriated for this purpose by the General Assembly.

ARTICLE III
RESIDUAL WASTE

Section 301. Management of residual waste.

No person or municipality shall store, transport, process, or dispose of residual waste within this Commonwealth unless such storage, or transportation, is consistent with or such processing or disposal is authorized by the rules and regulations of the department and no person or municipality shall own or operate a residual waste processing or disposal facility unless such person or municipality has first obtained a permit for such facility from the department.

Section 302. Disposal, processing and storage of residual waste.

(a) It shall be unlawful for any person or municipality to dispose, process, store, or permit the disposal, processing or storage of any residual waste in a manner which is contrary to the rules and regulations of the department or to any permit or to the terms or conditions of any permit or any order issued by the department.

(b) It shall be unlawful for any person or municipality who stores, processes, or disposes of residual waste to fail to:

(1) Use such methods and facilities as are necessary to control leachate, runoff, discharges and emissions from residual waste in accordance with department regulations.

(2) Use such methods and facilities as are necessary to prevent the harmful or hazardous mixing of wastes.

(3) Design, construct, operate and maintain facilities and areas in a manner which shall not adversely effect or endanger public health, safety and welfare or the environment or cause a public nuisance.

Section 303. Transportation of residual waste.

(a) It shall be unlawful for any person or municipality to transport or permit the transportation of residual waste:

(1) to any processing or disposal facility within the Commonwealth unless such facility holds a permit issued by the department to accept such waste; or

(2) in a manner which is contrary to the rules and regulations of the department or any permit or the conditions of any permit or any order issued by the department.

(b) It shall be unlawful for any person or municipality who transports residual waste to fail to:

(1) use such methods, equipment and facilities as are necessary to transport residual waste in a manner which shall not adversely affect or endanger the environment or the public health, welfare and safety; and

(2) take immediate steps to contain and clean up spills or accidental discharges of such waste, and notify the department, pursuant to department regulations, of all spills or accidental discharges which occur on public highways or public areas or which may enter the waters of the Commonwealth as defined by the act of June 22, 1937 (P.L.1987, No.394), known as "The Clean Streams Law," or any other spill which is governed by any notification requirements of the department.

ARTICLE IV
HAZARDOUS WASTE

Section 401. Management of hazardous waste.

(a) No person or municipality shall store, transport, treat, or dispose of hazardous waste within this Commonwealth unless such storage, transportation, treatment, or disposal is authorized by the rules and regulations of the department; no person or municipality shall own or operate a hazardous waste storage, treatment or disposal facility unless such person or municipality has first obtained a permit for the storage, treatment and disposal of hazardous waste from the department; and, no person or municipality shall transport hazardous waste within the Commonwealth unless such person or municipality has first obtained a license for the transportation of hazardous waste from the department.

(b) The storage, transportation, treatment, and disposal of hazardous waste are hereby declared to be activities, which subject the person carrying on those activities to liability for harm although he has exercised utmost care to prevent harm, regardless whether such activities were conducted prior to the enactment hereof.

Section 402. Listing of hazardous waste.

The Environmental Quality Board shall establish rules and regulations identifying the characteristics of hazardous wastes and listing particular hazardous wastes which shall be subject to the provisions of this act. The list promulgated shall in no event prevent the department from regulating other wastes, which, although not listed, the department has determined to be hazardous; the Department of Environmental Resources may regulate such hazardous wastes when the department has determined such waste poses a substantial present or potential hazard to the human health or the environment by any means including, but not limited to, issuance of orders and the imposition of terms and conditions of permits. The board shall identify the characteristics of hazardous wastes and list particular hazardous

wastes within 30 days after the effective date of this section, which initial list shall not be subject to section 107 of this act but shall be promulgated in accordance with section 204(3) (relating to omission of notice of proposed rule making) of the act of July 31, 1968 (P.L.769, No.240), referred to as the Commonwealth Documents Law.

Section 403. Generation, transportation, storage, treatment and disposal of hazardous waste.

(a) It shall be unlawful for any person or municipality who generates, transports or stores hazardous waste to transfer such waste unless such person or municipality complies with the rules and regulations of the department and the terms or conditions of any applicable permit or license and any applicable order issued by the department.

(b) It shall be unlawful for any person or municipality who generates, transports, stores, treats or disposes of hazardous waste to fail to:

(1) Maintain such records as are necessary to accurately identify the quantities of hazardous waste generated, the constituents thereof which are significant in quantity or in potential harm to human health or the environment, the method of transportation and the disposition of such wastes; and where applicable, the source and delivery points of such hazardous waste.

(2) Label any containers used for the storage, transportation or disposal of such hazardous waste so as to identify accurately such waste.

(3) Use containers appropriate for such hazardous waste and for the activity undertaken.

(4) Furnish information on the general chemical composition of such hazardous waste to persons transporting, treating, storing or disposing of such wastes.

(5) Use a manifest system as required by the department to assure that all such hazardous waste generated is designated for treatment, storage or disposal in such treatment, storage or disposal facilities (other than facilities on the premises where the waste is generated, where the use of a manifest system is not necessary) approved by the department, as provided in this article.

(6) Transport hazardous waste for treatment, storage or disposal to such treatment, storage or disposal facilities which the shipper has designated on the manifest form as a facility permitted to receive such waste or as a facility not within the Commonwealth.

(7) Submit reports to the department at such times as the department deems necessary, listing out:

(i) the quantities of hazardous waste generated during a particular time period; and

(ii) the method of disposal of all hazardous waste.

(8) Carry out transportation activities in compliance with the rules and regulations of the department and the Pennsylvania Department of Transportation.

(9) Treat, store and dispose of all such waste in accordance with the rules and regulations of the department and permits, permit conditions and orders of the department.

(10) Develop and implement contingency plans for effective action to minimize and abate hazards from any treatment, storage, transportation or disposal of any hazardous waste.

(11) Maintain such operation, train personnel, and assure financial responsibility for such storage, treatment or disposal operations to prevent adverse effects to the public health, safety and welfare and to the environment and to prevent public nuisances.

(12) Immediately notify the department and the affected municipality or municipalities of any spill or accidental discharge of such waste in accordance with a contingency plan approved by the department and take immediate steps to contain and clean up the spill or discharge.

(c) After January 1, 1981 any producer of any hazardous waste or any producer having a by-product of production which is a hazardous waste may be required by the department to submit to the department for its approval a plan relating to the disposal of such hazardous waste at either an on-site disposal area or an off-site disposal area before transferring, treating or disposing of this waste.

Section 404. Transition scheme.

(a) Any person or municipality who:

(1) owns or operates a hazardous waste storage or treatment facility required to have a permit under this act, which facility is in existence on the effective date of this act;

(2) has complied with the requirements of section 501(c);

(3) has made an application for a permit under this act; and

(4) operates and continues to operate in such a manner as will not cause, or create a risk of, a health hazard, a public nuisance, or an adverse effect upon the environment;

shall be treated as having been issued such permit until such time as a final departmental action on such application is made. In no instance shall such person or municipality continue to store or treat hazardous wastes without obtaining a permit from the department within two years after the date of enactment hereof.

(b) Any person or municipality who:

(1) as of the effective date of this act transports hazardous waste within the Commonwealth and is required to have a license under this act;

(2) has complied with the requirements of section 501(c);

(3) has made an application for a license under this act; and

(4) transports and continues to transport in such a manner as will not cause, or create a risk of, a health hazard, a public nuisance, or an adverse effect upon the environment;

shall be treated as having been issued such license until such time as a final departmental action on such application is made. In no instance

shall such person or municipality continue to transport hazardous waste without obtaining a license from the department within two years after the date of enactment.

Section 405. Conveyance of disposal site property.

After the effective date of this act, the grantor in every deed for the conveyance of property on which hazardous waste is presently being disposed, or has ever been disposed by the grantor or to the grantor's actual knowledge shall include in the property description section of such deed an acknowledgement of such hazardous waste disposal; such acknowledgement to include to the extent such information is available, but not be limited to, the surface area size and exact location of the disposed waste and a description of the types of hazardous wastes contained therein. Such amended property description shall be made a part of the deed for all future conveyances or transfers of the subject property: Provided, however, That the warranty in such deed shall not be applicable to the surface area size and exact location of the disposed waste and a description of the types of hazardous wastes contained therein.

ARTICLE V
APPLICATIONS AND PERMITS

Section 501. Permits and licenses required; transition scheme; reporting requirements.

(a) It shall be unlawful for any person or municipality to use, or continue to use, their land or the land of any other person or municipality as a solid waste processing, storage, treatment or disposal area without first obtaining a permit from the department as required by this act: Provided, however, That this section shall not apply to the short-term storage of by-products which are utilized in the processing or manufacturing of other products, to the extent that such by-products are not hazardous, and do not create a public nuisance or adversely affect the air, water and other natural resources of the Commonwealth: And provided further, however, That the provisions of this section shall not apply to agricultural waste produced in the course of normal farming operations nor the use of food processing wastes in the course of normal farming operations provided that such wastes are not classified by the board as hazardous.

(b) It shall be unlawful for any person or municipality to transport hazardous waste within the Commonwealth unless such person or municipality has first obtained a license from the department to conduct such transportation activities.

(c) Not later than 90 days after promulgation or revision of regulations under section 402 identifying by its characteristics or listing any substance as hazardous waste, any person or municipality generating or transporting such substance or owning or operating a facility for treatment, storage, or disposal of such substance shall file with the department a notification stating the location and general description

of such activity and the identified or listed hazardous wastes handled by such person or municipality. Not more than one such notification shall be required to be filed with respect to the same substance. No identified or listed hazardous waste may be transported, treated, processed, stored or disposed of unless notification has been given as required under this subsection.

Section 502. Permit and license application requirements.

(a) Application for any permit or license shall be in writing, shall be made on forms provided by the department and shall be accompanied by such plans, designs and relevant data as the department may require. Such plans, designs and data shall be prepared by a registered professional engineer.

(b) The application for a permit to operate a hazardous waste storage, treatment or disposal facility shall also be accompanied by a form, prepared and furnished by the department, containing the written consent of the landowner to entry upon any land to be affected by the proposed facility by the Commonwealth and by any of its authorized agents prior to and during operation of the facility and for 20 years after closure of the facility, for the purpose of inspection and for the purpose of any such pollution abatement or pollution prevention activities as the department deems necessary. Such forms shall be deemed to be recordable documents and prior to the initiation of operations under the permit, such forms shall be recorded and entered into the deed book (d.b.v.) indexing system at the office of the recorder of deeds in the counties in which the area to be affected under the permit is situated.

(c) All records, reports, or information contained in the hazardous waste storage, treatment or disposal facility permit application submitted to the department under this section shall be available to the public; except that the department shall consider a record, report or information or particular portion thereof, confidential in the administration of this act if the applicant can show cause that the records, reports or information, or a particular portion thereof (but not emission or discharge data or information concerning solid waste which is potentially toxic in the environment), if made public, would divulge production or sales figures or methods, processes or production unique to such applicant or would otherwise tend to affect adversely the competitive position of such applicant by revealing trade secrets. Nothing herein shall be construed to prevent disclosure of such report, record or information to the Federal Government or other State agencies as may be necessary for purposes of administration of any Federal or State law.

(d) The application for a permit shall set forth the manner in which the operator plans to comply with the requirements of the act of June 22, 1937 (P.L.1987, No.394), known as "The Clean Streams Law," the act of May 31, 1945 (P.L.1198, No.418), known as the "Surface Mining Conservation and Reclamation Act," the act of

January 8, 1960 (1959 P.L.2119, No.787), known as the "Air Pollution Control Act," and the act of November 26, 1978 (P.L.1375, No.325), known as the "Dam Safety and Encroachments Act," as applicable. No approval shall be granted unless the plan provides for compliance with the statutes hereinabove enumerated, and failure to comply with the statutes hereinabove enumerated during construction and operation or thereafter shall render the operator liable to the sanctions and penalties provided in this act for violations of this act and to the sanctions and penalties provided in the statutes hereinabove enumerated for violations of such statutes. Such failure to comply shall be cause for revocation of any approval or permit issued by the department to the operator. Compliance with the provisions of this subsection and with the provisions of this act and the provisions of the statutes hereinabove enumerated shall not relieve the operator of the responsibility for complying with the provisions of all other applicable statutes, including, but not limited to the act of July 17, 1961 (P.L.659, No.339), known as the "Pennsylvania Bituminous Coal Mine Act," the act of November 10, 1965 (P.L.721, No.346), known as the "Pennsylvania Anthracite Coal Mine Act," and the act of July 9, 1976 (P.L.931, No.178), entitled "An act providing emergency medical personnel; employment of emergency medical personnel and emergency communications in coal mines."

(e) The application for a permit shall certify that the operator has in force, or will, prior to the initiation of operations under the permit have in force, an ordinary public liability insurance policy in an amount to be prescribed by rules and regulations promulgated hereunder.

(f) The department may require such other information, and impose such other terms and conditions, as it deems necessary or proper to achieve the goals and purposes of this act.

(g) The department, upon receipt of an application for a permit, shall give written notice to each and every municipality in which the proposed hazardous waste facility will be located.

Section 503. Granting, denying, renewing, modifying, revoking and suspending permits and licenses.

(a) Upon approval of the application, the department shall issue a permit for the operation of a solid waste storage, treatment, processing or disposal facility or area or a license for the transportation of hazardous wastes, as set forth in the application and further conditioned by the department.

(b) No permit shall be issued unless and until all applicable bonds have been posted with the department.

(c) In carrying out the provisions of this act, the department may deny, suspend, modify, or revoke any permit or license if it finds that the applicant, permittee or licensee has failed or continues to fail to comply with any provision of this act, the act of June 22, 1937 (P.L.1987, No.394), known as "The Clean Streams Law," the act of

January 8, 1960 (1959 P.L.2119, No.787), known as the "Air Pollution Control Act," and the act of November 26, 1978 (P.L.1375, No.325), known as the "Dam Safety and Encroachments Act," or any other state or Federal statute relating to environmental protection or to the protection of the public health, safety and welfare; or any rule or regulation of the department; or any order of the department; or any condition of any permit or license issued by the department; or if the department finds that the applicant, permittee or licensee has shown a lack of ability or intention to comply with any provision of this act or any of the acts referred to in this subsection or any rule or regulation of the department or order of the department, or any condition of any permit or license issued by the department as indicated by past or continuing violations. In the case of a corporate applicant, permittee or licensee, the department may deny the issuance of a license or permit if it finds that a principal of the corporation was a principal of another corporation which committed past violations of this act.

(d) Any person or municipality which has engaged in unlawful conduct as defined in this act, or whose partner, associate, officer, parent corporation, subsidiary corporation, contractor, subcontractor or agent has engaged in such unlawful conduct, shall be denied any permit or license required by this act unless the permit or license application demonstrates to the satisfaction of the department that the unlawful conduct has been corrected. Independent contractors and agents who are to operate under any permit shall be subject to the provisions of this act. Such independent contractors, agents and the permittee shall be jointly and severally liable, without regard to fault, for violations of this act which occur during the contractor's or agent's involvement in the course of operations.

(e) Any permit or license granted by the department, as provided in this act, shall be revocable or subject to modification or suspension at any time the department determines that the solid waste storage, treatment, processing or disposal facility or area or transportation of solid waste:

(1) is, or has been, conducted in violation of this act or the rules, regulations, adopted pursuant to the act;

(2) is creating a public nuisance;

(3) is creating a potential hazard to the public health, safety and welfare;

(4) adversely affects the environment;

(5) is being operated in violation of any terms or conditions of the permit; or

(6) was operated pursuant to a permit or license that was not granted in accordance with law.

Section 504. Approval by governing body.

Applications for a permit shall be reviewed by the appropriate county, county planning agency or county health department where

they exist and the host municipality, and they may recommend to the department conditions upon, revisions to, or disapproval of the permit only if specific cause is identified. In such case the department shall be required to publish in the Pennsylvania Bulletin its justification for overriding the county's recommendations. If the department does not receive comments within 60 days, the county shall be deemed to have waived its right to review.

Section 505. Bonds.

(a) With the exception of municipalities operating landfills solely for municipal waste not classified hazardous, prior to the commencement of operations, the operator of a municipal or residual waste processing or disposal facility or of a hazardous waste storage, treatment or disposal facility for which a permit is required by this section shall file with the department a bond for the land affected by such facility on a form prescribed and furnished by the department. Such bond shall be payable to the Commonwealth and conditioned so that the operator shall comply with the requirements of this act, the act of June 22, 1937 (P.L.1987, No.394), known as "The Clean Streams Law," the act of May 31, 1945 (P.L.1198, No.418), known as the "Surface Mining Conservation and Reclamation Act," the act of January 8, 1960 (1959 P.L.2119, No.787), known as the "Air Pollution Control Act," and the act of November 26, 1978 (P.L.1375, No.325), known as the "Dam Safety and Encroachments Act." The department may require additional bond amounts for the permitted areas should such an increase be determined by the department to be necessary to meet the requirements of this act. The amount of the bond required shall be in an amount determined by the secretary based upon the total estimated cost to the Commonwealth of completing final closure according to the permit granted to such facility and such measures as are necessary to prevent adverse effects upon the environment; such measures include but are not limited to satisfactory monitoring, post-closure care, and remedial measures. The bond amount shall reflect the additional cost to the Commonwealth which may be entailed by being required to bring personnel and equipment to the site. All permits shall be bonded for at least $10,000. Liability under such bond shall be for the duration of the operation, and for a period of up to ten full years after final closure of the permit site. Such bond shall be executed by the operator and a corporate surety licensed to do business in the Commonwealth and approved by the secretary: Provided, however, That the operator may elect to deposit cash, certificates of deposit, automatically renewable irrevocable letters of credit which are terminable only upon 90 days written notice to the operator and the department, or negotiable bonds of the United States Government or the Commonwealth of Pennsylvania, the Pennsylvania Turnpike Commission, the General State Authority, the State Public School Building Authority, or any municipality within the Commonwealth, with the department in lieu of a

corporate surety. The cash amount of such deposit, irrevocable letters of credit or market value of such securities shall be equal at least to the sum of the bond. The secretary shall, upon receipt of any such deposit of cash or negotiable bonds, immediately place the same with the State Treasurer, whose duty it shall be to receive and hold the same in the name of the Commonwealth, in trust, for the purposes for which such deposit is made. The State Treasurer shall at all times be responsible for the custody and safekeeping of such deposits. The operator making the deposit shall be entitled from time to time to demand and receive from the State Treasurer, on the written order of the secretary, the whole or any portion of any collateral so deposited, upon depositing with him, in lieu thereof, other collateral of the classes herein specified having a market value at least equal to the sum of the bond, also to demand, receive and recover the interest and income from said negotiable bonds as the same becomes due and payable: Provided, however, That where negotiable bonds, deposited as aforesaid, mature or are called, the State Treasurer, at the request of the permittee, shall convert such negotiable bonds into such other negotiable bonds of the classes herein specified as may be designated by the permittee: And provided further, That where notice of intent to terminate a letter of credit is given, the department shall, after 30 days written notice to the operator and in the absence of a replacement of such letter of credit within such 30-day period by the operator with other acceptable bond guarantees provided herein, draw upon and convert such letter of credit into cash and hold it as a collateral bond guarantee.

(b) In the case of applications for permits where the department determines that the operations are reasonably anticipated to continue for a period of at least ten years from the date of application, the operator may elect to deposit collateral and file a collateral bond as provided in subsection (a) according to the following phase deposit schedule. The operator shall, prior to commencing operations, deposit $10,000 or 25% of the amount of the bond determined under subsection (a), whichever is greater. The operator shall, thereafter, annually deposit 10% of the remaining bond amount for a period of ten years. Interest accumulated by such collateral shall become a part of the bond. The department may require additional bonding at any time to meet the intent of subsection (a). The collateral shall be deposited in trust, with the State Treasurer as provided in subsection (a) or with a bank, selected by the department, which shall act as trustee for the benefit of the Commonwealth, according to rules and regulations promulgated hereunder, to guarantee the operator's compliance with this act and the statutes enumerated in subsection (a). The operator shall be required to pay all costs of the trust. The collateral deposit, or part thereof, shall be released of liability and returned to the operator, together with a proportional share of accumulated interest, upon the conditions of and pursuant to the schedule and criteria for release provided in this act.

(c) The operator shall, prior to commencing operations on any additional land exceeding the estimate made in the application for a permit, file an additional application and bond. Upon receipt of such additional application and related documents and information as would have been required for the additional land had it been included in the original application for a permit and should all the requirements of this act be met as were necessary to secure the permit, the secretary shall promptly issue an amended permit covering the additional acreage covered by such application, and shall determine the additional bond requirement therefor.

(d) If the operator abandons the operation of a municipal or residual waste processing or disposal facility or a hazardous waste storage, treatment or disposal facility for which a permit is required by this section or if the permittee fails or refuses to comply with the requirements of this act in any respect for which liability has been charged on the bond, the secretary shall declare the bond forfeited and shall certify the same to the Department of Justice which shall proceed to enforce and collect the amount of liability forfeited thereon, and where the operation has deposited cash or securities as collateral in lieu of a corporate surety, the secretary shall declare said collateral forfeited and shall direct the State Treasurer to pay said funds into the Waste Abatement Fund. Should any corporate surety fail to promptly pay, in full, forfeited bond, it shall be disqualified from writing any further surety bonds under this act.

(e) Prior to the issuance of any license for the transportation of hazardous waste, the applicant for a license shall file with the department a collateral bond on a form prescribed and furnished by the department. Such bond shall be payable to the Commonwealth and conditioned upon compliance by the licensee with every requirement of this act, rule and regulation of the department, order of the department and term and condition of the license. The amount of the bond required shall be in an amount determined by the secretary, but in an amount no less than $10,000. The department may require additional bond amounts if the department determines such additional amounts are necessary to guarantee compliance with this act. The licensee may elect to deposit cash or automatically renewable irrevocable letters of credit which are terminable only upon 90 days written notice to the operator and the department, or negotiable bonds of the United States Government or the Commonwealth of Pennsylvania, the Pennsylvania Turnpike Commission, the General State Authority, the State Public School Building Authority, or any municipality within the Commonwealth. No corporate surety bond is authorized by this subsection. The cash amount of such deposit, irrevocable letters of credit, or market value of such securities shall be equal at least to the sum of the bond. The secretary shall, upon receipt of any such deposit of cash or negotiable bonds, immediately place the same with the State Treasurer, whose duty it shall be to receive and hold the same in

the name of the Commonwealth, in trust, for the purposes for which such deposit is made. The State Treasurer shall at all times be responsible for the custody and safekeeping of such deposits. The licensee making the deposit shall be entitled from time to time to demand and receive from the State Treasurer, on the written order of the secretary, the whole or any portion of any collateral so deposited, upon depositing with him, in lieu thereof, other collateral of the classes herein specified having a market value at least equal to the sum of the bond, also to demand, receive and recover the interest and income from said negotiable bonds as the same becomes due and payable: Provided, however, That where negotiable bonds, deposited as aforesaid, mature or are called, the State Treasurer, at the request of the licensee, shall convert such negotiable bonds into such other negotiable bonds of the classes herein specified as may be designated by the licensee: And provided further, That where notice of intent to terminate a letter of credit is given, the department shall, after 30 days written notice to the licensee and in the absence of a replacement of such letter of credit within such 30-day period by the licensee with other acceptable bond guarantees provided herein, draw upon and convert such letter of credit into cash and hold it as a collateral bond guarantee. Liability under such bond shall be for the duration of the license and for a period of one year after the expiration of the license.

Section 506. Financial responsibility.

The Environmental Quality Board shall adopt such additional regulations to provide for proof of financial responsibility of owners or operators of hazardous waste storage, treatment, and disposal facilities, as necessary or desirable for closure of the facility, post-closure monitoring and maintenance, sudden and accidental occurrences, and nonsudden and accidental occurrences, and to comply with section 3004 of the Resource Conservation and Recovery Act of 1976 42 U.S.C. § 6924.

Section 507. Siting of hazardous waste treatment and disposal facilities.

(a) The Department of Environmental Resources shall have the power and authority to develop, prepare and modify the Pennsylvania Hazardous Waste Facilities Plan. The plan shall include:

(1) Criteria and standards for siting hazardous waste treatment and disposal facilities.

(2) An inventory and evaluation of the sources of hazardous waste concentration within the Commonwealth including types and quantities of hazardous waste.

(3) An inventory and evaluation of current hazardous waste practices within the Commonwealth including existing hazardous waste treatment and disposal facilities.

(4) A determination of future hazardous waste facility needs based on an evaluation of existing treatment and disposal facilities including their location, capacities and capabilities, and the existing and projected generation of hazardous waste within the Commonwealth and including where the department within its discretion finds such information to be available, the projected generation outside the Commonwealth of hazardous wastes expected to be transported into the Commonwealth for storage, treatment or disposal.

(5) An analysis of methods, incentives or technologies for source reduction, detoxification, reuse and recovery of hazardous waste and a strategy for implementing such methods, incentives and technologies.

(6) Identification of such hazardous waste treatment and disposal facilities and their locations (in addition to existing facilities) as are necessary to provide for the proper management of hazardous waste generated within this Commonwealth.

(b) In preparation of the plan the department shall consult with affected persons, municipalities and State agencies. Within 60 days after the effective date of this act the secretary shall appoint the Pennsylvania Hazardous Waste Facilities Planning Advisory Committee. The department shall insure that the advisory body consist of substantially equivalent proportions of the following four groups: private citizens, representatives of public interest groups, public officials and citizens or representatives of organizations with substantial economic interest in the plan. It shall specifically include but not be limited to a representative of a waste treatment operator, a waste generator, local governments, environmentalists, and academic scientist.

(c) The committee may recommend to the department the adoption of such rules and regulations, standards, criteria and procedures as it deems necessary and advisable for the preparation, development, adoption and implementation of the Pennsylvania Hazardous Waste Facilities Plan.

(d) A vacancy occurring on the committee shall be filled in the same manner as the original appointment and the secretary or his representative shall serve as chairperson of the committee.

(e) The committee shall establish operating procedures and may solicit the advice of municipalities or other persons.

(f) The committee shall disband after adoption of the plan by the Environmental Quality Board unless the committee is reconstituted as a provision of the plan.

(g) Not later than two years after the date of enactment of this act, the Environmental Quality Board shall adopt the Pennsylvania Hazardous Waste Facilities Plan and the department shall review and amend said plan as necessary but in no event less than every five years following adoption.

ARTICLE VI
ENFORCEMENT AND REMEDIES

Section 601. Public nuisances.

Any violation of any provision of this act, any rule or regulation of the department, any order of the department, or any term or condition of any permit, shall constitute a public nuisance. Any person or municipality committing such a violation shall be liable for the costs of abatement of any pollution and any public nuisance caused by such violation. The Environmental Hearing Board and any court of competent jurisdiction is hereby given jurisdiction over actions to recover the costs of such abatement.

Section 602. Enforcement orders.

(a) The department may issue orders to such persons and municipalities as it deems necessary to aid in the enforcement of the provisions of this act. Such orders may include, but shall not be limited to, orders modifying, suspending or revoking permits and orders requiring persons and municipalities to cease unlawful activities or operations of a solid waste facility which in the course of its operation is in violation of any provision of this act, any rule or regulation of the department or any terms and conditions of a permit issued under this act. An order issued under this act shall take effect upon notice, unless the order specifies otherwise. An appeal to the Environmental Hearing Board shall not act as a supersedeas. The power of the department to issue an order under this act is in addition to any other remedy which may be afforded to the department pursuant to this act or any other act.

(b) If the department finds that the storage, collection, transportation, processing, treatment or disposal of solid waste is causing pollution of the air, water, land or other natural resources of the Commonwealth or is creating a public nuisance, the department may order the person or the municipality to alter its storage, collection, transportation, processing, treatment or disposal systems to provide such storage, collection, transportation, processing, treatment, or disposal systems as will prevent pollution and public nuisances. Such order shall specify the length of time after receipt of the order within which the facility or area shall be repaired, altered, constructed or reconstructed.

(c) Any person or municipality ordered by the department to repair, alter, construct, or reconstruct a solid waste facility or area shall take such steps for the repair, alteration, construction, or reconstruction of the facility or area as may be necessary for the storage, processing, treatment and disposal of its solid waste in compliance with this act and the rules and regulations of the department, and standards and orders of the department.

(d) The Department of Environmental Resources shall have the power to order, orally or in writing, any person or municipality to

immediately suspend or modify hazardous waste treatment or disposal activities when he determines that continued operation will jeopardize public health, safety or welfare. Said order shall be effective upon issuance and may only be superseded by further department action or, after an appeal has been perfected, by the Environmental Hearing Board after notice and hearing. Furthermore, said order may require remedial actions to be taken in order to prevent harm to public health, safety or welfare. Within two business days after the issuance of such oral order, the department shall issue a written order reciting and modifying, where appropriate, the terms and conditions contained in the oral order.

Section 603. Duty to comply with orders of the department.

It shall be the duty of any person and municipality to proceed diligently to comply with any order issued pursuant to section 602. If such person or municipality fails to proceed diligently, or fails to comply with the order within such time, if any, as may be specified, such person or municipality shall be guilty of contempt, and shall be punished by the court in an appropriate manner and for this purpose, application may be made by the department to the Commonwealth Court, which court is hereby granted jurisdiction.

Section 604. Restraining violations.

(a) In addition to any other remedies provided in this act, the department may institute a suit in equity in the name of the Commonwealth where a violation of law or nuisance exists for an injunction to restrain a violation of this act or the rules, regulations, standards or orders adopted or issued thereunder and to restrain the maintenance or threat of a public nuisance. In any such proceeding, the court shall, upon motion of the Commonwealth, issue a prohibitory or mandatory preliminary injunction if it finds that the defendant is engaging in unlawful conduct as defined by this act or is engaged in conduct which is causing immediate and irreparable harm to the public. The Commonwealth shall not be required to furnish bond or other security in connection with such proceedings. In addition to an injunction, the court in such equity proceedings, may levy civil penalties as specified in section 605.

(b) In addition to any other remedies provided for in this act, upon relation of any district attorney of any county affected, or upon relation of the solicitor of any municipality affected, an action in equity may be brought in a court of competent jurisdiction for an injunction to restrain any and all violations of this act or the rules and regulations promulgated hereunder, or to restrain any public nuisance or detriment to health.

(c) The penalties and remedies prescribed by this act shall be deemed concurrent and the existence of or exercise of any remedy shall not prevent the department from exercising any other remedy hereunder, at law or in equity.

(d) Actions instituted under this section may be filed in the appropriate court of common pleas or in the Commonwealth Court, which courts are hereby granted jurisdiction to hear such actions.

Section 605. Civil penalties.

In addition to proceeding under any other remedy available at law or in equity for a violation of any provision of this act, any rule or regulation of the department or order of the department or any term or condition of any permit issued by the department, the department may assess a civil penalty upon a person for such violation. Such a penalty may be assessed whether or not the violation was willful or negligent. In determining the amount of the penalty, the department shall consider the willfulness of the violation, damage to air, water, land or other natural resources of the Commonwealth or their uses, cost of restoration and abatement, savings resulting to the person in consequence of such violation, and other relevant factors. If the violation leads to the issuance of a cessation order or occurs after the release of security for performance, a civil penalty shall be assessed. When the department proposes to assess a civil penalty, it shall inform the person or municipality of the proposed amount of said penalty. The person charged with the penalty shall then have 30 days to pay the proposed penalty in full or, if the person wishes to contest either the amount of the penalty or the fact of the violation, the person shall within such 30 day period file an appeal of such action with the Environmental Hearing Board. Failure to appeal within 30 days shall result in a waiver of all legal rights to contest the violation or the amount of the penalty. The maximum civil penalty which may be assessed pursuant to this section is $25,000 per offense. Each violation for each separate day and each violation of any provision of this act, any rule or regulation under this act, any order of the department, or any term or condition of a permit shall constitute a separate and distinct offense under this section. A generator of hazardous waste who has complied with section 403 and has designated on the manifest a facility permitted to treat or dispose of his wastes shall not be held liable for civil penalties with respect to such wastes by other persons after:

(1) the wastes have been transported in compliance with all applicable provisions of this act and regulations promulgated and licenses issued thereunder; and

(2) such wastes have been accepted by a disposal or treatment facility permitted to receive such wastes and designated on the manifest.

Section 606. Criminal penalties.

(a) Any person, other than a municipal official exercising his official duties, or any municipality who violates any provision of this act, the rules and regulations of the department, or any order of the department, or any term or condition of any permit upon conviction thereof in a summary proceeding, shall be sentenced to pay a fine of

not less than $100 and not more than $1,000 and costs and, in default of the payment of such fine and costs, to undergo imprisonment for not more than 30 days.

(b) Any person other than a municipal official exercising his official duties who violates any provision of this act, any rule or regulation of the department, any order of the department, or any term or condition of any permit, shall be guilty of a misdemeanor of the third degree and, upon conviction, shall be sentenced to pay a fine of not less than $1,000 but not more than $25,000 per day for each violation or to imprisonment for a period of not more than one year, or both.

(c) Any person other than a municipal official exercising his official duties who, within two years after a conviction of a misdemeanor for any violation of this act, violates any provision of this act, any rule or regulation of the department, any order of the department, or any term or condition of any permit shall be guilty of a misdemeanor of the second degree and, upon conviction, shall be sentenced to pay a fine of not less than $2,500 nor more than $50,000 for each violation or to imprisonment for a period of not more than two years, or both.

(d) Any person or municipality that knowingly:

(1) transports any hazardous waste to a facility which does not have a permit under this act to accept such waste for storage, treatment or disposal; or

(2) makes any false statement or representation in any application label, manifest, record, report, permit or other document relating to hazardous waste generation, storage, transportation, treatment or disposal, which is filed, submitted, maintained or used for purposes of compliance with this act or any municipality which knowingly stores, treats or disposes of any hazardous waste without having obtained a permit for such storage, treatment or disposal;

shall be guilty of a misdemeanor of the third degree and, upon conviction, shall be sentenced to pay a fine of not less than $1,000 but not more than $25,000 per day for each violation.

(e) Any person or municipality that within two years after a conviction of a misdemeanor for any violation of this act, commits a violation of subsection (d), shall be guilty of a misdemeanor of the second degree and upon conviction, shall be sentenced to pay a fine of not less than $2,500 nor more than $50,000 for each violation or to a term of imprisonment of not less than two years, but not more than 20 years, or both.

(f) Any person who stores, transports, treats, or disposes of hazardous waste within the Commonwealth in violation of section 401, or in violation of any order of the department shall be guilty of a felony of the second degree and, upon conviction, shall be sentenced to pay a fine of not less than $2,500 but not more than $100,000 per day for each violation or to imprisonment for not less than two years but not more than ten years, or both.

(g) Any person who intentionally, knowingly or recklessly stores, transports, treats, or disposes of hazardous waste within the Commonwealth in violation of any provision of this act, and whose acts or omissions cause pollution, a public nuisance or bodily injury to any person, shall be guilty of a felony of the first degree, and upon conviction, shall be sentenced to pay a fine of not less than $10,000 but not more than $500,000 per day for each violation or to a term of imprisonment of not less than two years, but not more than 20 years, or both.

(h) Each violation for each separate day and each violation of any provision of this act, any rule or regulation of the department, any order of the department, or term and condition of a permit shall constitute a separate and distinct offense under subsections (a), (b), (c), (d) and (e).

(i) With respect to the offenses specified in subsections (a), (b), (c) and (f), it is the legislative purpose to impose absolute liability for such offenses. However, a generator who has complied with section 403 shall not be held criminally liable under this section if wastes have been transported in compliance with all applicable provisions of this act and the regulations promulgated and licenses issued thereunder, and provided that such wastes have been accepted by a facility designated in accordance with section 403(b)(6).

(j) With respect to the offenses specified in subsections (a), (b), (c), (d), (e), (f) and (g), it is the legislative purpose to impose liability on corporations.

Section 607. Existing rights and remedies preserved; cumulative remedies authorized.

Nothing in this act shall be construed as estopping the Commonwealth, or any district attorney or solicitor of a municipality, from proceeding in courts of law or equity to abate pollution forbidden under this act, or abate nuisances under existing law. It is hereby declared to be the purposes of this act to provide additional and cumulative remedies to control the collection, storage, transportation, processing, treatment, and disposal of solid waste within the Commonwealth, and nothing contained in this act shall in any way abridge or alter rights of action or remedies now or hereafter existing in equity, or under the common law or statutory law, criminal or civil, nor shall any provision in this act, or the granting of any permit under this act, or any act done by virtue of this act, be construed as estopping the Commonwealth, persons or municipalities, in the exercise of their rights under the common law or decisional law or in equity, from proceeding in courts of law or equity to suppress nuisances, or to abate any pollution now or hereafter existing, or to enforce common law or statutory rights. No courts of this Commonwealth having jurisdiction to abate public or private nuisances shall be deprived of such jurisdiction in any action to abate any private or public nuisance instituted by any person for the reasons that such nuisance constitutes air or water pollution.

Section 608. Production of materials; recordkeeping requirements; rights of entry.

The department and its agents and employees shall:

(1) Have access to, and require the production of, books and papers, documents, and physical evidence pertinent to any matter under investigation.

(2) Require any person or municipality engaged in the storage, transportation, processing, treatment or disposal of any solid waste to establish and maintain such records and make such reports and furnish such information as the department may prescribe.

(3) Enter any building, property, premises or place where solid waste is generated, stored, processed, treated or disposed of for the purposes of making such investigation or inspection as may be necessary to ascertain the compliance or noncompliance by any person or municipality with the provisions of this act and the rules or regulations promulgated hereunder. In connection with such inspection or investigation, samples may be taken of any solid, semisolid, liquid or contained gaseous material for analysis. If any analysis is made of such samples, a copy of the results of the analysis shall be furnished within five business days to the person having apparent authority over the building, property, premises or place.

Section 609. Search warrants.

An agent or employee of the department may apply for a search warrant to any Commonwealth official authorized to issue a search warrant for the purposes of inspecting or examining any property, building, premise, place, book, record or other physical evidence, of conducting tests, or of taking samples of any solid waste. Such warrant shall be issued upon probable cause. It shall be sufficient probable cause to show any of the following:

(1) that the inspection, examination, test, or sampling is pursuant to a general administrative plan to determine compliance with this act;

(2) that the agent or employee has reason to believe that a violation of this act has occurred or may occur; or

(3) that the agent or employee has been refused access to the property, building, premise, place, book, record or physical evidence, or has been prevented from conducting tests or taking samples.

Section 610. Unlawful conduct.

It shall be unlawful for any person or municipality to:

(1) Dump or deposit, or permit the dumping or depositing, of any solid waste onto the surface of the ground or underground or into the waters of the Commonwealth, by any means, unless a permit for the dumping of such solid wastes has been obtained from the department; provided, the Environmental Quality Board may by regulation exempt certain activities associated with normal farming operations as defined by this act from such permit requirements.

(2) Construct, alter, operate or utilize a solid waste storage, treatment, processing or disposal facility without a permit from the department as required by this act or in violation of the rules or regulations adopted under this act, or orders of the department, or in violation of any term or condition of any permit issued by the department.

(3) Burn solid wastes without a permit from the department.

(4) Store, collect, transport, process, treat, or dispose of, or assist in the storage, collection, transportation, processing, treatment, or disposal of, solid waste contrary to the rules or regulations adopted under this act, or orders of the department, or any term or any condition of any permit, or in any manner as to create a public nuisance or to adversely affect the public health, safety and welfare.

(5) Transport hazardous waste without first having obtained a license from the department to conduct such transport activities.

(6) Transport or permit the transportation of any solid waste to any storage, treatment, processing or disposal facility or area unless such facility or area possesses a permit issued by the department to accept such wastes, or contrary to the rules or regulations adopted under this act, or orders of the department, or in such a manner as to adversely affect or endanger the public health, safety and welfare or environment through which such transportation occurs.

(7) Refuse, hinder, obstruct, delay, or threaten any agent or employee of the department in the course of performance of any duty under this act, including, but not limited to, entry and inspection under any circumstances.

(8) Consign, assign, sell, entrust, give or in any way transfer residual or hazardous waste which is at any time subsequently, by any such person or any other person;

(i) dumped or deposited or discharged in any manner into the surface of the earth or underground or into the waters of the Commonwealth unless a permit for the dumping or depositing or discharging of such residual or hazardous waste has first been obtained from the department; or

(ii) stored, treated, processed, disposed of or discharged by a residual or hazardous waste facility unless such facility is operated under a permit first obtained from the department.

(9) Cause or assist in the violation of any provision of this act, any rule or regulation of the department, any order of the department or any term or condition of any permit.

Section 611. Presumption of law for civil and administrative proceedings.

It shall be presumed as a rebuttable presumption of law that a person or municipality which stores, treats, or disposes of hazardous waste shall be liable, without proof of fault, negligence, or causation, for all damages, contamination or pollution within 2,500 feet of the perimeter of the area where hazardous waste activities have been

carried out. Such presumption may be overcome by clear and convincing evidence that the person or municipality so charged did not contribute to the damage, contamination, or pollution.

Section 612. Collection of fines and penalties.

All fines and penalties shall be collectible in any manner provided by law for the collection of debts. If any person liable to pay any such penalty neglects or refuses to pay the same after demand, the amount together with interest and any costs that may accrue, shall be a judgment in favor of the Commonwealth upon the property of such person, but only after same has been entered and docketed of record by the prothonotary of the county where such property is situated. The department may, at any time, transmit to the prothonotaries of the respective counties certified copies of all such judgments, and it shall be the duty of each prothonotary to enter and docket the same of record in his office, and to index the same as judgments are indexed, without requiring the payment of costs as a condition precedent to the entry thereof.

Section 613. Recovery of costs of abatement.

Any person or municipality who causes a public nuisance shall be liable for the costs of abatement. The department, any Commonwealth agency, or any municipality which undertakes to abate a public nuisance may recover the costs of abatement in an action in equity brought before any court of competent jurisdiction. In addition, the Environmental Hearing Board is hereby given jurisdiction over actions by the department to recover the costs of abatement.

Section 614. Forfeiture of contraband.

Any vehicle, equipment, or conveyance used for the transportation or disposal of hazardous waste in the commission of an offense under section 606 shall be deemed contraband and shall be seized and forfeited to the department. The provisions of law relating to the seizure, summary and judicial forfeiture, and condemnation of intoxicating liquor shall apply to seizures and forfeitures under the provisions of this section.

Section 615. Right of citizen to intervene in proceedings.

Any citizen of this Commonwealth having an interest which is or may be adversely affected shall have the right on his own behalf, without posting bond, to intervene in any action brought pursuant to section 604 or 605.

Section 616. Notice of proposed settlement.

If a settlement is proposed in any action brought pursuant to section 604 or 605, the terms of such settlement shall be published in a newspaper of general circulation in the area where the violations are alleged to have occurred at least 30 days prior to the time when such settlement is to take effect. The publication shall contain a solicitation for public comments concerning such settlement which shall be directed to the government agency bringing the action.

Section 6[illegible] Limitation on action.

The provisions of any other statute to the contrary not withstanding, actions for civil or criminal penalties under this act may be commenced at any time within a period of 20 years from the date the offense is discovered.

ARTICLE VII
SOLID WASTE ABATEMENT FUND

Section 701. Solid Waste Abatement Fund.

(a) All fines, penalties and bond forfeitures collected under the provisions of this act shall be paid into the Treasury of the Commonwealth into a special fund to be known as the "Solid Waste Abatement Fund" hereby established. The Solid Waste Abatement Fund shall be administered by the department for abatement or elimination of present or potential hazards to human health or to the environment from the improper treatment, transportation, storage, processing, or disposal of solid wastes, and for the enforcement of this act.

(b) All such moneys placed in the Solid Waste Abatement Fund under the provisions of this section are hereby made available immediately, and are hereby specifically appropriated to the department for the purposes specified in this section.

(c) Estimates of the amounts to be expended under this act shall be submitted to the Governor for his approval or disapproval.

ARTICLE VIII
LEASING REAL ESTATE

Section 801. No prohibition against leasing real estate.

Nothing in this act shall be construed to prevent the Commonwealth from leasing such real estate owned by the Commonwealth as is not being used in connection with the work of any department, board or commission thereof for a period of not more than 50 years to individuals, firms, corporations or the United States Government pursuant to section 2402(i) of "The Administrative Code of 1929," for the purpose of operating hazardous waste storage, treatment or disposal facilities.

ARTICLE IX
LIBERAL CONSTRUCTION

Section 901. Construction of act.

The terms and provisions of this act are to be liberally construed, so as to best achieve and effectuate the goals and purposes hereof.

ARTICLE X
REPEALER; EFFECTIVE DATE

Section 1001. Repeal.

The act of July 31, 1968 (P.L.788, No.241), known as the "Pennsylvania Solid Waste Management Act," is repealed: Provided,

[illegible]owever, That all permits and orders issued, municipal solid waste management plans approved, and regulations promulgated under such act shall remain in full force and effect unless and until modified, amended, suspended or revoked.

Section 1002. Severability.

If any provision of this act or the application thereof is held invalid, such invalidity shall not effect other provisions or applications of this act which can be given effect without the invalid provisions or application and to this end the provisions of this act are declared to be severable.

Section 1003. Effective date.

Section 402 of this act shall take effect immediately; the remainder of this act shall take effect in 60 days.

APPROVED—The 7th day of July, A. D. 1980.

DICK THORNBURGH

No. 1980-87

AN ACT

HB 1899

Amending the act of April 9, 1929 (P.L.177, No.175), entitled "An act providing for and reorganizing the conduct of the executive and administrative work of the Commonwealth by the Executive Department thereof and the administrative departments, boards, commissions, and officers thereof, including the boards of trustees of State Normal Schools, or Teachers Colleges; abolishing, creating, reorganizing or authorizing the reorganization of certain administrative departments, boards. and commissions; defining the powers and duties of the Governor and other executive and administrative officers, and of the several administrative departments, boards, commissions, and officers; fixing the salaries of the Governor, Lieutenant Governor, and certain other executive and administrative officers; providing for the appointment of certain administrative officers, and of all deputies and other assistants and employes in certain departments, boards, and commissions; and prescribing the manner in which the number and compensation of the deputies and all other assistants and employes of certain departments, boards and commissions shall be determined," authorizing a lease for oil rights at Woodville State Hospital and further providing for the powers and duties of the Department of Environmental Resources.

The General Assembly of the Commonwealth of Pennsylvania hereby enacts as follows:

Section 1. Clause (6) of section 1902-A, act of April 9, 1929 (P.L.177, No.175), known as "The Administrative Code of 1929," amended October 4, 1978 (P.L.1006, No.214), is amended to read:

Section 1902-A. Forest Powers and Duties.—The Department of Environmental Resources shall have the power, and its duty shall be:

* * *

(6) Whenever it shall appear that the welfare of the Commonwealth, with reference to reforesting, and the betterment of the State forests, with respect to control, management, protection, utilization, development, and regulation, of their occupancy and use, will be advanced by selling or disposing of any of the timber on the State forests, to dispose of such timber on terms most advantageous to the State: Provided, That the department is authorized and directed to set aside, within the State forests, unusual or historical groves of trees, or natural features, especially worthy of permanent preservation, to make the same accessible and convenient for public use, and to dedicate them in perpetuity to the people of the State for their recreation and enjoyment. And the said department is hereby empowered, to make and execute contracts or leases, in the name of the Commonwealth, for the mining or removal of any valuable minerals that may be found in said State forests, or of oil and gas beneath those waters of Lake Erie owned by the Commonwealth, or of *oil and* gas beneath the land

of Woodville State Hospital owned by the Commonwealth, whenever it shall appear to the satisfaction of the department that it would be for the best interests of the State to make such disposition of said minerals: And provided further, That any proposed contracts or leases of valuable minerals, exceeding one thousand dollars ($1,000) in value, shall have been advertised once a week for three weeks, in at least two newspapers published nearest the locality indicated, in advance of awarding such contract or lease. Such contracts or leases may then be awarded to the highest and best bidder, who shall give bond for the proper performance of the contract as the department shall designate: Provided, however, That where the Commonwealth owns a fractional interest in the oil, natural gas and other minerals under State forest lands, the requirement of competitive bidding may be waived, and the department may enter into a contract to lease that fractional interest, with the approval of the Governor, and upon such terms and conditions as the department deems to be in the best interest of the Commonwealth.

* * *

Section 2. The act is amended by adding a section to read:

Section 1904-A.1. Uranium Tailings.—(a) The Department of Environmental Resources shall have the power and its duty shall be:

(1) To enter into such cooperative agreements with the United States Department of Energy as are described in section 103 of the Uranium Mill Tailings Radiation Control Act of 1978, Public Law 95-604, 42 U.S.C. § 7901 et seq. to perform remedial actions at each processing site in Pennsylvania designated by the Secretary of the United States Department of Energy under the Uranium Mill Tailings Radiation Control Act of 1978.

(2) To acquire, in consultation with the United States Government, by purchase or by eminent domain, such property or interest therein as is necessary for performance of remedial action.

(3) To pay, in cooperation with the United States Government, to both tenants and owners in fee of such property as is acquired by purchase, in addition to the purchase price, those moving and removal expenses and other damages as are provided for in Article VI of the act of June 22, 1964 (Sp.Sess., P.L.84, No.6), known as the "Eminent Domain Code."

(4) To dispose of any property or interest therein acquired under the provisions of this section in accordance with the terms and conditions of cooperative agreements entered into pursuant to clause (1).

(5) To perform, in cooperation with the United States Government, such other remedial action as may be necessary.

(b) For the purposes of this section "processing site" means:

(1) any site in the Commonwealth, including the mill, containing residual radioactive materials at which all or substantially all of the uranium was produced for sale to any Federal agency prior to January 1, 1971, under a contract with any Federal agency; or

(2) any other real property or improvement which is in the vicinity of such site and is determined by the Secretary of the United States Department of Energy to be contaminated with residual radioactive materials derived from such site.

Section 3. This act shall take effect immediately.

APPROVED—The 2nd day of July, A. D. 1980.

DICK THORNBURGH